AGENDA
CITY OF GLENWOOD SPRINGS
Planning and Zoning Commission
Regular Meeting
JUNE 23, 2020
Council Chambers, First Floor
101 W. 8TH STREET
6:00 PM

You are invited to a Zoom webinar.

When: Jun 23, 2020 06:00 PM Mountain Time (US and Canada)

Topic: 2020/06/23 Planning and Zoning Commission Meeting

Please click the link below to join the webinar:

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1 Zoom Meeting Instructions

2 Roll Call

3 Receipt of the Minutes

A. Minutes-May 26, 2020

4 Comments from citizens appearing for items not on the agenda

5 Continued Items

A. 04-20 Consideration of a Major Site/Architectural Plan Review, Rezoning from RH Residential High-Density to RT Residential Transitional, and Variance applications for the construction of 100 Multifamily apartment units in 6 buildings on approximately 5.8 acres (PIN 2185-153-04-001, 2185-153-02-008, and 2185-211-00-002)

6 New Items

A. Consideration of a Minor Site/Architectural Plan Review for the 2838 square foot expansion of an existing commercial building (PIN: 2185-053-41-001 and 002)

B. Consideration of a Location & Extent Review application for construction of an 1,800 s.f. covered storage building, a 5-bay 2,250 s.f. garage/storage building, a 3,200 s.f. temporary canvas covered building, and temporary mobile and storage units. The application includes moving and extending an existing chain link fencing on the north property line and constructing a concrete pad for street sweeper use.

7 Commissioner Comments

8 Director Comments

9 Adjournment

MINUTES
City of Glenwood Springs
Planning and Zoning Commission
Regular Meeting
May 26, 2020
Zoom
6:00PM

1. **Roll Call**

Present at roll call were Commissioners:	George Shaver, Marco Dehm, Kathryn Grosscup, Amber Wissing, Carolyn Cipperly, Ingrid Wussow, Sumner Schachter
Absent at roll call were Commissioners:	None
Also present were:	Jenn Ooton, Asst. City Manager, Terri Partch, City Engineer, Gretchen Ricehill, Asst. Economic/Community Development Director, Trent Hyatt, Senior Planner Anna S. Itenberg, City Attorney's Office Catherine Fletcher, City Clerk Jessica Bowser, Asst. City Engineer, Alissa Owsley, IT Director

2. **Receipt of Minutes- Receipt of April 28, 2020 and May 5, 2020 minutes.**

   Commissioner Wussow made a motion to receive the minutes, seconded by Commissioner Shaver. Motion passed unanimously.

3. **Public Comments**
   Comments from citizens appearing for items not on the agenda. No citizens were present.

4. **Continued Items –**
   a. *04-20 Consideration of a Major Site/Architectural Plan Review, Rezoning from RH Residential High-Density to RT Residential Transitional and Variance applications for the construction of 100 Multifamily apartment units in 6 buildings on approximately 5.8 acres (PIN 2185-153-04-001, 2185-153-02-008, and 2185-211-00-002)*

Commissioner Dehm reviewed the status of the hearing since May 5, 2020. Dehm noted that the public comment section was closed prior to losing internet connection and that the Planning Commission members had started deliberations prior to losing connection.

Commissioner Schachter asked for clarification of the status of the Blake gate and Blake Avenue improvements. City Engineer Terri Partch explained that these Blake Avenue items were conditions of a previous approval. Jenn Ooton clarified that the gate direction came from Council and was subsequent to Council's consideration of this application. Jenn Ooton indicated that it would be ideal to hold a neighborhood meeting following this application to address Blake gate and other neighborhood traffic issues. Terri Partch confirmed that the traffic study model was created with the assumption that the Blake gate was open.

Commissioner Schachter asked staff when the Blake gate would be opened and asked about the possibility of changing direction, if at all, on Blake. Terri Partch explained that the one-way direction for Blake was determined due to the condition of the asphalt on Blake Avenue.

Commissioner Wissing asked how long the on-site manager would be in place on site. Michael O'Connor from Triumph Development, LLC clarified that that on-site manager was to be a permanent fixture on the site. Commissioner Shaver also asked to confirm the ownership of the property and Trent Hyatt confirmed that the owner of the property, Triumph Development LLC, was also the applicant. Commissioner Shaver also asked about the status of off-site drainage improvements and the parking management plan.

Michael O'Connor explained that part of the parking management plan will rely on the on-site manager and that part of the parking management would be restricting the number of residents per unit and that parking spaces would be numbered and assigned per each tenant's lease. Stephanie Copeland from Triumph confirmed that there would be restrictions for number of residents per unit.

Jenn Ooton clarified the timing of the opening of Blake gate and that it would be open only to construction traffic during building construction and officially opened following issuance of Certificate of Occupancy for the final building on the property.

Commissioner Cipperly asked for clarification of other improvements related to the former project approval. Cipperly specifically asked about sidewalk size and the lack of sidewalk on both sides of the street. Trent Hyatt explained that the new engineering standards were adopted after approval of last application which results in the new application having a different sidewalk width than in the previous project. Trent Hyatt also explained that City Engineer Terri Partch has ability to waive certain construction standards based on topography. Cipperly also expressed concern over the planned 9-foot tall, 400' long retaining wall and expressed concern about wildlife movement. Michael O'Connor confirmed that wildlife would not be able to move through the fence and would need to move around it. Trent Hyatt confirmed that pedestrian access was not required to the privately owned land bordering the site. Cipperly also expressed concern over mitigation of trespassing issues and homeless encampments on the nearby hillside and asked how the site will deter trespassing. O'Connor explained that there will likely be cameras in the parking lots as well as retaining walls and fencing that would also deter trespassing on the site. Cipperly also asked if it was possible to require tenants to list all vehicles registered to a tenant and Stephanie Copeland confirmed that they would require tenants to provide list of all registered vehicle as part of the residency application.

Commissioner Dehm asked if the proposed traffic flow was acceptable to the Engineering Department. City Engineer Terri Partch confirmed that the two way directional flow through gate on Blake Avenue was acceptable. Commissioner Dehm also asked Trent Hyatt to confirm that what the applicant was proposing was a use by right for the zoning district, which was confirmed by Trent Hyatt. Commissioner Dehm also asked the applicant if they had conducted a community meeting. O'Connor summarized that the community meeting was well attended and that the sentiments of the public meeting were similar to the public comments that had been submitted during past Planning & Zoning Commission meetings. The public comments at the meeting addresses scale of project, road conditions, and traffic. application conditions of approval- can these be referenced in the current conditions of approval. Commissioner Dehm also asked if the conditions of approval from previous projects could be referenced with this application and both City Attorney Anna Itenberg and Trent Hyatt both confirmed that Planning & Zoning Commission could include conditions from previous approvals to pass on with this new application as it moves to City Council.

Commissioner Dehm then moved to consider the variances.

Action 1: 04-20 Variance from Section 070.040.080(d)(2)a.2 of the Glenwood Springs Municipal Code which requires internalized parking to be located away from street frontages.

Commissioner Schachter had a question if the variances were not approved if that would prohibit the application from proceeding. City Attorney Anna Itenberg explained that each variance would need to be examined individually and that the applicant could either proceed with denied variances which would require to amend the site plan or appeal the denial. Schachter also asked for confirmation as to how the criteria for approval for each variance related to approval of the whole project. Trent Hyatt explained that many of the variances are closely related and although they are reviewed individually that denying one could substantially alter the entire development.

Commissioner Wussow asked to confirm that since Planning & Zoning is a recommending body that any variance denied by Planning & Zoning could still be approved by City Council. Hyatt explained that Planning & Zoning Commission is the deciding body for variances and the Planning & Zoning could deny a variance and that an appeal would then have to be made by the applicant to City Council.

Commissioner Grosscup made a motion to approve Action #1 with the seven recommended findings on page 12 of staff report. Commissioner Wussow seconded the motion

Commissioner Dehm opened the motion for discussion.

Commissioner Schachter expressed reservations about proceeding with the application without understanding the circulation plan and felt that there were too many unknowns. Schachter explained that he would like to see a circulation plan that had approval of the neighborhood before even considering application approval. Commissioner Wussow stated that it seemed that the variance would not be needed if the owner kept the density as originally approved. Commissioner Shaver found no issue with this specific variance and that he would reserve comments about the general development to the final action item. Commissioner Grosscup expressed no issues with this variance request and felt that this proposed variance allows the project to utilize the topography of the hillside and that this variance resulted in an improved site plan. Commissioner Wissing asked for clarification that the applicant did not create the hardship by their own actions and that the hardship was not related to

convenience. Trent Hyatt confirmed that analysis on page 10 of the staff report identified that the hardship is created by the topography shape and geologic conditions of the property.

Further discussion among Commission members included a general discussion about how the variances relate to the entire development and discussed the need to develop a circulation plan prior to proceeding with all actions.

Jenn Ooton explained that the Planning Commission per Code would be allowed to remand an application back to the Director for further consider and would need to tie the request to remand the application to a specific variance. Ooton explained that if the Commission wanted to see a circulation plan that this request would need to be added as a condition to an applicable variance.

Commissioner Grosscup added that a circulation plan was critical and that ultimately, this area is difficult from a transportation perspective and would like to see more engagement by the City and that the new site plan was an improvement over previous plans for the site.

City Engineer Terri Partch explained that there is an existing circulation plan which was indicated in the traffic study which was modeled with Blake Avenue as a two-way street. Partch explained that the applicant has provided information on circulation and what could be done is request the developer to assist by working with residents to develop a mitigation plan. Commissioner Schachter asked if there were ways to develop a plan that would direct traffic away from the neighborhood. Commissioner Shaver asked for clarification as to what a mitigation plan would involve and Terri Partch explained that a mitigation plan would involve both public input and the creation of solutions based on that public input which could slow, reduce, or redirect traffic through the neighborhood. Ooton mentioned that any sort of street solution such as a cul-de-sac or additional gates could be added as conditions and would need additional consideration for things such as fire access and snow plowing. Commissioner Dehm also mentioned the possibility of moving the gate to 26th Street or a bollard. Commissioner Cipperly expressed concern that the City has not adequately heard from the neighborhoods due to social distancing due to COVID-19. Cipperly also asked if there was a master circulation plan or sidewalk plan for the neighborhood. Commissioner Wussow expressed that it seemed that had the owners kept the original density, construction on the project would have already started. Wussow also stated that if the Commission wished to discuss the development as whole, that should be addressed in Action 4 and that this discussion should focus on Action Item 1.

Commissioner Dehm called for the question.

Commissioners Grosscup, Shaver, Wissing, Cipperly, and Dehm approved, Commissioners Schachter and Wussow denied the Action.

Motion passed 5-2.

Action #2: Variance from Section 070.040.080(e)(3) of the Glenwood Springs Municipal Code requiring developments encompassing three acres to provide at least two housing types.

Commissioner Grosscup made a motion to approve Action #2. Motion was seconded by Commissioner Shaver.

Commissioner Dehm then started discussion on the item.

Commissioner Dehm expressed the opinion that this variance request did not meet the seven criteria. Commissioner Wussow agreed that the hardship was created by increase in density and that this proposed project did not fit with the feel and character of the surrounding area. Commissioner Schachter cited that the singular use of the property does not fit with the goal of trying to provide for a diversity of housing within the city. Commissioner Dehm asked for staff to clarify if the developer could have started construction per prior approval. Trent Hyatt confirmed that the applicant could still start construction based on plans which received previous approval. Commissioner Grosscup stated that this application is an improvement compared to the previously approved application.

Dehm then called for the question to approve Action Item #2.

Commissioners Shaver and Grosscup approved, Commissioners Schachter, Wissing, Dehm, Cipperly, and Wussow denied the motion.

Motion failed 5-2.

Action #3: Rezoning of 2710 Blake Avenue (PIN: 2185-211-002) from RH Residential High Density to RT Residential Transitional.

Commissioner Wussow made a motion to approve the motion, Commissioner Wissing seconded the motion.

Motion passed unanimously.

Action 4: Major Site/Architectural Plan Review to allow for the construction of 100 multi-family apartment units in six buildings.

Commissioner Schachter made a motion to continue the item with the objective to gather more information based on collaborative neighborhood circulation plans with city. Commissioner Wussow seconded the motion. Commissioner Grosscup asked about the motion to continue and if the applicant would be able to create said circulation plan. Jenn Ooton asked to clarify what specifically would be included in the plan and what type of timeline would the plan require. Commissioner Schachter explained that it would be necessary to hold public meetings involving the neighborhood to find a solution for the traffic and transportation concerns. Jenn Ooton explained there would be a need to set a deadline for this process and Commissioner Dehm suggested a period of 60 days. Commissioner Wussow stated that this development that has been a long-term project and that there have been significant community concerns at every juncture. Wussow stated that the current plan, while better than previous plans, still lacks some items and believes that not rushing the project and working with the neighborhood might be the most prudent way to proceed. Commissioner Shaver expressed concern about the project, specifically Building F, and suggested to remove it allowing for more open space and to enlarge Building E to compensate for unit loss. Shaver also questioned if the City would have the resources to improve the streets in the neighborhood given the current economic situation.

Commissioner Schachter made a motion to amend the continuance to 60 days and Commissioner Wussow seconded the amended motion. Commissioner Dehm cautioned that the discussion with the neighborhood would need to focus specifically on traffic circulation and mitigation and trying to develop solutions. Trent Hyatt asked if a date could be chosen for the continuance such as July 28, 2020. Both Commissioner Schachter and Wussow agreed with the date.

The motion passed unanimously.

Following the vote, Stephanie Copeland, Triumph Development, LLC, asked to clarify specifically which items would be required for a circulation plan and if July 28th was the earliest or the latest the application could be heard. Commissioner Schachter explained that what would be satisfy the requirement is a solution-based proposal that better involves the neighborhood to create a circulation and/or mitigation plan that will go to the City for approval. Copeland asked for clarification as to what would constitute satisfaction of the neighbors. Commissioner Schachter indicated that it would be likely best for the City to run the meetings while involving the application. Jenn Ooton also explained that July 28th would likely be the soonest that this issue could be discussed.

Commissioner Wussow also asked if it would be possible to have more information about the possible financial ramifications of the project to the City as to better understand how involved the City would be with this project. Jen Ooton questioned how that directly related to this application.

Commissioner Dehm called for a 5-minute recess at 8:34 PM.

Commissioner Dehm called the meeting back to order following a 5-minute recess.

b. *06-20 Consideration of a Special Use Permit for a Retail Marijuana establishment at 2114 Grand Avenue (PIN 2185-164-00-095)*

At the previous meeting on 5/5/2020, this item had been in the middle of public input when the internet connection was lost. Commissioner Dehm continued the public input portion. City staff had received the following written comments which were read into the record.

- Joel Dembinsky, on April 17th, 2020 sent an e-mail stating that this location is not an appropriate location for a dispensary and believes it incompatible with surrounding residential and commercial uses. Requested denial of the application.
- Garfield & Hecht Law Firm, representing Cedar Lodge, Inc, provided written comment stating that it was their opinion that the proposed marijuana store at 2114 Grand Avenue did not meet the criteria for approval as the location did not seem appropriate given the nearby proximity of a gun store and residential units sharing walls with the proposed store. The letter also expressed concerns over the small size of the parking lot as well as concerns that overflow parking from the proposed store would end up in the Cedar Lodge lot. The letter also mentioned concerns over Kind Castle's ability to adequately manage the odor. Requested denial of the application.
- Michelle Keplinger expressed the opinion that Planning & Zoning Commission should deny the application as there are multiple existing dispensaries in Glenwood Springs. Requested denial of the application.
- Suzanne Stewart requested denial of the application based on the fact there are already eight existing dispensaries and concerns that the proximity of the gas station to the proposed store could lead to increased driving under the influence. Requested denial of the application.
- Cindy Svatos, expressed the opinion that there were already enough dispensaries in Glenwood Springs and stated displeasure over the displacement of the existing frame store. Requested denial of the application.

- Barbara Koziol, provided comments on behalf of the Cedar Lodge, and expressed concerns regarding the location of the proposed store, the proximity to the Cedar Lodge, ability of Kind Castle to adequately manage the odor, and the possibility of an increase in traffic and the possibility of overflow parking from Kind Castle spilling over onto Cedar Lodge's lot. Requested denial of the application.
- Sue Sharpe, provided comments which expressed concerns that there are already a sufficient number of dispensaries in Glenwood Springs, possible negative effects on tourism, proximity of the store to Cedar Lodge and the gun store, and the displacement of the existing frame store. Requested denial of the application.
- Lynette Marie Lacerda, 285 Michaela Lane, New Castle provided comments which expressed concerns over possible increased traffic and congestion on site and a perceived lack of parking. Requested denial of the application.
- Linda Drake, April 29th, provided comments which expressed displeasure over the displacement of the frame store and expressed the opinion that there were already enough dispensaries in Glenwood Springs. Requested denial of the application.
- Dendy Heisel, provided comments which expressed the opinion that there are enough dispensaries in Glenwood Springs and expressed concern over possible increased traffic on site. Requested denial of the application.
- Debbie Roof provided comments that expressed the opinion that there are enough dispensaries in Glenwood Springs and expressed concern over possible increased traffic on site and its proximity to the high school. Requested denial of the application.
- Katie Laven, provided comments that expressed the opinion that there are enough dispensaries in Glenwood Springs and expressed concern over possible increased traffic on site and its proximity to the high school. Requested denial of the application.
- Kristine Del Rio, 1009 Colorado Avenue provided comments that expressed the opinion that there are already enough dispensaries in Glenwood Springs and expressed concern over the proximity of the site to the high school.

Commissioner Dehm opened the public comment to any individuals in the Zoom meeting that wished to speak on the item that had already not submitted comment. No members of the public had comments.

Commissioner Dehm closed the public comment portion of the meeting.

John Dyet, applicant and owner of Kind Castle, provided a summary to the Commission how odor would be managed on site with details of the systems used and how its effects on nearby properties would be managed. Dyet also stated that other dispensaries in town operate with proximity to other businesses and residential areas and felt that their proposed plan made adequate measures to control odor. Dyet also stated that previous amendments to the code ordinance regarding dispensaries were created due to concern over dispensaries effects on tourism which resulted in dispensaries not being allowed in the downtown area and that the proposed location would not negatively affect tourism given the distance from downtown. Dyet also explained that the possible overflow parking into Cedar Lodge is something that Kind Castle could control and manage. Dyet explained that Kind Castle would be a good neighbor to Cedar Lodge and other nearby businesses.

Mark Mayasich, Kind Castle addressed some of the comments expressed during public comment portion of the meeting. Mayasich questioned why it was an issue for a dispensary to share a wall with a gun store when it also shares a wall with a pawn shop and why that would be different. Mayasich also

stated that the location of Kind Castle met the distance requirements of the ordinance and due to its distance from downtown, would not have a negative effect on tourism. Mayasich explained that the barbershop had closed which would free up additional parking spaces and that overflow parking is likely to happen with any business. Mayasich also explained that pre-packaged flower will be sold on site and explained that odor management plan would be more than adequate. Mayasich described how the Kind Castle Parachute location resulted in increased revenue for nearby businesses and believed that the Kind Castle location in Glenwood Springs would have a similar effect. Mayasich also described security measures such as video cameras and window tint that would be used on site.

Discussion among commission members.

Commissioner George Shaver requested staff to provide summary of Police Department and Fire Department comments on the project. Trent Hyatt explained that Police Chief Joe Deras had expressed general concerns over the proposed location and its proximity to residential areas and the general traffic and congestion of the area. Fire Department comments expressed concern over access and ability to maneuver on site.

Commissioner Wissing asked how many complaints the City has received in connection with the marijuana industry in Glenwood Springs. Gretchen Ricehill explained that the City had not received complaints on the retail establishments and has received complaints on the grow facilities on Devereux Road. Commissioner Grosscup asked when the new ordinances for marijuana establishments were established. Trent Hyatt mentioned that City Council has discussed a possible cap on limiting number of dispensaries in town and that no action towards that beyond discussion had occurred.

Commissioner Schachter asked questions regarding the access control plan to the property and how redevelopment would affect the site. Trent Hyatt explained that CDOT had recommended combining the access in the future if the site was redeveloped. Commissioner Dehm asked to confirm that there were two residential units connected to the proposed project space and Trent Hyatt confirmed this.

Commissioner Cipperly had questions regarding the CDOT access permit and if the possible sidewalk realignment would result in a loss of parking. Trent Hyatt explained that there are existing substandard conditions on site and that was unable to comment on possible number of parking spaces lost based on that CDOT access plan. Commissioner Grosscup asked for confirmation for the total number of marijuana applications in town and Trent Hyatt confirmed that there are nine approved applications with seven operating, which does include two cultivation facilities with retail.

Commissioner Wussow made the motion to deny the application. Wussow cited the comprehensive plan and stated reason for denial was that this business pulls business away from downtown. The motion was seconded by Commissioner Cipperly.

Commissioner Schachter mentioned that the application meets the SUP criteria and that the application did not fit the general purpose of the Comprehensive Plan. Schachter also voiced support for City Council to consider a cap on marijuana establishments within the City. Commissioner Cipperly stated that while the use of this property was appropriate, there are concerns over increase in traffic to an already congested area. Commissioner Wussow further explained that the Comprehensive Plan is clear on the importance on consolidating businesses in the downtown. Commissioner Dehm stated that it is not Planning & Zoning Commission's job to determine the appropriate number of marijuana establishments in the City. Dehm explained that the purpose of a Special Use Permit is to evaluate if a

proposed use fits with surrounding uses and cited the fact that no other marijuana establishments in town are in a mixed-use building. Dehm explained that because it was a mixed-use building with residential units, that this site was not the best place for the proposed project.

Vote taken. Motion to deny the application passed unanimously.

5. New Items

a. *20-19 Consideration of a Code Amendment to Section 070.010.070 of the Glenwood Springs Municipal Code regarding the City's nonconforming use regulations.*

Commissioner Shaver recused himself and left the meeting.

Trent Hyatt summarized the intent of the proposed code amendment as it related to legal non-conforming structures in riparian areas.

No public comments were received.

Commissioner Wussow asked if the City would provide additional information to the public that resides along the river. Trent Hyatt explained that additional outreach would be provided for the proposed riparian setback code amendment and not this specific amendment.

Commissioner Cipperly made a motion to approve the item with the findings as stated in the staff report. The motion was seconded by Commissioner Schachter.

The motion to approve the item passed unanimously. Commissioner Shaver had already recused himself from the meeting.

6. Commissioner Comments

Commissioner Wussow stated that this meeting illustrated two potential problems with code in the variance requirements and the number of marijuana establishments and that the City could explore further discussion on those items. Commissioner Schachter expressed a desire to be able to restart the conversation and discussion on housing with the Housing Commission. Commissioner Grosscup mirrored Schachter's statement on housing and asked if Midland Avenue improvement were still planned. Jenn Ooton confirmed that these improvements were still on schedule. Commissioner Cipperly stated would like to see a reconsideration of code regarding the parking requirement reduction in code based on proximity to transit. Commissioner Dehm asked if City Hall would be reopening to the public and Jenn Ooton explained that a press release would be issued explaining that staff would be allowed back in the office and not the public. Dehm also asked if there was a possibility of an in-person meeting in June and Jen Ooton could not confirm that and explained that the City was looking at option for an in person meeting. Commissioner Schachter also congratulated City Clerk Catherine Fletcher for her recent feature in the Post Independent.

7. Adjournment

Meeting was adjourned at 10:06 PM.

Planning and Zoning Commission Report

Date: June 23, 2020

To: Planning and Zoning Commission

From: Trent Hyatt, Senior Planner

Subject: A. 04-20 Consideration of a Major Site/Architectural Plan Review, Rezoning from RH Residential High-Density to RT Residential Transitional, and Variance applications for the construction of 100 Multifamily apartment units in 6 buildings on approximately 5.8 acres (PIN 2185-153-04-001, 2185-153-02-008, and 2185-211-00-002)

REQUEST	Major Site/Architectural Plan Review, Rezoning, and Variances related to a 100-unit multi-family apartment development
APPLICANT	Triumph Development West, LLC
OWNER	Bell Rippy Glenwood LLC
LOCATION	Adjacent to Palmer Avenue between 26th Street and Blake Avenue (PIN: 2185-153-04-001, 2185-153-02-008, and 2185-211-00-002)
ZONE	RH Residential High-Density and RT Residential Transitional
SURROUNDING LAND USES	North: Mixed residential South: Retail East: Vacant, Bureau of Land Management West: Multi-family residential, mixed commercial
LOT SIZE	Approximately 250,034 square feet (5.74 acres)

ACTION ITEMS

Action 4 – Major Site/Architectural Plan Review – to allow for the construction of 100-unit multi-family apartment units in six buildings.

BACKGROUND

The subject proposal was first considered by the Commission at the April 28, 2020 regular meeting which was followed by a special meeting on May 5 to allow for the receipt of additional public comment. Technical difficulties interrupted the May 5 meeting and consideration of the application was continued to the May 26 regular meeting.

At the May 26 meeting, the Commission voted to approve one of the variance requests related to the location of interior parking lots while denying another related to the requirement for a minimum of two housing types. A recommendation for approval of the requested rezoning was also provided. However, prior to acting on the Major Site/Architectural Plan Review application (Action Item 4), the Commission requested the applicant and staff conduct a neighborhood meeting to discuss the options for access and circulation in the area as it relates to the project. In order to allow time for the separate traffic related neighborhood meeting, the Commission continued consideration of the request to July 28, 2020.

Following the meeting on May 26, the applicant informed staff of their need to move forward with review of the application prior to the July 28 Commission meeting. Therefore, the access and circulation neighborhood meeting was quickly scheduled and noticed for June 8. Details of the meetings are addressed below. In order, to proceed with consideration of the proposal, the applicant has re-noticed for the June 23

Commission meeting.

The neighborhood access and circulation meeting, hosted by the City via Zoom on June 8, was attended by approximately 25 citizens. While numerous options for traffic control/calming were discussed, the City, applicant, and those in attendance supported a site layout and street redesign referred to as option C. The street redesign includes an elimination of a full extension of Palmer Avenue from 26th Street to Blake Avenue and restricts access to the development site to the intersection of Palmer and Blake Avenues only. The remainder of the street construction in the Palmer Avenue right-of-way, above and to the north of driveway aisles, is limited to a bicycle and pedestrian path which allows fire/emergency access only. In this scenario, the City supports the addition of speed bumps on both Blake and Palmer Avenues between 23rd and 26th Streets. Some members of the public also support a one way along Blake Avenue between the same numbered streets, as per the 2018 development approval. However, the City prefers two-way traffic circulation along both avenues.

Option C also revises the layout and sizes of site buildings. Former building F is eliminated and the associated units are relocated to other site buildings addressing concerns about its proximity to the Oakhurst Townhomes. Parking previously proposed at the north end of the site has been converted to public park space. Finally, a duplex site has been designated just south of the new park space in response to the Commission's denial of the related variance request. A total of 100 units are still provided.

Minutes from the June 8 meeting are attached for your review. Additionally, a copy of the presentation and a recording of the meeting are located at http://cogs.us/285/Planning-Department. A revised site plan, building elevations, and landscaping plans related to option C are attached as well as revised recommended conditions of approval addressing the proposed changes. All other previously provided plans, reports, minutes, etc. are also included.

PROJECT SUMMARY

REVIEW CRITERIA AND STAFF ANALYSIS

REVIEWING AGENCY COMMENTS

ACTION ITEMS & STAFF RECOMMENDATIONS

Suggested Findings:

Suggested Motion
Planning Item #04-20, Triumph-Bell Rippy
Planning and Zoning Commission
June 23, 2020

Action 4 – Major Site/Architectural Plan Review – to allow for the construction of 100-unit multi-family apartment units in six buildings.

Motion to Approve:
I move to recommend City Council approve the Major Site/Architectural Plan Review application for the construction of 100 multi-family and duplex units, as amended in Option C, with the findings and conditions outlined on pages 1 and 2 of the June 23, 2020 revised suggested motions included of the staff report packet.

Findings:

1. The applicant has revised the site layout and street design (referred to as Option C) in response to the Planning and Zoning Commission's request for additional information related to access and circulation in the neighborhood, concerns regarding the location of various buildings, and the Commission's denial of a variance related to the number of housing types provided as follows:
   a. Eliminate the full extension of Palmer Avenue from 26th Street to Blake Avenue and restrict access to the development site to the intersection of Palmer and Blake Avenues only. The remainder of the street construction in the Palmer Avenue right-of-way, above and to the north of driveway aisles, is limited to a bicycle and pedestrian path which allows fire/emergency access only. Add speed bumps along both Blake and Palmer Avenues, between 23rd and 26th Streets;
   b. Revise the locations and sizes of site buildings and number of multi-family units provided to 98;
   c. Eliminate building F;
   d. Provide a public park as the north end of the subject property; and
   e. Provide a duplex site between the proposed public park and multi-family buildings.
2. The site/architectural plan is consistent with the general purpose and intent of the Code;
3. The site/architectural plan is consistent with the dimensional, design, development, and all other standards of this Code;
4. The site/architectural plan is not in conflict with precedent land use approvals; and
5. The site/architectural plan is substantially consistent with the Comprehensive Plan and other adopted City policies and plans.

Conditions of Approval:
1. Prior to occupancy of any related residential units, the applicant shall install/construct all traffic improvements required to accommodate the access and circulation plan outlined in Option C above, as per the City Engineer and Public Works Director. Additionally, the City shall open the Blake Avenue gate located south of the project site;
2. The Palmer Avenue right-of-way shall be reserved for any future circulation needs of the City, as determined necessary;
3. Prior to approval of a Construction Plans Review application, the applicant shall work with the Fire Marshall to address the design details related to the Palmer Avenue bicycle/pedestrian/emergency access road (i..e exact grade, width, surface type, etc.), the exact number and location of fire hydrants, and the location of bollards (or similar easily

removable impediments) to restrict vehicular access to the bicycle/pedestrian/emergency access road;

4. Prior to the approval of a Construction Plan Review application, the applicant will enter into a maintenance agreement for the pedestrian path/fire lane, include snow removal;
5. Prior to approval of a Construction Plans Review application, the applicant shall work with staff to revise all drawings and reports, as is necessary, relative to the changes outlined in Option C in accordance with all applicable Municipal Code and Engineering Standards.
6. Applicant shall work with staff to revise the conditions list between Planning and Zoning Commission and City Council meetings to remove any duplicative or irrelevant conditions as recommended by staff for the original site plan;
7. The applicant shall comply with/address all City staff comments related to specific Code requirements prior to approval of a Construction Plans application;
8. The development shall comply with the requirements of the Code except where specific variances have been granted. Any future physical changes or improvements to the property or buildings on the parcel are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code;
9. 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;
10. Prior to submitting a building or grading permit application, the applicant shall
    a. Submit a Construction Plans application in accordance with Municipal Code section 070.060.050(c);
    b. Enter into a development agreement with the City which shall be recorded with the Garfield County Clerk and Recorder;
    c. Submit an engineer's estimate of all public improvement and submit a financial security for any required improvement not yet completed;
    d. Schedule a pre-construction meeting with applicable City departments;
    e. Submit combination of lots plat for the three subject parcels;
    f. Submit a landscaping plan in compliance with applicable regulations at that time;
11. Prior to approval of a Construction Plans application, the applicant shall amend and obtain approval of CDOT access permits, as required.

Motion to Deny:

I move to recommend City Council deny the Major Site/Architectural Plan Review application for the construction of 100 multi-family units finding [**please state your findings here**]:….

From: Gretchen E Ricehill
To: Jennifer Ooton; Trent Hyatt
Subject: FW: Bell Rippy / Triumph Development by Walmart
Date: Monday, June 8, 2020 8:05:58 AM

FYI

-----Original Message-----
From: Clara Trujillo <clarajtrujillo@hotmail.com>
Sent: Monday, June 8, 2020 12:42 AM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: Bell Rippy / Triumph Development by Walmart

Dear Ms. Ricehill,

I write to you today to express my concern regarding the traffic flow proposal of routing traffic along Blake Avenue and Palmer Avenue, that accompanies the Bell Rippy / Truimph Development plan.

I am a resident of 2203 Crestwood Drive and the mother of four young children. As do many other residents of the neighborhood, we frequently walk and ride our bikes around the park of Crestwood Drive and Palmer Avenue where the traffic flow changes have been proposed. There are no sidewalks along that section of road and it is very narrow which makes it very difficult to avoid the traffic that currently uses it.

When the Grand Avenue bridge was closed last year, we experienced a huge increase in traffic on this section of road. It made for very unsafe conditions for pedestrians due to speeding vehicles and drivers not following the rules of the stop sign at the end of the road. If the traffic flow is directed through Palmer Avenue then these unsafe conditions will become worse and permanent.

I am not against the development, however, routing traffic through Palmer and Blake Avenue will be detrimental for the entire neighborhood surrounding this area, and I would like to put my support forward for a different solution.

Thank you very much for your time,

Sincerely,

Clara Trujillo
2203 Crestwood Drive
970-319-5808

Sent from my iPhone

From:	Jennifer Ooton
To:	Gretchen E Ricehill; Trent Hyatt
Subject:	FW: Traffic access and circulation on Blake Avenue between 24th and 27th St. and opening Blakegate
Date:	Monday, June 8, 2020 7:52:39 AM

Please add this to the upcoming agenda for P&Z.
Thanks,
Jenn

-----Original Message-----
From: Mary Anne Taylor <taylor.maryanne@gmail.com>
Sent: Monday, June 8, 2020 7:41 AM
To: Jennifer Ooton <jenn.ooton@cogs.us>
Subject: Traffic access and circulation on Blake Avenue between 24th and 27th St. and opening Blakegate

As our family has lived on Blake Avenue for over 70 years we are very concerned about the city's proposal to open Blake to 2 way traffic and opening the gate. We would like to have our comments on record.

I would hope that your committee has spent time in this area both driving and walking and can appreciate that the street is in extremely poor condition, is very narrow and there are no sidewalks or street lights. No maintenance has occurred on this street for probably 30 years except for the occasional filling of a pothole or two. It is like driving down a mine field. With the RFTA station and Walmart there are a number of pedestrians trying to walk and dodge potholes and oncoming cars. With the pandemic, more and more people are walking which can be dangerous with increased traffic.

As previous Bell Rippy LLC owners, when the gate was installed the property owners were assured it would only be opened for emergencies. After earlier discussions at meetings with city for the last developer, it was our understanding that the gate would not open until the project was completed. With the gate open we can only imagine the increase in traffic and speed. During the bridge construction there was a steady stream of traffic morning and night. It was very difficult for two cars to pass on such a narrow thoroughfare.
The speed limit is 15 mph which is never enforced and the 3 way stop at 24th and Blake seems to be optional.

Perhaps our subdivision could go back to the original with a gate across 26th and all traffic from Oakhurst and the new development and Walmart area could access Glen Avenue on 27th.

Otherwise the only option we could support would be the one way south bound with speed deterrents. As mentioned above the pedestrians and children are at risk with the narrow street and increased two way traffic. We would also hope that improvements are made to the street.

Mary Anne and Paul Taylor
2418 Blake
Glenwood Springs

From:	Jennifer Ooton
To:	Gretchen E Ricehill; Trent Hyatt
Cc:	Terri Partch
Subject:	FW: Traffic impacts and circulation surrounding the proposed Triumph Bell Rippy project
Date:	Monday, June 8, 2020 9:56:12 AM

Please include with the P&Z packet.

From: Phil Harris <Phil@bu-inc.com>
Sent: Monday, June 8, 2020 9:55 AM
To: Jennifer Ooton <jenn.ooton@cogs.us>; Hannah Klausman <hannah.klausman@cogs.us>
Subject: Traffic impacts and circulation surrounding the proposed Triumph Bell Rippy project

To the City of Glenwood Springs regarding the traffic impacts and circulation surrounding the proposed Triumph Bell Rippy project: Please read into the record for tonight's virtual meeting:

My name is Phil Harris and we have lived at 2501 Blake Avenue for 23 years.

Blake Avenue between 24th and 26th Streets is a neighborhood road with a posted speed limit of 15 MPH. The road is in dire condition; it is very narrow (only 16 feet wide in one section) and has no sidewalks. It is not a safe corridor for pedestrians, and especially our local children and animals and those of us walking our pets. The ROW width is not standard and I am under the impression that a full road reconstruction with standard drive lanes, curb and gutter, sidewalks and drainage improvements can not physically fit within the available ROW.

The 'old timers' of the neighborhood told us that when Walmart was built and the gate on Blake was installed there was an agreement that that gate would never be opened permanently. Time has evolved and this no longer appears to be the case. The gate will be opened. When this happens, it will inevitably increase traffic on this potion of roadway.

Although there currently is a City Council agreement to turn the stretch of road between 24th and 26th Streets into a one-way south designation, there is discussion that this portion of Blake should be kept as two way to help with traffic circulation and Highway 82 bypass traffic.

The written stated GOAL of the City Street Design Standards is to encourage walking and biking and a safe balance for all street users. The first FIVE written OBJECTIVES of the City street standards are to optimize safer routes and create intermodal connections with enhanced pedestrian safety and encourage non-motorized modes of travel.

Increasing traffic and allowing this portion of Blake to become even more of a Highway 82 bypass than it currently is, is an intenable situation. It defeats the goals and all of the objectives of the City's policies by sacrificing the neighborhood for additional traffic circulation. Traffic should be concentrated on Highway 82 where it was intended and not invited to the back streets of a 15 MPH neighborhood.

When the Blake gate is opened, this section of roadway should be designated as one-way south. Assuming one day the road may be upgraded, the future design should be for a single lane with a bicycle path and a sidewalk that will be wide enough for emergency access and will support all the goals and objectives of the City and keep the neighborhood residents safe.

Thank you.

From:	Jennifer Ooton
To:	Gretchen E Ricehill; Trent Hyatt
Cc:	Terri Partch
Subject:	FW: Triumph Bell Rippy Project Access and Circulation Discussion for Monday June 8, 2020
Date:	Monday, June 8, 2020 10:55:56 AM

Please include in the upcoming P&Z packet.

From: Carol Turtle <c.turtle@icloud.com>
Sent: Monday, June 8, 2020 10:52 AM
To: Jennifer Ooton <jenn.ooton@cogs.us>
Subject: Triumph Bell Rippy Project Access and Circulation Discussion for Monday June 8, 2020

To: Jenn Ooton and Hannah Klausman

I was informed that some in our community are revisiting an upgraded 2-way street on Blake Avenue, which has prompted my letter. I own two properties that will be impacted by enlarging Blake Avenue to accommodate 2-way traffic and the much needed curb and gutter, sidewalks, and necessary drainage structures. My properties are located at 2429 Blake and 501 Easy Street. While this obviously concerns me, I believe there is a better solution that will benefit the City of Glenwood Springs, and the neighborhood.

Since zero notice was given to me (I just found out about the Zoom Meeting Saturday from a neighbor), I haven't had the necessary time to investigate whether the width of the Blake Avenue right-of-way will support these changes. Without confirming this first, if the current right-of-way is not adequate enough, portions of properties would have to be acquired through eminent domain, which would force the owners to sell to the city to make room for the infrastructure improvements. This would increase the costs of the project substantially.

Instead, I suggest we revisit the original proposal of one-way traffic flow south from 23rd Street to 26th Street. That proposal was put forth to affected residents along Blake by the first developers and was the major reason I and a number of residents gave our approval to the project 2 years ago.

If a 2-way road is built, not only would this section of Blake have increased traffic accessing the new 102 units at Triumph Bell Rippy, BRT Station, and Walmart, but it would generate additional commuter traffic trying to avoid the Grand Avenue congestion. This phenomenon has already degraded other neighborhoods in Glenwood Springs.

Additionally, I suggest adding a dedicated bicycle lane, which would be more congruent with the City's overall push to increase bicycle use. This would not only reduce traffic congestion but also the number of vehicles parking at the BRT Station, which already has inadequate parking. Unfortunately, the city has allowed the only bicycle corridor on the east side of town to deteriorate making it unsafe. Please consider being more forward thinking by not putting more vehicles into another quiet and established neighborhood.

I plan to join the Zoom Meeting, but we are on a congested CenturyLink Network and I might be unable to stay connected. This letter is my only opportunity to voice my concerns and to give suggestions.

Best,

David J. Turtle
Glenwood Springs, CO

From:	Jerry and Jamie Raehal
To:	Trent Hyatt; Terri Partch
Subject:	follow up questions
Date:	Monday, June 8, 2020 6:51:45 PM

Good evening,
First, allow me to say thank you for facilitating the meeting this evening. I have a few follow up questions regarding Option C.

I assume based off the comments made this evening that Option C will be presented at the P&Z meeting, is that correct?

Will it be possible (or likely) to create a regular city street on the portion of Palmer that will be a walking/biking path (in the project area) at a future date, say 5-20 years in the future?

It has been said something to the effect of 'the developers will go ahead with the plan that is already approved if this more recent one is not allowed to move forward by a certain date.' Can you tell me what that date is and what needs to occur by this date?

Sincerely,
Jamie Raehal

June 8, 2020

Public Comment Re: Triumph Bell Rippy Project Access & Circulation Discussion of June 8, 2020

From: Annie Hoghaug, Owner of 519 Easy Street, Glenwood Springs

Contact Info: 970-945-5649 (home)
970-948-7888 (mobile)
3milebooks@comcast.net
678 County Rd 127, Glenwood Spgs, CO 81601

To: Trent Hyatt

Thank you to city staff; to the P&Z Commissioners; and to Michael O'Connor and his team for, not only listening to the plethora of public comment associated with the Bell Rippy proposal, but ACTING on making this a project that the existing neighborhood can feel better about.

I own 519 Easy Street and have some additional comments regarding access and circulation – specifically regarding Blake Avenue, but also regarding Palmer Avenue because I care about my neighbors.

My big concern at this point is related to Terri Partch stating that she would like to see Blake Avenue remain open to 2-way traffic – yikes! I was starting to think I would get through this meeting without my blood pressure rising, but nope… 2-way traffic on this section of Blake Avenue WITH an OPEN Blake Gate will severely compromise alternate modes of transportation (i.e. walking & biking) and be devastating to our sense of neighborhood as well as the safety of our children.

Again, before I go on, I STILL have some lingering confusion about whether the proposed 1-way section is from 23rd to 26th OR from 24th to 26th. The maps shown at the meeting certainly seem to indicate 23rd as the 1-way start point. My below comments are consistent with either start point, so irrelevant to my comments. It would just be nice to know. And to be clear, Easy Street intersects Blake Ave between 24th and 26th streets.

Some background: I do not currently live in my Easy Street house though I plan to move back to Easy Street on a 1 to 2-year time frame. I did live in my Easy Street house from 2003 through 2005 when my daughter was in Kindergarten, First and Second grades. The nearest school bus stop was at 23rd and Blake so we made the trek along Blake Avenue. Even then I was grateful for the potholes, bumps and rocks that slowed drivers down and allowed me, my daughter, my dog and other neighborhood school kids to feel good about walking to and from the school bus stop.

An open Blake Gate and 2-way traffic along this section of Blake Ave will be an open invitation to "cheater" northbound Hwy 82 traffic to hop onto Blake Ave at McDonalds and just stay on it ALL the way through town! Some (Terri?) may consider this an effective way to move traffic headed to points west of Glenwood Spgs through our town. Others, myself included, see this as a huge negative impact to affected neighborhoods throughout Glenwood Springs, INCLUDING the proposed Bell Rippy project! AND, the section of Blake Avenue from 26th to 24th streets is narrow! Potentially, the city of Glenwood Spgs could take full advantage of existing right of ways along this section of Blake, but I suspect there

would still be inadequate room for 2 lanes of traffic; sidewalk & gutter; AND a bike lane! I am compelled to remind all of us of the developer's intent for their project to be walk, bike and public transit friendly. I would add that their plan for this type of project IS consistent with stated goals of the 2011 City of Glenwood Spgs Comprehensive Plan.

How does the open Blake Gate and 2-way traffic along this section of Blake Ave enhance those goals? Simply put, it would be devastating to those goals!

So, to summarize:

- It is clear to me that the Blake Gate **will** open.
- I strongly support Blake Avenue between 23rd and 26th streets becoming a ONE-WAY southbound!
- A one-way southbound could possibly allow space for a sidewalk & gutter and a dedicated bike lane at some point.

Again, anyone involved here should walk this section of Blake Avenue prior to passing judgement.

Regarding Palmer Avenue… I understand that "cheater" traffic does and will continue to utilize Palmer Ave as an alternate route through Glenwood Spgs. However, I believe that it is not going to be quite the obvious open invite that a non-gated Blake Ave would provide. Additionally, I believe the Bell Rippy alternate plan 'C' that limits the northeast portion of Palmer Avenue to non-motorized travel and emergency uses only will be a huge stride toward preserving the Palmer Ave neighborhood and discouraging "cheater" traffic from opting for this route.

So, to summarize re Palmer Ave:

- Triumph goes with alternate plan 'C'
- Palmer Ave remains a 2-way street
- Utilize speed bumps to slow traffic and discourage cheaters.

Respectfully,

~ Annie Hoghaug

From:	Gretchen E Ricehill
To:	Jennifer Ooton; Trent Hyatt
Cc:	Anna S. Itenberg
Subject:	FW: The Bell-Rippy / Triumph proposal
Date:	Monday, June 1, 2020 8:07:55 AM

From: Marilyn Shettel <shettellbs@gmail.com>
Sent: Saturday, May 30, 2020 10:30 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: Re: The Bell-Rippy / Triumph proposal

Dear Gretchen,

It is unlawful to make any decisions on a property development during an international Pandemic when the affected neighbors and those who are most vulnerable to the virus cannot meet in person with the Planning Commission and other city authorities.

Sincerely,

Marilyn Shettel
970-945-7048

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Triumph Development
www.triumphdev.com

To: COGS Planning Staff

From: Triumph Development West, LLC

Date: June 17, 2020

RE: Bell Rippy Community Meeting Update and Revised Traffic Mitigation Proposal

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On June 8, 2020 COGS Staff, in conjunction with Triumph, hosted an online community meeting with the Oakhurst neighborhood to discuss potential traffic impacts from the development of the Bell Rippy Apartment Community.

Prior to this meeting, Triumph and Staff spent several days brainstorming possible traffic mitigation options and refining this list down to options that have Staff support.

All these options were presented to the Community at the beginning of the meeting, with particular focus on the options supported by Staff and the logic behind these conclusions. The community was then given the opportunity to provide feedback on the alternatives. Nine neighbors spoke at the meeting, each providing feedback on the alternatives discussed.

Based on this feedback, Triumph is proposing to construct the following traffic mitigation measures as a component of our application:

1. Maintain the traffic mitigation of the current approvals including opening the Blake Gate and the one-way south configuration of Blake Ave between 23rd and 26th Street. Triumph will construct an island the formalizes the one-way configuration of Blake at the intersection of 26th and Blake, as well as one-way signage required at the intersections along Blake.

   This option had community support from the neighbor that addressed this condition and had not opposition.

2. Addition of two sets of speed bumps on Palmer Ave between 23rd and 26th Street. Several speed control options were discussed, but two sets of speed bumps evenly spaced along Palmer was the preferred solution of staff.

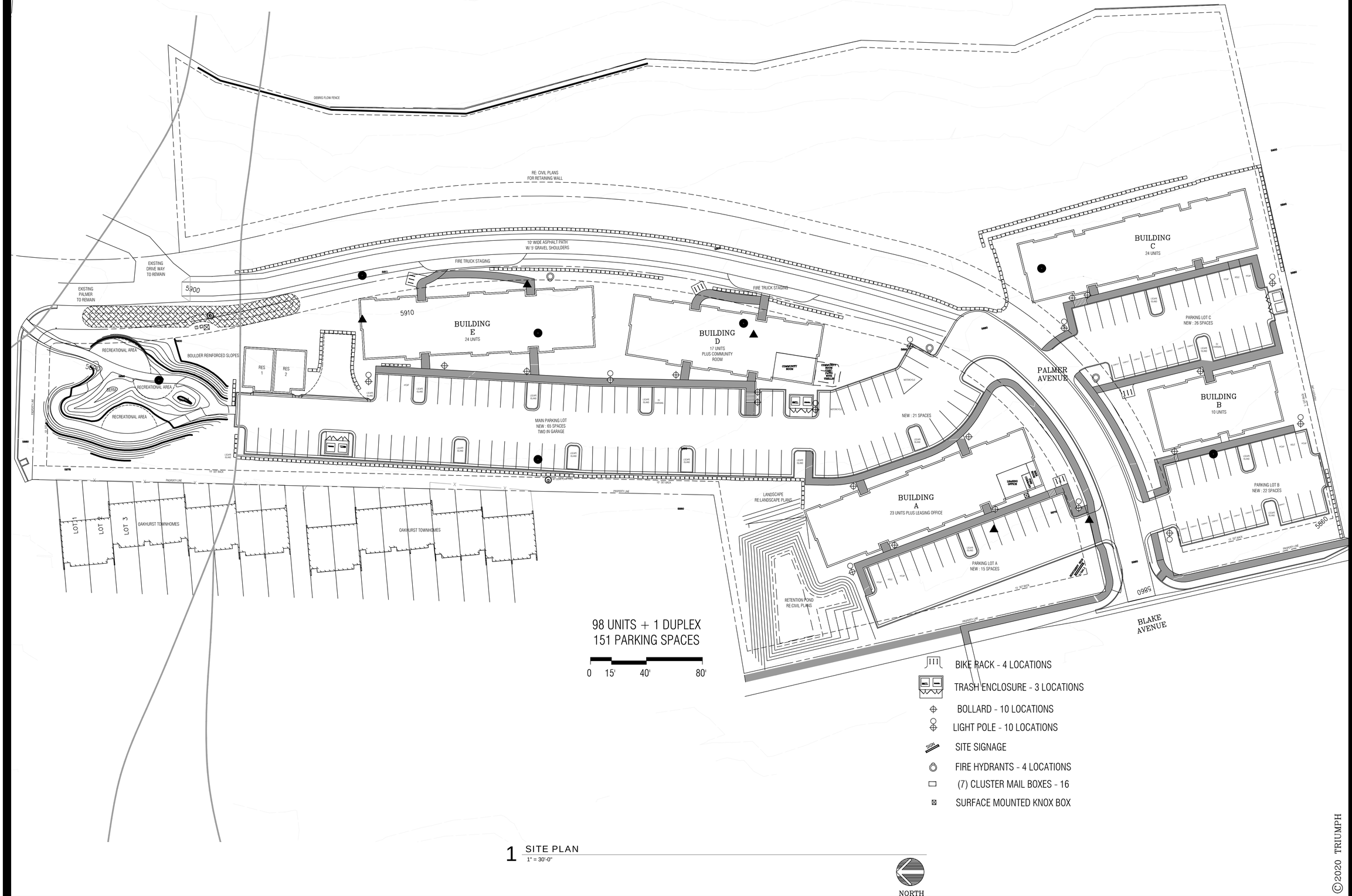
   Several participants with residences on and near Palmer supported the idea of speed control measures along Palmer, and no one opposed this alternative.

P. 970.688.5057 12 Vail Road, Suite 700, Vail, CO 81657

TRIUMPH

3. Revised Site Plan that directs all vehicular access to the Bell Rippy Apartments to the new Blake and Palmer intersection, and construct the existing Palmer Avenue right of way as a pedestrian and bike path through the northern portion of the site. This path would be engineered to provide emergency vehicle access to Bell Rippy and the Oakhurst neighborhood, and would continue to carry the utilities servicing the neighborhood. There will be no means of through-traffic into the Oakhurst neighborhood via the right of way through the new development

   This revised site plan option had unanimous and enthusiastic support from all neighbors who spoke.



1 SITE PLAN
1" = 30'-0"

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BELL RIPPY NEIGHBORHOOD
2700 PALMER AVE
GLENWOOD SPRINGS COLORADO

Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
DD PRICING PACKAGE 5-13-20
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 6-16-20

Sheet title: SCHEMATIC SITE PLAN

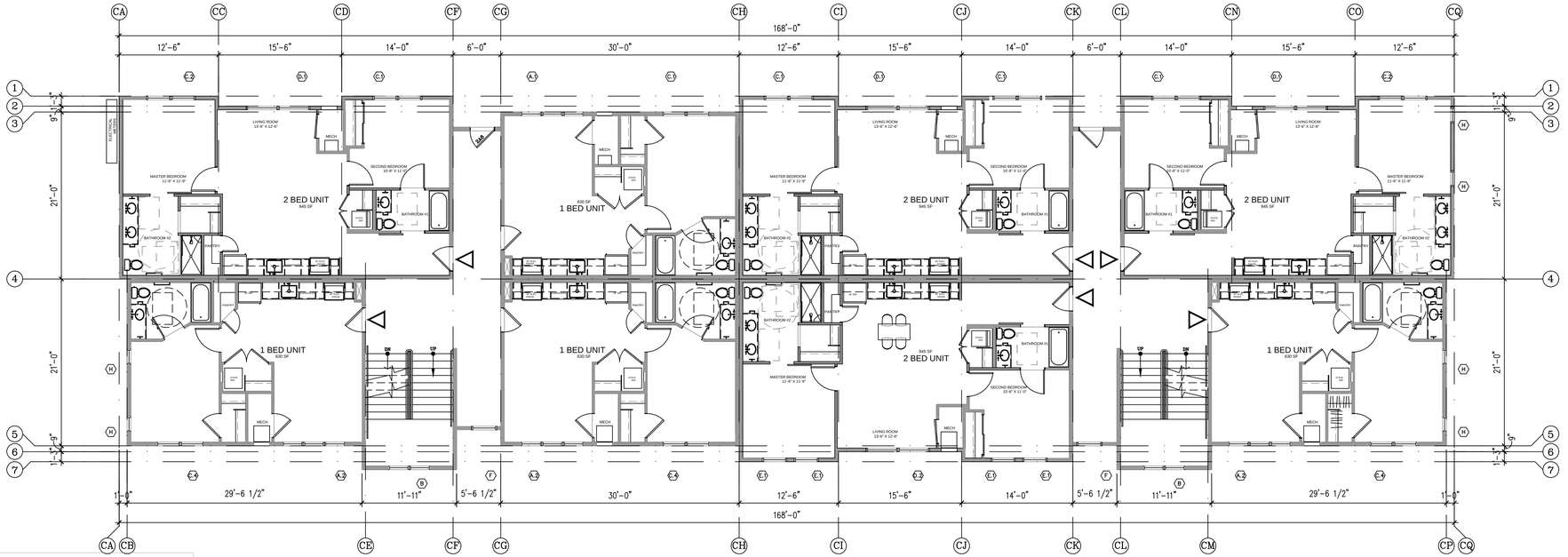
Stamp

Date: 6/10/2020
Project No:
Drawn by: MEF
Checked by: MEF

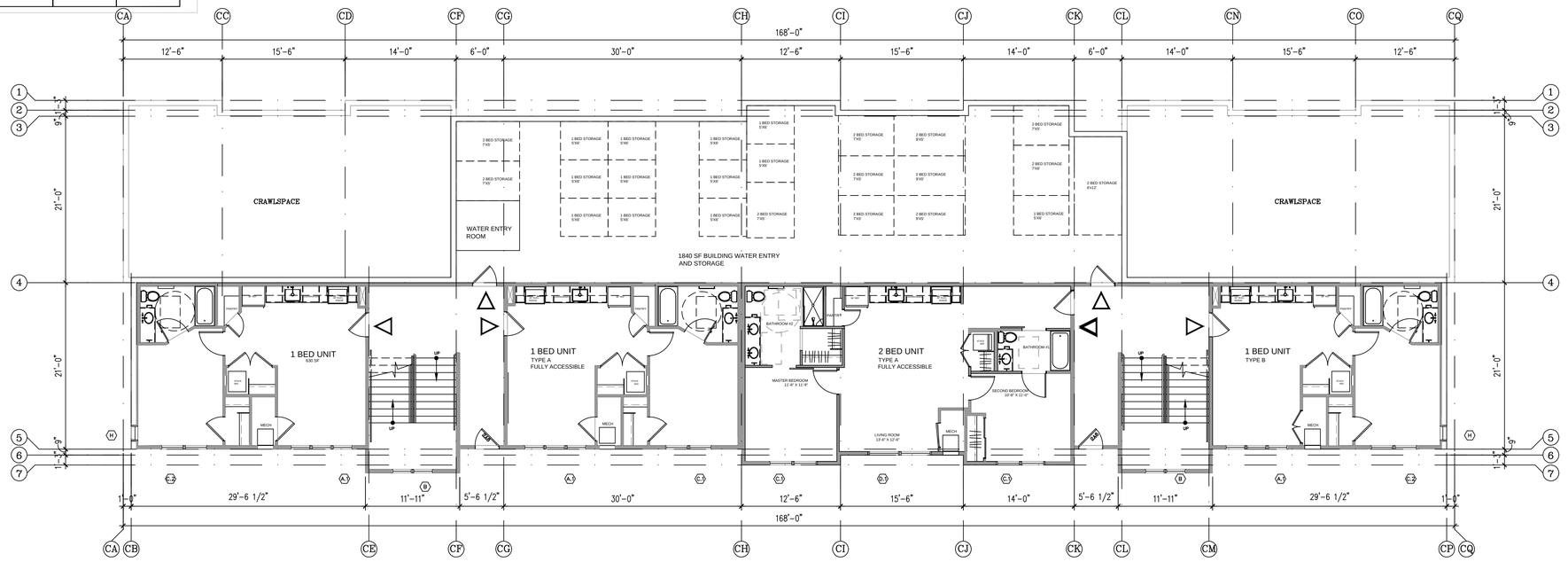
Sheet AA1.0

BELL RIPPY APARTMENTS

FLOOR	BUILDING COMMUNITY ROOM / LEASING	1 BEDROOM UNITS	2 BEDROOM UNITS	CIRCULATION	UTILITY / STORAGE	TOTAL SF (NOT INCLUDING STORAGE)
BUILDING A	630 SF	2 UNITS	9 UNITS	1,720 SF	1,750 SF	22,340 SF
BUILDING B		3 UNITS	7 UNITS	3,440 SF	940 SF	10,210 SF
BUILDING C		12 UNITS	12 UNITS	3,440 SF	1,540 SF	22,340 SF
BUILDING D	630 SF	11 UNITS	12 UNITS	3,440 SF	1,750 SF	22,340 SF
BUILDING E		6 UNITS	12 UNITS	3,440 SF	1,225 SF	18,560 SF
BUILDING F						
TOTALS EACH BUILDING	1,260 SF	37 UNITS	61 UNITS	15,480 SF	7,505 SF	95,790 SF +7,505 SF 103,295 SF



2 BUILDING A - FIRST LEVEL PLAN
1/8" = 1'-0"



1 BUILDING A - GARDEN LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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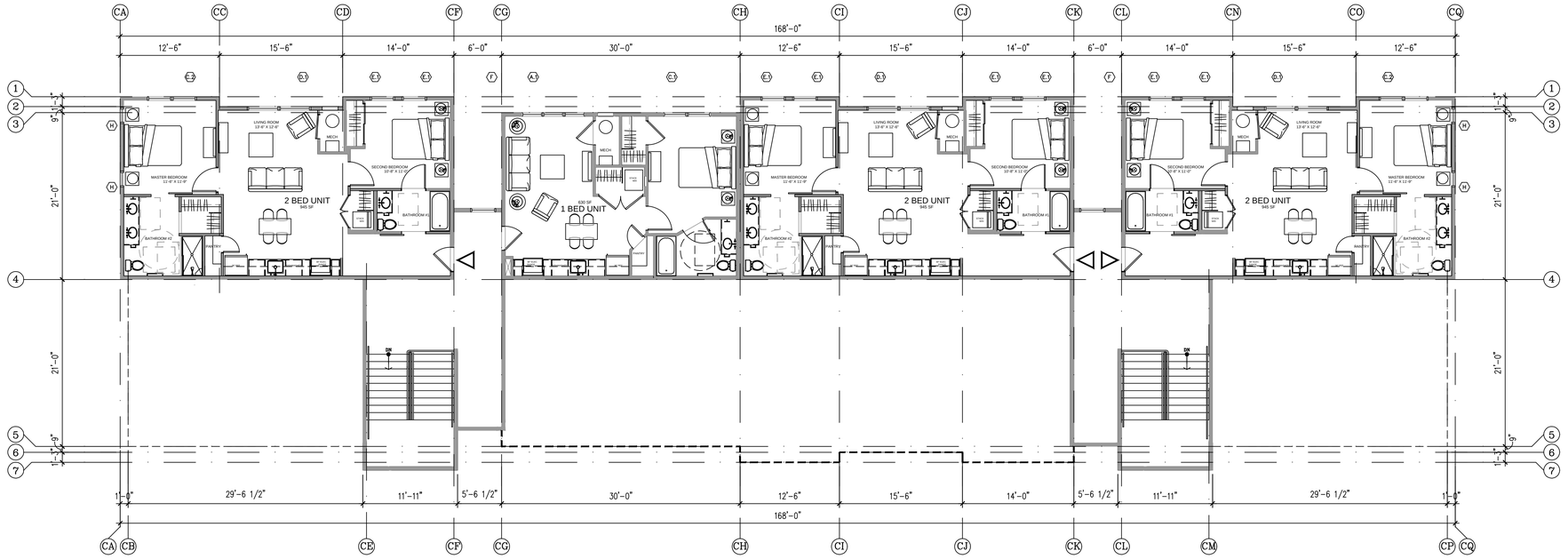
Revisions:
MAJOR SITE, ARCHITECTURAL
revised PLAN SUBMISSION
4-20-20
DD
PRICING PACKAGE
5.1.20
MAJOR SITE, ARCHITECTURAL
revised PLAN SUBMISSION
6-16-20

Sheet title
SCHEMATIC
BUILDING
A
PLANS

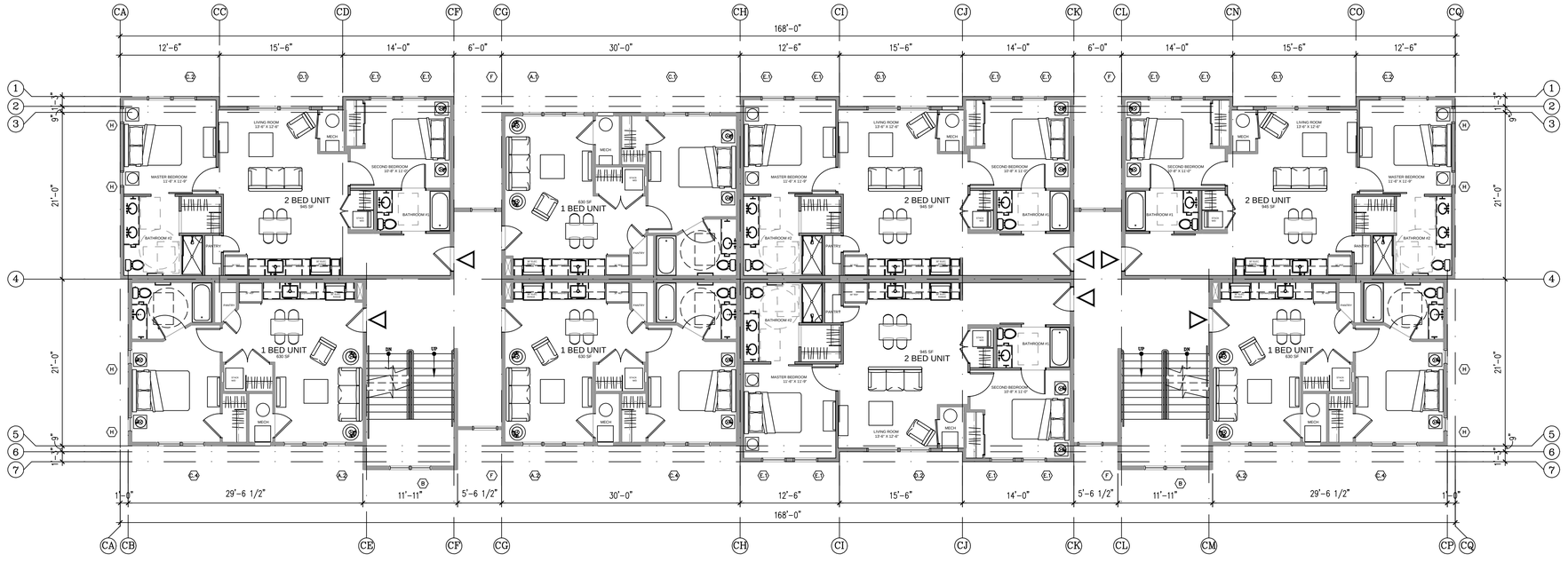
Stamp

Date: 5/11/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AA2.0



4 BUILDING A - THIRD LEVEL PLAN
1/8" = 1'-0"



3 BUILDING A - SECOND LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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Revisions:
MAJOR SITE ARCHITECTURAL revised PLAN SUBMISSION 4-20-20
DD PRICING PACKAGE 6-1-20
MAJOR SITE ARCHITECTURAL revised PLAN SUBMISSION 6-16-20

Sheet title: SCHEMATIC BUILDING A PLANS

Stamp

Date: 5/11/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AA2.1

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1 BUILDING A - WEST ELEVATION
1/8" = 1'-0"

BUILDING A - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 3/4" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 1/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
WO1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

1. IN THE CASE OF ANY DISCREPANCIES BETWEEN THIS SCHEDULE AND OTHER CONTRACT DOCUMENTS, THE INFORMATION ON THIS SCHEDULE SHALL TAKE PRECEDENCE.
2. ALL FLASHING, VENTS, FLUES, ROOFTOP MECHANICAL EQUIPMENT, UTILITY BOXES, AND SIMILAR ITEMS SHALL BE PAINTED TO MATCH ADJACENT PORTIONS OF BUILDINGS UNLESS OTHERWISE NOTED.
3. TYPICAL SIDEWALL FLASHING /CEAWATER SHIELD 2'-0" VERT UP WALL, WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE, METAL FLASHING EXPOSED 6" UP WALL TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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 BUILIDNG PERMIT APPLICATION.

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING A - ELEVATIONS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20
DD PRICING PACKAGE 5-11-20
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 6-16-20

Sheet title: BUILDING ELEVATIONS

Stamp

Date: 5/11/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AA4.0

BUILDING A - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - $\frac{5}{16}$" X 7 $\frac{1}{4}$" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT - $\frac{4}{4}$ RUSTIC 3.5" RAILS $\frac{6}{4}$ RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - $\frac{4}{4}$ RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ GABLES	FIBER CEMENT - $\frac{4}{4}$ RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - $\frac{4}{4}$ RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - $\frac{4}{4}$ RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - $\frac{4}{4}$ RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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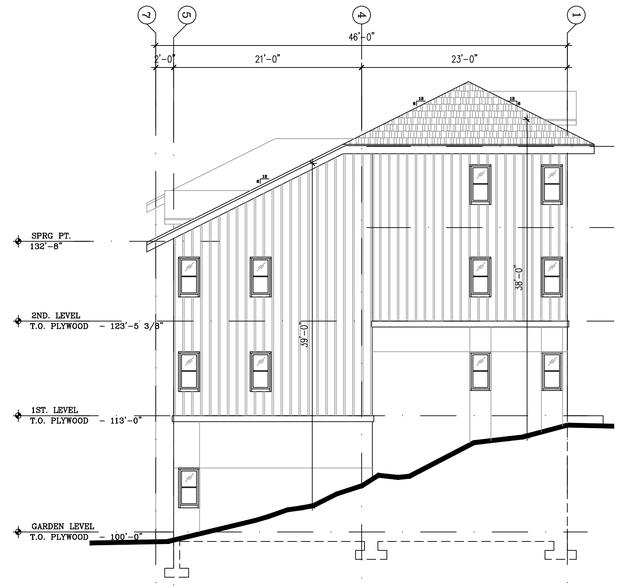
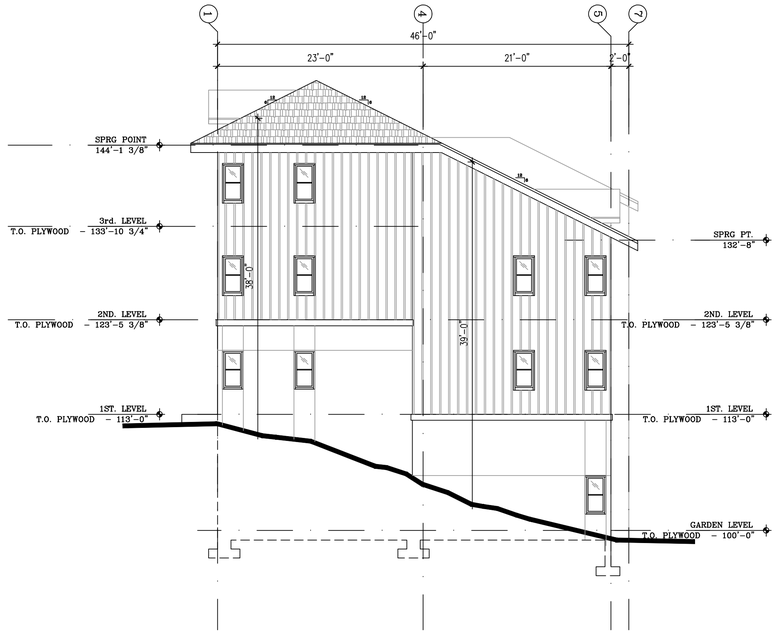
3. TYPICAL SIDEWALL FLASHING ICE&WATER SHIELD 2'-6" VERT UP WALL; WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE, METAL FLASHING EXPOSED 6" UP WALL TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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 BUILDNG PERMIT APPLICATION.



3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

BUILDING A - ELEVATIONS

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Revisions:
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DD PRICING PACKAGE 5-11-20
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 6-16-20

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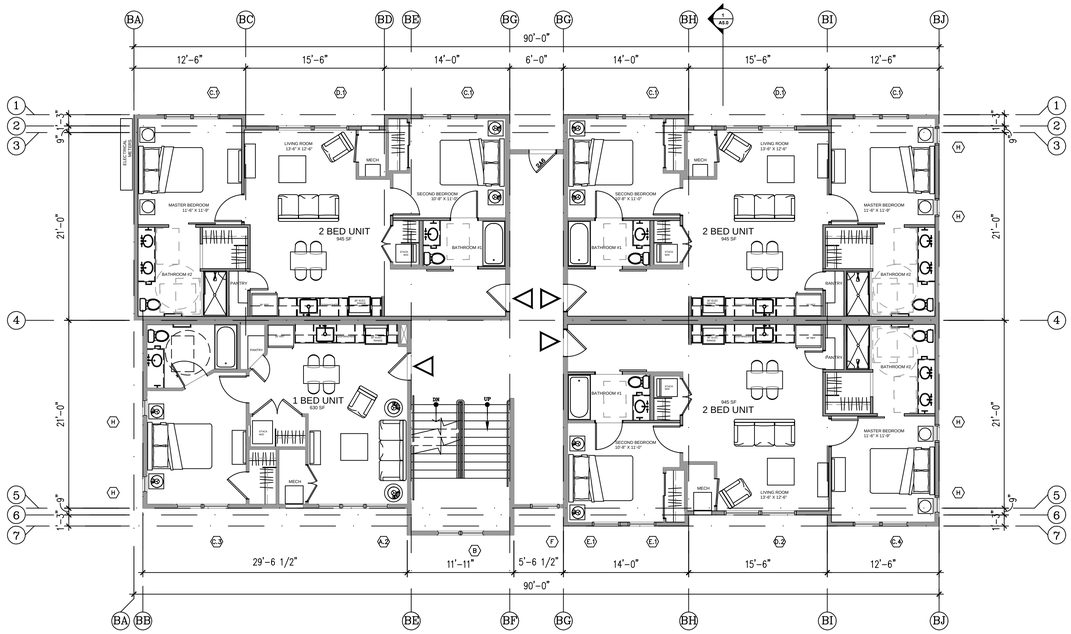
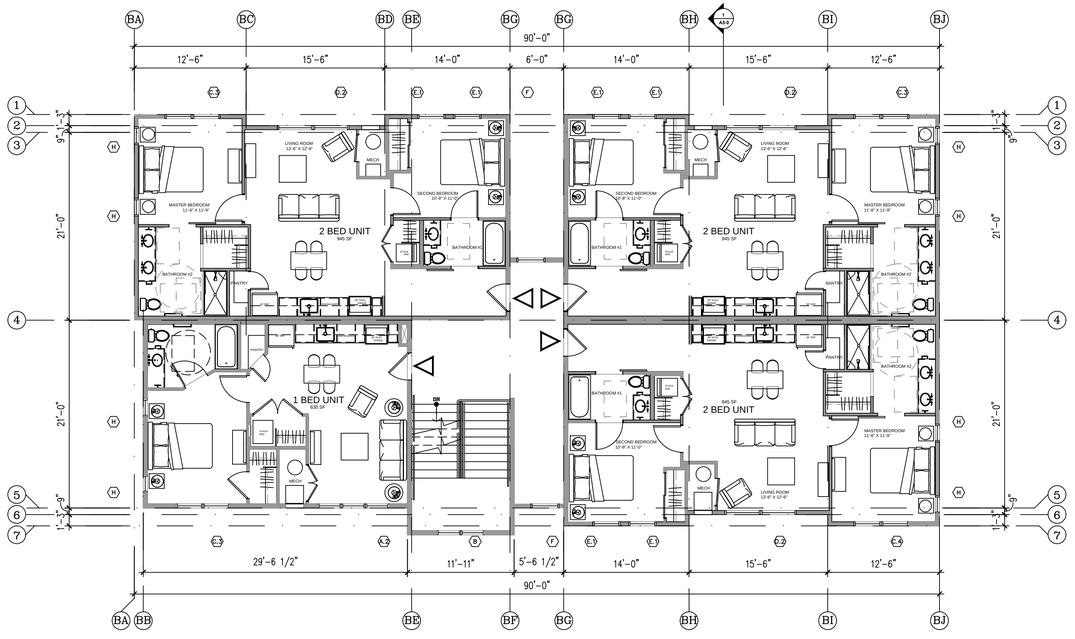
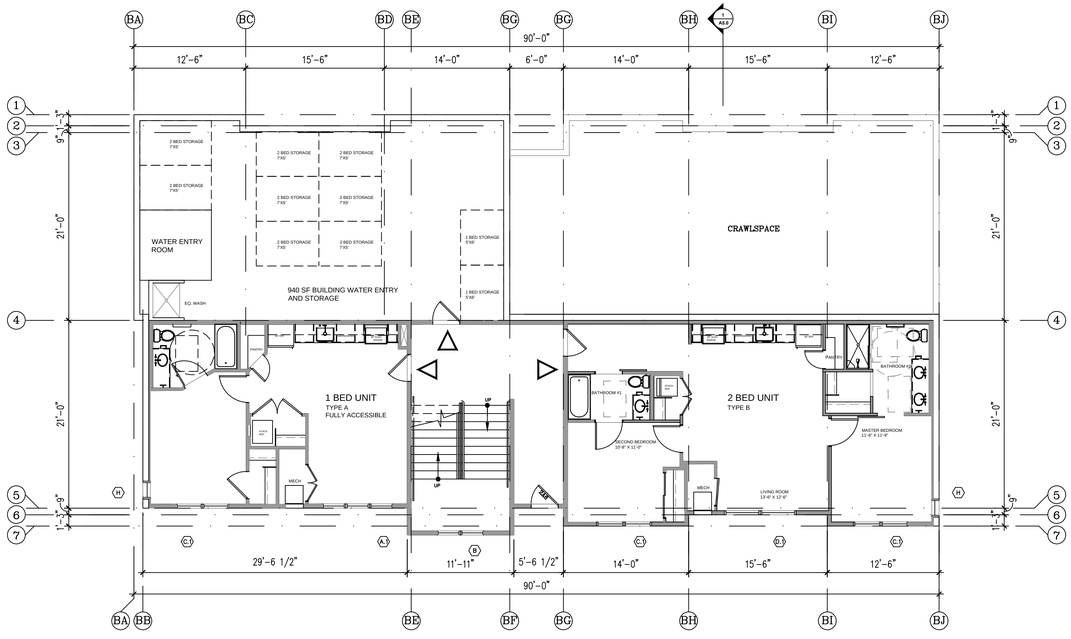


2 BUILDING B - FIRST LEVEL PLAN
1/8" = 1'-0"



3 BUILDING B - SECOND LEVEL PLAN
1/8" = 1'-0"



1 BUILDING B - GARDEN LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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revised PLAN SUBMISSION 6-16-20

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BUILDING B - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	RUSTIC SLATE
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 3/4" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	KHAKI BROWN
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	COBBLE BROWN
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	BENJAMIN MOORE "WISH" AF-680
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	BRONZE
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 3/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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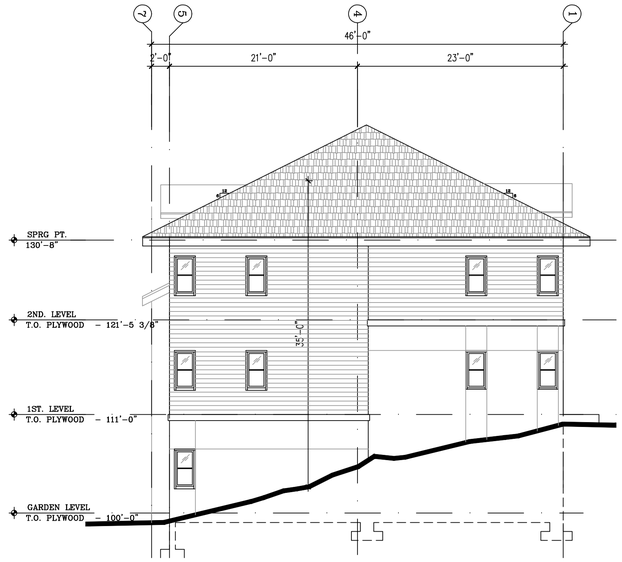
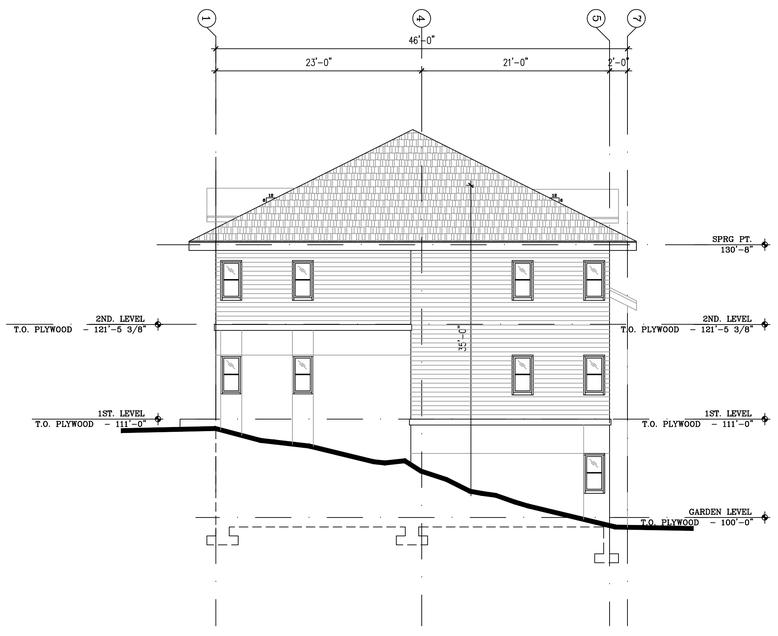


3 SOUTH ELEVATION
1/8" = 1'-0"

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING B - ELEVATIONS

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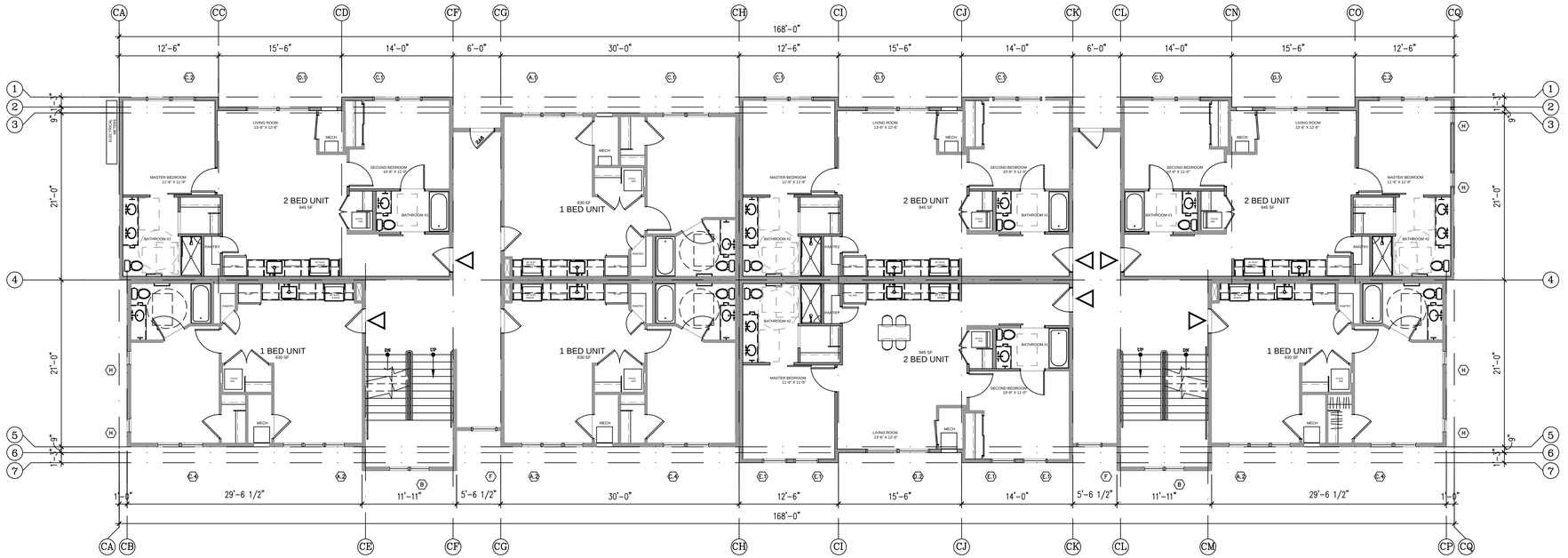
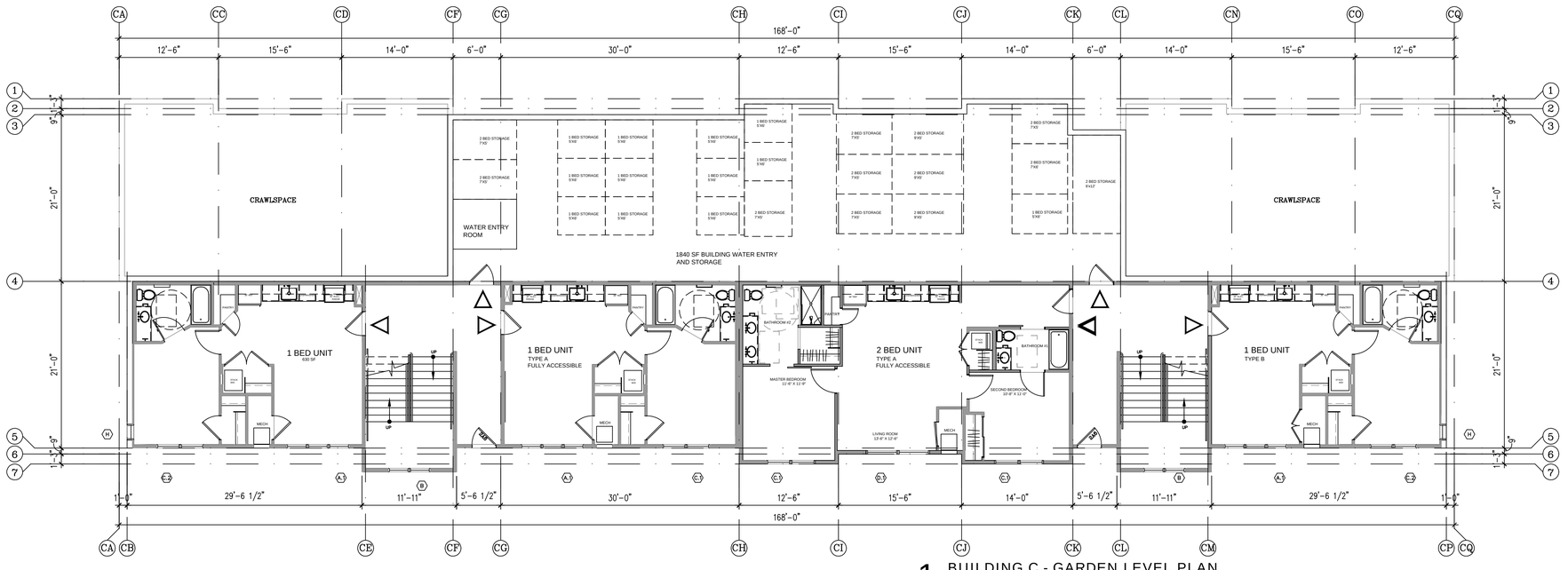


2 BUILDING C - FIRST LEVEL PLAN
1/8" = 1'-0"



1 BUILDING C - GARDEN LEVEL PLAN
1/8" = 1'-0"

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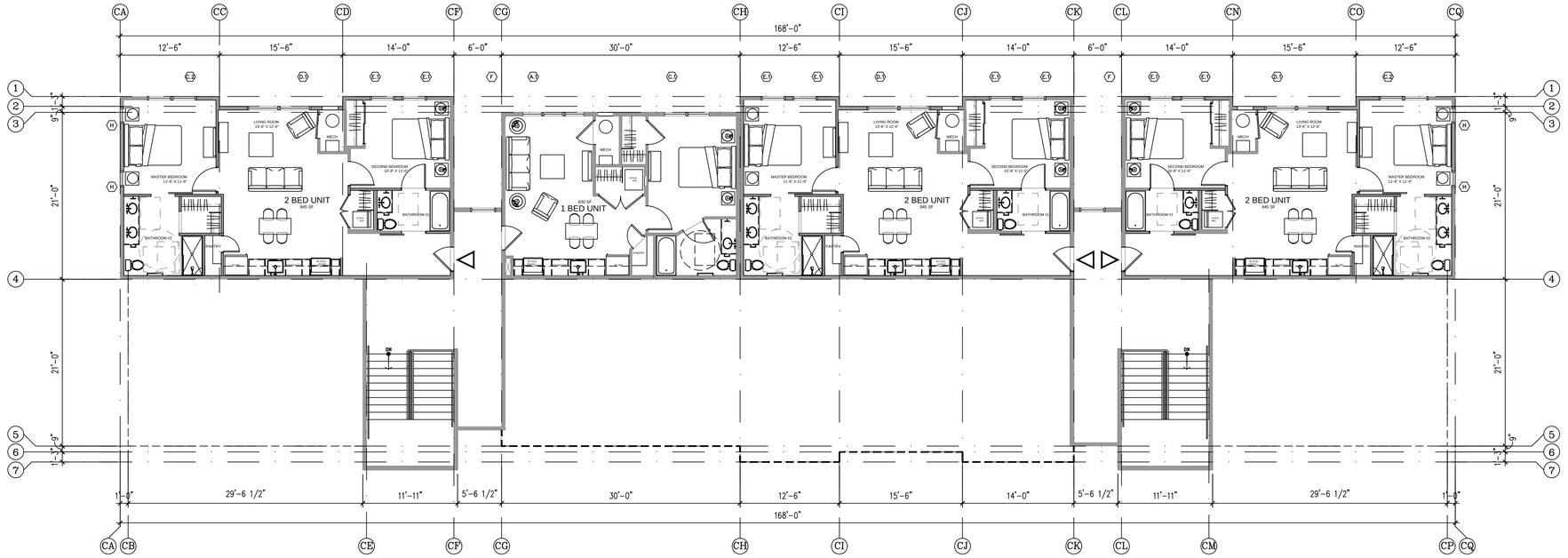
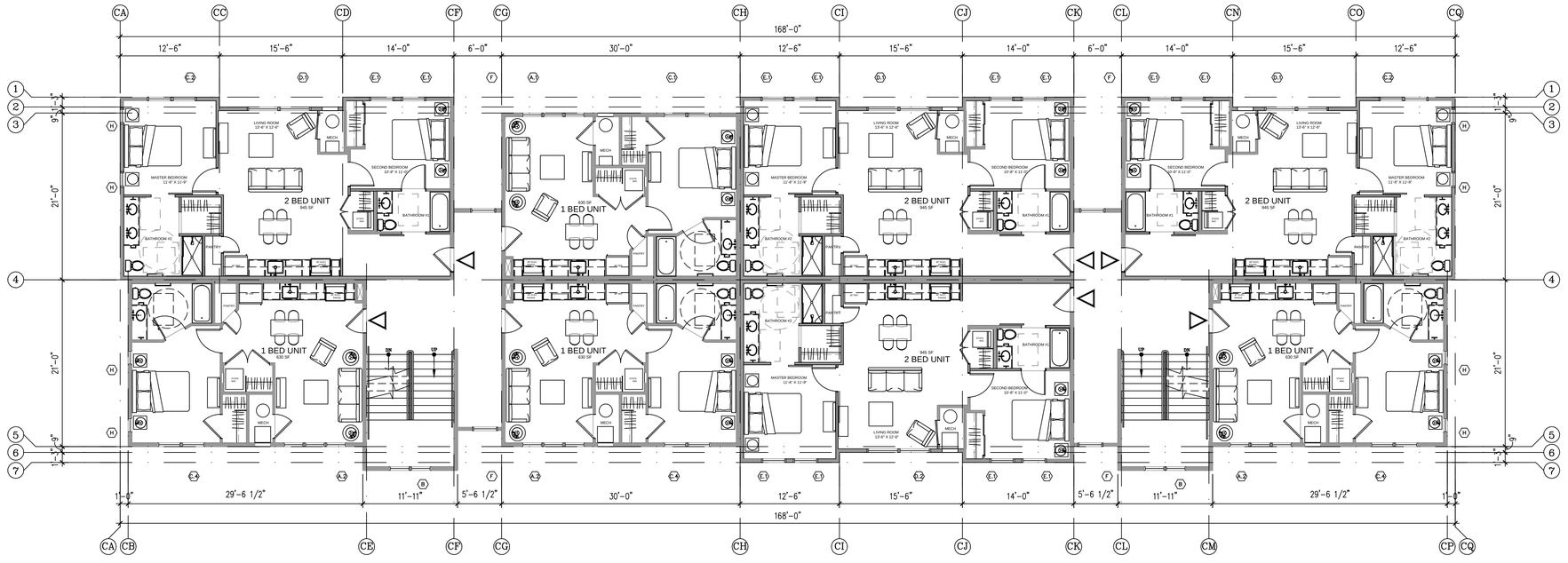


4 BUILDING C - THIRD LEVEL PLAN
1/8" = 1'-0"



3 BUILDING C - SECOND LEVEL PLAN
1/8" = 1'-0"

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SCHEMATIC BUILDING C PLANS

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Checked by: MEF

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BUILDING C - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 7/8" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT - 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENDS	FIBER CEMENT - 5/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 5/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING C - ELEVATIONS

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BUILDING C - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 5/16" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 3/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 3/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
W01	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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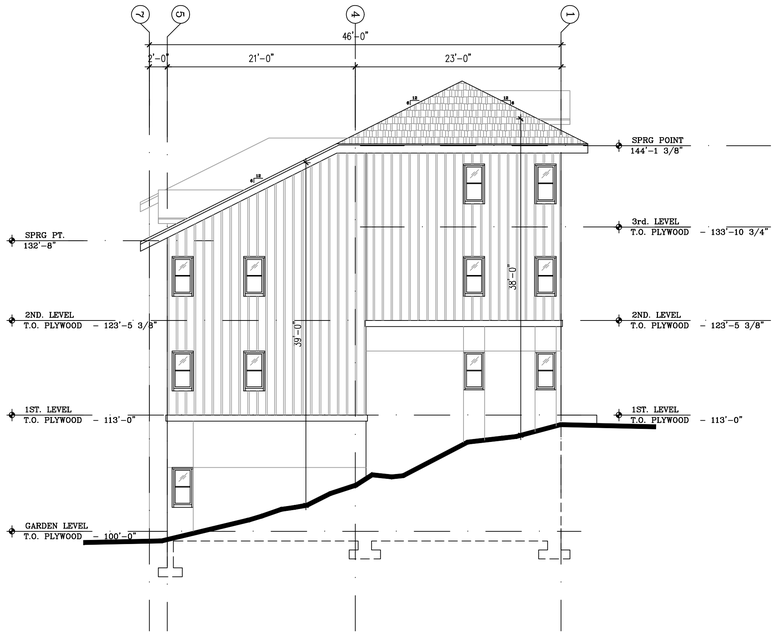

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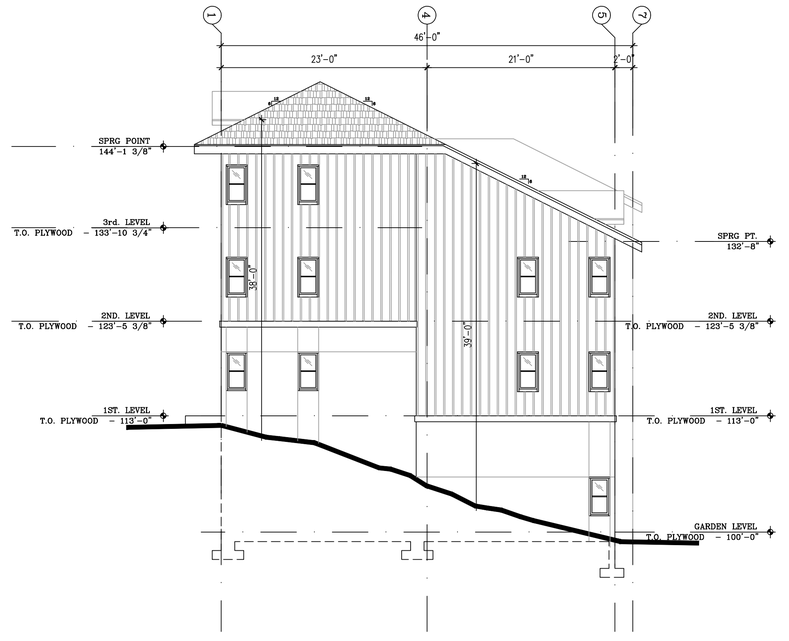
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

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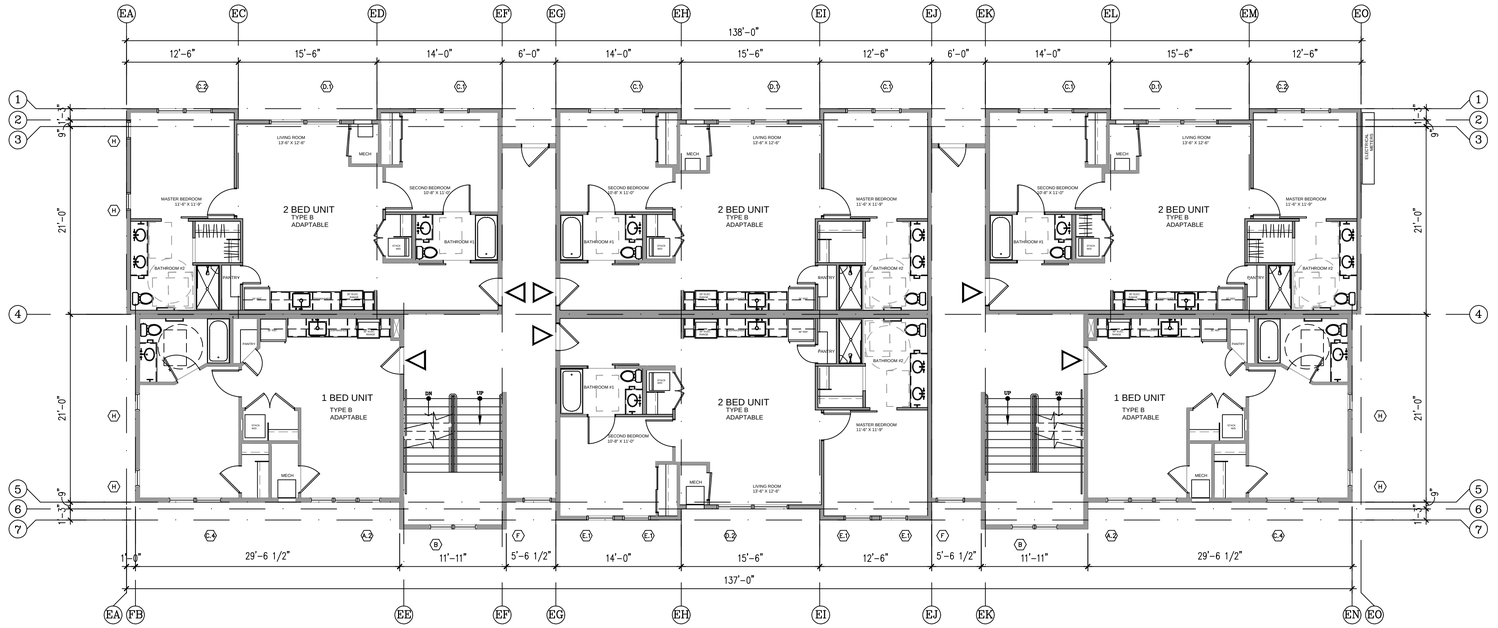
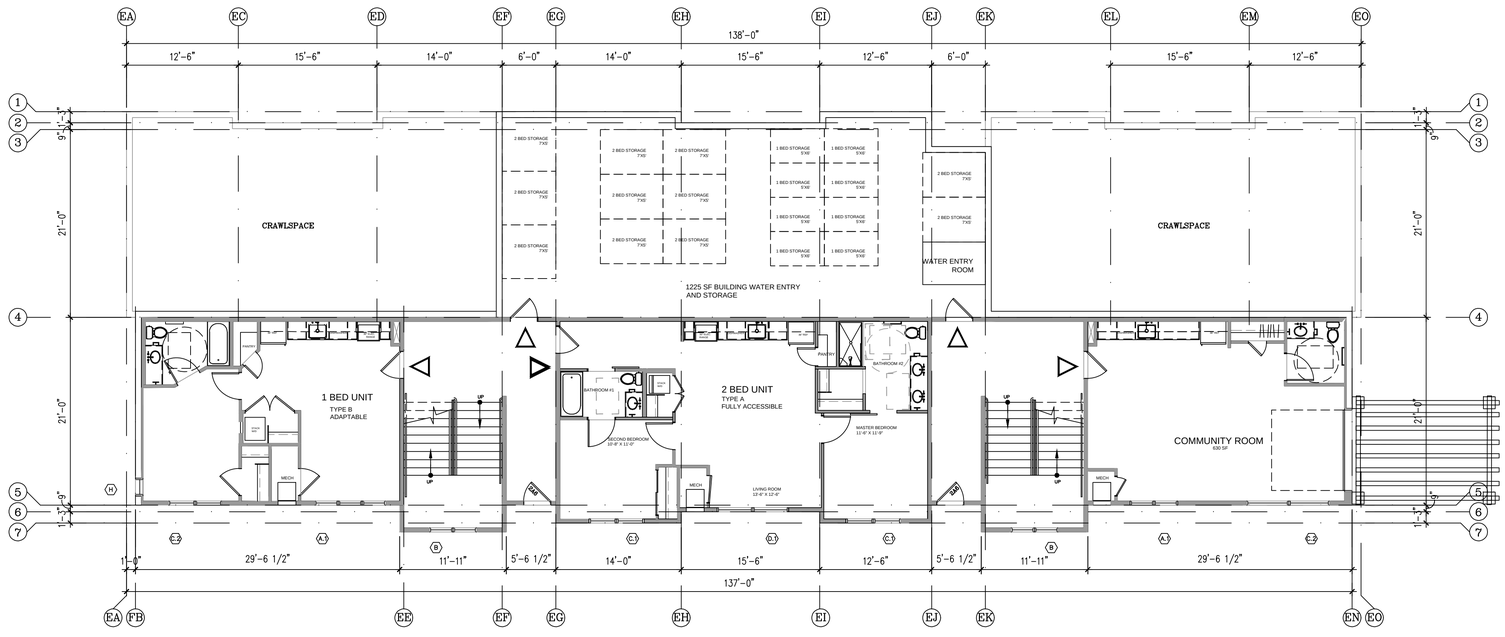


2 BUILDING D - FIRST LEVEL PLAN
1/8" = 1'-0"



1 BUILDING D - GARDEN LEVEL PLAN
1/8" = 1'-0"

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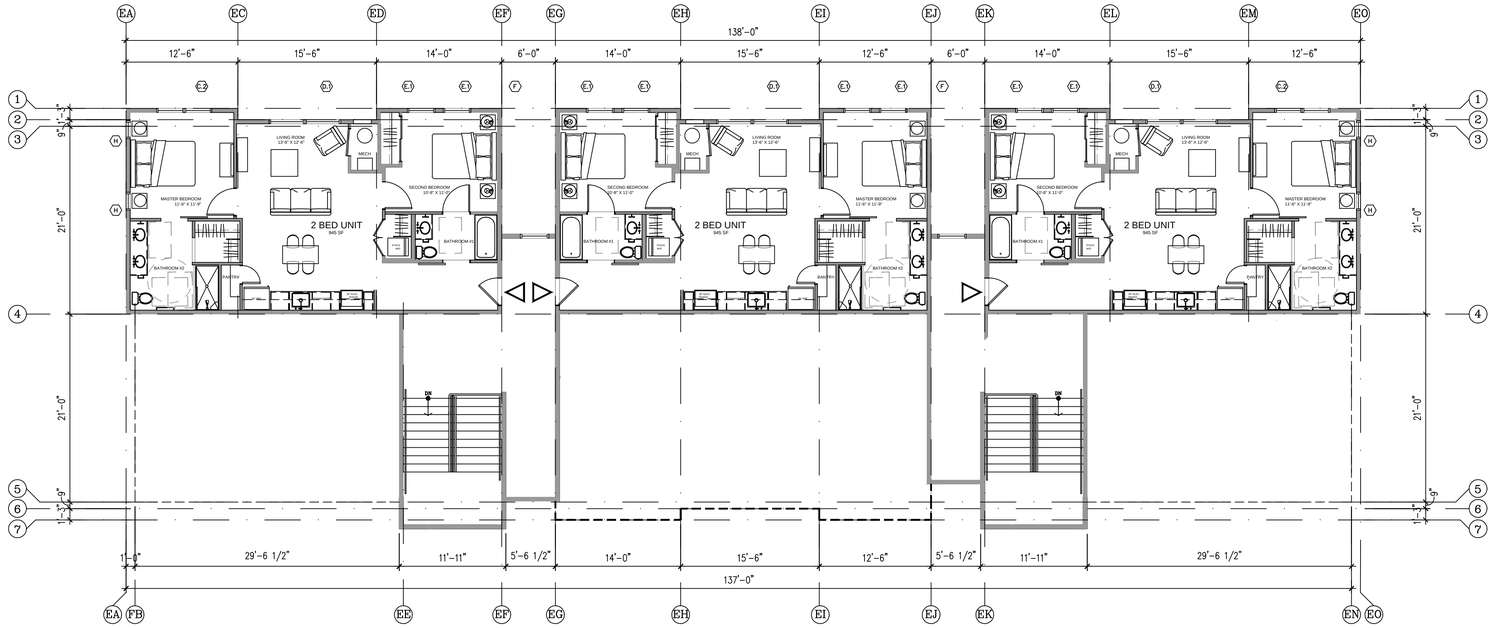
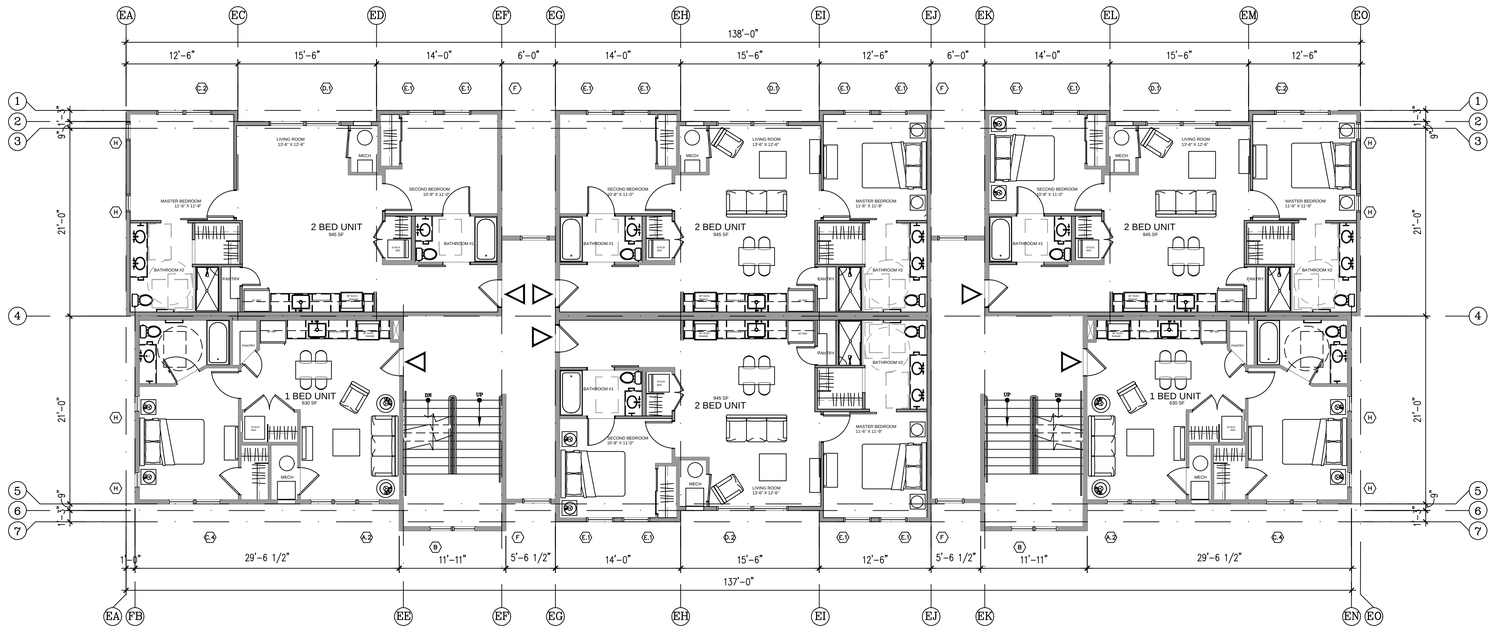


4 BUILDING D - THIRD LEVEL PLAN
1/8" = 1'-0"



3 BUILDING D - SECOND LEVEL PLAN
1/8" = 1'-0"

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MAJOR SITE ARCHITECTURAL
revised PLAN SUBMISSION 6-16-20

Sheet title
SCHEMATIC BUILDING D PLANS

Stamp

Date: 5/11/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AD2.1

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

BUILDING D - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	RUSTIC SLATE
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 3/8" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	KHAKI BROWN
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	COBBLE BROWN
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	BENJAMIN MOORE "WISH" AF-680
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	BRONZE
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT - 4/4 RUSTIC 3.5" RAILS	FRENCH ROAST
T2	SIDING TRIM	4/4 RUSTIC 5.5" HEAD AND SILL FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 5/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 5/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
W01	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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3. TYPICAL SIDEWALL FLASHING: ICE&WATER SHIELD 2'-0" VERT UP WALL; WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE. METAL FLASHING EXPOSED 6" UP WALL. TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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 BUILDNG PERMIT APPLICATION.

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING D - ELEVATIONS

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BELL RIPPY
NEIGHBORHOOD
GLENWOOD SPRINGS COLORADO

Revisions:
MAJOR SITE ARCHITECTURAL PLANT re-SUBMISSION 4-20-20
DD PRICING PACKAGE 5-11-20
MAJOR SITE ARCHITECTURAL PLANT re-SUBMISSION 6-16-20

Sheet title: BUILDING ELEVATIONS

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Checked by: MEF

Sheet AD4.0

BUILDING D - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	RUSTIC SLATE
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S3	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 5/16" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	KHAKI BROWN
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	COBBLE BROWN
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	BENJAMIN MOORE "WISH" AF-680
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	BRONZE
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT -4- RUSTIC 3.5" RAILS 4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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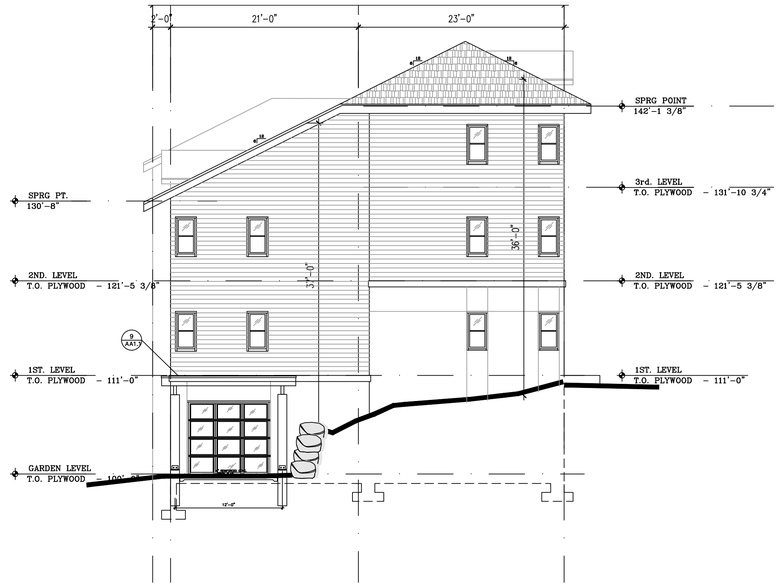
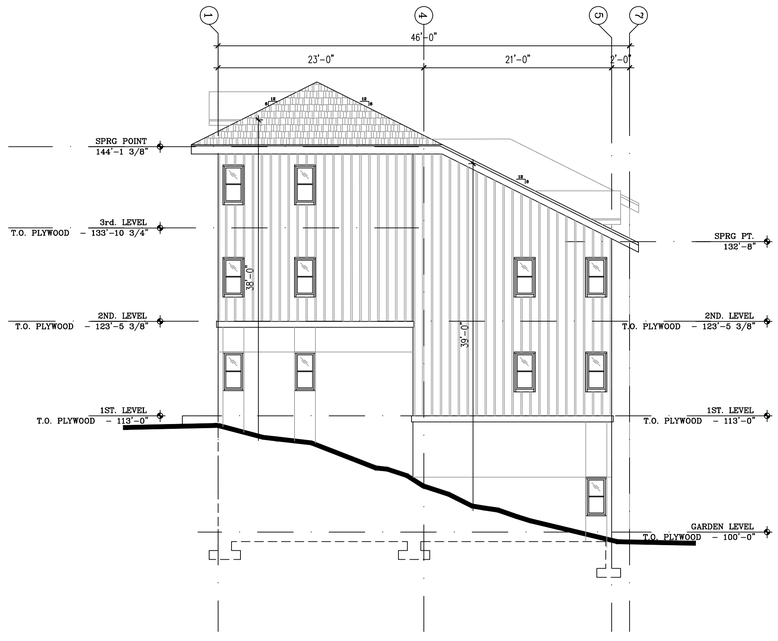


3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

BUILDING D - ELEVATIONS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20
DD PRICING PACKAGE 5-11-20
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 6-16-20

Sheet title: BUILDING ELEVATIONS

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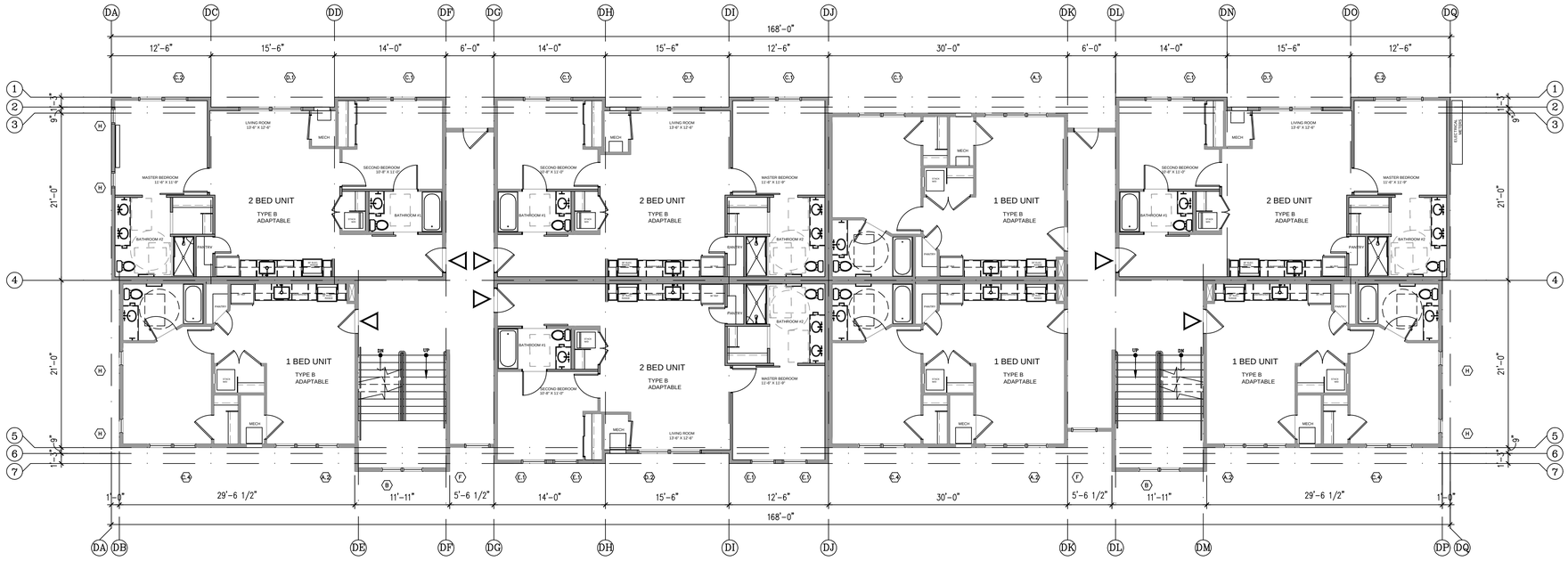
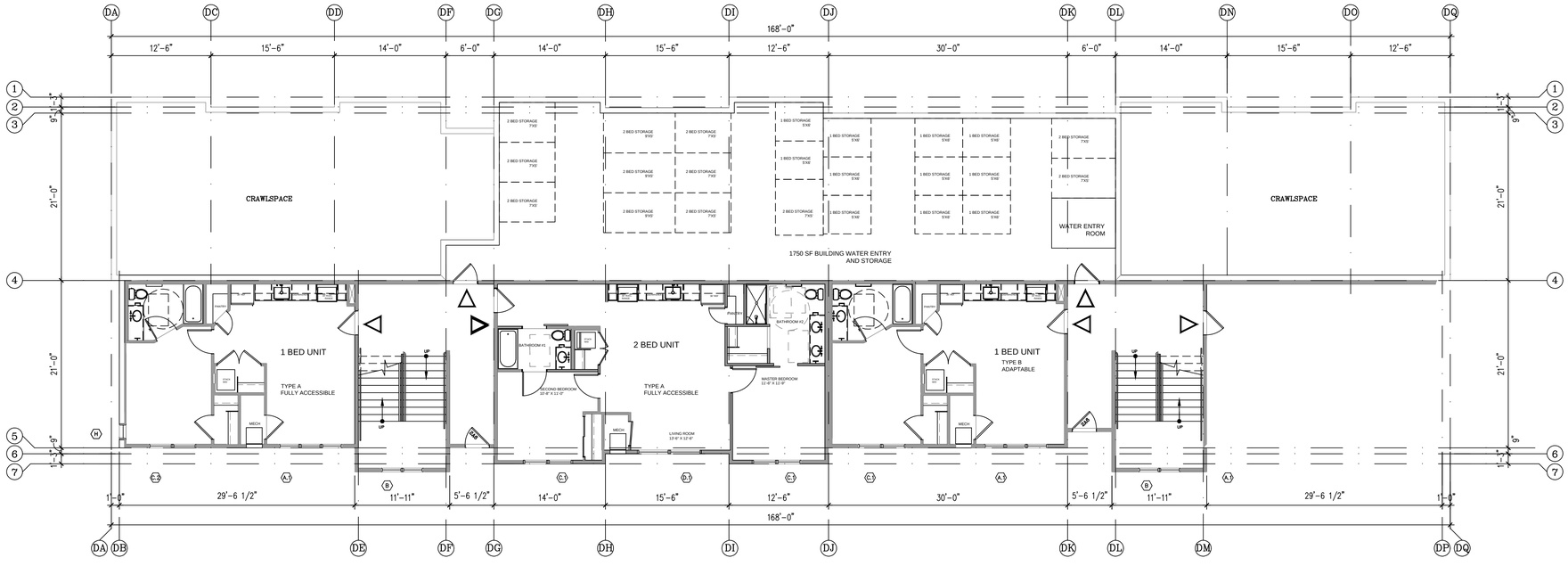


2 BUILDING E - FIRST LEVEL PLAN
1/8" = 1'-0"



1 BUILDING E - GARDEN LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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Sheet title
SCHEMATIC BUILDING E PLANS

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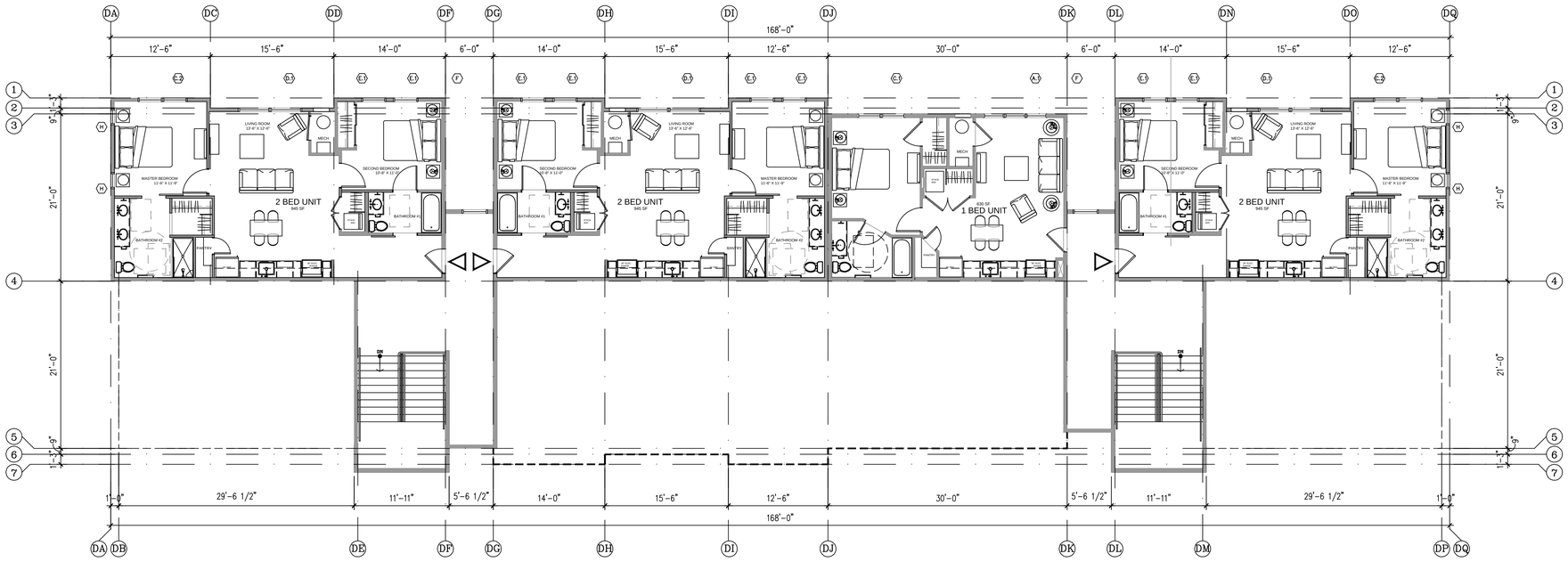
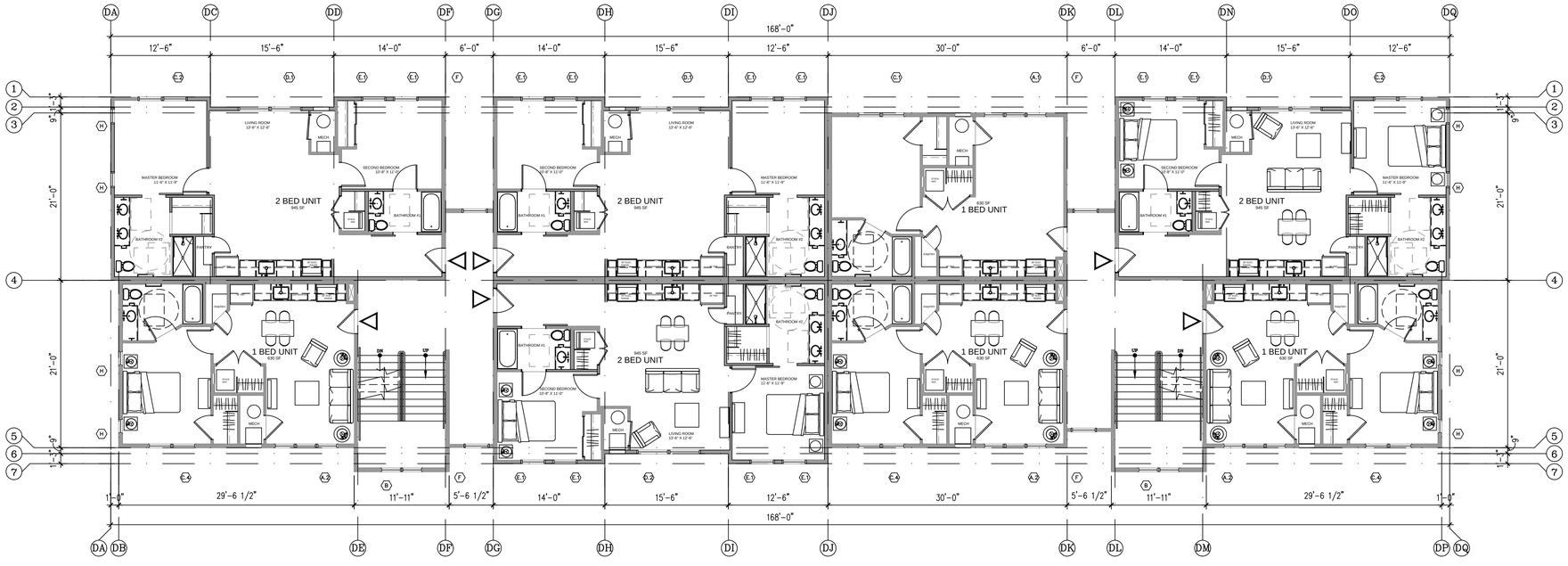


4 BUILDING E - THIRD LEVEL PLAN
1/8" = 1'-0"



3 BUILDING E - SECOND LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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Sheet title: SCHEMATIC BUILDING E PLANS

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BUILDING E - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 7/16" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 1/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING E - ELEVATIONS

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BUILDING E - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 1" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	2 COAT STUCCO SYSTEM W/ INTEGRAL COLOR	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 4/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ LEVEL	FIBER CEMENT - 4/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 4/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 4/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 4/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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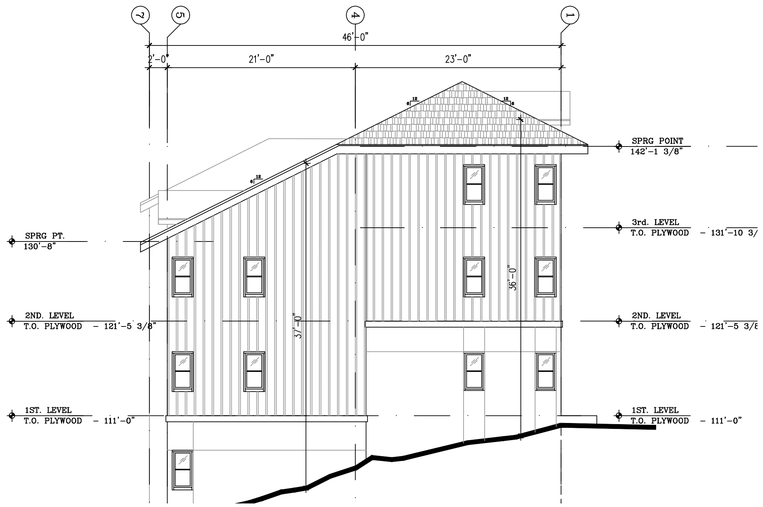
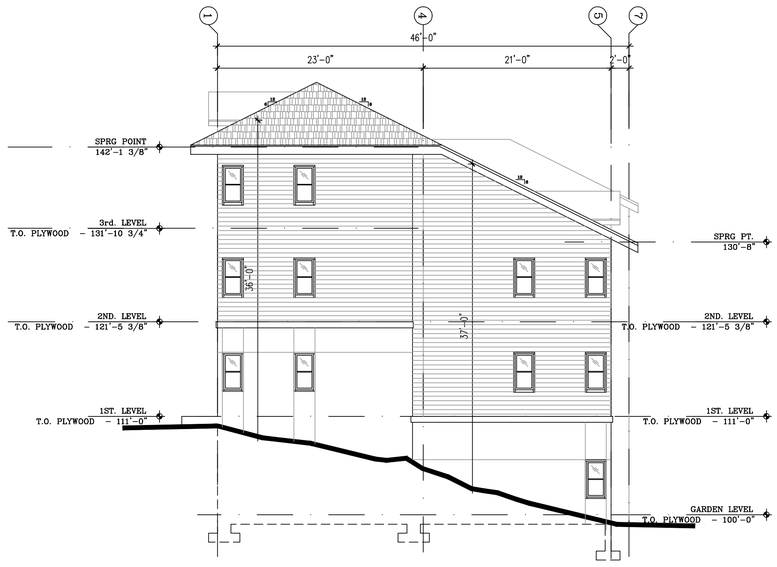


3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

BUILDING E - ELEVATIONS

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Sheet title: BUILDING ELEVATIONS

Stamp

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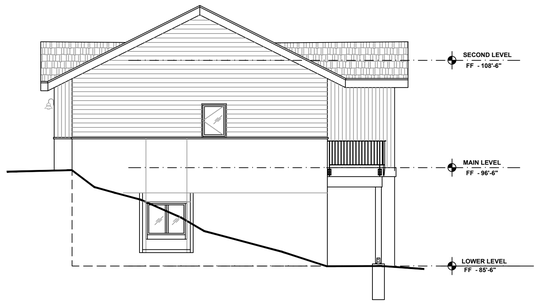
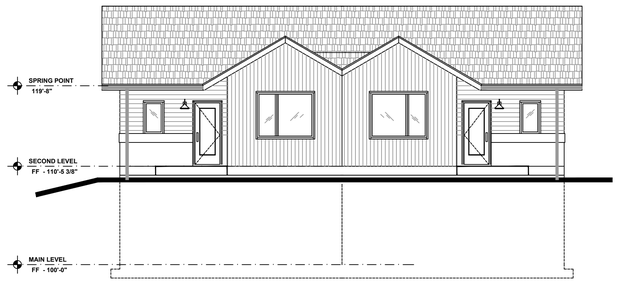
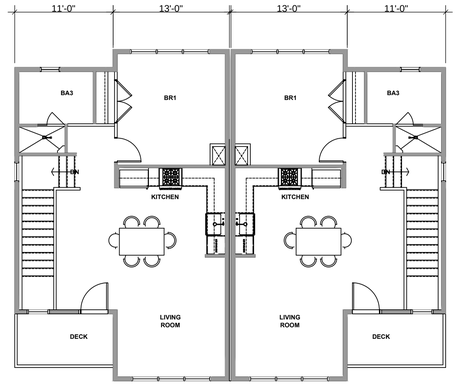


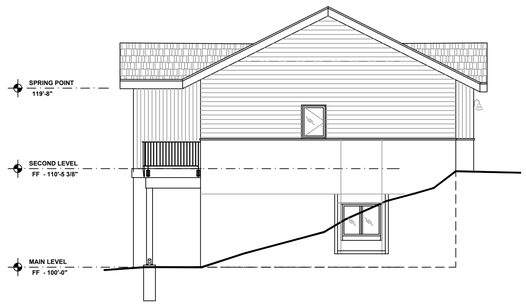
6 NORTH ELEVATION
1/8" = 1'-0"



4 EAST ELEVATION
1/8" = 1'-0"

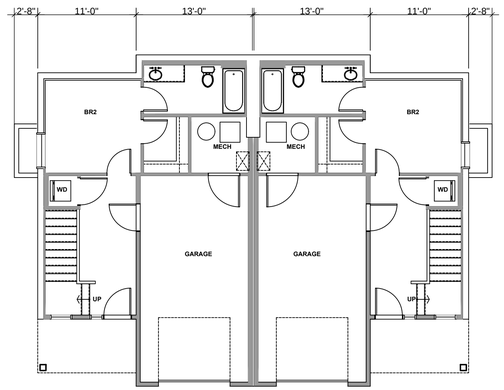


2 SECOND LEVEL PLAN
1/8" = 1'-0"



5 SOUTH ELEVATION
1/8" = 1'-0"

3 WEST ELEVATION
1/8" = 1'-0"



1 MAIN LEVEL PLAN
1/8" = 1'-0"

DUPLEX PLANS AND ELEVATIONS

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GLENWOOD SPRINGS COLORADO

Revisions:
MAJOR SITE
ARCHITECTURAL
PLAN SET-SUBMISSION
6-16-20

Sheet title
DUPLEX
PLANS /
ELEVATIONS

Stamp

Date: 6/16/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AF1.0

LEGEND

- SHADE TREES
- EVERGREEN TREES
- ORNAMENTAL TREES
- SHRUBS
- ORNAMENTAL GRASSES
- PERENNIALS
- ROLL TOP PERFORATED STEEL EDGER
- TERRACE WALLS
- DROUGHT TOLERANT BLUEGRASS
- NATIVE SEED MIX

DEBRIS FLOW FENCE

UNDISTURED SLOPE AREA

UNDISTURBED SLOPE AREA

TERRACE WALLS

COMMUNITY GATHERING AREA - SEE ENLARGEMENT

EXISTING DRIVE WAY TO REMAIN

10' WIDE ASPHALT PATH W/ 5' GRAVEL SHOULDERS

FIRE TRUCK STAGING

FIRE TRUCK STAGING

PALMER AVE.

OFFSITE STORMWATER DEFLECTION BERM

BIKE RACKS

BUILDING E
24 UNITS

BIKE RACKS

BUILDING D
17 UNITS
PLUS COMMUNITY ROOM

BUILDING C
24 UNITS

GARDENS AT ENTRY AREAS

PARKING LOT C
NEW : 26 SPACES

BIKE RACKS

TRASH

PALMER AVE

BUILDING B
10 UNITS

PARKING LOT B
NEW : 23 SPACES

ACCENT PARKING ENTRIES

96TH. STREET

1/2 COURT BASKETBALL

SEATING AREA

TRASH

MAIN PARKING LOT
NEW : 67 SPACES
(2 in Garage)

NEW : 21 SPACES

TRASH

BUILDING A
23 UNITS PLUS LEASING OFFICE

BIKE RACKS

PROJECT SIGN

PARKING LOT A
NEW : 15 SPACES

MIXED EVERGREEN, ORNAMENTAL TREES BUFFER

ZONE A

ZONE D

LARGE SHRUB BUFFER OVER UTILITY EASEMENTS

STORMWATER DETENTION

BLAKE AVENUE

NOTES:

A COMPREHENSIVE AND CONSISTENT LANDSCAPE SOLUTION IS PROPOSED ACROSS THE ENTIRE PROPERTY WITH THE FOLLOWING POINTS:

- TREES AND SHRUBS ARE LOCATED AROUND THE BUILDINGS TO ACCENT THE STRUCTURES.
- RETAINING WALLS ARE SCREENED WITH TREES AND SHRUBS ON THE DOWNHILL SIDE.
- PARKING AREAS HAVE REQUIRED LANDSCAPE ISLANDS WITH TREES AND SHRUBS.
- ALL BUILDINGS ARE SURROUNDED WITH A MINIMUM 5' MULCH BED TO KEEP PLANNED GRASS AREAS AWAY FROM THE STRUCTURES TO AVOID ADDING IRRIGATION WATER TO THE SOILS UNDER THE BUILDINGS.
- ALL LANDSCAPE PLANTINGS ARE LOCATED A MINIMUM OF 5' AWAY FROM THE BUILDING TO AVOID ADDING IRRIGATION WATER TO THE SOILS UNDER THE BUILDINGS.
- ALL LANDSCAPE PLANTINGS ARE LOCATED TO ALLOW FOR SNOW STORAGE AREAS EQUALLING 20% OF THE ADJACENT PAVING AREAS.
- ALL REMAINING AREAS ON THE SITE NOT TO BE PAVED, BUILT UPON, OR MULCH BED WILL RECEIVE REVEGETATION WITH NATIVE GRASSES, TO INCLUDE TEMPORARY IRRIGATION UNTIL ADEQUATE REGROWTH.
- ALL LANDSCAPE PLANTINGS WILL HAVE ONE COMPREHENSIVE PERMANENT DRIP IRRIGATION SYSTEM INSTALLED AND MAINTAINED BY THE APARTMENT COMPLEX MANAGEMENT.
- ALL LANDSCAPE PLANTING WILL MEET THE MINIMUM SIZE AS REQUIRED BY GLENWOOD DEVELOPMENT CODE.

1 MASTER LANDSCAPE PLAN

1" = 30'-0"

0 30 60 FT

scale: 1"=30'-0"

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BELL RIPPY NEIGHBORHOOD
GLENWOOD SPRINGS COLORADO

Revisions: DD SET

Sheet title: MASTER LANDSCAPE PLAN

Stamp

Date:	Project No:	Drawn by:	Checked by:
06/15/2020		OSLA	SG

Sheet L1.0

LEGEND

- SHADE TREES
- EVERGREEN TREES
- ORNAMENTAL TREES
- SHRUBS
- ORNAMENTAL GRASSES
- PERENNIALS
- ROLL TOP PERFORATED STEEL EDGER
- TERRACE WALLS
- DROUGHT TOLERANT BLUEGRASS
- NATIVE SEED MIX

1 DETAILED LANDSCAPE PLAN - NORTH

1" = 30'-0"

0 20 40 FT

scale: 1"=20'-0"

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Revisions: DD SET

Sheet title: DETAILED LANDSCAPE PLAN - NORTH

Stamp

Date:	Project No:	Drawn by:	Checked by:
06/15/2020		OSLA	SG

Sheet L1.1

LEGEND

- SHADE TREES
- EVERGREEN TREES
- ORNAMENTAL TREES
- SHRUBS
- ORNAMENTAL GRASSES
- PERENNIALS
- ROLL TOP PERFORATED STEEL EDGER
- TERRACE WALLS
- DROUGHT TOLERANT BLUEGRASS
- NATIVE SEED MIX

0 20 40 FT

scale: 1"=20'-0"

1 DETAILED LANDSCAPE PLAN - SOUTH

1" = 30'-0"

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Sheet title: DETAILED LANDSCAPE PLAN - SOUTH

Stamp

Date: 06/15/2020
Project No:
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Checked by: SG

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Sheet L1.2

POTENTIAL PLANT LIST 6/15/20

QTY	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	o.c. SPACING
SHADE TREES:					
18	EPT	ExclamaSensation Box Elderion! Plane	Acer negundo 'Sensation'	2" clp.	as shown
17	HB	Hackberry	Celtis occidentalis	2" clp.	as shown
2	KC	Kentucky Coffeetree	Gymnocladus dioicus	2" clp.	as shown
13	RP	Prospector Elm	Ulmus wilsoniana 'prospector'	2" clp.	as shown
10	SHL	Skyline Honeylocust	Gleditsia triacanthos var. inermis 'Skyline'	2" clp.	as shown
60	**TOTAL**				
EVERGREEN TREES:					
8	AP	Austrian Pine	Pinus nigra	6' ht.	as shown
4	CBS	Colorado Blue Spruce	Picea pungens	6' ht.	as shown
7	DF	Douglas Fir	Pseudotsuga menziesii	6' ht.	as shown
6	SWP	Southwestern White Pine	Pinus strobiformus	6' ht.	as shown
25	**TOTAL**				
ORNAMENTAL TREES:					
9	ABP	Crabapple	Malus sp	1.5" clp.	as shown
3	ABS	Autumn Brilliance Serviceberry	Amelanchier x grandiflora'Autumn Brilliance'	1.5" clp.	as shown
11	FAM	Flame Amur Maple	Acer ginnala 'Flame'	1.5" clp.	as shown
23	**TOTAL**				
SHRUBS:					
4	AYJ	Andorra Youngstown Juniper	Juniperus horizontalis 'Youngstonwn'	5 gal.	3' o.c.
23	BJ	Buffalo Juniper	Juniperus sabina 'Buffalo'	5 gal.	5' o.c.
77	BMS	Dark Knight Bluemist Spirea	Caaryopteris x clandonensis 'Dark Knight'	5 gal.	4' o.c.
15	CL	Common Lilac	Syringa vulgaris	5 gal.	3' o.c.
101	CTLS	Creeping Three-Leaf Sumac	Rhus trilobata 'Autumn Amber'	5 gal.	4' o.c.
46	DBRB	Dwarf Blue Rabbitbrush	Chrysothamnus nausoesus nauseosus	5 gal.	4' o.c.
25	DN	Dwarf Ninebark	Physocarpus opulifolius 'Nanus'	5 gal.	4' o.c.
35	NFS	Neon Flash Spirea	Spiraea japonica 'Neon Flash'	5 gal.	3' o.c.
68	NWR	Nearly Wild Rose (Floribunda)	Rosa x 'Nearly Wild'	5 gal.	4' o.c.
49	RGD	Tall Blue Sagebrush	Artemisia trideneta 'Tall Blue'	5 gal.	6' o.c.
28	RTD	Isanti Redtwig Dogwood	Cornus sericea 'Isanti'	5 gal.	5' o.c.
471	**TOTAL**				
ORNAMENTAL GRASSES & PERENNIALS					
50	CMG	Arabesque Maiden Grass	Miscanthus sinensis 'Arabesque'	1 gal.	48" o.c.
124	FRG	Foerster Feather Reed Grass	Calamagrostis x acutiflora `Karl Foerster`	1 gal.	36" o.c.
185	L	Deep Blue Lavender	Lavendula aungustifolia 'Hidcote'	1 gal.	24" o.c.
133	SD	Becky Shasta Daisy	Leucanthemum x 'Becky'	1 gal.	18" o.c.
492	**TOTAL**				

LANDSCAPE AREA: 6/15/2020

SITE LANDSCAPE (not including parking lot landscape)

NORTH & SOUTH PARCELS		TREES: REQUIRED (1/400 sf)	TREES: PROVIDED	SHRUBS: REQUIRED (1/100 sf)	SHRUBS: PROVIDED	PERENNIALS & ORN. GRASSES REQUIRED (1/50 sf)	PERENNIALS & ORN. GRASSES PROVIDED
Disturbed Area Lot 1:	66,281						
Disturbed Area Lot 3:	106,010						
2710 Blake Street	10,018						
TOTAL DISTURBED:	182,309						
20% Landscape Area:	36,462	92	92.00	365	365	730	474
	total:	92	92	365	365	730	474
							sub 26 shrubs for deficit

STREET TREES	LINEAR FEET:	REQ. TREES - 1/75 LF	PROVIDED
PALMER AVE - EAST SIDE	240	3	3
PALMER AVE. - WEST SIDE	240	3	3
26TH ST. SOUTH SIDE	110	2	2
BLAKE AVE. EAST SIDE	444	6	6
	total:	14	14

PARKING LOT ISLANDS:		1 TREE/ISLAND REQUIRED	1 TREE/ISLAND PROVIDED	5 SHRUBS/ISLAND REQUIRED	5 SHRUBS/ISLAND PROVIDED		
		16	16	80	80		
	total project:	108	108	445	471	730	474

PARKING LOT AREA	% required	REQUIRED SF	PROVIDED SF	percentage provided
50,068	20	10,014	10,014	20%

PLANT NOTES:

1. All plant material shall meet specifications of the American Association of Nurserymen (AAN) for number one grade. All trees shall be balled and burlapped or equivalent. All plant materials shall have all wire, twine or other containment materials, except for burlap, removed from trunk and root ball of the plant prior to planting. Any tree or shrub planted within sight triangles (access points to drives and roadways) should be limbed between 3.5' and 8' for clear views.

2. Trees shall not be planted closer 10 feet to any sewer or water line. Tree planting shall be coordinated with all dry utilities. Locations of all utilities shall be verified in the field prior to planting. Trees planted within sight triangles will be trimmed so no branches are below 8'.

3. Grades shall be set to allow for proper drainage away from structures. Grades shall maintain smooth profiles and be free of surface debris, bumps, and depressions.

4. Developers shall ensure that the landscape plan is coordinated with the plans done by other consultants so that the proposed grading, storm drainage, or other constructions does not conflict nor preclude installation and maintenance of landscape elements on this plan.

5. All shrub beds adjacent to turf areas shall be edged with roll top Perforated Steel Ryerson or approved equivalent steel edger.

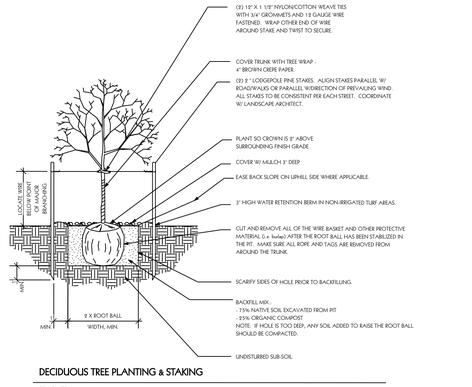
6. All shrub bed areas shall be mulched with wood bark mulch over weed barrier fabric to a depth of 4". Perennials and groundcover areas shall be mulched with a 3" layer of shredded bark mulch. No weed barrier in perennial/annual areas.

7. Prior to installation of plant materials, areas that have been compacted or disturbed by construction activity shall be thoroughly loosened; organic soil amendments shall be incorporated at the rate of at least five (5) cubic yards per 1000 square feet of landscape area.

8. All landscape (plant materials and grass) will be irrigated with an automatic system according to Town of Vail Design Specifications. Turf and seed areas will have a spray zone, shrubs will have a drip zone and perennials/groundcovers (part of the drip zone) will have micro-jet sprays where appropriate.

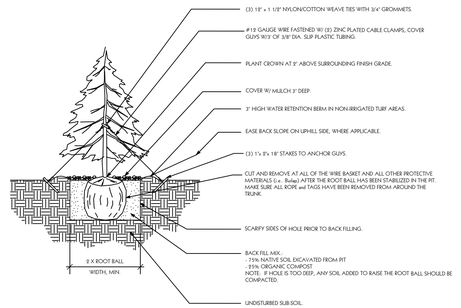
9. Contractor shall verify all material quantities prior to installation. Actual number of plant symbols shall have priority over the quantity designated.

10. All planting will comply with the Town of Glenwood Springs, Engineering Standards and specifications.



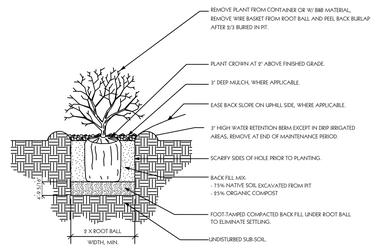
DECIDUOUS TREE PLANTING & STAKING

SCALE: NTS



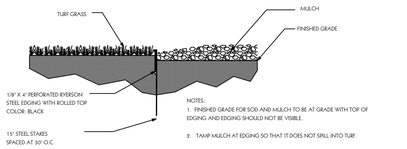
EVERGREEN TREE PLANTING & STAKING

SCALE: NTS



TYPICAL SHRUB PLANTING

SCALE: NTS



EDGING

SCALE: NTS

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Revisions: DD SET

Sheet title: LANDSCAPE NOTES & DETAILS

Stamp

Date: 06/15/2020
Project No:
Drawn by: OSLA
Checked by: SG

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Sheet **L2.0**

Access and Circulation Discussion
Regarding Triumph-Bell Rippy Proposal

NEIGHBORHOOD MEETING
JUNE 8, 2020

ATTENDANCE

City Staff	Triumph
Jenn Ooton, Assistant City Manager/Community Development Director	Michael O'Conner
Trent Hyatt, Senior Planner	Stephanie Copeland
Terri Partch, City Engineer	Michael Foster
Matt Langhorst, Public Works Director	Derik Walter
Gretchen Ricehill, Asst. Community Development Dir.	

Trent Hyatt, Senior Planner, Glenwood Springs Community Development Department opened the meeting at 4:32PM.

He provided a summary of the purpose of the meeting to discuss traffic and mitigation associated specifically with Triumph's proposed development of the Bell Rippy property and introduced city staff and Triumph development team. He reviewed the existing development approvals and current traffic mitigation options from the development proposed approved in January 2018.

Stephanie Copeland, Triumph development team, stated that although disappointed in the development review delay, the extra time resulted in what she felt was a better overall site plan.

Michael O'Conner, Triumph development team, provided a PowerPoint summary that

- Reviewed existing approvals
- Reviewed traffic mitigation considerations based on current approvals
- Provided an image of a new proposed site plan
    - Focused on closure of the upper section of Palmer to traffic
    - Moving building F
    - Concentrating parking
    - Adding new park/open space at 26th & Palmer

Public Comments

Erin Lee- 2502 Palmer Ave
Thanked applicants for listening to the neighborhood. Option C felt like a blessing. 100 % voting for option C. Spoke with a number of other residents that felt the same.

Trish Kramer - 2501 Palmer
Thanked Trent for sharing the plan ahead of time. This is the concept that the neighborhood has asked the prior developers and the city to consider. See revised site plan as helping and stated that mitigation Option A or portions of it are still necessary. Blake gate opening is a powerful change. Gate opens the neighborhood to commuter and shopper traffic avoiding highway 82 – speed controlling option is

necessary. Urges city staff and developer to consider impacts on section of Palmer. Still need speed controlling options on Palmer.

Scott Kramer - 2501 Palmer
In favor of traffic mitigation option C. Moving building F was a good move for Oakhurst residents. Thanked developer for insight on developing Option C

Laura Speck
Pleased with improved option of plan C. Asked about need to drop the street 9 feet as originally proposed. Liked new site plan.

Matt – 2510 Blake Ave
Discussed traffic in his block of Blake Avenue and explained concerns about traffic even with option C. Still wanted Blake as a one way or as a one way couplet with Palmer Avenue. Suggested also moving the gate to Blake at 26th.

Jamie Raehal - 2413 Palmer Ave
Asked about the status of Blake as a one way. Liked option C. Not a fan of the one way. Felt that speed controls are still needed

Frank Martin - 805 Crestwood Drive
Agreed with the Kramer's. Liked the new site plan. Still concerned about traffic on Palmer. Speed mitigation is still needed. Concerned about one way on Palmer.

Brianna Milspaugh
Liked option C. Asked for the developers to consider a sign near Walmart to indicate no through traffic.

Shelly Lott
Concern with Option C – coupled with one way. Agreed that there needed to be a no through sign. Liked the park at 26th and Palmer. Asked whether debris flow mitigation to remain safe and in place to protect downstream properties.

Chat room question from Trish Kramer- name unknown
Does option C include one ways?

Trish Kramer – requested information about the following:

- Width of bike path and surface material
- Gates to discourage vehicles
- Height of retaining wall
- Access to uphill property
- Debris flow mitigation remain the same
- Park – able to be used by entire neighborhood or are there restrictions
- Speed dips instead of speed bumps – might help drainage
- Gate moved to 26th & Blake intersection – why can't it be moved.

Trent Hyatt turned meeting over to Michael O'Conner to address development-related questions.

Michael O'Conner
Bike path – size of retaining wall will be less. Not certain of final height yet. Might be reduced by 3-5 feet. Explained that option C will still be an emergency access – working width is 10 feet with shoulders. Need to maintain a wider access for EMS. Material will be asphalt or concrete. Details not finalized.
Debris flow – will not change.
Park will be private property, but public access will be allowed.
Speed dips – uncertain of the details.
Moving the gate deferred to Terri Partch
Configuration of Blake – will take current approvals and enhance those but Blake Avenue will remain one way.
Preventing circling traffic – staff and most of neighborhood do not prefer one way streets.

Terri Partch
Blake one way south option with a Palmer one way south will not work and is not supported by city staff
Blake one way south Palmer one way north creates a disadvantage for Palmer residents. Creates more potential traffic on Palmer Avenue.

Through traffic from Walmart
Moving gate – will send all traffic up to Palmer and make it difficult for Blake residents to use this street.

Is direction of Blake set – was a condition of the original approval. With new development the old conditions don't necessarily have to remain. Blake can be a two way.

Opening Blake gate – can still be negotiated. Yes, however traffic study created for this development assumed gate open. All traffic would have to go to 27th – creates issues for RFTA – would change traffic plan.

Speed bumps v dips – bumps or tables already used on Midland, bumps in South Park neighborhood. Latter are very steep; accelerate between the bumps. Hard to plow. Matt Langhorst – not big fan, prefer the bumps – hard to maintain in the winter. Changes drainage patterns.

No through traffic signs – it's possible but signs not generally observed.

Question from Trish, chat room: Distance between speed bumps – Matt Langhorst 2 bumps on Palmer.

Trent Hyatt notified everyone that the application will be re-noticed and will be heard at the June 23rd meeting. Send comments to Trent, Jenn and Gretchen as they will be entered into the record.

Question from Trish, chat room: drainage issues with speed bumps. Matt Langhorst indicated that there may be some but comparatively, bumps on Palmer are easier to maintain.

Final comments from Stephanie, Michael.

Meeting concluded at 5:35 PM

From:	Carol Turtle
To:	Trent Hyatt
Subject:	Fwd: 100 apartment application proposed for Blake Avenue
Date:	Tuesday, April 28, 2020 7:17:43 AM

Begin forwarded message:

From: Carol Turtle <c.turtle@icloud.com>
Date: April 23, 2020 at 11:10:00 AM MDT
To: letters@postindependent.com
Subject: 100 apartment application proposed for Blake Avenue

On April 28, 2020, Glenwood Springs Planning and Zoning Commission will consider an application for a proposed major development of 100 apartments in 6 buildings located South of Oakhurst Townhomes and North of Walmart on Blake Avenue. The hillside location sits above the Bus Rapid Transit Station in South Glenwood. If they have not already done so, I suggest the P&Z Commission and City Council members visit the proposed site, and more importantly, visit the surrounding neighborhoods of Blake and Palmer Avenues. These 2 streets will serve as major access roads into the development from South Glenwood. Blake and Palmer Avenues are both substandard streets with improper drainage and no sidewalks. Both streets are totally inadequate to handle the traffic they have now, let alone taking on the increase of traffic generated by 100 apartments while providing no safe passage for children to access schools and parks.

I hope our P&Z Commission will deny approval of this major development application until our city can address the inadequate roads with its lack of sidewalks in the Blake and Palmer neighborhoods.

David J. Turtle
Glenwood Springs, CO

Dear Planning + Zoning

April 16, 2020

My name is Lisa Manzano

I have lived in Glenwood Springs since 1976. My current residence for the past 16 years is 23rd + Palmer, The stop sign sits on my property. During construction on the Grand Ave. Bridge with the increase of traffic 90% of the cars did not stop, Dangerous maybe a lawsuit next time.

My neighborhood has change with many young families lots of

small children, playing outside kickball, walking, riding bikes — The proposed Bell Rippy Development in the past was single family homes, and now it has turned into multi family condo's - The project is simply to BIG to ~~many~~ many people to many cars.

Please reconsider a smaller scale of a project. In a perfect world we would love open space - Thankyou for your time

Lucas M Mangan

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: Concern over Bell Rippy Development
Date: Monday, April 27, 2020 8:07:07 AM

Hello Trent
I hope you had a pleasant weekend.
I received this message yesterday. According to the plan, on May 5th P & Z meeting you'll need to read it into the record. If we receive a lot of written comments, I'll help you do that.
Best,
Gretchen

From: Christine Smalley <csmalley@rfschools.com>
Sent: Sunday, April 26, 2020 10:45 AM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: Concern over Bell Rippy Development

Dear Miss Ricehill,

My name is Chrisitne Smalley, a high school social studies teacher, mother of two, and resident of Palmer Ave. I write to you today to express my concern over the Bell Rippy Development by Walmart.

They plan to have two bedroom apartments with only 1.5 spots available per apartment. This is unrealistic as almost every family that needs two bedrooms has two cars. With high costs of housing people will certainly be having roommates, again a situation that would have two cars. The neighborhood does not have the space or the road conditions to allow for overflow parking. Additionally, there are many children in the neighborhood riding bikes and families walking. Without sidewalks, they are in the street and already in an unsafe condition; additional traffic through this area is scary for all residents and our children.

I'm not opposed to the development, but it needs to come with sidewalks and safety precautions for those in the neighborhood around it. Successful city planning requires thoughtful consideration for impacts of developments beyond the confines of the parking lot. City council must consider the overall effects that a development will have on the area as a whole.

If you have not walked through these areas, you need to, and please do so with your fellow council members, consider discussing these concerns with Paula Steep who walks the neighborhood regularly. You need to see people pushing their strollers and kids trying to navigate the already pot-holed streets on their training wheels; you too would feel the concern that our neighborhood has. Thank you for your time.

--
Christine Smalley
Glenwood Springs High School Social Studies Teacher

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: Bell Rippy Development Comments
Date: Monday, April 27, 2020 12:32:25 PM
Attachments: ~$mmunity Development DepartmentRichard.docx

Here's another one.
Gretchen

From: Richard OConnell <r.oconnell@sbcglobal.net>
Sent: Monday, April 27, 2020 12:18 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>; jandjraehal@gmail.com; Jan OConnell <tenacity71@gmail.com>; Christine Smalley <csmalley@rfsd.k12.co.us>; Ralph Smalley <rsmalley@rfsd.k12.co.us>
Subject: Bell Rippy Development Comments

Community Development Department
Richard & Janet O'Connell

101 W. 8th Street 2409
Palmer Ave

Glenwood Springs, Co 81601
Glenwood Springs, Co 81601

Attn: Planning and Zoning Commission

Gretchen Ricehill

We own a multi- generational home at 2409 Palmer Ave. We are concerned that the existing roads do not support the existing Oakhearst Townhomes and the new Bell Rippy Development will make a bad situation worse. We are also concerned that the Bell Rippy Development will end up with non-residential parking and increased traffic on the developed portion of Plamer Ave.

Blake Street has no sidewalks and always has cars and trucks parked on the East side of the street. 26th Street is worse, with a high grade, poor condition, no sidewalks and cars always parked on the north side of the street. The opening of the Blake Ave gate by Walmart will also increase the traffic load on Blake Ave. The existing foot traffic is already high with the RFTA bus stop at 27th Street and will be considerably higher with the Bell Rippy Development. Parking is limited at the RFTA bus stop, which also adds pressure to parking in the area.

At their February 4, 2020 meeting, the new developers reviewed their proposed plans

for the property. It is our understanding that they are proposing 100 apartments located in 6, three and a half story buildings, based on taking advantage of the relatively steep grade of the site. This is an increase of 30 apartments from the previous developer. They were able to increase the number of apartments by eliminating parking under the buildings proposed by the previous developer. There will be a mix of 1 and 2 bedroom rental apartments. They are not planning on any elevators so there will be no handicap access for the upper floors. Per the Glenwood Springs development code Table 0.30.1, they are required to have 1.5 parking spaces per each dwelling and a quest parking space for every five dwellings. Based on 100 apartments they would need to have 170 parking spaces at a minimum. The developers noted they plan to ask for a variance in the parking space requirements which we believe should not be allowed due to the overloaded parking in the area.

Sincerely

Richard and Janet O'Connell

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: P & Z discussion-public comment
Date: Tuesday, April 28, 2020 12:27:59 PM

-----Original Message-----
From: Joan Troth <jktroth@comcast.net>
Sent: Tuesday, April 28, 2020 12:24 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: P & Z discussion

I request that Planning & Zoning deny the request to approve 100 apartments in six buildings between Blake and Palmer for these reasons:

The city's mission statement includes maintaining the small town character of Glenwood Springs

Massive buildings do not comply with this statement

Adding the huge number of new residents on the south edge of town will impact the surrounding neighborhood negatively regarding home values and traffic

Adding more cars to Grand Avenue will result in congestion becoming the norm

Adding the large number of apartments will impact the city's water supply and sewage capacity

The city of Glenwood Springs has no responsibility to provide housing for up-valley workers

Joan Troth, 3202 Cooper Ct.
945-0668

From:	Sara Sims
To:	Trent Hyatt
Cc:	Sara Sims
Subject:	FW: statement for the record
Date:	Tuesday, April 28, 2020 2:51:46 PM

Good afternoon, Trent.

Please accept this communication as Mountain Valley Developmental Services' official public comment regarding the Bell Rippy development of the Oakhurst subdivision:

Mountain Valley Developmental Services is a Community Centered Board and Program Approved Service Provider, supporting people who have intellectual and developmental disabilities. We own a home at 2503 Palmer Avenue, which is adjacent to said development. This home supports 7 adults of varying levels of need, but nearly all require a little extra time and space to physically maneuver through their environments. This includes getting into and out of vehicles on Palmer Avenue and 26th Street.

I am aware of the current issues regarding the on-street parking to accommodate for the overflow of Oakhurst Townhomes and the lack of sidewalks in the area. After attending the neighborhood meeting on February 4th, it is clear that the new development will exacerbate these concerns.

Additionally, the increase in traffic produced by the property's future inhabitants will inevitably render Palmer Ave a higher density traffic area which is not equipped to handle this volume of vehicles.

I am worried about the safety of the people living not only in our home, but in the neighborhood, and their ability to navigate these hazards. Our current space is adequate to accommodate for staff vehicles and specially equipped vehicles (which are larger than typical) on which the residents rely. However, with more vehicles and increased traffic flow, I fear that we won't be able to safely or easily find parking, load/unload residents, or maneuver our vehicles onto and off Palmer Avenue and 26th Street.

Here are a few considerations to mitigate our concerns:

- Request the developers commit to subdivision improvements to address these issues (mentioned above);
- Extend these improvements past the development's property lines to 23rd and Palmer, along 26th Street, and from 27th to 23rd and Blake; and
- Dedicate City resources to creating better parking and traffic plans that includes safety measures for pedestrians along the streets mentioned above.

Thank you for your consideration.

Sara Sims

From:	Elaine Speck
To:	Gretchen E Ricehill; Trent Hyatt; michael@triumphdev.com
Subject:	Triumph Development West Application for Apartment Community
Date:	Thursday, April 30, 2020 4:59:55 PM

This is a follow-up to our Zoom meeting held on April 28. In 2017 the P&Z held numerous meetings for a development similar to the current proposal. We had dozens of concerned citizens attending the meetings and speaking of their concerns, i.e. increased traffic flow, to open or not open the gate on Blake, one way on Blake, one way on Palmer, density of the proposal, grade of the road, P&Z will hopefully look back to see concerns at that time.
The proposal, although finally approved, went silent.
Several months ago notices were sent to residents about a new proposal. The meeting was held in a small room at the Community Center with standing room only (6 chairs were provided). Nothing pertinent came of this gathering - preliminary architectural plans were shown. It is perplexing that this new developer can just pick up where the previous developer failed and move forward. Are they not required to start as a new entity? The proposal has significant differences. The next meeting of P&Z will be held on Tuesday, May 4th, one week after the Zoom Meeting.
The impact to the residents of the Oakhurst Condominiums is truly horrid. The traffic will be a nightmare.
I have lived at 2506 Palmer since the 70's. Now I find that I might have to move my driveway to accommodate the new construction. Really?
Please consider tabling this matter and resume when we are on the other side of the current health crisis. Most of us are still in some kind of "social distancing" and "safer at home" mode.
Thank you for your consideration.
Elaine Speck

From:	The Silver Bead Colorado
To:	Gretchen E Ricehill; Trent Hyatt; Michael O"Connor
Subject:	Planning and Zoning
Date:	Thursday, April 30, 2020 8:11:05 PM

I am requesting that you deny/postpone ANY decisions that could possibly be made in regards to the development proposed by Triumph LLC during this time of Pandemic in our world. Most of our lives have been turned upside down and I feel that it is incredibly irresponsible to make any crucial decisions on a project of this scale, that greatly effects so many citizens.

I know that many other concerned residents were unable to communicate their questions due to the Zoom/You Tube platform on Tuesday night. It is only fair that you have heard from every citizen before rendering any decisions.

This presentation was the first that many of us have seen the illustrations and information of the proposed plans and it was also the first time we got to "see" who the members of Triumph Development LLC are. During this lengthy presentation many disturbing topics were brought up that NEED to be discussed before we continue any further. Please allow me to present a few of my families concerns;

#1. This project is still TOO MUCH for this land parcel. They have proposed to basically tear up most of the property to construct buildings, concrete, asphalt and fences. They have not taken into consideration any neutral/open space to allow for significant privacy or environmental impact.

#2. Why is it that when new developers (mainly who reside in other towns or states) that see a "potential" to develop areas in OUR town, seem to have more rights and allowances than the current residents who have been investing into our community and paying taxes for years??? As I mentioned on the video conference the other night, my father built our house 48 years ago on this land. The whole area was then zoned for single family house developments. Unfortunately, zones have been changed over the years and the Bell/Rippy multi-family land owners seem hell bent on only allowing LARGE developers to decimate the land and turn the whole area into high density housing units.
The reason why there is such push back and frustrations over these proposals is because it is just TOO MUCH and needs to be scaled down to a more measurable and responsible size. I would like the newer members on this commission to know that this is at least the FOURTH time in the past 12 years that "we", as the neighbors have had to deal with these proposals. Yet, we are never informed as to what happened when the previous plans fell through or failed. We are left questioning and hoping that perhaps the land owners have finally realized it is time for ANOTHER type of development option to be explored (example...open space or a park).

#3. Just because Planning and Zoning and the City Council approved the last development in 2017, that does NOT just "grandfather" in this new proposed development. There are

significant changes that have been made in this plan and well as a whole new set of questions that need to be answered. One of the biggest concerns, that impacts our family's property is this NEW Northside parking lot that would be directly in front of our house. This was NOT in the previous plan!!! I am sure that any one of you reading this can appreciate how difficult that is for us to even comprehend this type of change. I ask that you have compassion and try to imagine if this was YOUR house. The street lights/ noise would penetrate our beautiful dark skies at night, headlights would be facing directly towards our front windows, as well as the Oakhurst condominiums. Not to mention the exhaust that would be contaminating our entire neighborhood with the substantial increase of vehicles not only driving into the proposed parking lots, but also idling in the cooler winter months. It is kind of unbelievable that an entire plot of land needs to be developed for a parking lot that only accommodates some 25 cars!!! How greedy and unnecessary and dare I say...cruel .

Mike O'Conner casually mentioned that "we" (the house at 2506 Palmer) would need to re-configure OUR driveway to accommodate for this new plan. WHAT???? As you know by my comments on the video chat, that was completely shocking news to us and absolutely unacceptable. There should be more concern for NOT impacting the current residents in ANY sort of way. Again, let me state, WHY would you allow a project to progress that causes so much disruption to such a large area of citizens??? The people from 23rd street, the entire block of Palmer Avenue, down to the Oakhurst Condominiums, 26th Street and Blake street are all being impacted. Not to mention RAFTA, Highway 6 & 82, 25th street and more. Doesn't that seem a bit much to you???

What I would like to propose is a compromise. I understand that change is inevitable, but no positive changes can ever occur without compassion and flexibility. What I propose is to eliminate the North side parking lot completely and leave that area as a neutral open space. That would alleviate our major concerns as well as for some of the residents at Oakhurst. It would also greatly decrease the potential traffic volume on Palmer Avenue and 25th Street. I would also like to see this project scaled down from 100 units to 80 or less. I think buildings E & F could be removed from this plan to assist in the direct impact on Oakhurst. I propose NO sidewalks be developed on the side of Palmer Avenue (as one commissioner mentioned, it is a sidewalk that goes "no where", because there are no other sidewalks constructed for it to attach to until the other side of 23rd street). The entryway to the parking lot would be removed completely as well and there would only be ONE entry point into the main internal parking lot and that would be located further down on Palmer. This would allow for this area to remain peaceful and clam and make good strides to be kind neighbors to each other. It would also not impact our family's house in any way and allow for us to breath easy again.

I would also like to see the proposed debris flow fence be moved significantly further away from our property line to allow for spatial distance and privacy. In addition, I would like the developer to post signage of no parking areas so that Palmer Avenue road is not filled up with additional vehicles/trailers/campers, etc. because they do not fit into the "allocated spaces". No one can really believe that 1.5 parking spots will accommodate the accurate number of

what people will actually be driving. They are going to need to strongly limit and monitor the amount of vehicles their tenants own and not just charge them an extra "fee" if, and when, they show up with more. The main source of impact that this development needs to focus it's energy on is the wide open space at the corner of Palmer and Blake where it is not effecting the current residents as much.

I would also like to see these property owners address the trash and homeless encampments that have taken over the entire area up here. Initially I wanted to bring this topic up on the video chat the other night...but then so many other more pertinent issues arose that I forgot to mention it again. I am in the process of creating a task force to finally clean up these horrific camps once, and for all in this area (from Palmer down to the south side of Walmart). ECOS will have to be hired to help us clean up these toxic and incredibly dangerous sites. I would like this developer (as well as the members of Bell/Rippy) to consider contributing significantly to this cause. It is partially the fault of these current land owners that have allowed this situation to have gotten to this point, as well as BLM and the state. I would hope that Triumph Developers LLC would also like to help and make contributions that would benefit our entire neighborhood. That would show us some good faith that you are really trying to be a positive part of our neighborhood and perhaps, we can really all come together in hopes of a development that benefits us all.

I appreciate you taking the time to read my lengthy email and I look forward to hearing back from you soon.

Sincerely,
Laura Speck
2506 Palmer Avenue
Glenwood Springs, Colorado 81601
970-945-5663 (work)

4/30/2020

We the people living in the Oakhurst townhomes oppose the building of the proposed Apartments Because:

(1) the increased traffic will make the neighborhood hazardous to walk or ride bikes in

(2) An increase of vehicles will make an already bad road worse - especially in winter

(3) There is not enough places to park for the current residents And their guests/family to park

(4) DO you think there will be only one car per Apartment And no one will ever have any visitors? At least 200 + parking spaces are needed - where will they be?

(5) Low income housing will make this section of Glenwood A slum part of the city faster. IN Slums there is always an increase of Crime, violence And drug Dealing (Gangs). Can the police Department handle this? We DO not want the Apartment people coming into our Neighborhood Destroying our Property

(6) How are the homeless people and their Dogs

That chase people going to be addressed?

1) Lori Nelson Oakhurst #34
2) Dulce Ramirez Oakhurst #33
3) Blanca Ramirez #33
4) BRADLEY Rice #10
5 Brandy Rice #10
6 Cathy Cassand #10
7. Drake Timroth #7
8. Kristen Levey #7
9. [illegible] #7
10. Steve Pierce #28
11. Erickxa Crampton #28
12. Marie Dohm #4
13. George Dana #1
14. Shelly Lo ~~##~~ 19 Oakhurst
15. Joan Guilianelli #15
16. Breanna Millspaugh #18
17. Zachary Apke #18
18. Daisy Apke #18

May 1, 2020

To: Glenwood Springs City Hall – Community Development Department

Regarding: The Application from Triumph Development West LLC on behalf of property owner, Bell Rippy Glenwood LLC

Public Comment from: Ann E "Annie" Hoghaug

Address: 678 County Rd 127, Glenwood Spgs CO 81601

Owner: 519 Easy Street, Glenwood Spgs CO 81601

Firstly, thank you for the comprehensive informational session with the P&Z Commission and the Developer and related parties on April 28, 2020. I attended the meeting via the Zoom protocol. I was also in attendance at the February 4, 2020 Community Information Session at the Glenwood Springs Community Center.

My concerns with this project are primarily related to PARKING. Looking at the number of bedrooms in the project and doing the math at the average number of people per bedroom, as estimated by Michael O'Connor during the 4/28/2020 meeting, I get 204 people (163 bedrooms x's 1.25 people/bdrm). Note that this estimate seems low to me due to the likelihood that the per unit rental costs will be high at approximately $2,000 + per unit as of initial leasing upon project completion. In my experience, high rental rates equate to high occupancy per unit in tenant efforts to manage affordability. Note also that the $2,000 + per/month amount was suggested by Michael O'Connor at the February community meeting about the project.

But, back to the parking… perhaps a portion of the 204 people are either children or the unusual adult who does not own a motor vehicle. With a non-vehicle estimate at 15% of the total 204 people, the number of car owners drops to 174. The proposal includes a total of 148 parking spots. At one car per person this is an immediate parking spot deficit of 26 spaces OR an average of .85 parking spots per vehicle owning tenant. I would speculate that the EXTRA vehicles related to tenants of this project will be parking anywhere they can – along Blake Ave, Palmer Ave and 26th Street; as well as in the Wal Mart parking lot and RFTA Park & Ride parking lot! As pointed out by Trish Kramer during the Public Comments portion of the 4/28/20 meeting, "reduced vehicle usage" does not necessarily equate to "reduced vehicle ownership". In other words, yes, this project may result in more people taking the bus and biking, BUT they will likely still own a vehicle or two (i.e. work vehicle; car for recreating on the weekends; etc.).

I understand that Triumph is simply taking advantage of the parking spot requirements as dictated by the City of Glenwood Spgs. I, therefore, respectfully request that P&Z as well as City Planning Dept and City Council reconsider required parking allotments for developments of this type; and subsequently, deny approval of this project. Ironically, I ran across an article in the *Glenwood Springs Post Independent dated April 20, 2016 and titled "Developers: Proposed Fee Schedule Still Falls Short"*. The article includes a few interesting tidbits. One I find interesting is seeing that P&Z recommended denial of the 116-unit Oasis Creek Apartments due to building height ***and parking code*** variances:

> "One project that would benefit from whatever fee reductions come about is the proposed 116-unit Oasis Creek Apartments, which is also before council on Thursday. That project has its own hurdles to clear, including a recommendation for denial by the city's Planning and Zoning Commission, primarily due to the developer's requested building height and parking code variances."

First, it is interesting to me that 1.5 (or less) parking spots per unit ***used to be*** considered a variance. Now it appears to be the status quo for projects of this type. Secondly, I wonder who benefits from such minimal parking requirements? I would guess the developers are OK with it. Seems like nothing but trouble for prospective tenants AND rental management agents.

Other interesting tidbits from this article:

> From Chad Lee, Local Land-Use Attorney --"The comprehensive plan, updated in 2011, was the product of hundreds of hours of citizen comment and participation. The comprehensive plan acknowledges a dearth of housing in Glenwood. It also acknowledges the market's inability to deliver both affordable and attainable housing. Part of the problem, he said, is Glenwood Springs' affordable housing mandate, which requires developers of free-market, for-purchase housing to build a certain number of below-market, deed restricted units as well. The comprehensive plan explicitly says the city will use incentives and regulations to encourage attainable housing, he said."

This, to me, explains, in part, why there are so many rental complexes springing up all over town. The developers are incentivized to build this type of housing in Glenwood Springs since deed restricted units are a drag on their profits. Additionally, at the 2/4/20 meeting, Michael O'Connor, stated that the Bell Rippy project is NOT considered "affordable" housing. I would agree that $2,000/month and just one parking spot for my family's 2 cars would NOT make me feel as if I had found anything close to ***affordable*** housing. Finally, the "attainable" piece – "attainable" seems to be subject to considerable interpretation. Perhaps Bell Rippy units will be attainable for middle income earners… but, I must wonder, will they be ***desirable***?

Finally, IF the Bell Rippy project continues down the path of approval, I respectfully propose that a City of Glenwood Springs CONDITION OF APPROVAL become part of the permanent record to the effect that: Leasing Agent/s, in perpetuity, are required to explicitly specify number of parking spots per each unit AND assign spots per a spot numbering system that correlates to an assigned number physically attached to the actual space, as well as on the lease agreement. I believe the existing neighborhood and greater Glenwood Springs community deserve recourse that such a condition could afford in the event of the parking situation becoming a free for all at some point in the future. This CONDITION OF APPROVAL could also enact NO PARKING ZONES along the portions of Palmer Ave and Blake Ave that abut the Bell Rippy property, along with ENFORCEMENT of the No Parking Zones.

I am also compelled to comment on the opening of the Blake Gate and the city plan to make Blake Ave between 24th Street and 26th Street a one-way going south. Multiple times last night the one-way portion was referred to as being between 23rd Street and 26th Street so I would appreciate clarification on that. My understanding is that it would be between only 24th and 26th streets and I am supportive of this plan in order to prevent "cheater" traffic at times of high volume north bound travel on Hwy 82. Easy Street intersects Blake Avenue in the proposed one-way section, and, I believe, Easy

Street residents would accept the inconvenience of a lifetime of left hand turns off of Easy Street over the likelihood of this section of Blake Avenue seeing increased traffic in BOTH directions. Note also that this section of Blake Avenue is VERY narrow. A one-way section here could potentially pave the way (no pun intended) for improvements to Blake Avenue that could include gutter and sidewalk. I strongly encourage all city personnel, P&Z commissioners and city council members to walk this stretch of Blake Avenue prior to making any binding decisions regarding its fate.

Finally, I wish to emphasize the public comment from Trish Kramer during the 4/28/20 meeting regarding her concerns about Coronavirus and its effects on the city's ability to support and improve infrastructure peripheral to the Bell Rippy proposed project, i.e. Blake Avenue, Palmer Avenue, 26th Street and 23rd Street and supporting infrastructure therein, such as sewer and water systems, gutters and sidewalks. In other words, does this project put undue burden on the City of Glenwood Springs (as well as neighbors of the project) during this time when the City has already had to slash their budget??

In closing, I wholeheartedly support "infill" and public transportation for Glenwood Springs and the Roaring Fork Valley. I also support SMART growth. In my opinion, the Bell Rippy Project, as proposed, just does not deliver on the smart growth piece of what Glenwood Springs deserves.

Respectfully Submitted,

~ Ann E "Annie" Hoghaug
970-945-5649
Annieh49@comcast.net

05/04/2020

Bell Rippy Development

I am writing on behalf of myself, Dave Malehorn and my family living at 2407 Palmer Avenue. Family members include my wife, Polly; my 80-year-old mother, Linda, my daughter Shelby; and my Granddaughter, Eliza, 9 months as well as our three dogs.

First, I would like to start with **The City of Glenwood Spring's Mission** statement that states" *To meet the health, safety, and welfare needs of it citizens, and contribute to their quality of life, the City of Glenwood Springs* and *its employees believe the following"* bullet point number 7 states" *We advance the interest of the community openly and transparently"* In 2018, the City of Glenwood Springs voted to open the Blake Street gate and make Blake Street one way without any notification to it's citizens. I implore you to re-think that decision.

Second, the **City of Glenwood Springs 2020-2025 Strategic Vision** bullet point 3 "*protect and preserve our quality of life"* states, *"…. There are challenges to our quality of life including traffic congestion, rising housing costs, increased impacts from growth etc…."*

With these two statements, I have many concerns about the new Bell Rippy development as outlined below:

- **Walkability to retail and downtown**
  - Currently, there are no sidewalks on South Blake
  - Currently, there are no sidewalks on 26th Street
  - Currently, there are no sidewalks on Palmer Ave.

  How does the city reconcile the walkability of the neighborhoods if there is nowhere to walk other than on the streets?

- **Conditions of adjoining streets**
  - South Blake Street is in very poor condition
  - 26th Street is in very poor condition
  - Palmer Street has no sidewalks and is used as a major walking route for the Palmer and adjacent neighborhoods
  - 23th street in poor condition

  Does the city currently have the means to fix these streets before this development is completed?

- **Develop affordable housing**
    - What is the definition of affordable per the city?
    - What is the proposed rent for the Bell Rippy property?
    - How much free market housing is already approved and/or being developed. (The Lofts, Six Canyons, the old Buffalo Valley property, the old Lutheran Church property in West Glenwood)

  Does the city really need 100 more units of free market housing?

- **Parking**
    - The 27th Street Park and Ride parking already overflows onto South Blake, 26th Street and upper Palmer
    - Oakhurst Condominiums has 34 units and 80 parking spots and their residents overflow park on South Blake and 26th Street
    - RFTA buses are currently parking by the Blake Street Gate as the can no longer park at the old American Furniture parking lot. Where will they go?
    - Bell Rippy's snow removal program currently is to plow the snow into parking spaces, where will those cars go?

  Does the city have a plan to deal with the parking issue that will be exasperated with Bell Rippy?

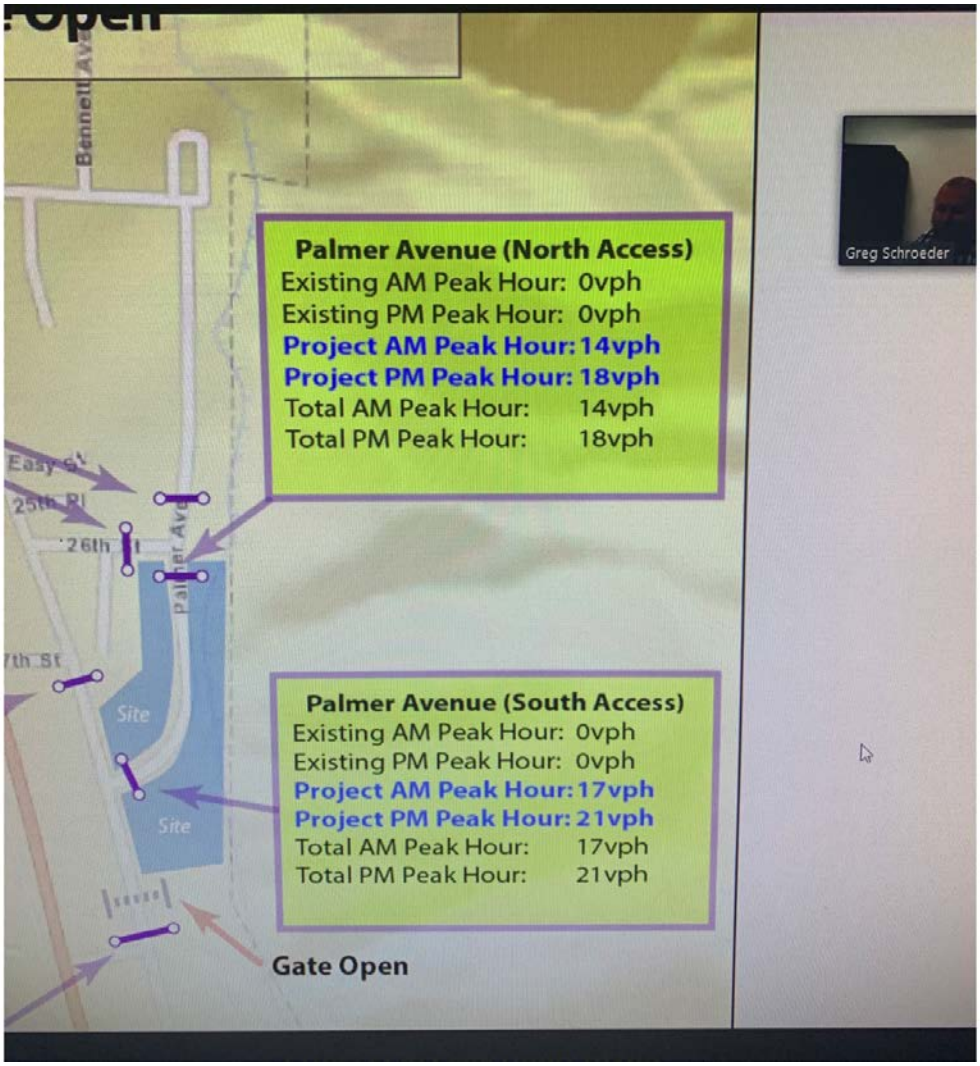
- **Traffic in the adjacent neighborhoods**

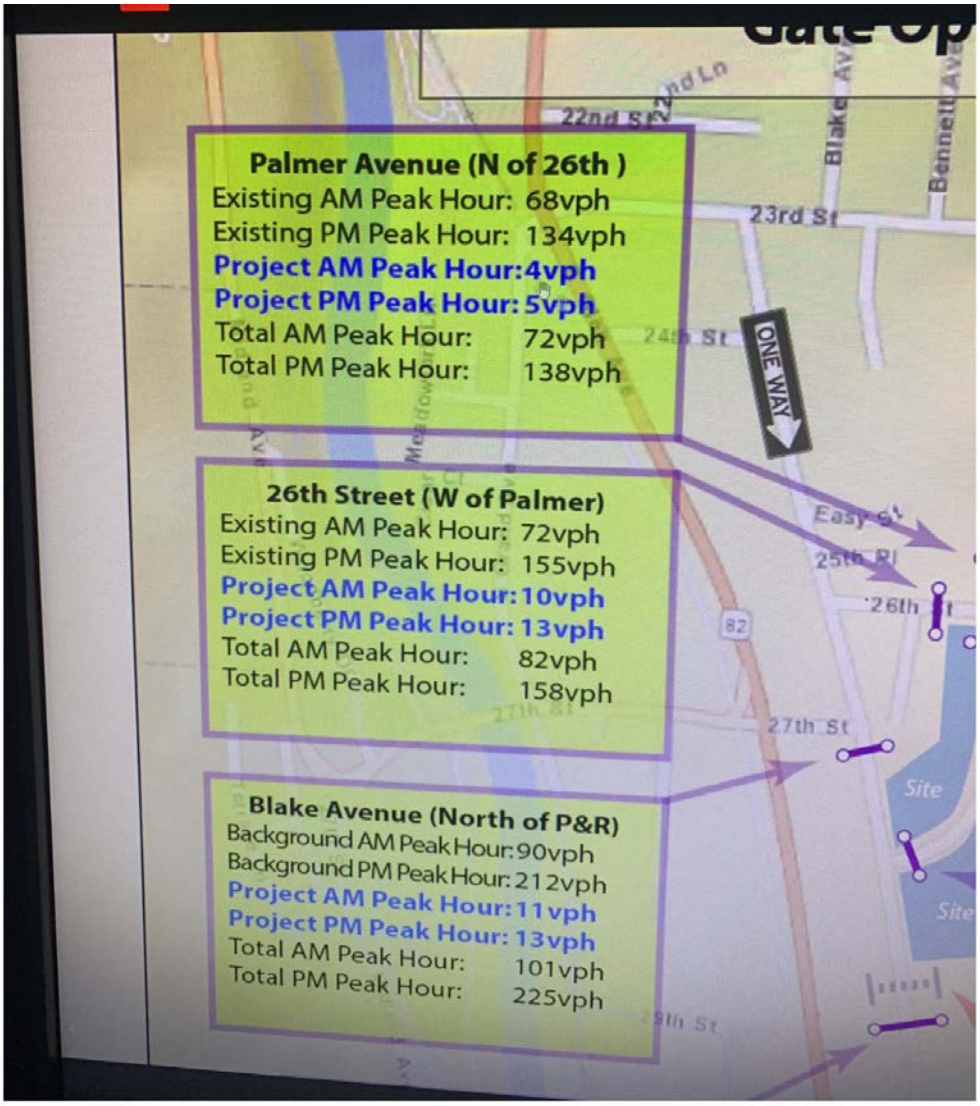
  In a letter to the City of Glenwood Springs dated November 21, 2017 from McDowell Engineering LLC (attached) several points were made about the traffic impacts from the Bell Rippy development

    - Blake Street one way would route northbound traffic onto Palmer Ave
    - Traffic calming measures would include curb extensions but there currently are no curbs nor sidewalk on Palmer
    - A graph on this document shows and 86.5% increase in traffic with Blake Street one way and the Blake Street Gate opened. How does that kind of impact not need a CDOT Access Permit?
    - In a revised traffic study by McDowell Engineering, (attached) the projected traffic impact on North Palmer was estimated at a 4VPH am peak traffic and 5 VPH pm peak traffic, *those numbers are not realistic, they are almost fanciful.*

    - We have seen the impact of traffic through Palmer Ave during the GAP (see attach photo) when Palmer was not connected to Blake and the Blake Street Gate was closed. The neighborhood is very concerned with our quiet community being overrun with traffic.
- **Bell Rippy P&Z meeting April 28th, 2020**
    - The statement "we will figure that out later" was used frequently. That is not an acceptable statement. The time to resolve issues is before they are created, not vise versa
    - The developer noted a "10 year involvement", what does that mean? They will no longer manage this new development and any issues it creates?

I look forward to working with P&Z as well as a receptive city council to resolve these issues. Until these are solved, it is irresponsible to approve this development.


Palmer Avenue (North Access)
Existing AM Peak Hour: 0vph
Existing PM Peak Hour: 0vph
Project AM Peak Hour: 14vph
Project PM Peak Hour: 18vph
Total AM Peak Hour: 14vph
Total PM Peak Hour: 18vph
Palmer Avenue (South Access)
Existing AM Peak Hour: 0vph
Existing PM Peak Hour: 0vph
Project AM Peak Hour: 17vph
Project PM Peak Hour: 21vph
Total AM Peak Hour: 17vph
Total PM Peak Hour: 21vph
Gate Open
Site
Site
26th
Greg Schroeder


Palmer Avenue (N of 26th)
Existing AM Peak Hour: 68vph
Existing PM Peak Hour: 134vph
Project AM Peak Hour: 4vph
Project PM Peak Hour: 5vph
Total AM Peak Hour: 72vph
Total PM Peak Hour: 138vph
26th Street (W of Palmer)
Existing AM Peak Hour: 72vph
Existing PM Peak Hour: 155vph
Project AM Peak Hour: 10vph
Project PM Peak Hour: 13vph
Total AM Peak Hour: 82vph
Total PM Peak Hour: 158vph
Blake Avenue (North of P&R)
Background AM Peak Hour: 90vph
Background PM Peak Hour: 212vph
Project AM Peak Hour: 11vph
Project PM Peak Hour: 13vph
Total AM Peak Hour: 101vph
Total PM Peak Hour: 225vph
22nd St
23rd St
24th St
ONE WAY
Easy St
25th Pl
26th
27th St
Site
Site
82

November 21, 2017

City of Glenwood Springs
Attn: Terri Partch, City Engineer
101 West 8th Street
Glenwood Springs, CO 81601

RE: Glenwood Multifamily
Traffic Impacts of One-Way Blake Avenue from 23rd Street to 26th Street
Glenwood Springs, Colorado

Dear Terri:

In response to your inquiry regarding developing a comprehensive traffic solution for the neighborhood near Blake and Palmer Avenues between 23rd and 26th Streets, McDowell Engineering has prepared this letter to provide you with additional information on revised options and strategies.

Blake Avenue One-Way Configuration

Blake Avenue between 23rd and 26th Street is proposed to be reconfigured as southbound one way from 23rd to 26th Street. Traffic that previously used Blake Avenue northbound would now be routed to either Palmer Avenue to the east or SH 82 to the west to continue northbound. This configuration would also keep the majority of northbound commercial traffic off of Blake Avenue, and would primarily use SH 82, and to a lesser extent, Palmer Avenue. Based upon the circuitous re-routing to Palmer Avenue and the current traffic distribution, it was assumed that seventy percent of the re-directed traffic will utilize the SH 82 route.

RFTA Park and Ride Effects

The RFTA Park and Ride is adding a significant amount of the current traffic volume on Blake Avenue. This traffic is anticipated to be re-routed via SH 82 and Palmer Avenue in a similar distribution to the overall area traffic, as described above.

Gate Closure Options

Option A –Gate Closed (Existing Condition)

This option would keep the existing gate closed, replicating existing conditions. This option will not allow any of the commercial traffic to access Blake Street and will keep the distribution of this commercial traffic at its present locations, mainly at the Blake Avenue/SH 82 signal near the McDonald's entrance and 29th Street/SH 82.

Option B –Gate Open

This option would open the existing gate and would reconnect Blake Street to the south SH 82 connection near the McDonald's entrance. This option would support parallel routes through the south side of Glenwood Springs and would provide additional traffic flow and emergency access for the community. Local residential neighborhoods can better access the commercial areas without accessing SH 82. Opening the Blake Avenue gate will provide another parallel option for traffic, allowing for the completion of the gridded street network and dispersing traffic access to SH 82.

The gate configuration (open or closed) is not significantly impacted by the Glenwood Multifamily project traffic. The site generated traffic addition ranges from 2% to 14% of the anticipated Year 2040 total traffic on the adjacent street network.

Currently no curbs nor sidewalks

Traffic Calming Options

A number of traffic calming options can be proposed to help manage traffic, speeds, and driver route choices. Curb extensions can be installed on 26th Street and/or Palmer Avenue to create a narrowing effect and visually differentiate smaller neighborhood streets. In addition, improved pedestrian crossings can create awareness of the multimodal nature of the neighborhood.

Speed bumps or humps are not recommended as they can impact emergency response times, cause street maintenance concerns, and cause driver aggravation. A series of speed humps or bumps is typically required to make a significant impact and for the installation to perform successfully.

The creation of these traffic calming options will create slower speeds and increase travel time throughout the area, which will deter drivers from cutting through the neighborhood and will promote using the SH 82 corridor.

Traffic Impacts

The anticipated traffic volumes on Blake Avenue, Palmer Avenue, 26th Street, and 23rd Street are depicted in the attached Figure 11A and Figure 12A and summarized in the table below.

Year 2040 Traffic Volumes (vph)	Blake Avenue One-Way Southbound from 23rd Street to 26th Street (Blake Avenue Gate CLOSED)			
	Blake Avenue SB One-Way (South of 23rd Street)	Palmer Avenue (South of 23rd Street)	26th Street (East of Blake Ave.)	23rd Street (East of SH 82)
Background Traffic	74	105	122	668
Site Traffic	2	7	20	12
Total Traffic	76	112	142	680
Year 2040 Traffic Volumes (vph)	Blake Avenue One-Way Southbound from 23rd Street to 26th Street (Blake Avenue Gate OPEN)			
	Blake Avenue SB One-Way (South of 23rd Street)	Palmer Avenue (South of 23rd Street)	26th Street (East of Blake Ave.)	23rd Street (East of SH 82)
Background Traffic	154	118	135	661
Site Traffic	2	7	20	12
Total Traffic	156	125	155	673

The above table shows that the site generated traffic adds a very small percentage of the overall traffic. With the southbound one-way configuration of Blake Avenue, opening the gate is anticipated to have little impact upon the neighborhood traffic volumes. Blake Avenue currently has 191 vph south of 23rd Street in its presently configured two-way street. Both proposed scenarios listed above result in less traffic on Blake Avenue.

State Highway Access Permit

With the proposed configurations (one-way Blake Street and opening the Blake Street gate), a new State Highway Access Permit will be required at the intersection of SH 82 and 27th Street. The anticipated total traffic volumes on the east leg of 27th Street exceed a twenty percent increase in the current State Highway Access Permit volume of 163dhv. With the gate closed, the site-generated traffic is anticipated to be 19.8% of the total Year 2040 traffic volume on the east leg of this intersection. With the gate open, the site-generated traffic is 10.5%.

The following table summarizes the percent increase of traffic from the current access permit volumes, the gate configuration, Blake Avenue lane configuration, and development impacts:

Condition	Gate	Development Traffic (dhv)	Total Year 2040 Traffic at SH 82 and 27th Street (dhv)	% Increase from Access Permit
Baseline Traffic (Two-way Blake), No Development Impacts	Closed	N/A	191	17.2%
One-way Blake, No Development Impacts	Closed	N/A	195	19.6%
One-way Blake, No Development Impacts	Open	N/A	272	66.8%
One-way Blake w/ Development	Closed	48	243	49.1%
One-way Blake w/ Development	Open	32	304	86.5%

Conclusions

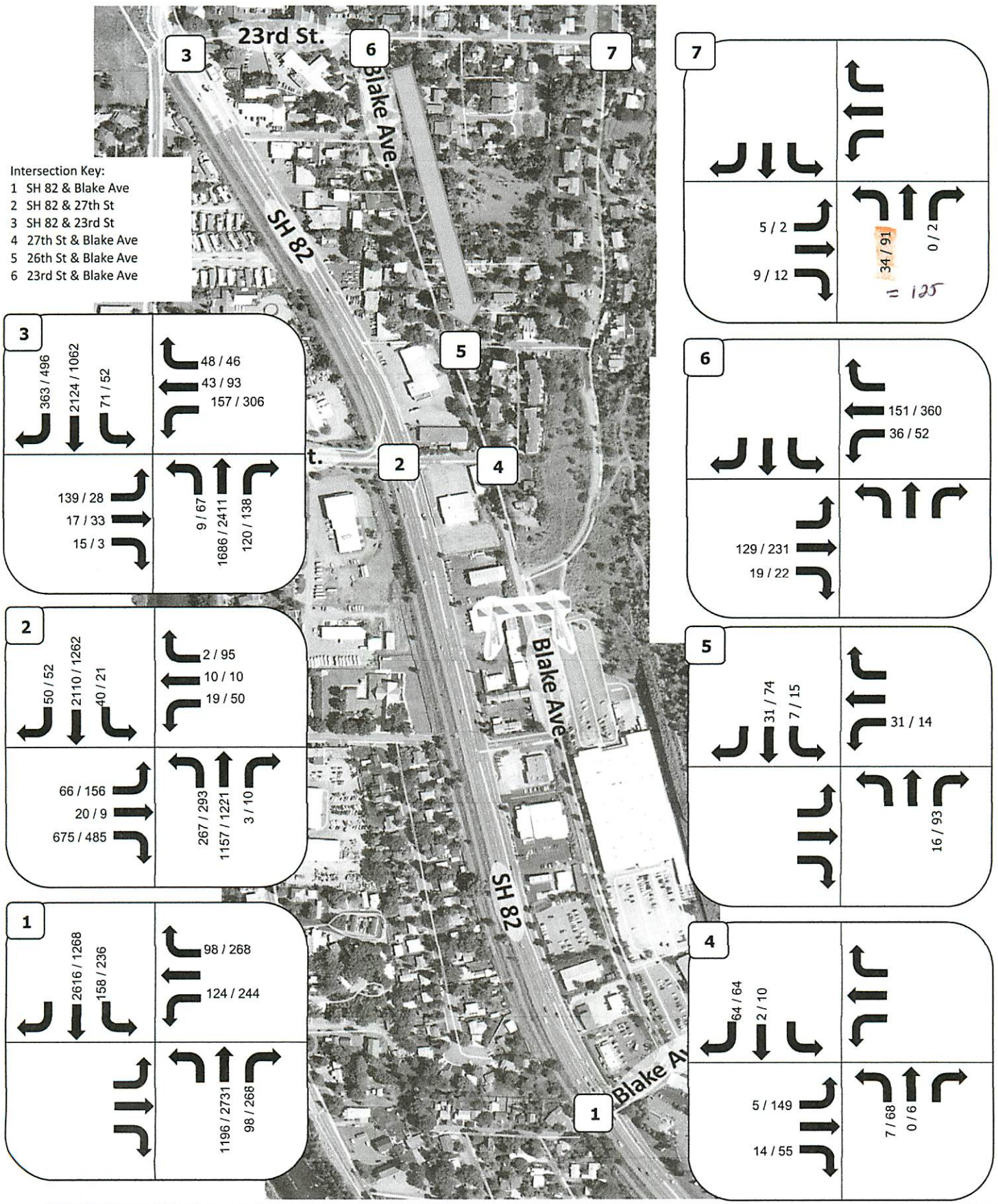
The proposed traffic volumes from the Glenwood Multifamily are not substantial compared to the background traffic volumes that presently exist. The creation of the one-way Blake Avenue configuration is not significantly impacted by the site traffic. Opening the Blake Avenue gate will provide another parallel option for traffic, allowing for the completion of the gridded street network and dispersing traffic access to SH 82.

Sincerely,
McDowell Engineering

Kari McDowell Schroeder, PE, PTOE
Traffic/Transportation Engineer

Encl: Figure 4A – Year 2040 Background Traffic – Blake Ave. Gate is Closed and Blake is One-Way SB Street from 23rd to 26th.
Figure 5A – Year 2040 Background Traffic – Blake Ave. Gate is Open and Blake is One-Way SB Street from 23rd to 26th.
Figure 7 – Project-Generated Traffic Assignment – Bake Ave. Gate Remains Closed
Figure 8 – Project-Generated Traffic Assignment – Bake Ave. Gate is Open
Figure 11 – Year 2040 Total Traffic – Blake Ave. Gate Remains Closed, Blake is Two-Way
Figure 11A - Year 2040 Total Traffic – Blake Ave. Gate is Closed and Blake is One-Way SB Street from 23rd to 26th.
Figure 12A – Year 2040 Total Traffic – Blake Ave. Gate is Open and Blake is One-Way SB Street from 23rd to 26th.

Figure 4A: Year 2040 Background Traffic - Blake Ave. Gate is Closed and Blake is One-Way Southbound Street from 23rd to 26th



Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

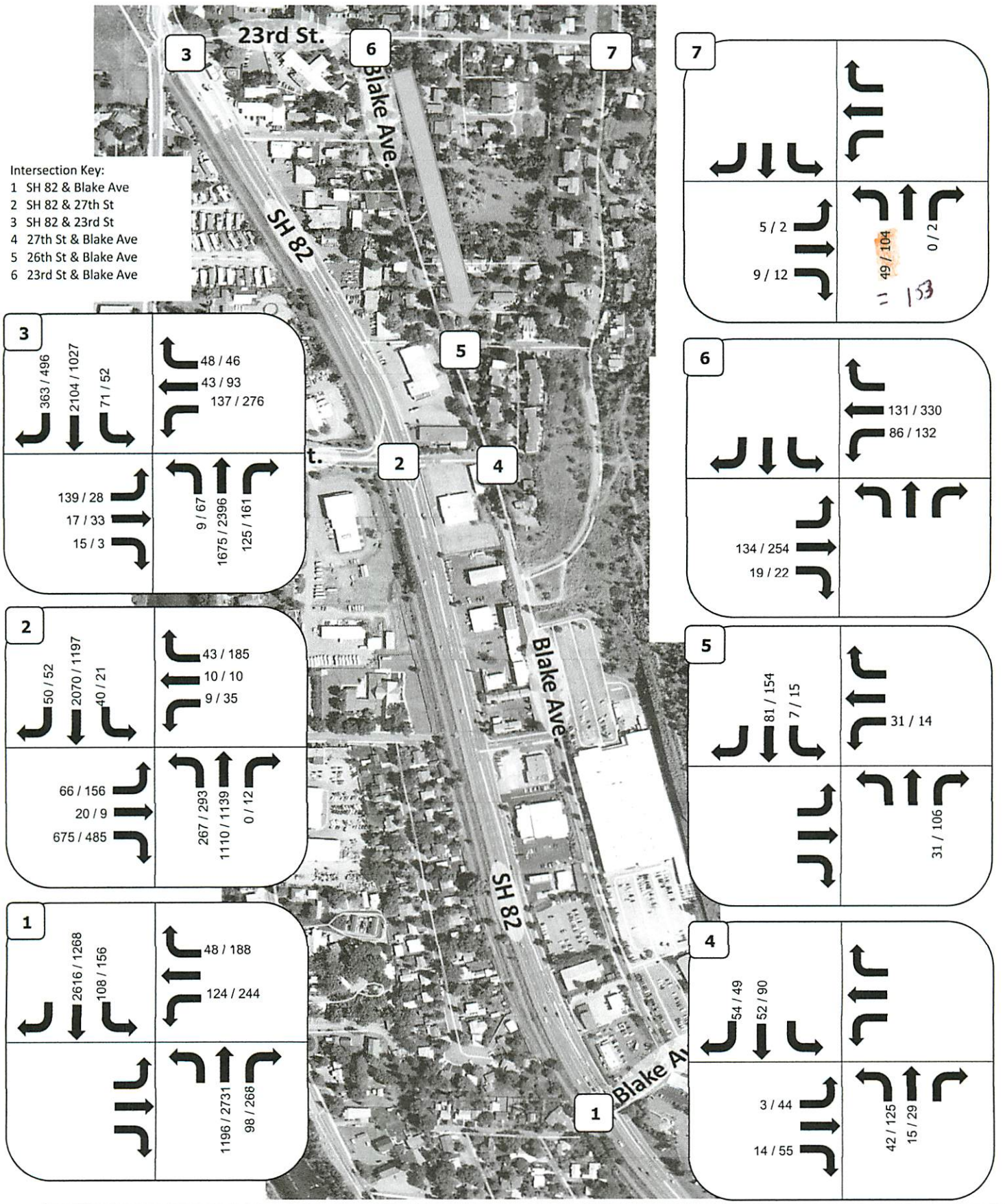
LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

ınds
ıds for
;500-600

Figure 5A: Year 2040 Background Traffic - Blake Ave. Gate is Open and Blake is One-Way Southbound Street from 23rd to 26th



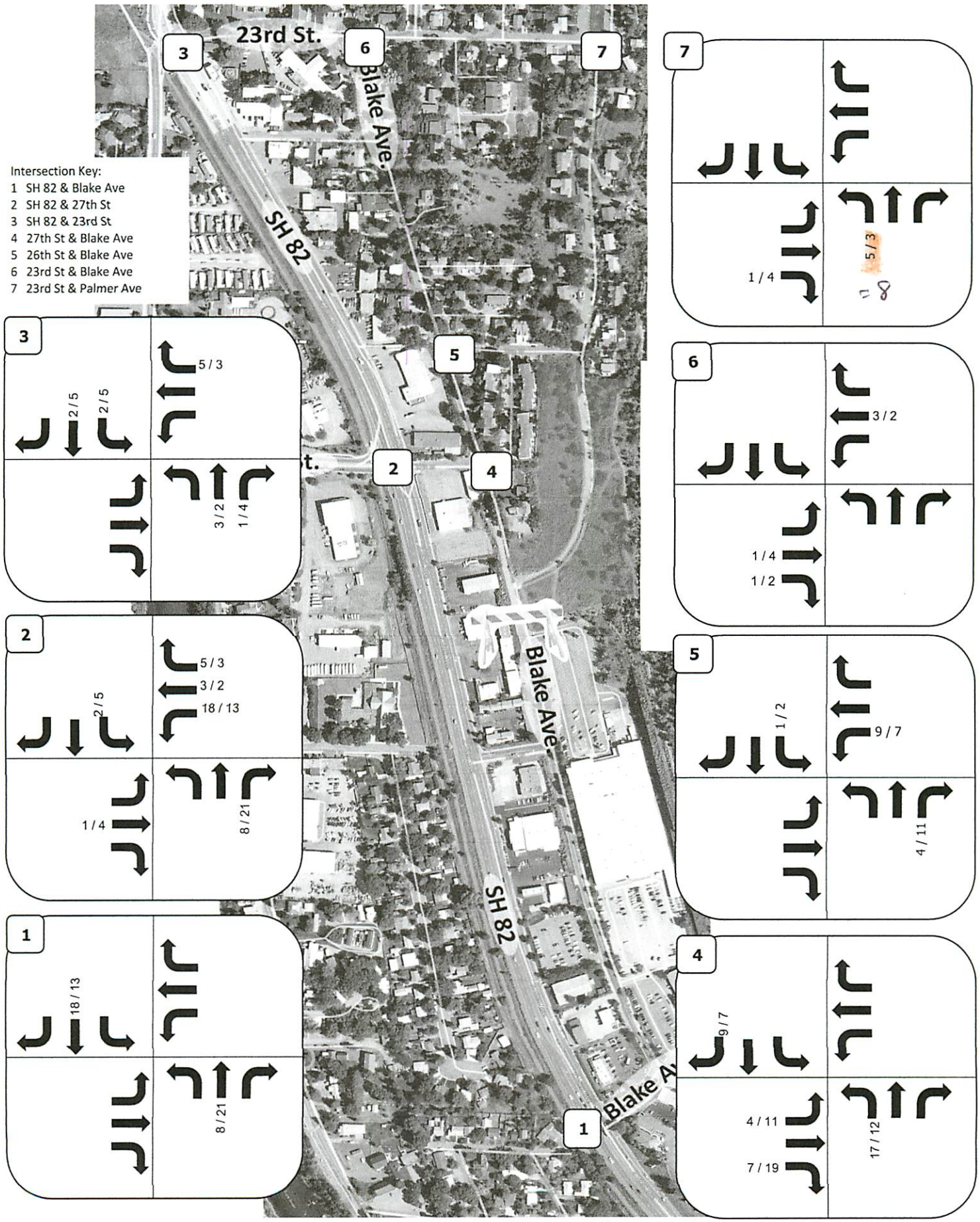
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

Figure 7: Project-Generated Traffic Assignment - Blake Ave. Gate Remains Closed



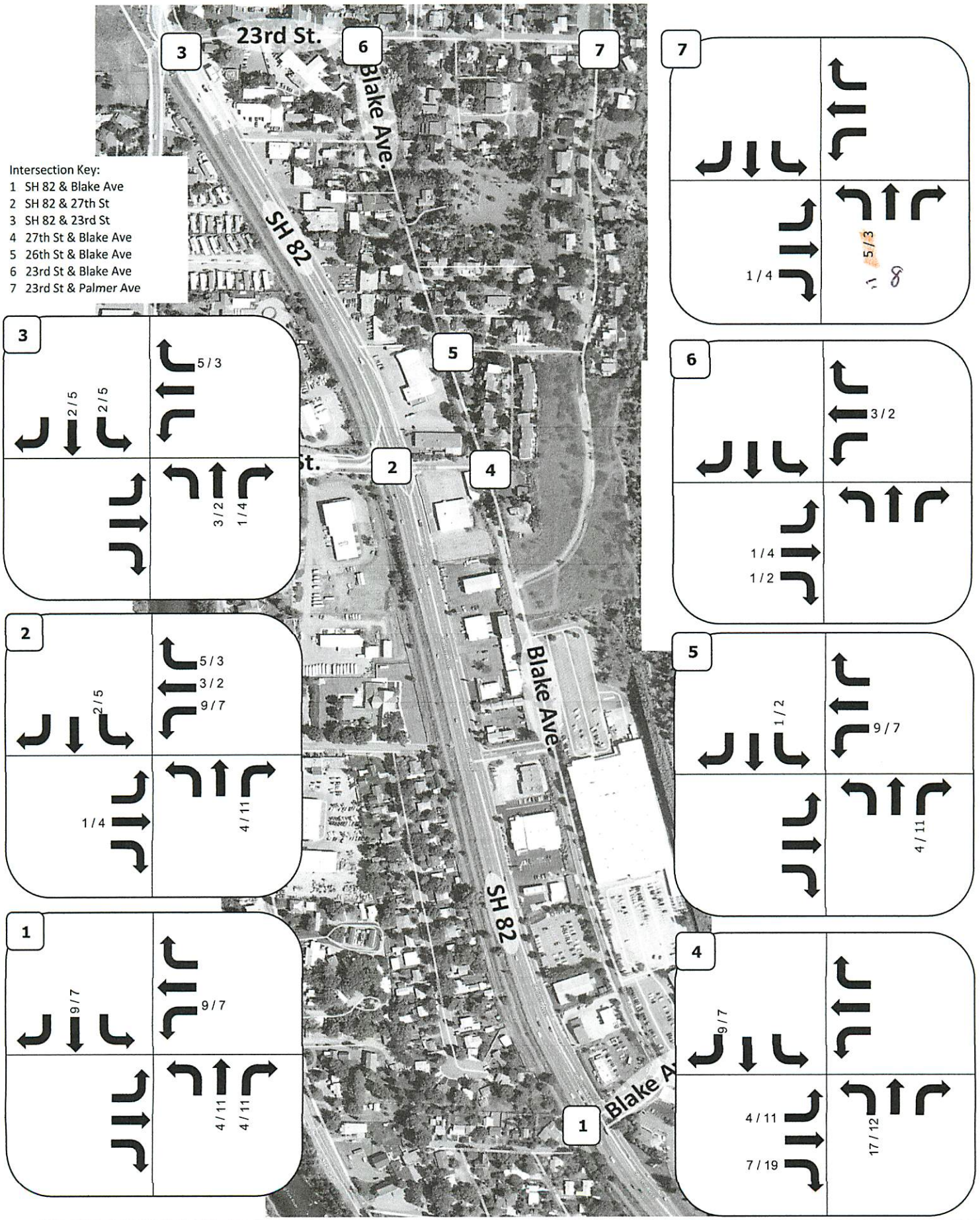
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

March 9, 2017

Figure 8: Project-Generated Traffic Assignment - Blake Ave. Gate is Opened



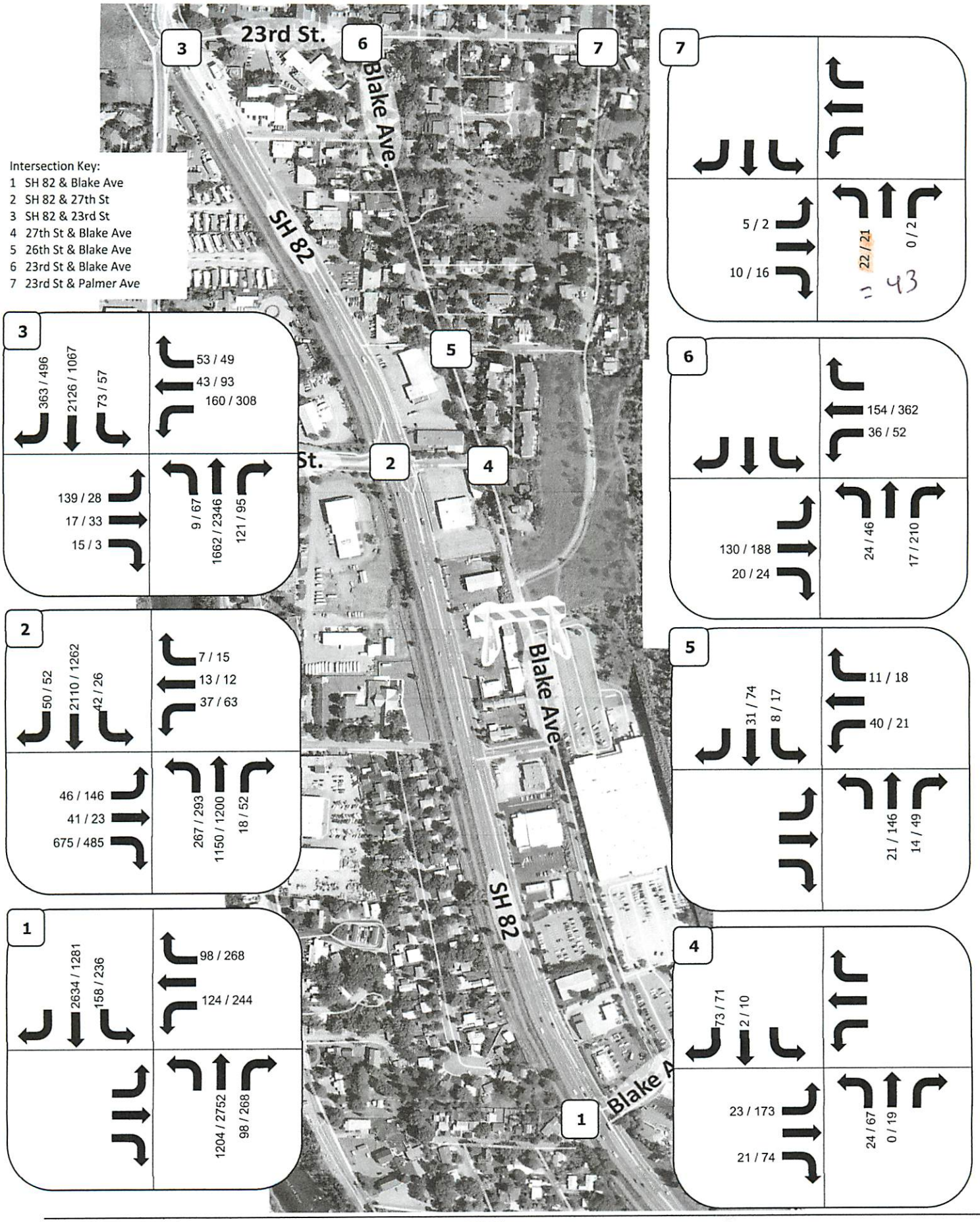
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

March 9, 2017

Figure 11: Year 2040 Total Traffic - Blake Ave. Gate Remains Closed, Blake is Two-Way



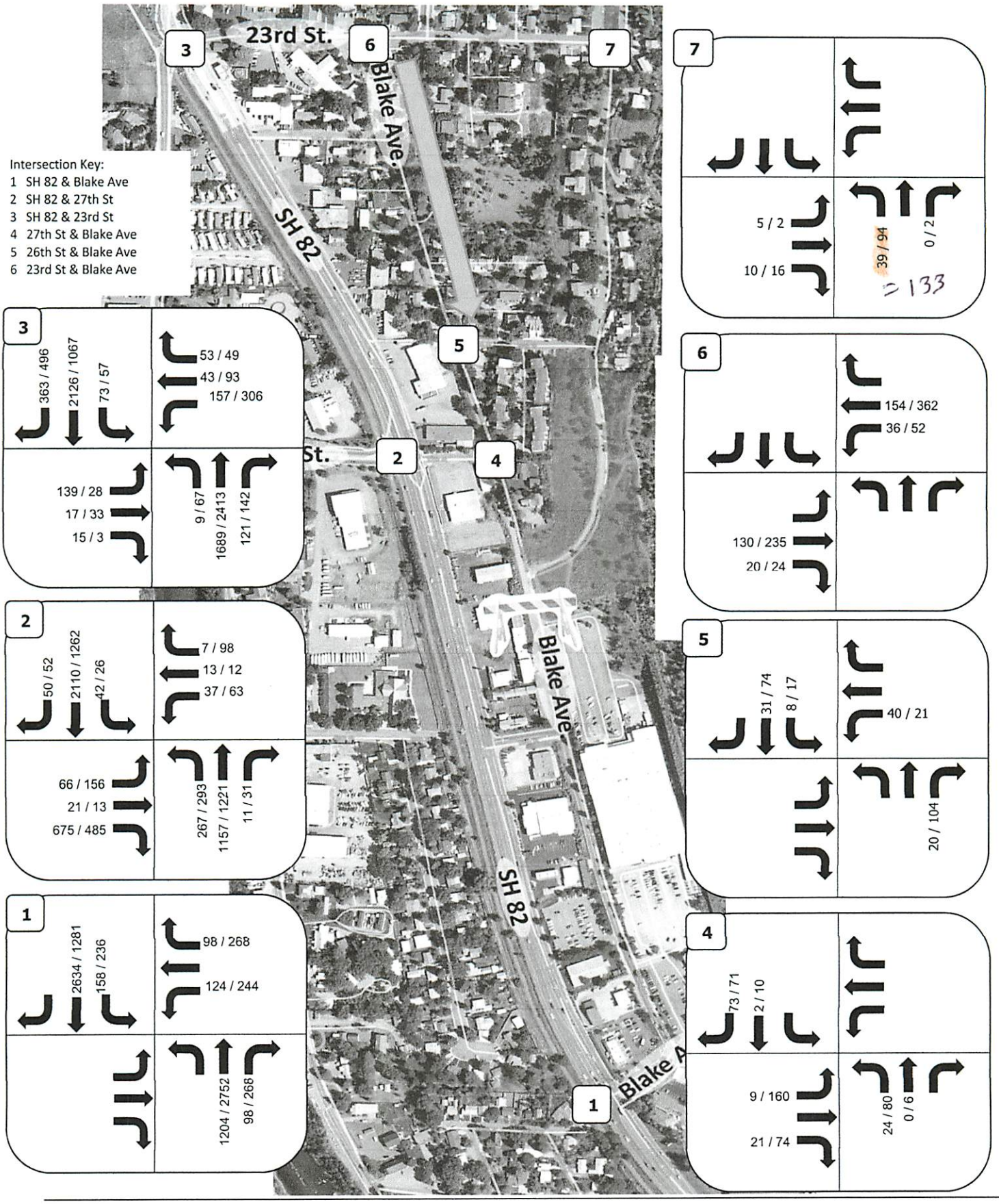
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

March 9, 2017

Figure 11A: Year 2040 Total Traffic - Blake Ave. Gate Remains Closed and Blake is One-Way Southbound Street from 23rd to 26th



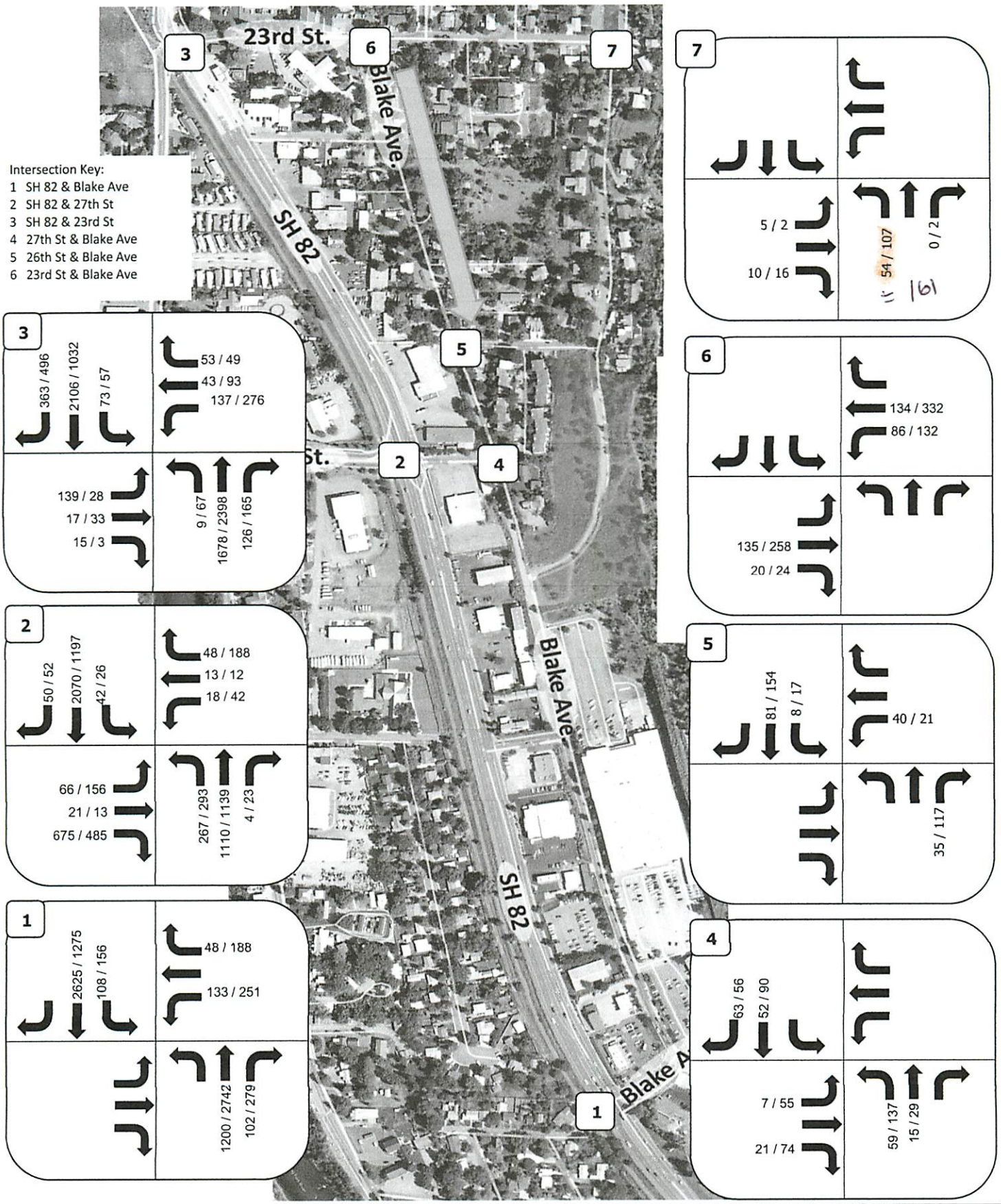
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

Figure 12A: Year 2040 Total Traffic - Blake Ave. Gate is Opened and Blake is One-Way Southbound Street from 23rd to 26th



Project Number: 1247
Prepared By: McDowell Engineering, KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

Questions to Planning and Zoning Commissioners – Triumph/Rippy Application

Alison Brett, 2201 Crestwood Drive

- Commissioners have conflated the building of the new development with the opening of Blake Gate and development of Palmer as a through road.

- Traffic studies presented on April 28, 2020 were misleading and inadequate. They present the impact of additional traffic as though the new development is to be created in a bubble.

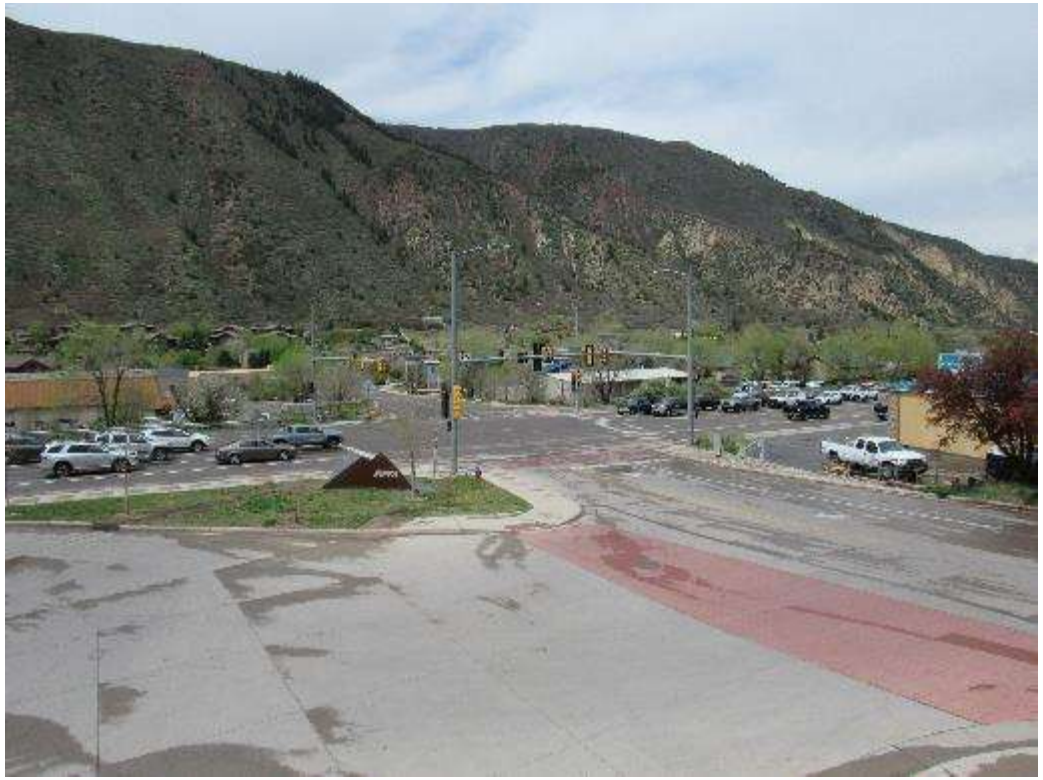
Consequently…

Commuter and commercial traffic infiltration into residential areas is inevitable.

- **What data is available to indicate the number of vehicles currently using Highway 82 during recent peak seasons and hours?**
- **From that, what data is available to estimate the percentage of those vehicles that will divert through the new routes once the development is complete?**

The opening of Blake Gate and continuation of Palmer encourages unnecessary commuter and commercial traffic off Highway 82 into residential areas.
Residents in both existing and the new residential areas will be negatively affected.
What is being done to avoid substantial change and significant adverse impacts upon current residents' experience of living there?

Commuter traffic from Highway 82



Walmart traffic

How can additional traffic be justified when there are no safe crossings or sidewalks?

27th Street is already steep and dangerous.

The steep hill up 27th Street makes the junction onto Blake at the top difficult to see and negotiate. The sidewalk stops there.

Blake has no facilities for increased traffic volume. Residents and other road users will suffer from crowding, noise and pollution.
Residences and play areas are too close to the physical dangers of additional traffic.
What are commissioners' plans for overcoming these problems?

Oakhurst families need protection from vehicles.

Blake has no sidewalks nor protection from the effects of vehicles.

Currently, neither of these signs along Blake are effective against speeding motorists. How will commissioners protect busy residential areas from the dangers of additional commuter and commercial traffic?

Another truck jumping the stop sign at this dangerous junction of 27th Street and Blake.

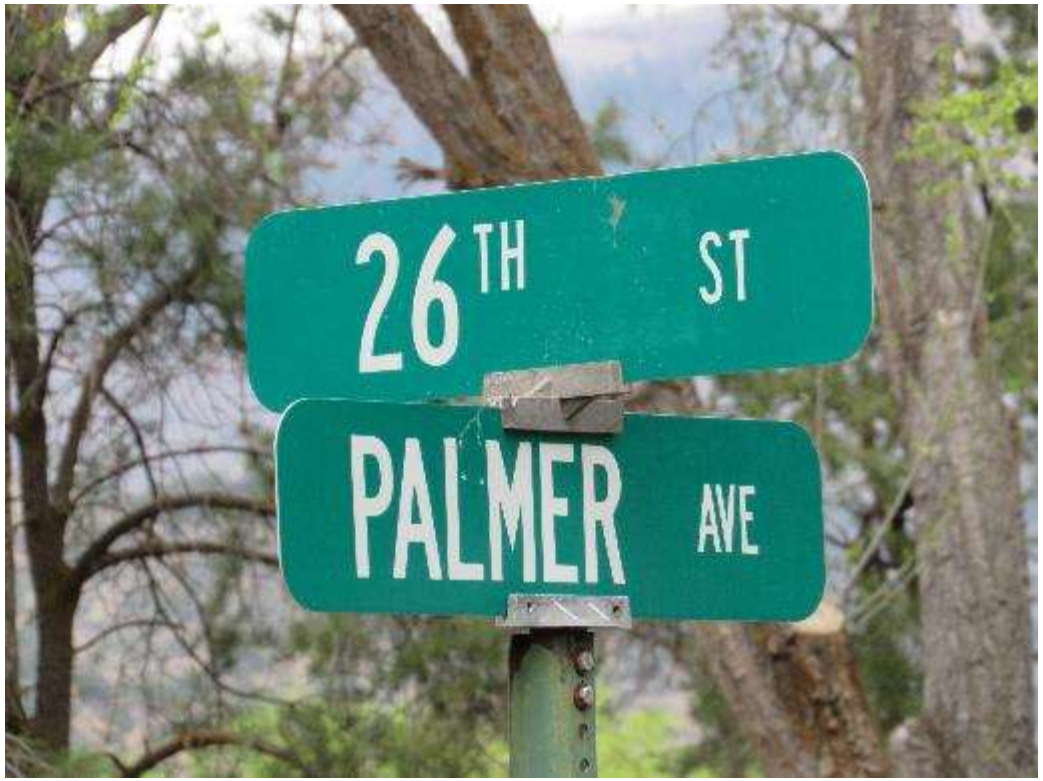
Oakhurst Road descends awkwardly towards 26th Street. This whole areas is extremely slippery in winter.

26th Street, Palmer and surrounding areas are very popular walking and cycling routes.
How will such users be protected from the traffic?
What will be done to provide for cyclists and pedestrians along the existing Palmer Avenue and beyond?

Oakhurst Townhomes – single entrance and exit onto 26th Street, which is destined to become a busy road.

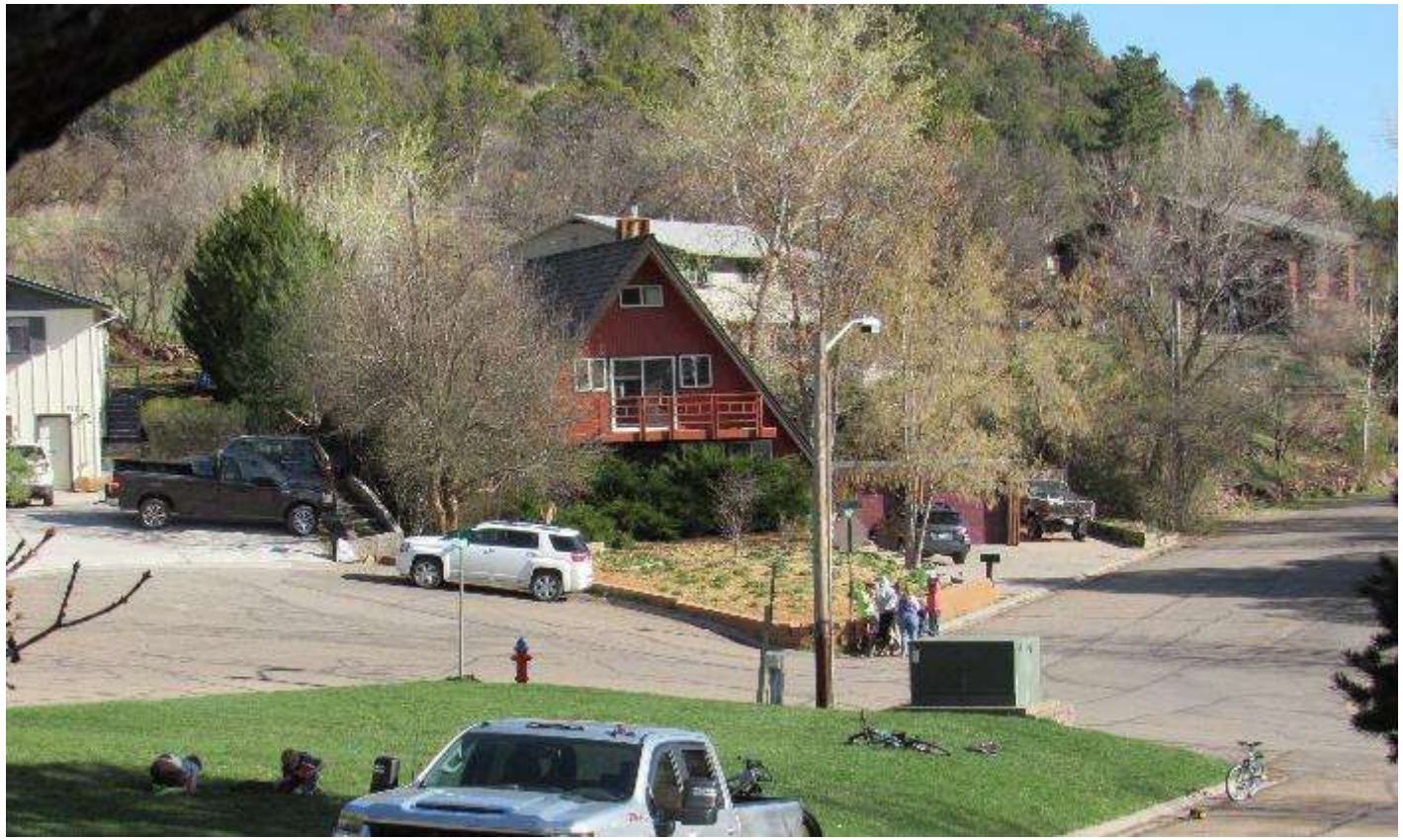
Looking from south to north up Palmer Avenue. The sidewalk for the new development stops at this 26th Street junction.

How will commissioners preserve the multi-modal use of existing routes and prevent travelers resorting to using their cars because walking and cycling become dangerous and unhealthy? If Blake is to be ‘one way south’ to protect residents in that area, why can’t the existing Palmer Avenue also be one way south for a similar reason?



Air quality in the entire area will deteriorate because additional traffic will travel along Bennett past Valley View Hospital in the same way that commuter traffic does now.
Why has there been no mention of effects upon air quality?
Why is the City's air quality data so meagre?
How do commissioners justify allowing increased pollution in residential areas and detrimental effects upon residents' health?

CHILDREN BREATHING
NIÑOS RESPIRANDO
NO IDLE ZONE
Turn your engine off
¡Apague su motor!



TO THE Glenwood City Council members:

I live in the Oakhurst townhomes in front of where the proposed low income apartments are to be built. I think building those apartments is a very bad idea.

IN Oakhurst there are a number of renters. The units of the renters have trash around them, lots of visitors, and they tend not to follow the Rules. They come and go at all hours and often are very noisy. They all drive cars and there are not enough parking spaces now. Increasing the number of renters will only make the problem worse.

There is no fence between Oakhurst and the proposed apartments. That means people living in those apartments can break into the yards and Oakhurst units. One hundred apartments will increase the crime, violence and illegal activity in the area the police force in Glenwood do not have enough personal to handle the increase crime that happens with low income housing.

Another reason the apartments are a bad idea is the wildlife on that hillside. There are deer, bear, mountain lions and coyotes that roam there. Where will they go? They already have a limited area in Glenwood. The only wildlife that wouldn't be missed are the homeless people and their dogs. However I'm sure they would stay and continue to be a fire hazard and

wander Through the apartment Complex as they do the neighborhood now.

These are only a few of my Concerns.
I would ask the people on the Council (especially if you live in Glenwood) to consider the effect adding more rental units to this neighborhood would cost Glenwood in increased crime (Slum neighborhood) and decreased tourists visits. People don't want to vacation in areas with A high crime rate. Would you? It's A short walk to downtown And tourists From this neighborhood. It's in your hands to make this decision. I hope the decision you make is for Glenwood And not financial reasons.

Thank You For your time

Dan Giulianelli
Unit #15

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: Bell Rippy Development Comments
Date: Tuesday, May 5, 2020 8:35:51 AM

Another, different comment from Richard O'Connell

From: Richard OConnell <r.oconnell@sbcglobal.net>
Sent: Monday, May 4, 2020 8:58 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>; jandjraehal@gmail.com; Jan OConnell <tenacity71@gmail.com>; Christine Smalley <csmalley@rfsd.k12.co.us>; Ralph Smalley <rsmalley@rfsd.k12.co.us>
Subject: Re: Bell Rippy Development Comments

Community Development Department
Richard & Janet O'Connell

101 W. 8th Street 2409
Palmer Ave

Glenwood Springs, Co 81601
Glenwood Springs, Co 81601

Attn: Planning and Zoning Commission

Gretchen Ricehill

We own a multi- generational home at 2409 Palmer Ave. We are concerned that the Bell Rippy Development will end up with non-residential parking and unsafe traffic on the developed portion of Palmer Ave. The existing roads do not support the Oakhearst Townhomes and RAFTA parking and the new Bell Rippy Development will make a bad situation worse. We are also concerned that the proposed schedule does not provide time to evaluate the many considerations for a development of this size.

The city development code calls for the creation of the best environment for the city by promoting an orderly efficient and integrated development of Glenwood Spings. It is clear from the April 26 meeting that the new developers are relying on previous development plans and decisions that are not necessary in the current best interest of the existing neighborhood. It is important that all ideas from the existing neighborhood be discussed and evaluated. To do this we suggest a continuance of the review process with a open public meeting. The Zoom meetings are simple but many of the existing neighbors do not have the computer skills to participate in the meeting.

Ideas which the city development commission should consider and discuss to integrate the Bell Rippy Development, with the existing neighborhood. include the

creation of a culdisac for the development, adding speed bumps to the developed portion of Palmer Ave, making Palmer one way South, adding sidewalks to the developed portion of Palmer Ave, improving the intersection of 23rd Street and Grand to handle the increased traffic.

Sincerely

Richard and Janet O’Connell

From:	Gretchen E Ricehill
To:	Trent Hyatt
Subject:	FW: Comment-4-20 MultiFamily project
Date:	Tuesday, May 5, 2020 8:36:55 AM

From: Lynette Marie <stete78@hotmail.com>
Sent: Monday, May 4, 2020 10:22 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: 4-20 MultiFamily project

Dear Ms. Ricehill,

My name is Lynette-Marie Lacerda and I live at 285 Mikala Lane in New Castle. My dwelling place was at 1814 Ouray Road in GWS just a few weeks ago until I realized it was contaminated with black mold and I was forced to relocate temporarily.

As someone that attends multiple Homeowners Association meetings a year, there is a common thread of lack of parking. The proposed 1.5 spaces per unit is an unrealistic number to accommodate the number of vehicles that will require a parking spot. Renters and owners have multiple cars. Glenwood Springs is the bedroom community for Aspen and even if someone took the bus to work, they own vehicles. Some get work trucks as part of their job packages. Sure the TDW allows for 136 spaces, however, this is not enough parking for the size of this residential project. It is an all to common theme at Cardiff Glen, not enough parking for the families that own 2 and 3 cars. I could go on...

In closing, please don't reduce the parking spots to less than 170. When all is said and done the parking burden/headache will be left on the surrounding neighborhood, the residence of this project and property management company.

Best,
Lynette Marie Lacerda

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: Comments - Bell Rippy
Date: Tuesday, May 5, 2020 8:35:00 AM

From: Ryan Roberts <ryaninyanga@me.com>
Sent: Monday, May 4, 2020 6:41 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: Continuance

To the City of Glenwood Springs Council .
I think it is vital that the vote on the amended plans for the proposed new development on Palmer avenue be delayed until the residents have the capacity to speak about it face to face with each other. The Zoom meetings are a barrier to some residents. In addition , the restrictions on being able to assemble in groups in a public debate are a substantial barrier to the process. The developer changed plans unilaterally and must allow time for the new plans to be reconsidered. Our capacity as residents to assemble freely has been severely impeded. We must have time to reconnect, reconsider and offer coherent input. The Council Zoom meetings are restrictive in a way that traditional debate and regular council meetings are not.
Please reschedule the decision process until we are in a position to meet up.
Sincerely,
Ryan Roberts
2419 Palmer Avenue
Glenwood Springs
Colorado
970 274 8161

Sent from my iPhone

Sent from my iPhone

May 4, 2020

A. David Cox
Cynthia Green
2504 Palmer Ave.
Glenwood Springs, CO 81601

Ms. Gretchen Ricehill
Assistant Economic/Community Development Director
Glenwood Springs Planning Department
Via email: Gretchen.Ricehill@cogs.us

Dear Ms. Ricehill:

We are owners and residents of 2504 Palmer Avenue in the Oakhurst Subdivision neighborhood in Glenwood Springs. We respectfully submit the following comments and concerns regarding the Bell Rippy Neighborhood (Applicant) proposed development that has been submitted to you for review:

Concern 1: Community Meeting with Neighborhood

We understand the challenges with public meetings in light of COVID-19. However, a development of the intensity proposed in Applicant's plan, especially with variances requested, demands that effective public meetings be held. The Oakhurst neighborhood has not been accommodated with such an effective forum. As was demonstrated at the P&Z meeting last week, Zoom meetings are an insufficient substitute and do not provide adequate means for meaningful public comment and participation. At a minimum, proceeding with the development application should be delayed until the residents of the neighborhood are afforded an appropriate public hearing on the development.

Concern 2: Development Proposal Differs from Predecessor's

Applicant's narrative makes several references to the Glenwood Multi Family LLC project that was granted a development permit in 2018. The current development proposed by Applicant differs from that of its predecessor in several material ways:

1. Number of units increased from 79 to 100;
2. Number of parking spaces decreased from 163 to 148; and
3. Acquisition of an additional parcel in March 2020 at 2710 Blake requested to be rezoned and included in Applicant's development.

Because of the significance of each of these changes, Applicant's development and related variance requests should be evaluated independently of those granted to its predecessor.

Concern 3: Variance for Variety of Housing Types

Applicant is requesting relief from the municipal requirement of housing variety on a 3-acre development due to "unique site constraints." The "site constraints" of this parcel are self-evident and should have been known by the Developer prior to the purchase of the property with proper due

diligence. Requesting a variance from a known site limitation is an unreasonable request of the City and places unreasonable demands on both the City and its citizenry.

Applicant further states "multifamily rental units are so badly needed in Glenwood Springs" as rationale for approving its request. This claim is inconsistent with fact that the Six Canyon Apartment complex in West Glenwood is largely vacant. There are also hundreds of new, partially completed units to be completed in the near term within the City limits proper. At the southern edge of the City, Applicant's development is also inconsistent with the stated City goals of directing development upward rather than outward and to redevelopment locations, preserving natural resources and minimizing human/wildlife interactions, and directing development to cost-effective locations to serve.

Concern 4: Design Variance – Sidewalks on Both Sides of the Street

Again, Applicant is requesting relief due to "unique site constraints." The "site constraints" of this parcel are self-evident and should have been known by the Developer prior to the purchase of the property. Requesting a variance from a known site limitation is an unreasonable request of the City. Because the development is high-density in nature and the Applicant is promoting it as "transit oriented," Section 070.040.070(f)(1)(a)(2) of the Municipal Code is clear and vitally important to accomplish the goals of residential-transition zone development to promote foot traffic over vehicular traffic to the adjacent stores, RFTA Park and Ride, and neighborhood facilities.

Concern 5: Design Variance – Grades at Driveway, Parking Lot and Intersection Approach

In the past, several other developments requesting similar grading variances due to "unique site constraints" were declined by the City. This project should not be allowed variances of this type when others were routinely declined in the past. Further, the high-density nature of this development and attendant vehicle traffic, necessitate safe ingress and egress of both vehicles and pedestrians. Again, the topography of this particular lot should not be used as justification to abandon established municipal code principles.

Concern 6: Re-zoning Newly-Acquired Parcel Included in Development

Applicant is requesting re-zoning of an RH-zoned parcel at 2710 Blake Avenue to include in its development. Applicant recently acquired this parcel in March 2020 to eliminate the existing triplex structure and is proposing construction of an 18-unit building, Building C on Applicant's schematic.

Applicant is requesting re-zoning this parcel to allow construction of 100 units between it and the adjacent parcel, along with redirecting traffic on Blake Avenue to a south-bound, one-way and opening what has come to be known as the 'WalMart gate.' What this density and revision to current traffic flow, will be to increase north-bound traffic onto Palmer Avenue. The currently developed area of Palmer Avenue is all zoned RM1 with a current density of 11 single-family homes with a total of 41 bedrooms. Applicant's development will increase the density on Palmer Avenue nearly four-fold in number of bedrooms and ten-fold in number of households. Pushing all of this increased density north-bound into the downtown core of Glenwood Springs via Palmer Avenue does not comply with the Comprehensive Plan goals of sustainability, maintaining small town character, directing development to locations and building forms that are cost-effective to serve in compact forms and in infill and/or redevelopment. This development is directing growth outward rather than the stated goal of directing growth inward. Further, the increased traffic load onto Palmer Avenue from Applicant's requests for the

WalMart gate opening and south-bound only on Blake Avenue forces a medium-density neighborhood's infrastructure on Palmer Avenue to support the traffic demands of high-density/transitional density/commercial density from WalMart through Applicant's development.

We appreciate your thoughtful consideration of our concerns for both our neighborhood and the vibrancy and sustainability of development in the City of Glenwood Springs.

A. David Cox
Cynthia Green

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: message about the Bell Rippy Property
Date: Tuesday, May 5, 2020 3:35:46 PM

From: Erin & William Lee <threeolee@gmail.com>
Sent: Tuesday, May 5, 2020 3:09 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: message about the Bell Rippy Property

Respectfully to everyone whom it may concern,

My name is Erin Lee and I live at 2502 Palmer Avenue, GWS, CO. I thank you for taking the time to read my letter. I would like to first and foremost let you all know that I am absolutely not opposed to development and growth, in fact I like it! Truthfully, I personally am one that loves change when the change creates a better situation or environment rather it be inside my own home, my neighborhood or my community. I have tried to embrace the new Bell Rippy Development that is being proposed with an open mind, and have went as far as reaching out to the developer myself to ask questions, inquire with what I think could be thoughtful ideas that would possibly become good solutions. All though Mr O'Connor was very polite and listened to what I had to say, he ultimately was telling me that the things I had to say, needed to be directed to and addressed by the city.

I was present on the zoom meeting on April 28th, and listened to everything that was said. One of the main things said at least twice that night, was that the city was wanting to have a community meeting with the residents that currently live in this neighborhood. Which was extremely comforting and welcoming to hear several times over, because we all know that a development will inevitably become part of our neighborhood and hopefully if done right, will fit right in nicely and enhance our community.

In the present situation of COVID-19 that we are all now in social isolation, the whole world seems to be “trying” to communicate through the zoom platform, which I am hearing that most school age children, let alone adults, are finding this form of communication to be very difficult to embrace. When it comes to having meaningful conversations with all parties involved and making a decision this large, that will impact this neighborhood and our entire community to the north of us, FOREVER, I am asking you to please postpone this major decision until we have the ability to have proper and personal communication between the city and the residents of this neighborhood and definitely not through an online zoom meeting.

Also, not to be whining, but in the previous meeting the developer said many, many, many, times that this was a project that was already approved by the city. Considering that the developer is truthfully asking for more units, with more vehicles, creating more traffic does not make this the same previously approved project in the minds of the citizens effected by this development. Developments should enhance a neighborhood, and our neighboring neighborhoods, not hurt them. That alone, I am hoping speaks volumes to you, and hopefully you will postpone this matter until we can have the opportunity to have an in-person meeting with our neighborhood members to try to come up with solutions to bring to a proper in-person community meeting with the city (without technical difficulties) that would help this development fit nicely into all the neighborhoods of Glenwood Springs.

Thank you for your time,

Erin Lee

To: Glenwood Springs Planning and Zoning Commission and the Glenwood Springs City Council

Topic: Triumph Development West, LLC Project at Blake and Palmer

The City of Glenwood should deny the Triumph Development West apartment proposal and project. We have no responsibility or commitment to provide housing for people to live here and then get in their cars or on a bus to go to their jobs in Carbondale, El Jebel, Basalt, and Aspen. The majority of the occupants would travel out of town for employment.

This project should be denied for the following concerns:

1. **The project is too large**. Six buildings, one hundred units, 150-200 people. Simply overwhelming for 5 acres of steep land.
2. **Not enough parking.** 148 parking spots is not enough. For example, Oakhurst Townhomes has 2 spots for each of the 36 units and that is not *nearly* enough. Blake and 26th street are always full of people's excess vehicles.
3. **Inaccurate traffic flow situations**. Almost every afternoon, traffic on Hwy 82 slows and backs up from Walmart into Glenwood. Many vehicles turn right on 27th to Blake north or east on 26th to Palmer then north. These trips all lead to Blake north at the same time all of the Valley View employees are getting off of work. Add to these all the vehicles turning right onto 23rd to go north on Blake and more vehicles from this new development to determined realistic traffic numbers in these neighborhoods.
4. **Inadequate flood debris control**. The last high flood decades ago saw boulders as big as cars come down and damage Oakhurst Townhomes. No flood control fence could stop this.
5. **Water flow problems from parking lots and sidewalks.** No control plan is in place whatsoever. Where will this water go? It will go onto private properties on Palmer and down 26th to Blake. There is already a 6-inch deep gulley on the south side of 26th the top 1/3 of the street where inadequate repair of the street happened after a new electric line was replaced years ago. The water goes down to 26th and Blake where it forms a huge (almost impassable) debris-filled puddle.
6. **No fencing planned.** There should be fencing completely around the development to prevent trespassing to and from Oakhurst and to keep people from the homeless camp out.
7. **Light pollution from parking lots and buildings coming into right into Oakhurst homes.** No amount of landscaping could stop this. Fencing *might* help where cars park.
8. **There was no landscaping plan provided.**
9. **Noise pollution from 150 to 200 people is a huge concern.**
10. **Homeless people problems for the people living in the development.** We have had problems with the noise, dogs, fires, drugs, theft, trespassing and soliciting in the past. The results would be a big increase in police, fire and ambulance calls from people in the development.
11. **No sidewalks on Blake, 26th or Palmer.** Pedestrians and bicycle riders coming out of complex would have to walk or ride in the already too-narrow streets, causing an already dangerous situation to escalate.

12. **Snow removal problems.** The city makes 1 or 2 snowplow passes on the above mentioned streets and on 23rd. This results in snow buildup on the sides of the streets, making them even more narrow and dangerous.
13. **Steepness of 26th Street.** After snowstorms, snow and ice buildup (especially in the early morning hours and after dark). This steepness makes it impossible for many cars to make it up to Palmer. They have to back down or turn around to go back down. Very dangerous!
14. **Not enough parking for the 27th Street Bus Station**. Many riders already park on Blake, 26th, Palmer, Walmart, the Rivers Restaurant, etc… More people from the development… more problems.
15. **Engineering/building problems**. Just like Ironbridge, The Terraces, The Meadows and Lofts, Red Mtn., Oakhurst and the recently abandoned/ sold City MOC Building, this site will have stability problems that engineers may not be able to alleviate.
16. **This area has always been a "wildlife sanctuary zone"**, providing an area of protection for many, many species of mammals, birds, reptiles, insects, etc… also there are a wide variety of trees and plants there.
17. **Who will live in this development?** If Triumph Development could rent units only to people who have jobs in Glenwood like hospital/medical employees, first responders and other city employees, school district employees, county employees, restaurant/bar workers, business employees recreation related employment, etc… "Anything in Glenwood" then maybe we could support this development. But this would not be legal. So we should not support this project. Remember that a majority of the people living there would work in other towns.

In conclusion, please remember that these out of town developers from the Eagle-Vail area have purchased this land at the lowest cost available to them. They will develop it with the incentives to keep costs as low as possible for their investors. This may include not correctly addressing all the problems and issues that exist with this development. In addition, their rental rates will be as high as possible. Keep in mind their job is to maximize profits for their company and investors.

Please protect the citizens of Glenwood Springs from unnecessary development that would result in higher costs to our already constrained budgets.

Please vote to not approve this development from Triumph Development West, LLC.

George Dana
Resident, Oakhurst Townhomes

From:	lcrfnd@rof.net
To:	Gretchen E Ricehill
Subject:	FW: RE: development variances
Date:	Tuesday, May 5, 2020 9:59:28 AM

Hello Gretchen,
I had sent this email for the 1st P & Z meeting on April 28 which Trent said was included in the packets for the P & Z members. My comments were never mentioned at the meeting.
I have a couple of more items for tonight's meeting: The developers are from out of town and have never seen normal traffic on Hwy 82 (Grand Ave) at 5pm. No one from this development will take the hwy to get to City Market, they will take Palmer to 23rd to Blake.
Also one of the developers said maybe they would have a "dog wash". Are they going to allow pets?
Thank you for your time,
Lynn Cary
2405 Palmer Ave

-----Original Message-----
From: "Trent Hyatt" <trent.hyatt@cogs.us>
Sent: Friday, April 24, 2020 8:22am
To: "lcrfnd@rof.net" <lcrfnd@rof.net>
Cc: "Debra Figueroa" <debra.figueroa@cogs.us>, "Paula Stepp" <paula.stepp@cogs.us>, "jandjraehal@gmail.com" <jandjraehal@gmail.com>
Subject: RE: development variances

Lynn,
Thanks for your comments. I have included them in the packet we will provide to the Planning and Zoning Commission later today.

Regards,

Trent L. Hyatt
970.384.6427 (p)
trent.hyatt@cogs.us

From: lcrfnd@rof.net <lcrfnd@rof.net>
Sent: Wednesday, April 22, 2020 2:40 PM
To: Trent Hyatt <trent.hyatt@cogs.us>
Cc: Debra Figueroa <debra.figueroa@cogs.us>; Paula Stepp <paula.stepp@cogs.us>; jandjraehal@gmail.com
Subject: development variances

Trent Hyatt, Planning and Zoning Commission,

I have seen the posts concerning the request for variances by Triumph Development on Palmer Ave: Public Notice in Post Independent on April 14 and 21, 2020 and sign erected at 26th and Palmer on April 17 for public hearing on April 28.

The entire country including GLENWOOD SPRINGS is under a Stay-at-Home order. I don't think that people are aware of your posts with a very short time frame.

I feel that this request for variances should be postponed until the Stay-at-Home order is lifted so that the neighbors who are affected by this development can visit in person.

I have lived at 2405 Palmer Ave longer than any other person in this area and certainly understand the neighborhood.

I have read the request for the variances and nowhere is the traffic pattern addressed. How do all the vehicles access the development? Where is the map and where is the site view of buildings, park, parking lots, dumpster locations, lights, etc?

Directing traffic up 23rd st and down existing Palmer Ave is not acceptable. There are more than 10 grade school or younger children who live on Palmer Ave/ Crestwood Dr.

After the original development was approved the developer was to meet with the city to arrange to install a gate at his expense on Palmer to the south of the Speck property. It would be able to be opened by First Responders only.

We were told that these apartments would be rented at " market rates" with no restrictions on how many people could occupy each unit so it will not be cheaper than over-priced existing units.

Increasing the density and not having adequate parking will certainly cause many future problems. Just because it is close to the bus station is certainly no guarantee that people will not have at least two vehicles per unit (even a one bedroom) or even ride the bus.

I hope you will answer my questions and address the concerns of the neighborhood.

Thank you,
Lynn B Cary
2405 Palmer Ave
Glenwood Spgs, Co 81601
970-945-7215
lcrfnd@rof.net

Scott B. Kramer
2501 Palmer Avenue, Glenwood Springs CO 81601
Kramers85@comcast.net 970-618-5235

To: Planning and Zoning Commissioners, City of Glenwood Springs

RE: Triumph-Bell Rippy Development

First of all, I'd like to convey thoughts brought forward from the last proposal. All of the residents of Palmer Avenue have been adamant that our street's infrastructure is completely inadequate NOW, never mind to handle more traffic as there are no sidewalks, curbs/gutter, etc. All foot and bike traffic travels on the Palmer Avenue driving lane. When the Blake Gate is opened and the section of Blake Avenue made one-way, Hwy 82 commuters will (and always have) get around rush-hour gridlock by using Palmer Avenue at 27th and 29th street access points. Palmer Ave already experiences speeding commuters for years now. This dangerous problem will be vastly worsened due to the city's decisions on Blake Gate/one-way Blake Avenue. Commuter/shopper traffic is unacknowledged by city and traffic experts. Their "expert" traffic manuals and numbers notwithstanding, we see this dangerous, speeding commuter traffic every day.

During the previous application process, the city's traffic flow people met with a group of Palmer Avenue residents. We were basically told that the city was more interested in moving commuters through our neighborhood and to their destination than in our unsafe infrastructure and increased traffic concerns. (Connectivity?) Our impression from city staff member comments at the 4/28 zoom meeting this week is that this policy remains intact. This sure doesn't jive with the city's stated goal of preserving small town quality of life. All north-south oriented neighborhoods/streets are evidently exempt from deserving of quality small town living? We are promised solutions to this but our trust in that happening is beyond low. We proposed a fire gate at north end of new Palmer to give the new neighborhood a quiet, safe neighborhood for their kids free from speeding commuters as well as preserving our own. It seems such a simple solution that still keeps everyone safe. This was denied. One current resident south of that gate was opposed, as well. Vague promises of traffic calming "efforts" ring hollow.

We invite you to pull up a lawn chair and join us to watch commuters and shoppers speed through our neighborhood every afternoon and evening. Once new Palmer Avenue is improved and paved, Blake Gate is open and sections of Blake are one-way,

Scott B. Kramer
2501 Palmer Avenue, Glenwood Springs CO 81601
Kramers85@comcast.net 970-618-5235

this dangerous behavior will only worsen on an unsafe street full of little kids on bikes, owners walking their dogs or walking to and from work/school.

Secondly, I wish to comment on the new development proposal itself. Generally, I consider it well-thought out in many important aspects and an improvement over the original proposal. Additional housing provision is an important regional goal. My one serious concern is about Building F and its extremely close proximity to the existing Oakhurst condos. The separation is very minimal. All three floors of Building F will look directly over the fence and right into those home's tiny yard and windows. These condos only have their small backyards for privacy as front views are driveway/street only.

In addition, the 1.38 parking spaces (variance based on proximity to RFTA) per unit is woefully inadequate. Use of vehicles to get to work/retail is a different matter than OWNERSHIP of vehicles. Proximity to RFTA may encourage/solve getting to work/some shopping without use of a car, but does not eliminate car/truck ownership needs for many other aspects of life. 2 Bedroom units will have roommates as often or more often than one family (two working parents?) due to rent cost. There WILL BE two vehicles OWNED per unit even if they are not used daily to get to jobs! Where will they park? Along old and new Palmer Avenue? If leases limit #vehicles, where are additional already-owned vehicles going to park? Would applicant consider eliminating Building F (12 units) to allow additional parking and eliminate crowding onto Oakhurst condos privacy? Could one of the other buildings expand in design to capture some of eliminated Building F units? (eg. Building A) 88 units is still a big addition to the city housing pool. Provide new housing but help preserve "small town quality of life" for existing and future home owners?

Thank you for your consideration. P&Z commissioners have asked and addressed many of our concerns earnestly and we appreciate that. Sadly, it seems city council and city staff are happy to ignore those concerns and even denigrate our public comments as a waste of their valuable time, to quote Councilman Godes during the original application approval process. Out of that apparent disdain came a sudden vote to open Blake Gate at end of construction of the original development proposal. We were totally blindsided by this unexpected and unannounced but likely previously planned decision. It was a disheartening at best and very angering experience for all of us who attended that public meeting and had worked to open discussion with staff and council up to that point.

4-29-20
8:10 PM

PLANNING DEPT
P & Z
CITY COUNCIL

I'M NOT SURE WHO TO ADRESS THIS QUESTION TO BUT AFTER LAST NITES ZOOM MEETING (4-28) AND TODAY VISITING WITH MANY MEMBERS OF THE PALMER AVE. CONCERNED CITIZENS

① HOW COME THIS PROPOSAL IS BEING RAMRODED THRU IN TWO MEETINGS OVER SEVEN DAYS? IN THE PAST IT WAS ALWAY A MONTH TO MONTH SCHEDULE.

② MANY PEOPLE TRIED TO GET THRU TO MAKE COMMENTS LAST NIGHT BUT WERE EITHER UNSUCCESSFUL OR DIDN'T UNDERSTAND HOW TO ACCESS THE ZOOM PLATFORM.

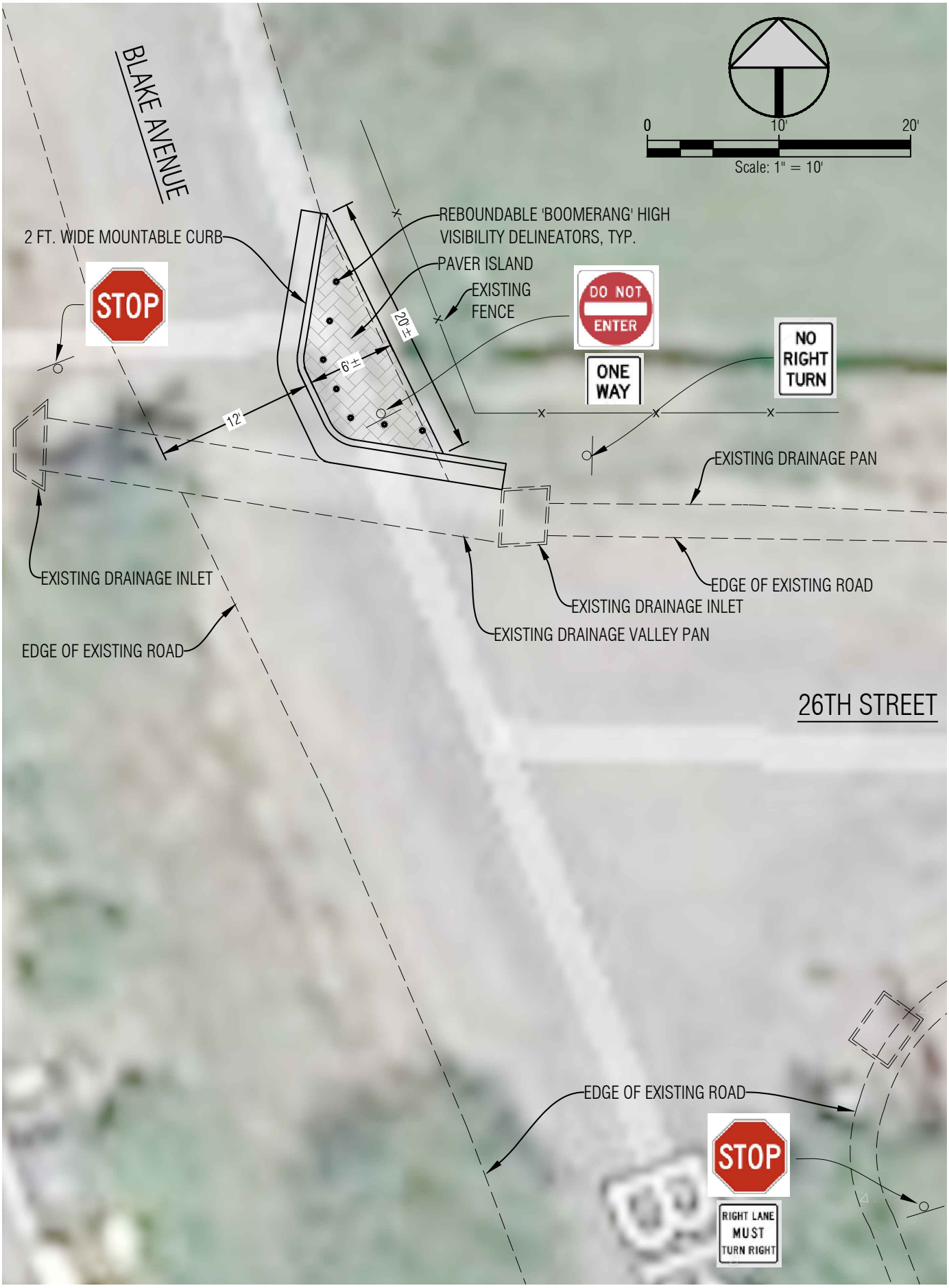
③ A FEW OF THE FOLKS I TALKED TO HEARD COMMENTS TO THE FACT THAT THERE IS VERY LITTLE OPPOSITION THIS TIME. * THIS COULDN'T BE FURTHER FROM THE TRUTH *
I ENCOURAGED THEM TO PUT THERE THOUGHTS IN WRITING AND GET THOSE THOUGHTS TO CITY HALL

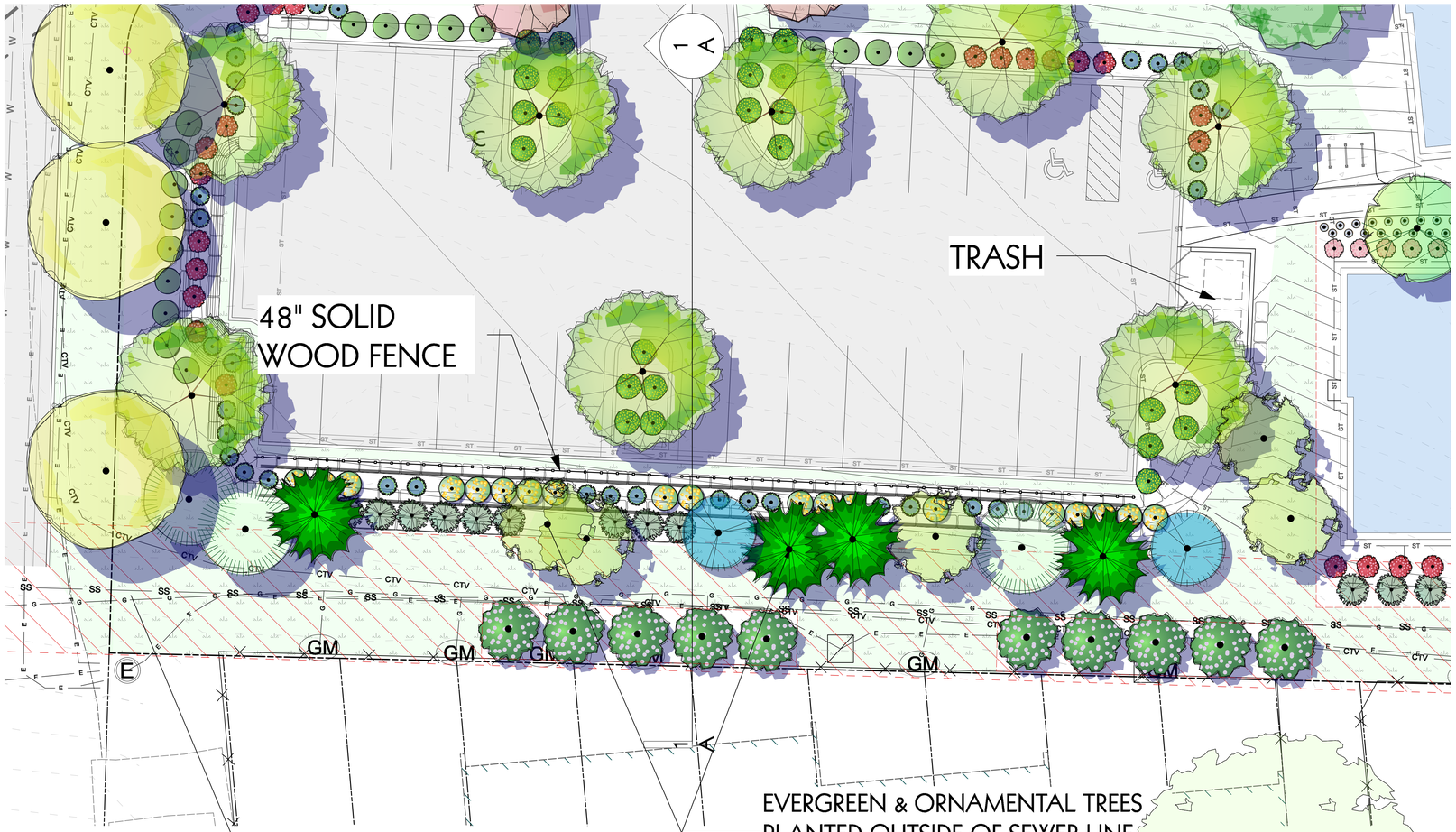
④ THE DEVELOPER HAS A HUGE ADVANTAGE BY THE PALMER - BLAKE - CRESTWOOD NEIGHBOR HOODS CONFUSION AND LACK OF CORRESPONDANCE WITH EACH OTHER DURING THIS COVID CRISIS AND VERY VERY SHORT TIMEFRAME IN WHICH TO RESPOND AFTER THE INITIAL 4-28 MEETING. THEY MUST BE VERY HAPPY WITH THIS FORMAT.

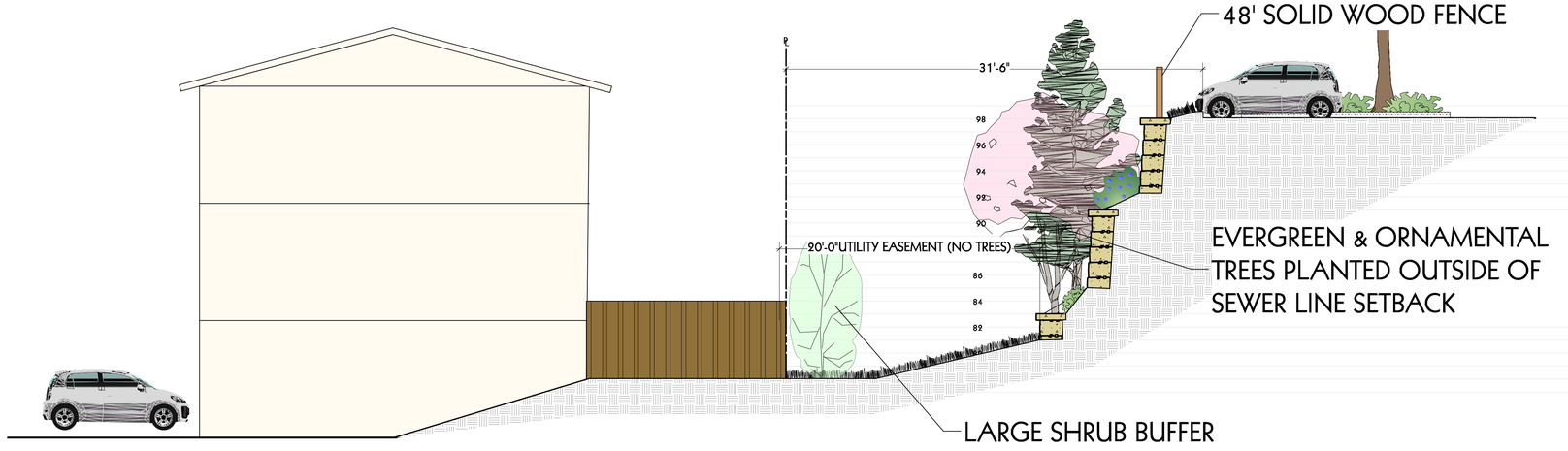
VERY FRUSTRATED

SCOTT KRAMER
2501 PALMER AVE

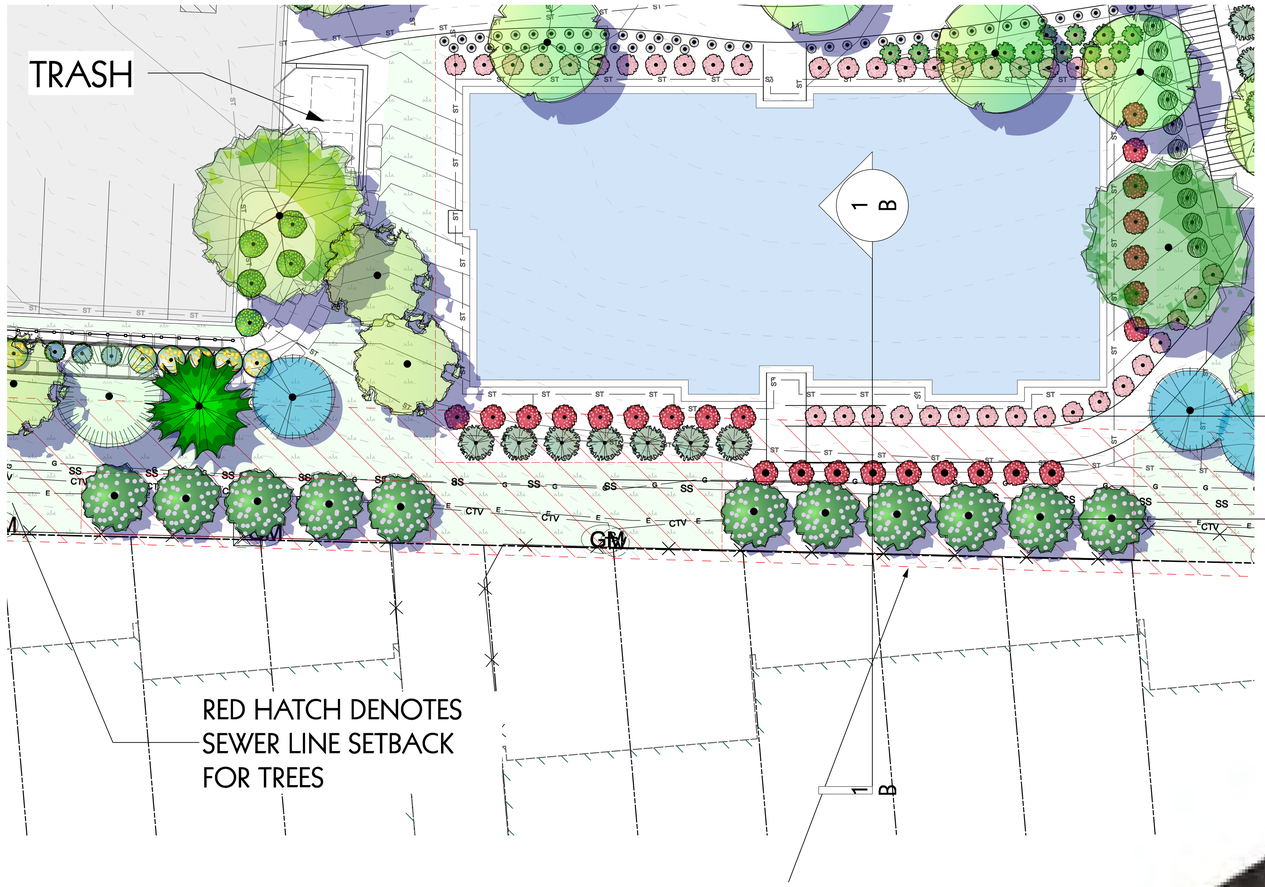
970 618 5235

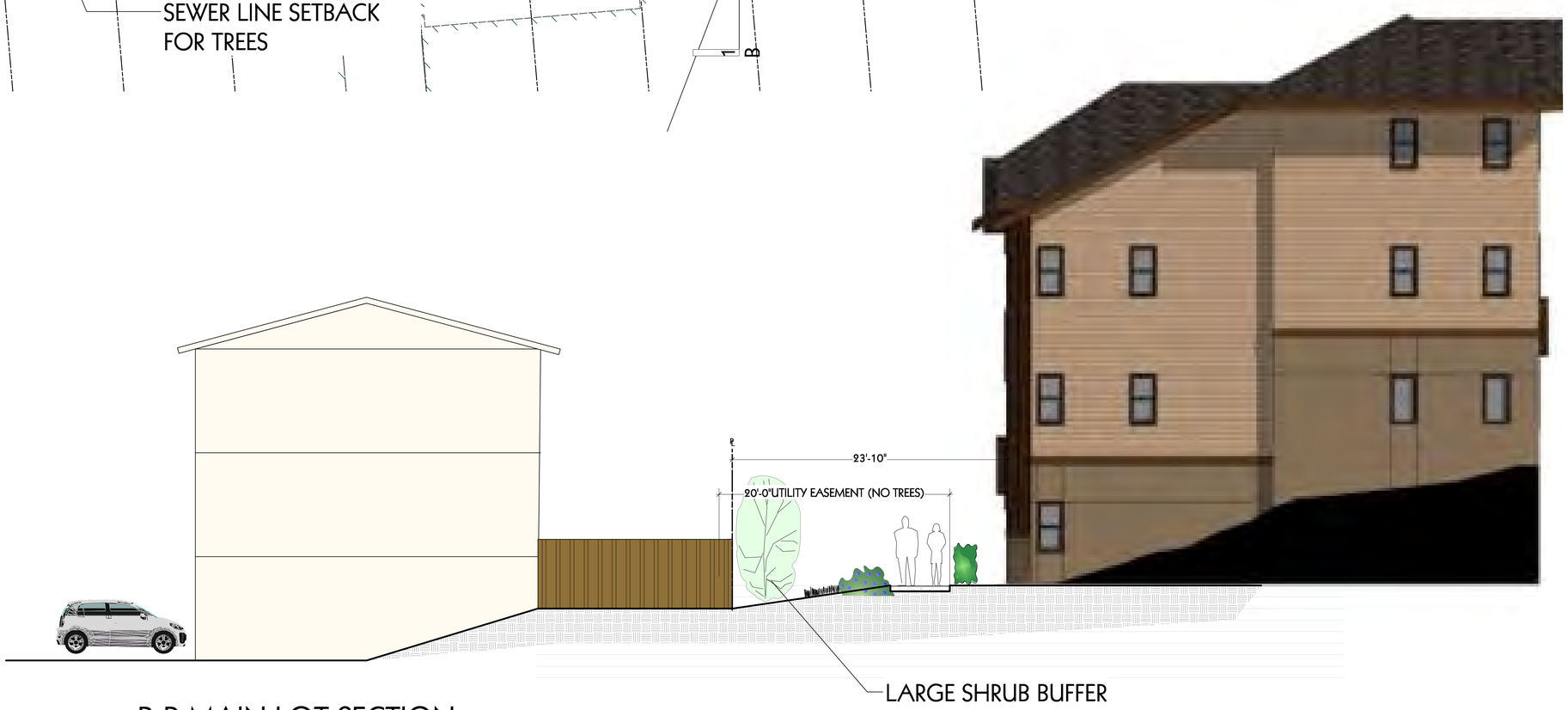

BLAKE AVENUE
0
10'
20'
Scale: 1" = 10'
2 FT. WIDE MOUNTABLE CURB
REBOUNDABLE 'BOOMERANG' HIGH VISIBILITY DELINEATORS, TYP.
PAVER ISLAND
EXISTING FENCE
STOP
DO NOT ENTER
ONE WAY
NO RIGHT TURN
20'±
6'±
12'
EXISTING DRAINAGE PAN
EXISTING DRAINAGE INLET
EDGE OF EXISTING ROAD
EXISTING DRAINAGE INLET
EXISTING DRAINAGE VALLEY PAN
EDGE OF EXISTING ROAD
26TH STREET
EDGE OF EXISTING ROAD
STOP
RIGHT LANE MUST TURN RIGHT



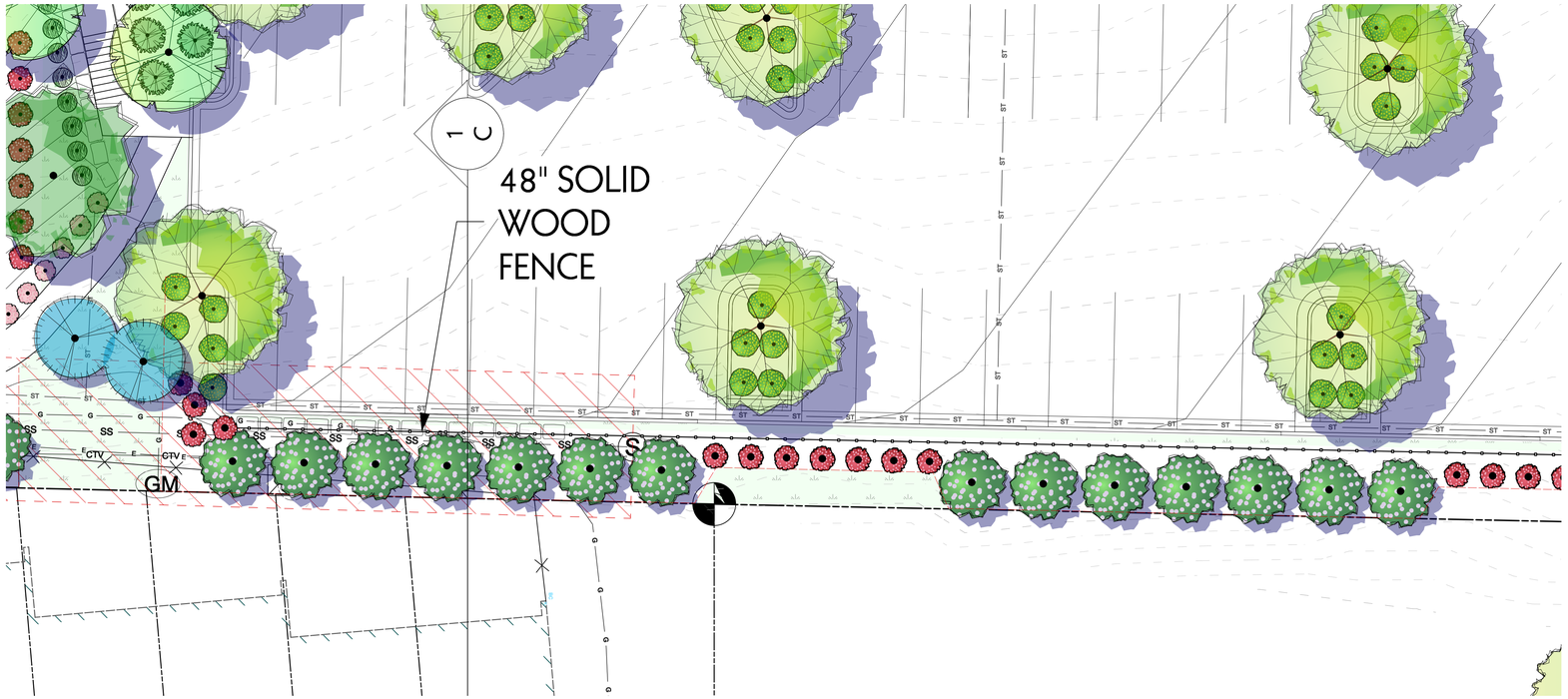


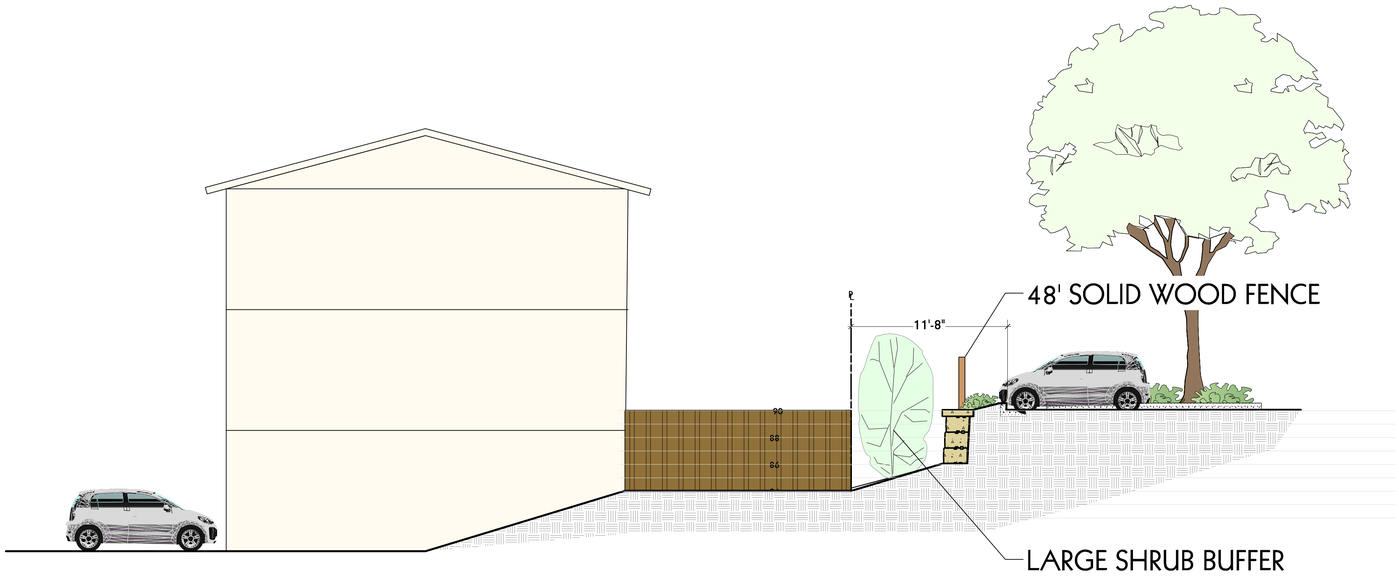
A-A NORTH LOT SECTION





B-B MAIN LOT SECTION





C-C MAIN LOT SECTION

BELL RIPPY NEIGHBORHOOD

OVERALL SITE PLAN

Civil Engineering
Surveying
& Beyond
Boundaries Unlimited Inc.
923 Cooper Ave., Ste. 201
Glenwood Springs, CO 81601
(T) 970.945.5252
www.bu-inc.com

N/A

N/A
N/A
N/A

Engineer or Surveyor Seal

NOT FOR CONSTRUCTION
Review

Client Information:

TRIUMPH
12 VAIL ROAD, SUITE 700
VAIL, COLORADO 81657
970 479-9990

NORTH

0 40' 80'
Scale: 1" = 40'

811
Know what's below.
Call before you dig.

GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Overall Site Plan

30% Review Set - Major Site Plan Submission

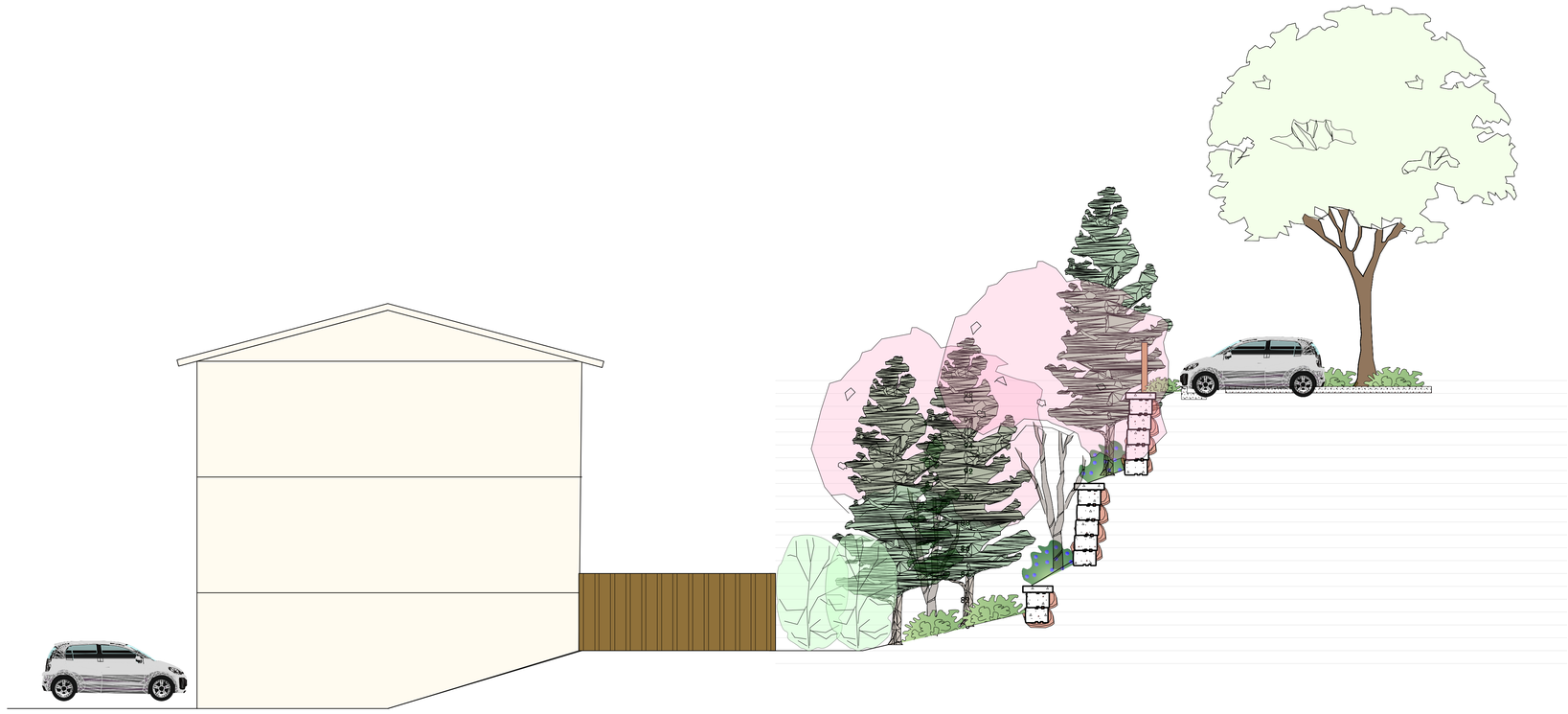
No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

PROJECT NO.
20002
Designer:
DJW
Drafter:
BUI
Date:
5/01/20

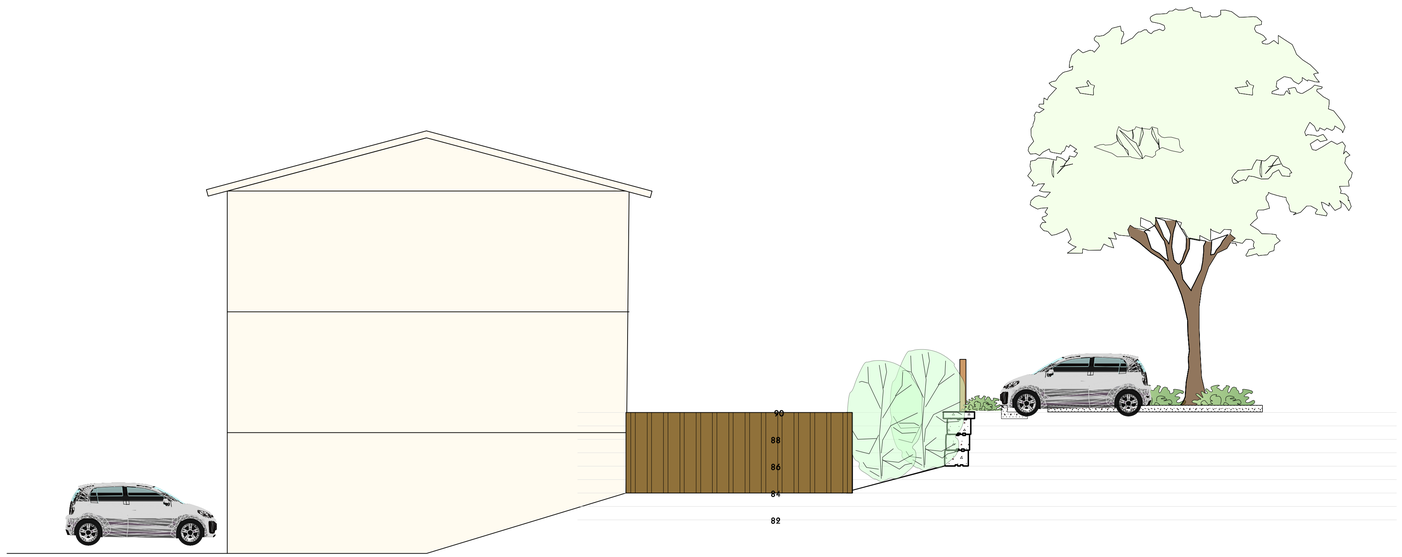
Sheet
C.1

File Name: 20002-c-cover.dwg

N:\PROJECTS\2020\20002-Bell Rippy Townhouses\dwg\20002-C-Cover.dwg 5/1/2020 9:23 AM



NORTH LOT SECTION



MAIN LOT SECTION

Triumph-Bell Rippy

Major Site/Architectural Plan Review, Rezoning, and Variances Planning File #04-20

Planning and Zoning Commission

April 28, 2020

CITY OF GLENWOOD SPRINGS COLORADO

Process

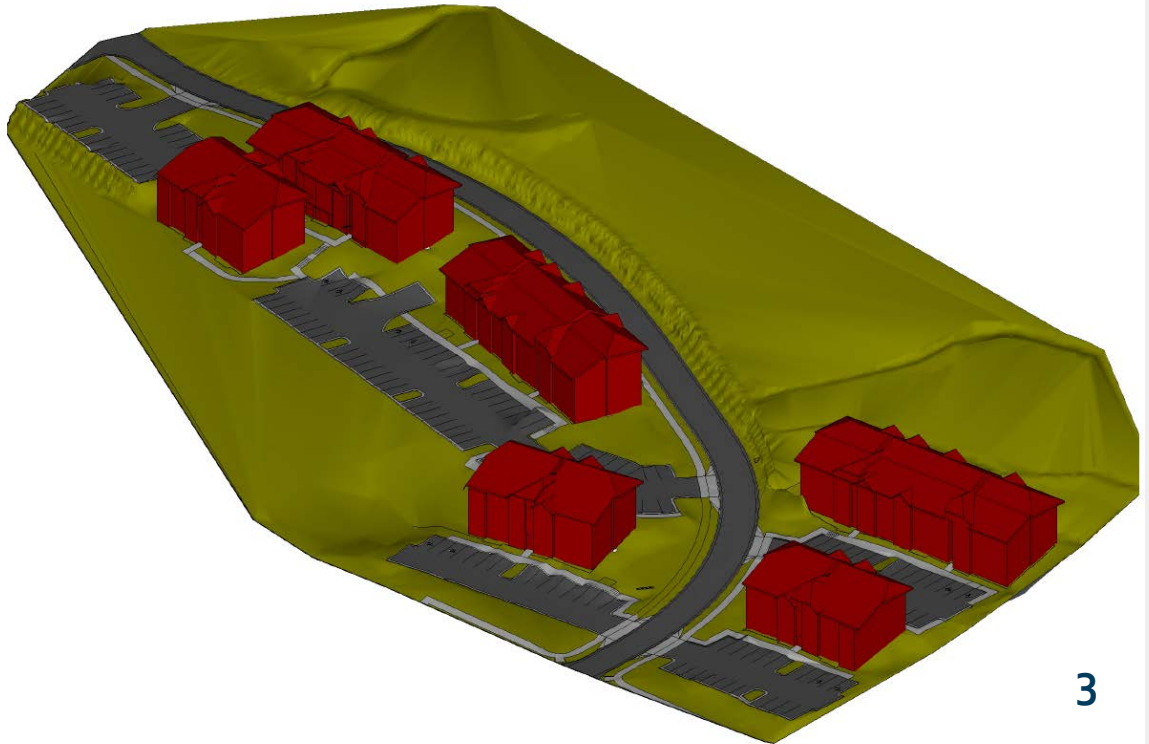
- 070.060.020/Table 060.1
  - Planning and Zoning Commission
    - Recommending body
      - Major Site/Architectural Plan Review
        - 25 or more new dwelling units and/or
        - 30,000 or more gross sf of nonresidential space
      - Rezoning
    - Decision making body
      - Variances
  - City Council
    - Decision making body
      - Major Site/Architectural Plan Review
      - Rezoning
  - City Staff
    - Construction Plans prior to building permit application

CITY OF GLENWOOD SPRINGS COLORADO

Background/Proposal

- 2018
  - Council approved similar yet separate proposal
    - 79 multi-family units
    - 10 buildings
- Current proposal- Triumph Development West
  - 100 multi-family units
  - 6 buildings
  - Rezoning of newly added parcel at 2710 Blake Avenue RH to RT
  - Extension of Palmer Avenue
  - Common open space improvements/landscaping
  - 5.74 acres

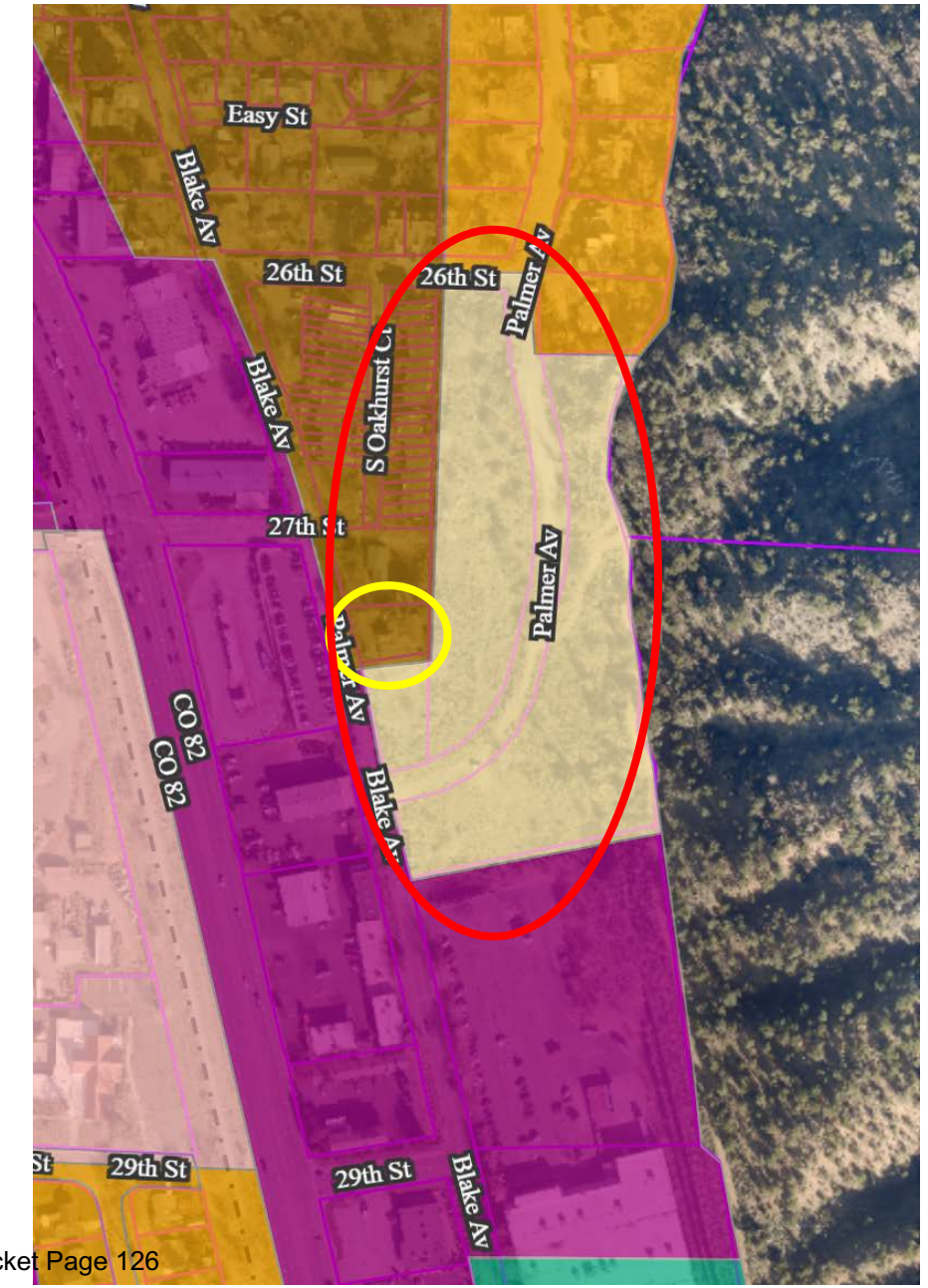
Existing northeast view (photo credit: Google Maps) and related perspective view



CITY OF GLENWOOD SPRINGS COLORADO

Zoning and Adjacent Land Uses

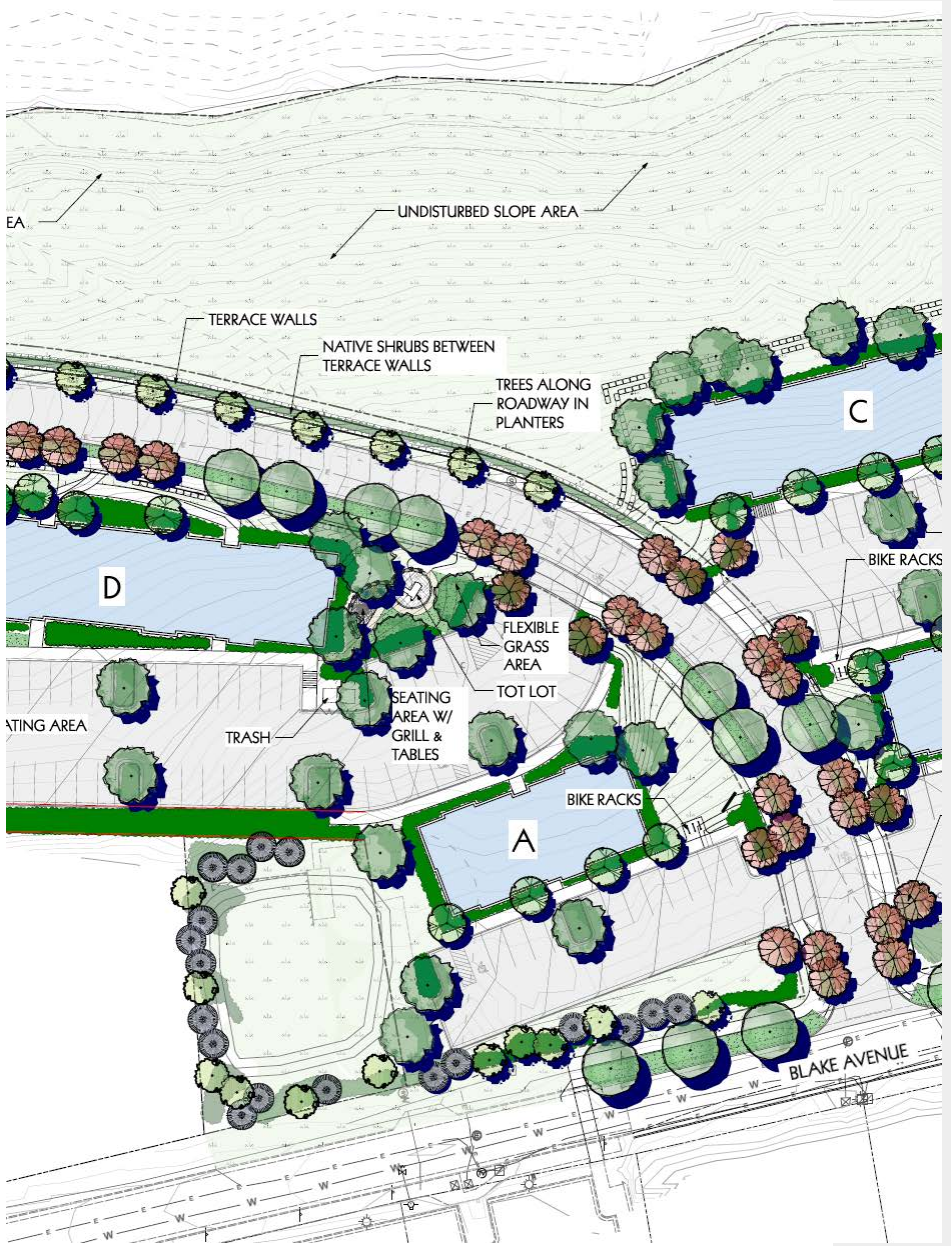
- 5.74 acre
  - RT Residential Transitional (tan)
  - RH Residential High-Density (brown)
  - Borders city boundary to the east



CITY OF GLENWOOD SPRINGS COLORADO

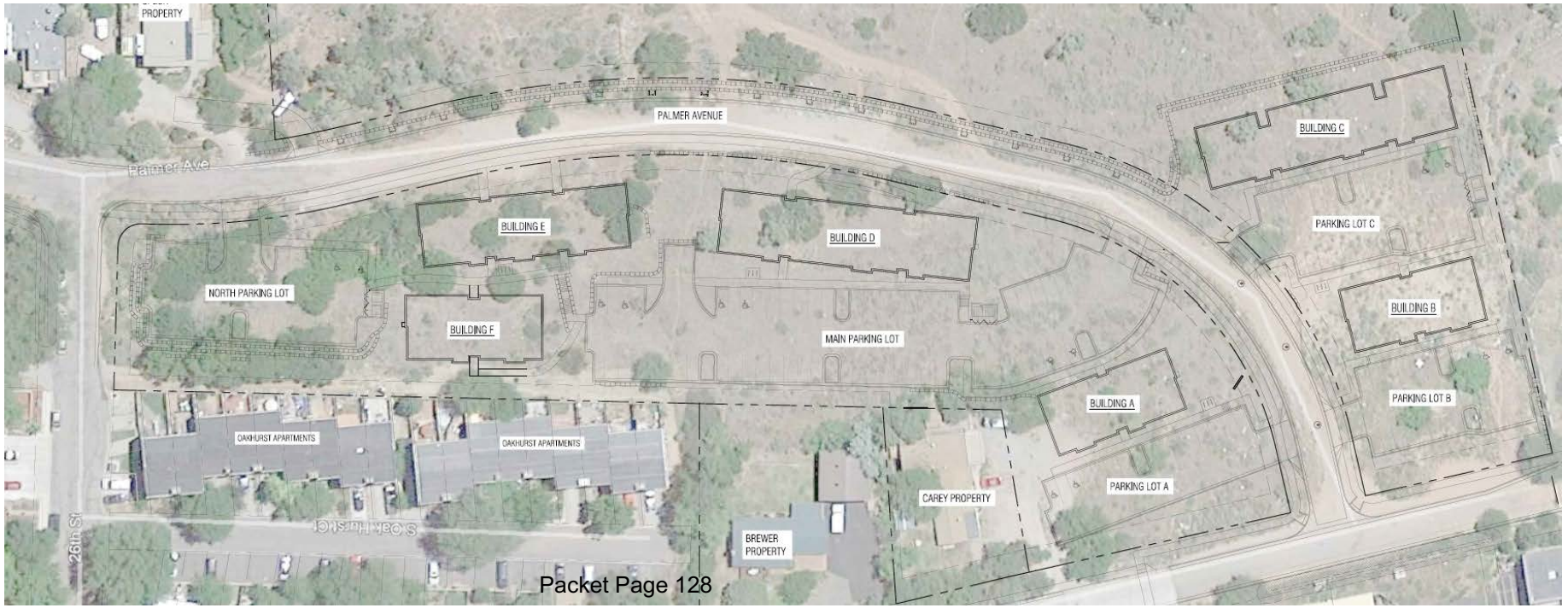
070.040 Development Standards

- Open Space (070.040.040) and Landscaping (070.040.050)
  - Min. 20 percent of development site as landscaping/common open space
    - 37,631 square feet total required
    - 1,360 square feet required as interior parking lot landscaping
    - Street trees adjacent to site
    - Active and passive recreation
  - Proposed
    - 72,026 square feet/38 percent
    - Tot plays area, outdoor gathering spaces, an indoor community room, geologic hazard debris flow area, stormwater retention area, and undeveloped portions of the property



Off Street Parking and Loading (070.030.020(e)/Table 030.1)

- 1.5 spaces per multi-family dwelling unit required and 1 guest space per five dwelling units
- 170 total spaces
- 20 percent reduction requested by TDW per 070.040.060(e)
- 136 required
- 148 proposed



Site Layout and Building Design (070.040.080)

- 070.040.080(d)(2)a.2
  - Requires MF developments to internalize parking lots
  - Buildings A and B are located behind parking lots
- 70.040.080(e)(3)
  - Requires developments of three acres to incorporate min. two housing types.
  - Only MF apartments proposed

CITY OF GLENWOOD SPRINGS COLORADO

Site Layout and Building Design (070.040.080)

- Architectural variety and four-sided design
  - Numerous element articulate the buildings
    - variations in color, materials, texture, roof forms,
    - changes in in wall planes,
    - prominent entries, and
    - windows on all sides

East elevation-Building C
(facades facing Palmer Avenue)

WEST ELEVATION - BUILDING E

Traffic Impacts

- Updated analysis by McDowell Engineering, LLC
  - Forecasts/analyzes project impacts on surrounding streets and intersections
  - 489 vehicle trips per day on an average weekday
    - 30 vehicle trips AM peak hour traffic
    - 38 vehicle trips PM peak hour traffic
  - Majority of impacts at the intersections of
    - 27th Street and Highway 82 and
    - Blake Street and Highway 82
  - CDOT access permits granted but will need revising
    - Intersection improvements not required by CDOT nor City Council prior
    - Blake one way south 23rd to 29th median improvements
  - City wishes to further discuss circulation options with neighborhood, following any approval

CITY OF GLENWOOD SPRINGS COLORADO

Debris Flow

- Analysis by Golder Associates
  - Debris flow flexible fencing
  - Berms

CITY OF GLENWOOD SPRINGS COLORADO

Variance Approval Criteria (070.060.070(a)(3)e.2)

- i. The subject property has an exceptional shape, topography, building configuration or other exceptional site condition that is not a general condition throughout the zone district;
  - Exceptionally long, narrow shape
  - Significant topography (15.5 percent within development site)
  - Debris flow, rockfall, and hydrocompactive soils
  - Curvilinear ROW
- ii. The strict application of the Code standards for which a variance is sought would produce undue hardship;
  - Exceptional conditions create difficulty in developing the site
  - Limits ability to utilize the topography in the building design and develop adjacent to exiting ROW

CITY OF GLENWOOD SPRINGS COLORADO

Variance Approval Criteria (070.060.070(a)(3)e.2)

- iii. The applicant did not create the hardship by his/her own actions;
  - Hardships not created by the applicant

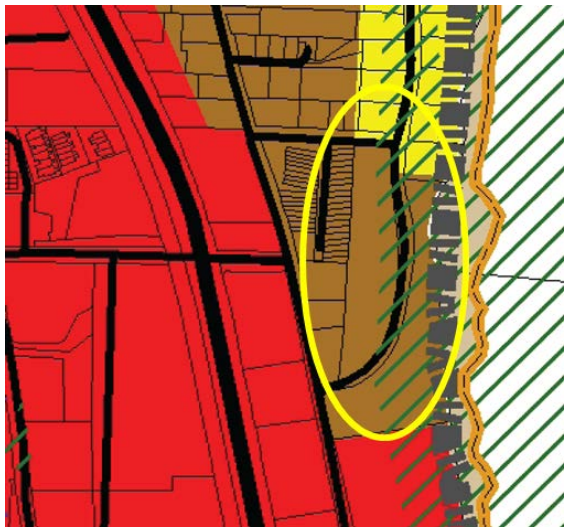
- iv. The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;
  - Consistent with the general purpose and intent of the Code
    - natural hazards,
    - efficient development,
    - compatible design, and
    - addressing impacts

Variance Approval Criteria (070.060.070(a)(3)e.2)

- v. The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;
  - Allow development of the site in manner intended by the RT district
- vi. The variance request will not violate building or fire code requirements; and
  - Does not
- vii. The variance is the minimum variance that will afford relief of the subject standards of the Code.
  - Minimum necessary for development of the site

Rezoning Approval Criteria (070.060.040(a)(3)f.3)

- i. The rezoning is consistent with the City's comprehensive plan and the purpose of this Code;
  - Designated "Multi-family Residential" "Hillside Preservation" with green hatching
  - Numerous community goals and related objectives and strategies supported
    - Encourage economic development,
    - Preserve small town character
    - Convenient transportation,
    - Infill development,
    - Housing opportunities, and
    - Social diversity



- ii. The rezoning is consistent with the proposed purpose statement of the proposed zoning district;
  - Consistent with transition between residential and commercial uses which exist in the area per RT purpose statement

Rezoning Approval Criteria (070.060.040(a)(3)f.3)

- iii. Substantial changes in the subject area warrant a zoning change; and/or
  - Development proposal is a substantial change/consideration and prevents a split zoning
- iv. The intensity of development in the new zoning district is not expected to create significantly adverse impacts to surrounding properties or the neighborhood.
  - Intensity of development expected to decrease with the current proposal
    - Replaces an existing triplex with a stormwater detention area
    - RH is a more intense zone district than the RT

CITY OF GLENWOOD SPRINGS COLORADO

Site/Architectural Plan Review Approval Criteria 070.060.050(6)

- a. The site/architectural plan is consistent with the general purpose and intent of this Code;
  - Consistent with the general purpose and intent of the Code as outlined above

- b. The site/architectural plan is consistent with the dimensional, design, development, and all other standards of this Code;
  - Consistent with the dimensional, design, development, and other standards excluding variance requests

- c. The site/architectural plan is consistent with any previously approved plat, PUD, or any other precedent land use approval; and
  - Consistent with the dimensional, design, development, and other standards excluding variance requests

CITY OF GLENWOOD SPRINGS COLORADO

Site/Architectural Plan Review Approval Criteria 070.060.050(6)

- d. The site/architectural plan is consistent with the Comprehensive Plan and other adopted City policies and plans.
  - Consistent with the general purpose and intent of the Code as outlined above

CITY OF GLENWOOD SPRINGS COLORADO

Referral Agency/Adjacent Property Comments

- Agencies
  - Fire Department – Comments discuss fire apparatus road longer than 150 feet without a turnaround
  - Engineering - Comments received outline procedures for exceptions related to the proposed Palmer Avenue extension, request to increase the width of the single sidewalk along said extension, clarification from CDOT regarding applicable traffic mitigation, site acreage, soil type outlined in the drainage report, proposed contours, and necessary revisions to debris flow analysis and other plans needed prior to development
  - Parks and Recreation – Comments received outline the need for the applicant to submit a full landscaping and irrigation plan.
  - Public Works - Comments received outline numerous revisions/clarifications required for the civil plan set related to the fire hydrant location and specifications, storm sewer connections, water/sewer line locations/sizes/specifications, debris flow mitigation, and personnel contact information.

CITY OF GLENWOOD SPRINGS COLORADO

Referral Agency/Adjacent Property Comments

- Adjacent property owners
  - In opposition
    - Jamie Raehal
    - Joan Troth
    - David J. Turtle
    - Richard and Janet O'Connell
    - Christine Smalley

Action Items 1-4 and Staff Recommendation

- Section 070.060.030(g)(1)d
  - Approve,
  - Approve with conditions
  - Deny
  - Continue

- Staff recommends
  - Approval of Action Items 1 and 2 (Variances)
    - Findings on pages 12 and 13
  - Recommending approval with conditions to City Council of Action Item 3 (Rezoning) and 4 (Major Site/Arch Plan Review)
    - Findings and conditions on pages 13-14

CITY OF GLENWOOD SPRINGS COLORADO

Bell Rippy Apartment Homes

Major Site/Architectural Plan Review with Variances

& Rezoning of 2710 Blake Ave

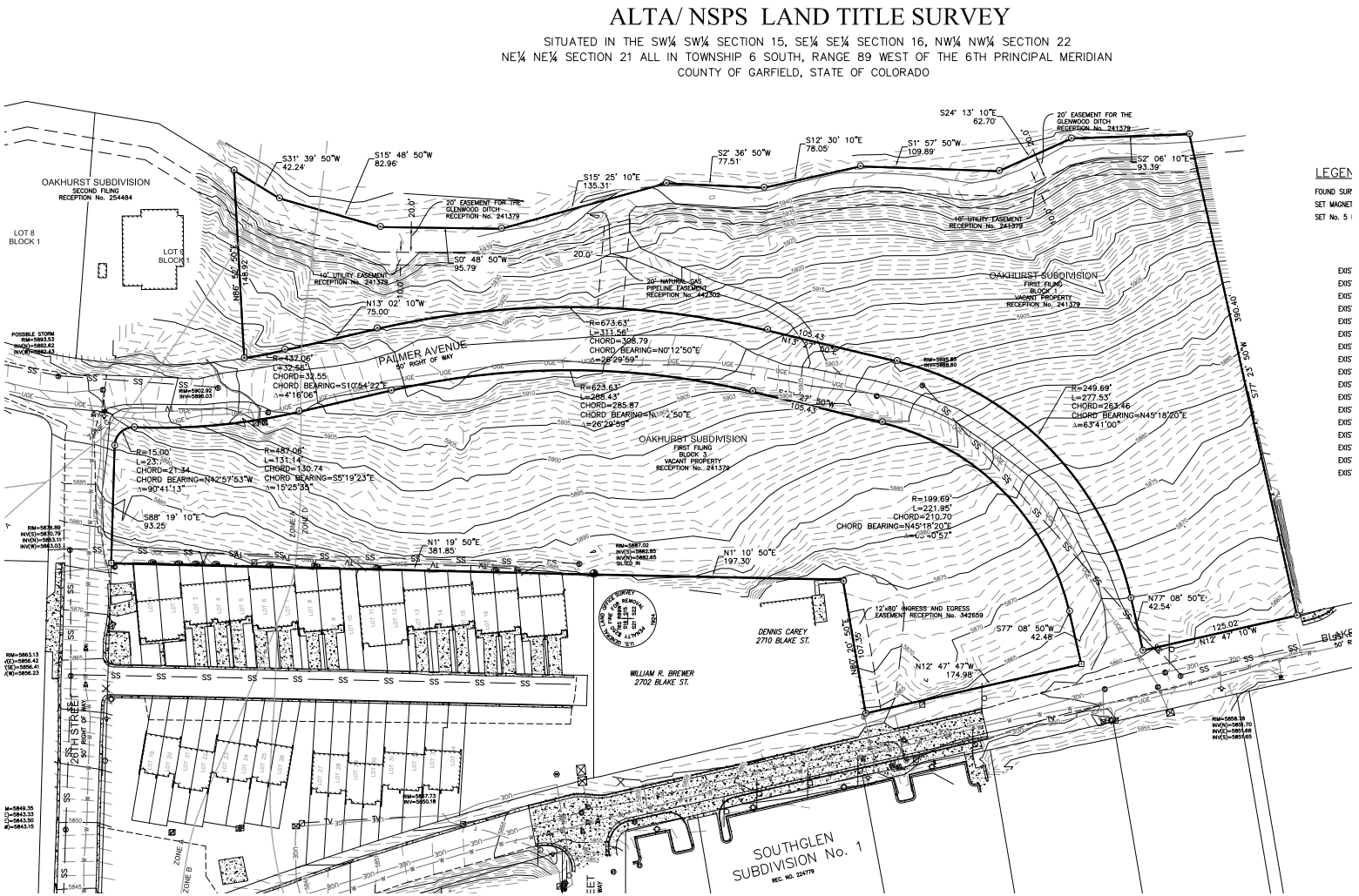
Planning & Zoning Commission Meeting - 4.28.20

Development Team

- Owner: Bell Rippy Glenwood, LLC - c/o Four Points Funding - Stephanie Copeland
- Owners Rep & Co-Sponsor: Triumph Development West - Michael O'Connor
- Architect: Triumph West Architecture - Mike Foster
- Civil Design: Boundaries Unlimited - Deric Walter
- Landscape Design: Outside LA – Sandi Gibson
- Traffic Engineering: McDowell Engineering - Greg Schroeder

Bell Rippy Aerial

Survey and Flood Zone A Location



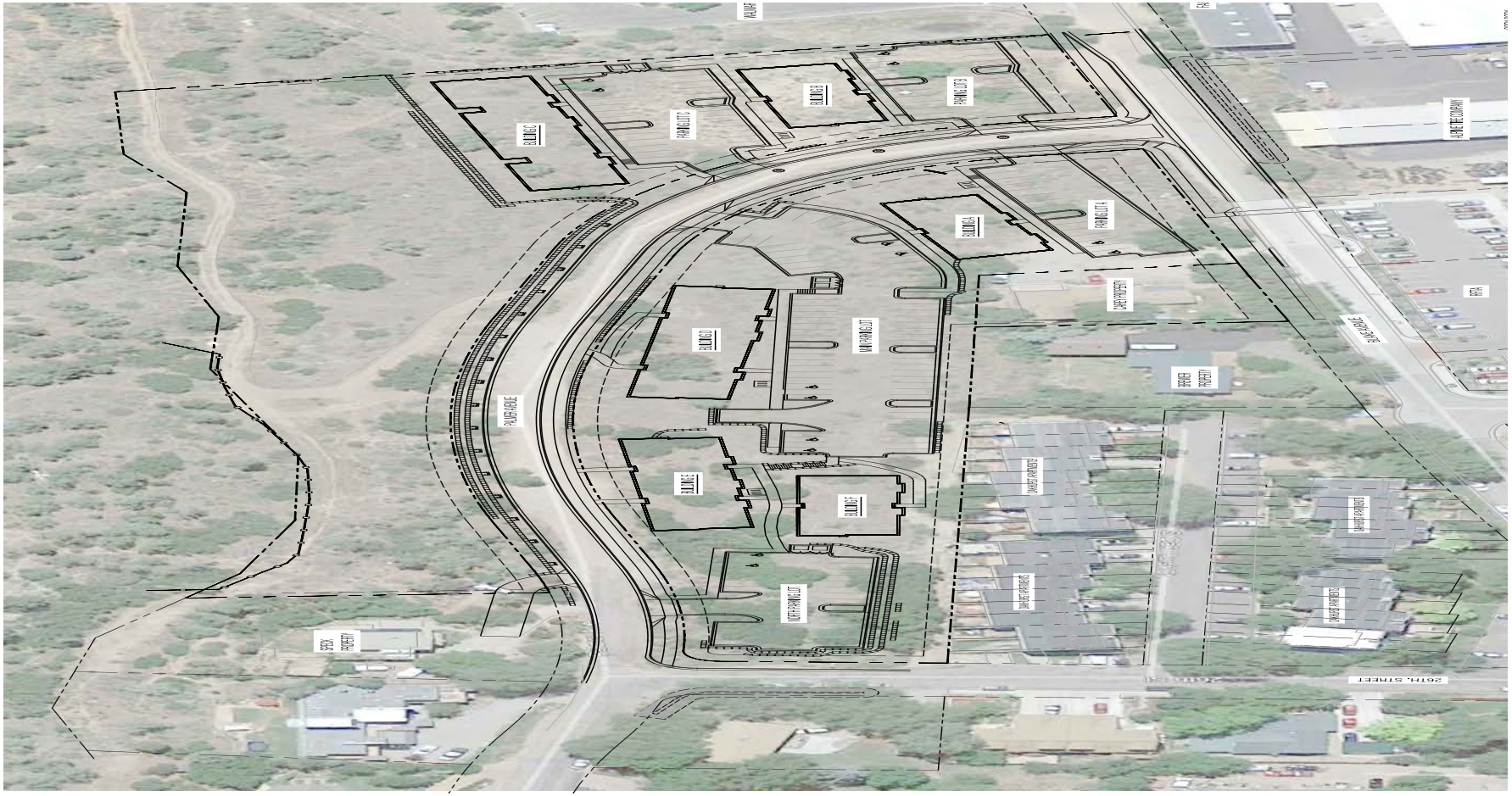
Current Development Approvals

- 10 three-story buildings buildings with 79 homes and 156 bedrooms. Mostly 2BR
- Construction of the Palmer Avenue ROW to the COGS design standards, along with debris flow mitigation
- CDOT Access Permit received for the proposed traffic pattern

Overview of Proposed Development

- Added 2710 Blake to the Development Application.
- 6 three-story buildings buildings with 100 homes and 162 bedrooms. Mix of 2BR and 1BR homes.
- Construction of the Palmer Avenue ROW to COGS standards, along with debris flow mitigation for the neighborhood.

Development Plan Over Site Aerial

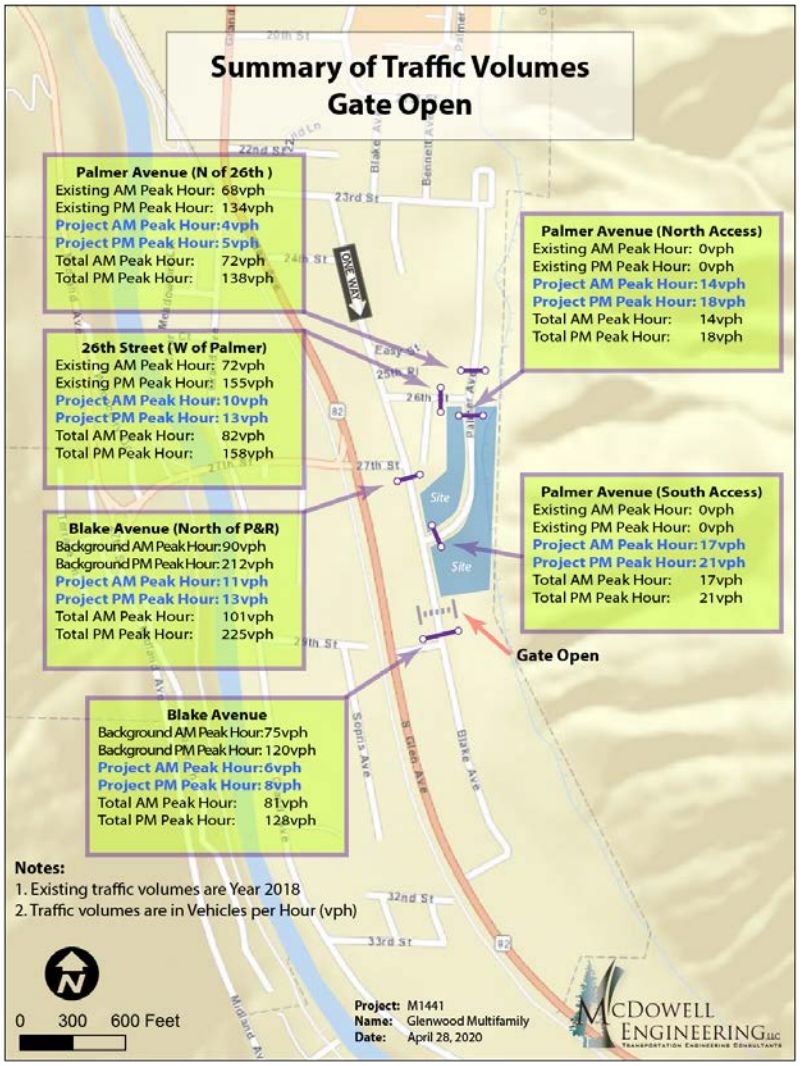


Site and Architectural Design Presentation
Mike Foster, Triumph West Architecture

Traffic Impact Study Presentation
Greg Shroeder, McDowell Engineering

Traffic Impact Conclusions

- Applicant's proposed traffic pattern is the same configuration approved in Current Plan.
- CDOT Access Permit has been received for current plan.
- Traffic volumes of this plan are lower than Current Approvals
- Decision to open Blake Gate was made by City Council in the Current Plan with strong support from Glenwood Springs Transportation Commission.
- Traffic impacts from this Project on the surrounding neighborhood are minor - only 4 to 13 vph on existing neighborhood streets.



Summary of the Proposed Parking Plan

- Parking Plan exceed the requirements of the GSMC which recognizes the benefit of access to public transit.
- Access to public transit does not get better than this site.
- Community targets residents whose lives are conducive to public transit and will attract households that only need 1 car.
- Managed community where parking will be controlled via leases:
  - Onsite manager to control parking
  - Leases to specify number of cars and residents for each unit
  - Assigned parking spaces
  - Management tools such as charge for parking in excess of 1 space per unit

Number of Units		100
Resident Parking (Per Unit)	1.50	150
Guest Parking (Per Unit)	0.20	20
Transit Proximity Discount	20%	(34)
Total Parking Required		136
Total Parking Proposed		148
Extra Parking Spaces to Code		12

Overview of Major Site/Architectural Plan Improvements to the Currently Approved Plan

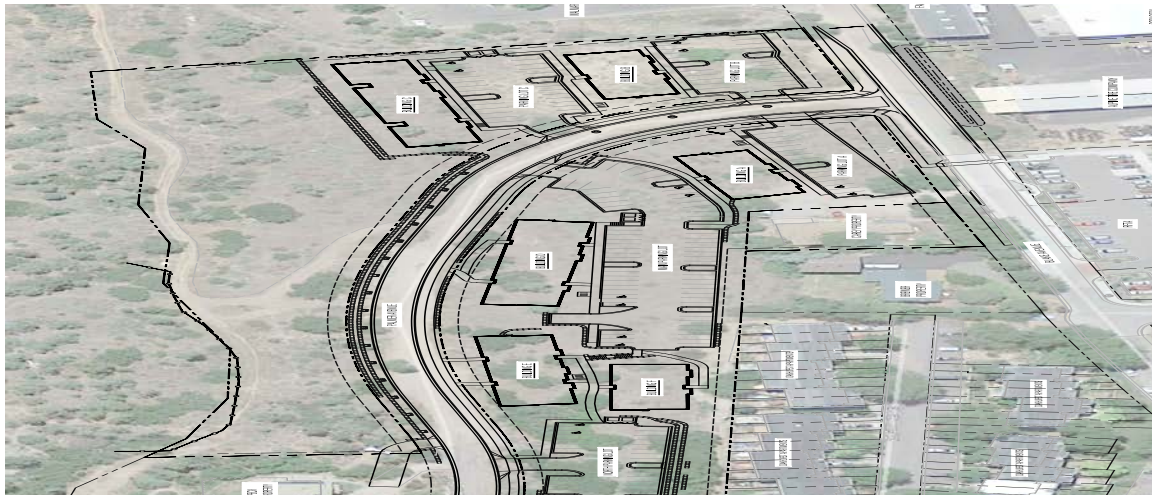
- Proposed construction of Palmer to COGS standards – drops grade as much as 9 feet
- Retaining walls vs. significant uphill site excavation to preserve highly visible native landscape
- Construction of 400’ debris flow fence for the benefit of the entire neighborhood
- Site plan that discourages access to uphill open lands and improves the safety of the neighborhood
- Fewer, attractive buildings than Current Approvals that compliment and complete the neighborhood and comply with all the main zoning standards
- Plan that avoid Flood Zone A with all buildings
- Units that are more affordable, yet livable, by design with surface parking.
- Mix of 2BR and 1BR with separate basement storage to cater to a mix of households.
- Transit oriented development that encourages the use of public transit andis walkable to essential retail.
- Honors the prior commitments and approvals of the currently approved plan for offsite traffic improvements and debris flow mitigation.

Zoning Compliance & Comparison of Current vs. Proposed Plan

Zoning Criteria		Code		Current Approved Plan		Proposed Plan	
Lot Size		5.74	acres	5.51	acres	5.74	acres
Density	Lot SF/Unit	2,500					
	Total Permitted Units	100	units	79	units	100	units
Unit Mix	1BR	n/a		77	2BR	63	2BR
	2BR	n/a		2	1BR	37	1BR
Total Bedrooms				156	bedrooms	163	bedrooms
Setbacks	Front (Non-Arterial)	10	feet	10+	feet	10+	feet
	Side	5	feet	5+	feet	5+	feet
	Rear	10	feet	10+	feet	10+	feet
Height		40	feet	3	stories	40	feet
Lot Coverage	Allowed	50%					
	Square Feet	120,008	sf	49,635	sf	32,406	sf
						27%	of permitted
Landscape Area	Minimum Required	20%					
	Square Feet	48,003	sf	134,209	sf	125,103	sf
						261%	of required
Proposed Parking		136.00		179	spaces	148	spaces
Zoning Variances				5	variances	2	variances

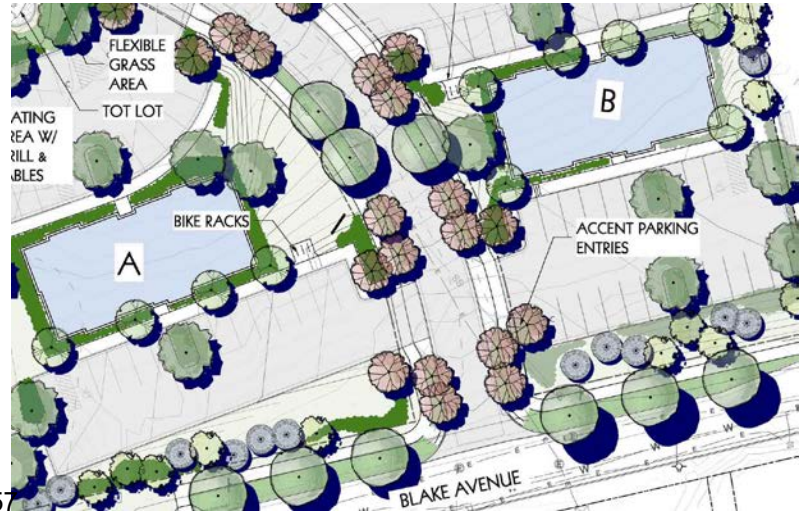
Zoning Variance #1 – Multiple Housing Types

- Section 70.040.080(e)(3) the *GSMC* requiring developments with three acres to provide at least two housing types.
- Site grade and engineering requirements for the Palmer Avenue engineering standards drive a development plan with a condensed footprint that minimizes uphill development disturbances
- Current Approved Plan requested and received this same variance.
- See Staff Memo for compliance with 7 Variance Criteria

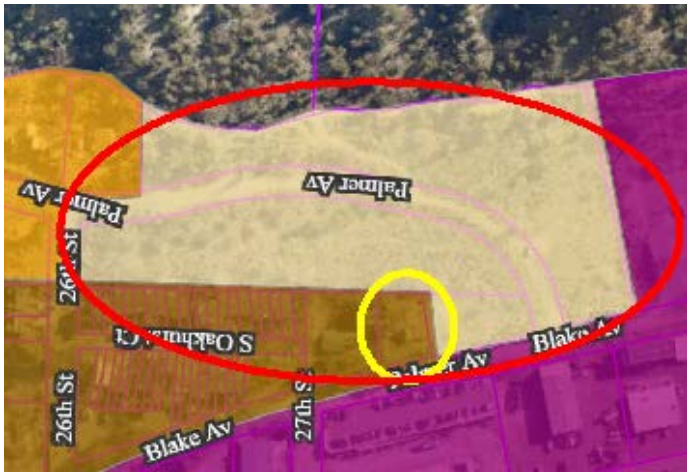


Zoning Variance #2 – Parking Internal to Site

- Section 070.040.080(d)(3)a.2 of the *GSMC* requires internalized parking located away from street frontages.
- Site grade and ROW and parking engineering standards dictate site plan with tiered parking. Plan proposes to use foundations for site retaining rather than tall retaining walls.
- Current Plan and Proposed Plan have similar site layout condition.
- See Staff Memo for compliance with the 7 Variance Criteria



Rezoning of 2710 Blake



- Rezoning this 0.25-acre parcel to be consistent with the larger 5.5-acre parcel.
- Rezoning of 2710 Blake is consistent with Comp Plan
- Rezoning represents a slight downzoning in the allowable number of units that can be developed. All other development standards remain the same.
- See Staff Memo for compliance with Variance Criteria.

Questions?

GLENWOOD MULTIFAMILY DEVELOPMENT

Planning & Zoning Meeting

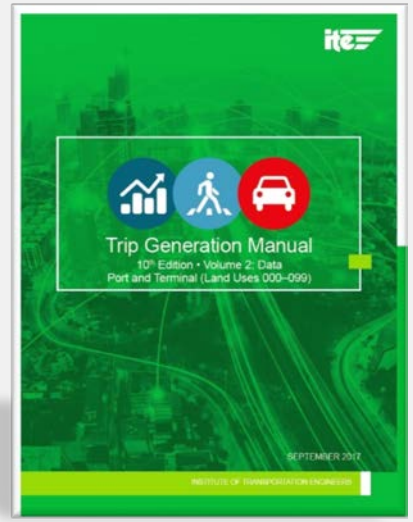
April 28, 2020

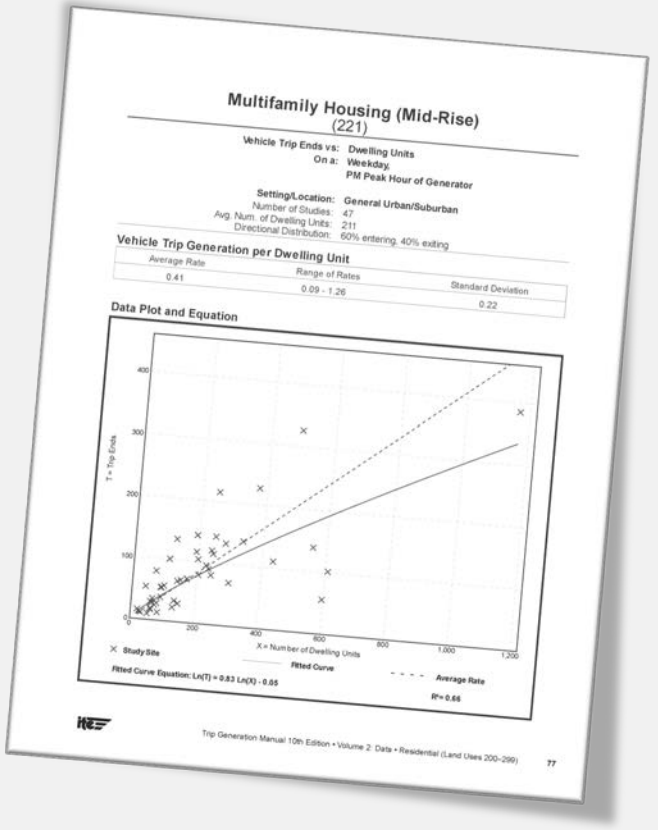
TRAFFIC UPDATE

- Direction from February 2018 City Council Hearing
  - Approved by Engineering Department and Council
  - Opening the gate at Blake Avenue was agreed at Town Council direction. Improvement to the traffic circulation pattern in the neighborhood is desirable.
  - One Way on Blake Avenue to control cut through traffic
    - Southbound from 23rd to 26th
- CDOT Approval
  - State Highway Access Permits are approved for the currently approved plan with higher projected traffic volume
- Proposed volumes are less than previous development
  - March 2020 Memorandum to City

ESTIMATE GLENWOOD MULTIFAMILY DEVELOPMENT SPECIFIC TRAFFIC

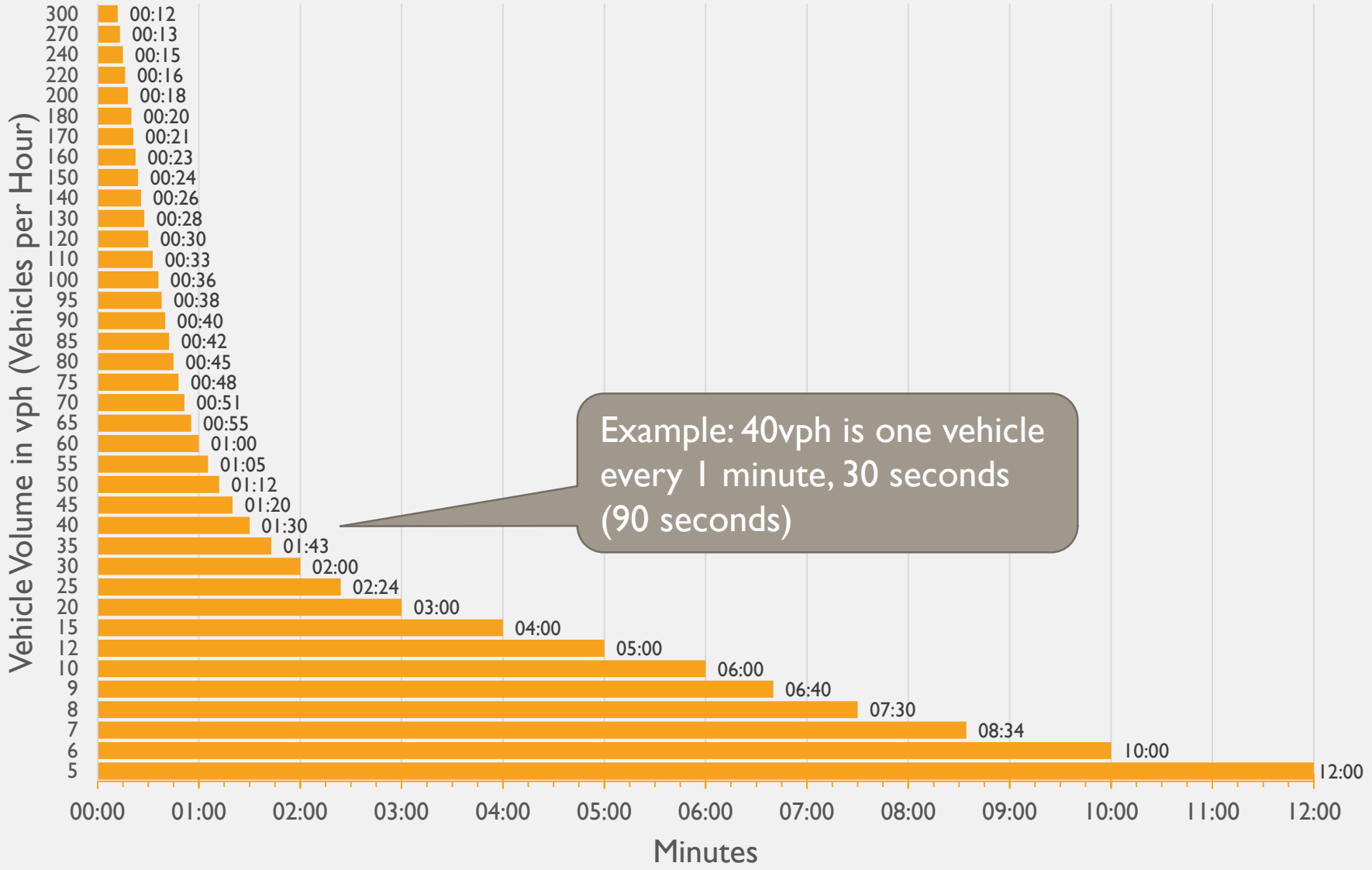
- ITE Trip Generation Manual, 10th Edition
- 3000+ pages of traffic trip generation studies





Vehicle Volumes

Average Number of Minutes Between Vehicles



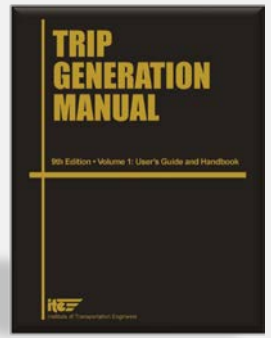
TRAFFIC VOLUME / TRIP GENERATION COMPARISON

- Previous Development Proposal
- Trip Generation
  - 79 Dwelling Units.
  - 10% Multimodal Trip Reduction (due to proximity to transit)
  - 543vpd Average Weekday Trips, 43vph AM Peak Hour, and 57vph PM Peak Hour

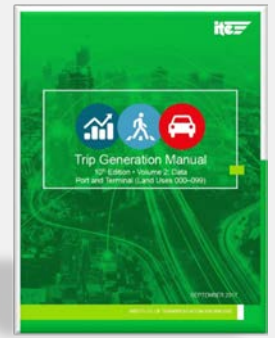
- This Development Proposal
- Trip Generation
  - 100 Dwelling Units.
  - 10% Multimodal Trip Reduction (due to proximity to transit)
  - 489vpd Average Weekday Trips, 30vph AM Peak Hour, and 38vph PM Peak Hour

WHY DID THE TRAFFIC VOLUMES GO DOWN WHEN THE # OF UNITS INCREASED?

- Previous Proposal
  - Project began in 2016/2017
  - First Submittal in early 2017
  - Used ITE Trip Generation 9th Edition
    - Published in 2012
    - Land Use #220 – Apartment
    - Land Use #223 – Mid Rise Apartment did not have enough data
      - Manual did not allow use

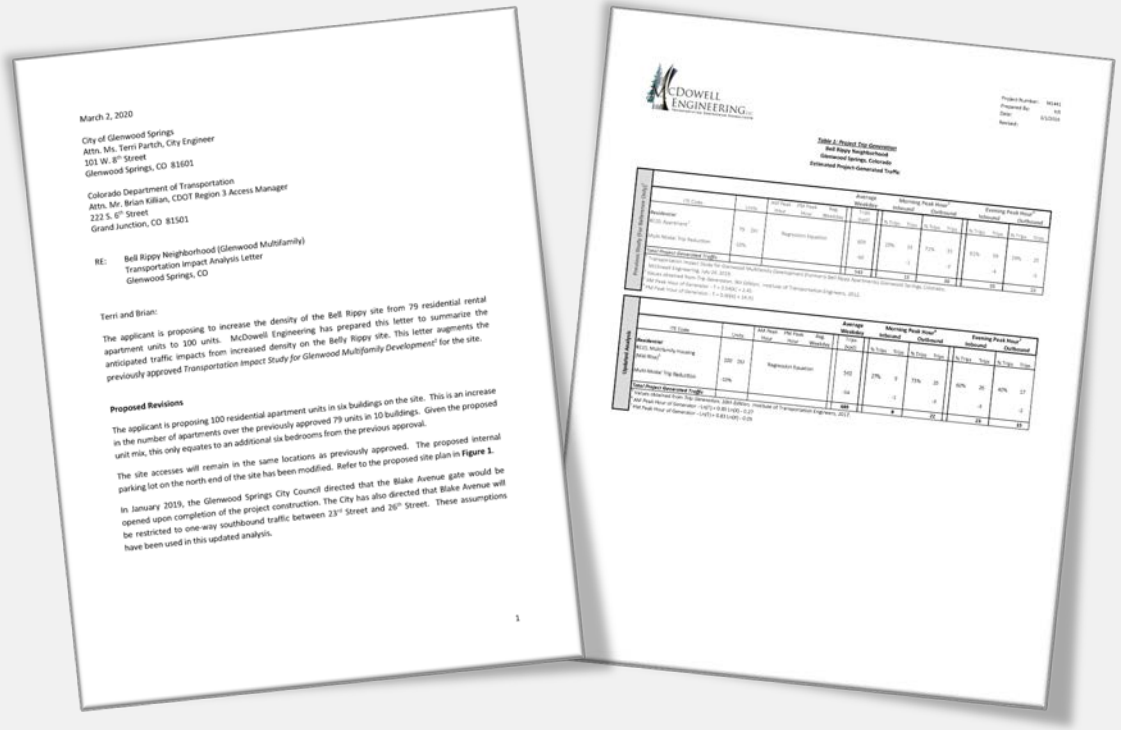


- This Proposal
  - Revised Application submitted 2019/2020
  - Used ITE Trip Generation 10th Edition
    - More Data Points
    - Better Land Use Distinctions
    - Published in September 2017
    - Land Use #221, Multifamily Housing (Mid-Rise)
  - Memorandum to City, March 2020



MARCH 2020 MEMORANDUM

- Discussed the change of traffic volumes due to the ITE Trip Generation 9th vs10th data updates
- Use most current and reliable data
- 10th Edition gathered more data for the mid-rise multifamily category
- Lower projected traffic volumes than current approvals.
- No changes for infrastructure improvements from previously submitted studies.
- Very little traffic impact on neighborhood streets from the project. Most traffic from the project will use Blake Avenue.



March 2, 2020

City of Glenwood Springs
Attn. Ms. Terri Partch, City Engineer
101 W. 8th Street
Glenwood Springs, CO 81601

Colorado Department of Transportation
Attn. Mr. Brian Killian, CDOT Region 3 Access Manager
222 S. 6th Street
Grand Junction, CO 81501

RE: Bell Rippy Neighborhood (Glenwood Multifamily)
Transportation Impact Analysis Letter
Glenwood Springs, CO

Terri and Brian:

The applicant is proposing to increase the density of the Bell Rippy site from 79 residential rental apartment units to 100 units. McDowell Engineering has prepared this letter to summarize the anticipated traffic impacts from increased density on the Belly Rippy site. This letter augments the previously approved *Transportation Impact Study for Glenwood Multifamily Development*[1] for the site.

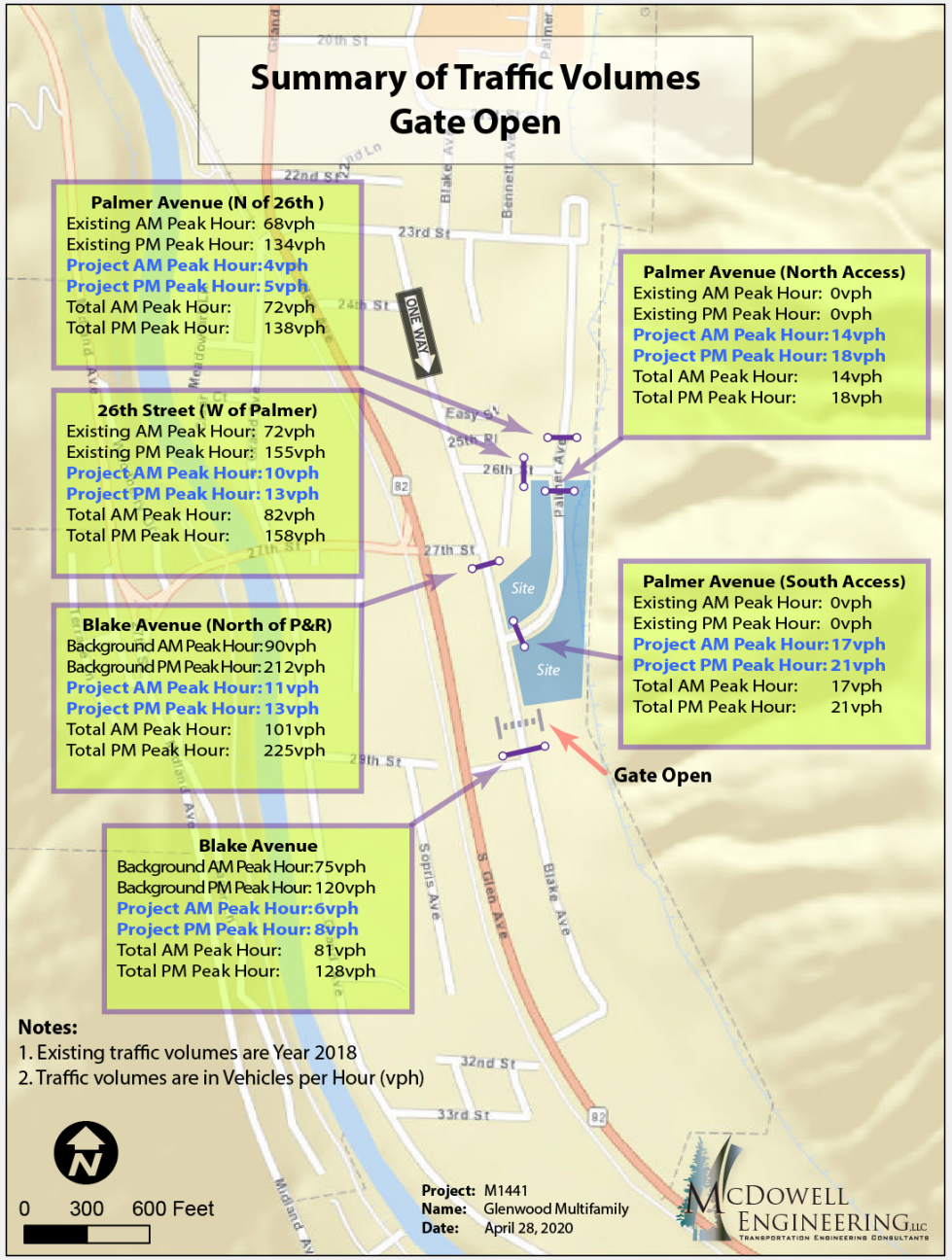
Proposed Revisions

The applicant is proposing 100 residential apartment units in six buildings on the site. This is an increase in the number of apartments over the previously approved 79 units in 10 buildings. Given the proposed unit mix, this only equates to an additional six bedrooms from the previous approval.

The site accesses will remain in the same locations as previously approved. The proposed internal parking lot on the north end of the site has been modified. Refer to the proposed site plan in **Figure 1**.

In January 2019, the Glenwood Springs City Council directed that the Blake Avenue gate would be opened upon completion of the project construction. The City has also directed that Blake Avenue will be restricted to one-way southbound traffic between 23rd Street and 26th Street. These assumptions have been used in this updated analysis.

1


Summary of Traffic Volumes
Gate Open
Palmer Avenue (N of 26th)
Existing AM Peak Hour: 68vph
Existing PM Peak Hour: 134vph
Project AM Peak Hour: 4vph
Project PM Peak Hour: 5vph
Total AM Peak Hour: 72vph
Total PM Peak Hour: 138vph
26th Street (W of Palmer)
Existing AM Peak Hour: 72vph
Existing PM Peak Hour: 155vph
Project AM Peak Hour: 10vph
Project PM Peak Hour: 13vph
Total AM Peak Hour: 82vph
Total PM Peak Hour: 158vph
Blake Avenue (North of P&R)
Background AM Peak Hour: 90vph
Background PM Peak Hour: 212vph
Project AM Peak Hour: 11vph
Project PM Peak Hour: 13vph
Total AM Peak Hour: 101vph
Total PM Peak Hour: 225vph
Blake Avenue
Background AM Peak Hour: 75vph
Background PM Peak Hour: 120vph
Project AM Peak Hour: 6vph
Project PM Peak Hour: 8vph
Total AM Peak Hour: 81vph
Total PM Peak Hour: 128vph
Palmer Avenue (North Access)
Existing AM Peak Hour: 0vph
Existing PM Peak Hour: 0vph
Project AM Peak Hour: 14vph
Project PM Peak Hour: 18vph
Total AM Peak Hour: 14vph
Total PM Peak Hour: 18vph
Palmer Avenue (South Access)
Existing AM Peak Hour: 0vph
Existing PM Peak Hour: 0vph
Project AM Peak Hour: 17vph
Project PM Peak Hour: 21vph
Total AM Peak Hour: 17vph
Total PM Peak Hour: 21vph
Gate Open
Site
Site
ONE WAY
Notes:
1. Existing traffic volumes are Year 2018
2. Traffic volumes are in Vehicles per Hour (vph)
0 300 600 Feet
Project: M1441
Name: Glenwood Multifamily
Date: April 28, 2020
McDowell Engineering, LLC
Transportation Engineering Consultants

Planning and Zoning Commission Report

Date: April 28, 2020
To: Planning and Zoning Commission
From: Trent L. Hyatt, Senior Planner
Subject: #04-20– Triumph-Bell Rippy

REQUEST	Major Site/Architectural Plan Review, Rezoning, and Variances related to a 100-unit multi-family apartment development
APPLICANT	Triumph Development West, LLC
OWNER	Bell Rippy Glenwood LLC
LOCATION	Adjacent to Palmer Avenue between 26th Street and Blake Avenue (PIN: 2185-153-04-001, 2185-153-02-008, and 2185-211-00-002)
ZONE	RH Residential High-Density and RT Residential Transitional
SURROUNDING LAND USES	North: Mixed residential South: Retail East: Vacant, Bureau of Land Management West: Multi-family residential, mixed commercial
LOT SIZE	Approximately 250,034 square feet (5.74 acres)

ACTION ITEM

Per Section 070.060.020/Table 060.1 of the *Glenwood Springs Municipal Code* (Code), the Planning and Zoning Commission (Commission) reviews and provides a recommendation to City Council for all Major Site/Architectural Plan Review applications which include 25 or more new dwelling units and/or more than 30,000 gross square feet of nonresidential space as well as all Rezoning applications. Additionally, the Commission reviews and decides all Variance requests. Following any approval (with or without conditions) of the related applications, the applicant must still submit and receive approval of a Construction Plans application from City staff prior to submitting a building permit application.

Action 1 – Variance – from Section 070.040.080(d)(3)a.2 of the *Glenwood Springs Municipal Code* requiring internalized parking located away from street frontages.

Staff recommendation: *Staff recommends **approval** of the Variance with the findings and conditions on page 12.*

Action 2 – Variance – from Section 70.040.080(e)(3) the *Glenwood Springs Municipal Code* requiring developments encompassing three acres to provide at least two housing types.

Staff recommendation: *Staff recommends **approval** of the Variance with the findings and conditions on pages 12-13.*

Action 3 – <u>Rezoning</u> – of 2710 Blake Avenue (PIN: 2185-211-00-002) from RH Residential High-Density to RT Residential Transitional.

<u>Staff recommendation</u>: *Staff recommends **approval (with conditions)** of the Rezoning with the findings page 13.*

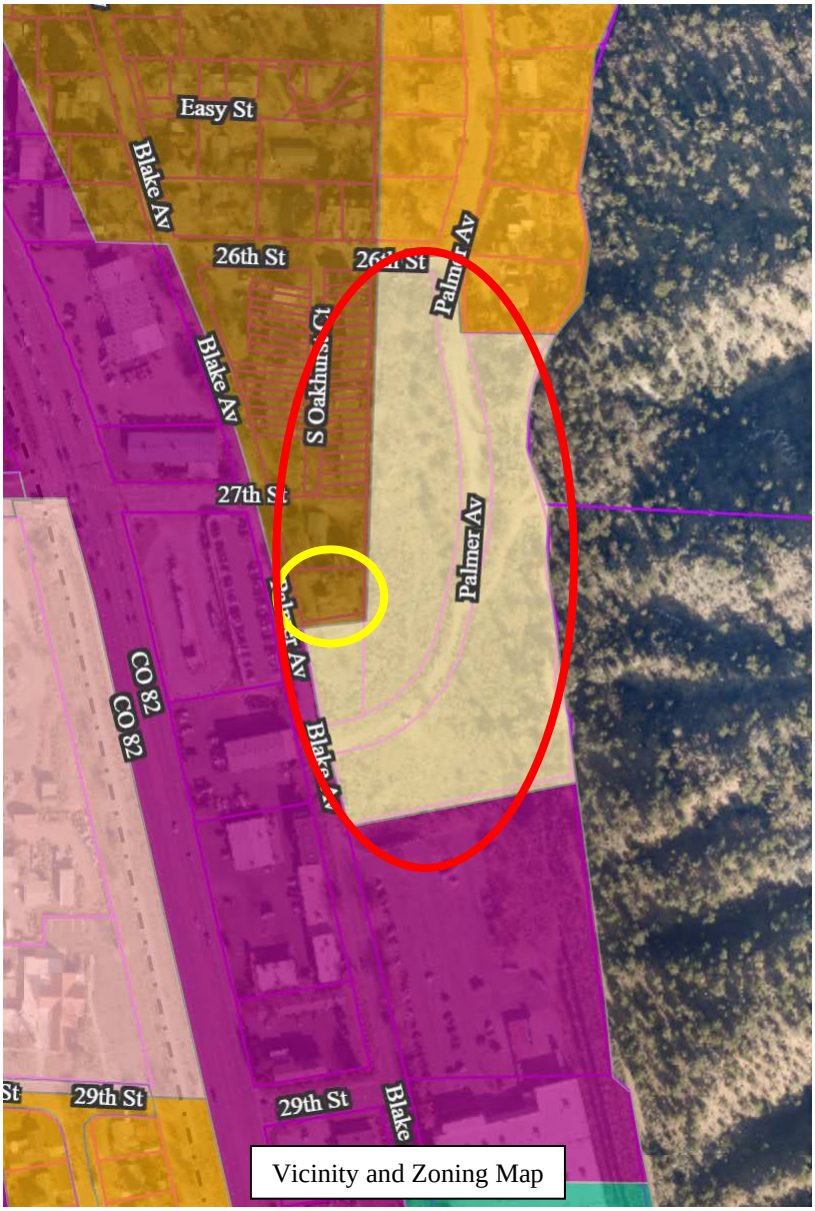
Action 4 – <u>Major Site/Architectural Plan Review</u> – to allow for the construction of 100-~~unit~~ multi-family apartment units in six buildings.

<u>Staff recommendation</u>: *Staff recommends **approval (with conditions)** of the Major Site/Architectural Plan Review with the findings and conditions on pages 13-14.*

BACKGROUND/ANALYSIS

Proposal

Triumph Development West, LLC (TDW) proposes the construction of 100 multi-family apartment units in six separate buildings on the approximately 5.74 acre subject property (circled in red at right) lying adjacent to the undeveloped right-of-way of Palmer Avenue between 26th Street and intersection of Blake Avenue. The site is primarily vacant and zoned RT Residential Transitional (excluding the portion zoned RH Residential High- Density circled in yellow) and is nestled between established residential neighborhoods and commercial developments.



Vicinity and Zoning Map

A similar, yet different development proposal including 79 multi-family units in 10 buildings as outlined in Planning Item 08-17 was approved by City Council on February 1, 2018. The total increase in the number of bedrooms is six with 38 units being one bedroom and 62 offered as two-bedroom units. Site layout related to building locations and

parking between the two proposals is different due to the reduced number of buildings (10 to six). The new proposal relies on the City's new parking standards/reductions resulting in less surface parking yet exceeds the amount required by 12 spaces. Related traffic impacts between the two proposals are similar as are the proposed offsite traffic mitigation measures/improvements. Application materials include a site plan, floor plans, elevations, landscaping plan, grading plan, and related reports which are attached for your review.

Existing southeast view (photo credit: Google Maps)

Existing southwest view (photo credit: Google Maps)

Development Standards

Section 070.020.080 outlines the RH zone district dimensional standards (height, setbacks, lot area) for the site and project. Development details related to site layout, building design, parking, landscaping, and other specifics within much of the City are subject to Section 070.040 of the Code. Staff provides an overview of the various applicable standards below.

Landscaping and Open Space

Section 070.020.080 requires multi-family developments provide a minimum of 20 percent of the

area of the limits of disturbance as landscaping (requiring 37,631 square feet), whereas Sections 070.040.050(c) and 070.040.060(h)(6) provides details as the required amount of various plant types and their locations (screening, interior to parking lots (requiring 1,360 square feet), adjacent to access streets, etc.). Staff has determined that the required number of shrubs and perennials outlined in Table 040.5 of the Code is quite excessive. Therefore, a Code text amendment is recommended by staff separate from and unrelated to the current proposals.

Additionally, Section 070.040.040(c) of the Code requires residential developments provide 20 percent of the development site as common open space. The proposal provides 72,026 square feet, or 38 percent, of the site as common open space including both passive (outdoor gathering spaces, an indoor community room, geologic hazard debris flow area, stormwater retention area, undeveloped portions of the property, landscaping discussed above) and active recreational areas (tot lot play area).

Off Street Parking and Loading

Section 070.030.020(e)/Table 030.1 Table of Allowed Uses outlines 1.5 spaces per multi-family dwelling unit (regardless of size) and one guest space per five dwelling units requiring 170 total spaces for the current proposal, or 1.7 per unit. TDW is requesting a 20 percent reduction in the number of required spaces per Section 070.040.060(e) (which allows for a cumulative maximum 30 percent reduction by the Community Development Director per various factors) based on the site's proximity to transit (27th Street Station park and ride owned/operated by the Roaring Fork Transportation Authority) which reduces said minimum to 136 spaces parking spaces/1.36 per unit. The Code also allows for compact spaces to account for 20 percent of the required number of spaces.

Site Layout and Building Design

Section 070.040.080 of the Code outlines design specifics related to lot coverage, site building/parking orientation, architectural design and elements provided, and façade articulation. Section 070.040.080(d)(2)a.2 requires multi-family developments to internalize parking lots placing them away from street frontages. As depicted on the overall site plan at left, Buildings A and B are located behind parking lots located at the intersection of Blake and Palmer Avenues.

Section 70.040.080(e)(3) requires developments encompassing three acres or more to incorporate at least two housing types (i.e. single-family homes, townhomes, apartment, etc.), however, the proposal only includes multi-family apartments. Adherence to these regulations is constrained by the varying topography at the site. Therefore, TDW is requesting variances related thereto as outlined below.

East elevation-Building C
(representative of facades facing Palmer Avenue for Buildings D and E)

Architectural variety and four-sided design are required for all multi-family development in the City. As depicted in the elevations below, the applicant provides numerous elements which help articulate the buildings such as variations in color, materials, texture, roof forms. Additionally, the design provides changes in in wall planes, prominent entries, and windows on all sides.

North and South elevations -Building C

West elevation-Building C

Traffic Study

TDW updated the traffic impact analysis, completed by McDowell Engineering, LLC for the former development proposal in order to forecast and analyze the impacts of traffic volumes associated with the project on surrounding streets and intersections. The project is anticipated to add 489 vehicle trips per day on an average weekday. Weekday AM peak hour traffic is expected to generate 30 vehicle trips as PM peak hour traffic is expected to generate 38 vehicle trips.

The vast majority of impacts are expected at the intersections of 27th Street and Highway 82 and Blake Street and Highway 82. Access permits with the Colorado Department of Transportation were required for the former proposal (due to an increase in traffic volume of twenty percent or more), and an update will be required for the new, current proposal. However, significant intersection improvements were not required by CDOT nor City Council previously, and none are expected with the current proposal. Following approval of the development proposal, if applicable, the City wishes to further discuss circulation options with citizens in the greater neighborhood to determine various implementation options.

Geological/Debris Flow Hazards

The project is subject to several geologic hazards such as debris flow, rockfall, and hydrocompactive soils. The debris flow hazard is associated with a special flood hazard zone and has been reviewed extensively by reports provided by the applicant and reviewed by the Engineering Department. The site layout and drainage infrastructure provide/accommodate for the hazard. Other hazards, such as hydrocompactive soils and rockfall were also taking into consideration.

Rezoning and Related Approval Criteria

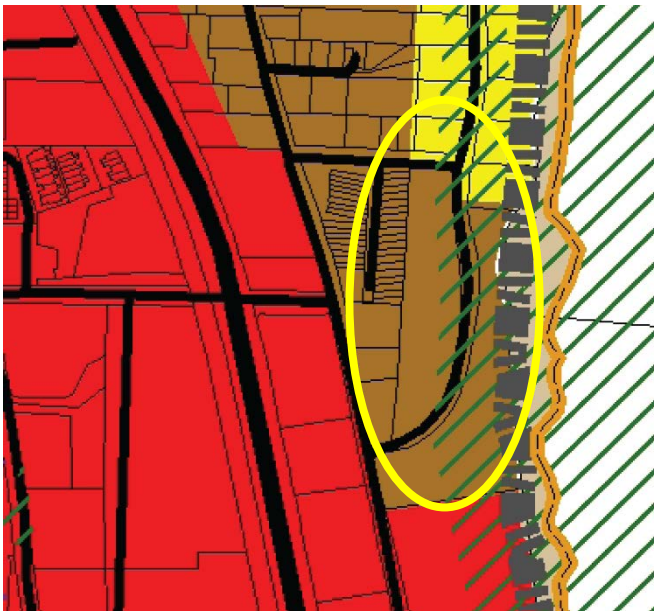
As mentioned above, the vast majority of the site is zoned RT -Residential Transitional. However, the parcel located at 2710 Blake Avenue (PIN: 2185-211-00-002), which is the location of an existing triplex, is currently zoned RH-Residential High Density. To maintain consistency, the applicant proposed to rezone the parcel to RT.

Section 070.060.040(a)(3)f.3 outlines the criteria for the review and approval of a Rezoning

application. Said criteria are provided in ***bold italics*** below. Other language is provided by staff.

In reviewing a proposed rezoning, the Planning Commission and City Council shall consider whether:

i. The rezoning is consistent with the City's comprehensive plan and the purpose of this Code;



As shown at right, *Map 2.2 Future Land Use – Central Portion of the City of the Glenwood Springs* of the Comprehensive Plan (Comp Plan) identifies the area as "Multi-family Residential" in brown and "Hillside Preservation" with green hatching. According to the Comp Plan, the "Multi-family Residential" designation "… *accommodates multifamily structures of 3 units or greater. Home occupations, assisted living facilities, institutional uses such as churches, schools, public building, parks and trails are allowed uses."* "Hillside Preservation" are areas of "…*defined by prominent ridge lines, steep slopes, varied unstable geologic conditions, rock outcroppings, and extensive vegetation*". This includes slopes which are equal to or greater than 20 percent where development requires special care or is discouraged. It is important to note that the Comprehensive Plan's map is an inexact measurement of slope. The new Development Code requires identification of the Limits of Disturbance (LOD) and an exact measurement of the average slope within the LOD. With that, TDW verified that the average slopes within the limits of disturbance of this development are less than 20 percent.

Numerous community goals and related objectives and strategies are outlined in the Executive Summary and subsequent chapters of the Comp Plan which are summarized in the following table.

Comprehensive Plan Goal Supported	**Objective and Strategies**
Promote long-term, sustainable, diverse, economic development	-Direct development into a compact form: infill and redevelopment (Chapter 3, Page 34)
Staff Comment: The objective/strategy outlined above are supported by the current application as it includes infill development/redevelopment.	
Preserve small town character while maintaining the livability of Glenwood Springs and increasing the vibrancy and commercial success of the downtown	-Develop according to the vision (Chapter 4, Page 34) -Direct development into a compact form: infill and redevelopment (Chapter 3, Page

	34) -Enhance pedestrian–friendliness while facilitating traffic (Chapter 3, Page 36) -Direct growth inward (Chapter 9, Page 102)
Staff Comment: Infill, as proposed, makes improvements more cost effective. The design of the project is in character with surrounding the site area and aligns with zone district purpose.	
Address transportation and provide multiple convenient travel choices	-Direct development into a compact form: infill and redevelopment (Chapter 3, Page 34) -Encourage reduction of single occupant vehicles and encourage alternate travel modes through land use planning and community design (Chapter 5, Page 66)
Staff Comment: Dense infill, as proposed, is a land use strategy used to address transportation issues per the Comp Plan which also encourages the use of public transportation to reduce single occupancy vehicle use.	
Direct development to locations and building forms that are cost effective to serve	-Direct development into a compact form: infill and redevelopment (Chapter 3, Page 34) -Direct growth to areas where utilities and services can be provided efficiently (Chapter 7, Page 82) -Direct growth inward (Chapter 9, Page 102)
Staff Comment: Infill/redevelopment, as proposed, makes improvements more cost effective. Therefore, the objectives/strategies associated with the project support the Comp Plan goal.	
Provide housing opportunities for the entire community	-Direct development into a compact form: infill and redevelopment (Chapter 3, Page 34) -Require good design for mixed-use and higher density project (Chapter 6, Page 78)
Staff Comment: Infill/redevelopment, as proposed, makes improvements more cost effective while providing a nice aesthetic. Therefore, the objectives/strategies associated with the project support the Comp Plan goal.	
Support social diversity	-Direct development into a compact form: infill and redevelopment (Chapter 3, Page 34) -Require good design for mixed-use and higher density projects (Chapter 6, Page 78) -Direct growth inward (Chapter 9, Page 102)
Staff Comment: Dense infill, as proposed, is a land use strategy to address transportation issues per the Comp Plan which encourage the use of public transportation and reduce single occupancy vehicle use. Infill/development allows for easier access to goods/services for the entire community.	

ii. The rezoning is consistent with the proposed purpose statement of the proposed zoning district;

The rezoning is consistent with the transition between residential and commercial uses which exist in the area as described in the purpose statement for the RT zone district located in Section 070.020.080(a) of the Code.

iii. Substantial changes in the subject area warrant a zoning change; and/or

The current development proposal is a substantial change/consideration which warrants the rezoning of the parcel and prevents the existence of a split zoning classification of the development site.

iv. The intensity of development in the new zoning district is not expected to create significantly adverse impacts to surrounding properties or the neighborhood.

Intensity of development in the area proposed for rezoning is expected to decrease with the current proposal as it replaces an existing triplex with a stormwater detention area for the larger site. Comparatively, the RH is a more intense zone district than the RT in terms of residential minimum and per unit area requirements as outlined in Table 020.2 and highlighted below. That being said, while not associated with the current proposal, the RT zone district does allow for some uses, , not permitted in the RH zone such as a club or lounge (by special use), community centered board facility, hospital or medical clinic, bar (by special use), restaurant (by special use), hotel (by special use), printing establish (by special use), personal services (some by special use), retail (some by special use) parking (by special use),and a geothermal heat exchange.

Table 020.2: Summary of Residential Dimensional Standards

	RR	RL	RM1	RM2	RH	RT
Lot Standards, Minimum						
Lot area	40,000 sf	20,000 sf	6,000 sf	--	--	--
Lot area, lots created prior to March 1, 1965			5,000 sf			
Lot area, single-family detached	--	--	--	5,000 sf	4,500 sf	5,000 sf
Lot area, attached dwellings sharing common wall	--	--	7,500 sf	2,500 sf/unit	2,250 sf/unit	2,500 sf/unit
Landscaped area (for multifamily dwellings)	--	--	--	20 percent	20 percent	20 percent
Setbacks, Minimum						
Front (from arterial streets)	50 feet	50 feet	30 feet	30 feet	15 feet	15 feet
Front (from other streets)	25 feet	25 feet	20 feet	20 feet	10 feet	10 feet
Side	10 feet	10 feet[1]	5 feet	5 feet[2]	5 feet[2]	5 feet[2]
Rear	25 feet	25 feet	15 feet	10 feet	10 feet	10 feet
Building Standards, Maximum						
Building height	27 feet	27 feet	27 feet	27 feet	40 feet	40 feet

Variance Approval Criteria

As addressed above, TDW is requesting two variances related to site layout standards: parking lot location relative to intersections and providing numerous housing types.. Variance requests must adhere to the approval criteria outlined in Section 070.060.070(a)(3)e.2 of the Code and as included in ***bold italics*** below. Other language is provided by staff.

i. The subject property has an exceptional shape, topography, building configuration or other exceptional site condition that is not a general condition throughout the zone district;

The varying topography (15.5 percent within the limits of disturbance), elongated shape, debris flow and curvilinear right-of-way bisecting the subject property are exceptional site conditions. However, it is not possible to compare these conditions throughout the zone district as the site makes up the entirety. That being said, these conditions are not a general condition in the surrounding area.

ii. The strict application of the Code standards for which a variance is sought would produce undue hardship;

The exceptional conditions outlined above create difficulty in developing the site in manner intended by the RT zone district. Strictly adhering to the Code standards (parking lot location and multiple housing types) creates undue hardship not allowing the applicant to utilize the topography in the building design nor develop the site along the exiting right-of-way.

iii. The applicant did not create the hardship by his/her own actions;

The existing topography, shape, and debris flow/flood zone are not hardships created by the applicant.

iv. The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;

The proposal is consistent with the general purpose and intent of the Code regarding guarding against natural hazards, efficient development, compatible design, and addressing impacts.

v. The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;

As outlined above the exceptional hardship is not related to convenience nor financial burden and is required to allow development of the site in the manner intended by the RT zone district.

vi. The variance request will not violate building or fire code requirements; and

The request does not create a building nor fire code violation.

vii. The variance is the minimum variance that will afford relief of the subject standards of the Code.

This variance request is the minimum required to allow for construction on the subject parcel as intended by the RT zone district.

Site/Architectural Plan Review Approval Criteria

A Major Site/Architectural Plan Review application must adhere to the approval criteria outlined in Section 070.060.050(6) of the Code and as included in ***bold italics*** below. Other language is provided by staff.

a. The site/architectural plan is consistent with the general purpose and intent of this Code;

As mentioned above, the proposal is consistent with the general purpose and intent of the Code regarding guarding against natural hazards, efficient development, compatible design, and addressing impacts.

b. The site/architectural plan is consistent with the dimensional, design, development, and all other standards of this Code;

As outlined above, staff found that the proposal is consistent with the dimensional, design, development, and all other standards of the Code exclusive of the variance requests discussed herein.

c. The site/architectural plan is consistent with any previously approved plat, PUD, or any other precedent land use approval; and

As outlined above, staff found that the proposal is consistent with the dimensional, design, development, and all other standards of the Code exclusive of the variance requests discussed herein.

d. The site/architectural plan is consistent with the Comprehensive Plan and other adopted City policies and plans.

As addressed in detail above, the current proposal is in compliance with the *Future Land Use* map designations and descriptions and goals and objectives of the Comp Plan.

Reviewing Agency Comments

An overview of comments received from referral agencies is provided below. Said comments are also attached.

Fire Department - Comments received discuss the need to eliminate the construction of a fire apparatus road longer than 150 feet without a turnaround.

Engineering - Comments received outline procedures for exceptions related to the proposed Palmer Avenue extension, request to increase the width of the single sidewalk along said extension, clarification from CDOT regarding applicable traffic mitigation, site acreage, soil type outlined in the drainage report, proposed contours, and necessary revisions to debris flow analysis and other plans needed prior to development.

Parks and Recreation – Comments received outline the need for the applicant to submit a full landscaping and irrigation plan.

Public Works - Comments received outline numerous revisions/clarifications required for the civil plan set related to the fire hydrant location and specifications, storm sewer connections, water/sewer line locations/sizes/specifications, debris flow mitigation, and personnel contact information.

ACTION ALTERNATIVES AND STAFF RECOMMENDATION:

Section 070.060.030(g)(1)d outlines the review and decision procedures for applications being considered by the Commission and/or City Council stating, "[T]he applicable review body shall **approve, approve with conditions, or deny** the application **based on the applicable approval criteria** listed in the application-specific procedures. The body may also **continue** the hearing…"

Action 1 – Variance – from Section 070.040.080(d)(3)a.2 of the *Glenwood Springs Municipal Code* requiring internalized parking located away from street frontages.

Staff Recommendation/Suggested Motion
Staff recommends **approval** of the Variance with the following findings:

Recommended Findings:
1. The subject property has an exceptional shape, topography, and soil conditions that are not general conditions throughout the RT-residential transitional zone district or vicinity;
2. The strict application of the Code standards for which the variance is sought produce undue hardship;
3. The applicant did not create the hardship by his/her own actions;
4. The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;
5. The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;
6. The variance request does not violate building or fire code requirements; and
7. The variance is the minimum variance that will afford relief of the subject standards of the Code.

Action 2 – Variance – from Section 70.040.080(e)(3) the *Glenwood Springs Municipal Code* requiring developments encompassing three acres to provide at least two housing types.

Staff Recommendation/Suggested Motion
Staff recommends **approval** of the Variance with the following findings:

Recommended Findings:
1. The subject property has an exceptional shape, topography, and soil conditions that are not general conditions throughout the RT-residential transitional zone district or vicinity;
2. The strict application of the Code standards for which the variance is sought produce undue hardship;
3. The applicant did not create the hardship by his/her own actions;

4. The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;
5. The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;
6. The variance request does not violate building or fire code requirements; and
7. The variance is the minimum variance that will afford relief of the subject standards of the Code.

Action 3 – Rezoning – of 2710 Blake Avenue (PIN: 2185-211-00-002) from RH Residential High-Density to RT Residential Transitional.

Staff Recommendation/Suggested Motion
Staff recommends **approval (with conditions)** of the Rezoning request with the following **findings** and **conditions**:

Recommended Findings:
1. The rezoning is consistent with the City's comprehensive plan and the purpose of this Code;
2. The rezoning is consistent with the proposed purpose statement of the RT- Residential Transitional zone district;
3. Substantial changes in the subject area warrant a zoning change; and/or
4. The intensity of development in the new zoning district is not expected to create significantly adverse impacts to surrounding properties or the neighborhood.

Action 4 – Major Site/Architectural Plan Review – to allow for the construction of a 89-unit multi-family apartment building.

Staff Recommendation/Suggested Motion
Staff recommends **approval (with conditions)** of the Major Site/Architectural Plan Review with the following **findings** and **conditions**:

Recommended Findings:
1. The site/architectural plan is consistent with the general purpose and intent of the Code;
2. The site/architectural plan is consistent with the dimensional, design, development, and all other standards of this Code;
3. The site/architectural plan is not in conflict with precedent land use approvals; and
4. The site/architectural plan is substantially consistent with the Comprehensive Plan and other adopted City policies and plans.

Recommended Conditions:
1. The applicant shall comply with/address all City staff comments related to specific Code requirements prior to approval of a Construction Plans application.
2. The development shall comply with the requirements of the Code except where specific variances have been granted. Any future physical changes or improvements to the property or buildings on the parcel are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal

Code.

3. 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.
4. Prior to submitting a building or grading permit application, the applicant shall
   a. Submit a Construction Plans application in accordance with Municipal Code section 070.060.050(c).
   b. Enter into a development agreement with the City which shall be recorded with the Garfield County Clerk and Recorder.
   c. Submit an engineer's estimate of all public improvement and submit a financial security for any required improvement not yet completed.
   d. Schedule a pre-construction meeting with applicable City departments.
   e. Submit combination of lots plat for the three subject parcels
   f. Submit a landscaping plan in compliance with applicable regulations at that time.
5. Prior to approval of a Construction Plans application, the applicant shall amend and obtain approval of CDOT access permits, as required.

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Triumph Development
www.triumphdev.com

March 3, 2020
(Revised April 16, 2020)

Bell Rippy Apartments - Project Narrative
Major Site/Architectural Plan Review with Variances & Rezoning

Development Team

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The Property

The subject property is located at the south end of the Oakhurst Subdivision, just to the north of Walmart and east of the RFTA bus station at 27th Street. The property is bounded by Blake Street to the west and 26th Street the north. The unimproved portion of the Palmer Avenue right-of-way runs through the middle of the site. The subject property consists of three total parcels – the remaining un-subdivided portion of the Block 1 of the Oakhurst Subdivision First Filing, Block 3 of the Oakhurst Subdivision First Filing, and the parcel with the address 2710 Blake Avenue.

Block 1 and Block 3 include 5.51 acres that are currently undeveloped and zoned Residential Transitional District (RT). 2710 Blake is 0.23 acres currently improved with a triplex and zoned Residential High-Density District (RH).

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The Development

With close-proximity to the RFTA bus station and nearby commercial amenities, the new development will be a transit-oriented rental community targeted towards housing for the local workforce as allowed by the current zoning on all three properties. The plan proposes to remove the existing triplex which is the only vertical improvement to the property, and construct 100 new garden apartments in six total buildings. The development will include an onsite management office, indoor community room, outdoor community space, as well as the surface parking required by the City's Municipal Code. The development will also complete the construction of Palmer Avenue through the site, and will also include uphill debris flow fencing and drainage channels for protection of this new community as well as the Oakhurst Townhomes to the west of the site. The proposed mix of units includes 38 one-bedroom units and 62 two-bedroom units. The one-bedroom units are approximately 630 square feet. The two-bedroom units are approximately 945 square feet. All of the apartments will be owned by a single ownership entity, rented on monthly basis, and managed via an onsite management office.

The applicant believes the proposed plan represents a meaningful improvement to the currently approved development plan for the site. While the unit count has increased from 79 to 100 units, the plan has added another parcel to development site with the addition of 2710 Blake. The new plan has also added many more one-bedroom units into the unit mix to better serve a range of households (the prior plan was almost entirely two bedrooms). The plan has only added 6 more bedrooms to the development (from 162 bedrooms vs 156 bedrooms in the prior plan). In additional the development has been consolidated from ten buildings into just six buildings.

Palmer Avenue and Building Access

One of the primary drivers of the overall site plan is the location and grades of the existing Palmer Avenue right-of-way. This new road will be constructed in the existing 50-foot right-of-way that bisects the property. Due to the maximum grades allowed by the City's Engineering Standards, improving the Palmer Avenue right-of-way requires that grade be dropped as much as 10 feet in areas. The significance of this cut, along with the applicant's desire to minimize impacts on surrounding uphill open space, has led to many of the applicant's proposed layout and each of the zoning variances discussed below. All buildings will be accessed from the new extension of Palmer Avenue, and are located on the lower portion of the site. Palmer Avenue will be built to the requirements of the Engineering Standards, but will maximize the allowable grades. On the uphill side of Palmer Avenue, the applicant plans to build landscaped retaining walls, that will minimize the amount of uphill disturbance and preserve as much native vegetation as possible. Sidewalks will be located in convenient locations for the residents and provide easy pedestrian access through the neighborhood and down to the RFTA bus station. The proposed plan does not include sidewalks on the uphill, east

side of the new Palmer Avenue as this would further increase the size of the retaining walls and uphill disturbance.

Overview of Building Design

The buildings are designed and located to work with the natural grade of the site, with a garden level apartment on the downhill side of each building, and a ground-floor unit walking out to grade on the uphill side of the building. There is storage for residents in the basement behind the garden level apartments. The buildings are each three stories on the downhill side of the building, and three stories on the uphill side of the building, with all units accessed from a central stair tower. The orientation of the buildings and parking lots has been carefully laid out to work with existing grade as much as possible, and the buildings help serves as natural retaining of the site. The buildings are oriented toward the street and parking lots.

The buildings are planned to be constructed as wood-framed structures. The site's varying soil conditions will be evaluated at each building location prior to construction, with the anticipation that there will be some need for foundation systems that deal with expansive or settling soils as recommended by the geotechnical engineer. There are three different building types spread across the six total buildings. The exterior of the buildings will be a combination of cementitious siding with stucco accents and base. The cementitious siding will be a combination of horizontal and vertical to differentiate and provide visual interest to the design. The pitched roof will be constructed with asphalt shingles and will include gabled sections that provide further visual interest. The color pallet will consist of two different, but complimentary, schemes with natural colors that are spread through the neighborhood to create a variation in the outward appearance of the six buildings.

Amenities

The proposed plan includes the following onsite amenities: an onsite management office, and indoor community room, conveniently located dumpsters and two outdoor gathering spaces and kids park.

Landscape

All landscape planting will meet the minimum size as required by Municipal Code. A comprehensive and consistent landscape solution is proposed across the entire property with the following highlights: Trees and shrubs are located around the buildings to accent the structures. Parking lots are screened with trees and shrubs to neighboring homes. Parking areas have required landscape islands with trees and shrubs. All buildings are surrounded with a mulch bed to keep planned grass areas away from the

structures to avoid adding irrigation water to the soils under the buildings. All remaining areas on the site not to be paved, built upon, or mulched will receive revegetation with native grasses which will include temporary irrigation until adequate regrowth. All landscape plantings will have one comprehensive permanent drip irrigation system installed and maintained by the apartment complex management.

Site Lighting

To maintain the residential character of the proposed development, we are proposing a consistent lighting package across the property that is in context with the surrounding neighborhood. Exterior lights will be a combination of wall-mounted, timer-controlled sconces at each ground floor building entrance; as well as a limited number of street lights and bollards strategically located in parking lots and internal paths without close proximity to a building. All lights will be Dark Sky Compliant.

Rezoning of 2710 Blake Avenue

The applicant is the owner of all parcels that are the subject of this application. In order to create one cohesive development plan with one consistent set of zoning requirements, the applicant proposes to rezone the smaller 0.23-acre 2710 Blake parcel to be consistent with the larger 5.5-acre site. This parcel will eventually be combined with the adjacent Block 3 parcel through a Minor Subdivision.

From a zoning standpoint, this rezoning will result in very few changes to the site's zoning characteristics. Setbacks, building height, lot coverage, landscape area and parking requirements will all remain the same with the new RT District zoning. The one change to the rezoning will be a small decrease in the number of units permitted for the rezoned lot – 1 unit per 2,250 square feet of site area under the RH District would be changed to 1 unit per 2500 square feet of site area in the RT District.

There are several review criteria for consideration for this rezoning by the Planning & Zoning Commission and City Council that are each discussed below.

1. *The rezoning is consistent with the City's comprehensive plan and the purpose of this Code;*

The 2011 Glenwood Springs Comprehensive Plan calls for Multifamily Residential at this location. The proposed new RT District zoning for 2710 Blake Avenue is consistent with this Comprehensive Plan

2. *The rezoning is consistent with the proposed purpose statement of the proposed zoning district;*

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This proposed development is consistent with both the current RH District Zoning and the proposed RT District Zoning. The rezoning will clean up difference in zoning for a lot with common ownership that will be developed as one community.

3. *Substantial changes in the subject area warrant a zoning change; and/or*

All the properties subject to this application are adjacent and have just recently come into common ownership.

4. *The intensity of development in the new zoning district is not expected to create significantly adverse impacts to surrounding properties or the neighborhood*

There is no increase in the intensity of development that results from this rezoning. Rezoning 2710 Blake to the RT District represents a slight decrease in the permitted number of units with no changes to the other major zoning standards.

Overview of Zoning Criteria

The goal for the proposed housing development is to meet each of the requirements for development in the RT District. A summary of each of the development requirements is outlined below:

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Bell Rippy Apartments - Zoning Summary for Residential Transitional (RT) District							
Lot Area	2700 Palmer		5.51	acres			
	2710 Blake		0.23	acres			
	Total		5.74	acres			
Zoning Criteria			**Code**			**Proposed Plan**	
Use			Permitted Use			Dwelling, multifamily	
Density	Lot SF/Unit		2,500				
	Total Permitted Units		100	units		100	units
Setbacks	Front (Non-Arterial)		10	feet		10+	feet
	Side		5	feet		5+	feet
	Rear		10	feet		10+	feet
Height			40	feet		40	feet
Lot Coverage	Allowed		50%				
	Square Feet		120,008	sf		31,630	sf
Landscape Area	Minimum Required		20%				
	Square Feet		48,003	sf		122,540	sf
Parking	Resident Parking (per DU)		1.5	150			
	Guest Parking (per DU)		0.2	20			
	Subtotal			170			
	Transit Proximity Discount		20%	(34)			
	Total			136		148	spaces

Parking

The proposed parking plan for the development meets each of the requirements of the Town Code for parking. With the goal of keeping development costs and corresponding rents lower, the plan includes several surface parking lots for the neighborhood. With immediate proximity to the RFTA station, and apartments that are targeted to residents who use public transit, the development plan looks to take

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advantage of the 20% parking discount for proximity to transit as allowed in the City's Development Standards for properties within 750 feet of public transit. The development will provide 148 parking spaces, exceeding the amount required by code by 12 spaces. All resident parking spaces will be numbered and assigned via a lease. Guest parking will be monitored by management to ensure that it is not improperly used by residents.

Traffic and Transportation

The applicant is proposing to replicate the traffic management solutions approved in the prior plan – including the one-way configuration of Blake Avenue, the offsite improvements required in the prior application, and opening the Blake Street gate. As the project is only introducing 6 more bedrooms, and decreasing the number of parking spaces in the plan by 25 spaces, the change to the traffic impacts from this new version of the apartment community will be very minor when compared to the currently approved plan and CDOT Access Permit. An updated letter from our traffic engineer, McDowell Engineering, is included as part of this application.

Construction Phasing

The applicant intends to construct the development in one continuous construction that begins with the necessary relocation of the existing utilities in Palmer Avenue, followed by the sequential construction of Palmer Avenue and the apartment community over approximately 18 months. The applicant anticipates receiving a certificate of occupancy and occupying some buildings that are completed first, while the remaining buildings on the site may still be under construction.

Variances from Municipal Code

Despite meeting most of the development criteria required by the zone, the application is seeking four variances from the Municipal Code and Engineering Standards – each having to do with the steepness of the natural grade of the site, the location of a flood zone impacting the site, and requirement to construct Palmer Ave. This represents a substantial reduction from the six variances approved in the current approvals for the site. Variance #1 "Variety of Housing Types" is a planning variance for consideration by Planning & Zoning Commission. Variance #2 "Sidewalks on Both Sides of the Street" and Variance #3 "Grades at Driveway, Parking Lot and Intersection Approach" are technical variances for review by the City's Public Works Department. The final Variance #4 relates to locating buildings in proximity to city streets.

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Design Variance #1 – Variety of Housing Types

Section 070.040.080(e)(3) of the Municipal Code states:

"Variety of Housing Types. Development parcels encompassing more than three (3) acres shall incorporate a minimum of two (2) housing types…The following housing types may be used to satisfy these standards:

a. *Detached single-family dwellings;*
b. *Accessory dwelling units;*
c. *Two family dwelling units;*
d. *Single-family townhouse dwellings;*
e. *Multi-family dwellings other than two-family or townhouse dwellings"*

The applicant is requesting a variance from this section of the Code due the unique site constraints of the 5.7-acre parcel as outlined below. Each of the seven criteria for a variance are discussed in detail. Please note that this same variance was requested and approved as part of the currently approved development plan for the site.

1. *The subject property has an exceptional shape, topography, building configuration or other exceptional site condition that is not a general condition throughout the zone district;*

The site's steep topography, the designated flood zone on the north side of the site, and the applicant's desire to concentrate development and minimize the uphill limits of disturbance are all factors leading to the proposed development with only multifamily rental units that are so badly needed in Glenwood Springs. In addition, the requirement to construct Palmer Avenue to meet City's Engineering Standards requires a significant drop in grade, which makes spreading out development around the site difficult and would require design solutions that run counter to many of the goals of the town for transit-oriented development and development that works with existing site conditions rather than building large retaining walls.

A development plan that minimizes the areas of disturbance and concentrates development into a smaller footprint will create housing that is needed and will leave a larger portion of the uphill, visible hillside intact.

In an attempt to meet the intensions of the code, the applicant has varied the size of buildings throughout the development with three different building sizes, and provided a greater variety of unit types than are currently approved for the site in order to serve different households of different sizes.

2. *The strict application of the Code standards for which a variance is sought would produce undue hardship;*

A strict application of the code would create undue hardship. In order to introduce other, less-dense housing types, the development plan would need to have a larger development footprint and locate units on the much steeper portions of the site, either on the uphill side of Palmer Avenue or in the designate flood area at the north side of the site. Both of these factors make development in these areas impractical and would require substantial and unattractive retaining walls and flood protection structures.

3. *The applicant did not create the hardship by his/her own actions;*

Neither of the site constraints discussed above, the location of the Palmer Avenue right-of-way, nor the Engineering Standards that dictate the construction of Palmer Avenue were caused by the applicant.

4. *The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;*

There is no harm to the public good resulting from this variance. The surrounding neighborhood already contains a mix of complimentary uses including townhomes to the development's west and single-family homes to the north. Instead, the proposed plan meets the intent of the Residential "Transitional" zone and creates a complimentary and more affordable housing type at an infill location close to transit.

5. *The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;*

The exceptional hardship discussed above is not a matter of convenience or financial burden to the applicant. Instead, it is a factor of creating a development plan that meets the requirements of the Engineering Standards and minimizes the area of disturbance to the more visible, uphill areas of the site. In addition, it will minimize the need for even more substantial retaining walls along Palmer Avenue and other areas around the site that would be required to create more buildable areas for other housing types.

6. *The variance request will not violate building or fire code requirements;*

There is no impact on the building or fire code related to this variance request.

7. *The variance is the minimum variance that will afford relief of the subject standards of the Code.*

This variance request is asking for a deviation from the two housing types required by the Code to only one type of housing. This is the minimum deviation.

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Engineering Variance # 2 – Sidewalks on Both Sides of the Street

Section 070.040.070(f)(1)(a)(2) of the Municipal Code states:

"Sidewalks shall be installed on both sides of all arterials, collector streets, and local streets (including loop streets and cul-de-sac), and within and along the frontage of all new development and redevelopment."

The applicant is requesting a variance from this section of the code due to the unique site constraints as outlined below. Each of the seven criteria for a variance are discussed in detail. Please note that this same variance was requested and approved as part of the currently approved development plan for the site.

1. *The subject property has an exceptional shape, topography, building configuration or other exceptional site condition that is not a general condition throughout the zone district;*

This request is a direct result of the steep slopes of this site and the need to drop the grade of Palmer Avenue in the existing right-of-way.

2. *The strict application of the Code standards for which a variance is sought would produce undue hardship;*

The above discussed site conditions make installing a sidewalk on both sides of the street an undue hardship and unnecessary. Sidewalks are proposed in proximity to all buildings and will provide safe and convenient pedestrian access throughout the neighborhood and down to the RFTA station. The ten-foot total dimensions for a sidewalk and planting strip along the section of Palmer Avenue above and to the north of Building C would require an even more substantial retaining wall and much more site disturbance for a sidewalk that does not provide any meaningful pedestrian connectivity.

3. *The applicant did not create the hardship by his/her own actions;*

Neither of the site constraints discussed above, the location of the Palmer Avenue right-of-way, nor the Engineering Standards that dictate the construction of Palmer Avenue were caused by the applicant.

4. *The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;*

There is no harm to the public good by this request. The applicant will still construct new, safe pedestrian circulation via public sidewalks in the right-of-way and internal paths that provide convenient pedestrian circulation in all areas that will be traveled by the residents and neighbors.

5. *The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;*

The exceptional hardship discussed above is not a matter of convenience or financial burden to the applicant. Instead, it is a factor of creating a development plan that meets the requirements of the Engineering Standards for a neighborhood street and minimizes the area of disturbance to the more visible, uphill areas of the site. In addition, it will minimize the need for more substantial retaining walls along Palmer Avenue that are discourage by the Municipal Code.

6. *The variance request will not violate building or fire code requirements;*

There is no impact on the building or fire code related to this variance request.

7. *The variance is the minimum variance that will afford relief of the subject standards of the Code.*

The proposed road grades have been optimized to Engineering Standards. The applicant is only asking for a variance in the areas where sidewalks would not be used by the residents and the neighboring public.

Engineering Variance #3 – Grades at Driveway, Parking Lot and Intersection Approach

Sections 5.2.4.E and 5.2.10.J Glenwood Springs Engineering Design Standards deal with grades for local roads, driveways and parking lots. These Engineering Standards allow local streets to be up to 10% grade, but require driveway and intersections approaches to by 4% within 50’ of an intersection or driveway access. Access grades for parking lots have a maximum of 6% allowed. The applicant is requesting a variance from this section of the Standards due to the unique site constraints as discussed below. Please note that this same variance was requested and approved as part of the currently approved development plan for the site.

1. *The subject property has an exceptional shape, topography, building configuration or other exceptional site condition that is not a general condition throughout the zone district;*

This request is a direct result of the steep slope of this site and the need to drop the grade of Palmer Avenue in the existing right-of-way to meet the requirements of the City’s Engineering Standards.

2. *The strict application of the Code standards for which a variance is sought would produce undue hardship;*

Due to the steepness of the site and these engineering standards, the grade of the existing Palmer Avenue right-of-way needs to be dropped as much as 10 feet in places to meet the maximum 10% grade allowed by the City. The applicant's development plan is however seeking a variance in a few select areas for the grade of the approaches to intersections and parking lot driveways. The applicant is proposing to maintain a 4% grade within 29 feet of the new intersection at Palmer and Blake, but not the full 50 feet of approach. Likewise, the application is looking to maintain the steeper grade of Palmer Avenue throughout the site, including at the parking lot access drives, but transitioning to the 6% driveway grades quickly. These variances are sought with the intention of meeting the grade requirements for a local street, and providing for a safe condition at the intersection, but not unnecessarily creating further hardship by requiring an even more excessive cut at Palmer Avenue. Without this variance the plan would require approximately another three more feet of cut and retaining.

3. *The applicant did not create the hardship by his/her own actions;*

Neither the steepness of the slope, the location of the Palmer Avenue right-of-way, nor the municipal building requirements that dictate the construction of Palmer Avenue were caused by the applicant.

4. *The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;*

There is no harm to the public good by this request. The applicant will still provide adequate and safe vehicular circulation via a local street that meets the grades allowed by the code.

5. *The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;*

The exceptional hardship discussed above is not a matter of convenience or financial burden to the applicant. Instead, it is a factor of creating a development plan that meets the requirements of the Engineering Standards and minimizes the amount of excavation need to build on an unimproved right-of-way that was not constructed at the time it was dedicated. The variance will minimize the area of disturbance and size of retaining walls on the more visible uphill side of the new Palmer Avenue.

6. *The variance request will not violate building or fire code requirements;*

There is no impact on the building or fire code plans for the development related to this variance request. These variances are for Engineering Standards that can be reviewed by the Public Works department.

7. The variance is the minimum variance that will afford relief of the subject standards of the Code.

The proposed road grades have been optimized to the Engineering Standards. The applicant is only asking for a variance at the driveway access and intersections. And at these intersections, a 4% grade is still being provided for safety at the bottom of Palmer Avenue, albeit for 29 feet.

Design Variance #4 – Orienting Building Toward the Street

Section 070.040.080(e)(2)(b) of the Municipal Code states:

"To the maximum extent feasible, the primary entrance and façade of individual buildings within a multi-family development shall be oriented towards:(i) Primary, internal or perimeter streets; or (ii) Common open space, such as interior courtyards, parks, or on-site natural areas or features with a clearly defined and easily accessible pedestrian circulation system."

The applicant believes that it has satisfied the requirements of this section of the code "*to the maximum extend feasible*" – however is requesting a variance from this section of the Code for Buildings A, B and F due the unique site constraints of the 5.7-acre parcel as outlined below. Each of the seven criteria for a variance are discussed in detail. Please note that the proposed site layout is largely consistent with the design of the currently approved plan for the site.

1. The subject property has an exceptional shape, topography, building configuration or other exceptional site condition that is not a general condition throughout the zone district;

The site's relatively steep topography is the primary factors leading to the proposed site plan with Building A and B located away from the street behind the proposed surface parking. Rather than building large retaining walls to construct vehicular circulation and parking areas that need to be flat, the site plan for the community utilizes each buildings' foundation as efficient and attractive site retaining. In the case of Building A and B, this requires placing a parking lot at the front of the site which is slightly more level, and placing buildings behind the parking to work with natural grade and retain the earth for the next tier of parking and buildings. These buildings still face our internal street in the parking lot. And allows for tiered parking as the buildings and parking work up the site.

In the case of Building F, the building cannot be shifted to the north and orient toward 26th Street due to the location of the designated Flood Zone A area in this vicinity that is shown on the civil plans and survey. Instead, the applicant has located this building to the south of this flood zone area to minimize

the risk of flooding. The primary entrance to the building has been located off of an internal courtyard in a location that works well with existing and proposed grade.

2. *The strict application of the Code standards for which a variance is sought would produce undue hardship;*

A strict application of the code would create undue hardship. In order to locate Buildings A, B and F in locations with immediate proximity to the street it would require more substantial retaining walls and as well as a building that is located in a Flood Zone A. Both of these factors make development in these areas impractical and would require substantial and sizeable retaining walls and/or flood protection structures that are discouraged by the municipal code.

3. *The applicant did not create the hardship by his/her own actions;*

Neither of the site constraints discussed above, the location of the Flood Zone or steepness of the site were caused by the applicant. The proposed plan is a thoughtful and efficient layout that addresses these issues.

4. *The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;*

There is no harm to the public good resulting from this variance and the proposed site plan supports many of the other goals of the code that encourages the site plan that is responsive to the site and minimizes negative impacts of development and encourages housing and efficient public transit.

5. *The variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden;*

The exceptional hardship discussed above is not a matter of convenience or financial burden to the applicant. Instead, it is a factor of creating a development plan that minimizes the area of disturbance to the more visible, uphill areas of the site and using attractive buildings for site retaining rather than retaining walls that are 6 feet or more at internal locations to the site.

6. *The variance request will not violate building or fire code requirements;*

There is no impact on the building or fire code related to this variance request.

7. *The variance is the minimum variance that will afford relief of the subject standards of the Code.*

This variance request is only for the two buildings along Blake Ave at the lower, more level part of the site that best facilitates surface parking, and for Building F that needs to avoid the debris flow area.

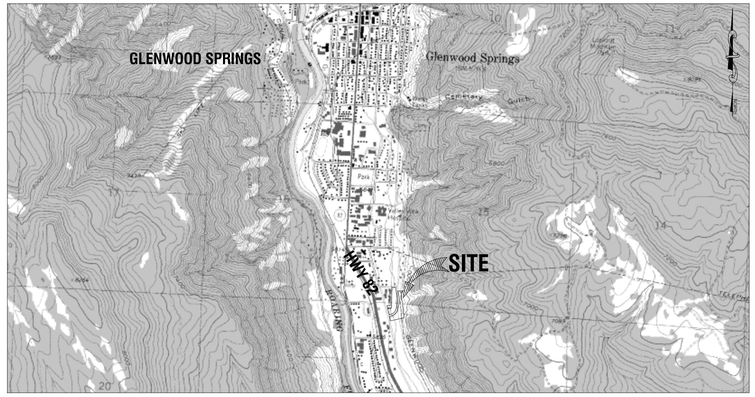
ABBREVIATIONS

APROX	*APPROXIMATE*	GA	*GAUGE*	QTY	*QUANTITY*		
ARCH	*ARCHITECT*	GAL	*GALLON*				
AVG	*AVERAGE*	GALV	*GALVANIZED*	R	*RADIUS*		
		GB	*GRADE BREAK*	RE	*REFERENCE*		
B&B	*BALLED AND BURLAPPED*	GC	*GENERAL CONTRACT(OR)*	REINF	*REINFORCE(D), (ING)*		
BLDG	*BUILDING*	GPM	*GALLON PER MINUTE*	REQ'D	*REQUIRED*		
BM	*BENCHMARK*			REV	*REVISION(S), REVISED*		
BOC	*BACK OF CURB*	HORIZ	*HORIZONTAL*	RIM	*RIM ELEVATION*		
BOV	*BLOW OFF VALVE*	HP	*HIGH POINT*	ROW	*RIGHT-OF-WAY*		
BR	*BOTTOM OF RAMP*	HT	*HEIGHT*	RP	*RADIUS POINT*		
BS	*BOTTOM OF STEP*						
BW	*BOTTOM OF WALL*	ID	*INSIDE DIAMETER*	SAN	*SANITARY*		
		INV	*INVERT ELEVATION*	SCH	*SCHEDULE*		
CAL	*CALIPER*	IN	*INCHES*	SD	*STORM DRAIN*		
CF	*CUBIC FEET*	INCL	*INCLUDE(D)*	SEC	*SECTION*		
CIP	*CAST-IN-PLACE*	IRR	*IRRIGATION*	SF	*SQUARE FOOT (FEET)*		
CJ	*CONTROL JOINT*			SHT	*SHEET*		
CL	*CENTERLINE*	JT	*JOINT(S)*	SIM	*SIMILAR*		
CLR	*CLEAR(ANCE)*			SPECS	*SPECIFICATIONS*		
C/O	*CLEANOUT*	LIN	*LINEAR*	SQ	*SQUARE*		
COMP	*COMPACTED*	LP	*LOW POINT*	STA	*STATION*		
CONC	*CONCRETE*	LT	*LIGHT*	STD	*STANDARD*		
CONT	*CONTINUOUS*			STL	*STEEL*		
CONTR	*CONTRACTOR*	MATL	*MATERIAL*	STRUCT	*STRUCTURAL*		
CU	*CUBIC*	MAX	*MAXIMUM*	SYM	*SYMMETRICAL*		
		MECH	*MECHANICAL*				
DBL	*DOUBLE*	MH	*MANHOLE*	TBC	*TOP OF BACK OF CURB*		
DEG	*DEGREE*	MIN	*MINIMUM*	TC	*TOP OF CURB*		
DEMO	*DEMOLISH, DEMOLITION*	MISC	*MISCELLANEOUS*	THK	*THICK*		
DIA	*DIAMETER*			T LF	*TOP OF LIGHT FOOTING*		
DIM	*DIMENSION*	NIC	*NOT IN CONTRACT*	TO	*TOP OF*		
DN	*DOWN*	NOM	*NOMINAL*	TOPO	*TOPOGRAPHY*		
DTL	*DETAIL*	NTS	*NOT TO SCALE*	TR	*TOP OF RAMP*		
DWG	*DRAWING*			TRANS	*TRANSFORMER*		
		OC	*ON CENTER(S)*	TS	*TOP OF STEP*		
EA	*EACH*	OD	*OUTSIDE DIAMETER*	TW	*TOP OF WALL*		
EF	*EACH FACE*	OPP	*OPPOSITE*	TYP	*TYPICAL*		
EJ	*EXPANSION JOINT*						
ELEV	*ELEVATION*	PA	*PLANTING AREA*	UNFIN	*UNFINISHED*		
ELECT	*ELECTRICAL*	PC	*POINT OF CURVATURE*				
ENG	*ENGINEER*	PERF	*PERFORATE(D)*	VAR	*VARIES*		
EOP	*CURB LIP*	PED	*PEDESTRIAN*	VERT	*VERTICAL*		
EQ	*EQUAL*	PERM	*PERIMETER*	VEH	*VEHICLE*		
EST	*ESTIMATE*	PI	*POINT OF INTERSECTION*	VOL	*VOLUME*		
EW	*EACH WAY*	PL	*PROPERTY LINE*				
EXIST	*EXISTING*	POB	*POINT OF BEGINNING*	W/	*WITH*		
		PSF	*POUNDS PER SQUARE FOOT*	W/O	*WITHOUT*		
FG	*FINISHED GRADE*	PSI	*POUNDS PER SQUARE INCH*	WT	*WEIGHT*		
FIN	*FINISH*	PT	*POINT, POINT OF TANGENCY*	WWF	*WELDED WIRE FABRIC*		
FL	*FLOW LINE*	PVC	*POLYVINYL CHLORIDE*				
FOB	*FACE OF BUILDING*	PVMT	*PAVEMENT*	YD	*YARD*		
FOW	*FACE OF WALL*	PVR	*PAVER(S)*				
FS	*FINISH SURFACE*						
FT	*FOOT (FEET)*						
FTG	*FOOTING*						

MAJOR SITE/ARCHITECTURAL PLAN SUBMISSION

BELL RIPPY NEIGHBORHOOD

GLENWOOD SPRINGS, COLORADO

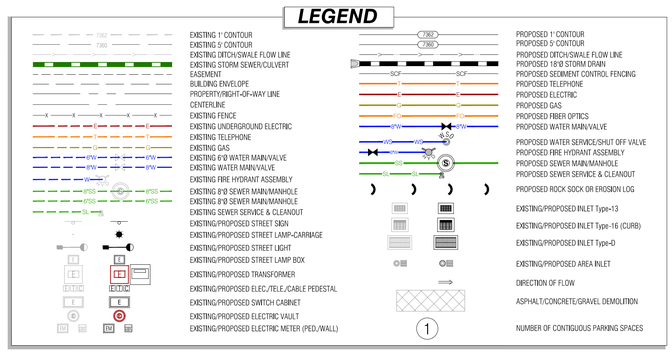


VICINITY MAP
Scale: 1"=2000'

NOTES:

THIS PLAN SET IS INTENDED TO BE PLOTTED IN COLOR. FAILURE TO DO SO MAY RESULT IN MISSING DATA & INFORMATION CRITICAL TO THE PROJECT.

LEGEND



A PORTION OF THE SITE IS LOCATED WITHIN ZONE A OF THE FIRM (FLOOD INSURANCE RATE MAP) FOR THE CITY OF GLENWOOD SPRINGS, COMMUNITY PANEL NUMBER 080071 1434C, MAP REVISED OCTOBER 15, 1985.

THIS PROPERTY IS SUBJECT TO GEOLOGIC HAZARDS PER THE ADOPTED MAPPING BY THE CITY OF GLENWOOD SPRINGS. HAZARDS TO NOTE ARE DEBRIS FLOWS. A FINAL GEOLOGIC HAZARD REPORT WILL BE SUBMITTED UPON APPLICATION OF A BUILDING PERMIT.

PROPOSED PUBLIC FACILITIES (ROAD, SIDEWALKS, UTILITIES, ETC.) REQUIRED FOR THE PROJECT, AND THE RESPONSIBILITY FOR PAYMENT THEREOF IS BY THE DEVELOPER.

GENERAL NOTES

1. THE WARRANTY PERIOD SHALL BE TWO (2) YEARS FROM THE DATE OF ACCEPTANCE.
2. CONSTRUCTION WORK, ANY NOISE CREATED BY OPERATING OR CAUSING TO BE OPERATED ANY EQUIPMENT (MECHANICAL OR NON-MECHANICAL, SELF-PROPELLED OR MANUALLY MANIPULATED) USED IN CONSTRUCTION, REPAIR, ALTERATION OR DEMOLITION WORK ON BUILDINGS, STRUCTURES, STREETS, ALLEYS OR APPURTENANCES AT ANY TIME OTHER THAN BETWEEN THE HOURS OF 7:00 A.M. AND 8:00 P.M. ON MONDAY THROUGH FRIDAY, AND 8:00 A.M. AND 6:00 P.M. ON SATURDAY AND SUNDAY. THE CITY MANAGER IS HEREBY AUTHORIZED TO ISSUE A CONSTRUCTION WORK NOISE PERMIT ALLOWING CONSTRUCTION WORK NOISE TO OCCUR AT A TIME OTHER THAN THE TIME SET FORTH HEREIN BASED ON CIRCUMSTANCES WHICH NECESSITATE SUCH CONSTRUCTION WORK, IN THE EVENT THE CITY MANAGER ISSUES SUCH A PERMIT, THE CITY COUNCIL SHALL BE ADVISED OF SUCH ISSUANCE AT THE NEXT REGULAR CITY COUNCIL MEETING.
3. IN ORDER OF PRECEDENCE, ALL CONSTRUCTION SHALL MEET OR EXCEED THE PROJECT PLANS AND TECHNICAL SPECIFICATIONS; STANDARDS ESTABLISHED IN THE LATEST EDITIONS OF THE CITY PUBLIC WORKS MANUAL AND/OR ENGINEERING STANDARDS; AND CDOT SPECIFICATIONS, AS REFERENCED HEREIN, AND BE SUBJECT TO OBSERVATION BY THE PROJECT ENGINEER, TOWN/CITY AND CDOT, AS APPLICABLE.
4. IN CASE OF A CONFLICT BETWEEN VARYING SPECIFICATIONS, THE MOST STRINGENT SHALL APPLY.
5. THE CONTRACTOR SHALL OBTAIN A COPY OF THE LATEST STANDARD SPECIFICATIONS AND DETAILS OF ALL AGENCIES EXERCISING JURISDICTION OVER THIS PROJECT. A COPY OF THESE SPECIFICATIONS AND DETAILS SHALL BE MAINTAINED ON THE JOBSITE AT ALL TIMES.
6. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES TWO (2) SIGNED COPIES OF THE LATEST PLANS, STANDARDS, AND SPECIFICATIONS AS APPROVED BY THE APPROPRIATE GOVERNING AGENCY AND PROJECT ENGINEER. THE CONTRACTOR SHALL NOT CHANGE OR DEVIATE FROM THESE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE OWNER, PROJECT ENGINEER, AND GOVERNING AGENCY.
7. ALL WORK SHALL CONFORM TO ALL LOCAL, STATE, AND FEDERAL APPLICABLE LAWS AND REGULATIONS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL JOB SITE SAFETY ON THE PROJECT. THIS SHALL INCLUDE THE SAFETY OF HIS OWN PERSONNEL, SUBCONTRACTORS, ALL VISITORS TO THE SITE, AND THE GENERAL PUBLIC. ALL JOB SITE SAFETY SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS AND CODES, AND ENSURE COMPLIANCE INCLUDING, BUT NOT LIMITED TO, THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
9. THE CONTRACTOR SHALL CONTACT ONE CALL OF COLORADO AT #811 (1-800-922-1987), FOR THE MARKING OF MEMBER UNDERGROUND UTILITIES. (www.uncc2.org) A MINIMUM OF SEVENTY TWO (72) HOURS (EXCLUDING WEEKENDS AND HOLIDAYS) IN ADVANCE OF ANY EXCAVATION.
10. ALL MATERIALS SHALL BE NEW UNLESS OTHERWISE INDICATED IN THE PLANS, AND SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE OWNER, PROJECT ENGINEER, TOWN/CITY AND CDOT, AS APPLICABLE.
11. LOCATIONS AND ELEVATIONS OF EXISTING IMPROVEMENTS TO BE MET (OR AVOIDED) BY THE PROPOSED WORK SHALL BE CONFIRMED BY THE CONTRACTOR THROUGH FIELD EXPLORATIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL REPORT TO THE PROJECT ENGINEER ANY DISCREPANCIES BETWEEN HIS MEASUREMENTS AND THESE PLANS.
12. THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES SHOWN IN THE PLANS AND/OR SPECIFICATIONS. THE CONTRACTOR SHALL NOT SCALE DRAWINGS FOR CONSTRUCTION PURPOSES. ANY MISSING DIMENSIONS OR DISCREPANCIES IN PLANS, FIELD STAKING, OR PHYSICAL FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT ENGINEER. IF THE CONTRACTOR PROCEEDS WITH THE WORK WITHOUT NOTIFYING THE PROJECT ENGINEER, HE DOES SO AT HIS OWN RISK.
13. ALL ESTIMATES OF QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR AND SUBCONTRACTORS SHALL BE RESPONSIBLE FOR DETERMINING ACTUAL QUANTITIES, AND SHALL PROVIDE ALL WORK AND MATERIALS NECESSARY TO CONSTRUCT THE PROJECT IN ITS ENTIRETY.
14. THE CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS NOT DESIGNATED FOR REMOVAL AND THOSE IMPROVEMENTS THAT ARE OUTSIDE THE LIMITS OF THE PROPOSED CONSTRUCTION. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE THERETO AND SHALL PROVIDE TEMPORARY FENCING, BARRICADES, SUPPORTS, RESTRAINTS, AND/OR BRACING WHERE REQUIRED TO PROTECT EXISTING IMPROVEMENTS. DAMAGE TO EXISTING IMPROVEMENTS SHALL BE REPAIRED AND/OR REPLACED TO EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
15. ALL GRADING AND CONSTRUCTION ACTIVITIES SHALL BE CONFINED TO THE OWNERS PROPERTY, PUBLIC RIGHT-OF-WAY, PERMANENT EASEMENTS, AND TEMPORARY CONSTRUCTION EASEMENTS. THE CONTRACTOR SHALL NOT OPERATE OUTSIDE THIS AREA WITHOUT THE PRIOR CONSENT OF THE PROPERTY OWNER INVOLVED. ANY DAMAGE TO PRIVATE PROPERTY BY THE CONTRACTOR OUTSIDE THESE LIMITS WITHOUT THE PERMISSION OF THE PRIVATE PROPERTY OWNER WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS NOT OBTAINED BY THE OWNER OR OWNERS REPRESENTATIVES, AND PAY ALL FEES AS REQUIRED BY THE CONSTRUCTION COVERED IN THESE PLANS.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE APPROPRIATE GOVERNING AGENCIES AND LOCAL FIRE DEPARTMENT OF ALL STREET CLOSURES AND EXISTING FIRE HYDRANTS/FIRE SUPPRESSION TAKEN OUT OF SERVICE AT LEAST SEVENTY TWO (72) HOURS PRIOR TO CONSTRUCTION.
18. THE CONTRACTOR IS RESPONSIBLE FOR ALL SITE SECURITY AND SHALL PROPERLY PROTECT AND BARRICADE THE CONSTRUCTION SITE UNTIL CONSTRUCTION IS COMPLETE. STORAGE, LOSS DUE TO THEFT, OR VANDALISM OF MATERIALS, AND EQUIPMENT (SECURED OR UNSECURED) WILL BE SOLELY AT THE CONTRACTOR'S EXPENSE.
19. PRIOR TO BEGINNING THE WORK, THE CONTRACTOR SHALL OBTAIN ANY WRITTEN AGREEMENTS FOR INGRESS AND EGRESS TO THE WORK FROM ADJACENT PRIVATE PROPERTY OWNERS. ACCESS TO ANY ADJACENT PRIVATE PROPERTY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD, DURING ALL HOURS OF OPERATION FOR THE BUSINESS LOCATED ON THOSE PARCELS.
20. FOR ANY CHANGES OR DEVIATIONS FROM THESE PLANS PROPOSED BY THE CONTRACTOR, SHOP DRAWINGS AND MATERIAL SPECIFICATIONS SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF MATERIAL.
21. CONTRACTOR MUST COORDINATE ALL CONSTRUCTION WITH THE OWNERS DEDICATED CONSTRUCTION PROJECT MANAGER OR THE PROJECT ENGINEER.
22. CONTRACTOR SHALL PROTECT AND PRESERVE ALL SURVEY CONTROL AND PROPERTY MONUMENTATION. ANY DAMAGED MONUMENTS SHALL BE RESET BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE PROJECT'S STATE AT THE CONTRACTOR'S EXPENSE.
23. PRIOR TO MOVING OFF THE JOB SITE THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR THE OWNER'S CONSTRUCTION PROJECT MANAGER TO PERFORM THE FINAL WALK-THROUGH OF THE CONSTRUCTION SITE.
24. TEMPORARY POWER, TELEPHONE, WATER, SANITARY SEWER AND WASTE DISPOSAL SERVICE FOR THE SITE IS THE CONTRACTOR'S RESPONSIBILITY UNLESS OTHERWISE SPECIFIED.
25. NO BELOW GRADE WORK SHALL BE BACKFILLED (INCLUDING BEDDING MATERIAL ABOVE THE SPRING LINE OF THE PIPE) UNTIL THE CONSTRUCTION HAS BEEN INSPECTED AND APPROVED FOR BACKFILLING BY THE APPROPRIATE GOVERNING AGENCY, PROJECT ENGINEER AND/OR OWNER'S CONSTRUCTION PROJECT MANAGER. INSPECTIONS SHALL BE SCHEDULED AT LEAST FORTY EIGHT (48) HOURS PRIOR.
26. THE CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL NECESSARY TO COMPLETE THE WORK. ALL TRAFFIC CONTROL DEVICES AND METHODS OF CONTROLLING TRAFFIC THROUGH CONSTRUCTION ZONES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND ALL REVISIONS THERETO INCLUDING LOCAL AND STATE SUPPLEMENTS. ADDITIONAL WORK IN THE RIGHT-OF-WAY OR TRAFFIC CONTROL PERMITS MAY BE NECESSARY AND SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
27. FOR ANY CONSTRUCTION ACTIVITY WITHIN A ROAD RIGHT-OF-WAY, CONTRACTOR SHALL PROVIDE ALL WARNING LIGHTS, SIGNS, BARRICADES, FLAG MEN OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH THE LASTED EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL CONSTRUCTION ZONE TRAFFIC CONTROL. A CONSTRUCTION TRAFFIC CONTROL PLAN MUST BE SUBMITTED FOR REVIEW AND APPROVAL TO THE TOWN/CITY AND PROJECT ENGINEER, 7 DAYS PRIOR TO COMMENCING CONSTRUCTION WITHIN A PUBLIC RIGHT-OF-WAY.
28. CONTRACTOR SHALL DESIGNATE A CERTIFIED TRAFFIC CONTROL SUPERVISOR (TCS) TO MANAGE CONSTRUCTION SIGNAGE AND SAFETY OF OPERATIONS DURING ACTIVITIES WITHIN THE RIGHT OF WAY. A TRAFFIC CONTROL SUPERVISOR SHALL BE AVAILABLE WHENEVER WORK IS IN PROGRESS.
29. IF UNANTICIPATED HAZARDOUS MATERIALS OF ANY KIND ARE ENCOUNTERED IN THE WORK, THE CONTRACTOR SHALL IMMEDIATELY CEASE ALL CONSTRUCTION OPERATIONS AND NOTIFY THE PROJECT ENGINEER AND/OR OWNER'S CONSTRUCTION PROJECT MANAGER FOR FURTHER DIRECTION.
30. ALL DEBRIS RESULTING FROM CONSTRUCTION AND DEMOLITION SHALL BE HAULED OFF SITE AND DISPOSED OF PROPERLY AND LEGALLY AND SHALL BE CONSIDERED PART OF THE WORK.
31. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES IN ALL DIRECTIONS. DRAINAGE FACILITIES MAY NEED TO BE CONSTRUCTED & MAINTAINED AS NECESSARY TO PROTECT PUBLIC & PRIVATE PROPERTY.
32. ALL CONSTRUCTION SHALL BE SUBJECT TO OBSERVATION AND REVIEW BY THE TOWN/CITY AND THE PROJECT ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF OBSERVATIONS AND REVIEW OF ALL INSTALLATIONS. OBSERVATIONS AND REVIEW OF CONSTRUCTION WORK IN PROGRESS ARE NOT TO BE CONSTRUED AS A GUARANTEE OR WARRANTY BY THE OBSERVER OF THE COMPLETED WORK. ALL GUARANTEES OR WARRANTIES REMAIN WITH THE CONTRACTOR.
33. ALL DISTURBED AREAS MUST BE RECLAIMED WITH VEGETATION AS DIRECTED BY CITY AND/OR THE ENGINEER OF RECORD. THE CONTRACTOR SHALL REPAIR OR REPLACE ALL AFFECTED OR DAMAGED LANDSCAPING, INCLUDING IRRIGATION, WITH SIMILAR MATERIALS AND SIZE. SOD SHALL BE USED TO REPLACE LAWN.
34. THE CONTRACTOR SHALL TAKE APPROPRIATE PRECAUTIONS TO SIGNIFICANTLY REDUCE POTENTIAL POLLUTION FROM CONSTRUCTION ACTIVITIES, INCLUDING VEHICLE FUELING & MAINTENANCE, AND STORAGE AND USE OF CHEMICALS & FERTILIZERS. THE CONTRACTOR SHALL IDENTIFY BEST MANAGEMENT PROCEDURES FOR HANDLING POTENTIAL POLLUTANTS AND SUBMIT SPILL PREVENTION AND RESPONSE PROCEDURES TO THE TOWN/CITY AND PROJECT ENGINEER PRIOR TO ANY ACTIVITY AT THE PROJECT SITE.
35. THE CONTRACTOR SHALL VERIFY EXISTING PIPE OR MANHOLE INVERTS/DEPTHS PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
36. THE CITY WILL PROVIDE THE CONTRACTOR WITH A TAX EXEMPT FORM FOR USE IN PURCHASING OF MATERIALS AND SUPPLIES.
37. ALL PRODUCT INFORMATION SHOWN IS AS PROVIDED BY THE MANUFACTURER. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND COMPLYING WITH THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS FOR THE INSTALLATION OF ALL MATERIALS WITH SPECIAL ATTENTION TO PROPER SEALING OF MATING SURFACES. THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE ENGINEER IF ANY DISCREPANCIES ARE FOUND BETWEEN THE DELIVERED PRODUCTS AND THOSE SHOWN ON THIS PLAN.
38. ALL SIGNS REMOVED FROM THE RIGHT-OF-WAY WILL BE RETURNED TO THE CITY OR STORED ONSITE. CONTRACTOR TO RECORD PHOTOS OF THE AREA AND REINSTALL SIGNS THAT ARE REMOVED DURING CONSTRUCTION.
39. ANY MUD OR OTHER MATERIAL TRACKED OR OTHERWISE DEPOSITED ON THE ROADWAY SHALL BE REMOVED DAILY OR AS ORDERED BY THE DEPARTMENT INSPECTOR.
40. THE CONTRACTOR SHALL PROVIDE ON-SITE SANITARY FACILITIES UNLESS FACILITIES ARE ALREADY PROVIDED THAT ARE REASONABLY CLOSE TO THE CONSTRUCTION SITE.
41. THE CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS TO AFFECTED PROPERTY OWNERS AT ALL TIMES DURING CONSTRUCTION AT NO ADDITIONAL COST.
42. THE CONTRACTOR SHALL COMPLY WITH ALL AGREEMENTS BETWEEN THE CITY AND PRIVATE PROPERTY OWNERS.
43. ADDITIONAL NOTES ARE LOCATED THROUGHOUT THE CONSTRUCTION DOCUMENTS.

STORMWATER MANAGEMENT AND EROSION/SEDIMENT CONTROL NOTES

1. THE PREPARATION OF STORMWATER MANAGEMENT PLANS, PERMITTING AND COMPLIANCE ARE THE RESPONSIBILITY OF THE CONTRACTOR. THIS PROJECT MAY ALSO REQUIRE A PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY FROM THE STATE OF COLORADO. THE CONTRACTOR IS TO COMMENCE WORK ON THIS SITE ONLY AFTER AN ACTIVE PERMIT NUMBER HAS BEEN OBTAINED FROM THE STATE OF COLORADO. THE STORMWATER MANAGEMENT PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO APPLYING FOR THE PERMIT. THE CONTRACTOR IS TO PROVIDE EROSION CONTROL IN ACCORDANCE WITH STATE OF COLORADO GUIDELINES.
2. THE CONTRACTOR SHALL CONTINUOUSLY PROVIDE ADEQUATE STORMWATER MANAGEMENT IN ACCORDANCE WITH AN APPROVED STORMWATER MANAGEMENT PLAN (SWMP) FROM THE STATE OF COLORADO.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE PUBLIC STREETS, ACCESS ROUTES, AND WATERWAYS IN THE VICINITY OF THE JOB SITE CLEAN AND FREE OF ROCKS, SOIL AND DEBRIS.
4. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROL "BEST MANAGEMENT PRACTICES" (BMPS) PRIOR TO ANY SITE PREPARATION WORK (E.G., CLEARING, GRUBBING, DEMOLITION, OR EXCAVATION).
5. A GROUNDWATER DISCHARGE PERMIT MAY BE REQUIRED FROM THE STATE GOVERNING AUTHORITY PRIOR TO DISCHARGE. GROUNDWATER SHALL BE SAMPLED AND SENT TO AN APPROVED LABORATORY FOR TESTING PRIOR TO BEING DISCHARGED. TESTING SHALL BE IN ACCORDANCE WITH THE PERMIT FOR STORMWATER DISCHARGE.
6. A WATER SOURCE MUST BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
7. ALL DITCHES & EROSION CONTROL SHOULD BE COMPLETED TO THE RECEIVING STREAM.
8. THE PLACEMENT OF EROSION AND SEDIMENT BMPS SHALL BE IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN IF IT WAS PREPARED FOR THE PROJECT. CONTRACTOR TO ADJUST QUANTITY, LOCATION, AND TYPE OF EROSION AND SEDIMENT CONTROL BMPS AS NECESSARY FOR THE VARIOUS PHASES OF THE WORK AND AS ACTUAL CONDITIONS WARRANT. CONTRACTOR SHALL CONTINUOUSLY MODIFY THE EROSION AND SEDIMENT CONTROL PLAN WITH CURRENT BMPS IN ACCORDANCE WITH THE CONSTRUCTION STORMWATER PERMIT REQUIREMENTS. ADDITIONAL EROSION AND SEDIMENT CONTROL BMPS EMPLOYED BY THE CONTRACTOR AT HIS DISCRETION WILL NOT BE MEASURED OR PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
9. APPROVED EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT, UNLESS OTHERWISE REQUIRED BY THE STATE'S CONSTRUCTION STORMWATER PERMIT, AT A MINIMUM THE CONTRACTOR SHALL INSPECT ALL BMPS EVERY 14 DAYS, AND AFTER ALL SIGNIFICANT PRECIPITATION EVENTS I.E. RAINFALL, SNOWMELT. ALL NECESSARY MAINTENANCE AND REPAIR ACTIVITIES SHALL BE COMPLETED WITHIN TWENTY-FOUR (24) HOURS AFTER DIRECTION BY THE INSPECTOR. ACCUMULATED SEDIMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED WEEKLY FROM ALL BMPS, OR AT ANY TIME THAT SEDIMENT OR CONSTRUCTION DEBRIS ADVERSELY IMPACTS THE FUNCTIONING OF THE BMPS.
10. TOPSOIL AND SUITABLE EARTHEN MATERIALS SHALL BE SEGREGATED AND STOCKPILED WITHIN THE LIMITS OF CONSTRUCTION FOR USE ON AREAS TO BE FILLED AND RE-VEGETATED. ANY AND ALL STOCKPILES SHALL BE PLACED IN AN APPROVED LOCATION AND PROTECTED FROM EROSIVE ELEMENTS USING MEASURES SPECIFIED IN THE EROSION/SEDIMENT CONTROL PLAN AND APPROVED STORMWATER MANAGEMENT PLAN (SWMP) FROM THE STATE OF COLORADO.
11. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE MULCHED AND SEEDED WITH A TEMPORARY OR PERMANENT GRASS COVER WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION.
12. ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
13. THE CONTRACTOR MUST KEEP ALL POLLUTANTS, INCLUDING SEDIMENT, CONSTRUCTION DEBRIS, AND TRENCH BACKFILL MATERIALS FROM ENTERING THE STORM SEWER SYSTEM.
14. ALL SPILLS, INCLUDING, BUT NOT LIMITED TO, PETROLEUM PRODUCTS, SOLVENTS, AND CEMENT SHALL BE CLEANED UP IMMEDIATELY. THE LOCAL TOWN/CITY/COUNTY AND STATE'S GOVERNING AUTHORITY SHALL BE NOTIFIED IMMEDIATELY.
15. THE CONTRACTOR SHALL ENSURE THAT ALL LOADS OF CUT AND FILL MATERIAL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORT ON PUBLIC RIGHT-OF-WAY. ALL MATERIAL EXPORTED FROM THE SITE SHALL BE DISPOSED OF AT A SITE PERMITTED TO ACCEPT SUCH MATERIAL.
16. THE USE OF REBAR, STEEL STAKES OR STEEL FENCE POSTS FOR STAKING DOWN STRAW OR HAY BALES, OR TO SUPPORT SILT FENCING USED AS AN EROSION CONTROL MEASURE, IS PROHIBITED.
17. THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED LOCATIONS ON THE JOB SITE. THE DISCHARGE OF WASHOUT WATER DURING WASTE CLEANUP TO THE STORM SEWER SYSTEM IS PROHIBITED. ALL CONCRETE WASTE SHALL BE PROPERLY CLEANED UP AND DISPOSED OF AT AN APPROPRIATE LOCATION.
18. CONTRACTOR SHALL PROVIDE A COMPLETED "NOTICE OF TERMINATION" TO OWNER, FOR OWNERS SUBMITTAL TO THE STATE'S GOVERNING AUTHORITY ONCE THE PROJECT IS COMPLETE, ALL DISTURBED AREAS HAVE BEEN STABILIZED AND TEMPORARY BMPS HAVE BEEN REMOVED.
19. THE CONTRACTOR SHALL CLEAN OUT ALL EXISTING AND PROPOSED INLETS, PIPES AND MANHOLES OF DEBRIS AND SEDIMENTATION AT COMPLETION OF SITEWORK. THIS WORK SHALL BE DONE TO THE SATISFACTION OF THE OWNER AND LOCAL AUTHORITIES. ANY CONSTRUCTION DEBRIS OR MUD DROPPED INTO MANHOLES, INLETS, PIPES OR TRACKED ONTO EXISTING ROADWAYS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL REPAIR ANY EXCAVATIONS OR PAVEMENT FAILURES CAUSED BY HIS CONSTRUCTION.
20. THE CONTRACTOR SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO SIGNIFICANTLY REDUCE ANY POTENTIAL POLLUTION CAUSED BY HIS ACTIVITIES, INCLUDING VEHICLE FUELING, STORAGE OF FERTILIZERS OR CHEMICALS, ETC. THE CONTRACTOR SHALL HAVE IDENTIFIED PROCEDURES FOR HANDLING POTENTIAL POLLUTANTS AND HAVE IDENTIFIED SPILL PREVENTION AND RESPONSE PROCEDURES PRIOR TO ANY ACTIVITIES AT THE PROJECT SITE.
21. ALL EROSION CONTROL FABRIC SHALL BE NORTH AMERICAN GREEN SC250 OR ENGINEER APPROVED EQUAL UNLESS SPECIFIED DIRECTLY.

S

BELL RIPPY NEIGHBORHOOD

OVERALL SITE PLAN

Boundaries Unlimited Inc.
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& Beyond
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(T) 970.945.5252
www.bu-inc.com

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N/A
N/A

Engineer or Surveyor Seal

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Review

Client Information:

TRIUMPH
12 VAIL ROAD, SUITE 700
VAIL, COLORADO 81657
970 479-9990

NORTH

0 40' 80'
Scale: 1" = 40'

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Know what's below.
Call before you dig.

GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Overall Site Plan

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
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PROJECT NO.
20002
Designer:
DJW
Drafter:
BUI
Date:
3/03/20

Sheet
C.1

File Name: 20002-c-cover.dwg

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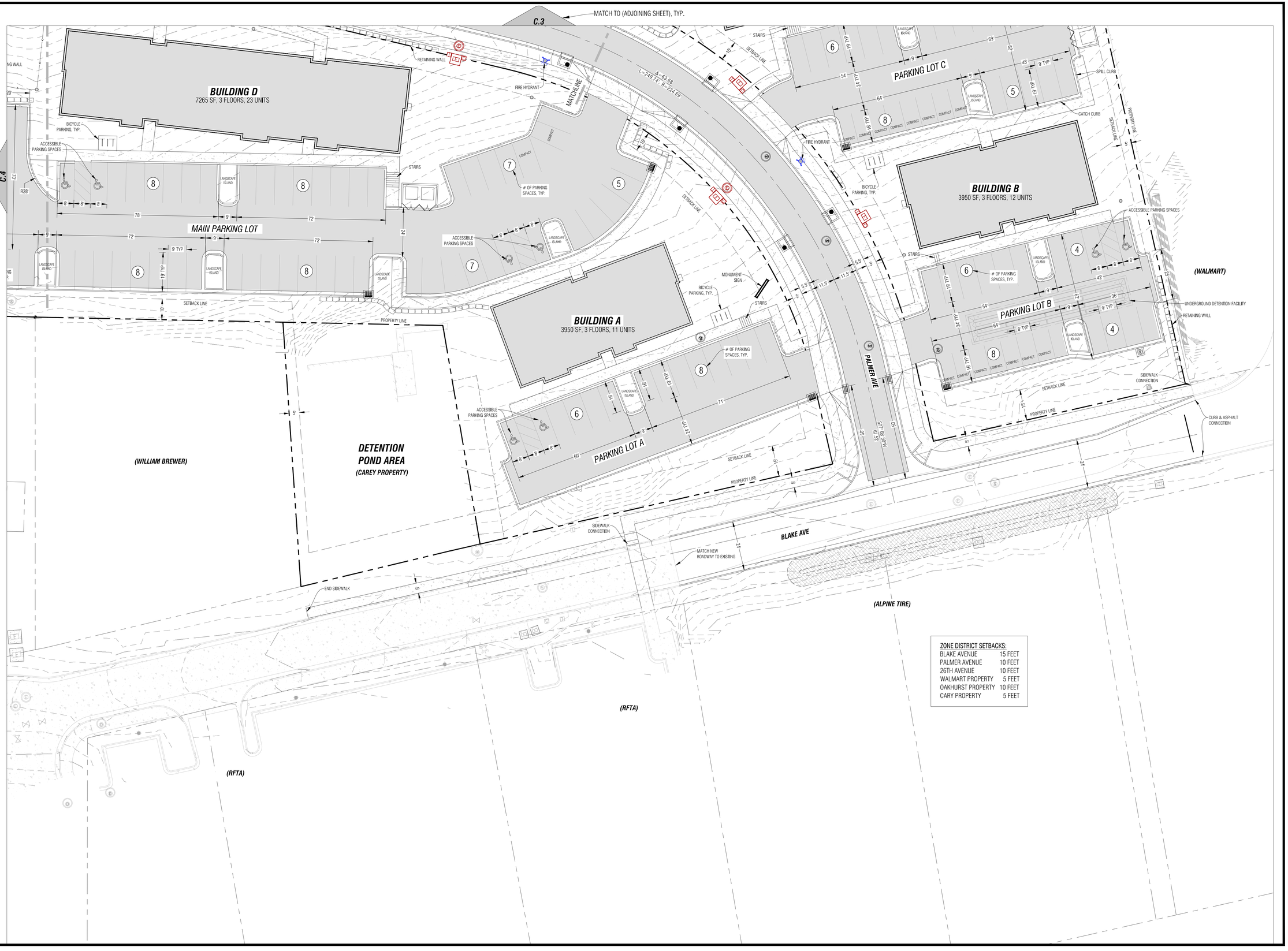

ZONE DISTRICT SETBACKS:	
BLAKE AVENUE	15 FEET
PALMER AVENUE	10 FEET
26TH AVENUE	10 FEET
WALMART PROPERTY	5 FEET
OAKHURST PROPERTY	10 FEET
CARY PROPERTY	5 FEET

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VAIL, COLORADO 81657
970 479-9990

NORTH
0 20' 40'
Scale: 1" = 20'

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Bell Rippy Neighborhood

Site Plan

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
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PROJECT NO. 20002
Designer: DJW
Drafter: BUI
Date: 3/02/20

Sheet C.2

File Name: 20002 c-site.dwg

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ZONE DISTRICT SETBACKS:	
BLAKE AVENUE	15 FEET
PALMER AVENUE	10 FEET
26TH AVENUE	10 FEET
WALMART PROPERTY	5 FEET
OAKHURST PROPERTY	10 FEET
CARY PROPERTY	5 FEET

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Glenwood Springs, CO 81601
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970 479-9990

NORTH

0 20' 40'
Scale: 1" = 20'

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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Site Plan

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No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
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PROJECT NO.
20002
Designer:
DJH
Drafter:
BUI
Date:
3/03/20

Sheet
C.3

File Name: **20002 c-site.dwg**

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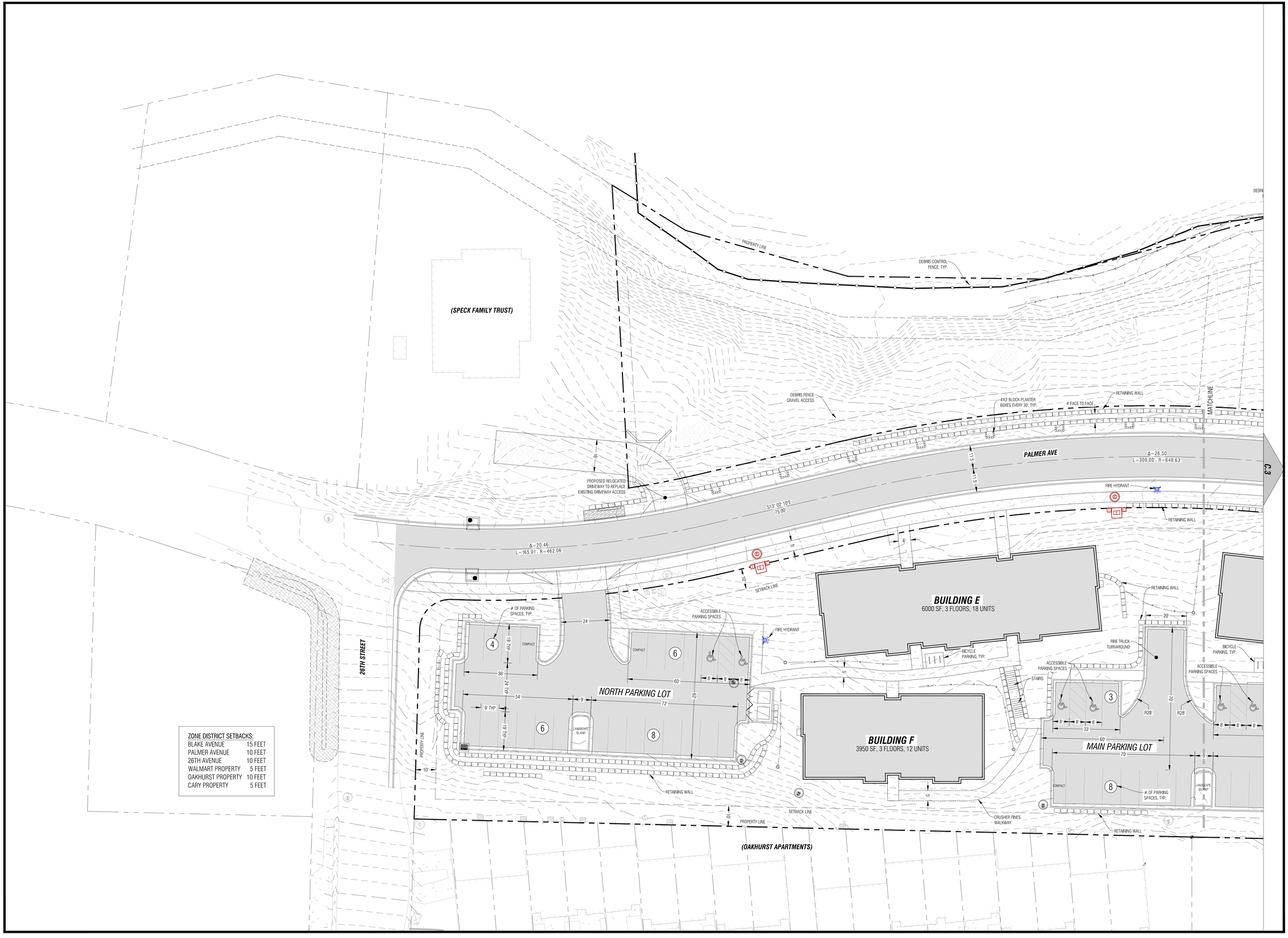

ZONE DISTRICT SETBACKS:	
BLAKE AVENUE	15 FEET
PALMER AVENUE	10 FEET
26TH AVENUE	10 FEET
WALMART PROPERTY	5 FEET
OAKHURST PROPERTY	10 FEET
CARY PROPERTY	5 FEET

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NORTH

0 20' 40'
Scale: 1" = 20'

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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Site Plan

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
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PROJECT NO.
20002
Designer:
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Drafter:
BUI
Date:
3/03/20

Sheet
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File Name: 20002 c-site.dwg

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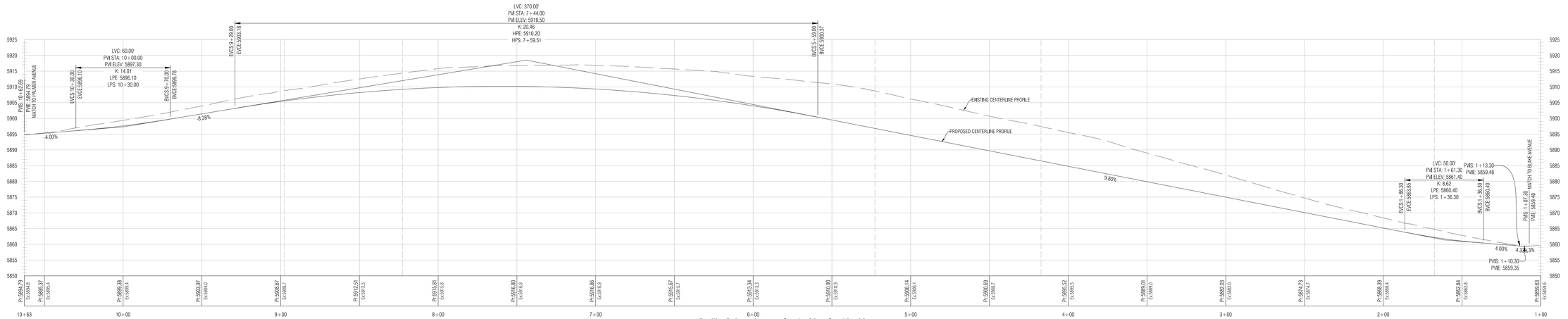

Profile: Palmer Avenue, Sta:1+00 to Sta:10+63
Scale: Vert.=15', Horiz.=30'

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NORTH
0 30' 60'
Scale: 1" = 30'

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Bell Rippy Neighborhood

Palmer Avenue Plan & Profile

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.			
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PROJECT NO.
20002
Designer:
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Drafter:
BUI
Date:
3/03/20

Sheet
C.5

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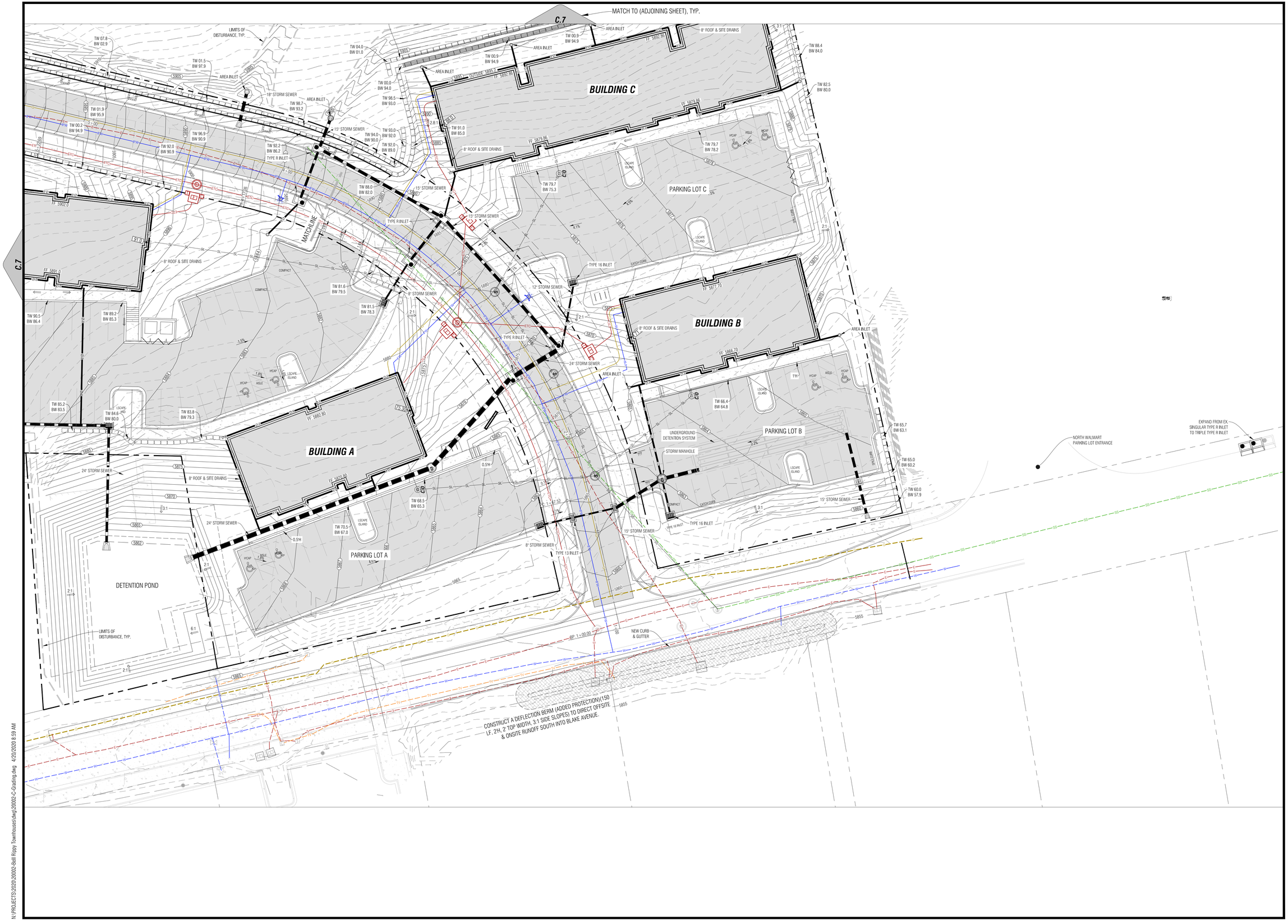

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NORTH

0 20' 40'
Scale: 1" = 20'

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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Grading & Drainage Plan

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
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PROJECT NO. **20002**
Designer: **DJW**
Drafter: **BUI**
Date: **3/03/20**

Sheet **C.6**

File Name: **20002-c-grading.dwg**

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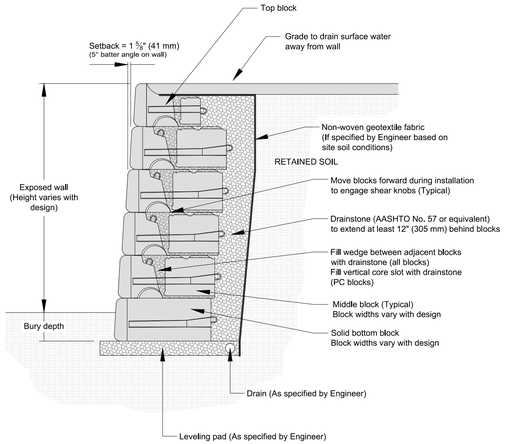
Typical Gravity Wall Section above Palmer Avenue.

(Actual wall to be determined)



This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site.

DRAWN BY:	JRJ
APPROVED BY:	JRJ
DATE:	17MAR2016
SHEET:	1 of 1

TITLE: Typical Gravity Wall Detail

FILE: 1 Typical Gravity Wall Detail 031716.dwg

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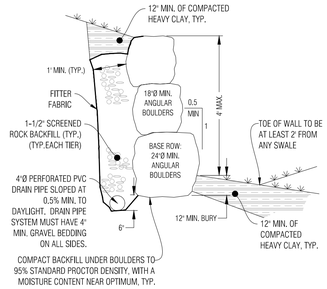
(866) 222-8400 ext 3010 • engineering@redrock.com
www.redrocks.com



BOULDER LANDSCAPE WALL NOTES:

1. THIS DETAIL IS TO BE USED ONLY FOR RETAINING LANDSCAPED AREAS WITH A MAXIMUM WALL HEIGHT OF 4-FEET. THIS DETAIL SHALL NOT BE USED TO RETAIN STRUCTURES/VEHICLE LOADED AREAS OR AREAS REQUIRING GREATER RETENTION.
2. FREE DRAINING WALL BACKFILL SHOULD BE CAPPED WITH AT LEAST 12 INCHES OF COMPACTED HEAVY CLAYS TO REDUCE SURFACE WATER INFILTRATION.
3. BOULDERS SHALL BE ANGULAR AND SQAURE/RECTANGULAR IN SHAPE. ROUND RIVER BOULDERS ARE NOT ACCEPTABLE.
4. INSTALL MIRAFI 140N FILTER FABRIC BETWEEN THE NATIVE EXCAVATION AND THE SCREENED ROCK BACKFILL.
5. SET BASE ROWS ON BENCHES WHERE THE TOPSOIL HAS BEEN REMOVED AND THE SUBBASE HAS BEEN SCARIFIED TO 9" MINIMUM DEPTH & RECOMPACTED TO 95% STANDARD PROCTOR.
6. CARE SHOULD BE TAKEN NOT TO OVER COMPACT THE BACKFILL OR USE LARGE EQUIPMENT NEAR THE WALL.
7. SELECT AND PLACE BOULDERS IN A MANNER WHICH PERMITS AT LEAST 30% CONTACT AREA WITH ADJACENT BOULDERS.
8. PLACE LARGER BOULDERS AT BOTTOM AND TRANSITION TO SMALLER BOULDERS AT TOP OF WALL. UNDER NO CIRCUMSTANCES SHOULD ANY BOULDER BE PLACED ON TOP OF ANOTHER BOULDER WHICH IS SMALLER THAN ITSELF.

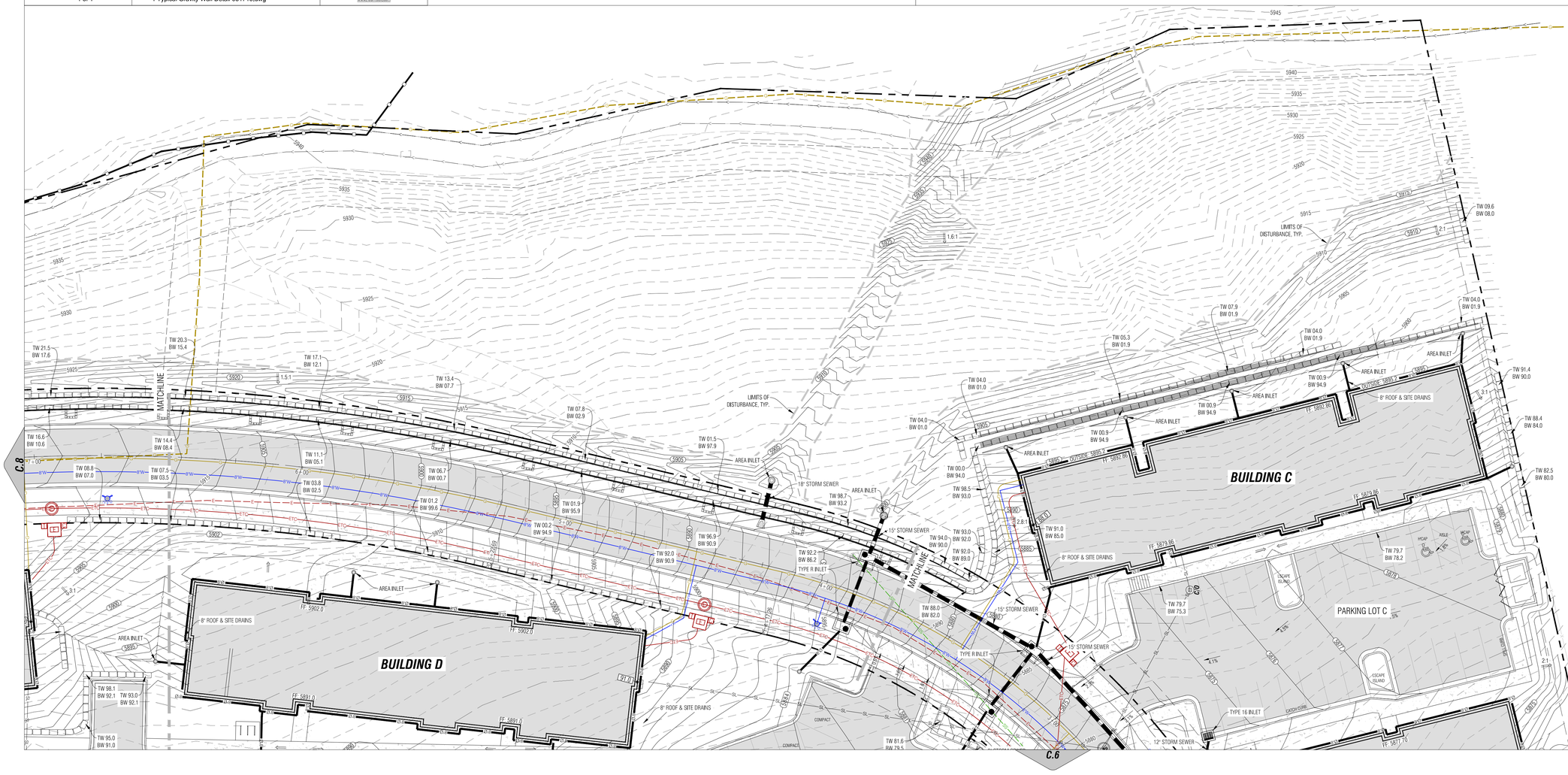
(Actual wall to be determined)

BOULDER WALL DETAIL, LANDSCAPED AREA

N.T.S.

TO BE VERIFIED BY PROJECT SOILS ENGINEER

REFER & COORDINATE WITH THE GEOTECHNICAL REPORT



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N/A
N/A

Engineer or Surveyor Seal

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Review

Client Information:

TRIUMPH
12 VAIL ROAD, SUITE 700
VAIL, COLORADO 81657
970 479-9990

NORTH

0 20' 40'

Scale: 1" = 20'

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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Grading & Drainage Plan

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
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PROJECT NO.: **20002**
Designer: **DJW**
Drafter: **BUI**
Date: **3/03/20**

Sheet: **C.7**

File Name: **20002-c-grading.dwg**

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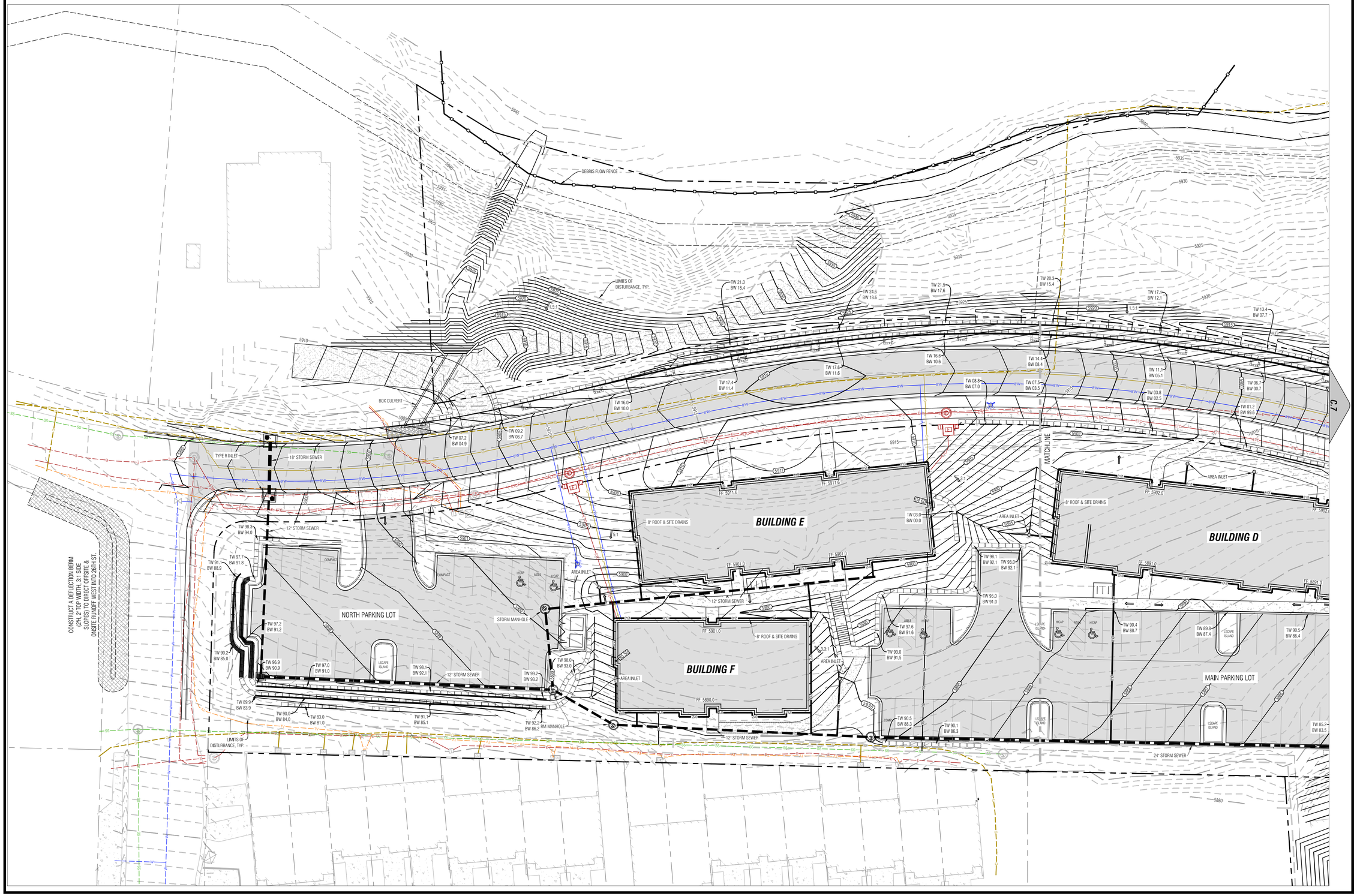

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VAIL, COLORADO 81657
970 479-9990

NORTH
0 20' 40'
Scale: 1" = 20'

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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Grading & Drainage Plan

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PROJECT NO.
20002
Designer:
DJW
Drafter:
BUI
Date:
3/03/20

Sheet
C.8

File Name: 20002-c-grading.dwg

LEGEND

EXISTING 1' CONTOUR
EXISTING 5' CONTOUR
EXISTING DITCH/SWALE FLOW LINE
EXISTING STORM SEWER/CULVERT
EASEMENT
BUILDING ENVELOPE
PROPERTY/RIGHT-OF-WAY LINE
CENTERLINE
EXISTING FENCE
EXISTING UNDERGROUND ELECTRIC
EXISTING TELEPHONE
EXISTING GAS
EXISTING 6"Ø WATER MAIN/VALVE
EXISTING WATER MAIN/VALVE
EXISTING FIRE HYDRANT ASSEMBLY
EXISTING 8"Ø SEWER MAIN/MANHOLE
EXISTING 8"Ø SEWER MAIN/MANHOLE
EXISTING SEWER SERVICE & CLEANOUT
EXISTING/PROPOSED STREET SIGN
EXISTING/PROPOSED STREET LAMP-CARRIAGE
EXISTING/PROPOSED STREET LIGHT
EXISTING/PROPOSED STREET LAMP BOX
EXISTING/PROPOSED TRANSFORMER
EXISTING/PROPOSED ELEC./TELE./CABLE PEDESTAL
EXISTING/PROPOSED SWITCH CABINET
EXISTING/PROPOSED ELECTRIC VAULT
EXISTING/PROPOSED ELECTRIC METER (PED./WALL)

PROPOSED 1' CONTOUR
PROPOSED 5' CONTOUR
PROPOSED DITCH/SWALE FLOW LINE
PROPOSED 18"Ø STORM DRAIN
PROPOSED SEDIMENT CONTROL FENCING
PROPOSED TELEPHONE
PROPOSED ELECTRIC
PROPOSED GAS
PROPOSED FIBER OPTICS
PROPOSED WATER MAIN/VALVE
PROPOSED WATER SERVICE/SHUT OFF VALVE
PROPOSED FIRE HYDRANT ASSEMBLY
PROPOSED SEWER MAIN/MANHOLE
PROPOSED SEWER SERVICE & CLEANOUT
PROPOSED ROCK SOCK OR EROSION LOG
EXISTING/PROPOSED INLET Type-13
EXISTING/PROPOSED INLET Type-16 (CURB)
EXISTING/PROPOSED INLET Type-D
EXISTING/PROPOSED AREA INLET
DIRECTION OF FLOW
ASPHALT/CONCRETE/GRAVEL DEMOLITION

ZONE C
ZONE A
ZONE A
ZONE D
ELECTRIC & CABLE SERVICE LINES TO BE RELOCATED
GAS LINE TO BE RELOCATED
EX. ELECTRIC VAULT, BEGIN NEW ELECTRIC LINE CONSTRUCTION
BEGIN NEW 8" WATER LINE CONSTRUCTION
EX. FIRE HYDRANT TO BE RELOCATED IN FRONT OF NEW SIDEWALK
NEW GAS LINE LOCATION
ZONE C
ZONE B
ZONE A
EX. MANHOLE
INSTALL FIRE HYDRANT
WATER SERVICE, FIRE SPRINKLER SERVICE, ELECTRIC, GAS & COMMUNICATION SERVICES
BUILDING F
SEWER SERVICE LOCATION
EX. MANHOLE
GAS LINE TO BE RELOCATED
NEW 8" WATER LINE
ELECTRIC LINE TO BE RELOCATED
EX. MANHOLE & SEWER LINE TO BE REMOVED
WATER SERVICE, FIRE SPRINKLER SERVICE, ELECTRIC, GAS & COMMUNICATION SERVICES
INSTALL FIRE HYDRANT
BUILDING E
BUILDING D
WATER SERVICE, FIRE SPRINKLER SERVICE, ELECTRIC, GAS & COMMUNICATION SERVICES
SEWER SERVICE LOCATION
INSTALL FIRE HYDRANT
BUILDING C
WATER SERVICE, FIRE SPRINKLER SERVICE, ELECTRIC, GAS & COMMUNICATION SERVICES
SEWER SERVICE LOCATION
INSTALL FIRE HYDRANT
BUILDING B
WATER SERVICE, FIRE SPRINKLER SERVICE, ELECTRIC, GAS & COMMUNICATION SERVICES
NEW MANHOLE
NEW 8" SEWER MAIN
SEWER SERVICE LOCATION
PARKING LOT B
WATER SERVICE, FIRE SPRINKLER SERVICE, ELECTRIC, GAS & COMMUNICATION SERVICES
BUILDING A
SEWER SERVICE LOCATION
NEW MANHOLE
EX. FIRE HYDRANT
INSTALL NEW SEWER LINE INTO EX. MANHOLE
END NEW 8" WATER LINE CONSTRUCTION
EX. ELECTRIC VAULT END NEW ELECTRIC LINE CONSTRUCTION
ZONE A
ZONE B
ZONE D
ZONE D
ZONE A

N:\PROJECTS\2020\20002-Bell Rippy Townhouses\dwg\20002 C-Utility.dwg 4/20/2020 9:01 AM

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Engineer or Surveyor Seal

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Review

Client Information:
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12 VAIL ROAD, SUITE 700
VAIL, COLORADO 81657
970 479-9990

NORTH
0 40' 80'
Scale: 1" = 40'

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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Overall Utility Plan

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
2.			
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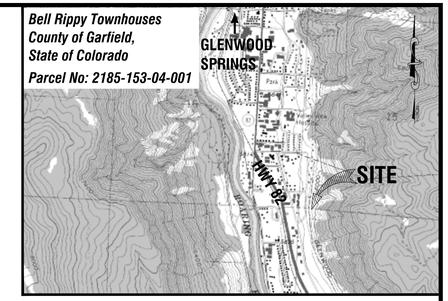
PROJECT NO. 20002
Designer: DJW
Drafter: BUI
Date: 3/03/20

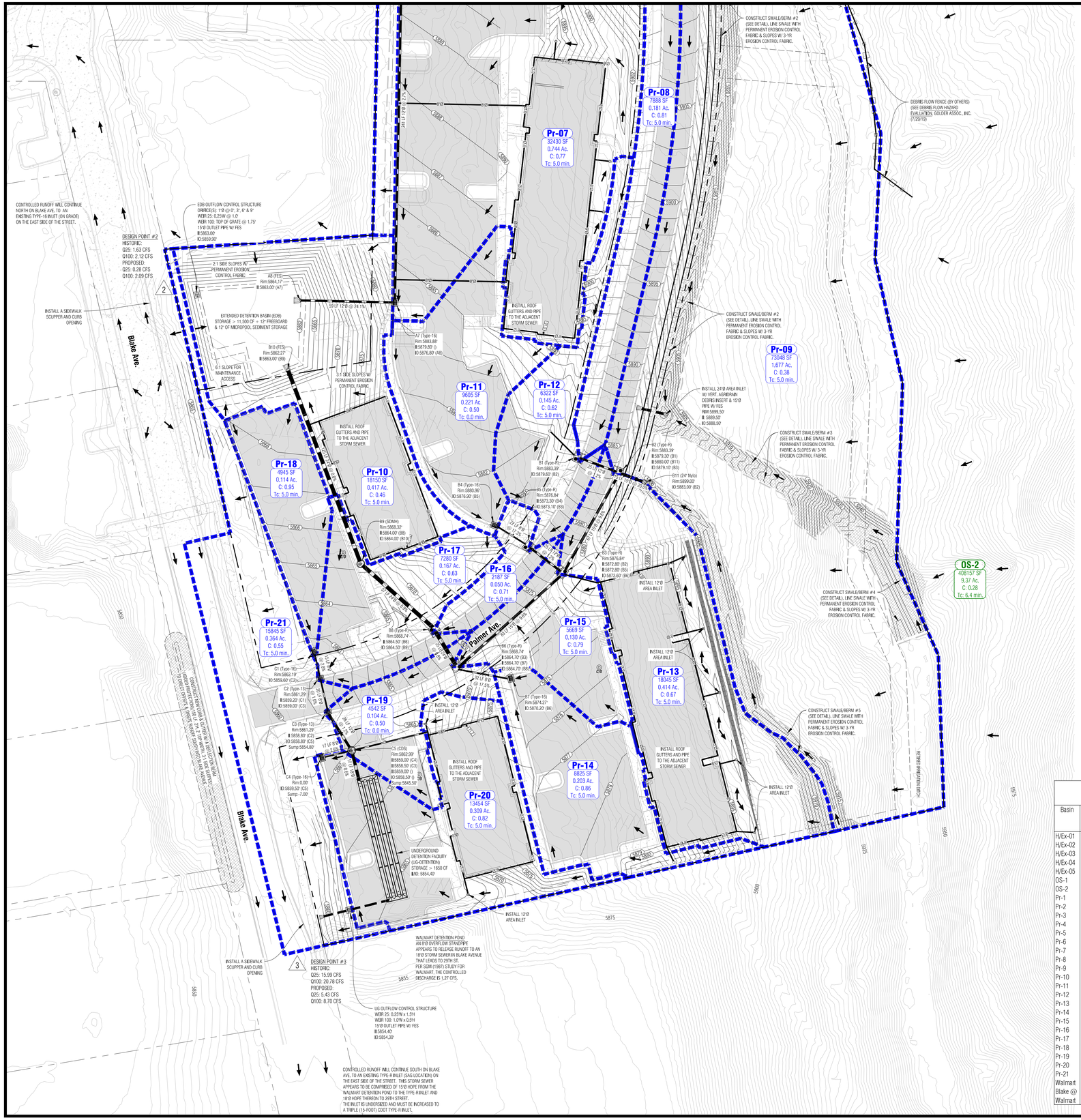
Sheet C.9

File Name: 20002 c-utility.dwg

Bell Rippy Townhouses
County of Garfield,
State of Colorado
Parcel No: 2185-153-04-001



VICINITY MAP
Scale: 1" = 4000'



STORMWATER MANAGEMENT AND EROSION/SEDIMENT CONTROL NOTES

1. THE PREPARATION OF STORMWATER MANAGEMENT PLANS, PERMITTING AND COMPLIANCE ARE THE RESPONSIBILITY OF THE CONTRACTOR. THIS PROJECT MAY ALSO REQUIRE A PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY FROM THE STATE OF COLORADO. THE CONTRACTOR IS TO COMMENCE WORK ON THIS SITE ONLY AFTER AN ACTIVE PERMIT NUMBER HAS BEEN OBTAINED FROM THE STATE OF COLORADO. THE STORMWATER MANAGEMENT PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO APPLYING FOR THE PERMIT. THE CONTRACTOR IS TO PROVIDE EROSION CONTROL IN ACCORDANCE WITH STATE OF COLORADO GUIDELINES.
2. THE CONTRACTOR SHALL CONTINUOUSLY PROVIDE ADEQUATE STORMWATER MANAGEMENT IN ACCORDANCE WITH AN APPROVED STORMWATER MANAGEMENT PLAN (SWMP) FROM THE STATE OF COLORADO.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE PUBLIC STREETS, ACCESS ROUTES, AND WATERWAYS IN THE VICINITY OF THE JOB SITE CLEAN AND FREE OF ROCKS, SOIL AND DEBRIS.
4. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROL "BEST MANAGEMENT PRACTICES" (BMPS) PRIOR TO ANY SITE PREPARATION WORK (E.G., CLEARING, GRUBBING, DEMOLITION, OR EXCAVATION).
5. A GROUNDWATER DISCHARGE PERMIT MAY BE REQUIRED FROM THE STATE GOVERNING AUTHORITY PRIOR TO DISCHARGE. GROUNDWATER SHALL BE SAMPLED AND SENT TO AN APPROVED LABORATORY FOR TESTING PRIOR TO BEING DISCHARGED. TESTING SHALL BE IN ACCORDANCE WITH THE PERMIT FOR STORMWATER DISCHARGE.
6. A WATER SOURCE MUST BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
7. ALL DITCHES & EROSION CONTROL SHOULD BE COMPLETED TO THE RECEIVING STREAM.
8. THE PLACEMENT OF EROSION AND SEDIMENT BMPS SHALL BE IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN IF IT WAS PREPARED FOR THE PROJECT. CONTRACTOR TO ADJUST QUANTITY, LOCATION, AND TYPE OF EROSION AND SEDIMENT CONTROL BMPS AS NECESSARY FOR THE VARIOUS PHASES OF THE WORK AND AS ACTUAL CONDITIONS WARRANT. CONTRACTOR SHALL CONTINUOUSLY MODIFY THE EROSION AND SEDIMENT CONTROL PLAN WITH CURRENT BMPS IN ACCORDANCE WITH THE CONSTRUCTION STORMWATER PERMIT REQUIREMENTS. ADDITIONAL EROSION AND SEDIMENT CONTROL BMPS EMPLOYED BY THE CONTRACTOR AT HIS DISCRETION WILL NOT BE MEASURED OR PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
9. APPROVED EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. UNLESS OTHERWISE REQUIRED BY THE STATE'S CONSTRUCTION STORMWATER PERMIT, AT A MINIMUM THE CONTRACTOR SHALL INSPECT ALL BMPS EVERY 14 DAYS, AND AFTER ALL SIGNIFICANT PRECIPITATION EVENTS I.E. RAINFALL, SNOWMELT. ALL NECESSARY MAINTENANCE AND REPAIR ACTIVITIES SHALL BE COMPLETED WITHIN TWENTY-FOUR (24) HOURS AFTER DIRECTION BY THE INSPECTOR. ACCUMULATED SEDIMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED WEEKLY FROM ALL BMPS, OR AT ANY TIME THAT SEDIMENT OR CONSTRUCTION DEBRIS ADVERSELY IMPACTS THE FUNCTIONING OF THE BMPS.
10. TOPSOIL AND SUITABLE EARTHEN MATERIALS SHALL BE SEGREGATED AND STOCKPILED WITHIN THE LIMITS OF CONSTRUCTION FOR USE ON AREAS TO BE FILLED AND RE-VEGETATED. ANY AND ALL STOCKPILES SHALL BE PLACED IN AN APPROVED LOCATION AND PROTECTED FROM EROSIVE ELEMENTS USING MEASURES SPECIFIED IN THE EROSION/SEDIMENT CONTROL PLAN AND APPROVED STORMWATER MANAGEMENT PLAN (SWMP) FROM THE STATE OF COLORADO.
11. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE MULCHED AND SEEDED WITH A TEMPORARY OR PERMANENT GRASS COVER WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION.
12. ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
13. THE CONTRACTOR MUST KEEP ALL POLLUTANTS, INCLUDING SEDIMENT, CONSTRUCTION DEBRIS, AND TRENCH BACKFILL MATERIALS FROM ENTERING THE STORM SEWER SYSTEM.
14. ALL SPILLS INCLUDING, BUT NOT LIMITED TO, PETROLEUM PRODUCTS, SOLVENTS, AND CEMENT SHALL BE CLEANED UP IMMEDIATELY. THE LOCAL TOWN/CITY/COUNTY AND STATE'S GOVERNING AUTHORITY SHALL BE NOTIFIED IMMEDIATELY.
15. THE CONTRACTOR SHALL ENSURE THAT ALL LOADS OF CUT AND FILL MATERIAL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORT ON PUBLIC RIGHT-OF-WAY. ALL MATERIAL EXPORTED FROM THE SITE SHALL BE DISPOSED OF AT A SITE PERMITTED TO ACCEPT SUCH MATERIAL.
16. THE USE OF REBAR, STEEL STAKES OR STEEL FENCE POSTS FOR STAKING DOWN STRAW OR HAY BALES, OR TO SUPPORT SILT FENCING USED AS AN EROSION CONTROL MEASURE, IS PROHIBITED.
17. THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED LOCATIONS ON THE JOB SITE. THE DISCHARGE OF WATER CONTAINING WASTE CEMENT TO THE STORM SEWER SYSTEM IS PROHIBITED. ALL CONCRETE WASTE SHALL BE PROPERLY CLEANED UP AND DISPOSED OF AT AN APPROPRIATE LOCATION.
18. CONTRACTOR SHALL PROVIDE A COMPLETED "NOTICE OF TERMINATION" TO OWNER, FOR OWNERS SUBMITTAL TO THE STATE'S GOVERNING AUTHORITY ONCE THE PROJECT IS COMPLETE, ALL DISTURBED AREAS HAVE BEEN STABILIZED AND TEMPORARY BMPS HAVE BEEN REMOVED.
19. THE CONTRACTOR SHALL CLEAN OUT ALL EXISTING AND PROPOSED INLETS, PIPES AND MANHOLES OF DEBRIS AND SEDIMENTATION AT COMPLETION OF SITEWORK. THIS WORK SHALL BE DONE TO THE SATISFACTION OF THE OWNER AND LOCAL AUTHORITIES. ANY CONSTRUCTION DEBRIS OR MUD DROPPED INTO MANHOLES, INLETS, PIPES OR TRACKED ONTO EXISTING ROADWAYS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL REPAIR ANY EXCAVATIONS OR PAVEMENT FAILURES CAUSED BY HIS CONSTRUCTION.
20. THE CONTRACTOR SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO SIGNIFICANTLY REDUCE ANY POTENTIAL POLLUTION CAUSED BY HIS ACTIVITIES, INCLUDING VEHICLE FUELING, STORAGE OF FERTILIZERS OR CHEMICALS, ETC. THE CONTRACTOR SHALL HAVE IDENTIFIED PROCEDURES FOR HANDLING POTENTIAL POLLUTANTS AND HAVE IDENTIFIED SPILL PREVENTION AND RESPONSE PROCEDURES PRIOR TO ANY ACTIVITIES AT THE PROJECT SITE.
21. GRADE LANDSCAPED AREAS TO PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDINGS AND SIDEWALKS IN CONFORMANCE WITH THE REQUIREMENTS OF THE PROJECT GEOTECHNICAL REPORT.
22. IN CASE OF ANY DISCREPANCIES REGARDING EARTHWORK BETWEEN THE GEOTECHNICAL REPORT AND THE SPECIFICATIONS SHOWN IN THESE PLANS, NOTIFY THE PROJECT ENGINEER AND OWNERS CONSTRUCTION PROJECT MANAGER IMMEDIATELY.
23. ROOF GUTTERS ARE REQUIRED ON ALL BUILDINGS AND DOWNSPOUTS ARE TO BE PIPED INTO THE STORMSEWER SYSTEM. ROOF RUNOFF IS NOT PERMITTED TO DISCHARGE ONTO THE GROUND SURFACE.
24. STORM SEWER PIPE MATERIALS SHALL BE WATER TIGHT HDPE DOUBLE-WALL, SMOOTH INTERIOR PIPE (ADS N-12-WT OR ENGINEER APPROVED EQUAL) OR RUBBER GASKET REINFORCED CONCRETE PIPE (RCP) UNLESS OTHERWISE SPECIFIED IN THE PLANS.
25. STORM SEWER STRUCTURES SHALL BE COMPLY WITH COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD PLANS (M-STANDARDS) AND/OR MILE HIGH FLOOD DISTRICT (MHFD) STANDARDS, LATEST EDITIONS.
26. SOIL EROSION CONTROL FABRIC SHALL BE NORTH AMERICAN GREEN VMAX P500 (PERMANENT) IN FLOW CHANNELS/SWALES AND C125 (3-YR) ON DISTURBED SLOPES STEEPER THAN 3:1), OR ENGINEER APPROVED EQUAL.
27. BEARINGS ARE BASED ON THE SOUTH LINE OF OAKHURST SUBDIVISION, FIRST FILING ACCORDING TO THE PLAT FILED AT RECEPTION NO. 241379 IN THE OFFICE OF THE GARFIELD COUNTY CLERK AND RECORDER. THE VALUE USED, S77°23'50"W AS SHOWN THEREON WAS DETERMINED FROM A FOUND PLASTIC CAP STAMPED LS 37935 AT THE WEST AND EAST ENDS OF SAID LINE.

Drainage Basin Summary
Bell Rippy Townhouses

Basin	Area (sf)	Impervious		Soil Type B				Soil Type D		Runoff C	Tc (min.)	WQCV (EDB) (in)	V_{WQ} (cf) (d6=0.34)	Design Point V_{WQ} (cf)	Q_{25} (cfs)	Q_{100} (cfs)
				Open Space/LS		Natural Vegetation		Natural Vegetation								
		Area (sf)	%	Area (sf)	%	Area (sf)	%	Area (sf)	%							
H/Ex-01	67574	-	-	-	-	-	-	67574	100%	0.37	7.21	-	-		2.46	3.20
H/Ex-02	20084	-	-	-	-	-	-	20084	100%	0.37	6.51	-	-		0.77	0.99
H/Ex-03	15964	-	-	-	-	-	-	15964	100%	0.37	6.54	-	-		0.61	0.79
H/Ex-04	30586	-	-	-	-	-	-	30586	100%	0.37	7.39	-	-		1.10	1.43
H/Ex-05	170017	-	-	-	-	-	-	170017	100%	0.37	8.75	-	-		5.67	7.37
OS-1	5423220	-	-	5097827	94%	-	-	325393	6%	0.36	22.45	-	-		102.44	131.82
OS-2	408157	-	-	89794.58	22%	-	-	318363	78%	0.28	6.32	-	-		11.93	15.50
Pr-1	24815	5590	22.5%	1125	4.5%	14510	58.5%	3590	14.5%	0.48	5.00	0.126	206		1.38	1.79
Pr-2	5326	4301	80.8%	1025	19.2%	-	-	-	-	0.83	5.00	0.333	117		0.51	0.67
Pr-3	12339	9259	75.0%	3080	25.0%	-	-	-	-	0.79	5.00	0.300	244		0.82	1.06
Pr-4	14372	1442	10.0%	-	-	12930	90.0%	-	-	0.33	5.00	0.057	64		0.55	0.71
Pr-5	6391	4551	71.2%	1840	28.8%	-	-	-	-	0.77	5.00	0.281	118		0.57	0.74
Pr-6	12701	9241	72.8%	3460	27.2%	-	-	-	-	0.78	5.00	0.288	241		1.15	1.49
Pr-7	32430	23160	71.4%	9270	28.6%	-	-	-	-	0.77	5.00	0.282	602		2.90	3.76
Pr-8	7888	6098	77.3%	1790	22.7%	-	-	-	-	0.81	5.00	0.312	162		0.74	0.96
Pr-9	73048	4913	6.7%	1895	2.6%	51070	69.9%	15170	20.8%	0.38	5.00	0.047	228		3.22	4.18
Pr-10	18150	5040	27.8%	13110	72.2%	-	-	-	-	0.46	5.00	0.144	173		0.97	1.26
Pr-11	9605	8225	85.6%	1380	14.4%	-	-	-	-	0.87	5.00	0.367	232		0.97	1.26
Pr-12	6322	3192	50.5%	3130	49.5%	-	-	-	-	0.62	5.00	0.208	86		0.45	0.59
Pr-13	18045	9315	51.6%	1720	9.5%	7010	38.8%	-	-	0.67	5.00	0.211	251		1.40	1.82
Pr-14	8825	7585	85.9%	1240	14.1%	-	-	-	-	0.86	5.00	0.369	215		0.88	1.14
Pr-15	5669	4239	74.8%	1430	25.2%	-	-	-	-	0.79	5.00	0.298	111		0.52	0.67
Pr-16	2187	417	19.1%	1770	80.9%	-	-	-	-	0.40	5.00	0.112	16		0.34	0.44
Pr-17	7280	3830	52.6%	3450	47.4%	-	-	-	-	0.63	5.00	0.213	102	3167	0.16	0.21
Pr-18	4945	4815	97.4%	130	2.6%	-	-	-	-	0.95	5.00	0.471	154		0.55	0.71
Pr-19	4542	3562	78.4%	980	21.6%	-	-	-	-	0.82	5.00	0.319	95		0.43	0.56
Pr-20	13454	10464	77.8%	1495	11.1%	1495	11.1%	-	-	0.82	5.00	0.315	279		1.28	1.66
Pr-21	15845	6365	40.2%	9480	59.8%	-	-	-	-	0.55	5.00	0.180	188	835	1.01	1.31
Walmart	67518	67518	100.0%	-	-	-	-	-	-	0.95	10.00	N/A	N/A	N/A	5.45	7.08
Blake @ Walmart	1743	1743	100.0%	-	-	-	-	-	-	0.97	5.00	N/A	N/A	N/A	0.20	0.26

Civil Engineering
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Boundaries Unlimited Inc.
923 Cooper Ave., Ste. 201
Glenwood Springs, CO 81601
(T) 970.945.5252
www.bu-inc.com

Subsurface Utility Engineering (SUE)
Required Project: ***N/A***

If "Yes", SUE Certification by:
Firm: ***N/A***
Job #: ***N/A***
Date: ***N/A***

Engineer or Surveyor Seal

Client Information:
TRIUMPH
12 VAIL ROAD, SUITE 700
VAIL, COLORADO 81657
970 479-9990

NORTH
0 10' 20'
Scale: 1" = 10'

Know what's **below.**
Call before you dig.

GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Drainage Site Plan

30% Review Set - Major Site Plan Submission

No.	Date	Revision	By
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

PROJECT NO. ***20002***
Designer: ***DJW***
Drafter: ***BUI***
Date: ***3/03/20***

Sheet
SD-1

File Name: ***20002-c-drainage.dwg***

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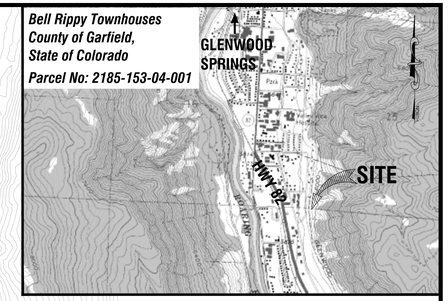
Bell Rippy Townhouses
County of Garfield,
State of Colorado
Parcel No: 2185-153-04-001



VICINITY MAP
Scale: 1" = 4000'

ZONE A
ZONE B
ZONE C
ZONE D

RUNOFF (OFFSITE PASS-THRU) MINUS A MINOR AMOUNT CAPTURED BY INLETS A1/A2/) WILL CONTINUE NORTH ON 26TH ST., TO EXISTING AREA INLETS ON BLAKE AVE.

DESIGN POINT #1
HISTORIC:
Q25: 102.44 CFS
Q100: 131.82 CFS
PROPOSED:
Q25: 102.12 CFS
Q100: 131.44 CFS

CONSTRUCT A DEFLECTION BERM (2H, 2' TOP WIDTH, 3:1 SIDE SLOPES) TO DIRECT OFFSITE & ONSITE RUNOFF WEST INTO 26TH ST.

A3 (Type-16)
Rim:5896.76
I: 5891.20' (A2)
O: 5891.00' (A4)

A2 (Type-R)
Rim:5896.57
I: 5892.20' (A1)
O: 5892.00' (A3)

81 LF 12"Ø @ 1.2%

25 LF 12"Ø @ 1.2%

A1 (Type-R)
Rim:5896.57
O: 5892.50' (A2)

RUNOFF CAPTURE HEAD/STEM WALL W/ CONCRETE APRON & A 24'x2' CONCRETE BOX CULVERT @ 1% MIN.
TOW: 5910.00'
I: 5902.50' O: 5902.00'
INSTALL GROUTED RIPRAP (5'x20') FROM THE OUTLET TO THE CURB.

Pr-04
14401 SF
0.331 Ac.
C: 0.33
Tc: 5.0 min.

RUNOFF FROM PR-04 WILL SHEET FLOW WEST ONTO ADJACENT PROPERTIES AT A PEAK FLOW RATE AND QUANTITY LESS THAN HISTORIC

Pr-03
12339 SF
0.283 Ac.
C: 0.79
Tc: 5.0 min.

13 LF 12"Ø @ 10%

CONSTRUCT SWALE/BERM #1 (SEE DETAIL), LINE SWALE WITH PERMANENT EROSION CONTROL FABRIC & SLOPES W/ 3-YR EROSION CONTROL FABRIC.

CONSTRUCT 16'W DRIVE (8% MAX.)

CONSTRUCT 10'W ACCESS TRAIL (8% MAX.)

1.5:1 SLOPES W/ 3-YR EROSION CONTROL FABRIC

DEBRIS FLOW FENCE (BY OTHERS) (SEE DEBRIS FLOW HAZARD EVALUATION, GOLDER ASSOC., INC. (7/29/19)

REINFORCED FENCE

CUT IN SWALE BEHIND THE FENCE TO DIRECT RUNOFF TO SWALE/BERM #1

Pr-01
24815 SF
0.570 Ac.
C: 0.48
Tc: 5.0 min.

OS-1
5423220 SF
124.5 Ac.
C: 0.36
Tc: 22.5 min.

A9 (SDMH)
Rim:5900.19'
I: 5894.40' (A10)
O: 5894.20' (A4)

34 LF 12"Ø @ 1.1%

A4 (SDMH)
Rim:5899.80
I: 5889.70' (A3)
I: 5893.80' (A9)
O: 5889.50' (A5)

A5 (SDMH)
Rim:5893.80'
I: 5889.10' (A4)
O: 5888.90' (A6)

Pr-05
6391 SF
0.147 Ac.
C: 0.77
Tc: 5.0 min.

117 LF 12"Ø @ 2.1%

Pr-02
5326 SF
0.122 Ac.
C: 0.83
Tc: 5.0 min.

Pr-06
12701 SF
0.292 Ac.
C: 0.78
Tc: 5.0 min.

A6 (SDMH)
Rim:5890.77'
I: 5886.50' (A5)

A10 (12" NyloI)
Rim:5899.00'
O: 5896.00' (A9)

1.5:1 SLOPES W/ 3-YR EROSION CONTROL FABRIC

CONSTRUCT SWALE/BERM #2 (SEE DETAIL), LINE SWALE WITH PERMANENT EROSION CONTROL FABRIC & SLOPES W/ 3-YR EROSION CONTROL FABRIC.

Pr-08
7888 SF
0.181 Ac.
C: 0.81
Tc: 5.0 min.

241 LF 12"Ø @ 2.1%

Pr-07
32430 SF
0.744 Ac.

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Subsurface Utility Engineering (SUE)
Required Project: *N/A*

If "Yes", SUE Certification by:
Firm: *N/A*
Job #: *N/A*
Date: *N/A*

Engineer or Surveyor Seal

Client Information:
TRIUMPH
12 VAIL ROAD, SUITE 700
VAIL, COLORADO 81657
970 479-9990

NORTH
0 10' 20'
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811
Know what's **below.**
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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Drainage Site Plan

30% Review Set - Major Site Plan Submission

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9.			

PROJECT NO.
20002
Designer:
DJW
Drafter:
BUI
Date:
3/03/20

Sheet
SD-2

File Name: *20002-c-drainage.dwg*

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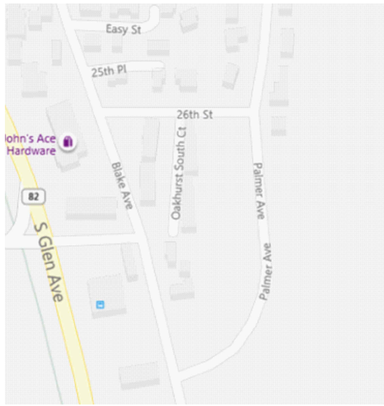
BELL RIPPY APARTMENTS

RENTAL RESIDENTIAL UNITS
- 6 BUILDINGS
- 100 UNITS

GLENWOOD SPRINGS
GARFIELD COUNTY, COLORADO



VACINITY MAP

LANDSCAPE AREA: 4/21/2020

SITE LANDSCAPE (not including parking lot landscape)

		TREES		SHRUBS		PERENNIALS	
NORTH PARCEL		REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED
lot	121,154						
Bldgs	51,594						
parking lot	37,585						
landscape	56,475	141	86	565	678	1,129	substitute 113 shrubs
walk	5,892						
SOUTH PARCEL		TREES		SHRUBS		PERENNIALS	
		REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED
lot	43,121						
BLDg	19,000						
parking lot	14,777						
landscape	15,554	39	65	156	188	311	substitute 32 shrubs
walk	2,669						
	total	180	131	720	866	1,441	sub for 144 shrubs

STREET TREES	LINEAR FEET	REQ. TREES - 1/25 LF	PROVIDED
PALMER AVE - EAST SIDE	924	13	58
PALMER AVE - WEST SIDE	924	13	32
26TH ST SOUTH SIDE	110	5	5
BLAKE AVE. EAST SIDE	444	9	9
	total	34	60

PARKING LOT ISLANDS:		1 TREE/ISLAND		5 SHRUBS/ISLAND		
		REQUIRED	PROVIDED	REQUIRED	PROVIDED	
		19	18	93	93	
	total project	233	217	815	951	1,441 sub for shrubs
			(16)		146	10 per/shrub

PARKING LOT AREA	% required	REQUIRED SF	PROVIDED SF	percentage provided
NORTH:	10	7,517	23,57	10%
SOUTH:	10	5,955	5,955	20%

LANDSCAPE TOTALS

Bell Rippy Apartments - Zoning Summary for Residential Transitional (RT) District

Lot Area	2700 Palmer	5.51	acres		
	2710 Blake	0.23	acres		
	Total	5.74	acres		
Zoning Criteria		**Code**		**Proposed Plan**	
Use		Permitted Use		Dwelling, multifamily	
Density	Lot SF/Unit	2,500			
	Total Permitted Units	100	units	100	units
Setbacks	Front (Non-Arterial)	10	feet	10+	feet
	Side	5	feet	5+	feet
	Rear	10	feet	10+	feet
Height		40	feet	40	feet
Lot Coverage	Allowed	50%			
	Square Feet	120,008	sf	31,630	sf
Landscape Area	Minimum Required	20%			
	Square Feet	48,003	sf	122,540	sf
Parking	Resident Parking (per DU)	1.5	150		
	Guest Parking (per DU)	0.2	20		
	Subtotal		170		
	Transit Proximity Discount	20%	(34)		
	Total		136	148	spaces

ZONING TABLE

LIST OF SHEETS

ARCHITECTURAL

A0	COVER SHEET, LIST OF SHEETS, PROJECT DATA
A1	SITE PLAN
A1.1	SITE ACCESSORIES
A1.2	SITE LIGHTING PLAN
AA2.0	BUILDING A FLOOR PLANS
AA3.0	BUILDING A ELEVATIONS
AA3.1	BUILDING A ELEVATIONS MATERIAL CALCS
AA5.0	BUILDING SECTIONS
AA8.0	TYPICAL UNIT PLANS
AB2.0	BUILDING B FLOOR PLANS
AB3.0	BUILDING B ELEVATIONS
AB3.1	BUILDING B ELEVATIONS MATERIAL CALCS
AC2.0	BUILDING C FLOOR PLANS
AC2.1	BUILDING C FLOOR PLANS
AC3.0	BUILDING C ELEVATIONS
AC3.1	BUILDING C ELEVATIONS
AC3.2	BUILDING C ELEVATIONS MATERIAL CALCS
AC3.3	BUILDING C ELEVATIONS MATERIAL CALCS
AD2.0	BUILDING D FLOOR PLANS
AD2.1	BUILDING D FLOOR PLANS
AD3.0	BUILDING D ELEVATIONS
AD3.1	BUILDING D ELEVATIONS
AD3.2	BUILDING D ELEVATIONS MATERIAL CALCS
AD3.3	BUILDING D ELEVATIONS MATERIAL CALCS
AE2.0	BUILDING E FLOOR PLANS
AE2.1	BUILDING E FLOOR PLANS
AE3.0	BUILDING E ELEVATIONS
AE3.1	BUILDING E ELEVATIONS
AE3.2	BUILDING E ELEVATIONS MATERIAL CALCS
AE3.3	BUILDING E ELEVATIONS MATERIAL CALCS
AF2.0	BUILDING F FLOOR PLANS
AF3.0	BUILDING F ELEVATIONS
AF3.1	BUILDING F ELEVATIONS MATERIAL CALCS

CIVIL

T1	COVER SHEET - SPEC
C1	OVERALL SITE PLAN
C2	SOUTH SITE PLAN
C3	SOUTH EAST SITE PLAN
C4	NORTH SITE PLAN
C5	PROFILES
C6	SOUTH GRADING / DRAINAGE
C7	SOUTH EAST GRADING / DRAINAGE
C8	NORTH GRADING / DRAINAGE
C9	OVERALL UTILITY PLAN
SD1	SOUTH DRAINAGE PLAN
SD2	NORTH DRAINAGE PLAN

LANDSCAPE:

L1	LANDSCAPE PLAN AND MATERIAL SCHEDULE

STRUCTURAL

MECHANICAL, ELECTRICAL, PLUMBING (MEP)

PROJECT DATA

OWNER: BELL RIPPY GLENWOOD, LLC

OWNER REPRESENTATIVE: TRIUMPH DEVELOPMENT WEST, LLC
MICHAEL O'CONNOR (970) 688-5057

ARCHITECT: TRIUMPH CUSTOM HOMES
MIKE FOSTER (303-475-4413)

STRUCTURAL ENGINEERING: MONROE NEWELL STRUCTURAL ENGINEERS
GRAIG CARROLL (303) 807-8403

MEP ENGINEERING: BURGGRAAF AND ASSOCIATES
MARK BURGGRAAF (970) 240-5990

CONTRACTOR: TBD

PROPERTY INFORMATIN
PARCEL #: 218515304001, 218515302008, 218521100002

ADDRESS: 2700 PALMER AVE & 2710 BLAKE AVE
GLENWOOD SPRINGS, CO 81601
LEGAL: BLOCK 1 (SOUTH OF LOT 9) AND BLOCK 3,

ZONING: RT DISTRICT AND RH DISTRICT

BLDG. HT: 42'-0" AT HIGHEST RIDGE ELEVATION

DESCRIPTION: RESIDENTIAL
TOTAL SF: 99,540 + 7,635 (STORAGE)
TOTAL OF SIX BUILDINGS / 100 UNITS

NOTES:

1. BUILDING CODES:
ALL WORK SHALL COMPLY WITH THE CURRENT CODES, THE INTERNATIONAL BUILDING CODE 2015. INCLUDING THE INTERNATIONAL ENERGY CODE 2009, THE INTERNATIONAL PLUMBING AND MECHANICAL CODES, THE CURRENT NEC AND ALL LOCAL CODES HAVING JURISDICTION.

2. PROPOSED BUILDING TYPE:
TYPE V-A, NFPA 13R SPRINKLED BUILDING
OCCUPANT GROUP:
R-2 - 200 SF / OCCUPANT
BUSINESS - 100 SF / OCCUPANT
MINIMUM FIRE RESISTIVE REQUIREMENTS:
STRUCTURAL FRAME 1 HR
BEARING WALLS 1 HR
FLOOR CONSTRUCTION 1 HR
ROOF CONSTRUCTION 1 HR

OCCUPANCY SEPARATION:
R-2 / B = 1 HR.

FIRE PROTECTION SYSTEM SUBMITTED SEPRATELY (SECTION 903.3)

SMOKE DETECTION SHALL BE PROVIDED THROUGHOUT.

FIRE ALARM SYSTEM (SECTION 907) PROVIDED THROUGHOUT

3. PROPOSED ENERGY COMPLIANCE:
WINDOW AND DOORS, U-0.35 OR LESS.
MINIMUM R-VALUES,
CEILINGS AND ROOFS, R-38
WALLS, R-23
FLOORS, R-30
SLAB PERIMETER AND DEPTH, R10/24-IN
CRAWL SPACE, R-10/13

4. AREA CALCULATIONS:

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Revision to Site
ARCHITECTURAL
PLAN SUBMISSION
3-3-20
MAJOR SITE
ARCHITECTURAL
PLAN RE-SUBMISSION
4-21-20

Sheet title
COVER
SHEET

Stamp

Date: 4/21/2020
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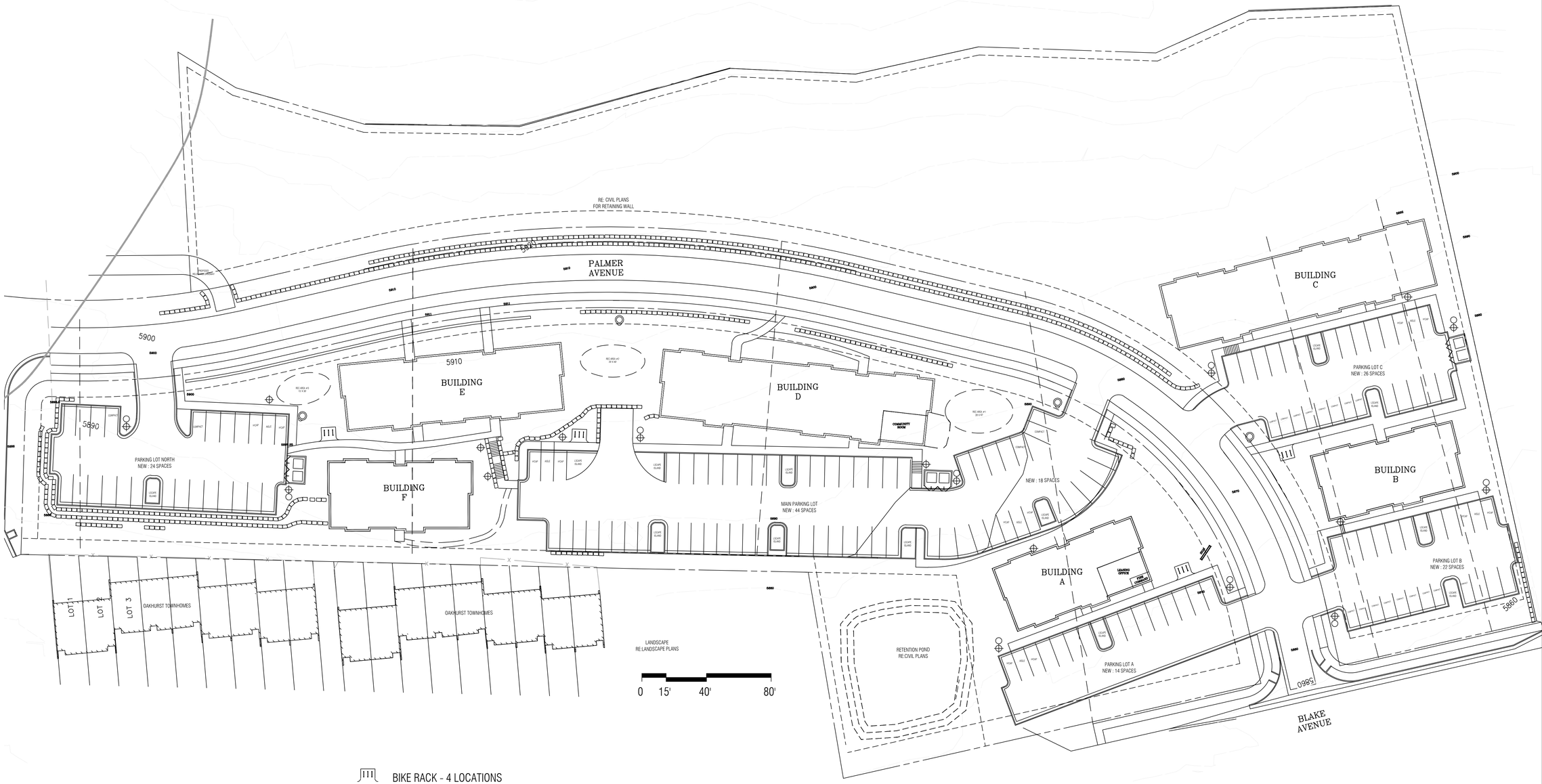
Sheet AA0.0



BIKE RACK - 4 LOCATIONS

TRASH ENCLOSURE - 3 LOCATIONS

BOLLARD - 10 LOCATIONS

LIGHT POLE - 11 LOCATIONS

SITE SIGNAGE

FIRE HYDRANTS - 4 LOCATIONS

1 SITE PLAN
1" = 30'-0"

NORTH

SITE PLAN

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PLAN SUBMISSION
3-3-20

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SCHEMATIC
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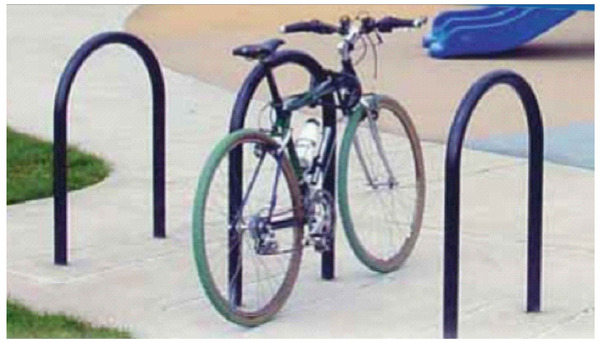

7 BIKE RACKS
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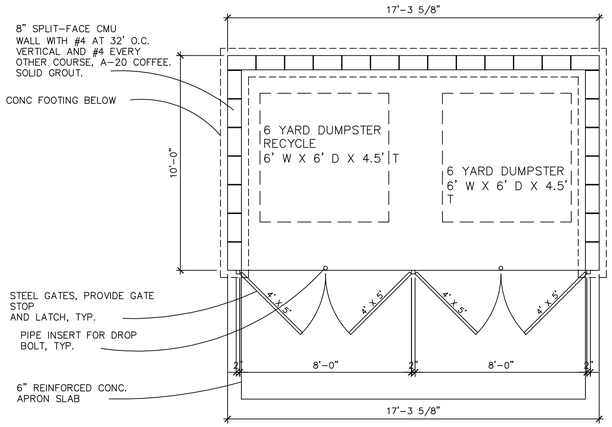

4 TRASH ENCLOSURE PLAN
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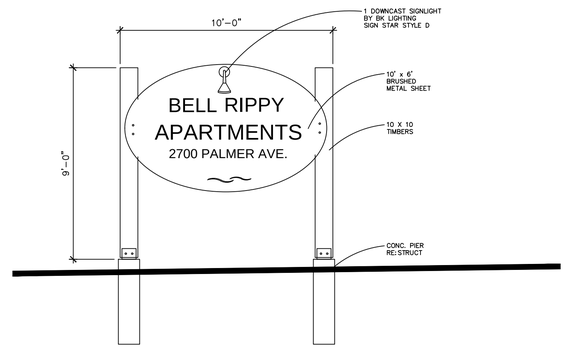
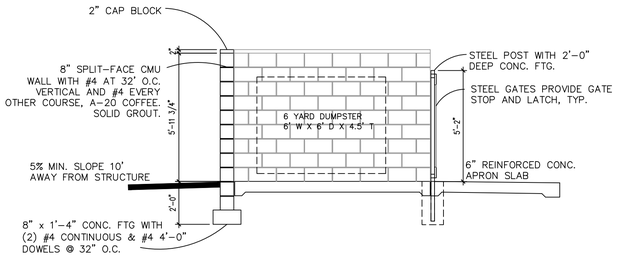


1 MONUMENT SIGN
N.T.S.

8 TRASH ENCLOSURE
N.T.S.



5 TRASH ENCLOSURE SECTION
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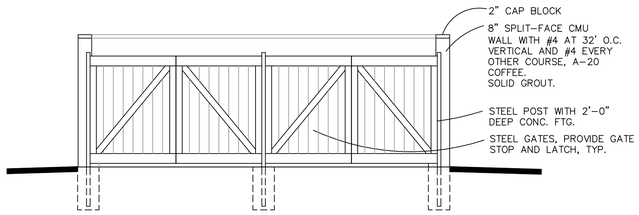
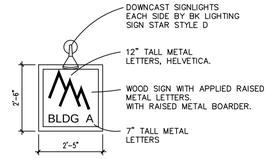


6 TRASH ENCLOSURE ELEVATION
N.T.S.



2 BUILDING SIGNAGE
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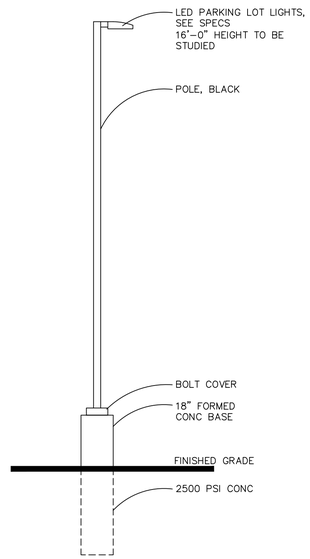

3 PARKING LOT LIGHTING
N.T.S.

SITE - ACCESSORIES

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MAJOR SITE ARCHITECTURAL PLAN RE-SUBMISSION 4-21-20

Sheet title
SITE PLAN ACCESSORIES

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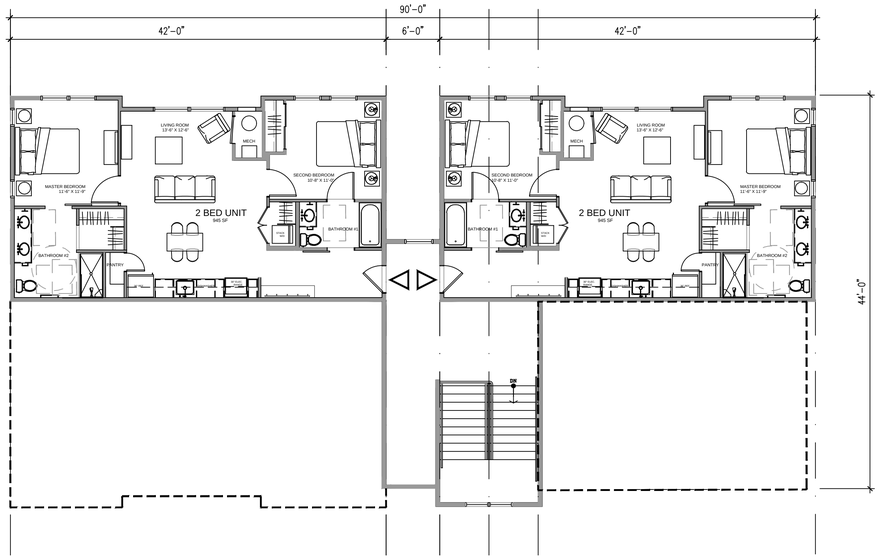
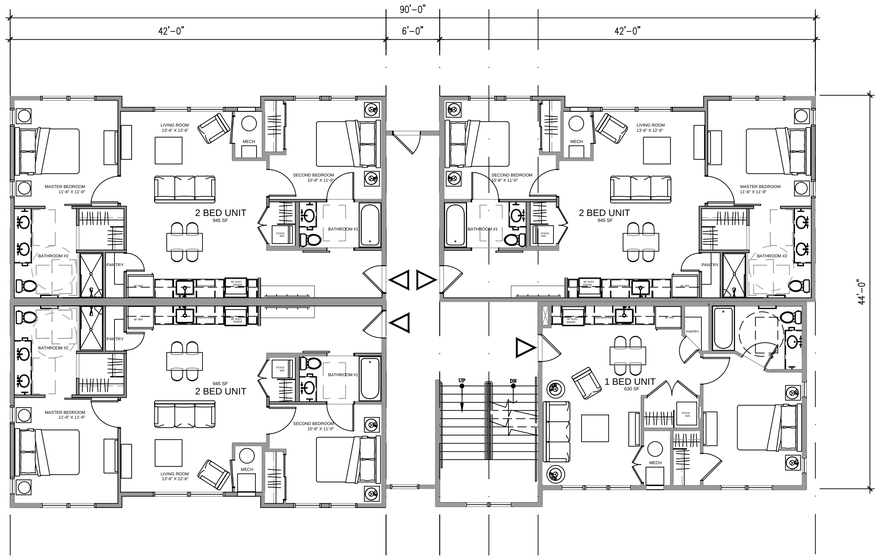


4 BUILDING A - THIRD LEVEL PLAN

1/8" = 1'-0"

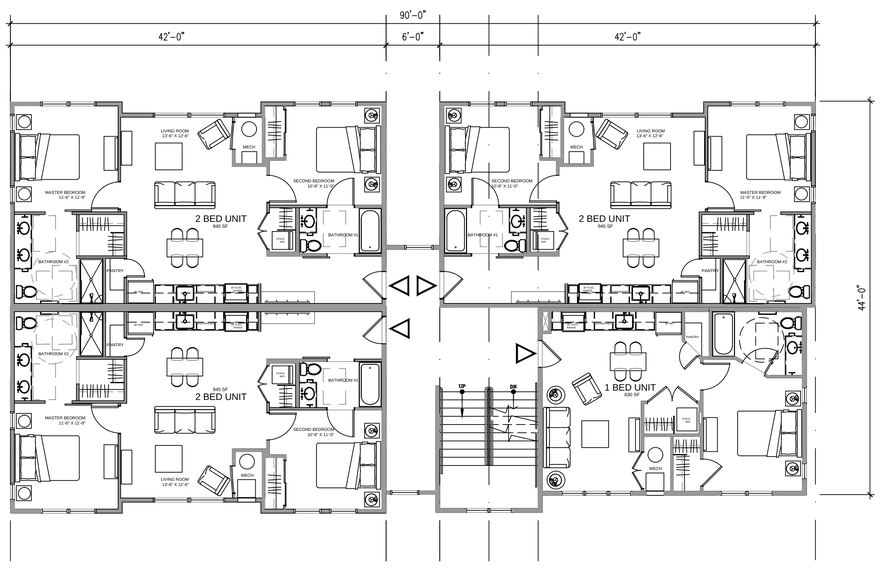


2 BUILDING A - FIRST LEVEL PLAN

1/8" = 1'-0"

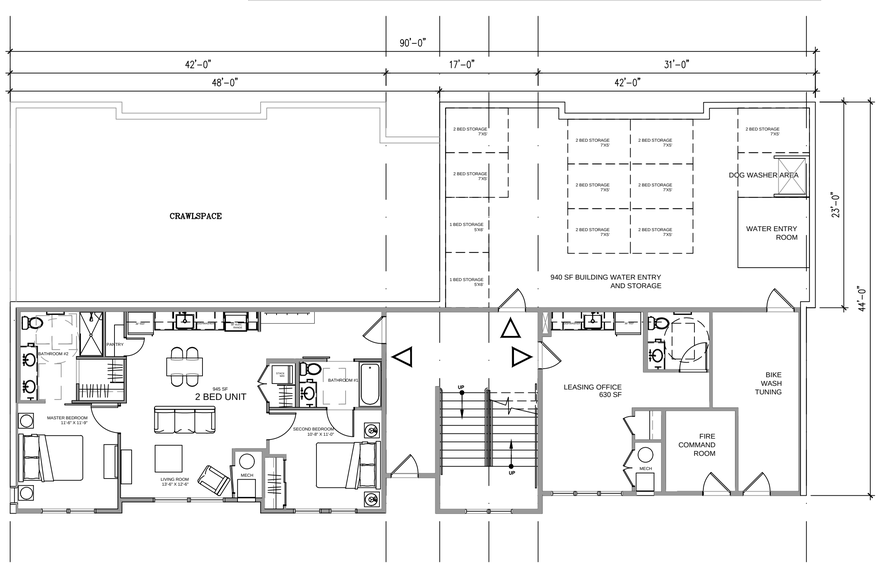
BELL RIPPY APARTMENTS

FLOOR	BUILDING COMMUNITY ROOM / LEASING	1 BEDROOM UNITS	2 BEDROOM UNITS	CIRCULATION	UTILITY / STORAGE	TOTAL SF (NOT INCLUDING STORAGE)
BUILDING A	630 SF	2 UNITS	9 UNITS	1,720 SF	940 SF	12,100 SF
BUILDING B		3 UNITS	9 UNITS	1,720 SF	940 SF	12,100 SF
BUILDING C		12 UNITS	12 UNITS	3,440 SF	1,840 SF	22,340 SF
BUILDING D	630 SF	11 UNITS	12 UNITS	3,440 SF	1,750 SF	22,340 SF
BUILDING E		6 UNITS	12 UNITS	3,440 SF	1,225 SF	18,580 SF
BUILDING F		3 UNITS	9 UNITS	1,720 SF	940 SF	12,100 SF
TOTALS EACH BUILDING	1,260 SF	37 UNITS	63 UNITS	15,480 SF	7,635 SF	99,540 SF +7,635 SF 107,175 SF



3 BUILDING A - SECOND LEVEL PLAN

1/8" = 1'-0"



1 BUILDING A - GARDEN LEVEL PLAN

1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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Date: 4/16/2020
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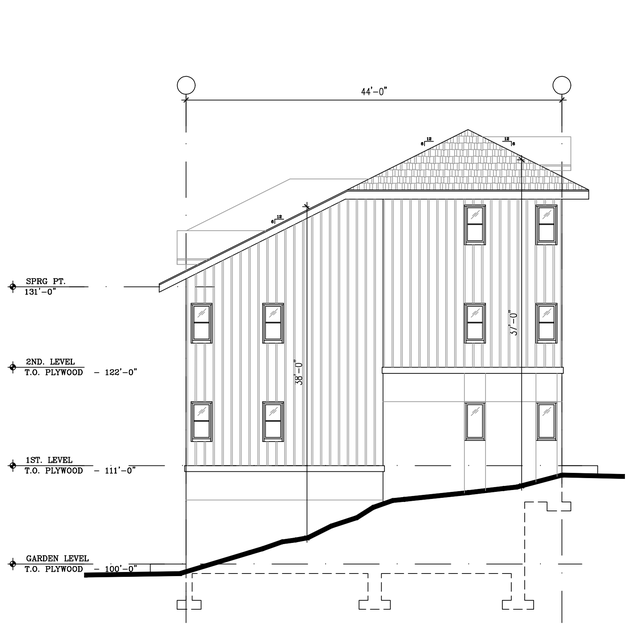
Sheet AA2.0

BUILDING A - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	RUSTIC SLATE
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 7" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	KHAKI BROWN
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	COBBLE BROWN
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	BENJAMIN MOORE "WISH" AF-680
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	BRONZE
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 1/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

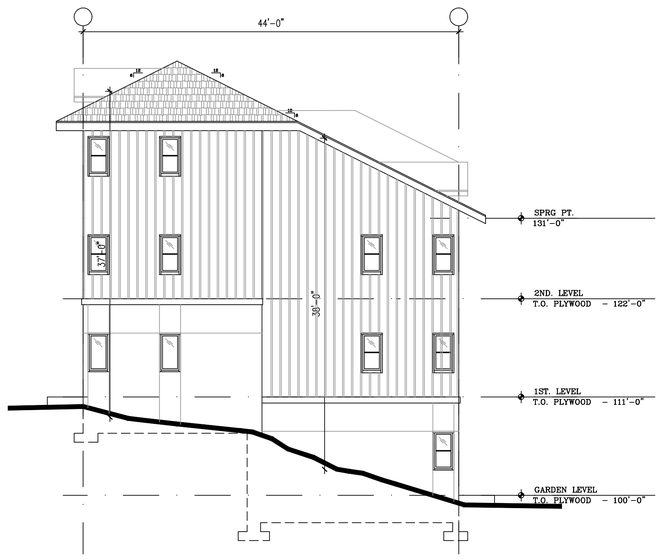
1. IN THE CASE OF ANY DISCREPANCIES BETWEEN THIS SCHEDULE AND OTHER CONTRACT DOCUMENTS, THE INFORMATION ON THIS SCHEDULE SHALL TAKE PRECEDENCE.
2. ALL FLASHING, VENTS, FLUES, ROOFTOP MECHANICAL EQUIPMENT, UTILITY BOXES, AND SIMILAR ITEMS SHALL BE PAINTED TO MATCH ADJACENT PORTIONS OF BUILDINGS UNLESS OTHERWISE NOTED.
3. TYPICAL SIDEWALL FLASHING: ICE&WATER SHIELD 2'-6" VERT UP WALL; WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE. METAL FLASHING EXPOSED 6" UP WALL: TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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 BUILIDNG PERMIT APPLICATION.



3 SOUTH ELEVATION
1/8" = 1'-0"

1 BUILDING A - WEST ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING A - ELEVATIONS

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Sheet title
BUILDING ELEVATIONS

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Date: 4/17/2020
Project No:
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Sheet AA3.0

NET GLAZING

METAL PANEL

STUCCO

SIGNAGE

CEMENTITIOUS BOARDS

BUILDING A - EXTERIOR FINISH PERCENTAGE

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	2830 SF	NA
NET GLAZING	738 SF	26.1%
NET STUCCO	666 SF	23.5%
NET CEMENTITIOUS BOARDS	1181 SF	41.7%
NET METAL PANEL	245 SF	8.6%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING A - EXTERIOR FINISH PERCENTAGE

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	2770 SF	NA
NET GLAZING	727 SF	26.2%
NET STUCCO	752 SF	27.1%
NET CEMENTITIOUS BOARDS	815 SF	29.4%
NET METAL PANEL	476 SF	17.2%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING A - EXTERIOR FINISH PERCENTAGE

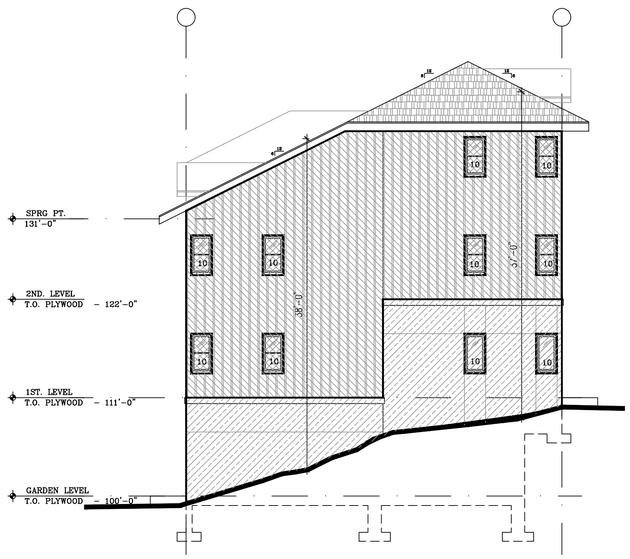
SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	100 SF	7.1%
NET STUCCO	438 SF	31.1%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING A - EXTERIOR FINISH PERCENTAGE

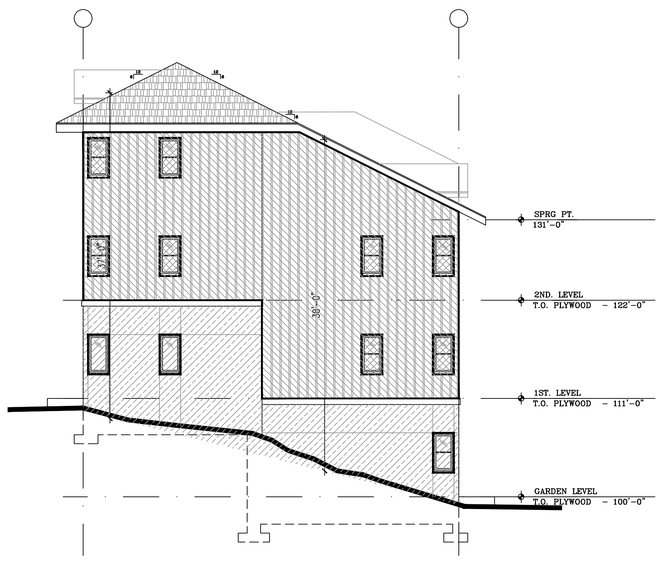
NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS



3 SOUTH ELEVATION
1/8" = 1'-0"

1 BUILDING A - WEST ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING A - ELEVATIONS

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BUILDING ELEVATIONS
MATERIAL CALCS

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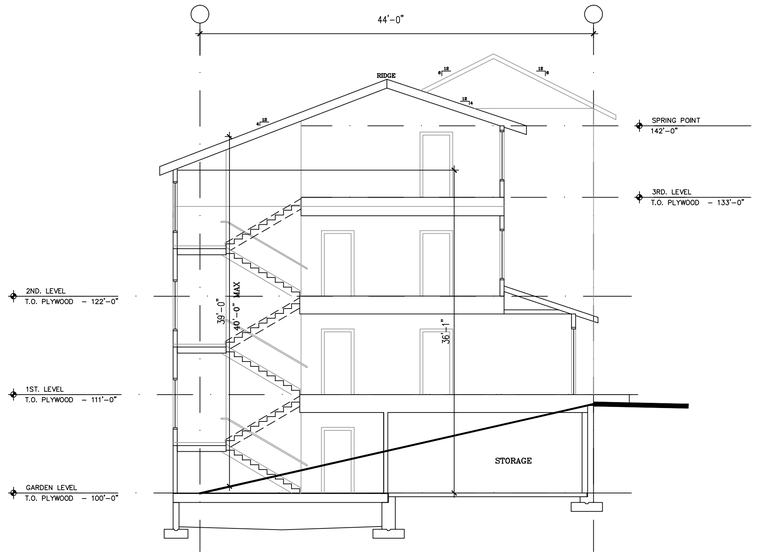
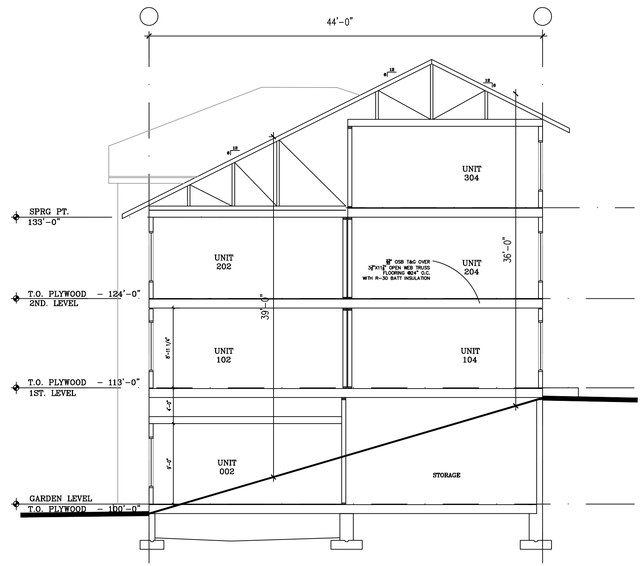


1 BUILDING SECTION - STAIR
1/8" = 1'-0"



2 TYPICAL BUILDING SECTOIN
1/8" = 1'-0"

BUILDING SECTIONS

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BUILDING SECTIONS

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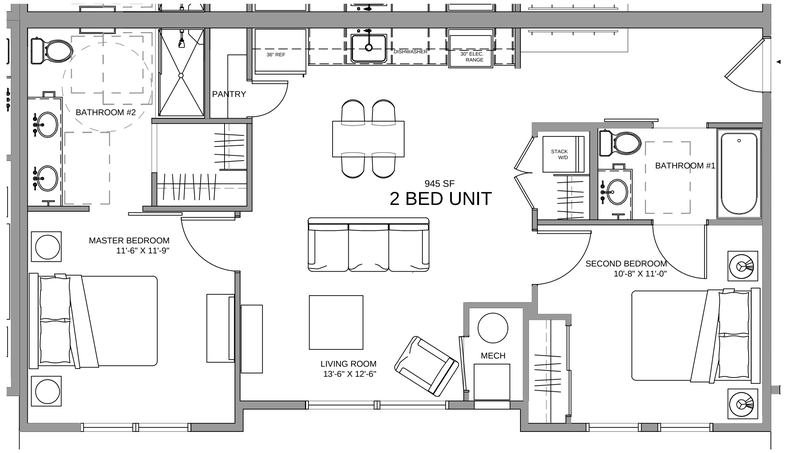

1 TYPICAL TWO BEDROOM UNIT
1/4" = 1'-0"

2 TYPICAL ONE BEDROOM UNIT
1/4" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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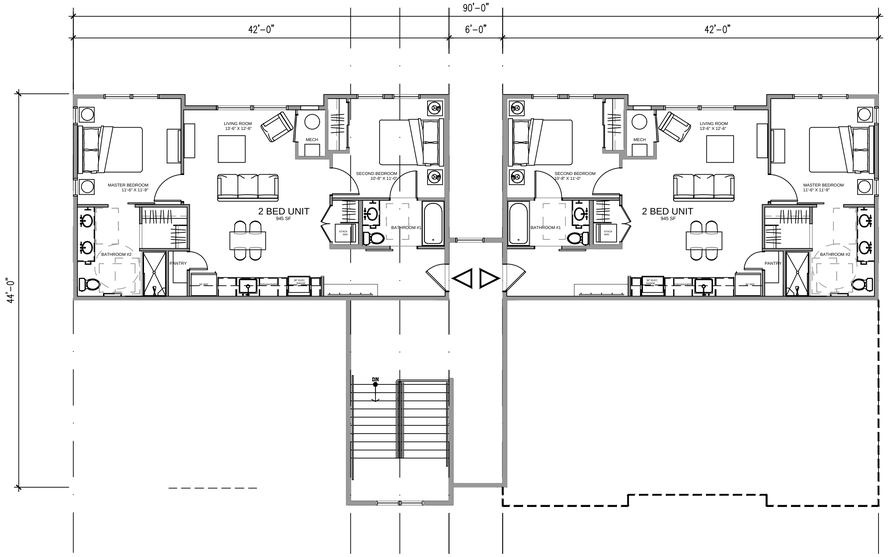
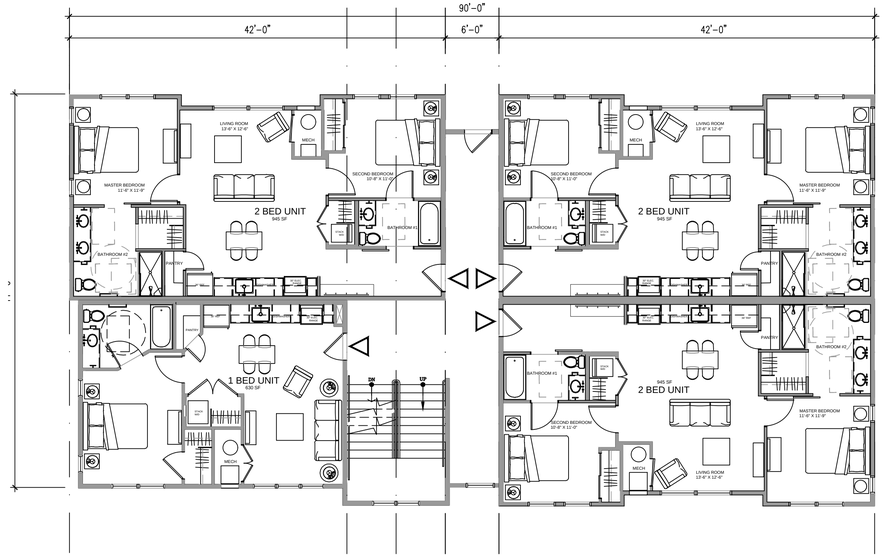
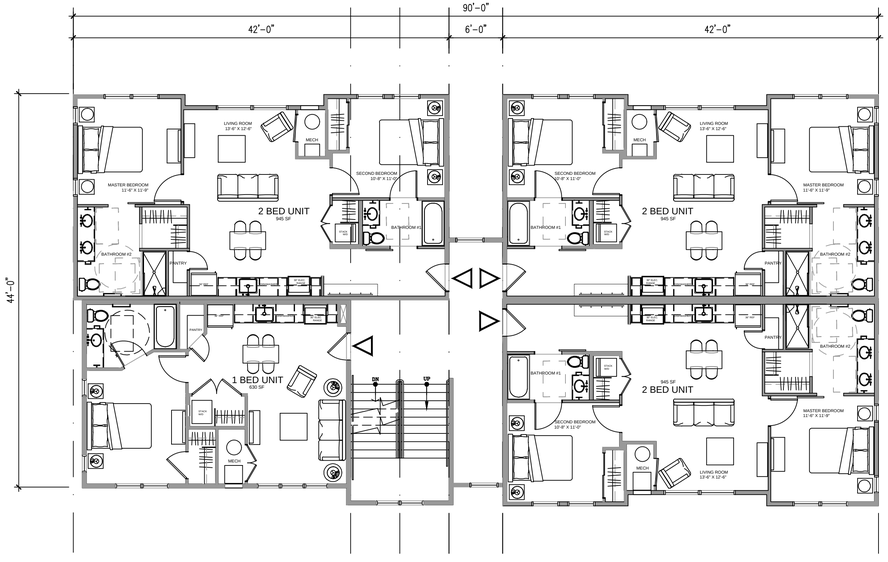


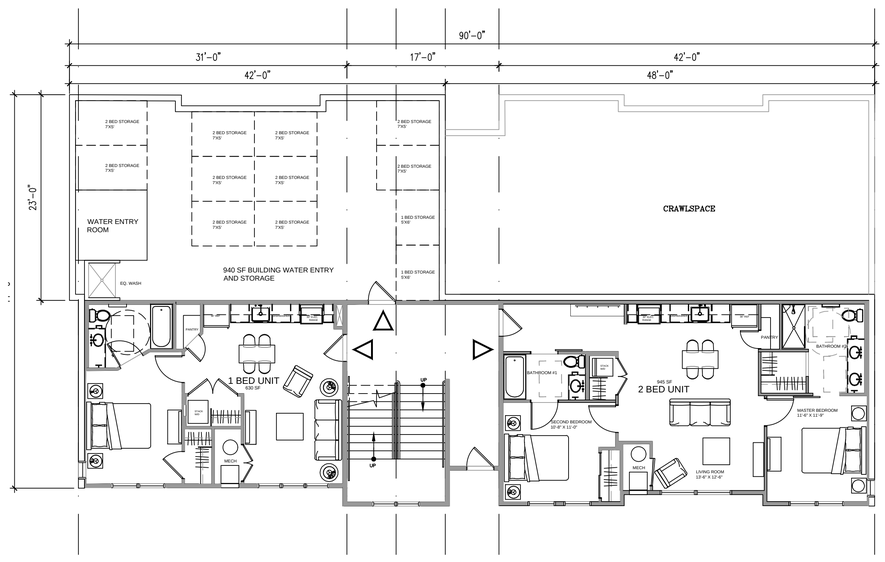
4 BUILDING B - THIRD LEVEL PLAN
1/8" = 1'-0"



2 BUILDING B - FIRST LEVEL PLAN
1/8" = 1'-0"



3 BUILDING B - SECOND LEVEL PLAN
1/8" = 1'-0"



1 BUILDING B - GARDEN LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL revised PLAN SUBMISSION 4-20-20

Sheet title: SCHEMATIC BUILDING B PLANS

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Date: 4/16/2020
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Drawn by: MEF
Checked by: MEF

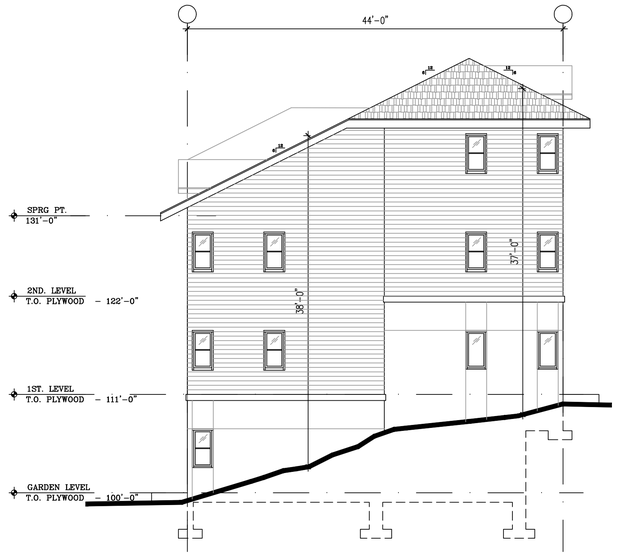
Sheet AB2.0

BUILDING B - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	RUSTIC SLATE
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 7/16" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	KHAKI BROWN
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	COBBLE BROWN
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	BENJAMIN MOORE "WISH" AF-680
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	BRONZE
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS & RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 1/2 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENDS	FIBER CEMENT - 1/2 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 1/2 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 1/2 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 1/2 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

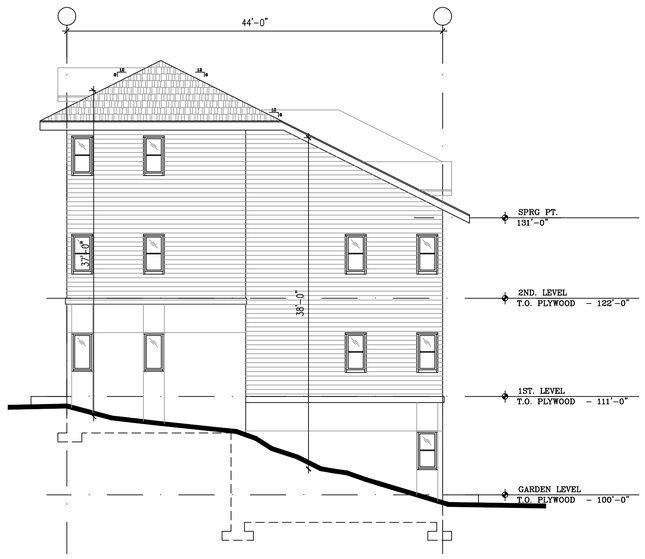
1. IN THE CASE OF ANY DISCREPANCIES BETWEEN THIS SCHEDULE AND OTHER CONTRACT DOCUMENTS, THE INFORMATION ON THIS SCHEDULE SHALL TAKE PRECEDENCE.
2. ALL FLASHING, VENTS, FLUES, ROOFTOP MECHANICAL EQUIPMENT, UTILITY BOXES, AND SIMILAR ITEMS SHALL BE PAINTED TO MATCH ADJACENT PORTIONS OF BUILDINGS UNLESS OTHERWISE NOTED.
3. TYPICAL SIDEWALL FLASHING: ICE&WATER SHIELD 2'-6" VERT UP WALL; WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE. METAL FLASHING EXPOSED 6" UP WALL; TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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.



3 SOUTH ELEVATION
1/8" = 1'-0"

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING B - ELEVATIONS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN 2nd SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS

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Sheet AB3.0

NET GLAZING

METAL PANEL

STUCCO

SIGNAGE

CEMENTITIOUS BOARDS

BUILDING B - EXTERIOR FINISH PERCENTAGE

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	2830 SF	NA
NET GLAZING	738 SF	26.1%
NET STUCCO	666 SF	23.5%
NET CEMENTITIOUS BOARDS	1181 SF	41.7%
NET METAL PANEL	245 SF	8.6%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING B - EXTERIOR FINISH PERCENTAGE

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	2770 SF	NA
NET GLAZING	727 SF	26.2%
NET STUCCO	752 SF	27.1%
NET CEMENTITIOUS BOARDS	815 SF	29.4%
NET METAL PANEL	476 SF	17.2%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING B - EXTERIOR FINISH PERCENTAGE

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

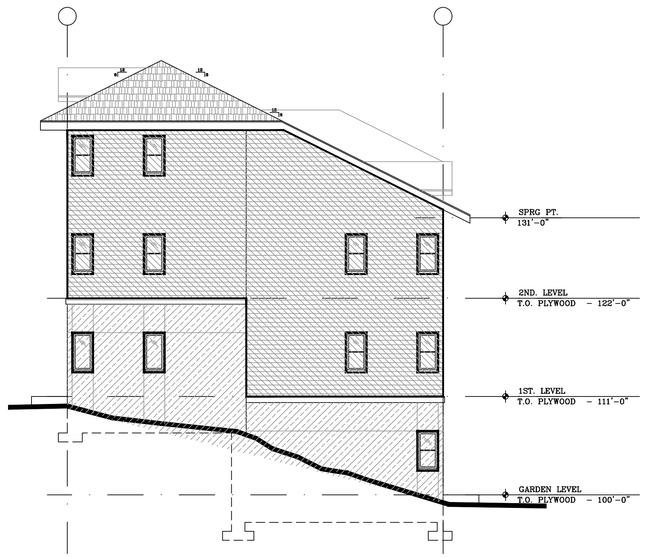
BUILDING B - EXTERIOR FINISH PERCENTAGE

NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

3 SOUTH ELEVATION
1/8" = 1'-0"

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING B - ELEVATIONS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
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Sheet title
BUILDING ELEVATIONS MATERIAL CALCS

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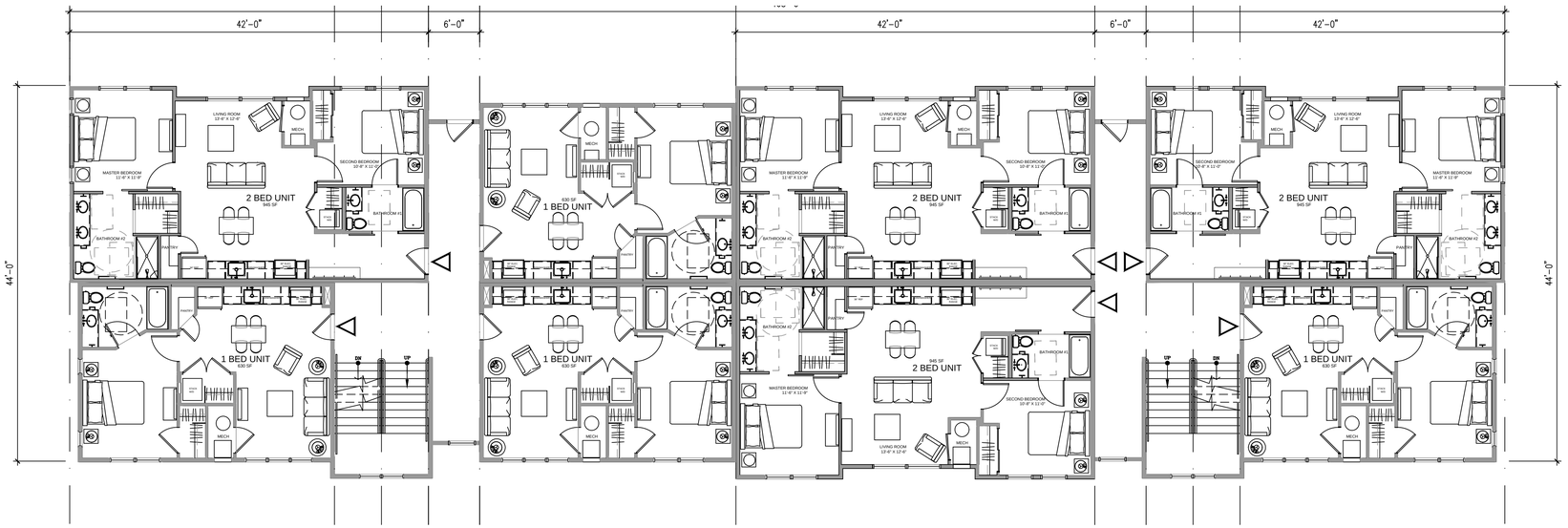

2 BUILDING C - FIRST LEVEL PLAN

1/8" = 1'-0"

1 BUILDING C - GARDEN LEVEL PLAN

1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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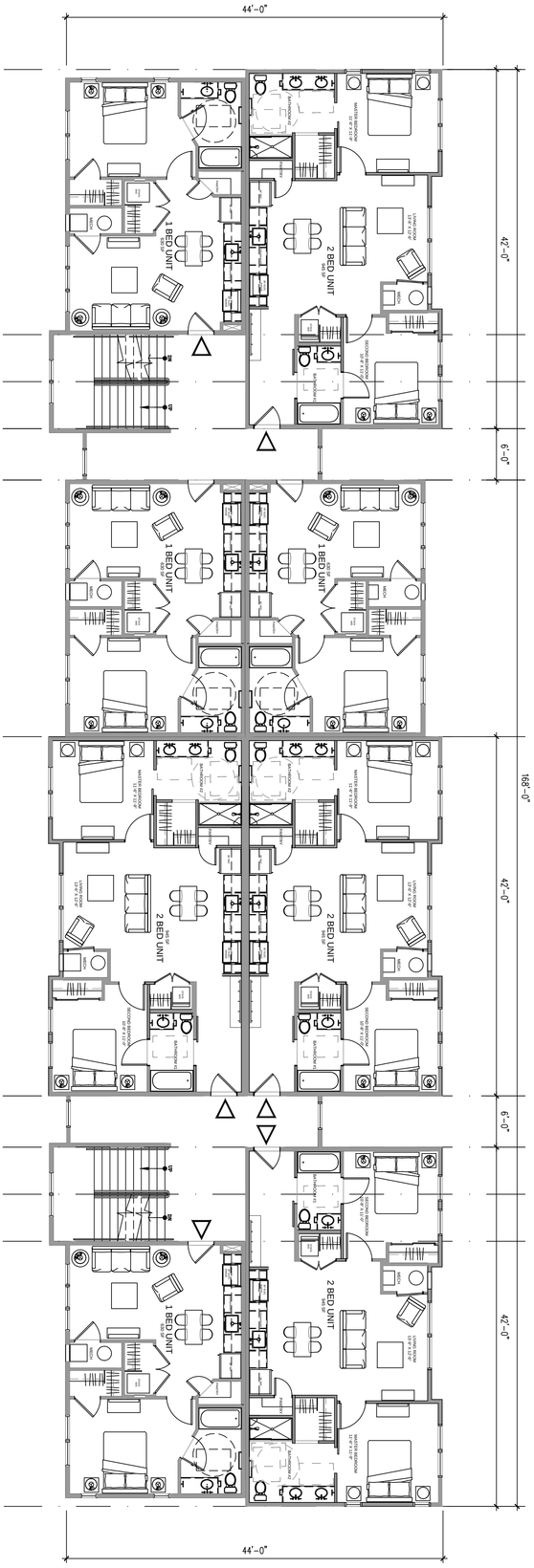
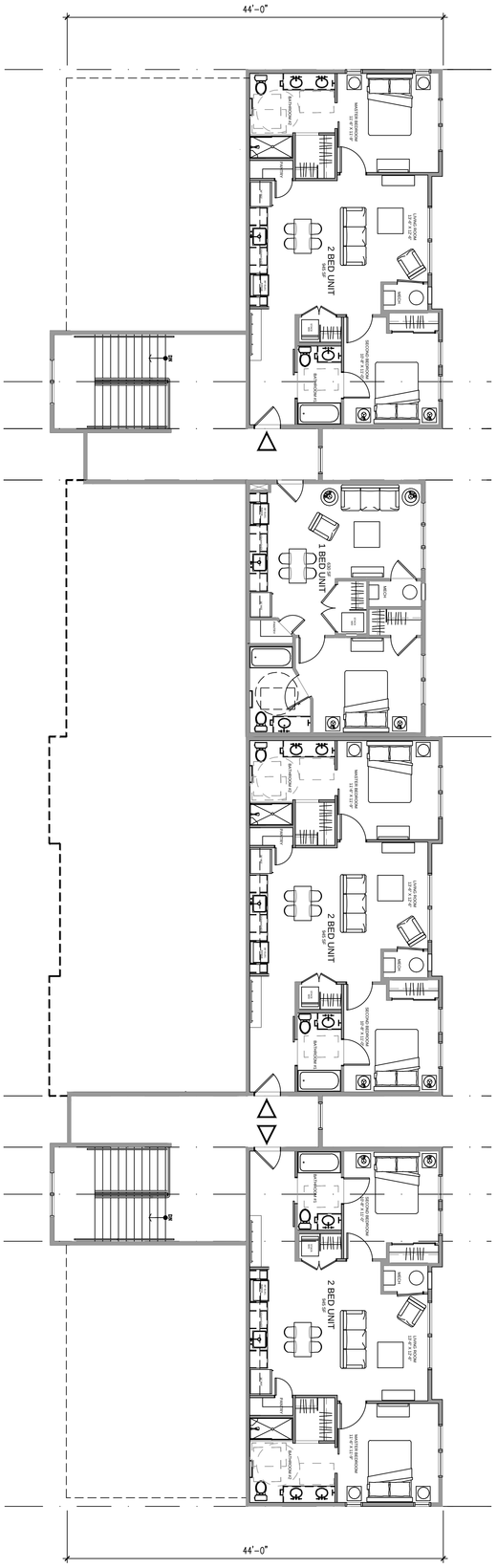


3 BUILDING C - SECOND LEVEL PLAN
1/8" = 1'-0"



4 BUILDING C - THIRD LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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SCHEMATIC BUILDING C PLANS

Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL revised PLAN SUBMISSION 4-20-20

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BUILDING C - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 5/16" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT - 1/4" RUSTIC 3.5" RAILS 1/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ GABLES	FIBER CEMENT - 1/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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3. TYPICAL SIDEWALL FLASHING: ICE&WATER SHIELD 2'-6" VERT UP WALL; WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE. METAL FLASHING EXPOSED 6" UP WALL: TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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 BUILIDNG PERMIT APPLICATION.

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING C - ELEVATIONS

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Sheet title: BUILDING ELEVATIONS

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Sheet AC3.0

BUILDING C - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 1/2" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ GABLE	FIBER CEMENT - 3/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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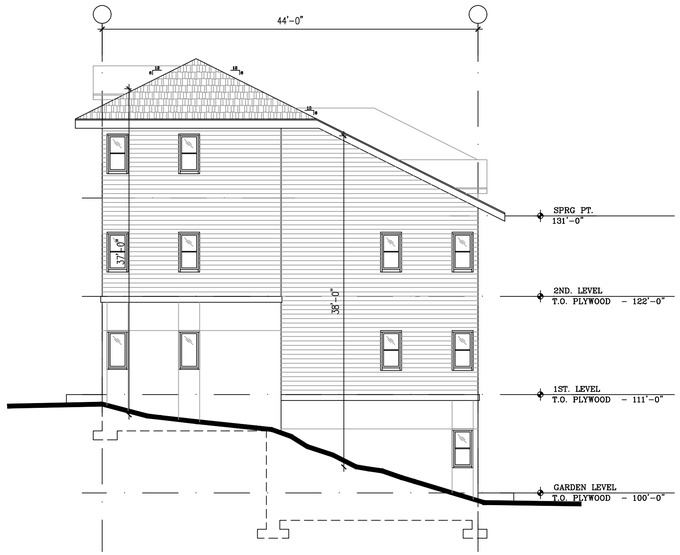
3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

BUILDING C - ELEVATIONS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN RESUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS

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Date: 4/17/2020
Project No:
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Sheet AC3.1

NET GLAZING

METAL PANEL

STUCCO

SIGNAGE

CEMENTITIOUS BOARDS

BUILDING C - EXTERIOR FINISH PERCENTAGE

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	5300 SF	NA
NET GLAZING	1353 SF	25.5%
NET STUCCO	1400 SF	26.4%
NET CEMENTITIOUS BOARDS	2250 SF	42.4%
NET METAL PANEL	486 SF	9.7%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING C - EXTERIOR FINISH PERCENTAGE

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	5175 SF	NA
NET GLAZING	1361 SF	26.3%
NET STUCCO	1314 SF	25.4%
NET CEMENTITIOUS BOARDS	1528 SF	29.5%
NET METAL PANEL	972 SF	18.8%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING C - EXTERIOR FINISH PERCENTAGE

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING C - EXTERIOR FINISH PERCENTAGE

NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING C - ELEVATIONS

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Revisions:
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MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS MATERIAL CALCS

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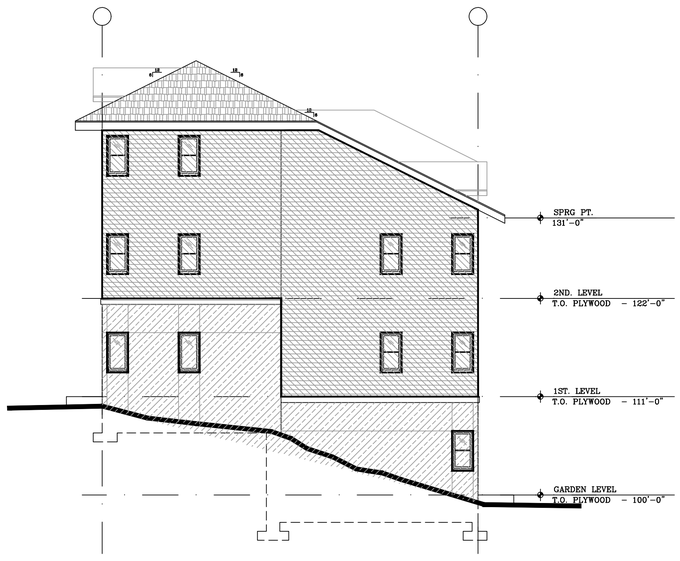
Sheet AC3.2

3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

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Sheet title
BUILDING ELEVATIONS
MATERIAL CALCS

Stamp

Date: 4/20/2020
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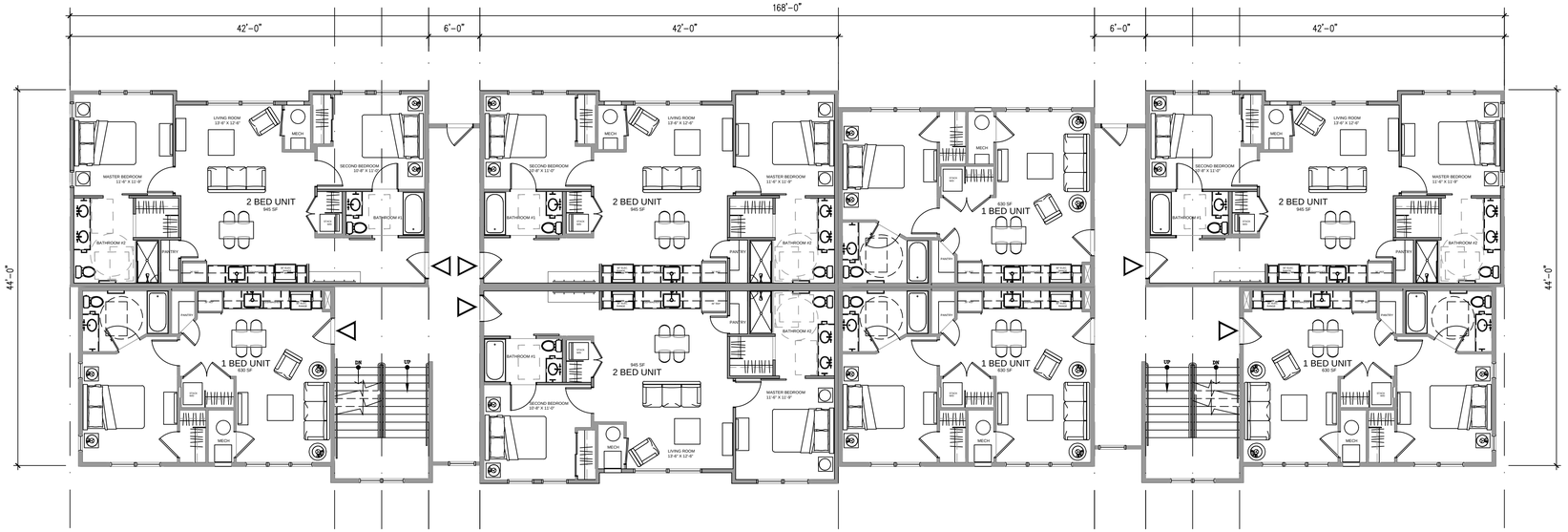
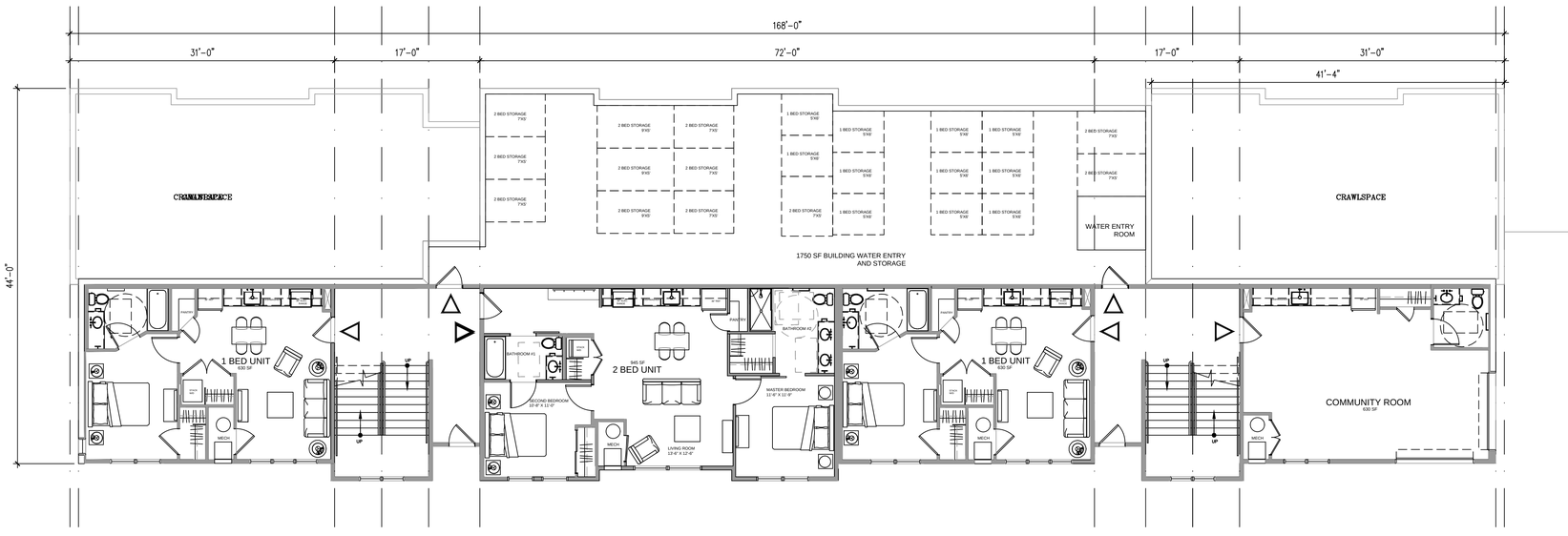
Sheet AC3.3



2 BUILDING D - FIRST LEVEL PLAN

1/8" = 1'-0"



1 BUILDING D - GARDEN LEVEL PLAN

1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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MAJOR SITE ARCHITECTURAL revised PLAN SUBMISSION 4-20-20

Sheet title
SCHEMATIC BUILDING D PLANS

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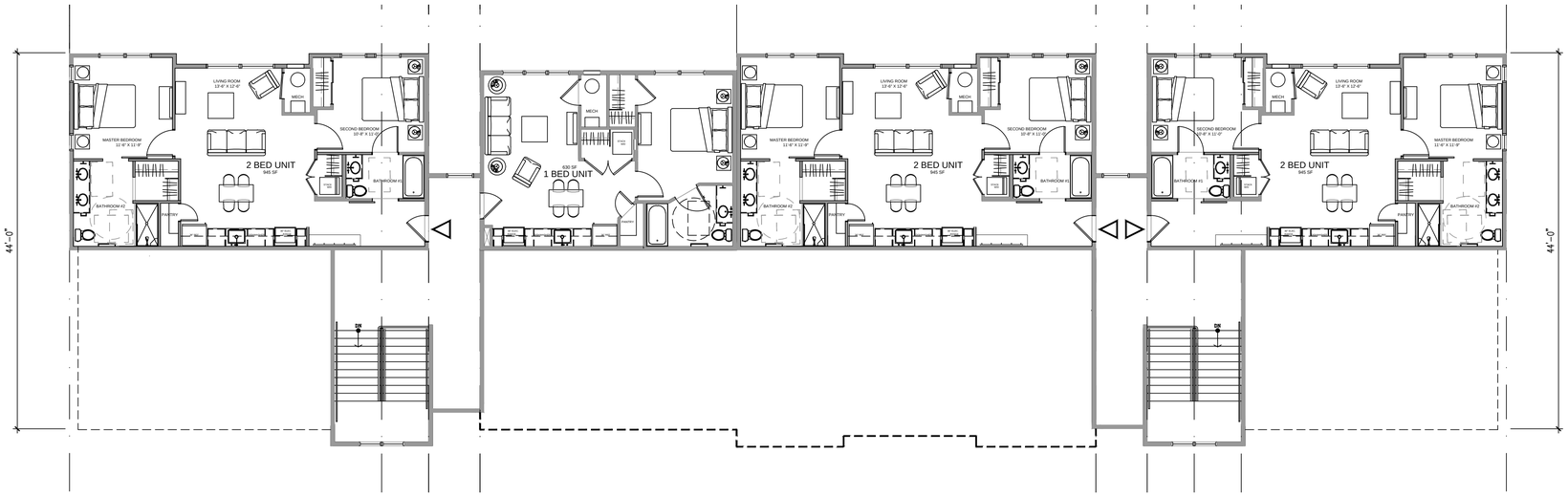
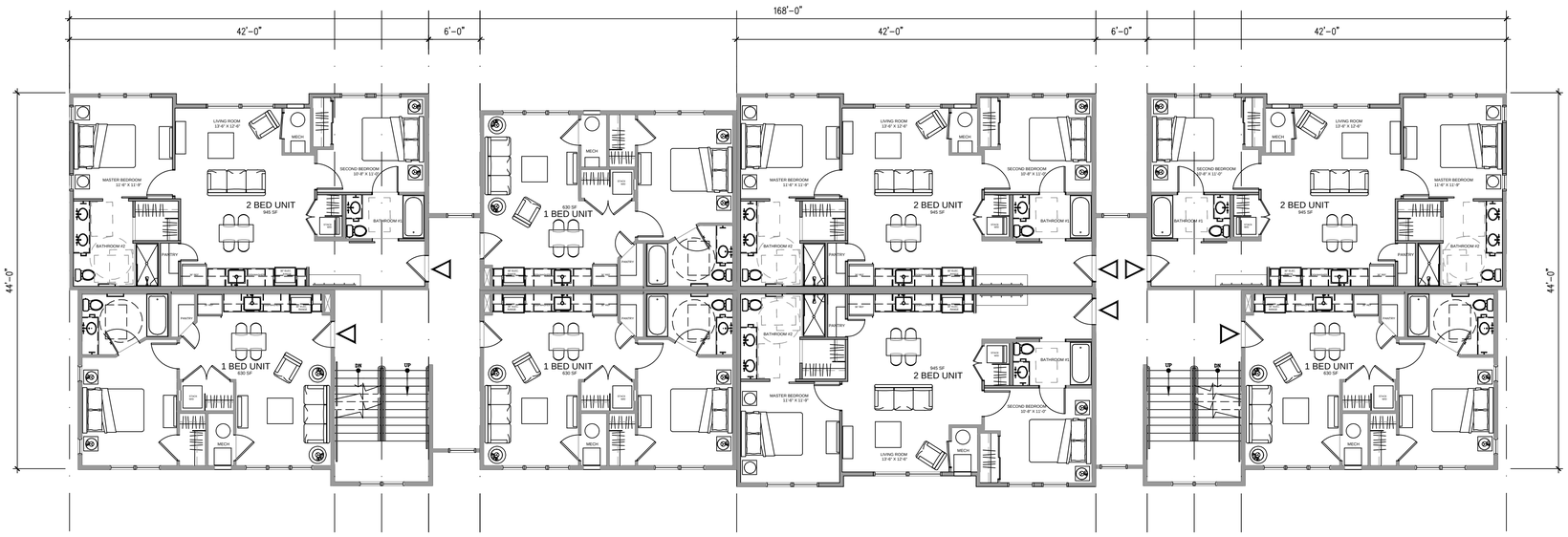


4 BUILDING D - THIRD LEVEL PLAN

1/8" = 1'-0"



3 BUILDING D - SECOND LEVEL PLAN

1/8" = 1'-0"

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Drawn by: MEF
Checked by: MEF

Sheet AD2.1

BUILDING D - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 7" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 2.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ GABLE	FIBER CEMENT - 5/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 5/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 5/4 RUSTIC 5.5"	FRENCH ROAST
W01	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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3. TYPICAL SIDEWALL FLASHING: ICE&WATER SHIELD 2'-6" VERT UP WALL; WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE. METAL FLASHING EXPOSED 8" UP WALL: TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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 BUILDNG PERMIT APPLICATION.

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING D - ELEVATIONS

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MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS

Stamp

Date: 4/17/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AD3.0

BUILDING D - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 7/16" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENDS	FIBER CEMENT - 3/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
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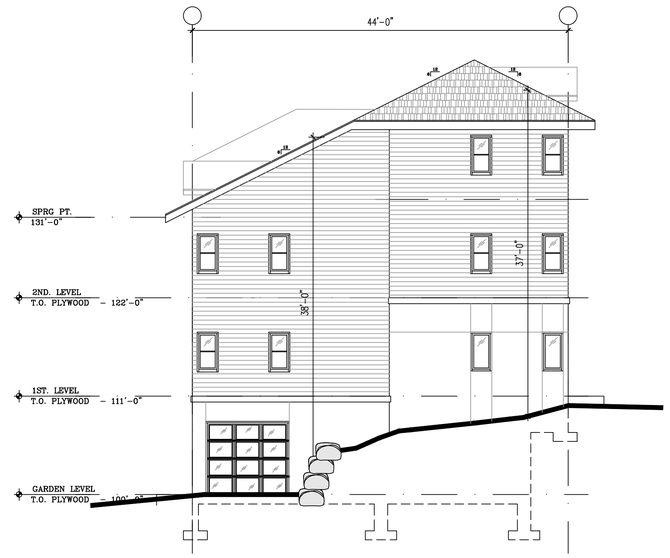
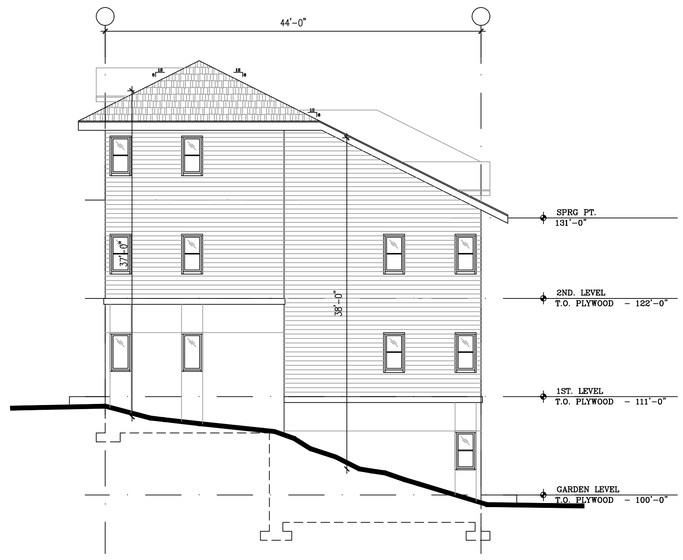


3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

BUILDING D - ELEVATIONS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN RESUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS

Stamp

Date: 4/17/2020
Project No:
Drawn by: MEF
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Sheet AD3.1

NET GLAZING

METAL PANEL

STUCCO

SIGNAGE

CEMENTITIOUS BOARDS

BUILDING D - EXTERIOR FINISH PERCENTAGE

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	5300 SF	NA
NET GLAZING	1398 SF	26.4%
NET STUCCO	1355 SF	25.6%
NET CEMENTITIOUS BOARDS	2250 SF	42.4%
NET METAL PANEL	486 SF	9.7%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING D - EXTERIOR FINISH PERCENTAGE

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	5175 SF	NA
NET GLAZING	1361 SF	26.3%
NET STUCCO	1314 SF	25.4%
NET CEMENTITIOUS BOARDS	1528 SF	29.5%
NET METAL PANEL	972 SF	18.8%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING D - EXTERIOR FINISH PERCENTAGE

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	135 SF	9.6%
NET STUCCO	400 SF	28.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING D - EXTERIOR FINISH PERCENTAGE

NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING D - ELEVATIONS

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MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS MATERIAL CALCS

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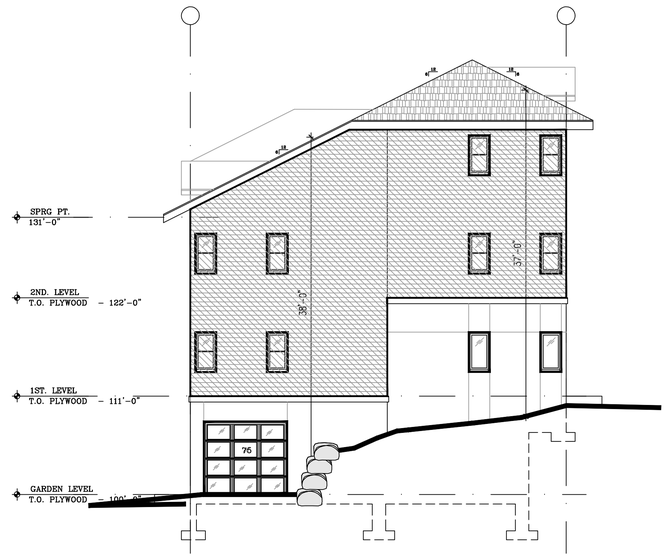
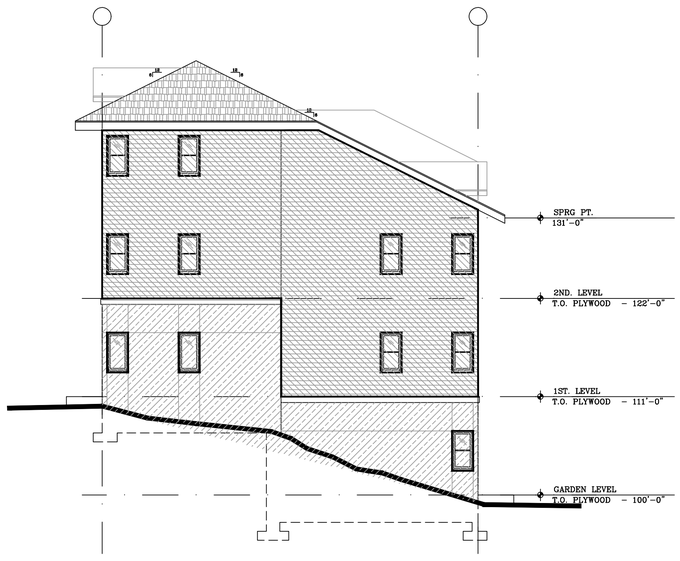
Sheet AD3.2



3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

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Sheet title
BUILDING ELEVATIONS
MATERIAL CALCS

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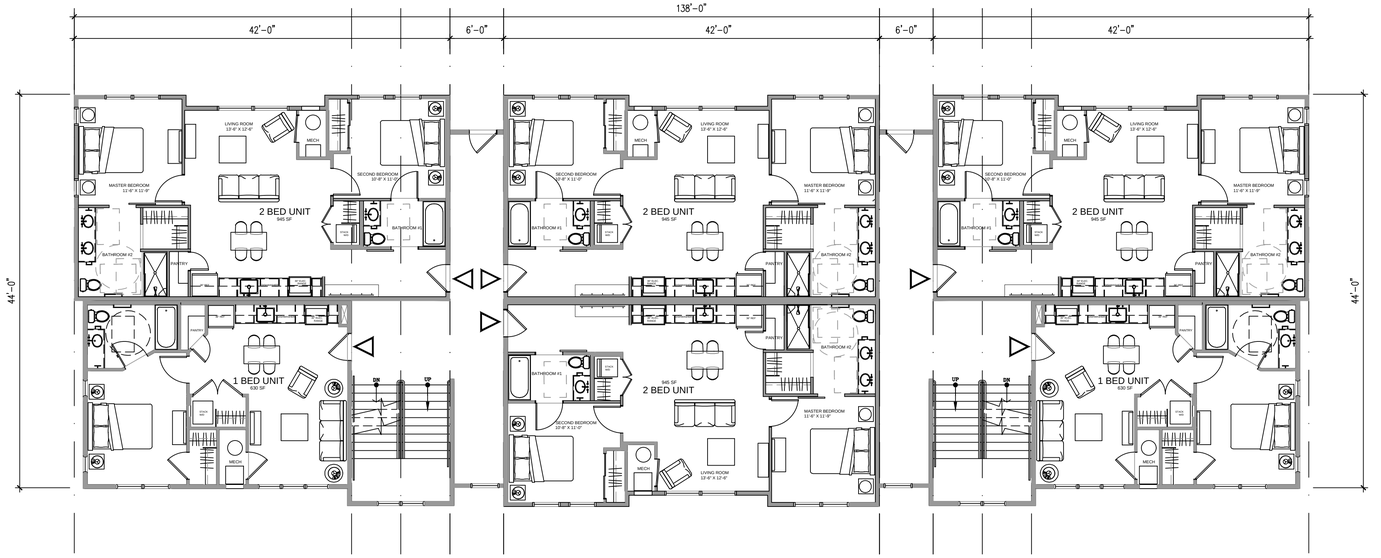

2 BUILDING E - FIRST LEVEL PLAN

1/8" = 1'-0"

1 BUILDING E - GARDEN LEVEL PLAN

1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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SCHEMATIC BUILDING E PLANS

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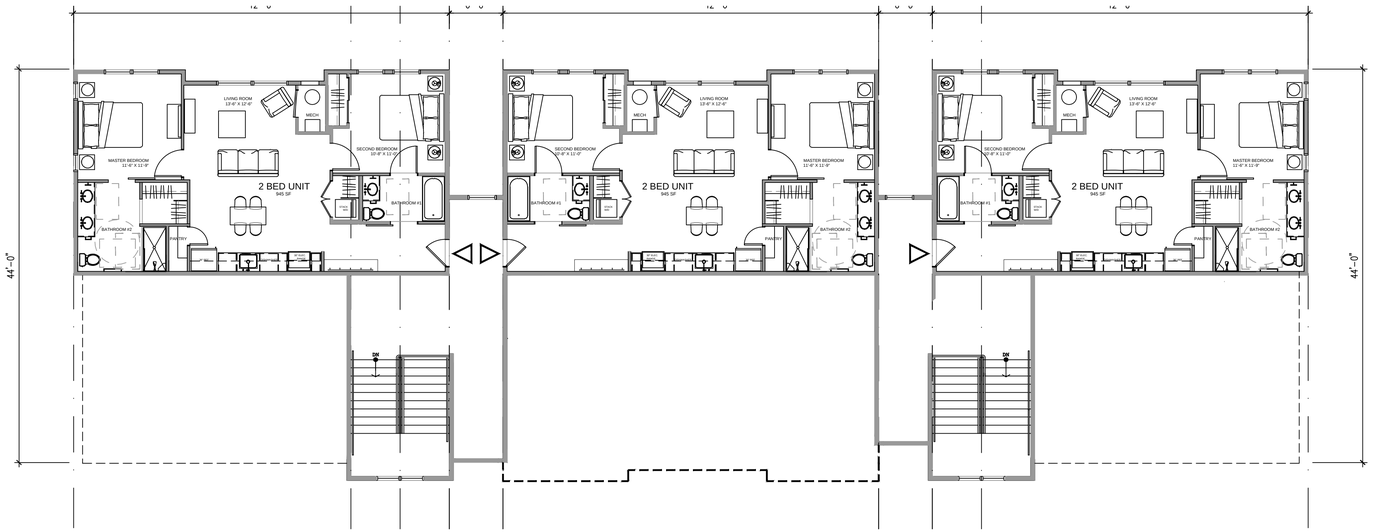
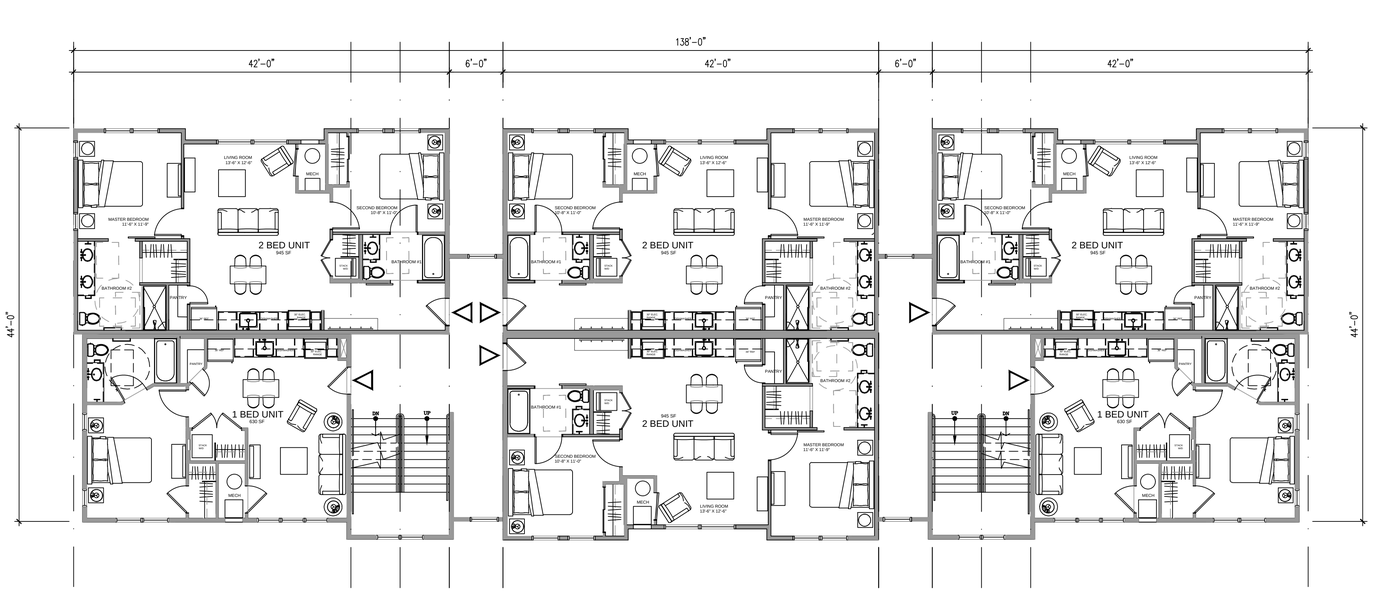


4 BUILDING E - THIRD LEVEL PLAN
1/8" = 1'-0"



3 BUILDING E - SECOND LEVEL PLAN
1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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Sheet title: SCHEMATIC BUILDING E PLANS

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Checked by: MEF

Sheet AE2.1

BUILDING E - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
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S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 7/16" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
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T3	HORIZONTAL SIDING TRIM @ ENDS	FIBER CEMENT - 5/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 5/4 RUSTIC 3.5"	FRENCH ROAST
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WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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BUILDING E - ELEVATIONS

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Sheet AE3.0

BUILDING E - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
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S2	STUCCO	SYNTHETIC STUCCO SYSTEM	SW - BUCKHORN
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	SLATE GREY
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ GABLE	FIBER CEMENT - 1/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
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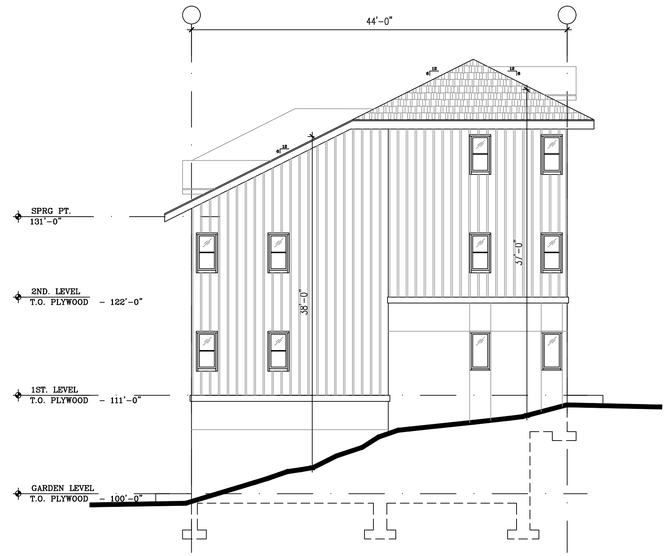
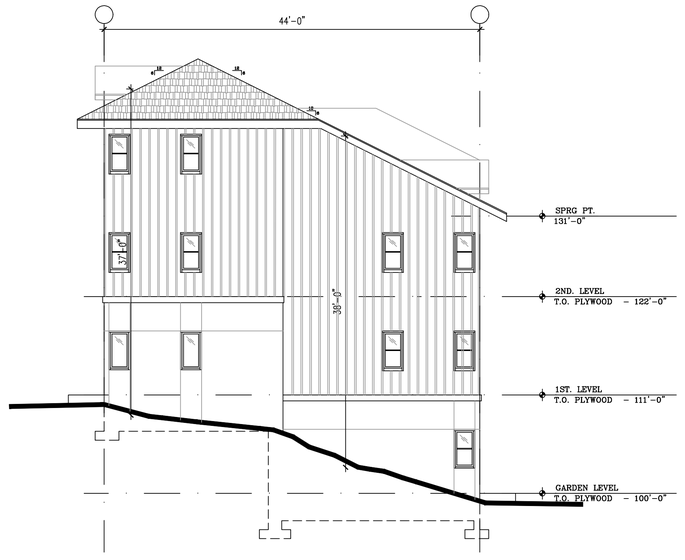


3 SOUTH ELEVATION
1/8" = 1'-0"



4 WEST ELEVATION
1/8" = 1'-0"

BUILDING E - ELEVATIONS

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BELL RIPPY NEIGHBORHOOD
GLENWOOD SPRINGS COLORADO

Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS

Stamp

Date: 4/17/2020
Project No:
Drawn by: MEF
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Sheet AE3.1

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NET GLAZING

METAL PANEL

STUCCO

SIGNAGE

CEMENTITIOUS BOARDS

BUILDING E - EXTERIOR FINISH PERCENTAGE

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	4355 SF	NA
NET GLAZING	1007 SF	23.1%
NET STUCCO	1034 SF	23.7%
NET CEMENTITIOUS BOARDS	2071 SF	47.5%
NET METAL PANEL	243 SF	5.6%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING E - EXTERIOR FINISH PERCENTAGE

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	4235 SF	NA
NET GLAZING	1114 SF	26.3%
NET STUCCO	1086 SF	25.6%
NET CEMENTITIOUS BOARDS	1306 SF	30.8%
NET METAL PANEL	729 SF	17.2%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING E - EXTERIOR FINISH PERCENTAGE

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.6%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING E - EXTERIOR FINISH PERCENTAGE

NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.4%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING E - ELEVATIONS

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Revisions:
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MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS
MATERIAL CALCS

Stamp

Date: 4/20/2020
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Sheet AE3.2

3 SOUTH ELEVATION
1/8" = 1'-0"

4 WEST ELEVATION
1/8" = 1'-0"

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Revisions:
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MAJOR SITE ARCHITECTURAL PLAN RESUBMISSION 4-20-20

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BUILDING ELEVATIONS
MATERIAL CALCS

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Sheet AE3.3

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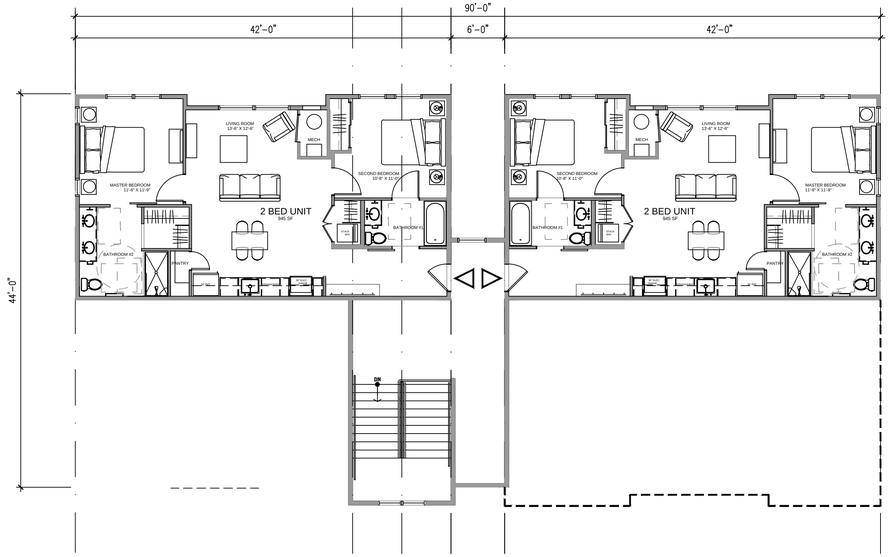
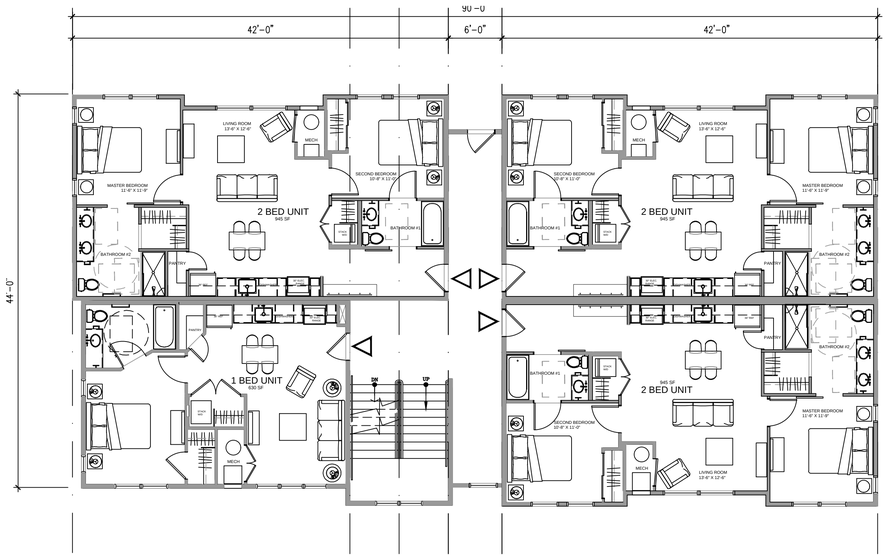


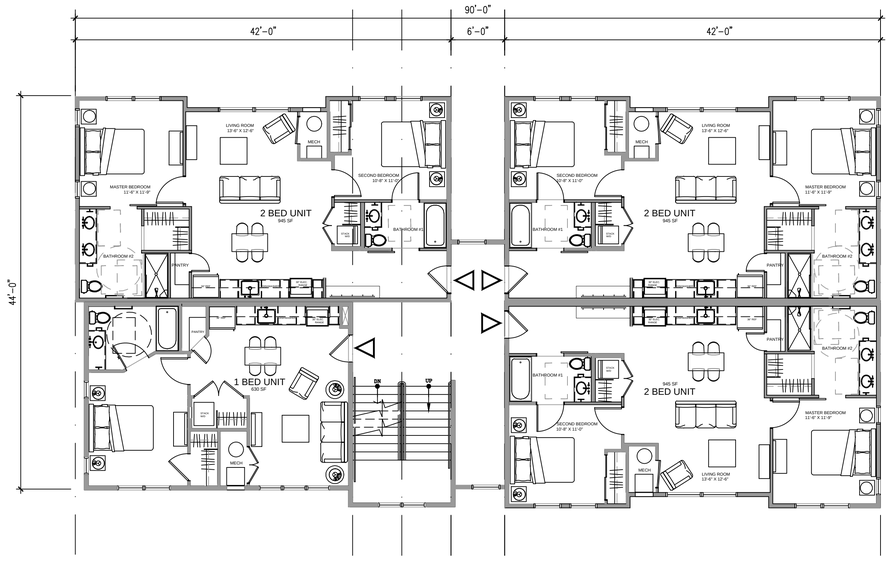
4 BUILDING F - THIRD LEVEL PLAN

1/8" = 1'-0"



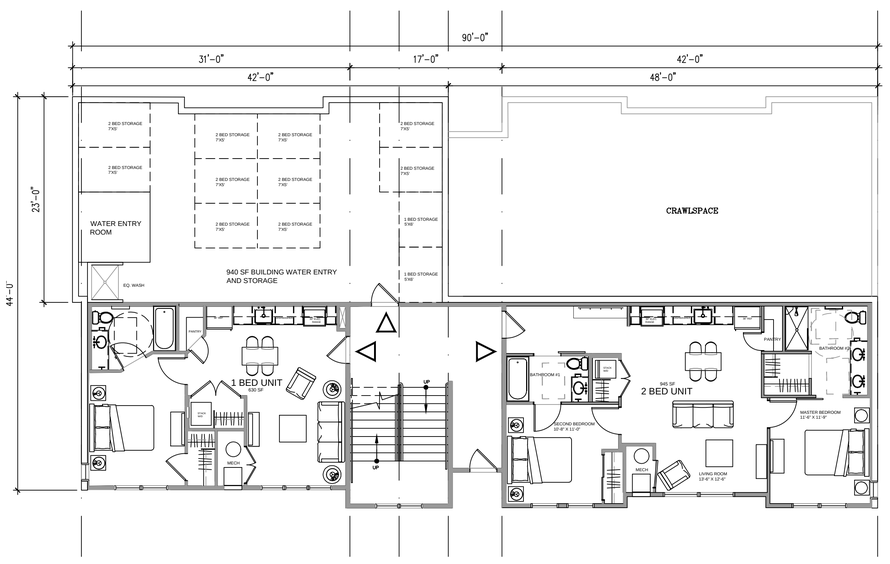
2 BUILDING F - FIRST LEVEL PLAN

1/8" = 1'-0"



3 BUILDING F - SECOND LEVEL PLAN

1/8" = 1'-0"



1 BUILDING F - GARDEN LEVEL PLAN

1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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GLENWOOD SPRINGS COLORADO

Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION revised 4-20-20

Sheet title
SCHEMATIC BUILDING F PLANS

Stamp

Date: 4/16/2020
Project No:
Drawn by: MEF
Checked by: MEF

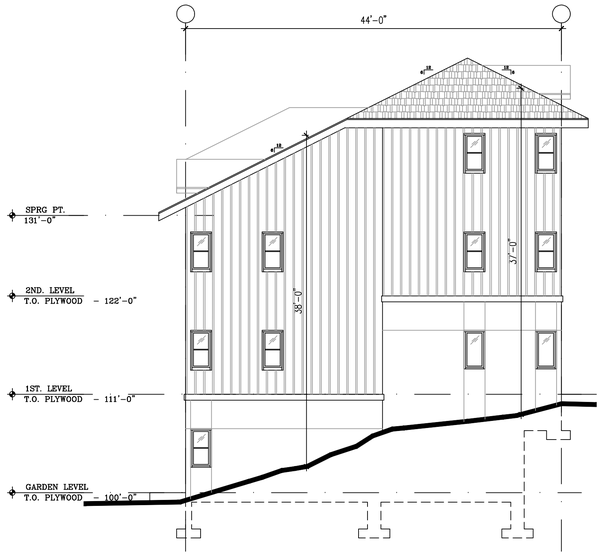
Sheet AF2.0

BUILDING F - EXTERIOR FINISH SCHEDULE

TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	RUSTIC SLATE
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 3/4" X 7 1/4" 6" EXPOSED - @ WINDOW / DOOR INFILL	KHAKI BROWN
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	COBBLE BROWN
S2	STUCCO	SYNTHETIC STUCCO SYSTEM	BENJAMIN MOORE "WISH" AF-680
S4	METAL SIDING PANELS	METAL WALL SYSTEM - PBC	BRONZE
W1	DOORS AND WINDOWS	PREMIUM VINYL	BRONZE
T1	DOORS AND WINDOWS TRIM	FIBER CEMENT 4/4 RUSTIC 3.5" RAILS 3/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	FIBER CEMENT - 1/4 RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - 1/4 RUSTIC 5.5"	FRENCH ROAST
W01	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

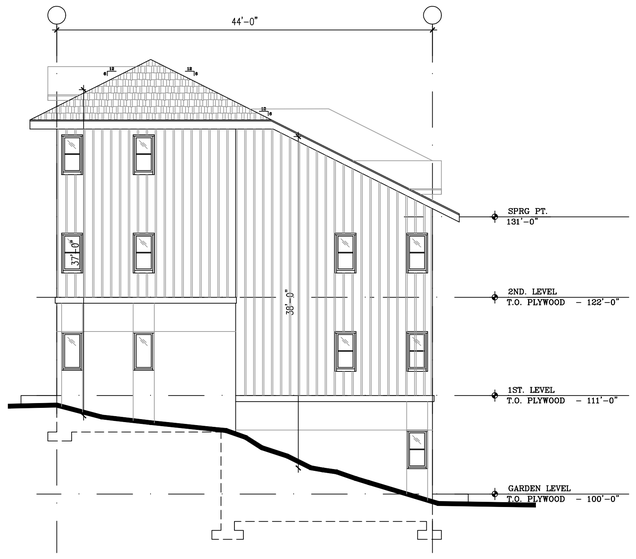
1. IN THE CASE OF ANY DISCREPANCIES BETWEEN THIS SCHEDULE AND OTHER CONTRACT DOCUMENTS, THE INFORMATION ON THIS SCHEDULE SHALL TAKE PRECEDENCE.
2. ALL FLASHING, VENTS, FLUES, ROOFTOP MECHANICAL EQUIPMENT, UTILITY BOXES, AND SIMILAR ITEMS SHALL BE PAINTED TO MATCH ADJACENT PORTIONS OF BUILDINGS UNLESS OTHERWISE NOTED.
3. TYPICAL SIDEWALL FLASHING: ICE&WATER SHIELD 2'-6" VERT UP WALL; WRAP INTO OPENINGS, THEN APPLY TYVEK FLASHING TAPE AROUND PENETRATING PIPE. METAL FLASHING EXPOSED 6" UP WALL: TYPICAL AT ALL SIDEWALL CONDITIONS.

4. 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.



3 SOUTH ELEVATION
1/8" = 1'-0"

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"



4 NORTH ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING F - ELEVATIONS

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Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN RESUBMISSION 4-20-20

Sheet title: BUILDING ELEVATIONS

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Date: 4/17/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AF3.0

NET GLAZING

METAL PANEL

STUCCO

SIGNAGE

CEMENTITIOUS BOARDS

BUILDING F - EXTERIOR FINISH PERCENTAGE

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	2830 SF	NA
NET GLAZING	736 SF	26.1%
NET STUCCO	666 SF	23.5%
NET CEMENTITIOUS BOARDS	1181 SF	41.7%
NET METAL PANEL	245 SF	8.6%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING F - EXTERIOR FINISH PERCENTAGE

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	2770 SF	NA
NET GLAZING	727 SF	26.2%
NET STUCCO	752 SF	27.1%
NET CEMENTITIOUS BOARDS	815 SF	29.4%
NET METAL PANEL	476 SF	17.2%

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING F - EXTERIOR FINISH PERCENTAGE

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.6%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS

BUILDING F - EXTERIOR FINISH PERCENTAGE

NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
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1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
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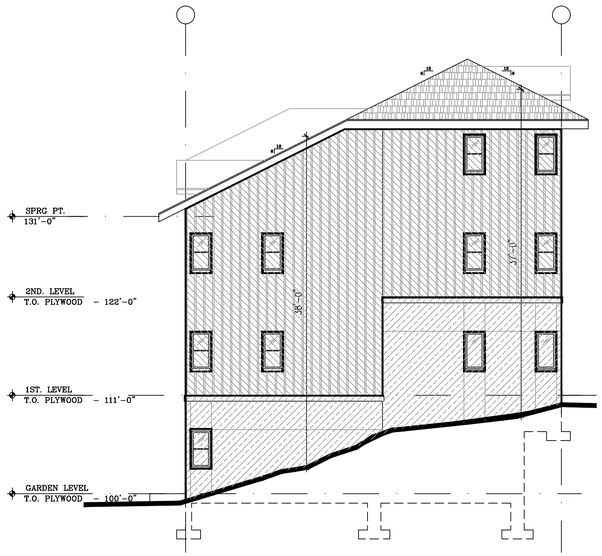
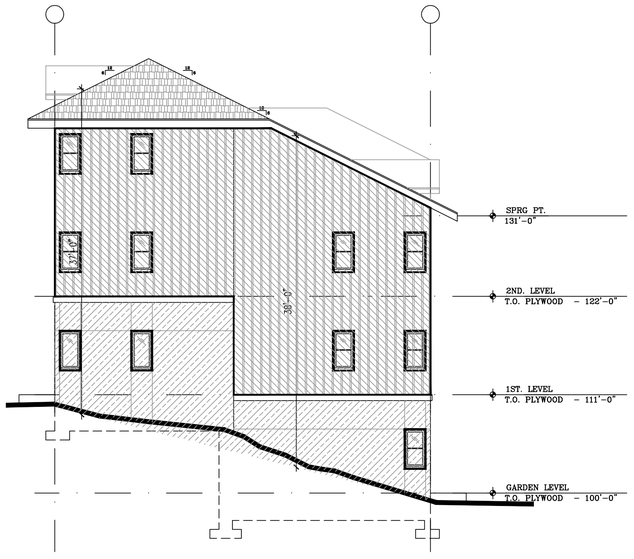


3 SOUTH ELEVATION
1/8" = 1'-0"

1 BUILDING - WEST ELEVATION
1/8" = 1'-0"



4 NORTH ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

BUILDING F - ELEVATIONS

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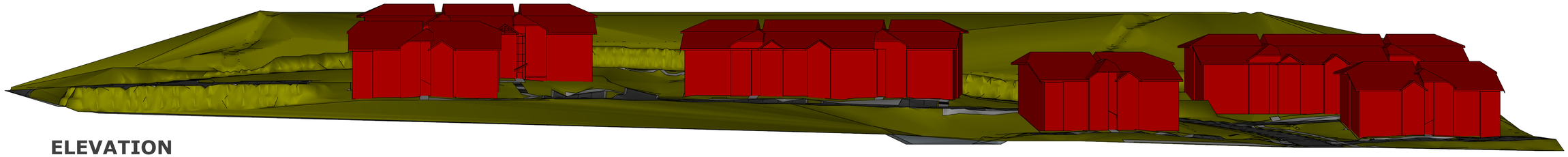
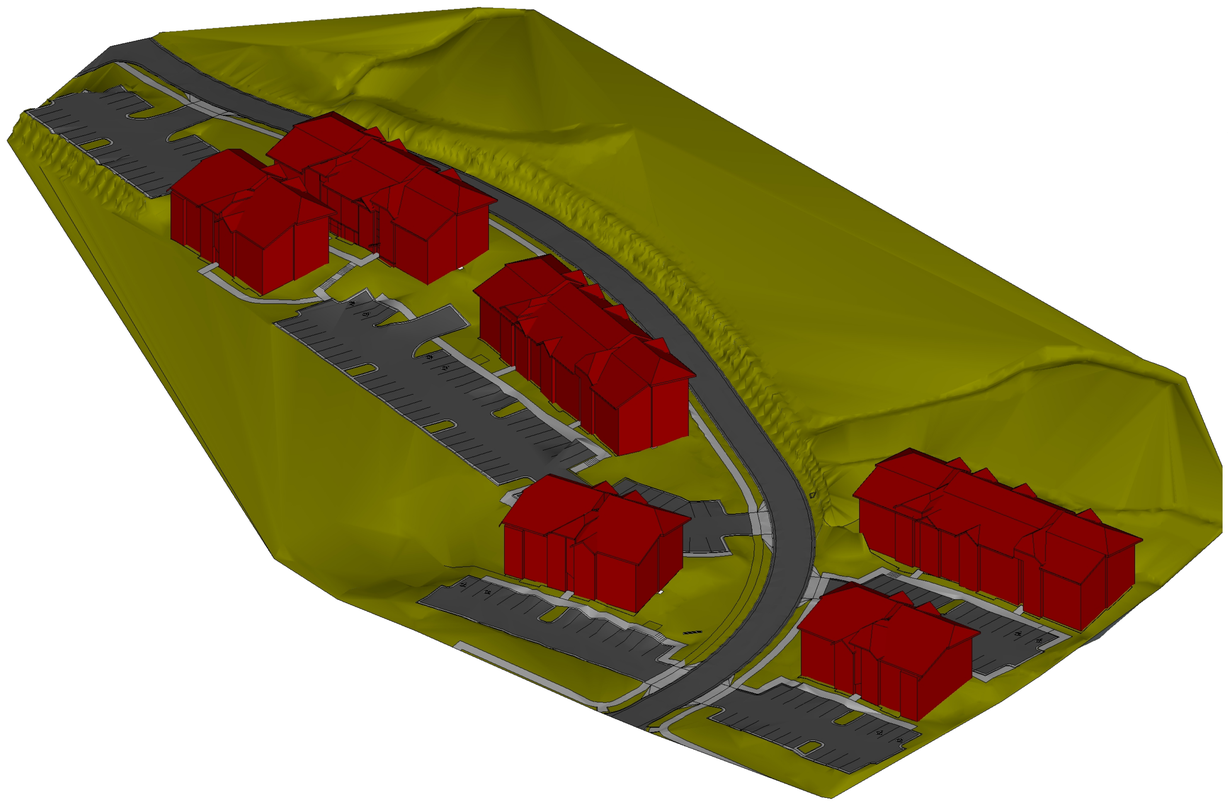


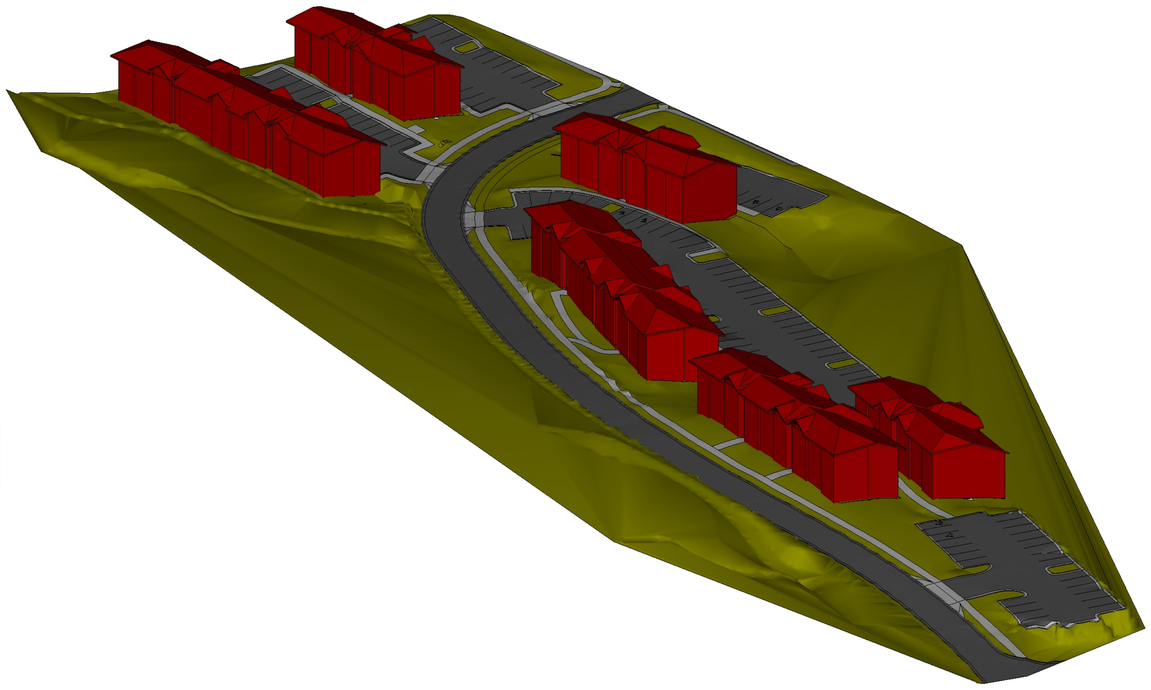
ELEVATION

Scale: 1"=30'-0"



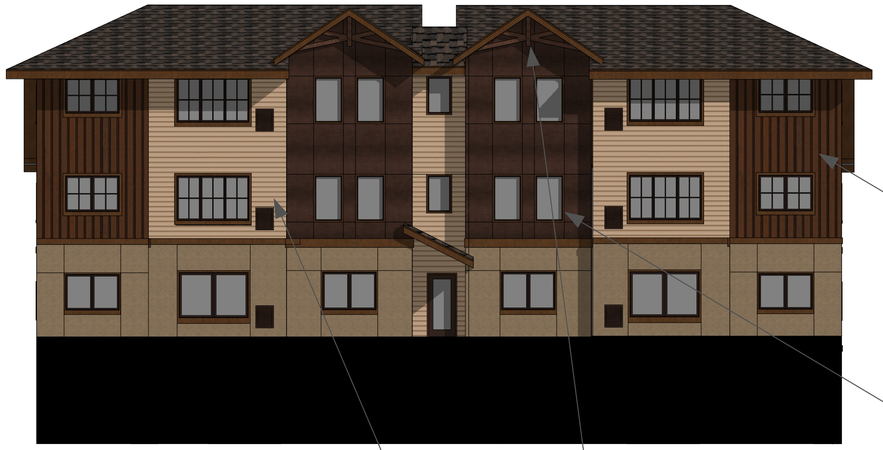
PERSPECTIVE 1

Scale: 1"=40'-0"



PERSPECTIVE 2

Scale: 1"=40'-0"



NORTH ELEVATION - BUILDING A

Scale: 1/8"=1'-0"

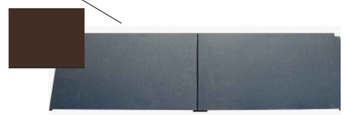
DARK SKY COMPLIANT LIGHTING

TAMKO ASPHALT SHINGLES, RUSTIC SLATE

HARDIE T&G HORIZONTAL SIDING, SW - GINGER ROOT

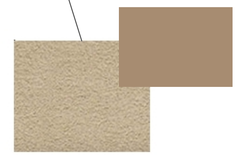
TIMBER TRUSSES, DARK BROWN

VYNIL WINDOWS AND DOORS, BRONZE COLOR

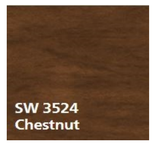


FLAT METAL PANEL, DARK BROWN

HARDIE BOARD (1X12) AND BATTEN (1X4) SW-FRENCH ROAST



STUCCO WITH EXPANSIONS: LIGHT SAND FINISH, SW - DOUBLE LATTE



TRIMS AND FASCIA

WEST ELEVATION - BUILDING A

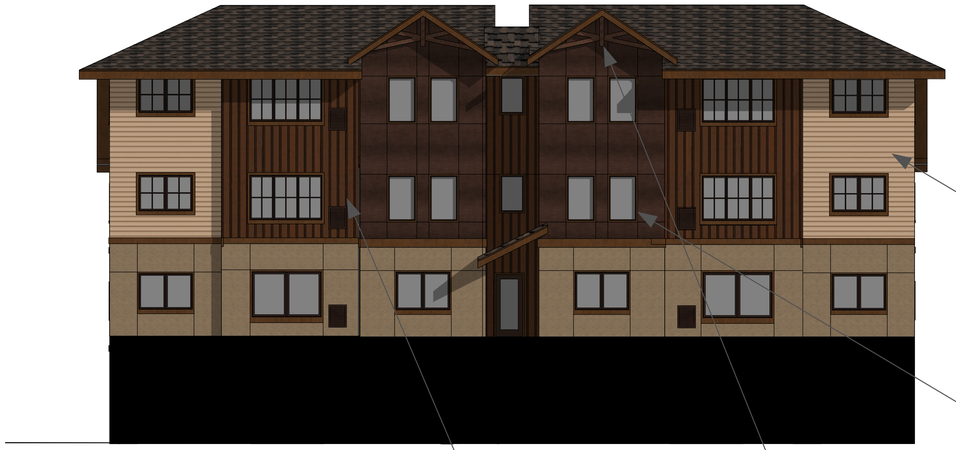
Scale: 1/8"=1'-0"

SOUTH ELEVATION - BUILDING A

Scale: 1/8"=1'-0"

EAST ELEVATION - BUILDING A

Scale: 1/8"=1'-0"



NORTH ELEVATION - BUILDING B

Scale: 1/8"=1'-0"

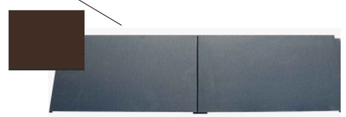
DARK SKY COMPLIANT LIGHTING

TAMKO ASPHALT SHINGLES, RUSTIC SLATE

HARDIE T&G HORIZONTAL SIDING, SW - GINGER ROOT

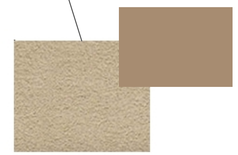
TIMBER TRUSSES, DARK BROWN

VYNIL WINDOWS AND DOORS, BRONZE COLOR

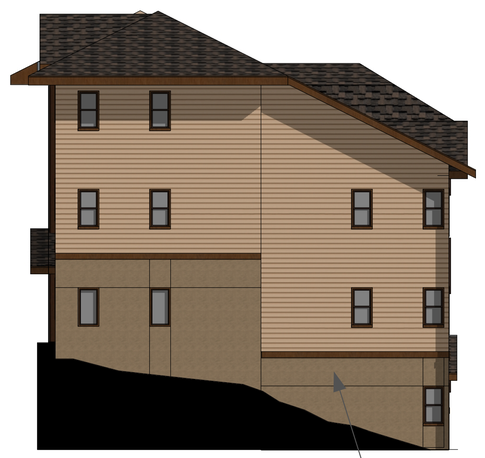


FLAT METAL PANEL, DARK BROWN

HARDIE BOARD (1X12) AND BATTEN (1X4) SW-FRENCH ROAST

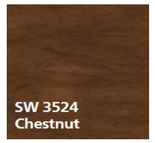


STUCCO WITH EXPANSIONS: LIGHT SAND FINISH, SW - DOUBLE LATTE

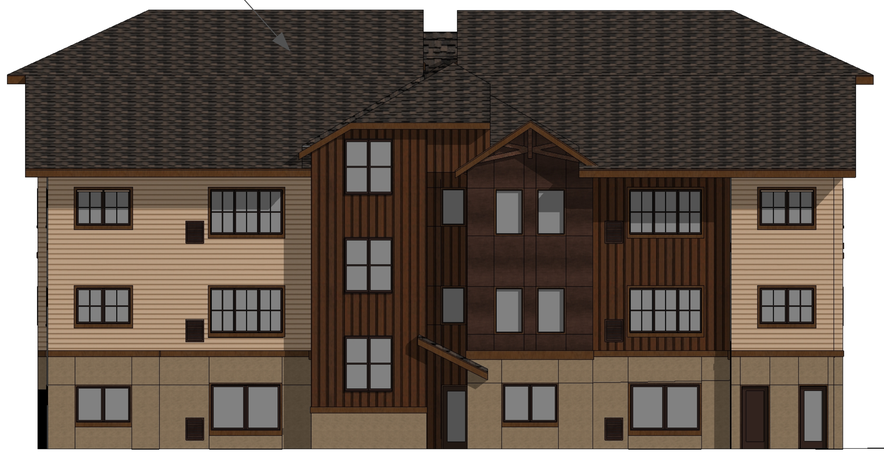


WEST ELEVATION - BUILDING B

Scale: 1/8"=1'-0"



TRIMS AND FASCIA

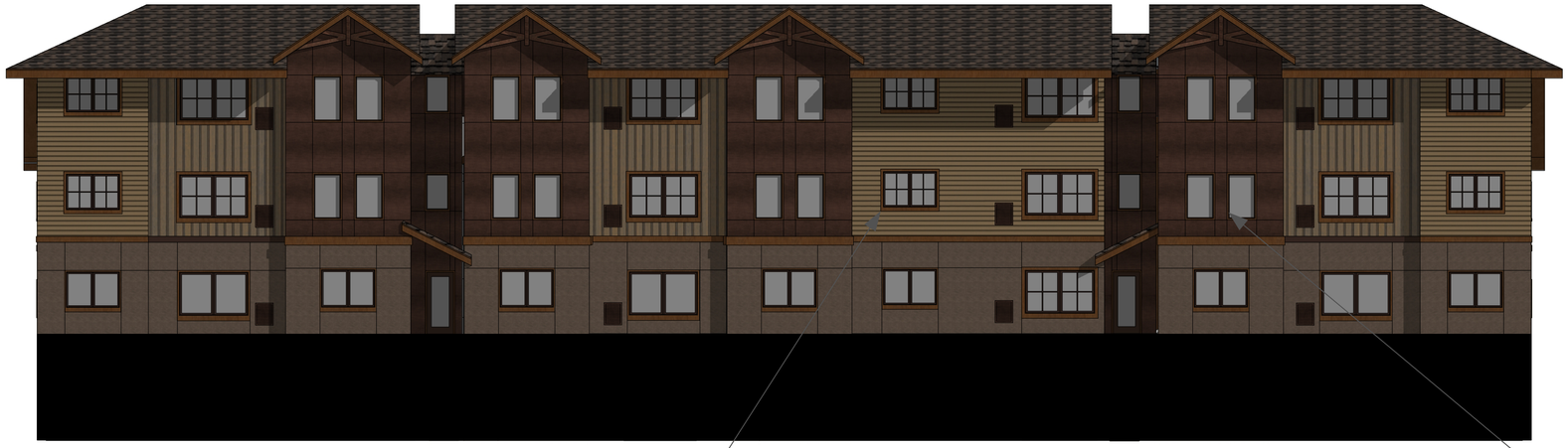


SOUTH ELEVATION - BUILDING B

Scale: 1/8"=1'-0"

EAST ELEVATION - BUILDING B

Scale: 1/8"=1'-0"

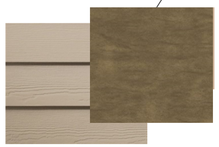


NORTH ELEVATION - BUILDING C

Scale: 1/8"=1'-0"

DARK SKY COMPLIANT LIGHTING

TAMKO ASPHALT SHINGLES, BLACK WALNUT



HARDIE T&G HORIZONTAL SIDING, SW LEEWARD

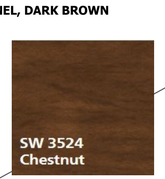
TIMBER TRUSSES, DARK BROWN

VYNIL WINDOWS AND DOORS, BRONZE COLOR

FLAT METAL PANEL, DARK BROWN

HARDIE BOARD (1X12) AND BATTEN (1X4) SW-RIVERWOOD

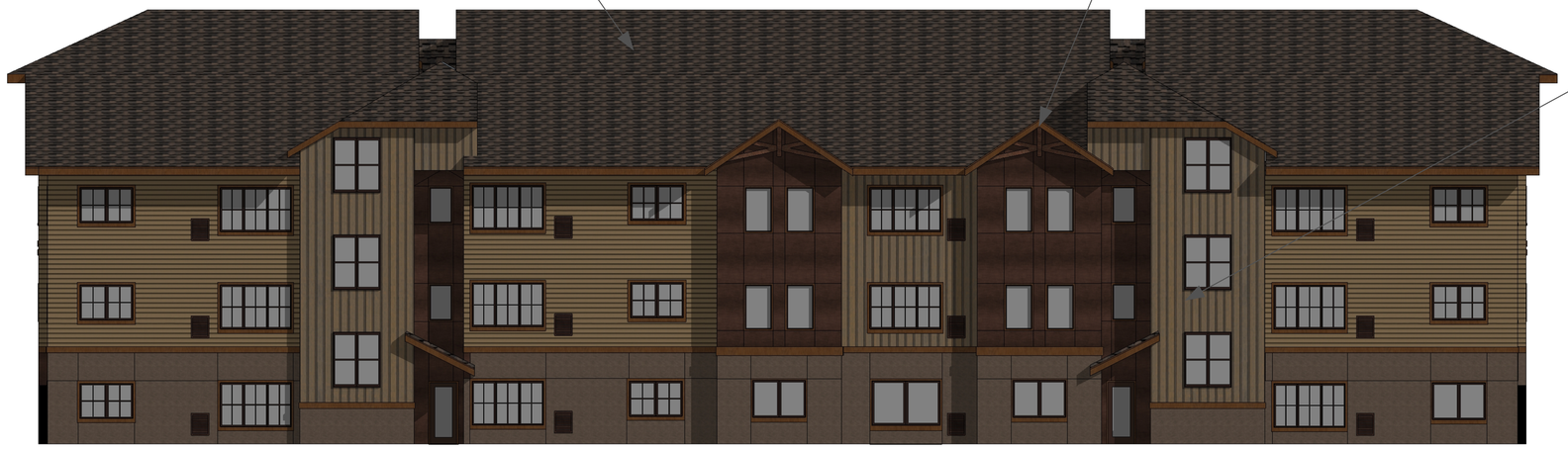
SYNTHETIC STUCCO SYSTEM: BUCKHORN



TRIMS AND FASCIA

WEST ELEVATION - BUILDING C

Scale: 1/8"=1'-0"

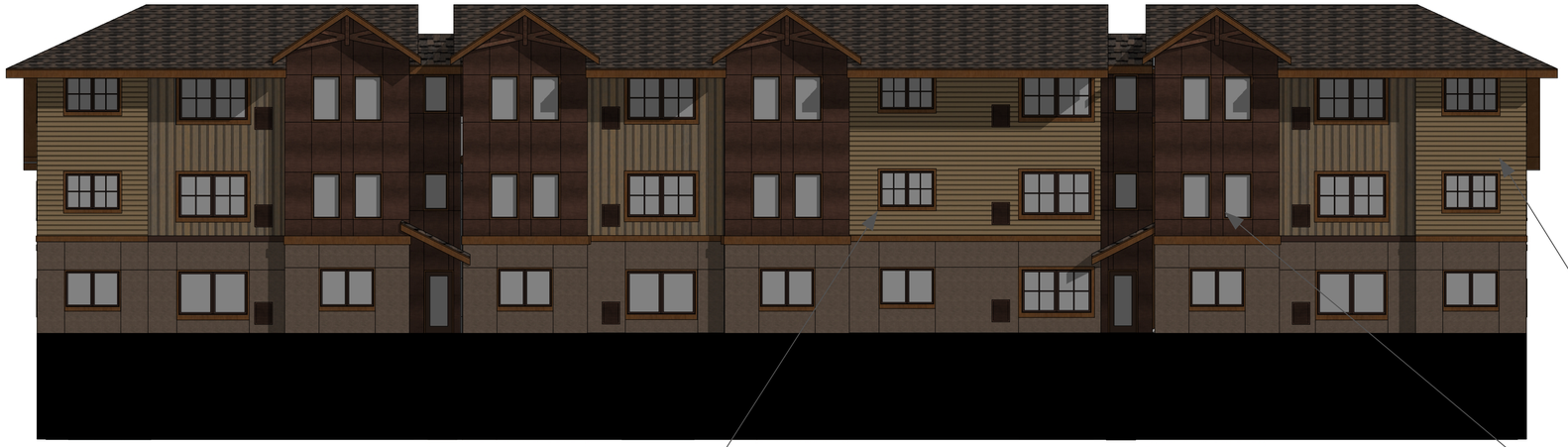


SOUTH ELEVATION - BUILDINGS C

Scale: 1/8"=1'-0"

EAST ELEVATION - BUILDING C

Scale: 1/8"=1'-0"

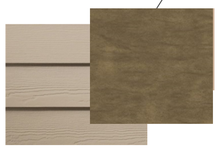


NORTH ELEVATION - BUILDING D

Scale: 1/8"=1'-0"

DARK SKY COMPLIANT LIGHTING

TAMKO ASPHALT SHINGLES, BLACK WALNUT



HARDIE T&G HORIZONTAL SIDING, SW LEEWARD

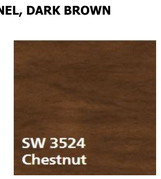
TIMBER TRUSSES, DARK BROWN

VYNIL WINDOWS AND DOORS, BRONZE COLOR

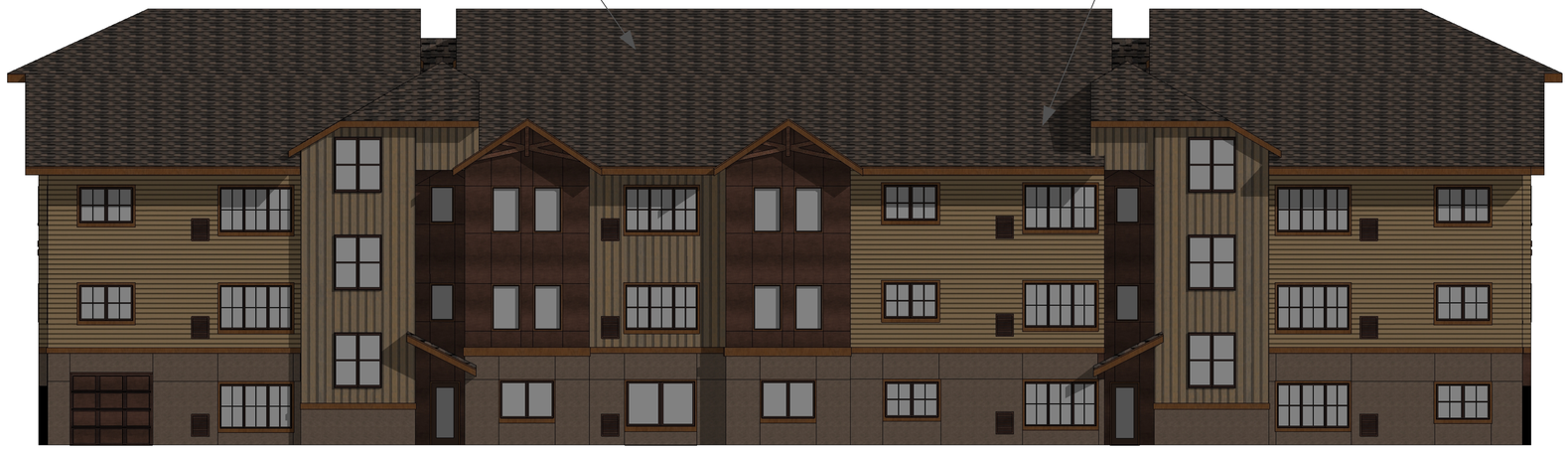
FLAT METAL PANEL, DARK BROWN

HARDIE BOARD (1X12) AND BATTEN (1X4) SW-RIVERWOOD

SYNTHETIC STUCCO SYSTEM: BUCKHORN



TRIMS AND FASCIA



SOUTH ELEVATION - BUILDINGS D

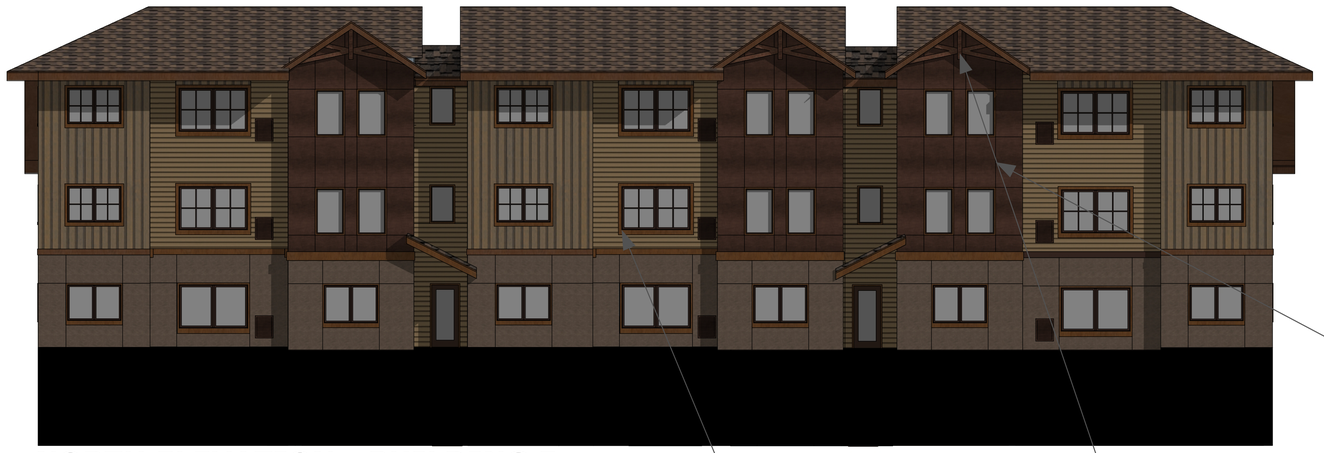
Scale: 1/8"=1'-0"

WEST ELEVATION - BUILDING D

Scale: 1/8"=1'-0"

EAST ELEVATION - BUILDING D

Scale: 1/8"=1'-0"

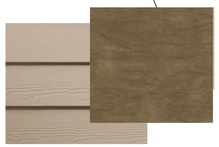


NORTH ELEVATION - BUILDING E

Scale: 1/8"=1'-0"

DARK SKY COMPLIANT LIGHTING

TAMKO ASPHALT SHINGLES, BLACK WALNUT



HARDIE T&G HORIZONTAL SIDING, SW LEEWARD

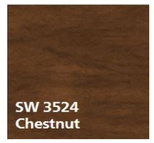
TIMBER TRUSSES, DARK BROWN

VYNIL WINDOWS AND DOORS, BRONZE COLOR

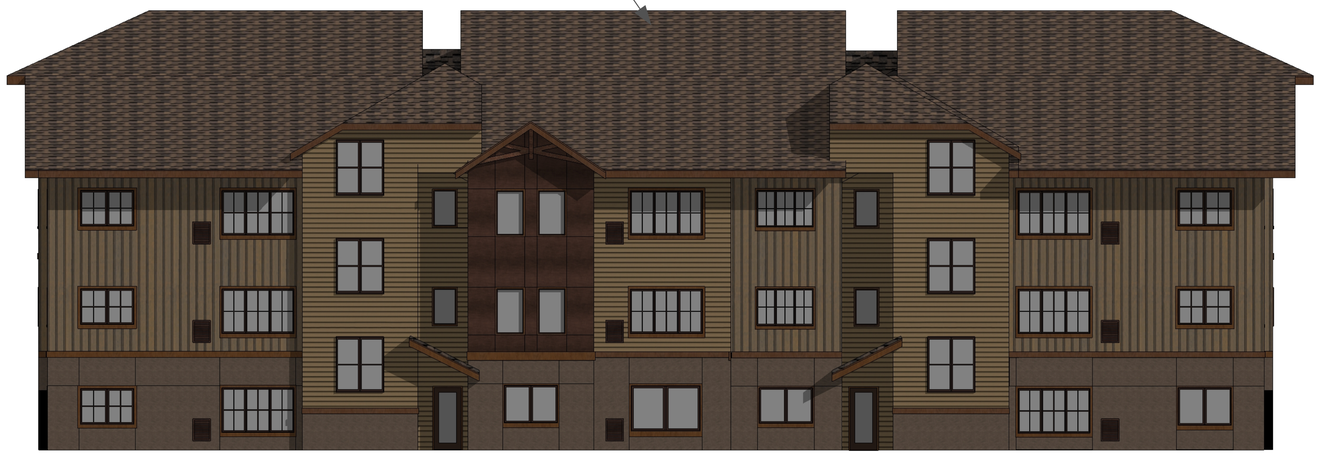
FLAT METAL PANEL, DARK BROWN

HARDIE BOARD (1X12) AND BATTEN (1X4) SW-RIVERWOOD

SYNTHETIC STUCCO SYSTEM: BUCKHORN



TRIMS AND FASCIA

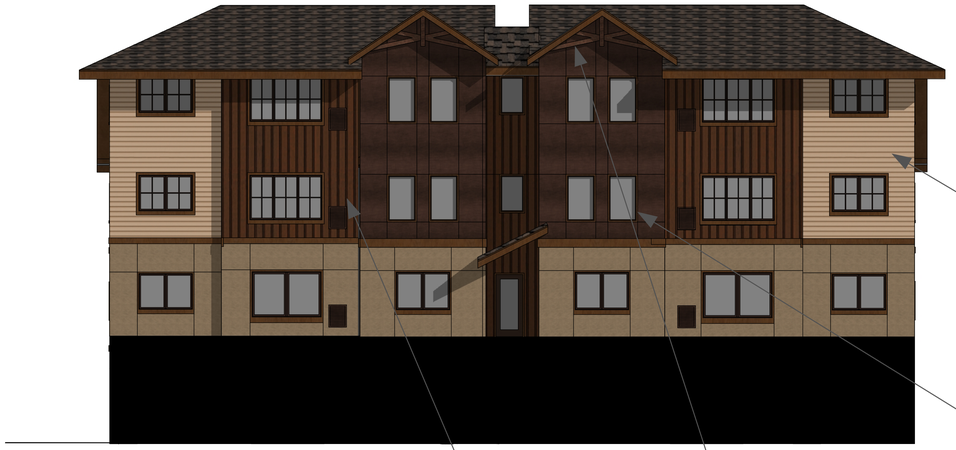


SOUTH ELEVATION - BUILDING E

Scale: 1/8"=1'-0"

EAST ELEVATION - BUILDING E

Scale: 1/8"=1'-0"



NORTH ELEVATION - BUILDING F

Scale: 1/8"=1'-0"

DARK SKY COMPLIANT LIGHTING

TAMKO ASPHALT SHINGLES, RUSTIC SLATE

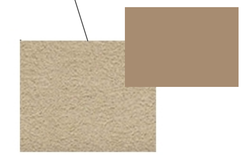
HARDIE T&G HORIZONTAL SIDING, SW - GINGER ROOT

TIMBER TRUSSES, DARK BROWN

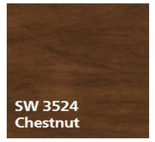
VYNIL WINDOWS AND DOORS, BRONZE COLOR

FLAT METAL PANEL, DARK BROWN

HARDIE BOARD (1X12) AND BATTEN (1X4) SW-FRENCH ROAST



STUCCO WITH EXPANSIONS: LIGHT SAND FINISH, SW - DOUBLE LATTE



TRIMS AND FASCIA

WEST ELEVATION - BUILDING F

Scale: 1/8"=1'-0"

SOUTH ELEVATION - BUILDING F

Scale: 1/8"=1'-0"

EAST ELEVATION - BUILDING F

Scale: 1/8"=1'-0"

CITY OF GLENWOOD SPRINGS

Engineering Department

Engineering Department **Jessica Bowser,** **Asst. City Engineer** **&** **Terri Partch, City Engineer**	**Date:** April 2, 2020 **To:** Community Development **Re:** Bell Rippy Glenwood LLC Apartments Major Development Permit

Please see the following engineering comments for the Bell Rippy Glenwood LLC Apartments Major Development Permit**.**

Miscellaneous Comments on the submitted Development Permit:

1. The variances that apply to the engineering standards to not need to be presented to the Planning Commission as they are the City Engineer's sign off. It would be advisable to tell the Commission we are approving these variances from the engineering standards because they make valid arguments for the variance and there is not negative impact for the allowancing of them.

2. The Transportation Commission has made a request that the developer to widen the sidewalk on the north side of Palmer Avenue to 8' and continue along the east side of Blake avenue to a mid-block crossing that ties into the RFTA BRT Station. This would help facilitate bike/pedestrian sidewalk and use of multimodal facilities.

Traffic Study Comments to be addressed prior to Development Permit Approval:

1. The Developer should submit a letter to CDOT from the Traffic Engineer stating that the recommendations of the first study will not change with the revision of traffic along with the traffic engineering update letter. CDOT should verify that no further action from the developer is necessary.

Geotechnical Report Comments to be addressed prior to Development Permit Approval:

1. The new HB Report states a different Acreage amount than in the application. The application states 5.74 Acres. The Report states that the site is 6.4 Acres under the first paragraph of section 1.3.

Drainage Report Comments to be addressed prior to Development Permit Approval:

1. The accurate soil classification to be used in the drainage calculations. Per the geotechnical report, the soil classification in site is type C.

    a. WSS information from the NRCS is not always the most accurate. While utilizing this information is acceptable for off-site flows, the on-site soils observed should be considered. If the engineer would like to have a more conservative approach, the less impervious soil type could be used, but should be justified in the report.

2. P13 – Proposed contours should be shown on the proposed drainage mapping.

3. There are some small grammatical/formatting errors throughout the report. Please proofread prior to final submittal. Otherwise, the report is comprehensive and addresses the concerns the City had previously.

Preliminary Debris Analysis Comments to be addressed prior to Development Permit Approval:

1. Goulder should revise their report to include the revised drainage report information and site plan.

    a. The reports still included site features that were supposed to be removed prior to revision. These diversion walls/berms were not and are not planned on this site. This should be updated to show the intent to use debris fencing and how this changes the debris potential in a developed condition.

2. Goulder should adjust their modeling or describe why the southern debris fan disappears and reappears to the west on Blake avenue.

Miscellaneous Comments to on the Submitted Plans:

1. Cover Sheet:

    a. Please Provide a Sheet Index.

2. Overall Site Plan:

    a. Property Lines should be identified with basis of bearings and distance. The lots should also be identified. General dimensions should be provided for orientation of the plan set. See the attached checklist for further direction.

    b. It would be helpful to remove the contour lines from the site plan sheets.

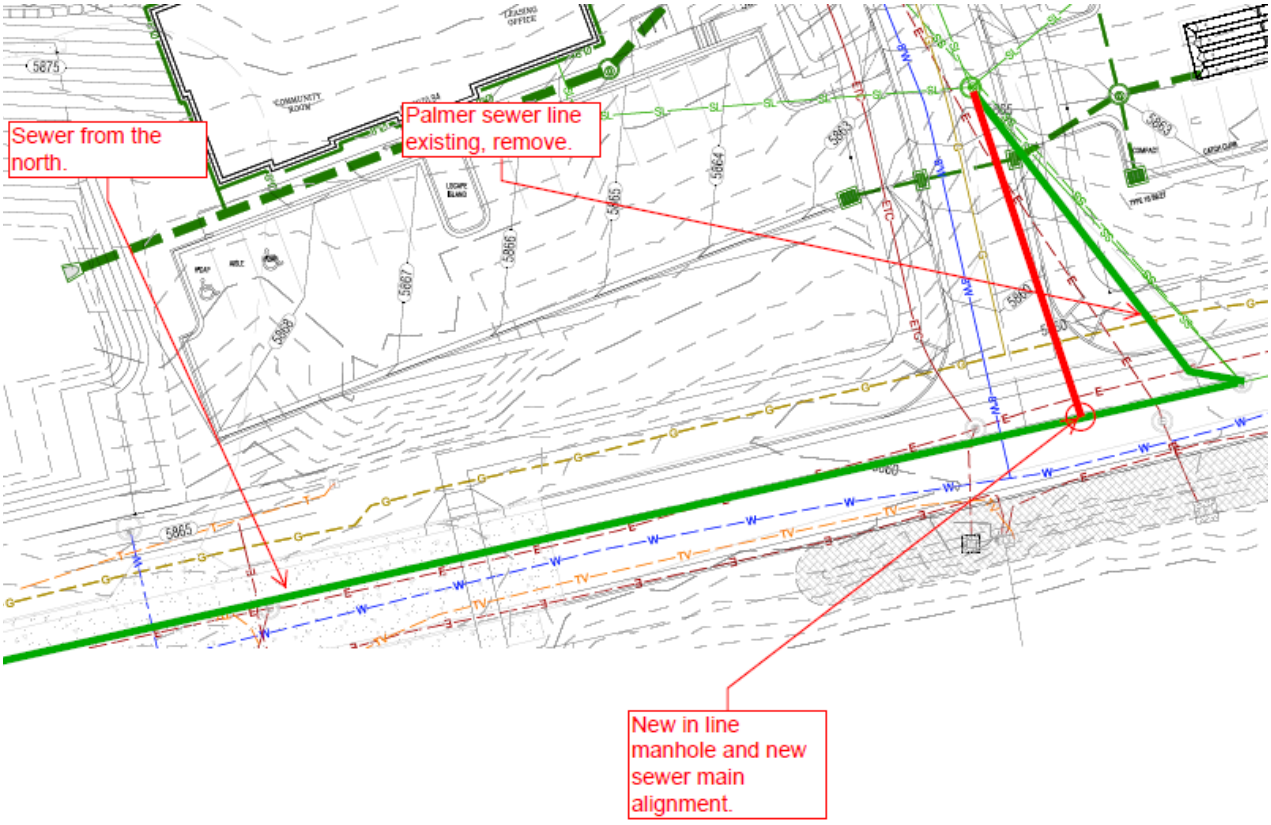
3. Site Plan:

    a. It would be helpful to remove the contour lines from the site plan sheets.

    b. ADA ramps should be directional and not point into intersections.

4. Utility Plan:

    a. The Sanitary Sewer main should be extended in Blake with a new manhole with the main remaining within the City ROW. Work for the installation/replacement of utilities within ROW should meet the engineering standards.



b. Service lines should not tie into manholes unless they are of equal size to the main; otherwise, they should enter perpendicular to the main with a WYE and a backwater valve placed at the property line.

c. Utility sizes should be identified.

5. Grading and Drainage Plan:

a. Include limits of disturbance (LOD) delineation on the grading plan. This LOD should include all off-site improvements as well.

b. The deflection berm proposed at 26th and Palmer appears to encroach on the adjacent property. Please provide documentation that the homeowner will allow this construction and is prepared to take responsibility for the maintenance, or that the Bell Rippy Property Owner will accept maintenance responsibility and it is included with their planning.

Comments to be addressed prior to Grading/Building Permit Approval:

1. Provide an Existing Conditions Plan.

2. Provide a Demolition Plan.

a. Please refer to the City Code regarding street cuts, asphalt installation, and patching.

3. Utility Plan:

a. There should be a minimum of at least 2' from the edge of dry utility and the city ROW. Please provide a dry utility trench detail. Additionally, the utilities should have appropriate separation the is in compliance with the Engineering Standards.

b. Plan and Profiles are required for all Utilities in City ROW. This project will require Provide Subsurface Utility Engineering (SUE) or stamped letter stating why this project is exempt from a SUE.

c. Provide Utility Details.

4. Provide retaining wall details.

    a. All structural retaining walls over 4' from bottom of footer to top of wall **and/or** expect to bear traffic loading, shall have a structural engineered design submitted for review

5. Drainage Plan:

    a. Drainage Details should be included.

    b. Foundation design and underdrains should be provided per the recommendation of the Geotechnical Report.

    c. Check dams may need to be installed within the drainage channels to reduce velocity and erosion. Please have the geotechnical engineer comment on the slopes and treatments allowed for slope stability.

6. Include a Signage and Striping Plan.

    a. No parking signs should be provided along Palmer Avenue.

7. A CDPHE Construction Stormwater Discharges Permit will be required. The Developer should submit a copy of the completed (and approved) SWMP to the City.

8. No work for this project will be allowed to commence until **all** easements (temporary or permanent), on or off site, are in place for the development of property.

9. A maintenance plan and agreement will need to be completed for all debris berms, fencing, and swales.

10. Update the drainage report with the final detail information for the proposed underground detention system prior to final drainage report submittal.

Comments to be addressed prior to Certificate of Occupancy:

1. The City will require a maintenance plan and agreement with the development for the detention and debris system/s. If the system/s are not being maintained property and having a negative effect on downstream facilities, the City will need access to perform the maintenance and back charge the facility owner.

2. All drainage and site improvements will require a certification letter from the design engineer that verifies that all improvements were constructed per plan.

3. Record drawings will be required to be submitted to the City along with electronic drawings (CAD).

Miscellaneous Comments (no need to be addressed, for tracking purposes only):

1. Palmer Avenue and the storm system is being constructed to support the development of this parcel and it is not likely to be a publicly used road. The drainage across this property and Palmer Avenue will be the responsibility of the property owner to treat and detain as it has multiple connections into the private development and will have a direct impact to the maintenance frequency of the facilities in the ROW.

    a. The City will only maintain the inlets within City ROW. The City will not be responsible for the maintenance for any drainage or water quality facilities crossing/entering private property. Maintenance frequency will be monitored and in the event the City sees excessive debris in these facilities that impact the maintenance schedule of these inlets the City will require the submission of maintenance logs from the property owner for the facilities that tie into the public ROW. If it is found that there is undue impacts to the public system, the City will require the owner to maintain or repair the public facilities until such time that they can provide documentation that their on site facilities have been repaired/maintained to prevent excess debris from entering the public system.

Matthew Langhorst DPW
(970) 384-6438 (o)

CITY OF GLENWOOD SPRINGS PUBLIC WORKS

101 West 8th Street
Glenwood Springs, CO 81601

April 6th, 2020

RE: Bell Rippy Plan Comments

The following are comments regarding the proposed project plans:

1. The fire hydrant located along Palmer between buildings A and C is too close to the Type R inlet to maintain, please adjust its location.
2. Private storm sewer system is hook directly to the roadway storm sewer system, a storm water maintenance agreement will need to be competed with the City, all infrastructure will be maintained by the development.
3. No main line water valve locations have been shown, please add valves per the city engineering standards and general practice.
4. What is the purpose of the two water services to each building location? Fire and domestic? Fire and domestic lines can be run to each building as one service and separated internally to the building.
5. Several fire hydrants do not have lead lines shown to them.
6. Please add fire hydrant valves to the plans.
7. Please add service line valves to the plans attached to the main line tee.
8. What size sewer line is being proposed? Any main lines located on the property will be the responsibility of the property owner. The City will not take ownership or maintain ace of these lines. The three manholes and main within Palmer Avenue will become the property and maintenance responsibility of the City.
9. Services lines are not allowed to enter a City manhole directly unless it is of equal size to the sewer main. All other service connections should be completed with a wye connection to the sewer main itself. What size services are being proposed?
10. Debris flow/Storm mitigation structures and piping will be maintained by the property owner or HOA. A maintenance agreement will need to be completed with the City for these items also.
11. The construction work hours are noted incorrectly in the general notes on page one of the plans set.
12. Note 15 within the utility notes seems to contradict the plan set design pertaining to sewer services and manhole connections.
13. The City would prefer note 23 under utilities call out C900 versus DIP.
14. Utility providers contact updates:
    a. Broadband: Michael Gardner 384-4807.
    b. Water/Sewer: Mike Hoffman 384-6343
    c. Public Works Director: Matthew Langhorst 384-6438
15. The city will assign a PM for the project, which may not be PW. Please just not a city representative for this position.
16. Testing should be noted as it is currently, or per City Engineering Standards.

17. Reviewing the Golder Debris Flow Report 29Jul19 it appears that the development has not been shown with the new site planning included, this will change the model and design.
18. Reviewing the Golder Debris Flow Report 29Jul19 it appears that the development significantly changes the location of the debris flow entering the Oak Hurst Townhome development and appears to add flow to the western side of the townhomes that was not there in the existing conditions. Please explain the change in historic flows noted if these still occur in with the updated plan.
19. Reviewing the Golder Debris Flow Report 29Jul19 it appears that the development changes the location of the debris flow on the southern portion of the property and it relocates the flow from the back-side of 2830 Glen Avenue to more in line with 2772 Glen Avenue. Please explain if either the existing condition or proposed condition overtops in a minor way to the properties noted if this still occurs with the updated plan.
20. Upon approval of the PUD the developer will be required to follow the **Glenwood Springs Line Extension Policy.** (attached)
21. A pre-construction meeting must be held with the developer's contractor and the electric department superintendent to clarify all responsibilities of the rules and regulations pertaining to the installation of electric infrastructure. Landscaping cannot interfere with required clearances around transformers and metering equipment.
    The electric department will need more information on the proposed transformer location in respect to grades and retaining walls and more information on metering equipment locations. Residential units will be metered separately.
22. Municipal Code 070.030.130 Underground Utilities. Utility easements and right-of-ways shall be provided in the subdivision or development meeting the requirements of the City of Glenwood Springs Electric System for the installation and maintenance of energy distribution and telecommunication facilities.

Additional Water line comments

23. The water line on Blake Ave is believed to be thin wall steel pipe. We will not allow a tap into the existing thin wall. A large portion of the main will need to be replaced. Recommended that potholing be done to verify material and size.
24. There is a stub out at the top of palmer. If this stub out is not utilized it will need to be abandoned to City standards. W/WW Department may require the replacement of the existing valve if it is determined to be in unacceptable condition. We recommend potholing to verify material and size of pipe.
25. It was noted on previous reviews that this is a geologically active area and that bell restraints will may be required on all wet pipe
26. The plans show 2 service lines for each building 1 for fire and 1 for domestic water. 1 combined service line for fire and domestic will be required. The line shall be designed and constructed to NFPA 24 standards The lead valve will be the demarcation point for the private water service for each building.
27. No fire hydrant leads, or valves are shown
28. No water service lead valves are shown or mainline valves.
29. There is no profile for the water or sewer lines. All water/sewer crossings must meet CDPHE requirements for separation.
30. How is metering for each building proposed sizes?

31. For fire hydrants located on private property, The W/WW department will operate, maintain and repair the hydrants and all hydrant leads. Each hydrant requires a minimum 15' square easement around the hydrant and access easement up to the hydrants for maintenance and repair.

Additional Sewer line comments

32. Service lines are not allowed to connect directly into Manholes unless 8" or greater. All service lines shall be connected with a factory wye. As noted in Utility notes line 15
33. Ensure the development meets the Wastewater Discharge Ordinance for sanitary sewer discharges.
34. The sewer service for building F and E shows a tie in to an existing sewer line. It is believed to be truss pipe. Recommend that potholing be done to verify material and size.
35. Will need a detail of new sewer line tie-in to existing manhole on Blake Ave.

Thank you,

Matthew Langhorst
City of Glenwood Springs, Director of Public Works

YCCD Response: Landscape islands were not previously coordinated with civil. The plans have been updated to reflect the islands.

50. The pavement hatch is not shown in the legend on C1.0.
    YCCD Response: Pavement hatch has been added to the legend.
51. Please include striping along Palmer Avenue.
    YCCD Response: Per discussions with Jessica Bowser, none of the residential streets in this neighborhood are striped.
52. Please add a stop sign to the north side of the Palmer Avenue and 26th Street intersection.
    YCCD Response: A "stop" sign has been added to the north side of the intersection.

Water / Wastewater Department

1. For all main extensions (water and sewer), contractor must warranty workmanship of City-accepted infrastructure for a minimum of two years.
   YCCD Response: Refer to General Note 25 on Sheet C1.1. ok
2. City main extension must be installed per City specifications.
   YCCD Response: There are several notes throughout the drawings which state this. ok
3. Tapping sleeve and ancillary hardware must be stainless steel.
   YCCD Response: This is not appropriate for drawings but instead for project specifications. Note 24 has been added to Sheet C7.2 to satisfy the comment. ok
4. City requires restraints for all fittings. Additionally, the city recommends restraints for all joints on wet pipe in this geologically-challenging area.
   YCCD Response: Refer to Water Note 3 on Sheet C7.2 and Sanitary Sewer Note 2 on Sheet C9.1. Restraint will be provided for all joints. ok
5. Rather than re-tapping the main for the new hydrant, can the existing tap be re-used and just extend the lead?
   YCCD Response: The existing lateral will be extended to the new fire hydrant location.

   ok for this submittal but need to see detail at some point showing coupling, restraints, thrust restraint, etc.
6. Our records indicate there may be an existing valve with stub-out, which would eliminate the need for a new tap. Suggest field-verification of the stub-out. City may require replacement of the existing valve if it is determined to be in unacceptable condition.
   YCCD Response: Note 21 on Sheet C7.2 has been added accordingly. ok
7. City recommends contractor pothole ASAP to verify existing water pipe type and material (in 26th Street and Palmer Avenue intersection).
   YCCD Response: A contractor for this project has not been selected. This comment is better suited for a Building Permit submittal. The work will be coordinated at a future date.

   ok for this submittal, but potholing recommendation should be included in future submittal
8. The isolation valve for each service line is the demarcation point for city / private responsibilities. Customer responsibility begins downstream of the service valve. (This is a general statement that applies to all service valves in the project.)
   YCCD Response: This is not appropriate for drawings but instead for City Municipal Code. Note 23 on Sheet C7.2 has been added, however, to satisfy the comment. ok
9. What size meters will be installed for each building?
   YCCD Response: This information is unknown as we are applying for a Development Permit not a Building Permit. No plumbing design has been completed. Meter sizes will not be known until the Building Permit submittal.

   ok for this submittal, but comment should be included in future submittal that indicates a City-approved meter must be installed in accordance with City specs.
10. For fire hydrants located on private property, the City Water Department will operate, maintain, and repair the hydrants and all hydrant lead piping located downstream of the hydrant lead isolation valve. Maintenance / repairs of the hydrant lead isolation valve and all piping upstream of the valve is the responsibility of the property owner. Each hydrant requires a minimum 15' square easement around the hydrant and access easement up to the hydrants for City repairs.

YCCD Response: No fire hydrants will be connected to private services. All fire hydrants will be fed from public water mains.

REQUIRED: Fire hydrant location needs to be approved by Fire Department so that we know if any hydrants are on private property.

11. Provide centralizer detail for all encasements.
    YCCD Response: No encasements are proposed for the project. There will be sleeves beneath the retaining wall along Palmer Avenue. Per discussion with Brad, there is no requirement to keep the pipe centralized in a sleeve. YCCD will consider this for a future Building Permit submittal.

ok for this submittal because the lines in question would be considered private. If plan changes, encasement w/ pipe centralizers may be required.

12. Fire Department expressed concern about fire hydrants on east side of development versus west side along the access road.
    YCCD Response: The fire hydrant layout is in conformance with the International Fire Code and further conforms to the original direction given by the fire department. The design team has received no written comments from the fire department but has made a substantial effort to seek their guidance on this issue. No direction has been received. If revisions are needed, we need firm direction from the fire department. Any changes will be incorporated into the Building Permit submittal.

see note 10

13. Will the addition of two new fire hydrants for the project be acceptable to the fire department?
    YCCD Response: The fire hydrant layout is in conformance with the International Fire Code and further conforms to the original direction given by the fire department. The design team has received no written comments from the fire department but has made a substantial effort to seek their guidance on this issue. No direction has been received. If revisions are needed, we need firm direction from the fire department. Any changes will be incorporated into the Building Permit submittal.

see note 10

14. Construction water must be metered and equipped with a City-approved cross-connection control device. Contact the W/WW Department prior to using any water for construction purposes (Please see attached construction water usage policy).
    YCCD Response: This is not appropriate for drawings but instead for documentation associated with a Building Permit. I assume you will provide the City's Water / Wastewater specifications to the contractor when they apply for a Building Permit.

ok for this submittal but please add this comment to future drawings.

15. Any existing water or sewer service stubs originally installed for these lots that are not utilized in the development of the lot shall be abandoned by the developer at the originating main line.
    YCCD Response: There are no known service stubs to this property.

ok, but if a stub out is encountered, it will need to be abandoned per City policy.

16. All wet utility lines shall be restrained joint pipe.
    YCCD Response: Refer to Water Note 3 on Sheet C7.2 and Sanitary Sewer Note 2 on Sheet C9.1. Restraint will be provided for all joints.
17. Contact 811 to schedule the appropriate utility locations prior to construction.
    YCCD Response: This note continues to be included on every single civil plan. ok
18. The City's standard minimum depth-of-bury requirement for water and sewer mains is 5.5 feet (top of finished surface to top of pipe). The City recommends that private service lines meet the same standard.
    YCCD Response: This continues to be labeled not only on the utility profiles but also Water Note 10. ok
19. The City shall inspect and approve pressure testing, disinfection, and bacteria sampling of the completed water and sewer line extensions.
    YCCD Response: Refer to Note 13 on Sheet C7.2 and Note 23 on Sheet C9.2. ok
20. All modifications to City infrastructure must conform to City standards (see attached W/WW Department).
    YCCD Response: There are several notes throughout the drawings which state this. ok
21. Please contact the City's W/WW Department prior to construction to discuss additional installation and material requirements for taps and hydrant installation.
    YCCD Response: Refer to Note 25 on Sheet C7.2. ok

22. The City's W/WW Department staff must be onsite to observe, inspect, and approve ANY work that may affect water or sewer mains.
    YCCD Response: This is not appropriate for drawings but instead for documentation associated with a Building Permit. Refer to Note 26 on Sheet C7.2. ok
23. Only City W/WW Department staff may perform a tap into the City's water or sewer mains. In certain circumstances --and only with pre-authorization --the City may approve a qualified contractor to install the tap while under the City's direct supervision.
    YCCD Response: This is not appropriate for drawings but instead for documentation associated with a Building Permit. Refer to Note 27 on Sheet C7.2. ok
24. The customer is responsible for all costs incurred by the City for the installation of tap(s).
    YCCD Response: This is not appropriate for drawings but instead for documentation associated with a Building Permit. Refer to Note 28 on Sheet C7.2. ok
25. All tap materials must conform to City standards (see attached W/WW Department Standards).
    YCCD Response: There are several notes throughout the drawings which state to conform to City standards for all aspects of construction. ok
26. As built utility drawings shall be provided to the City.
    YCCD Response: Refer to General Note 24 on Sheet C1.1. ok. Engineer-certification is also req'd
27. Ensure the development meets the Wastewater Discharge Ordinance for sanitary sewer discharges. (see attached ordinance).
    YCCD Response: Construction will be in accordance with the City's standards. ok
28. Please provide a detail of service connection inside mechanical rooms for all buildings.
    YCCD Response: This information is unknown as we are applying for a Development Permit not a Building Permit. No plumbing design has been completed.

    ok, but comment shall be made in future subittals that meter and backflow devices need to be installed per City requirements.
29. City accepts Mueller or Kennedy brand fire hydrants.
    YCCD Response: This is not appropriate for drawings but instead for project specifications to be prepared for the Building Permit submittal. ok, but ensure this is noted in future submittals
30. City field staff recalls that the existing 8" main that runs along Blake may transition from DI to thin-walled steel approx. 75-100 feet to the north of this proposed tie-in point. City recommends contractor pothole ASAP to verify existing water pipe type and material at the proposed tie-in point. City will not allow tap into the thin walled steel pipe. If existing pipe is thin-walled steel, City will require new DI pipe to be installed up to the existing DI-steel transition.
    YCCD Response: A contractor for this project has not been selected. Note 22 on Sheet C7.2 has been added accordingly. The work will be coordinated at a future date.

    REQUIRED - This is an important consideration that could have significant design and cost implications. Additional consideration is needed at this phase of the project. Note #22 on Sheet C7.2 should be modified to indicate that potholing is not a "City suggestion" but rather a requirement of the project.
31. Provide detail for connection to main. Assume hot tap w/ valve? Hot tap sleeve and ancillary hardware must be stainless steel.
    YCCD Response: A label has been added for this connection. ok
32. Ensure that all water/sewer crossings meet CDPHE requirements for separation distance. City requests additional detail for all water/sewer crossings (this is a general comment applicable to all crossings).
    YCCD Response: Encasement of the sanitary sewer pipe will be provided when it crosses the water main. A detail will be provided in a future Building Permit submittal.

    REQUIRED - We are concerned that water/ sewer separation and crossing requirements have not been appropriately addressed. The crossings need to be identified in the drawing set and a general detail needs to be provided for the crossings. Also, explain why two types of gravity sewer pipe are specified (SDR35 and C900). One type of pipe for the project is preferred.
33. Fire Department expressed concern about fire hydrants on east side of development vs. west side along the access road. Consider relocating?
    YCCD Response: The fire hydrant layout is in conformance with the International Fire Code and further conforms to the original direction given by the fire department. The design team has received no written comments from the fire department but has made a substantial effort to seek their guidance on this issue. No direction has been received. If revisions are needed, we need firm direction from the fire department. Any changes will be incorporated into the Building Permit submittal.

    see note 10

34. If existing manhole will be re-used, it appears the existing ladder rungs will interfere with the new core hole. Ladder rungs will need to be removed and relocated to a different location in the manhole. An additional rung is needed. The ring will need to be replaced.
    YCCD Response: It is desired to adjust the incoming pipe elevation to avoid removing and relocating the ladder rungs. Direction will be discussed and agreed upon during field reconnaissance with the contractor and City prior to construction.
    ok, but comment shall be made in future submittal that rungs need to be relocated, as necessary.
35. Provide detail on how the existing stub-out pipe will be abandoned.
    YCCD Response: Per a conversation with Brad, the City is going to further investigate the presence of a stub-out. ok. The City's original comment was incorrect.
36. What will be the pressure testing requirements for C900 (sewer) pipe? Please provide specification.
    YCCD Response: This information will be included in project specifications prepared for a Building Permit submittal. This submittal is only for a Development Permit.
    ok, but comment shall be made in future subittals tregarding testing procedure
37. What will be the pressure testing requirement for SDR35 sewer pipe? Please provide specification.
    YCCD Response: This information will be included in project specifications prepared for a Building Permit submittal. This submittal is only for a Development Permit.
    ok, but comment shall be made in future subittals tregarding testing procedure
38. Is SDR35 sewer pipe adequate for this application given the challenging soils in this area?
    YCCD Response: Certa-Lok joint restraints can be added to SDR-35 pipe; therefore, yes, this pipe is adequate for the application. ok
39. Field staff wanted to emphasize that proper bedding of the pipe in this geographically-challenging area is critical.
    YCCD Response: Noted. ok
40. We understand that C900 pipe is spec'd as alternative approach to meeting the minimum separation distance requirements between water and sewer pipe. Please provide documentation that this is approach is acceptable to CDPHE.
    YCCD Response: Information from CDPHE has been forwarded for review. Any revisions will be incorporated into the Building Permit submittal.
    See note 32. City's current interpretation of CDPHE policy is that C900 does not eliminate the need for sleeving at crossings.
41. City requires CCTV of the new sewer mains after they are completed. A copy of the video must be submitted to the City.
    YCCD Response: This is not appropriate for drawings but instead for documentation associated with a Building Permit. Requirement is noted.
    ok, but requirement will be included in development agreement.
42. Verify this manhole will be brought to grade?
    YCCD Response: As indicated by the notes on this drawing, the existing structure (be it a manhole or a clean-out) is proposed to be replaced with a new manhole. ok
43. This is a cleanout, not a manhole.
    YCCD Response: There is a manhole cover at-grade. Whatever the structure, it will be replaced with a manhole. ok
44. Provide connection detail.
    YCCD Response: Per discussion with Brad, the existing pipe in Palmer Avenue is truss pipe – a product readily produced and sold by Contech Engineered Solutions. An appropriate coupler will be required between the truss pipe and C900 PVC. ok

City of Glenwood Springs Line Extension Policy

1. AVAILABILITY AND APPLICABILITY.

This Line Extension Policy is available in all territories served by the City of Glenwood Springs Electric System and is applicable to all classes of electric service.

2. GENERAL PROVISIONS.

The provisions of this policy are subject to the following rules for all customers served outside and within the City limits:

A. Construction Policies of the Glenwood Springs Electric Department.
B. Rules and Regulations of the City of Glenwood Springs.
C. Line Extension Policy as filed with the Public Utilities Commission of the State of Colorado.
   (i) Customers within City limits: Courtesy Filing
   (ii) Customers outside City limits: Filing per PUC of Colorado

3. POLICY.

The rules and regulations of the City of Glenwood Springs Electric System, as outlined above under the General Provisions, require that the customer, owner or developer pay the full estimated cost for the requested new line extension.

The cost for the new requested facilities shall be paid for by the customer in full in advance of construction with no provisions for rebates or refunds.

Line extensions and new electrical facilities needed to serve new customers shall be classified into two categories of construction: On-site Facilities and Off-site Facilities. The new consumer, owner or developer shall pay the full amount for the new on-site and off-site facilities needed to provide electric service to the new customer.

4. DEFINITIONS.

On-site facilities are comprised of those electrical facilities on the premises of the project needed to provide electric service to the new load. These new facilities include but are not limited to the following items: poles and line appurtenances, primary underground cables, trenching and backfilling, transformers, meters, sectionalizing equipment, vaults, equipment pads, secondary pedestals, and secondary services.

Off-site facilities are comprised of electrical facilities not located on the premises of the project, but are associated with the backbone system comprised of substation equipment and main primary feeder lines which may or may not need to be upgraded to serve the new load.

5. FEE CALCULATION.

The Glenwood Springs Electric Department will estimate the investment required for on-site facilities and off-site facilities needed to provide electric service to the new customer. The cost estimate for each new project will be provided by the City Electric Department and will be based on historical cost records. In the case of large, phased projects, the City may permit estimates and construction advances for individual phases of the project. No construction shall proceed until the required construction advance is received by the City. If, during the course of construction, it is apparent that actual construction costs are or will exceed, by more than ten percent (10%) the original estimate, construction shall cease until a sufficient additional construction advance is received by the City to cover additional estimated costs.

A. The investment estimate shall include all costs necessary for the extension for appropriate new on-site and off-site equipment and facilities.
B. The investment estimate shall include all incidental costs such as engineering fees, fees for legal counsel, and all other overhead costs incurred in conjunction with the extension.
C. The investment estimate shall not include any additional costs for capacity, size or strength in excess of that necessary to meet the requirements of the customer or customers requesting the extension.

If the actual costs for the extension is less than the cost estimate submitted by the City, this overcharge will be refunded to the owner upon completion of all work for the line extension. If the actual cost for the extension is more than the cost estimate submitted by the City, this underpayment amount shall be paid by the owner to the City prior to energization of the project.

From: Lisa DiNardo
To: Trent Hyatt
Subject: Re: April 6 Department Review Meeting
Date: Sunday, April 5, 2020 5:16:15 PM
Attachments: image001.png

Hi Trent,

I hope all is going well with you.

I'm looking forward to seeing how the Raymond property plant material that were planted last fall have overwintered. I'll let you know what I find.

Here are my comments for the three land use proposals.

I. Bell Rippy

1. The landscape plan for the Bell Rippy development of Block 1 and Block 3 in the Oakhurst Subdivision are recommending a drip system throughout the proposed landscape. While drip irrigation may be suitable for perennials; shrubs and trees require larger volumes of water hence an irrigation system with pop-up spray heads is more appropriate for shrubs and trees with maturing, spreading root systems. A pop-up spray head irrigation system, if properly maintained, will ensure the long term health and vitality of the landscape.
2. Please have the applicant submit a detailed irrigation plan.
3. Please have the applicant submit a detailed landscape plan calling out the plants and their locations.

II. Zayo Group – Special Use Permit

1. I did not see any construction impacts to the landscaping. If it arises please let me know.

III. Kind Castle - Special Use Permit

1. There are mature trees on the east side of this building. It was not noted in the document that these will be impacted by any improvements. If something changes, please let me know.

Please let me know if you have any questions.

:)

Lisa

From: Greg Bak
To: Trent Hyatt
Subject: Re: Bell Rippy
Date: Friday, April 10, 2020 8:57:07 AM
Attachments: image001.png

I apologize, I had that meeting marked on my calendar and still missed it.

I met with the architect a couple weeks ago regarding water supply and access.

The chief concern is the length of the parking lot on the east side of the project. 150' without a turnaround for fire apparatus is the limit allowed: this lot is considerably longer than that. My first preference would be to have a continuous emergency access road across the south side of the complex, emptying out onto 26th. He was going to check into the feasibility of that.

Did this get mentioned at the meeting?

Thanks,

Greg

From: Trent Hyatt <trent.hyatt@cogs.us>
Sent: Thursday, April 9, 2020 5:30 PM
To: Greg Bak <greg.bak@cogs.us>
Subject: Bell Rippy

Greg,
I think I may have accidentally removed you from the department review meeting on Monday. I apologize if so and want to follow up with you to see if you had any comments on the proposal.

Thanks,

Trent L. Hyatt
Senior Planner
City of Glenwood Springs
101 W. Eighth Street
Glenwood Springs, CO 81601
970.384.6427 (p) 970.945.8582 (f)
trent.hyatt@cogs.us

From:	lcrfnd@rof.net
To:	Trent Hyatt
Cc:	Debra Figueroa; Paula Stepp; jandjraehal@gmail.com
Subject:	development variances
Date:	Wednesday, April 22, 2020 2:40:18 PM

Trent Hyatt, Planning and Zoning Commission,

I have seen the posts concerning the request for variances by Triumph Development on Palmer Ave: Public Notice in Post Independent on April 14 and 21, 2020 and sign erected at 26th and Palmer on April 17 for public hearing on April 28.

The entire country including GLENWOOD SPRINGS is under a Stay-at-Home order. I don't think that people are aware of your posts with a very short time frame.

I feel that this request for variances should be postponed until the Stay-at-Home order is lifted so that the neighbors who are affected by this development can visit in person.

I have lived at 2405 Palmer Ave longer than any other person in this area and certainly understand the neighborhood.

I have read the request for the variances and nowhere is the traffic pattern addressed. How do all the vehicles access the development? Where is the map and where is the site view of buildings, park, parking lots, dumpster locations, lights, etc?

Directing traffic up 23rd st and down existing Palmer Ave is not acceptable. There are more than 10 grade school or younger children who live on Palmer Ave/ Crestwood Dr.

After the original development was approved the developer was to meet with the city to arrange to install a gate at his expense on Palmer to the south of the Speck property. It would be able to be opened by First Responders only.

We were told that these apartments would be rented at " market rates" with no restrictions on how many people could occupy each unit so it will not be cheaper than over-priced existing units.

Increasing the density and not having adequate parking will certainly cause many future problems. Just because it is close to the bus station is certainly no guarantee that people will not have at least two vehicles per unit (even a one bedroom) or even ride the bus.

I hope you will answer my questions and address the concerns of the neighborhood.

Thank you,
Lynn B Cary
2405 Palmer Ave
Glenwood Spgs, Co 81601
970-945-7215
lcrfnd@rof.net

Dear Planning and Zoning Commision in regards to the Bell Rippy Development:

I have spoken to Trent Hyatt, Terri Partch, and Linda DuPriest about this issue. I have done extensive research into various street and traffic issues. I cannot endorse this development in the current state of application. This is not smart growth.

To start, the development is trying to squeeze too many people and not enough parking spaces into too small of a space. The lack of parking will spill out into a neighborhood that already has parking issues. The development plan is focused more with money making rather than quality of life.

The developer is asking for several variances from City code. The code is there to keep people safe. Varying as much from the code as they are asking is questionable.

The most unsafe part of all of this is the street and traffic issues surrounding the development. The neighborhood streets infrastructure is far below what is necessary for the creation of through streets and the opening of Blake Street gate.

Very few of the streets in this neighborhood have sidewalks. There is copious amounts of research done saying sidewalks are the best way to keep pedestrians and kids safe, including City of Glenwood Springs own documents. There are so many kids in this neighborhood, why endanger lives by adding traffic to streets that don't have basic safety infrastructure? A few minutes of convenience should never come before safety. The traffic is frustrating, but my children's lives, my neighbor's lives and our pet's lives mean more than an added 5-10 minutes travel time.

I applaud Linda DuPriest and Terri Partch in efforts to use new and innovative ideas to help find a solution, but the solution needs to be fully planned out before the plan for the development is accepted. We need solutions to the problems before there is a safety issue.

I applaud the City with its traffic calming initiative, but here is a chance to make it right before needing the traffic calming funds that could certainly be used in other areas of the City. The traffic calming program is not an excuse for improper planning.

I don't make my kids wear a bike helmet only after they sustain a serious injury, they put on their helmets before getting on the bike every time. The streets and traffic safety should be done in the same manner.

Safety is this mother's top priority, and when looking at the City of Glenwood's goals for Long Range Transportation this development in the current form hinders 7 of the 8 goals rather than supporting them. That is not smart growth.

Sincerely,
Jamie Raehal

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: Bell Rippy Development Comments
Date: Monday, April 27, 2020 12:32:25 PM
Attachments: ~$mmunity Development DepartmentRichard.docx

Here's another one.
Gretchen

From: Richard OConnell <r.oconnell@sbcglobal.net>
Sent: Monday, April 27, 2020 12:18 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>; jandjraehal@gmail.com; Jan OConnell <tenacity71@gmail.com>; Christine Smalley <csmalley@rfsd.k12.co.us>; Ralph Smalley <rsmalley@rfsd.k12.co.us>
Subject: Bell Rippy Development Comments

Community Development Department
Richard & Janet O'Connell

101 W. 8th Street 2409
Palmer Ave

Glenwood Springs, Co 81601
Glenwood Springs, Co 81601

Attn: Planning and Zoning Commission

Gretchen Ricehill

We own a multi- generational home at 2409 Palmer Ave. We are concerned that the existing roads do not support the existing Oakhearst Townhomes and the new Bell Rippy Development will make a bad situation worse. We are also concerned that the Bell Rippy Development will end up with non-residential parking and increased traffic on the developed portion of Plamer Ave.

Blake Street has no sidewalks and always has cars and trucks parked on the East side of the street. 26th Street is worse, with a high grade, poor condition, no sidewalks and cars always parked on the north side of the street. The opening of the Blake Ave gate by Walmart will also increase the traffic load on Blake Ave. The existing foot traffic is already high with the RFTA bus stop at 27th Street and will be considerably higher with the Bell Rippy Development. Parking is limited at the RFTA bus stop, which also adds pressure to parking in the area.

At their February 4, 2020 meeting, the new developers reviewed their proposed plans

for the property. It is our understanding that they are proposing 100 apartments located in 6, three and a half story buildings, based on taking advantage of the relatively steep grade of the site. This is an increase of 30 apartments from the previous developer. They were able to increase the number of apartments by eliminating parking under the buildings proposed by the previous developer. There will be a mix of 1 and 2 bedroom rental apartments. They are not planning on any elevators so there will be no handicap access for the upper floors. Per the Glenwood Springs development code Table 0.30.1, they are required to have 1.5 parking spaces per each dwelling and a quest parking space for every five dwellings. Based on 100 apartments they would need to have 170 parking spaces at a minimum. The developers noted they plan to ask for a variance in the parking space requirements which we believe should not be allowed due to the overloaded parking in the area.

Sincerely

Richard and Janet O'Connell

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: Concern over Bell Rippy Development
Date: Monday, April 27, 2020 8:07:07 AM

Hello Trent
I hope you had a pleasant weekend.
I received this message yesterday. According to the plan, on May 5th P & Z meeting you'll need to read it into the record. If we receive a lot of written comments, I'll help you do that.
Best,
Gretchen

From: Christine Smalley <csmalley@rfschools.com>
Sent: Sunday, April 26, 2020 10:45 AM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: Concern over Bell Rippy Development

Dear Miss Ricehill,

My name is Chrisitne Smalley, a high school social studies teacher, mother of two, and resident of Palmer Ave. I write to you today to express my concern over the Bell Rippy Development by Walmart.

They plan to have two bedroom apartments with only 1.5 spots available per apartment. This is unrealistic as almost every family that needs two bedrooms has two cars. With high costs of housing people will certainly be having roommates, again a situation that would have two cars. The neighborhood does not have the space or the road conditions to allow for overflow parking. Additionally, there are many children in the neighborhood riding bikes and families walking. Without sidewalks, they are in the street and already in an unsafe condition; additional traffic through this area is scary for all residents and our children.

I'm not opposed to the development, but it needs to come with sidewalks and safety precautions for those in the neighborhood around it. Successful city planning requires thoughtful consideration for impacts of developments beyond the confines of the parking lot. City council must consider the overall effects that a development will have on the area as a whole.

If you have not walked through these areas, you need to, and please do so with your fellow council members, consider discussing these concerns with Paula Steep who walks the neighborhood regularly. You need to see people pushing their strollers and kids trying to navigate the already pot-holed streets on their training wheels; you too would feel the concern that our neighborhood has. Thank you for your time.

--
Christine Smalley
Glenwood Springs High School Social Studies Teacher

From: Gretchen E Ricehill
To: Trent Hyatt
Subject: FW: P & Z discussion-public comment
Date: Tuesday, April 28, 2020 12:27:59 PM

-----Original Message-----
From: Joan Troth <jktroth@comcast.net>
Sent: Tuesday, April 28, 2020 12:24 PM
To: Gretchen E Ricehill <gretchen.ricehill@cogs.us>
Subject: P & Z discussion

I request that Planning & Zoning deny the request to approve 100 apartments in six buildings between Blake and Palmer for these reasons:

The city's mission statement includes maintaining the small town character of Glenwood Springs

Massive buildings do not comply with this statement

Adding the huge number of new residents on the south edge of town will impact the surrounding neighborhood negatively regarding home values and traffic

Adding more cars to Grand Avenue will result in congestion becoming the norm

Adding the large number of apartments will impact the city's water supply and sewage capacity

The city of Glenwood Springs has no responsibility to provide housing for up-valley workers

Joan Troth, 3202 Cooper Ct.
945-0668

From:	Sara Sims
To:	Trent Hyatt
Cc:	Sara Sims
Subject:	FW: statement for the record
Date:	Tuesday, April 28, 2020 2:51:46 PM

Good afternoon, Trent.

Please accept this communication as Mountain Valley Developmental Services' official public comment regarding the Bell Rippy development of the Oakhurst subdivision:

Mountain Valley Developmental Services is a Community Centered Board and Program Approved Service Provider, supporting people who have intellectual and developmental disabilities. We own a home at 2503 Palmer Avenue, which is adjacent to said development. This home supports 7 adults of varying levels of need, but nearly all require a little extra time and space to physically maneuver through their environments. This includes getting into and out of vehicles on Palmer Avenue and 26th Street.

I am aware of the current issues regarding the on-street parking to accommodate for the overflow of Oakhurst Townhomes and the lack of sidewalks in the area. After attending the neighborhood meeting on February 4th, it is clear that the new development will exacerbate these concerns.

Additionally, the increase in traffic produced by the property's future inhabitants will inevitably render Palmer Ave a higher density traffic area which is not equipped to handle this volume of vehicles.

I am worried about the safety of the people living not only in our home, but in the neighborhood, and their ability to navigate these hazards. Our current space is adequate to accommodate for staff vehicles and specially equipped vehicles (which are larger than typical) on which the residents rely. However, with more vehicles and increased traffic flow, I fear that we won't be able to safely or easily find parking, load/unload residents, or maneuver our vehicles onto and off Palmer Avenue and 26th Street.

Here are a few considerations to mitigate our concerns:

- Request the developers commit to subdivision improvements to address these issues (mentioned above);
- Extend these improvements past the development's property lines to 23rd and Palmer, along 26th Street, and from 27th to 23rd and Blake; and
- Dedicate City resources to creating better parking and traffic plans that includes safety measures for pedestrians along the streets mentioned above.

Thank you for your consideration.

Sara Sims

Executive Director
Mountain Valley Developmental Services
P.O. Box 338
Glenwood Springs, Colorado 81602
970-230-9831 office phone
970-404-0089 cell phone
970-945-6469 fax
www.mtnvalley.org
Ssims@mtnvalley.org

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From:	Carol Turtle
To:	Trent Hyatt
Subject:	Fwd: 100 apartment application proposed for Blake Avenue
Date:	Tuesday, April 28, 2020 7:17:43 AM

Begin forwarded message:

From: Carol Turtle <c.turtle@icloud.com>
Date: April 23, 2020 at 11:10:00 AM MDT
To: letters@postindependent.com
Subject: 100 apartment application proposed for Blake Avenue

On April 28, 2020, Glenwood Springs Planning and Zoning Commission will consider an application for a proposed major development of 100 apartments in 6 buildings located South of Oakhurst Townhomes and North of Walmart on Blake Avenue. The hillside location sits above the Bus Rapid Transit Station in South Glenwood. If they have not already done so, I suggest the P&Z Commission and City Council members visit the proposed site, and more importantly, visit the surrounding neighborhoods of Blake and Palmer Avenues. These 2 streets will serve as major access roads into the development from South Glenwood. Blake and Palmer Avenues are both substandard streets with improper drainage and no sidewalks. Both streets are totally inadequate to handle the traffic they have now, let alone taking on the increase of traffic generated by 100 apartments while providing no safe passage for children to access schools and parks.

I hope our P&Z Commission will deny approval of this major development application until our city can address the inadequate roads with its lack of sidewalks in the Blake and Palmer neighborhoods.

David J. Turtle
Glenwood Springs, CO

ALTA/ NSPS LAND TITLE SURVEY

SITUATED IN THE SW¼ SW¼ SECTION 15, SE¼ SE¼ SECTION 16, NW¼ NW¼ SECTION 22
NE¼ NE¼ SECTION 21 ALL IN TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN
COUNTY OF GARFIELD, STATE OF COLORADO

TABLE A

OPTIONAL SURVEY RESPONSIBILITIES AND SPECIFICATIONS

1. Monuments placed (or a reference monument or witness to the corner) at all major corners of the boundary of the property, unless already marked or referenced by existing monuments or witnesses in close proximity to the corner.
- shown hereon

2. Address(es) of the surveyed property if disclosed in documents provided to or obtained by the surveyor, or observed while conducting the fieldwork.
- No address Blake and Palmer Avenue, Glenwood Springs, CO 81601

3. Flood zone classification (with proper annotation based on federal Flood Insurance Rate Maps or the state or local equivalent) depicted by scaled map location and graphic plotting only.
The Property described on this Survey does lie within a Special Flood Hazard Area ("SFHA") as defined by the Federal Emergency Management Agency; the Property lies within Zone(s) A,B,C and D of the Flood Insurance Rate Map identified as Community Panel No 0802051434 Suffix B, bearing an effective date of January 3, 1986 and within Zone(s) A,B,C, and D of the Flood Insurance Rate Map identified as Community Panel No 0802051434 Suffix C, bearing an effective date of October 15, 1985.

Zone A - Areas of 100-year flood; base flood elevations and flood hazard factors not determined.

Zone B - Areas between limits of the 100-year flood and the 500-year flood; or certain areas subject to 100-year flooding with depths less than one foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

Zone C - Areas of minimal flooding.

Zone D - Areas of undetermined, but possible flood hazards.

4. Gross land area.
- 5.508 acres

5. Vertical relief with the source of information (e.g., ground survey, aerial map), contour interval, datum and originating benchmark identified.
- Contours were devised by a ground survey conducted during December, 2019, Vertical Datum 6.04 feet below NAVD88.

7. (a) Exterior dimensions of all buildings at ground level.
- vacant property

(B) Square footage of:
(1) exterior footprint of all buildings at ground level.
- vacant property

8. Substantial features observed in the process of conducting the fieldwork (in addition to the improvements and features required pursuant to Section 5 above) (e.g., parking lots, billboards, signs, swimming pools, landscaped areas, substantial areas of refuse).
- shown hereon

10. (a) As designated by the client, a determination of the relationship and location of certain division or party walls with respect to adjoining properties (client to obtain necessary permission)
- none found
11. Location of utilities existing on or serving the surveyed property as determined by:
- shown hereon
-observed evidence collected pursuant to Section 5.E.iv.
-evidence from plans requested by the surveyor and obtained from utility companies, or provided by client (with reference as to the sources of information), and
-markings requested by the surveyor pursuant to an 811 utility locate or similar request

Representative examples of such utilities include, but are not limited to:
-Manholes, catch basins, valve vaults and other surface indications of subterranean uses;
-Wires and cables (including their function, if readily identifiable) crossing the surveyed property, and all poles on or within ten feet of the surveyed property. Without expressing a legal opinion as to the ownership or nature of the potential encroachment, the dimensions of all encroaching utility pole crossmembers or overhangs; and
-Utility company installations on the surveyed property.
Note to the client, insurer, and lender – With regard to Table A, item 11, source information from plans and markings will be combined with observed evidence of utilities pursuant to Section 5.E.iv. to develop a view of the underground utilities. However, lacking excavation, the exact location of underground features cannot be accurately, completely, and reliably depicted. In addition, in some jurisdictions, 811 or other similar utility locate requests from surveyors may be ignored or result in an incomplete response, in which case the surveyor shall note on the plat or map how this affected the surveyor's assessment of the location of the utilities. Where additional or more detailed information is required, the client is advised that excavation and/or a private utility locate request may be necessary.

14. As specified by the client, distance to the nearest intersecting street.
non specified property falls at intersection of Blake and Palmer Avenue.

16. Evidence of recent earth moving work, building construction, or building additions observed in the process of conducting the fieldwork.
- none observed

17. Proposed changes in street right of way lines, if such information is made available to the surveyor by the controlling jurisdiction. Evidence of recent street or sidewalk construction or repairs observed in the process of conducting the fieldwork.
- none observed

18. If there has been a field delineation of wetlands conducted by a qualified specialist hired by the client, the surveyor shall locate any delineation markers observed in the process of conducting the fieldwork and show them on the face of the plat or map. If no markers were observed, the surveyor shall so state.

- none observed

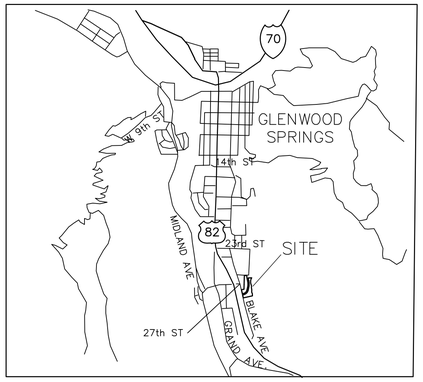
19. Include any plottable offsite (i.e., appurtenant) easements or servitudes disclosed in documents provided to or obtained by the surveyor as a part of the survey pursuant to Sections 5 and 6 (and applicable selected Table A items) (client to obtain necessary permissions).
- shown hereon

General Notes:

1. OWNERSHIP, RECORDED RIGHTS–OF–WAY, AND EASEMENT INFORMATION WAS DONE USING A CURRENT TITLE COMMITMENT BY LAND TITLE GUARANTEE COMPANY. ORDER NUMBER GPR63014324.

2. BEARINGS ARE BASED ON THE SOUTH LINE OF OAKHURST SUBDIVISION FIRST FILING ACCORDING TO THE PLAT FILED AT RECEPTION NO. 241379 IN THE OFFICE OF THE GARFIELD COUNTY CLERK AND RECORDER. THE VALUE USED, S77°23'50"W AS SHOWN THEREON WAS DETERMINED FROM A FOUND PLASTIC CAP STAMPED LS 37935 AT THE WEST AND EAST ENDS OF SAID LINE.

3. ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVERED SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.



VICINITY MAP

LEGAL DESCRIPTION:

OAKHURST SUBDIVISION (FIRST FILING) ACCORDING TO THE PLAT THEREOF FILED AT RECEPTION NO. 241379 IN THE OFFICE OF THE GARFIELD COUNTY CLERK AND RECORDER.

EXCEPT: (1) LOTS 1, 2, AND 3 IN BLOCK I, ACCORDING TO SAID PLAT;
(2) LOTS 1, 2 AND 3 IN BLOCK 2, ACCORDING TO SAID PLAT; AND(3) LOTS 4, 5, 6, 7, 8, AND 9 IN BLOCK 1 AND LOTS 4, S. 6, 7, 8 AND 9 IN BLOCK 2, ACCORDING TO THE MAP OF OAKHURST SUBDIVISION, SECOND FILING FILED AT RECEPTION NO. 254484 IN SAID OFFICE.

COUNTY OF GARFIELD
STATE OF COLORADO

SURVEYORS CERTIFICATION:

To Land Title Guarantee Company, Glenwood Multi Family, LLC, A Colorado Limited Liability Company, and Four Points Funding.

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2016 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 5, 7(a), 8, 10, 11, 14, 16, 17, and 18 of Table A thereof. The fieldwork was completed on December 11, 2019.

Date of Plat or Map: December 11, 2019
Patrick W. Click

Dated: December 16, 2019 Registration No. 37904

SCHEDULE B, PART II
EXCEPTIONS

1. Any facts, rights, interests, or claims thereof, not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
– SHOWN HEREON
2. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
– NOT A SURVEY MATTER
3. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
– SHOWN HEREON
4. Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the Public Records.
– NOT A SURVEY MATTER
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 of the proposed insured acquires of record for value the estate or interest or mortgage thereon covered by this Commitment.
– NOT A SURVEY MATTER
6. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
– NOT A SURVEY MATTER
7. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water.
– NOT A SURVEY MATTER
8. 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, AND A RIGHT OF WAY FOR DITCHES OR CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES, AS RESERVED IN UNITED STATES PATENT RECORDED DECEMBER 07 1891 IN BOOK 12 AT PAGE 342 AND RECORDED MARCH 14, 1891 IN BOOK 12 AT PAGE 72.
– BLANKET EASEMENT
9. EASEMENTS AND RIGHT OF WAY FOR TELEPHONE/TELEGRAPH PURPOSES AS CONTAINED IN INSTRUMENT RECORDED JUNE 25, 1936 IN BOOK 183 AT PAGE 422.
– NONE FOUND

10. TERMS, CONDITIONS, PROVISIONS, BURDENS, OBLIGATIONS AND EASEMENTS AS SET FORTH AND GRANTED IN INSTRUMENT RECORDED JUNE 06, 1983 UNDER RECEPTION NO. 342659.
– SHOWN HEREON
11. TERMS, CONDITIONS AND PROVISIONS OF MAINTENANCE AGREEMENT RECORDED APRIL 16, 1986 AT RECEPTION NO. 370323.
– DOES NOT AFFECT PROPERTY SURVEYED HEREON
12. TERMS, CONDITIONS AND PROVISIONS OF AGREEMENT RECORDED MAY 08, 1970 AT RECEPTION NO. 246299.
– ACCESS AGREEMENT FOR PALMER AVENUE TO THE NORTH OF THE PROPERTY SURVEYED HEREON
13. TERMS, CONDITIONS AND PROVISIONS OF ORDINANCE NO. 62 RECORDED JANUARY 13, 1988 AT RECEPTION NO. 388990.
– NOT A SURVEY MATTER (REZONE OF PROPERTY)
14. TERMS, CONDITIONS, PROVISIONS, BURDENS, OBLIGATIONS AND EASEMENTS AS SET FORTH AND GRANTED IN RIGHT OF WAY EASEMENT RECORDED DECEMBER 18, 1992 UNDER RECEPTION NO. 442302.
– SHOWN HEREON
15. EASEMENTS, CONDITIONS, COVENANTS, RESTRICTIONS, RESERVATIONS AND NOTES ON THE PLAT OF OAKHURST SUBDIVISION RECORDED JULY 25, 1968 UNDER RECEPTION NO. 241379 AND THE FILING NO. 2 PLAT RECORDED FEBRUARY 2, 1972 AT RECEPTION NO. 254484.
– SHOWN HEREON

EASEMENTS AND RIGHT OF WAY FOR THE GLENWOOD DITCH.

ALTA/NSPS LAND TITLE SURVEY
SITUATED IN SECTION 15, 16, 22 AND 21
TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN
COUNTY OF GARFIELD, STATE OF COLORADO

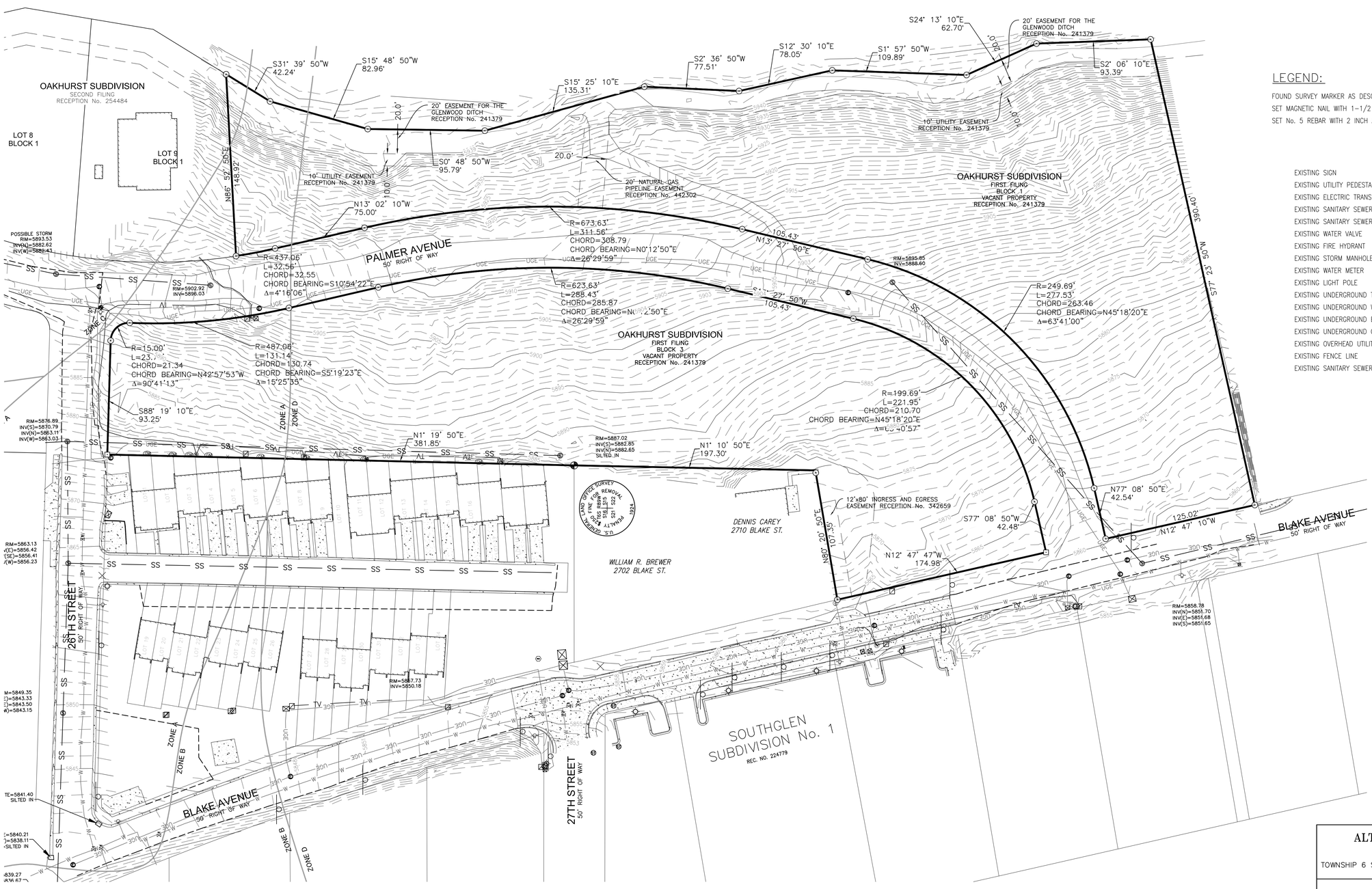
JOB #: 2019159 FIELD WORK: PC
DATE: 12/16/19 DRAWING NAME: ALTA DRAWN BY: PC

POLARIS SURVEYING
PATRICK W. CLICK P.L.S.
3194 MESA AVE. #B
GRAND JUNCTION, CO 81504
PHONE/FAX (970)434–7038

SH: 1 OF 2

ALTA/ NSPS LAND TITLE SURVEY

SITUATED IN THE SW¼ SW¼ SECTION 15, SE¼ SE¼ SECTION 16, NW¼ NW¼ SECTION 22
NE¼ NE¼ SECTION 21 ALL IN TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN
COUNTY OF GARFIELD, STATE OF COLORADO



N

GRAPHIC SCALE:
1"=40'
40 0 40 80
LINEAR UNITS ARE U.S. SURVEY FEET

LEGEND:

FOUND SURVEY MARKER AS DESCRIBED	◔
SET MAGNETIC NAIL WITH 1-1/2 INCH BRASS DISC PLS 37904	⊙
SET No. 5 REBAR WITH 2 INCH ALUMINUM CAP PLS 37904	⊡
EXISTING SIGN	○
EXISTING UTILITY PEDESTAL	▨
EXISTING ELECTRIC TRANSFORMER	⊠
EXISTING SANITARY SEWER MANHOLE	Ⓢ
EXISTING SANITARY SEWER CLEANOUT	⊛
EXISTING WATER VALVE	⋈
EXISTING FIRE HYDRANT	⊕
EXISTING STORM MANHOLE	Ⓢ
EXISTING WATER METER	Ⓦ
EXISTING LIGHT POLE	☼
EXISTING UNDERGROUND TELEPHONE LINE	— T — T — T —
EXISTING UNDERGROUND WATER LINE	— W — W — W —
EXISTING UNDERGROUND ELECTRIC LINE	— UGE — UGE — UGE —
EXISTING UNDERGROUND GAS LINE	— GAS — GAS —
EXISTING OVERHEAD UTILITY LINE	— OH — OH —
EXISTING FENCE LINE	— X —
EXISTING SANITARY SEWER LINE	— SS — SS —

COLORADO LICENSED
PATRICK W. CLICK
12-16-19
37904
PROFESSIONAL LAND SURVEYOR

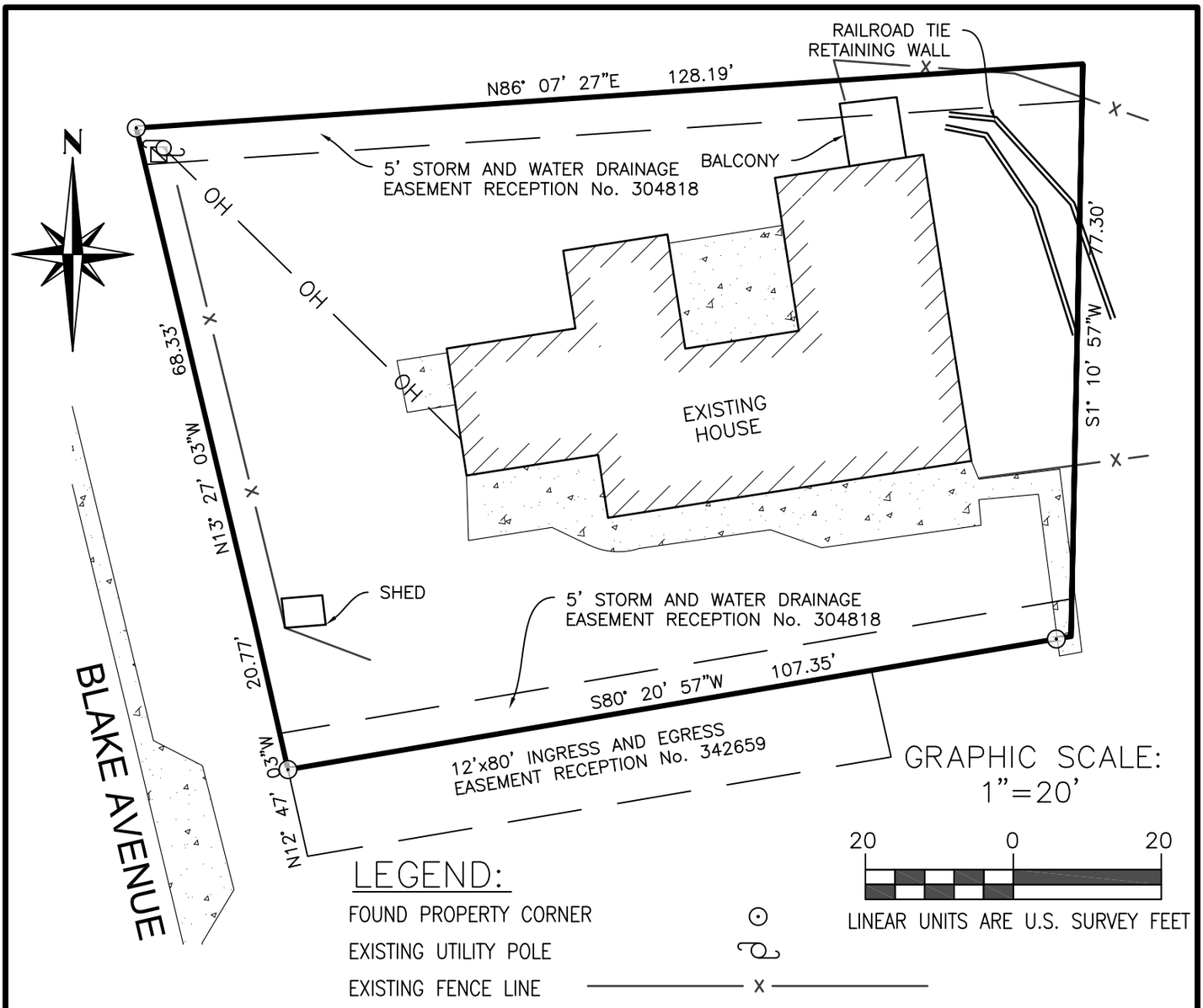
ALTA/NSPS LAND TITLE SURVEY

SITUATED IN SECTION 15, 16, 22 AND 21
TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN
COUNTY OF GARFIELD, STATE OF COLORADO

JOB #: 2019159 FIELD WORK: PC
DATE: 12/16/19 DRAWING NAME: ALTA DRAWN BY: PC

POLARIS SURVEYING
PATRICK W. CLICK P.L.S.
3194 MESA AVE. #B
GRAND JUNCTION, CO 81504
PHONE/FAX (970)434-7038

SH: 1 OF 2



LEGAL DESCRIPTION:

A tract or parcel of land being all that part of the NE1/4NE1/4 of Section 21, Township 6 South, Range 89 West of the 6th P.M., lying westerly of the easterly line of said Section 21 and easterly of the proposed Blake Street extension in the City of Glenwood Springs, described as follows:

Beginning at a point on the easterly line of said Section 21, whence the Northeast corner of said Section 21 bears North 1°11' East 120.00 feet;

thence South 1°11' West 77.30 feet along the easterly line of said Section 21; thence South 80°21' West 107.35 feet to a point on the easterly line of said Blake Street extension; thence North 12°47'West 20.77 feet along the easterly line of said Blake Street extension;

thence North 13°27'West 68.33 feet along the easterly line of said Blake Street extension; thence North 86°07'30" East 128.19 feet to a point on the easterly line of said Section 21, the Point of Beginning.

Together with a non-exclusive easement for ingress and egress situate in the NE1/4 of the NE1/4 of Section 21, Township 6 South, Range 89 West of the 6th P.M., being more particularly described as follows: Beginning at the Northeast corner of said Section 21;

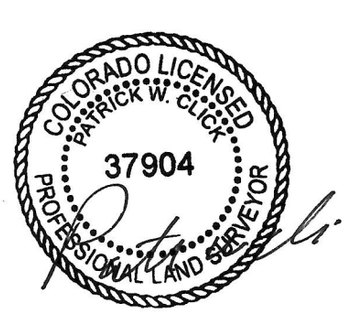
thence South 01°11' West 197.30 feet along the East line of said Section 21, thence South 80°21'West 107.35 feet to the True Point of Beginning; thence North 80°21'East 80.00 feet; thence South 12°47'East 12.00 feet; thence South 80°21'West 80.00 feet to the easterly line of Blake Street extension; thence North 12°47'West 12.00 feet along said easterly line to the True Point of Beginning.

IMPROVEMENT LOCATION CERTIFICATE

I hereby certify that this improvement location certificate was prepared for COMMONWEALTH LAND TITLE INSURANCE COMPANY, that it is not a land survey plat or improvement survey plat, and that it is not to be relied upon for the establishment of fence, building, or other future improvement lines. I further certify that the improvements on the above described parcel on this date, FEBRUARY 19, 2020, except utility connections, are entirely within the boundaries of the parcel, except as shown, that there are no encroachments upon the described premises by improvements on any adjoining premises, except as indicated, and that there is no apparent evidence or sign of any easement crossing or burdening any part of said parcel, except as noted.

Stamp By: PATRICK W CLICK

DATE: February 21, 2020



POLARIS SURVEYING
PATRICK W. CLICK P.L.S.
3194 MESA AVE
GRAND JUNCTION, CO 81504
PHONE (970)434-7038

2710 Blake Avenue

NOTES:

A COMPREHENSIVE AND CONSISTENT LANDSCAPE SOLUTION IS PROPOSED ACROSS THE ENTIRE PROPERTY WITH THE FOLLOWING POINTS:

- TREES AND SHRUBS ARE LOCATED AROUND THE BUILDINGS TO ACCENT THE STRUCTURES.
- RETAINING WALLS ARE SCREENED WITH TREES AND SHRUBS ON THE DOWNHILL SIDE.
- PARKING AREAS HAVE REQUIRED LANDSCAPE ISLANDS WITH TREES AND SHRUBS.
- ALL BUILDINGS ARE SURROUNDED WITH A MINIMUM 5' MULCH BED TO KEEP PLANNED GRASS AREAS AWAY FROM THE STRUCTURES TO AVOID ADDING IRRIGATION WATER TO THE SOILS UNDER THE BUILDINGS.
- ALL LANDSCAPE PLANTINGS ARE LOCATED A MINIMUM OF 5' AWAY FROM THE BUILDING TO AVOID ADDING IRRIGATION WATER TO THE SOILS UNDER THE BUILDINGS.
- ALL LANDSCAPE PLANTINGS ARE LOCATED TO ALLOW FOR SNOW STORAGE AREAS EQUALLING 20% OF THE ADJACENT PAVING AREAS.
- ALL REMAINING AREAS ON THE SITE NOT TO BE PAVED, BUILT UPON, OR MULCH BED WILL RECEIVE REVEGETATION WITH NATIVE GRASSES, TO INCLUDE TEMPORARY IRRIGATION UNTIL ADEQUATE REGROWTH.
- ALL LANDSCAPE PLANTINGS WILL HAVE ONE COMPREHENSIVE PERMANENT DRIP IRRIGATION SYSTEM INSTALLED AND MAINTAINED BY THE APARTMENT COMPLEX MANAGEMENT.
- ALL LANDSCAPE PLANTING WILL MEET THE MINIMUM SIZE AS REQUIRED BY GLENWOOD DEVELOPMENT CODE.

1 ILLUSTRATIVE SITE PLAN

1" = 30'-0"

0 30 60 FT

scale: 1"=30'-0"

TRIUMPH
Vail Office
12 Vail Road,
suite 700
Vail, CO 81657
Tel: 970.479.9890
www.triumphdev.com

BELL RIPPY
NEIGHBORHOOD
GLENWOOD SPRINGS COLORADO

Revisions:
GS PLANNING MEETING 11.20.19

Sheet title
ILLUSTRATIVE SITE PLAN

Stamp

Date:	Project No:	Drawn by:	Checked by:
2/28/2020		MEF	MEF

© 2020 TRIUMPH

Sheet L1.0

March 2, 2020

City of Glenwood Springs
Attn. Ms. Terri Partch, City Engineer
101 W. 8th Street
Glenwood Springs, CO 81601

Colorado Department of Transportation
Attn. Mr. Brian Killian, CDOT Region 3 Access Manager
222 S. 6th Street
Grand Junction, CO 81501

RE: Bell Rippy Neighborhood (Glenwood Multifamily)
Transportation Impact Analysis Letter
Glenwood Springs, CO

Terri and Brian:

The applicant is proposing to increase the density of the Bell Rippy site from 79 residential rental apartment units to 100 units. McDowell Engineering has prepared this letter to summarize the anticipated traffic impacts from increased density on the Belly Rippy site. This letter augments the previously approved *Transportation Impact Study for Glenwood Multifamily Development*[1] for the site.

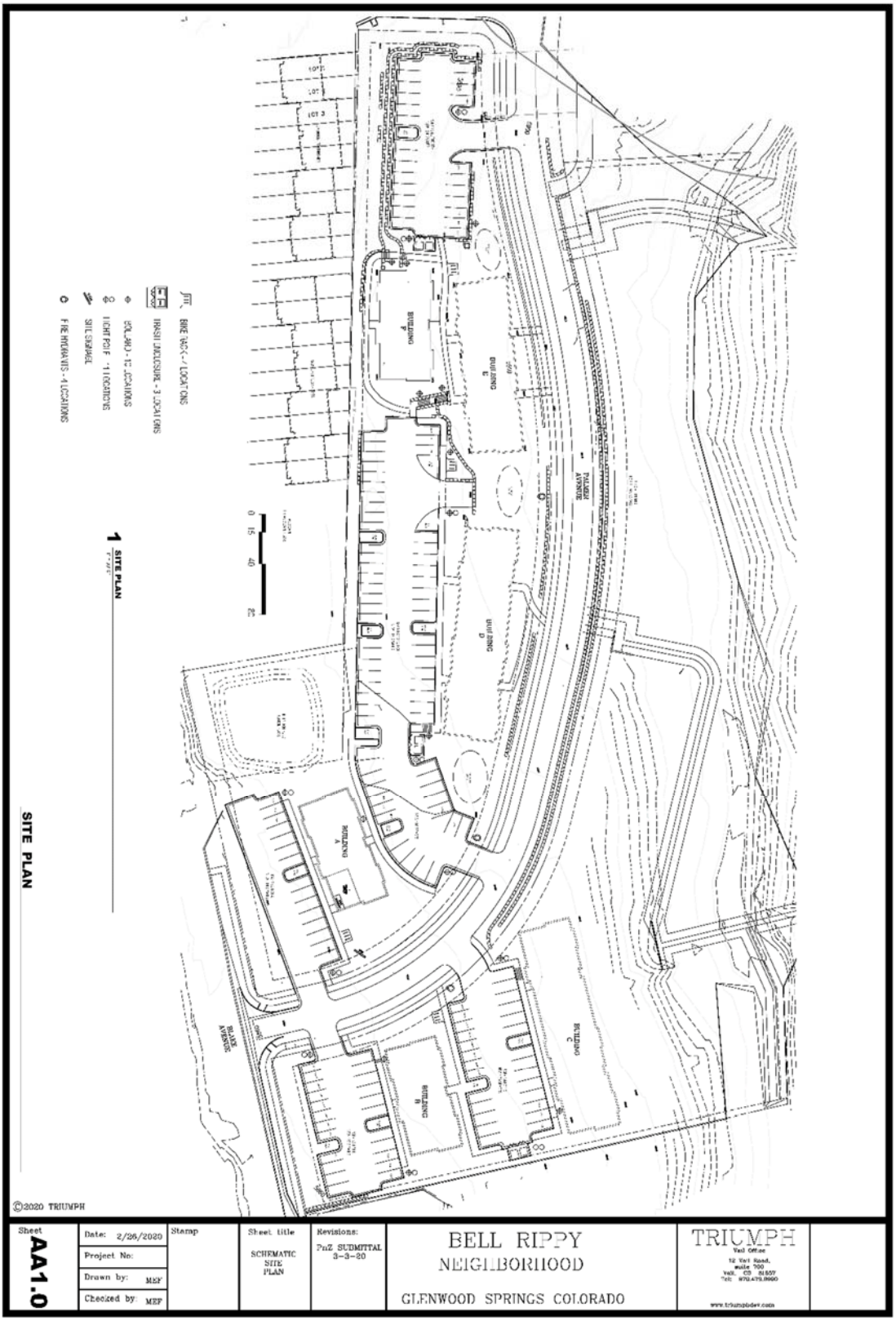
Proposed Revisions

The applicant is proposing 100 residential apartment units in six buildings on the site. This is an increase in the number of apartments over the previously approved 79 units in 10 buildings. Given the proposed unit mix, this only equates to an additional six bedrooms from the previous approval.

The site accesses will remain in the same locations as previously approved. The proposed internal parking lot on the north end of the site has been modified. Refer to the proposed site plan in **Figure 1**.

In January 2019, the Glenwood Springs City Council directed that the Blake Avenue gate would be opened upon completion of the project construction. The City has also directed that Blake Avenue will be restricted to one-way southbound traffic between 23rd Street and 26th Street. These assumptions have been used in this updated analysis.

Figure 1: Site Plan



Trip Generation

This development is anticipated to consist of six separate four-story buildings of rental apartments. Per the Institute of Transportation Engineers' *Trip Generation Manual*[2], this proposed use is classified as Land Use #221 Multifamily Housing (Mid-Rise). The analysis includes the same 10 percent multimodal reduction as the previous analysis due to the direct access to a RFTA Park 'n Ride facility and connectivity to local bicycle and pedestrian facilities.

The previous trip generation calculations used the 9th Edition of the *Trip Generation Manual*[2]. Land Use #223 Mid-Rise Apartment did not have enough data points for use in the previous analysis, so Land Use #220 Apartment was used. Since the previous traffic analysis, the 10th Edition of the *Trip Generation Manual*[2] has been released. The 10th Edition of the *Trip Generation Manual*[2] defines the new Land Use #221 Multifamily Housing (Mid-Rise) as apartments having between three and ten floors and at least three other dwelling units within the same building. There are 27 to 48 data points available, allowing accurate comparisons using this data.

Table 1 calculates the anticipated trip generation of this development along with a comparison to the previous study performed for this parcel. The proposed apartment complex is anticipated to generate a total of 489 trips over the course of an average weekday, including a total of 30 trips during the morning peak hour and 38 trips during the evening peak hour.

With the new available methodology, the new trip generation estimate represents a decrease of 54 trips during an average weekday. During the morning peak hour, the reduction is 13 trips and during the evening peak hour the expected reduction is 19 trips when compared to the previous study.

Total Traffic

The total traffic is anticipated to be less than the previous *Transportation Impact Study for Glenwood Multifamily Development*[1] analysis, given the updated methodology and data sets available by the 10th Edition of the Institute of Transportation Engineering's *Trip Generation Manual*[2] for mid-rise multifamily housing. Therefore, no modifications to the infrastructure recommendations are anticipated for the proposed land use revision.

Project Number: M1441
Prepared By: KJS
Date: 3/1/2020
Revised:

Table 1: Project Trip Generation
Bell Rippy Neighborhood
Glenwood Springs, Colorado
Estimated Project-Generated Traffic

Previous Study (For Reference Only)[1]

ITE Code	Units	AM Peak Hour	PM Peak Hour	Avg. Weekday	Average Weekday Trips (vpd)	Morning Peak Hour[3] Inbound % Trips	Morning Peak Hour[3] Inbound Trips	Morning Peak Hour[3] Outbound % Trips	Morning Peak Hour[3] Outbound Trips	Evening Peak Hour[4] Inbound % Trips	Evening Peak Hour[4] Inbound Trips	Evening Peak Hour[4] Outbound % Trips	Evening Peak Hour[4] Outbound Trips
Residential													
#220, Apartment[2]	79 DU	Regression Equation			603	29%	14	71%	33	61%	39	39%	25
Multi-Modal Trip Reduction	-10%				-60		-1		-3		-4		-3
Total Project Generated Traffic					**543**		**13**		**30**		**35**		**22**

[1] Transportation Impact Study for Glenwood Multifamily Development (Formerly Bell Rippy Apartments) Glenwood Springs, Colorado. McDowell Engineering, July 24, 2019.
[2] Values obtained from *Trip Generation, 9th Edition,* Institute of Transportation Engineers, 2012.
[3] AM Peak Hour of Generator - T = 0.54(X) + 2.45
[4] PM Peak Hour of Generator - T = 0.60(X) + 14.91

Updated Analysis

ITE Code	Units	AM Peak Hour	PM Peak Hour	Avg. Weekday	Average Weekday Trips (vpd)	Morning Peak Hour[6] Inbound % Trips	Morning Peak Hour[6] Inbound Trips	Morning Peak Hour[6] Outbound % Trips	Morning Peak Hour[6] Outbound Trips	Evening Peak Hour[7] Inbound % Trips	Evening Peak Hour[7] Inbound Trips	Evening Peak Hour[7] Outbound % Trips	Evening Peak Hour[7] Outbound Trips
Residential													
#221, Multifamily Housing (Mid-Rise)[5]	100 DU	Regression Equation			543	27%	9	73%	25	60%	26	40%	17
Multi-Modal Trip Reduction	-10%				-54		-1		-3		-3		-2
Total Project Generated Traffic					**489**		**8**		**22**		**23**		**15**

[5] Values obtained from *Trip Generation, 10th Edition,* Institute of Transportation Engineers, 2017.
[6] AM Peak Hour of Generator - Ln(T) = 0.83 Ln(X) - 0.27
[7] PM Peak Hour of Generator - Ln(T) = 0.83 Ln(X) - 0.05

Infrastructure Recommendations

The previous *Transportation Impact Study for Glenwood Multifamily Development*[1] recommendations included the following:

SH 82 & 27th Street: With site-generated traffic the length of the southbound queue at this intersection can be anticipated to increase by two cars or fifty feet. The City and/or CDOT may consider re-striping the southbound left turn lane to the north to address this existing operational concern.

SH 82 & 23rd Street: Year 2019 background traffic conditions require the construction of a longer westbound left turn lane and a northbound right turn lane.

27th Street & Blake Avenue: Year 2019 background traffic conditions require the construction of an eastbound left turn lane and northbound left turn lane.

Refer to **Table 5** in the original *Transportation Impact Study for Glenwood Multifamily Development*[1] for geometric requirements for these turn lanes. All of these improvements are needed with or without the construction of the proposed development.

As is typical with all side streets accessing SH 82, 27th Street currently has excessive delays with or without the addition of project traffic. Delay is anticipated to increase through Year 2040 background traffic conditions. This is largely due to the 120 seconds of the 160 second cycle length being allocated to SH 82 movements. Per June 2019 correspondence, CDOT will not adjust signal timing to clear the queuing on the side streets. Given the current site constraints, widening of 27th Street is not feasible.

The applicant is promoting multimodal travel by locating this project in close proximity to a transit center, constructing sidewalks for increased mobility, and providing bicycle facilities for its residents.

State Highway Access Permits

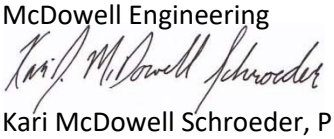
CDOT issued Access Permits to the City of Glenwood Springs on August 22, 2019 for the intersections of State Highway 82 and 27th Street (Permit #319104) and the intersection of State Highway 82 and Blake Avenue (Permit #319105). These permits included the previous (higher) volume of traffic anticipated for the Bell Rippy site. Therefore, the existing permits are adequate to cover the anticipated traffic from the new development application. Both permits are included with this letter.

Conclusions

The applicant is proposing to increase the density of the Bell Rippy site from 79 residential rental apartment units to 100 units. Since the preparation of the previous *Transportation Impact Study for Glenwood Multifamily Development*[1] was analyzed, the Institute of Transportation Engineer's *Trip Generation Manual*[2] has revised their land use definitions with numerous new data points for multifamily mid-rise apartments. With the updated Institute of Transportation Engineers' *Trip Generation Manual*[2], the number of project trips is anticipated to decrease from the previous analysis.

Therefore, no modifications to the infrastructure recommendations are anticipated for the proposed land use revision.

Sincerely,
McDowell Engineering



Kari McDowell Schroeder, PE, PTOE
Traffic/Transportation Engineer

References:

[1]*Transportation Impact Study for Glenwood Multifamily Development (Formerly Bell Rippy Apartments) Glenwood Springs, Colorado*. McDowell Engineering, July 24, 2019.

[2]*Trip Generation Manual, 10th Edition*. Institute of Transportation Engineers, September 2017.

Enclosed:

State Highway Access Permit for the intersection of State Highway 82 and 27th Street (Permit #319104)

State Highway Access Permit for the intersection of State Highway 82 and Blake Avenue (Permit #319105)

COLORADO
Department of Transportation
Region 3

R3 Traffic Section, Access Unit
222 S 6th St, Rm 100
Grand Junction, CO 81501
PH (970) 683-6284 FAX (970) 683-6290

<<<<< e-mailed >>>>>

August 22, 2019 **Permit No. 319104**

City of Glenwood Springs
101 W 8th St
Glenwood Springs, Colorado 81601

Dear Permittee:

1. Please review the attached State Highway Access Permit (Form #101) and all enclosed attachments.
2. If you choose NOT to act on the permit, please return the permit unsigned.
3. If you ACCEPT the Permit and its Terms and Conditions (and are authorized to sign as legal owner of the property, or as an authorized representative), please sign and date the Access Permit form on the line marked "**PERMITTEE**" within 60 days of the transmittal date on the permit. Your signature confirms your agreement to all the listed Terms and Conditions.
4. If you fail to sign and return the attached Access Permit within 60 days of the permit transmittal date, the Colorado Department of Transportation (CDOT) will consider this permit withdrawn.
5. You must return the signed Access Permit hard copies with original signature(s), including all pages of terms and conditions and all attachments, with your payment to the Colorado Department of Transportation (CDOT) at the address noted below. The Department will return an executed copy of this permit. You may retain this cover letter for your records.
6. Provide a check or money order made payable to "CDOT" for the total amount due of $100.00.
7. If you wish to APPEAL the Terms and Conditions of the permit, please refer to the attached Form 101, Pages 2 and 3 for an explanation of the appeal procedures.
8. As described in the additional attached Terms and Conditions, you must make a written request to obtain a Notice to Proceed. DO NOT begin any work within the State Highway Right-of-Way without a validated Access Permit and Notice to Proceed. Use of this permit without the Colorado Department of Transportation's validation shall be considered a violation of State Law.

If you have any questions please call Kandis Aggen, Access Coordinator, at (970) 683-6270 or Dan Roussin, Region 3 Permit Manager, at the number above.

Please return Access Permit and attachments to: Region 3 Access Unit
Attn: Kandis Aggen, Access Coordinator
222 S 6th St, Rm 100
Grand Junction, CO 81501

COLORADO DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ACCESS PERMIT

CDOT Permit No.	
319104	
State Highway No / Mp / Side	
082A / 1.715 / Left	

Permit Fee	Date of Transmittal	Region / Section / Patrol / Name	Local Jurisdiction
$100.00	08/22/2019	3 / 02 / 2K12 Alan Hayes	Glenwood Springs

The Permittee(s):

City of Glenwood Springs
101 W 8th St
Glenwood Springs, Colorado 81601
(970) 384-6388

The Applicant(s):

is hereby granted permission to have an access to the state highway at the location noted below. The access shall be constructed, maintained and used in accordance with this permit, including the State Highway Access Code and any attachments, terms, conditions and exhibits. This permit may be revoked by the Issuing Authority if at any time the permitted access and its use violate any parts of this permit. The issuing authority, the Department and their duly appointed agents and employees shall be held harmless against any action for personal injury or property damage sustained by reason of the exercise of the permit.

Location: Located on the north (east) side of Hwy 082A at 27th St. and approximately 4725 feet east of MP 1

Access to Provide Service to:	(Land Use Code)	(Size)	(Units)
	999 - City Street 27th Street (North Side)	**348**	**DHV**

Additional Information:

No Construction needed

MUNICIPALITY OR COUNTY APPROVAL
Required only when the appropriate local authority retains issuing authority.

Signature	Print Name	Date	Title

Upon the signing of this permit the permittee agrees to the terms and conditions and referenced attachments contained herein. All construction shall be completed in an expeditious and safe manner and shall be finished within 45 days from Initiation. The permitted access shall be completed in accordance with the terms and conditions of the permit prior to being used.

The permittee shall notify Les Stanton 2K2 with the Colorado Department of Transportation, at (970) 384-3357 at least 48 hours prior to commencing construction within the State Highway right-of-way.

The person signing as the permittee must be the owner or legal representative of the property served by the permitted access and have full authority to accept the permit and its terms and conditions.

Permittee Signature:	Print Name	Date
Co-Permittee Signature: (if applicable)	Print Name	Date

This permit is not valid until signed by a duly authorized representative of the Department.
COLORADO DEPARTMENT OF TRANSPORTATION

Signature	Print Name	Title	Date (of issue)

Copy Distribution: Required: 1.Region 2.Applicant 3.Staff Access Section 4.Central Files
Make copies as necessary for: Local Authority Inspector MTCE Patrol Traffic Engineer

Previous editions are obsolete and may not be used

State Highway Access Permit
Form 101, Page 2

The following paragraphs are excerpts of the State Highway Access Code. These are provided for your convenience but do not alleviate compliance with all sections of the Access Code. A copy of the State Highway Access Code is available from your local issuing authority (local government) or the Colorado Department of Transportation (Department). When this permit was issued, the issuing authority made its decision based in part on information submitted by the applicant, on the access category which is assigned to the highway, what alternative access to other public roads and streets is available, and safety and design standards. Changes in use or design not approved by the permit or the issuing authority may cause the revocation or suspension of the permit.

APPEALS

1. Should the permittee or applicant object to the denial of a permit application by the Department or object to any of the terms or conditions of a permit placed there by the Department, the applicant and permittee (appellant) have a right to appeal the decision to the [Transportation] Commission [of Colorado]. To appeal a decision, submit a request for administrative hearing to the Transportation Commission of Colorado within 60 days of transmittal of notice of denial or transmittal of the permit for signature. Submit the request to the Transportation Commission of Colorado, 4201 East Arkansas Avenue, Denver, Colorado 80222-3400. The request shall include reasons for the appeal and may include changes, revisions, or conditions that would be acceptable to the permittee or applicant.

2. Any appeal by the applicant or permittee of action by a local issuing authority shall be filed with the local authority and be consistent with the appeal procedures of the local authority.

3. In submitting the request for administrative hearing, the appellant has the option of including within the appeal a request for a review by the Department's internal administrative review committee pursuant to [Code] subsection 2.10. When such committee review is requested, processing of the appeal for formal administrative hearing, 2.9(5) and (6), shall be suspended until the appellant notifies the Commission to proceed with the administrative hearing, or the appellant submits a request to the Commission or the administrative law judge to withdraw the appeal. The two administrative processes, the internal administrative review committee, and the administrative hearing, may not run concurrently.

4. Regardless of any communications, meetings, administrative reviews or negotiations with the Department or the internal administrative review Committee regarding revisions or objections to the permit or a denial, if the permittee or applicant wishes to appeal the Department's decision to the Commission for a hearing, the appeal must be brought to the Commission within 60 days of transmittal of notice of denial or transmittal of the permit.

PERMIT EXPIRATION

1. A permit shall be considered expired if the access is not under construction within one year of the permit issue date or before the expiration of any authorized extension. When the permittee is unable to commence construction within one year after the permit issue date, the permittee may request a one year extension from the issuing authority. No more than two one-year extensions may be granted under any circumstances. If the access is not under construction within three years from date of issue the permit will be considered expired. Any request for an extension must be in writing and submitted to the issuing authority before the permit expires. The request should state the reasons why the extension is necessary, when construction is anticipated, and include a copy of page 1 (face of permit) of the access permit. Extension approvals shall be in writing. The local issuing authority shall obtain the concurrence of the Department prior to the approval of an extension, and shall notify the Department of all denied extensions within ten days. Any person wishing to reestablish an access permit that has expired may begin again with the application procedures. An approved Notice to Proceed, automatically renews the access permit for the period of the Notice to Proceed.

CONSTRUCTION

1. Construction may not begin until a Notice to Proceed is approved. (Code subsection 2.4]

2. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee except as provided in subsection 2.14. All materials used in the construction of the access within the highway right-of-way or on permanent easements, become public property. Any materials removed from the highway right-of-way will be disposed of only as directed by the Department. All fencing, guard rail, traffic control devices and other equipment and materials removed in the course of access construction shall be given to the Department unless otherwise instructed by the permit or the Department inspector.

3. The permittee shall notify the individual or the office specified on the permit or Notice to Proceed at least two working days prior to any construction within state highway right-of-way. Construction of the access shall not proceed until both the access permit and the Notice to Proceed are issued. The access shall be completed in an expeditious and safe manner and shall be finished within 45 days from initiation of construction within the highway right-of-way. A construction time extension not to exceed 30 working days may be requested from the individual or office specified on the permit.

4. The issuing authority and the Department may inspect the access during construction and upon completion of the access to ensure that all terms and conditions of the permit are met. Inspectors are authorized to enforce the conditions of the permit during construction and to halt any activities within state right-of-way that do not comply with the provisions of the permit, that conflict with concurrent highway construction or maintenance work, that endanger highway property, natural or cultural resources protected by law, or the health and safety of workers or the public.

5. Prior to using the access, the permittee is required to complete the construction according to the terms and conditions of the permit. Failure by the permittee to abide by all permit terms and conditions shall be sufficient cause for the Department or issuing authority to initiate action to suspend or revoke the permit and close the access. If in the determination of the Department or issuing authority the failure to comply with or complete the construction requirements of the permit create a highway safety hazard, such shall be sufficient cause for the summary suspension of the permit. If the permittee wishes to use the access prior to completion, arrangements must be approved by the issuing authority and Department and included in the permit. The Department or issuing authority may order a halt to any unauthorized use of the access pursuant to statutory and regulatory powers. Reconstruction or improvement of the access may be required when the permittee has failed to meet required specifications of design or materials. If any construction element fails within two years due to improper construction or material specifications, the permittee shall be responsible for all repairs. Failure to make such repairs may result in suspension of the permit and closure of the access.

6. The permittee shall provide construction traffic control devices at all times during access construction, in conformance with the M.U.T.C.D. as required by section 42-4-104, C.R.S., as amended.

7. A utility permit shall be obtained for any utility work within highway right-of-way. Where necessary to remove, relocate, or repair a traffic control device or public or private utilities for the construction of a permitted access, the relocation, removal or repair shall be accomplished by the permittee without cost to the Department or issuing authority, and at the direction of the Department or utility company. Any damage to the state highway or other public right-of-way beyond that which is allowed in the permit shall be repaired immediately. The permittee is responsible for the repair of any utility damaged in the course of access construction, reconstruction or repair.

8. In the event it becomes necessary to remove any right-of-way fence, the posts on either side of the access shall be securely braced with an approved end post before the fence is cut to prevent any slacking of the remaining fence. All posts and wire removed are Department property and shall be turned over to a representative of the Department.

9. The permittee shall ensure that a copy of the permit is available for review at the construction site at all times. The permit may require the contractor to notify the individual or office specified on the permit at any specified phases in construction to allow the field inspector to inspect various aspects of construction such as concrete forms, subbase, base course compaction, and materials specifications. Minor changes and additions may be ordered by the Department or local authority field inspector to meet unanticipated site conditions.

10. Each access shall be constructed in a manner that shall not cause water to enter onto the roadway or shoulder, and shall not interfere with the existing drainage system on the right-of-way or any adopted municipal system and drainage plan.

11. By accepting the permit, permittee agrees to save, indemnify, and hold harmless to the extent allowed by law, the issuing authority, the Department, its officers, and employees from suits, actions, claims of any type or character brought because of injuries or damage sustained by any person resulting from the permittee's use of the access permit during the construction of the access.

CHANGES IN ACCESS USE AND PERMIT VIOLATIONS

1. It is the responsibility of the property owner and permittee to ensure that the use of the access to the property is not in violation of the Code, permit terms and conditions or the Act. The terms and conditions of any permit are binding upon all assigns, successors-in-interest, heirs and occupants. If any significant changes are made or will be made in the use of the property which will affect access operation, traffic volume and or vehicle type, the permittee or property owner shall contact the local issuing authority or the Department to determine if a new access permit and modifications to the access are required.

2. When an access is constructed or used in violation of the Code, section 43-2-147(5)(c), C.R.S., of the Act applies. The Department or issuing authority may summarily suspend an access permit and immediately order closure of the access when its continued use presents an immediate threat to public health, welfare or safety. Summary suspension shall comply with article 4 of title 24, C.R.S.

MAINTENANCE

1. The permittee, his or her heirs, successors-in-interest, assigns, and occupants of the property serviced by the access shall be responsible for meeting the terms and conditions of the permit, the repair and maintenance of the access beyond the edge of the roadway including any cattle guard and gate, and the removal or clearance of snow or ice upon the access even though deposited on the access in the course of Department snow removal operations. Within unincorporated areas the Department will keep access culverts clean as part of maintenance of the highway drainage system. However, the permittee is responsible for the repair and replacement of any access-related culverts within the right-of-way. Within incorporated areas, drainage responsibilities for municipalities are determined by statute and local ordinance. The Department will maintain the roadway including auxiliary lanes and shoulders, except in those cases where the access installation has failed due to improper access construction and/or failure to follow permit requirements and specifications in which case the permittee shall be responsible for such repair. Any significant repairs such as culvert replacement, resurfacing, or changes in design or specifications, requires authorization from the Department.

STATE of COLORADO HIGHWAY ACCESS PERMIT
ADDITIONAL TERMS and CONDITIONS

August 22, 2019 **PERMIT No. 319104**
Permittee(s): City of Glenwood Springs
Location: Garfield County on CO Highway 082A, near Mile Ref. Pt. 1.715 Left

1. This permitted access is only for the use and purpose stated in the Application and Permit. This Permit is issued in accordance with the State Highway Access Code (2 CCR 601-1), also referred to as the Access Code (Code), and is based in part upon the information submitted by the Permittee.
2. Any subsequent relocation, reconstruction, or modifications to the access (or changes in the traffic volume or traffic nature using the access) shall be requested from CDOT by the means of a new application. Any changes to the access that causes non-compliance with the Access Code may render this permit void, and shall require a new application for a new permit.
3. This permit replaces any and all additional access permits that may be in existence for this access.
4. This permit is for an as-constructed access with a change in use for 27th Street (north side).
5. The total traffic volume shall be 348 DHV (1 vehicle in the peak hour-- passenger vehicle equivalents).
6. This access shall have a full-turning movement signalized intersection.
7. The Permittee is responsible for obtaining any necessary additional Federal, State and/or City/County permits or clearances required for construction of the access. Approval of this access permit does not constitute verification of this action by the Permittee. Permittee is also responsible for obtaining all necessary utility permits in addition to this access permit.
8. The permittee, his or her heirs, successors-in-interest, assigns, and occupants of the property serviced by the access shall be responsible for meeting the terms and conditions of the permit, the repair and maintenance of the access beyond the edge of the roadway including any cattle guard and gate, and the removal or clearance of snow or ice upon the access driveway, even if the deposited material is on the access in the course of the Department's snow-removal operations. Within unincorporated areas, the Department will keep access culverts clean as part of maintenance of the highway drainage system. However, the permittee is responsible for the repair and replacement of any access-related culverts within the right-of-way. Within incorporated areas, drainage responsibilities for municipalities are determined by statute and local ordinance. The Department will maintain the roadway including auxiliary lanes and shoulders, except in those cases where the access construction has failed due to improper access installation and/or failure to follow permit requirements and specifications in which case the permittee shall be responsible for such repair. Any significant repair such as culvert replacement, resurfacing, or changes in design or specifications, requires authorization from the Department.

COLORADO
Department of Transportation

What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like roads and sidewalks prevent stormwater from naturally soaking into the ground

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt and other pollutants and flow into CDOT's storm drain system or directly into a stream, river, lake, wetland or reservoir. Anything that enters CDOT's storm drain system is discharged untreated into the waterways we use for fishing, swimming, and providing drinking water.

Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, pH, wrecked or discarded equipment, rock, sand, any industrial, municipal, or agricultural waste.

Tips for Reporting an Illicit Discharge

Call the illicit discharge hotline at **(303) 512-4426**
From a safe distance try to estimate the amount of the discharge.
Identify characteristics of the discharge (color, odor, algae, etc.).
Obtain information on the vehicle dumping the waste (if applicable).
Do not approach!
Call *CSP for illicit dumping.
If possible, take a photo, record a license plate.

REMEMBER:
Never get too close to the illicit discharge, it may be dangerous!!!

For more information on CDOT Utility Permits:

https://www.codot.gov/business/permits/utilitiesspecialuse

For more information on CDOT Access Permits:

https://www.codot.gov/business/permits/accesspermits

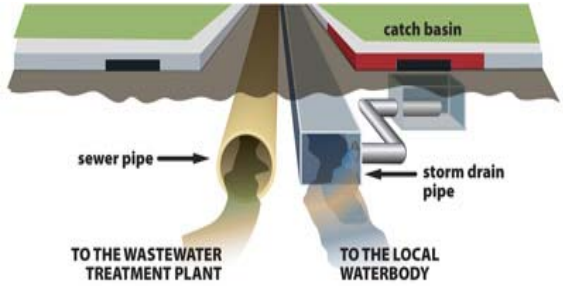
For more information on CDOT Water Quality Program:

Water Quality Program Manager
4201 E. Arkansas Ave.
Shumate Building
Denver, Colorado 80222
303-757-9343

COLORADO
Department of Transportation

Water Quality Program Industrial Facilities Program

CDOT has a Municipal Separate Storm Sewer System permit, otherwise known as (MS4) from the Colorado Department of Public Health and Environment. The permit states that only stormwater can be discharged from CDOT's storm drain system

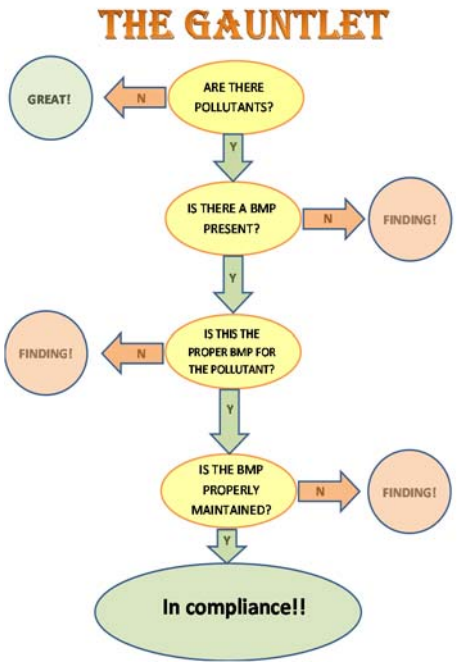


As part of the permit, CDOT has several different programs to prevent pollutants from entering into the storm drain system:

- Construction Site Program
- New Development Redevelopment Program
- Illicit Discharge Program
- Industrial Facilities Program
- Public Education and Outreach Program
- Pollution Prevention and Good Housekeeping Program
- Wet Weather Monitoring Program

Control Measures for Industrial Facilities

Industrial facilities can use control measures (CM) otherwise known as Best Management Practices (BMP) during the construction of a facility and when operating the facility. Control measures are schedules of activities, maintenance procedures, and other management practices to prevent and reduce pollution entering into CDOT's storm drain system. Control Measures also include treatment, operating procedures, and practices to control site run off which can include structural and non-structural controls.



CDOT defines a utility, or utility facility as any privately, publicly, or cooperatively owned line, facility, or system producing, transmitting or distributing the following:

- ✓ Communications
- ✓ Cable television
- ✓ Power
- ✓ Electricity
- ✓ Light
- ✓ Heat Gas
- ✓ Oil
- ✓ Crude Products
- ✓ Water
- ✓ Stream
- ✓ Waste
- ✓ Stormwater not connected with highway drainage
- ✓ Similar Commodity

Industrial Facilities Program Elements:

1. **Educate and outreach to owners or operators that have potential to contribute substantial pollutant to water.**
2. **Report and include information on discharge and water quality concerns. Provide written notification within 15 days of discovery to CDPHE.**
3. **Submit an annual report to CDPHE containing the number of informational brochures distributed; name and title of each individual trained.**

Education

There are instances when a utility company or other entity doing work in the state highway right-of-way will require some type of environmental permit or clearance for that work. CDOT has put together an Environmental Clearances Information Summary for those applying for a CDOT Utility and Special Use Permit or Access Permit to obtain all required clearances. This fact sheet is given to each permittee and is available at: http://www.coloradodot.info/programs/environmental/resources/guidance-standards/Environmental%20Clearances%20Info%20Summary.pdf

COLORADO DEPARTMENT OF TRANSPORTATION
Environmental Clearances Information Summary

PURPOSE - This summary is intended to inform entities external to CDOT that may be entering the state highway right-of-way to perform work related to their own facilities (such as Utility, Special Use or Access Permittees), about some of the more commonly encountered environmental permits/clearances that may apply to their activities. This listing is not all-inclusive - additional environmental or cultural resource permits/clearances may be required in certain instances. Appropriate local, state and federal agencies should be contacted for additional information if there is any uncertainty about what permits/clearances are required for a specific activity. **IMPORTANT – Please Review The Following Information Carefully – Failure to Comply With Regulatory Requirements May Result In Suspension or Revocation of Your CDOT Permit, Or Enforcement Actions By Other Agencies**

CLEARANCE CONTACTS - As indicated in the permit/clearance descriptions listed below, the following individuals or agencies may be contacted for additional information:

- Colorado Department of Public Health and Environment (CDPHE): General Information – (303) 692-2035
  Water Quality Control Division (WQCD): (303) 692-3500
  Environmental Permitting Website https://www.colorado.gov/pacific/cdphe/all-permits
- CDOT Water Quality Program Manager: (303) 757-9343 https://www.codot.gov/programs/environmental/water-quality
- CDOT Asbestos Project Manager: Phil Kangas, (303) 512-5519
- Colorado Office of Archaeology and Historic Preservation: (303) 866-3395
- U.S. Army Corps of Engineers, District Regulatory Offices:
  Omaha District (NE CO), Denver Office (303) 979-4120
  http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/Colorado.aspx
  Sacramento Dist. (Western CO), Grand Junction Office (970) 243-1199
  http://www.spk.usace.army.mil/Missions/Regulatory.aspx
  Albuquerque District (SE CO), Pueblo Office (719)-543-9459
  http://www.spa.usace.army.mil/Missions/RegulatoryProgramandPermits.aspx
- CDOT Utilities, Special Use and Access Permitting: (303) 757-9654 https://www.codot.gov/business/permits

Wildlife Resources - Disturbance of wildlife shall be avoided to the maximum extent practicable. Entry into areas of known or suspected threatened or endangered species habitat will require special authorization from the CDOT permitting office. If any threatened or endangered species are encountered during the progress of the permitted work, work in the subject area shall be halted and the CDOT Regional Permitting Office and Region Planning and Environmental Manager shall be contacted immediately. Authorization must be provided by CDOT prior to the continuation of work. Information about threatened or endangered species may be obtained from the CDOT website, http://www.codot.gov/programs/environmental/wildlife/guidelines, or the Colorado Parks and Wildlife (CPW) website, http://www.cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx. Additional guidance may be provided by the appropriate Region Planning and Environmental Manager (RPEM).

Cultural Resources - The applicant must request a file search of the permit area through the Colorado Office of Archaeology and Historic Preservation (OAHP), Denver, to ascertain if historic or archaeological resources have previously been identified (http://www.historycolorado.org/oahp/file-search). Inventory of the permit area by a qualified cultural resources specialist may be necessary, per the recommendation of CDOT. If archaeological sites/artifacts or historic resources are known to exist prior to the initiation of the permitted work or are encountered as the project progresses, all work in the subject area shall be halted and the CDOT Regional Permitting Office and Region Planning and Environmental Manager shall be contacted immediately. Authorization must be provided by CDOT prior to the continuation of work. Additional guidance may be provided by the Regional Permitting Office and RPEM. ***Contact Information:*** Contact the OAHP for file searches at (303) 866-3395.

Paleontological Resources - The applicant must request a fossil locality file search through the University of Colorado Museum, Boulder (https://cumuseum.colorado.edu/research/paleontology/vertebrates/policies), and the Denver Museum of Nature and Science (http://www.dmns.org/science/collections/earth-science-collections/) to ascertain if paleontological resources have been previously identified in or near the permit area. Inventory of the permit area by a qualified paleontologist may be necessary, per the recommendation of CDOT. If fossils are encountered during the permitted work, all work in the subject area shall be halted and the CDOT Regional Permitting Office and Region Planning and Environmental Manager shall be contacted immediately. Authorization must be provided by CDOT prior to the continuation of work. Additional guidance may be provided by the Regional Permitting Office in the Permit Special Provisions. **Contact Information:** See the museum websites listed above for Paleontological Collections Manager contact information. Contact the CDOT Paleontologist for further information at nicole.peavey@state.co.us or (303) 757-9632. The CDOT Paleontologist will not conduct a comprehensive file search independently of the museums.

Hazardous Materials, Solid Waste - The Solid Wastes Disposal Sites and Facilities Act C.R.S. 30-20-100, et al, and Regulations Pertaining to Solid Waste Disposal Sites and Facilities (6 CCR 1007-2), prohibit solid waste disposal without an approved Certificate of Designation (a landfill permit). The Colorado Hazardous Waste Act C.R.S. 25-15-301 et al, and the Colorado Hazardous Waste Regulations (6 CCR 1007-3) prohibit the transfer, storage or disposal (TSD) of hazardous waste except at permitted TSD sites. There are no permitted landfills or TSD sites within the State Highway Right of Way. Therefore, all solid or hazardous wastes that might be generated by the activities of entities entering the State Highway Right of Way must be removed from the ROW and disposed of at a permitted facility or designated collection point (e.g., for solid waste, a utility or construction company's own dumpster). If pre-existing solid waste or hazardous materials contamination (including oil or petroleum contaminated soil, asbestos, chemicals, mine tailings, etc.) is encountered during the performance of work, the permittee shall halt work in the affected area and immediately contact the CDOT Regional Permitting Office for direction as to how to proceed. ***Contact Information:*** Theresa Santangelo-Dreiling, CDOT Hazardous Materials Project Manager, (303) 512-5524, or Andy Flurkey, (303) 512-5520.

Asbestos Containing Materials, Asbestos Contaminated Soil - All work on asbestos containing materials (ACM) must comply with the applicable requirements of the CDPHE Air Pollution Control Division's (APCD) Regulation 8. Disposal of ACM, and work done in asbestos-contaminated soil, must comply with the CDPHE Hazardous Materials and Waste Management Division's (HMWMD) Solid

Waste Regulations. The application for any CDOT permit must specifically identify any ACM involved in the work for which authorization is being requested. Additional guidance or requirements may be specified in the permit special provisions. ***Contact Info:*** CDPHE APCD and HMWMD Regulations can be accessed via the CDPHE Environmental Permitting Website listed above. Additional information **concerning clearance on CDOT projects** is available from the CDOT Asbestos Project Manager (303) 512-5519, or Theresa Santangelo-Dreiling, Hazardous Materials Management Supervisor (303) 512-5524.

Transportation of Hazardous Materials - No person may offer or accept a hazardous material for transportation in commerce unless that person is registered in conformance with the United States Department of Transportation regulations at 49 CFR, Part 171. The hazardous material must be properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by applicable requirements, or an exemption, approval or registration has been issued. Vehicles requiring a placard, must obtain authorization and a State HAZMAT Permit from the Colorado Public Utilities Commission. ***Contact Information:*** For authorization and more info call the Federal Motor Safety Carrier Administration, US DOT for inter- and intra-state HAZMAT Registration (303) 969-6748. Colorado Public Utilities Commission: (303) 894-2868.

Discharge of Dredged or Fill Material – 404 Permits Administered By the U.S. Army Corps of Engineers, and Section 401 Water Quality Certifications Issued by the CDPHE WQCD - Corps of Engineers 404 permits are required for the discharge of dredged or fill materials into waters of the United States, including wetlands. There are various types of 404 permits, including nationwide permits, which are issued for activities with relatively minor impacts. For example, there is a nationwide permit for utility line activities (nwp #12). Depending upon the specific circumstances, it is possible that either a "general" or "individual" 404 permit would be required. If an individual 404 permit is required, section 401 water quality certification from the CDPHE WQCD is also required. Contact the appropriate Corps District Regulatory Office for information about what type of 404 permit may be required (contact information above). Contact the CDPHE Water Quality Control Division at (303) 692-3500.

Working on or in any stream or its bank - In order to protect and preserve the state's fish and wildlife resources from actions that may obstruct, diminish, destroy, change, modify, or vary a natural existing stream or its banks or tributaries, it may be necessary to obtain a Senate Bill 40 certification from the Colorado Department of Natural Resources. A stream is defined as 1) represented by a solid blue line on USGS 7.5' quadrangle maps; and/or 2) intermittent streams providing live water beneficial to fish and wildlife; and/or 3) segments of streams supporting 25% or more cover within 100 yards upstream or downstream of the project; and/or 4) segments of streams having wetlands present within 200 yards upstream or downstream of the project measured by valley length. The CPW application, as per guidelines agreed upon by CDOT and CPW, can be accessed at http://www.coloradodot.info/programs/environmental/wildlife/guidelines.

Stormwater Construction Permit (SCP) and Stormwater Discharge From Industrial Facilities - Discharges of stormwater runoff from construction sites disturbing one acre or more - or certain types of industrial facilities, such as concrete batch plants - requires a CDPS Stormwater Permit. ***Contact Information:*** Contact the CDPHE Water Quality Control Division at (303) 692-3500. Website: https://www.colorado.gov/pacific/cdphe/wq-construction-general-permits and https://colorado.gov/pacific/cdphe/wq-commerce-and-industry-permits.

Construction Dewatering (Discharge or Infiltration) and Remediation Activities - Discharges of water encountered during excavation or work in wet areas may require a Construction Dewatering or Remediation Activities Discharge Permit. ***Contact Information:*** For Construction Dewatering and Remediation Activities Discharge Permits, contact the CDPHE WQCD at (303) 692-3500. For Applications and Instructions (CDPHE website): https://www.colorado.gov/pacific/cdphe/wq-construction-general-permits.

Municipal Separate Storm Sewer System (MS4) Discharge Permit - Discharges from the storm sewer systems of larger municipalities, and from the CDOT highway drainage system that lies within those municipalities, are subject to MS4 Permits issued by the CDPHE WQCD. For facilities that lie within the boundaries of a municipality that is subject to an MS4 permit, the owner of such facility should contact the municipality regarding stormwater related clearances that may have been established under that municipality's MS4 permit. All discharges to the CDOT highway drainage system or within the Right of Way (ROW) must comply with the applicable provisions of the Colorado Water Quality Control Act, the Water Quality Control Commission (WQCC) Regulations (https://www.colorado.gov/pacific/cdphe/wqcc-regulations-and-policies-and-water-quality-statutes) and the CDOT MS4 Permit # COS-000005 (https://www.codot.gov/programs/environmental/water-quality/documents). Discharges are subject to inspection by CDOT and CDPHE. Contact the CDPHE Water Quality Control Division at (303) 692-3500 for a listing of municipalities required to obtain MS4 Permits, or go to https://www.colorado.gov/pacific/cdphe/wq-municipal-ms4-permits.

General Prohibition – Discharges - All discharges are subject to the provisions of the Colorado Water Quality Control Act and the Colorado Discharge Permit Regulations. Prohibited discharges include, but are not limited to, substances such as wash water, paint, automotive fluids, solvents, oils or soaps and sediment. ***Contact Information****:* Contact the CDPHE Water Quality Control Division at (303) 692-3500.

General Authorization - Allowable Non-Stormwater Discharges - Unless otherwise identified by CDOT or the WQCD as significant sources of pollutants to the waters of the State, the following discharges to stormwater systems are allowed without a Colorado Discharge Permit System permit: landscape irrigation, diverted stream flows, uncontaminated ground water infiltration to separate storm sewers, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, uncontaminated springs, footing drains, water line flushing, flows from riparian habitats and wetlands, and flow from firefighting activities. Allowable non-stormwater discharges can be found at https://www.codot.gov/programs/environmental/water-quality/glossary.html. ***Contact Information****:* The CDPHE Water Quality Control Division (telephone #'s listed above).

Erosion and Sediment Control Practices - For activities requiring a Stormwater Construction Permit, erosion control requirements will be specified in that permit. In those situations where a stormwater permit is not required, all reasonable measures should be taken in order to minimize erosion and sedimentation according to CDOT Standard Specifications 107.25 and 208. All disturbances require a stabilization plan, native seeding or landscape design plan according to applicable CDOT Standard Specifications 212-217 and 623. In any case, the CDOT Erosion Control and Stormwater Quality Guide (most recent version) should be used to design erosion controls and to restore disturbed vegetation. ***Contact Information****:* The CDOT Erosion Control and Stormwater Quality Guide may be obtained from the Bid Plans Office at (303) 757-9313 or from: https://www.codot.gov/programs/environmental/landscape-architecture/erosion-storm-quality.

Disposal of Drilling Fluids - Drilling fluids used in operations such as Horizontal Directional Drilling may be classified as "discharges" or "solid wastes," and in general, should be pumped or vacuumed from the construction area, removed from the State Highway Right of Way, and disposed of at permitted facilities that specifically accept such wastes. Disposal of drilling fluids into storm drains, storm sewers, roadside ditches or any other type of man-made or natural waterway is prohibited by Water Quality Control and/or Solid Waste regulations. Small quantities of drilling fluid solids (less than 1 cubic yard of solids) may be left on-site after either being separated from fluids or after infiltration of the water, provided: 1) the drilling fluid consists of only water and bentonite clay, or, if required for proper drilling properties, small quantities of polymer additives that are approved for use in drinking water well drilling; 2) the solids are fully contained in a pit, and are not likely to pose a nuisance to future work in the area, 3) the solids are covered and the area restored as required by CDOT permit requirements (Utility, Special Use, or Access Permits, etc.). ***Contact Information:*** Contact CDPHE (telephone #'s listed above).

Noxious Weeds and Invasive Species Management Plan – Noxious Weeds and Invasive Species guidance can be found by contacting the Colorado Department of Agriculture (https://www.colorado.gov/pacific/agconservation/noxiousweeds) and the Colorado Division of Parks and Wildlife (http://cpw.state.co.us/aboutus/Pages/RS-NoxiousWeeds.aspx). In either case, management plans involving the control of noxious weeds associated with the permitted activity and cleaning of equipment will be required.

Concrete Washout - Waste generated from concrete activities shall NOT be allowed to flow into the drainage ways, inlets, receiving waters, or in the CDOT ROW. Concrete waste shall be placed in a temporary concrete washout facility and must be located a minimum of 50 feet from state waters, drainageways, and inlets. Concrete washout shall only be performed as specified by the CDOT Environmental Program and shall be in accordance to CDOT specifications and guidelines. ***Contact Information****:* Contact CDPHE or find additional information on the CDOT website: https://www.codot.gov/business/designsupport/2011-construction-specifications/2011-Specs and refer to the specifications and their revisions for sections 101, 107 and 208.

Spill Reporting - Spills shall be contained and cleaned up as soon as possible. Spills shall NOT be washed down into the storm drain or buried. All spills shall be reported to the CDOT Illicit Discharge Hotline at (303) 512-4446 (4H20), as well as the Regional Permitting Office and Regional Maintenance Supervisor. Spills on highways, into waterways, any spill in the highway right-of-way exceeding 25 gallons, or that may otherwise present an immediate danger to the public shall be reported by calling 911, and shall also be reported to the CDPHE at 1-877-518-5608. More information can be found at https://www.colorado.gov/pacific/cdphe/emergency-reporting-line.

About This Form - Questions or comments about this Information Summary may be directed to Alex Karami, Program Administrator, CDOT Access Management Unit, at (303) 757-9841, alex.karami@state.co.us.

COLORADO
Department of Transportation
Region 3

R3 Traffic Section, Access Unit
222 S 6th St, Rm 100
Grand Junction, CO 81501
PH (970) 683-6284 FAX (970) 683-6290

<<<<< e-mailed >>>>>

August 22, 2019 **Permit No. 319105**

City of Glenwood Springs
101 W 8th St
Glenwood Springs, Colorado 81601

Dear Permittee:

1. Please review the attached State Highway Access Permit (Form #101) and all enclosed attachments.
2. If you choose NOT to act on the permit, please return the permit unsigned.
3. If you ACCEPT the Permit and its Terms and Conditions (and are authorized to sign as legal owner of the property, or as an authorized representative), please sign and date the Access Permit form on the line marked "**PERMITTEE**" within 60 days of the transmittal date on the permit. Your signature confirms your agreement to all the listed Terms and Conditions.
4. If you fail to sign and return the attached Access Permit within 60 days of the permit transmittal date, the Colorado Department of Transportation (CDOT) will consider this permit withdrawn.
5. You must return the signed Access Permit hard copies with original signature(s), including all pages of terms and conditions and all attachments, with your payment to the Colorado Department of Transportation (CDOT) at the address noted below. The Department will return an executed copy of this permit. You may retain this cover letter for your records.
6. Provide a check or money order made payable to "CDOT" for the total amount due of .
7. If you wish to APPEAL the Terms and Conditions of the permit, please refer to the attached Form 101, Pages 2 and 3 for an explanation of the appeal procedures.
8. As described in the additional attached Terms and Conditions, you must make a written request to obtain a Notice to Proceed. DO NOT begin any work within the State Highway Right-of-Way without a validated Access Permit and Notice to Proceed. Use of this permit without the Colorado Department of Transportation's validation shall be considered a violation of State Law.

If you have any questions please call Kandis Aggen, Access Coordinator, at (970) 683-6270 or Dan Roussin, Region 3 Permit Manager, at the number above.

Please return Access Permit and attachments to: Region 3 Access Unit
Attn: Kandis Aggen, Access Coordinator
222 S 6th St, Rm 100
Grand Junction, CO 81501

COLORADO DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ACCESS PERMIT

CDOT Permit No.	
319105	
State Highway No / Mp / Side	
082A / 2.190 / Left	

Permit Fee	Date of Transmittal	Region / Section / Patrol / Name	Local Jurisdiction
$100.00	08/22/2019	3 / 02 / 2K12 Alan Hayes	Glenwood Springs

The Permittee(s):

City of Glenwood Springs
101 W 8th St
Glenwood Springs, Colorado 81601
(970) 384-6388

The Applicant(s):

is hereby granted permission to have an access to the state highway at the location noted below. The access shall be constructed, maintained and used in accordance with this permit, including the State Highway Access Code and any attachments, terms, conditions and exhibits. This permit may be revoked by the Issuing Authority if at any time the permitted access and its use violate any parts of this permit. The issuing authority, the Department and their duly appointed agents and employees shall be held harmless against any action for personal injury or property damage sustained by reason of the exercise of the permit.

Location: Located on the north (east) side of Hwy 082A at Blake St. and approximately 1050 feet east of MP 2

Access to Provide Service to:

(Land Use Code)	(Size)	(Units)
999 - City Street Blake Street	**750**	**DHV**

Additional Information:

No Construction needed

MUNICIPALITY OR COUNTY APPROVAL
Required only when the appropriate local authority retains issuing authority.

Signature	Print Name	Date	Title

Upon the signing of this permit the permittee agrees to the terms and conditions and referenced attachments contained herein. All construction shall be completed in an expeditious and safe manner and shall be finished within 45 days from Initiation. The permitted access shall be completed in accordance with the terms and conditions of the permit prior to being used.

The permittee shall notify Les Stanton 2K2 with the Colorado Department of Transportation, at (970) 384-3357 at least 48 hours prior to commencing construction within the State Highway right-of-way.

The person signing as the permittee must be the owner or legal representative of the property served by the permitted access and have full authority to accept the permit and its terms and conditions.

Permittee Signature:	Print Name	Date
Co-Permittee Signature: (if applicable)	Print Name	Date

This permit is not valid until signed by a duly authorized representative of the Department.
COLORADO DEPARTMENT OF TRANSPORTATION

Signature	Print Name	Title	Date (of issue)

Copy Distribution: Required: 1.Region 2.Applicant 3.Staff Access Section 4.Central Files
Make copies as necessary for: Local Authority Inspector MTCE Patrol Traffic Engineer

Previous editions are obsolete and may not be used

State Highway Access Permit
Form 101, Page 2

The following paragraphs are excerpts of the State Highway Access Code. These are provided for your convenience but do not alleviate compliance with all sections of the Access Code. A copy of the State Highway Access Code is available from your local issuing authority (local government) or the Colorado Department of Transportation (Department). When this permit was issued, the issuing authority made its decision based in part on information submitted by the applicant, on the access category which is assigned to the highway, what alternative access to other public roads and streets is available, and safety and design standards. Changes in use or design not approved by the permit or the issuing authority may cause the revocation or suspension of the permit.

APPEALS

1. Should the permittee or applicant object to the denial of a permit application by the Department or object to any of the terms or conditions of a permit placed there by the Department, the applicant and permittee (appellant) have a right to appeal the decision to the [Transportation] Commission [of Colorado]. To appeal a decision, submit a request for administrative hearing to the Transportation Commission of Colorado within 60 days of transmittal of notice of denial or transmittal of the permit for signature. Submit the request to the Transportation Commission of Colorado, 4201 East Arkansas Avenue, Denver, Colorado 80222-3400. The request shall include reasons for the appeal and may include changes, revisions, or conditions that would be acceptable to the permittee or applicant.

2. Any appeal by the applicant or permittee of action by a local issuing authority shall be filed with the local authority and be consistent with the appeal procedures of the local authority.

3. In submitting the request for administrative hearing, the appellant has the option of including within the appeal a request for a review by the Department's internal administrative review committee pursuant to [Code] subsection 2.10. When such committee review is requested, processing of the appeal for formal administrative hearing, 2.9(5) and (6), shall be suspended until the appellant notifies the Commission to proceed with the administrative hearing, or the appellant submits a request to the Commission or the administrative law judge to withdraw the appeal. The two administrative processes, the internal administrative review committee, and the administrative hearing, may not run concurrently.

4. Regardless of any communications, meetings, administrative reviews or negotiations with the Department or the internal administrative review Committee regarding revisions or objections to the permit or a denial, if the permittee or applicant wishes to appeal the Department's decision to the Commission for a hearing, the appeal must be brought to the Commission within 60 days of transmittal of notice of denial or transmittal of the permit.

PERMIT EXPIRATION

1. A permit shall be considered expired if the access is not under construction within one year of the permit issue date or before the expiration of any authorized extension. When the permittee is unable to commence construction within one year after the permit issue date, the permittee may request a one year extension from the issuing authority. No more than two one-year extensions may be granted under any circumstances. If the access is not under construction within three years from date of issue the permit will be considered expired. Any request for an extension must be in writing and submitted to the issuing authority before the permit expires. The request should state the reasons why the extension is necessary, when construction is anticipated, and include a copy of page 1 (face of permit) of the access permit. Extension approvals shall be in writing. The local issuing authority shall obtain the concurrence of the Department prior to the approval of an extension, and shall notify the Department of all denied extensions within ten days. Any person wishing to reestablish an access permit that has expired may begin again with the application procedures. An approved Notice to Proceed, automatically renews the access permit for the period of the Notice to Proceed.

CONSTRUCTION

1. Construction may not begin until a Notice to Proceed is approved. (Code subsection 2.4]

2. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee except as provided in subsection 2.14. All materials used in the construction of the access within the highway right-of-way or on permanent easements, become public property. Any materials removed from the highway right-of-way will be disposed of only as directed by the Department. All fencing, guard rail, traffic control devices and other equipment and materials removed in the course of access construction shall be given to the Department unless otherwise instructed by the permit or the Department inspector.

3. The permittee shall notify the individual or the office specified on the permit or Notice to Proceed at least two working days prior to any construction within state highway right-of-way. Construction of the access shall not proceed until both the access permit and the Notice to Proceed are issued. The access shall be completed in an expeditious and safe manner and shall be finished within 45 days from initiation of construction within the highway right-of-way. A construction time extension not to exceed 30 working days may be requested from the individual or office specified on the permit.

4. The issuing authority and the Department may inspect the access during construction and upon completion of the access to ensure that all terms and conditions of the permit are met. Inspectors are authorized to enforce the conditions of the permit during construction and to halt any activities within state right-of-way that do not comply with the provisions of the permit, that conflict with concurrent highway construction or maintenance work, that endanger highway property, natural or cultural resources protected by law, or the health and safety of workers or the public.

5. Prior to using the access, the permittee is required to complete the construction according to the terms and conditions of the permit. Failure by the permittee to abide by all permit terms and conditions shall be sufficient cause for the Department or issuing authority to initiate action to suspend or revoke the permit and close the access. If in the determination of the Department or issuing authority the failure to comply with or complete the construction requirements of the permit create a highway safety hazard, such shall be sufficient cause for the summary suspension of the permit. If the permittee wishes to use the access prior to completion, arrangements must be approved by the issuing authority and Department and included in the permit. The Department or issuing authority may order a halt to any unauthorized use of the access pursuant to statutory and regulatory powers. Reconstruction or improvement of the access may be required when the permittee has failed to meet required specifications of design or materials. If any construction element fails within two years due to improper construction or material specifications, the permittee shall be responsible for all repairs. Failure to make such repairs may result in suspension of the permit and closure of the access.

6. The permittee shall provide construction traffic control devices at all times during access construction, in conformance with the M.U.T.C.D. as required by section 42-4-104, C.R.S., as amended.

7. A utility permit shall be obtained for any utility work within highway right-of-way. Where necessary to remove, relocate, or repair a traffic control device or public or private utilities for the construction of a permitted access, the relocation, removal or repair shall be accomplished by the permittee without cost to the Department or issuing authority, and at the direction of the Department or utility company. Any damage to the state highway or other public right-of-way beyond that which is allowed in the permit shall be repaired immediately. The permittee is responsible for the repair of any utility damaged in the course of access construction, reconstruction or repair.

8. In the event it becomes necessary to remove any right-of-way fence, the posts on either side of the access shall be securely braced with an approved end post before the fence is cut to prevent any slacking of the remaining fence. All posts and wire removed are Department property and shall be turned over to a representative of the Department.

9. The permittee shall ensure that a copy of the permit is available for review at the construction site at all times. The permit may require the contractor to notify the individual or office specified on the permit at any specified phases in construction to allow the field inspector to inspect various aspects of construction such as concrete forms, subbase, base course compaction, and materials specifications. Minor changes and additions may be ordered by the Department or local authority field inspector to meet unanticipated site conditions.

10. Each access shall be constructed in a manner that shall not cause water to enter onto the roadway or shoulder, and shall not interfere with the existing drainage system on the right-of-way or any adopted municipal system and drainage plan.

11. By accepting the permit, permittee agrees to save, indemnify, and hold harmless to the extent allowed by law, the issuing authority, the Department, its officers, and employees from suits, actions, claims of any type or character brought because of injuries or damage sustained by any person resulting from the permittee's use of the access permit during the construction of the access.

CHANGES IN ACCESS USE AND PERMIT VIOLATIONS

1. It is the responsibility of the property owner and permittee to ensure that the use of the access to the property is not in violation of the Code, permit terms and conditions or the Act. The terms and conditions of any permit are binding upon all assigns, successors-in-interest, heirs and occupants. If any significant changes are made or will be made in the use of the property which will affect access operation, traffic volume and or vehicle type, the permittee or property owner shall contact the local issuing authority or the Department to determine if a new access permit and modifications to the access are required.

2. When an access is constructed or used in violation of the Code, section 43-2-147(5)(c), C.R.S., of the Act applies. The Department or issuing authority may summarily suspend an access permit and immediately order closure of the access when its continued use presents an immediate threat to public health, welfare or safety. Summary suspension shall comply with article 4 of title 24, C.R.S.

MAINTENANCE

1. The permittee, his or her heirs, successors-in-interest, assigns, and occupants of the property serviced by the access shall be responsible for meeting the terms and conditions of the permit, the repair and maintenance of the access beyond the edge of the roadway including any cattle guard and gate, and the removal or clearance of snow or ice upon the access even though deposited on the access in the course of Department snow removal operations. Within unincorporated areas the Department will keep access culverts clean as part of maintenance of the highway drainage system. However, the permittee is responsible for the repair and replacement of any access-related culverts within the right-of-way. Within incorporated areas, drainage responsibilities for municipalities are determined by statute and local ordinance. The Department will maintain the roadway including auxiliary lanes and shoulders, except in those cases where the access installation has failed due to improper access construction and/or failure to follow permit requirements and specifications in which case the permittee shall be responsible for such repair. Any significant repairs such as culvert replacement, resurfacing, or changes in design or specifications, requires authorization from the Department.

STATE of COLORADO HIGHWAY ACCESS PERMIT
ADDITIONAL TERMS and CONDITIONS

August 22, 2019 **PERMIT No. 319105**
Permittee(s): City of Glenwood Springs
Location: Garfield County on CO Highway 082A, near Mile Ref. Pt. 2.19 Left

1. This permitted access is only for the use and purpose stated in the Application and Permit. This Permit is issued in accordance with the State Highway Access Code (2 CCR 601-1), also referred to as the Access Code (Code), and is based in part upon the information submitted by the Permittee.
2. Any subsequent relocation, reconstruction, or modifications to the access (or changes in the traffic volume or traffic nature using the access) shall be requested from CDOT by the means of a new application. Any changes to the access that causes non-compliance with the Access Code may render this permit void, and shall require a new application for a new permit.
3. This permit replaces any and all additional access permits that may be in existence for this access.
4. This permit is for an as-constructed access with a change in use for Blake Avenue.
5. The total traffic volume shall be 750 DHV (1 vehicle in the peak hour-- passenger vehicle equivalents).
6. This access shall have a full-turning movement signalized intersection.
7. The Permittee is responsible for obtaining any necessary additional Federal, State and/or City/County permits or clearances required for construction of the access. Approval of this access permit does not constitute verification of this action by the Permittee. Permittee is also responsible for obtaining all necessary utility permits in addition to this access permit.
8. The permittee, his or her heirs, successors-in-interest, assigns, and occupants of the property serviced by the access shall be responsible for meeting the terms and conditions of the permit, the repair and maintenance of the access beyond the edge of the roadway including any cattle guard and gate, and the removal or clearance of snow or ice upon the access driveway, even if the deposited material is on the access in the course of the Department's snow-removal operations. Within unincorporated areas, the Department will keep access culverts clean as part of maintenance of the highway drainage system. However, the permittee is responsible for the repair and replacement of any access-related culverts within the right-of-way. Within incorporated areas, drainage responsibilities for municipalities are determined by statute and local ordinance. The Department will maintain the roadway including auxiliary lanes and shoulders, except in those cases where the access construction has failed due to improper access installation and/or failure to follow permit requirements and specifications in which case the permittee shall be responsible for such repair. Any significant repair such as culvert replacement, resurfacing, or changes in design or specifications, requires authorization from the Department.

What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like roads and sidewalks prevent stormwater from naturally soaking into the ground

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt and other pollutants and flow into CDOT's storm drain system or directly into a stream, river, lake, wetland or reservoir. Anything that enters CDOT's storm drain system is discharged untreated into the waterways we use for fishing, swimming, and providing drinking water.

Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, pH, wrecked or discarded equipment, rock, sand, any industrial, municipal, or agricultural waste.

Tips for Reporting an Illicit Discharge

Call the illicit discharge hotline at **(303) 512-4426**
From a safe distance try to estimate the amount of the discharge.
Identify characteristics of the discharge (color, odor, algae, etc.).
Obtain information on the vehicle dumping the waste (if applicable).
Do not approach!
Call *CSP for illicit dumping.
If possible, take a photo, record a license plate.

REMEMBER:
Never get too close to the illicit discharge, it may be dangerous!!!

For more information on CDOT Utility Permits:

https://www.codot.gov/business/permits/utilitiesspecialuse

For more information on CDOT Access Permits:

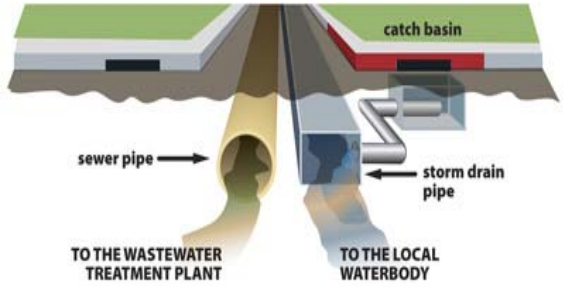
https://www.codot.gov/business/permits/accesspermits

For more information on CDOT Water Quality Program:

Water Quality Program Manager
4201 E. Arkansas Ave.
Shumate Building
Denver, Colorado 80222
303-757-9343

Water Quality Program Industrial Facilities Program

CDOT has a Municipal Separate Storm Sewer System permit, otherwise known as (MS4) from the Colorado Department of Public Health and Environment. The permit states that only stormwater can be discharged from CDOT's storm drain system



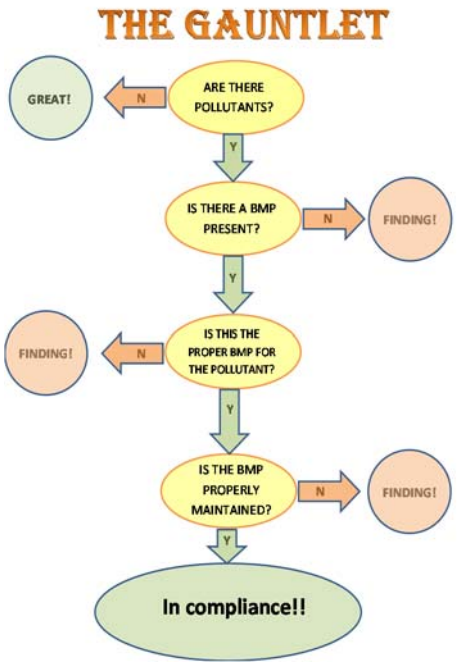
As part of the permit, CDOT has several different programs to prevent pollutants from entering into the storm drain system:

- Construction Site Program
- New Development Redevelopment Program
- Illicit Discharge Program
- Industrial Facilities Program
- Public Education and Outreach Program
- Pollution Prevention and Good Housekeeping Program
- Wet Weather Monitoring Program

COLORADO
Department of Transportation

Control Measures for Industrial Facilities

Industrial facilities can use control measures (CM) otherwise known as Best Management Practices (BMP) during the construction of a facility and when operating the facility. Control measures are schedules of activities, maintenance procedures, and other management practices to prevent and reduce pollution entering into CDOT's storm drain system. Control Measures also include treatment, operating procedures, and practices to control site run off which can include structural and non-structural controls.



CDOT defines a utility, or utility facility as any privately, publicly, or cooperatively owned line, facility, or system producing, transmitting or distributing the following:

- ✓ Communications
- ✓ Cable television
- ✓ Power
- ✓ Electricity
- ✓ Light
- ✓ Heat Gas
- ✓ Oil
- ✓ Crude Products
- ✓ Water
- ✓ Stream
- ✓ Waste
- ✓ Stormwater not connected with highway drainage
- ✓ Similar Commodity

COLORADO
Department of Transportation

Industrial Facilities Program Elements:

1. **Educate and outreach to owners or operators that have potential to contribute substantial pollutant to water.**
2. **Report and include information on discharge and water quality concerns. Provide written notification within 15 days of discovery to CDPHE.**
3. **Submit an annual report to CDPHE containing the number of informational brochures distributed; name and title of each individual trained.**

Education

There are instances when a utility company or other entity doing work in the state highway right-of-way will require some type of environmental permit or clearance for that work. CDOT has put together an Environmental Clearances Information Summary for those applying for a CDOT Utility and Special Use Permit or Access Permit to obtain all required clearances. This fact sheet is given to each permittee and is available at: http://www.coloradodot.info/programs/environmental/resources/guidance-standards/Environmental%20Clearances%20Info%20Summary.pdf

COLORADO DEPARTMENT OF TRANSPORTATION
Environmental Clearances Information Summary

PURPOSE - This summary is intended to inform entities external to CDOT that may be entering the state highway right-of-way to perform work related to their own facilities (such as Utility, Special Use or Access Permittees), about some of the more commonly encountered environmental permits/clearances that may apply to their activities. This listing is not all-inclusive - additional environmental or cultural resource permits/clearances may be required in certain instances. Appropriate local, state and federal agencies should be contacted for additional information if there is any uncertainty about what permits/clearances are required for a specific activity. **IMPORTANT – Please Review The Following Information Carefully – Failure to Comply With Regulatory Requirements May Result In Suspension or Revocation of Your CDOT Permit, Or Enforcement Actions By Other Agencies**

CLEARANCE CONTACTS - As indicated in the permit/clearance descriptions listed below, the following individuals or agencies may be contacted for additional information:

- Colorado Department of Public Health and Environment (CDPHE): General Information – (303) 692-2035
  Water Quality Control Division (WQCD): (303) 692-3500
  Environmental Permitting Website https://www.colorado.gov/pacific/cdphe/all-permits
- CDOT Water Quality Program Manager: (303) 757-9343 https://www.codot.gov/programs/environmental/water-quality
- CDOT Asbestos Project Manager: Phil Kangas, (303) 512-5519
- Colorado Office of Archaeology and Historic Preservation: (303) 866-3395
- U.S. Army Corps of Engineers, District Regulatory Offices:
  Omaha District (NE CO), Denver Office (303) 979-4120
  http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/Colorado.aspx
  Sacramento Dist. (Western CO), Grand Junction Office (970) 243-1199
  http://www.spk.usace.army.mil/Missions/Regulatory.aspx
  Albuquerque District (SE CO), Pueblo Office (719)-543-9459
  http://www.spa.usace.army.mil/Missions/RegulatoryProgramandPermits.aspx
- CDOT Utilities, Special Use and Access Permitting: (303) 757-9654 https://www.codot.gov/business/permits

Wildlife Resources - Disturbance of wildlife shall be avoided to the maximum extent practicable. Entry into areas of known or suspected threatened or endangered species habitat will require special authorization from the CDOT permitting office. If any threatened or endangered species are encountered during the progress of the permitted work, work in the subject area shall be halted and the CDOT Regional Permitting Office and Region Planning and Environmental Manager shall be contacted immediately. Authorization must be provided by CDOT prior to the continuation of work. Information about threatened or endangered species may be obtained from the CDOT website, http://www.codot.gov/programs/environmental/wildlife/guidelines, or the Colorado Parks and Wildlife (CPW) website, http://www.cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx. Additional guidance may be provided by the appropriate Region Planning and Environmental Manager (RPEM).

Cultural Resources - The applicant must request a file search of the permit area through the Colorado Office of Archaeology and Historic Preservation (OAHP), Denver, to ascertain if historic or archaeological resources have previously been identified (http://www.historycolorado.org/oahp/file-search). Inventory of the permit area by a qualified cultural resources specialist may be necessary, per the recommendation of CDOT. If archaeological sites/artifacts or historic resources are known to exist prior to the initiation of the permitted work or are encountered as the project progresses, all work in the subject area shall be halted and the CDOT Regional Permitting Office and Region Planning and Environmental Manager shall be contacted immediately. Authorization must be provided by CDOT prior to the continuation of work. Additional guidance may be provided by the Regional Permitting Office and RPEM. ***Contact Information:*** Contact the OAHP for file searches at (303) 866-3395.

Paleontological Resources - The applicant must request a fossil locality file search through the University of Colorado Museum, Boulder (https://cumuseum.colorado.edu/research/paleontology/vertebrates/policies), and the Denver Museum of Nature and Science (http://www.dmns.org/science/collections/earth-science-collections/) to ascertain if paleontological resources have been previously identified in or near the permit area. Inventory of the permit area by a qualified paleontologist may be necessary, per the recommendation of CDOT. If fossils are encountered during the permitted work, all work in the subject area shall be halted and the CDOT Regional Permitting Office and Region Planning and Environmental Manager shall be contacted immediately. Authorization must be provided by CDOT prior to the continuation of work. Additional guidance may be provided by the Regional Permitting Office in the Permit Special Provisions. **Contact Information:** See the museum websites listed above for Paleontological Collections Manager contact information. Contact the CDOT Paleontologist for further information at nicole.peavey@state.co.us or (303) 757-9632. The CDOT Paleontologist will not conduct a comprehensive file search independently of the museums.

Hazardous Materials, Solid Waste - The Solid Wastes Disposal Sites and Facilities Act C.R.S. 30-20-100, et al, and Regulations Pertaining to Solid Waste Disposal Sites and Facilities (6 CCR 1007-2), prohibit solid waste disposal without an approved Certificate of Designation (a landfill permit). The Colorado Hazardous Waste Act C.R.S. 25-15-301 et al, and the Colorado Hazardous Waste Regulations (6 CCR 1007-3) prohibit the transfer, storage or disposal (TSD) of hazardous waste except at permitted TSD sites. There are no permitted landfills or TSD sites within the State Highway Right of Way. Therefore, all solid or hazardous wastes that might be generated by the activities of entities entering the State Highway Right of Way must be removed from the ROW and disposed of at a permitted facility or designated collection point (e.g., for solid waste, a utility or construction company's own dumpster). If pre-existing solid waste or hazardous materials contamination (including oil or petroleum contaminated soil, asbestos, chemicals, mine tailings, etc.) is encountered during the performance of work, the permittee shall halt work in the affected area and immediately contact the CDOT Regional Permitting Office for direction as to how to proceed. ***Contact Information:*** Theresa Santangelo-Dreiling, CDOT Hazardous Materials Project Manager, (303) 512-5524, or Andy Flurkey, (303) 512-5520.

Asbestos Containing Materials, Asbestos Contaminated Soil - All work on asbestos containing materials (ACM) must comply with the applicable requirements of the CDPHE Air Pollution Control Division's (APCD) Regulation 8. Disposal of ACM, and work done in asbestos-contaminated soil, must comply with the CDPHE Hazardous Materials and Waste Management Division's (HMWMD) Solid

Waste Regulations. The application for any CDOT permit must specifically identify any ACM involved in the work for which authorization is being requested. Additional guidance or requirements may be specified in the permit special provisions. ***Contact Info:*** CDPHE APCD and HMWMD Regulations can be accessed via the CDPHE Environmental Permitting Website listed above. Additional information **concerning clearance on CDOT projects** is available from the CDOT Asbestos Project Manager (303) 512-5519, or Theresa Santangelo-Dreiling, Hazardous Materials Management Supervisor (303) 512-5524.

Transportation of Hazardous Materials - No person may offer or accept a hazardous material for transportation in commerce unless that person is registered in conformance with the United States Department of Transportation regulations at 49 CFR, Part 171. The hazardous material must be properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by applicable requirements, or an exemption, approval or registration has been issued. Vehicles requiring a placard, must obtain authorization and a State HAZMAT Permit from the Colorado Public Utilities Commission. ***Contact Information:*** For authorization and more info call the Federal Motor Safety Carrier Administration, US DOT for inter- and intra-state HAZMAT Registration (303) 969-6748. Colorado Public Utilities Commission: (303) 894-2868.

Discharge of Dredged or Fill Material – 404 Permits Administered By the U.S. Army Corps of Engineers, and Section 401 Water Quality Certifications Issued by the CDPHE WQCD - Corps of Engineers 404 permits are required for the discharge of dredged or fill materials into waters of the United States, including wetlands. There are various types of 404 permits, including nationwide permits, which are issued for activities with relatively minor impacts. For example, there is a nationwide permit for utility line activities (nwp #12). Depending upon the specific circumstances, it is possible that either a "general" or "individual" 404 permit would be required. If an individual 404 permit is required, section 401 water quality certification from the CDPHE WQCD is also required. Contact the appropriate Corps District Regulatory Office for information about what type of 404 permit may be required (contact information above). Contact the CDPHE Water Quality Control Division at (303) 692-3500.

Working on or in any stream or its bank - In order to protect and preserve the state's fish and wildlife resources from actions that may obstruct, diminish, destroy, change, modify, or vary a natural existing stream or its banks or tributaries, it may be necessary to obtain a Senate Bill 40 certification from the Colorado Department of Natural Resources. A stream is defined as 1) represented by a solid blue line on USGS 7.5' quadrangle maps; and/or 2) intermittent streams providing live water beneficial to fish and wildlife; and/or 3) segments of streams supporting 25% or more cover within 100 yards upstream or downstream of the project; and/or 4) segments of streams having wetlands present within 200 yards upstream or downstream of the project measured by valley length. The CPW application, as per guidelines agreed upon by CDOT and CPW, can be accessed at http://www.coloradodot.info/programs/environmental/wildlife/guidelines.

Stormwater Construction Permit (SCP) and Stormwater Discharge From Industrial Facilities - Discharges of stormwater runoff from construction sites disturbing one acre or more - or certain types of industrial facilities, such as concrete batch plants - requires a CDPS Stormwater Permit. ***Contact Information:*** Contact the CDPHE Water Quality Control Division at (303) 692-3500. Website: https://www.colorado.gov/pacific/cdphe/wq-construction-general-permits and https://colorado.gov/pacific/cdphe/wq-commerce-and-industry-permits.

Construction Dewatering (Discharge or Infiltration) and Remediation Activities - Discharges of water encountered during excavation or work in wet areas may require a Construction Dewatering or Remediation Activities Discharge Permit. ***Contact Information:*** For Construction Dewatering and Remediation Activities Discharge Permits, contact the CDPHE WQCD at (303) 692-3500. For Applications and Instructions (CDPHE website): https://www.colorado.gov/pacific/cdphe/wq-construction-general-permits.

Municipal Separate Storm Sewer System (MS4) Discharge Permit - Discharges from the storm sewer systems of larger municipalities, and from the CDOT highway drainage system that lies within those municipalities, are subject to MS4 Permits issued by the CDPHE WQCD. For facilities that lie within the boundaries of a municipality that is subject to an MS4 permit, the owner of such facility should contact the municipality regarding stormwater related clearances that may have been established under that municipality's MS4 permit. All discharges to the CDOT highway drainage system or within the Right of Way (ROW) must comply with the applicable provisions of the Colorado Water Quality Control Act, the Water Quality Control Commission (WQCC) Regulations (https://www.colorado.gov/pacific/cdphe/wqcc-regulations-and-policies-and-water-quality-statutes) and the CDOT MS4 Permit # COS-000005 (https://www.codot.gov/programs/environmental/water-quality/documents). Discharges are subject to inspection by CDOT and CDPHE. Contact the CDPHE Water Quality Control Division at (303) 692-3500 for a listing of municipalities required to obtain MS4 Permits, or go to https://www.colorado.gov/pacific/cdphe/wq-municipal-ms4-permits.

General Prohibition – Discharges - All discharges are subject to the provisions of the Colorado Water Quality Control Act and the Colorado Discharge Permit Regulations. Prohibited discharges include, but are not limited to, substances such as wash water, paint, automotive fluids, solvents, oils or soaps and sediment. ***Contact Information****:* Contact the CDPHE Water Quality Control Division at (303) 692-3500.

General Authorization - Allowable Non-Stormwater Discharges - Unless otherwise identified by CDOT or the WQCD as significant sources of pollutants to the waters of the State, the following discharges to stormwater systems are allowed without a Colorado Discharge Permit System permit: landscape irrigation, diverted stream flows, uncontaminated ground water infiltration to separate storm sewers, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, uncontaminated springs, footing drains, water line flushing, flows from riparian habitats and wetlands, and flow from firefighting activities. Allowable non-stormwater discharges can be found at https://www.codot.gov/programs/environmental/water-quality/glossary.html. ***Contact Information****:* The CDPHE Water Quality Control Division (telephone #'s listed above).

Erosion and Sediment Control Practices - For activities requiring a Stormwater Construction Permit, erosion control requirements will be specified in that permit. In those situations where a stormwater permit is not required, all reasonable measures should be taken in order to minimize erosion and sedimentation according to CDOT Standard Specifications 107.25 and 208. All disturbances require a stabilization plan, native seeding or landscape design plan according to applicable CDOT Standard Specifications 212-217 and 623. In any case, the CDOT Erosion Control and Stormwater Quality Guide (most recent version) should be used to design erosion controls and to restore disturbed vegetation. ***Contact Information****:* The CDOT Erosion Control and Stormwater Quality Guide may be obtained from the Bid Plans Office at (303) 757-9313 or from: https://www.codot.gov/programs/environmental/landscape-architecture/erosion-storm-quality.

Disposal of Drilling Fluids - Drilling fluids used in operations such as Horizontal Directional Drilling may be classified as "discharges" or "solid wastes," and in general, should be pumped or vacuumed from the construction area, removed from the State Highway Right of Way, and disposed of at permitted facilities that specifically accept such wastes. Disposal of drilling fluids into storm drains, storm sewers, roadside ditches or any other type of man-made or natural waterway is prohibited by Water Quality Control and/or Solid Waste regulations. Small quantities of drilling fluid solids (less than 1 cubic yard of solids) may be left on-site after either being separated from fluids or after infiltration of the water, provided: 1) the drilling fluid consists of only water and bentonite clay, or, if required for proper drilling properties, small quantities of polymer additives that are approved for use in drinking water well drilling; 2) the solids are fully contained in a pit, and are not likely to pose a nuisance to future work in the area, 3) the solids are covered and the area restored as required by CDOT permit requirements (Utility, Special Use, or Access Permits, etc.). ***Contact Information:*** Contact CDPHE (telephone #'s listed above).

Noxious Weeds and Invasive Species Management Plan – Noxious Weeds and Invasive Species guidance can be found by contacting the Colorado Department of Agriculture (https://www.colorado.gov/pacific/agconservation/noxiousweeds) and the Colorado Division of Parks and Wildlife (http://cpw.state.co.us/aboutus/Pages/RS-NoxiousWeeds.aspx). In either case, management plans involving the control of noxious weeds associated with the permitted activity and cleaning of equipment will be required.

Concrete Washout - Waste generated from concrete activities shall NOT be allowed to flow into the drainage ways, inlets, receiving waters, or in the CDOT ROW. Concrete waste shall be placed in a temporary concrete washout facility and must be located a minimum of 50 feet from state waters, drainageways, and inlets. Concrete washout shall only be performed as specified by the CDOT Environmental Program and shall be in accordance to CDOT specifications and guidelines. ***Contact Information****:* Contact CDPHE or find additional information on the CDOT website: https://www.codot.gov/business/designsupport/2011-construction-specifications/2011-Specs and refer to the specifications and their revisions for sections 101, 107 and 208.

Spill Reporting - Spills shall be contained and cleaned up as soon as possible. Spills shall NOT be washed down into the storm drain or buried. All spills shall be reported to the CDOT Illicit Discharge Hotline at (303) 512-4446 (4H20), as well as the Regional Permitting Office and Regional Maintenance Supervisor. Spills on highways, into waterways, any spill in the highway right-of-way exceeding 25 gallons, or that may otherwise present an immediate danger to the public shall be reported by calling 911, and shall also be reported to the CDPHE at 1-877-518-5608. More information can be found at https://www.colorado.gov/pacific/cdphe/emergency-reporting-line.

About This Form - Questions or comments about this Information Summary may be directed to Alex Karami, Program Administrator, CDOT Access Management Unit, at (303) 757-9841, alex.karami@state.co.us.

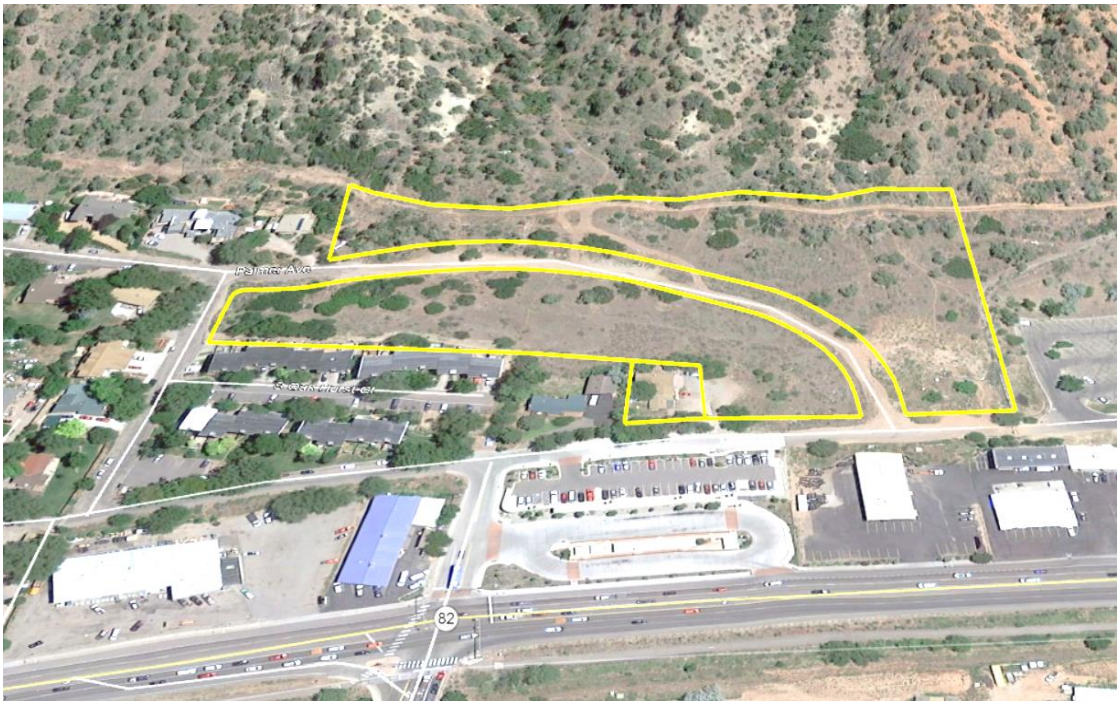
Boundaries Unlimited Inc.

Civil Engineering
Surveying
& Beyond

Major Drainage Report

Bell Rippy Neighborhood

March 3, 2020
BUI Project #20002.01



Google Earth 2020

"I hereby affirm that this report and the accompanying plans for the Bell Rippy Neighborhood was prepared by me (or under my supervision) for the owners thereof in accordance with the provisions of the City of Glenwood Springs Stormwater, Drainage, Water Quality and Erosion Control Chapter and approved variances and exceptions listed thereto. I understand that it is the policy of the City of Glenwood Springs that the City of Glenwood Springs does not and will not assume liability for drainage facilities designed by others."

COLORADO LICENSED
DERIC JON WALTER
37110
3/3//20
PROFESSIONAL ENGINEER

_____ *License No. 37110*
Licensed Professional Engineer, State of Colorado

(Seal)

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Appendix

A. Introduction

The purpose of this report is to provide an outline and basis of design for the drainage improvements proposed for the Bell Rippy Neighborhood in Glenwood Springs, Colorado (situated within Sections 15, 16, 21 & 22 of Township 6 South, Range 89 West of the Sixth Principal Meridian). The intent of the project is to construct several apartment buildings with associated roads/parking/sidewalks/landscaping and to mitigate the drainage impacts resulting from the development.

B. Existing Conditions

The project area consists of two (2) undeveloped parcels of land included in the Oakhurst Subdivision (First Filing) and the previously developed 2710 Blake Avenue (single family residence). The undeveloped parcels are bisected by the Palmer Avenue right-of-way. The project area is bounded by 26th Street to the north, Oakhurst Townhomes west/northwest, Blake Avenue to the west/southwest, Walmart to the south and very steep mountainous slopes to the east. The only significant disturbances on the project are the construction of a dirt road within the right-of-way, a retired irrigation ditch along the east boundary, the improvements to 2710 Blake Avenue (multi-family) and various utility installations. In general, the topography within the property slopes from east to west with slopes beginning from 40%-70% directly below the irrigation ditch which taper down to 20%-30% above the Oakhurst Townhomes and 10%-15% above Blake Avenue. Site vegetation consists primarily of sagebrush and native grasses with intermittent groupings of oak brush and sparse juniper trees. The USDA NRCS Web Soil Survey indicates that soils are primarily Atencio-Azeltine complex (hydrologic Group B) with a small section of Torriorthents-Rock outcrop complex (hydrologic Group D) along the southeast edge of the property.

C. Existing Drainage Basins

The construction of the Palmer Avenue dirt road and Oakhurst Townhomes has effectively divided the project area into five (5) existing drainage basins. The property is impacted by two (2) offsite drainage basins, OS-1 and OS-2. Please see Table 1 for basin areas, runoff coefficients, times of concentration and runoff rates and Figures 1 (offsite) and 2 (onsite) for basin boundaries and hydrologic soil groups.

Basin	Area		Runoff	Tc	Q_{25}	Q_{100}
	(sf)	(Ac.)		(min.)	(cfs)	(cfs)
H/Ex-01	67574	1.551	0.37	7.21	2.46	3.20
H/Ex-02	20084	0.461	0.37	6.51	0.77	0.99
H/Ex-03	15964	0.366	0.37	6.54	0.61	0.79
H/Ex-04	30586	0.702	0.37	7.39	1.10	1.43
H/Ex-05	170017	3.903	0.37	8.75	5.67	7.37
OS-1	5423220	124.500	0.36	22.45	102.44	131.82
OS-2	408157	9.370	0.28	6.32	11.93	15.50

Table 1: Existing Basins

A geotechnical investigation was performed by Huddleston-Berry Engineering & Testing, LLC (Job No. 01402-0002, dated December 2, 2017). The borings and test pits generally encountered red, moist, dense to very dense silty to clayey gravel soils with cobbles and boulders. Groundwater was not encountered.

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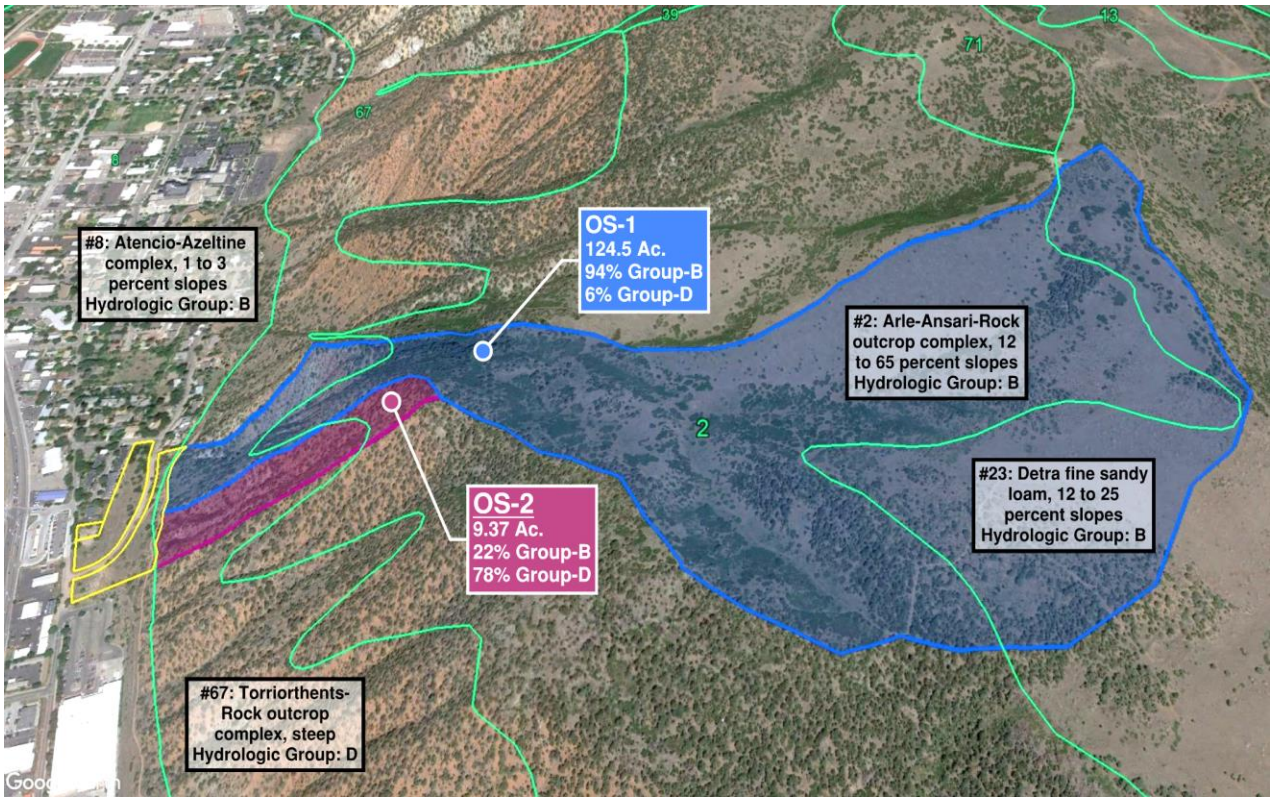

Figure 1: Existing Drainage Basins

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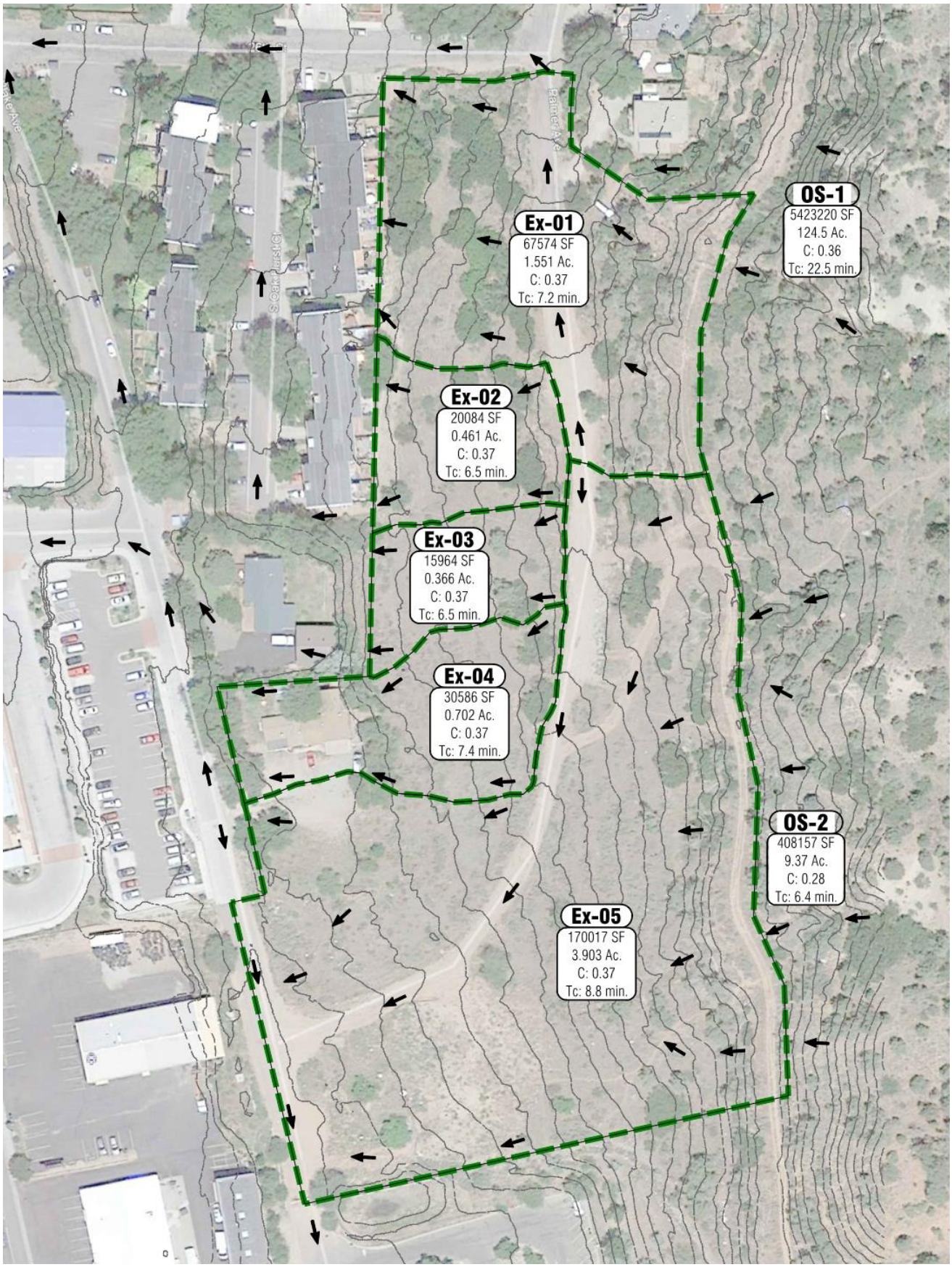

Figure 2: Existing Drainage Basins

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1. Basin OS-1

Basin OS-1 exists above the north 1/3 of the site. The 124.5-acre basin extends up the steep mountain slope and then just over 3000-feet into the undisturbed upper mountain mesa. Vegetation consists primarily of juniper/pinyon trees, sagebrush and native grasses. Soil ratios are 94% hydrologic Group B and 6% Group D. Runoff sheet flows in the upper limits, shallow flows to the edge of the steep slope and then channel flows down the steep slope onto onsite Basin Ex-01. According to the Debris Flow Hazard Evaluation by Golder Associates Inc. (Project No. 1669256, dated July 29, 2019), offsite runoff from this basin is anticipated to consist of a sediment load of 20% during the major storm event which could result in flow depths greater than 2-feet.

2. Basin OS-2

Basin OS-2 exists above the south 2/3 of the site. The 9.4-acre basin extends up the steep mountain slope to a ridgeline adjacent to Basin OS-1. Vegetation consists primarily of juniper/pinyon trees and native grasses. Soil ratios are 22% hydrologic Group B and 78% Group D. Runoff sheet flows in the upper limits and shallow flows down the steep slope onto onsite Basin Ex-05. According to the Golder evaluation, runoff during the major storm event could result in flow depths greater than 1.5-feet.

3. Basin Ex-01

Basin Ex-01 (1.551 acres) consists of the northern portion of the site adjacent to 26th Street and above the north half of the Oakhurst Townhomes. During minor storm events, runoff sheet flows in the upper limits to Palmer Avenue where it concentrates and shallow flows north into 26th Street. There is an existing storm sewer system at the intersection of 26th Street/Blake Avenue that captures minor runoff flows. Runoff below Palmer Avenue sheet flows and shallow flows into the fence line of the Oakhurst Townhomes. Runoff may be deflected north to 26th Street by the fence line and/or the existing dirt maintenance trail. During major storm events, onsite runoff flows appear to peak and then recede prior to peak flows entering from Basin OS-1. When the offsite flows arrive, the Golder evaluation indicates that these flows are slightly redirected north, but that debris could still likely impact 4 to 5 of the northernmost townhomes.

4. Basin Ex-02

Basin Ex-02 (0.461 acres) consists of a central portion of the site above of the southern half of the Oakhurst Townhomes. During minor and major storm events, runoff sheet flows in the upper limits and shallow flows directly into a section of the Oakhurst Townhomes fence line which is relatively level and does not appear to deflect or redirect the runoff. Runoff onto the adjacent property may flood the existing townhomes or be redirected by interior grading. Whichever occurs, it is likely that runoff eventually continues downstream to Blake Avenue and then north towards 26th Street.

5. Basin Ex-03

Basin Ex-03 (0.366 acres) consists of a central portion of the site above 2707 Blake Avenue (existing single-family residence). During minor and major storm events, runoff sheet flows in the upper limits and shallow flows directly onto the adjacent property. Runoff onto the adjacent property may flood the existing building or be redirected by interior grading. Whichever occurs, it is likely that runoff eventually continues down to Blake Avenue and then north towards 27th Street and possibly further on to 26th Street. A storm sewer system exists at the intersection of 27th Street/Blake Avenue to capture runoff from minor storm events while excess runoff likely splits to continue down 27th Street to Highway 82 and north on Blake Avenue.

6. Basin Ex-04

Basin Ex-04 (0.702 acres) consists of 2710 Blake Avenue and a central portion of the site above. During minor and major storm events, runoff sheet flows in the upper limits and shallow flows directly onto 2710 Blake Avenue. Runoff may flood the existing building or be redirected by interior grading. Whichever occurs, it is likely that runoff eventually continues down to Blake Avenue and then north towards 27th Street where it follows the paths previously described.

7. Basin Ex-05

Basin Ex-05 (3.903 acres) consists of the southern portion of the site adjacent to Walmart and above Blake Avenue. During minor storm events, runoff sheet flows in the upper limits to Palmer Avenue where it concentrates and shallow flows south onto an incomplete section of Blake Avenue that slopes south at 1%-2%. There is an existing storm sewer system that was constructed by Walmart which includes a detention pond, outflow controls, a CDOT Type-R inlet at a sag location in the road and an 18"Ø storm sewer leading to 29th Street. The existing inlet/sag is located directly behind the Factor Surplus building. During major storm events, onsite runoff flows appear to peak and then partially recede prior to peak flows entering from Basin OS-2. When the offsite flows arrive at the site, the Golder evaluation indicates that these flows continue due west and that debris could impact the Factory Surplus and Alpine Tire properties. The Golder evaluation did not extend south towards the existing inlet, but an evaluation of the inlet concluded that it does not contain sufficient capacity to receive the peak offsite runoff rate from Basin OS-2.

8. Floodplain

The site is partially located in a floodplain per the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA) for Garfield County, Colorado, Community Panel Number 080071 1434 C, effective date: October 15, 1985. As indicated, most of the property is in Zone D - areas of undetermined, but possible, flood hazards. A portion of the site is within Zone A - areas of 100-year flood; base flood elevations and flood hazard factors have not been determined. That portion of the site north of Zone A is within Zone C - areas of minimal flooding. Please see Figure 3.

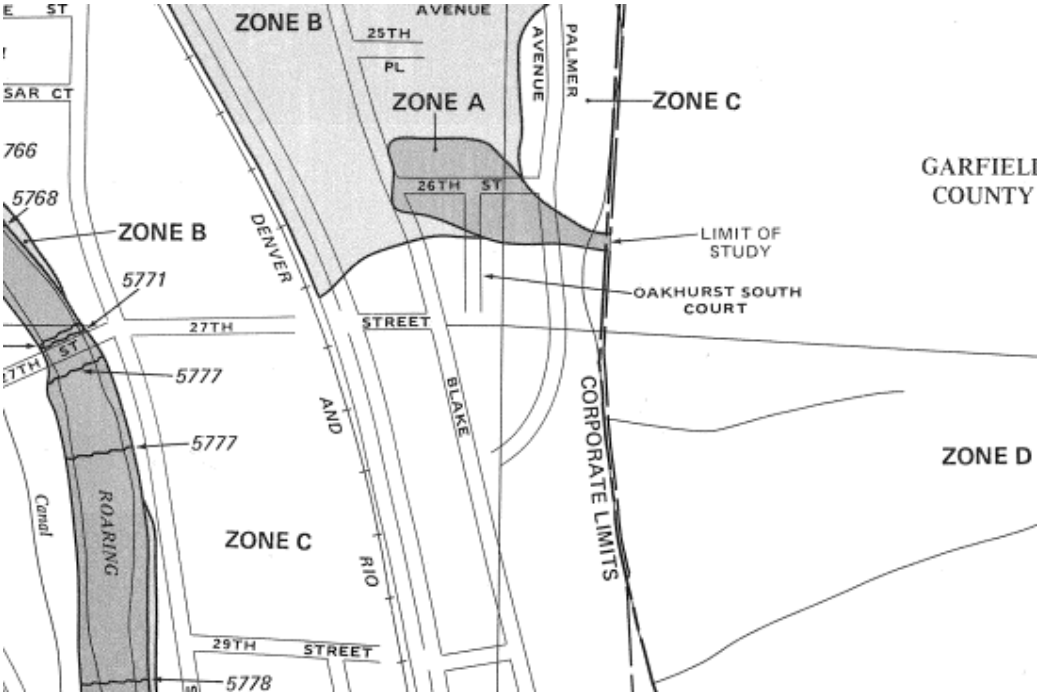

Figure 3: Existing Drainage Basins

9. Existing Design Points

The previous construction of Palmer Avenue (dirt road), 26th Street, Blake Avenue and adjacent properties largely confines the overall drainage basin boundary inside the property boundary. As discussed, there are three (3) topographic low points (outfalls/design points): the intersection of 26th Street/Blake Avenue; the intersection of 27th Street/Blake Avenue; and the existing CDOT Type-R inlet in Blake Avenue below Walmart. Please see the following Figure 4 (historic/existing peak runoff rates indicated).

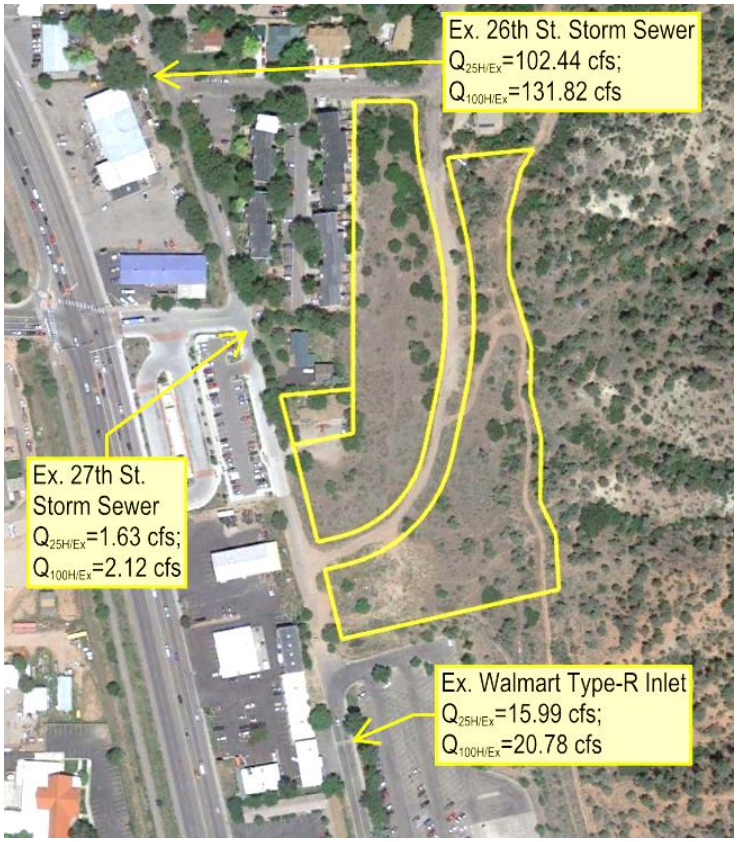

Figure 4: Outfalls/Design Points

D. Proposed Conditions

The proposed development will be multi-story multifamily residential apartments with three (3) topographic low points (outfalls/design points). These low points correspond with the existing conditions with concentrated flows at the intersection of 26th Street/Blake Avenue, 27th Street/Blake Avenue and the existing CDOT Type-R inlet in Blake Avenue below Walmart.

In planning out the design, several stormwater management alternatives were considered, including: bioretention; WQCV Drywells; Extended Detention Basin (EDB); Underground Detention (UGD) with hydrodynamic separators and conveyance structures. Per City requirements, the Project is required to treat runoff for the Water Quality Capture Volume (WQCV), manage runoff from the minor (25-year) and ensure conveyance of the 100-year storm event without adversely impacting downstream properties.

In preparing the design, it was determined that the soils were not suitable for infiltration and that the steep slopes and limited available flat areas negated the ability to utilize bioretention effectively. A previous study by Yarnell Consulting & Civil Design, LLC for the Glenwood Apartments (dated May 26, 2017) for a similar design on the site concluded that underground

detention with hydrodynamic separation was the best solution. The new Owner/Developer selected to expand the project site by purchasing 2710 Blake Avenue and utilize that property for a new EDB system which could serve the majority of the development. Despite all efforts to enable the EDB to serve the entire site, there remains a portion of land that is topographically lower than the EDB near the southwest corner where a UGD system is needed.

The Project has been designed to utilize roof gutters, downspouts, area inlets, curb inlets and storm sewer piping for the capture and conveyance of runoff to the treatment/detention facilities. Water Quality Capture Volume (WQCV) and runoff from impervious areas under the 25-year and 100-year, 1-hour storms will be managed using multi-stage outflow control in the EDB. A hydrodynamic separator will be installed upstream of the UGD for treatment and 25-year/100-year discharge will be managed using multi-stage outflow controls. The controlled discharge will be released into Blake Avenue for conveyance to the existing storm sewer systems. The undeveloped portion of Blake Avenue at the intersection of Blake Avenue/Palmer Avenue will be completed with curb, gutter and sidewalk. While the site runoff is well managed by the proposed systems, the offsite runoff exceeds feasible solutions. In an effort to better protect adjacent properties, earthen berms are proposed along the west side of Blake Avenue and along the north side of 26th Street to deflect the conveyed offsite runoff to the existing outfall points previously discussed. The existing CDOT Type-R Inlet below Walmart will also have to be increased from a single inlet (5' wide) to a triple inlet (15' wide). This should be accomplished in accordance with CDOT Standard Plan M-Standards using an "Inlet with Drop Box" configuration.

According to the Golder evaluation, the offsite debris flows are to be mitigated through the use of a 430± LF x 9' high flexible debris flow fence below Basin OS-1 and a combination of channels/berms below Basin OS-2. The debris flow fence is to be designed by others to extend across the basin fan and contain sediment while allowing relatively clear water to pass through which behaves as typical water flow rather than debris flow. A conveyance channel is to be constructed below the debris flow fence to capture and direct the clear water to a 24"x72" box culvert running under the new driveway of 2506 Palmer Avenue. The channel is to be 1.5' deep, have a 6.0' wide bottom width, have 1.5:1 side slopes and be lined with grouted riprap or a permanent UV stable erosion control fabric vegetated with native grasses. The box culvert needs to be angled to direct runoff north and down Palmer Avenue and towards 26th Street. Because of the steep slopes and high flow rates, the culvert headwall is required to be a wing/stem wall system which extends 4-feet up above the adjacent driveway. Grouted riprap needs to be installed below the culvert outfalls and extended to the top back of the street curb to control erosion. Dimensional details for the wing/stem wall and channel have been included in the Drainage Plans.

A deflection berm and conveyance channel are to be constructed across and below the debris fan of Basin OS-2. The berm is to be 3.0' high, have a 3.0' top width, have 2:1 side slopes and be lined with a permanent a permanent UV stable erosion control fabric vegetated with native grasses. The channel is to be 1.0' deep, have a 3.0' wide bottom width, have 1.5:1 side slopes and be lined with grouted riprap or a permanent UV stable erosion control fabric vegetated with native grasses.

A tiered retaining wall system is proposed along the east side of Palmer Avenue to minimize the amount of site disturbance, excavation and export. A drainage channel will need to be constructed above the wall to redirect runoff and protect the wall system. The channel is to be 1.0' deep, have a 1.0' wide bottom width, have 1.5:1 side slopes and be lined with grouted riprap or a permanent UV stable erosion control fabric vegetated with native grasses. Two (2) 24"Ø Nyloplast areas equipped with Agridrain heavy duty vertical debris guards are to be

installed in the channel above the retaining wall to capture the runoff and discharge it into Palmer Avenue.

As indicated on the attached Drainage Plans, a storm sewer system is to be installed in Palmer Avenue with branches into the adjacent parking lots and leads to the EDB. CDOT Type-R inlets are to be installed in Palmer Avenue to maximize on grade inlet capture and CDOT Type-16 inlets are to be installed in the parking areas to screen trash and maximize sump inlet capture. A detailed storm sewer analysis of this system has been performed using Autodesk Storm and Sanitary Sewer Analysis (SSA) v2020 software. Inlet and street capacities have also been confirmed using Mile High Flood District (MHFD) *Street and Inlet Hydraulics* software. Copies of each have been included in the Appendix.

A secondary storm sewer system is also to be installed in Palmer Avenue just above the intersection of Blake Avenue/Palmer Avenue because the area is topographically lower than the EDB. CDOT Type-13 valley inlets are to be installed across the driveway ramps and CDOT Type-16 inlets are to be installed in the parking areas. This storm sewer will direct runoff to a hydrodynamic separator positioned upstream of the underground detention facility.

In general, runoff from the roofs will be collected by roof gutters and downspouts connected to the storm sewer systems. Runoff from landscaped areas around the building will be captured by swales and area inlets also connected to the storm sewers. Runoff from the parking areas and street will be collected by the curb inlets previously described.

The available treatment/storage depth of the EDB is limited to just 3-feet by the elevation difference between the adjacent parking lot and Blake Avenue. The EDB treatment/storage requirements and outflow controls were designed using MHFD *Detention Basin Design Workbook* software for a three (3) zone system. The permissible outflow must be limited to the historic/existing runoff rates estimated at the intersection of Blake Avenue/27th Street and to prevent adverse impacts to downstream properties/systems. A copy has been included in the Appendix. The EDB storage requirements and proposed outflow controls are as follows:

Storm Event/ Zone	Storage Req'd (ac-ft)	Storage Req'd (cf)	Orifice Ø (in)	Weir Width (ft)	Weir Height (ft)	Weir Stage (ft)	Peak Outflow WQCV (cfs)	Peak Outflow Q25 (cfs)	Peak Outflow Q100 (cfs)
WQCV	0.074	3223	1	-	-	0	(40 hr)		
			1	-	-	0.25			
			1	-	-	0.5			
			1	-	-	0.75	0.07		
25-yr	0.219	9540	-	0.25	0.75	1.75		0.28	
100-yr*	0.262	11413	-	7.5*	-	2.5			2.09
*Overflow grate, not a typical weir									

Table 2: EDB Storage Requirements and Outflow Control

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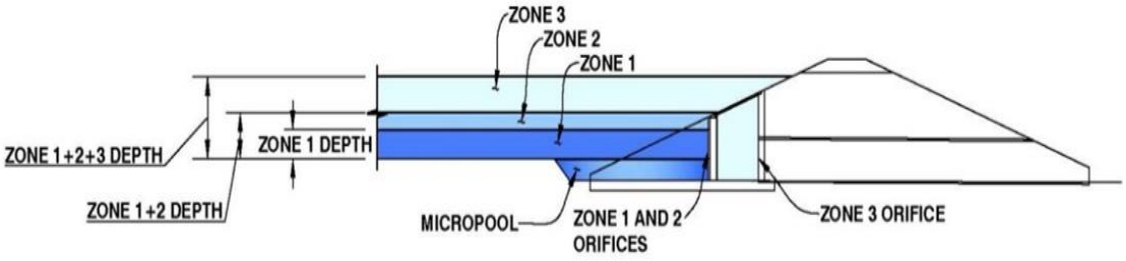

Figure 5: Extended Detention with 3 zones

The EDB has been depicted on the Drainage Plans to fit within the 2710 Blake Avenue parcel (available space). Steep 2:1 side slopes are required to meet the 100-year storage requirements above. The proposed Stage-Storage dimensions above the micropool are:

Stage (ft)	Area (sf)	Volume (cf)	Volume (ac-ft)	Storm Event/ Zone	HWL (ft)
-1 (micropool)	500	-	-	-	-
0	3139	0	0.000	WQCV	0.94
1	3774	3456	0.079	25-yr	2.45
2	4379	7533	0.173	100-yr	2.84
3	5044	12244	0.281		
4	5747	17640	0.405		

Table 3: EDB Stage-Storage

The EDB should contain a 500 sf x 12" deep micropool near the outflow control structure for sediment storage and a 10-foot wide access trail at the southwest corner at 6:1 max. The bottom of the micropool must be lined with 9"Ø nominal riprap and the remaining bottom of the EDB and side slopes must be lined with a permanent UV stable erosion control fabric vegetated with native grasses. Outflow control structure details have been included in the Drainage Plans.

The available treatment/storage depth of the UGD is limited to just 3-feet by the elevation difference between the rims of the Type-13 inlet proposed in Palmer Avenue and the existing curb flowline in Blake Avenue near the southwest corner of the site. Treatment will be obtained through the use of a hydrodynamic separator (Contech Vortech/CDS, ADS Barracuda, Forterra BioClean DSD or similar). The selected system will need to be sized by the manufacturer. Detention is proposed through the use of a large diameter perforated pipe network system (ADS LandMax or similar) backfilled with clean angular gravels with a 40% minimum void content. Alternative chamber systems capable of sustaining H-20 traffic loads may also be considered. Since the soils are not conducive to infiltration, the bottom and sides of the system will have to be lined with a full depth impermeable 30mil PVC pond liner. The UGD must have a minimum storage capacity of 2050 cf at a maximum depth of 2-feet. A suitable large diameter pipe system would consist of four (4) 24"Ø x 80 LF HDPE laterals with tee/bend manifolds, 24-inches of wall-to-wall separation, 4" of gravel subgrade, gravel backfill and 6" of gravel cover. The permissible outflow must be limited to the historic/existing runoff rates estimated at the intersection of Blake Avenue/27th Street at to prevent adverse impacts to downstream properties/systems. This is proposed to be accomplished through a two-stage weir as follows:

Storm Event/ Zone	Weir				
	Width (ft)	Height (ft)	Stage (ft)	Q25 (cfs)	Q100 (cfs)
WQCV	Hydrodynamic Separator			-	-
25-yr	0.25	1.5	0	5.43	

Table 4: UGD Outflow Control

E. Proposed Drainage Basins

Proposed drainage basin boundaries have been delineated in order to accurately size major receiving inlet structures. Please see Figure 6 for basin boundaries and Table 5 for areas, runoff coefficients, times of concentration and hydrology.

Basin	Area		Runoff C	Tc (min.)	WQCV (EDB) (in)	V_{WQ} (cf) (d6=0.34	Design Point V_{WQ} (cf)	Q_{25} (cfs)	Q_{100} (cfs)
	(sf)	(Ac.)							
OS-1	5423220	124.5	0.36	22.45	-	-	-	102.44	131.82
OS-2	408157	9.37	0.28	6.32	-	-	-	11.93	15.50
Pr-1	24815	0.570	0.48	5.00	0.126	206	-	1.38	1.79
Pr-2	5326	0.122	0.83	5.00	0.333	117	-	0.51	0.67
Pr-3	12339	0.283	0.79	5.00	0.300	244	-	0.82	1.06
Pr-4	14372	0.330	0.33	5.00	0.067	64	-	0.55	0.71
Pr-5	6391	0.147	0.77	5.00	0.281	118	-	0.57	0.74
Pr-6	12701	0.292	0.78	5.00	0.288	241	-	1.15	1.49
Pr-7	32430	0.744	0.77	5.00	0.282	602	-	2.90	3.76
Pr-8	7888	0.181	0.81	5.00	0.312	162	-	0.74	0.96
Pr-9	73048	1.677	0.38	5.00	0.047	228	-	3.22	4.18
Pr-10	18150	0.417	0.46	5.00	0.144	173	-	0.97	1.26
Pr-11	9605	0.221	0.87	5.00	0.367	232	-	0.97	1.26
Pr-12	6322	0.145	0.62	5.00	0.208	86	-	0.45	0.59
Pr-13	18045	0.414	0.67	5.00	0.211	251	-	1.40	1.82
Pr-14	8825	0.203	0.86	5.00	0.369	215	-	0.88	1.14
Pr-15	5669	0.130	0.79	5.00	0.298	111	-	0.52	0.67
Pr-16	2187	0.050	0.71	5.00	0.247	36	-	0.60	0.78
Pr-17	7280	0.167	0.63	5.00	0.213	102	3187	0.16	0.21
Pr-18	4945	0.114	0.95	5.00	0.471	154	-	0.55	0.71
Pr-19	4542	0.104	0.82	5.00	0.319	95	-	0.43	0.56
Pr-20	13454	0.309	0.82	5.00	0.315	279	-	1.28	1.66
Pr-21	15845	0.364	0.55	5.00	0.180	188	716	1.01	1.31
Walmart	67518	1.550	0.95	10.00	-	-	-	5.45	7.08
Blake @ Walmart	1743	0.040	0.97	5.00	-	-	-	0.20	0.26

Table 5: Proposed Basins

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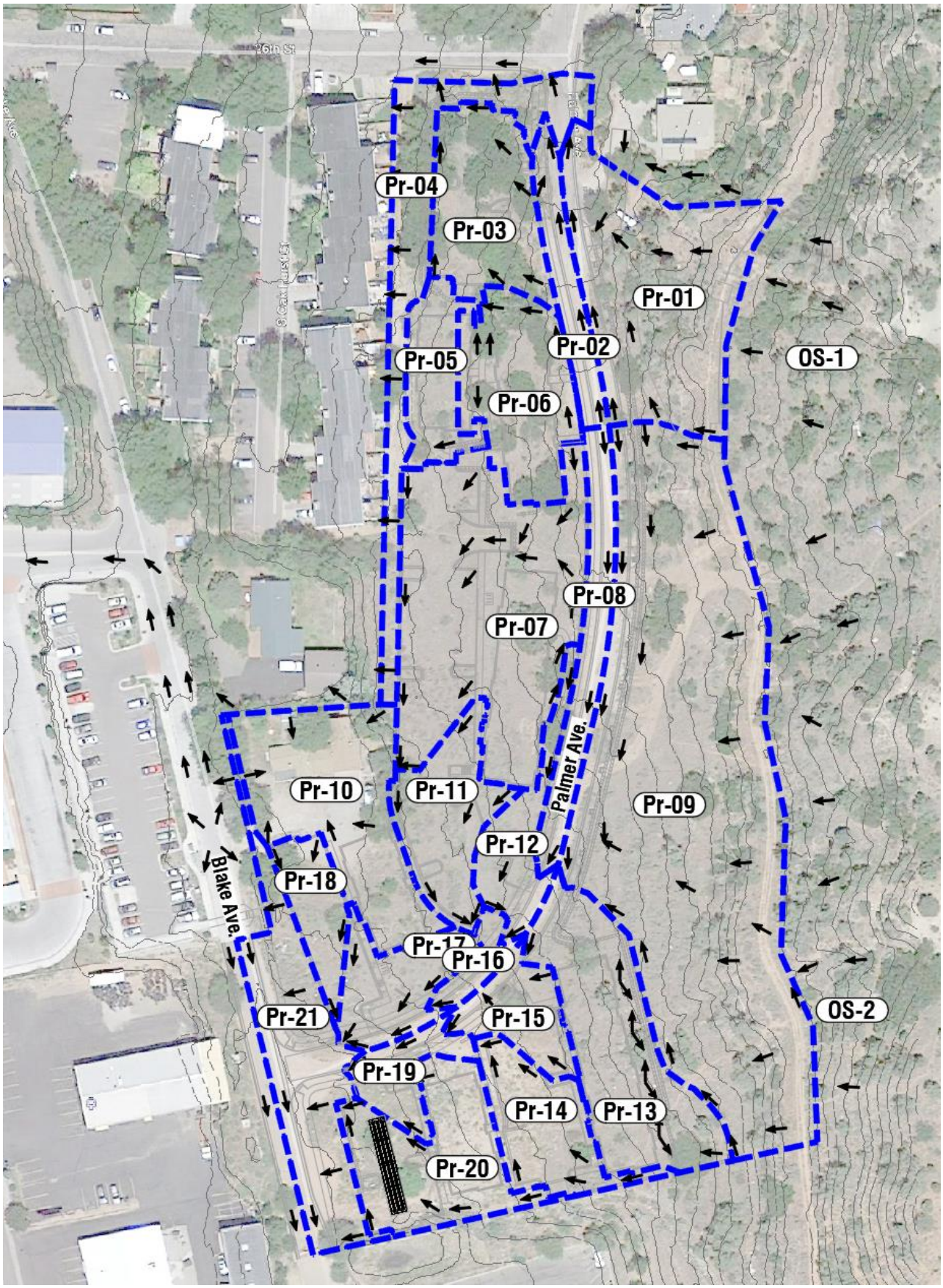

Figure 6: Proposed Drainage Basins

1. Basin Pr-01

Basin Pr-01 (0.570 acres; C=0.48; Tc=5 min. Q_{25}=1.38 cfs; Q_{100}=1.79 cfs) is situated at the northeast corner of the site below Offsite Basin OS-1 along with the east side of Palmer Avenue. As previously discussed, a conveyance channel is to be constructed across the basin below the proposed flexible debris flow fence to capture and direct the clear water from Offsite Basin OS-1 through the basin and to a 24"x72" box culvert running under the new driveway of 2506 Palmer Avenue. A 10-foot wide gravel maintenance trail will need to be constructed across the basin to obtain access to the debris flow fence for removal of debris and routine maintenance. A tiered retaining wall system is also proposed along the east side of Palmer Avenue to minimize the amount of site disturbance, excavation and export. A drainage channel will need to be constructed above the wall to redirect runoff and protect the wall system. The smaller wall channel is to be 1.0' deep, have a 1.0' wide bottom width, have 1.5:1 side slopes and be lined with grouted riprap or a permanent UV stable erosion control fabric vegetated with native grasses. No impervious buildings, streets or parking areas are proposed in this basin. In general, runoff will sheet flow in the upper limits, then shallow flow down to Palmer Avenue and shallow flow in Palmer Avenue to a proposed CDOT Type-R curb inlet located just above 26th Street. The inlet has a design intercept capacity of 2.2 cfs (minor) and 3.2 cfs (major) which in total is greater than the runoff from this basin. Uncaptured excess runoff from Offsite Basin OS-2 will bypass the inlets and continue down the roadway to the next set of inlets in Basin Pr-12. The inlet will also capture a minimal quantity of runoff from Offsite Basin OS-1. Although minimal, this capture will provide a net benefit for downstream properties/systems by reducing the peak runoff at Blake Avenue/26th Street from 131.82 cfs to 131.44 cfs. Captured runoff will be routed through a new storm sewer system to the EDB for treatment, detention and controlled release. The east half of Palmer Avenue has a street capacity of 1.4 cfs under the minor storm event with a maximum spread of 4-feet which is less than the runoff from this basin. Any disturbed slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native grasses.

2. Basin Pr-02

Basin Pr-02 (0.122 acres; C=0.83; Tc=5 min. Q_{25}=0.51 cfs; Q_{100}=0.67 cfs) is the west one-half of the proposed Palmer Avenue at the north end of the site which flows into 26th Street. Runoff from Offsite Basin OS-1 will likely overtop the crown and enter the lower limits of this basin. Impervious areas will include the street and sidewalk. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. No slopes steeper than 4:1 are anticipated which would require erosion control fabric. In general, runoff will sheet flow in the short upper limits, shallow flow in the street curb to two CDOT Type-R curb inlets located at the north end of the basin just above 26th Street, and channel (pipe) flow in the storm sewer. These inlets contain sufficient capacity to capture the anticipated minor and major runoff from this basin and onsite Basin Pr-01. The inlets will also capture a minimal quantity of runoff from Offsite Basin OS-1. Although minimal, this capture will provide a net benefit for downstream properties/systems by reducing the peak runoff at Blake Avenue/26th Street from 131.82 cfs to 131.44 cfs. Captured runoff will be routed through a new storm sewer system to the EDB for treatment, detention and controlled release. Palmer Avenue has a street capacity of 2.8 cfs (1.4 cfs on each side of the crown) under the minor storm event at a maximum spread of 4-feet which is less than the combined runoff from onsite Basins Pr-01/Pr-02.

3. Basin Pr-03

Basin Pr-03 (0.286 acres; C=0.79; Tc=5 min. Q_{25}=0.82 cfs; Q_{100}=1.06 cfs) is the north parking lot near the intersection Palmer Avenue/26th Street and adjacent landscape areas. Impervious areas will include the parking and entry sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be

lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Captured runoff will be routed through a new storm sewer system to the EDB for treatment, detention and controlled release. In general, runoff will be sheet flow in the upper limits, shallow flow in the parking curbs, and channel (pipe) flow in the storm sewer.

4. Basin Pr-04

Basin Pr-04 (0.330 acres; C=0.33; Tc=5 min. Q_{25}=0.55 cfs; Q_{100}=0.71 cfs) is the long narrow strip of undeveloped/revegetated land adjacent to the Oakhurst Townhomes and 26th Street. It also includes a minor portion of the impervious Palmer Avenue just below the Pr-02 curb inlets. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Runoff will not be captured from the basin and will sheet flow onto the adjacent properties and 26th Street. Historically, these adjacent properties received much more runoff from Basins Ex-01 (2.46/3.20 cfs), Ex-02 (0.77/0.99 cfs) and Ex-03 (0.61/0.79 cfs) than they will once site improvements have been completed. Therefore, development will result in a net benefit for downstream properties/systems.

5. Basin Pr-05

Basin Pr-05 (0.147 acres; C=0.77; Tc=5 min. Q_{25}=0.57 cfs; Q_{100}=0.74 cfs) is the majority of Building-F and the surrounding walks and landscaping. Impervious areas will include the building and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Roof runoff will be captured by gutters/downspouts and piped directly into the storm sewer system leading to the EDB. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the roof/upper limits, shallow flow in swales, and channel (pipe) flow in the storm sewer.

6. Basin Pr-06

Basin Pr-06 (0.292 acres; C=0.78; Tc=5 min. Q_{25}=1.15 cfs; Q_{100}=1.49 cfs) is Building-E, a portion of Building-F and the surrounding walks and landscaping. Impervious areas will include the buildings and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Roof runoff will be captured by gutters/downspouts and piped directly into the storm sewer system leading to the EDB. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the roof/upper limits, shallow flow in swales, and channel (pipe) flow in the storm sewer.

7. Basin Pr-07

Basin Pr-07 (0.292 acres; C=0.78; Tc=5 min. Q_{25}=1.15 cfs; Q_{100}=1.49 cfs) is Building-E, the majority of the adjacent parking, and the surrounding walks and landscaping. Impervious areas will include the building, parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Roof runoff will be captured by gutters/downspouts and piped directly into the storm sewer system leading to the EDB. Parking runoff will be captured by curb and CDOT Type-16 curb inlets connected to the same storm sewer. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the roof/upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer.

8. Basin Pr-08

Basin Pr-08 (0.181 acres; C=0.81; Tc=5 min. Q_{25}=0.74 cfs; Q_{100}=0.96 cfs) is the west half of the upper portion of Palmer Avenue flowing south to Blake Avenue prior to the first set of curb inlets along with the adjacent landscape strips/sidewalk. Impervious areas will include the road and sidewalk. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. No slopes steeper than 4:1 are anticipated which would require erosion control fabric. In general, runoff will sheet flow in the short upper limits, shallow flow in the street curb to a CDOT Type-R curb inlet located just above the driveway of Building-D, and channel (pipe) flow in the storm sewer. The inlet has a design intercept capacity of 2.2 cfs (minor) and 3.2 cfs (major) which in total is greater than the runoff from the basin.

9. Basin Pr-09

Basin Pr-09 (1.677 acres; C=0.38; Tc=5 min. Q_{25}=3.22 cfs; Q_{100}=4.18 cfs) is the east half of Palmer Avenue adjacent to Basin Pr-08 and the undeveloped portion of the site above Palmer Avenue and Building-C. As previously discussed, a deflection berm/conveyance channel is to be constructed across the basin to capture and direct the runoff from Offsite Basin OS-2 through the basin and to an area inlet discharging into Palmer Avenue. Drainage channels will need to be constructed above the wall and Basin Pr-13 to redirect runoff and protect the wall systems and Building-C. The smaller channels are to be 1.0' deep, have a 1.0' wide bottom width, have 1.5:1 side slopes and be lined with grouted riprap or a permanent UV stable erosion control fabric vegetated with native grasses. No impervious buildings, streets or parking areas are proposed in this basin. In general, runoff will sheet flow in the upper limits and then shallow flow down to Palmer Avenue where it will join with the runoff from Offsite Basin OS-2 and enter a CDOT Type-R curb inlet. The inlet has a design intercept capacity of 2.2 cfs (minor) and 3.2 cfs (major) which in total is less than the combined runoff from this basin and the offsite basin. Uncaptured runoff will bypass the inlet and continue down the street to the next inlet in Basin Pr-13. Any disturbed slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native grasses.

10. Basin Pr-10

Basin Pr-10 (0.417 acres; C=0.46; Tc=5 min. Q_{25}=0.97 cfs; Q_{100}=1.26 cfs) is Building-A, the EDB, and the surrounding walks and landscaping. Impervious areas will include the building and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Roof runoff will be captured by gutters/downspouts and piped directly into the storm sewer system leading to the EDB. Other surface areas will be captured by swales and area inlets also connected to the storm sewer or the EDB. In general, runoff will be sheet flow on the roof/upper limits, shallow flow in swales, and channel (pipe) flow in the storm sewer.

11. Basin Pr-11

Basin Pr-11 (0.221 acres; C=0.87; Tc=5 min. Q_{25}=0.97 cfs; Q_{100}=1.26 cfs) is the lower portion of the parking lot near Building-D and the surrounding walks and landscaping. Impervious areas will include the parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Parking runoff will be captured by curb and a CDOT Type-16 curb inlet connected to the storm sewer leading to the EDB. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer.

12. Basin Pr-12

Basin Pr-12 (0.221 acres; C=0.87; Tc=5 min. Q_{25}=0.97 cfs; Q_{100}=1.26 cfs) is the remainder of the parking lot near Building-D, one-half of Palmer Avenue below Basin Pr-08 and the surrounding walks and landscaping. Impervious areas will include the street, parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Parking runoff will be captured by curb leading to a CDOT Type-16 curb inlets connected to the storm sewer leading to the EDB. Street runoff will be captured by a CDOT Type-R curb inlet connected to the same storm sewer. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer. The Type-R inlet has a design intercept capacity of 2.2 cfs (minor) and 3.2 cfs (major) which is greater than the runoff from the basin.

13. Basin Pr-13

Basin Pr-13 (0.414 acres; C=0.67; Tc=5 min. Q_{25}=1.40 cfs; Q_{100}=1.82 cfs) is Building-C, one-half of Palmer Avenue below Basin-09, and the surrounding walks and landscaping. Impervious areas will include the street, building and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Roof runoff will be captured by gutters/downspouts and piped directly into the storm sewer system leading to the EDB. Street runoff will be captured by curb and a CDOT Type-R curb inlet connected to the same storm sewer. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the roof/upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer. The Type-R inlet has a design intercept capacity of 2.2 cfs (minor) and 3.2 cfs (major) which is greater than the runoff from the basin, but less than the bypass runoff produced by Offsite Basin OS-2. Uncaptured runoff will bypass the inlet and continue down the street to the next inlet in Basin Pr-15.

14. Basin Pr-14

Basin Pr-14 (0.203 acres; C=0.86; Tc=5 min. Q_{25}=0.88 cfs; Q_{100}=1.14 cfs) is the majority of the parking lot adjacent to Building-C and the surrounding walks and landscaping. Impervious areas will include the parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Parking runoff will be captured by curb and a CDOT Type-16 curb inlet connected to the storm sewer leading to the EDB. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer.

15. Basin Pr-15

Basin Pr-15 (0.130 acres; C=0.79; Tc=5 min. Q_{25}=0.52 cfs; Q_{100}=0.67 cfs) is the remainder of the parking lot adjacent to Building-C, one-half of Palmer Avenue below Basin-13, and the surrounding walks and landscaping. Impervious areas will include the street and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Street runoff will be captured by curb and a CDOT Type-R curb inlet connected to the storm sewer leading to the EDB. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer. The Type-R inlet has a design intercept capacity of 2.2 cfs (minor) and 3.2 cfs (major)

which is greater than the runoff from the basin, but less than the bypass runoff produced by Offsite Basin OS-2. Uncaptured runoff will bypass the inlet and continue down the street to the next inlet in Basin Pr-19.

16. Basin Pr-16

Basin Pr-16 (0.050 acres; C=0.71; Tc=5 min. Q_{25}=0.60 cfs; Q_{100}=0.78 cfs) is one-half of Palmer Avenue below Basin Pr-12 and the surrounding walks and landscaping. Impervious areas will include the street and sidewalk. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Street runoff will be captured by a CDOT Type-R curb inlet connected to the storm sewer leading to the EDB. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer. The Type-R inlet has a design intercept capacity of 2.2 cfs (minor) and 3.2 cfs (major) which is greater than the runoff from the basin.

17. Basin Pr-17

Basin Pr-17 (0.167 acres; C=0.63; Tc=5 min. Q_{25}=0.16 cfs; Q_{100}=0.21 cfs) is one-half of Palmer Avenue below Basin Pr-16, the lower portion of the parking lot near Building-A and the surrounding walks and landscaping. Impervious areas will include the street, parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Street/parking runoff will be captured by curb and a CDOT Type-13 valley inlet connected to the storm sewer leading to the UGD. Other surface areas will be captured by swales and area inlets also connected to the same storm sewer. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer. The Type-13 inlet has a design intercept capacity of 1.3 cfs (minor) and 1.5 cfs (major) which is greater than the runoff from the basin, but not all of the runoff is captured because of gutter spread and a minor amount of bypass from Basin Pr-18. Minor runoff bypassing the Type-13 inlet will continue down the street to Blake Avenue.

18. Basin Pr-18

Basin Pr-18 (0.114 acres; C=0.95; Tc=5 min. Q_{25}=0.55 cfs; Q_{100}=0.71 cfs) is the majority of the parking lot adjacent to Building-A and the surrounding walks and landscaping. Impervious areas will include the parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Parking runoff will be captured by curb and a CDOT Type-16 curb inlet connected to the storm sewer leading to the UGD. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer. The Type-16 inlet has a design intercept capacity of 1.5 cfs (minor) and 2.0 cfs (major) which is greater than the runoff from the basin.

19. Basin Pr-19

Basin Pr-19 (0.104 acres; C=0.82; Tc=5 min. Q_{25}=0.43 cfs; Q_{100}=0.56 cfs) is a portion of the parking lot adjacent to Building-B, one-half of Palmer Avenue below Basin-15, and the surrounding walks and landscaping. Impervious areas will include the street, parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Street/parking runoff will be captured by curb and a CDOT Type-13 valley inlet connected to the storm sewer leading to the UGD. In general, runoff will be sheet flow on the upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer. The Type-13 inlet has a design intercept capacity of 1.3 cfs (minor) and 1.5

cfs (major) which is greater than the runoff from the basin, but less than the bypass runoff produced by Offsite Basin OS-2. Uncaptured runoff will bypass the inlet and continue down the street to Blake Avenue to the existing Type-R inlet located below Walmart.

20. Basin Pr-20

Basin Pr-20 (0.309 acres; C=0.82; Tc=5 min. Q_{25}=1.28 cfs; Q_{100}=1.66 cfs) is Building-B, the majority of the adjacent parking, and the surrounding walks and landscaping. Impervious areas will include the building, parking and sidewalks. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Roof runoff will be captured by gutters/downspouts and piped directly into the storm sewer system leading to the UGD. Parking runoff will be captured by curb and a CDOT Type-16 curb inlet connected to the same storm sewer. Other surface areas will be captured by swales and area inlets also connected to the storm sewer. In general, runoff will be sheet flow on the roof/upper limits, shallow flow in swales/curbs, and channel (pipe) flow in the storm sewer.

21. Basin Pr-21

Basin Pr-21 (0.364 acres; C=0.55; Tc=5 min. Q_{25}=1.01 cfs; Q_{100}=1.31 cfs) is Blake Avenue, the uncaptured portion of Palmer Avenue, and the surrounding walks and landscaping. Disturbed areas will be vegetated with native grasses, lawn grasses and landscape shrubs/trees. Slopes steeper than 4:1 will need to be lined with a 3-year stable erosion control fabric vegetated with native/lawn grasses. Blake Avenue will be completed to connect to the existing curbed street below Walmart where an existing single (5-foot) Type-R inlet is located in a sag condition. The single inlet does not contain sufficient inflow capacity to receive the remaining 8.96 cfs of Offsite Basin OS-2 runoff being conveyed through the site. Therefore, and as previously discussed, the existing inlet must be expanded to a triple (15-foot) Type-R inlet constructed per CDOT Standard Plan M-Standards using an “Inlet with Drop Box” configuration.

22. Design Point Impacts

The proposed drainage system has been designed to reduce peak flow rates at each of the three (3) previously define design points. Please see the following Figure 5 for a comparison of (historic/existing peak runoff rates verses developed peak runoff rates.

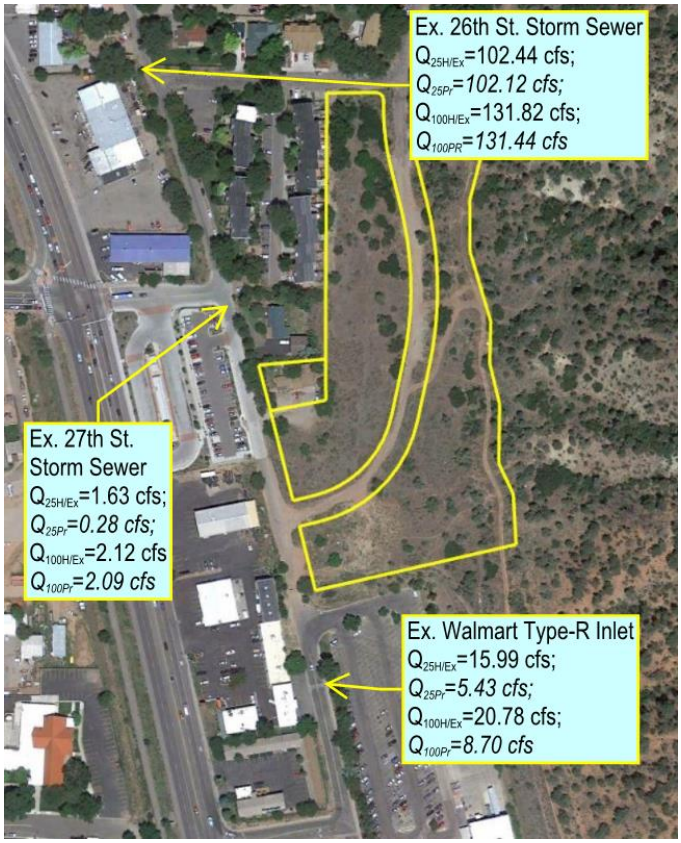

Figure 7: Outfall/Design Point Comparison

F. Low Impact Site Design

The landscaping strategy is to reduce impervious areas where possible and stabilize slopes with erosion fabric and vegetation and utilize low water demanding plants and grasses. Low Impact Site Design (LID) principals have been considered for implementation as follows:

Principle 1: Consider stormwater quality needs early in the design process

The need to manage and treat stormwater runoff was discussed during the design process affording the design team and owner an opportunity to discuss the options and evaluate their feasibility. Recognizing that the building footprints, parking and street would utilize the majority of this steep site, it was decided that detention/treatment would be more feasible than other BMP options. Plans were made to minimize the extent of hardscape improvements and install vegetative planting areas in parking islands and between the buildings and the parking. The use of grated inlets will, skim larger floating trash. The EDB will provide sediment fallout, hydrocarbon reduction and minor infiltration. The hydrodynamic separator will provide sediment fallout.

Principle 2: Use the entire site when planning for stormwater quality treatment

The design was prepared with the intent of promoting sheet flow (landscape areas between buildings/parking/walks), reducing imperviousness (minimized amount of parking/sidewalk), removing floating trash (grated inlets) and increasing sediment dropout (EDB/hydrodynamic separator).

Principle 3: Avoid unnecessary impervious area

The sidewalks and parking spaces were all reworked and reduced by utilizing some compact parking to minimize the amount of impervious area.

Principle 4: Reduce runoff rates and volumes to more closely match natural conditions

The use of the EDB and UGD with outflow control structures will reduce the runoff rates for the minor (25-year) and major (100-yr) storm events to the pre-developed level as required by City code.

Principle 5: Integrate stormwater quality management and flood control

The purposed use of vegetated planting areas around the building/parking provides for minor pretreatment while the EDB and hydrodynamic separator will provide more extensive treatment. The EDB, UGD and outflow control structures will reduce runoff rates.

Principle 6: Develop stormwater quality facilities that enhance the site, the community and the environment

Grading and area inlet placements have been designed to protect the building structures and capture large quantities of runoff. Treating the runoff will bolster the community and environment.

Principle 7: Use a treatment train approach

A train approach is not feasible on this site because of the steep topography and need to convey large quantities of runoff to the EDB and UGD.

Principle 8: Design sustainable facilities that can be safely maintained

The EDB will be equipped with a 6:1 access slope for maintenance and emergency ingress/egress. The water storage depth of the EDB has been kept shallow 3-feet. The bottom micropool will be lined with angular riprap to create a solid base and define the sediment removal limits.

Principle 9: Design and maintain facilities with public safety in mind

The 6:1 access slope in the EDB will enable humans and animals to enter/exit the EDB for maintenance or in emergency situations.

G. Hydrologic Criteria

The stormwater management system has been designed to treat polluted runoff, detain and release the 25-year and 100-year, 1-hour storm event runoffs and allow excess runoff beyond the 100-year event to overflow the EDB and UGD safely. Rainfall intensities are based on rainfall date contained in Chapter 4 of the City Engineering Design Standards. Runoff rates and volumes were estimated using Autodesk Storm and Sanitary Sewer Analysis (SSA) v2020 software and the Rational Method. Copies of these data sheets have been included in the Appendix.

H. Hydraulic Criteria

The EDB/outflow control structure was designed using MHFD calculation spreadsheets. Storm sewer pipes and inlets were sized using Autodesk SSA software. Curb and valley inlets were confirmed using MHFD calculation spreadsheets. The MHFD recommends a clogging factor of 50% for grates and 10% for curb openings. This study utilized 25% for curb openings because of the potential for debris flow entering from Offsite Basin OS-2. The box culvert was sized using the Autodesk Hydraflow Express extension. Copies of these data sheets have been included in the Appendix.

I. Proposed Facilities

Erosion control measures and Best Management Practices (BMPS) should be followed during construction to ensure that the property and the adjacent streets are not impacted from sedimentation. This should include a combination of temporary sediment control fence, erosion control logs, rock socks, inlet silt sacks, terraced excavations and erosion fabrics to minimize

erosion and control runoff. A detailed Stormwater Management and Erosion Control Plan will need to be design and approved by the City of Glenwood Springs Engineering Department prior to construction. Preparation of stormwater management plans, permitting and compliance are the responsibility of the contractor. This project will also require a permit for stormwater discharge associated with construction activity from the station of Colorado.

The EDB will treat the WQCV for the majority of the site. The hydrodynamic separator will treat the WQCV of the runoff which cannot be directed to the EDB. Runoff from the minor and major storm events will be captured and released at controlled rates as discussed. Excess runoff beyond the major event will safely pass through the control structures. The majority of the offsite runoff will be conveyed through the site with some minor capture which will provide a net benefit for downstream properties and systems.

J. Operation and Maintenance

During construction activities and until vegetation can be established, temporary rock socks should be installed in the roadside curb and gutter and around curb inlets. Temporary silt sacks should be installed in roadway drop inlets. Temporary certified weed free hay bales, check dams, silt dikes, erosion control logs or sediment control fencing should be installed around below all disturbances in Colorado Department of Transportation M-Standards. The Contractor shall be responsible for removing debris from the sediment structures after each storm event. The Contractor shall also repair any damaged erosion controls, remove accumulated sediment from the EDB, from the hydrodynamic separator and from behind hay bales/check dams/silt dikes/erosion control logs/sediment control fence after each storm event. After construction, the property owner shall be responsible for removing debris and sediment after each storm event and dredging sediment on an as-needed basis.

The hydrodynamic separator and EDB/UGD Outflow Control Structures must be inspected and maintained semi-annually to remove sediment and debris that has collected. Heat tape from the roof downspouts should be extended into nearby area inlets secured to the bottom of the inlet grates.

Extended detention basins have low to moderate maintenance requirements. Routine and non-routine maintenance is necessary to assure performance, enhance aesthetics, and protect structural integrity. The dry basins can result in nuisance complaints if not properly designed or maintained. Bio-degradable pesticides may be required to limit insect problems. Frequent debris removal and grass-mowing can reduce aesthetic complaints. If a shallow wetland or marshy area is included, mosquito breeding and nuisance odors could occur if the water becomes stagnant. The basic elements of the maintenance requirements are presented as follows:

Required Action	Maintenance Objective	Frequency of Action
Lawn mowing and lawn care	Occasional mowing to limit unwanted vegetation. Maintain irrigated turf grass as 2 to 4 inches tall and non-irrigated native turf grasses at 4 to 6 inches.	Routine – Depending on aesthetic requirements.
Debris and litter removal	Remove debris and litter from the entire pond to minimize outlet clogging and improve aesthetics.	Routine – Following spring runoff and following significant rainfall events.
Sediment removal from forebay and micro-pool	Remove accumulated sediment from the forebay and micro-pool. Dewatering of the micro-pool by pumping onto the EDB's bottom grasses and temporary diversion of all base flows will be needed to remove the accumulated sediment from micro-pool's bottom.	Routine – The sediment accumulations forebay and the micro-pool will need to be cleaned out every one to three years. Cleaning of micro-pool is important for mosquito control.

(AMEC Earth and Environmental Inc., Wright Water Engineers Inc., Wenk & Associates;, 2010, Rev. 12/2014)

Sediment and mud should be prevented from leaving the construction site by the immediate placement of a stabilized construction entrance. The Contractor should be responsible for cleaning and general upkeep of the site and adjacent roadways. As an effective dust control measure, water and weed-free straw may be utilized to minimize uprising of dust.

Forterra BioClean recommends the following inspection and maintenance procedures for underground detention: (BioClean, 2020)

Inspection and maintenance of the underground detention, retention, or infiltration system is vital for the performance and life cycle of the stormwater management system. All local, state, and federal permits and regulations must be followed for system compliance. Manway access locations are provided on each system for ease of ingress and egress for routine inspection and maintenance activities. Stormwater regulations require that all BMP(s) be inspected and maintained to ensure they are operating as designed and providing protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site specific conditions. Inspection after the first significant rainfall event and at quarterly intervals is typical. This is recommended because pollutant loading and pollutant characteristics can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding on roads, amount of daily traffic and land use can increase pollutant loading on the system. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided. Without appropriate maintenance a BMP can exceed its storage capacity, become blocked, or damaged, which can negatively affect its continued performance.

Inspection Equipment

Following is a list of equipment to allow for simple and effective inspection of the underground detention, retention, or infiltration system:

- *Bio Clean Environmental Inspection and Maintenance Report Form*
- *Flashlight*
- *Manhole hook or appropriate tools to access hatches and covers*
- *Appropriate traffic control signage and procedures*
- *Measuring pole and/or tape measure*
- *Protective clothing and eye protection*

Note: Entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system.

Inspection Steps

The key to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the underground detention, retention, or infiltration system are quick and easy. As mentioned above, the first year should be seen as the maintenance interval establishment phase. During the first year more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long term inspection and maintenance interval requirements.

The underground detention, retention, or infiltration system can be inspected though visual observation without entry into the system. All necessary pre-inspection steps must be carried out before inspection occurs, especially traffic control and other safety measures to protect the inspector and nearby pedestrians from any dangers associated with an open access hatch or manhole. Once these access covers have been safely opened the inspection process can proceed:

- *Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other information (see inspection form).*
- *Observe the upstream drainage area and look for sources of pollution, sediment, trash and debris.*
- *Observe the inside of the system through the access manholes. If minimal light is available and vision into the unit is impaired, utilize a flashlight to see inside the system and all of its modules.*
- *Look for any out of the ordinary obstructions in the inflow and outflow pipes. Check pipes for movement or leakage. Write down any observations on the inspection form.*
- *Observe any movement of modules.*
- *Observe concrete for cracks and signs of deterioration.*
- *In detention and retention systems inspect for any signs of leakage.*
- *In infiltration systems inspect for any signs of blockage or reasons that the soils are not infiltrating.*
- *Through observation and/or digital photographs, estimate the amount of floatable debris accumulated in the system. Record this information on the inspection form. Next, utilizing a tape measure or measuring stick, estimate the amount of sediment accumulated in the system. Sediment depth may vary throughout the system, depending on the flow path. Record this depth on the inspection form.*
- *Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.*

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- *Damaged inlet and outlet pipes.*
- *Obstructions in the system or its inlet or outlet.*
- *Excessive accumulation of floatables.*
- *Excessive accumulation of sediment of more than 6" in depth.*
- *Damaged joint sealant.*

Maintenance Equipment

While maintenance can be done fully by hand it is recommended that a vacuum truck be utilized to minimize time requirements required to maintain the underground detention, retention, or infiltration system:

- *Bio Clean Environmental Inspection and Maintenance Report Form*
- *Flashlight*
- *Manhole hook or appropriate tools to access hatches and covers*
- *Appropriate traffic control signage and procedures*
- *Measuring pole and/or tape measure*
- *Protective clothing and eye protection*
- *Vacuum truck*
- *Trash can*
- *Pressure washer*

Note: Entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system. Entry into the system will be required if maintenance is required.

Maintenance Procedures

It is recommended that maintenance occurs at least three days after the most recent rain event to allow for drain down of the system and any upstream detention systems designed to drain down over an extended period of time. Maintaining the system while flows are still entering it will increase the time and complexity required for maintenance. Once all safety measures have been set up cleaning of the system can proceed as follows:

- *Using an extension on a boom on the vacuum truck, position the hose over the opened manway and lower into the system. Remove all floating debris, standing water (as needed) and sediment from the system. A power washer can be used to assist if sediments have become hardened and stuck to the walls and columns. Repeat the same procedure at each manway until the system has been fully maintained. Be sure not to pressure wash the infiltration area as it may scour.*

If maintenance requires entry into the vault:

- *Following rules for confined space entry use a gas meter to detect the presence of any hazardous gases. If hazardous gases are present do not enter the vault. Follow appropriate confined space procedures, such as utilizing venting system, to address the hazard. Once it is determined to be safe, enter utilizing appropriate entry equipment such as a ladder and tripod with harness.*
- *The last step is to close up and replace all manhole covers and remove all traffic control.*

- *All removed debris and pollutants shall be disposed of following local and state requirements.*

Good housekeeping BMP(s) should be followed throughout the entire life of the project. These include but are not limited to:

- refuge receptacles should be regularly emptied and equipped with lids;
- keeping machinery in good operating condition to prevent leakage;
- apply appropriate (not excessive) amounts of fertilizer to the landscaping;
- scheduled maintenance cleaning of any downstream curb and gutter, storm sewer inlets, culverts and ditches;
- general site cleanliness and proper training of employees;
- Grading must be performed (but not in excess) to ensure that drainage is directed away from all structures in all directions.

Once construction activities are completed, final stabilization of the disturbed areas should begin. Within one growing season of the project completion, uniform vegetative site coverage should be equal to or greater than 70% of the pre-disturbance levels, or equivalent permanent, physical erosion reduction methods should be employed. When the site is determined to have reached the final stabilization stage, erosion control structures can be removed.

K. Works Cited

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Appendix

- *Drainage Basin Summary Spreadsheet*
- *Autodesk Storm and Sanitary Sewer Analysis (SSA) datasheets*
- *MHFD Street and Inlet Hydraulics datasheets*
- *MHFD Detention Basin Design Workbook datasheets*
- *Autodesk Hydraflow Express datasheets*
- *NRCS Web Soil Survey*
- *Design Plans & Details (11”x17”)*
- *Contech Inline CDS Detail (to be confirmed)*
- *ADS Underground Detention Details & Specifications*

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Drainage Basin Summary
Bell Rippy Townhouses

Basin	Area (sf)	Impervious		Soil Type B				Soil Type D		Runoff C	Tc (min.)	WQCV (EDB) (in)	V_{WQ} (cf) (d6=0.34)	Design Point V_{WQ} (cf)	Q_{25} (cfs)	Q_{100} (cfs)
				Open Space/LS		Natural Vegetation		Natural Vegetation								
		Area (sf)	%	Area (sf)	%	Area (sf)	%	Area (sf)	%							
H/Ex-01	67574	-	-	-	-	-	-	67574	100%	0.37	7.21	-	-	-	2.46	3.20
H/Ex-02	20084	-	-	-	-	-	-	20084	100%	0.37	6.51	-	-	-	0.77	0.99
H/Ex-03	15964	-	-	-	-	-	-	15964	100%	0.37	6.54	-	-	-	0.61	0.79
H/Ex-04	30586	-	-	-	-	-	-	30586	100%	0.37	7.39	-	-	-	1.10	1.43
H/Ex-05	170017	-	-	-	-	-	-	170017	100%	0.37	8.75	-	-	-	5.67	7.37
OS-1	5423220	-	-	5097827	94%	-	-	325393	6%	0.36	22.45	-	-	-	102.44	131.82
OS-2	408157	-	-	89794.58	22%	-	-	318363	78%	0.28	6.32	-	-	-	11.93	15.50
Pr-1	24815	5590	22.5%	1125	4.5%	14510	58.5%	3590	14.5%	0.48	5.00	0.126	206	-	1.38	1.79
Pr-2	5326	4301	80.8%	1025	19.2%	-	-	-	-	0.83	5.00	0.333	117	-	0.51	0.67
Pr-3	12339	9259	75.0%	3080	25.0%	-	-	-	-	0.79	5.00	0.300	244	-	0.82	1.06
Pr-4	14372	1442	10.0%	-	-	12930	90.0%	-	-	0.33	5.00	0.067	64	-	0.55	0.71
Pr-5	6391	4551	71.2%	1840	28.8%	-	-	-	-	0.77	5.00	0.281	118	-	0.57	0.74
Pr-6	12701	9241	72.8%	3460	27.2%	-	-	-	-	0.78	5.00	0.288	241	-	1.15	1.49
Pr-7	32430	23160	71.4%	9270	28.6%	-	-	-	-	0.77	5.00	0.282	602	-	2.90	3.76
Pr-8	7888	6098	77.3%	1790	22.7%	-	-	-	-	0.81	5.00	0.312	162	-	0.74	0.96
Pr-9	73048	4913	6.7%	1895	2.6%	51070	69.9%	15170	20.8%	0.38	5.00	0.047	228	-	3.22	4.18
Pr-10	18150	5040	27.8%	13110	72.2%	-	-	-	-	0.46	5.00	0.144	173	-	0.97	1.26
Pr-11	9605	8225	85.6%	1380	14.4%	-	-	-	-	0.87	5.00	0.367	232	-	0.97	1.26
Pr-12	6322	3192	50.5%	3130	49.5%	-	-	-	-	0.62	5.00	0.208	86	-	0.45	0.59
Pr-13	18045	9315	51.6%	1720	9.5%	7010	38.8%	-	-	0.67	5.00	0.211	251	-	1.40	1.82
Pr-14	8825	7585	85.9%	1240	14.1%	-	-	-	-	0.86	5.00	0.369	215	-	0.88	1.14
Pr-15	5669	4239	74.8%	1430	25.2%	-	-	-	-	0.79	5.00	0.298	111	-	0.52	0.67
Pr-16	2187	1382	63.2%	805	36.8%	-	-	-	-	0.71	5.00	0.247	36	-	0.60	0.78
Pr-17	7280	3830	52.6%	3450	47.4%	-	-	-	-	0.63	5.00	0.213	102	3187	0.16	0.21
Pr-18	4945	4815	97.4%	130	2.6%	-	-	-	-	0.95	5.00	0.471	154	-	0.55	0.71
Pr-19	4542	3562	78.4%	980	21.6%	-	-	-	-	0.82	5.00	0.319	95	-	0.43	0.56
Pr-20	13454	10464	77.8%	1495	11.1%	1495	11.1%	-	-	0.82	5.00	0.315	279	-	1.28	1.66
Pr-21	15845	6365	40.2%	9480	59.8%	-	-	-	-	0.55	5.00	0.180	188	716	1.01	1.31
Walmart	67518	67518	100.0%	-	-	-	-	-	-	0.95	10.00	-	-	-	5.45	7.08
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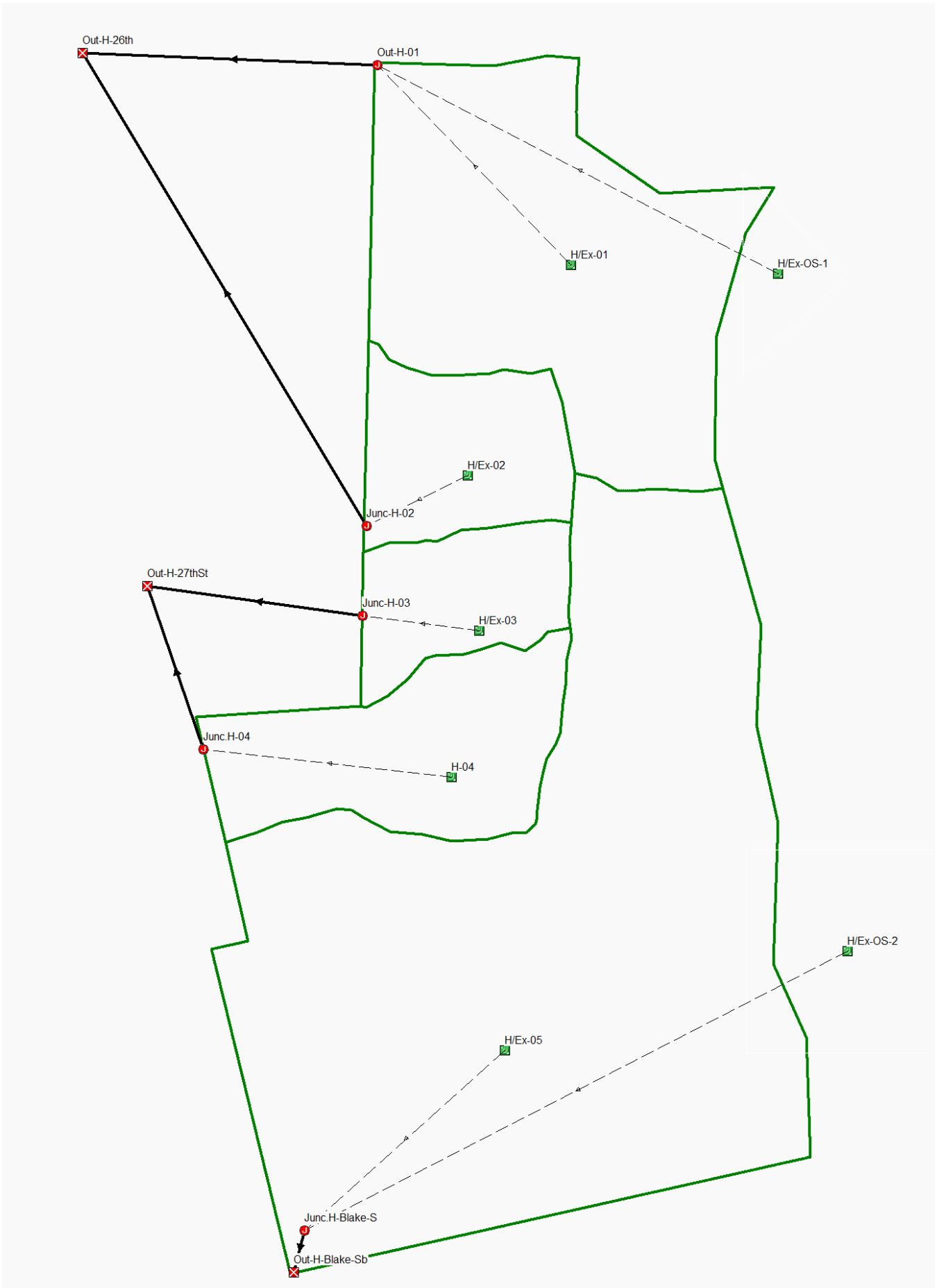
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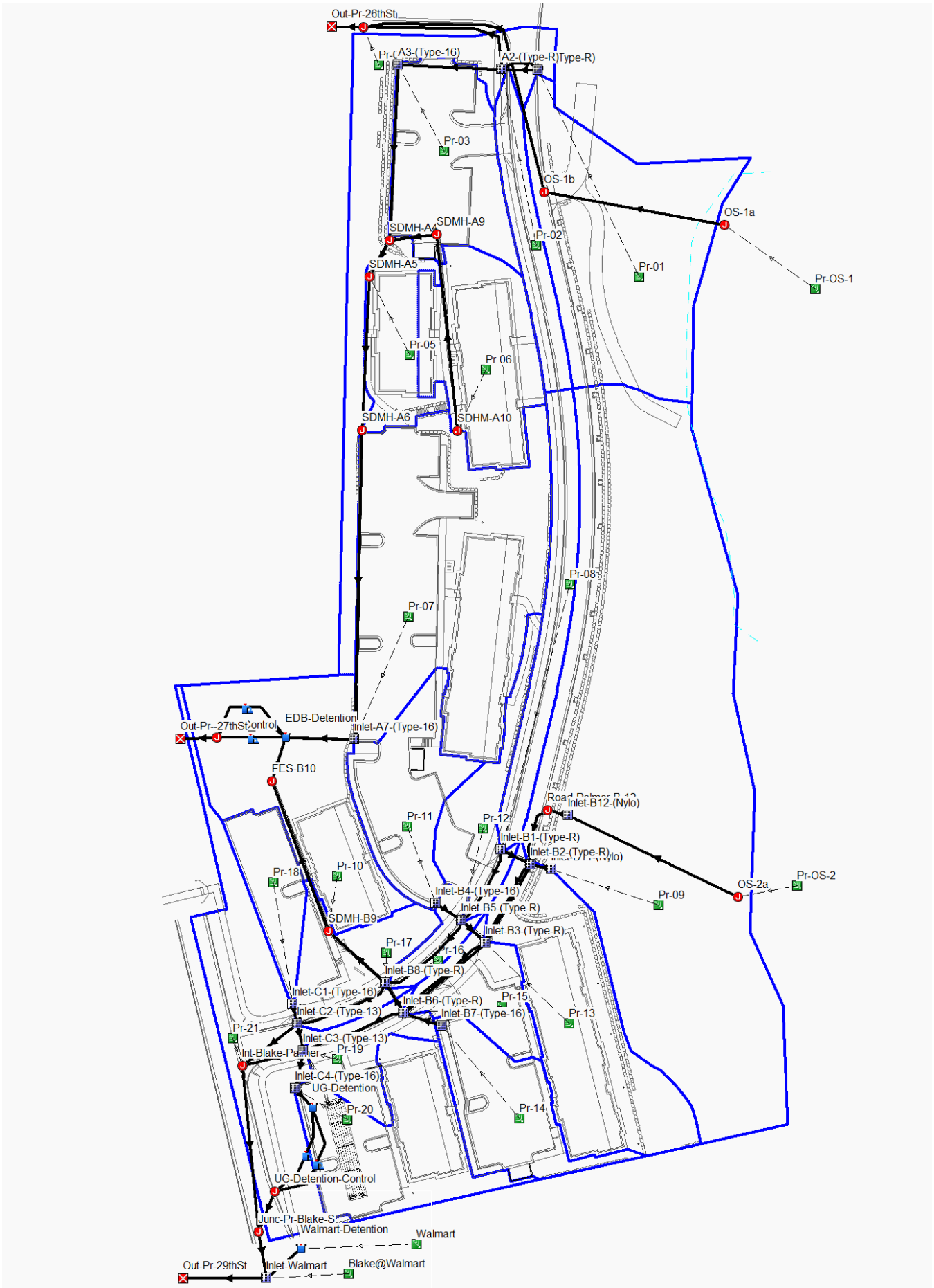
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Pr-03
OS-1b
OS-1a
Pr-02
Pr-01
Pr-OS-1
SDMH-A9
SDMH-A5
Pr-05
Pr-06
SDMH-A6
SDHM-A10
Pr-08
Pr-07
Out-Pr--27thSt-control
EDB-Detention
Inlet-A7-(Type-16)
FES-B10
Inlet-B12-(Nylo)
Pr-11
Pr-12
Inlet-B1-(Type-R)
Inlet-B2-(Type-R)
Pr-18
Pr-10
Inlet-B4-(Type-16)
OS-2a
Pr-OS-2
Pr-09
Inlet-B5-(Type-R)
SDMH-B9
Inlet-B3-(Type-R)
Pr-17
Pr-16
Inlet-B8-(Type-R)
Inlet-C1-(Type-16)
Inlet-B6-(Type-R)
Pr-15
Inlet-C2-(Type-13)
Inlet-B7-(Type-16)
Pr-13
Pr-21
Inlet-C3-(Type-13)
Pr-19
Inlet-C4-(Type-16)
UG-Detention
Pr-20
Pr-14
UG-Detention-Control
Junc-Pr-Blake-S
Walmart-Detention
Walmart
Out-Pr-29thSt
Inlet-Walmart
Blake@Walmart

Project Description

File Name 20002-SSA.SPF

Project Options

Flow Units ..... CFS
Elevation Type ..... Elevation
Hydrology Method ..... Rational
Time of Concentration (TOC) Method ..... SCS TR-55
Link Routing Method ..... Kinematic Wave
Enable Overflow Ponding at Nodes ..... YES
Skip Steady State Analysis Time Periods ..... YES

Rainfall Details

Return Period..... 25 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ft³)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Blake@Walmart	0.040	0.97	0.42	0.41	59.2	0.20	0 00:05:00
2	H/Ex-01	1.551	0.37	0.51	0.19	1064.3	2.46	0 00:07:12
3	H/Ex-02	0.461	0.37	0.49	0.18	301.3	0.77	0 00:06:30
4	H/Ex-03	0.366	0.37	0.49	0.18	238.1	0.61	0 00:06:32
5	H/Ex-05	3.903	0.37	0.58	0.21	3032.0	5.67	0 00:08:45
6	H/Ex-OS-1	124.700	0.36	0.86	0.31	139419.6	102.44	0 00:22:27
7	H/Ex-OS-2	9.370	0.28	0.48	0.13	4557.8	11.93	0 00:06:19
8	H-04	0.702	0.37	0.52	0.19	489.4	1.10	0 00:07:23
9	Pr-01	0.570	0.48	0.42	0.20	417.7	1.38	0 00:05:00
10	Pr-02	0.122	0.83	0.42	0.35	154.9	0.51	0 00:05:00
11	Pr-03	0.283	0.79	0.42	0.33	341.4	1.13	0 00:05:00
12	Pr-04	0.330	0.33	0.42	0.14	166.5	0.55	0 00:05:00
13	Pr-05	0.147	0.77	0.42	0.32	172.6	0.57	0 00:05:00
14	Pr-06	0.292	0.78	0.42	0.33	347.2	1.15	0 00:05:00
15	Pr-07	0.745	0.77	0.42	0.32	875.6	2.90	0 00:05:00
16	Pr-08	0.181	0.81	0.42	0.34	224.2	0.74	0 00:05:00
17	Pr-09	1.677	0.38	0.42	0.16	974.0	3.22	0 00:05:00
18	Pr-10	0.417	0.46	0.42	0.19	293.4	0.97	0 00:05:00
19	Pr-11	0.221	0.87	0.42	0.37	293.0	0.97	0 00:05:00
20	Pr-12	0.145	0.62	0.42	0.26	137.5	0.45	0 00:05:00
21	Pr-13	0.414	0.67	0.42	0.28	424.1	1.40	0 00:05:00
22	Pr-14	0.203	0.86	0.42	0.36	266.2	0.88	0 00:05:00
23	Pr-15	0.130	0.79	0.42	0.33	156.8	0.52	0 00:05:00
24	Pr-16	0.167	0.71	0.42	0.30	181.4	0.60	0 00:05:00
25	Pr-17	0.050	0.63	0.42	0.27	48.3	0.16	0 00:05:00
26	Pr-18	0.114	0.95	0.42	0.40	164.8	0.55	0 00:05:00
27	Pr-19	0.104	0.82	0.42	0.35	130.6	0.43	0 00:05:00
28	Pr-20	0.309	0.82	0.42	0.35	386.8	1.28	0 00:05:00
29	Pr-21	0.364	0.55	0.42	0.23	305.2	1.01	0 00:05:00
30	Pr-OS-1	124.700	0.36	0.86	0.31	139419.6	102.44	0 00:22:27
31	Pr-OS-2	9.370	0.28	0.48	0.13	4557.8	11.93	0 00:06:19
32	Walmart	1.550	0.95	0.62	0.59	3297.1	5.45	0 00:10:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ft³)	Total Time Flooded (min)
1	EDB-Control	Junction	5863.00	5866.00	5863.00	0.00	0.00	0.160	5863.10	0.00	2.90	0 00:00	0.00	0.00
2	FES-B10	Junction	5863.00	5869.00	5863.00	0.00	0.00	12.640	5864.09	0.00	4.91	0 00:00	0.00	0.00
3	Int-Blake-Palmer	Junction	5859.50	5859.50	5859.50	0.00	0.00	4.340	5859.82	0.00	0.28	0 00:00	0.00	0.00
4	Junc.H-04	Junction	5870.00	5876.00	5870.00	5876.00	0.00	1.100	5870.00	0.00	6.00	0 00:00	0.00	0.00
5	Junc.H-Blake-S	Junction	5858.00	5864.00	5858.00	5864.00	0.00	15.990	5858.00	0.00	6.00	0 00:00	0.00	0.00
6	Junc-H-02	Junction	5885.00	5891.00	5885.00	5891.00	0.00	0.770	5885.00	0.00	6.00	0 00:00	0.00	0.00
7	Junc-H-03	Junction	5888.00	5894.00	5888.00	5894.00	0.00	0.610	5888.00	0.00	6.00	0 00:00	0.00	0.00
8	Junc-Pr-Blake-S	Junction	5858.20	5858.20	5858.20	0.00	0.00	5.620	5858.70	0.00	0.75	0 00:00	0.00	0.00
9	OS-1a	Junction	5942.00	5942.00	5942.00	0.00	0.00	102.440	5942.96	0.00	0.54	0 00:00	0.00	0.00
10	OS-1b	Junction	5906.00	5906.00	5906.00	0.00	0.00	102.290	5906.96	0.00	0.54	0 00:00	0.00	0.00
11	OS-2a	Junction	5942.00	5942.00	5942.00	0.00	0.00	11.930	5942.30	0.00	0.20	0 00:00	0.00	0.00
12	Out-H-01	Junction	5875.00	5881.00	5875.00	5881.00	0.00	102.440	5875.00	0.00	6.00	0 00:00	0.00	0.00
13	Pr-26th	Junction	5876.00	5877.00	5876.00	11753.00	0.00	102.120	5876.52	0.00	0.48	0 00:00	0.00	0.00
14	Road-Palmer-B-12	Junction	5888.00	5888.00	5888.00	0.00	0.00	11.510	5888.73	0.00	0.52	0 00:00	0.00	0.00
15	SDHM-A10	Junction	5896.00	5899.00	5896.00	5899.00	0.00	1.150	5896.37	0.00	2.63	0 00:00	0.00	0.00
16	SDMH-A4	Junction	5889.50	5899.80	5889.50	5899.80	0.00	3.660	5894.15	0.00	5.65	0 00:00	0.00	0.00
17	SDMH-A5	Junction	5888.90	5893.65	5888.90	5893.65	0.00	4.160	5889.55	0.00	4.10	0 00:00	0.00	0.00
18	SDMH-A6	Junction	5886.30	5890.77	5886.30	5890.77	0.00	4.150	5887.15	0.00	3.63	0 00:00	0.00	0.00
19	SDMH-A9	Junction	5894.20	5900.19	5894.20	5900.19	0.00	1.110	5894.76	0.00	5.43	0 00:00	0.00	0.00
20	SDMH-B9	Junction	5864.00	5867.21	5864.00	5867.21	0.00	12.700	5865.09	0.00	2.12	0 00:00	0.00	0.00
21	UG-Detention-Control	Junction	5858.30	5858.30	5858.30	0.00	0.00	1.650	5858.80	0.00	1.50	0 00:00	0.00	0.00
22	Out-H-26th	Outfall	5841.00					102.440	5841.00					
23	Out-H-27thSt	Outfall	5858.00					1.630	5858.00					
24	Out-H-Blake-Sb	Outfall	5858.00					15.990	5858.00					
25	Out-Pr-26thSt	Outfall	5875.00					102.120	5875.00					
26	Out-Pr--27thSt	Outfall	5862.00					0.160	5862.10					
27	Out-Pr-29thSt	Outfall	5850.80					5.860	5852.30					
28	EDB-Detention	Storage Node	5863.00	5869.00	5863.00		0.00	19.080	5865.00				0.00	0.00
29	UG-Detention	Storage Node	5858.40	5861.40	5858.40		0.00	4.370	5859.96				0.00	0.00
30	Walmart-Detention	Storage Node	5852.00	5855.00	5852.00		0.00	5.450	5854.02				0.00	0.00

Replace w/ the MHFD Detention Basin Design Workbook value for an EDB outflow control (0.28 cfs)

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)
1	26thSt	Pipe	Pr-26th	Out-Pr-26thSt	25.49	5876.00	5875.00	3.9200	0.000	0.0120	102.120	0.00	0.00	0.00	0.00	0.00	0.00
2	Link-B10	Pipe	FES-B10	EDB-Detention	35.65	5863.00	5863.00	0.0000	0.000	0.0120	12.640	0.00	0.05	0.00	0.24	0.41	0.00
3	Link-H-01	Pipe	Out-H-01	Out-H-26th	230.30	5875.00	5841.00	14.7600	0.000	0.0120	102.440	0.00	0.13	0.00	0.31	0.52	0.00
4	Link-H-02	Pipe	Junc-H-02	Out-H-26th	177.03	5885.00	5841.00	24.8500	0.000	0.0120	0.770	0.00	0.13	0.00	0.31	0.52	0.00
5	Link-H-03	Pipe	Junc-H-03	Out-H-27thSt	169.29	5888.00	5858.00	17.7200	0.000	0.0120	0.610	0.00	0.13	0.00	0.31	0.52	0.00
6	Link-H-04	Pipe	Junc.H-04	Out-H-27thSt	134.40	5870.00	5858.00	8.9300	0.000	0.0120	1.100	0.00	0.13	0.00	0.31	0.52	0.00
7	Link-H-Blake-S	Pipe	Junc.H-Blake-S	Out-H-Blake-Sb	33.46	5858.00	5858.00	0.0000	0.000	0.0120	15.990	0.00	0.13	0.00	0.31	0.52	0.00
8	Pipe-29thSt	Pipe	Inlet-Walmart	Out-Pr-29thSt	265.00	5851.40	5850.80	0.2300	18.000	0.0120	5.860	5.41	1.08	3.85	1.41	0.94	0.00
9	Pipe-A1	Pipe	A1-(Type-R)	A2-(Type-R)	24.33	5892.50	5892.20	1.2300	12.000	0.0120	0.860	4.29	0.20	4.98	0.30	0.30	0.00
10	Pipe-A10	Pipe	SDHM-A10	SDMH-A9	153.02	5896.00	5894.40	1.0500	12.000	0.0120	1.110	3.95	0.28	7.14	0.36	0.36	0.00
11	Pipe-A2	Pipe	A2-(Type-R)	A3-(Type-16)	80.85	5892.00	5891.20	0.9900	12.000	0.0120	1.540	3.84	0.40	4.64	0.44	0.44	0.00
12	Pipe-A3	Pipe	A3-(Type-16)	SDMH-A4	133.17	5891.00	5889.70	0.9800	12.000	0.0120	2.570	3.81	0.67	5.26	0.60	0.60	0.00
13	Pipe-A4	Pipe	SDMH-A4	SDMH-A5	29.56	5889.50	5888.90	2.0300	15.000	0.0120	3.660	9.97	0.37	7.50	0.52	0.42	0.00
14	Pipe-A5	Pipe	SDMH-A5	SDMH-A6	117.00	5888.90	5886.50	2.0500	12.000	0.0120	4.150	5.53	0.75	7.77	0.65	0.65	0.00
15	Pipe-A6	Pipe	SDMH-A6	Inlet-A7-(Type-16)	240.10	5886.30	5879.80	2.7100	12.000	0.0120	4.110	6.35	0.65	8.72	0.58	0.58	0.00
16	Pipe-A7	Pipe	Inlet-A7-(Type-16)	EDB-Detention	54.21	5876.80	5863.00	25.4600	12.000	0.0120	6.480	19.47	0.33	22.29	0.40	0.40	0.00
17	Pipe-A9	Pipe	SDMH-A9	SDMH-A4	34.80	5894.20	5893.80	1.1500	12.000	0.0120	1.110	4.14	0.27	4.47	0.35	0.35	0.00
18	Pipe-B1	Pipe	Inlet-B1-(Type-R)	Inlet-B2-(Type-R)	24.33	5879.60	5879.30	1.2300	12.000	0.0120	0.570	4.29	0.13	4.34	0.25	0.25	0.00
19	Pipe-B11	Pipe	Inlet-B11-(Nylo)	Inlet-B2-(Type-R)	15.00	5883.00	5880.00	20.0000	15.000	0.0120	3.200	32.82	0.10	16.99	0.26	0.21	0.00
20	Pipe-B12	Pipe	Inlet-B12-(Nylo)	Road-Palmer-B-12	15.00	5889.00	5888.00	6.6700	15.000	0.0120	11.510	18.07	0.64	15.59	0.72	0.58	0.00
21	Pipe-B2	Pipe	Inlet-B2-(Type-R)	Inlet-B3-(Type-R)	65.73	5879.10	5872.80	9.5800	15.000	0.0120	5.810	21.67	0.27	14.97	0.44	0.35	0.00
22	Pipe-B3	Pipe	Inlet-B3-(Type-R)	Inlet-B6-(Type-R)	82.21	5872.60	5864.70	9.6100	15.000	0.0120	9.110	21.69	0.42	16.91	0.57	0.45	0.00
23	Pipe-B4	Pipe	Inlet-B4-(Type-16)	Inlet-B5-(Type-R)	20.78	5876.90	5873.30	17.3300	8.000	0.0120	0.880	5.45	0.16	11.47	0.18	0.27	0.00
24	Pipe-B5	Pipe	Inlet-B5-(Type-R)	Inlet-B3-(Type-R)	24.33	5873.10	5872.80	1.2300	12.000	0.0120	1.370	4.29	0.32	4.85	0.39	0.39	0.00
25	Pipe-B6	Pipe	Inlet-B6-(Type-R)	Inlet-B8-(Type-R)	24.34	5864.70	5864.50	0.8200	24.000	0.0120	11.730	22.21	0.53	7.17	1.03	0.52	0.00
26	Pipe-B7	Pipe	Inlet-B7-(Type-16)	Inlet-B6-(Type-R)	29.28	5870.20	5864.70	18.7800	8.000	0.0120	0.870	5.67	0.15	11.78	0.18	0.26	0.00
27	Pipe-B8	Pipe	Inlet-B8-(Type-R)	SDMH-B9	57.48	5864.50	5864.00	0.8700	24.000	0.0120	11.810	22.86	0.52	7.34	1.02	0.51	0.00
28	Pipe-B9	Pipe	SDMH-B9	FES-B10	125.34	5864.00	5863.00	0.8000	24.000	0.0120	12.640	21.89	0.58	7.24	1.09	0.55	0.00
29	Pipe-C1	Pipe	Inlet-C1-(Type-16)	Inlet-C2-(Type-13)	14.31	5859.60	5859.20	2.8000	8.000	0.0120	0.440	2.19	0.20	4.91	0.20	0.30	0.00
30	Pipe-C2	Pipe	Inlet-C2-(Type-13)	Inlet-C3-(Type-13)	19.75	5859.00	5858.80	1.0100	8.000	0.0120	1.120	1.32	0.85	4.24	0.47	0.71	0.00
31	Pipe-C3	Pipe	Inlet-C3-(Type-13)	Inlet-C4-(Type-16)	27.52	5858.80	5858.50	1.0900	15.000	0.0120	3.320	7.31	0.45	5.81	0.59	0.47	0.00
32	Pipe-C4	Pipe	Inlet-C4-(Type-16)	UG-Detention	20.00	5858.50	5858.40	0.5000	18.000	0.0120	4.370	8.05	0.54	4.65	0.79	0.52	0.00
33	Pipe-EDB-Control	Pipe	EDB-Control	Out-Pr--27thSt	28.55	5863.00	5862.00	3.5000	15.000	0.0120	0.160	13.10	0.01	3.66	0.10	0.08	0.00
34	Pipe-UG-Control	Pipe	UG-Detention-Control	Junc-Pr-Blake-S	20.00	5858.30	5858.20	0.5000	15.000	0.0120	1.650	4.95	0.33	3.62	0.50	0.40	0.00
35	Bypass-A1	Channel	A1-(Type-R)	A2-(Type-R)	31.56	5896.57	5896.57	0.0100	7.200	0.0160	0.480	19.28	0.02	1.79	0.20	0.34	0.00
36	Bypass-A2	Channel	A2-(Type-R)	Pr-26th	140.00	5896.57	5876.00	14.6900	12.000	0.0160	0.250	565.61	0.00	3.97	0.07	0.07	0.00
37	Bypass-B1	Channel	Inlet-B1-(Type-R)	Inlet-B5-(Type-R)	64.47	5883.39	5876.84	10.1700	7.200	0.0160	0.160	68.98	0.00	6.05	0.09	0.14	0.00
38	Bypass-B2	Channel	Inlet-B2-(Type-R)	Inlet-B3-(Type-R)	71.42	5883.39	5876.84	9.1800	7.200	0.0160	9.170	65.53	0.14	6.88	0.33	0.55	0.00
39	Bypass-B3	Channel	Inlet-B3-(Type-R)	Inlet-B6-(Type-R)	85.00	5876.84	5868.74	9.5300	7.200	0.0160	7.820	66.77	0.12	6.74	0.31	0.52	0.00
40	Bypass-B5	Channel	Inlet-B5-(Type-R)	Inlet-B8-(Type-R)	80.66	5876.84	5868.74	10.0300	7.200	0.0160	0.100	68.52	0.00	3.20	0.07	0.12	0.00
41	Bypass-B6	Channel	Inlet-B6-(Type-R)	Inlet-C3-(Type-13)	84.14	5868.74	5861.29	8.8600	7.200	0.0160	6.110	64.40	0.09	6.18	0.29	0.49	0.00
42	Bypass-B8	Channel	Inlet-B8-(Type-R)	Inlet-C2-(Type-13)	78.55	5868.74	5861.29	9.4900	7.200	0.0160	0.010	66.65	0.00	1.63	0.03	0.06	0.00
43	Bypass-C1	Channel	Inlet-C1-(Type-16)	Inlet-C2-(Type-13)	18.27	5862.19	5861.29	4.9300	7.200	0.0160	0.100	95.74	0.00	3.96	0.06	0.11	0.00
44	Bypass-C2	Channel	Inlet-C2-(Type-13)	Int-Blake-Palmer	51.37	5861.29	5859.50	3.4800	7.200	0.0160	0.170	80.42	0.00	2.08	0.08	0.14	0.00
45	Bypass-C3	Channel	Inlet-C3-(Type-13)	Int-Blake-Palmer	58.47	5861.29	5859.50	3.0600	7.200	0.0160	3.760	75.38	0.05	3.15	0.24	0.41	0.00
46	Link-Blake-S	Channel	Int-Blake-Palmer	Junc-Pr-Blake-S	230.46	5859.50	5858.20	0.5600	7.200	0.0160	4.100	32.38	0.13	4.25	0.31	0.52	0.00
47	Out-Pr-Blake	Channel	Junc-Pr-Blake-S	Inlet-Walmart	200.00	5858.20	5856.00	1.1000	7.200	0.0160	5.450	45.21	0.12	2.44	0.31	0.52	0.00
48	Road-B12	Channel	Road-Palmer-B-12	Inlet-B2-(Type-R)	48.58	5888.00	5883.39	9.4800	7.200	0.0160	11.500	132.73	0.09	6.23	0.28	0.48	0.00
49	Road-OS-1b	Channel	OS-1b	Pr-26th	240.00	5906.00	5876.00	12.5000	12.000	0.0160	102.120	521.70	0.20	14.29	0.52	0.52	0.00
50	Swale-OS-1a	Channel	OS-1a	OS-1b	143.20	5942.00	5804.00	96.3700	18.000	0.0300	102.290	260.63	0.39	18.12	0.96	0.64	0.00
51	Swale-OS-2	Channel	OS-2a	Inlet-B12-(Nylo)	146.88	5942.00	5889.00	36.0800	6.000	0.0300	11.820	30.08	0.39	10.14	0.30	0.60	0.00
52	Orifice-EDB-WQCV	Orifice	EDB-Detention	EDB-Control		5863.00	5863.00		1.250		0.060						
53	Walmart-Det-Control	Orifice	Walmart-Detention	Inlet-Walmart		5852.00	5851.40		5.600		1.130						
54	Weir-EDB-100	Weir	EDB-Detention	EDB-Control		5863.00	5863.00				0.000						
55	Weir-EDB-25	Weir	EDB-Detention	EDB-Control		5863.00	5863.00				0.100						
56	Weir-UG-100	Weir	UG-Detention	UG-Detention-Control		5858.40	5858.30				0.050						
57	Weir-UG-25	Weir	UG-Detention	UG-Detention-Control		5858.40	5858.30				1.590						

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Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft^2)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	A1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.50	5896.57	5892.50	N/A	1.380	0.86	0.52	62.58	7.00	3.96	5896.75
2	A2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.00	5896.57	5892.00	N/A	0.950	0.69	0.26	72.66	7.00	3.01	5896.72
3	A3-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5891.00	5896.76	5891.00	100.00	1.130	N/A	N/A	N/A	7.00	7.38	5897.15
4	Inlet-A7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.80	5883.87	5876.80	100.00	2.890	N/A	N/A	N/A	7.00	15.58	5884.42
5	Inlet-B1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.60	5883.39	5879.60	N/A	0.740	0.58	0.17	77.71	7.00	2.30	5883.53
6	Inlet-B11-(Nylo)	CALTRANS	GCP	On Sag	1	5883.30	5899.00	5883.30	36.00	3.220	N/A	N/A	N/A	7.00	18.39	5899.63
7	Inlet-B12-(Nylo)	CALTRANS	GCP	On Sag	1	5889.00	5901.00	5889.00	36.00	11.820	N/A	N/A	N/A	7.00	152.55	5905.09
8	Inlet-B2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.10	5883.39	5879.10	N/A	11.500	2.32	9.18	20.19	7.00	11.23	5883.71
9	Inlet-B3-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5872.60	5876.84	5872.60	N/A	10.030	2.19	7.84	21.85	7.00	10.61	5877.15
10	Inlet-B4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.90	5880.96	5876.90	100.00	0.970	N/A	N/A	N/A	7.00	6.52	5881.30
11	Inlet-B5-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5873.10	5876.84	5873.10	N/A	0.610	0.50	0.10	82.76	7.00	1.84	5876.97
12	Inlet-B6-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.70	5868.74	5864.70	N/A	8.130	2.00	6.13	24.66	7.00	9.71	5869.03
13	Inlet-B7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5870.20	5874.26	5870.20	0.00	0.880	N/A	N/A	N/A	7.00	5.92	5874.59
14	Inlet-B8-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.50	5868.74	5864.50	N/A	0.100	0.09	0.01	88.56	7.00	0.30	5868.77
15	Inlet-C1-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.60	5862.19	5859.60	N/A	0.540	0.44	0.10	81.17	7.00	4.32	5862.36
16	Inlet-C2-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.00	5861.29	5859.00	N/A	0.860	0.68	0.18	78.89	7.00	5.60	5861.48
17	Inlet-C3-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5858.50	5861.29	5858.50	N/A	6.350	2.58	3.77	40.60	7.00	13.94	5861.65
18	Inlet-C4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5853.50	5862.46	5853.50	0.00	1.280	N/A	N/A	N/A	7.00	8.14	5862.87
19	Inlet-Walmart	FHWA HEC-22 GENERIC	N/A	On Sag	1	5851.40	5856.00	5851.40	100.00	5.460	N/A	N/A	N/A	7.00	15.32	5856.57

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Subbasin Hydrology

Subbasin : Blake@Walmart

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.9700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.04	B (6%+)	0.97
Composite Area & Weighted Runoff Coeff.	0.04		0.97

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

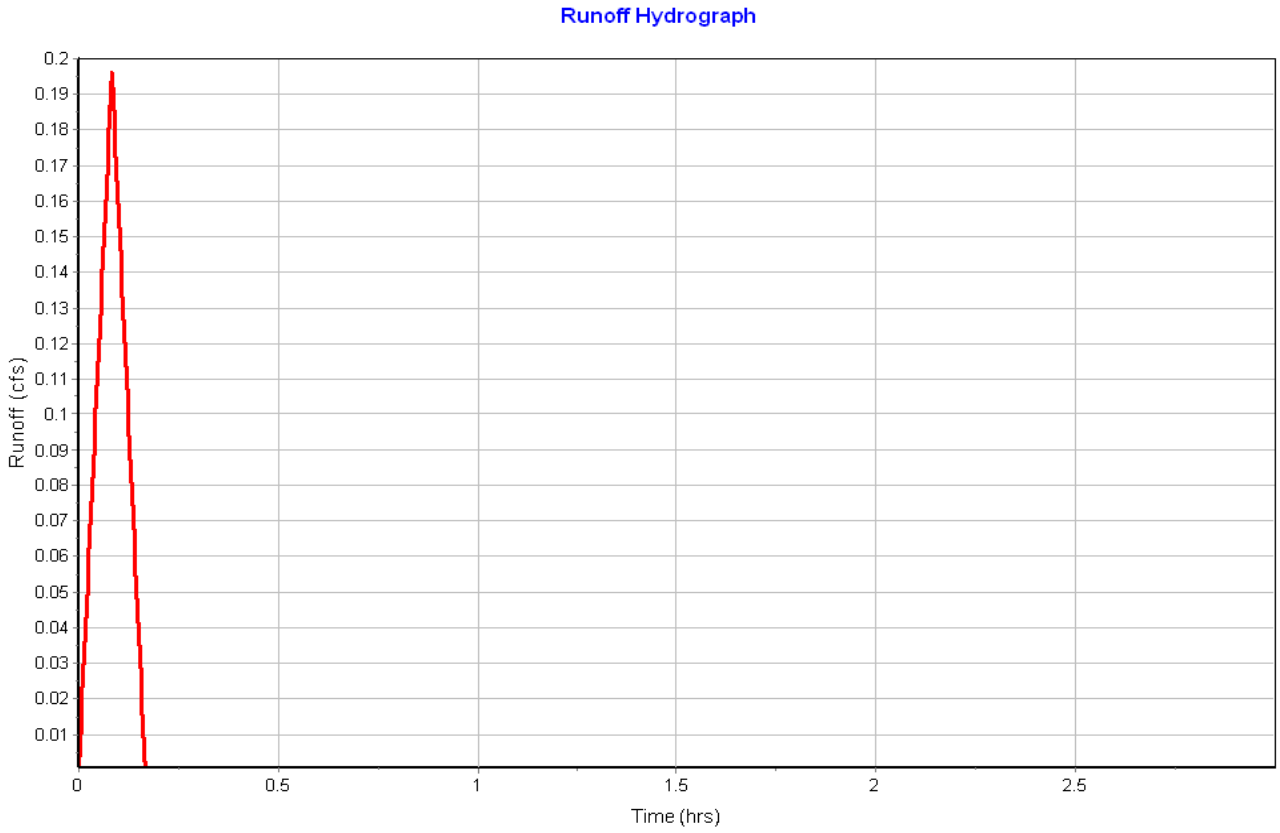
Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.41
Peak Runoff (cfs) 0.20
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.9700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Blake@Walmart



Subbasin : H/Ex-01

Input Data

Area (ac) 1.55
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	1.55	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	1.55		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	23	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.29	0.00	0.00
Computed Flow Time (min) :	5.74	0.00	0.00

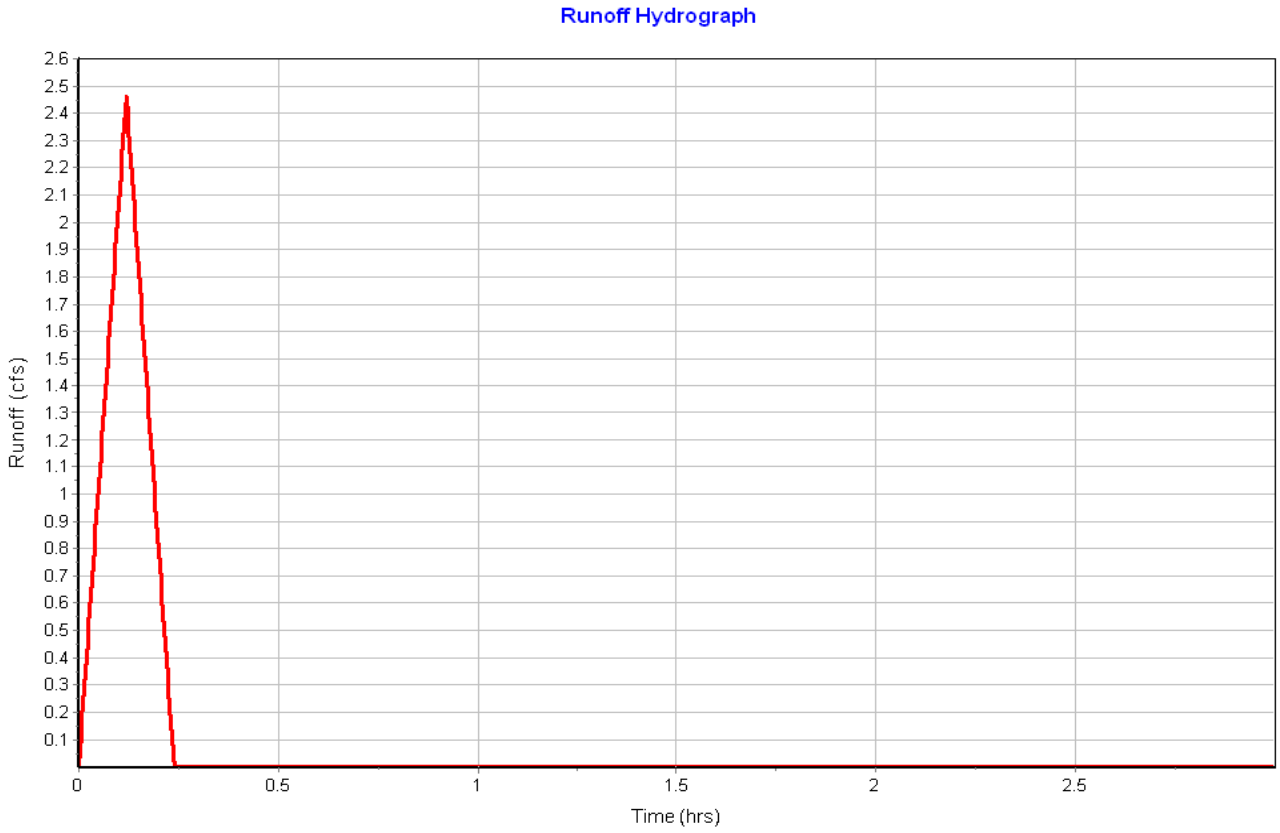
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	440	0.00	0.00
Slope (%) :	9.6	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	5.00	0.00	0.00
Computed Flow Time (min) :	1.47	0.00	0.00

Total TOC (min) 7.21

Subbasin Runoff Results

Total Rainfall (in) 0.51
Total Runoff (in) 0.19
Peak Runoff (cfs) 2.46
Rainfall Intensity 4.285
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:07:13

Subbasin : H/Ex-01



Subbasin : H/Ex-02

Input Data

Area (ac) 0.46
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	0.46	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.46		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	19	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.27	0.00	0.00
Computed Flow Time (min) :	6.20	0.00	0.00

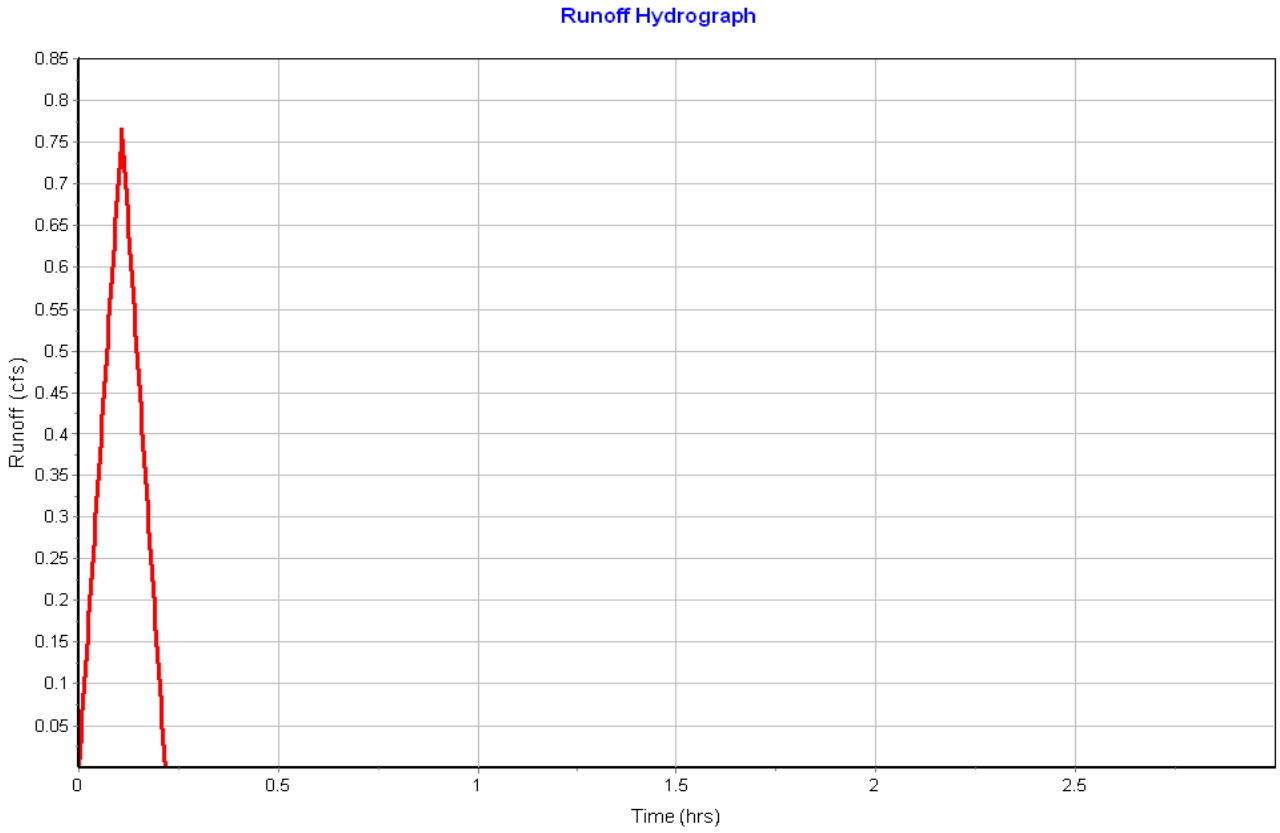
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	75	0.00	0.00
Slope (%) :	16	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	4.00	0.00	0.00
Computed Flow Time (min) :	0.31	0.00	0.00

Total TOC (min) 6.51

Subbasin Runoff Results

Total Rainfall (in) 0.49
Total Runoff (in) 0.18
Peak Runoff (cfs) 0.77
Rainfall Intensity 4.486
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:06:31

Subbasin : H/Ex-02



Subbasin : H/Ex-03

Input Data

Area (ac) 0.37
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	0.37	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.37		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	19	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.27	0.00	0.00
Computed Flow Time (min) :	6.20	0.00	0.00

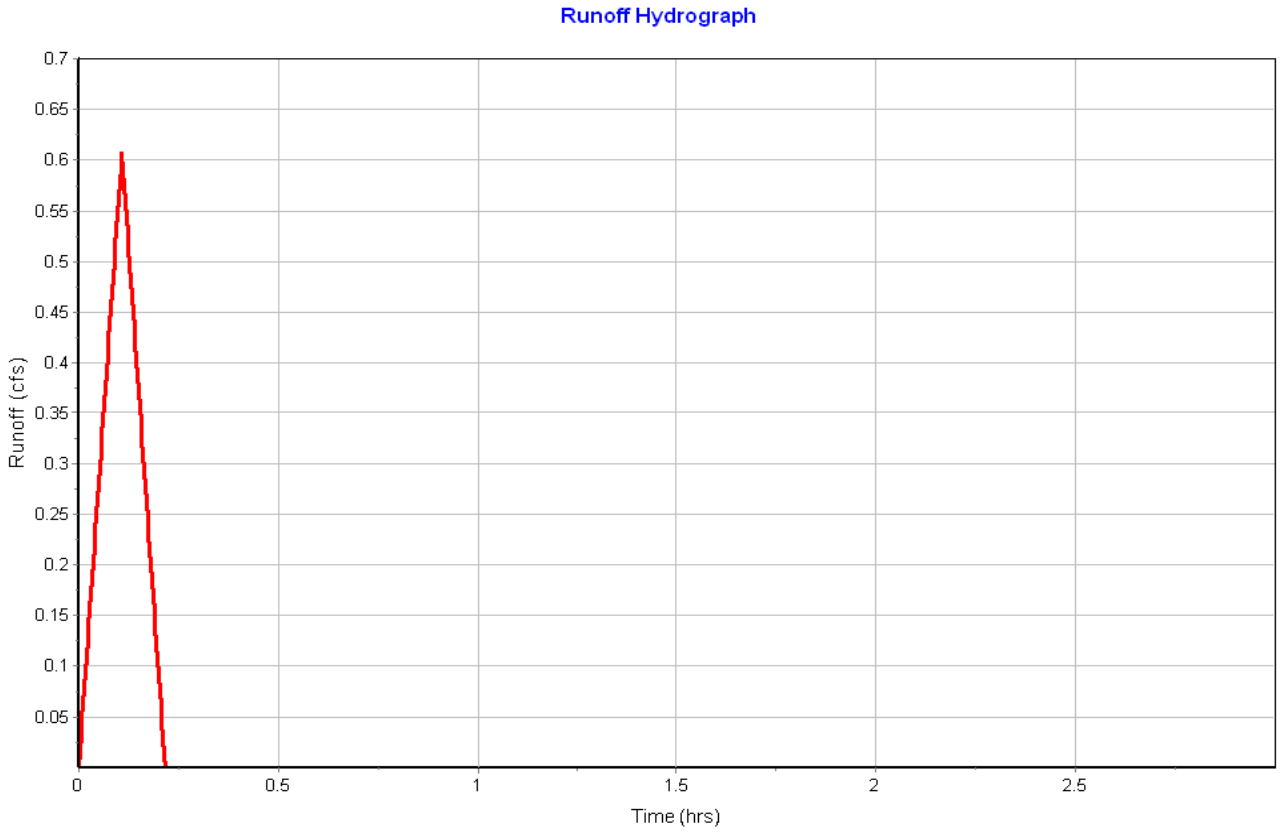
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	70	0.00	0.00
Slope (%) :	11.5	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.39	0.00	0.00
Computed Flow Time (min) :	0.34	0.00	0.00

Total TOC (min) 6.54

Subbasin Runoff Results

Total Rainfall (in) 0.49
Total Runoff (in) 0.18
Peak Runoff (cfs) 0.61
Rainfall Intensity 4.477
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:06:32

Subbasin : H/Ex-03



Subbasin : H/Ex-05

Input Data

Area (ac) 3.90
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	3.90	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	3.90		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	23	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.29	0.00	0.00
Computed Flow Time (min) :	5.74	0.00	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	560	140	0.00
Slope (%) :	10	1.5	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	5.10	1.98	0.00
Computed Flow Time (min) :	1.83	1.18	0.00

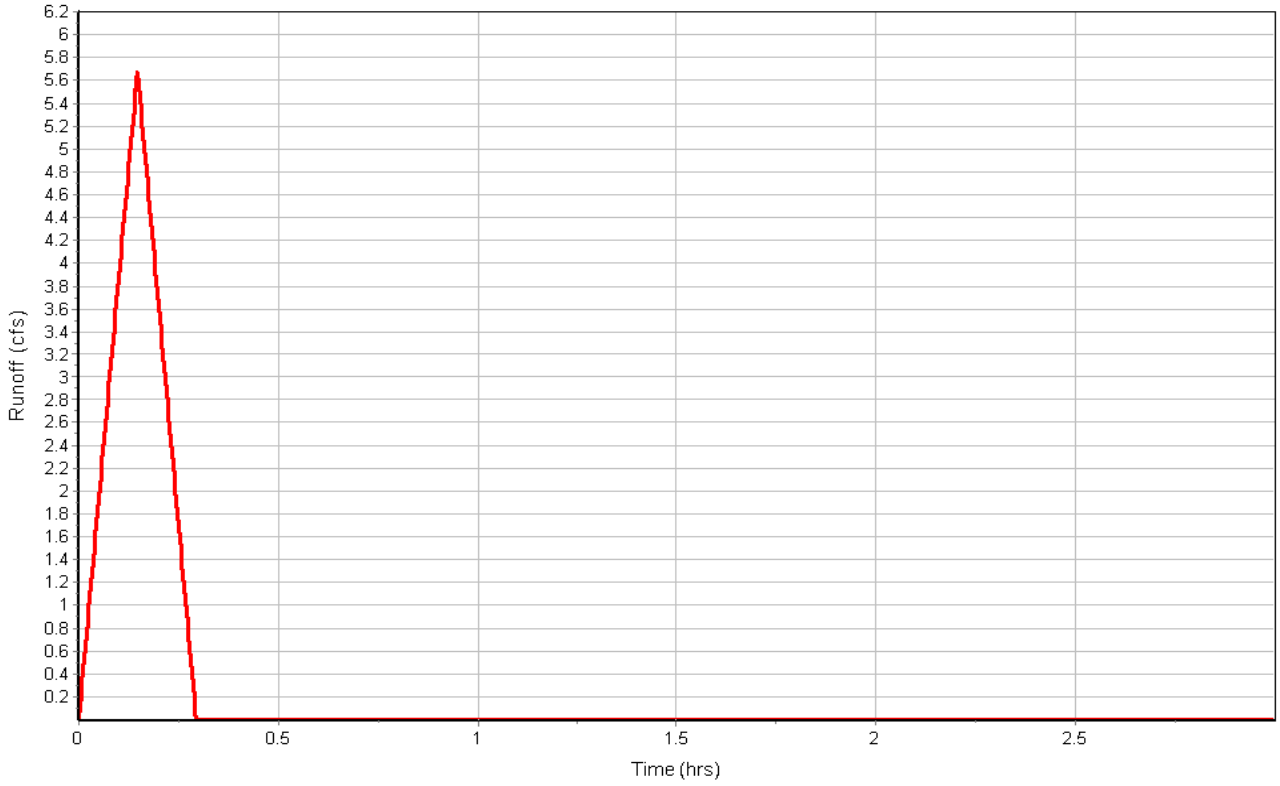
Total TOC (min) 8.75

Subbasin Runoff Results

Total Rainfall (in) 0.58
Total Runoff (in) 0.21
Peak Runoff (cfs) 5.67
Rainfall Intensity 3.928
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:08:45

Subbasin : H/Ex-05

Runoff Hydrograph



Subbasin : H/Ex-OS-1

Input Data

Area (ac) 124.70
Weighted Runoff Coefficient 0.3600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	117.22	B (6%+)	0.37
Forest, 25 years or greater	7.48	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	124.70		0.36

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	10	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.21	0.00	0.00
Computed Flow Time (min) :	8.01	0.00	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3200	0.00	0.00
Slope (%) :	15	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	0.00	0.00
Computed Flow Time (min) :	13.78	0.00	0.00

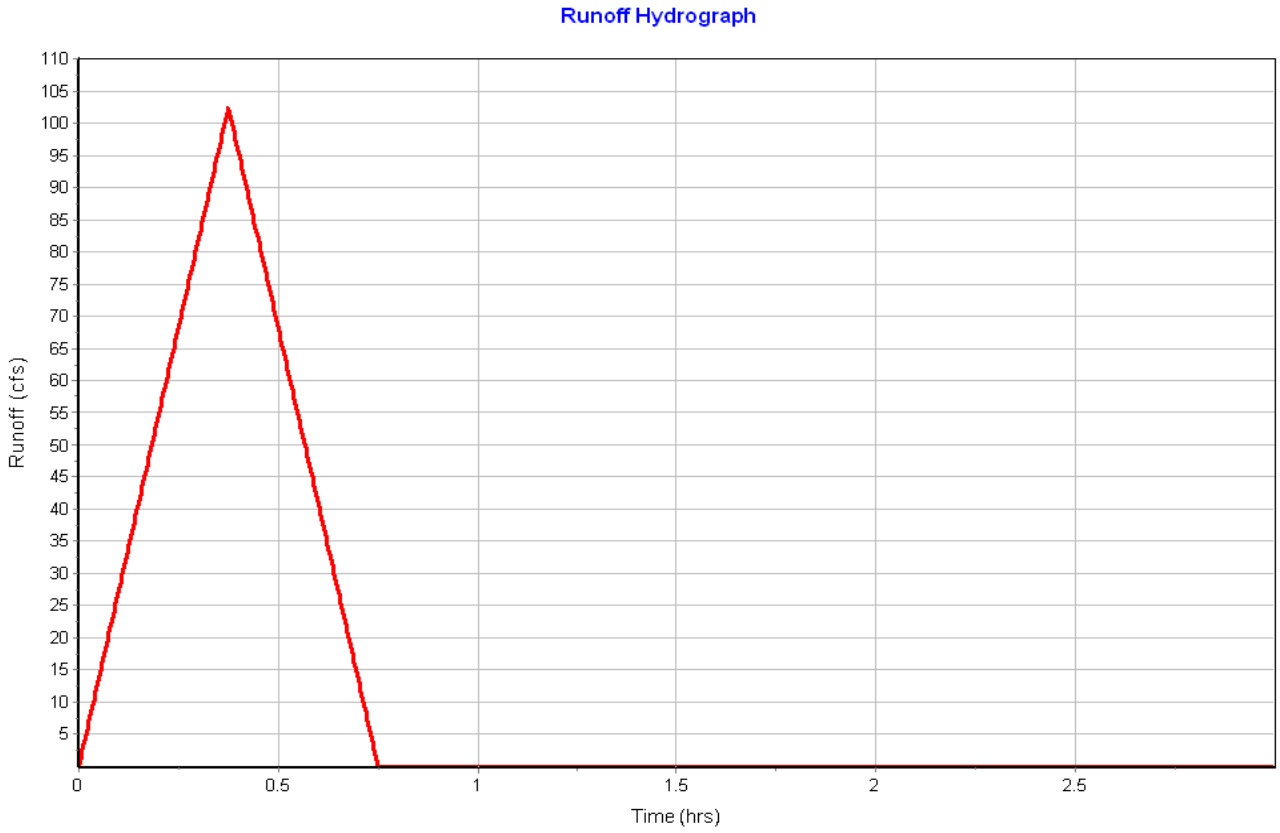
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	0.66	0.00	0.00

Total TOC (min) 22.45

Subbasin Runoff Results

Total Rainfall (in) 0.86
Total Runoff (in) 0.31
Peak Runoff (cfs) 102.44
Rainfall Intensity 2.282
Weighted Runoff Coefficient 0.3600
Time of Concentration (days hh:mm:ss) 0 00:22:27

Subbasin : H/Ex-OS-1



Subbasin : H/Ex-OS-2

Input Data

Area (ac) 9.37
Weighted Runoff Coefficient 0.2800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	2.06	B (6%+)	0.37
Forest, 25 years or greater	7.31	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	9.37		0.28

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	45	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.38	0.00	0.00
Computed Flow Time (min) :	4.39	0.00	0.00

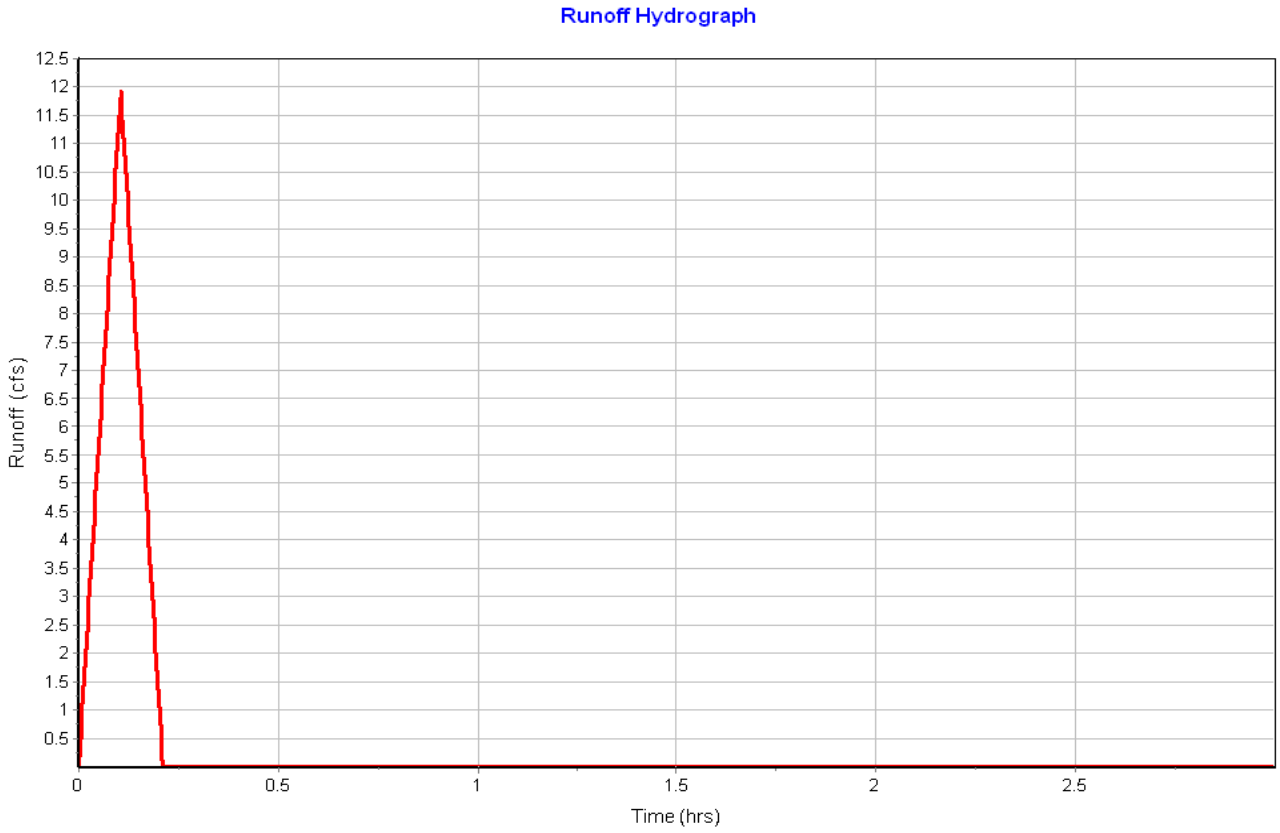
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in) 0.48
Total Runoff (in) 0.13
Peak Runoff (cfs) 11.93
Rainfall Intensity 4.546
Weighted Runoff Coefficient 0.2800
Time of Concentration (days hh:mm:ss) 0 00:06:19

Subbasin : H/Ex-OS-2



Subbasin : H-04

Input Data

Area (ac) 0.70
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	0.70	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.70		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	19	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.27	0.00	0.00
Computed Flow Time (min) :	6.20	0.00	0.00

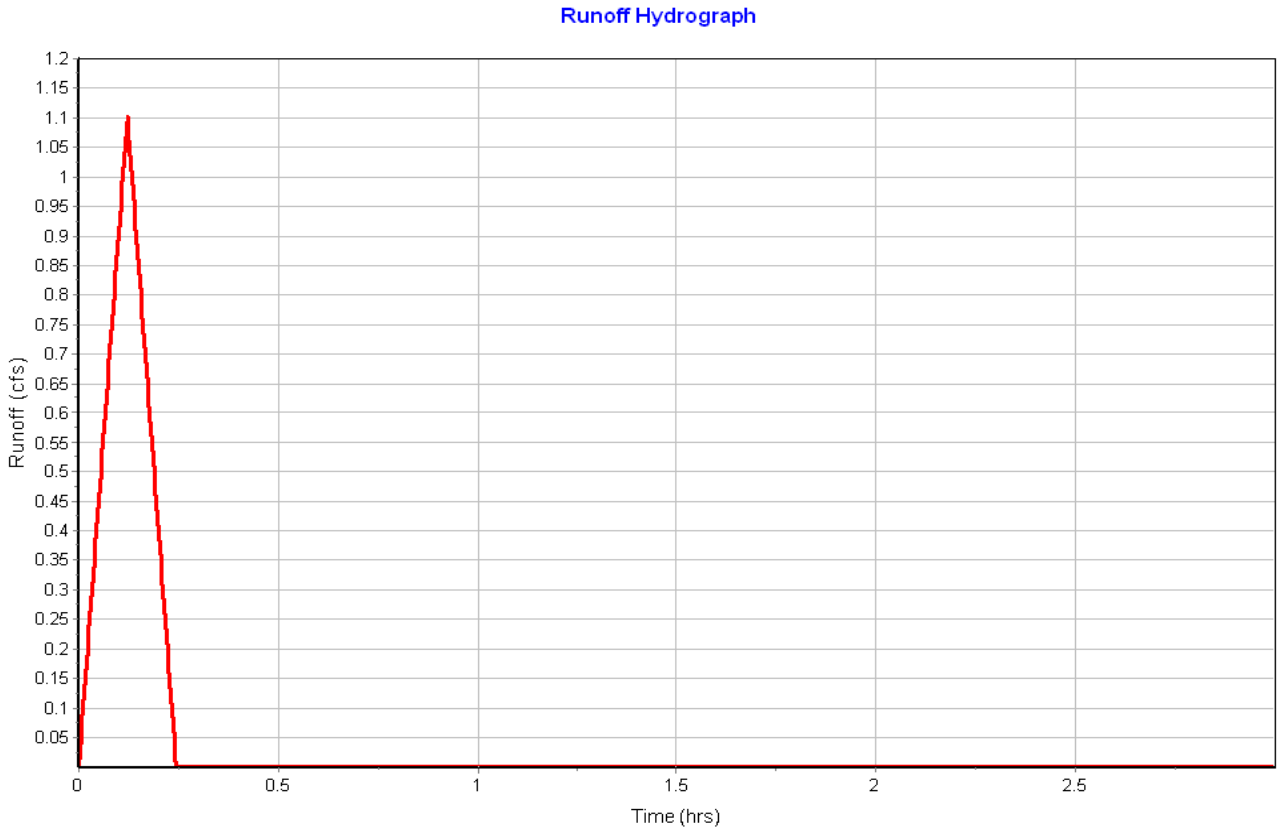
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	140	110	0.00
Slope (%) :	15	3.7	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	3.10	0.00
Computed Flow Time (min) :	0.60	0.59	0.00

Total TOC (min) 7.39

Subbasin Runoff Results

Total Rainfall (in) 0.52
Total Runoff (in) 0.19
Peak Runoff (cfs) 1.10
Rainfall Intensity 4.238
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:07:23

Subbasin : H-04



Subbasin : Pr-01

Input Data

Area (ac) 0.57
Weighted Runoff Coefficient 0.4800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.13	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Meadow, 25 years or greater	0.33	B (6%+)	0.37
Forest, 25 years or greater	0.08	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	0.57		0.48

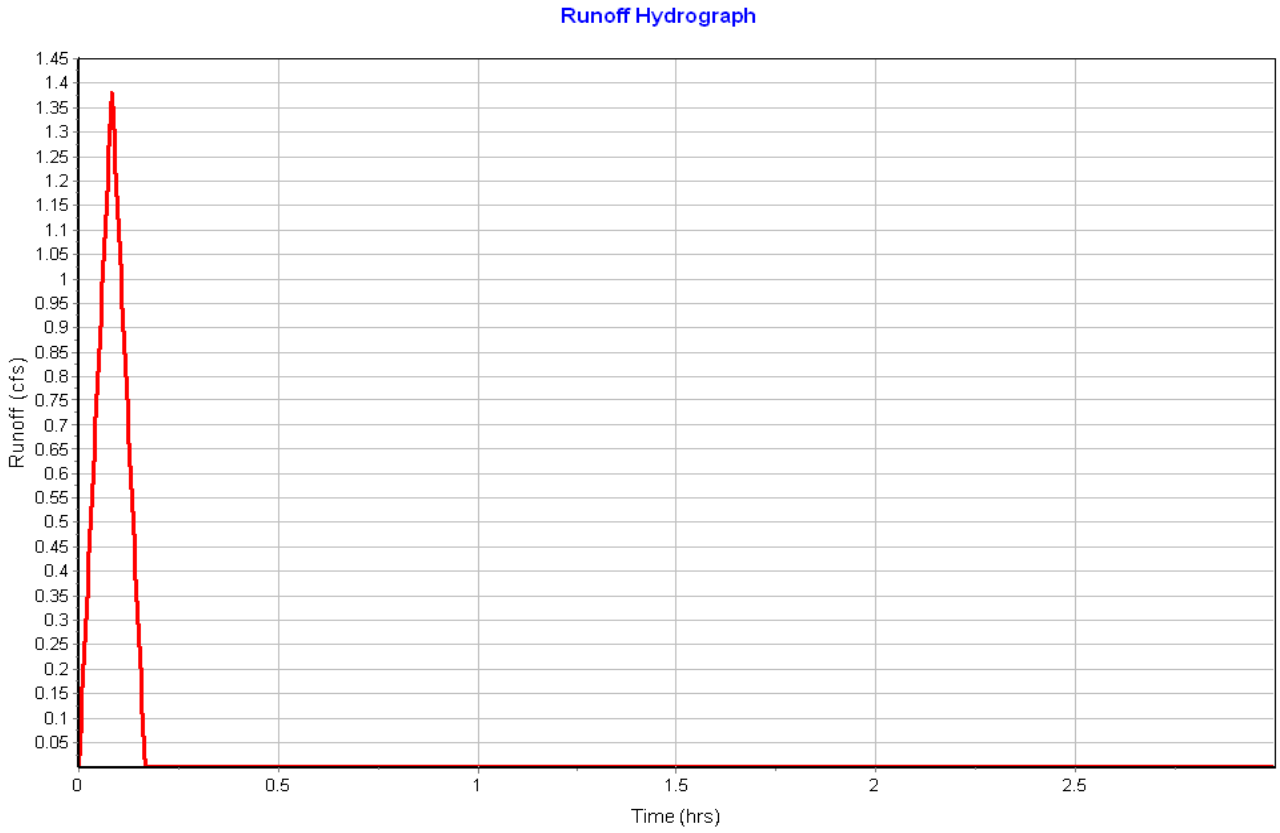
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.20
Peak Runoff (cfs) 1.38
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.4800
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-01



Subbasin : Pr-02

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.8300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.10	B (6%+)	0.97
Open Space, 25 years or greater	0.02	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.12		0.83

Time of Concentration

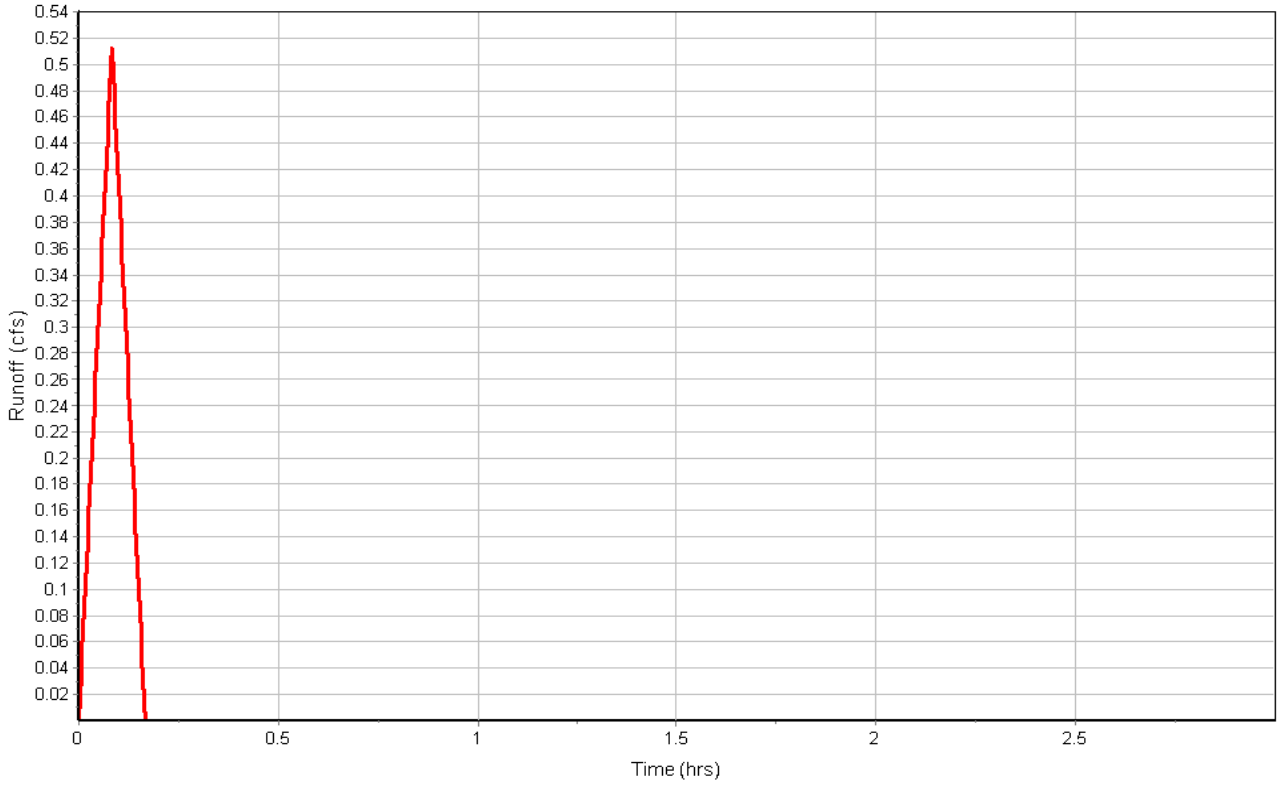
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.35
Peak Runoff (cfs) 0.51
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.8300
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-02

Runoff Hydrograph



Subbasin : Pr-03

Input Data

Area (ac) 0.28
Weighted Runoff Coefficient 0.7900

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.21	B (6%+)	0.97
Open Space, 25 years or greater	0.07	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.28		0.79

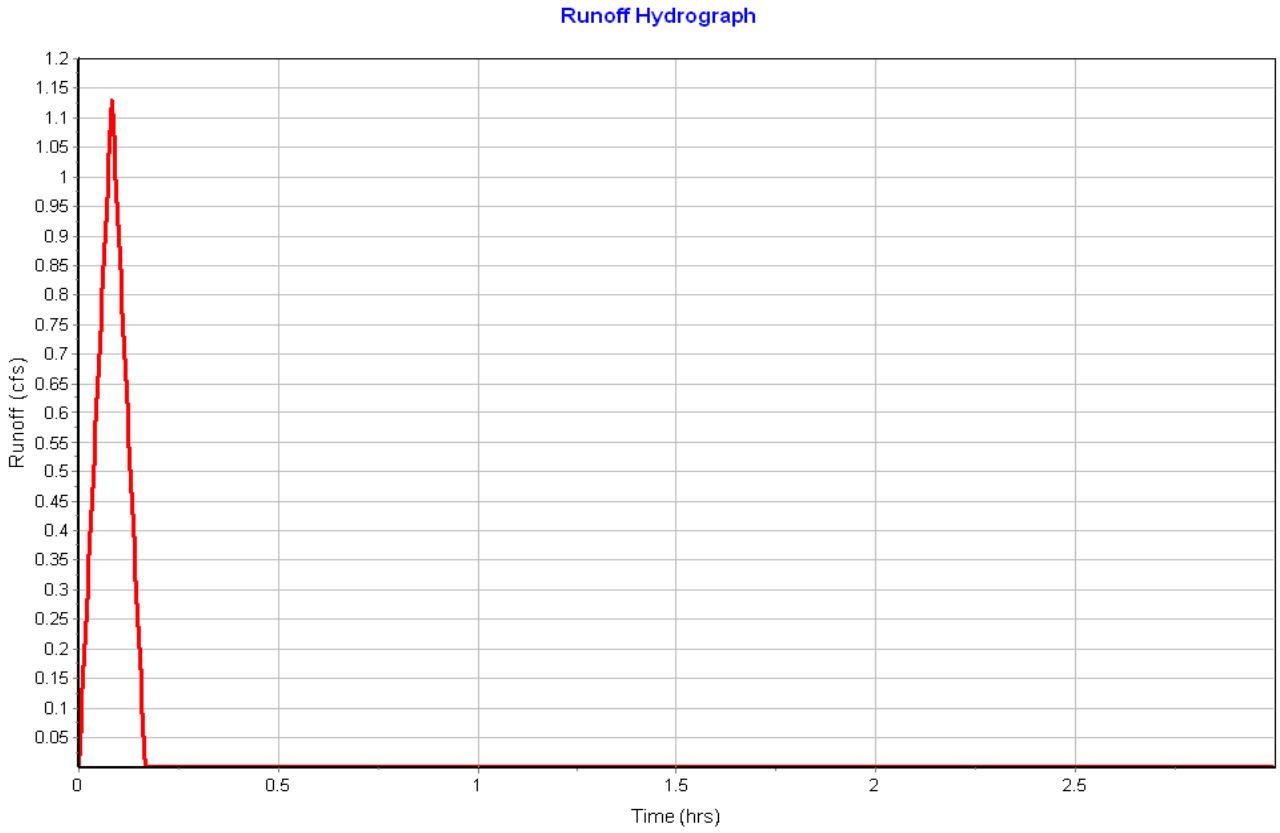
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.33
Peak Runoff (cfs) 1.13
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.7900
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-03



Subbasin : Pr-04

Input Data

Area (ac) 0.33
Weighted Runoff Coefficient 0.3300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.03	B (6%+)	0.97
Open Space, 25 years or greater	0.30	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.33		0.33

Time of Concentration

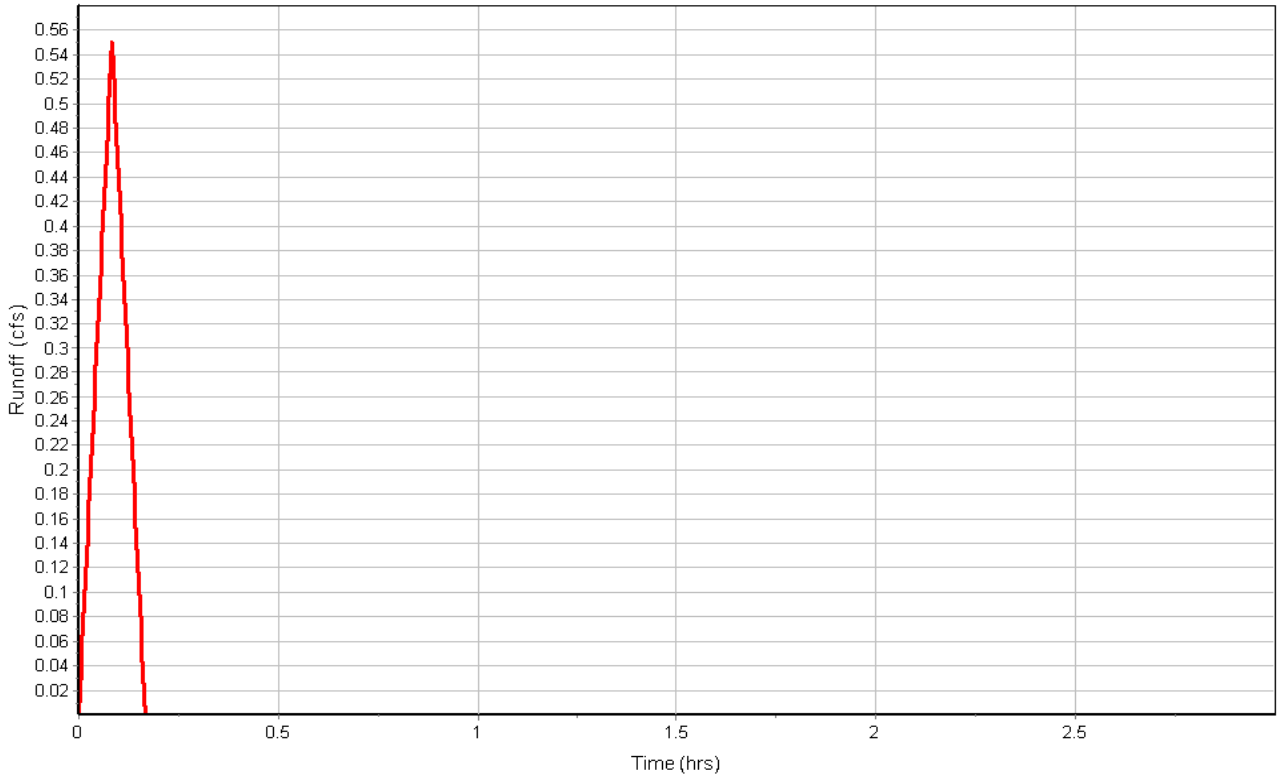
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.14
Peak Runoff (cfs) 0.55
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.3300
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-04

Runoff Hydrograph



Subbasin : Pr-05

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.7700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.10	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.14		0.77

Time of Concentration

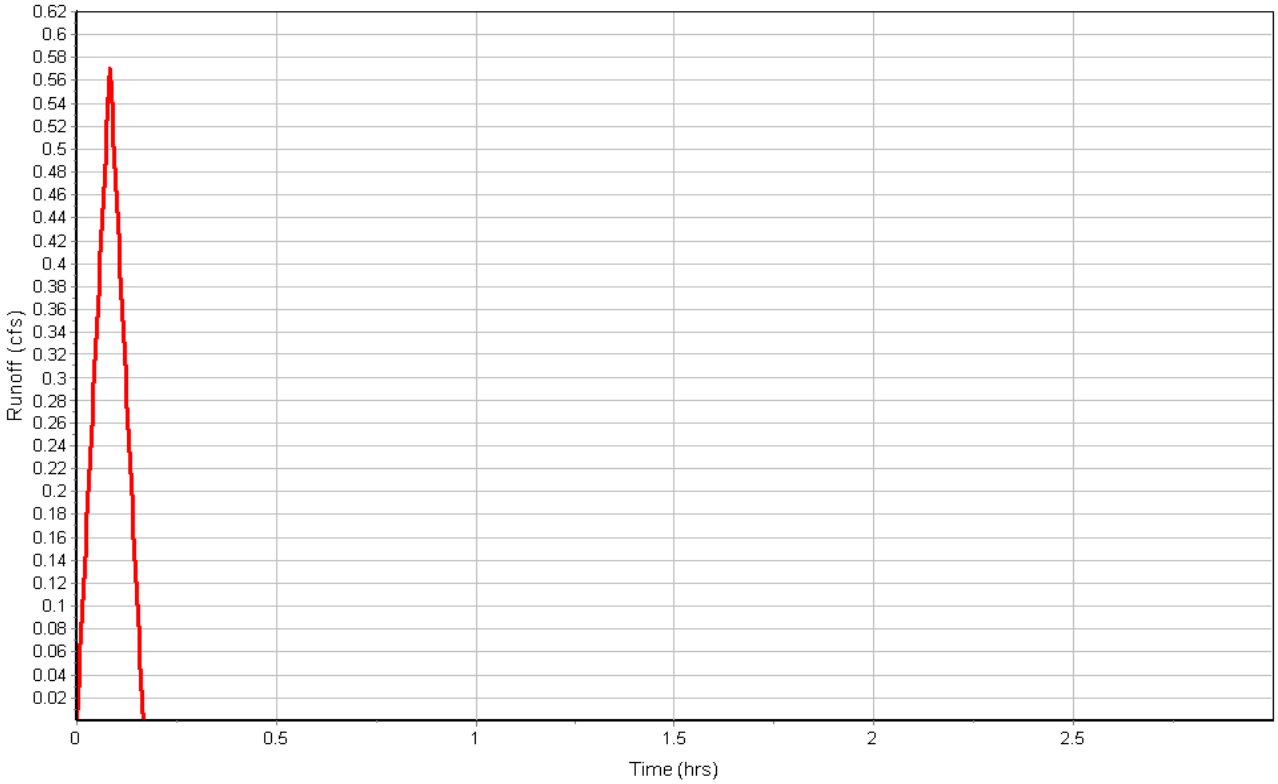
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.32
Peak Runoff (cfs) 0.57
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.7700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-05

Runoff Hydrograph



Subbasin : Pr-06

Input Data

Area (ac) 0.29
Weighted Runoff Coefficient 0.7800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.21	B (6%+)	0.97
Open Space, 25 years or greater	0.08	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.29		0.78

Time of Concentration

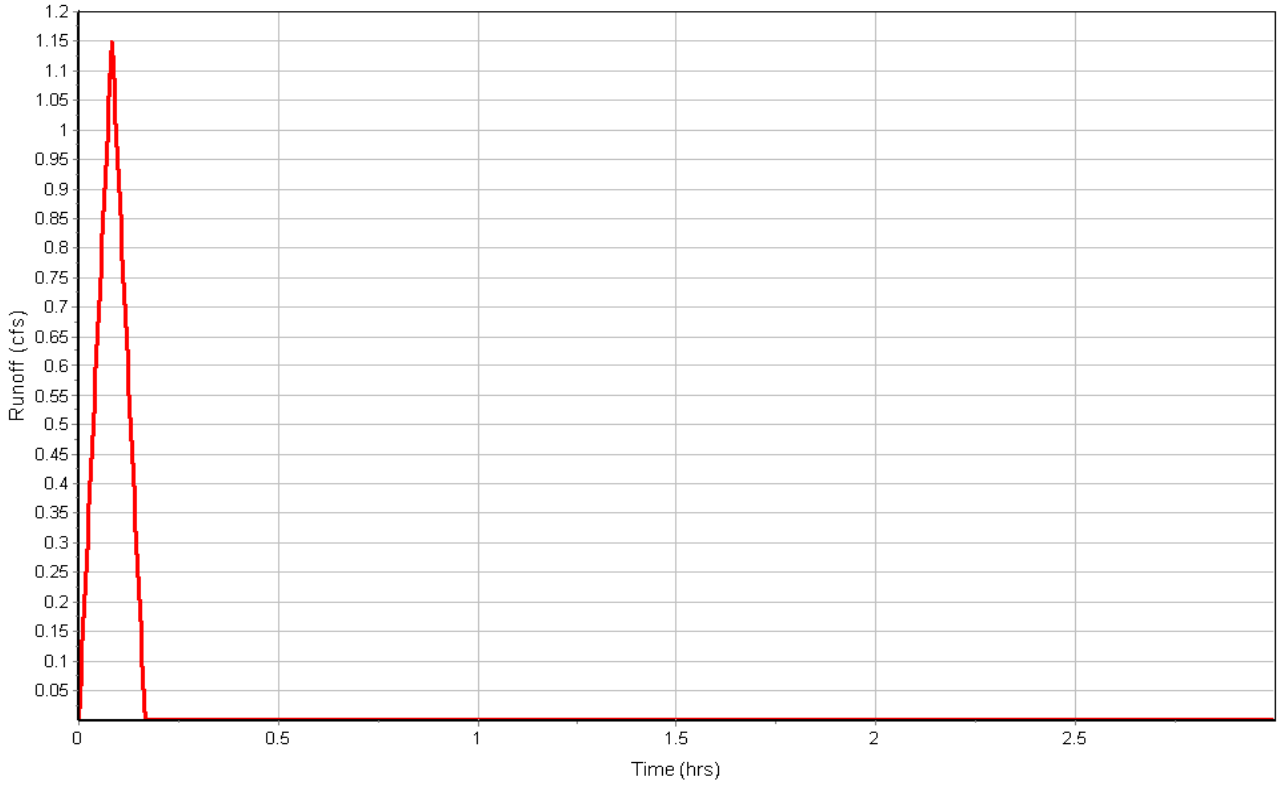
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.33
Peak Runoff (cfs) 1.15
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.7800
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-06

Runoff Hydrograph



Subbasin : Pr-07

Input Data

Area (ac) 0.74
Weighted Runoff Coefficient 0.7700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.53	B (6%+)	0.97
Open Space, 25 years or greater	0.21	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.74		0.77

Time of Concentration

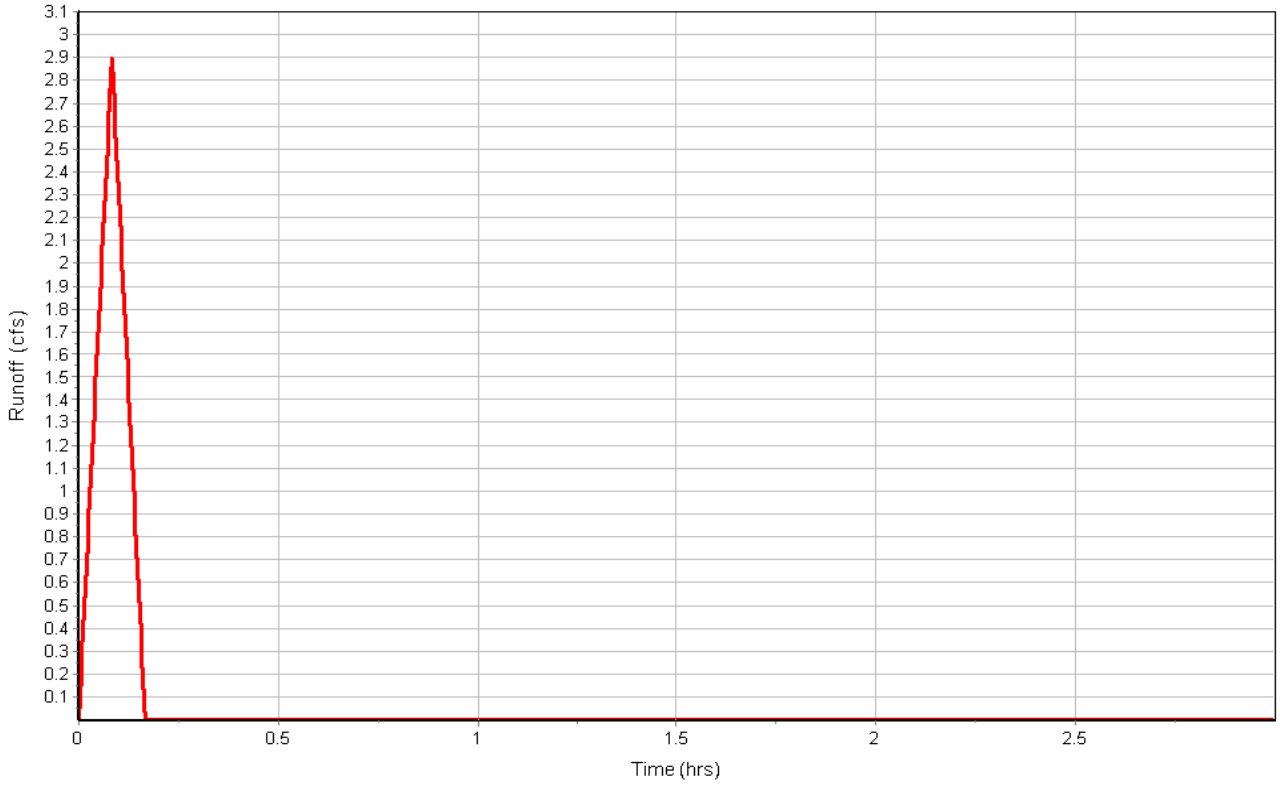
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.32
Peak Runoff (cfs) 2.90
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.7700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-07

Runoff Hydrograph



Subbasin : Pr-08

Input Data

Area (ac) 0.18
Weighted Runoff Coefficient 0.8100

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.14	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.18		0.81

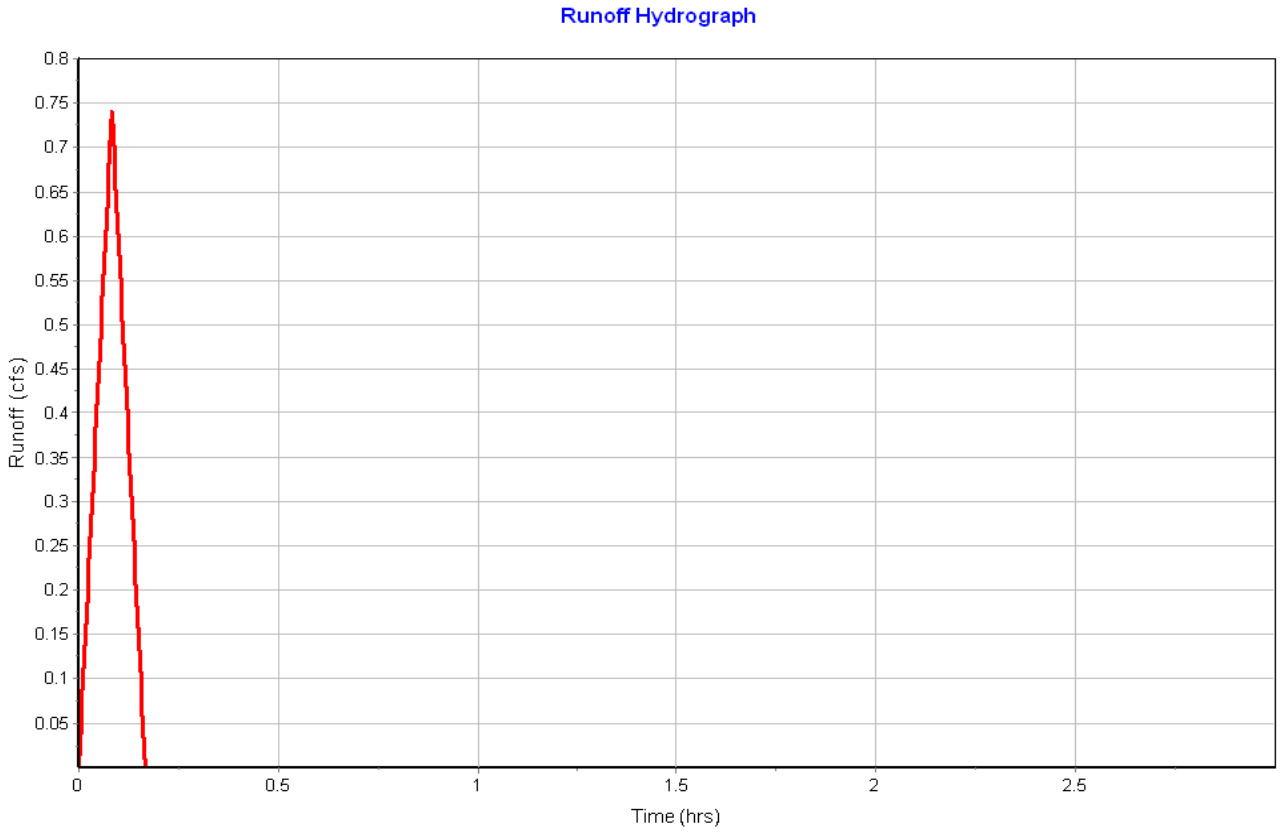
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.34
Peak Runoff (cfs) 0.74
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.8100
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-08



Subbasin : Pr-09

Input Data

Area (ac) 1.68
Weighted Runoff Coefficient 0.3800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.11	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Meadow, 25 years or greater	1.17	B (6%+)	0.37
Forest, 25 years or greater	0.35	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	1.67		0.38

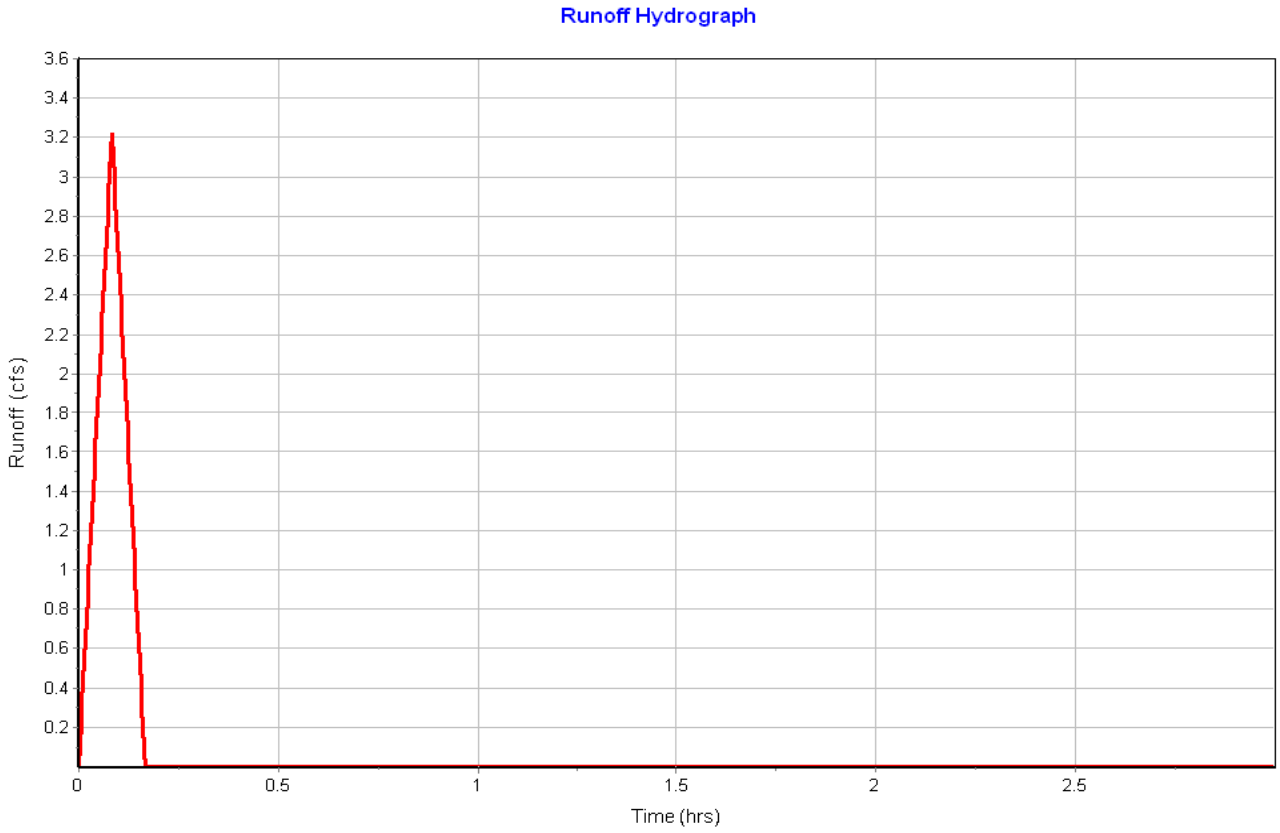
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.16
Peak Runoff (cfs) 3.22
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.3800
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-09



Subbasin : Pr-10

Input Data

Area (ac) 0.42
Weighted Runoff Coefficient 0.4600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.12	B (6%+)	0.97
Open Space, 25 years or greater	0.30	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.42		0.46

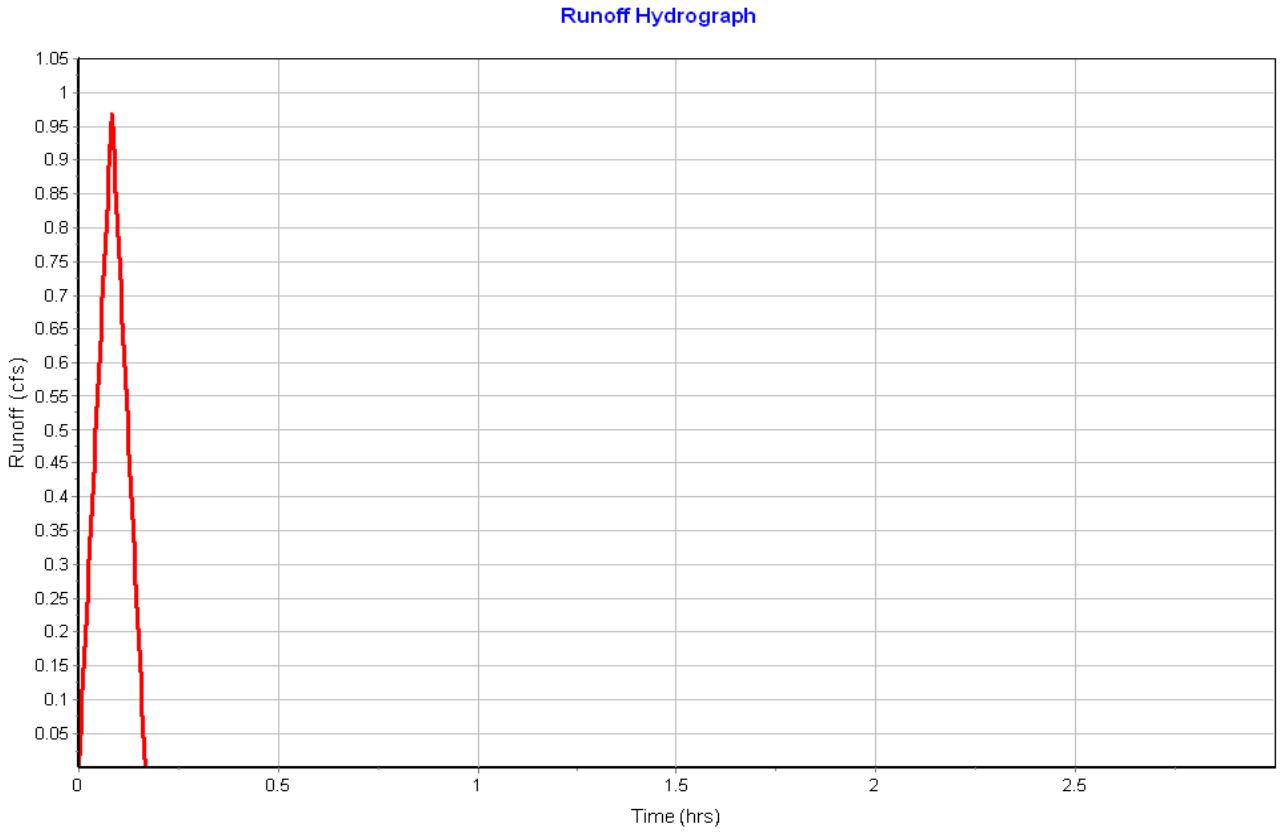
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.19
Peak Runoff (cfs) 0.97
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.4600
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-10



Subbasin : Pr-11

Input Data

Area (ac) 0.22
Weighted Runoff Coefficient 0.8700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.19	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.22		0.87

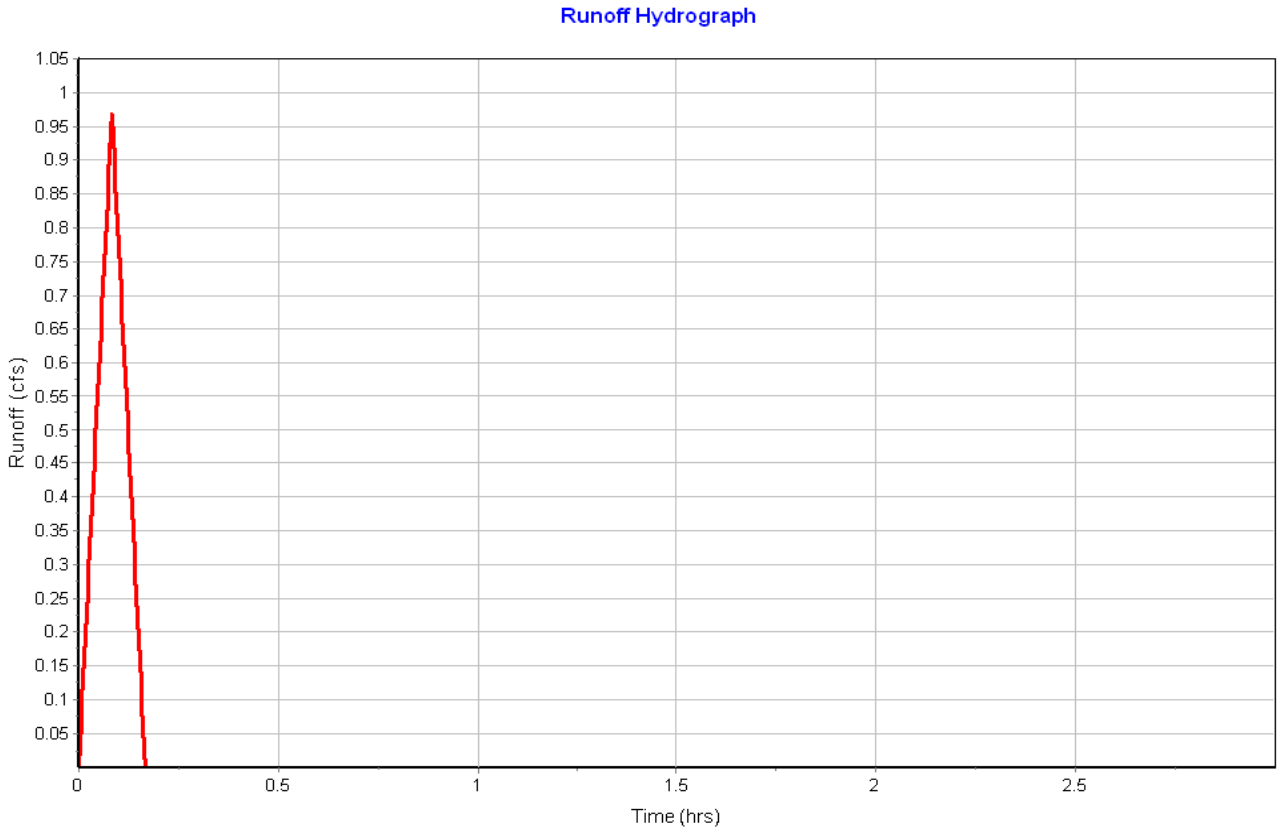
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.37
Peak Runoff (cfs) 0.97
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.8700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-11



Subbasin : Pr-12

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.6200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.07	B (6%+)	0.97
Open Space, 25 years or greater	0.07	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.14		0.62

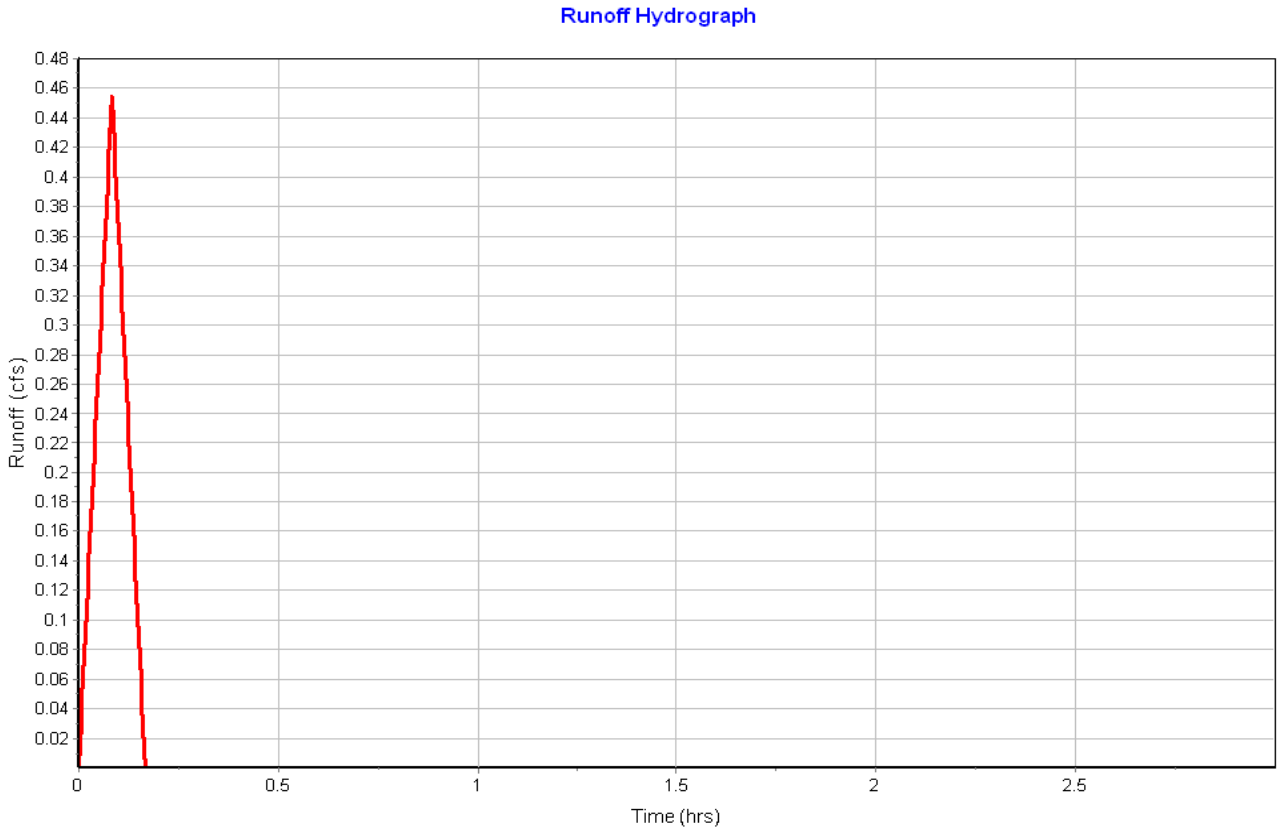
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.26
Peak Runoff (cfs) 0.45
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.6200
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-12



Subbasin : Pr-13

Input Data

Area (ac) 0.41
Weighted Runoff Coefficient 0.6700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.21	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Meadow, 25 years or greater	0.16	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.41		0.67

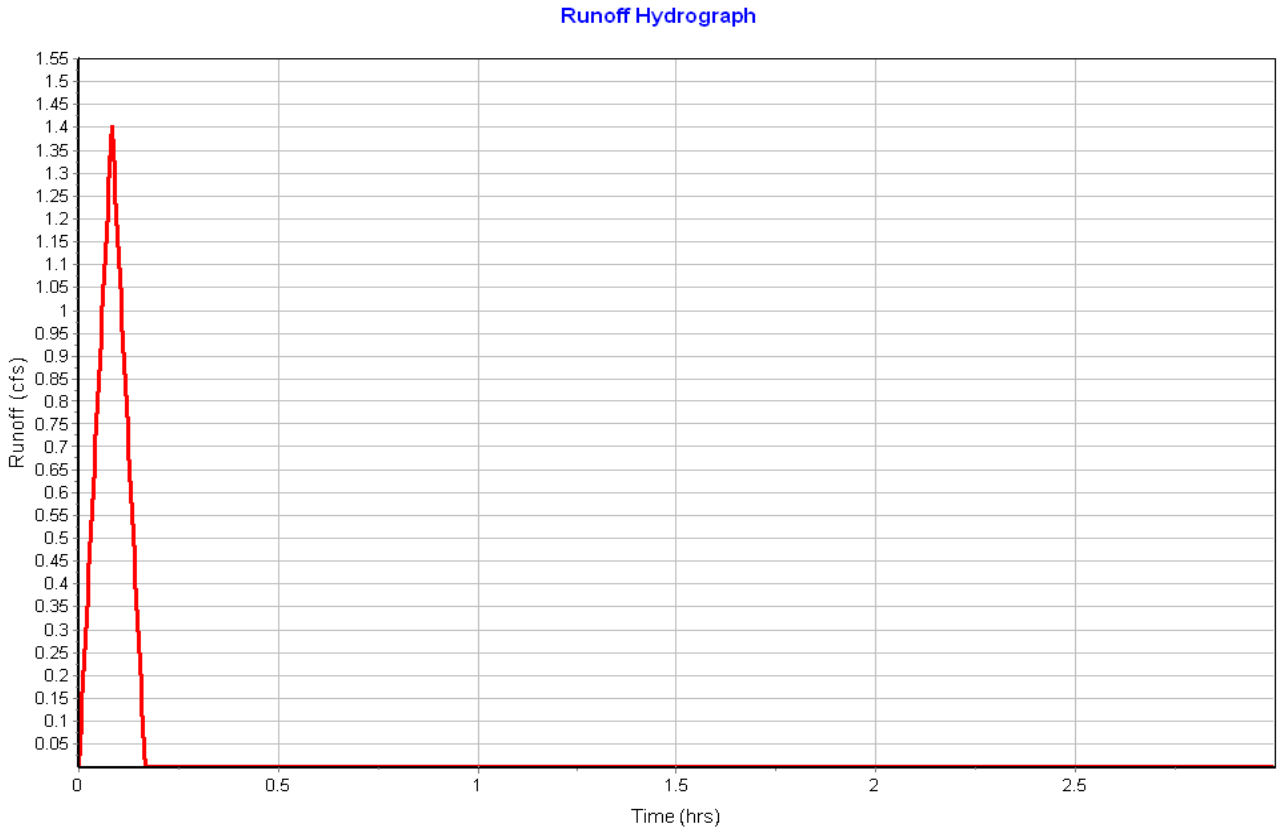
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.28
Peak Runoff (cfs) 1.40
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.6700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-13



Subbasin : Pr-14

Input Data

Area (ac) 0.20
Weighted Runoff Coefficient 0.8600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.17	B (2-6%)	0.96
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.20		0.86

Time of Concentration

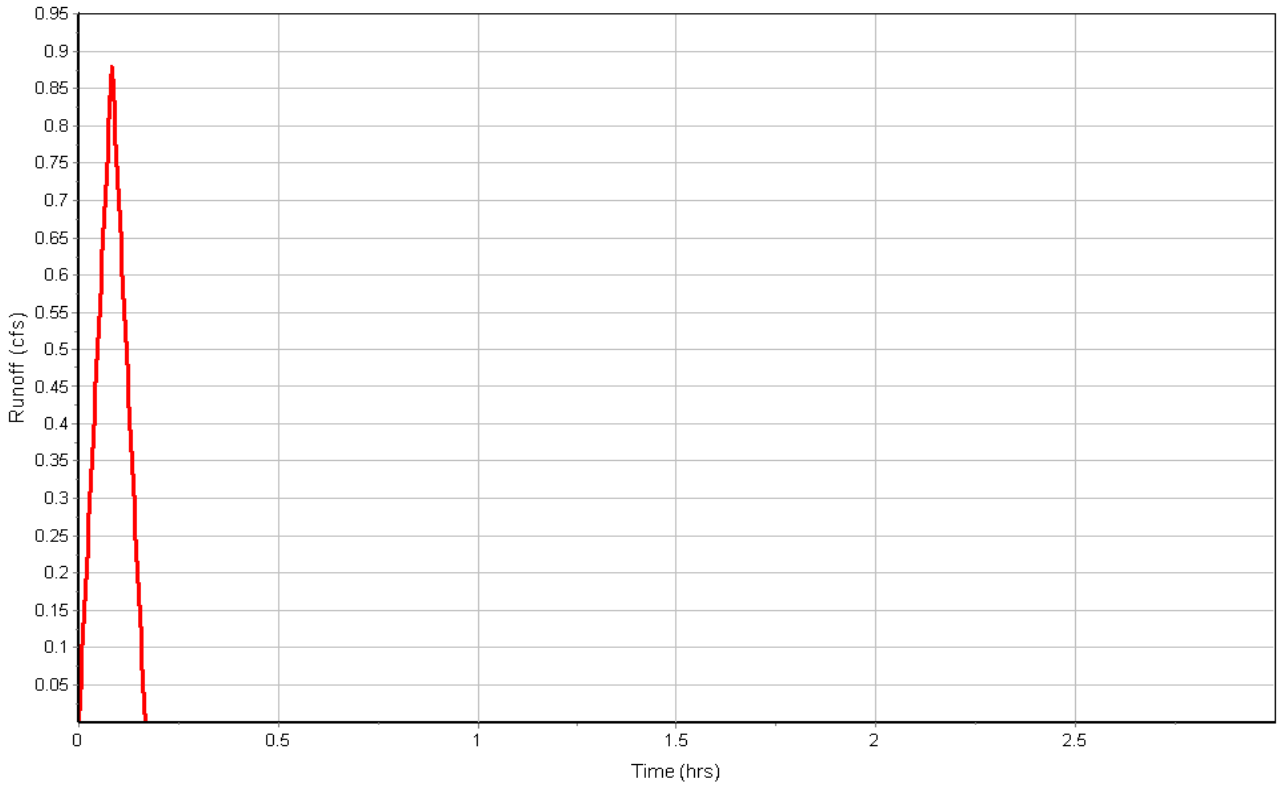
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.36
Peak Runoff (cfs) 0.88
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.8600
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-14

Runoff Hydrograph



Subbasin : Pr-15

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7900

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.10	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.13		0.79

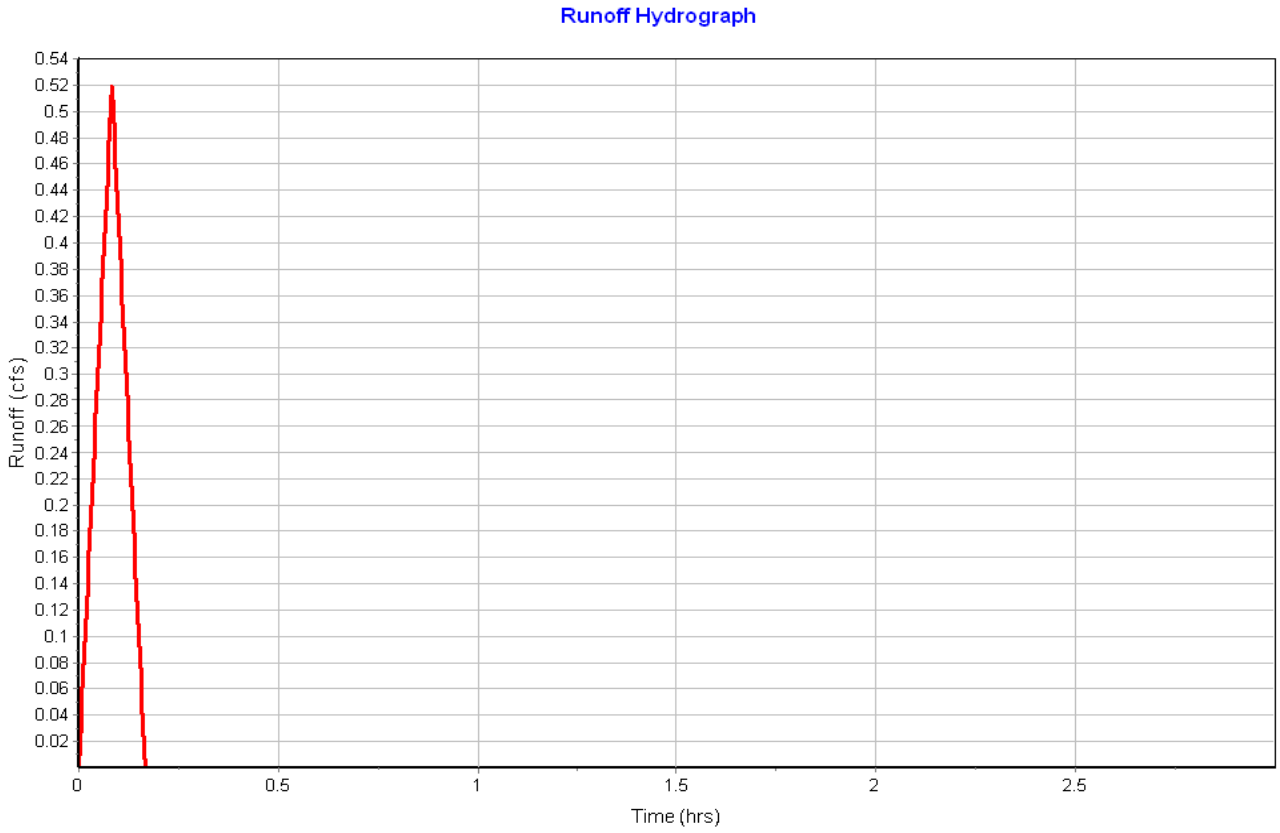
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.33
Peak Runoff (cfs) 0.52
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.7900
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-15



Subbasin : Pr-16

Input Data

Area (ac) 0.17
Weighted Runoff Coefficient 0.7100

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.11	B (6%+)	0.97
Open Space, 25 years or greater	0.06	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.17		0.71

Time of Concentration

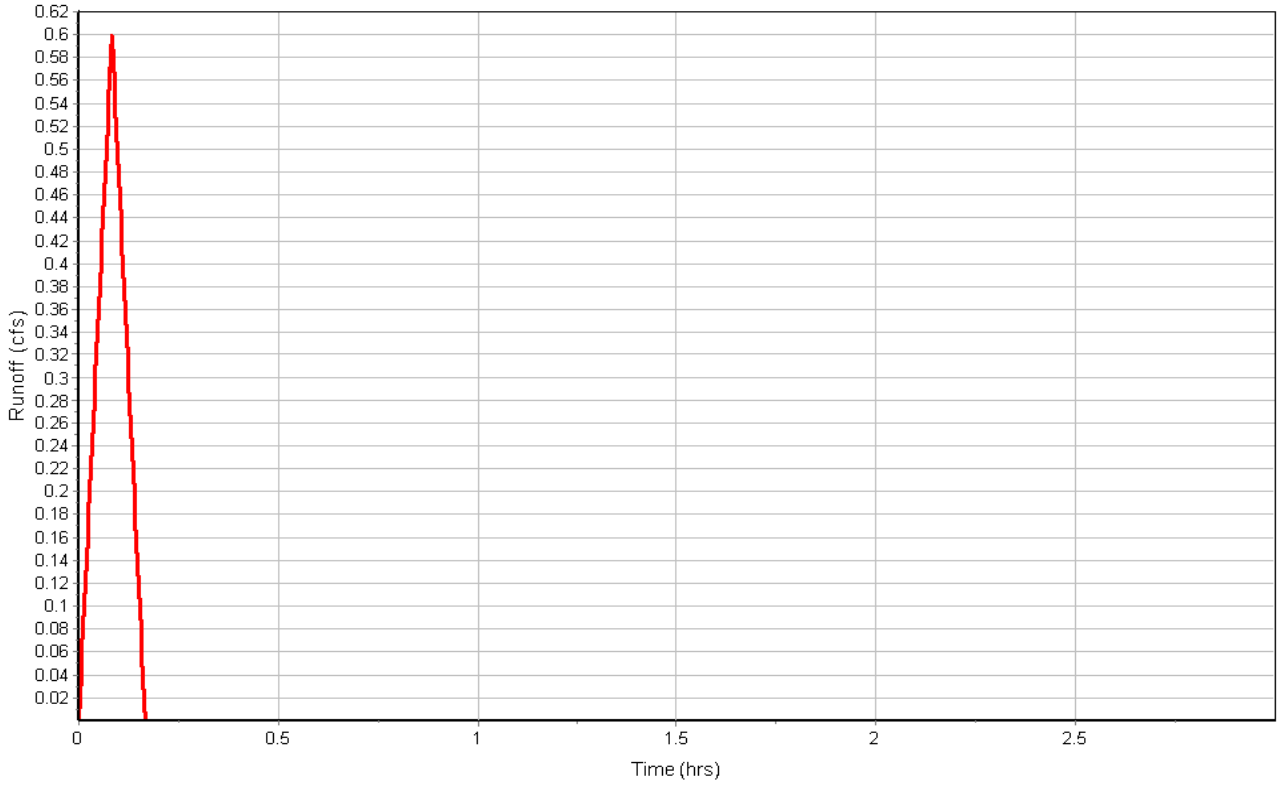
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.30
Peak Runoff (cfs) 0.60
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.7100
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-16

Runoff Hydrograph



Subbasin : Pr-17

Input Data

Area (ac) 0.05
Weighted Runoff Coefficient 0.6300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.03	B (6%+)	0.97
Open Space, 25 years or greater	0.02	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.05		0.63

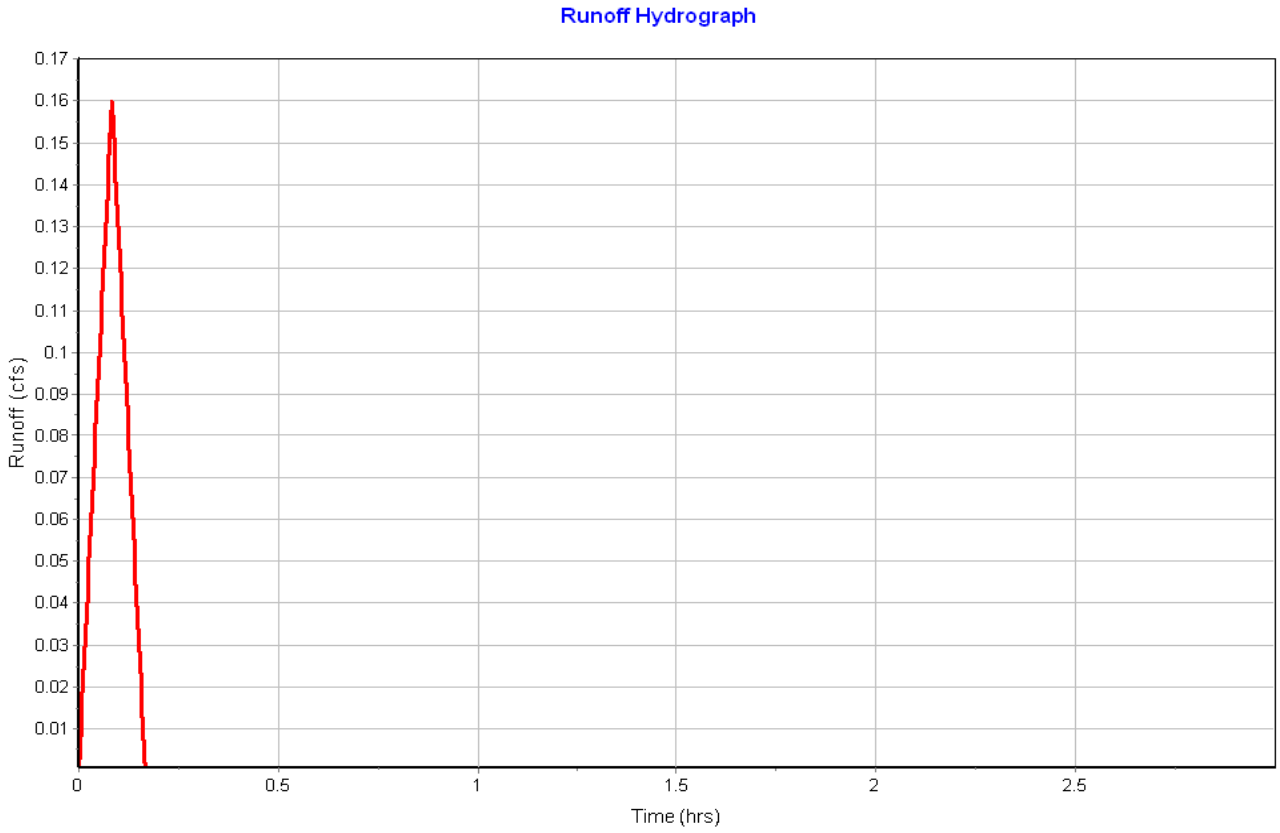
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.27
Peak Runoff (cfs) 0.16
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.6300
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-17



Subbasin : Pr-18

Input Data

Area (ac) 0.11
Weighted Runoff Coefficient 0.9500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.11	B (6%+)	0.97
Open Space, 25 years or greater	0.00	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.11		0.95

Time of Concentration

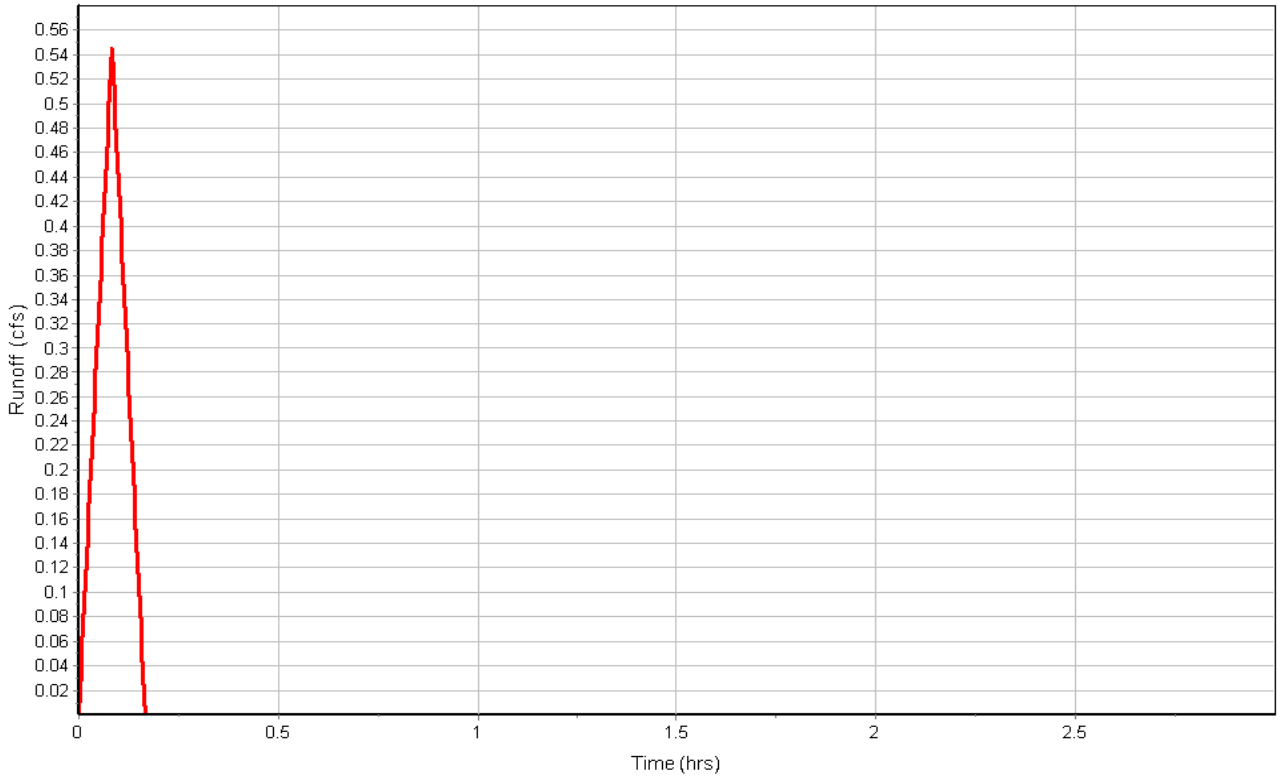
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.40
Peak Runoff (cfs) 0.55
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.9500
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-18

Runoff Hydrograph



Subbasin : Pr-19

Input Data

Area (ac) 0.10
Weighted Runoff Coefficient 0.8200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.08	B (6%+)	0.97
Open Space, 25 years or greater	0.02	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.10		0.82

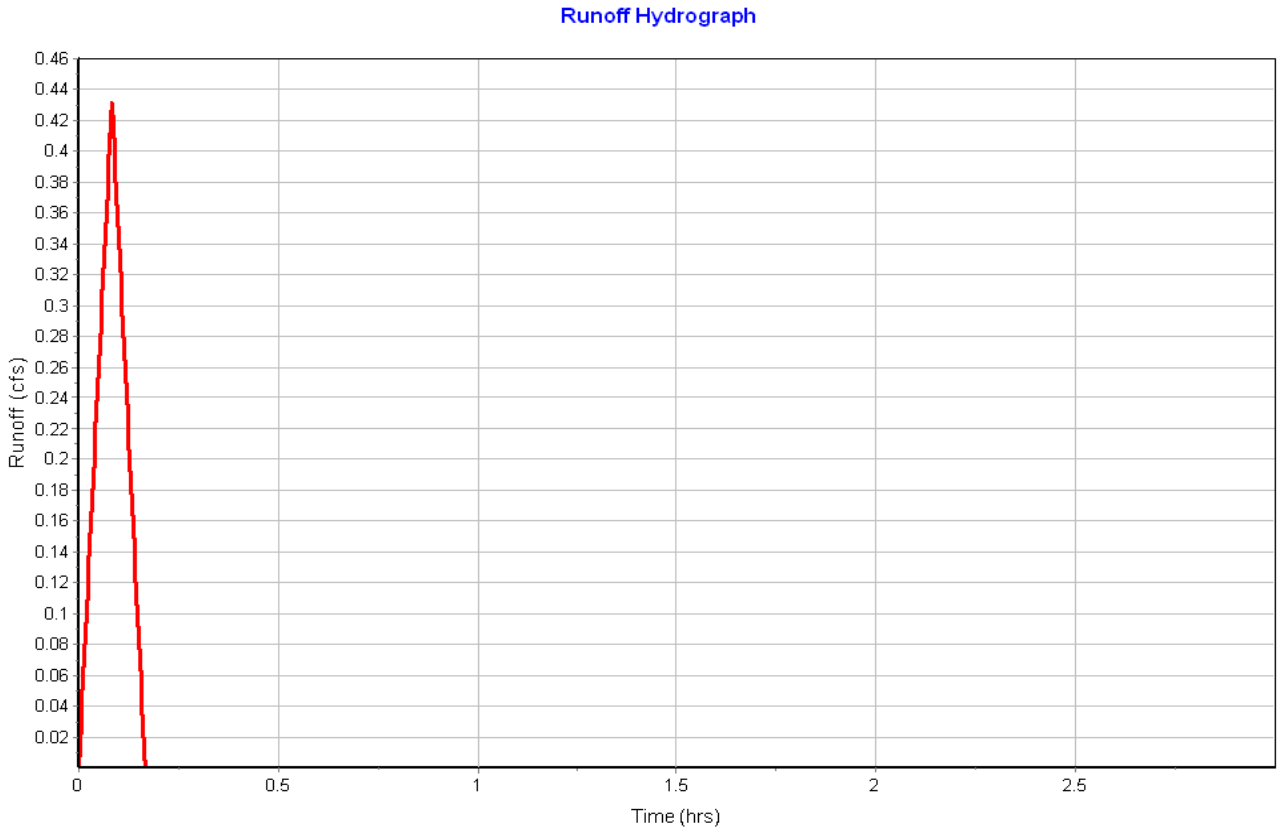
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.35
Peak Runoff (cfs) 0.43
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.8200
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-19



Subbasin : Pr-20

Input Data

Area (ac) 0.31
Weighted Runoff Coefficient 0.8200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.24	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Meadow, 25 years or greater	0.03	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.30		0.82

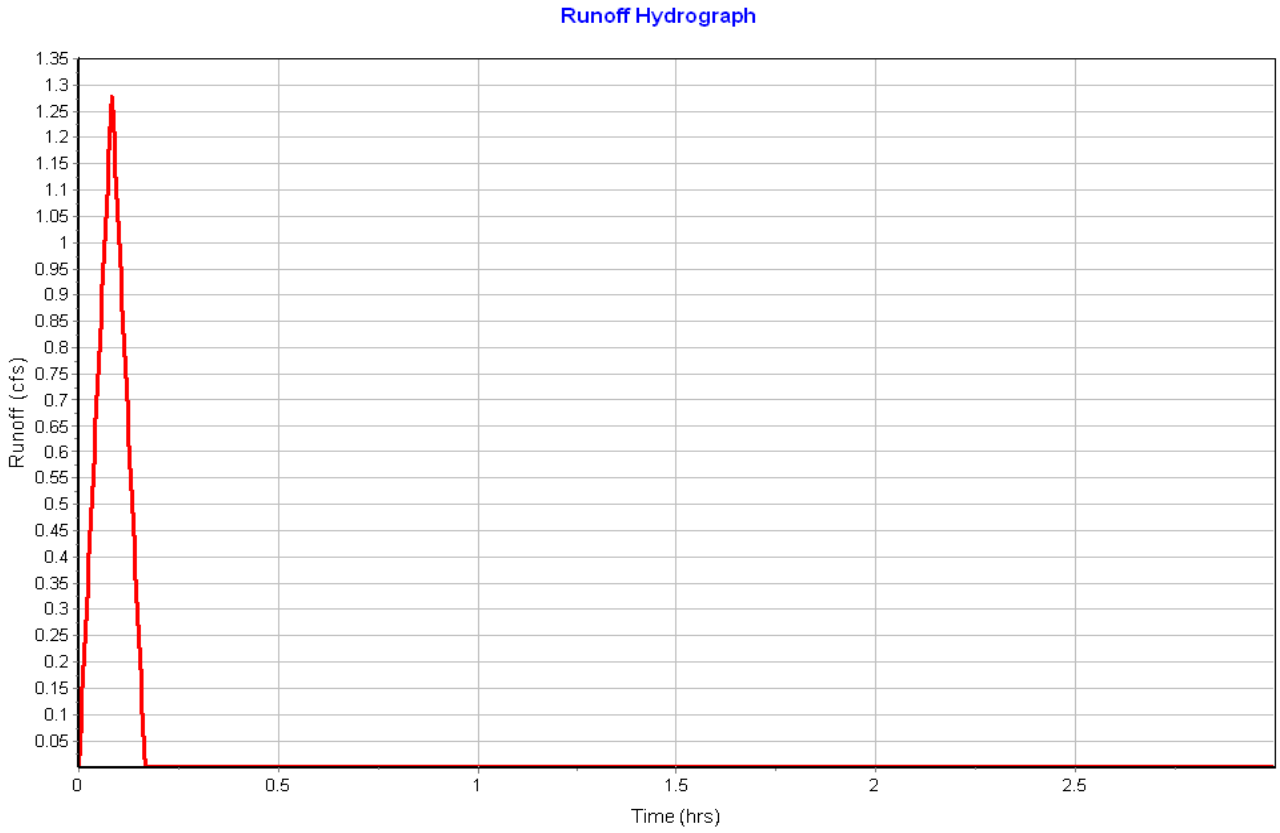
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.35
Peak Runoff (cfs) 1.28
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.8200
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-20



Subbasin : Pr-21

Input Data

Area (ac) 0.36
Weighted Runoff Coefficient 0.5500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.15	B (6%+)	0.97
Open Space, 25 years or greater	0.22	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.37		0.55

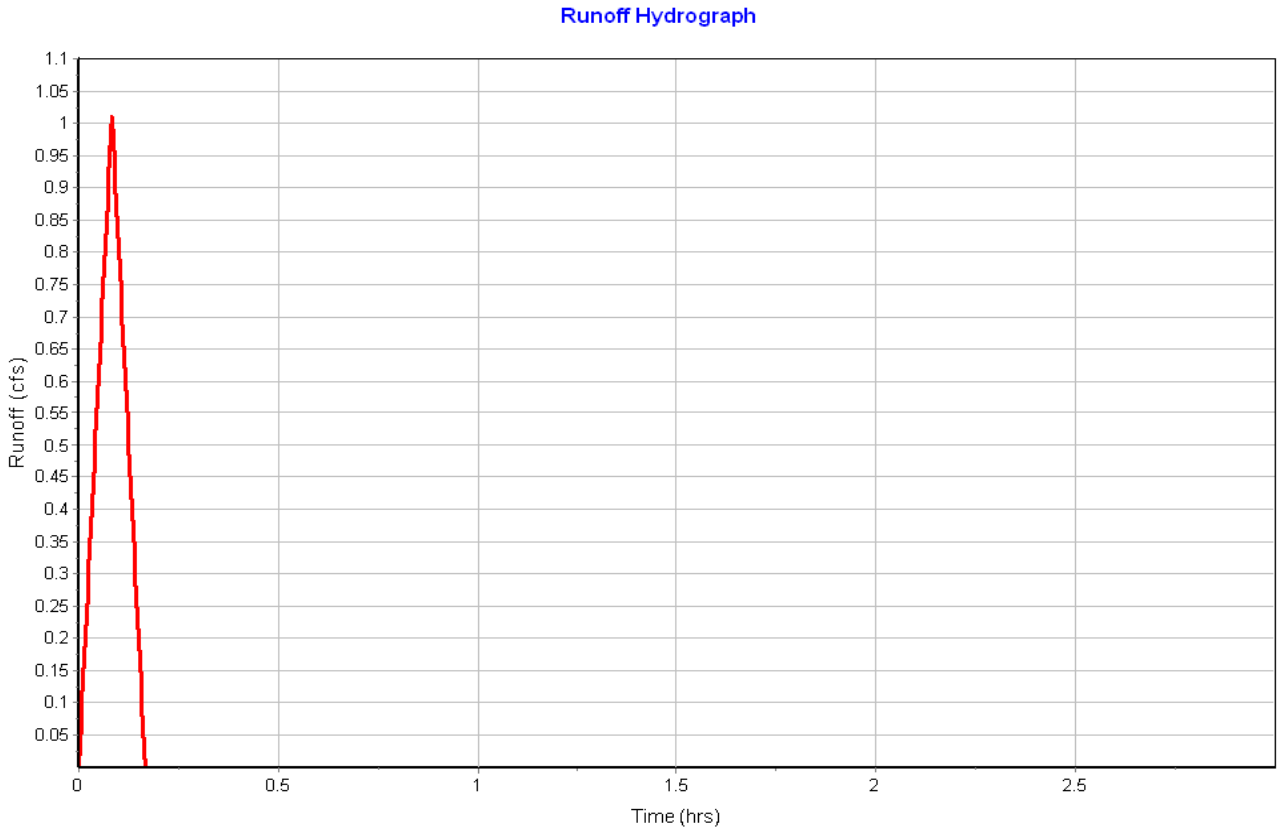
Time of Concentration

User-Defined TOC override (minutes): 5.00

Subbasin Runoff Results

Total Rainfall (in) 0.42
Total Runoff (in) 0.23
Peak Runoff (cfs) 1.01
Rainfall Intensity 5.050
Weighted Runoff Coefficient 0.5500
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-21



Subbasin : Pr-OS-1

Input Data

Area (ac) 124.70
Weighted Runoff Coefficient 0.3600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	117.22	B (6%+)	0.37
Forest, 25 years or greater	7.48	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	124.70		0.36

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	10	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.21	0.00	0.00
Computed Flow Time (min) :	8.01	0.00	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3200	0.00	0.00
Slope (%) :	15	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	0.00	0.00
Computed Flow Time (min) :	13.78	0.00	0.00

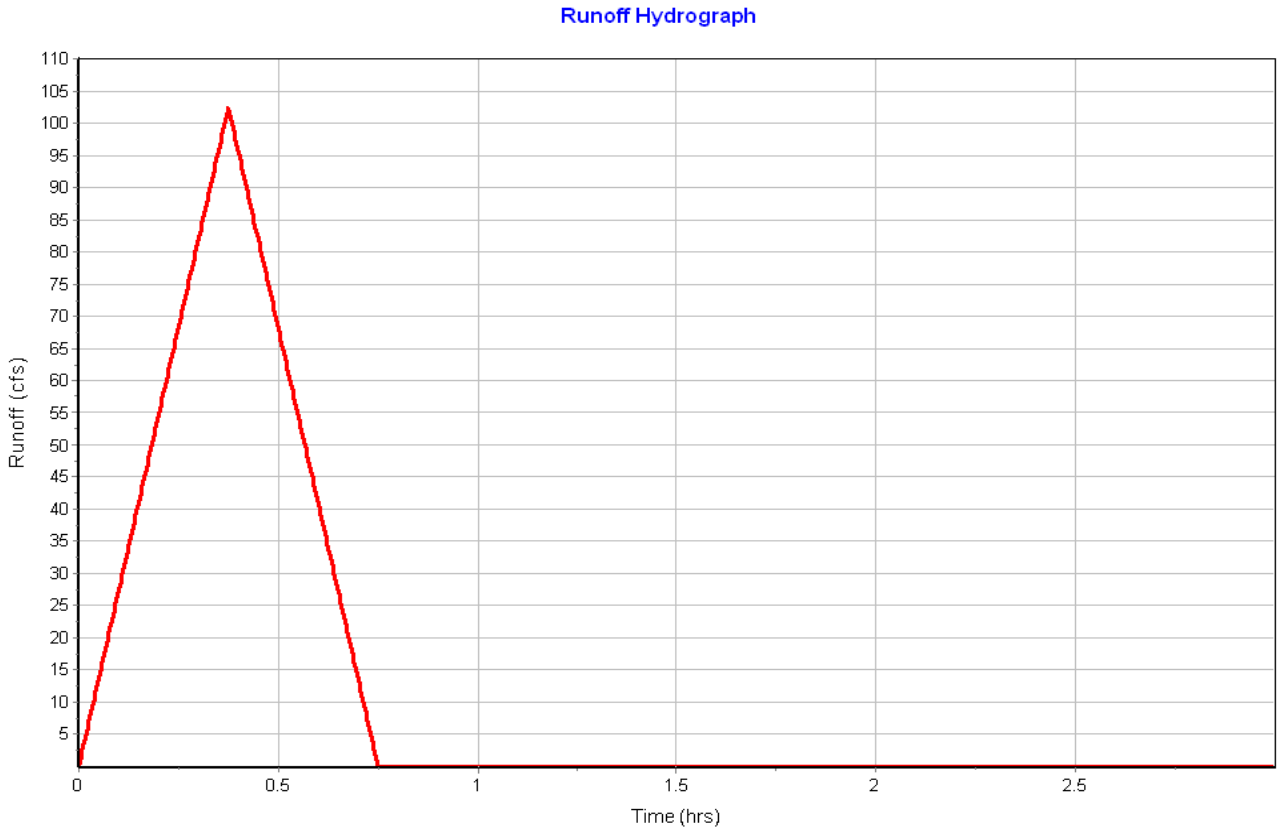
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	0.66	0.00	0.00

Total TOC (min) 22.45

Subbasin Runoff Results

Total Rainfall (in) 0.86
Total Runoff (in) 0.31
Peak Runoff (cfs) 102.44
Rainfall Intensity 2.282
Weighted Runoff Coefficient 0.3600
Time of Concentration (days hh:mm:ss) 0 00:22:27

Subbasin : Pr-OS-1



Subbasin : Pr-OS-2

Input Data

Area (ac) 9.37
Weighted Runoff Coefficient 0.2800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	2.06	B (6%+)	0.37
Forest, 25 years or greater	7.31	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	9.37		0.28

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	45	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.38	0.00	0.00
Computed Flow Time (min) :	4.39	0.00	0.00

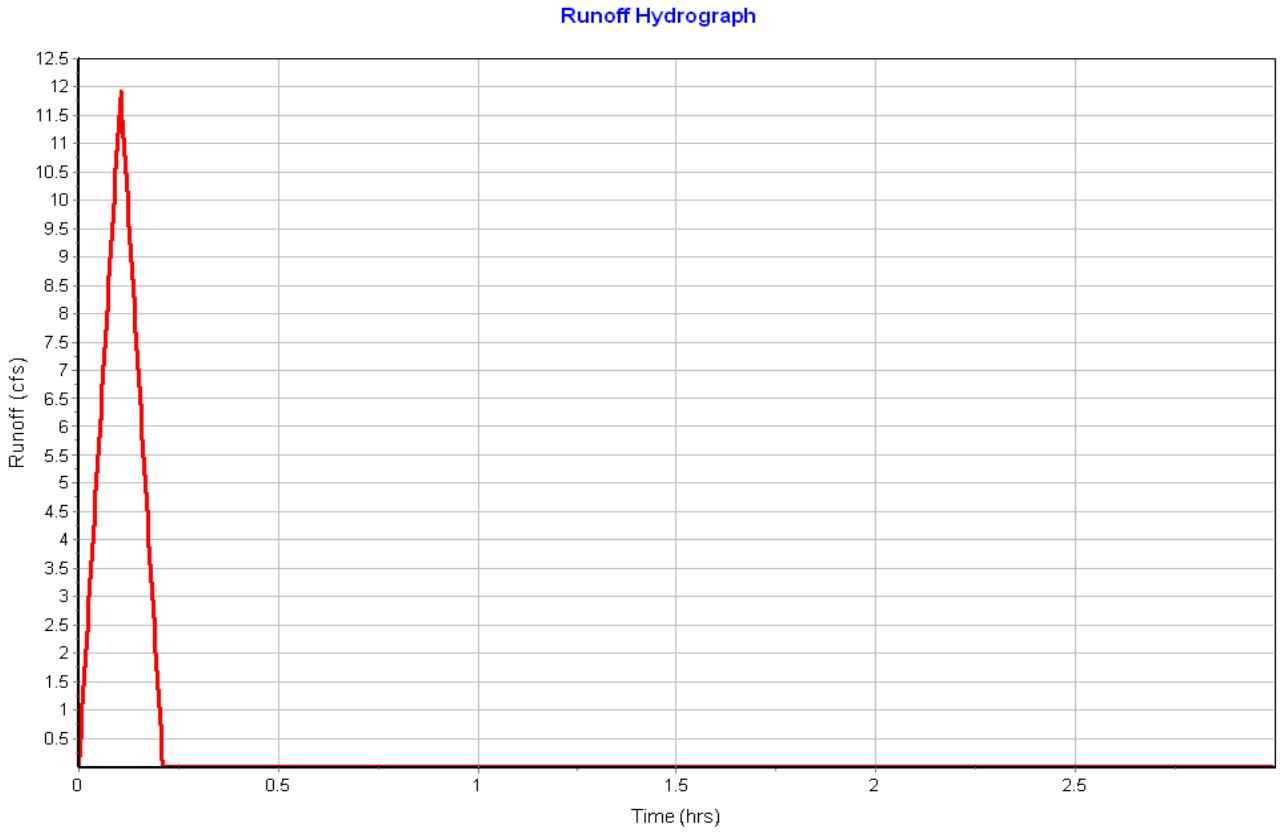
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in) 0.48
Total Runoff (in) 0.13
Peak Runoff (cfs) 11.93
Rainfall Intensity 4.546
Weighted Runoff Coefficient 0.2800
Time of Concentration (days hh:mm:ss) 0 00:06:19

Subbasin : Pr-OS-2



Subbasin : Walmart

Input Data

Area (ac) 1.55
Weighted Runoff Coefficient 0.9500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	3.28	-	0.95
Composite Area & Weighted Runoff Coeff.	3.28		0.95

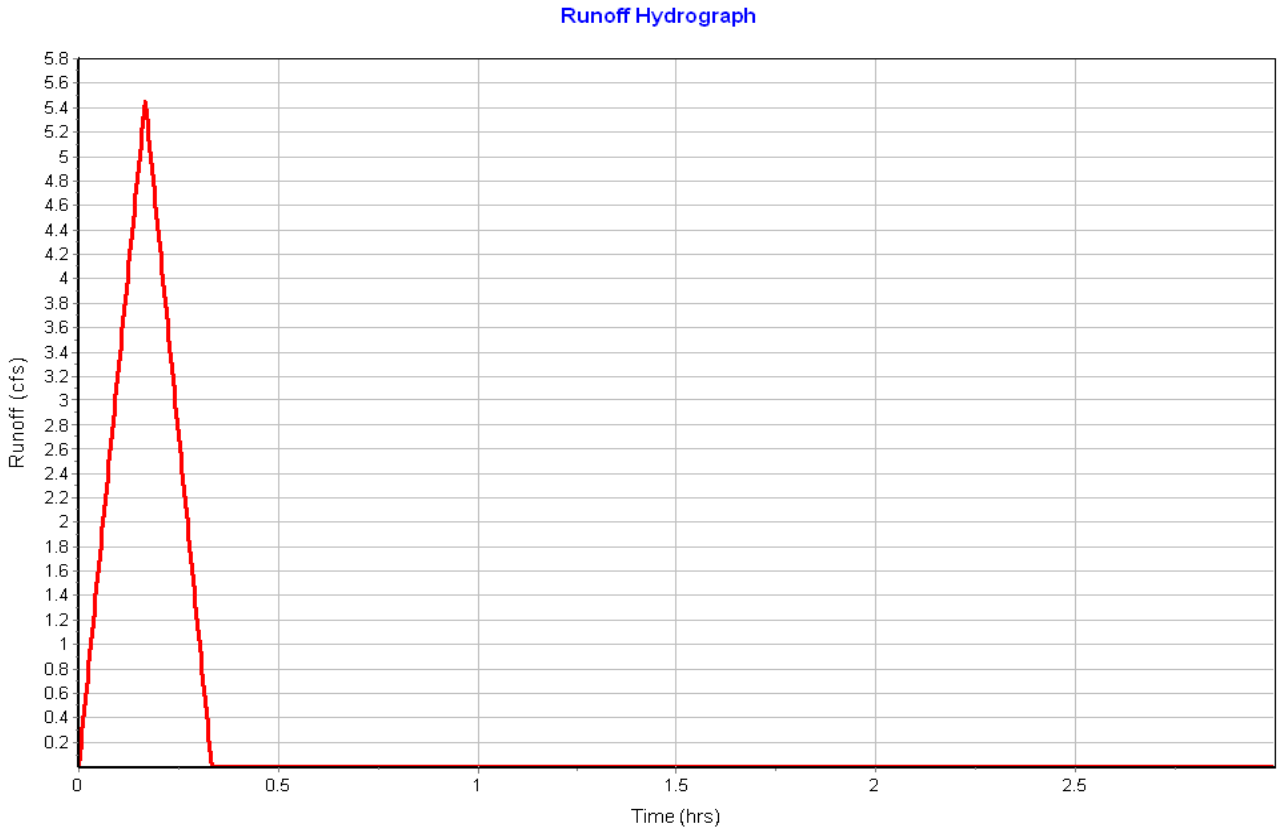
Time of Concentration

User-Defined TOC override (minutes): 10

Subbasin Runoff Results

Total Rainfall (in) 0.62
Total Runoff (in) 0.59
Peak Runoff (cfs) 5.45
Rainfall Intensity 3.700
Weighted Runoff Coefficient 0.9500
Time of Concentration (days hh:mm:ss) 0 00:10:00

Subbasin : Walmart



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)
1	EDB-Control	5863.00	5866.00	3.00	5863.00	0.00
2	FES-B10	5863.00	5869.00	6.00	5863.00	0.00
3	Int-Blake-Palmer	5859.50	5859.50	0.00	5859.50	0.00
4	Junc.H-04	5870.00	5876.00	6.00	5870.00	0.00
5	Junc.H-Blake-S	5858.00	5864.00	6.00	5858.00	0.00
6	Junc-H-02	5885.00	5891.00	6.00	5885.00	0.00
7	Junc-H-03	5888.00	5894.00	6.00	5888.00	0.00
8	Junc-Pr-Blake-S	5858.20	5858.20	0.00	5858.20	0.00
9	OS-1a	5942.00	5942.00	0.00	5942.00	0.00
10	OS-1b	5906.00	5906.00	0.00	5906.00	0.00
11	OS-2a	5942.00	5942.00	0.00	5942.00	0.00
12	Out-H-01	5875.00	5881.00	6.00	5875.00	0.00
13	Pr-26th	5876.00	5877.00	1.00	5876.00	0.00
14	Road-Palmer-B-12	5888.00	5888.00	0.00	5888.00	0.00
15	SDHM-A10	5896.00	5899.00	3.00	5896.00	0.00
16	SDMH-A4	5889.50	5899.80	10.30	5889.50	0.00
17	SDMH-A5	5888.90	5893.65	4.75	5888.90	0.00
18	SDMH-A6	5886.30	5890.77	4.47	5886.30	0.00
19	SDMH-A9	5894.20	5900.19	5.99	5894.20	0.00
20	SDMH-B9	5864.00	5867.21	3.21	5864.00	0.00
21	UG-Detention-Control	5858.30	5858.30	0.00	5858.30	0.00

Junction Results

SN	Element ID	Peak Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Total Flooded Volume	Total Time Flooded
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(ft³)	(min)
1	EDB-Control	0.160	5863.10	0.10	2.90	5863.07	0.07	0 00:16	0.00	0.00
2	FES-B10	12.640	5864.09	1.09	4.91	5863.06	0.06	0 00:05	0.00	0.00
3	Int-Blake-Palmer	4.340	5859.82	0.32	0.28	5859.52	0.02	0 00:07	0.00	0.00
4	Junc.H-04	1.100	5870.00	0.00	6.00	5870.00	0.00	0 00:00	0.00	0.00
5	Junc.H-Blake-S	15.990	5858.00	0.00	6.00	5858.00	0.00	0 00:00	0.00	0.00
6	Junc-H-02	0.770	5885.00	0.00	6.00	5885.00	0.00	0 00:00	0.00	0.00
7	Junc-H-03	0.610	5888.00	0.00	6.00	5888.00	0.00	0 00:00	0.00	0.00
8	Junc-Pr-Blake-S	5.620	5858.70	0.50	0.75	5858.30	0.10	0 00:10	0.00	0.00
9	OS-1a	102.440	5942.96	0.96	0.54	5942.16	0.16	0 00:22	0.00	0.00
10	OS-1b	102.290	5906.96	0.96	0.54	5906.16	0.16	0 00:22	0.00	0.00
11	OS-2a	11.930	5942.30	0.30	0.20	5942.01	0.01	0 00:06	0.00	0.00
12	Out-H-01	102.440	5875.00	0.00	6.00	5875.00	0.00	0 00:00	0.00	0.00
13	Pr-26th	102.120	5876.52	0.52	0.48	5876.10	0.10	0 00:22	0.00	0.00
14	Road-Palmer-B-12	11.510	5888.73	0.73	0.52	5888.04	0.04	0 00:06	0.00	0.00
15	SDHM-A10	1.150	5896.37	0.37	2.63	5896.01	0.01	0 00:05	0.00	0.00
16	SDMH-A4	3.660	5894.15	4.65	5.65	5893.81	4.31	0 00:05	0.00	0.00
17	SDMH-A5	4.160	5889.55	0.65	4.10	5888.93	0.03	0 00:05	0.00	0.00
18	SDMH-A6	4.150	5887.15	0.85	3.63	5886.53	0.23	0 00:05	0.00	0.00
19	SDMH-A9	1.110	5894.76	0.56	5.43	5894.41	0.21	0 00:05	0.00	0.00
20	SDMH-B9	12.700	5865.09	1.09	2.12	5864.06	0.06	0 00:05	0.00	0.00
21	UG-Detention-Control	1.650	5858.80	0.50	1.50	5858.40	0.10	0 00:10	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)
1	Bypass-A1	31.56	5896.57	4.07	5896.57	4.57	0.00	0.0100	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
2	Bypass-A2	140.00	5896.57	4.57	5876.00	0.00	20.57	14.6900	User-Defined	1.000	32.000	0.0160	0.5000	0.5000	0.0000	0.000
3	Bypass-B1	64.47	5883.39	3.79	5876.84	3.74	6.55	10.1700	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
4	Bypass-B2	71.42	5883.39	4.29	5876.84	4.24	6.55	9.1800	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
5	Bypass-B3	85.00	5876.84	4.24	5868.74	4.04	8.10	9.5300	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
6	Bypass-B5	80.66	5876.84	3.74	5868.74	4.24	8.09	10.0300	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
7	Bypass-B6	84.14	5868.74	4.04	5861.29	2.79	7.46	8.8600	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
8	Bypass-B8	78.55	5868.74	4.24	5861.29	2.29	7.46	9.4900	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
9	Bypass-C1	18.27	5862.19	2.59	5861.29	2.29	0.90	4.9300	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
10	Bypass-C2	51.37	5861.29	2.29	5859.50	0.00	1.79	3.4800	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
11	Bypass-C3	58.47	5861.29	2.79	5859.50	0.00	1.79	3.0600	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
12	Link-Blake-S	230.46	5859.50	0.00	5858.20	0.00	1.30	0.5600	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
13	Out-Pr-Blake	200.00	5858.20	0.00	5856.00	4.60	2.20	1.1000	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
14	Road-B12	48.58	5888.00	0.00	5883.39	4.29	4.61	9.4800	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
15	Road-OS-1b	240.00	5906.00	0.00	5876.00	0.00	30.00	12.5000	User-Defined	1.000	32.000	0.0160	0.5000	0.5000	0.0000	0.000
16	Swale-OS-1a	143.20	5942.00	0.00	5804.00	-102.00	138.00	96.3700	Trapezoidal	1.500	12.000	0.0300	0.5000	0.5000	0.0000	0.000
17	Swale-OS-2	146.88	5942.00	0.00	5889.00	0.00	53.00	36.0800	Trapezoidal	0.500	6.000	0.0300	0.5000	0.5000	0.0000	0.000

Channel Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Bypass-A1	0.480	0 00:05	19.280	0.02	1.79	0.29	0.20	0.34	0.00	
2	Bypass-A2	0.250	0 00:05	565.610	0.00	3.97	0.59	0.07	0.07	0.00	
3	Bypass-B1	0.160	0 00:05	68.980	0.00	6.05	0.18	0.09	0.14	0.00	
4	Bypass-B2	9.170	0 00:07	65.530	0.14	6.88	0.17	0.33	0.55	0.00	
5	Bypass-B3	7.820	0 00:07	66.770	0.12	6.74	0.21	0.31	0.52	0.00	
6	Bypass-B5	0.100	0 00:05	68.520	0.00	3.20	0.42	0.07	0.12	0.00	
7	Bypass-B6	6.110	0 00:07	64.400	0.09	6.18	0.23	0.29	0.49	0.00	
8	Bypass-B8	0.010	0 00:05	66.650	0.00	1.63	0.80	0.03	0.06	0.00	
9	Bypass-C1	0.100	0 00:05	95.740	0.00	3.96	0.08	0.06	0.11	0.00	
10	Bypass-C2	0.170	0 00:05	80.420	0.00	2.08	0.41	0.08	0.14	0.00	
11	Bypass-C3	3.760	0 00:07	75.380	0.05	3.15	0.31	0.24	0.41	0.00	
12	Link-Blake-S	4.100	0 00:08	32.380	0.13	4.25	0.90	0.31	0.52	0.00	
13	Out-Pr-Blake	5.450	0 00:09	45.210	0.12	2.44	1.37	0.31	0.52	0.00	
14	Road-B12	11.500	0 00:07	132.730	0.09	6.23	0.13	0.28	0.48	0.00	
15	Road-OS-1b	102.120	0 00:22	521.700	0.20	14.29	0.28	0.52	0.52	0.00	
16	Swale-OS-1a	102.290	0 00:22	260.630	0.39	18.12	0.13	0.96	0.64	0.00	
17	Swale-OS-2	11.820	0 00:06	30.080	0.39	10.14	0.24	0.30	0.60	0.00	

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	26thSt	25.49	5876.00	0.00	5875.00	0.00	1.00	3.9200	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
2	Link-B10	35.65	5863.00	0.00	5863.00	0.00	0.00	0.0000	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
3	Link-H-01	230.30	5875.00	0.00	5841.00	0.00	34.00	14.7600	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
4	Link-H-02	177.03	5885.00	0.00	5841.00	0.00	44.00	24.8500	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
5	Link-H-03	169.29	5888.00	0.00	5858.00	0.00	30.00	17.7200	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
6	Link-H-04	134.40	5870.00	0.00	5858.00	0.00	12.00	8.9300	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
7	Link-H-Blake-S	33.46	5858.00	0.00	5858.00	0.00	0.00	0.0000	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
8	Pipe-29thSt	265.00	5851.40	0.00	5850.80	0.00	0.60	0.2300	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.000	No	1
9	Pipe-A1	24.33	5892.50	0.00	5892.20	0.20	0.30	1.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
10	Pipe-A10	153.02	5896.00	0.00	5894.40	0.20	1.60	1.0500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
11	Pipe-A2	80.85	5892.00	0.00	5891.20	0.20	0.80	0.9900	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
12	Pipe-A3	133.17	5891.00	0.00	5889.70	0.20	1.30	0.9800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
13	Pipe-A4	29.56	5889.50	0.00	5888.90	0.00	0.60	2.0300	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
14	Pipe-A5	117.00	5888.90	0.00	5886.50	0.20	2.40	2.0500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
15	Pipe-A6	240.10	5886.30	0.00	5879.80	3.00	6.50	2.7100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
16	Pipe-A7	54.21	5876.80	0.00	5863.00	0.00	13.80	25.4600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
17	Pipe-A9	34.80	5894.20	0.00	5893.80	4.30	0.40	1.1500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
18	Pipe-B1	24.33	5879.60	0.00	5879.30	0.20	0.30	1.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
19	Pipe-B11	15.00	5883.00	-0.30	5880.00	0.90	3.00	20.0000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
20	Pipe-B12	15.00	5889.00	0.00	5888.00	0.00	1.00	6.6700	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
21	Pipe-B2	65.73	5879.10	0.00	5872.80	0.20	6.30	9.5800	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
22	Pipe-B3	82.21	5872.60	0.00	5864.70	0.00	7.90	9.6100	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
23	Pipe-B4	20.78	5876.90	0.00	5873.30	0.20	3.60	17.3300	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
24	Pipe-B5	24.33	5873.10	0.00	5872.80	0.20	0.30	1.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
25	Pipe-B6	24.34	5864.70	0.00	5864.50	0.00	0.20	0.8200	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.000	No	1
26	Pipe-B7	29.28	5870.20	0.00	5864.70	0.00	5.50	18.7800	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
27	Pipe-B8	57.48	5864.50	0.00	5864.00	0.00	0.50	0.8700	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.000	No	1
28	Pipe-B9	125.34	5864.00	0.00	5863.00	0.00	1.00	0.8000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.000	No	1
29	Pipe-C1	14.31	5859.60	0.00	5859.20	0.20	0.40	2.8000	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
30	Pipe-C2	19.75	5859.00	0.00	5858.80	0.30	0.20	1.0100	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
31	Pipe-C3	27.52	5858.80	0.30	5858.50	5.00	0.30	1.0900	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
32	Pipe-C4	20.00	5858.50	5.00	5858.40	0.00	0.10	0.5000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.000	No	1
33	Pipe-EDB-Control	28.55	5863.00	0.00	5862.00	0.00	1.00	3.5000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
34	Pipe-UG-Control	20.00	5858.30	0.00	5858.20	0.00	0.10	0.5000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)
1	26thSt	102.120	0 00:22	0.00	0.00	0.00		0.00	0.00	0.00
2	Link-B10	12.640	0 00:05	0.00	0.05	0.00		0.24	0.41	0.00
3	Link-H-01	102.440	0 00:22	0.00	0.13	0.00		0.31	0.52	0.00
4	Link-H-02	0.770	0 00:06	0.00	0.13	0.00		0.31	0.52	0.00
5	Link-H-03	0.610	0 00:06	0.00	0.13	0.00		0.31	0.52	0.00
6	Link-H-04	1.100	0 00:07	0.00	0.13	0.00		0.31	0.52	0.00
7	Link-H-Blake-S	15.990	0 00:06	0.00	0.13	0.00		0.31	0.52	0.00
8	Pipe-29thSt	5.860	0 00:12	5.41	1.08	3.85	1.15	1.41	0.94	0.00
9	Pipe-A1	0.860	0 00:05	4.29	0.20	4.98	0.08	0.30	0.30	0.00
10	Pipe-A10	1.110	0 00:05	3.95	0.28	7.14	0.36	0.36	0.36	0.00
11	Pipe-A2	1.540	0 00:05	3.84	0.40	4.64	0.29	0.44	0.44	0.00
12	Pipe-A3	2.570	0 00:05	3.81	0.67	5.26	0.42	0.60	0.60	0.00
13	Pipe-A4	3.660	0 00:05	9.97	0.37	7.50	0.07	0.52	0.42	0.00
14	Pipe-A5	4.150	0 00:05	5.53	0.75	7.77	0.25	0.65	0.65	0.00
15	Pipe-A6	4.110	0 00:06	6.35	0.65	8.72	0.46	0.58	0.58	0.00
16	Pipe-A7	6.480	0 00:06	19.47	0.33	22.29	0.04	0.40	0.40	0.00
17	Pipe-A9	1.110	0 00:05	4.14	0.27	4.47	0.13	0.35	0.35	0.00
18	Pipe-B1	0.570	0 00:05	4.29	0.13	4.34	0.09	0.25	0.25	0.00
19	Pipe-B11	3.200	0 00:05	32.82	0.10	16.99	0.01	0.26	0.21	0.00
20	Pipe-B12	11.510	0 00:06	18.07	0.64	15.59	0.02	0.72	0.58	0.00
21	Pipe-B2	5.810	0 00:05	21.67	0.27	14.97	0.07	0.44	0.35	0.00
22	Pipe-B3	9.110	0 00:05	21.69	0.42	16.91	0.08	0.57	0.45	0.00
23	Pipe-B4	0.880	0 00:05	5.45	0.16	11.47	0.03	0.18	0.27	0.00
24	Pipe-B5	1.370	0 00:05	4.29	0.32	4.85	0.08	0.39	0.39	0.00
25	Pipe-B6	11.730	0 00:05	22.21	0.53	7.17	0.06	1.03	0.52	0.00
26	Pipe-B7	0.870	0 00:05	5.67	0.15	11.78	0.04	0.18	0.26	0.00
27	Pipe-B8	11.810	0 00:05	22.86	0.52	7.34	0.13	1.02	0.51	0.00
28	Pipe-B9	12.640	0 00:05	21.89	0.58	7.24	0.29	1.09	0.55	0.00
29	Pipe-C1	0.440	0 00:05	2.19	0.20	4.91	0.05	0.20	0.30	0.00
30	Pipe-C2	1.120	0 00:05	1.32	0.85	4.24	0.08	0.47	0.71	0.00
31	Pipe-C3	3.320	0 00:07	7.31	0.45	5.81	0.08	0.59	0.47	0.00
32	Pipe-C4	4.370	0 00:05	8.05	0.54	4.65	0.07	0.79	0.52	0.00
33	Pipe-EDB-Control	0.160	0 00:16	13.10	0.01	3.66	0.13	0.10	0.08	0.00
34	Pipe-UG-Control	1.650	0 00:10	4.95	0.33	3.62	0.09	0.50	0.40	0.00

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)
1	A1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.50	5896.57	4.07	5892.50	0.00	N/A	25.00
2	A2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.00	5896.57	4.57	5892.00	0.00	N/A	25.00
3	A3-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5891.00	5896.76	5.76	5891.00	0.00	100.00	50.00
4	Inlet-A7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.80	5883.87	7.07	5876.80	0.00	100.00	50.00
5	Inlet-B1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.60	5883.39	3.79	5879.60	0.00	N/A	25.00
6	Inlet-B11-(Nylo)	CALTRANS	GCP	On Sag	1	5883.30	5899.00	15.70	5883.30	0.00	36.00	50.00
7	Inlet-B12-(Nylo)	CALTRANS	GCP	On Sag	1	5889.00	5901.00	12.00	5889.00	0.00	36.00	50.00
8	Inlet-B2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.10	5883.39	4.29	5879.10	0.00	N/A	25.00
9	Inlet-B3-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5872.60	5876.84	4.24	5872.60	0.00	N/A	25.00
10	Inlet-B4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.90	5880.96	4.06	5876.90	0.00	100.00	50.00
11	Inlet-B5-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5873.10	5876.84	3.74	5873.10	0.00	N/A	25.00
12	Inlet-B6-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.70	5868.74	4.04	5864.70	0.00	N/A	25.00
13	Inlet-B7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5870.20	5874.26	4.06	5870.20	0.00	0.00	50.00
14	Inlet-B8-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.50	5868.74	4.24	5864.50	0.00	N/A	25.00
15	Inlet-C1-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.60	5862.19	2.59	5859.60	0.00	N/A	50.00
16	Inlet-C2-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.00	5861.29	2.29	5859.00	0.00	N/A	50.00
17	Inlet-C3-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5858.50	5861.29	2.79	5858.50	0.00	N/A	50.00
18	Inlet-C4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5853.50	5862.46	8.96	5853.50	0.00	0.00	50.00
19	Inlet-Walmart	FHWA HEC-22 GENERIC	N/A	On Sag	1	5851.40	5856.00	4.60	5851.40	0.00	100.00	25.00

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	A1-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
2	A2-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
3	A3-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
4	Inlet-A7-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
5	Inlet-B1-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
6	Inlet-B11-(Nylo)	N/A	0.0208	0.0300	0.0620	2.00	0.0656	7.00
7	Inlet-B12-(Nylo)	N/A	0.0208	0.0300	0.0620	2.00	0.3937	7.00
8	Inlet-B2-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
9	Inlet-B3-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
10	Inlet-B4-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
11	Inlet-B5-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
12	Inlet-B6-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
13	Inlet-B7-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
14	Inlet-B8-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
15	Inlet-C1-(Type-16)	0.0100	0.0200	0.0160	0.0620	2.00	0.0656	7.00
16	Inlet-C2-(Type-13)	0.0100	0.0200	0.0160	0.0620	2.00	0.0656	7.00
17	Inlet-C3-(Type-13)	0.0100	0.0200	0.0160	0.0620	2.00	0.0656	7.00
18	Inlet-C4-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
19	Inlet-Walmart	N/A	0.0200	0.0160	0.0830	1.50	0.0656	7.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ft^3)	Total Time Flooded (hr)
1	A1-(Type-R)	1.380	1.38	0.86	0.52	62.58	3.96	5896.75	0.17	0 00:05	0.00	0.00
2	A2-(Type-R)	0.950	0.51	0.69	0.26	72.66	3.01	5896.72	0.15	0 00:05	0.00	0.00
3	A3-(Type-16)	1.130	1.13	N/A	N/A	N/A	7.38	5897.15	0.39	0 00:05	0.00	0.00
4	Inlet-A7-(Type-16)	2.890	2.89	N/A	N/A	N/A	15.58	5884.42	0.56	0 00:06	0.00	0.00
5	Inlet-B1-(Type-R)	0.740	0.74	0.58	0.17	77.71	2.30	5883.53	0.14	0 00:05	0.00	0.00
6	Inlet-B11-(Nylo)	3.220	3.22	N/A	N/A	N/A	18.39	5899.63	0.63	0 00:05	0.00	0.00
7	Inlet-B12-(Nylo)	11.820	0.00	N/A	N/A	N/A	152.55	5905.09	4.09	0 00:06	0.00	0.00
8	Inlet-B2-(Type-R)	11.500	0.00	2.32	9.18	20.19	11.23	5883.71	0.32	0 00:05	0.00	0.00
9	Inlet-B3-(Type-R)	10.030	1.40	2.19	7.84	21.85	10.61	5877.15	0.31	0 00:05	0.00	0.00
10	Inlet-B4-(Type-16)	0.970	0.97	N/A	N/A	N/A	6.52	5881.30	0.34	0 00:05	0.00	0.00
11	Inlet-B5-(Type-R)	0.610	0.45	0.50	0.10	82.76	1.84	5876.97	0.13	0 00:05	0.00	0.00
12	Inlet-B6-(Type-R)	8.130	0.52	2.00	6.13	24.66	9.71	5869.03	0.29	0 00:05	0.00	0.00
13	Inlet-B7-(Type-16)	0.880	0.88	N/A	N/A	N/A	5.92	5874.59	0.33	0 00:05	0.00	0.00
14	Inlet-B8-(Type-R)	0.100	0.00	0.09	0.01	88.56	0.30	5868.77	0.02	0 00:05	0.00	0.00
15	Inlet-C1-(Type-16)	0.540	0.54	0.44	0.10	81.17	4.32	5862.36	0.17	0 00:05	0.00	0.00
16	Inlet-C2-(Type-13)	0.860	0.76	0.68	0.18	78.89	5.60	5861.48	0.20	0 00:05	0.00	0.00
17	Inlet-C3-(Type-13)	6.350	0.43	2.58	3.77	40.60	13.94	5861.65	0.36	0 00:07	0.00	0.00
18	Inlet-C4-(Type-16)	1.280	1.28	N/A	N/A	N/A	8.14	5862.87	0.41	0 00:05	0.00	0.00
19	Inlet-Walmart	5.460	0.20	N/A	N/A	N/A	15.32	5856.57	0.57	0 00:08	0.00	0.00

Storage Nodes

Storage Node : EDB-Detention

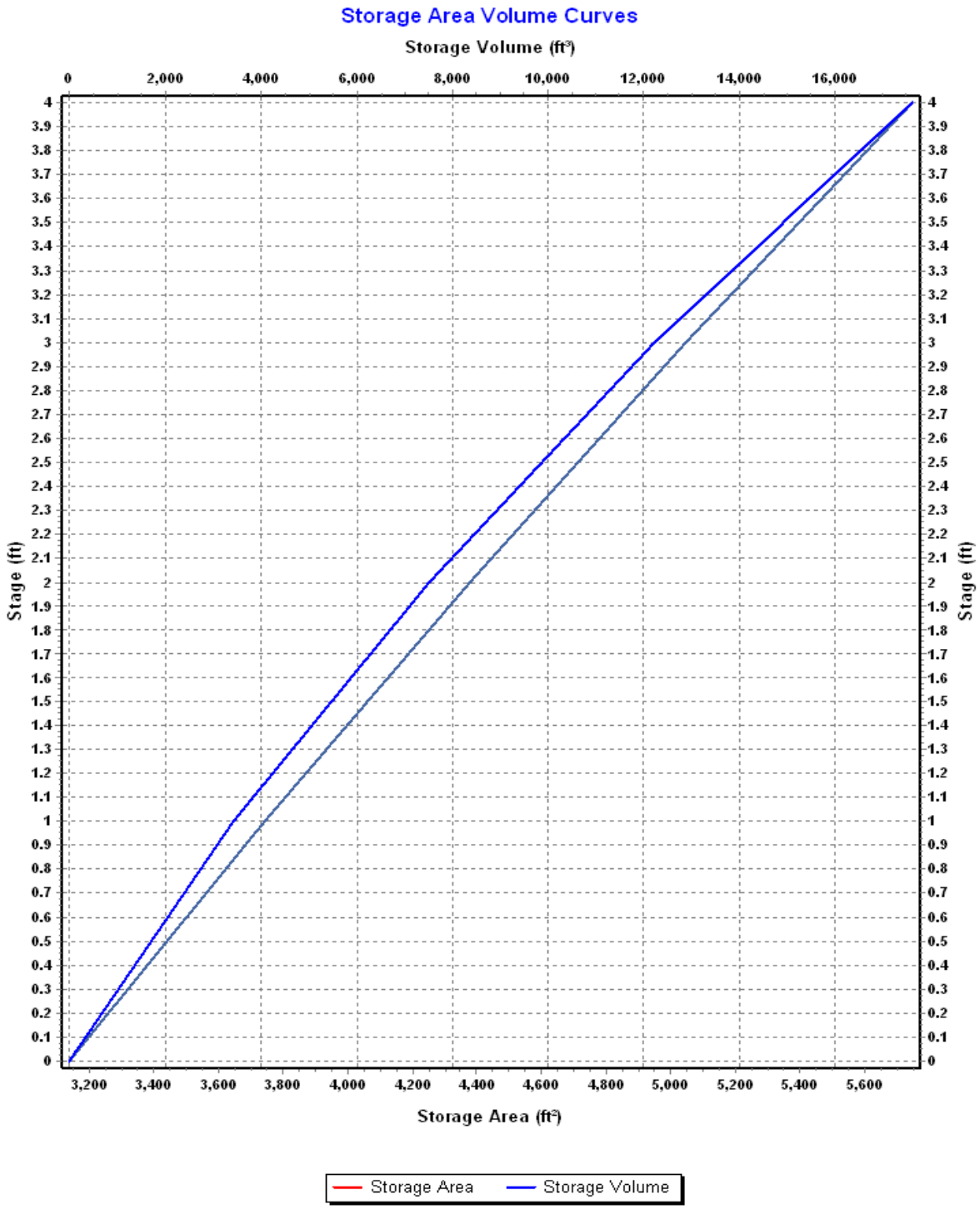
Input Data

Invert Elevation (ft)	5863.00
Max (Rim) Elevation (ft)	5869.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	5863.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : EDB

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	3139	0.000
1	3744	3441.50
2	4379	7503.00
3	5044	12214.50
4	5747	17610.00


Storage Area Volume Curves
Storage Volume (ft³)
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
Stage (ft)
Stage (ft)
Storage Area (ft²)
3,200
3,400
3,600
3,800
4,000
4,200
4,400
4,600
4,800
5,000
5,200
5,400
5,600
Storage Area
Storage Volume

Storage Node : EDB-Detention (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-EDB-100	Rectangular	No	5865.50	2.50	7.50	0.50	3.33
2	Weir-EDB-25	Rectangular	No	5864.75	1.75	0.25	0.75	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-EDB-WQCV	Side	CIRCULAR	No	1.25			5863.00	0.61

Output Summary Results

Peak Inflow (cfs)	19.08
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.16
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	5865.00
Max HGL Depth Attained (ft)	2
Average HGL Elevation Attained (ft)	5864.81
Average HGL Depth Attained (ft)	1.81
Time of Max HGL Occurrence (days hh:mm)	0 00:16
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : UG-Detention

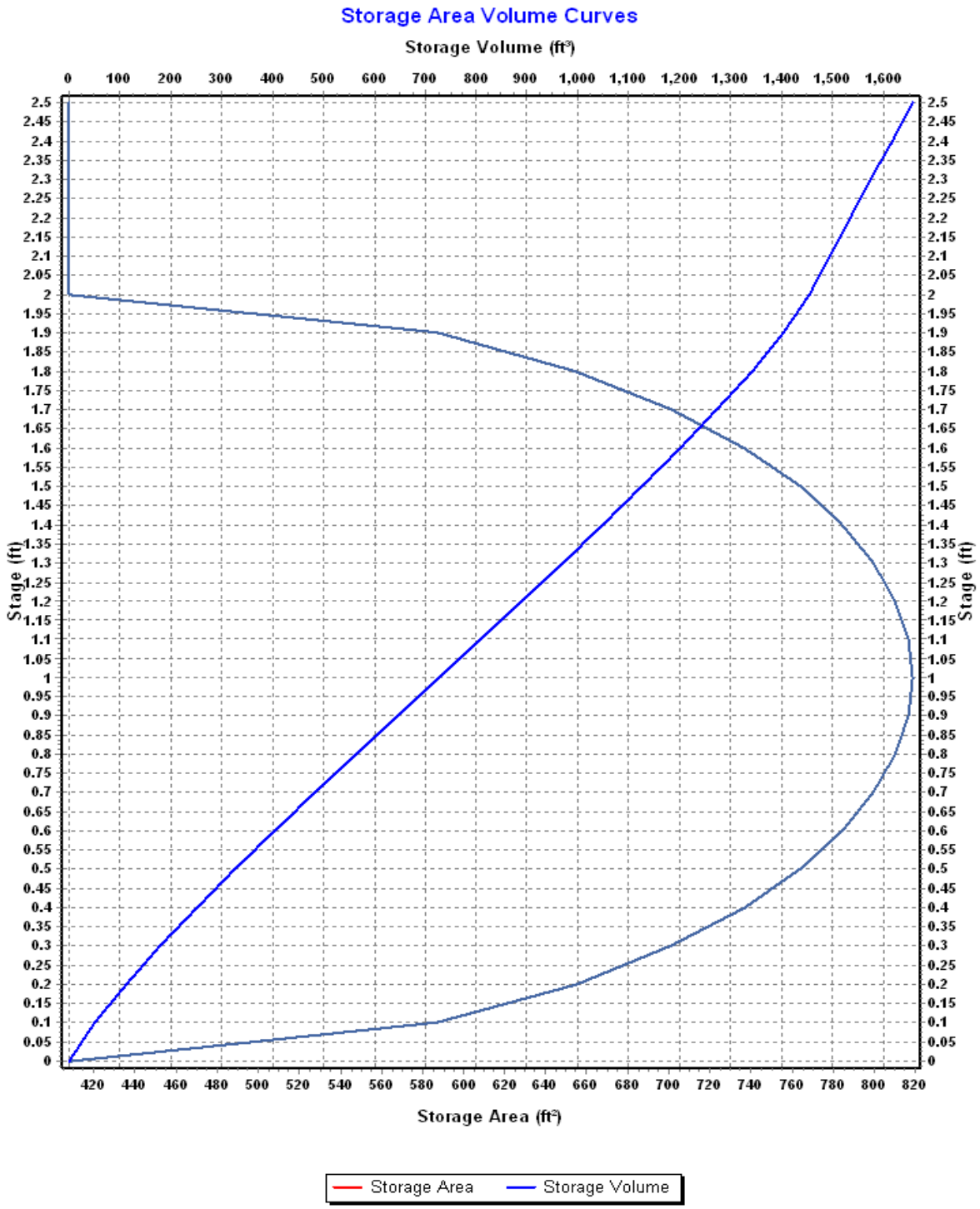
Input Data

Invert Elevation (ft)	5858.40
Max (Rim) Elevation (ft)	5861.40
Max (Rim) Offset (ft)	3.00
Initial Water Elevation (ft)	5858.40
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : UG-Detention

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	408.0000	0.000
0.1	586.8892	49.74
0.2	654.2400	111.80
0.3	701.0842	179.57
0.4	736.3200	251.44
0.5	763.4168	326.43
0.6	784.1378	403.81
0.7	799.4966	482.99
0.8	810.1082	563.47
0.9	816.3428	644.79
1	818.4000	726.53
1.1	816.3428	808.27
1.2	810.1082	889.59
1.3	799.4966	970.07
1.4	784.1378	1049.25
1.5	763.4168	1126.63
1.6	736.3200	1201.62
1.7	701.0842	1273.49
1.8	654.2400	1341.26
1.9	586.8892	1403.32
2	408.0000	1453.06
2.1	408.0000	1493.86
2.2	408.0000	1534.66
2.3	408.0000	1575.46
2.4	408.0000	1616.26
2.5	408.0000	1657.06


Storage Area Volume Curves
Storage Volume (ft³)
0 100 200 300 400 500 600 700 800 900 1,000 1,100 1,200 1,300 1,400 1,500 1,600
Stage (ft)
2.5 2.45 2.4 2.35 2.3 2.25 2.2 2.15 2.1 2.05 2 1.95 1.9 1.85 1.8 1.75 1.7 1.65 1.6 1.55 1.5 1.45 1.4 1.35 1.3 1.25 1.2 1.15 1.1 1.05 1 0.95 0.9 0.85 0.8 0.75 0.7 0.65 0.6 0.55 0.5 0.45 0.4 0.35 0.3 0.25 0.2 0.15 0.1 0.05 0
420 440 460 480 500 520 540 560 580 600 620 640 660 680 700 720 740 760 780 800 820
Storage Area (ft²)
Storage Area
Storage Volume

Storage Node : UG-Detention (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-UG-100	Rectangular	No	5859.90	1.50	1.00	0.50	3.33
2	Weir-UG-25	Rectangular	No	5858.40	0.00	0.25	1.50	3.33

Output Summary Results

Peak Inflow (cfs)	4.37
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	1.65
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	5859.96
Max HGL Depth Attained (ft)	1.56
Average HGL Elevation Attained (ft)	5858.63
Average HGL Depth Attained (ft)	0.23
Time of Max HGL Occurrence (days hh:mm)	0 00:10
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : Walmart-Detention

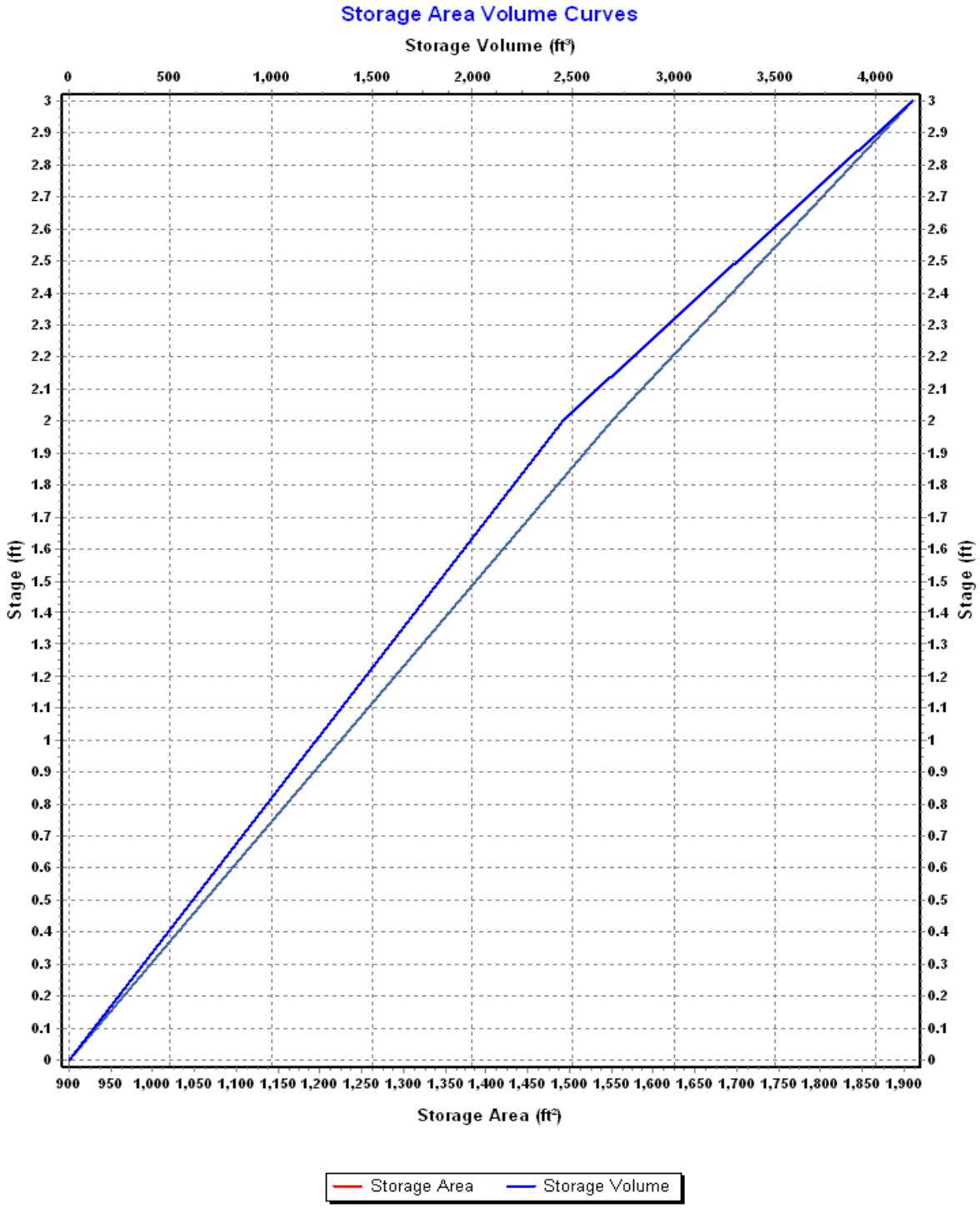
Input Data

Invert Elevation (ft)	5852.00
Max (Rim) Elevation (ft)	5855.00
Max (Rim) Offset (ft)	3.00
Initial Water Elevation (ft)	5852.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Walmart

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	900	0.000
2	1550	2450.00
3	1910	4180.00


Storage Area Volume Curves
Storage Volume (ft³)
0
500
1,000
1,500
2,000
2,500
3,000
3,500
4,000
Stage (ft)
Storage Area (ft²)
900
950
1,000
1,050
1,100
1,150
1,200
1,250
1,300
1,350
1,400
1,450
1,500
1,550
1,600
1,650
1,700
1,750
1,800
1,850
1,900
Storage Area
Storage Volume

Storage Node : Walmart-Detention (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Walmart-Det-Control	Side	CIRCULAR	No	5.60			5852.00	0.61

Output Summary Results

Peak Inflow (cfs)	5.45
Peak Lateral Inflow (cfs)	5.45
Peak Outflow (cfs)	1.13
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	5854.02
Max HGL Depth Attained (ft)	2.02
Average HGL Elevation Attained (ft)	5852.47
Average HGL Depth Attained (ft)	0.47
Time of Max HGL Occurrence (days hh:mm)	0 00:18
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Project Description

File Name 20002-SSA.SPF

Project Options

Flow Units ..... CFS
Elevation Type ..... Elevation
Hydrology Method ..... Rational
Time of Concentration (TOC) Method ..... SCS TR-55
Link Routing Method ..... Kinematic Wave
Enable Overflow Ponding at Nodes ..... YES
Skip Steady State Analysis Time Periods ..... YES

Rainfall Details

Return Period..... 100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ft³)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Blake@Walmart	0.040	0.97	0.55	0.53	77.0	0.26	0 00:05:00
2	H/Ex-01	1.551	0.37	0.67	0.25	1385.3	3.20	0 00:07:12
3	H/Ex-02	0.461	0.37	0.63	0.23	391.6	0.99	0 00:06:30
4	H/Ex-03	0.366	0.37	0.63	0.23	310.0	0.79	0 00:06:32
5	H/Ex-05	3.903	0.37	0.75	0.28	3938.8	7.37	0 00:08:45
6	H/Ex-OS-1	124.700	0.36	1.10	0.40	179253.8	131.82	0 00:22:27
7	H/Ex-OS-2	9.370	0.28	0.62	0.18	5952.3	15.50	0 00:06:19
8	H-04	0.702	0.37	0.67	0.25	634.7	1.43	0 00:07:23
9	Pr-01	0.570	0.48	0.55	0.26	541.8	1.79	0 00:05:00
10	Pr-02	0.122	0.83	0.55	0.45	201.5	0.67	0 00:05:00
11	Pr-03	0.283	0.79	0.55	0.43	444.3	1.47	0 00:05:00
12	Pr-04	0.330	0.33	0.55	0.18	215.6	0.71	0 00:05:00
13	Pr-05	0.147	0.77	0.55	0.42	224.2	0.74	0 00:05:00
14	Pr-06	0.292	0.78	0.55	0.43	450.9	1.49	0 00:05:00
15	Pr-07	0.745	0.77	0.55	0.42	1137.8	3.76	0 00:05:00
16	Pr-08	0.181	0.81	0.55	0.44	291.2	0.96	0 00:05:00
17	Pr-09	1.677	0.38	0.55	0.21	1266.2	4.18	0 00:05:00
18	Pr-10	0.417	0.46	0.55	0.25	379.6	1.26	0 00:05:00
19	Pr-11	0.221	0.87	0.55	0.48	381.0	1.26	0 00:05:00
20	Pr-12	0.145	0.62	0.55	0.34	178.6	0.59	0 00:05:00
21	Pr-13	0.414	0.67	0.55	0.37	550.4	1.82	0 00:05:00
22	Pr-14	0.203	0.86	0.55	0.47	345.6	1.14	0 00:05:00
23	Pr-15	0.130	0.79	0.55	0.43	204.1	0.67	0 00:05:00
24	Pr-16	0.167	0.71	0.55	0.39	235.4	0.78	0 00:05:00
25	Pr-17	0.050	0.63	0.55	0.34	62.7	0.21	0 00:05:00
26	Pr-18	0.114	0.95	0.55	0.52	213.8	0.71	0 00:05:00
27	Pr-19	0.104	0.82	0.55	0.45	169.6	0.56	0 00:05:00
28	Pr-20	0.309	0.82	0.55	0.45	502.3	1.66	0 00:05:00
29	Pr-21	0.364	0.55	0.55	0.30	397.7	1.31	0 00:05:00
30	Pr-OS-1	124.700	0.36	1.10	0.40	179253.8	131.82	0 00:22:27
31	Pr-OS-2	9.370	0.28	0.62	0.18	5952.3	15.50	0 00:06:19
32	Walmart	1.550	0.95	0.80	0.76	4287.4	7.08	0 00:10:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ft³)	Total Time Flooded (min)
1	EDB-Control	Junction	5863.00	5866.00	5863.00	0.00	0.00	0.470	5863.16	0.00	2.84	0 00:00	0.00	0.00
2	FES-B10	Junction	5863.00	5869.00	5863.00	0.00	0.00	15.550	5864.25	0.00	4.75	0 00:00	0.00	0.00
3	Int-Blake-Palmer	Junction	5859.50	5859.50	5859.50	0.00	0.00	6.800	5859.86	0.00	0.24	0 00:00	0.00	0.00
4	Junc.H-04	Junction	5870.00	5876.00	5870.00	5876.00	0.00	1.430	5870.00	0.00	6.00	0 00:00	0.00	0.00
5	Junc.H-Blake-S	Junction	5858.00	5864.00	5858.00	5864.00	0.00	20.780	5858.00	0.00	6.00	0 00:00	0.00	0.00
6	Junc-H-02	Junction	5885.00	5891.00	5885.00	5891.00	0.00	0.990	5885.00	0.00	6.00	0 00:00	0.00	0.00
7	Junc-H-03	Junction	5888.00	5894.00	5888.00	5894.00	0.00	0.790	5888.00	0.00	6.00	0 00:00	0.00	0.00
8	Junc-Pr-Blake-S	Junction	5858.20	5858.20	5858.20	0.00	0.00	9.140	5858.88	0.00	0.57	0 00:00	0.00	0.00
9	OS-1a	Junction	5942.00	5942.00	5942.00	0.00	0.00	131.820	5943.09	0.00	0.41	0 00:00	0.00	0.00
10	OS-1b	Junction	5906.00	5906.00	5906.00	0.00	0.00	131.640	5907.09	0.00	0.41	0 00:00	0.00	0.00
11	OS-2a	Junction	5942.00	5942.00	5942.00	0.00	0.00	15.500	5942.35	0.00	0.15	0 00:00	0.00	0.00
12	Out-H-01	Junction	5875.00	5881.00	5875.00	5881.00	0.00	131.820	5875.00	0.00	6.00	0 00:00	0.00	0.00
13	Pr-26th	Junction	5876.00	5877.00	5876.00	11753.00	0.00	131.440	5876.57	0.00	0.43	0 00:00	0.00	0.00
14	Road-Palmer-B-12	Junction	5888.00	5888.00	5888.00	0.00	0.00	14.830	5888.86	0.00	0.39	0 00:00	0.00	0.00
15	SDHM-A10	Junction	5896.00	5899.00	5896.00	5899.00	0.00	1.490	5896.43	0.00	2.57	0 00:00	0.00	0.00
16	SDMH-A4	Junction	5889.50	5899.80	5889.50	5899.80	0.00	4.660	5894.21	0.00	5.59	0 00:00	0.00	0.00
17	SDMH-A5	Junction	5888.90	5893.65	5888.90	5893.65	0.00	5.320	5889.69	0.00	3.96	0 00:00	0.00	0.00
18	SDMH-A6	Junction	5886.30	5890.77	5886.30	5890.77	0.00	5.300	5887.28	0.00	3.49	0 00:00	0.00	0.00
19	SDMH-A9	Junction	5894.20	5900.19	5894.20	5900.19	0.00	1.440	5894.82	0.00	5.37	0 00:00	0.00	0.00
20	SDMH-B9	Junction	5864.00	5867.21	5864.00	5867.21	0.00	15.640	5865.25	0.00	1.96	0 00:00	0.00	0.00
21	UG-Detention-Control	Junction	5858.30	5858.30	5858.30	0.00	0.00	2.860	5858.98	0.00	1.32	0 00:00	0.00	0.00
22	Out-H-26th	Outfall	5841.00					131.820	5841.00					
23	Out-H-27thSt	Outfall	5858.00					2.120	5858.00					
24	Out-H-Blake-Sb	Outfall	5858.00					20.780	5858.00					
25	Out-Pr-26thSt	Outfall	5875.00					131.440	5875.00					
26	Out-Pr--27thSt	Outfall	5862.00					0.470	5862.16					
27	Out-Pr-29thSt	Outfall	5850.80					5.860	5852.30					
28	EDB-Detention	Storage Node	5863.00	5869.00	5863.00		0.00	24.020	5865.37				0.00	0.00
29	UG-Detention	Storage Node	5858.40	5861.40	5858.40		0.00	5.640	5860.33				0.00	0.00
30	Walmart-Detention	Storage Node	5852.00	5855.00	5852.00		0.00	7.080	5854.54				0.00	0.00

Replace w/ the MHFD Detention Basin Design Workbook value for an EDB outflow control (2.09 cfs)

The existing 18"dia pipe leading from the inlet near Walmart will be slightly surcharged, but should not exceed the structure rim.

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)
1	26thSt	Pipe	Pr-26th	Out-Pr-26thSt	25.49	5876.00	5875.00	3.9200	0.000	0.0120	131.440	0.00	0.00	0.00	0.00	0.00	0.00
2	Link-B10	Pipe	FES-B10	EDB-Detention	35.65	5863.00	5863.00	0.0000	0.000	0.0120	15.550	0.00	0.08	0.00	0.28	0.46	0.00
3	Link-H-01	Pipe	Out-H-01	Out-H-26th	230.30	5875.00	5841.00	14.7600	0.000	0.0120	131.820	0.00	0.20	0.00	0.36	0.59	0.00
4	Link-H-02	Pipe	Junc-H-02	Out-H-26th	177.03	5885.00	5841.00	24.8500	0.000	0.0120	0.990	0.00	0.20	0.00	0.36	0.59	0.00
5	Link-H-03	Pipe	Junc-H-03	Out-H-27thSt	169.29	5888.00	5858.00	17.7200	0.000	0.0120	0.790	0.00	0.20	0.00	0.36	0.59	0.00
6	Link-H-04	Pipe	Junc.H-04	Out-H-27thSt	134.40	5870.00	5858.00	8.9300	0.000	0.0120	1.430	0.00	0.20	0.00	0.36	0.59	0.00
7	Link-H-Blake-S	Pipe	Junc.H-Blake-S	Out-H-Blake-Sb	33.46	5858.00	5858.00	0.0000	0.000	0.0120	20.780	0.00	0.20	0.00	0.36	0.59	0.00
8	Pipe-29thSt	Pipe	Inlet-Walmart	Out-Pr-29thSt	265.00	5851.40	5850.80	0.2300	18.000	0.0120	5.860	5.41	1.08	3.88	1.50	1.00	5.00
9	Pipe-A1	Pipe	A1-(Type-R)	A2-(Type-R)	24.33	5892.50	5892.20	1.2300	12.000	0.0120	0.990	4.29	0.23	5.26	0.33	0.33	0.00
10	Pipe-A10	Pipe	SDHM-A10	SDMH-A9	153.02	5896.00	5894.40	1.0500	12.000	0.0120	1.440	3.95	0.37	7.54	0.42	0.42	0.00
11	Pipe-A2	Pipe	A2-(Type-R)	A3-(Type-16)	80.85	5892.00	5891.20	0.9900	12.000	0.0120	1.830	3.84	0.48	4.85	0.49	0.49	0.00
12	Pipe-A3	Pipe	A3-(Type-16)	SDMH-A4	133.17	5891.00	5889.70	0.9800	12.000	0.0120	3.220	3.81	0.85	5.53	0.70	0.70	0.00
13	Pipe-A4	Pipe	SDMH-A4	SDMH-A5	29.56	5889.50	5888.90	2.0300	15.000	0.0120	4.660	9.97	0.47	7.99	0.60	0.48	0.00
14	Pipe-A5	Pipe	SDMH-A5	SDMH-A6	117.00	5888.90	5886.50	2.0500	12.000	0.0120	5.300	5.53	0.96	8.11	0.78	0.78	0.00
15	Pipe-A6	Pipe	SDMH-A6	Inlet-A7-(Type-16)	240.10	5886.30	5879.80	2.7100	12.000	0.0120	5.260	6.35	0.83	9.20	0.69	0.69	0.00
16	Pipe-A7	Pipe	Inlet-A7-(Type-16)	EDB-Detention	54.21	5876.80	5863.00	25.4600	12.000	0.0120	8.520	19.47	0.44	23.96	0.46	0.46	0.00
17	Pipe-A9	Pipe	SDMH-A9	SDMH-A4	34.80	5894.20	5893.80	1.1500	12.000	0.0120	1.440	4.14	0.35	4.80	0.41	0.41	0.00
18	Pipe-B1	Pipe	Inlet-B1-(Type-R)	Inlet-B2-(Type-R)	24.33	5879.60	5879.30	1.2300	12.000	0.0120	0.700	4.29	0.16	4.60	0.27	0.27	0.00
19	Pipe-B11	Pipe	Inlet-B11-(Nylo)	Inlet-B2-(Type-R)	15.00	5883.00	5880.00	20.0000	15.000	0.0120	4.160	32.82	0.13	18.34	0.30	0.24	0.00
20	Pipe-B12	Pipe	Inlet-B12-(Nylo)	Road-Palmer-B-12	15.00	5889.00	5888.00	6.6700	15.000	0.0120	14.830	18.07	0.82	16.43	0.86	0.69	0.00
21	Pipe-B2	Pipe	Inlet-B2-(Type-R)	Inlet-B3-(Type-R)	65.73	5879.10	5872.80	9.5800	15.000	0.0120	7.130	21.67	0.33	15.83	0.49	0.39	0.00
22	Pipe-B3	Pipe	Inlet-B3-(Type-R)	Inlet-B6-(Type-R)	82.21	5872.60	5864.70	9.6100	15.000	0.0120	11.160	21.69	0.51	17.82	0.64	0.51	0.00
23	Pipe-B4	Pipe	Inlet-B4-(Type-16)	Inlet-B5-(Type-R)	20.78	5876.90	5873.30	17.3300	8.000	0.0120	1.230	5.45	0.23	12.60	0.22	0.32	0.00
24	Pipe-B5	Pipe	Inlet-B5-(Type-R)	Inlet-B3-(Type-R)	24.33	5873.10	5872.80	1.2300	12.000	0.0120	1.850	4.29	0.43	5.26	0.46	0.46	0.00
25	Pipe-B6	Pipe	Inlet-B6-(Type-R)	Inlet-B8-(Type-R)	24.34	5864.70	5864.50	0.8200	24.000	0.0120	14.320	22.21	0.64	7.51	1.17	0.58	0.00
26	Pipe-B7	Pipe	Inlet-B7-(Type-16)	Inlet-B6-(Type-R)	29.28	5870.20	5864.70	18.7800	8.000	0.0120	1.140	5.67	0.20	12.74	0.20	0.30	0.00
27	Pipe-B8	Pipe	Inlet-B8-(Type-R)	SDMH-B9	57.48	5864.50	5864.00	0.8700	24.000	0.0120	14.470	22.86	0.63	7.71	1.16	0.58	0.00
28	Pipe-B9	Pipe	SDMH-B9	FES-B10	125.34	5864.00	5863.00	0.8000	24.000	0.0120	15.550	21.89	0.71	7.60	1.24	0.62	0.00
29	Pipe-C1	Pipe	Inlet-C1-(Type-16)	Inlet-C2-(Type-13)	14.31	5859.60	5859.20	2.8000	8.000	0.0120	0.520	2.19	0.24	5.15	0.22	0.33	0.00
30	Pipe-C2	Pipe	Inlet-C2-(Type-13)	Inlet-C3-(Type-13)	19.75	5859.00	5858.80	1.0100	8.000	0.0120	1.410	1.32	1.07	4.42	0.61	0.92	0.00
31	Pipe-C3	Pipe	Inlet-C3-(Type-13)	Inlet-C4-(Type-16)	27.52	5858.80	5858.50	1.0900	15.000	0.0120	4.200	7.31	0.58	6.16	0.68	0.54	0.00
32	Pipe-C4	Pipe	Inlet-C4-(Type-16)	UG-Detention	20.00	5858.50	5858.40	0.5000	18.000	0.0120	5.640	8.05	0.70	4.93	0.92	0.62	0.00
33	Pipe-EDB-Control	Pipe	EDB-Control	Out-Pr--27thSt	28.55	5863.00	5862.00	3.5000	15.000	0.0120	0.470	13.10	0.04	5.04	0.16	0.13	0.00
34	Pipe-UG-Control	Pipe	UG-Detention-Control	Junc-Pr-Blake-S	20.00	5858.30	5858.20	0.5000	15.000	0.0120	2.860	4.95	0.58	4.18	0.68	0.55	0.00
35	Bypass-A1	Channel	A1-(Type-R)	A2-(Type-R)	31.56	5896.57	5896.57	0.0100	7.200	0.0160	0.750	19.28	0.04	1.92	0.23	0.38	0.00
36	Bypass-A2	Channel	A2-(Type-R)	Pr-26th	140.00	5896.57	5876.00	14.6900	12.000	0.0160	0.500	565.61	0.00	4.65	0.09	0.09	0.00
37	Bypass-B1	Channel	Inlet-B1-(Type-R)	Inlet-B5-(Type-R)	64.47	5883.39	5876.84	10.1700	7.200	0.0160	0.260	68.98	0.00	6.05	0.10	0.17	0.00
38	Bypass-B2	Channel	Inlet-B2-(Type-R)	Inlet-B3-(Type-R)	71.42	5883.39	5876.84	9.1800	7.200	0.0160	12.230	65.53	0.19	7.49	0.35	0.59	0.00
39	Bypass-B3	Channel	Inlet-B3-(Type-R)	Inlet-B6-(Type-R)	85.00	5876.84	5868.74	9.5300	7.200	0.0160	10.870	66.77	0.16	7.30	0.34	0.57	0.00
40	Bypass-B5	Channel	Inlet-B5-(Type-R)	Inlet-B8-(Type-R)	80.66	5876.84	5868.74	10.0300	7.200	0.0160	0.200	68.52	0.00	3.79	0.09	0.16	0.00
41	Bypass-B6	Channel	Inlet-B6-(Type-R)	Inlet-C3-(Type-13)	84.14	5868.74	5861.29	8.8600	7.200	0.0160	8.950	64.40	0.14	6.77	0.33	0.54	0.00
42	Bypass-B8	Channel	Inlet-B8-(Type-R)	Inlet-C2-(Type-13)	78.55	5868.74	5861.29	9.4900	7.200	0.0160	0.020	66.65	0.00	2.19	0.04	0.07	0.00
43	Bypass-C1	Channel	Inlet-C1-(Type-16)	Inlet-C2-(Type-13)	18.27	5862.19	5861.29	4.9300	7.200	0.0160	0.180	95.74	0.00	4.05	0.08	0.13	0.00
44	Bypass-C2	Channel	Inlet-C2-(Type-13)	Int-Blake-Palmer	51.37	5861.29	5859.50	3.4800	7.200	0.0160	0.320	80.42	0.00	2.36	0.11	0.18	0.00
45	Bypass-C3	Channel	Inlet-C3-(Type-13)	Int-Blake-Palmer	58.47	5861.29	5859.50	3.0600	7.200	0.0160	5.980	75.38	0.08	3.49	0.28	0.46	0.00
46	Link-Blake-S	Channel	Int-Blake-Palmer	Junc-Pr-Blake-S	230.46	5859.50	5858.20	0.5600	7.200	0.0160	6.520	32.38	0.20	4.72	0.36	0.59	0.00
47	Out-Pr-Blake	Channel	Junc-Pr-Blake-S	Inlet-Walmart	200.00	5858.20	5856.00	1.1000	7.200	0.0160	8.950	45.21	0.20	2.73	0.36	0.60	0.00
48	Road-B12	Channel	Road-Palmer-B-12	Inlet-B2-(Type-R)	48.58	5888.00	5883.39	9.4800	7.200	0.0160	14.830	132.73	0.11	6.62	0.31	0.51	0.00
49	Road-OS-1b	Channel	OS-1b	Pr-26th	240.00	5906.00	5876.00	12.5000	12.000	0.0160	131.440	521.70	0.25	15.75	0.57	0.57	0.00
50	Swale-OS-1a	Channel	OS-1a	OS-1b	143.20	5942.00	5804.00	96.3700	18.000	0.0300	131.640	260.63	0.51	19.39	1.09	0.72	0.00
51	Swale-OS-2	Channel	OS-2a	Inlet-B12-(Nylo)	146.88	5942.00	5889.00	36.0800	6.000	0.0300	15.370	30.08	0.51	11.00	0.35	0.69	0.00
52	Orifice-EDB-WQCV	Orifice	EDB-Detention	EDB-Control		5863.00	5863.00		1.250		0.060						
53	Walmart-Det-Control	Orifice	Walmart-Detention	Inlet-Walmart		5852.00	5851.40		5.600		1.280						
54	Weir-EDB-100	Weir	EDB-Detention	EDB-Control		5863.00	5863.00				0.000						
55	Weir-EDB-25	Weir	EDB-Detention	EDB-Control		5863.00	5863.00				0.400						
56	Weir-UG-100	Weir	UG-Detention	UG-Detention-Control		5858.40	5858.30				0.940						
57	Weir-UG-25	Weir	UG-Detention	UG-Detention-Control		5858.40	5858.30				1.920						

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Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	A1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.50	5896.57	5892.50	N/A	1.790	1.00	0.80	55.59	7.00	4.66	5896.76
2	A2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.00	5896.57	5892.00	N/A	1.370	0.86	0.51	62.76	7.00	3.94	5896.74
3	A3-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5891.00	5896.76	5891.00	100.00	1.470	N/A	N/A	N/A	7.00	9.09	5897.19
4	Inlet-A7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.80	5883.87	5876.80	100.00	3.760	N/A	N/A	N/A	7.00	22.92	5884.55
5	Inlet-B1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.60	5883.39	5879.60	N/A	0.960	0.70	0.26	72.52	7.00	3.04	5883.55
6	Inlet-B11-(Nylo)	CALTRANS	GCP	On Sag	1	5883.30	5899.00	5883.30	36.00	4.180	N/A	N/A	N/A	7.00	21.82	5899.70
7	Inlet-B12-(Nylo)	CALTRANS	GCP	On Sag	1	5889.00	5901.00	5889.00	36.00	15.370	N/A	N/A	N/A	7.00	257.50	5907.06
8	Inlet-B2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.10	5883.39	5879.10	N/A	14.830	2.58	12.24	17.43	7.00	12.45	5883.74
9	Inlet-B3-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5872.60	5876.84	5872.60	N/A	13.350	2.47	10.88	18.52	7.00	11.93	5877.17
10	Inlet-B4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.90	5880.96	5876.90	100.00	1.260	N/A	N/A	N/A	7.00	8.03	5881.37
11	Inlet-B5-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5873.10	5876.84	5873.10	N/A	0.840	0.63	0.21	75.07	7.00	2.62	5876.98
12	Inlet-B6-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.70	5868.74	5864.70	N/A	11.270	2.30	8.96	20.43	7.00	11.13	5869.06
13	Inlet-B7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5870.20	5874.26	5870.20	0.00	1.140	N/A	N/A	N/A	7.00	7.45	5874.65
14	Inlet-B8-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.50	5868.74	5864.50	N/A	0.200	0.18	0.02	88.56	7.00	0.61	5868.79
15	Inlet-C1-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.60	5862.19	5859.60	N/A	0.710	0.52	0.18	73.94	7.00	4.98	5862.37
16	Inlet-C2-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.00	5861.29	5859.00	N/A	1.180	0.85	0.33	72.34	7.00	6.65	5861.51
17	Inlet-C3-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5858.50	5861.29	5858.50	N/A	9.270	3.27	6.00	35.27	7.00	16.20	5861.70
18	Inlet-C4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5853.50	5862.46	5853.50	0.00	1.660	N/A	N/A	N/A	7.00	10.07	5862.91
19	Inlet-Walmart	FHWA HEC-22 GENERIC	N/A	On Sag	1	5851.40	5856.00	5851.40	100.00	8.980	N/A	N/A	N/A	7.00	21.39	5856.69

The existing inlet is a single (5') CDOT Type-R. The inlet curb opening must be increased to a triple (15') to accomodate the increased flow.

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Subbasin Hydrology

Subbasin : Blake@Walmart

Input Data

Area (ac) 0.04
Weighted Runoff Coefficient 0.9700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.04	B (6%+)	0.97
Composite Area & Weighted Runoff Coeff.	0.04		0.97

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

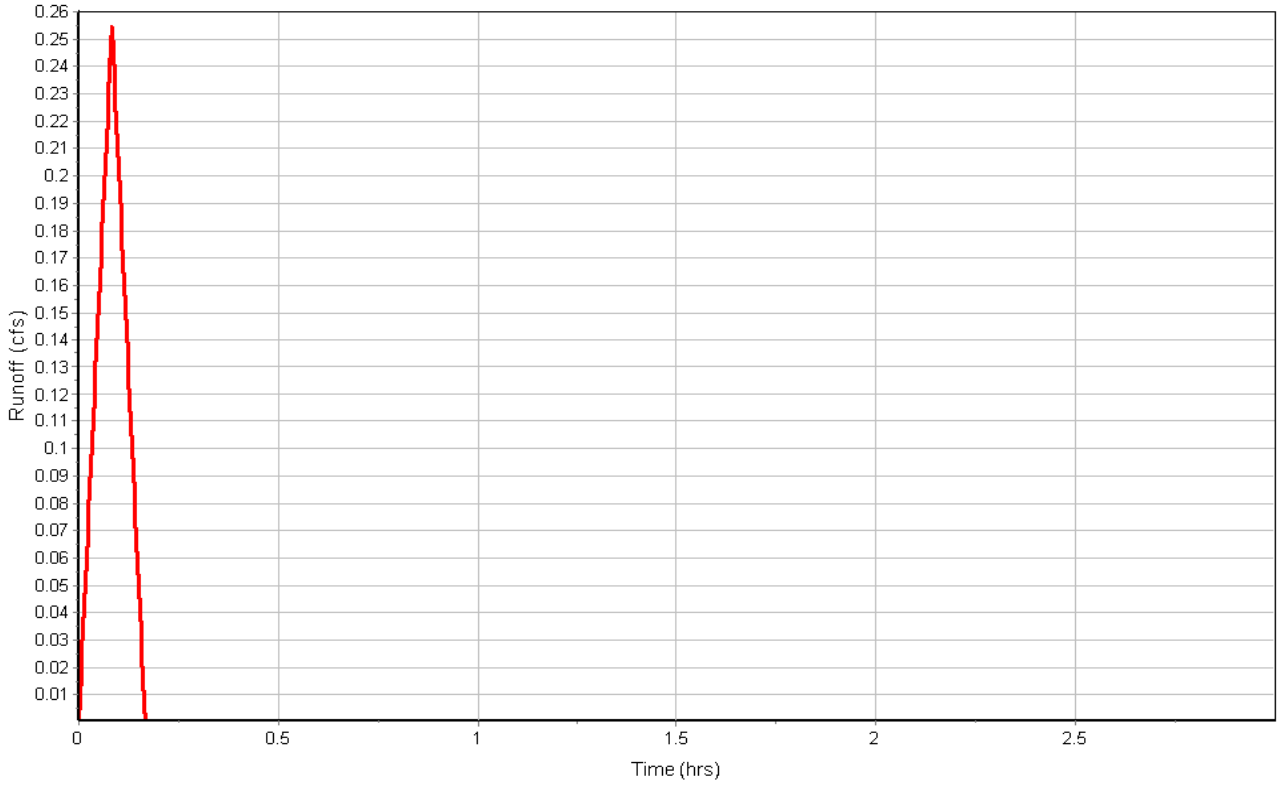
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.53
Peak Runoff (cfs) 0.26
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.9700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Blake@Walmart

Runoff Hydrograph



Subbasin : H/Ex-01

Input Data

Area (ac) 1.55
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	1.55	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	1.55		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	23	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.29	0.00	0.00
Computed Flow Time (min) :	5.74	0.00	0.00

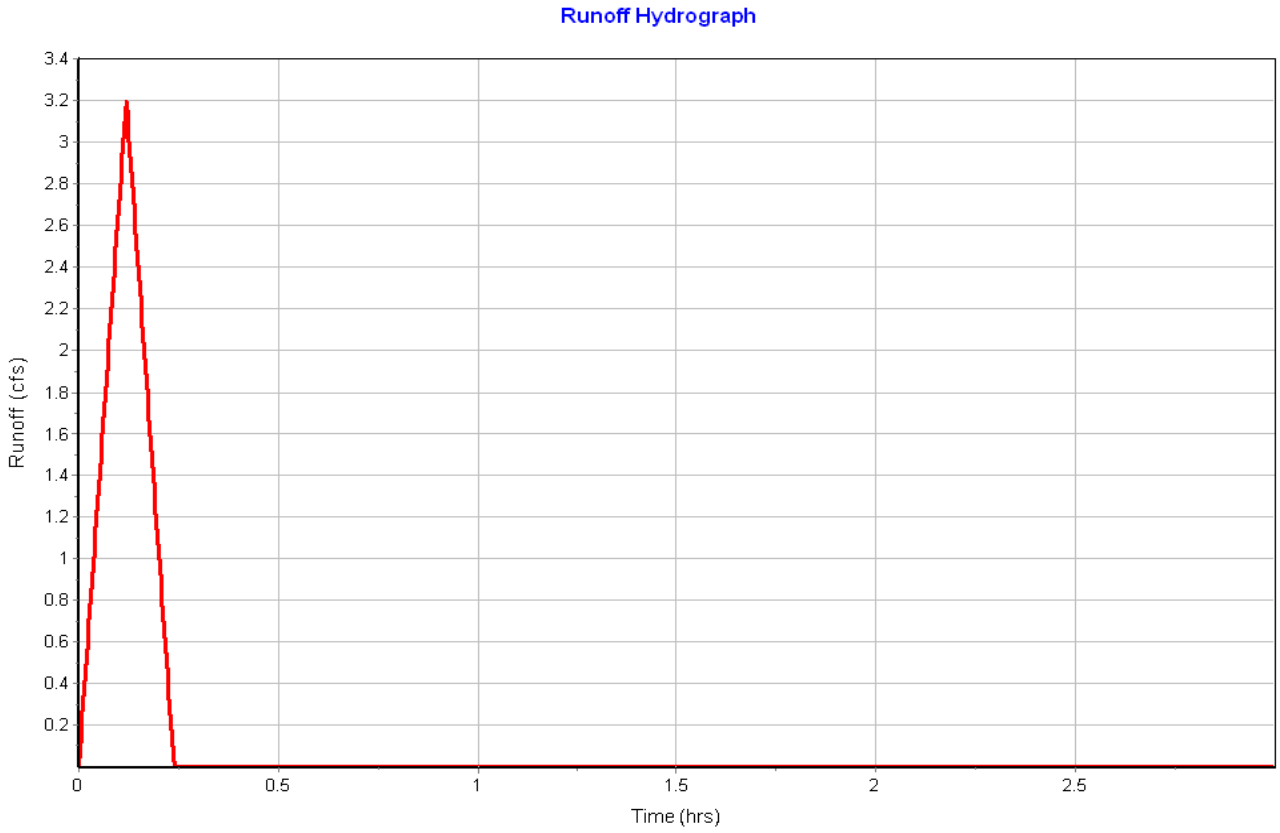
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	440	0.00	0.00
Slope (%) :	9.6	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	5.00	0.00	0.00
Computed Flow Time (min) :	1.47	0.00	0.00

Total TOC (min) 7.21

Subbasin Runoff Results

Total Rainfall (in) 0.67
Total Runoff (in) 0.25
Peak Runoff (cfs) 3.20
Rainfall Intensity 5.569
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:07:13

Subbasin : H/Ex-01



Subbasin : H/Ex-02

Input Data

Area (ac) 0.46
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	0.46	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.46		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	19	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.27	0.00	0.00
Computed Flow Time (min) :	6.20	0.00	0.00

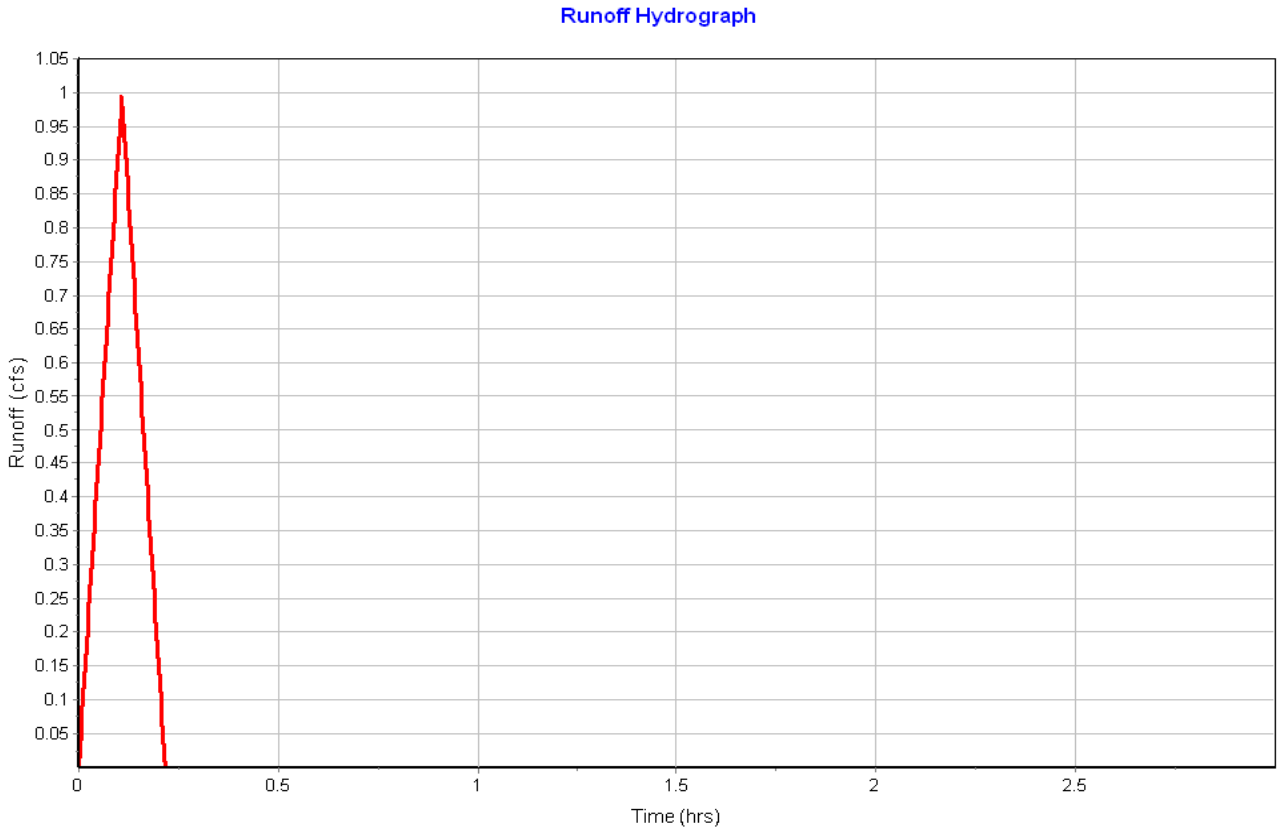
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	75	0.00	0.00
Slope (%) :	16	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	4.00	0.00	0.00
Computed Flow Time (min) :	0.31	0.00	0.00

Total TOC (min) 6.51

Subbasin Runoff Results

Total Rainfall (in) 0.63
Total Runoff (in) 0.23
Peak Runoff (cfs) 0.99
Rainfall Intensity 5.829
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:06:31

Subbasin : H/Ex-02



Subbasin : H/Ex-03

Input Data

Area (ac) 0.37
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	0.37	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.37		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	19	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.27	0.00	0.00
Computed Flow Time (min) :	6.20	0.00	0.00

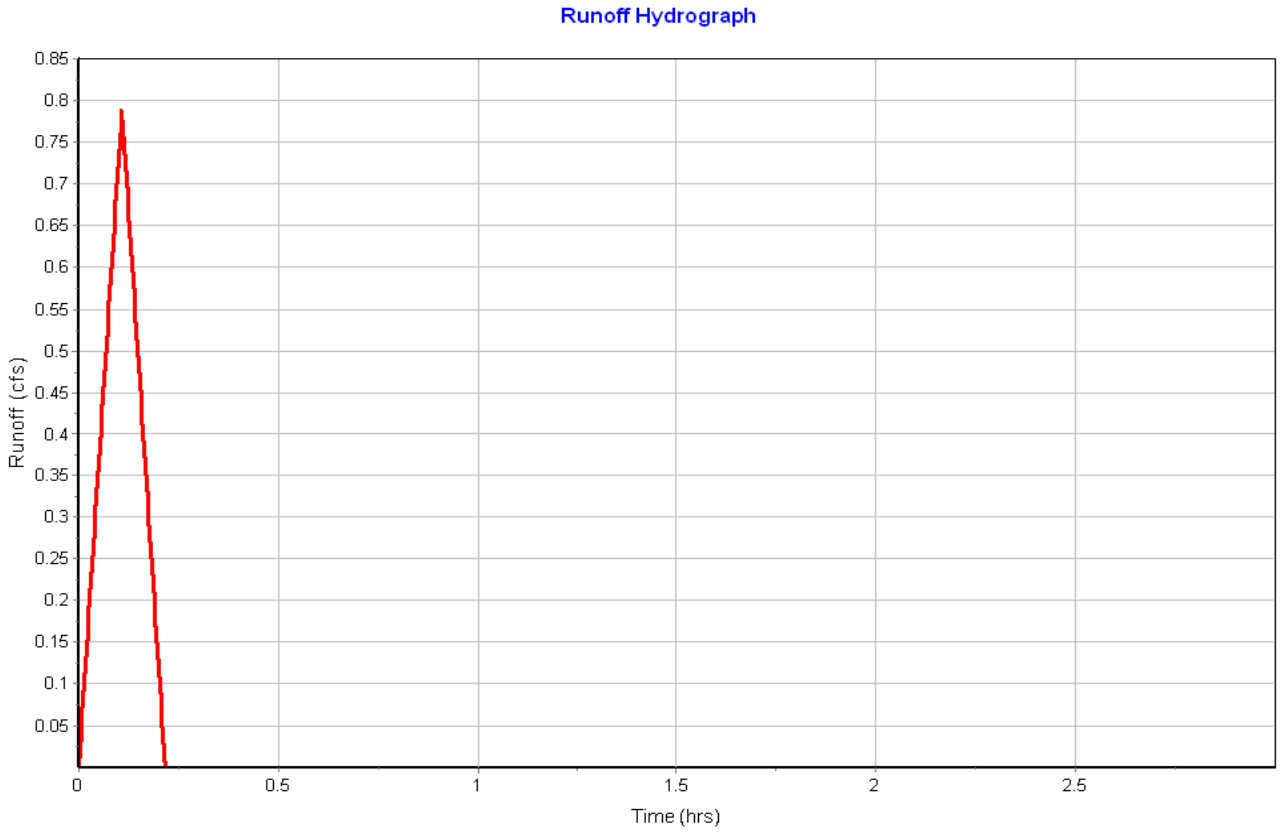
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	70	0.00	0.00
Slope (%) :	11.5	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.39	0.00	0.00
Computed Flow Time (min) :	0.34	0.00	0.00

Total TOC (min) 6.54

Subbasin Runoff Results

Total Rainfall (in) 0.63
Total Runoff (in) 0.23
Peak Runoff (cfs) 0.79
Rainfall Intensity 5.817
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:06:32

Subbasin : H/Ex-03



Subbasin : H/Ex-05

Input Data

Area (ac) 3.90
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	3.90	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	3.90		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	23	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.29	0.00	0.00
Computed Flow Time (min) :	5.74	0.00	0.00

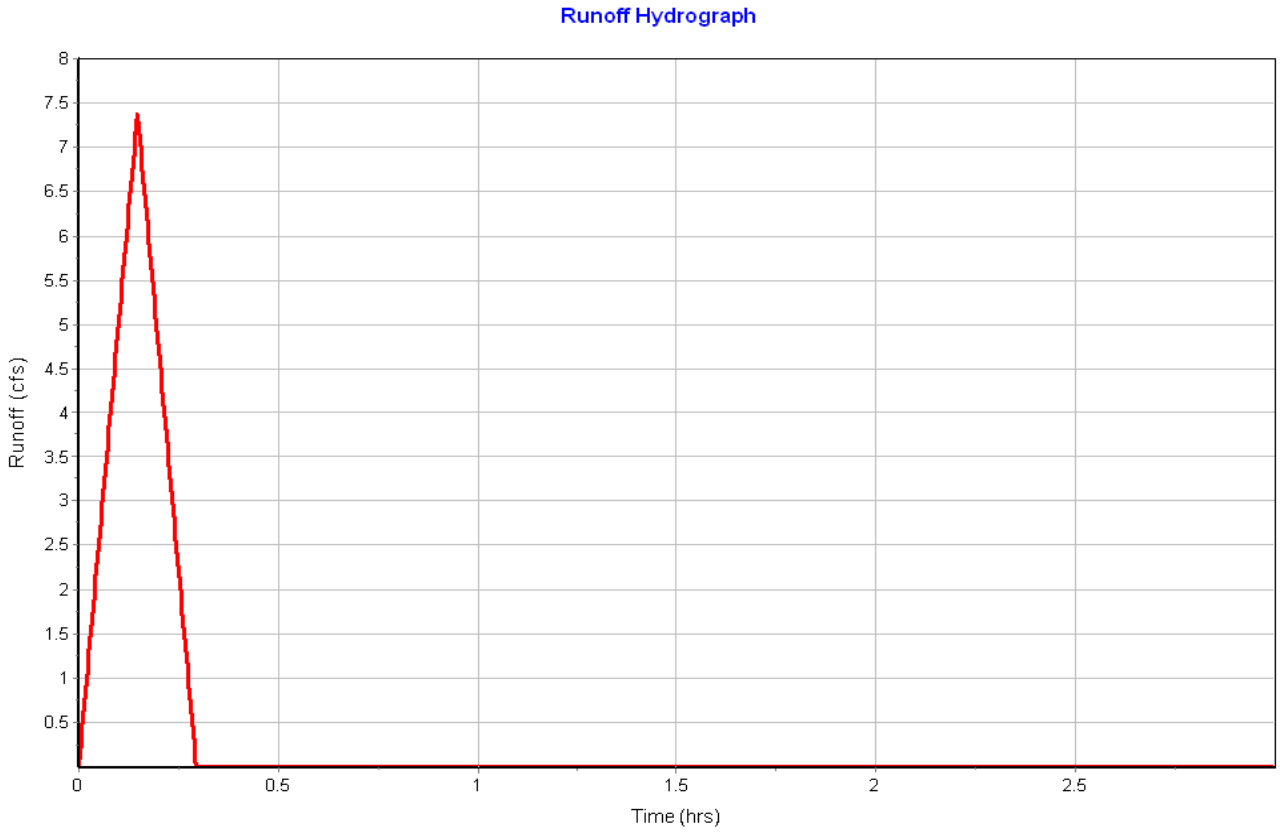
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	560	140	0.00
Slope (%) :	10	1.5	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	5.10	1.98	0.00
Computed Flow Time (min) :	1.83	1.18	0.00

Total TOC (min) 8.75

Subbasin Runoff Results

Total Rainfall (in) 0.75
Total Runoff (in) 0.28
Peak Runoff (cfs) 7.37
Rainfall Intensity 5.106
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:08:45

Subbasin : H/Ex-05



Subbasin : H/Ex-OS-1

Input Data

Area (ac) 124.70
Weighted Runoff Coefficient 0.3600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	117.22	B (6%+)	0.37
Forest, 25 years or greater	7.48	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	124.70		0.36

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	10	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.21	0.00	0.00
Computed Flow Time (min) :	8.01	0.00	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3200	0.00	0.00
Slope (%) :	15	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	0.00	0.00
Computed Flow Time (min) :	13.78	0.00	0.00

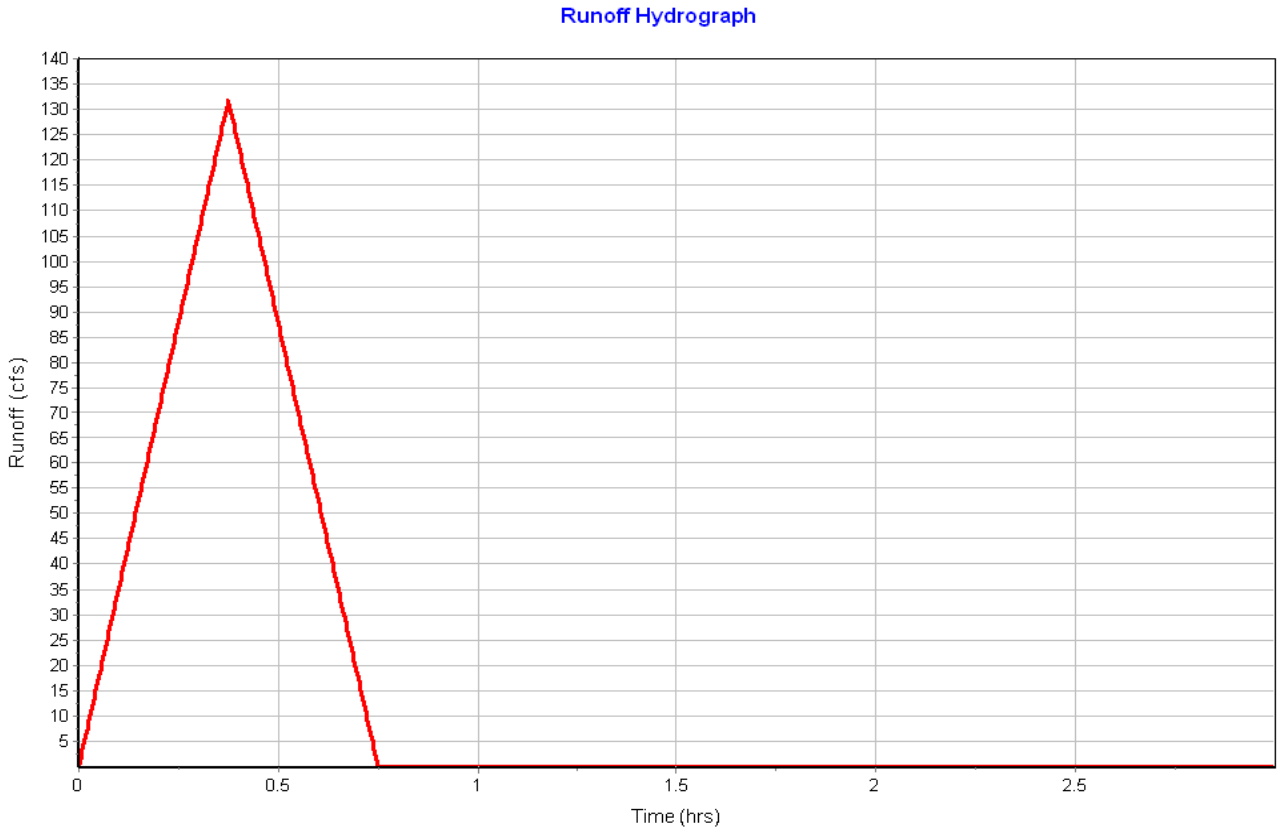
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	0.66	0.00	0.00

Total TOC (min) 22.45

Subbasin Runoff Results

Total Rainfall (in) 1.10
Total Runoff (in) 0.40
Peak Runoff (cfs) 131.82
Rainfall Intensity 2.936
Weighted Runoff Coefficient 0.3600
Time of Concentration (days hh:mm:ss) 0 00:22:27

Subbasin : H/Ex-OS-1



Subbasin : H/Ex-OS-2

Input Data

Area (ac) 9.37
Weighted Runoff Coefficient 0.2800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	2.06	B (6%+)	0.37
Forest, 25 years or greater	7.31	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	9.37		0.28

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	45	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.38	0.00	0.00
Computed Flow Time (min) :	4.39	0.00	0.00

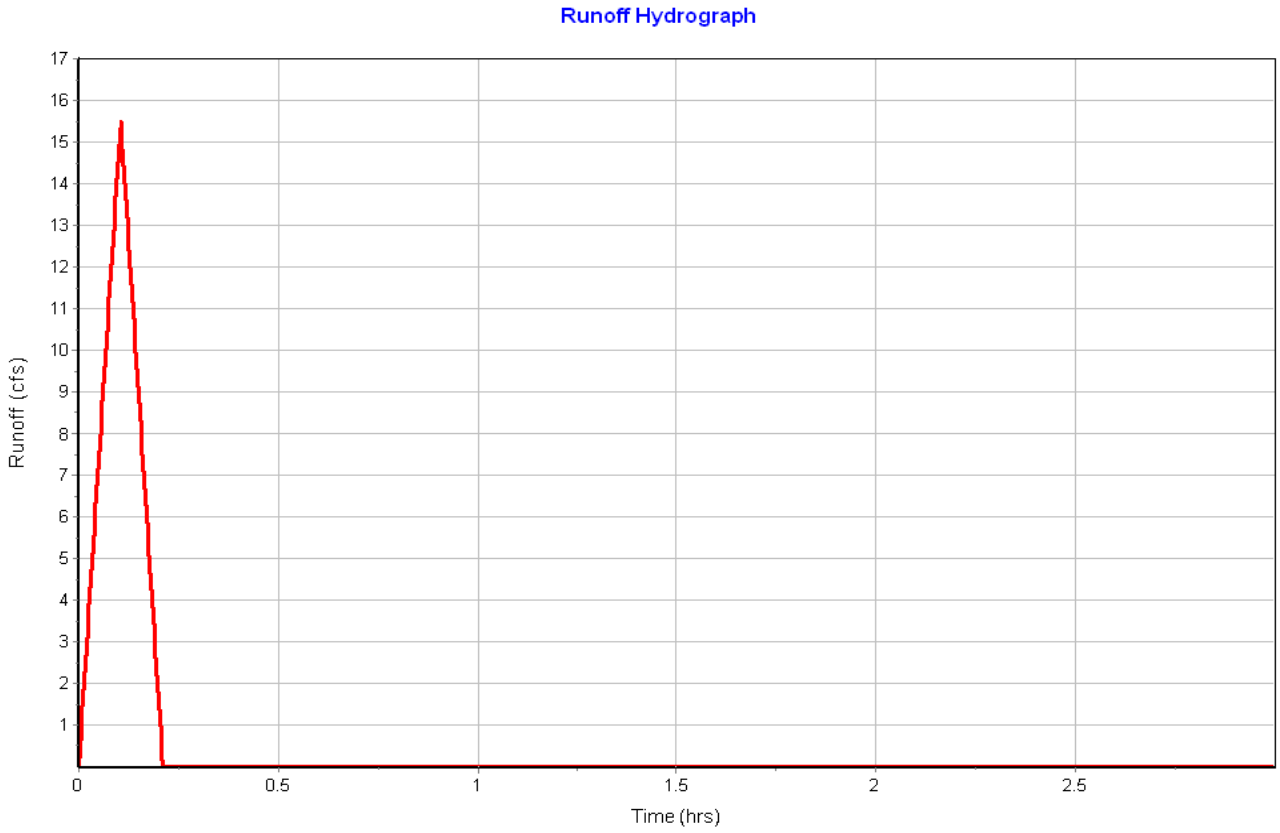
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in) 0.62
Total Runoff (in) 0.18
Peak Runoff (cfs) 15.50
Rainfall Intensity 5.907
Weighted Runoff Coefficient 0.2800
Time of Concentration (days hh:mm:ss) 0 00:06:19

Subbasin : H/Ex-OS-2



Subbasin : H-04

Input Data

Area (ac) 0.70
Weighted Runoff Coefficient 0.3700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	0.70	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.70		0.37

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	19	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.27	0.00	0.00
Computed Flow Time (min) :	6.20	0.00	0.00

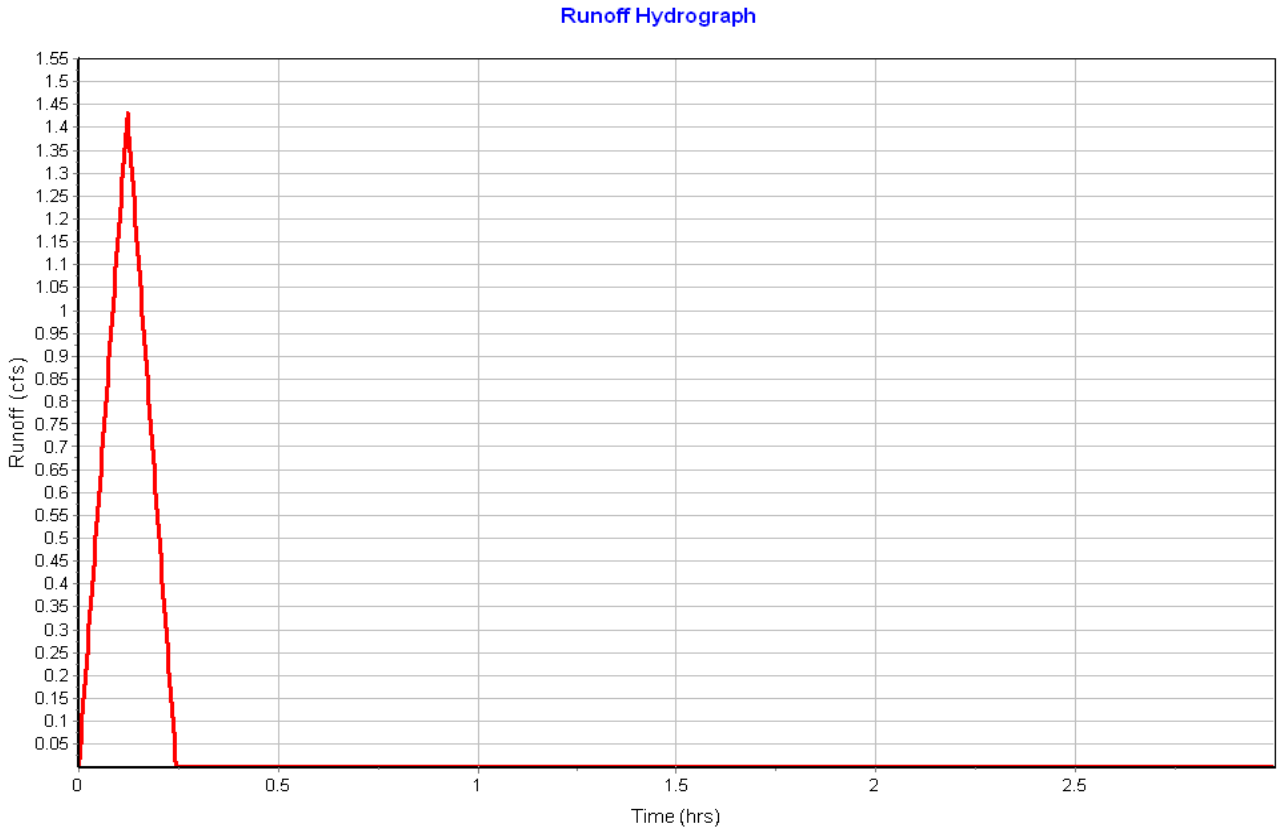
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	140	110	0.00
Slope (%) :	15	3.7	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	3.10	0.00
Computed Flow Time (min) :	0.60	0.59	0.00

Total TOC (min) 7.39

Subbasin Runoff Results

Total Rainfall (in) 0.67
Total Runoff (in) 0.25
Peak Runoff (cfs) 1.43
Rainfall Intensity 5.507
Weighted Runoff Coefficient 0.3700
Time of Concentration (days hh:mm:ss) 0 00:07:23

Subbasin : H-04



Subbasin : Pr-01

Input Data

Area (ac) 0.57
Weighted Runoff Coefficient 0.4800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.13	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Meadow, 25 years or greater	0.33	B (6%+)	0.37
Forest, 25 years or greater	0.08	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	0.57		0.48

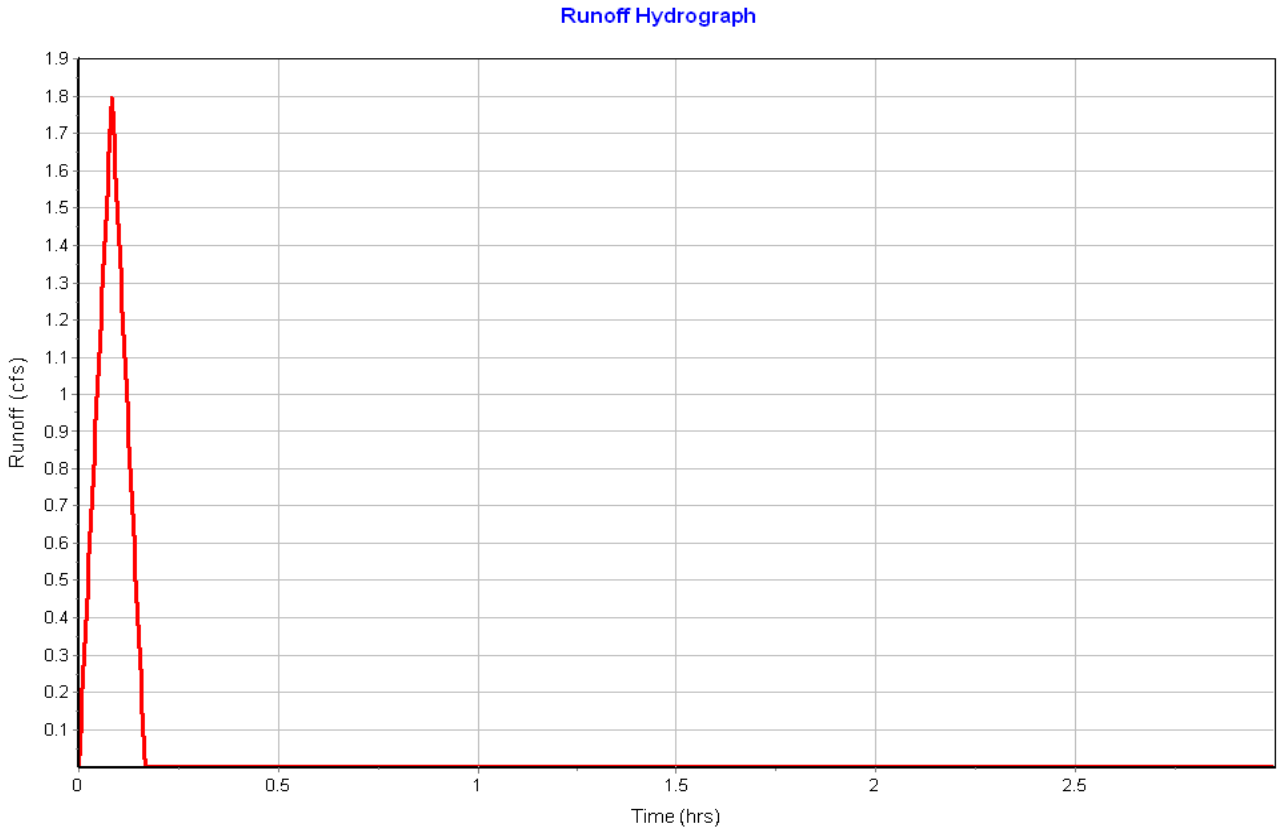
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.26
Peak Runoff (cfs) 1.79
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.4800
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-01



Subbasin : Pr-02

Input Data

Area (ac) 0.12
Weighted Runoff Coefficient 0.8300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.10	B (6%+)	0.97
Open Space, 25 years or greater	0.02	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.12		0.83

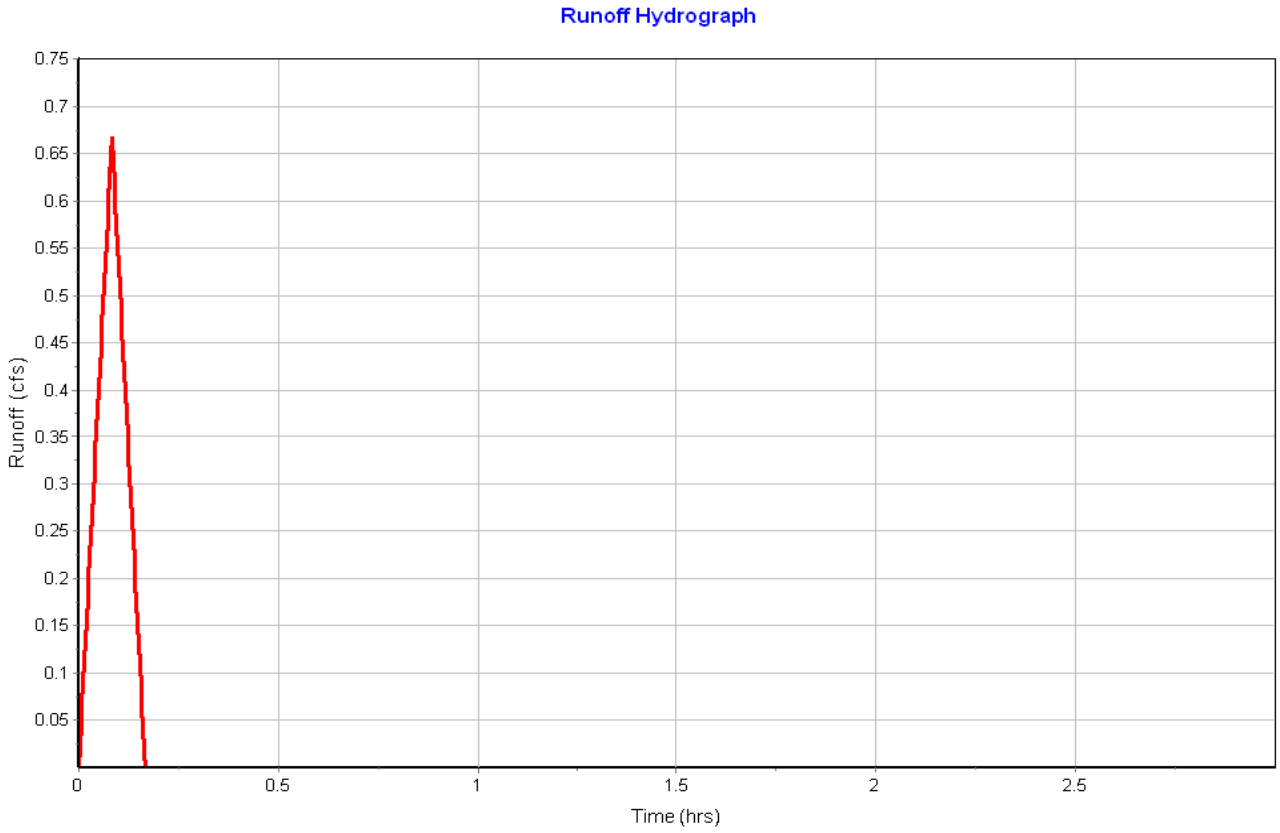
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.45
Peak Runoff (cfs) 0.67
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.8300
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-02



Subbasin : Pr-03

Input Data

Area (ac) 0.28
Weighted Runoff Coefficient 0.7900

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.21	B (6%+)	0.97
Open Space, 25 years or greater	0.07	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.28		0.79

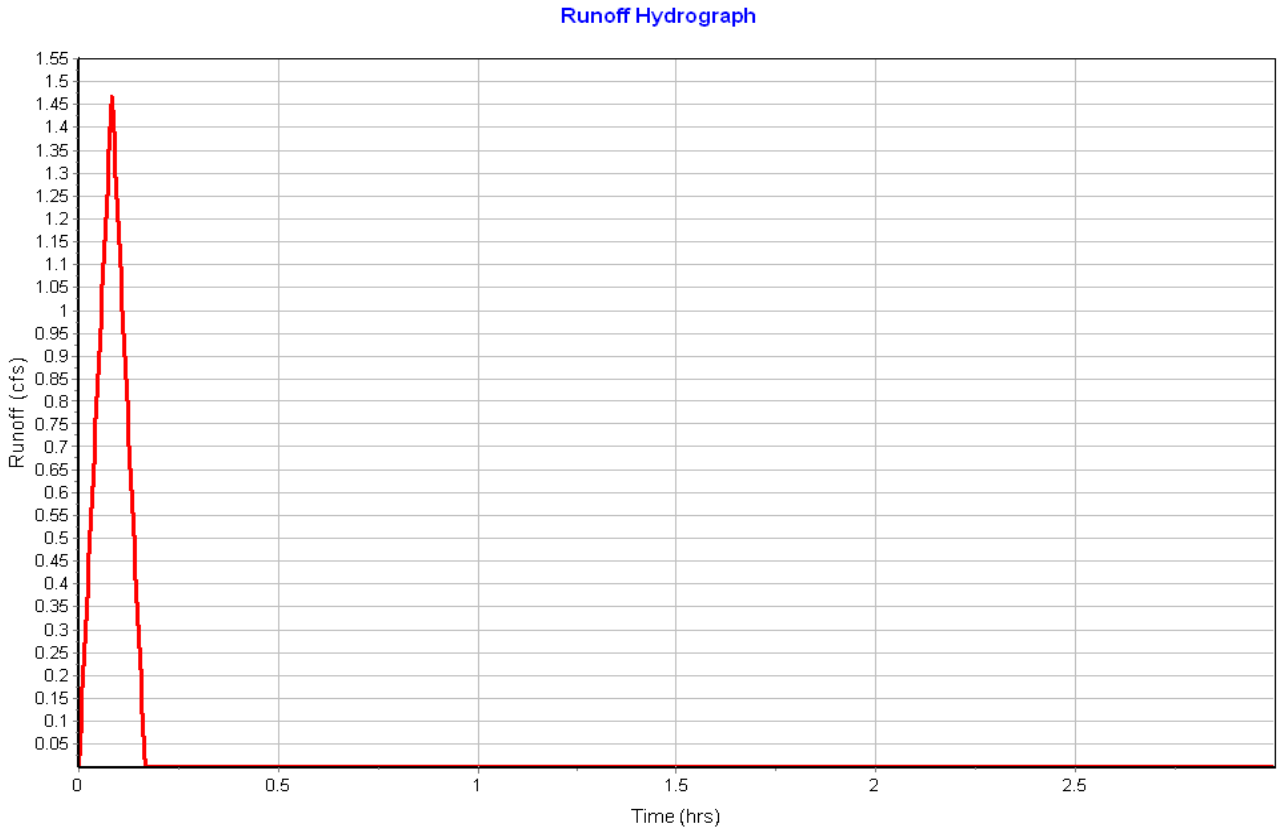
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.43
Peak Runoff (cfs) 1.47
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.7900
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-03



Subbasin : Pr-04

Input Data

Area (ac) 0.33
Weighted Runoff Coefficient 0.3300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.03	B (6%+)	0.97
Open Space, 25 years or greater	0.30	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.33		0.33

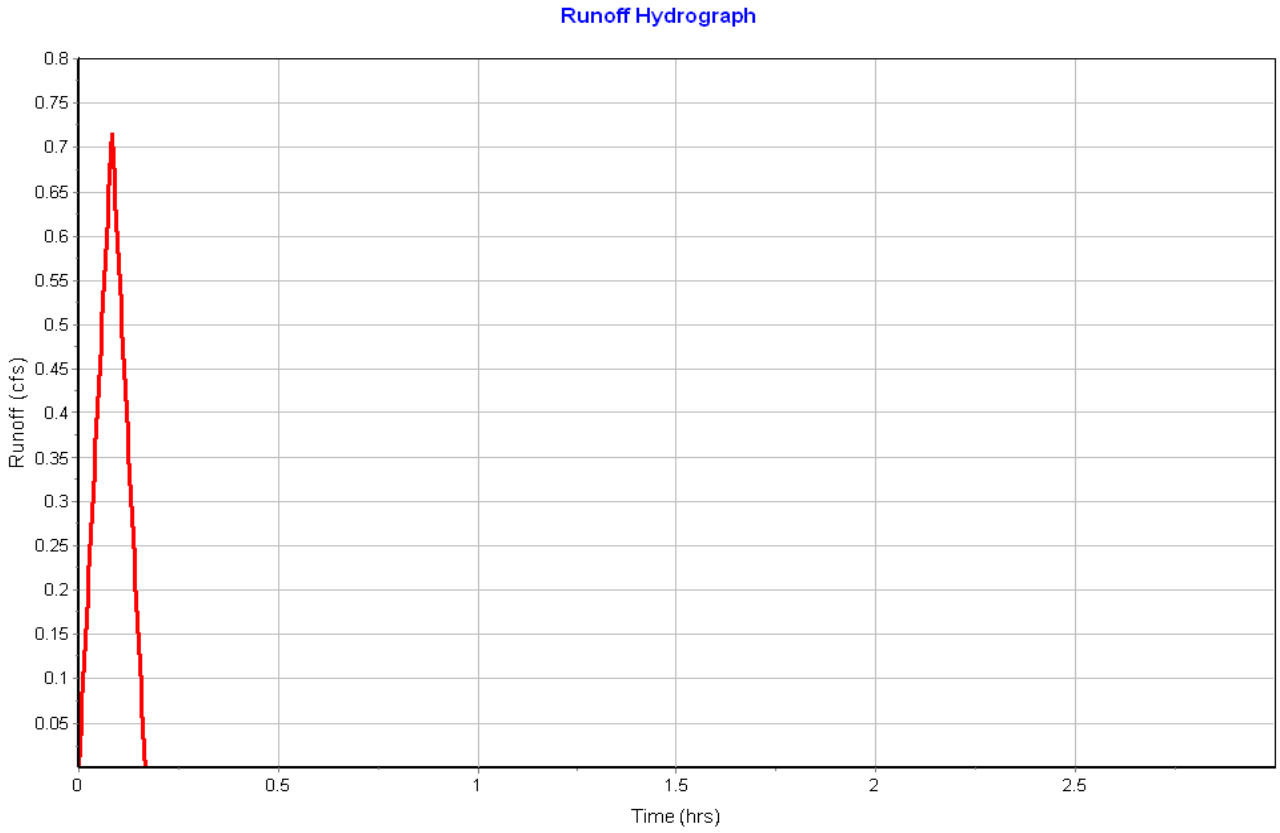
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.18
Peak Runoff (cfs) 0.71
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.3300
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-04



Subbasin : Pr-05

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.7700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.10	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.14		0.77

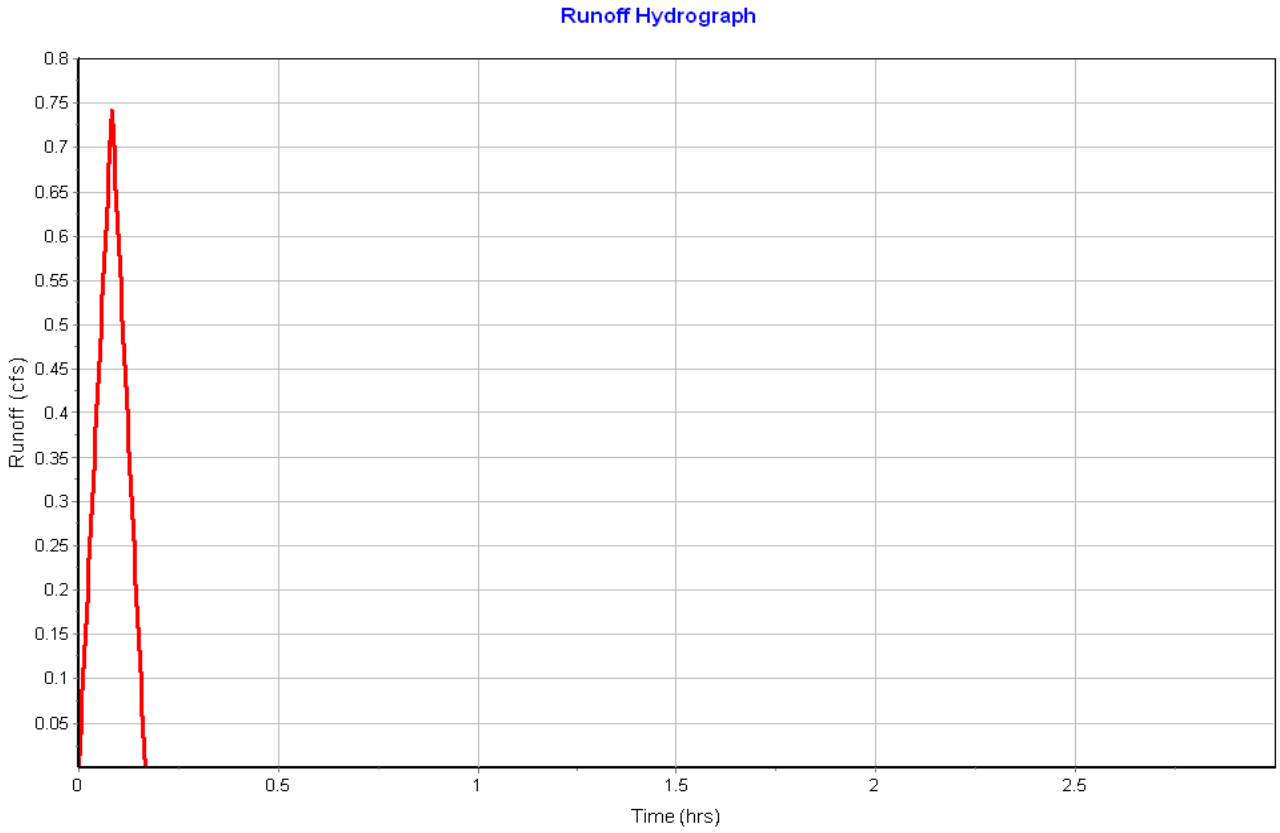
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.42
Peak Runoff (cfs) 0.74
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.7700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-05



Subbasin : Pr-06

Input Data

Area (ac) 0.29
Weighted Runoff Coefficient 0.7800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.21	B (6%+)	0.97
Open Space, 25 years or greater	0.08	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.29		0.78

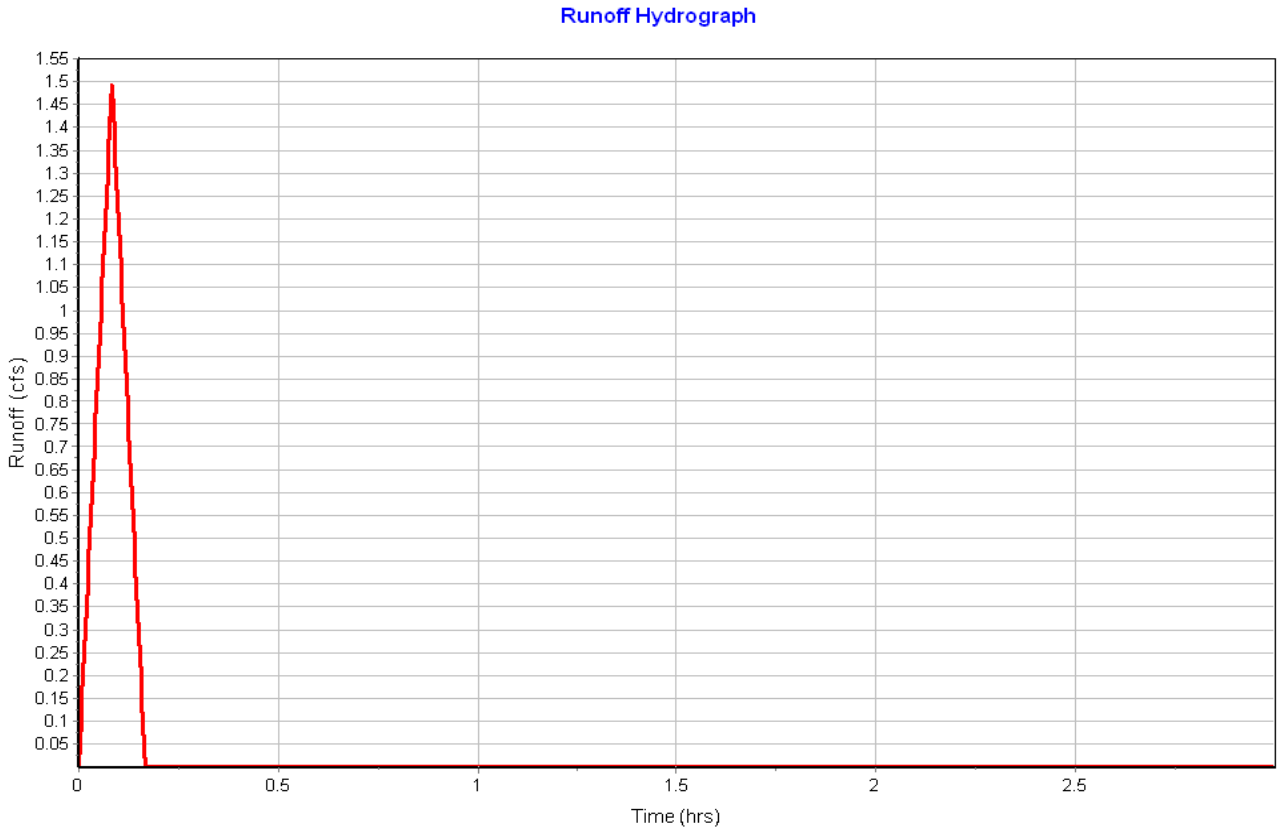
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.43
Peak Runoff (cfs) 1.49
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.7800
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-06



Subbasin : Pr-07

Input Data

Area (ac) 0.74
Weighted Runoff Coefficient 0.7700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.53	B (6%+)	0.97
Open Space, 25 years or greater	0.21	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.74		0.77

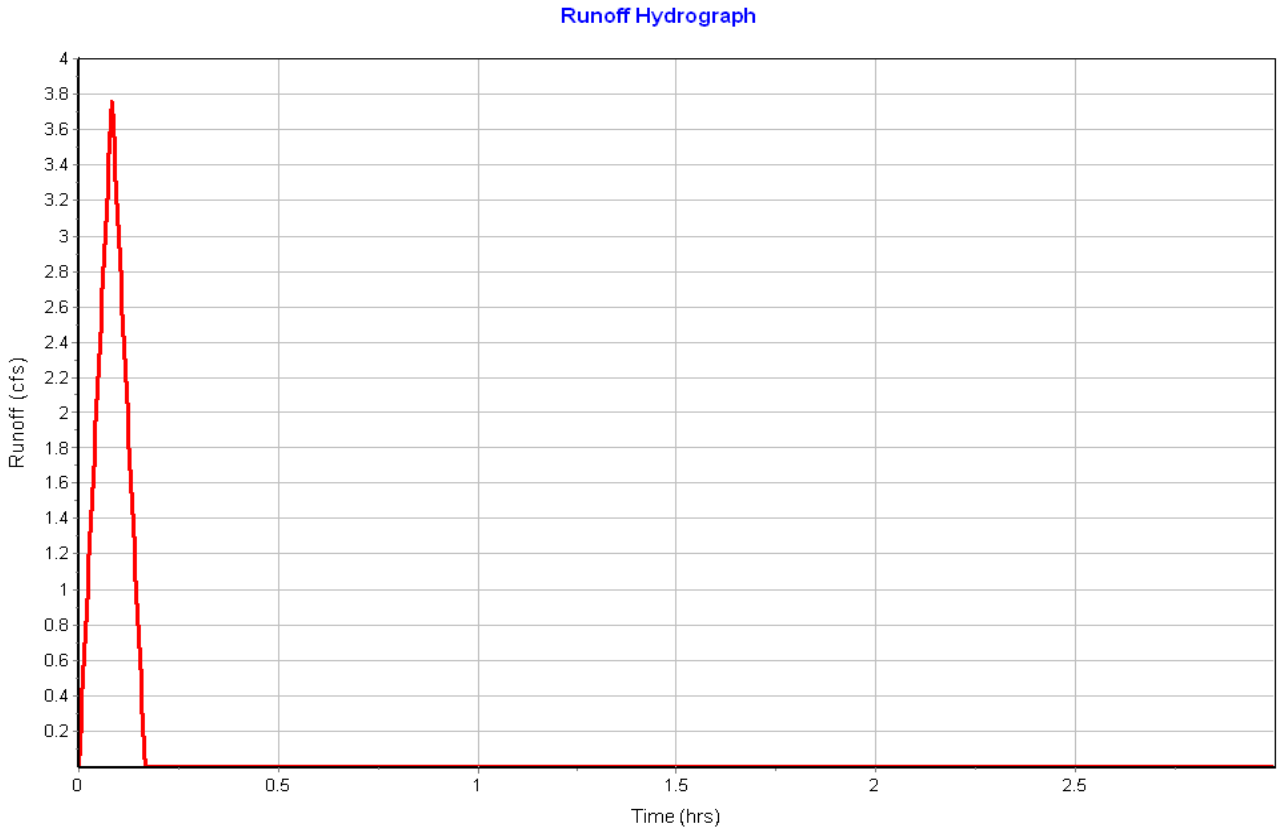
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.42
Peak Runoff (cfs) 3.76
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.7700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-07



Subbasin : Pr-08

Input Data

Area (ac) 0.18
Weighted Runoff Coefficient 0.8100

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.14	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.18		0.81

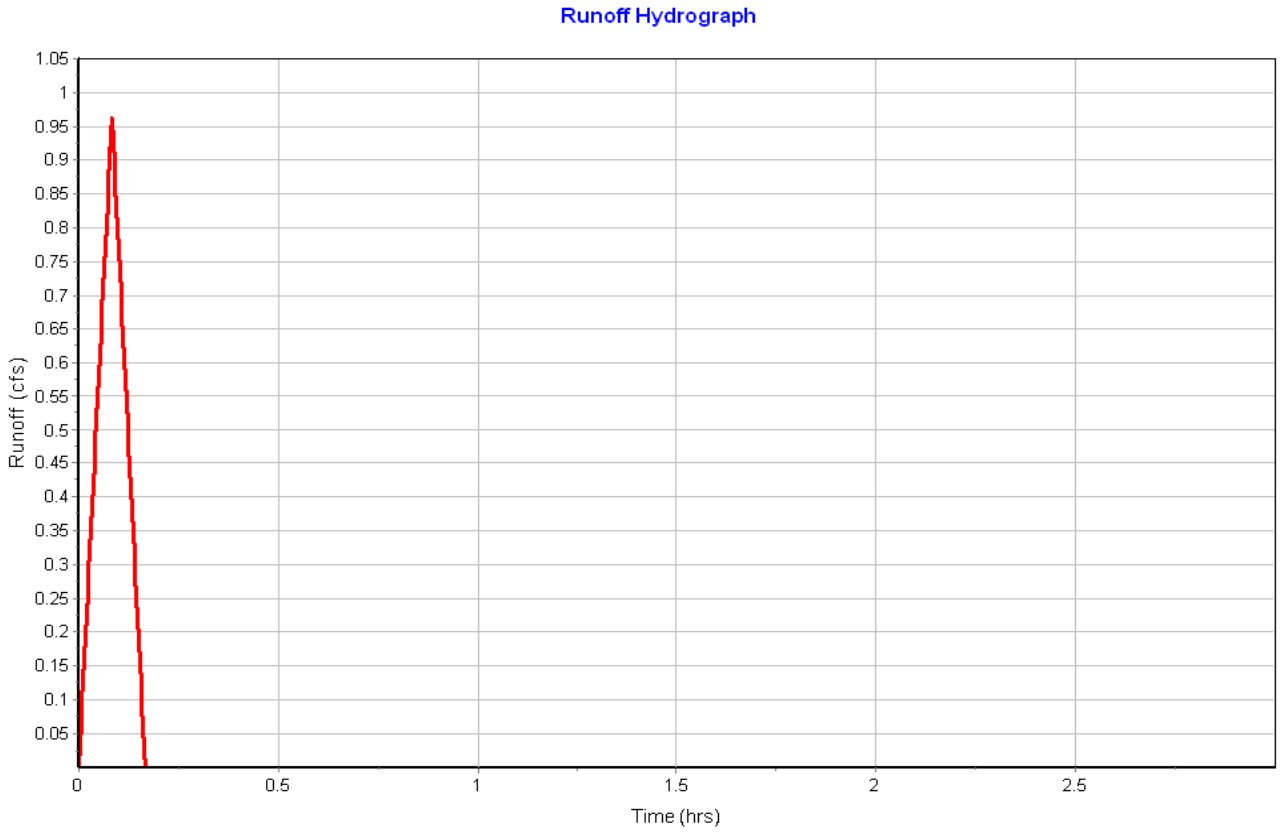
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.44
Peak Runoff (cfs) 0.96
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.8100
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-08



Subbasin : Pr-09

Input Data

Area (ac) 1.68
Weighted Runoff Coefficient 0.3800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.11	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Meadow, 25 years or greater	1.17	B (6%+)	0.37
Forest, 25 years or greater	0.35	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	1.67		0.38

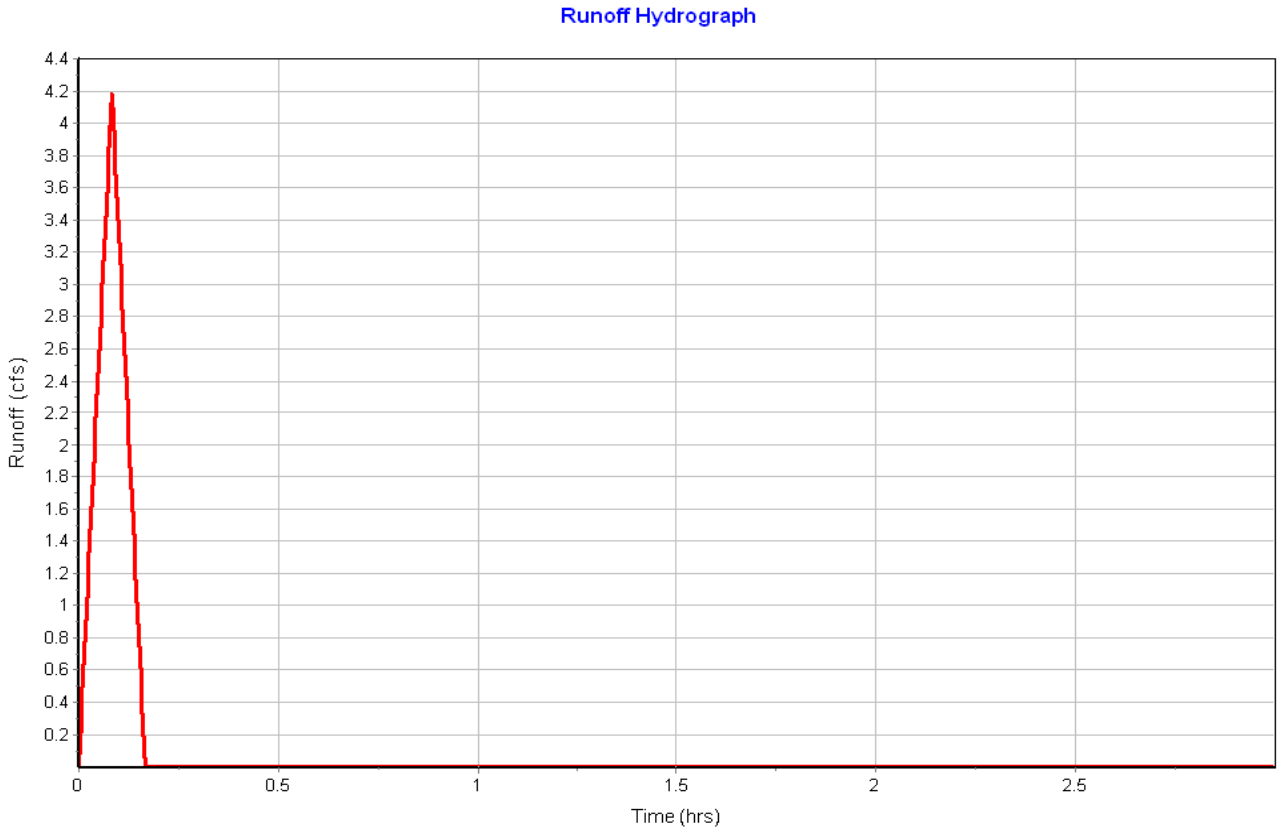
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.21
Peak Runoff (cfs) 4.18
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.3800
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-09



Subbasin : Pr-10

Input Data

Area (ac) 0.42
Weighted Runoff Coefficient 0.4600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.12	B (6%+)	0.97
Open Space, 25 years or greater	0.30	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.42		0.46

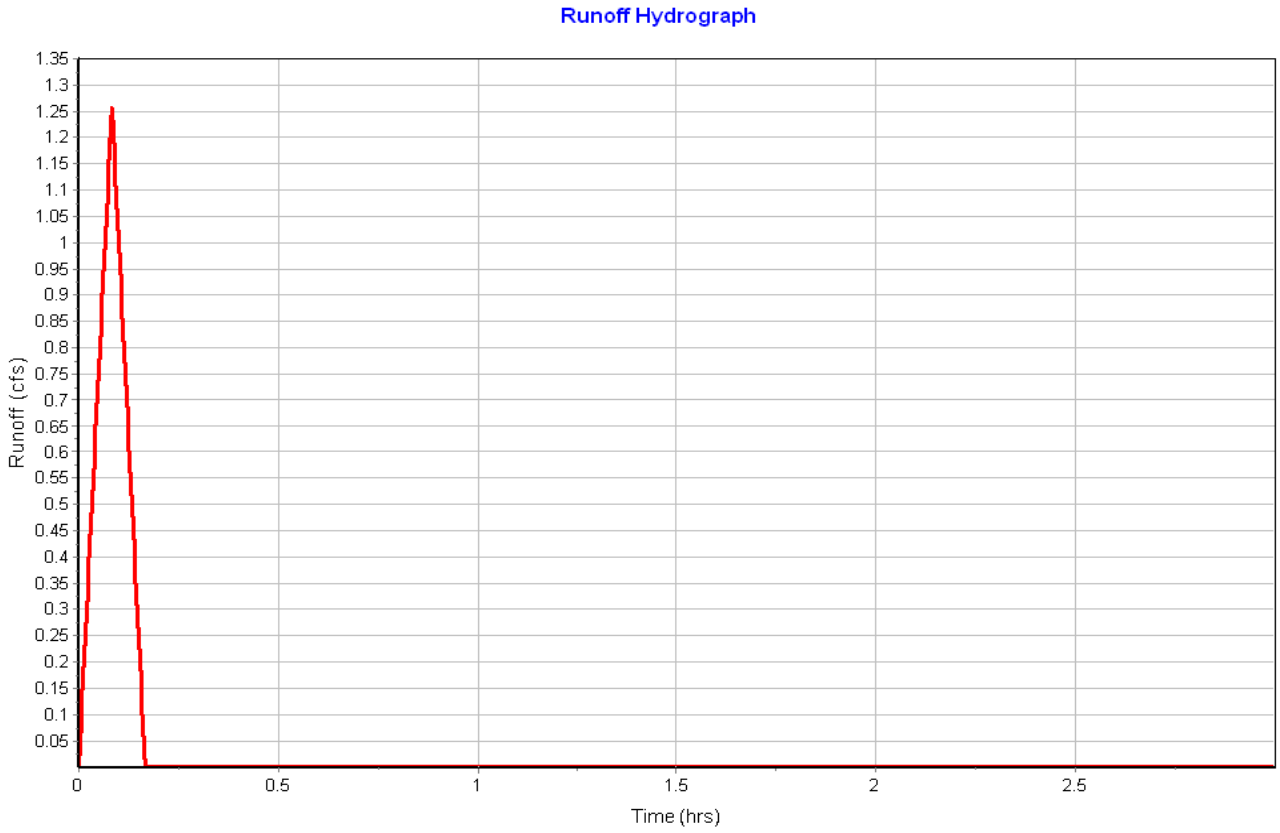
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.25
Peak Runoff (cfs) 1.26
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.4600
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-10



Subbasin : Pr-11

Input Data

Area (ac) 0.22
Weighted Runoff Coefficient 0.8700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.19	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.22		0.87

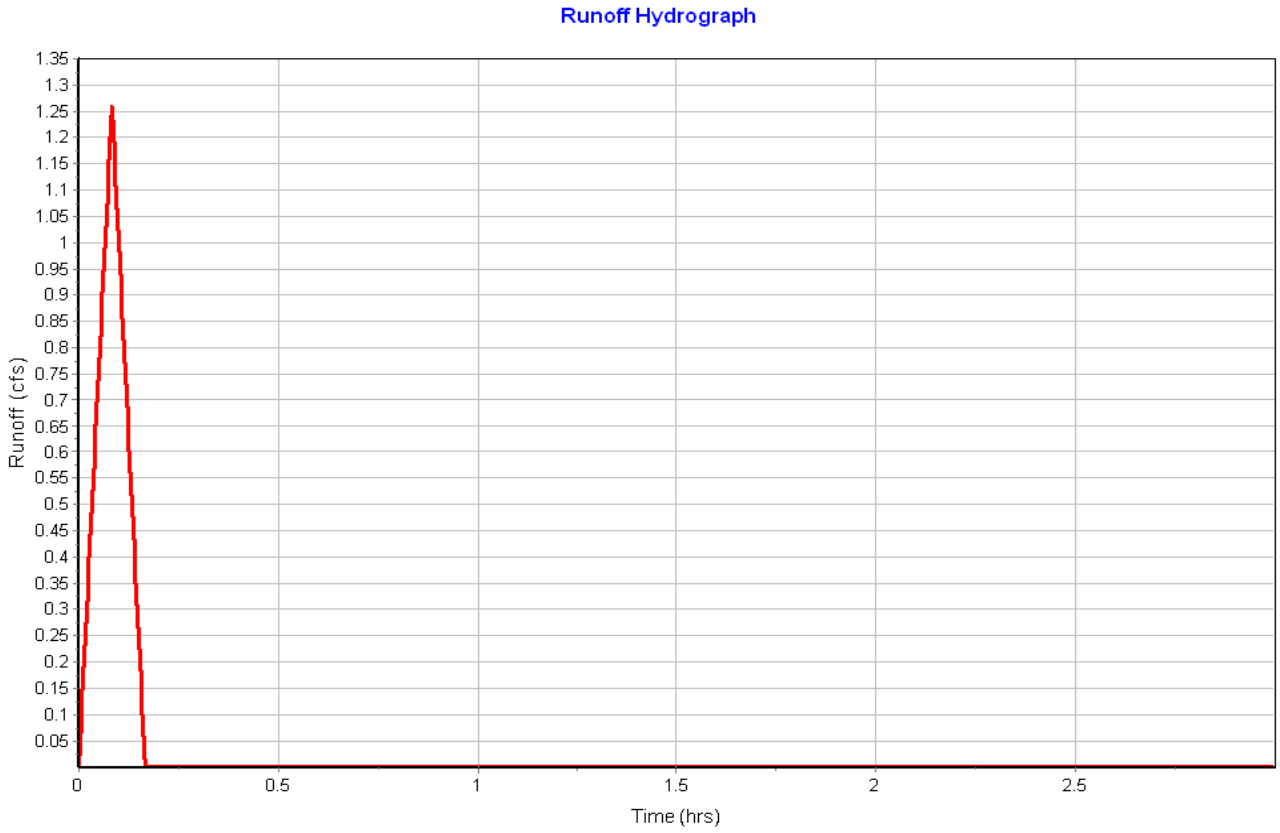
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.48
Peak Runoff (cfs) 1.26
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.8700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-11



Subbasin : Pr-12

Input Data

Area (ac) 0.15
Weighted Runoff Coefficient 0.6200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.07	B (6%+)	0.97
Open Space, 25 years or greater	0.07	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.14		0.62

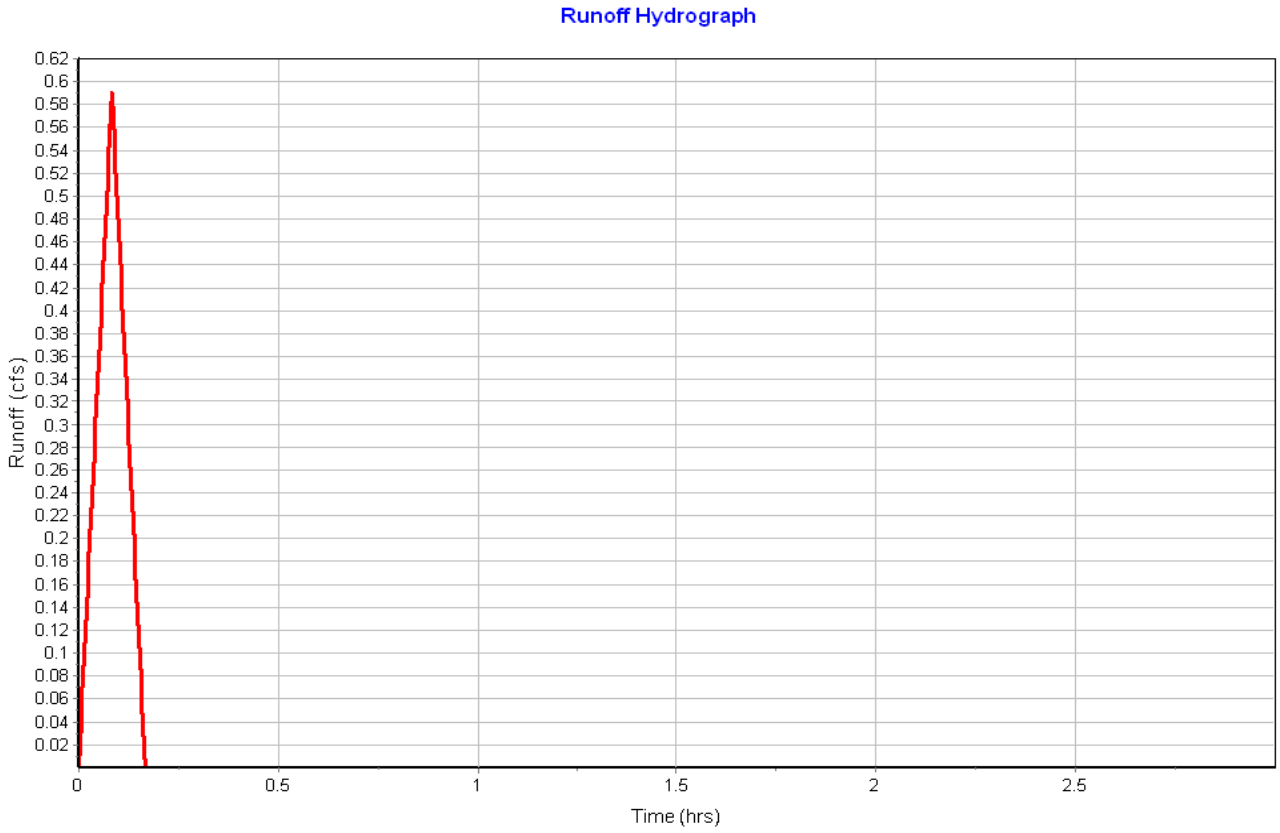
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.34
Peak Runoff (cfs) 0.59
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.6200
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-12



Subbasin : Pr-13

Input Data

Area (ac) 0.41
Weighted Runoff Coefficient 0.6700

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.21	B (6%+)	0.97
Open Space, 25 years or greater	0.04	B (6%+)	0.26
Meadow, 25 years or greater	0.16	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.41		0.67

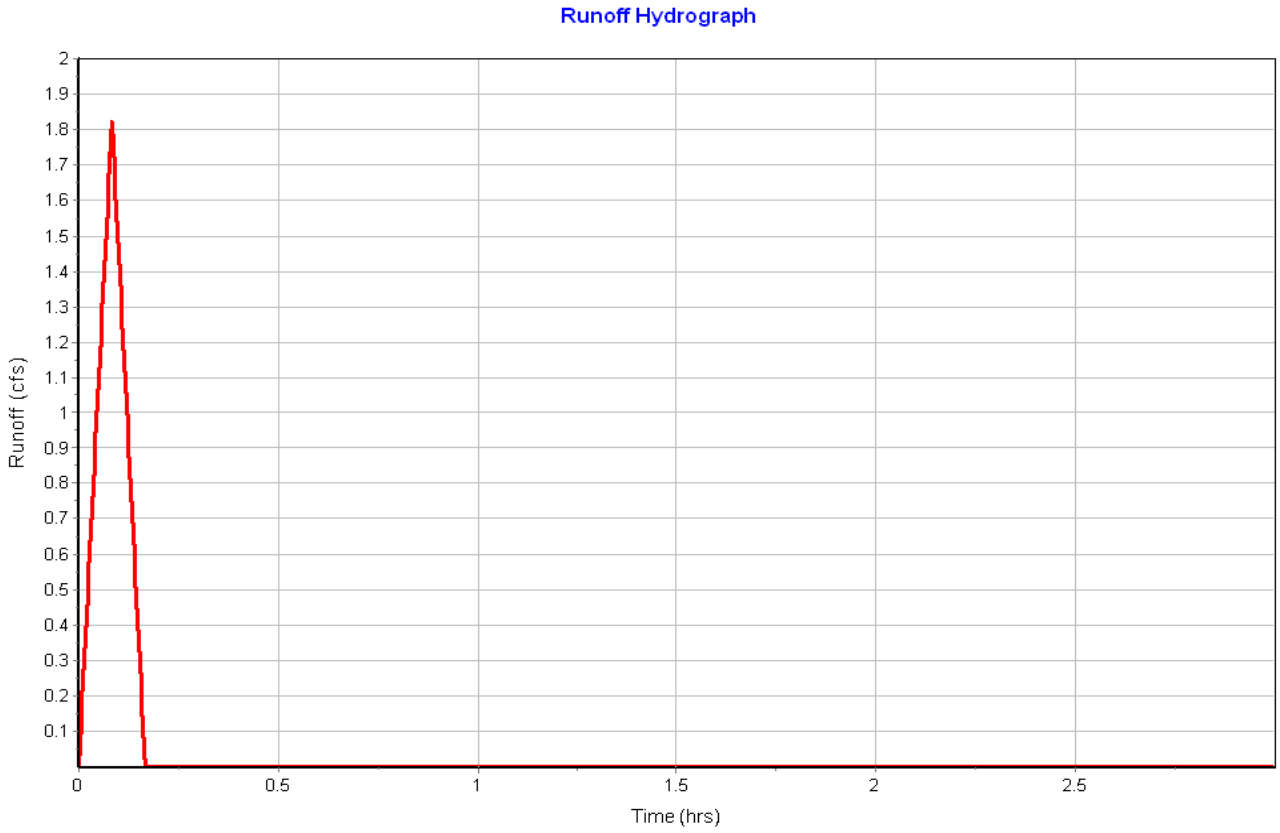
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.37
Peak Runoff (cfs) 1.82
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.6700
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-13



Subbasin : Pr-14

Input Data

Area (ac) 0.20
Weighted Runoff Coefficient 0.8600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.17	B (2-6%)	0.96
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.20		0.86

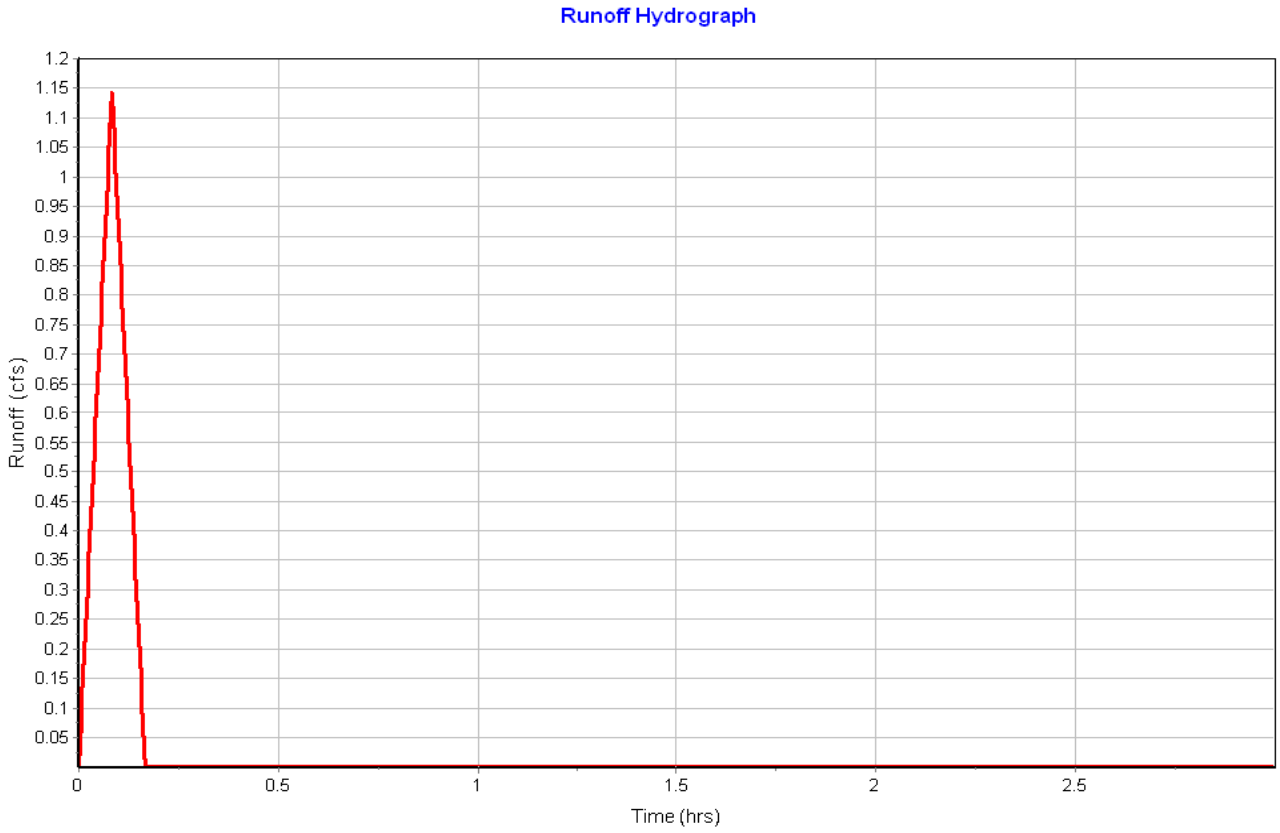
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.47
Peak Runoff (cfs) 1.14
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.8600
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-14



Subbasin : Pr-15

Input Data

Area (ac) 0.13
Weighted Runoff Coefficient 0.7900

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.10	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.13		0.79

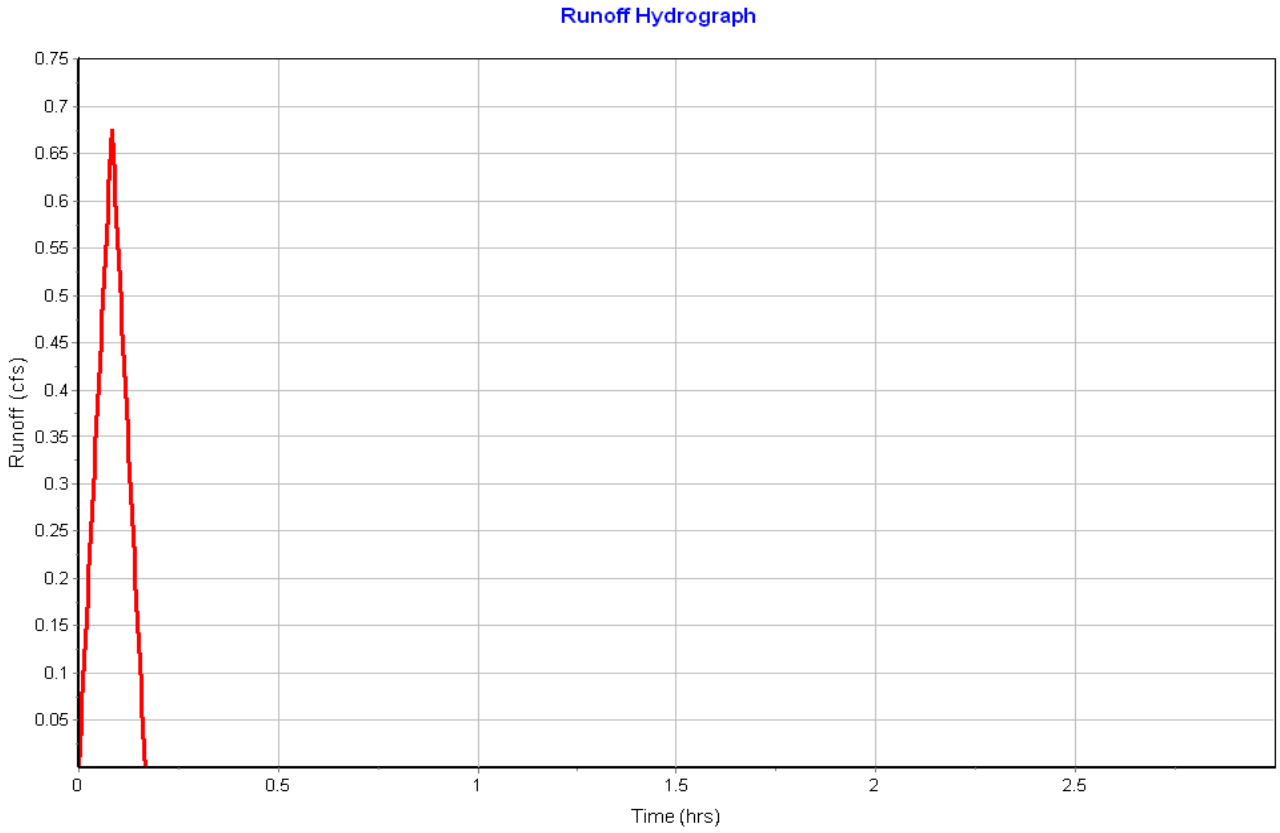
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.43
Peak Runoff (cfs) 0.67
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.7900
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-15



Subbasin : Pr-16

Input Data

Area (ac) 0.17
Weighted Runoff Coefficient 0.7100

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.11	B (6%+)	0.97
Open Space, 25 years or greater	0.06	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.17		0.71

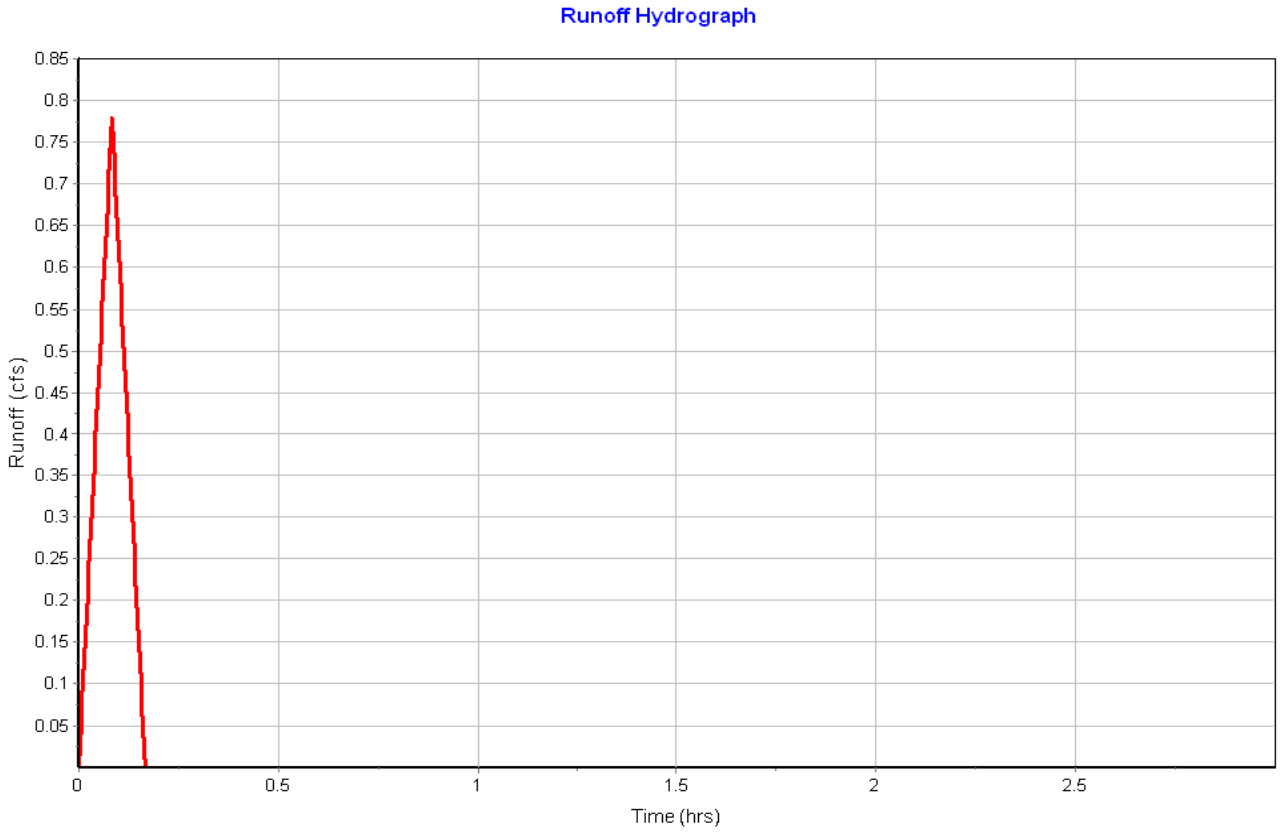
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.39
Peak Runoff (cfs) 0.78
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.7100
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-16



Subbasin : Pr-17

Input Data

Area (ac) 0.05
Weighted Runoff Coefficient 0.6300

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.03	B (6%+)	0.97
Open Space, 25 years or greater	0.02	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.05		0.63

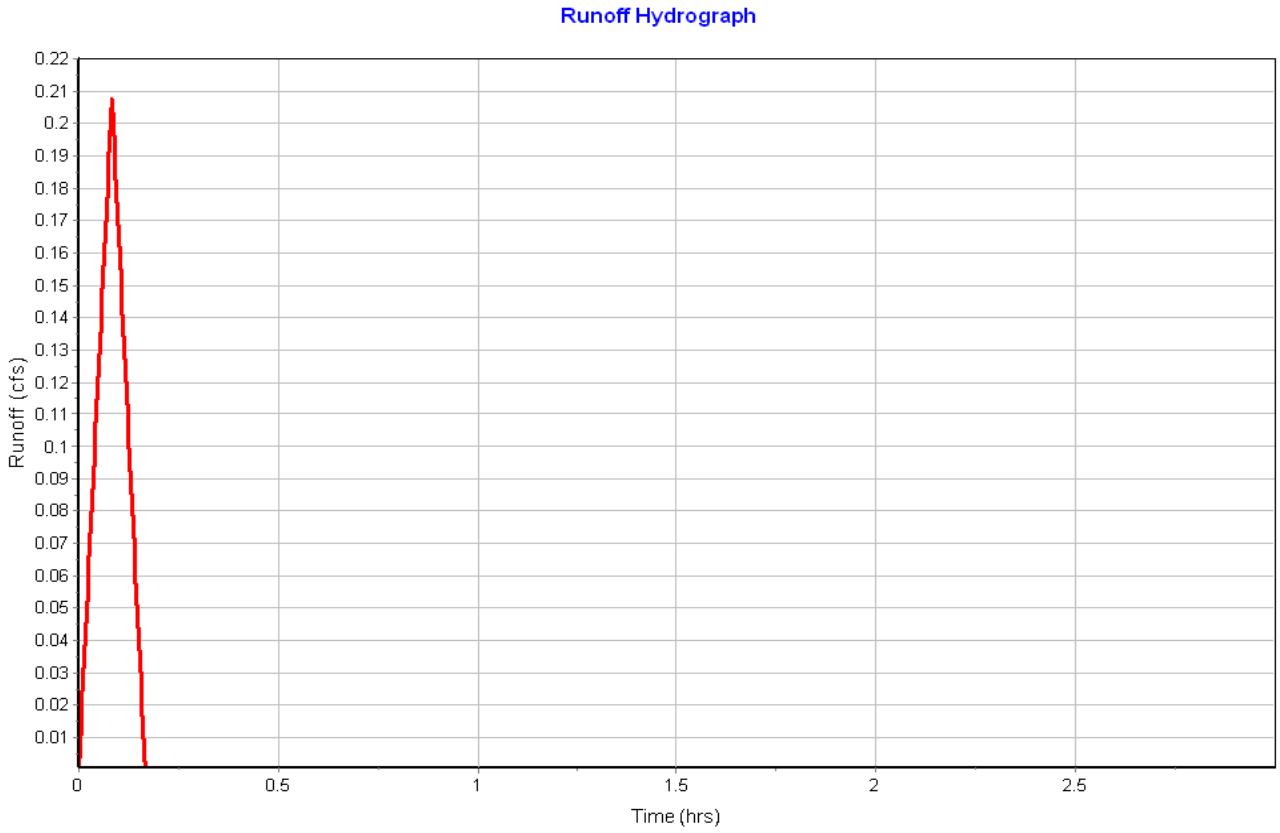
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.34
Peak Runoff (cfs) 0.21
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.6300
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-17



Subbasin : Pr-18

Input Data

Area (ac) 0.11
Weighted Runoff Coefficient 0.9500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.11	B (6%+)	0.97
Open Space, 25 years or greater	0.00	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.11		0.95

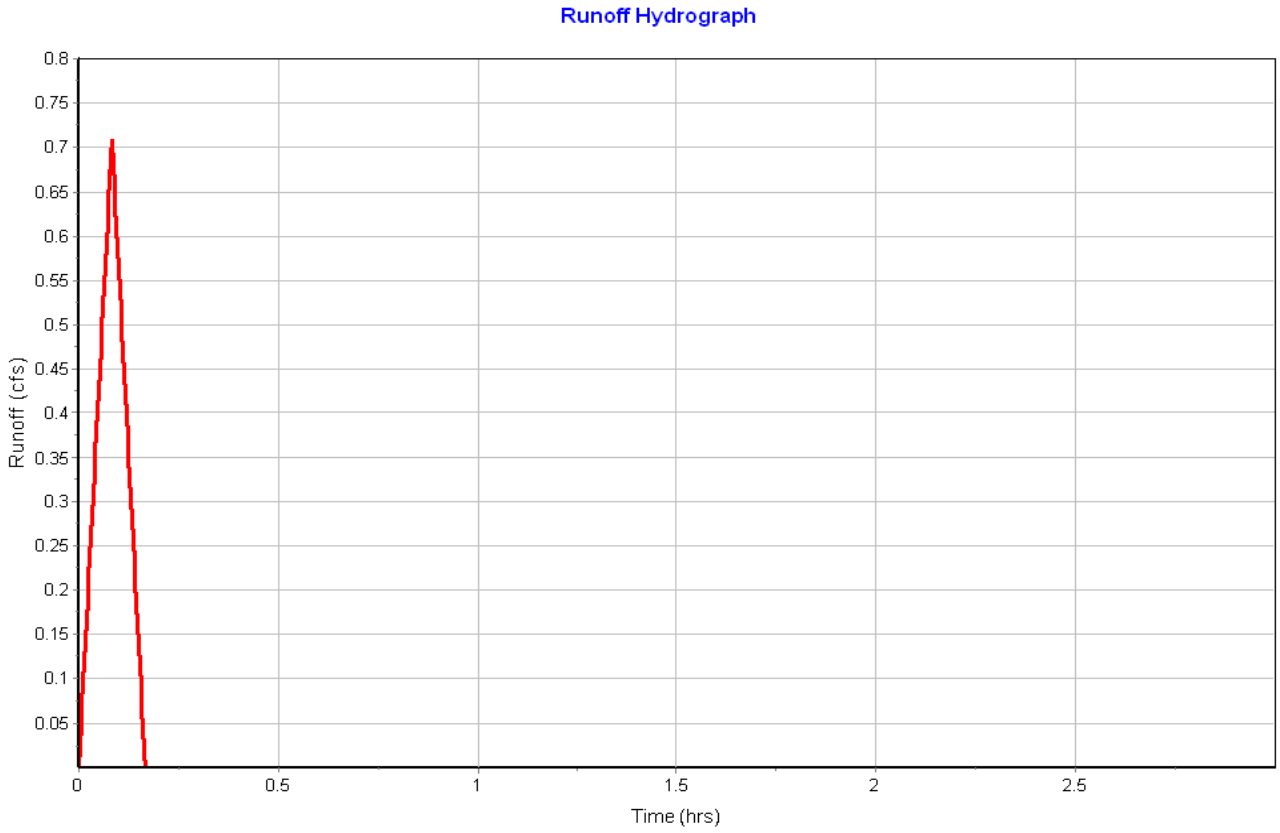
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.52
Peak Runoff (cfs) 0.71
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.9500
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-18



Subbasin : Pr-19

Input Data

Area (ac) 0.10
Weighted Runoff Coefficient 0.8200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.08	B (6%+)	0.97
Open Space, 25 years or greater	0.02	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.10		0.82

Time of Concentration

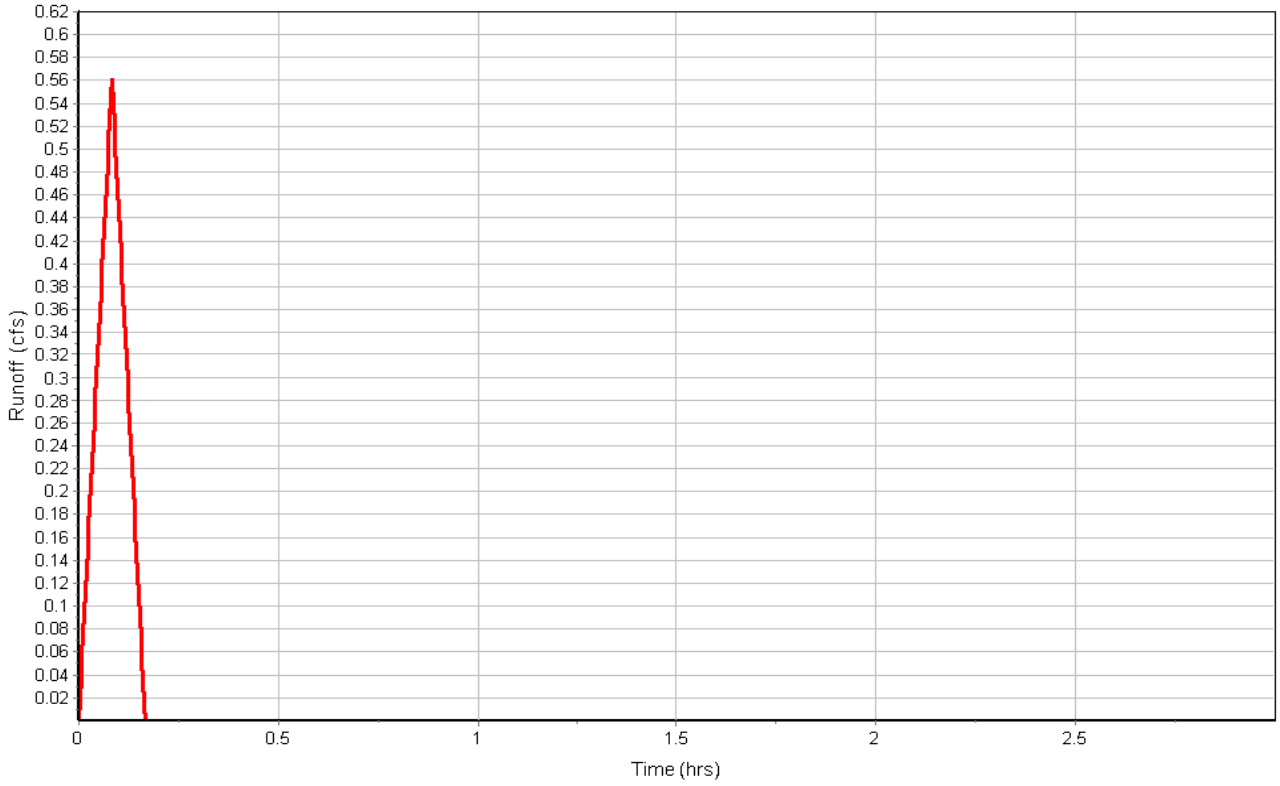
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.45
Peak Runoff (cfs) 0.56
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.8200
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-19

Runoff Hydrograph



Subbasin : Pr-20

Input Data

Area (ac) 0.31
Weighted Runoff Coefficient 0.8200

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.24	B (6%+)	0.97
Open Space, 25 years or greater	0.03	B (6%+)	0.26
Meadow, 25 years or greater	0.03	B (6%+)	0.37
Composite Area & Weighted Runoff Coeff.	0.30		0.82

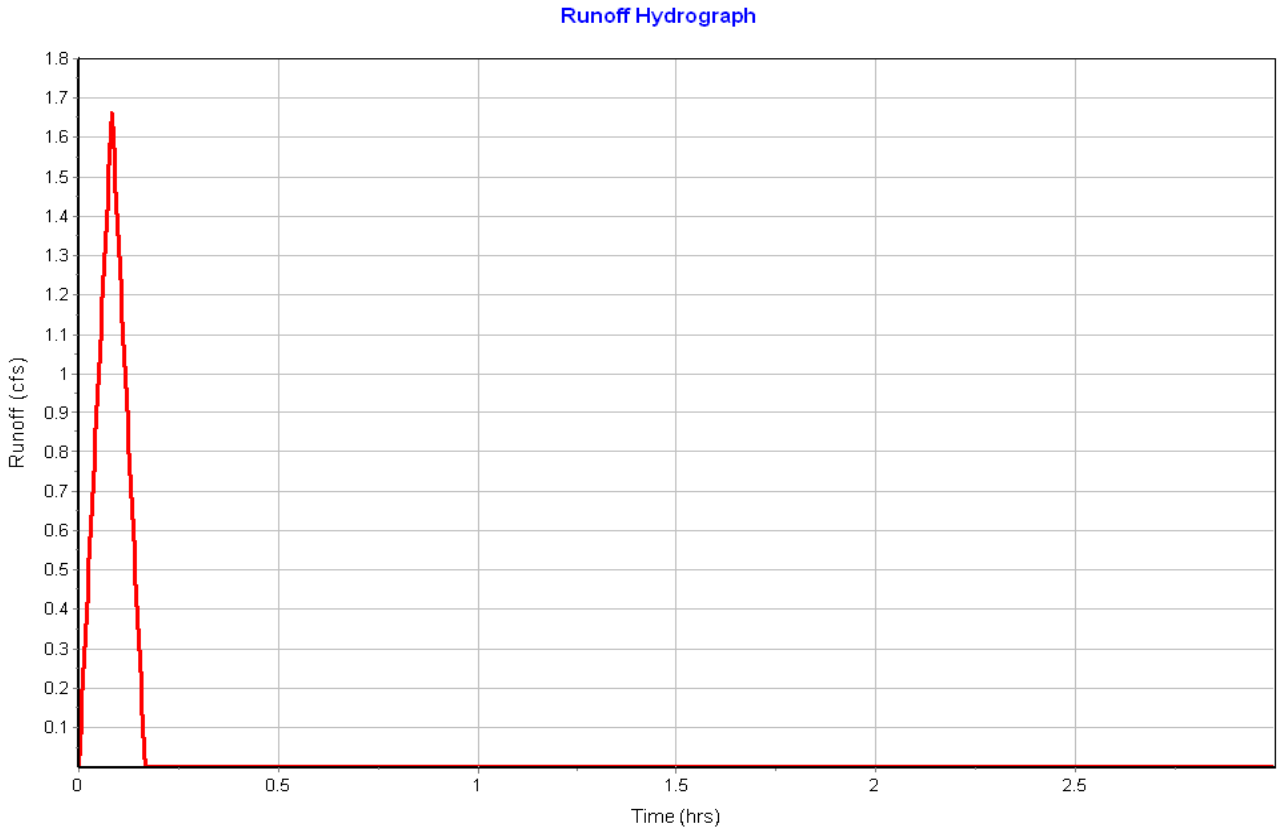
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.45
Peak Runoff (cfs) 1.66
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.8200
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-20



Subbasin : Pr-21

Input Data

Area (ac) 0.36
Weighted Runoff Coefficient 0.5500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Parking, 25 years or greater	0.15	B (6%+)	0.97
Open Space, 25 years or greater	0.22	B (6%+)	0.26
Composite Area & Weighted Runoff Coeff.	0.37		0.55

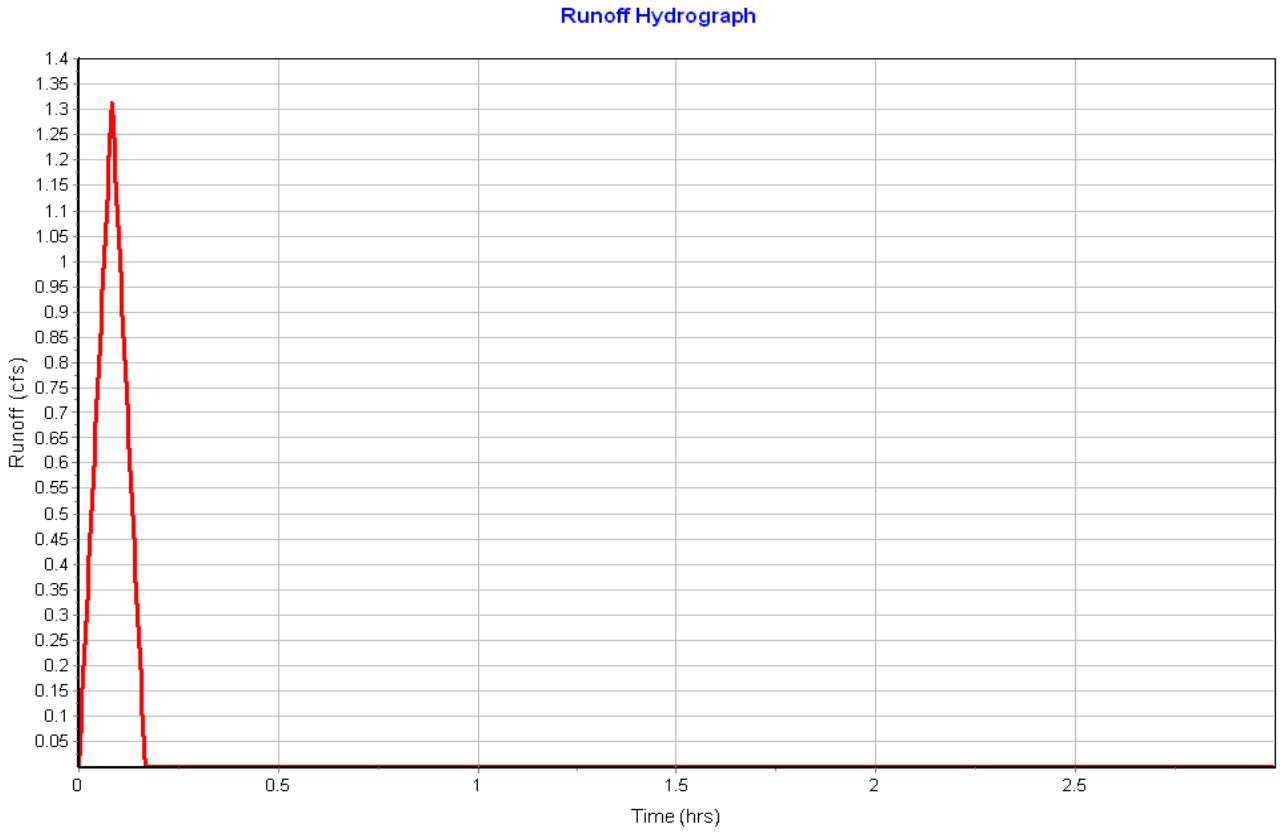
Time of Concentration

User-Defined TOC override (minutes): 5.00

Subbasin Runoff Results

Total Rainfall (in) 0.55
Total Runoff (in) 0.30
Peak Runoff (cfs) 1.31
Rainfall Intensity 6.560
Weighted Runoff Coefficient 0.5500
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : Pr-21



Subbasin : Pr-OS-1

Input Data

Area (ac) 124.70
Weighted Runoff Coefficient 0.3600

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	117.22	B (6%+)	0.37
Forest, 25 years or greater	7.48	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	124.70		0.36

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	10	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.21	0.00	0.00
Computed Flow Time (min) :	8.01	0.00	0.00

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	3200	0.00	0.00
Slope (%) :	15	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	0.00	0.00
Computed Flow Time (min) :	13.78	0.00	0.00

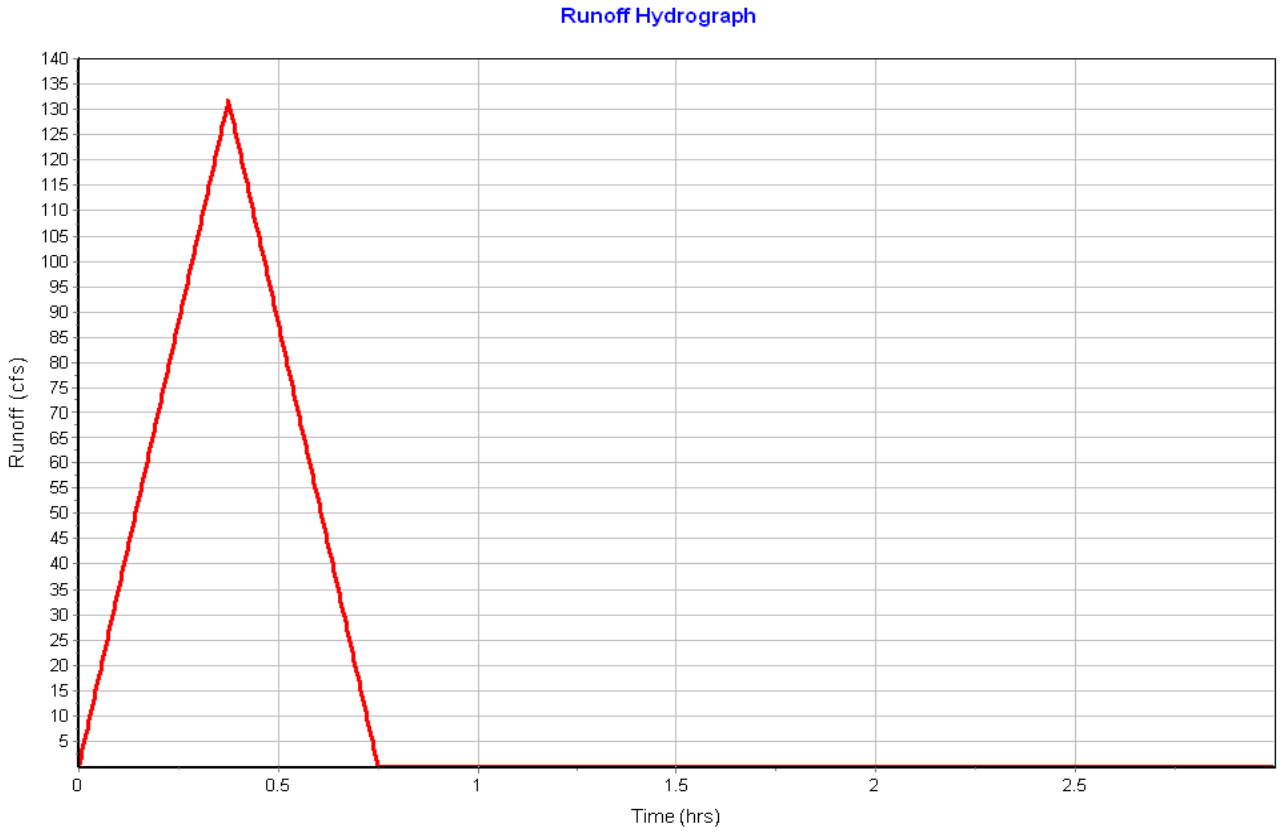
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	0.66	0.00	0.00

Total TOC (min) 22.45

Subbasin Runoff Results

Total Rainfall (in) 1.10
Total Runoff (in) 0.40
Peak Runoff (cfs) 131.82
Rainfall Intensity 2.936
Weighted Runoff Coefficient 0.3600
Time of Concentration (days hh:mm:ss) 0 00:22:27

Subbasin : Pr-OS-1



Subbasin : Pr-OS-2

Input Data

Area (ac) 9.37
Weighted Runoff Coefficient 0.2800

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
Meadow, 25 years or greater	2.06	B (6%+)	0.37
Forest, 25 years or greater	7.31	D (6%+)	0.25
Composite Area & Weighted Runoff Coeff.	9.37		0.28

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.13	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	45	0.00	0.00
2 yr, 24 hr Rainfall (in) :	1.05	0.00	0.00
Velocity (ft/sec) :	0.38	0.00	0.00
Computed Flow Time (min) :	4.39	0.00	0.00

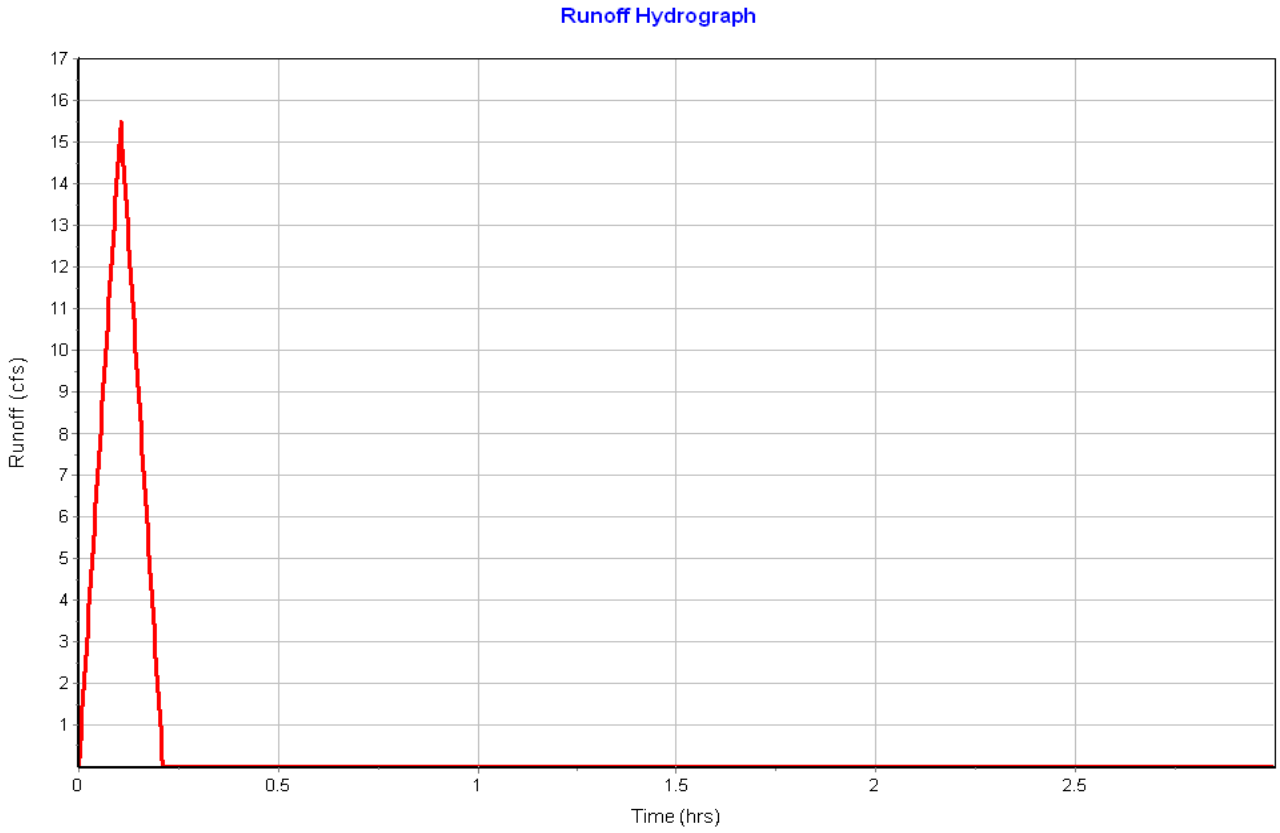
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

Total TOC (min) 6.32

Subbasin Runoff Results

Total Rainfall (in) 0.62
Total Runoff (in) 0.18
Peak Runoff (cfs) 15.50
Rainfall Intensity 5.907
Weighted Runoff Coefficient 0.2800
Time of Concentration (days hh:mm:ss) 0 00:06:19

Subbasin : Pr-OS-2



Subbasin : Walmart

Input Data

Area (ac) 1.55
Weighted Runoff Coefficient 0.9500

Runoff Coefficient

Soil/Surface Description	Area (acres)	Soil Group	Runoff Coeff.
-	3.28	-	0.95
Composite Area & Weighted Runoff Coeff.	3.28		0.95

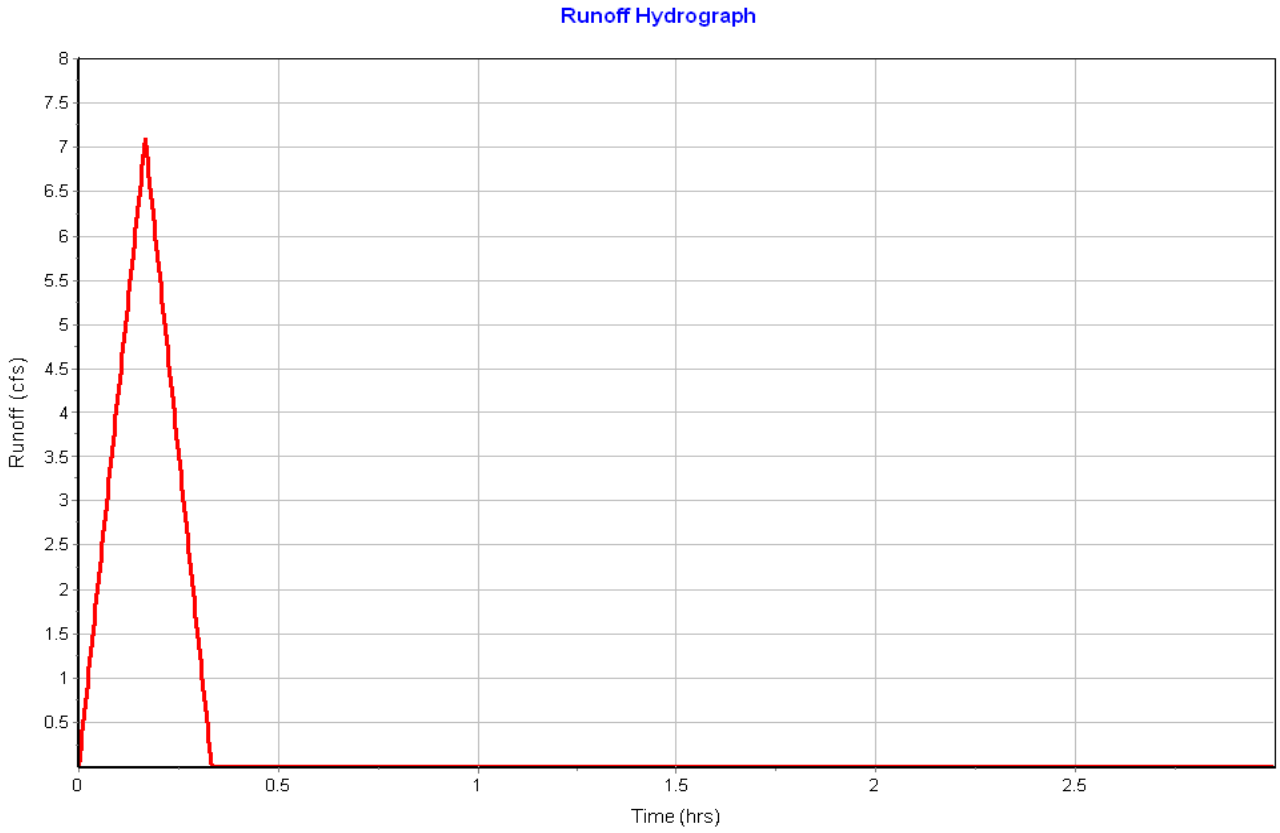
Time of Concentration

User-Defined TOC override (minutes): 10

Subbasin Runoff Results

Total Rainfall (in) 0.80
Total Runoff (in) 0.76
Peak Runoff (cfs) 7.08
Rainfall Intensity 4.810
Weighted Runoff Coefficient 0.9500
Time of Concentration (days hh:mm:ss) 0 00:10:00

Subbasin : Walmart



Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)
1	EDB-Control	5863.00	5866.00	3.00	5863.00	0.00
2	FES-B10	5863.00	5869.00	6.00	5863.00	0.00
3	Int-Blake-Palmer	5859.50	5859.50	0.00	5859.50	0.00
4	Junc.H-04	5870.00	5876.00	6.00	5870.00	0.00
5	Junc.H-Blake-S	5858.00	5864.00	6.00	5858.00	0.00
6	Junc-H-02	5885.00	5891.00	6.00	5885.00	0.00
7	Junc-H-03	5888.00	5894.00	6.00	5888.00	0.00
8	Junc-Pr-Blake-S	5858.20	5858.20	0.00	5858.20	0.00
9	OS-1a	5942.00	5942.00	0.00	5942.00	0.00
10	OS-1b	5906.00	5906.00	0.00	5906.00	0.00
11	OS-2a	5942.00	5942.00	0.00	5942.00	0.00
12	Out-H-01	5875.00	5881.00	6.00	5875.00	0.00
13	Pr-26th	5876.00	5877.00	1.00	5876.00	0.00
14	Road-Palmer-B-12	5888.00	5888.00	0.00	5888.00	0.00
15	SDHM-A10	5896.00	5899.00	3.00	5896.00	0.00
16	SDMH-A4	5889.50	5899.80	10.30	5889.50	0.00
17	SDMH-A5	5888.90	5893.65	4.75	5888.90	0.00
18	SDMH-A6	5886.30	5890.77	4.47	5886.30	0.00
19	SDMH-A9	5894.20	5900.19	5.99	5894.20	0.00
20	SDMH-B9	5864.00	5867.21	3.21	5864.00	0.00
21	UG-Detention-Control	5858.30	5858.30	0.00	5858.30	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Total Flooded Volume (ft³)	Total Time Flooded (min)
1	EDB-Control	0.470	5863.16	0.16	2.84	5863.11	0.11	0 00:15	0.00	0.00
2	FES-B10	15.550	5864.25	1.25	4.75	5863.07	0.07	0 00:05	0.00	0.00
3	Int-Blake-Palmer	6.800	5859.86	0.36	0.24	5859.52	0.02	0 00:07	0.00	0.00
4	Junc.H-04	1.430	5870.00	0.00	6.00	5870.00	0.00	0 00:00	0.00	0.00
5	Junc.H-Blake-S	20.780	5858.00	0.00	6.00	5858.00	0.00	0 00:00	0.00	0.00
6	Junc-H-02	0.990	5885.00	0.00	6.00	5885.00	0.00	0 00:00	0.00	0.00
7	Junc-H-03	0.790	5888.00	0.00	6.00	5888.00	0.00	0 00:00	0.00	0.00
8	Junc-Pr-Blake-S	9.140	5858.88	0.68	0.57	5858.31	0.11	0 00:09	0.00	0.00
9	OS-1a	131.820	5943.09	1.09	0.41	5942.18	0.18	0 00:22	0.00	0.00
10	OS-1b	131.640	5907.09	1.09	0.41	5906.18	0.18	0 00:22	0.00	0.00
11	OS-2a	15.500	5942.35	0.35	0.15	5942.02	0.02	0 00:06	0.00	0.00
12	Out-H-01	131.820	5875.00	0.00	6.00	5875.00	0.00	0 00:00	0.00	0.00
13	Pr-26th	131.440	5876.57	0.57	0.43	5876.11	0.11	0 00:22	0.00	0.00
14	Road-Palmer-B-12	14.830	5888.86	0.86	0.39	5888.04	0.04	0 00:06	0.00	0.00
15	SDHM-A10	1.490	5896.43	0.43	2.57	5896.02	0.02	0 00:05	0.00	0.00
16	SDMH-A4	4.660	5894.21	4.71	5.59	5893.82	4.32	0 00:05	0.00	0.00
17	SDMH-A5	5.320	5889.69	0.79	3.96	5888.93	0.03	0 00:05	0.00	0.00
18	SDMH-A6	5.300	5887.28	0.98	3.49	5886.53	0.23	0 00:05	0.00	0.00
19	SDMH-A9	1.440	5894.82	0.62	5.37	5894.42	0.22	0 00:05	0.00	0.00
20	SDMH-B9	15.640	5865.25	1.25	1.96	5864.06	0.06	0 00:05	0.00	0.00
21	UG-Detention-Control	2.860	5858.98	0.68	1.32	5858.41	0.11	0 00:09	0.00	0.00

Channel Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)
1	Bypass-A1	31.56	5896.57	4.07	5896.57	4.57	0.00	0.0100	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
2	Bypass-A2	140.00	5896.57	4.57	5876.00	0.00	20.57	14.6900	User-Defined	1.000	32.000	0.0160	0.5000	0.5000	0.0000	0.000
3	Bypass-B1	64.47	5883.39	3.79	5876.84	3.74	6.55	10.1700	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
4	Bypass-B2	71.42	5883.39	4.29	5876.84	4.24	6.55	9.1800	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
5	Bypass-B3	85.00	5876.84	4.24	5868.74	4.04	8.10	9.5300	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
6	Bypass-B5	80.66	5876.84	3.74	5868.74	4.24	8.09	10.0300	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
7	Bypass-B6	84.14	5868.74	4.04	5861.29	2.79	7.46	8.8600	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
8	Bypass-B8	78.55	5868.74	4.24	5861.29	2.29	7.46	9.4900	User-Defined	0.600	17.000	0.0160	0.5000	0.5000	0.0000	0.000
9	Bypass-C1	18.27	5862.19	2.59	5861.29	2.29	0.90	4.9300	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
10	Bypass-C2	51.37	5861.29	2.29	5859.50	0.00	1.79	3.4800	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
11	Bypass-C3	58.47	5861.29	2.79	5859.50	0.00	1.79	3.0600	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
12	Link-Blake-S	230.46	5859.50	0.00	5858.20	0.00	1.30	0.5600	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
13	Out-Pr-Blake	200.00	5858.20	0.00	5856.00	4.60	2.20	1.1000	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
14	Road-B12	48.58	5888.00	0.00	5883.39	4.29	4.61	9.4800	User-Defined	0.600	30.000	0.0160	0.5000	0.5000	0.0000	0.000
15	Road-OS-1b	240.00	5906.00	0.00	5876.00	0.00	30.00	12.5000	User-Defined	1.000	32.000	0.0160	0.5000	0.5000	0.0000	0.000
16	Swale-OS-1a	143.20	5942.00	0.00	5804.00	-102.00	138.00	96.3700	Trapezoidal	1.500	12.000	0.0300	0.5000	0.5000	0.0000	0.000
17	Swale-OS-2	146.88	5942.00	0.00	5889.00	0.00	53.00	36.0800	Trapezoidal	0.500	6.000	0.0300	0.5000	0.5000	0.0000	0.000

Channel Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Bypass-A1	0.750	0 00:05	19.280	0.04	1.92	0.27	0.23	0.38	0.00	
2	Bypass-A2	0.500	0 00:05	565.610	0.00	4.65	0.50	0.09	0.09	0.00	
3	Bypass-B1	0.260	0 00:05	68.980	0.00	6.05	0.18	0.10	0.17	0.00	
4	Bypass-B2	12.230	0 00:07	65.530	0.19	7.49	0.16	0.35	0.59	0.00	
5	Bypass-B3	10.870	0 00:07	66.770	0.16	7.30	0.19	0.34	0.57	0.00	
6	Bypass-B5	0.200	0 00:05	68.520	0.00	3.79	0.35	0.09	0.16	0.00	
7	Bypass-B6	8.950	0 00:07	64.400	0.14	6.77	0.21	0.33	0.54	0.00	
8	Bypass-B8	0.020	0 00:05	66.650	0.00	2.19	0.60	0.04	0.07	0.00	
9	Bypass-C1	0.180	0 00:05	95.740	0.00	4.05	0.08	0.08	0.13	0.00	
10	Bypass-C2	0.320	0 00:05	80.420	0.00	2.36	0.36	0.11	0.18	0.00	
11	Bypass-C3	5.980	0 00:07	75.380	0.08	3.49	0.28	0.28	0.46	0.00	
12	Link-Blake-S	6.520	0 00:08	32.380	0.20	4.72	0.81	0.36	0.59	0.00	
13	Out-Pr-Blake	8.950	0 00:09	45.210	0.20	2.73	1.22	0.36	0.60	0.00	
14	Road-B12	14.830	0 00:07	132.730	0.11	6.62	0.12	0.31	0.51	0.00	
15	Road-OS-1b	131.440	0 00:22	521.700	0.25	15.75	0.25	0.57	0.57	0.00	
16	Swale-OS-1a	131.640	0 00:22	260.630	0.51	19.39	0.12	1.09	0.72	0.00	
17	Swale-OS-2	15.370	0 00:06	30.080	0.51	11.00	0.22	0.35	0.69	0.00	

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	26thSt	25.49	5876.00	0.00	5875.00	0.00	1.00	3.9200	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
2	Link-B10	35.65	5863.00	0.00	5863.00	0.00	0.00	0.0000	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
3	Link-H-01	230.30	5875.00	0.00	5841.00	0.00	34.00	14.7600	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
4	Link-H-02	177.03	5885.00	0.00	5841.00	0.00	44.00	24.8500	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
5	Link-H-03	169.29	5888.00	0.00	5858.00	0.00	30.00	17.7200	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
6	Link-H-04	134.40	5870.00	0.00	5858.00	0.00	12.00	8.9300	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
7	Link-H-Blake-S	33.46	5858.00	0.00	5858.00	0.00	0.00	0.0000	Dummy	0.000	0.000	0.0120	0.5000	0.5000	0.000	No	1
8	Pipe-29thSt	265.00	5851.40	0.00	5850.80	0.00	0.60	0.2300	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.000	No	1
9	Pipe-A1	24.33	5892.50	0.00	5892.20	0.20	0.30	1.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
10	Pipe-A10	153.02	5896.00	0.00	5894.40	0.20	1.60	1.0500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
11	Pipe-A2	80.85	5892.00	0.00	5891.20	0.20	0.80	0.9900	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
12	Pipe-A3	133.17	5891.00	0.00	5889.70	0.20	1.30	0.9800	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
13	Pipe-A4	29.56	5889.50	0.00	5888.90	0.00	0.60	2.0300	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
14	Pipe-A5	117.00	5888.90	0.00	5886.50	0.20	2.40	2.0500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
15	Pipe-A6	240.10	5886.30	0.00	5879.80	3.00	6.50	2.7100	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
16	Pipe-A7	54.21	5876.80	0.00	5863.00	0.00	13.80	25.4600	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
17	Pipe-A9	34.80	5894.20	0.00	5893.80	4.30	0.40	1.1500	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
18	Pipe-B1	24.33	5879.60	0.00	5879.30	0.20	0.30	1.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
19	Pipe-B11	15.00	5883.00	-0.30	5880.00	0.90	3.00	20.0000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
20	Pipe-B12	15.00	5889.00	0.00	5888.00	0.00	1.00	6.6700	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
21	Pipe-B2	65.73	5879.10	0.00	5872.80	0.20	6.30	9.5800	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
22	Pipe-B3	82.21	5872.60	0.00	5864.70	0.00	7.90	9.6100	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
23	Pipe-B4	20.78	5876.90	0.00	5873.30	0.20	3.60	17.3300	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
24	Pipe-B5	24.33	5873.10	0.00	5872.80	0.20	0.30	1.2300	CIRCULAR	12.000	12.000	0.0120	0.5000	0.5000	0.000	No	1
25	Pipe-B6	24.34	5864.70	0.00	5864.50	0.00	0.20	0.8200	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.000	No	1
26	Pipe-B7	29.28	5870.20	0.00	5864.70	0.00	5.50	18.7800	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
27	Pipe-B8	57.48	5864.50	0.00	5864.00	0.00	0.50	0.8700	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.000	No	1
28	Pipe-B9	125.34	5864.00	0.00	5863.00	0.00	1.00	0.8000	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.000	No	1
29	Pipe-C1	14.31	5859.60	0.00	5859.20	0.20	0.40	2.8000	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
30	Pipe-C2	19.75	5859.00	0.00	5858.80	0.30	0.20	1.0100	CIRCULAR	8.040	8.040	0.0120	0.5000	0.5000	0.000	No	1
31	Pipe-C3	27.52	5858.80	0.30	5858.50	5.00	0.30	1.0900	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
32	Pipe-C4	20.00	5858.50	5.00	5858.40	0.00	0.10	0.5000	CIRCULAR	18.000	18.000	0.0120	0.5000	0.5000	0.000	No	1
33	Pipe-EDB-Control	28.55	5863.00	0.00	5862.00	0.00	1.00	3.5000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1
34	Pipe-UG-Control	20.00	5858.30	0.00	5858.20	0.00	0.10	0.5000	CIRCULAR	15.000	15.000	0.0120	0.5000	0.5000	0.000	No	1

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)
1	26thSt	131.440	0 00:22	0.00	0.00	0.00		0.00	0.00	0.00
2	Link-B10	15.550	0 00:05	0.00	0.08	0.00		0.28	0.46	0.00
3	Link-H-01	131.820	0 00:22	0.00	0.20	0.00		0.36	0.59	0.00
4	Link-H-02	0.990	0 00:06	0.00	0.20	0.00		0.36	0.59	0.00
5	Link-H-03	0.790	0 00:06	0.00	0.20	0.00		0.36	0.59	0.00
6	Link-H-04	1.430	0 00:07	0.00	0.20	0.00		0.36	0.59	0.00
7	Link-H-Blake-S	20.780	0 00:06	0.00	0.20	0.00		0.36	0.59	0.00
8	Pipe-29thSt	5.860	0 00:14	5.41	1.08	3.88	1.14	1.50	1.00	5.00
9	Pipe-A1	0.990	0 00:05	4.29	0.23	5.26	0.08	0.33	0.33	0.00
10	Pipe-A10	1.440	0 00:05	3.95	0.37	7.54	0.34	0.42	0.42	0.00
11	Pipe-A2	1.830	0 00:05	3.84	0.48	4.85	0.28	0.49	0.49	0.00
12	Pipe-A3	3.220	0 00:05	3.81	0.85	5.53	0.40	0.70	0.70	0.00
13	Pipe-A4	4.660	0 00:05	9.97	0.47	7.99	0.06	0.60	0.48	0.00
14	Pipe-A5	5.300	0 00:05	5.53	0.96	8.11	0.24	0.78	0.78	0.00
15	Pipe-A6	5.260	0 00:06	6.35	0.83	9.20	0.43	0.69	0.69	0.00
16	Pipe-A7	8.520	0 00:06	19.47	0.44	23.96	0.04	0.46	0.46	0.00
17	Pipe-A9	1.440	0 00:05	4.14	0.35	4.80	0.12	0.41	0.41	0.00
18	Pipe-B1	0.700	0 00:05	4.29	0.16	4.60	0.09	0.27	0.27	0.00
19	Pipe-B11	4.160	0 00:05	32.82	0.13	18.34	0.01	0.30	0.24	0.00
20	Pipe-B12	14.830	0 00:06	18.07	0.82	16.43	0.02	0.86	0.69	0.00
21	Pipe-B2	7.130	0 00:05	21.67	0.33	15.83	0.07	0.49	0.39	0.00
22	Pipe-B3	11.160	0 00:05	21.69	0.51	17.82	0.08	0.64	0.51	0.00
23	Pipe-B4	1.230	0 00:05	5.45	0.23	12.60	0.03	0.22	0.32	0.00
24	Pipe-B5	1.850	0 00:05	4.29	0.43	5.26	0.08	0.46	0.46	0.00
25	Pipe-B6	14.320	0 00:05	22.21	0.64	7.51	0.05	1.17	0.58	0.00
26	Pipe-B7	1.140	0 00:05	5.67	0.20	12.74	0.04	0.20	0.30	0.00
27	Pipe-B8	14.470	0 00:05	22.86	0.63	7.71	0.12	1.16	0.58	0.00
28	Pipe-B9	15.550	0 00:05	21.89	0.71	7.60	0.27	1.24	0.62	0.00
29	Pipe-C1	0.520	0 00:05	2.19	0.24	5.15	0.05	0.22	0.33	0.00
30	Pipe-C2	1.410	0 00:05	1.32	1.07	4.42	0.07	0.61	0.92	0.00
31	Pipe-C3	4.200	0 00:07	7.31	0.58	6.16	0.07	0.68	0.54	0.00
32	Pipe-C4	5.640	0 00:05	8.05	0.70	4.93	0.07	0.92	0.62	0.00
33	Pipe-EDB-Control	0.470	0 00:15	13.10	0.04	5.04	0.09	0.16	0.13	0.00
34	Pipe-UG-Control	2.860	0 00:09	4.95	0.58	4.18	0.08	0.68	0.55	0.00

The existing 18"dia pipe leading from the inlet near Walmart will be slightly surcharged, but should not exceed the structure rim.

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft^2)	Grate Clogging Factor (%)
1	A1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.50	5896.57	4.07	5892.50	0.00	N/A	25.00
2	A2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5892.00	5896.57	4.57	5892.00	0.00	N/A	25.00
3	A3-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5891.00	5896.76	5.76	5891.00	0.00	100.00	50.00
4	Inlet-A7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.80	5883.87	7.07	5876.80	0.00	100.00	50.00
5	Inlet-B1-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.60	5883.39	3.79	5879.60	0.00	N/A	25.00
6	Inlet-B11-(Nylo)	CALTRANS	GCP	On Sag	1	5883.30	5899.00	15.70	5883.30	0.00	36.00	50.00
7	Inlet-B12-(Nylo)	CALTRANS	GCP	On Sag	1	5889.00	5901.00	12.00	5889.00	0.00	36.00	50.00
8	Inlet-B2-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5879.10	5883.39	4.29	5879.10	0.00	N/A	25.00
9	Inlet-B3-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5872.60	5876.84	4.24	5872.60	0.00	N/A	25.00
10	Inlet-B4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5876.90	5880.96	4.06	5876.90	0.00	100.00	50.00
11	Inlet-B5-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5873.10	5876.84	3.74	5873.10	0.00	N/A	25.00
12	Inlet-B6-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.70	5868.74	4.04	5864.70	0.00	N/A	25.00
13	Inlet-B7-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5870.20	5874.26	4.06	5870.20	0.00	0.00	50.00
14	Inlet-B8-(Type-R)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5864.50	5868.74	4.24	5864.50	0.00	N/A	25.00
15	Inlet-C1-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.60	5862.19	2.59	5859.60	0.00	N/A	50.00
16	Inlet-C2-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5859.00	5861.29	2.29	5859.00	0.00	N/A	50.00
17	Inlet-C3-(Type-13)	FHWA HEC-22 GENERIC	N/A	On Grade	1	5858.50	5861.29	2.79	5858.50	0.00	N/A	50.00
18	Inlet-C4-(Type-16)	FHWA HEC-22 GENERIC	N/A	On Sag	1	5853.50	5862.46	8.96	5853.50	0.00	0.00	50.00
19	Inlet-Walmart	FHWA HEC-22 GENERIC	N/A	On Sag	1	5851.40	5856.00	4.60	5851.40	0.00	100.00	25.00

The existing inlet is a single (5') CDOT Type-R. The inlet curb opening must be increased to a triple (15') to accomodate the increased flow.

Roadway & Gutter Input

SN	Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1	A1-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
2	A2-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
3	A3-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
4	Inlet-A7-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
5	Inlet-B1-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
6	Inlet-B11-(Nylo)	N/A	0.0208	0.0300	0.0620	2.00	0.0656	7.00
7	Inlet-B12-(Nylo)	N/A	0.0208	0.0300	0.0620	2.00	0.3937	7.00
8	Inlet-B2-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
9	Inlet-B3-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
10	Inlet-B4-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
11	Inlet-B5-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
12	Inlet-B6-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
13	Inlet-B7-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
14	Inlet-B8-(Type-R)	0.0980	0.0200	0.0160	0.0830	1.50	0.0656	7.00
15	Inlet-C1-(Type-16)	0.0100	0.0200	0.0160	0.0620	2.00	0.0656	7.00
16	Inlet-C2-(Type-13)	0.0100	0.0200	0.0160	0.0620	2.00	0.0656	7.00
17	Inlet-C3-(Type-13)	0.0100	0.0200	0.0160	0.0620	2.00	0.0656	7.00
18	Inlet-C4-(Type-16)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00
19	Inlet-Walmart	N/A	0.0200	0.0160	0.0830	1.50	0.0656	7.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ft^3)	Total Time Flooded (hr)
1	A1-(Type-R)	1.790	1.79	1.00	0.80	55.59	4.66	5896.76	0.19	0 00:05	0.00	0.00
2	A2-(Type-R)	1.370	0.67	0.86	0.51	62.76	3.94	5896.74	0.17	0 00:05	0.00	0.00
3	A3-(Type-16)	1.470	1.47	N/A	N/A	N/A	9.09	5897.19	0.43	0 00:05	0.00	0.00
4	Inlet-A7-(Type-16)	3.760	3.76	N/A	N/A	N/A	22.92	5884.55	0.68	0 00:06	0.00	0.00
5	Inlet-B1-(Type-R)	0.960	0.96	0.70	0.26	72.52	3.04	5883.55	0.16	0 00:05	0.00	0.00
6	Inlet-B11-(Nylo)	4.180	4.18	N/A	N/A	N/A	21.82	5899.70	0.70	0 00:05	0.00	0.00
7	Inlet-B12-(Nylo)	15.370	0.00	N/A	N/A	N/A	257.50	5907.06	6.06	0 00:06	0.00	0.00
8	Inlet-B2-(Type-R)	14.830	0.00	2.58	12.24	17.43	12.45	5883.74	0.34	0 00:05	0.00	0.00
9	Inlet-B3-(Type-R)	13.350	1.82	2.47	10.88	18.52	11.93	5877.17	0.33	0 00:05	0.00	0.00
10	Inlet-B4-(Type-16)	1.260	1.26	N/A	N/A	N/A	8.03	5881.37	0.41	0 00:05	0.00	0.00
11	Inlet-B5-(Type-R)	0.840	0.59	0.63	0.21	75.07	2.62	5876.98	0.15	0 00:05	0.00	0.00
12	Inlet-B6-(Type-R)	11.270	0.67	2.30	8.96	20.43	11.13	5869.06	0.32	0 00:05	0.00	0.00
13	Inlet-B7-(Type-16)	1.140	1.14	N/A	N/A	N/A	7.45	5874.65	0.40	0 00:05	0.00	0.00
14	Inlet-B8-(Type-R)	0.200	0.00	0.18	0.02	88.56	0.61	5868.79	0.05	0 00:05	0.00	0.00
15	Inlet-C1-(Type-16)	0.710	0.71	0.52	0.18	73.94	4.98	5862.37	0.18	0 00:05	0.00	0.00
16	Inlet-C2-(Type-13)	1.180	0.99	0.85	0.33	72.34	6.65	5861.51	0.22	0 00:04	0.00	0.02
17	Inlet-C3-(Type-13)	9.270	0.56	3.27	6.00	35.27	16.20	5861.70	0.41	0 00:07	0.00	0.00
18	Inlet-C4-(Type-16)	1.660	1.66	N/A	N/A	N/A	10.07	5862.91	0.45	0 00:05	0.00	0.00
19	Inlet-Walmart	8.980	0.25	N/A	N/A	N/A	21.39	5856.69	0.69	0 00:07	0.00	0.00

Storage Nodes

Storage Node : EDB-Detention

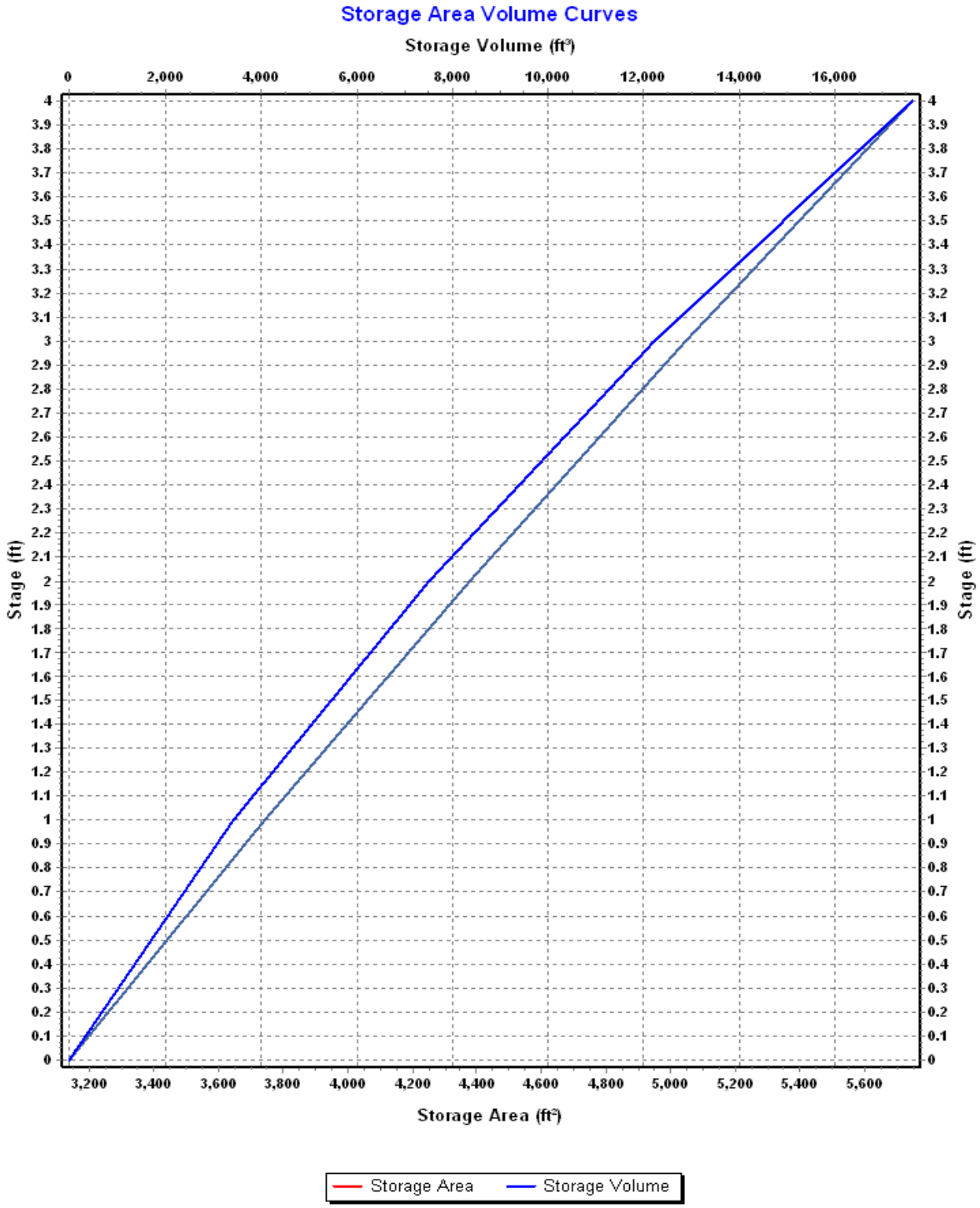
Input Data

Invert Elevation (ft)	5863.00
Max (Rim) Elevation (ft)	5869.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	5863.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : EDB

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	3139	0.000
1	3744	3441.50
2	4379	7503.00
3	5044	12214.50
4	5747	17610.00


Storage Area Volume Curves
Storage Volume (ft³)
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
Stage (ft)
Stage (ft)
Storage Area (ft²)
3,200
3,400
3,600
3,800
4,000
4,200
4,400
4,600
4,800
5,000
5,200
5,400
5,600
Storage Area
Storage Volume

Storage Node : EDB-Detention (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-EDB-100	Rectangular	No	5865.50	2.50	7.50	0.50	3.33
2	Weir-EDB-25	Rectangular	No	5864.75	1.75	0.25	0.75	3.33

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Orifice-EDB-WQCV	Side	CIRCULAR	No	1.25			5863.00	0.61

Use MHFD Spreadsheet design

Output Summary Results

Peak Inflow (cfs)	24.02
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	0.47
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	5865.37
Max HGL Depth Attained (ft)	2.37
Average HGL Elevation Attained (ft)	5865.01
Average HGL Depth Attained (ft)	2.01
Time of Max HGL Occurrence (days hh:mm)	0 00:15
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Set pond top of berm at 5866.5' for 12" min. freeboard

Storage Node : UG-Detention

Input Data

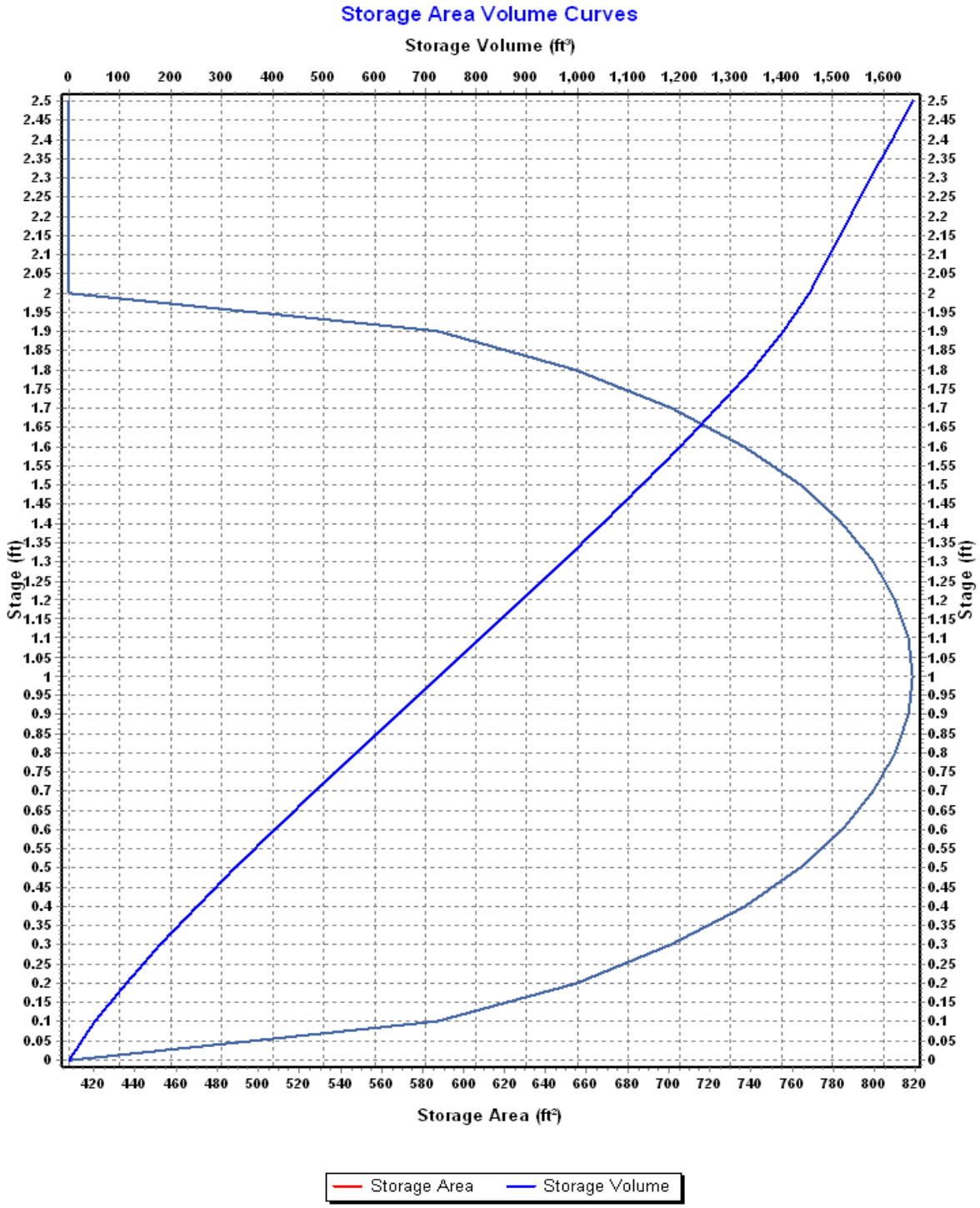
Invert Elevation (ft)	5858.40
Max (Rim) Elevation (ft)	5861.40
Max (Rim) Offset (ft)	3.00
Initial Water Elevation (ft)	5858.40
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : UG-Detention

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	408.0000	0.000
0.1	586.8892	49.74
0.2	654.2400	111.80
0.3	701.0842	179.57
0.4	736.3200	251.44
0.5	763.4168	326.43
0.6	784.1378	403.81
0.7	799.4966	482.99
0.8	810.1082	563.47
0.9	816.3428	644.79
1	818.4000	726.53
1.1	816.3428	808.27
1.2	810.1082	889.59
1.3	799.4966	970.07
1.4	784.1378	1049.25
1.5	763.4168	1126.63
1.6	736.3200	1201.62
1.7	701.0842	1273.49
1.8	654.2400	1341.26
1.9	586.8892	1403.32
2	408.0000	1453.06
2.1	408.0000	1493.86
2.2	408.0000	1534.66
2.3	408.0000	1575.46
2.4	408.0000	1616.26
2.5	408.0000	1657.06

Underground Pipe Lateral Storage
(4) 24"dia 80 LF Laterals
24" pipe clearance
Gravel backfill/storage (40% voids)
6" gravel cover
30 mil PVC pond liner (No Infiltration)


Storage Area Volume Curves
Storage Volume (ft³)
0 100 200 300 400 500 600 700 800 900 1,000 1,100 1,200 1,300 1,400 1,500 1,600
Stage (ft)
2.5 2.45 2.4 2.35 2.3 2.25 2.2 2.15 2.1 2.05 2 1.95 1.9 1.85 1.8 1.75 1.7 1.65 1.6 1.55 1.5 1.45 1.4 1.35 1.3 1.25 1.2 1.15 1.1 1.05 1 0.95 0.9 0.85 0.8 0.75 0.7 0.65 0.6 0.55 0.5 0.45 0.4 0.35 0.3 0.25 0.2 0.15 0.1 0.05 0
420 440 460 480 500 520 540 560 580 600 620 640 660 680 700 720 740 760 780 800 820
Storage Area (ft²)
Storage Area
Storage Volume

Storage Node : UG-Detention (continued)

Outflow Weirs

SN	Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1	Weir-UG-100	Rectangular	No	5859.90	1.50	1.00	0.50	3.33
2	Weir-UG-25	Rectangular	No	5858.40	0.00	0.25	1.50	3.33

Output Summary Results

Peak Inflow (cfs)	5.64
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	2.86
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	5860.33
Max HGL Depth Attained (ft)	1.93
Average HGL Elevation Attained (ft)	5858.66
Average HGL Depth Attained (ft)	0.26
Time of Max HGL Occurrence (days hh:mm)	0 00:09
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Peak Developed Outflow is less than the onsite existing/historic from Basin H/Ex-05 of 7.37 cfs

Storage Node : Walmart-Detention

Input Data

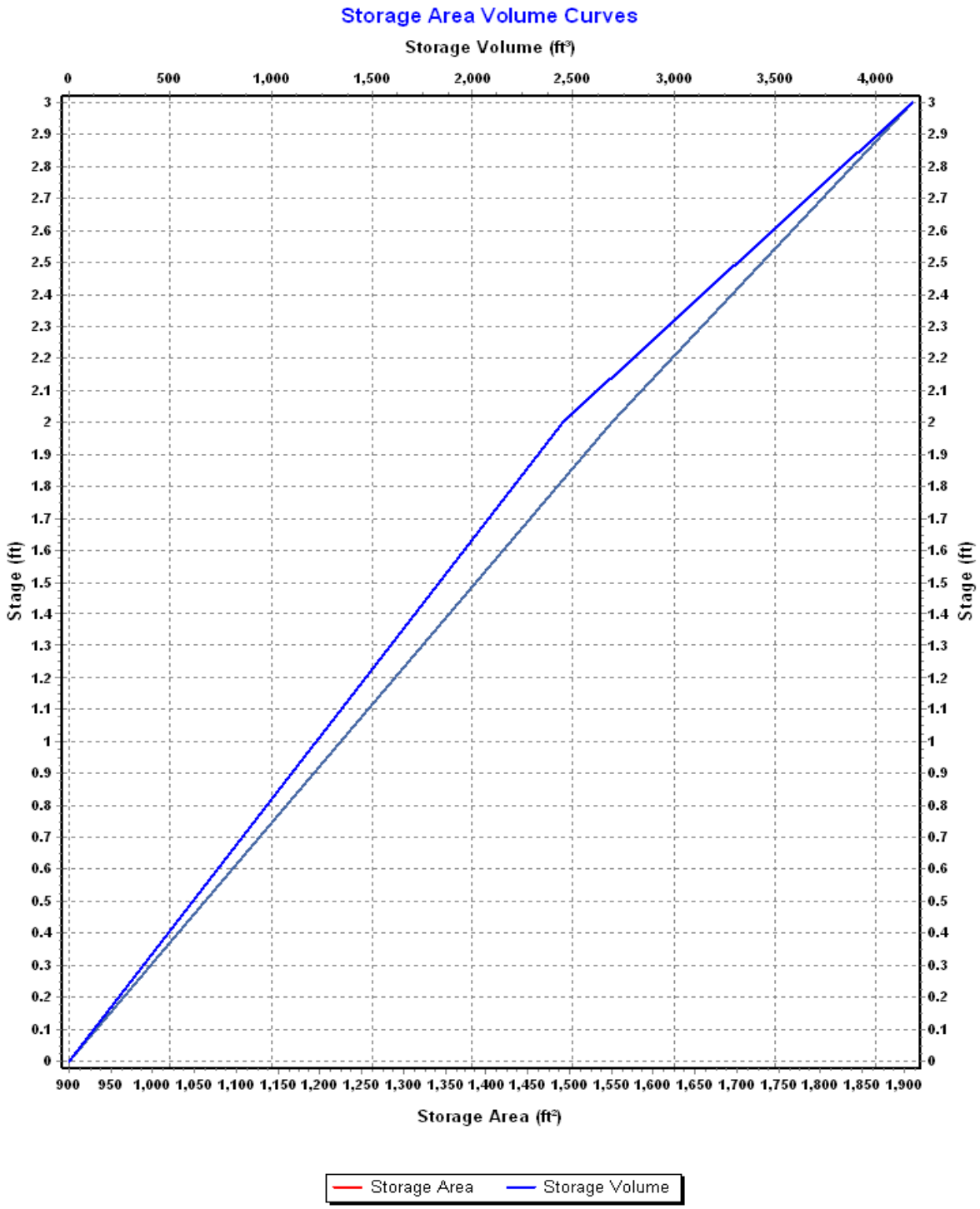
Invert Elevation (ft)	5852.00
Max (Rim) Elevation (ft)	5855.00
Max (Rim) Offset (ft)	3.00
Initial Water Elevation (ft)	5852.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Walmart

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	900	0.000
2	1550	2450.00
3	1910	4180.00

Based on design by SGM (1987) for 2' deep pond and approx. existing pond dimensions.


Storage Area Volume Curves
Storage Volume (ft³)
0
500
1,000
1,500
2,000
2,500
3,000
3,500
4,000
Stage (ft)
Storage Area (ft²)
900
950
1,000
1,050
1,100
1,150
1,200
1,250
1,300
1,350
1,400
1,450
1,500
1,550
1,600
1,650
1,700
1,750
1,800
1,850
1,900
Storage Area
Storage Volume

Storage Node : Walmart-Detention (continued)

Outflow Orifices

SN	Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1	Walmart-Det-Control	Side	CIRCULAR	No	5.60			5852.00	0.61

Output Summary Results

Peak Inflow (cfs)	7.08
Peak Lateral Inflow (cfs)	7.08
Peak Outflow (cfs)	1.28
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	5854.54
Max HGL Depth Attained (ft)	2.54
Average HGL Elevation Attained (ft)	5852.65
Average HGL Depth Attained (ft)	0.65
Time of Max HGL Occurrence (days hh:mm)	0 00:18
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

1.27 cfs permitted (historic 25-yr) per SGM (1987). Study did not calculate the 100-yr runoff.

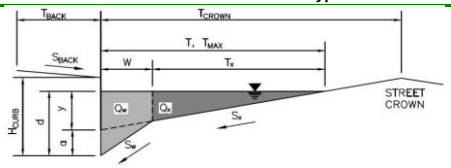
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Enter Your Project Name Here

Inlet ID: Type-R on 9.8% Grade



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.040	ft/ft
Warning 01 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.025	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	11.5	ft
Gutter Width	W =	1.50	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.098	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	4.0	11.5	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☑	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**1.4**	**58.9**	**cfs**

WARNING: MINOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

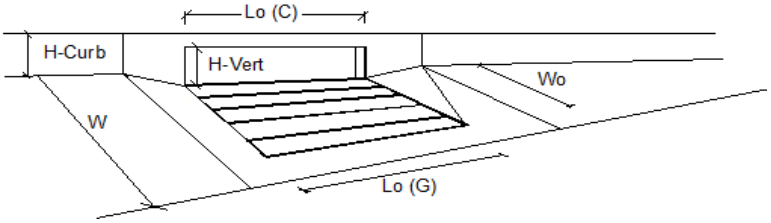
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Warning 01: Manning's n-value does not meet the USDCM recommended design range.

This is used to estimate the street capacity for 1/2 of Palmer Avenue which has a longitudinal slope of 9.8%.

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



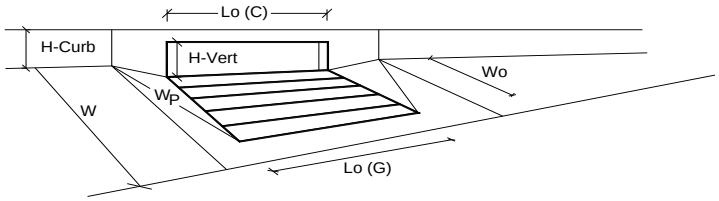
	Design Information (Input)		MINOR	MAJOR	
	Type of Inlet	Type =	CDOT Type R Curb Opening		
Warning 1	Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	2.0	2.0	inches
	Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
	Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
	Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
	Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Warning 1	Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.25	0.10	
	Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR STORM'		MINOR	MAJOR	
	Total Inlet Interception Capacity	**Q =**	**2.0**	**2.6**	**cfs**
	Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**2.0**	**2.6**	**cfs**
	Capture Percentage = Q_a/Q_o =	**C% =**	**50**	**50**	**%**

Warning 1: Dimension entered is not a typical dimension for inlet type specified.

This is used to estimate the inlet capacity of a CDOT Type-R Inlet on grade with longitudinal slope of 9.8%.

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



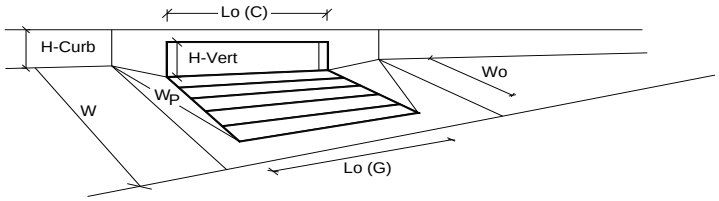
		MINOR	MAJOR	
Design Information (Input)				
Type of Inlet (Denver No. 16 Combination)	Type =	Denver No. 16 Combination		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	2.00	2.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.5	inches
Grate Information		MINOR	MAJOR	Override Depths
Length of a Unit Grate	L_o (G) =	3.00	3.00	feet
Width of a Unit Grate	W_o =	1.73	1.73	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	0.31	0.31	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	0.50	0.50	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	3.60	3.60	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	0.60	0.60	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	3.00	3.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.50	6.50	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	5.25	5.25	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	0.00	0.00	degrees
Warning 1 Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	1.50	1.50	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.25	0.25	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.70	3.70	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.66	0.66	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	0.512	0.721	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.36	0.57	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.94	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	0.94	1.00	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**3.5**	**5.4**	**cfs**
WARNING: Inlet Capacity less than Q Peak for Minor and Major Storms	$Q_{PEAK\ REQUIRED}$ =	5.0	8.0	cfs

Warning 1: Dimension entered is not a typical dimension for inlet type specified.

This is used to estimate the inlet capacity of a CDOT Type-16 Combination Inlet at a sag location.

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017

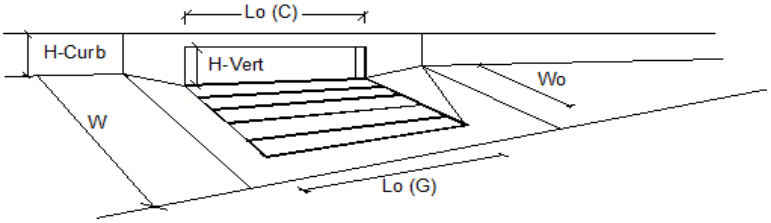


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.9	8.3	inches
Grate Information		MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	1.50	1.50	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.37	0.57	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.76	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.6**	**9.8**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	5.0	8.0	cfs

This is used to estimate the inlet capacity of a CDOT Type-R Inlet at a sag location.

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



	Design Information (Input)		MINOR	MAJOR	
	Type of Inlet	Type =	CDOT/Denver 13 Valley Grate		
Warning 1	Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	1.0	1.0	inches
	Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
	Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	3.00	3.00	ft
	Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	1.73	1.73	ft
	Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	0.50	0.50	
	Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	N/A	N/A	

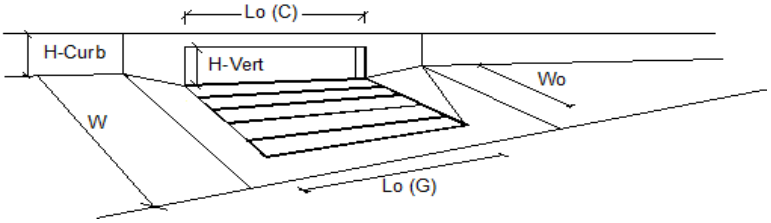
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR STORM'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.3**	**1.5**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**3.7**	**6.5**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**26**	**18**	**%**

Warning 1: Dimension entered is not a typical dimension for inlet type specified.

This is used to estimate the inlet capacity of a CDOT Type-13 Valley Inlet on grade with longitudinal slope of 9.8%.

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



	Design Information (Input)		MINOR	MAJOR	
	Type of Inlet	Type =	Denver No. 16 Combination		
	Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	2.0	2.0	inches
	Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
	Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	3.00	3.00	ft
	Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	1.73	1.73	ft
	Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	0.50	0.50	
Warning 2	Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.25	0.25	
	Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
	Total Inlet Interception Capacity	**Q =**	**1.5**	**2.0**	**cfs**
	Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**1.5**	**3.0**	**cfs**
	Capture Percentage = Q_a/Q_o =	**C% =**	**51**	**40**	**%**

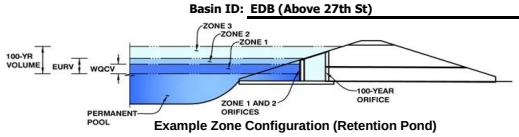
This is used to estimate the inlet capacity of a CDOT Type-16 Combination Inlet on grade with longitudinal slope of 2%.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.00 (December 2019)

Project: Bell Rippy Neighborhood

Basin ID: EDB (Above 27th St)



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	6.093	acres
Watershed Length =	800	ft
Watershed Length to Centroid =	300	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	41.60%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	93.8%	percent
Percentage Hydrologic Soil Groups C/D =	6.2%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.074	acre-feet	0.074	acre-feet
Excess Urban Runoff Volume (EURV) =	0.265	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 0.51 in.) =	0.077	acre-feet	0.510	inches
5-yr Runoff Volume (P1 = 0.71 in.) =	0.114	acre-feet	0.706	inches
10-yr Runoff Volume (P1 = 0.86 in.) =	0.149	acre-feet	0.858	inches
25-yr Runoff Volume (P1 = 1.05 in.) =	0.210	acre-feet	1.050	inches
50-yr Runoff Volume (P1 = 1.19 in.) =	0.269	acre-feet	1.190	inches
100-yr Runoff Volume (P1 = 1.32 in.) =	0.339	acre-feet	1.320	inches
500-yr Runoff Volume (P1 = 1.45 in.) =	0.401	acre-feet	1.450	inches
Approximate 2-yr Detention Volume =	0.085	acre-feet		
Approximate 5-yr Detention Volume =	0.131	acre-feet		
Approximate 10-yr Detention Volume =	0.184	acre-feet		
Approximate 25-yr Detention Volume =	0.219	acre-feet		
Approximate 50-yr Detention Volume =	0.231	acre-feet		
Approximate 100-yr Detention Volume =	0.262	acre-feet		

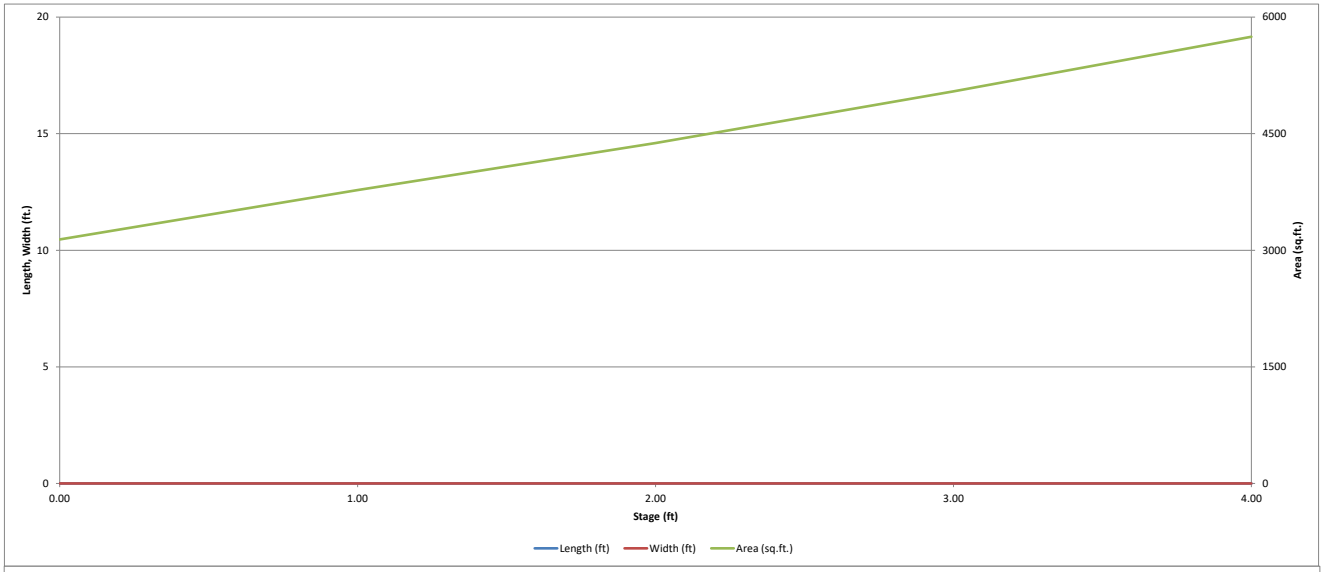
Define Zones and Basin Geometry

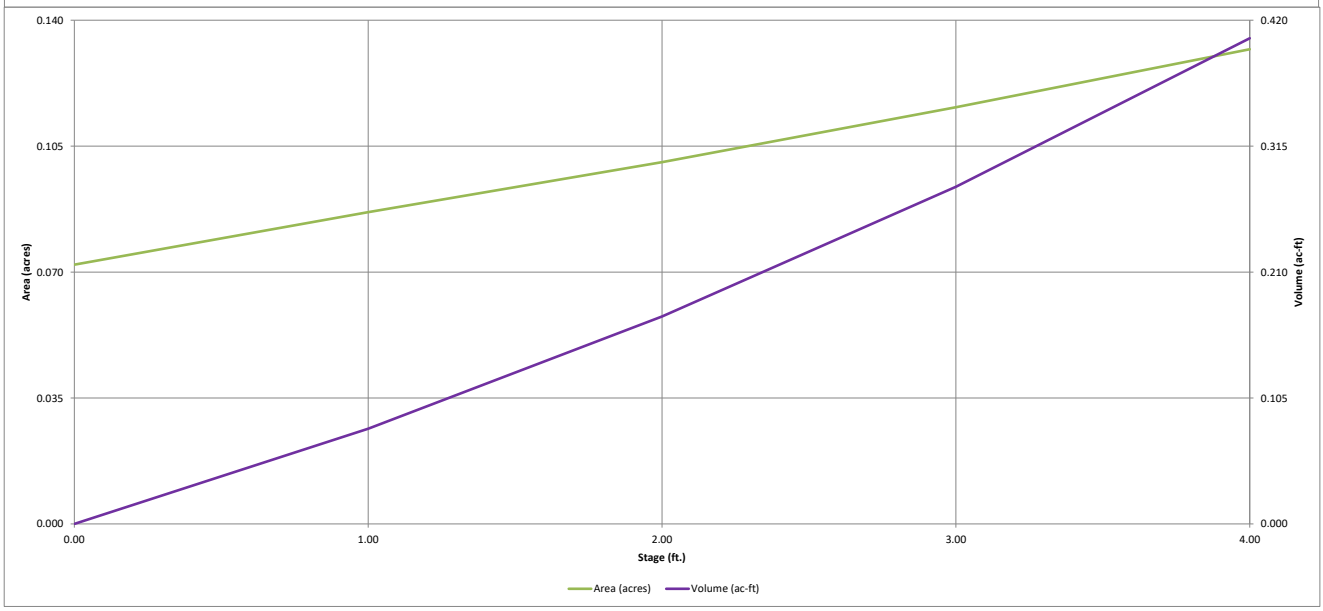
Zone 1 Volume (WQCV) =	0.074	acre-feet
Zone 2 Volume (25-year - Zone 1) =	0.146	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.043	acre-feet
Total Detention Basin Volume =	0.262	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Depth Increment = 1.00 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	3,139	0.072		
	--	1.00	--	--	--	3,774	0.087	3,456	0.079
	--	2.00	--	--	--	4,379	0.101	7,533	0.173
	--	3.00	--	--	--	5,044	0.116	12,244	0.281
	--	4.00	--	--	--	5,747	0.132	17,640	0.405


20
15
10
5
0
6000
4500
3000
1500
0
Length, Width (ft.)
Area (sq.ft.)
0.00
1.00
2.00
3.00
4.00
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)

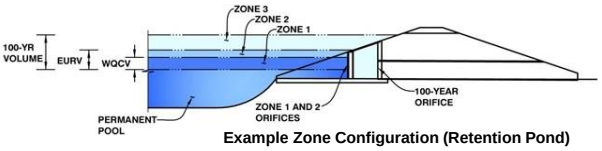

0.140
0.105
0.070
0.035
0.000
0.420
0.315
0.210
0.105
0.000
Area (acres)
Volume (ac-ft)
0.00
1.00
2.00
3.00
4.00
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.00 (December 2019)

Project: **Bell Rippy Neighborhood**

Basin ID: **EDB (Above 27th St)**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.94	0.074	Orifice Plate
Zone 2 (25-year)	2.45	0.146	Weir&Pipe (Restrict)
Zone 3 (100-year)	2.84	0.043	Weir&Pipe (Restrict)
Total (all zones)		0.262	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth = ft (distance below the filtration media surface)

Underdrain Orifice Diameter = inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = ft^2

Underdrain Orifice Centroid = feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	3.00	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	N/A	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.000	0.250	0.500	0.750				
Orifice Area (sq. inches)	0.785	0.785	0.785	0.785				

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected			Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	N/A	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches				

Calculated Parameters for Vertical Orifice

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 2 Weir	Zone 3 Weir			Zone 2 Weir	Zone 3 Weir	
Overflow Weir Front Edge Height, Ho =	1.75	2.50	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	N/A	2.50	feet
Overflow Weir Front Edge Length =	0.25	2.50	feet	Overflow Weir Slope Length =	N/A	2.50	feet
Overflow Weir Grate Slope =	0.00	0.00	H:V	Grate Open Area / 100-yr Orifice Area =	N/A	12.53	
Horiz. Length of Weir Sides =	N/A	2.50	feet	1 erflow Grate Open Area w/o Debris =	N/A	4.38	ft^2
Overflow Grate Open Area % =	100%	70%	%, grate open area/total area	Overflow Grate Open Area w/ Debris =	N/A	2.19	ft^2
Debris Clogging % =	0%	50%	%				

Calculated Parameters for Overflow Weir

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 2 Restrictor	Zone 3 Restrictor			Zone 2 Restrictor	Zone 3 Restrictor	
Depth to Invert of Outlet Pipe =	0.00	0.00	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	0.35	0.35	ft^2
Outlet Pipe Diameter =	8.00	8.00	inches	Outlet Orifice Centroid =	0.33	0.33	feet
Restrictor Plate Height Above Pipe Invert =	8.00	8.00	inches	Half-Central Angle of Restrictor Plate on Pipe =	3.14	3.14	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = feet

Spillway End Slopes = H:V

Freeboard above Max Water Surface = feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= feet

Stage at Top of Freeboard = feet

Basin Area at Top of Freeboard = acres

Basin Volume at Top of Freeboard = acre-ft

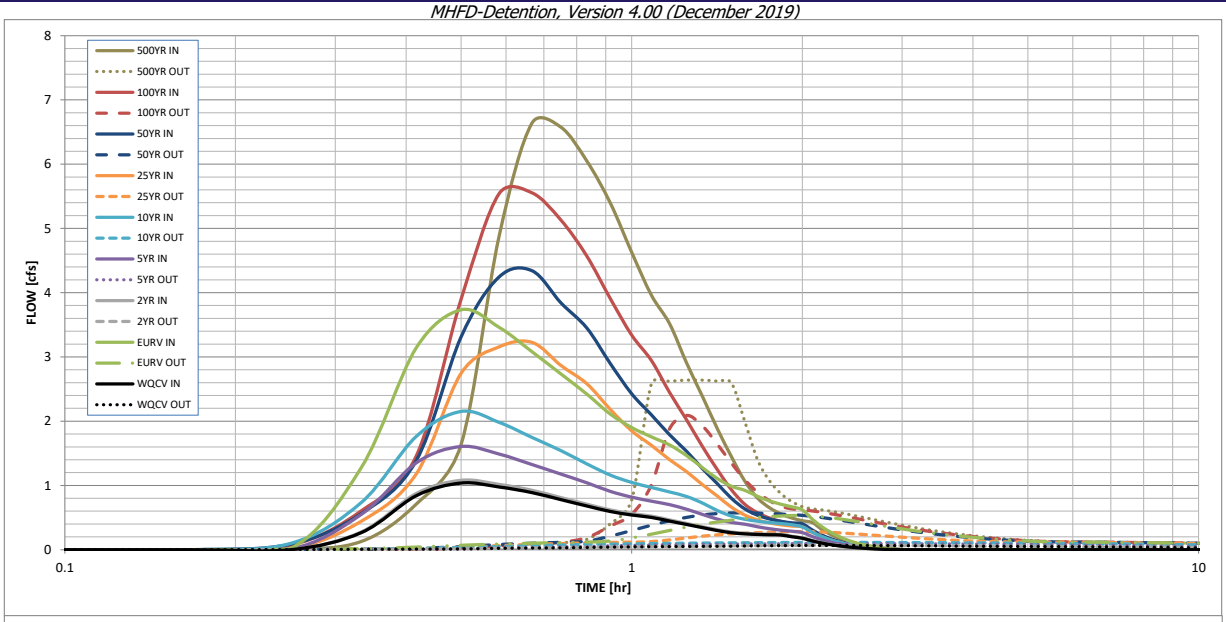
Routed Hydrograph Results

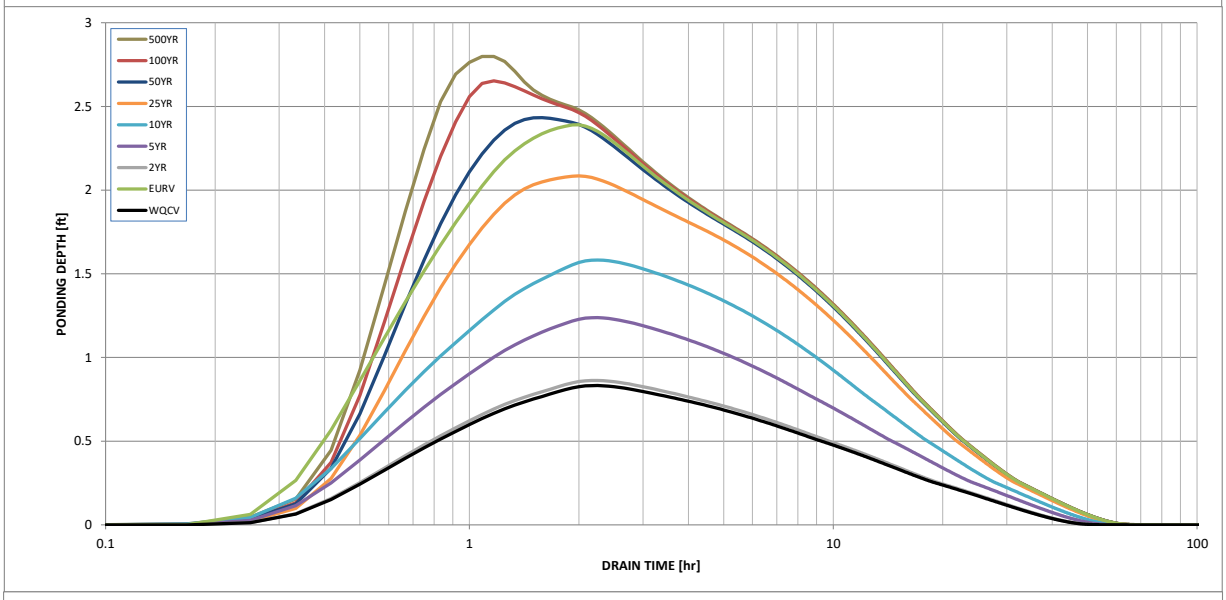
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

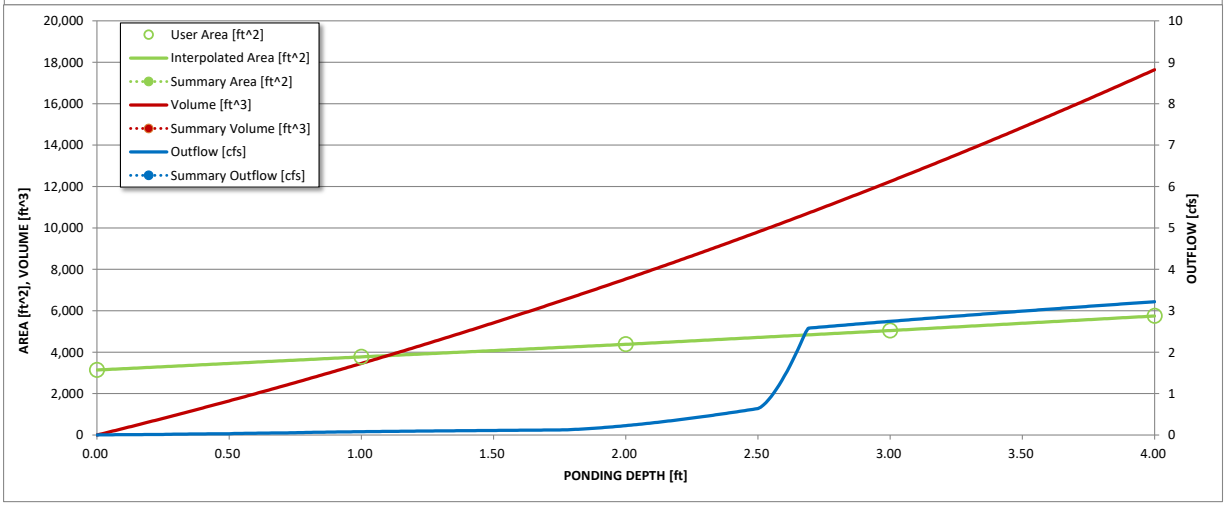
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	1.07	0.51	0.71	0.86	1.05	1.19	1.32	1.45
CUHP Runoff Volume (acre-ft) =	0.074	0.265	0.077	0.114	0.149	0.210	0.269	0.339	0.401
Inflow Hydrograph Volume (acre-ft) =	0.074	0.264	0.077	0.114	0.149	0.210	0.269	0.339	0.401
CUHP Predevelopment Peak Q (cfs) =	0.0	0.0	0.0	0.0	0.1	0.3	1.1	2.0	2.8
OPTIONAL Override Predevelopment Peak Q (cfs) =	0.0	0.0							
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.00	0.00	0.01	0.05	0.18	0.33	0.46
Peak Inflow Q (cfs) =	1.04	3.73	1.08	1.61	2.15	3.23	4.34	5.55	6.64
Peak Outflow Q (cfs) =	0.07	0.53	0.07	0.10	0.11	0.28	0.57	2.09	2.64
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	3.2	2.1	0.9	0.5	1.0	1.0
Structure Controlling Flow =	Plate	Overflow Weir 1	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 2	Outlet Plate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	0.4
Time to Drain 97% of Inflow Volume (hours) =	41	45	42	44	45	46	44	42	39
Time to Drain 99% of Inflow Volume (hours) =	**46**	54	47	50	52	54	54	52	51
Maximum Ponding Depth (ft) =	0.83	2.39	0.86	1.24	1.58	2.09	2.43	2.65	2.80
Area at Maximum Ponding Depth (acres) =	0.08	0.11	0.08	0.09	0.09	0.10	0.11	0.11	0.11
Maximum Volume Stored (acre-ft) =	0.065	0.213	0.067	0.100	0.132	0.181	0.218	0.242	0.257

DETENTION BASIN OUTLET STRUCTURE DESIGN

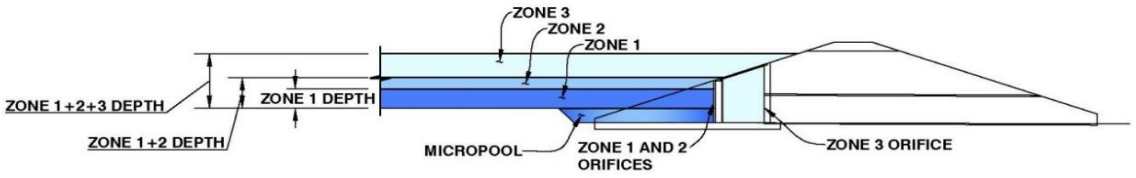
MHFD-Detention, Version 4.00 (December 2019)



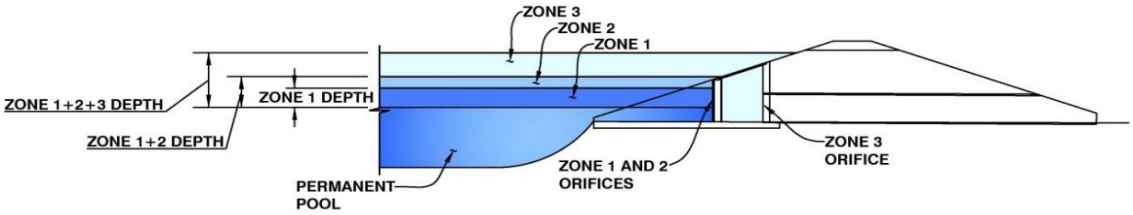




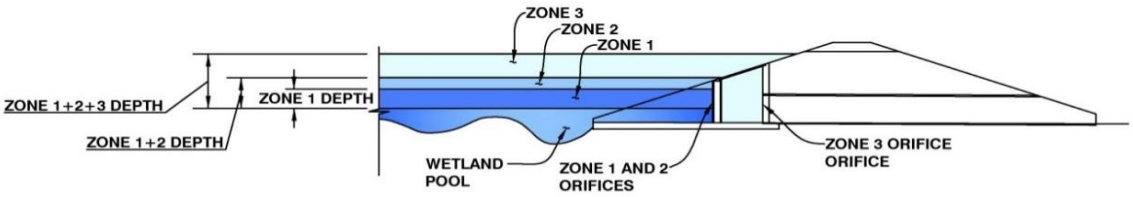
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			



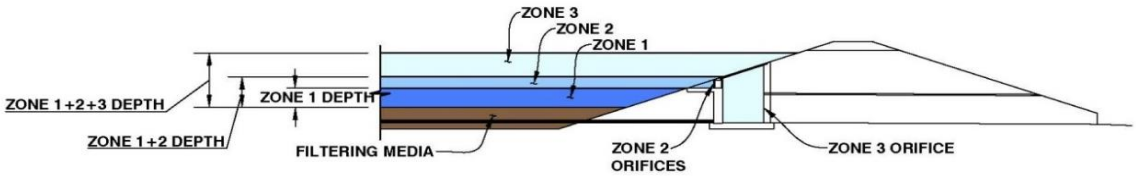
EXTENDED DETENTION BASIN WITH 3 ZONES



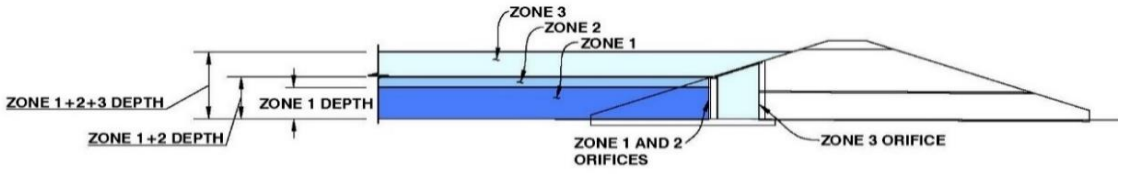
RETENTION POND WITH 3 ZONES



CONSTRUCTED WETLAND POND WITH 3 ZONES



FILTERING BMP WITH 3 ZONES



FLOOD CONTROL WITH THREE ZONES

Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Mar 4 2020

20002-Bell Rippy Box Culvert (Q100=132 cfs)

Invert Elev Dn (ft)	=	5902.00
Pipe Length (ft)	=	40.00
Slope (%)	=	1.25
Invert Elev Up (ft)	=	5902.50
Rise (in)	=	24.0
Shape	=	Box
Span (in)	=	36.0
No. Barrels	=	2
n-Value	=	0.012
Culvert Type	=	Flared Wingwalls
Culvert Entrance	=	30D to 75D wingwall flares
Coeff. K,M,c,Y,k	=	0.026, 1, 0.0347, 0.81, 0.4

Embankment

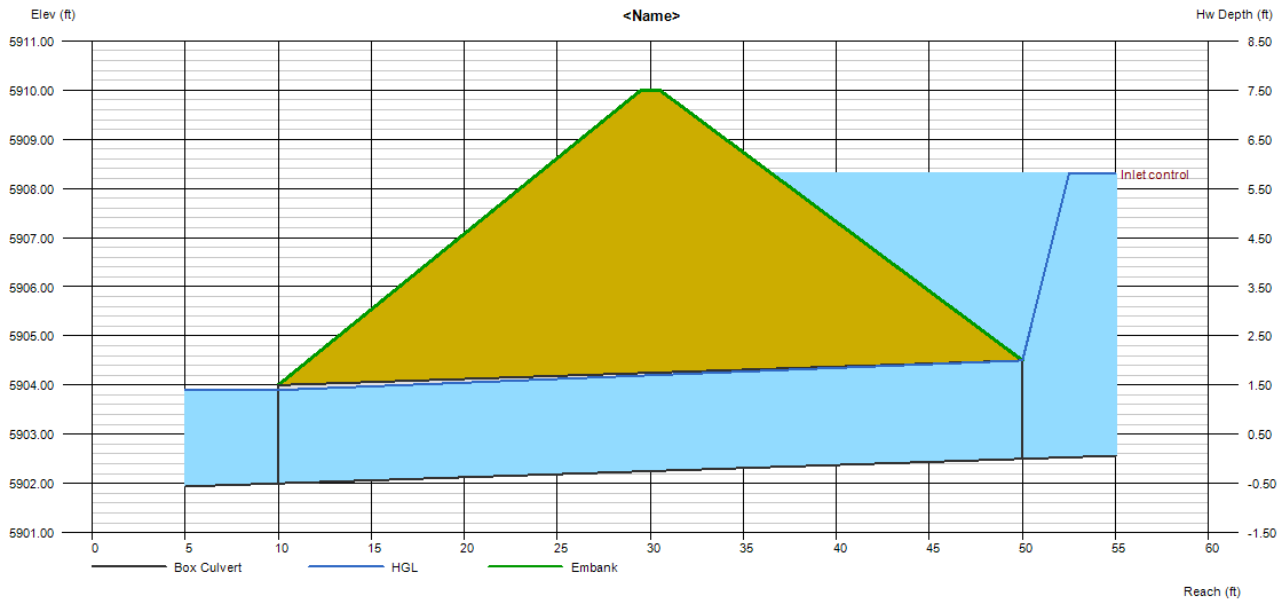
Top Elevation (ft)	=	5910.00
Top Width (ft)	=	1.00
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	0.00
Qmax (cfs)	=	132.00
Tailwater Elev (ft)	=	Critical

Highlighted

Qtotal (cfs)	=	132.00
Qpipe (cfs)	=	132.00
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	11.58
Veloc Up (ft/s)	=	11.00
HGL Dn (ft)	=	5903.90
HGL Up (ft)	=	5904.50
Hw Elev (ft)	=	5908.31
Hw/D (ft)	=	2.90
Flow Regime	=	Inlet Control



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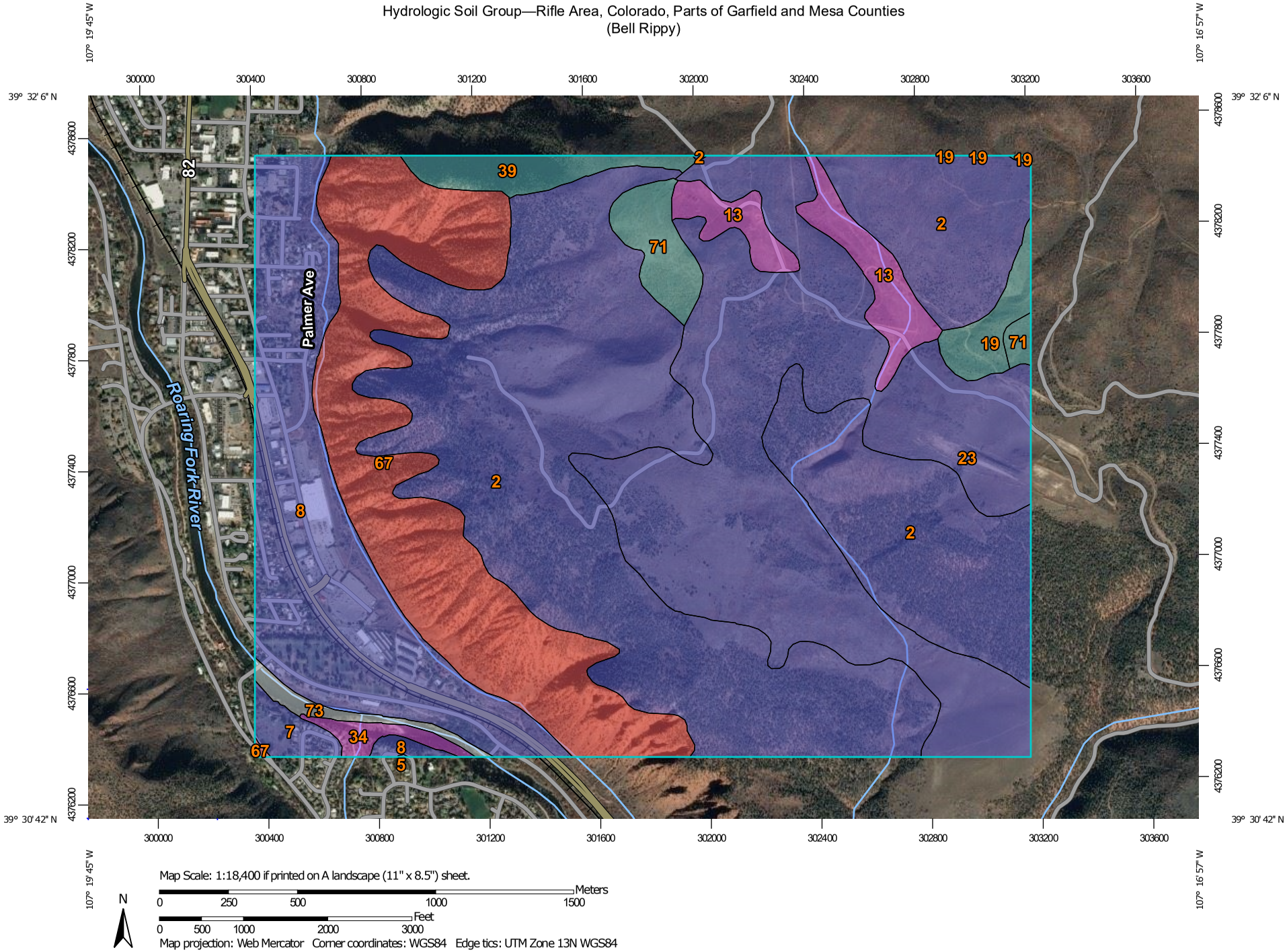
Hydrologic Soil Group—Rifle Area, Colorado, Parts of Garfield and Mesa Counties
(Bell Rippy)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 24, 2015—Nov 2, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Arle-Ansari-Rock outcrop complex, 12 to 65 percent slopes	B	603.3	40.0%
5	Ascalon fine sandy loam, 1 to 6 percent slopes	B	0.1	0.0%
7	Ascalon-Pena complex, 6 to 25 percent slopes	B	11.5	0.8%
8	Atencio-Azeltine complex, 1 to 3 percent slopes	B	197.7	13.1%
13	Chilton channery loam, 3 to 6 percent slopes	A	43.1	2.9%
19	Cochetopa-Jerry complex, 25 to 50 percent slopes	C	18.1	1.2%
23	Detra fine sandy loam, 12 to 25 percent slopes	B	346.4	23.0%
34	Ildefonso stony loam, 25 to 45 percent slopes	A	9.0	0.6%
39	Jerry loam, 12 to 50 percent slopes	C	23.5	1.6%
67	Torriorthents-Rock outcrop complex, steep	D	218.6	14.5%
71	Villa Grove-Zoltay loams, 15 to 30 percent slopes	C	27.1	1.8%
73	Water		9.1	0.6%
Totals for Area of Interest			**1,507.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

26th St.

27th St.

Palmer Ave.

Blake Ave.

DURING MINOR AND MAJOR EVENTS, RUNOFF FLOWS DIRECTLY ONTO DOWNSTREAM PROPERTIES.

DURING MINOR AND MAJOR EVENTS, RUNOFF FLOWS DIRECTLY ONTO DOWNSTREAM PROPERTIES

DURING MINOR STORM EVENTS, OFFSITE RUNOFF APPEARS TO COMBINE WITH ONSITE RUNOFF AND FLOW NORTH ON PALMER AVE. TO 26TH STREET AND THEN WEST TO EXISTING INLETS IN BLAKE AVE. DURING MAJOR STORM EVENTS, IT IS LIKELY THAT OFFSITE RUNOFF AND DEBRIS FLOW FLOW ACROSS PALMER AVE. TO COMBINE WITH BASINS H-01/02.

DURING MINOR STORM EVENTS, OFFSITE RUNOFF APPEARS TO COMBINE WITH ONSITE AND FLOW SOUTH ON BLAKE AVE. TO AN EXISTING TYPE-R INLET (SAG LOCATION) ON THE EAST SIDE OF THE STREET. THE STORM SEWER APPEARS TO BE COMPRISED OF 18"Ø HDPE FROM THE WALMART DETENTION POND TO THE TYPE-R INLET AND 24"Ø HDPE THEREON TO 29TH STREET. DURING MAJOR STORM EVENTS, IT IS LIKELY THAT OFFSITE RUNOFF AND DEBRIS FLOWS CONTINUE ACROSS BLAKE AVENUE AND ONTO DOWNSTREAM PROPERTIES.

Ex-01
67574 SF
1.551 Ac.
C: 0.37
Tc: 7.2 min.

Ex-02
20084 SF
0.461 Ac.
C: 0.37
Tc: 6.5 min.

Ex-03
15964 SF
0.366 Ac.
C: 0.37
Tc: 6.5 min.

Ex-04
30586 SF
0.702 Ac.
C: 0.37
Tc: 7.4 min.

Ex-05
170017 SF
3.903 Ac.
C: 0.37
Tc: 8.8 min.

OS-1
5423220 SF
124.5 Ac.
C: 0.36
Tc: 22.5 min.

OS-2
408157 SF
9.37 Ac.
C: 0.28
Tc: 6.4 min.

1 Existing Drainage Basins

Scale: 1"=100'

SEE SHEETS D.2 THRU D.7 FOR BASIN INFORMATION AND PROPOSED IMPROVEMENTS

Pr-01 Pr-02 Pr-03 Pr-04 Pr-05 Pr-06 Pr-07 Pr-08 Pr-09 Pr-10 Pr-11 Pr-12 Pr-13 Pr-14 Pr-15 Pr-16 Pr-17 Pr-18 Pr-19 Pr-20 Pr-21

OS-1 OS-2

2 Proposed Drainage Basins

Scale: 1"=100'

Boundaries Unlimited Inc.
Civil Engineering Surveying & Beyond
923 Cooper Ave., Ste. 201
Glenwood Springs, CO 81601
(T) 970.945.5252
www.bu-inc.com

Client Information:
Town Of Silt
PO Box 70
Silt, CO 81652
970.876.2353

NORTH
0 50' 100'
Scale: 1" = 100'

Main Street Improvements Project

Silt, Colorado

Overall Drainage Basin Map
Construction Set

No.	Date	Revision	By
##	##		

PROJECT NO. 11104
Designer: DJW
Drafter: BUI
Date: 2/5/13

Sheet D.1

File Name: 20002-C-Drainage.dwg

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CONSTRUCT A DEFLECTION BERM (2'H, 2' TOP WIDTH, 3:1 SIDE SLOPES) TO DIRECT OFFSITE & ONSITE RUNOFF WEST INTO 26TH ST.

RUNOFF (OFFSITE PASS-THRU MINUS A MINOR AMOUNT CAPTURED BY INLETS A1/A2)) WILL CONTINUE NORTH ON 26TH ST. TO EXISTING AREA INLETS ON BLAKE AVE.

DESIGN POINT #1
HISTORIC:
Q25: 102.44 CFS
Q100: 131.82 CFS
PROPOSED:
Q25: 102.12 CFS
Q100: 131.44 CFS

A3 (Type-16)
Rim:5896.76'
II:5891.20' (A2)
IO:5891.00' (A4)

A2 (Type-R)
Rim:5896.57'
II:5892.20' (A1)
IO:5892.00' (A3)

A1 (Type-R)
Rim:5896.57'
IO:5892.50' (A2)

81 LF 12"Ø @ 1.0%

25 LF 12"Ø @ 1.2%

RUNOFF CAPTURE HEAD/STEM WALL W/ CONCRETE APRON & A 24"x72" CONCRETE BOX CULVERT @ 1% MIN.
TOW: 5910.00'
II:5902.50'; IO:5902.00'
INSTALL GROUTED RIPRAP (5'x20') FROM THE OUTLET TO THE CURB.

Pr-04
14401 SF
0.331 Ac.
C: 0.33
Tc: 5.0 min.

133 LF 12"Ø @ 1.0%

Pr-03
12339 SF
0.283 Ac.
C: 0.79
Tc: 5.0 min.

RUNOFF FROM PR-04 WILL SHEET FLOW WEST ONTO ADJACENT PROPERTIES AT A PEAK FLOW RATE AND QUANTITY LESS THAN HISTORIC

CONSTRUCT 16'W DRIVE (8% MAX.)

CONSTRUCT SWALE/BERM #1 (SEE DETAIL). LINE SWALE WITH PERMANENT EROSION CONTROL FABRIC & SLOPES W/ 3-YR EROSION CONTROL FABRIC.

ZONE C
ZONE A

DEBRIS FLOW FENCE (BY OTHERS) (SEE DEBRIS FLOW HAZARD EVALUATION, GOLDER ASSOC., INC. (7/29/19)

34 LF 12"Ø @ 1.1%

A9 (SDMH)
Rim:5900.19'
II:5894.40' (A10)
IO:5894.20' (A4)

1.5:1 SLOPES W/ 3-YR EROSION CONTROL FABRIC

ZONE A
ZONE D

A4 (SDMH)
Rim:5899.80'
II:5889.70' (A3)
II:5893.80' (A9)
IO:5889.50' (A5)

29 LF 15"Ø @ 1.4%

CONSTRUCT 10'W ACCESS TRAIL (18% MAX.)

Pr-01
24815 SF
0.570 Ac.
C: 0.48
Tc: 5.0 min.

RETIRED IRRIGATION DITCH

OS-1
5423220 SF
124.5 Ac.
C: 0.36
Tc: 22.5 min.

A5 (SDMH)
Rim:5893.65'
II:5889.10' (A4)
IO:5888.90' (A6)

CUT IN SWALE BEHIND THE FENCE TO DIRECT RUNOFF TO SWALE/BERM #1

Pr-05
6391 SF
0.147 Ac.
C: 0.77
Tc: 5.0 min.

152 LF 12"Ø @ 1.0%

Pr-02
5326 SF
0.122 Ac.
C: 0.83
Tc: 5.0 min.

Match D.3

Boundaries Unlimited Inc.
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Client Information:
Town Of Silt
PO Box 70
Silt, CO 81652
970.876.2353

NORTH
0 15' 30'
Scale: 1" = 30'

Main Street Improvements Project

Silt, Colorado

Proposed Drainage Construction Set

No.	Date	Revision	By
##	##		

PROJECT NO: *11104*
Designer: *DJW*
Drafter: *BUI*
Date: *2/5/13*

Sheet
D.2

File Name: *20002-C-Drainage.dwg*

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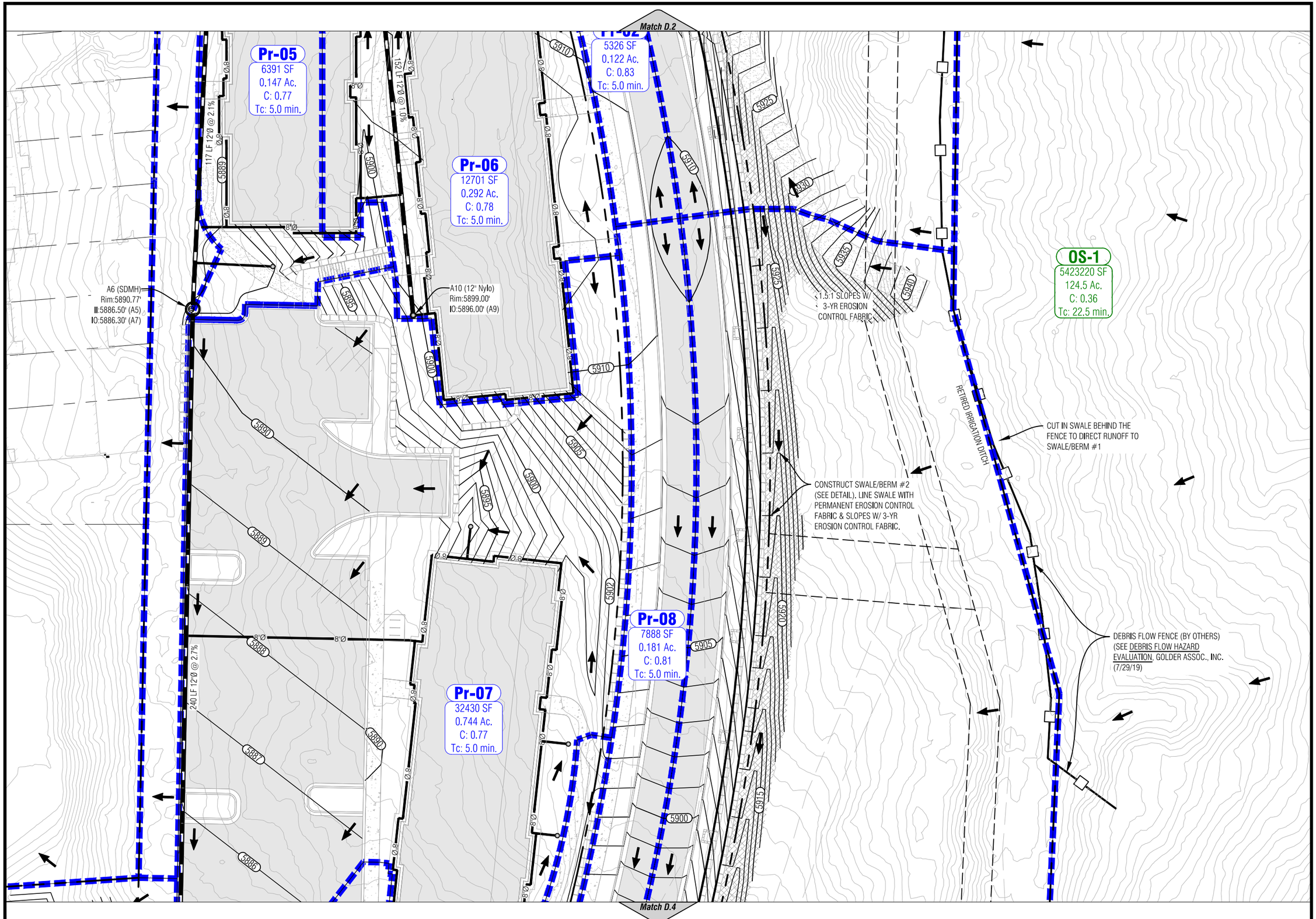

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Client Information:
Town Of Sill
PO Box 70
Sill, CO 81652
970.876.2353

NORTH
0 15' 30'
Scale: 1" = 30'

Main Street Improvements Project
Sill, Colorado
Proposed Drainage
Construction Set

No.	Date	Revision	By
##	##		
##	##		
##	##		
##	##		
##	##		
##	##		
##	##		

PROJECT NO. *11104*
Designer: *DJH*
Drafter: *BUI*
Date: *2/5/13*
Sheet *D.3*
File Name: *20002-C-Drainage.dwg*

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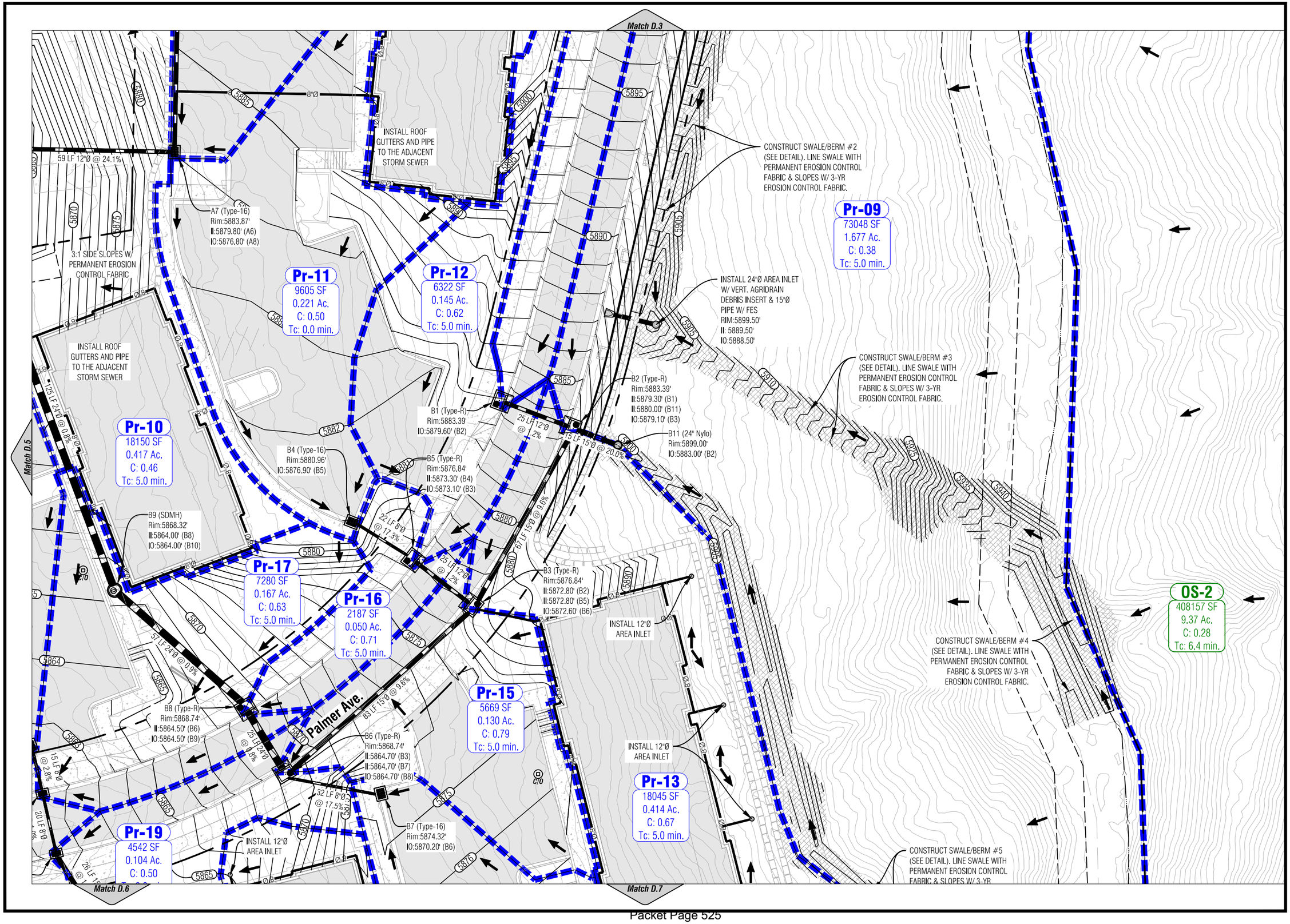

Boundaries Unlimited Inc.
Civil Engineering
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923 Cooper Ave., Ste. 201
Glenwood Springs, CO 81601
(T) 970.945.5252
www.bu-inc.com

Client Information:
Town Of Silt
PO Box 70
Silt, CO 81652
970.876.2353

NORTH
0 15' 30'
Scale: 1" = 30'

Silt, Colorado

Main Street Improvements Project

Proposed Drainage Construction Set

No.	Date	Revision	By
##	##		

PROJECT NO. 11104
Designer: DJW
Drafter: BUI
Date: 2/5/13

Sheet D.4

File Name: 20002-C-Drainage.dwg

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CONTROLLED RUNOFF WILL CONTINUE NORTH ON BLAKE AVE. TO AN EXISTING TYPE-16 INLET (ON GRADE) ON THE EAST SIDE OF THE STREET.

DESIGN POINT #2
HISTORIC:
Q25: 1.63 CFS
Q100: 2.12 CFS
PROPOSED:
Q25: 0.28 CFS
Q100: 2.09 CFS

EDB OUTFLOW CONTROL STRUCTURE
ORIFICE(S): 1"Ø @ 0", 3", 6" & 9"
WEIR 25: 0.25'W @ 1.0'
WEIR 100: TOP OF GRATE @ 1.75'
15"Ø OUTLET PIPE W/ FES
II:5863.00'
IO:5859.90'

2:1 SIDE SLOPES W/ PERMANENT EROSION CONTROL FABRIC

A8 (FES)
Rim:5864.17'
II:5863.00' (A7)

EXTENDED DETENTION BASIN (EDB)
STORAGE > 11,500 CF + 12" FREEBOARD
& 12" OF MICROPOOL SEDIMENT STORAGE

59 LF 12"Ø @ 24.1%

INSTALL A SIDEWALK SCUPPER AND CURB OPENING

Blake Ave.

B10 (FES)
Rim:5862.27'
II:5863.00' (B9)

6:1 SLOPE FOR MAINTENANCE ACCESS

3:1 SIDE SLOPES W/ PERMANENT EROSION CONTROL FABRIC

A7 (Type-16)
Rim:5883.87'
II:5879.80' (A6)
IO:5876.80' (A8)

INSTALL ROOF GUTTERS AND PIPE TO THE ADJACENT STORM SEWER

INSTALL ROO
GUTTERS AND
TO THE ADJAC
STORM SEW

Match D.3

Match D.4

Match D.6

Pr-11
9605 SF
0.221 Ac.
C: 0.50
Tc: 0.0 min.

Pr-18
4945 SF
0.114 Ac.
C: 0.95
Tc: 5.0 min.

Pr-10
18150 SF
0.417 Ac.
C: 0.46
Tc: 5.0 min.

Pr-17
7280 SF
0.167 Ac.
C: 0.63
Tc: 5.0 min.

Pr-16
2187 SF
0.050 Ac.
C: 0.71
Tc: 5.0 min.

Pr-21
15845 SF
0.364 Ac.
C: 0.55
Tc: 5.0 min.

125 LF 24"Ø @ 0.8%

51 LF 24"Ø @ 0.9%

83 LF 15"Ø @ 9.6%

25 LF 24"Ø @ 0.8%

15 LF 8"Ø @ 2.8%

22 LF 8"Ø @ 17.3%

32 LF 8"Ø

B4 (Type-16)
Rim:5880.96'
IO:5876.90' (B5)

B9 (SDMH)
Rim:5868.32'
II:5864.00' (B8)
IO:5864.00' (B10)

B8 (Type-R)
Rim:5868.74'
II:5864.50' (B6)
IO:5864.50' (B9)

B6 (Type-R)
Rim:5868.74'
II:5864.70' (B3)
II:5864.70' (B7)
IO:5864.70' (B8)

C1 (Type-16)
Rim:5862.19'

Palmer Ave.

5850 5862 5865 5866 5868 5870 5875 5880 5882 5884 5886

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NORTH
0 15' 30'
Scale: 1" = 30'

Main Street Improvements Project

Silt, Colorado

Proposed Drainage
Construction Set

No.	Date	Revision	By
##			
##			
##			
##			
##			
##			
##			
##			

PROJECT NO. *11104*
Designer: *DJW*
Drafter: *BUI*
Date: *2/5/13*

Sheet *D.5*

File Name: *20002-C-Drainage.dwg*

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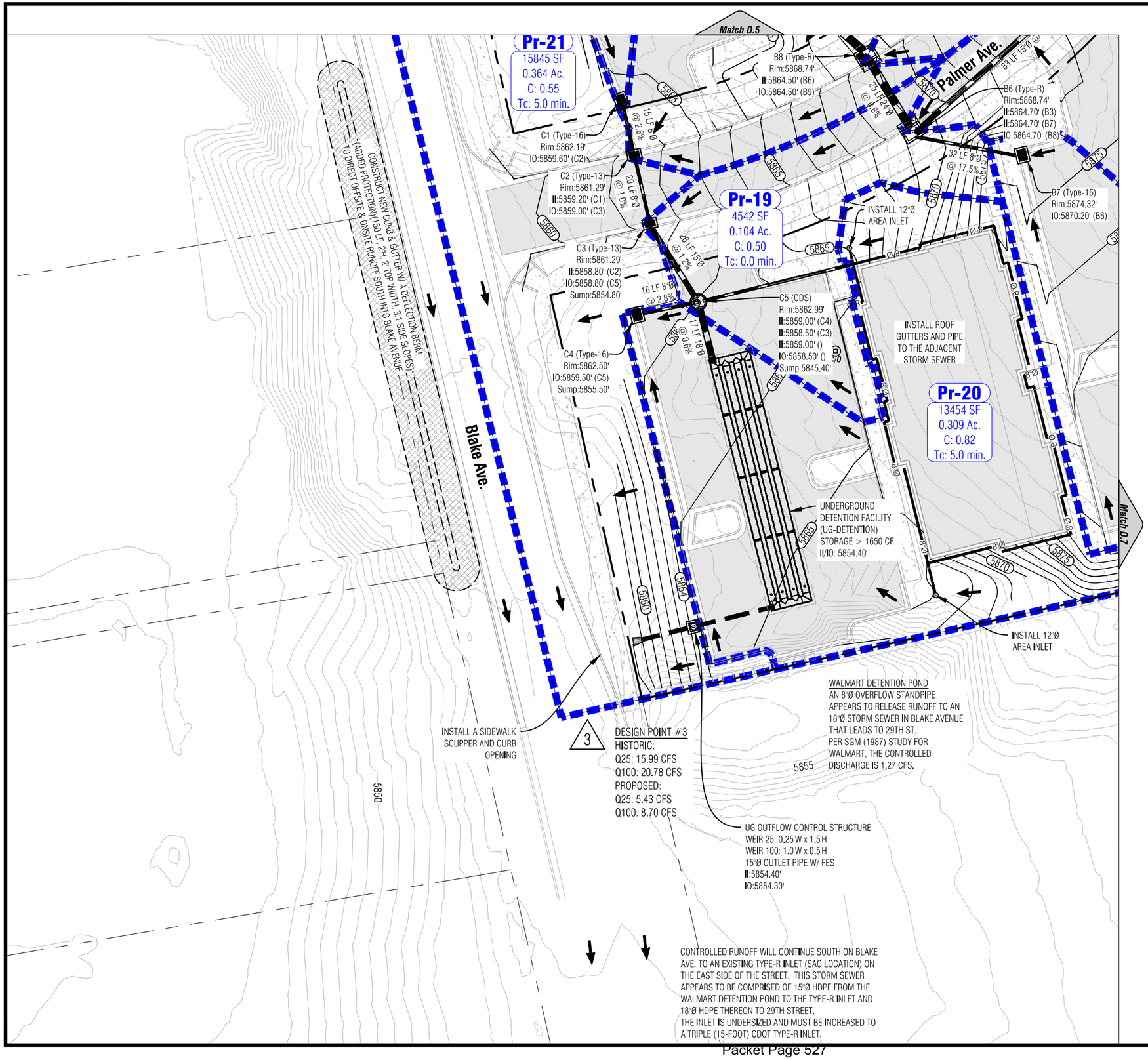

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NORTH
0 15' 30'
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Silt, Colorado

Main Street Improvements Project

Proposed Drainage Construction Set

No.	Date	Revision	By
##	##		
##	##		
##	##		
##	##		
##	##		
##	##		
##	##		
##	##		

PROJECT NO. 11104
Designer: DJW
Drafter: BU
Date: 2/5/13

Sheet D.6

File Name: 20002-C-Drainage.dwg

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Match D.4

Match D.6

Pr-16
2187 SF
0.050 Ac.
C: 0.71
Tc: 5.0 min.

7280 SF
0.167 Ac.
C: 0.63
Tc: 5.0 min.

Pr-15
5669 SF
0.130 Ac.
C: 0.79
Tc: 5.0 min.

Pr-13
18045 SF
0.414 Ac.
C: 0.67
Tc: 5.0 min.

Pr-19
4542 SF
0.104 Ac.
C: 0.50
Tc: 0.0 min.

Pr-14
8825 SF
0.203 Ac.
C: 0.86
Tc: 5.0 min.

Pr-20
13454 SF
0.309 Ac.
C: 0.82
Tc: 5.0 min.

OS-2
408157 SF
9.37 Ac.
C: 0.28
Tc: 6.4 min.

Palmer Ave.

57 LF 24"Ø @ 0.9%

83 LF 15"Ø @ 9.6%

25 LF 24"Ø @ 0.8%

15 LF 8"Ø @ 2.8%

20 LF 8"Ø @ 2%

26 LF 15"Ø @ 2%

16 LF 8"Ø @ 2.8%

17 LF 18"Ø @ 0.6%

32 LF 8"Ø @ 17.5%

B8 (Type-R)
Rim:5868.74'
II:5864.50' (B6)
IO:5864.50' (B9)

B6 (Type-R)
Rim:5868.74'
II:5864.70' (B3)
II:5864.70' (B7)
IO:5864.70' (B8)

B7 (Type-16)
Rim:5874.32'
IO:5870.20' (B6)

C5 (CDS)
Rim:5862.99'
II:5859.00' (C4)
II:5858.50' (C3)
II:5859.00' ()
IO:5858.50' ()
Sump:5845.40'

Rim:5876.84'
II:5872.80' (B2)
II:5872.80' (B5)
IO:5872.60' (B6)

INSTALL 12"Ø AREA INLET

INSTALL 12"Ø AREA INLET

INSTALL 12"Ø AREA INLET

INSTALL 12"Ø AREA INLET

INSTALL ROOF GUTTERS AND PIPE TO THE ADJACENT STORM SEWER

INSTALL ROOF GUTTERS AND PIPE TO THE ADJACENT STORM SEWER

CONSTRUCT SWALE/BERM #4 (SEE DETAIL). LINE SWALE WITH PERMANENT EROSION CONTROL FABRIC & SLOPES W/ 3-YR EROSION CONTROL FABRIC.

CONSTRUCT SWALE/BERM #5 (SEE DETAIL). LINE SWALE WITH PERMANENT EROSION CONTROL FABRIC & SLOPES W/ 3-YR EROSION CONTROL FABRIC.

RETIRED IRRIGATION DITCH

UNDERGROUND DETENTION FACILITY (UG-DETENTION) STORAGE > 1650 CF
II/IO: 5854.40'

INSTALL 12"Ø AREA INLET

WALMART DETENTION POND
AN 8"Ø OVERFLOW STANDPIPE APPEARS TO RELEASE RUNOFF TO AN 18"Ø STORM SEWER IN BLAKE AVENUE THAT LEADS TO 29TH ST.
PER SGM (1987) STUDY FOR WALMART, THE CONTROLLED DISCHARGE IS 1.27 CFS.

ESIGN POINT #3
STORIC:
25: 15.99 CFS
100: 20.78 CFS
ROPOSED:
25: 5.43 CFS
100: 8.70 CFS

UG OUTFLOW CONTROL STRUCTURE
WEIR 25: 0.25'W x 1.5'H
WEIR 100: 1.0'W x 0.5'H
15"Ø OUTLET PIPE W/ FES
II:5854.40'
IO:5854.30'

5855 5860 5865 5870 5875 5880 5885 5890 5895 5900 5925 5950 5975

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Main Street Improvements Project

Silt, Colorado

Proposed Drainage Construction Set

No.	Date	Revision	By
##	##		

PROJECT NO.
11104
Designer:
DJW
Drafter:
BUI
Date:
2/5/13

Sheet
D.7

File Name: *Z0002-C-Drainage.dwg*

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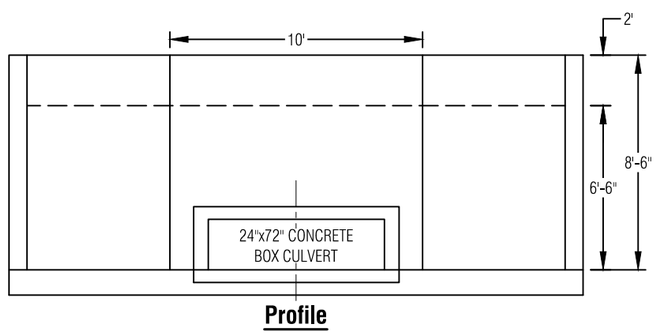
STORMWATER MANAGEMENT AND EROSION/SEDIMENT CONTROL NOTES

1. THE PREPARATION OF STORMWATER MANAGEMENT PLANS, PERMITTING AND COMPLIANCE ARE THE RESPONSIBILITY OF THE CONTRACTOR. THIS PROJECT MAY ALSO REQUIRE A PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY FROM THE STATE OF COLORADO. THE CONTRACTOR IS TO COMMENCE WORK ON THIS SITE ONLY AFTER AN ACTIVE PERMIT NUMBER HAS BEEN OBTAINED FROM THE STATE OF COLORADO. THE STORMWATER MANAGEMENT PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO APPLYING FOR THE PERMIT. THE CONTRACTOR IS TO PROVIDE EROSION CONTROL IN ACCORDANCE WITH STATE OF COLORADO GUIDELINES.
2. THE CONTRACTOR SHALL CONTINUOUSLY PROVIDE ADEQUATE STORMWATER MANAGEMENT IN ACCORDANCE WITH AN APPROVED STORMWATER MANAGEMENT PLAN (SWMP) FROM THE STATE OF COLORADO.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE PUBLIC STREETS, ACCESS ROUTES, AND WATERWAYS IN THE VICINITY OF THE JOB SITE CLEAN AND FREE OF ROCKS, SOIL AND DEBRIS.
4. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROL "BEST MANAGEMENT PRACTICES" (BMPS) PRIOR TO ANY SITE PREPARATION WORK (E.G., CLEARING, GRUBBING, DEMOLITION, OR EXCAVATION).
5. A GROUNDWATER DISCHARGE PERMIT MAY BE REQUIRED FROM THE STATE GOVERNING AUTHORITY PRIOR TO DISCHARGE. GROUNDWATER SHALL BE SAMPLED AND SENT TO AN APPROVED LABORATORY FOR TESTING PRIOR TO BEING DISCHARGED. TESTING SHALL BE IN ACCORDANCE WITH THE PERMIT FOR STORMWATER DISCHARGE.
6. A WATER SOURCE MUST BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
7. ALL DITCHES & EROSION CONTROL SHOULD BE COMPLETED TO THE RECEIVING STREAM.
8. THE PLACEMENT OF EROSION AND SEDIMENT BMPS SHALL BE IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN IF IT WAS PREPARED FOR THE PROJECT. CONTRACTOR TO ADJUST QUANTITY, LOCATION, AND TYPE OF EROSION AND SEDIMENT CONTROL BMPS AS NECESSARY FOR THE VARIOUS PHASES OF THE WORK AND AS ACTUAL CONDITIONS WARRANT. CONTRACTOR SHALL CONTINUOUSLY MODIFY THE EROSION AND SEDIMENT CONTROL PLAN WITH CURRENT BMPS IN ACCORDANCE WITH THE CONSTRUCTION STORMWATER PERMIT REQUIREMENTS. ADDITIONAL EROSION AND SEDIMENT CONTROL BMPS EMPLOYED BY THE CONTRACTOR AT HIS DISCRETION WILL NOT BE MEASURED OR PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
9. APPROVED EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. UNLESS OTHERWISE REQUIRED BY THE STATE'S CONSTRUCTION STORMWATER PERMIT, AT A MINIMUM THE CONTRACTOR SHALL INSPECT ALL BMPS EVERY 14 DAYS, AND AFTER ALL SIGNIFICANT PRECIPITATION EVENTS I.E. RAINFALL, SNOWMELT. ALL NECESSARY MAINTENANCE AND REPAIR ACTIVITIES SHALL BE COMPLETED WITHIN TWENTY-FOUR (24) HOURS AFTER DIRECTION BY THE INSPECTOR. ACCUMULATED SEDIMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED WEEKLY FROM ALL BMPS, OR AT ANY TIME THAT SEDIMENT OR CONSTRUCTION DEBRIS ADVERSELY IMPACTS THE FUNCTIONING OF THE BMPS.
10. TOPSOIL AND SUITABLE EARTHEN MATERIALS SHALL BE SEGREGATED AND STOCKPILED WITHIN THE LIMITS OF CONSTRUCTION FOR USE ON AREAS TO BE FILLED AND RE-VEGETATED. ANY AND ALL STOCKPILES SHALL BE PLACED IN AN APPROVED LOCATION AND PROTECTED FROM EROSIVE ELEMENTS USING MEASURES SPECIFIED IN THE EROSION/SEDIMENT CONTROL PLAN AND APPROVED STORMWATER MANAGEMENT PLAN (SWMP) FROM THE STATE OF COLORADO.
11. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE MULCHED AND SEEDED WITH A TEMPORARY OR PERMANENT GRASS COVER WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION.
12. ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
13. THE CONTRACTOR MUST KEEP ALL POLLUTANTS, INCLUDING SEDIMENT, CONSTRUCTION DEBRIS, AND TRENCH BACKFILL MATERIALS FROM ENTERING THE STORM SEWER SYSTEM.
14. ALL SPILLS INCLUDING, BUT NOT LIMITED TO, PETROLEUM PRODUCTS, SOLVENTS, AND CEMENT SHALL BE CLEANED UP IMMEDIATELY. THE LOCAL TOWN/CITY/COUNTY AND STATE'S GOVERNING AUTHORITY SHALL BE NOTIFIED IMMEDIATELY.
15. THE CONTRACTOR SHALL ENSURE THAT ALL LOADS OF CUT AND FILL MATERIAL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORT ON PUBLIC RIGHT-OF-WAY. ALL MATERIAL EXPORTED FROM THE SITE SHALL BE DISPOSED OF AT A SITE PERMITTED TO ACCEPT SUCH MATERIAL.
16. THE USE OF REBAR, STEEL STAKES OR STEEL FENCE POSTS FOR STAKING DOWN STRAW OR HAY BALES, OR TO SUPPORT SILT FENCING USED AS AN EROSION CONTROL MEASURE, IS PROHIBITED.
17. THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED LOCATIONS ON THE JOB SITE. THE DISCHARGE OF WATER CONTAINING WASTE CEMENT TO THE STORM SEWER SYSTEM IS PROHIBITED. ALL CONCRETE WASTE SHALL BE PROPERLY CLEANED UP AND DISPOSED OF AT AN APPROPRIATE LOCATION.
18. CONTRACTOR SHALL PROVIDE A COMPLETED "NOTICE OF TERMINATION" TO OWNER, FOR OWNERS SUBMITTAL TO THE STATE'S GOVERNING AUTHORITY ONCE THE PROJECT IS COMPLETE, ALL DISTURBED AREAS HAVE BEEN STABILIZED AND TEMPORARY BMPS HAVE BEEN REMOVED.
19. THE CONTRACTOR SHALL CLEAN OUT ALL EXISTING AND PROPOSED INLETS, PIPES AND MANHOLES OF DEBRIS AND SEDIMENTATION AT COMPLETION OF SITEWORK. THIS WORK SHALL BE DONE TO THE SATISFACTION OF THE OWNER AND LOCAL AUTHORITIES. ANY CONSTRUCTION DEBRIS OR MUD DROPPED INTO MANHOLES, INLETS, PIPES OR TRACKED ONTO EXISTING ROADWAYS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR. THE CONTRACTOR SHALL REPAIR ANY EXCAVATIONS OR PAVEMENT FAILURES CAUSED BY HIS CONSTRUCTION.
20. THE CONTRACTOR SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO SIGNIFICANTLY REDUCE ANY POTENTIAL POLLUTION CAUSED BY HIS ACTIVITIES, INCLUDING VEHICLE FUELING, STORAGE OF FERTILIZERS OR CHEMICALS, ETC. THE CONTRACTOR SHALL HAVE IDENTIFIED PROCEDURES FOR HANDLING POTENTIAL POLLUTANTS AND HAVE IDENTIFIED SPILL PREVENTION AND RESPONSE PROCEDURES PRIOR TO ANY ACTIVITIES AT THE PROJECT SITE.
21. GRADE LANDSCAPED AREAS TO PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDINGS AND SIDEWALKS IN CONFORMANCE WITH THE REQUIREMENTS OF THE PROJECT GEOTECHNICAL REPORT.
22. IN CASE OF ANY DISCREPANCIES REGARDING EARTHWORK BETWEEN THE GEOTECHNICAL REPORT AND THE SPECIFICATIONS SHOWN IN THESE PLANS, NOTIFY THE PROJECT ENGINEER AND OWNER'S CONSTRUCTION PROJECT MANAGER IMMEDIATELY.
23. ROOF GUTTERS ARE REQUIRED ON ALL BUILDINGS AND DOWNSPOUTS ARE TO BE PIPED INTO THE STORMSEWER SYSTEM. ROOF RUNOFF IS NOT PERMITTED TO DISCHARGE ONTO THE GROUND SURFACE.
24. STORM SEWER PIPE MATERIALS SHALL BE WATER TIGHT HDPE DOUBLE-WALL, SMOOTH INTERIOR PIPE (ADS N-12-WT OR ENGINEER APPROVED EQUAL) OR RUBBER GASKET REINFORCED CONCRETE PIPE (RCP) UNLESS OTHERWISE SPECIFIED IN THE PLANS.
25. STORM SEWER STRUCTURES SHALL BE COMPLY WITH COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD PLANS (M-STANDARDS) AND/OR MILE HIGH FLOOD DISTRICT (MHFD) STANDARDS, LATEST EDITIONS.
26. SOIL EROSION CONTROL FABRIC SHALL BE NORTH AMERICAN GREEN VMAX P500 (PERMANENT) IN FLOW CHANNELS/SWALES AND C125 (3-YR) ON DISTURBED SLOPES STEEPER THAN 3:1), OR ENGINEER APPROVED EQUAL.
27. BEARINGS ARE BASED ON THE SOUTH LINE OF OAKHURST SUBDIVISION FIRST FILING ACCORDING TO THE PLAT FILED AT RECEPTION NO. 241379 IN THE OFFICE OF THE GARFIELD COUNTY CLERK AND RECORDER. THE VALUE USED, S77°23'50"W AS SHOWN THEREON WAS DETERMINED FROM A FOUND PLASTIC CAP STAMPED LS 37935 AT THE WEST AND EAST ENDS OF SAID LINE.



NOTES

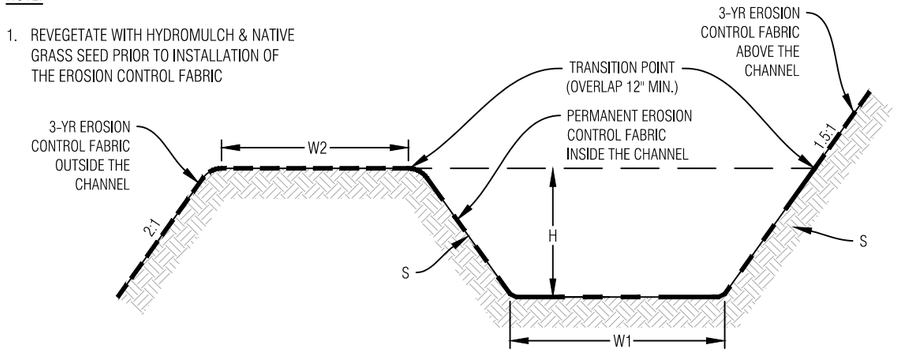
1. CONSTRUCTION SHALL CONFORM TO CDOT STANDARD PLAN NO(S). M-601-1 "SINGLE CONCRETE BOX CULVERT (CAST-IN-PLACE)", M-610-10 "HEADWALL FOR PIPES", M-610-20 "WINGWALLS FOR PIPE OR BOX CULVERTS", AND M-603-12 "TRAVERSABLE END SECTIONS AND SAFETY GRATES", LATEST EDITION.

1 Wing/Stem Wall

Scale: 1"=12"

NOTE:

1. REVEGETATE WITH HYDROMULCH & NATIVE GRASS SEED PRIOR TO INSTALLATION OF THE EROSION CONTROL FABRIC



SWALE/BERM DIMENSION				
NO.	H (FT)	W1 (FT)	W2 (FT)	S
1	1.5' MIN.	6'	N/A	1.5 : 1
2	1.0' MIN.	1'	3'	1.5 : 1
3	1.0' MIN.	3'	3	1.5 : 1
4	1.0' MIN.	3'	3	1.5 : 1
5	1.0' MIN.	2'	1	1.5 : 1

Drainage Berm/Swales

Scale: N.T.S.

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NORTH
0 0.5' 1'
Scale: 1" = 1'

No.	Date	Revision	By
##	##		

PROJECT NO. *11104*
Designer: *DJW*
Drafter: *BUI*
Date: *2/5/13*

Sheet *D.8*

File Name: *20002-C-Drainage.dwg*

Silt, Colorado

Main Street Improvements Project

Drainage Notes & Details
Construction Set

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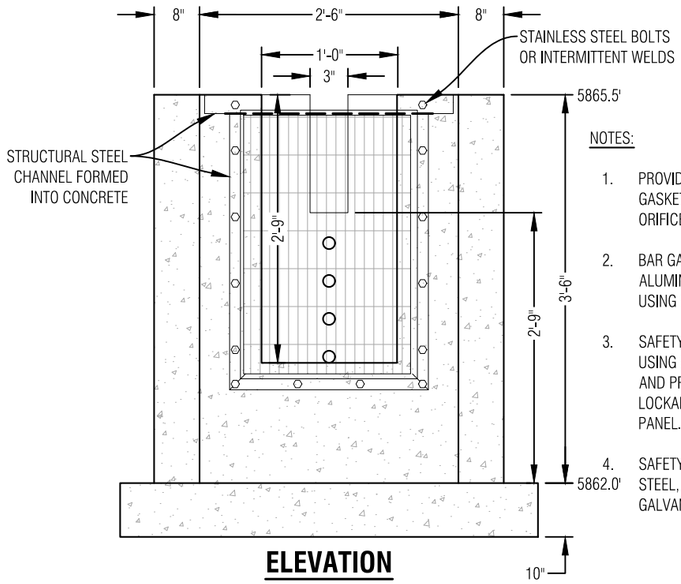
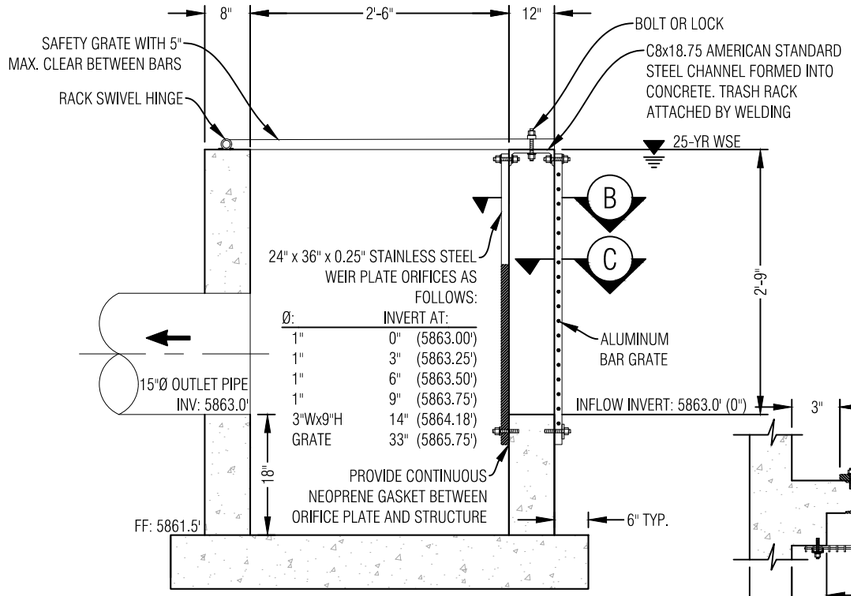


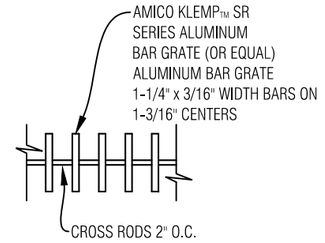
NOTES:

1. PROVIDE CONTINUOUS NEOPRENE GASKET MATERIAL BETWEEN THE ORIFICE PLATE AND CONCRETE.
2. BAR GATE TRASH RACK SHALL BE ALUMINUM AND SHALL BE BOLTED USING STAINLESS STEEL HARDWARE.
3. SAFETY GRATE SHALL BE MOUNTED USING STAINLESS STEEL HARDWARE AND PROVIDED WITH HINGED AND LOCKABLE OR BOLTABLE ACCESS PANEL.
4. SAFETY GRATE SHALL BE STAINLESS STEEL, ALUMINUM OR HOT DIP GALVANIZED STEEL.

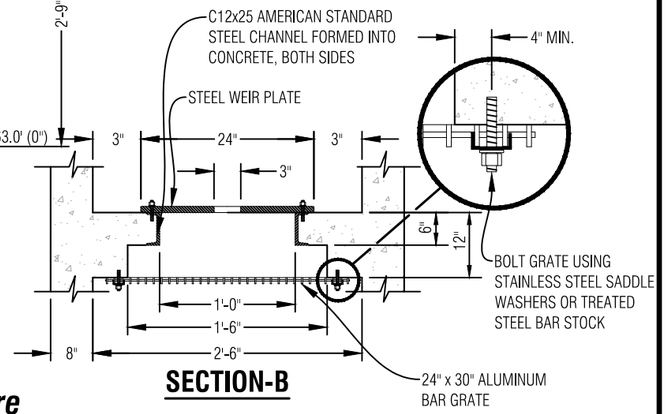
ELEVATION



SECTION VIEW



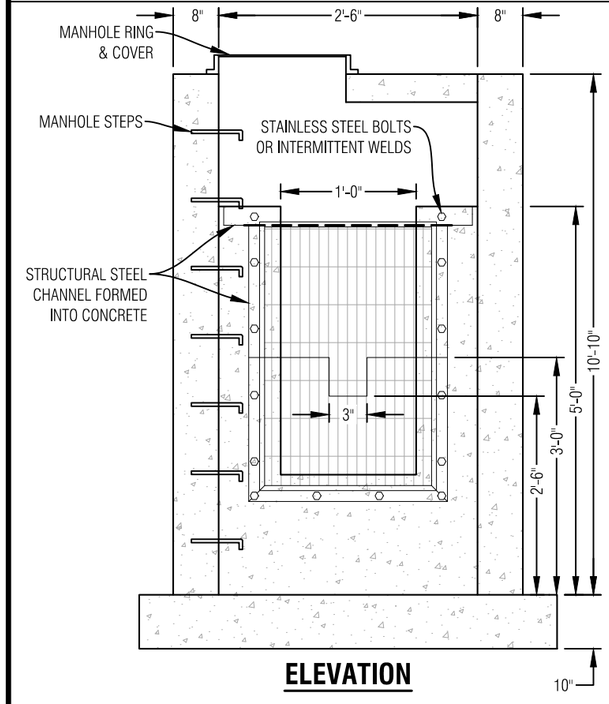
SECTION-C



SECTION-B

Extended Detention Basin (EDB) Outflow Control Structure

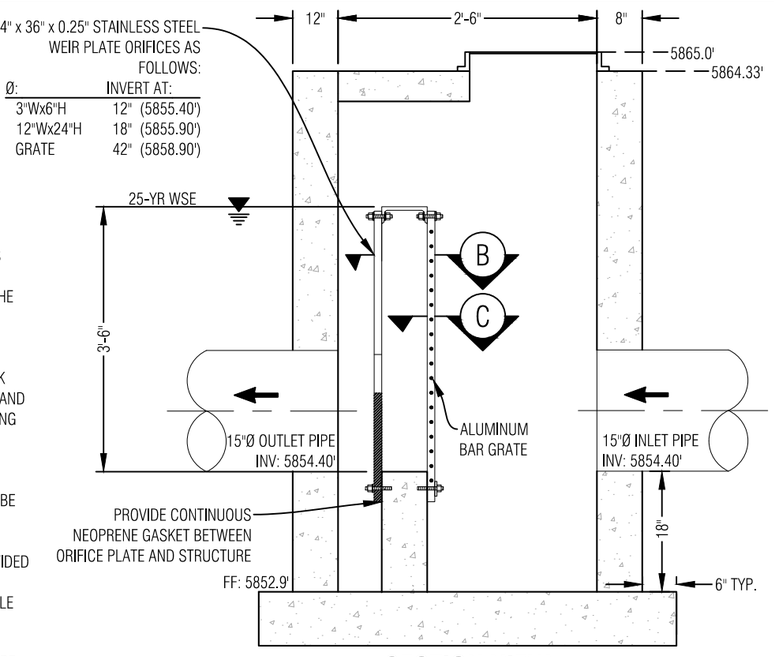
Scale: N.T.S.



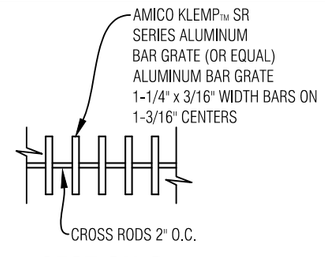
NOTES:

1. PROVIDE CONTINUOUS NEOPRENE GASKET MATERIAL BETWEEN THE ORIFICE PLATE AND CONCRETE.
2. BAR GATE TRASH RACK SHALL BE ALUMINUM AND SHALL BE BOLTED USING STAINLESS STEEL HARDWARE.
3. SAFETY GRATE SHALL BE MOUNTED USING STAINLESS STEEL HARDWARE AND PROVIDED WITH HINGED AND LOCKABLE OR BOLTABLE ACCESS PANEL.
4. SAFETY GRATE SHALL BE STAINLESS STEEL, ALUMINUM OR HOT DIP GALVANIZED STEEL.

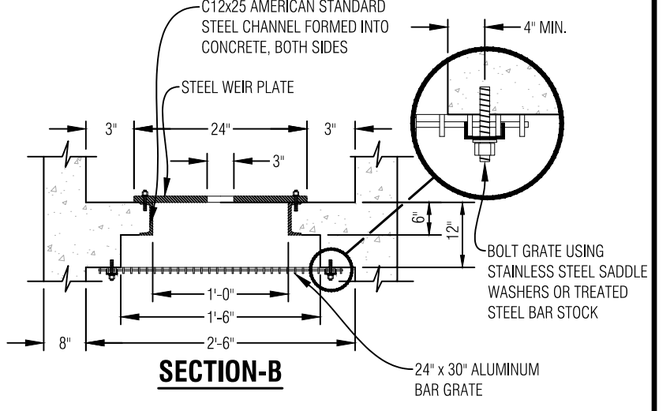
ELEVATION



SECTION VIEW



SECTION-C



SECTION-B

Underground (UG) Outflow Control Structure

Scale: N.T.S.

Boundaries Unlimited Inc.
Civil Engineering
Surveying
& Beyond
923 Cooper Ave., Ste. 201
Glenwood Springs, CO 81601
(T) 970.945.5252
www.bu-inc.com

Client Information:
Town Of Silt
PO Box 70
Silt, CO 81652
970.876.2353

NORTH
0 0.5' 1'
Scale: 1" = 1'

Main Street Improvements Project
Silt, Colorado
Drainage Details
Construction Set

No.	Date	Revision	By
##	##		
##	##		
##	##		
##	##		
##	##		
##	##		
##	##		

PROJECT NO. 11104
Designer: DJW
Drafter: BUI
Date: 2/5/13
Sheet D.9
File Name: 20002-C-Drainage.dwg

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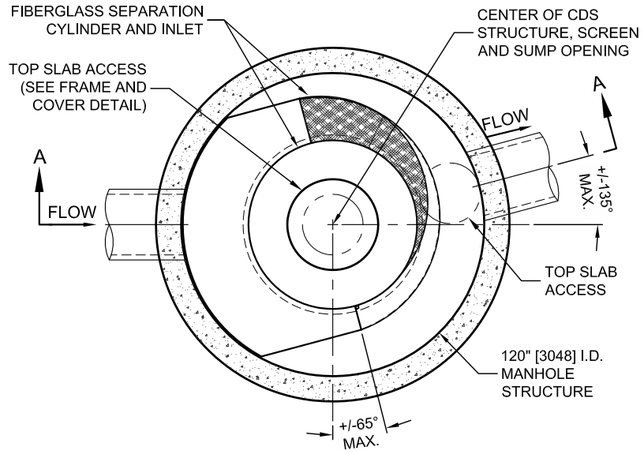
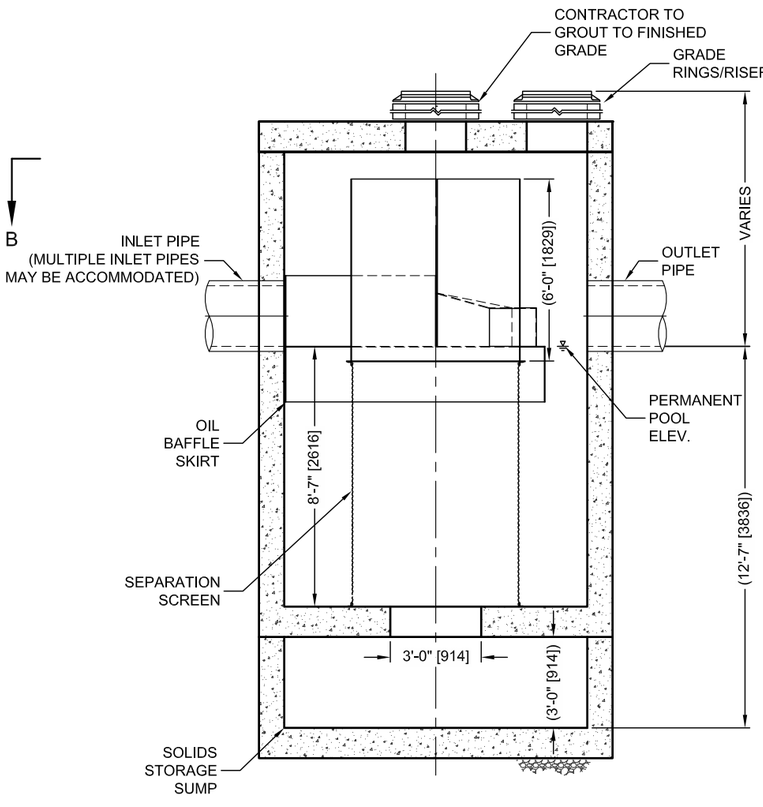


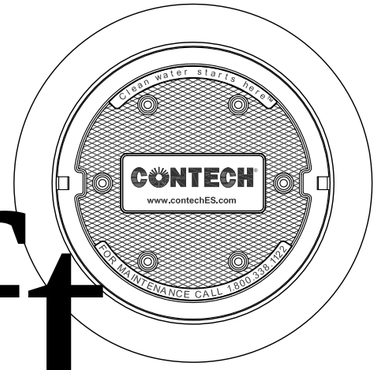
PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 6,511,595; 6,581,782; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

Draft



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

CDS5678-10-C DESIGN NOTES

THE STANDARD CDS5678-10-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECHENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS5678-10-C
INLINE CDS
STANDARD DETAIL

C:\USERS\SCHLACHTERH\DESKTOP\CDS DETAILS 180 MICRON SIZING\ACAD\CDS5678-10-C-DTL.DWG 5/19/2014 5:39 PM

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	EPM NAME EPM NUMBER EPM EMAIL
ADS SALES REP	SALES NAME SALES NUMBER SALES EMAIL
PROJECT NO.	

ADVANCED DRAINAGE SYSTEMS, INC.

BELL RIPPY NEIGHBORHOOD

GLENWOOD SPRINGS, CO

ADS RETENTION/DETENTION PIPE SYSTEM SPECIFICATION

SCOPE

THIS SPECIFICATION DESCRIBES ADS RETENTION/DETENTION PIPE SYSTEMS FOR USE IN NON-PRESSURE GRAVITY-FLOW STORM WATER COLLECTION SYSTEMS UTILIZING A CONTINUOUS OUTFALL STRUCTURE.

PIPE REQUIREMENTS

ADS RETENTION/DETENTION SYSTEMS MAY UTILIZE ANY OF THE VARIOUS PIPE PRODUCTS BELOW:

- N-12® STIB PIPE (PER AASHTO) SHALL MEET AASHTO M 294, TYPE S OR ASTM F2306
- N-12® STIB PIPE (PER ASTM F2648) SHALL MEET ASTM F2648
- N-12® MEGA GREEN™ STIB SHALL MEET ASTM F2648

ALL PRODUCTS SHALL HAVE A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. ALL STIB PIPE PRODUCTS ARE AVAILABLE AS PERFORATED OR NON-PERFORATED. WTIB PIPE PRODUCTS ARE ONLY AVAILABLE AS NON-PERFORATED. PRODUCT-SPECIFIC PIPE SPECIFICATIONS ARE AVAILABLE IN THE DRAINAGE HANDBOOK SECTION 1 "SPECIFICATIONS".

JOINT PERFORMANCE

PLAIN END / SOIL-TIGHT (STIB):
STIB PIPE SHALL BE JOINED USING A BELL AND SPIGOT JOINT. THE BELL AND SPIGOT JOINT SHALL MEET THE SOIL-TIGHT REQUIREMENTS OF ASTM F2306 AND GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477.

PLAIN END PIPE AND FITTINGS CONNECTIONS SHALL BE JOINED WITH COUPLING BANDS COVERING AT LEAST TWO FULL CORRUGATIONS ON EACH END OF THE PIPE. GASKETED SOIL-TIGHT COUPLING BAND CONNECTIONS SHALL INCORPORATE A CLOSED-CELL SYNTHETIC EXPANDED RUBBER GASKET MEETING THE REQUIREMENTS OF ASTM D1056 GRADE 2A2. GASKETS, WHEN APPLICABLE, SHALL BE INSTALLED BY THE PIPE MANUFACTURER.

FITTINGS

FITTINGS SHALL CONFORM TO ASTM F2306 AND MEET JOINT PERFORMANCE INDICATED ABOVE FOR FITTINGS CONNECTIONS. CUSTOM FITTINGS ARE AVAILABLE AND MAY REQUIRE SPECIAL INSTALLATION CRITERION.

INSTALLATION

INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 AND ADS RECOMMENDED INSTALLATION GUIDELINES, WITH THE EXCEPTION THAT MINIMUM COVER IN NON-TRAFFIC AREAS FOR 12-60 INCH (300-1500 mm) DIAMETERS SHALL BE 1 FT (0.3 m). MINIMUM COVER IN TRAFFICKED AREAS FOR 12-36 INCH (300-900 mm) DIAMETERS SHALL BE 1 FT (0.3 m) AND FOR 42-60 INCH (1050-1500 mm) DIAMETERS, THE MINIMUM COVER SHALL BE 2 FT (0.6 m). BACKFILL SHALL CONSIST OF CLASS I (COMPACTED) OR CLASS II (MINIMUM 95% SPD) MATERIAL, WITH THE EXCEPTION THAT 60 INCH (1500 mm) SYSTEMS SHALL USE CLASS I MATERIAL ONLY. MINIMUM COVER HEIGHTS DO NOT ACCOUNT FOR PIPE BUOYANCY. REFER TO ADS TECHNICAL NOTE 5.05 "PIPE FLOTATION" FOR BUOYANCY DESIGN CONSIDERATIONS. MAXIMUM COVER OVER SYSTEM USING STANDARD BACKFILL IS 8 FT (2.4 m); CONTACT A REPRESENTATIVE WHEN MAXIMUM FILL HEIGHT MAY BE EXCEEDED. ADDITIONAL INSTALLATION REQUIREMENTS ARE PROVIDED IN THE DRAINAGE HANDBOOK SECTION 6 "RETENTION/DETENTION".

ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES:

1) ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS, INLETS AND OUTLETS, SHALL BE VERIFIED BY THE ENGINEER PRIOR TO RELEASING FOR FABRICATION.

2) IN SITUATIONS WHERE A FINE-GRAINED BACKFILL MATERIAL IS USED ADJACENT TO THE PIPE SYSTEM, AND ESPECIALLY INVOLVING GROUND WATER CONDITIONS, CONSIDERATION SHOULD BE GIVEN TO THE USE OF GASKETED PIPE JOINTS. AT THE VERY LEAST THE PIPE JOINTS SHOULD BE WRAPPED IN A SUITABLE, NON-WOVEN GEOTEXTILE FABRIC TO PREVENT INFILTRATION OF FINES INTO THE PIPE SYSTEM.

3) CONSIDERATION FOR CONSTRUCTION EQUIPMENT LOADS MUST BE TAKEN INTO ACCOUNT.

4) ALL PIPE DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

5) ALL RISERS TO BE FIELD EXTENDED OR TRIMMED TO FINAL GRADE.

THE UNDERSIGNED HERBY APPROVES THE ATTACHED PAGES.

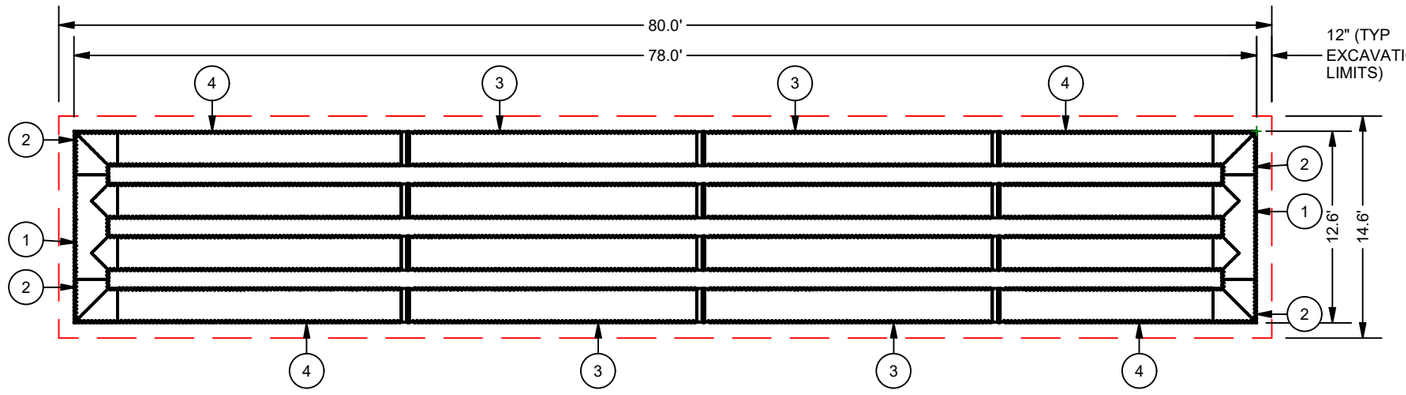
CUSTOMER DATE

©2013 ADS, INC.

ITEM	QTY	ALT. QTY	PART #	DESCRIPTION	STAN.	VENDOR	NOTE
1	2		2452AN	24".DOUBLE MANIFOLD TEE	STAN	ADS	SEE DETAIL
2	4		2498AN	24".MANIFOLD 90 DEG BEND	STAN	ADS	SEE DETAIL
3	8 STICKS	156 LF	24810020IB	24".N12 HWY.STIB.PERF.20'	STAN	ADS	AS SHOWN
4	7 STICKS	134 LF	24810020IB	24".N12 HWY.STIB.PERF.20'	STAN	ADS	FIELD CUT
5	12		2465AA	24".SPLIT COUPLER.(100/PALLET)	STAN	ADS	NOT SHOWN
6	1 ROLLS	417 SY	0601TG	601.15' X 300'.(500 SY).(NTPEP SCAN) (20% OVERAGE)	STAN	ADS	SEE DETAIL
7	139 TONS	100 CY	BY OTHERS	STONE (0% OVERAGE)	NA	BY OTHERS	NOT SHOWN
8	3683 CF	137 CY	NA	EXCAVATION	NA	NA	NOT SHOWN

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE PIPE COVER REQUIREMENTS ARE MET.
- STUB SIZES AND INVERTS TO BE VERIFIED BY THE SITE DESIGN ENGINEER PRIOR TO FABRICATION.
- ADS RISERS ARE FABRICATED 36" (900 mm) FROM TOP OF PIPE TO TOP OF RISER DUE TO SHIPPING LIMITATIONS. ADDITIONAL PIPE AND COUPLERS CAN BE USED TO EXTEND THE RISERS TO GRADE.
- LAYOUT SHOWN DOES NOT INCLUDE ADDITIONAL PIPE & MANIFOLD NEEDED FOR PROPER PIPE INSERTION INTO STRUCTURES.
- NOT FOR CONSTRUCTION



ADS GEOTEXTILE FABRIC

BELL RIPPY NEIGHBORHOOD
GLENWOOD SPRINGS, CO

DATE:
DRAWN: DW
PROJECT #:
CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

24" STIB PERF
DETENTION SYSTEM

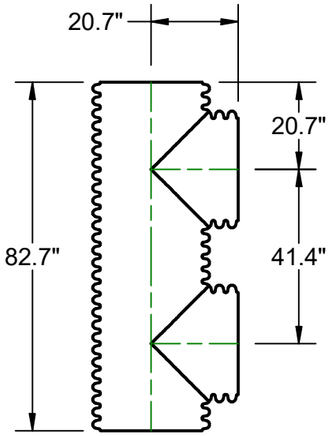
HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473
ADVANCED DRAINAGE SYSTEMS, INC.

0 10' 20'

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

24" DOUBLE MANIFOLD TEE [2452AN]



ITEM #: 1
QTY: 2
2452AN

BELL RIPPY NEIGHBORHOOD
GLENWOOD SPRINGS, CO

DATE:
DRAWN: DW
PROJECT #:
CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

24" STIB PERF
DETENTION SYSTEM

HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

ADS
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OF RECORD. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

24" X 90.00° MANIFOLD BEND [2498AN]

ITEM #: 2
QTY: 4
2498AN

BELL RIPPY NEIGHBORHOOD
GLENWOOD SPRINGS, CO

DATE:
DRAWN: DW
PROJECT #:
CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

24" STIB PERF
DETENTION SYSTEM

HDPE N-12

ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

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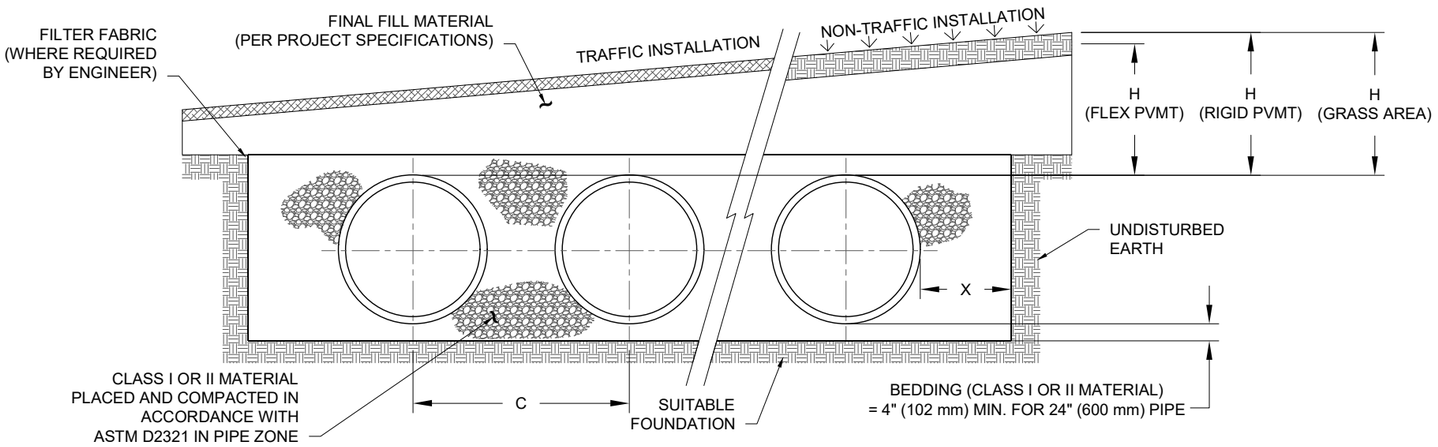


NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"	MIN. H (NON-TRAFFIC)	MIN. H (TRAFFIC)	MAX. H*
24" (600 mm)	28" (711 mm)	41.4" (1052 mm)	10" (254 mm)	12" (305 mm)	12" (305 mm)	8' (2.4 m)

* MAXIMUM FILL HEIGHTS OVER MANIFOLD FITTINGS. CONTACT MANUFACTURER'S REPRESENTATIVE FOR INSTALLATION CONSIDERATIONS WHEN COVER EXCEEDS 8 FT (2.4 m).

NOTES:

1. ALL REFERENCES TO CLASS I OR II MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.
3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.
4. FILTER FABRIC: A GEOTEXTILE FABRIC MAY BE USED AS SPECIFIED BY THE ENGINEER TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.
5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE. THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I OR II. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (102 mm) FOR 4"-24" (100-600 mm); 6" (152 mm) FOR 30-60" (750-900 mm).
7. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I OR II IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" (152 mm) ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
8. COVER: MINIMUM COVER OVER ALL RETENTION/DETENTION SYSTEMS IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (305 mm) FROM TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER IS 12" (305 mm) UP TO 36" (900 mm) DIAMETER PIPE AND 24" (610 mm) OF COVER FOR 42-60" (1050-1500 mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. MAXIMUM FILL HEIGHT LIMITED TO 8 FT (2.4 m) OVER FITTINGS FOR STANDARD INSTALLATIONS. CONTACT A SALES REPRESENTATIVE WHEN MAXIMUM FILL HEIGHTS EXCEED 8 FT (2.4 m) FOR INSTALLATION CONSIDERATIONS.

BELL RIPPY NEIGHBORHOOD
GLENWOOD SPRINGS, CO

DATE:
DRAWN: DW
PROJECT #:
CHECKED: N/A

REV	DRW	CHK	DESCRIPTION

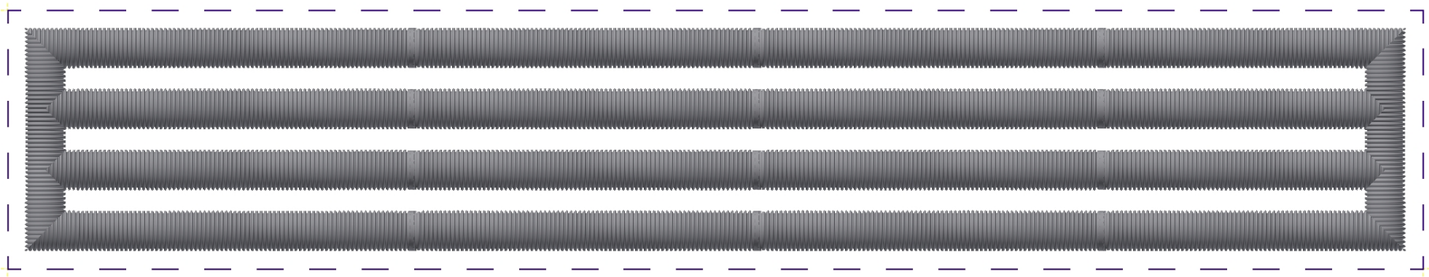
24" STIB PERF
DETENTION SYSTEM

HDPE N-12

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473
ADVANCED DRAINAGE SYSTEMS, INC.

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

SHEET
5 OF 5



REPORT

Debris Flow Hazard Evaluation

Glenwood Multifamily
Glenwood Springs, Colorado

Submitted to:

Mr. Dave Forenza
P.O. Box 2882
Edwards, Colorado

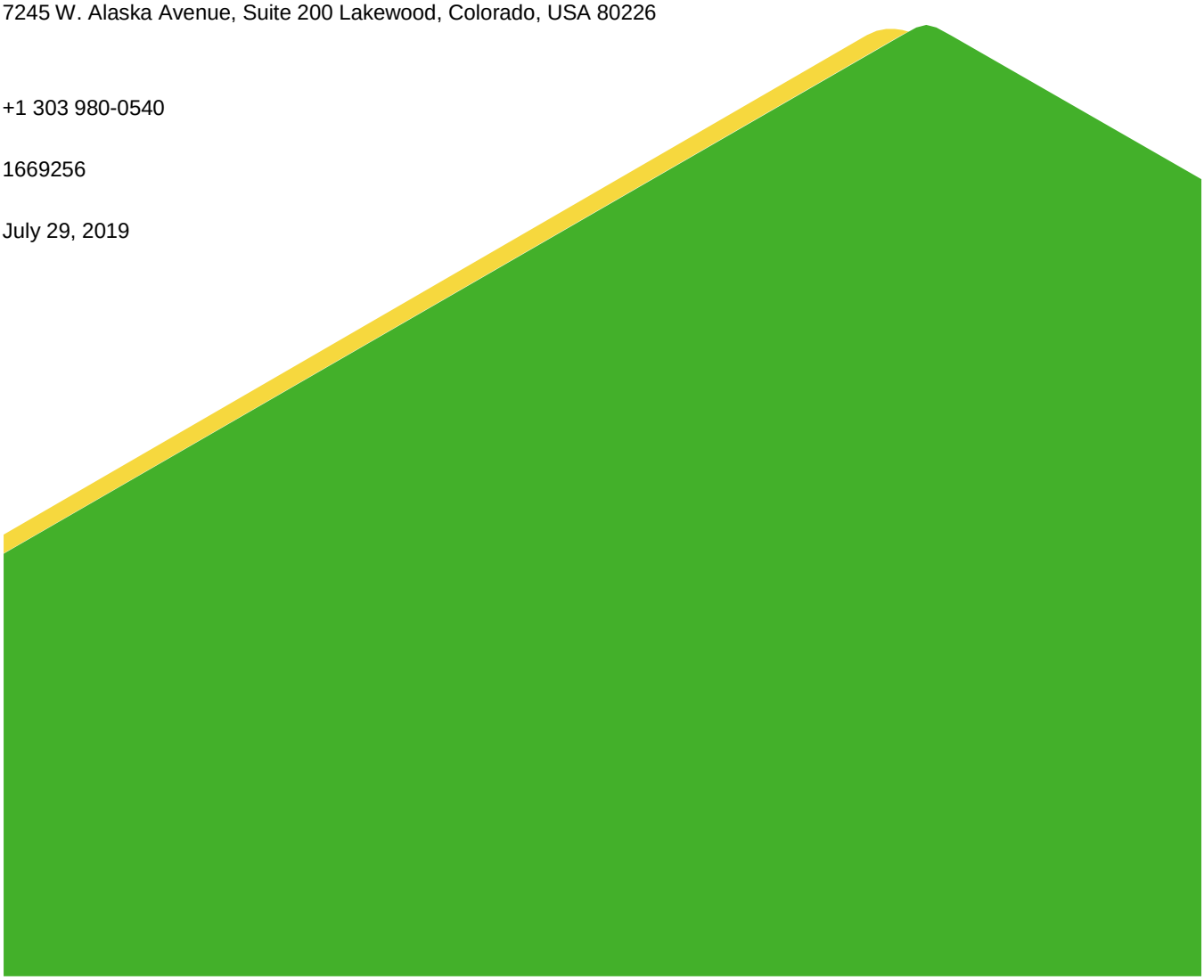
Submitted by:

Golder Associates Inc.
7245 W. Alaska Avenue, Suite 200 Lakewood, Colorado, USA 80226

+1 303 980-0540

1669256

July 29, 2019



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FIGURES

Figure 1 Flexible Debris Flow Fence Example 8

Figure 1 Flexible Debris Flow Fence Example

Figure 2 Site Location Map

Figure 3 Existing Conditions – Maximum Flow Depth

Figure 4 Proposed Conditions – Maximum Flow Depth

1.0 INTRODUCTION

In accordance with Golder Associates Inc.'s (Golder's) November 22, 2016, proposed Scope of Work, we have prepared this report to present the findings of our debris flow hazards evaluation and hydraulic modeling conducted for the Glenwood Multifamily project, Glenwood Springs, Colorado. The evaluation is intended to provide an assessment of the debris flow hazards, which may affect the planned development of the property. The report also describes hydraulic modeling completed in support of our evaluation and recommendations for additional mitigation.

Planned improvements at this site include ten apartment buildings, streets and associated infrastructure on the lower part of the property. The client is seeking land use approvals for the lot and the City of Glenwood Springs has required an evaluation of the debris flow hazards impacting the property. Site plans, topographic information, hydrologic inputs, and drainage plans with proposed mitigation were provided by RAL Architects, Inc (RAL) and Yarnell Consulting & Civil Design, LLC (Yarnell). The Yarnell drawings show drainage improvements including cast-in-place (CIP) walls and berms for routing storm water and some debris through the development. Golder analyzed the existing conditions and the conditions with the proposed mitigation shown on the Yarnell drawings to estimate how debris flow paths and depths change after construction of the proposed development.

Golder understands that a portion of the development is within Zone A of the FEMA Flood Insurance Rate Map for the area and that debris flows occurred in 1977 at this site as well as several others nearby. The Colorado Geological Survey (CGS) produced a report for this site that estimates a recurrence interval of approximately 50 years (2-percent chance of exceedance in any year) for the flow events and recommends mitigating the hazard by additional structural reinforcement of foundations walls and structural "catch" fences (CGS 1977). The CGS states that when debris flows occur in the basins, the flow depths can be expected to be approximately 5 ft deep.

2.0 SITE INVESTIGATION AND SITE CONDITIONS

The site is located on the east side of the Roaring Fork River valley within the city limits of Glenwood Springs, Colorado. The site location is shown on Figure 2. Golder's investigation consisted of review of existing documents and observations made during a site visit. Two Golder staff visited the site on June 29, 2017, to observe conditions on the fan, within the site, as well as within the drainages to the east contributing to the site.

The proposed development is located on an alluvial debris fan. Two basins contribute to the site, a larger basin on the north end (OS-1) and a smaller one on the south (OS-2). Based on the landforms observed during our site visit, it appears that recent, minor deposition onto the property has been generated from both basins. There is no development upstream of the property that has modified the natural flow paths. The apparently abandoned Glenwood irrigation ditch and maintenance road is located along the base of the steeper terrain to the east of the proposed development. The ditch and road provides a horizontal platform at the toe of the slope and apex of the fan that varies between 15 and 20 feet wide.

The fan and contributing basins are mapped hazards in at least two previous reports from 1977 and 1978. The reports were prepared in response to debris flow events on July 24, 1977, that caused significant damage to homes and infrastructure. Anecdotal evidence indicates that a previous flow event occurred around 1940. Reports from the 1977 event indicate entrained trees and boulders up to 5 feet in diameter in a muddy, fluid matrix. Post-flow observation indicates flow depths of 4 to 5 feet in the channels and in the oak trees where the channel gradient lessens at the top of the fan. This is supported by current observations of the fan surface and channels within the basin.

The basins on the east side of the valley are incised into the Maroon Formation, which consists of grey to reddish siltstone and silty sandstone with layers of red and purple arkosic sandstone. The Eagle Valley Evaporite Formation inter-fingers with the Maroon Formation but is not considered to be a major contributor of sediment for the two subject basins. Bedrock outcroppings are visible in the basin but the surface consists primarily of clayey, silty sandy soil with gravel, cobbles, and boulders. The Maroon Formation weathers to form silty, clayey sand and sandy, clayey silt soils, which have a significant fraction passing the #200 US Sieve but are relatively low plasticity. Locally, the Maroon Formation is the source for the majority of debris flow events in the Roaring Fork Valley due to its minerology, specifically clay forming minerals, and its differentially erodible layers that form cliffs interspersed with unconsolidated sediment that is available to scour as water flows over the cliffs.

Slope that are less than 35 degrees are moderately to well vegetated with Pinion, Gamble Oak, Juniper, grasses and undergrowth. The upper parts of the basins are moderately to well vegetated with modest slopes of 10 to 20 degrees. The lower part of the basin above the fan has slopes typically steeper than 40 degrees and areas of near vertical slopes and rock outcroppings. The steeper slopes are slightly vegetated to unvegetated and are subject to erosion of the bed load in the main and side channels along with sheet erosion and rill formation on the slopes adjacent to the channel. The fan consists of clayey, silty sand with gravel, cobbles, and boulders to 5 feet in diameter. The fan is populated with intermittent Juniper, Pinion and well mature cover of native grasses.

3.0 HYDROLOGY

A hydrologic analysis was conducted to determine flow hydrographs reporting to the apex of the fan that contributes to the subject property. The design storm event used for the debris flows is the 100-year, 24-hour event (1-percent annual exceedance probability). A flow hydrograph for the design storm was developed to which sediment was added to model the debris flow.

3.1 Methodology

Using parameters previously calculated by Yarnell for the two basins contributing to the property, the Hydrologic Engineering Center's Hydrologic Modeling Software (HEC-HMS) was used to estimate peak 100-year, 24-hour flow rates and hydrographs reporting to the alluvial fan apex (USACE 2017).

3.2 Data and Assumptions

Parameter	OS-1	OS-2
Subbasin Area (mi^2)	0.202	0.016
Composite Curve Number	82	85
Basin Lag Time (min)	15.8	6.12
100-year, 24-hour Rain Depth (in)	2.67	
NRCS Storm Distribution	Type II	

Note: Parameters from Yarnell Drainage Study for the Site (Yarnell 2017)

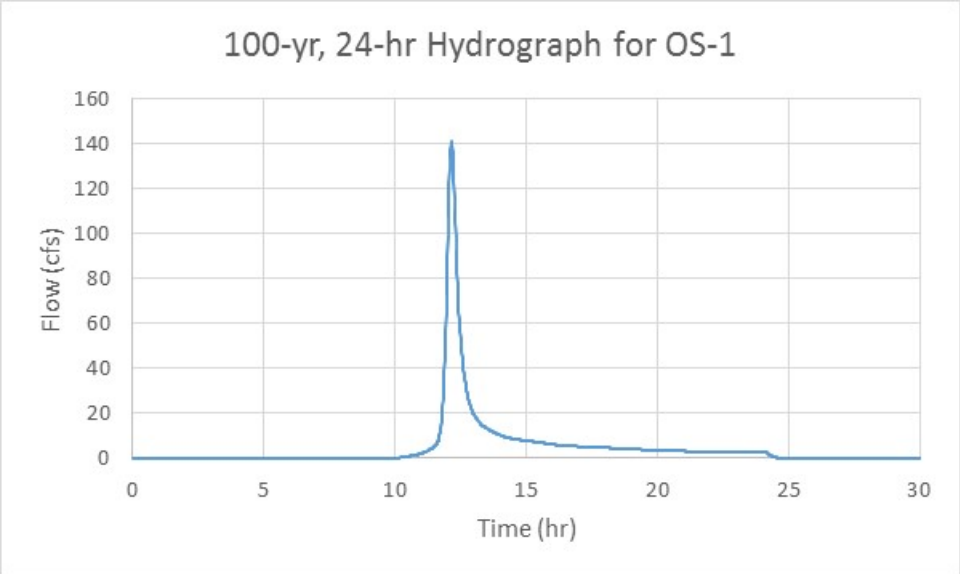
3.3 Analysis

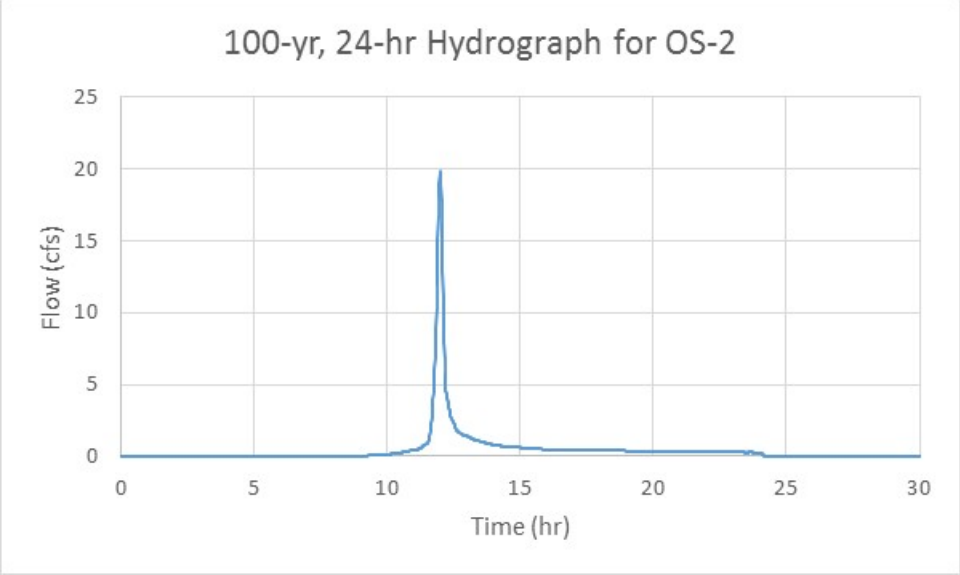
Calculations were performed by Yarnell for off-site basins OS-1 and OS-2 that correspond to the north and south contributing basins, respectively, subject to debris flows (Yarnell 2017). Precipitation that falls directly on the fan will not contribute significantly to the potential for debris flow at the proposed development location and therefore runoff generated by rainfall on the fan itself was not analyzed for this study. The analysis by Yarnell used the TR-55 tabular method (USSCS 1986) to determine peak flows for the two off-site basins. Because the entire flow

hydrograph is needed for debris flow modeling, Golder used the hydrologic parameters developed by Yarnell as inputs to HEC-HMS to develop the hydrographs required for OS-1 and OS-2.

3.4 Results

The results of the HEC-HMS model show that the peak flow contributing to the fan apex is estimated to be 141.4 cfs for OS-1 and 19.8 cfs for OS-2. The full hydrograph output from HEC-HMS was input to FLO-2D for routing of the debris flow through the alluvial fan. The hydrograph output from the HEC-HMS model is provided below (water only).





4.0 HYDRAULIC MODELING

A hydraulic model was created to route the design storm hydrograph, bulked with sediment, through the site and surrounding area. Debris flow models were developed for both existing and proposed conditions as shown on the

Yarnell drawings. The existing conditions model was used to compare against the proposed conditions models to determine the effectiveness of the berms and wall currently shown on the drawings.

4.1 Methodology

The potential debris flow depths and extents from the 100-year frequency, 24-hour duration event were simulated using FLO-2D modeling software (FLO-2D 2014a). FLO-2D preserves continuity for both water and sediment during mudflow simulations. The hydrograph developed during the hydrology analysis was input into FLO-2D and was bulked to account for sediment. The mud/debris flow function in FLO-2D was used and parameters for viscosity, yield stress, and laminar flow resistance were estimated and input into the model.

4.2 Data and Assumptions

- Incoming sediment specific gravity = 2.65
- Laminar Flow Resistance (LFR) values modeled (FLO-2D 2014b): 2,480 – FLO-2D recommended for sparse vegetation
- Coefficients and exponents for use in calculation of yield stress and viscosity (Glenwood 4 soil – FLO-2D recommended to represent high viscosity and moderate yield stress with high sediment concentrations) (FLO-2D 2014b):

	Yield Stress	**Viscosity**
α	0.00172	0.000602
β	29.5	33.1

4.3 Hydraulic Model Analysis

The FLO-2D model for the site was developed using the available topography, design storm hydrograph from HEC-HMS (100-yr, 24-hr), and sediment parameters as laid out above. The model grid encompasses the proposed development and surrounding properties/streets. The sediment concentration was specified for each incremental hydrograph flow at each inflow cell. Total sediment volume and sediment concentration during the hydrograph are extremely difficult to predict. Golder estimated these values based on empirical relationships developed for muddy debris flows (Rickenmann 1999), Golder's understanding of the site based on visual inspections during the site visit and aerial imagery, and comparison to historical debris flows recorded at this site. Sediment parameters were input globally for the entire model run. The model was set up and run with the existing topography to develop base conditions. Following this, the proposed features were input to the model including buildings, parking, streets, and proposed mitigation and used to analyze the differences in flow patterns from existing conditions.

FLO-2D documentation cautions that large flood events such as the 100-year event may not have enough sediment and rock supply to produce a high enough sediment concentration to constitute a mud flow (45% to 55% concentration by volume at the peak of the hydrograph) unless there is evidence of significant hill slope failure, recent wildfire, etc. (FLO-2D 2014b). There is no evidence in the contributing watershed of any of these characteristics from aerial imagery or site reconnaissance. Golder used the 100-year, 24-hour storm event as the design storm to be consistent with stormwater design requirements, however, more frequent storm events, such as the 10-year or 25-year event may trigger a debris flow event.

A constant sediment load of 20% over the design storm event hydrograph was deemed reasonable for the debris flow modeling. To create a conservative condition with higher concentrations, the sediment load was redistributed to create a period of high concentration discharge at the peak of the hydrograph. This was done by calculating the total sediment volume with a constant 20% concentration by volume and modifying the distribution to have a maximum 45% concentration by volume at the peak of the water hydrograph while maintaining the same sediment volume through the storm event.

Estimating sediment yield available for transport during a debris flow event is difficult. Golder used a power equation in a paper by Dieter Rickenmann entitled “Empirical Relationship’s for Debris Flows” (Rickenmann 1999) to estimate debris flow volumes with a given peak water flow rate. This paper presents several equations relating debris flow volume to water peak flow for a variety of conditions. The equation that was deemed most reasonable to the Glenwood Multifamily site is the equation for a muddy debris flow. Using the peak flow calculated for basins OS-1 and OS-2, the Rickenmann equation gives a sediment volume of 31,275 and 2,597 ft^3, respectively. Using Golder’s method to determine sediment volume, the modeled volume for each basin is 68,231 ft^3 for OS-1 and 6,274 ft^3 for OS-2, which is significantly higher than the empirical relationships suggested by Rickenmann. However, given the high uncertainty in estimating potential sediment volumes during debris flow events, the estimated volume of 68,231 ft^3 and 6,274 ft^3 was used in the model to provide a conservative, yet reasonable, estimation of the total volume of sediment based on Golder’s understanding of the site.

The incoming sediment inputs do not require a gradation; however, sediment properties and variables must be estimated to determine FLO-2D parameters for use in the mud flow computations. Variables for viscosity, yield stress, and laminar flow resistance are required for use in the FLO-2D model. FLO-2D provides tables of coefficients derived from lab data (viscosity and yield stress) and flow path roughness (laminar flow resistance). Viscosity and yield stress variables are difficult to choose without laboratory testing of on-site soil samples. FLO-2D however, recommends the “Glenwood 4” parameters when no lab data is available to calculate coefficients. The laminar flow resistance parameter (LFR) varies from 24 to 50,000 depending on flow path roughness. The LFR value chosen was 2,480, which is recommended by FLO-2D for urban areas and watersheds consisting of sparse vegetation.

4.4 Results

Results of the existing conditions debris flow modeling are presented in Figure 3. The existing conditions topography is based on available contours derived from the USGS National Elevation Dataset (10 m digital elevation model). The results of the preliminary proposed mitigation are shown in Figure 4 and include the initial mitigation options for debris flow events by Yarnell. The concept includes walls and diversion channels to pass the flow on to Palmer Avenue where it can be removed.

With minor adjustments, the proposed mitigation for flows contributing to the site from basin OS-2 is effective in reducing impact to proposed structures in the flow path. Results show up to approximately 1.5 feet of debris flow accumulation against the east side of proposed Building 10, which could be eliminated by modifying the berm. Flow from basin OS-1 overwhelms the currently proposed mitigation, bypassing and overtopping the mitigation and impacting Buildings 1 and 2 with flow depths greater than 2 feet.

4.5 Preliminary Mitigation Options

Several alternative options were discussed and analyzed to better protect the proposed development and neighboring properties from potential debris flow impacts from basin OS-1 including the following:

- Berms/swales to redirect flow to the north east of Palmer Avenue
- Detention basin above fan apex
- Flexible debris flow fencing

Several variations of berms were modeled to direct flow to the north and on to 26th Street, but the topography and required access for a neighboring house makes these options infeasible. Detention was deemed unpractical due to the large basin that would be required to contain the sediment-laden water along with the need to access the basin for maintenance, the steep terrain, and potentially problematic soils.

The flexible debris flow fencing appears to be the best option of those considered. Figure 1 below shows an image of a similar style fence as is being considered for the Glenwood Multifamily site. The concept for the fence is to place it on the downhill side of the existing ditch access road to allow for maintenance and cleaning. The fence will have to extend the entire width of the alluvial fan in the area, approximately 430 feet, for storage and to allow for changes in the flow paths as is common in an alluvial fan. Initial, preliminary calculations to determine the required height of the fence based only on the ability to store the sediment from a debris event in basin OS-1 show that the fence would have to be approximately 9 feet high.

Figure 1 Flexible Debris Flow Fence Example

Alluvial fans are very complex systems and modeling the effects of a mudflow on them is very difficult. It is impossible to predict how the flow paths will change throughout a mudflow event due to factors such as large boulders, trees, etc. blocking flow paths or avulsion due to a flow path filling with sediment and/or debris. These figures represent an estimate of possible maximum flow depths and extents encountered during a mudflow as a result of a major storm event.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed development for the Glenwood Multifamily site in Glenwood Springs, Colorado sits on an alluvial fan and has been subject to debris flows in the past. Debris flow mitigation is recommended to protect the proposed development. The recommended mitigation is a combination of a wall and channels/berms for basin OS-2 on the south and a flexible debris flow fence for basin OS-1 on the north.

Debris flow modeling using FLO-2D shows that the mitigation currently shown on the Yarnell plans for basin OS-2 will, with minor modification, effectively limit inundation for buildings on the site while not increasing flows into surrounding properties.

The addition of a debris flow fence, as recommended by this report for OS-1, will contain sediment while allowing relatively clear water to pass downstream thereby decreasing the hazard to the proposed development and surrounding properties during debris flow events. The relatively clear portion of the hydrograph may still be turbid and consists of sediment concentrations less than 20% by volume behaving more as a water flow (i.e. Newtonian flow) rather than debris flow (i.e. non-homogeneous, nonnewtonian, higher viscosity flow). The debris flow fence will need to extend over the width of the OS-1 fan for storage and in case the flow path changes due to avulsion. Preliminary dimensions for the fence indicate that its length will be approximately 430 feet with a height of 9 feet. The fence will be designed to contain the sediment while allowing relatively clear water to flow downstream to be handled by the storm water controls for the site. As such, limited impacts from debris flows should be seen on either the Glenwood Multifamily site or neighboring properties from OS-1. The debris fence shall be designed to withstand the impact forces from the expected debris based on the recommendations of the fence manufacturer.

6.0 LIMITATIONS

This report has been prepared in accordance with generally accepted geological and engineering practices in this area for use by the client for preliminary planning purposes. The preliminary conclusions and recommendations submitted in this report are based upon data obtained from the observations made in the field, results of hydrologic/hydraulic modeling and from information provided by the client. It should be noted that geological hazard events are sporadic and unpredictable. The findings and recommendations given in this report are site-specific, and are only valid for the subject site.

7.0 CLOSING

Golder expects that this report meets your needs for this facility and appreciates the opportunity to work on this project. Please feel free to contact us for if you have any questions or wish to discuss the results in further detail.

GOLDER ASSOCIATES INC.

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REFERENCES

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Figures

LEGEND

SITE LOCATION

KEY MAP

0 1,000 2,000 4,000 Feet

REFERENCE

1. AERIAL IMAGERY: ESRI BASEMAP SERVICES, BING MAPS, MICROSOFT CORPORATION.

CLIENT
GLENWOOD MULTIFAMILY, LLC

PROJECT
BELL RIPPY PARCEL DEBRIS FLOW HAZARD EVALUATION

TITLE
SITE LOCATION MAP

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-08-16
PREPARED	KJC
DESIGN	KJC
REVIEW	CPB
APPROVED	

PROJECT No.
1669256

FIGURE
2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 11in 0

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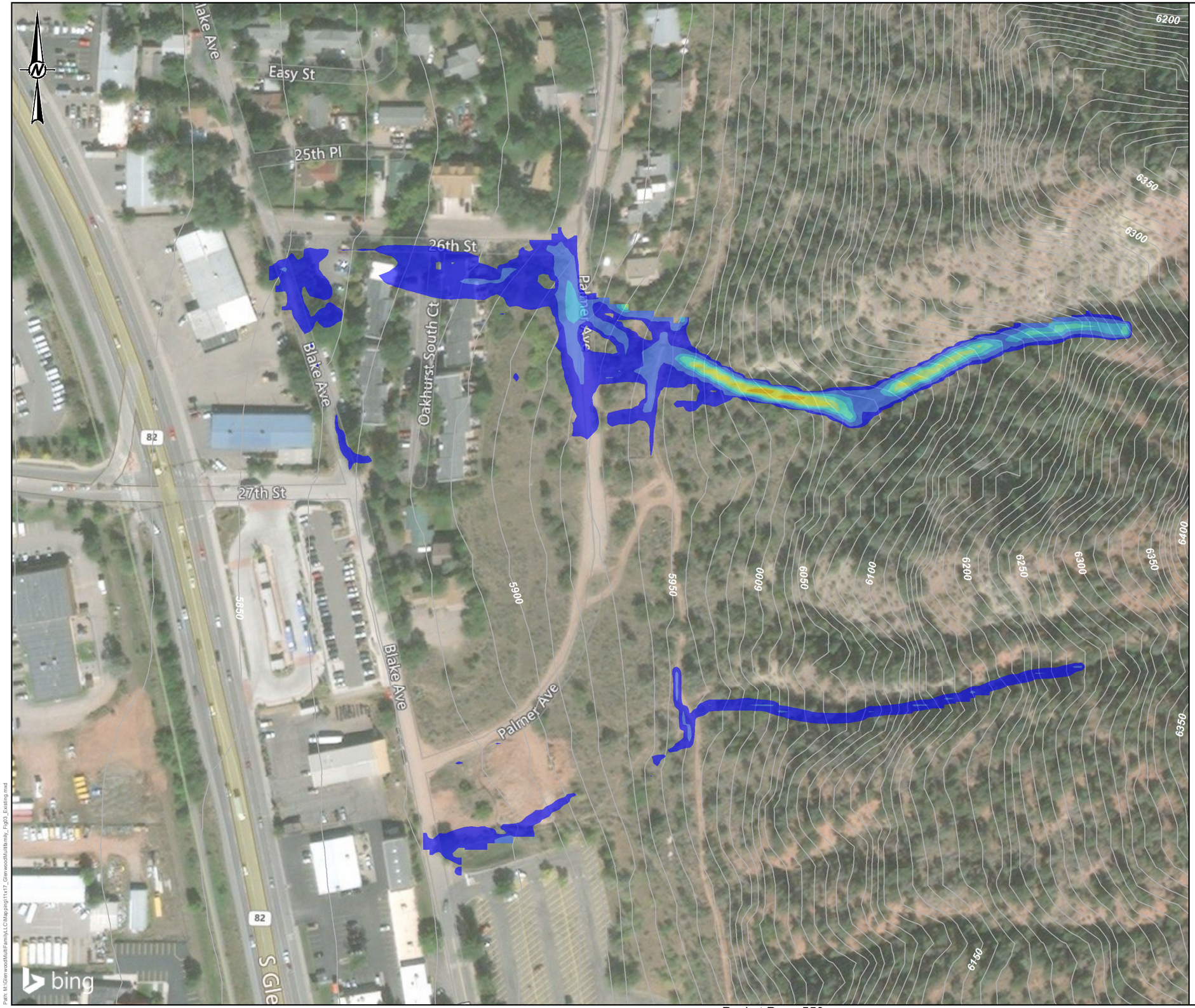

LEGEND

MAXIMUM FLOW DEPTH (FT)

- < 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 4
- 4 - 5
- > 5
- EXISTING TOPOGRAPHY (10-FT CONTOUR INTERVAL)

Feet

0 75 150 300

REFERENCE

1. AERIAL IMAGERY: ESRI BASEMAP SERVICES, BING MAPS, MICROSOFT CORPORATION.
2. EXISTING TOPOGRAPHY: CONTOURS DERIVED FROM THE USGS NATIONAL ELEVATION DATASET (NED) 10-METER DIGITAL ELEVATION MODEL.

CLIENT
GLENWOOD MULTIFAMILY, LLC

PROJECT
BELL RIPPY PARCEL DEBRIS FLOW HAZARD EVALUATION

TITLE
EXISTING CONDITIONS
MAXIMUM FLOW DEPTH

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-08-16
PREPARED	KJC
DESIGN	KJC
REVIEW	CPB
APPROVED	SWR

PROJECT No.
1669256

FIGURE
3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
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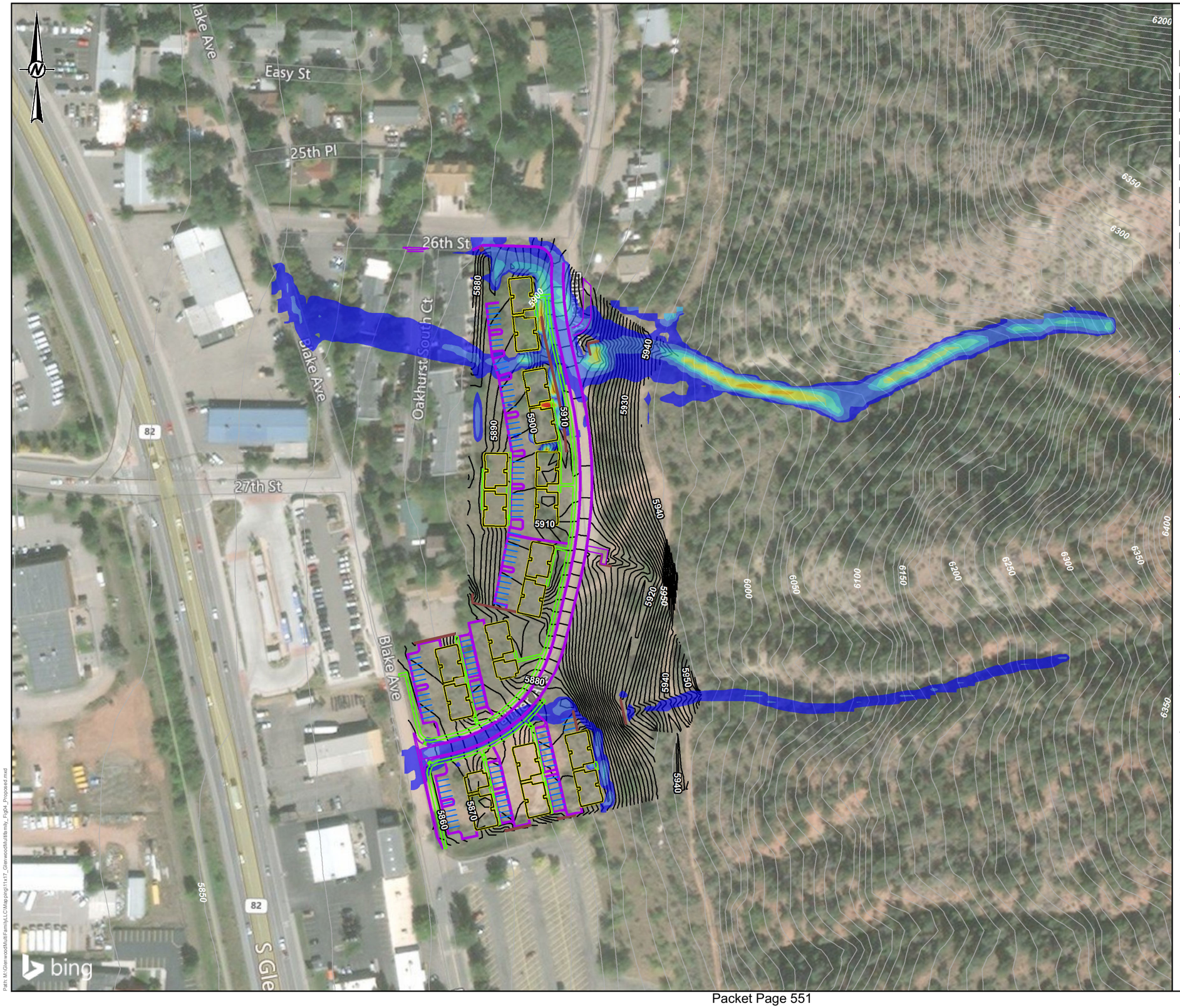

LEGEND

MAXIMUM FLOW DEPTH (FT)

- < 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 4
- 4 - 5
- > 5
- EXISTING TOPOGRAPHY (10-FT CONTOUR INTERVAL)

PROPOSED FEATURES

- BUILDING FOOTPRINT
- CURB
- PAVEMENT MARKING
- SIDEWALK
- WALL
- PROPOSED TOPOGRAPHY (1-FT CONTOUR INTERVAL)

Feet
0 75 150 300

REFERENCE

1. AERIAL IMAGERY: ESRI BASEMAP SERVICES, BING MAPS, MICROSOFT CORPORATION.
2. PROPOSED SITE TOPOGRAPHY AND SITE FEATURES RECEIVED FROM RAL ARCHITECTS ON JUNE 27, 2017.
3. EXISTING TOPOGRAPHY: CONTOURS DERIVED FROM THE USGS NATIONAL ELEVATION DATASET (NED) 10-METER DIGITAL ELEVATION MODEL.

CLIENT
GLENWOOD MULTIFAMILY, LLC

PROJECT
BELL RIPPY PARCEL DEBRIS FLOW HAZARD EVALUATION

TITLE
PROPOSED CONDITIONS MAXIMUM FLOW DEPTH

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-08-16
PREPARED	KJC
DESIGN	KJC
REVIEW	CPB
APPROVED	SWR

PROJECT No.
1669256

FIGURE
4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
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golder.com

Transportation Impact Study

for

Glenwood Multifamily Development
(Formerly Bell Rippy Apartments)
Glenwood Springs, Colorado

March 10, 2017
Revised April 9, 2019

PREPARED FOR:
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Project Number: M1247

Statement of Engineering Qualifications

Kari J. McDowell Schroeder, PE, PTOE is a Transportation and Traffic Engineer for McDowell Engineering, LLC. Ms. McDowell Schroeder has over twenty-two years of extensive traffic and transportation engineering experience. She has completed numerous transportation studies and roadway design projects throughout the State of Colorado. Ms. McDowell Schroeder is a licensed Professional Engineer in the State of Colorado and has her certification as a Professional Traffic Operations Engineer from the Institute of Transportation Engineers.

Traffic Impact Study for
Glenwood Multifamily Development Project

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1.0 Project Description

McDowell Engineering has prepared this Transportation Impact Study for the proposed Glenwood Multifamily (formerly Bell Rippy Apartments) Development in Glenwood Springs, Colorado. The purpose of this study is to forecast and analyze the impacts of the additional traffic volumes associated with this project on the surrounding roadway network. Recommendations to mitigate any traffic impacts are also included. The analysis complies with the City of Glenwood Springs and Colorado Department of Transportation standards.

The applicant is proposing to develop a 79-unit apartment project on Blocks 1 and 3 of the Oakhurst Subdivision located on Palmer Avenue in Glenwood Springs.

Refer to the area map in **Figure 1** and site plan in **Figure 2**.

Direct access to the project will be from Palmer Avenue at Blake Avenue and 26th Street.

It is anticipated that access to State Highway 82 will occur via the 23rd Street and 27th Street intersections.

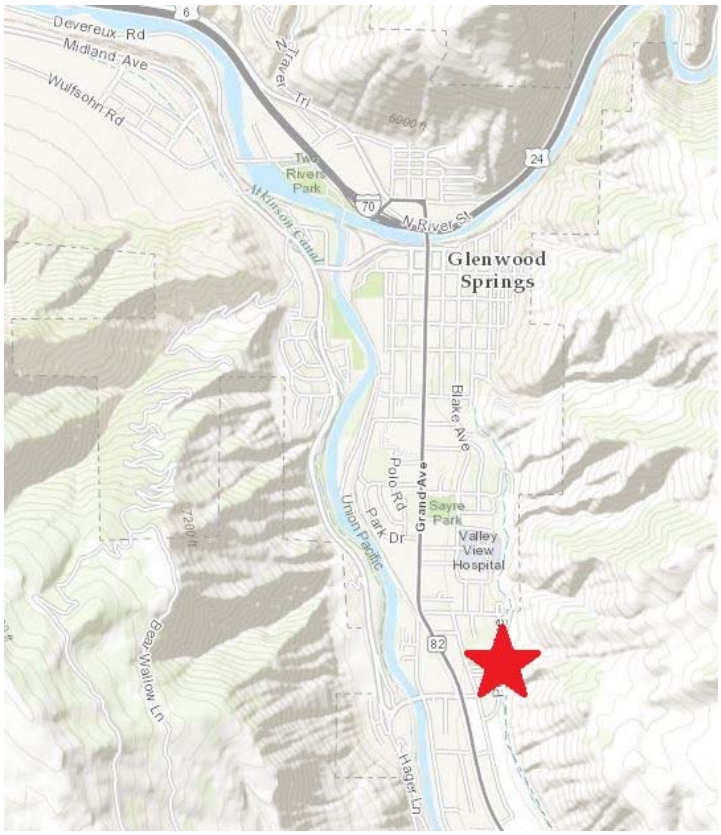
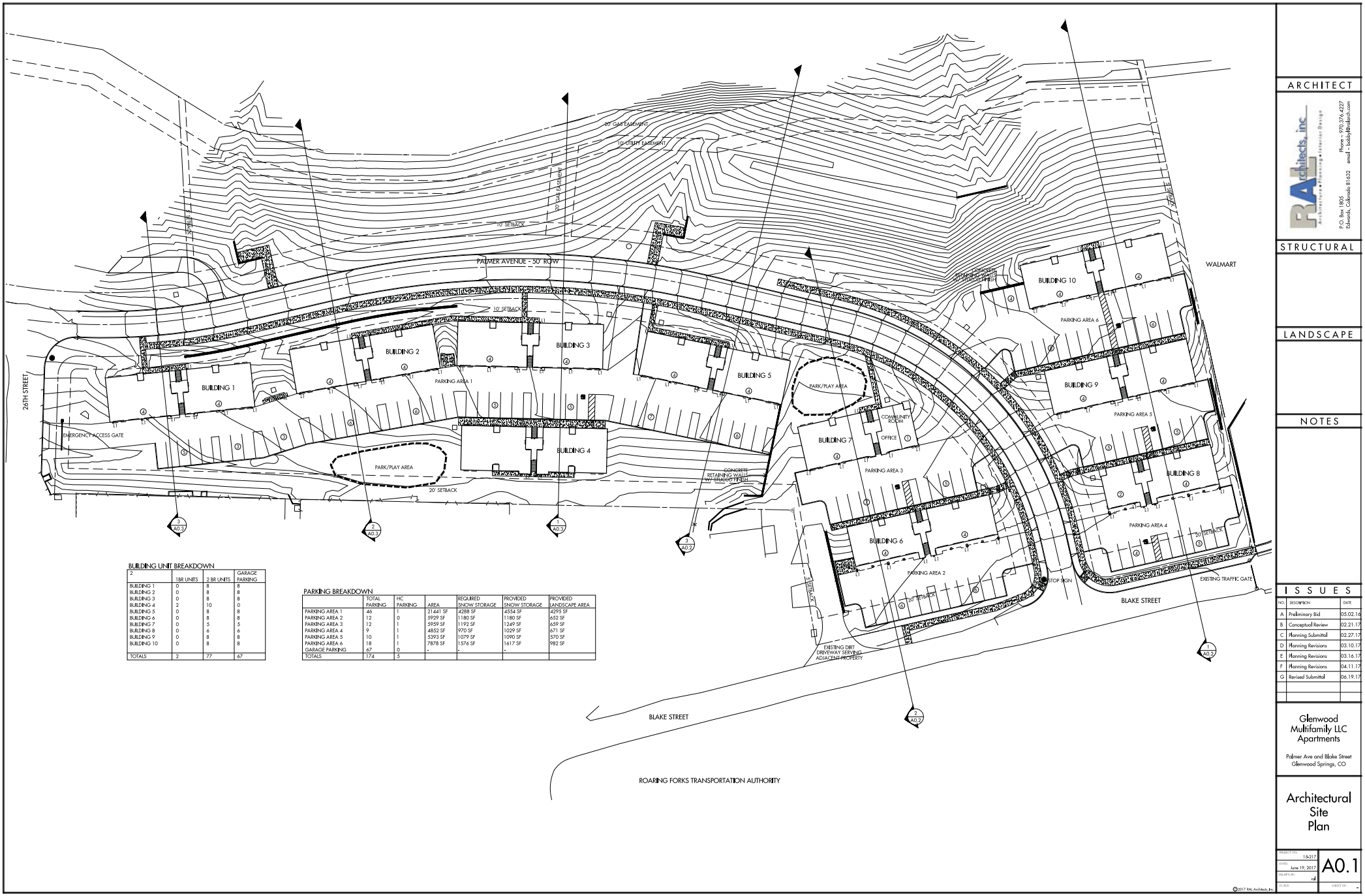


Figure 1: Area Map

Figure 2: Site Plan



BUILDING UNIT BREAKDOWN

2	1BR UNITS	2 BR UNITS	GARAGE PARKING
BUILDING 1	0	8	8
BUILDING 2	0	8	8
BUILDING 3	0	8	8
BUILDING 4	2	10	0
BUILDING 5	0	8	8
BUILDING 6	0	8	8
BUILDING 7	0	5	5
BUILDING 8	0	6	6
BUILDING 9	0	8	8
BUILDING 10	0	8	8
TOTALS	2	77	67

PARKING BREAKDOWN

	TOTAL PARKING	HC PARKING	AREA	REQUIRED SNOW STORAGE	PROVIDED SNOW STORAGE	PROVIDED LANDSCAPE AREA
PARKING AREA 1	46	1	21441 SF	4288 SF	4554 SF	4295 SF
PARKING AREA 2	12	0	5929 SF	1180 SF	1180 SF	652 SF
PARKING AREA 3	12	1	5959 SF	1192 SF	1249 SF	659 SF
PARKING AREA 4	9	1	4852 SF	970 SF	1029 SF	671 SF
PARKING AREA 5	10	1	5393 SF	1079 SF	1090 SF	570 SF
PARKING AREA 6	18	1	7878 SF	1576 SF	1617 SF	982 SF
GARAGE PARKING	67	0	-	-	-	
TOTALS	174	5				

ARCHITECT

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STRUCTURAL

LANDSCAPE

NOTES

ISSUES

NO.	DESCRIPTION	DATE
A	Preliminary Bid	05.02.16
B	Conceptual Review	02.21.17
C	Planning Submittal	02.27.17
D	Planning Revisions	03.10.17
E	Planning Revisions	03.16.17
F	Planning Revisions	04.11.17
G	Revised Submittal	06.19.17

Glenwood Multifamily LLC Apartments

Palmer Ave and Blake Street
Glenwood Springs, CO

Architectural Site Plan

PROJECT NO. 15-217
DATE: June 19, 2017
DRAWN BY: rd
CHECKED:
SHEET NO. A0.1

©2017 RAL Architects, Inc

2.0 Existing Conditions

2.1 Description of Existing Transportation System

SH 82 (South Glen Avenue): SH 82 is a State Highway that connects Interstate 70 at Glenwood Springs to US 24 south of Leadville. This major regional route is classified by the State as Access Category NR-B, Non-Rural Arterial, in the vicinity of the project. While SH 82 is generally considered an east/west highway, the alignment in this area is more north/south in nature. The posted speed limit is 35mph south of 23rd Street and 25mph north of 23rd Street. SH 82 is a four-lane facility from Glenwood Springs to just north of the City of Aspen.

23rd Street / South Grand Avenue: 23rd Street is a two-lane collector that provides access to residential development to the east of SH 82. The posted speed on 23rd Street is 25mph. 23rd Street is located approximately 0.3 miles north of 27th Street and 0.2 miles south of 20th Street.

South Grand Avenue is a two-lane collector that provides access to residential and commercial development to the west, parallel to SH 82. The posted speed on South Grand Avenue is 25mph. South Grand Avenue begins at the intersection of SH 82 / 23rd Street / South Grand Avenue and connects to 27th Street on the south.

The intersection of 23rd Street / South Grand Avenue and SH 82 is signalized.

27th Street: 27th Street is a two-lane collector roadway that connects SH 82 to Blake Avenue to the east and SH 82 to Midland Avenue to the west. The posted speed limit on 27th Street is 25 mph. 27th Street accesses local businesses and residential neighborhoods on both sides of SH 82 including a RFTA transit station just east of SH 82.

The intersection of 27th Street and SH 82 is signalized.

Palmer Avenue: Palmer Avenue is a local access road that will provide access to the project from 26th Street and Blake Avenue.

Blake Avenue: Blake Avenue is a local access road that begins at 7th Street and connects to SH 82 at the Roaring Fork Marketplace. Just south of the project the road is gated, restricting direct access to the Roaring Fork Marketplace. Blake Avenue serves residential and local businesses. The posted speed limit of Blake Avenue is 25mph south of 27th Street and 15mph north of 27th Street.

2.2 Traffic Data Collection

The original Transportation Impact Study used traffic data from October 2016. CDOT required updated current traffic data collection. Traffic data was collected at the following intersections on Wednesday, January 16 and Thursday, January 17, 2019.

- State Highway 82 / 23rd Street / South Grand Avenue
- State Highway 82 / 27th Street
- State Highway 82 / Blake Avenue (Roaring Fork Marketplace)
- 23rd Street / Blake Avenue
- 23rd Street / Palmer Avenue
- 26th Street / Blake Avenue
- 27th Street / Blake Avenue

Turning movement counts were collected from 7:00 – 9:00am and 4:00 – 6:00pm. The weather was mostly clear with a few periods of rain. This data was taken after the Grand Avenue bridge construction was complete and before construction started on the 27th Street bridge.

2.3 Background Infrastructure Assumptions

The following background infrastructure assumptions have been made based on previous studies:

23rd Street: The *City of Glenwood Springs State Highway 82 Access Study*[4] anticipates that there will be realignment of South Grand Avenue to create a more perpendicular intersection and improve safety for vehicles and trail users. It is not anticipated that the realignment would change the lane configuration of the intersection.

27th Street: The west leg of this intersection was recently reconstructed to include a left turn lane, shared left turn and through lane, and a separate right turn lane. Modeling reflects this recent modification.

SH 82 Signals: CDOT implemented adaptive signal coordination on the SH 82 corridor prior to the 2017-2018 construction of the new Grand Avenue Bridge at the Colorado River.

Per July 2017 conversations with CDOT Region 3 Traffic Operations staff, the adaptive signal controllers are anticipated optimize traffic flow on SH 82. This has the possibility to decrease the necessary green time for mainline SH 82, thus allowing for more time for side street traffic. CDOT will be analyzing the data from the new adaptive controllers and determining the impacts.

Per January 2019 conversations with CDOT Region 3 Traffic Operations staff, a new timing plan for the corridor has not been implemented. Therefore, the previous 2017 signal timing is used in the study analysis.

Blake Street: The City of Glenwood Springs staff requested an alternative analysis to evaluate the impact of opening the existing gate on Blake Avenue, north of Walmart. CDOT feels that from a traffic operations perspective, it is beneficial to provide the off-system interconnectivity, keeping some of the local traffic off the highway.

The City of Glenwood Springs' staff requested an alternative analysis to evaluate a one-way southbound Blake option. Some of the previous exhibits are included in the **Appendix** of the report. Please note that these exhibits were completed in February 2018 for a City Council presentation. These exhibits were based upon the previous set of traffic counts.

2.4 Background Traffic Growth

SH 82 Forecasting:

The City of Glenwood Springs and CDOT completed the *City of Glenwood Springs State Highway 82 Access Study*[4] in September 2013. The Study provides Year 2032 traffic volume projections for the SH 82 corridor including the intersections of SH 82 / 23rd / South Grand Avenue, SH 82 / 27th Street, and SH 82 / Blake Avenue. The *Access Control Plan* recommends a background traffic growth rate of 2%. This growth rate was used for all traffic forecasts. The methodology for traffic forecasting was reviewed with CDOT and City of Glenwood Springs staff. Refer to correspondence in the **Appendix**.

The model data used in this analysis can be seen in the **Appendix**. The resulting projected Year 2019 and Year 2040 background traffic volumes can be seen in **Figure 3** and **Figure 4**, respectively.

Seasonal Adjustment Factor:

Historic data from CDOT's Automated Traffic Recorders (ATRs) on SH 82 at mile marker 2.3, near the south end of Glenwood Springs, were reviewed to determine a seasonal adjustment factor for each off-peak month that counts were taken.

The AADTs by month were averaged over the past four years (January 2014 to February 2019) to determine the seasonal factors of SH 82 traffic. The seasonal adjustment factor was 1.20 to adjust January data to July peak volumes. Data for this derivation can be found in the **Appendix** of the report.

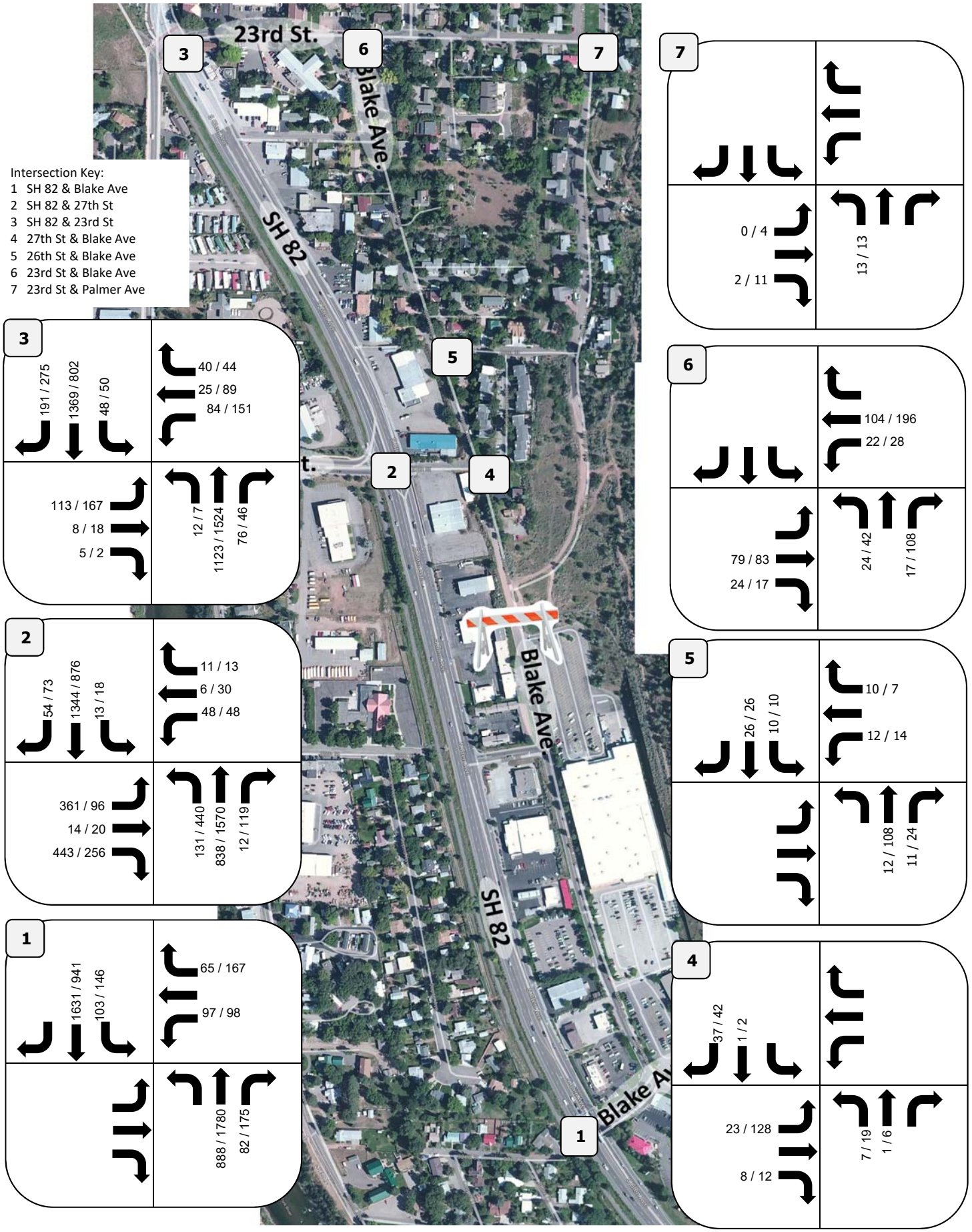
Existing Land Use:

The project site is currently vacant with no traffic activity.

Year 2019 and 2040 Background Traffic Forecasts:

The resulting Year 2019, seasonally-adjusted background traffic volumes can be found in **Figure 3**. Year 2040 background traffic volumes can be found in **Figure 4**.

Figure 3: Year 2019 Background Traffic - Blake Ave. Gate Remains Closed



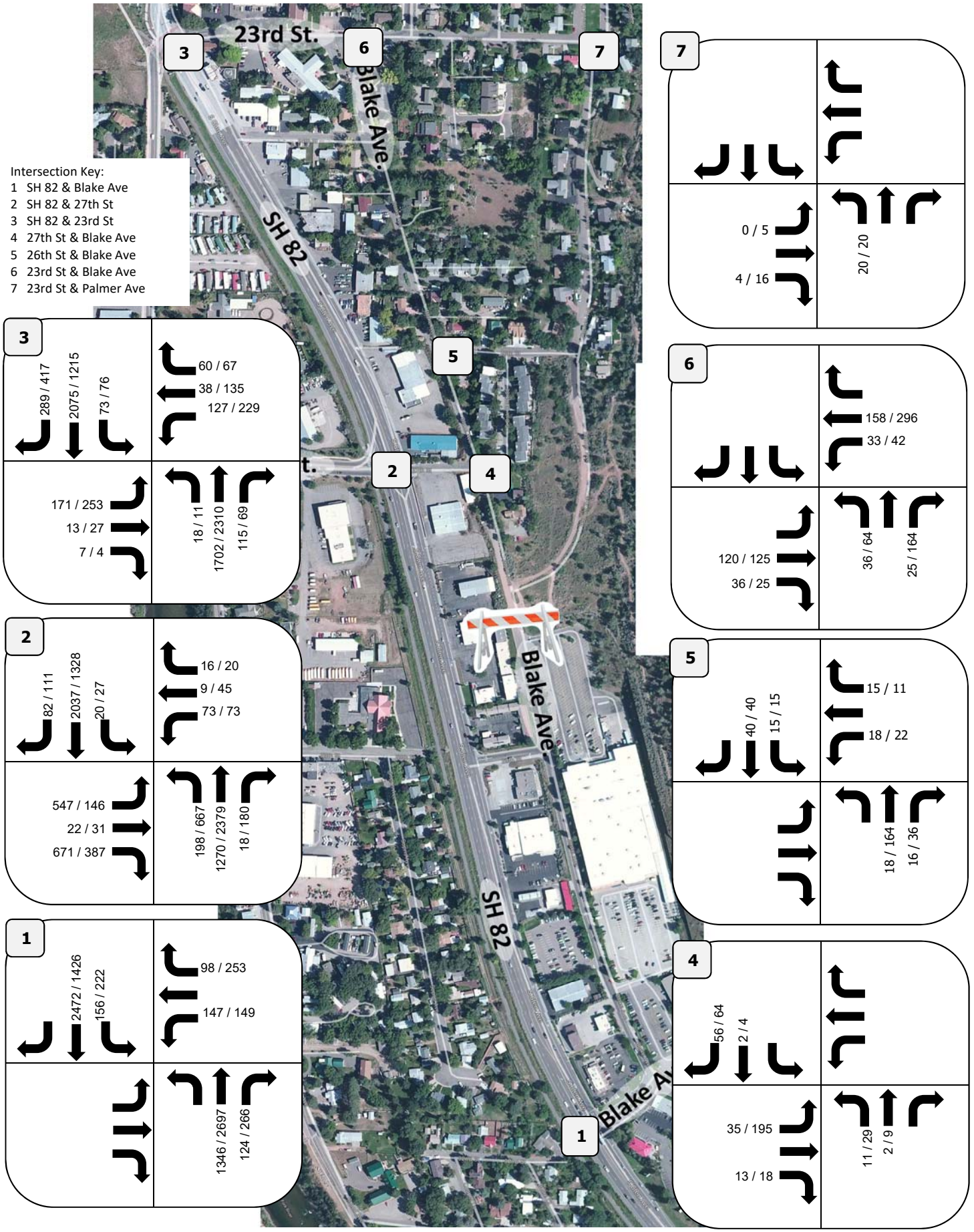
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

AM/PM Volumes

April 9, 2019

Figure 4: Year 2040 Background Traffic - Blake Ave. Gate Remains Closed



Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

April 9, 2019

2.5 Year 2019 and 2040 Background Traffic Capacity Analysis

Intersection Level of Service: Using *Highway Capacity Manual 2010* (HCM) methodology, Synchro Version 8 software was used to determine the delay and Level-of-Service (LOS) at the following study area intersections:

- SH 82 & Blake Ave.
- SH 82 & 27th St.
- SH 82 & 23rd St.
- 27th St. & Blake Ave.
- 26th St. & Blake Ave.
- 23rd St. & Blake Ave.
- 23rd St. & Palmer Ave.

HCM LOS is defined by the following criteria:

Table 1: HCM 2010 Level-of-Service Criteria

LOS	Expected Delay to Minor Street Traffic	Average Signal Delay (seconds/vehicle)	Average Stop-Controlled Delay (seconds/vehicle)
A	Little or no delay.	0-10	0-10
B	Short traffic delays.	>10-20	>10-15
C	Average traffic delays.	>20-35	>15-25
D	Long traffic delays.	>35-55	>25-35
E	Very long traffic delays.	>55-80	>35-50
F	When volume exceeds the capacity of the lane extreme delays will be encountered with queuing that may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improving the intersection.	>80	>50

The following **Table 2** shows the resulting LOS under background conditions as determined by the HCM analysis:

Table 2: Background Traffic Level of Service and Queues

Intersection	Traffic Control	Approach	Year 2019 HCM Level of Service (Delay in Seconds) AM	Year 2019 HCM Level of Service (Delay in Seconds) PM	Year 2019 95th Percentile Queue (Feet) AM	Year 2019 95th Percentile Queue (Feet) PM	Year 2040 HCM Level of Service (Delay in Seconds) AM	Year 2040 HCM Level of Service (Delay in Seconds) PM	Year 2040 95th Percentile Queue (Feet) AM	Year 2040 95th Percentile Queue (Feet) PM
#1 - SH 82 & Blake Ave.	Signal	NB	A (5.7)	B (18.5)	221	767	A (9.9)	F (217.0)	453	1316
		SB	B (12.3)	B (13.7)	651	286	B (16.9)	A (8.7)	707	292
		WB	E (76.5)	C (21.5)	168	80	E (71.8)	C (22.9)	242	126
#2 - SH 82 & 27th St.	Signal	NB	C (23.4)	E (72.0)	177	742	D (38.4)	F (363.4)	791	732
		SB	C (31.0)	C (30.7)	259	284	F (118.9)	F (140.5)	1714	605
		EB	F (809.1)	C (32.2)	600	106	F (1442.3)	E (78.8)	1006	188
		WB	E (75.5)	D (35.7)	84	48	E (79.8)	D (42.9)	122	82
#3 - SH 82 & 23rd St.	Signal	NB	A (9.1)	B (18.4)	277	220	C (28.4)	F (102.7)	497	200
		SB	B (11.8)	A (6.5)	604	147	C (22.9)	A (7.0)	1359	265
		EB	E (62.4)	D (48.5)	161	141	F (82.5)	F (198.4)	252	295
		WB	D (49.1)	D (45.2)	100	161	E (60.6)	F (123.7)	163	265
#4 - 27th St. & Blake Ave.	Stop	NB	A (9.3)	B (11.8)	1	4	A (9.9)	C (16.6)	7	30
		SB	A (8.5)	A (8.6)	3	4	A (9.4)	B (13.1)	10	24
		EB	A (5.4)	A (6.8)	1	7	A (4.8)	A (6.9)	1	10
#5 - 26th St. & Blake Ave.	Stop	NB	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0
		SB	A (2.1)	A (2.1)	1	1	A (2.2)	A (2.2)	1	1
		WB	A (8.7)	A (9.4)	2	2	A (9.2)	B (10.1)	4	4
#6 - 23rd St. & Blake Ave.	Stop	NB	A (9.8)	B (10.4)	4	18	B (10.8)	B (12.7)	8	39
		EB	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0
		WB	A (1.4)	A (1.0)	1	2	A (1.5)	A (1.2)	2	2
#7 - Blake Ave. & Palmer Ave.	Stop	NB	A (8.6)	A (9.3)	1	1	A (8.6)	A (8.7)	2	2
		SB	A (0.0)	A (8.5)	0	3	A (0)	A (0)	0	0
		EB	A (0.0)	A (5.4)	0	1	A (0)	A (1.7)	0	0

SH 82 / Blake Avenue: As can be seen in **Table 2**, this intersection currently has excessive delays on the side street. Delay is anticipated to increase through Year 2040 background traffic conditions. This is partially due to the 120 seconds of the 160 second cycle length being allocated to SH 82 movements.

SH 82 / 27th Street: As can be seen in **Table 2**, this intersection currently has excessive delays on the side street. Delay is anticipated to increase through Year 2040

background traffic conditions. This is partially due to the 120 seconds of the 160 second cycle length being allocated to SH 82 movements. The observed and modeled southbound queues are excessing in the morning peak hour. The City and/or CDOT may consider re-striping the southbound left turn lane to the north. Cars are currently backing into the existing two-way, left turn lane.

SH 82 / 23rd Street/ South Grand Avenue: As can be seen in **Table 2**, this intersection currently has excessive delays on the side street. Delay is anticipated to increase through Year 2040 background traffic conditions. This is partially due to the 120 seconds of the 160 second cycle length being allocated to SH 82 movements.

27th / Blake Avenue: As can be seen in **Table 2**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts. This is true whether the Blake Avenue gate remains closed or is opened to through traffic to the Roaring Fork Marketplace.

26th / Blake Avenue: As can be seen in **Table 2**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts. This is true whether the Blake Avenue gate remains closed or is opened to through traffic to the Roaring Fork Marketplace.

23rd / Blake Avenue: As can be seen in **Table 2**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts. This is true whether the Blake Avenue gate remains closed or is opened to through traffic to the Roaring Fork Marketplace.

23rd / Palmer Avenue: As can be seen in **Table 2**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts.

3.0 Project Traffic

3.1 Trip Generation for Proposed Land Use

The applicant is proposing a new, 79-unit, rental apartment complex located on Palmer Avenue between 26th Street and Blake Avenue in Glenwood Springs, Colorado.

The anticipated traffic generation for this project was calculated using the Institute of Transportation Engineers' (ITE's) 9*th Edition of the Trip Generation Manual.* The national standard rates were applied to the size/number of each use to determine the average weekday and morning/evening peak hour traffic volumes.

The trip generation calculations in **Table 3** summarize the anticipated traffic volumes that will be generated by the development.

Multi-Modal Trip Reduction

Due to the project location and proximity to transit, a 10 percent multi-modal reduction was applied to site generated trips. The 10% Multi-Modal Trip Reduction is believed to be justified conservative estimate.

Project Trip Generation

Based upon the applicant's proposed land uses, the site is anticipated to generate 543 vehicle trips per day. This includes 43 trips during the morning peak hour and 57 trips during the evening peak hour.

Internal Capture

The number of residents accessing the adjacent commercial area to the south may be 5-10% of the site traffic during the morning and evening peak hours. With the gate closed, residents will likely walk along Blake Avenue or drive on SH 82. With the gate open, residents will likely walk or drive Blake Avenue to access the retail and restaurants to the south. This equates to approximately 3-6vph per hour. This nominal reduction will not impact our traffic impact analysis and recommendations.

Project Number: M1247
Prepared By: KJS
Date: 12/27/2016
Revised: 7/9/2017

Table 3: Project Trip Generation
Bell Rippy Apartments
Glenwood Springs, Colorado
Estimated Project-Generated Traffic[1]

					Average Weekday	Morning Peak Hour[2]				Evening Peak Hour[3]			
						Inbound		Outbound		Inbound		Outbound	
ITE Code	Units	AM Peak Hour	PM Peak Hour	Avg. Weekday	Trips (vpd)	% Trips	Trips	% Trips	Trips	% Trips	Trips	% Trips	Trips
Residential													
#220, Apartment	79 DU	Regression Equation			603	29%	14	71%	33	61%	39	39%	25
Multi-Modal Trip Reduction	-10%				-60		-1		-3		-4		-3
Total Project Generated Traffic					**543**		**13**		**30**		**35**		**22**

[1] Values obtained from *Trip Generation, 9th Edition,* Institute of Transportation Engineers, 2012.
[2] AM Peak Hour of Generator - T = 0.54(X) + 2.45
[3] PM Peak Hour of Generator - T = 0.60(X) + 14.91

3.1 Trip Distribution

The anticipated directional distribution of the project-generated traffic is largely based upon the locations of employment, schools, and commercial centers that will be utilized by residents of the proposed apartment complex. Therefore, the project's directional distribution is anticipated to be:

- 30% of site traffic will come from/head to the north.
- 60% of site traffic will come from/head to the south.
- 10% of site traffic will come from/head to the west.

The anticipated directional distribution of project-generated traffic is depicted in **Figure 5**. **Figure 6** depicts the anticipated directional distribution is the Blake Street gate is opened.

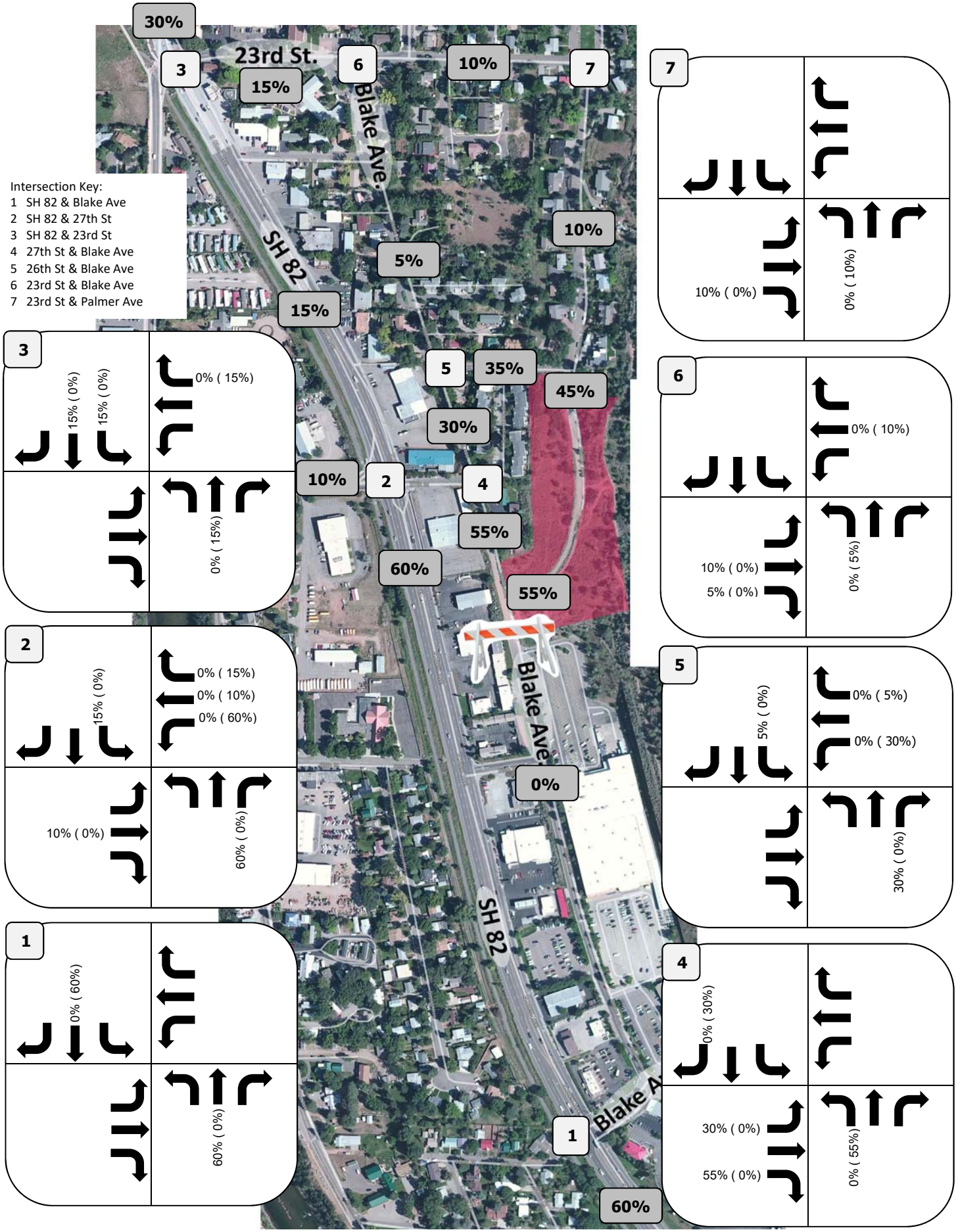
3.2 Traffic Assignment and Total Traffic

When the trip generation expected for this site is applied to the estimated trip distribution, the result is the anticipated assignment of trips on the roadway system. **Figure 7** depicts the new vehicle trips that are anticipated from the proposed Glenwood Multifamily Development project.

The Year 2019 total traffic with the Blake Avenue gate remaining closed is the sum of Year 2019 background traffic **(Figure 3)** with **Figure 7** and can be seen in **Figure 9.** Similarly, Year 2040 total traffic with the Blake Avenue gate remaining closed is the sum of **Figure 4** with **Figure 7** and can be seen in **Figure 11.**

The City of Glenwood Springs has requested an alternative analysis to evaluate the impact of opening the Blake Avenue gate. The Year 2019 total traffic with the Blake Avenue gate open can be seen in **Figure 10.** Similarly, Year 2040 total traffic with the Blake Avenue gate remaining closed can be seen in **Figure 12.**

Figure 5: Directional Distribution of Project Traffic - Blake Ave. Gate Remains Closed

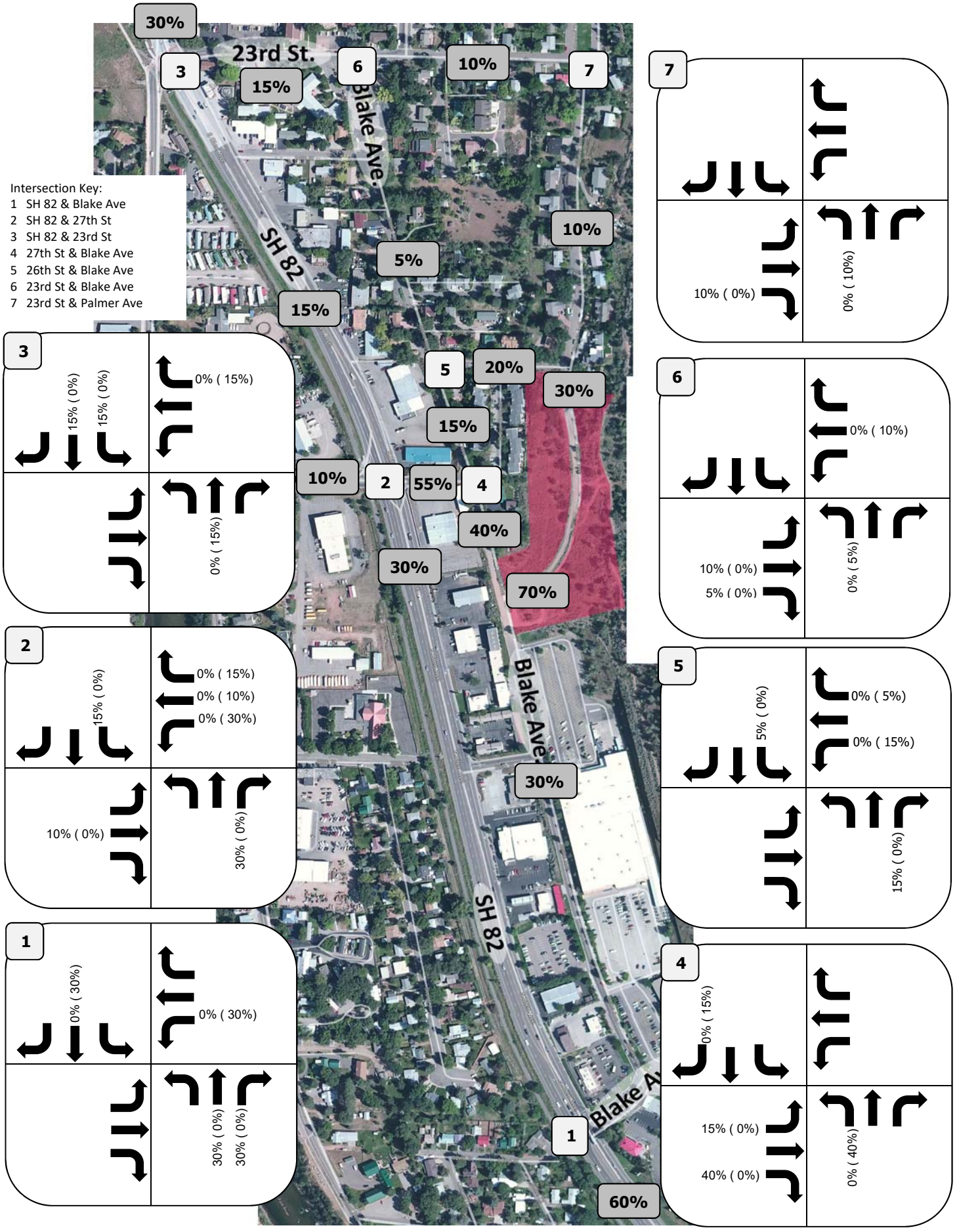


Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND
INBOUND % (OUTBOUND %) = XX% (XX%)
DIRECTIONAL DISTRIBUTION

April 9, 2019

Figure 6: Directional Distribution of Project Traffic - Blake Ave. Gate is Opened

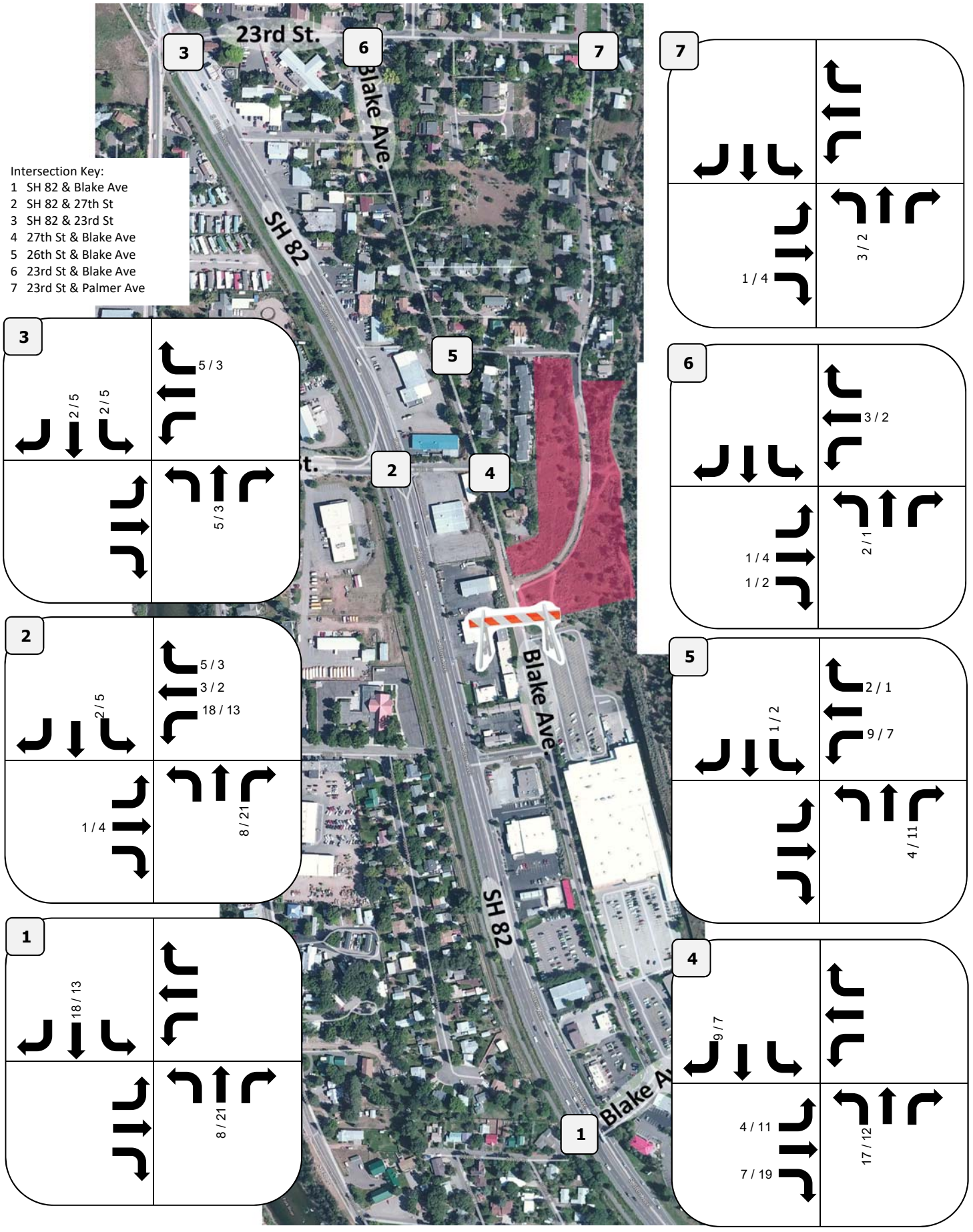


Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND
INBOUND % (OUTBOUND %) = XX% (XX%)
DIRECTIONAL DISTRIBUTION

April 9, 2019

Figure 7: Project-Generated Traffic Assignment - Blake Ave. Gate Remains Closed



Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX veh

April 9, 2019

Figure 8: Project-Generated Traffic Assignment - Blake Ave. Gate is Opened

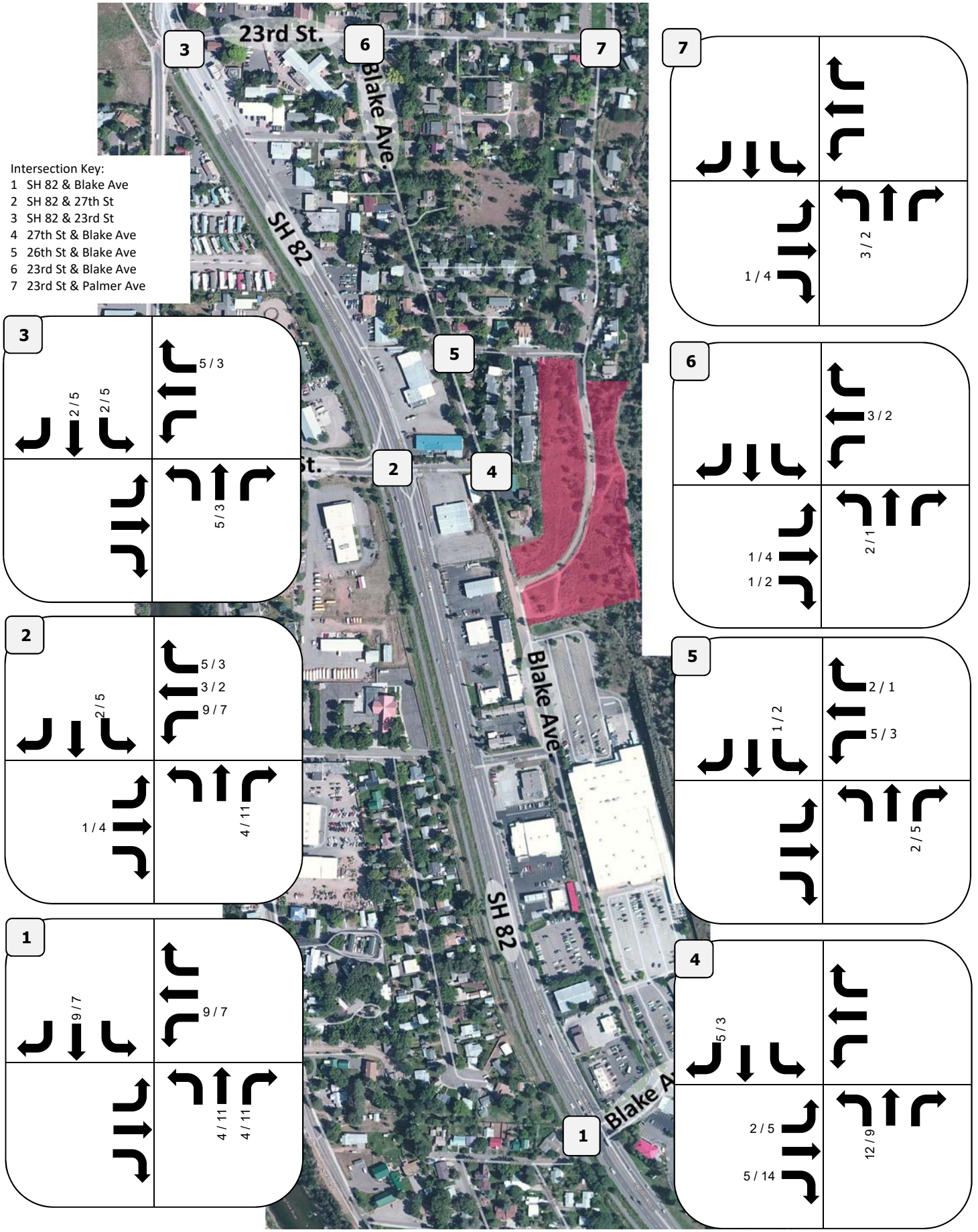


Figure 9: Year 2019 Total Traffic - Blake Ave. Gate Remains Closed

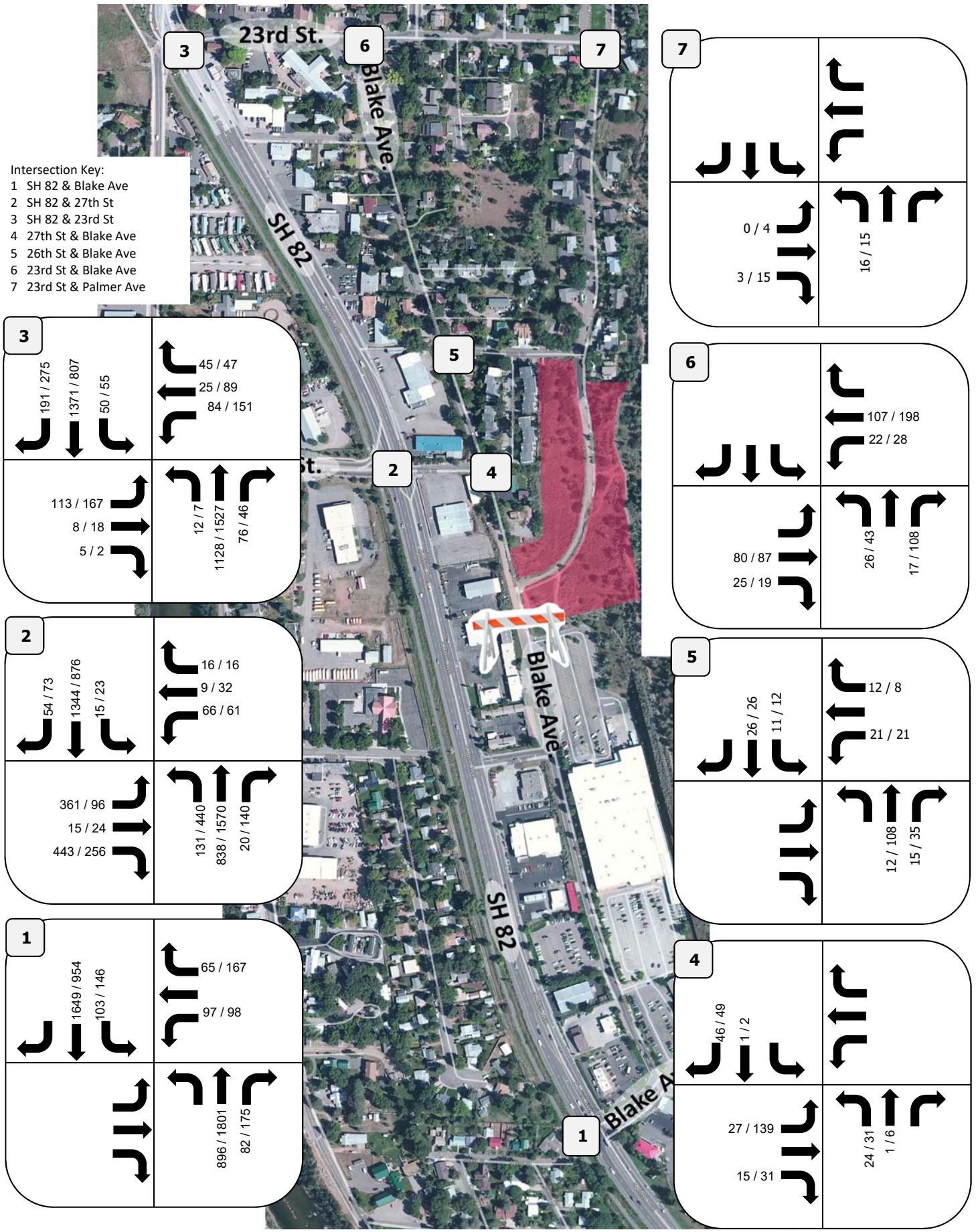
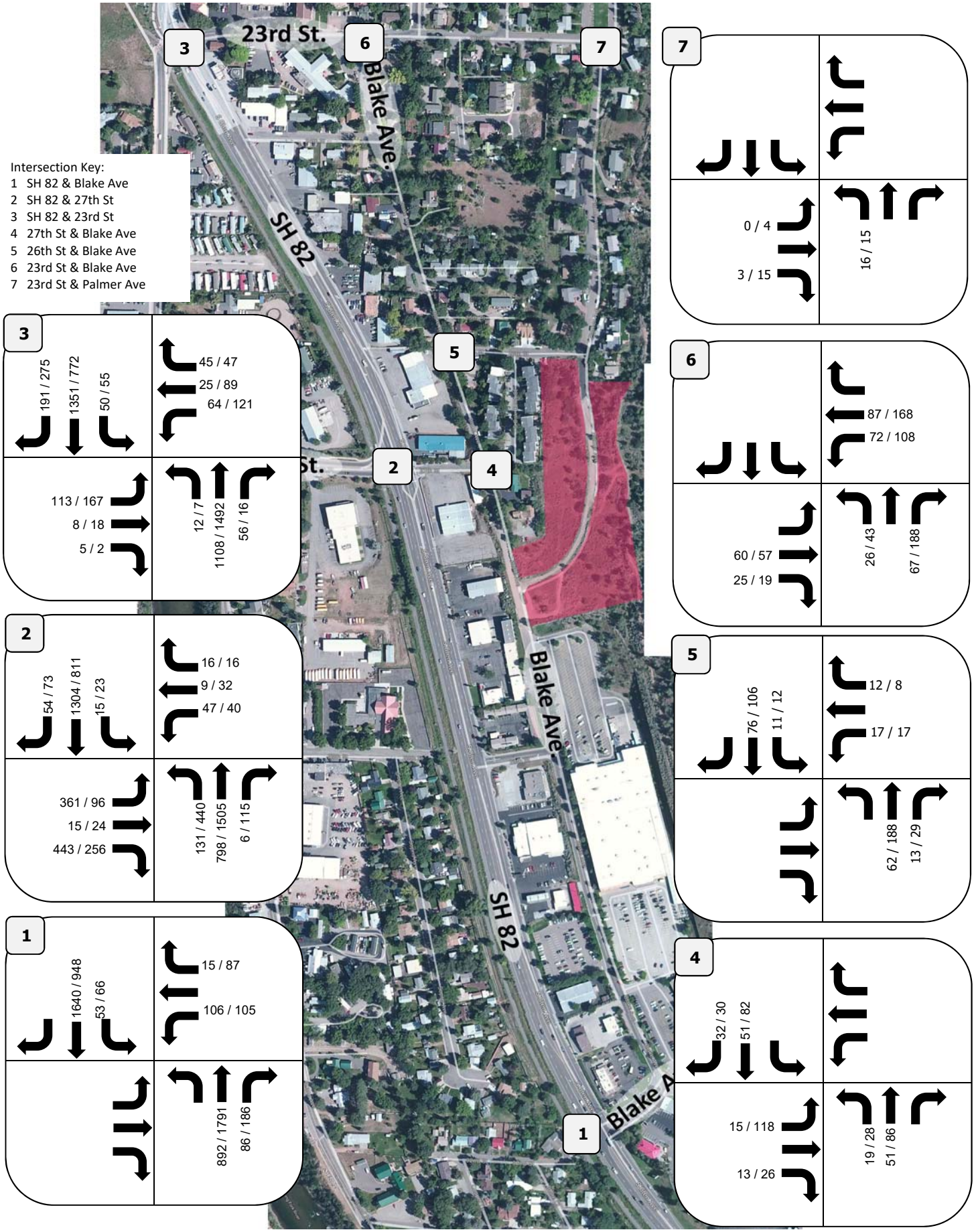


Figure 10: Year 2019 Total Traffic - Blake Ave. Gate is Opened



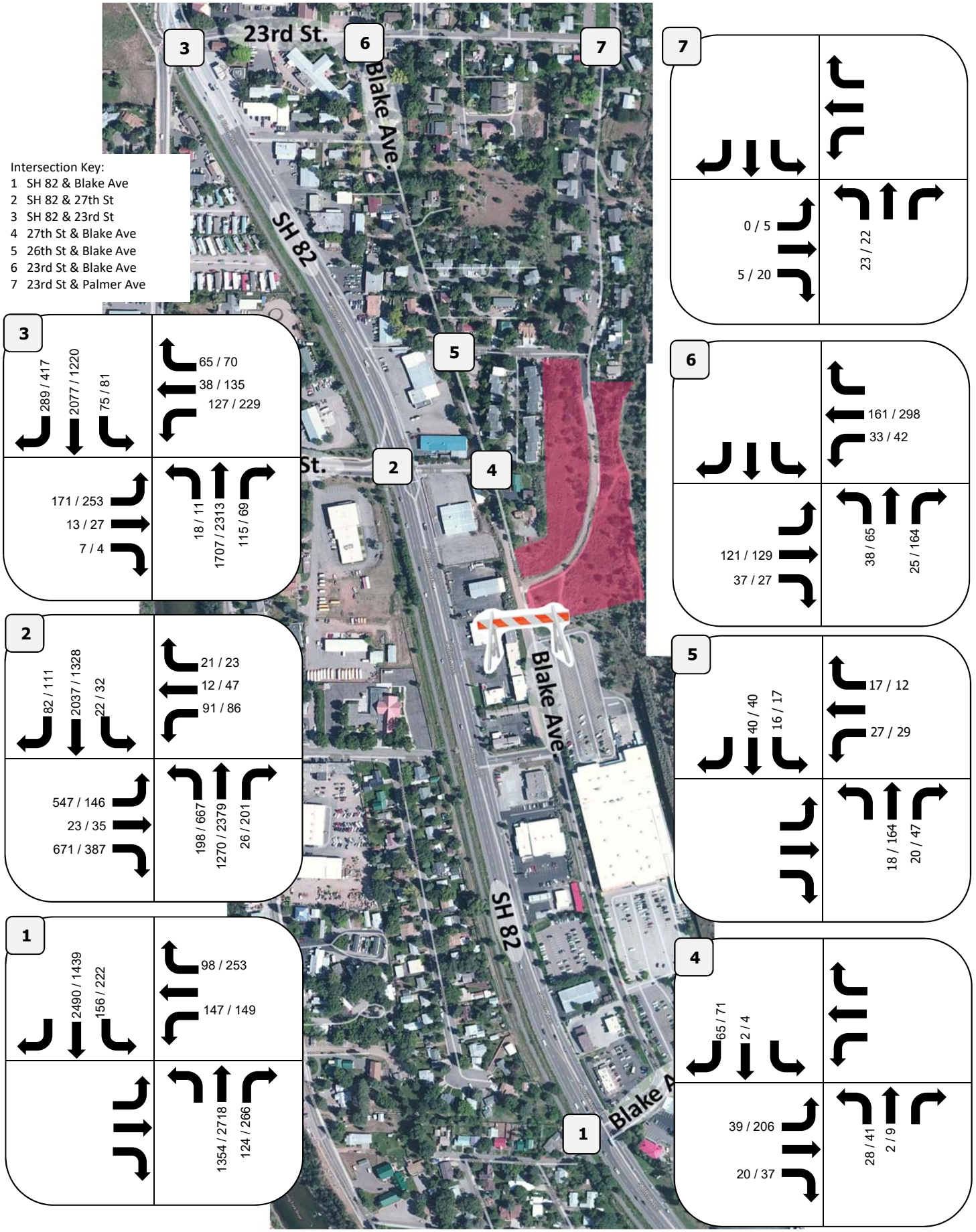
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX veh

April 9, 2019

Figure 11: Year 2040 Total Traffic - Blake Ave. Gate Remains Closed, Blake is Two-Way



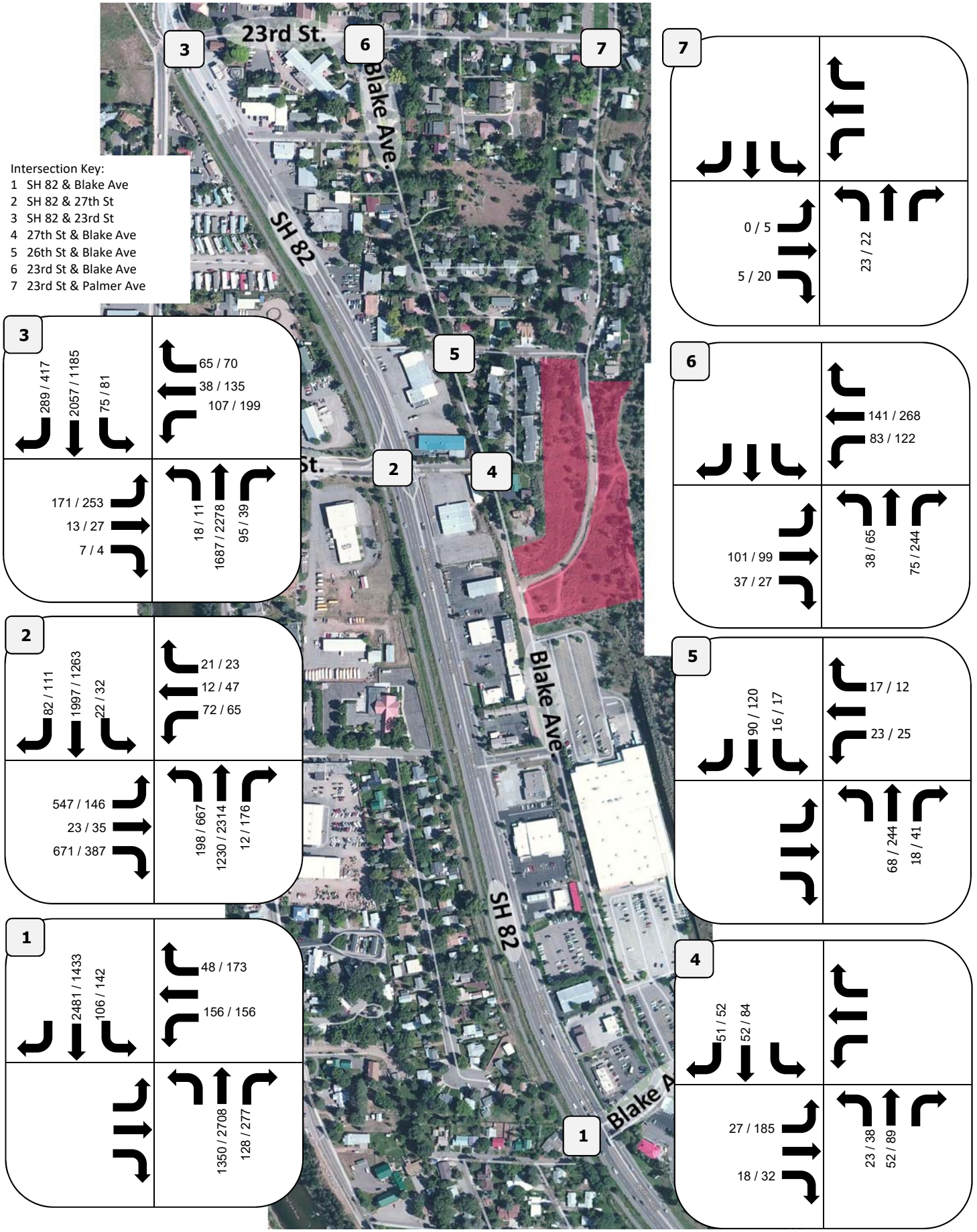
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes XX / XX vph

April 9, 2019

Figure 12: Year 2040 Total Traffic - Blake Ave. Gate is Opened



Project Number: 1247
Prepared By: McDowell Engineering, KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX

April 9, 2019

3.3 Year 2019 and Year 2040 Total Traffic Capacity Analysis

Intersection Level of Service: Using *Highway Capacity Manual 2010* (HCM) methodology, Synchro Version 8 software was used to determine the delay and Level-of-Service (LOS) at the at the study area intersections. **Table 4** on the following page shows the anticipated LOS and queues for Year 2019 and 2040 total traffic conditions.

SH 82 / Blake Avenue: As can be seen in **Table 4**, this intersection currently has excessive delays on the side street. Delay is anticipated to increase through Year 2040 background traffic conditions. This is partially due to the 120 seconds of the 160 second cycle length being allocated to SH 82 movements.

SH 82 / 27th Street: As can be seen in **Table 4**, this intersection currently has excessive delays on the side street. Delay is anticipated to increase through Year 2040 background traffic conditions. This is partially due to the 120 seconds of the 160 second cycle length being allocated to SH 82 movements.

With site-generated traffic the length of the southbound queue at this intersection can be anticipated to increase by two cars or fifty feet. The City and/or CDOT may consider re-striping the southbound left turn lane to the north to address this existing operational concern.

SH 82 / 23rd Street/ South Grand Avenue: As can be seen in **Table 4**, this intersection currently has excessive delays on the side street. Delay is anticipated to increase through Year 2040 background traffic conditions. This is partially due to the 120 seconds of the 160 second cycle length being allocated to SH 82 movements.

27th / Blake Avenue: As can be seen in **Table 4**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts. This is true whether the Blake Avenue gate remains closed or is opened to through traffic to the Roaring Fork Marketplace.

26th / Blake Avenue: As can be seen in **Table 4**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts. This is true whether the Blake Avenue gate remains closed or is opened to through traffic to the Roaring Fork Marketplace.

23rd / Blake Avenue: As can be seen in **Table 4**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts. This is true whether the Blake Avenue gate remains closed or is opened to through traffic to the Roaring Fork Marketplace.

23rd / Palmer Avenue: As can be seen in **Table 4**, this intersection is anticipated to operate at an acceptable LOS through Years 2019 and 2040 based on background traffic forecasts.

Table 4: Total Traffic Level of Service

Intersection	Traffic Control	Approach	Year 2019 - Blake Ave. Gate Closed				Year 2019 - Blake Ave. Gate Open				Year 2040 - Blake Ave. Gate Closed				Year 2040 - Blake Ave. Gate Open			
			HCM Level of Service (Delay in Seconds)		95th Percentile Queue (Feet)		HCM Level of Service (Delay in Seconds)		95th Percentile Queue (Feet)		HCM Level of Service (Delay in Seconds)		95th Percentile Queue (Feet)		HCM Level of Service (Delay in Seconds)		95th Percentile Queue (Feet)	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
#1 - SH 82 & Blake Ave.	Signal	NB	A (6.3)	C (27.8)	232	781	A (5.9)	B (18.9)	222	775	B (11.9)	F (283.8)	533	1335	B (10.3)	F (224.1)	457	1329
		SB	B (13.8)	B (16.2)	722	281	B (12.8)	B (13.8)	653	288	B (18.6)	B (10.2)	672	297	B (17.7)	A (9.0)	724	300
		WB	E (57.0)	B (17.6)	168	80	E (78.1)	C (22.1)	181	84	E (59.3)	C (26.4)	242	124	E (73.2)	C (23.1)	257	131
#2 - SH 82 & 27th St.	Signal	NB	C (24.0)	F (83.1)	187	706	C (23.8)	E (74.6)	179	742	D (44.2)	F (506.0)	871	691	D (40.4)	F (393.1)	794	721
		SB	C (33.8)	C (33.4)	289	348	C (31.8)	C (30.7)	260	284	F (150.5)	F (165.3)	1764	646	F (125.8)	F (140.0)	1714	606
		EB	F (823.9)	D (37.8)	593	112	F (820.8)	D (36.1)	601	112	F (1469.0)	F (86.1)	1071	234	F (1454.0)	F (84.4)	1029	195
		WB	E (79.1)	D (44.5)	127	87	E (74.3)	D (36.7)	99	52	F (81.9)	E (63.8)	165	130	E (76.9)	D (46.1)	135	95
#3 - SH 82 & 23rd St.	Signal	NB	A (9.1)	B (16.1)	277	218	A (9.0)	B (16.7)	277	217	C (27.2)	F (121.5)	460	148	C (28.4)	F (140.8)	472	177
		SB	B (11.9)	A (6.0)	621	157	B (11.8)	A (6.2)	605	148	C (24.1)	A (7.3)	1389	279	C (23.3)	A (7.1)	1365	266
		EB	E (62.5)	E (64.2)	161	158	E (62.7)	D (50.2)	161	142	F (83.7)	F (198.4)	251	295	F (83.8)	F (198.4)	251	295
		WB	D (50.0)	D (50.3)	124	164	D (47.9)	D (50.5)	100	164	E (61.6)	F (134.4)	191	267	E (60.2)	F (125.8)	163	267
#4 - 27th St. & Blake Ave.	Stop	NB	A (9.6)	B (12.5)	3	6	A (9.8)	B (13.3)	8	21	B (10.2)	C (16.1)	3	12	B (10.2)	C (17.9)	9	36
		SB	A (8.5)	A (8.6)	4	4	A (9.4)	B (11.7)	8	17	A (8.6)	A (8.9)	5	7	A (9.5)	B (13.3)	10	25
		EB	A (4.7)	A (6.2)	1	8	A (3.9)	A (6.2)	1	6	A (4.9)	A (6.6)	2	12	A (4.4)	A (6.6)	1	11
#5 - 26th St. & Blake Ave.	Stop	NB	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0
		SB	A (2.2)	A (2.4)	1	1	A (1.0)	A (0.9)	1	1	A (2.2)	A (2.4)	1	1	A (1.2)	A (1.1)	1	1
		WB	A (8.9)	A (9.6)	3	3	A (9.3)	B (10.5)	3	3	A (9.1)	B (10.2)	4	5	A (9.5)	B (11.4)	4	5
#6 - 24th St. & Blake Ave.	Stop	NB	A (9.8)	B (10.5)	5	19	A (9.8)	B (11.2)	10	32	B (10.9)	B (12.8)	8	40	B (10.9)	B (14.5)	15	64
		EB	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0
		WB	A (1.4)	A (1.1)	1	2	A (3.6)	A (3.4)	4	6	A (1.5)	A (1.2)	2	3	A (3.2)	A (3.0)	5	8
#7 - Blake Ave. & Palmer Ave.	Stop	NB	A (8.6)	A (8.7)	1	1	A (8.6)	A (8.7)	1	1	A (8.6)	A (8.7)	2	2	A (8.6)	A (8.7)	2	2
		SB	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0	A (0.0)	A (0.0)	0	0
		EB	A (0.0)	A (1.5)	0	0	A (0.0)	A (1.5)	0	0	A (0.0)	A (1.5)	0	0	A (0.0)	A (1.5)	0	0

4.0 Transportation Impact Analysis

4.1 State Highway Access Permits

Section 2.6(3) of the *State Highway Access Code* (*Access Code*) requires a new access permit when there is a new access, land use change, or the approach volume is anticipated to increase by more than twenty percent or safety issues have been identified.

SH 82 / Blake Avenue: If the Blake Avenue gate remains closed the project would add no peak hour trips to the SH 82 / Blake Avenue intersection.

If the Blake Avenue gate were to be opened it is anticipated that the project will add a total of 13 AM / 18 PM peak hour project generated trips to the east leg of the SH 82 / Blake Avenue intersection.

The Year 2019 background traffic for this leg is 347 AM / 454 PM peak hour trips. The project will add 3.6% AM / 3.8% PM to the westbound leg of the SH 80 / Blake Avenue intersection.

A new Access Permit will not be required for the SH 82 / Blake Avenue intersection because the increase in traffic volume is less than 20% and because safety issues have been identified.

SH 82 / 27th Street: The east leg of the intersection is currently permitted for 163 ADT per Access Permit #312051.

The project is anticipated to add a total of 24 AM / 32 PM peak hour trips to this leg resulting in an increase of 12.8% AM / 16.4% PM over the permitted volume.

A new State Highway Access Permit will not be required for the SH 82 / 27th Street intersection because the increase in traffic volume is less than 20% and because safety issues have been identified.

SH 82 / 23rd Street: The project will add a total of 7 AM / 8 PM peak hour trips to the east leg of the SH 82 and 23rd Street.

The Year 2019 background traffic for this leg is 281 AM / 398 PM peak hour trips. The project will add 2.4% AM / 2.0% PM to the east leg of the SH 82 / 23rd Street / South Grand Avenue intersection.

A new Access Permit will not be required for the SH 82 / 23rd Street / South Grand Avenue intersection because the increase in traffic volume is less than 20% and because safety issues have been identified.

4.2 State Highway Turn Lane Analysis

The *State Highway Access Code* establishes the need for auxiliary turn lanes. Several criteria apply when determining the traffic volume thresholds. SH 82 is a four-lane highway with a posted speed limit of 25-35mph in the vicinity of the proposed project site. It is classified by the Colorado Department of Transportation (CDOT) as an access category NR-B, non-rural arterial. Refer to **Table 5** for calculations of the required turn lane modifications and triggers.

Acceleration lanes are generally not used on low speed roadways.

SH 82 / Blake Avenue: The existing auxiliary turn lanes on SH 82 are sufficient for the anticipated Year 2040 traffic at this intersection. The turn lanes on Blake Avenue should be extended to accommodate the projected traffic volumes. However, the current shopping center configuration does not allow for these turn lanes to be extended due to the 90-degree bend and internal intersections. No infrastructure improvements are anticipated at this intersection.

SH 82 / 27th Street: Based upon the Year 2040 total traffic volumes, the existing turn lanes meet or exceed the requirements of the Access Code as shown in **Table 5.** However, the intersection is currently seeing peak hour queues that exceed the deceleration lane lengths. It is recommended that the City and CDOT review the impacts of the installation of the adaptive signals on SH 82. Without observed operational improvements, the northbound left turn lane will need to be extended to accommodate 800 feet of storage by Year 2040.

SH 82 / 23rd Street: Year 2019 background traffic conditions require the construction of a longer westbound left turn lane and a northbound right turn lane. Refer to **Table 5** for the geometric requirements.

Blake Avenue / 27th Street: Year 2019 background traffic conditions require the construction of an eastbound left turn lane and northbound left turn lane. Refer to **Table 5** for the geometric requirements.

4.3 Access Design Criteria

The proposed access shall be constructed per Section 4 of the *Access Code.* The City of Glenwood Springs design standards will also apply.

4.4 Recommended Design Vehicle for Site Access

Based upon the anticipated deliveries to the site, McDowell Engineering recommends the use of a WB-50 as the design vehicle for the site access.

Table 5: Auxiliary Turn Lane Requirements

Intersection	Movement	Roadway Classification	Posted Speed	Year 2019 Background		Year 2040 Total Traffic - Blake Gate Closed		Year 2040 Total Traffic - Blake Gate Open		*Access Code*[3] Threshold	Exsting Turn Lane	*Access Code*[3] Required Turn Lane (Based upon Blake Gate Open Scenario)[1,2]	Notes
			(mph)	AM	PM	AM	PM	AM	PM				
SH 82 / Blake Avenue**	WBL	Comm. Collector	25	97	98	147	149	156	156	>25vph	200' Total	156 'Storage +90' Taper	Limited by shopping center configuration
	WBR	Comm. Collector	25	65	167	98	253	48	173	>50vph	200' Total	173 'Storage +90' Taper	Limited by shopping center configuration
	NBR	NRB	35	82	175	124	266	128	277	>50vph	290' Storage + 120' Taper	277 'Storage +120' Taper	Existing Adequate
	SBL	NRB	35	103	146	156	222	106	142	>25vph	170' Storage + 150' Taper	142 'Storage +120' Taper	Existing Adequate
SH 82 /27th Street	WBL	Comm. Collector	25	48	48	91	86	72	65	>25vph	80' Storage + 90' Taper	65 'Storage +90' Taper	Existing Adequate
	WBR	Comm. Collector	25	11	13	21	23	21	23	>50vph	None	Not Required	Existing Adequate
	NBR	NRB	35	12	119	26	201	12	176	>50vph	270' Storage + 280' Shared Lane	176 'Storage +120' Taper	Existing Adequate
	SBL	NRB	35	13	18	22	32	22	32	>25vph	320' Storage + 220' Taper	41 'Storage +120' Taper	Existing Adequate
SH 82 / 23rd Street	WBL	Neighborhood Collector	25	84	151	127	229	107	199	>25vph	50' Storage + 90'+/- Taper	199 'Storage +90' Taper	Turn lane extension required by 2019 background
	WBR	Neighborhood Collector	25	40	44	65	70	65	70	>50vph	None	63 'Storage +90' Taper	Turn lane construction required by 2019 background
	NBR	NRB	35	76	46	115	69	95	39	>50vph	None	94 'Storage +120' Taper	Turn lane construction required by 2019 background
	SBL	NRB	25	48	50	75	81	75	81	>25vph	70' Storage + 95' Taper	77 'Storage +90' Taper	Existing Adequate
27th Street / Blake Avenue	EBL	Neighborhood Collector	25	23	128	39	206	27	185	>25vph	None	185 'Storage +90' Taper	Turn lane construction required by 2019 background
	EBR	Neighborhood Collector	25	8	12	20	37	18	32	>50vph	None	Not Required	Existing Adequate
	NBL	Neighborhood Collector	25	7	19	28	41	23	38	>25vph	None	43 'Storage +90' Taper	Turn lane construction required by 2040 background
	SBR	Neighborhood Collector	15	37	42	65	71	51	52	N/A	None	Not Required	Existing Adequate

[1]It is recommended that bay tapers (asymmetrical reverse curves) be used for deceleration transition tapers and that straight transition tapers be used for acceleration transition tapers. The taper length shall be calculated using CDOT SHAC Table 4-6 and be designed in accordance with CDOT SHAC

[2]SH 82 & Blake Ave volumes assume Blake Ave gate is open. If gate remains closed the project has no impact on the intersection.

5.0 Recommendations and Conclusions

The proposed Glenwood Multifamily Development Project is anticipated to be successfully accommodated into the greater roadway system.

Trip Generation:

The applicant is proposing to develop a 79-unit apartment project on Blocks 1 and 3 of the Oakhurst Subdivision located on Palmer Avenue in Glenwood Springs.

Based upon the applicant's proposed land uses, the site is anticipated to generate 543 vehicle trips per day. This includes 43 trips during the morning peak hour and 57 trips during the evening peak hour.

Intersection Level of Service:

Generally side street approaches to SH 82 will experience excessive delay through Year 2019 and Year 2040 primarily due to the current cycle length and signal timing.

CDOT has been considering adaptive signal coordination on the SH 82 corridor. Adaptive signal control technology adjusts the timing to accommodate changing traffic patterns and ease traffic congestion. Implementation of the adaptive signals should improve operations on the corridor.

State Highway Access Permits:

The proposed project will not require new State Highway Access Permits, as the project's anticipated increase in traffic on the east legs of SH 82 / 27th Street, SH 82 / 23rd Street, and SH 82 / Blake Avenue intersection will not exceed 20% and because safety issues have been identified.

Auxiliary Turn Lanes:

As described in **Section 4.2**, current Year 2019 background traffic volumes warrant the installation of additional auxiliary turn lanes at the following locations:

- SH 82 & 27th Street – With site-generated traffic the length of the southbound queue at this intersection can be anticipated to increase by two cars or fifty feet. The City and/or CDOT may consider re-striping the southbound left turn lane to the north to address this existing operational concern.

- SH 82 & 23rd Street – Year 2019 background traffic conditions require the construction of a longer westbound left turn lane and a northbound right turn lane.

- 27th Street & Blake Avenue - Year 2019 background traffic conditions require the construction of an eastbound left turn lane and northbound left turn lane.

Refer to **Table 5** for geometric requirements for these turn lanes. All of these improvements are needed with or without the construction of the proposed Glenwood Multifamily Development. In addition, new State Highway Access permits are not required for these intersections.

Side Street Delay Recommendations: Per conversations with CDOT Region 3 Traffic Operations staff, the adaptive signal controllers are anticipated optimize traffic flow on SH 82. This can decrease the necessary green time for mainline SH 82, thus allowing for more time for side street traffic. CDOT will be analyzing the data from the new adaptive controllers and determining the impacts.

6.0 Appendix

Reference Documents

1. OTIS Traffic Data. Colorado Department of Transportation. http://apps.coloradodot.info/dataaccess/
2. *Highway Capacity Manual.* Transportation Research Board, 2010.
3. *State Highway Access Code.* State of Colorado, 2002.
4. *City of Glenwood Springs State Highway 82 Access Study*. Stolfus & Associates, 2013.
5. *Trip Generation Manual*, *9th Edition*. Institute of Transportation Engineers, 2012.
6. *27th Street Bridge Study.* SGM, 2016.

Included Documents

1. Traffic Study Scoping Correspondence with CDOT
2. Traffic Counts
3. Seasonal Adjustment Factor Calculations
4. Alternative Analysis – One-Way Blake Southbound (February 2018 Analysis for Council)
5. HCM Reports
    a. SH 82 & Blake Ave.
    b. SH 82 & 27th St.
    c. SH 82 & 23rd St.
    d. 27th St. & Blake Ave.
    e. 26th St. & Blake Ave.
    f. 23rd St. & Blake Ave.
    g. 23rd St. & Palmer Ave.

April 9, 2019

City of Glenwood Springs
Terri Partch, City Engineer
101 W. 8th Street
Glenwood Springs, CO 81601

Glenwood Multifamily
Transportation Impact Study Revisions

McDowell Engineering has reviewed the comments from the City of Glenwood Springs' and CDOT staff. Per CDOT's request, we have collected new traffic data for the *Glenwood Multifamily Transportation Impact Study*. The new study dated April 11, 2019 incorporates the new data and the following revisions.

City of Glenwood Springs' Comments:

1. Page 3 -Study title refers to Winter Park.
   McDowell's Response: The revised study corrects this typo.

2. Page 7 – Second paragraph -This intersection is 23rd Street and South Grand Avenue. Please correct. Also, South Grand connects on the south end to 27th Street (last sentence in this section). Final sentence- This intersection is signalized.
   McDowell's Response: The revisions have been incorporated into the revised study.

3. Page 7 - Palmer Avenue section -Palmer Avenue connects from 26th Street to Blake .
   McDowell's Response: This revision has been incorporated into the revised study.

4. Page 9, Section 2.3 first paragraph – Grand should be re-labeled South Grand.
   McDowell's Response: This revision has been incorporated into the revised study.

5. Page 9, Section 2.3 third paragraph – I am not sure that the adaptive signal timing will represent an improvement for the City's side streets. My understanding is that these systems optimize on delay, which will favor the mainline, particularly as volume on the corridor increases.
   McDowell's Response: Several paragraphs have been added that detail our conversations with CDOT Region 3 Traffic Operations staff regarding the status of the adaptive controllers on SH 82.

6. Page 9, Section 2.4, first paragraph – This paragraph refers to Grand Avenue. It should be corrected to South Grand.
   McDowell's Response: This revision has been incorporated into the revised study.

7. Page 9, Section 2.4, fourth paragraph – The Access Control Plan recommends a background traffic growth rate of 2%. Please use this number for all projections.
   McDowell's Response: A growth rate of 2% has been applied to all movements of the study intersections per the City's request.

8. Page 10, Seasonal Adjustment Factor – Averaging this number over 10 years lowers the adjustment factor. Please reevaluate by month comparing October to July over the past four years.
   McDowell's Response: Per CDOT's requirement, McDowell collected new traffic data at the study intersections in January 2019. The seasonal adjustment factor was updated to use Year 2014 – 2019 data

to convert the January data to a July equivalent. The seasonal adjustment factor calculations are included in the Appendix.

9. Throughout the document you reference the completion of background infrastructure improvements in Section 2.4. No improvements are listed. Please revise, or if you are recommending certain improvements, please list them.
   McDowell's Response: A list of the assumed or recommended infrastructure improvements has been added to Section 2.4.

10. Your table labels and references are incorrect throughout the document. You have a Table 3, but no Table 1 or 2. I believe Table 3 should be Table 1, Trip Generation Calculations. Figure 11- Should be 2040 Total Traffic.
    McDowell's Response: The revised study updates all table references.

11. Figure 12 – Should be 2040 Total Traffic. Please revise/correct.
    McDowell's Response: The revised study updates all table references.

12. Page 27, Section 3.3, Table 4 – It appears that SH 82 NB fails in the pm peak hour under both a gate open and gate closed scenario. However, the gate open scenario has over 60s less delay.
    McDowell's Response: The gate open scenario does reduce some traffic volume on SH 82. Therefore, this observation makes sense at the Blake Avenue and 27th Street intersections.

13. Page 29, Section 4.1, paragraph 9 does not reference roads in Glenwood Springs.
    McDowell's Response: The revised study corrects this typo.

14. Page 30, SH 82/27th Street. I disagree with your conclusions based on the current intersection operations. The north bound left turn lane fails in the pm peak hour today. Queues extend into the north bound travel lanes and take several cycles to clear. Please reevaluate.
    McDowell's Response: Cars are currently backing into the existing two-way, left turn lane. With site-generated traffic the length of the southbound queue at this intersection can be anticipated to increase by two cars or fifty feet. The City and/or CDOT may consider re-striping the southbound left turn lane to the north to address this existing operational concern. This has been added to Section 2.5 and 3.3.

15. Overall – The study confirms poor levels of service on side streets at 23rd, 27th and Blake both in the existing condition and with the added traffic from development of the Bell Rippy parcel. I understand that most of this delay is related to the signal timing at each of these intersections, favoring the mainline. However, it does appear the project causes increasing delay in these intersections in the 2040 year. Please make recommendations to reduce delay on the side streets.
    McDowell's Response: CDOT is currently working on the adaptive signal timing for the SH 82corridor. The project will construct sidewalks and multimodal improvements that will encourage multimodal travel throughout the neighborhood.

16. There is a concern about changing the volume of people from the project using Blake gate to 0%. I don't have the model, but intuitively, 27th Street already functions at LOS E and is highly impacted by RFTA busses and traffic. The LOS at Blake and SH 82 is a D with a reduced delay of about 20 seconds. The queue is longer in the am peak, though. It doesn't seem like routing all project traffic to 27th street would be a true condition. Also it does conflict with the earlier reports. It would be good to see a revised report with the intersection LOS to verify.
    McDowell's Response: The directional distribution with the 1)gate open and 2)gate closed scenarios have been revised.

17. Figures 5 and 6: 30% is added to intersection 1 in the gate open scenario (figure 6). This brings the total directional distribution to 130%.

McDowell's Response: The directional distribution has been revised.

18. Figures 7 and 8: Intersections 5,7 and 4 all stayed the same from gate open to gate closed, except some turning volume was added at intersection 1 in the gate open scenario. It seems like volume at intersection 1 should reduce project traffic at intersections 4 and 5?
McDowell's Response: The directional distribution has been revised. Opening the gate now reflects a reduced amount of project traffic at intersections 4 and 5.

19. Figure 4A and Figure 5A: East west movement at intersection 2 stayed the same from gate closed to gate open. I think there may be a fair amount of traffic crossing from south Glenwood across SH 82 to Blake and heading south to the Walmart complex?
McDowell's Response: The directional distribution has been revised. Opening the gate now reflects a reduced amount of project traffic at intersections 4 and 5.

20. Intersection 4, Figure 5A- There was a large increase in the pm volume in the east bound to north bound turn that didn't make sense to me as a result of the gate opening…Also the east bound to south bound counts were the same, gate open and gate closed. AM movement seems low (14) …So many people use the BRT facility. When was the am peak hour?
McDowell's Response: The directional distribution has been revised. Opening the gate now reflects a reduced amount of project traffic at intersections 4 and 5. The morning peak hour for the intersection of SH 82 and 27th Street occurs from 7:30am – 8:30am.

21. Intersection 6, west bound to south bound movement. There was a large increase with the gate open. Is this traffic going to Walmart and avoiding SH 82? It seems like SH 82 might be easier due to the condition and width of Blake.
McDowell's Response: The study conservatively assumes that an average of one to two cars per minute will utilize the opened Blake Street connection during the morning peak hour with or without the construction of the Glenwood Multifamily project. In the evening peak hour, it is assumed that approximately two to three cars every minute will utilize the opened connection. The delay to turn left at the 23rd Street signal is such that, neighborhood drivers may use the Blake Street connection instead.

22. Figure 7 and Figure 8: Intersection 4- It seems like volumes should be reduced with the gate opening.
The directional distribution has been revised. Opening the gate now reflects a reduced amount of project traffic at intersections 4 and 5.

23. Figure 11 and 11A: Intersection 6 -eastbound movement. Why is there an increase from two-way configuration to one-way configuration south bound?
McDowell's Response: We added a paragraph in Section 2.3 describing the alternative analysis that was performed for the City Engineer to look at a one-way southbound Blake option. Some of the previous exhibits are included in the Appendix of the report. Please note that these exhibits were completed in February 2018 for a City Council presentation. These exhibits were based upon the previous set of traffic counts.

24. Figure 12: Intersection 6 east to south bound turning movement, no change from gate open to gate closed? Intersection 5, south bound through. The volume more than doubled. Why?
McDowell's Response: The eastbound to southbound movement at intersection 6 is not anticipated to increase by a measurable volume with the opening of the Blake gate.

<u>CDOT Comments:</u>

1. §1.0 Project Description and §5.0 Recommendations and Conclusions say a 105-unit apartment project is proposed, but 79 units were used for the trip generation in Table 3 and subsequent figures.

McDowell's Response: The revised study updates the unit count to 79.

2. Since the apartment residents can access commercial properties, especially WalMart, without accessing onto SH 82 an internal capture reduction can be applied. The amount of the reduction will differ between the scenarios with the gate opened or closed.
   McDowell's Response: The number of residents accessing the adjacent commercial area to the south may be 5-10% of the site traffic during the morning and evening peak hours. With the gate closed, residents will likely walk along Blake Avenue or drive on SH 82. With the gate open, residents will likely walk or drive Blake Avenue to access the retail and restaurants to the south. This equates to approximately 3-6vph per hour. This nominal reduction will not impact our traffic impact analysis and recommendations. Refer to Section 3.1.

3. Figures 3 and 4 show the background traffic for the scenario with the closed gate. The distribution will be different with the opened gate scenario. It could be emphasized that from a traffic operations perspective it is beneficial to provide the off-system interconnectivity, keeping some of the local traffic off the highway.
   McDowell's Response: The directional distribution has been reevaluated. The revised study added language about the importance of off-system interconnectivity in Section 2.3.

4. §4.1 State Highway Access Permits: The 20% increase in traffic volume threshold for requiring an access permit applies "unless there are identified safety problems." Include something to the effect of: "A new access permit will not be required for the xxx intersection because the increase in traffic volume is less than 20% and because safety issues have been identified."
   McDowell's Response: The revised study has added language in Section 4.1 about safety issues have been identified."

5. §4.1 State Highway Access Permits: Will a new access permit be required for the SH 82/23rd Street intersection for both scenarios; with and without the gate?
   McDowell's Response: No. Refer to Section 4.1.

6. §4.2 State Highway Turn Lane Analysis: For a category NR-B highway there are different turn lane thresholds for speeds above and below 40 mph; cf.: SHAC §3.11(4).
   McDowell's Response: The study's turn lane analysis has been revisited in Section 4.2 and Table 5.

7. §4.2 State Highway Turn Lane Analysis: Indicate which speed limits apply each of the intersections on SH 82. According to the strip map there are sections with speed limits of 25, 35 and 45 mph. Some speed limits change at or near the intersections so different criteria may apply opposite directions of travel.
   McDowell's Response: The study's turn lane analysis has been revisited in Section 4.2 and Table 5.

8. §4.2 State Highway Turn Lane Analysis: For the existing conditions where it says "plus taper" include the length of the taper.
   McDowell's Response: The taper lengths have been added in Table 5.

9. §4.2 State Highway Turn Lane Analysis: There is not a northbound right turn lane at 23rd Street.
   McDowell's Response: The study's turn lane analysis has been revisited in Section 4.2 and Table 5.

10. §4.2 State Highway Turn Lane Analysis, SH 82/23rd Street: The bullet point lists the existing length of the southbound left turn lane as 400-ft plus taper. The second paragraph says it is 86' plus a taper.
    McDowell's Response: The study's turn lane analysis has been revisited in Section 4.2 and Table 5.

11. Table 5:
    a. In the "Access Code Required Turn Lane" column all the tapers are listed as 120', but that is only applicable in the 35 mph sections.

b. For NR-B >40 mph the required lane length is the deceleration length; cf.: SHAC Table 4-5.
c. For the WBL and WBR movements it appears the lengths are referring to the deceleration lanes on the side streets. These movements may also cross the thresholds for acceleration lanes.
d. For the SH 82/23rd Street WBR acceleration(?) lane is listed as "Not Required" but the a.m. volume exceeds the threshold.
e. For the SH 82/23rd Street NBR deceleration lane is listed as "Not Required" but both the a.m. and the p.m. volumes exceed the threshold.
McDowell's Response: The study's turn lane analysis has been revisited in Section 4.2 and Table 5. Acceleration lanes are generally not used on low speed roadways.

Please call with any questions on the revisions to the study.

Thank you,
McDowell Engineering,

Kari J. McDowell Schroeder, PE, PTOE
Senior Traffic and Transportation Engineer

Encl. *Glenwood Multifamily Transportation Impact Study*. McDowell Engineering, April 9, 2019

T. Kent Harbert, PE
Access Engineer
CDOT Region 3, Traffic and Safety Residency

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Ben Gerdes <ben@mcdowelleng.com> Mon, Jan 9, 2017 at 9:45 AM
To: "Harbert - CDOT, Kent" <kent.harbert@state.co.us>
Cc: Daniel Roussin <Daniel.Roussin@state.co.us>, Kari McDowell Schroeder <kari@mcdowelleng.com>

Kent,

Attached is the scoping form for the Bell Rippy Apartments. Please let me know if you have questions or comments.

Thanks, Ben

Ben Gerdes, PE
Traffic / Transportation Engineer

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2017-01-09 McDowell Engineering Traffic Study Scoping Form for Bell Rippy Apts - Glenwood Springs.pdf
3439K

Traffic Study Scoping Form

Contact Information	
Consultant Name: Tele: E-mail:	McDowell Engineering; Kari McDowell Schroeder, PE, PTOE 970-623-0788 kari@mcdowelleng.com
Developer/Owner Name:	Glenwood Multi-Family, LLC

Project Information	*(Attach proposed Site Plan)*				
Project Name:	Bell Rippy Apartments				
Project Location:	Palmer Avenue - near 26th Street & Blake Avenue				
Project Description: Application type (rezoning, subdivision), acreage, new or re-development, etc.	105 Rental Apts (8 one-bedroom / 97 two-bedroom)				
Existing / Proposed Land Uses	ITE Code	#units or Size	Existing / Proposed Land Uses	ITE Code	#units or Size
Apartment	220	105			
Please attach Trip Generation Summary table for large or mixed use projects					

Assumptions			
Study Horizons	Current Year: 2017	Build-out : 2018	Long Term : 2040
Study Area Boundaries *(Attach map if needed)*	North: 23rd Street	South: Walmart (Blake)	
	East: Palmer Avenue	West: SH 82	
Intersections and Road Segments to be Evaluated *(Attach map if needed)*	1. All Site entrances	5. 23rd St & SH 82	
	2. 27th St & SH 82	6. 26th St & Blake Ave	
	3. 27th St & Blake Ave	7. 23rd St & Blake Ave	
	4. Walmart (Ave) & SH 82	8. 23rd & Palmer Ave	
Trip Distribution	*See Attached Sketch*		

Assumptions (continued)				
Trip Reductions *(include in Trip Generation table if provided)* (See below also.)	Internal Capture	Use: _____ 0 % Use: _____ ____%	Pass By	Use: _____ ____% Use: _____ ____%
Anticipated Future Traffic Growth Rates (*Describe methodology*)	2014 Access Control Plan 2032 volumes adjusted to 2040 using CDOT Otis data to develop growth rates (Sta ID 000214 20yr factor = 1.26 equals 1.16% annual growth rate for Blake / Sta ID 103503 20yr factor = 1.06 equals 0.29% annual growth rate at 23rd & 27th)	Study Time Periods *(circle all that apply)*	(AM (7-9)) (PM (4-6)) SAT (noon) Other	
Other Factors proposed/assumed transp. improvements, other studies, nearby proposed developments, etc.	Seasonal Adjustment Factor = 1.07 Side street growth rates will be calculated by interpolating between existing counts and 2032 projections from the Access Control Plan			
Analysis Methods & Issues *(check all that apply)*	☒ Synchro ☐ HCS ☐ aaSidra or Rodel ☒ Intersections ☐ Roadway Sections ☐ Signal Warrants ☒ Safety/Sight Distance ☒ Queuing & Storage ☒ CDOT (Access Permit, other) ☐ Identify Bicycle, Pedestrian & Transit Accommodations ☐ TDM ☐ Neighborhood Impacts ☐ Other _____			

ATTACHMENTS, NOTES, & other ASSUMPTIONS:

Study will evaluate a scenario where the Blake gate is closed and a second alternative where it is open.

SIGNED: Kari McDowell Schroeder
Applicant or Consultant

PRINT NAME: Kari McDowell Schroeder, PE, PTOE
Applicant or Consultant

DATE: 1/09/2017

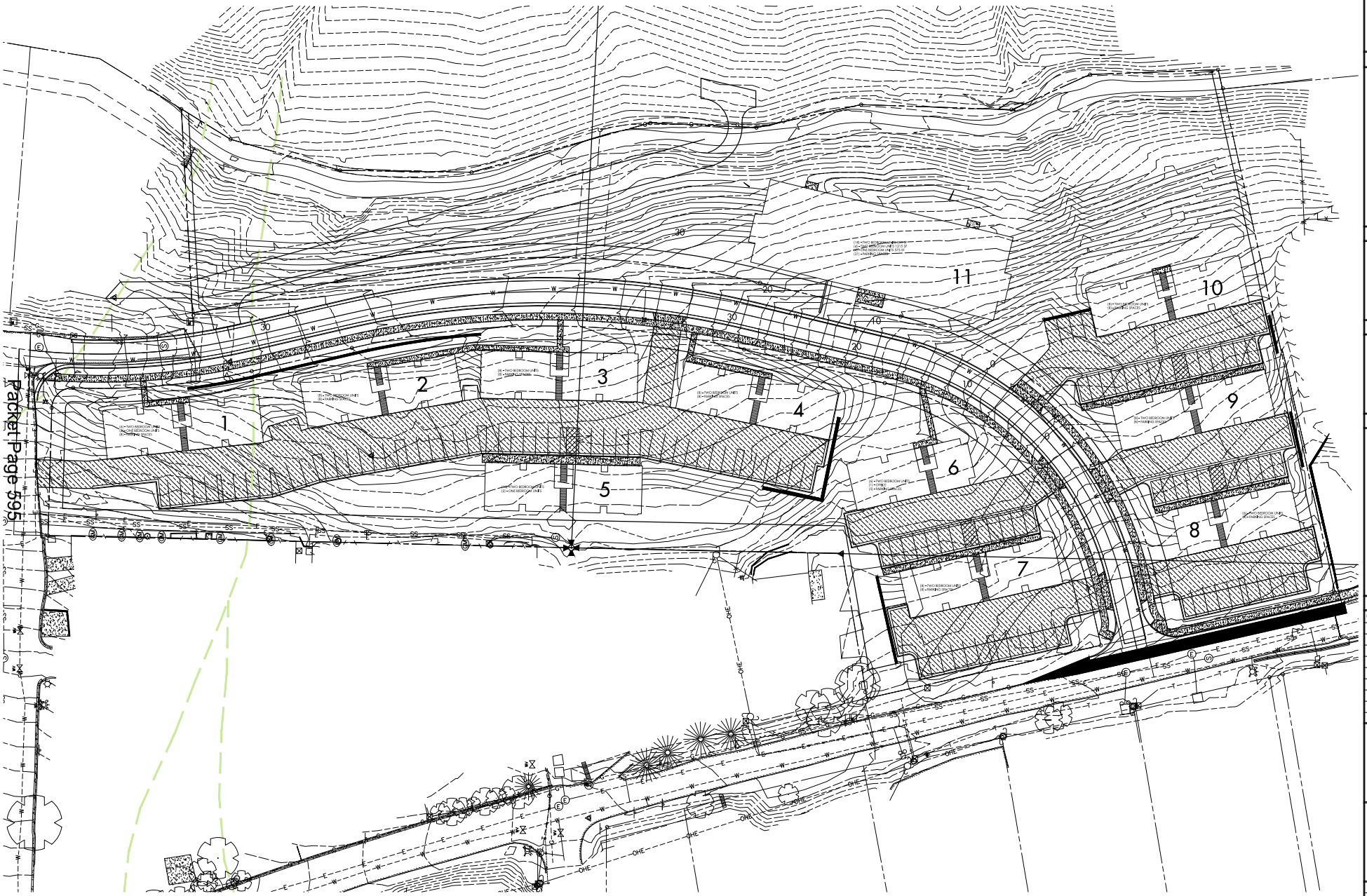
REVIEW AGENCY:

DEPARTMENT:

SIGNED:

PRINT NAME:

DATE:



ARCHITECT

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Edwards, Colorado 81632
Phone – 970.376.4227
email – bobby@raarch.com

STRUCTURAL

LANDSCAPE

NOTES

ISSUES

NO.	DESCRIPTION	DATE
A	Preliminary Bid	05.02.16

Bell Rippy Apartments

Palmer Ave and Blake Street
Glenwood Springs, CO

ARCHITECTURAL SITE PLAN

PROJECT NO.: 15-217
DATE: October 24, 2016
DRAWN BY: nl
SCALE:

A0.1

SHEET OF 1

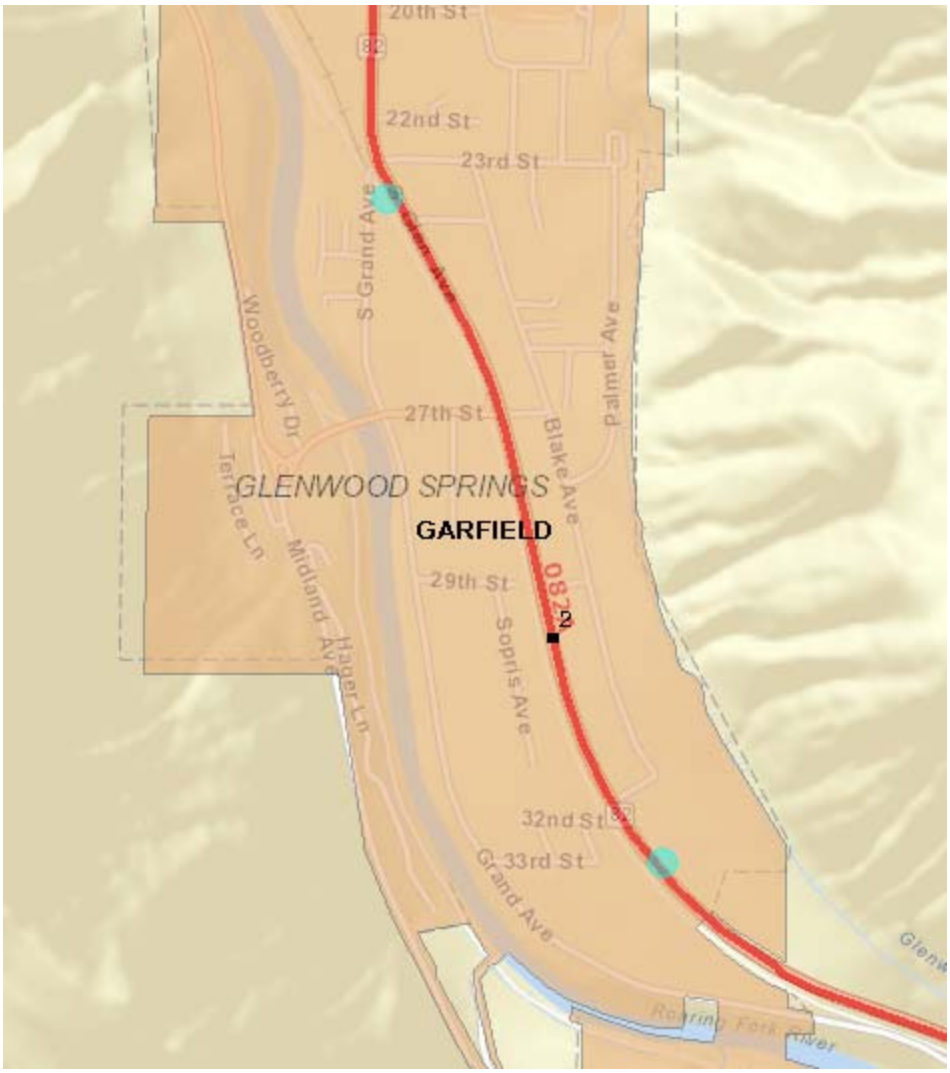
©2016 RAL Architects, Inc

Project N
Prepared
Date:
Revised:

Table 1 - Total Project Trip Generation
Bell Rippy Apartments
Glenwood Springs, Colorado
Estimated Project-Generated Traffic[1]

					Average Weekday	Morning Peak Hour				Evening Peak Hour			
						Inbound		Outbound		Inbound		Outbound	
ITE Code	Units	AM Peak Hour	PM Peak Hour	Avg. Weekday	Trips (vpd)	% Trips	Trips	% Trips	Trips	% Trips	Trips	% Trips	Trips
Residential													
#220, Apartment	105 DU		Regression Equation		760	29%	18	71%	42	61%	48	39%	31
Multi-Modal Trip Reduction	-10%				-76		-2		-4		-5		-3
Total Project Generated Traffic					**684**		**16**		**38**		**43**		**28**

[1] Values obtained from *Trip Generation, 9th Edition,* Institute of Transportation Engineers, 2012.



CDOT OTIS Station ID 103503 = 0.29% annual growth rate

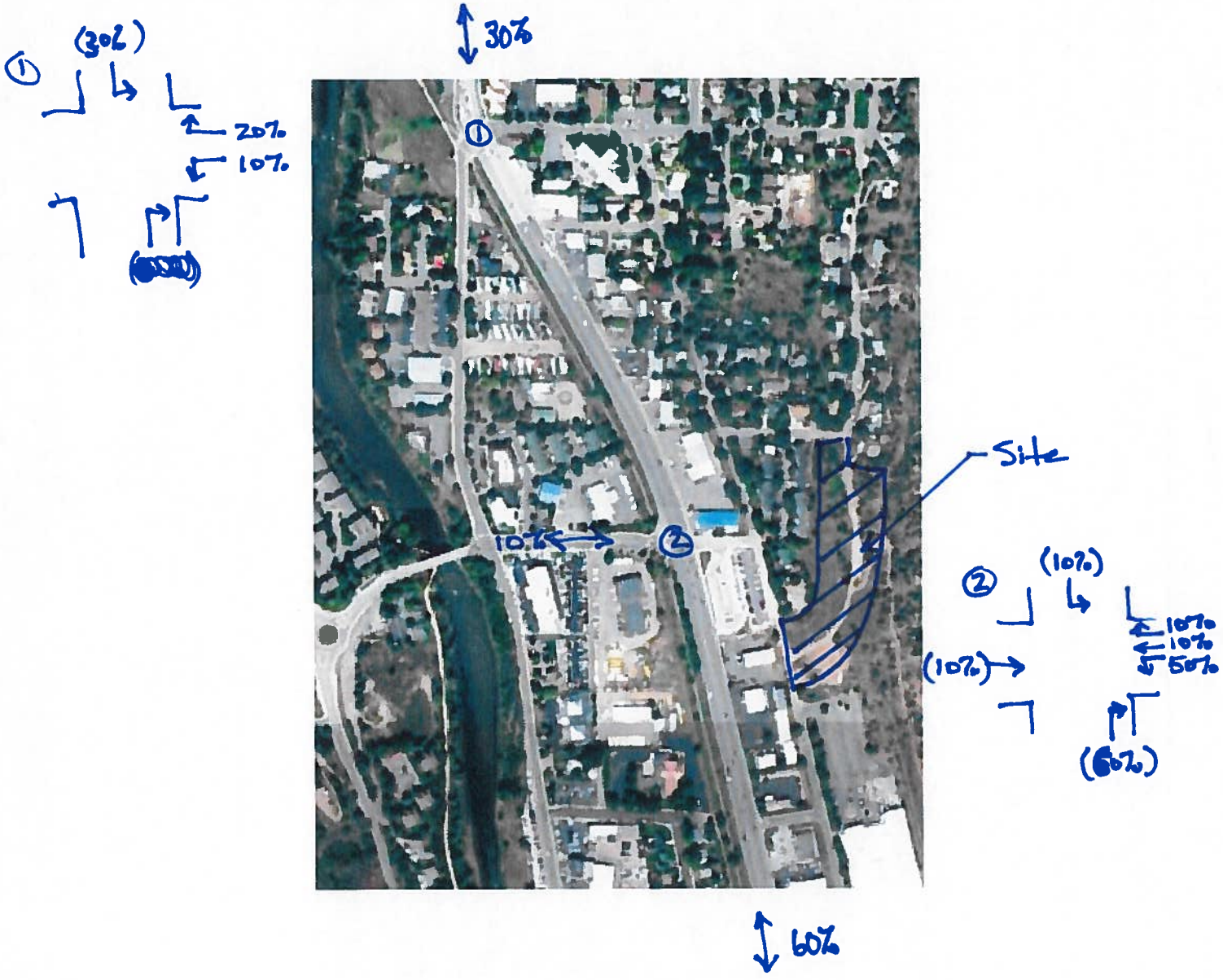
	Route	Start	End	Description	AADT	Year	Single Unit	Comb Trucks	% Trucks	20 Year Factor	DHV	DVMT	DD
	082A	1.405	2.194	ON SH 82, GLEN AVE SE/O SOUTH GR...	26,000	2015	650	360	3.9	1.06	10	20,384	63

CDOT OTIS Station ID 000214 = 1.16% annual growth rate

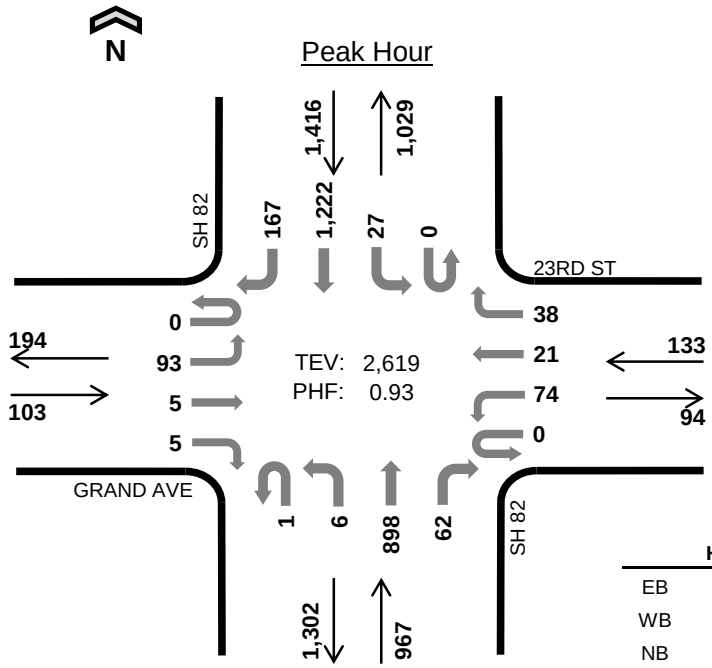
	Route	Start	End	Description	AADT	Year	Single Unit	Comb Trucks	% Trucks	20 Year Factor	DHV	DVMT	DD
	082A	2.194	7.824	ON SH 82, GLEN AVE S/O BLAKE AVE, ...	25,000	2015	580	350	3.7	1.26	11	138,725	57

Seasonal Adjustment = October to July = 1.07

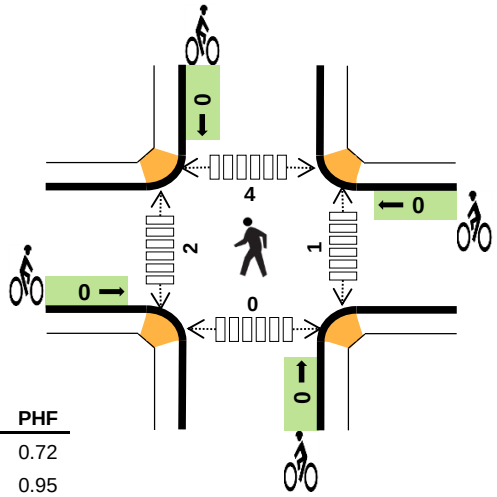
82 A	South end of Glenwood Springs	18,506	19,241	20,046	20,345	20,736	22,446	22,919	22,855	22,317	21,269	19,371	19,235
MM 2.3	Entire record: 1991 - 2016	1.24	1.19	1.14	1.13	1.11	1.02	1.00	1.00	1.03	1.08	1.18	1.19
	South end of Glenwood Springs	20,879	21,311	22,160	22,447	22,930	24,534	25,133	24,949	24,689	23,515	21,504	21,170
	Most recent 10 full years: 2006 - 2015	1.20	1.18	1.13	1.12	1.10	1.02	1.00	1.01	1.02	1.07	1.17	1.19


30%
(30%)
①
20%
10%
①
10%
②
Site
(10%)
②
10%
10%
50%
(10%)
(60%)
60%

SH 82
23RD ST



Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	2.9%	0.72
WB	3.8%	0.95
NB	3.8%	0.75
SB	4.3%	0.90
TOTAL	4.0%	0.93

Two-Hour Count Summaries

Interval Start	GRAND AVE Eastbound				23RD ST Westbound				SH 82 Northbound				SH 82 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	8	0	2	0	8	1	1	0	2	97	7	0	2	259	21	408	0
7:15 AM	**0**	**15**	**1**	**1**	**0**	**20**	**3**	**12**	**0**	**0**	**155**	**11**	**0**	**0**	**307**	**30**	**555**	0
7:30 AM	**0**	**22**	**2**	**1**	**0**	**22**	**5**	**6**	**0**	**1**	**216**	**8**	**0**	**9**	**326**	**45**	**663**	0
7:45 AM	**0**	**33**	**1**	**2**	**0**	**19**	**6**	**8**	**1**	**4**	**299**	**19**	**0**	**10**	**256**	**39**	**697**	2,323
8:00 AM	**0**	**23**	**1**	**1**	**0**	**13**	**7**	**12**	**0**	**1**	**228**	**24**	**0**	**8**	**333**	**53**	**704**	**2,619**
8:15 AM	0	16	3	0	0	16	3	7	0	3	193	12	0	13	226	22	514	2,578
8:30 AM	0	23	3	1	0	16	5	4	0	2	172	12	0	9	245	40	532	2,447
8:45 AM	0	30	3	1	0	16	6	6	0	0	176	15	0	6	214	27	500	2,250
Count Total	0	170	14	9	0	130	36	56	1	13	1,536	108	0	57	2,166	277	4,573	0
Peak Hour	**0**	**93**	**5**	**5**	**0**	**74**	**21**	**38**	**1**	**6**	**898**	**62**	**0**	**27**	**1,222**	**167**	**2,619**	**0**

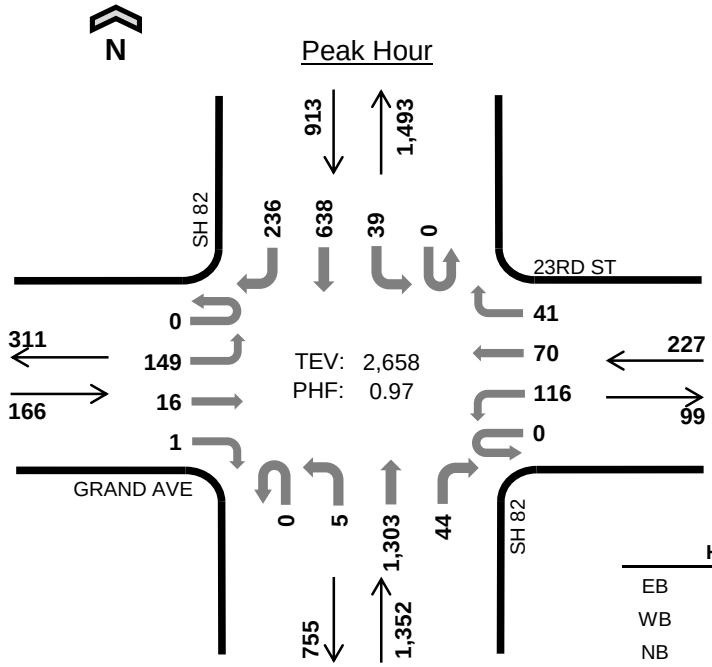
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	8	11	*21*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	**1**	**0**	**11**	**16**	***28***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**1**	**2**	**8**	**15**	***26***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**2**	**0**	*4*
7:45 AM	**0**	**1**	**12**	**17**	***30***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
8:00 AM	**1**	**2**	**6**	**13**	***22***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	***2***
8:15 AM	0	0	5	14	*19*	0	0	0	0	*0*	2	0	0	0	*2*
8:30 AM	1	0	11	17	*29*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	10	14	*24*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	6	5	71	117	*199*	0	0	0	0	*0*	3	2	4	1	*10*
Peak Hour	**3**	**5**	**37**	**61**	***106***	**0**	**0**	**0**	**0**	***0***	**1**	**2**	**4**	**0**	***7***

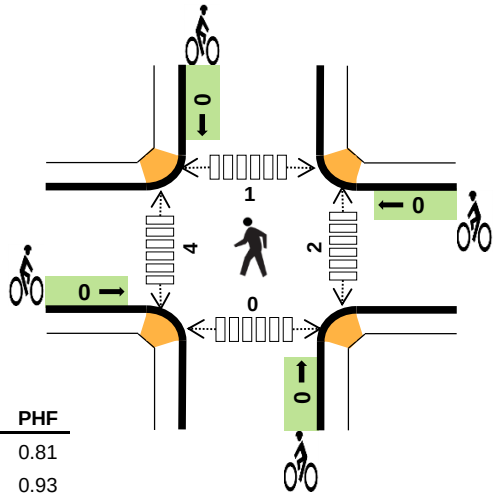
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SH 82
23RD ST

Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM



	HV %:	PHF
EB	1.2%	0.81
WB	0.0%	0.93
NB	2.0%	0.97
SB	2.5%	0.90
TOTAL	2.0%	0.97



Two-Hour Count Summaries

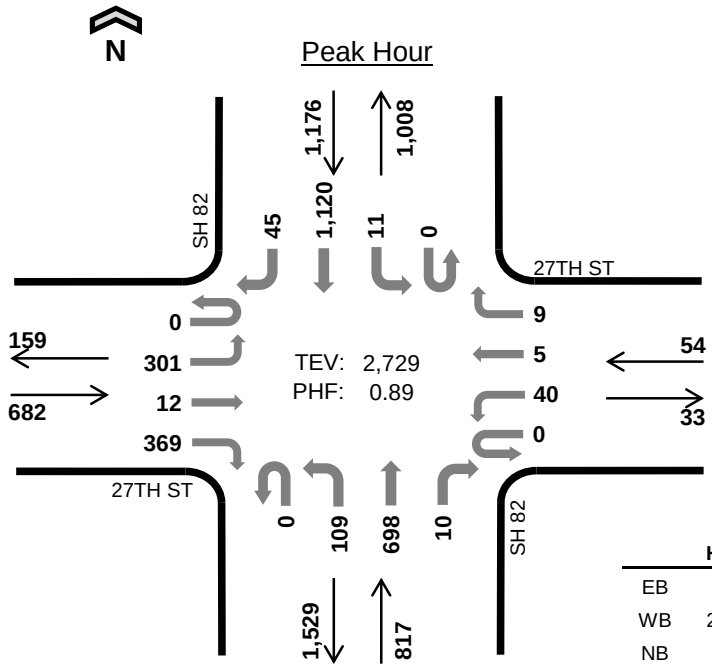
Interval Start	GRAND AVE Eastbound				23RD ST Westbound				SH 82 Northbound				SH 82 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	43	1	2	0	21	11	12	1	5	293	10	0	8	144	56	607	0
4:15 PM	**0**	**44**	**7**	**0**	**0**	**26**	**12**	**11**	**0**	**1**	**328**	**15**	**0**	**8**	**143**	**52**	**647**	0
4:30 PM	**0**	**40**	**3**	**0**	**0**	**34**	**20**	**6**	**0**	**2**	**295**	**13**	**0**	**15**	**175**	**65**	**668**	0
4:45 PM	**0**	**36**	**6**	**0**	**0**	**23**	**24**	**10**	**0**	**0**	**343**	**6**	**0**	**5**	**146**	**60**	**659**	2,581
5:00 PM	**0**	**29**	**0**	**1**	**0**	**33**	**14**	**14**	**0**	**2**	**337**	**10**	**0**	**11**	**174**	**59**	**684**	**2,658**
5:15 PM	0	34	6	1	0	36	16	7	0	2	295	9	0	11	173	45	635	2,646
5:30 PM	0	32	5	0	0	33	9	10	0	2	327	15	0	4	133	62	632	2,610
5:45 PM	0	32	2	1	0	13	5	6	1	2	320	9	0	4	143	46	584	2,535
Count Total	0	290	30	5	0	219	111	76	2	16	2,538	87	0	66	1,231	445	5,116	0
Peak Hour	**0**	**149**	**16**	**1**	**0**	**116**	**70**	**41**	**0**	**5**	**1,303**	**44**	**0**	**39**	**638**	**236**	**2,658**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

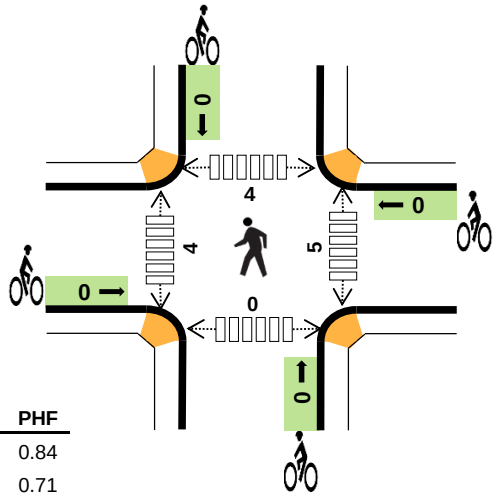
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	0	8	13	*22*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	**0**	**0**	**7**	**6**	***13***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**1**	**0**	*3*
4:30 PM	**1**	**0**	**3**	**6**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**0**	**0**	*3*
4:45 PM	**0**	**0**	**9**	**3**	***12***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
5:00 PM	**1**	**0**	**8**	**8**	***17***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	0	0	11	5	*16*	0	0	0	0	*0*	0	1	3	0	*4*
5:30 PM	1	0	7	2	*10*	0	0	0	0	*0*	3	1	0	1	*5*
5:45 PM	0	0	8	4	*12*	0	0	0	0	*0*	1	1	1	1	*4*
Count Total	4	0	61	47	*112*	0	0	0	0	*0*	6	7	5	2	*20*
Peak Hour	**2**	**0**	**27**	**23**	***52***	**0**	**0**	**0**	**0**	***0***	**2**	**4**	**1**	**0**	***7***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SH 82
27TH ST



Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	2.3%	0.84
WB	24.1%	0.71
NB	3.5%	0.82
SB	4.2%	0.95
TOTAL	3.9%	0.89

Two-Hour Count Summaries

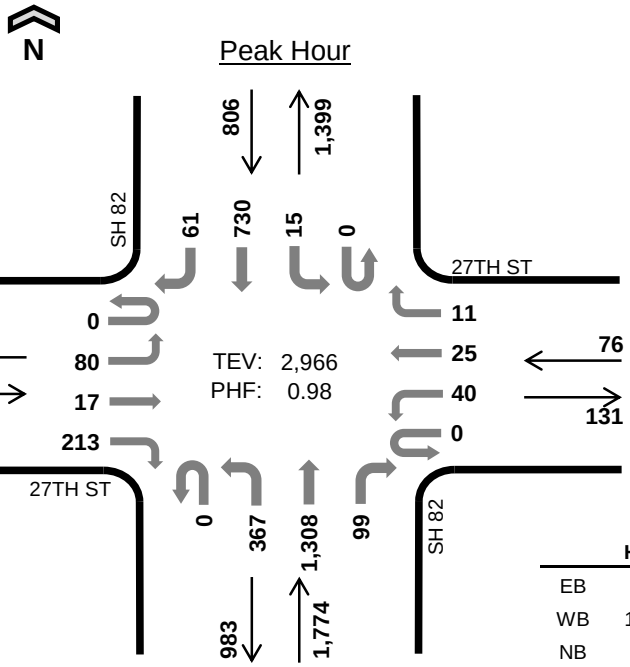
Interval Start	27TH ST Eastbound				27TH ST Westbound				SH 82 Northbound				SH 82 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	27	5	69	0	13	5	3	0	22	78	1	0	4	282	13	522	0
7:15 AM	0	57	2	113	0	7	1	1	0	18	99	0	0	4	281	12	595	0
7:30 AM	**0**	**77**	**5**	**94**	**0**	**5**	**3**	**2**	**0**	**21**	**158**	**3**	**0**	**0**	**298**	**11**	**677**	0
7:45 AM	**0**	**90**	**4**	**108**	**0**	**12**	**1**	**2**	**0**	**22**	**225**	**2**	**0**	**4**	**285**	**11**	**766**	2,560
8:00 AM	**0**	**76**	**2**	**87**	**0**	**6**	**1**	**3**	**0**	**39**	**174**	**2**	**0**	**3**	**254**	**8**	**655**	2,693
8:15 AM	**0**	**58**	**1**	**80**	**0**	**17**	**0**	**2**	**0**	**27**	**141**	**3**	**0**	**4**	**283**	**15**	**631**	**2,729**
8:30 AM	0	32	3	71	0	7	2	1	0	33	143	1	0	3	241	12	549	2,601
8:45 AM	0	29	3	71	0	5	2	4	0	35	164	3	0	2	217	7	542	2,377
Count Total	0	446	25	693	0	72	15	18	0	217	1,182	15	0	24	2,141	89	4,937	0
Peak Hour	**0**	**301**	**12**	**369**	**0**	**40**	**5**	**9**	**0**	**109**	**698**	**10**	**0**	**11**	**1,120**	**45**	**2,729**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

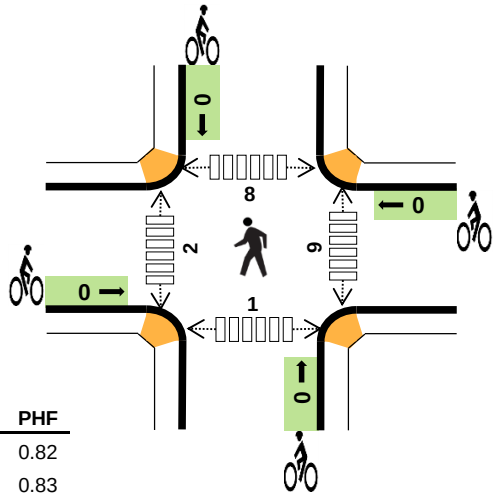
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	5	3	9	9	*26*	0	0	0	0	*0*	1	1	3	0	*5*
7:15 AM	7	3	6	17	*33*	0	0	0	0	*0*	2	0	2	0	*4*
7:30 AM	**6**	**3**	**6**	**14**	***29***	**0**	**0**	**0**	**0**	***0***	**1**	**2**	**1**	**0**	*4*
7:45 AM	**3**	**5**	**10**	**15**	***33***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:00 AM	**3**	**1**	**5**	**9**	***18***	**0**	**0**	**0**	**0**	***0***	**3**	**1**	**3**	**0**	*7*
8:15 AM	**4**	**4**	**8**	**11**	***27***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	***1***
8:30 AM	3	2	9	17	*31*	0	0	0	0	*0*	2	0	2	0	*4*
8:45 AM	2	2	11	12	*27*	0	0	0	0	*0*	1	0	1	0	*2*
Count Total	33	23	64	104	*224*	0	0	0	0	*0*	11	5	12	0	*28*
Peak Hour	**16**	**13**	**29**	**49**	***107***	**0**	**0**	**0**	**0**	***0***	**5**	**4**	**4**	**0**	***13***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SH 82
27TH ST



Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	1.9%	0.82
WB	14.5%	0.83
NB	2.1%	0.99
SB	2.5%	0.91
TOTAL	2.5%	0.98

Two-Hour Count Summaries

Interval Start	27TH ST Eastbound				27TH ST Westbound				SH 82 Northbound				SH 82 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	13	0	44	0	5	3	5	0	76	283	5	0	5	153	7	599	0
4:15 PM	0	29	9	58	0	8	4	5	0	100	338	10	0	2	123	8	694	0
4:30 PM	**0**	**23**	**3**	**57**	**0**	**8**	**5**	**1**	**0**	**90**	**326**	**20**	**0**	**6**	**201**	**15**	**755**	0
4:45 PM	**0**	**22**	**6**	**37**	**0**	**10**	**8**	**5**	**0**	**98**	**314**	**31**	**0**	**2**	**157**	**7**	**697**	2,745
5:00 PM	**0**	**23**	**6**	**66**	**0**	**9**	**6**	**2**	**0**	**80**	**345**	**23**	**0**	**4**	**176**	**20**	**760**	2,906
5:15 PM	**0**	**12**	**2**	**53**	**0**	**13**	**6**	**3**	**0**	**99**	**323**	**25**	**0**	**3**	**196**	**19**	**754**	**2,966**
5:30 PM	0	26	4	49	0	4	7	4	0	88	279	17	0	3	143	12	636	2,847
5:45 PM	0	18	2	28	0	7	4	3	0	71	291	7	0	3	135	10	579	2,729
Count Total	0	166	32	392	0	64	43	28	0	702	2,499	138	0	28	1,284	98	5,474	0
Peak Hour	**0**	**80**	**17**	**213**	**0**	**40**	**25**	**11**	**0**	**367**	**1,308**	**99**	**0**	**15**	**730**	**61**	**2,966**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	11	12	*25*	0	0	0	0	*0*	1	0	1	0	*2*
4:15 PM	2	5	5	7	*19*	0	0	0	0	*0*	3	1	1	0	*5*
4:30 PM	**3**	**3**	**5**	**6**	***17***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**1**	**0**	*3*
4:45 PM	**2**	**3**	**8**	**4**	***17***	**0**	**0**	**0**	**0**	***0***	**4**	**0**	**3**	**1**	*8*
5:00 PM	**0**	**3**	**12**	**5**	***20***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**2**	**0**	*4*
5:15 PM	**1**	**2**	**12**	**5**	***20***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**2**	**0**	***5***
5:30 PM	3	4	5	1	*13*	0	0	0	0	*0*	0	2	0	0	*2*
5:45 PM	0	5	11	4	*20*	0	0	0	0	*0*	4	1	0	0	*5*
Count Total	11	27	69	44	*151*	0	0	0	0	*0*	17	6	10	1	*34*
Peak Hour	**6**	**11**	**37**	**20**	***74***	**0**	**0**	**0**	**0**	***0***	**9**	**2**	**8**	**1**	***20***

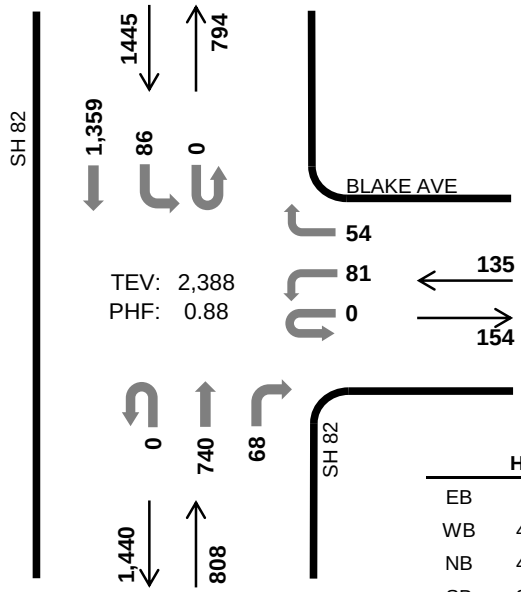
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SH 82
BLAKE AVE

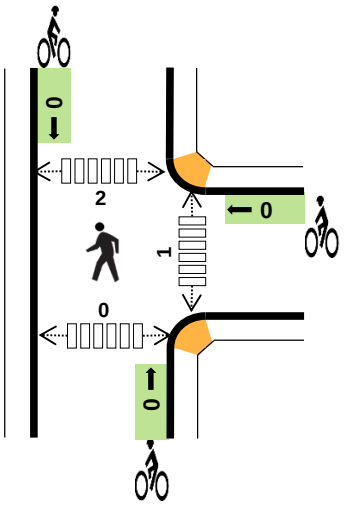
Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	4.4%	0.89
NB	4.3%	0.79
SB	3.7%	0.95
TOTAL	4.0%	0.88



Two-Hour Count Summaries

Interval Start	0				BLAKE AVE				SH 82				SH 82				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	22	0	9	0	0	78	7	0	15	300	0	431	0
7:15 AM	0	0	0	0	0	12	0	14	0	0	114	4	0	15	375	0	534	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**23**	**0**	**7**	**0**	**0**	**169**	**12**	**0**	**16**	**363**	**0**	**590**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**18**	**0**	**0**	**239**	**17**	**0**	**24**	**358**	**0**	**676**	2,231
8:00 AM	**0**	**0**	**0**	**0**	**0**	**22**	**0**	**14**	**0**	**0**	**179**	**20**	**0**	**26**	**322**	**0**	**583**	2,383
8:15 AM	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**15**	**0**	**0**	**153**	**19**	**0**	**20**	**316**	**0**	**539**	**2,388**
8:30 AM	0	0	0	0	0	24	0	11	0	0	155	0	0	14	289	0	493	2,291
8:45 AM	0	0	0	0	0	29	0	14	0	0	166	15	0	20	251	0	495	2,110
Count Total	0	0	0	0	0	168	0	102	0	0	1,253	94	0	150	2,574	0	4,341	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**81**	**0**	**54**	**0**	**0**	**740**	**68**	**0**	**86**	**1,359**	**0**	**2,388**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

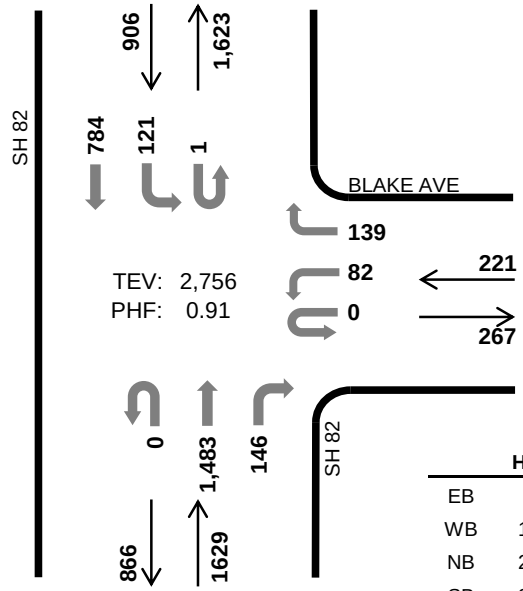
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	1	10	10	*21*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	3	6	17	*26*	0	0	0	0	*0*	0	1	1	0	*2*
7:30 AM	**0**	**3**	**8**	**13**	***24***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**0**	*2*
7:45 AM	**0**	**3**	**13**	**16**	***32***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:00 AM	**0**	**0**	**3**	**13**	***16***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**1**	**0**	*3*
8:15 AM	**0**	**0**	**11**	**12**	***23***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	1	8	13	*22*	0	0	0	0	*0*	0	1	0	0	*1*
8:45 AM	0	0	15	8	*23*	0	0	0	0	*0*	0	2	1	0	*3*
Count Total	0	11	74	102	*187*	0	0	0	0	*0*	1	7	4	0	*12*
Peak Hr	**0**	**6**	**35**	**54**	***95***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**2**	**0**	***6***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

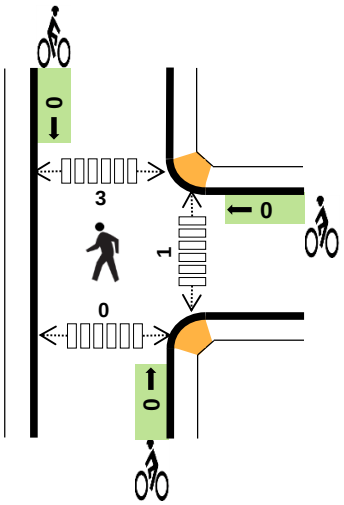
SH 82
BLAKE AVE

Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Peak Hour



	HV %:	PHF
EB	-	-
WB	1.4%	0.94
NB	2.4%	0.89
SB	2.4%	0.92
TOTAL	2.3%	0.91



Two-Hour Count Summaries

Interval Start	0				BLAKE AVE				SH 82				SH 82				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	22	0	32	0	0	275	39	0	20	148	0	536	0
4:15 PM	0	0	0	0	0	25	0	28	0	0	393	36	0	28	150	0	660	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**15**	**0**	**40**	**0**	**0**	**416**	**41**	**0**	**25**	**218**	**0**	**755**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**23**	**0**	**36**	**0**	**0**	**325**	**37**	**0**	**36**	**147**	**0**	**604**	2,555
5:00 PM	**0**	**0**	**0**	**0**	**0**	**27**	**0**	**27**	**0**	**0**	**376**	**29**	**0**	**25**	**220**	**0**	**704**	2,723
5:15 PM	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**36**	**0**	**0**	**366**	**39**	**1**	**35**	**199**	**0**	**693**	**2,756**
5:30 PM	0	0	0	0	0	29	0	33	0	0	319	28	0	27	146	0	582	2,583
5:45 PM	0	0	0	0	0	25	0	38	0	0	281	38	0	21	146	0	549	2,528
Count Total	0	0	0	0	0	183	0	270	0	0	2,751	287	1	217	1,374	0	5,083	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**82**	**0**	**139**	**0**	**0**	**1,483**	**146**	**1**	**121**	**784**	**0**	**2,756**	**0**

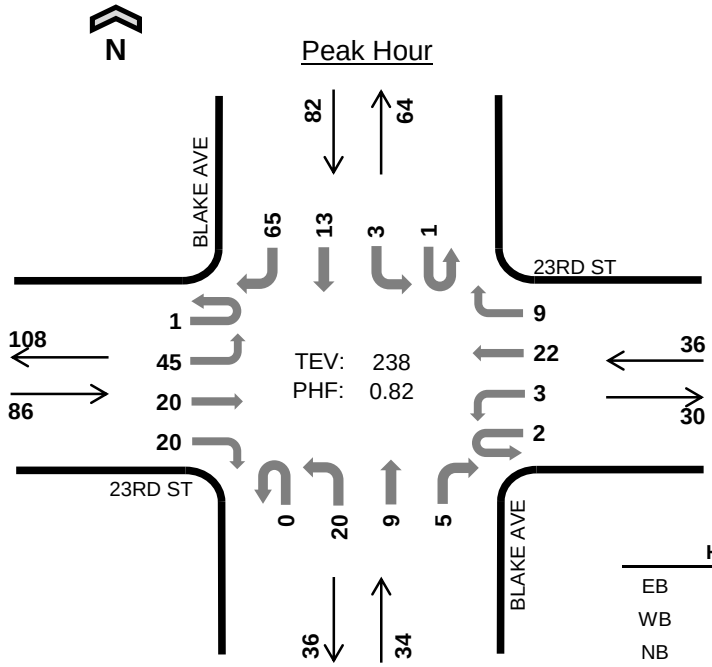
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

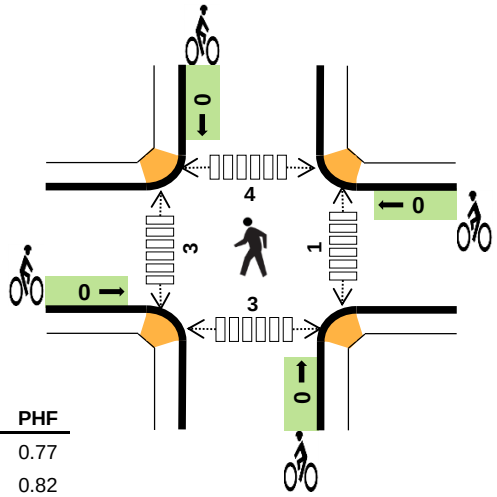
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	10	10	*22*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	1	6	10	*17*	0	0	0	0	*0*	1	3	1	0	*5*
4:30 PM	**0**	**0**	**6**	**7**	***13***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
4:45 PM	**0**	**2**	**10**	**5**	***17***	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**1**	**0**	*4*
5:00 PM	**0**	**1**	**13**	**6**	***20***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**10**	**4**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**2**	**0**	***3***
5:30 PM	0	1	7	4	*12*	0	0	0	0	*0*	0	1	0	0	*1*
5:45 PM	0	1	16	5	*22*	0	0	0	0	*0*	0	2	2	0	*4*
Count Total	0	8	78	51	*137*	0	0	0	0	*0*	2	10	6	0	*18*
Peak Hr	**0**	**3**	**39**	**22**	***64***	**0**	**0**	**0**	**0**	***0***	**1**	**4**	**3**	**0**	***8***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

BLAKE AVE
23RD ST

Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM





	HV %:	PHF
EB	2.3%	0.77
WB	2.8%	0.82
NB	0.0%	0.77
SB	4.9%	0.76
TOTAL	2.9%	0.82

Two-Hour Count Summaries

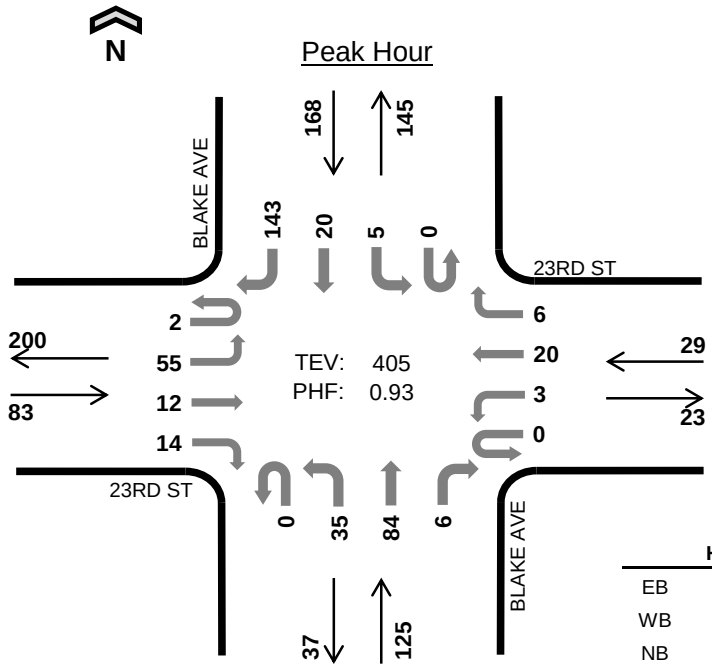
Interval Start	23RD ST Eastbound				23RD ST Westbound				BLAKE AVE Northbound				BLAKE AVE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	5	2	0	0	1	3	0	0	0	0	0	0	1	3	7	22	0
7:15 AM	0	13	0	0	0	0	9	2	0	3	2	0	0	0	1	19	49	0
7:30 AM	**1**	**5**	**4**	**4**	**2**	**1**	**5**	**1**	**0**	**3**	**3**	**2**	**1**	**0**	**3**	**19**	**54**	0
7:45 AM	**0**	**10**	**10**	**4**	**0**	**1**	**6**	**4**	**0**	**5**	**4**	**2**	**0**	**1**	**3**	**23**	**73**	198
8:00 AM	**0**	**18**	**3**	**7**	**0**	**0**	**8**	**3**	**0**	**8**	**1**	**0**	**0**	**1**	**2**	**10**	**61**	237
8:15 AM	**0**	**12**	**3**	**5**	**0**	**1**	**3**	**1**	**0**	**4**	**1**	**1**	**0**	**1**	**5**	**13**	**50**	**238**
8:30 AM	0	8	8	1	0	0	2	0	0	1	0	0	0	0	3	19	42	226
8:45 AM	0	12	1	4	0	0	3	1	0	2	3	0	0	0	1	13	40	193
Count Total	1	83	31	25	2	4	39	12	0	26	14	5	1	4	21	123	391	0
Peak Hour	**1**	**45**	**20**	**20**	**2**	**3**	**22**	**9**	**0**	**20**	**9**	**5**	**1**	**3**	**13**	**65**	**238**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

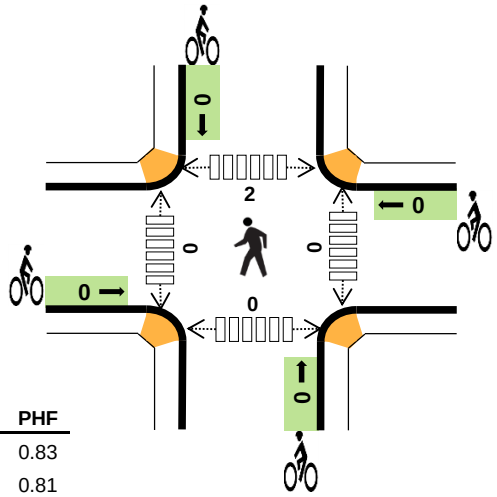
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	1	0	*1*
7:30 AM	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
7:45 AM	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**2**	**3**	*9*
8:00 AM	**1**	**1**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	***1***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	2	0	0	0	*2*	0	0	0	0	*0*	0	1	0	0	*1*
Count Total	6	1	0	4	*11*	0	0	0	0	*0*	1	4	5	4	*14*
Peak Hour	**2**	**1**	**0**	**4**	***7***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**4**	**3**	***11***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

BLAKE AVE
23RD ST



Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	0.0%	0.83
WB	0.0%	0.81
NB	0.0%	0.92
SB	0.0%	0.79
TOTAL	0.0%	0.93

Two-Hour Count Summaries

Interval Start	23RD ST Eastbound				23RD ST Westbound				BLAKE AVE Northbound				BLAKE AVE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	10	3	2	0	2	7	1	0	3	5	0	0	3	3	20	59	0
4:15 PM	1	11	3	4	0	0	6	1	0	2	6	1	0	1	4	16	56	0
4:30 PM	**1**	**11**	**2**	**6**	**0**	**3**	**5**	**1**	**0**	**9**	**17**	**2**	**0**	**2**	**5**	**33**	**97**	0
4:45 PM	**1**	**14**	**1**	**3**	**0**	**0**	**6**	**3**	**0**	**7**	**23**	**2**	**0**	**1**	**2**	**29**	**92**	304
5:00 PM	**0**	**12**	**5**	**2**	**0**	**0**	**5**	**1**	**0**	**12**	**18**	**1**	**0**	**1**	**8**	**44**	**109**	354
5:15 PM	**0**	**18**	**4**	**3**	**0**	**0**	**4**	**1**	**0**	**7**	**26**	**1**	**0**	**1**	**5**	**37**	**107**	**405**
5:30 PM	0	15	2	4	0	0	5	0	0	6	13	0	0	2	3	31	81	389
5:45 PM	0	10	7	3	0	0	6	4	0	2	6	0	0	2	3	18	61	358
Count Total	3	101	27	27	0	5	44	12	0	48	114	7	0	13	33	228	662	0
Peak Hour	**2**	**55**	**12**	**14**	**0**	**3**	**20**	**6**	**0**	**35**	**84**	**6**	**0**	**5**	**20**	**143**	**405**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	1	*2*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	0	*1*
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	*2*
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	1	0	0	*1*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	0	0	0	*1*	0	0	0	0	*0*	0	3	2	1	*6*
Peak Hour	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	***2***

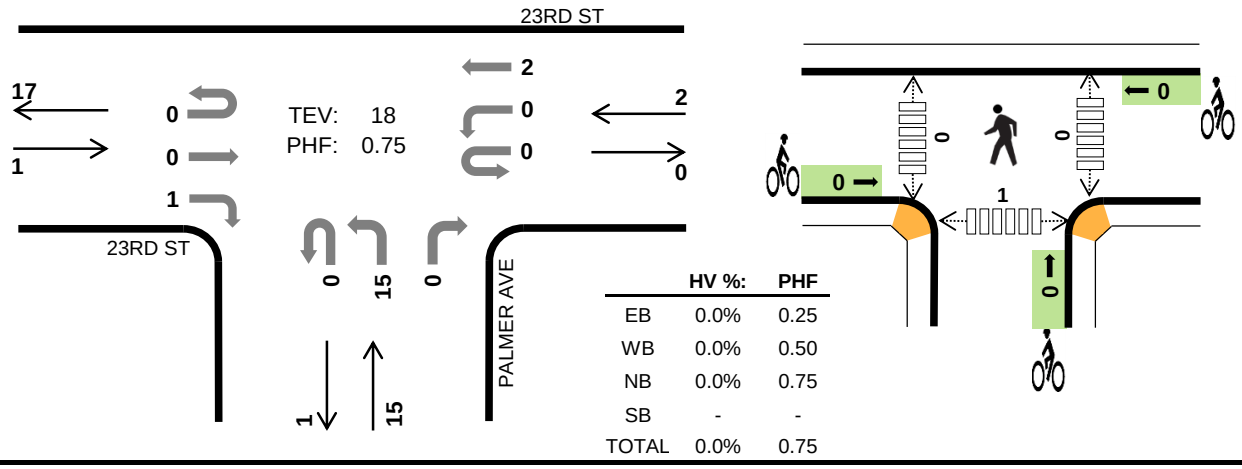
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

PALMER AVE
23RD ST

N

Peak Hour

Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	0.0%	0.25
WB	0.0%	0.50
NB	0.0%	0.75
SB	-	-
TOTAL	0.0%	0.75

Two-Hour Count Summaries

Interval Start	23RD ST Eastbound				23RD ST Westbound				PALMER AVE Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	3	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	0
7:30 AM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	17
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**18**
8:15 AM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	14
8:30 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	11
8:45 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	11
Count Total	0	0	0	3	0	0	5	0	0	20	0	0	0	0	0	0	28	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
7:30 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	***2***
8:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	0	0	*0*	0	0	0	0	*0*	0	0	2	2	*4*
Peak Hr	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**1**	***3***

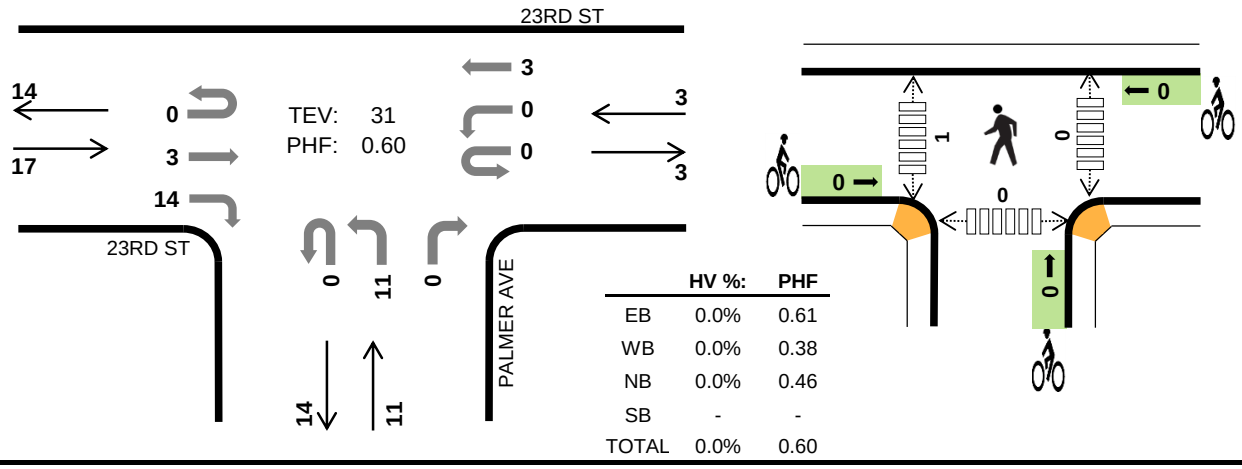
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

PALMER AVE
23RD ST

N

Peak Hour

Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	0.0%	0.61
WB	0.0%	0.38
NB	0.0%	0.46
SB	-	-
TOTAL	0.0%	0.60

Two-Hour Count Summaries

Interval Start	23RD ST Eastbound				23RD ST Westbound				PALMER AVE Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	4	0	0	0	0	0	3	0	0	0	0	0	0	8	0
4:15 PM	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	3	0
4:30 PM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	3	0
4:45 PM	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	3	17
5:00 PM	**0**	**0**	**1**	**6**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**13**	22
5:15 PM	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	23
5:30 PM	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	24
5:45 PM	**0**	**0**	**1**	**5**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**31**
Count Total	0	0	5	22	0	0	3	0	0	18	0	0	0	0	0	0	48	0
Peak Hour	**0**	**0**	**3**	**14**	**0**	**0**	**3**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**31**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
4:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
4:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
5:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	***1***
Count Total	0	0	0	0	*0*	0	0	0	0	*0*	2	1	1	0	*4*
Peak Hr	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**0**	***2***

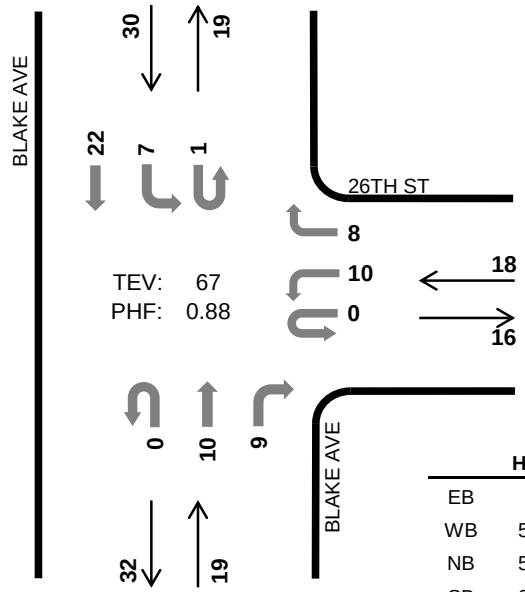
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

BLAKE AVE
26TH ST

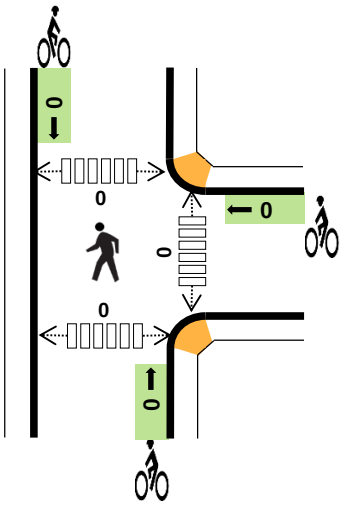
Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	5.6%	0.56
NB	5.3%	0.95
SB	0.0%	0.68
TOTAL	3.0%	0.88



Two-Hour Count Summaries

Interval Start	0				26TH ST				BLAKE AVE				BLAKE AVE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	4	0	0	0	0	0	1	0	1	4	0	10	0
7:15 AM	0	0	0	0	0	0	0	3	0	0	0	2	0	1	1	0	7	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**1**	**6**	**0**	**14**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**5**	**0**	**0**	**4**	**1**	**0**	**0**	**3**	**0**	**16**	47
8:00 AM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**0**	**3**	**2**	**1**	**3**	**5**	**0**	**18**	55
8:15 AM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**1**	**3**	**0**	**3**	**8**	**0**	**19**	**67**
8:30 AM	0	0	0	0	0	2	0	1	0	0	0	1	0	0	2	0	6	59
8:45 AM	0	0	0	0	0	2	0	2	0	0	2	1	0	0	3	0	10	53
Count Total	0	0	0	0	0	18	0	14	0	0	12	14	1	9	32	0	100	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**8**	**0**	**0**	**10**	**9**	**1**	**7**	**22**	**0**	**67**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
7:45 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:00 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:15 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	1	1	0	*2*	0	0	0	0	*0*	0	3	0	0	*3*
Peak Hr	**0**	**1**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**0**	**0**	***3***

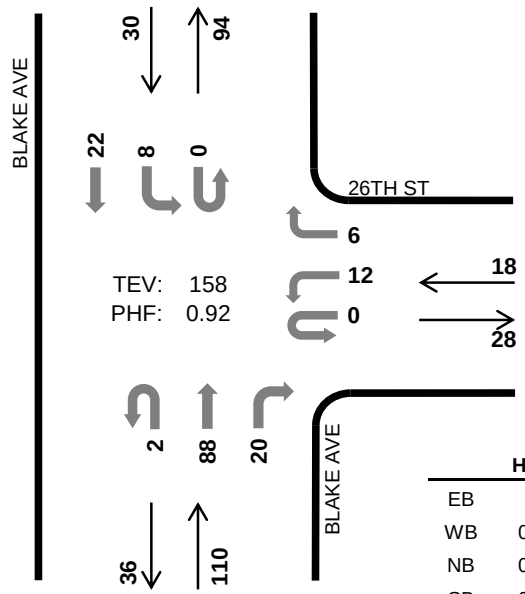
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

BLAKE AVE
26TH ST

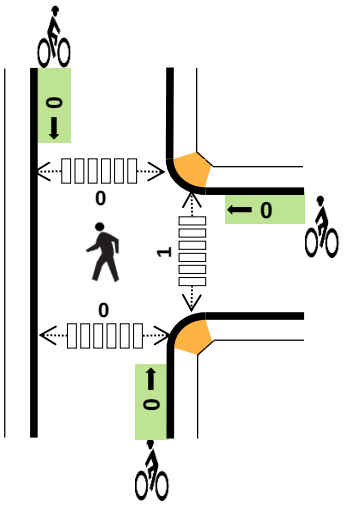
Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	0.0%	0.56
NB	0.0%	0.89
SB	0.0%	0.83
TOTAL	0.0%	0.92



Two-Hour Count Summaries

Interval Start	0				26TH ST				BLAKE AVE				BLAKE AVE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	4	0	1	0	0	4	3	0	0	2	0	14	0
4:15 PM	0	0	0	0	0	2	0	1	0	0	7	7	0	1	3	0	21	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**0**	**21**	**3**	**0**	**1**	**6**	**0**	**35**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**26**	**5**	**0**	**1**	**8**	**0**	**43**	113
5:00 PM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**18**	**9**	**0**	**4**	**5**	**0**	**39**	138
5:15 PM	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**2**	**2**	**0**	**23**	**3**	**0**	**2**	**3**	**0**	**41**	**158**
5:30 PM	0	0	0	0	0	1	0	1	0	0	16	4	0	1	6	0	29	152
5:45 PM	0	0	0	0	0	4	0	2	1	0	3	3	0	3	0	0	16	125
Count Total	0	0	0	0	0	23	0	11	3	0	118	37	0	13	33	0	238	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**6**	**2**	**0**	**88**	**20**	**0**	**8**	**22**	**0**	**158**	**0**

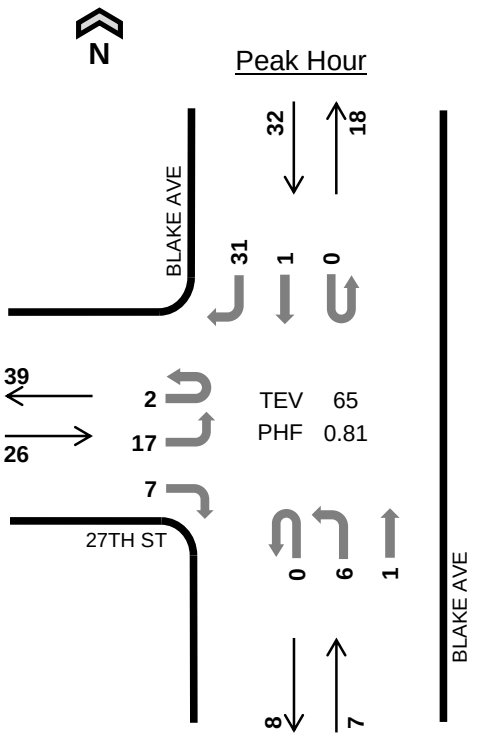
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	1	0	*2*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	7	0	0	*8*
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	***2***
5:30 PM	0	0	0	1	*1*	0	0	0	0	*0*	1	0	1	0	*2*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	1	*1*
Count Total	0	0	0	1	*1*	0	0	0	0	*0*	4	10	2	1	*17*
Peak Hr	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**0**	**0**	***4***

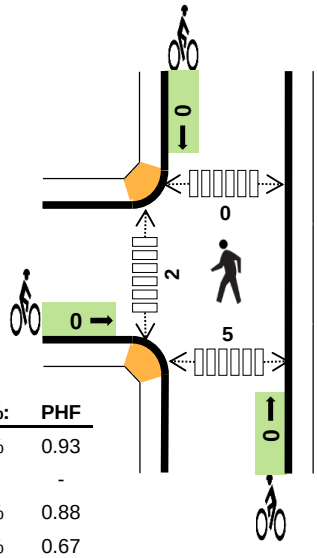
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

BLAKE AVE
27TH ST

Peak Hour



Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	3.8%	0.93
WB	-	-
NB	0.0%	0.88
SB	0.0%	0.67
TOTAL	1.5%	0.81

Two-Hour Count Summaries

Interval Start	27TH ST Eastbound				0 Westbound				BLAKE AVE Northbound				BLAKE AVE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	1	2	0	4	0	0	0	0	0	5	0	0	0	0	2	7	21	0
7:15 AM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	1	4	0
7:30 AM	**1**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**7**	**16**	0
7:45 AM	**1**	**3**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**6**	**15**	56
8:00 AM	**0**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**6**	**14**	49
8:15 AM	**0**	**4**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**12**	**20**	**65**
8:30 AM	0	1	0	3	0	0	0	0	0	3	1	0	0	0	0	4	12	61
8:45 AM	1	3	0	2	0	0	0	0	0	3	0	0	0	0	0	4	13	59
Count Total	4	23	0	17	0	0	0	0	0	19	2	0	0	0	3	47	115	0
Peak Hour	**2**	**17**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**6**	**1**	**0**	**0**	**0**	**1**	**31**	**65**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	2	*3*
7:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	4	4	0	*8*
7:30 AM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**1**	*3*
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**0**	**3**	*6*
8:00 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**0**	*2*
8:15 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**1**	***2***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	1	0	*2*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	0	0	0	*1*	0	0	0	0	*0*	7	7	5	7	*26*
Peak Hr	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**6**	**2**	**0**	**5**	***13***

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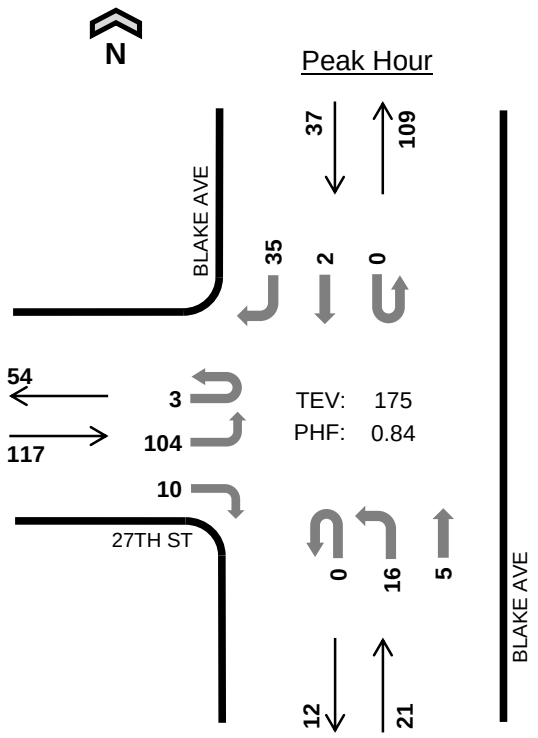
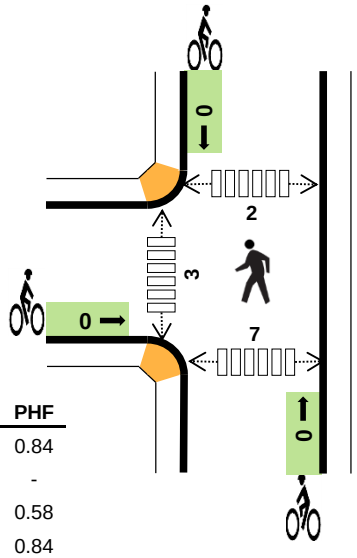
BLAKE AVE
27TH ST



Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	0.0%	0.84
WB	-	-
NB	0.0%	0.58
SB	0.0%	0.84
TOTAL	0.0%	0.84

Two-Hour Count Summaries

Interval Start	27TH ST Eastbound				0 Westbound				BLAKE AVE Northbound				BLAKE AVE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	7	0	2	0	0	0	0	0	8	0	0	0	0	0	6	23	0
4:15 PM	1	13	0	5	0	0	0	0	0	6	1	0	0	0	1	4	31	0
4:30 PM	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**8**	**33**	0
4:45 PM	**1**	**30**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**0**	**0**	**1**	**10**	**52**	139
5:00 PM	**1**	**26**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**7**	**43**	159
5:15 PM	**1**	**24**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**6**	**3**	**0**	**0**	**0**	**1**	**10**	**47**	**175**
5:30 PM	1	18	0	3	0	0	0	0	0	3	1	0	0	0	1	6	33	175
5:45 PM	2	5	0	4	0	0	0	0	0	5	0	0	2	0	0	3	21	144
Count Total	7	147	0	24	0	0	0	0	0	38	7	0	2	0	4	54	283	0
Peak Hour	**3**	**104**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**16**	**5**	**0**	**0**	**0**	**2**	**35**	**175**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	1	0	*1*	0	0	0	0	*0*	4	0	1	2	*7*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	3	7	0	3	*13*
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**1**	**0**	*3*
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
5:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**1**	*3*
5:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**5**	**0**	**1**	**5**	***11***
5:30 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	2	0	0	*2*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	3	0	1	*5*
Count Total	0	0	1	1	*2*	0	0	0	0	*0*	14	15	3	13	*45*
Peak Hr	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**6**	**3**	**2**	**7**	***18***

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Seasonal Adjustment Factor Calculation 4/9/2019
CDOT Continuous Counter Data on SH 82 at Station 214, south of Blake Ave. KJS
Glenwood Springs, CO

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	22045	22387										
2018	23365	23237	24444	24974	25824	26106	25420	25235	24793	23781	22025	21717
2017	22576	23590	24797	25270	25389	27223	27128	23295	21072	21144	22774	23736
2016	22629	22949	23948	24786	25563	27086	27406	27089	27051	25737	23475	23145
2015	22134	22151	23508	23842	24174	26460	27049	26201	26455	25224	22799	22782
2014	20312	20646	21761	22204	22727	24366	25318	24725	24859	23947	20843	21677
Yr 2014 - 2019 Daily Average per Month	22177	22493	23692	24215	24735	26248	26464	25309	24846	23967	22383	22611
Yr 2014 - 2019 Seasonal Adjustment Factor	1.19	1.18	1.12	1.09	1.07	1.01	1.00	1.05	1.07	1.10	1.18	1.17

Summary of Traffic Volumes
Gate Closed

Palmer Avenue (N of 26th)

Existing AM Peak Hour:	22 vph
Existing PM Peak Hour:	25vph
Project AM Peak Hour:	6vph
Project PM Peak Hour:	7vph
Total AM Peak Hour:	28vph
Total PM Peak Hour:	32vph

26th Street (W of Palmer)

Existing AM Peak Hour:	23vph
Existing PM Peak Hour:	26vph
Project AM Peak Hour:	14vph
Project PM Peak Hour:	19vph
Total AM Peak Hour:	37vph
Total PM Peak Hour:	45vph

Blake Avenue (North of P&R)

Existing AM Peak Hour:	15vph
Existing PM Peak Hour:	92vph
Project AM Peak Hour:	24vph
Project PM Peak Hour:	31vph
Total AM Peak Hour:	39vph
Total PM Peak Hour:	124vph

Blake Avenue

Existing AM Peak Hour:	0vph
Existing PM Peak Hour:	0vph
Project AM Peak Hour:	0vph
Project PM Peak Hour:	0vph
Total AM Peak Hour:	0vph
Total PM Peak Hour:	0vph

Palmer Avenue (North Access)

Existing AM Peak Hour:	0vph
Existing PM Peak Hour:	0vph
Project AM Peak Hour:	20vph
Project PM Peak Hour:	26vph
Total AM Peak Hour:	20vph
Total PM Peak Hour:	26vph

Palmer Avenue (South Access)

Existing AM Peak Hour:	0vph
Existing PM Peak Hour:	0vph
Project AM Peak Hour:	25vph
Project PM Peak Hour:	31vph
Total AM Peak Hour:	25vph
Total PM Peak Hour:	31vph

Gate Closed

Notes:

1. Existing traffic volumes are Year 2018
2. Traffic volumes are in Vehicles per Hour (vph)

Project: M1247
Name: Glenwood Multifamily
Date: January 31, 2018

McDowell Engineering LLC
Transportation Engineering Consultants

Summary of Traffic Volumes
Gate Open

Palmer Avenue (N of 26th)

Existing AM Peak Hour:	68vph
Existing PM Peak Hour:	134vph
Project AM Peak Hour:	6vph
Project PM Peak Hour:	7vph
Total AM Peak Hour:	74vph
Total PM Peak Hour:	141vph

26th Street (W of Palmer)

Existing AM Peak Hour:	23vph
Existing PM Peak Hour:	26vph
Project AM Peak Hour:	14vph
Project PM Peak Hour:	19vph
Total AM Peak Hour:	37vph
Total PM Peak Hour:	66vph

Blake Avenue (North of P&R)

Background AM Peak Hour:	90vph
Background PM Peak Hour:	212vph
Project AM Peak Hour:	16vph
Project PM Peak Hour:	20vph
Total AM Peak Hour:	106vph
Total PM Peak Hour:	232vph

Blake Avenue

Background AM Peak Hour:	75vph
Background PM Peak Hour:	120vph
Project AM Peak Hour:	9vph
Project PM Peak Hour:	11vph
Total AM Peak Hour:	84vph
Total PM Peak Hour:	131vph

Palmer Avenue (North Access)

Existing AM Peak Hour:	0vph
Existing PM Peak Hour:	0vph
Project AM Peak Hour:	20vph
Project PM Peak Hour:	27vph
Total AM Peak Hour:	20vph
Total PM Peak Hour:	27vph

Palmer Avenue (South Access)

Existing AM Peak Hour:	0vph
Existing PM Peak Hour:	0vph
Project AM Peak Hour:	25vph
Project PM Peak Hour:	31vph
Total AM Peak Hour:	25vph
Total PM Peak Hour:	31vph

Notes:

1. Existing traffic volumes are Year 2018
2. Traffic volumes are in Vehicles per Hour (vph)

Project: M1247
Name: Glenwood Multifamily
Date: January 31, 2018

McDowell Engineering LLC
Transportation Engineering Consultants

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	97	65	888	82	103	1631
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor				0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.264	
Satd. Flow (perm)	1770	1583	3539	1547	492	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		71		89		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)				1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	105	71	965	89	112	1773
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	1	1	0	0		
Act Effct Green (s)	15.3	15.3	123.1	123.1	135.2	133.2
Actuated g/C Ratio	0.10	0.10	0.77	0.77	0.84	0.83
v/c Ratio	0.62	0.33	0.35	0.07	0.24	0.60
Control Delay	84.4	16.6	6.7	1.2	5.1	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.4	16.6	6.7	1.2	5.1	12.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	F	B	A	A	A	B
Approach Delay	57.0		6.2			11.6
Approach LOS	E		A			B
90th %ile Green (s)	23.0	23.0	114.0	114.0	9.0	125.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Gap	Coord
70th %ile Green (s)	17.1	17.1	121.2	121.2	7.7	131.4
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	14.8	14.8	124.1	124.1	7.1	133.7
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	12.5	12.5	126.5	126.5	7.0	136.0
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	9.3	9.3	129.7	129.7	7.0	139.2
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	108	0	145	0	33	474
Queue Length 95th (ft)	168	49	229	17	m47	m664
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	297	2722	1210	662	2945
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.24	0.35	0.07	0.17	0.60

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	98	167	1780	175	146	941
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	1.00	0.99		0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.082	
Satd. Flow (perm)	1768	1563	3539	1547	153	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		182		190		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)	1	1		2	2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	182	1935	190	159	1023
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	3	3	1	1		
Act Effct Green (s)	12.1	12.1	46.4	46.4	58.4	56.4
Actuated g/C Ratio	0.15	0.15	0.58	0.58	0.73	0.70
v/c Ratio	0.40	0.47	0.94	0.19	0.61	0.41
Control Delay	33.2	8.4	28.7	2.5	27.0	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	8.4	28.7	2.5	27.0	14.5

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	C	A	C	A	C	B
Approach Delay	17.6		26.3			16.2
Approach LOS	B		C			B
90th %ile Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Max	Coord
70th %ile Green (s)	11.8	11.8	45.5	45.5	8.7	56.7
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	10.2	10.2	48.2	48.2	7.6	58.3
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	8.6	8.6	50.4	50.4	7.0	59.9
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	7.0	7.0	52.0	52.0	7.0	61.5
10th %ile Term Code	Min	Min	Coord	Coord	Min	Coord
Queue Length 50th (ft)	50	0	402	0	65	207
Queue Length 95th (ft)	80	44	#767	34	m#118	281
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	579	2053	977	262	2494
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.31	0.94	0.19	0.61	0.41

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 22.3 Intersection LOS: C
Intersection Capacity Utilization 75.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	97	15	888	82	53	1631
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor				0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.266	
Satd. Flow (perm)	1770	1583	3539	1547	495	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		16		89		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)				1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	105	16	965	89	58	1773
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	1	1	0	0		
Act Effct Green (s)	15.3	15.3	125.8	125.8	135.2	133.2
Actuated g/C Ratio	0.10	0.10	0.79	0.79	0.84	0.83
v/c Ratio	0.62	0.10	0.35	0.07	0.12	0.60
Control Delay	84.4	24.7	6.1	1.2	4.9	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.4	24.7	6.1	1.2	4.9	12.5

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	F	C	A	A	A	B
Approach Delay	76.5		5.7			12.3
Approach LOS	E		A			B
90th %ile Green (s)	23.0	23.0	115.5	115.5	7.5	125.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Gap	Coord
70th %ile Green (s)	17.1	17.1	121.9	121.9	7.0	131.4
70th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
50th %ile Green (s)	14.8	14.8	124.2	124.2	7.0	133.7
50th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
30th %ile Green (s)	12.5	12.5	126.5	126.5	7.0	136.0
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	9.3	9.3	140.7	140.7	0.0	139.2
10th %ile Term Code	Gap	Gap	Coord	Coord	Skip	Coord
Queue Length 50th (ft)	108	0	144	0	16	474
Queue Length 95th (ft)	168	24	221	16	m24	m651
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	251	2781	1234	664	2945
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.06	0.35	0.07	0.09	0.60

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	98	87	1780	175	66	941
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	1.00	0.99		0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.077	
Satd. Flow (perm)	1768	1563	3539	1547	143	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		95		190		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)	1	1		2	2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	95	1935	190	72	1023
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	3	3	1	1		
Act Effct Green (s)	12.1	12.1	52.5	52.5	60.9	60.1
Actuated g/C Ratio	0.15	0.15	0.66	0.66	0.76	0.75
v/c Ratio	0.40	0.30	0.83	0.18	0.29	0.39
Control Delay	33.2	8.3	20.0	2.4	15.5	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	8.3	20.0	2.4	15.5	13.6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	C	A	C	A	B	B
Approach Delay	21.5		18.5			13.7
Approach LOS	C		B			B
90th %ile Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Max	Coord
70th %ile Green (s)	11.8	11.8	47.2	47.2	7.0	56.7
70th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
50th %ile Green (s)	10.2	10.2	48.8	48.8	7.0	58.3
50th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
30th %ile Green (s)	8.6	8.6	50.4	50.4	7.0	59.9
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	0.0	0.0	75.5	75.5	0.0	74.0
10th %ile Term Code	Skip	Skip	Coord	Coord	Skip	Coord
Queue Length 50th (ft)	50	0	393	0	25	204
Queue Length 95th (ft)	80	33	#767	34	m40	m286
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	517	2321	1080	251	2657
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.18	0.83	0.18	0.29	0.39

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 17.1		Intersection LOS: B	
Intersection Capacity Utilization 70.7%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	97	65	896	82	103	1649
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor				0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.261	
Satd. Flow (perm)	1770	1583	3539	1547	486	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		71		89		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)				1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	105	71	974	89	112	1792
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	1	1	0	0		
Act Effct Green (s)	15.3	15.3	123.1	123.1	135.2	133.2
Actuated g/C Ratio	0.10	0.10	0.77	0.77	0.84	0.83
v/c Ratio	0.62	0.33	0.36	0.07	0.24	0.61
Control Delay	84.4	16.6	6.7	1.2	5.5	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.4	16.6	6.7	1.2	5.5	14.3

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	F	B	A	A	A	B
Approach Delay	57.0		6.3			13.8
Approach LOS	E		A			B
90th %ile Green (s)	23.0	23.0	114.0	114.0	9.0	125.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Gap	Coord
70th %ile Green (s)	17.1	17.1	121.2	121.2	7.7	131.4
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	14.8	14.8	124.1	124.1	7.1	133.7
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	12.5	12.5	126.5	126.5	7.0	136.0
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	9.3	9.3	129.7	129.7	7.0	139.2
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	108	0	146	0	33	527
Queue Length 95th (ft)	168	49	232	17	m48	m722
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	297	2722	1210	659	2945
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.24	0.36	0.07	0.17	0.61

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 13.7		Intersection LOS: B	
Intersection Capacity Utilization 61.0%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	98	167	1801	175	146	954
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	1.00	0.99		0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.082	
Satd. Flow (perm)	1768	1563	3539	1547	153	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		182		190		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)	1	1		2	2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	182	1958	190	159	1037
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	3	3	1	1		
Act Effct Green (s)	12.1	12.1	46.4	46.4	58.4	56.4
Actuated g/C Ratio	0.15	0.15	0.58	0.58	0.73	0.70
v/c Ratio	0.40	0.47	0.95	0.19	0.61	0.42
Control Delay	33.2	8.4	30.2	2.5	22.9	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	8.4	30.2	2.5	22.9	15.2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	C	A	C	A	C	B
Approach Delay	17.6		27.8			16.2
Approach LOS	B		C			B
90th %ile Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Max	Coord
70th %ile Green (s)	11.8	11.8	45.5	45.5	8.7	56.7
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	10.2	10.2	48.2	48.2	7.6	58.3
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	8.6	8.6	50.4	50.4	7.0	59.9
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	7.0	7.0	52.0	52.0	7.0	61.5
10th %ile Term Code	Min	Min	Coord	Coord	Min	Coord
Queue Length 50th (ft)	50	0	414	0	60	203
Queue Length 95th (ft)	80	44	#781	34	m86	m281
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	579	2053	977	262	2494
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.31	0.95	0.19	0.61	0.42

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 75.8%		ICU Level of Service D	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	106	15	892	86	53	1640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor				0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.264	
Satd. Flow (perm)	1770	1583	3539	1547	492	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		16		93		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)				1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	115	16	970	93	58	1783
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	1	1	0	0		
Act Effct Green (s)	16.0	16.0	125.1	125.1	134.5	132.5
Actuated g/C Ratio	0.10	0.10	0.78	0.78	0.84	0.83
v/c Ratio	0.65	0.09	0.35	0.08	0.12	0.61
Control Delay	85.5	24.5	6.3	1.2	5.1	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.5	24.5	6.3	1.2	5.1	13.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	F	C	A	A	A	B
Approach Delay	78.1		5.9			12.8
Approach LOS	E		A			B
90th %ile Green (s)	23.0	23.0	115.5	115.5	7.5	125.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Gap	Coord
70th %ile Green (s)	18.1	18.1	120.9	120.9	7.0	130.4
70th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
50th %ile Green (s)	15.7	15.7	123.3	123.3	7.0	132.8
50th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
30th %ile Green (s)	13.3	13.3	125.7	125.7	7.0	135.2
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	9.9	9.9	140.1	140.1	0.0	138.6
10th %ile Term Code	Gap	Gap	Coord	Coord	Skip	Coord
Queue Length 50th (ft)	118	0	150	0	17	485
Queue Length 95th (ft)	181	24	222	16	m24	m653
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	251	2767	1229	661	2930
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.06	0.35	0.08	0.09	0.61

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 60.8%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	105	87	1791	186	66	948
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	1.00	0.99		0.98		
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.077	
Satd. Flow (perm)	1768	1563	3539	1547	143	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		95		202		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Confl. Peds. (#/hr)	1	1		2	2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	114	95	1947	202	72	1030
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	3	3	1	1		
Act Effct Green (s)	12.3	12.3	52.3	52.3	60.7	59.9
Actuated g/C Ratio	0.15	0.15	0.65	0.65	0.76	0.75
v/c Ratio	0.42	0.30	0.84	0.19	0.29	0.39
Control Delay	33.6	8.3	20.6	2.3	15.6	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	8.3	20.6	2.3	15.6	13.7

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	C	A	C	A	B	B
Approach Delay	22.1		18.9			13.8
Approach LOS	C		B			B
90th %ile Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
90th %ile Term Code	Ped	Ped	Coord	Coord	Max	Coord
70th %ile Green (s)	12.2	12.2	46.8	46.8	7.0	56.3
70th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
50th %ile Green (s)	10.5	10.5	48.5	48.5	7.0	58.0
50th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
30th %ile Green (s)	8.8	8.8	50.2	50.2	7.0	59.7
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	0.0	0.0	75.5	75.5	0.0	74.0
10th %ile Term Code	Skip	Skip	Coord	Coord	Skip	Coord
Queue Length 50th (ft)	54	0	404	0	25	206
Queue Length 95th (ft)	84	33	#775	35	m40	m288
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	517	2313	1081	250	2649
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.18	0.84	0.19	0.29	0.39

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 17.5		Intersection LOS: B	
Intersection Capacity Utilization 70.7%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	147	98	1346	124	156	2472
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.130	
Satd. Flow (perm)	1770	1583	3539	1583	242	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		107		121		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	160	107	1463	135	170	2687
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	19.2	19.2	115.7	115.7	131.3	129.3
Actuated g/C Ratio	0.12	0.12	0.72	0.72	0.82	0.81
v/c Ratio	0.76	0.38	0.57	0.11	0.56	0.94
Control Delay	89.8	13.8	12.6	2.1	17.7	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.8	13.8	12.6	2.1	17.7	16.9
LOS	F	B	B	A	B	B
Approach Delay	59.3		11.7			17.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach LOS	E		B			B
90th %ile Green (s)	24.0	24.0	104.0	104.0	18.0	124.5
90th %ile Term Code	Max	Max	Coord	Coord	Gap	Coord
70th %ile Green (s)	22.4	22.4	110.4	110.4	13.2	126.1
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	19.7	19.7	116.4	116.4	9.9	128.8
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	16.9	16.9	121.4	121.4	7.7	131.6
30th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
10th %ile Green (s)	12.8	12.8	126.2	126.2	7.0	135.7
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	164	0	343	4	18	722
Queue Length 95th (ft)	242	58	525	30	m72	#738
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	328	2558	1178	494	2860
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.33	0.57	0.11	0.34	0.94

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 86.1%		ICU Level of Service E	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	149	253	2697	266	222	1426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.092	
Satd. Flow (perm)	1770	1583	3539	1583	171	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		184		203		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	275	2932	289	241	1550
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	12.8	12.8	40.8	40.8	57.7	55.7
Actuated g/C Ratio	0.16	0.16	0.51	0.51	0.72	0.70
v/c Ratio	0.57	0.67	1.63	0.32	0.65	0.63
Control Delay	38.3	19.4	305.6	5.4	18.1	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	19.4	305.6	5.4	18.1	21.1
LOS	D	B	F	A	B	C
Approach Delay	26.4		278.7			20.7

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach LOS	C		F			C
90th %ile Green (s)	18.5	18.5	36.0	36.0	11.5	50.0
90th %ile Term Code	Gap	Gap	Coord	Coord	Max	Coord
70th %ile Green (s)	14.6	14.6	36.5	36.5	14.9	53.9
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	12.6	12.6	40.2	40.2	13.2	55.9
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	10.6	10.6	43.7	43.7	11.7	57.9
30th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
10th %ile Green (s)	7.8	7.8	47.5	47.5	10.7	60.7
10th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
Queue Length 50th (ft)	76	41	~1135	21	99	371
Queue Length 95th (ft)	124	108	#1323	70	m92	m319
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	586	1804	906	371	2463
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.47	1.63	0.32	0.65	0.63

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.63			
Intersection Signal Delay: 173.7		Intersection LOS: F	
Intersection Capacity Utilization 106.8%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	147	48	1346	124	106	2472
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.135	
Satd. Flow (perm)	1770	1583	3539	1583	251	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		52		121		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	160	52	1463	135	115	2687
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	19.2	19.2	118.7	118.7	131.3	129.3
Actuated g/C Ratio	0.12	0.12	0.74	0.74	0.82	0.81
v/c Ratio	0.76	0.22	0.56	0.11	0.41	0.94
Control Delay	89.8	16.4	10.7	1.7	6.5	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.8	16.4	10.7	1.7	6.5	17.4
LOS	F	B	B	A	A	B
Approach Delay	71.8		9.9			16.9

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach LOS	E		A			B
90th %ile Green (s)	24.0	24.0	110.8	110.8	11.2	124.5
90th %ile Term Code	Max	Max	Coord	Coord	Gap	Coord
70th %ile Green (s)	22.4	22.4	115.4	115.4	8.2	126.1
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	19.7	19.7	118.8	118.8	7.5	128.8
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	16.9	16.9	122.1	122.1	7.0	131.6
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	12.8	12.8	126.2	126.2	7.0	135.7
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	164	0	321	3	12	718
Queue Length 95th (ft)	242	42	453	26	m20	#707
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	281	2624	1205	500	2860
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.19	0.56	0.11	0.23	0.94

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 17.0		Intersection LOS: B	
Intersection Capacity Utilization 86.1%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	149	173	2697	266	142	1426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.084	
Satd. Flow (perm)	1770	1583	3539	1583	156	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		184		203		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	188	2932	289	154	1550
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	12.6	12.6	44.9	44.9	57.9	55.9
Actuated g/C Ratio	0.16	0.16	0.56	0.56	0.72	0.70
v/c Ratio	0.58	0.47	1.48	0.30	0.54	0.63
Control Delay	39.1	9.0	237.9	4.6	16.7	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	9.0	237.9	4.6	16.7	7.9
LOS	D	A	F	A	B	A
Approach Delay	22.9		217.0			8.7

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Approach LOS	C		F			A
90th %ile Green (s)	17.4	17.4	36.6	36.6	12.0	51.1
90th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
70th %ile Green (s)	14.6	14.6	42.7	42.7	8.7	53.9
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
50th %ile Green (s)	12.6	12.6	45.7	45.7	7.7	55.9
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	10.6	10.6	48.4	48.4	7.0	57.9
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	7.8	7.8	51.2	51.2	7.0	60.7
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	76	2	~1067	18	21	166
Queue Length 95th (ft)	126	52	#1316	69	77	292
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	586	1987	977	284	2472
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.32	1.48	0.30	0.54	0.63

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.48			
Intersection Signal Delay: 136.8		Intersection LOS: F	
Intersection Capacity Utilization 102.3%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	147	98	1354	124	156	2490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.128	
Satd. Flow (perm)	1770	1583	3539	1583	238	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		107		120		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	160	107	1472	135	170	2707
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	19.2	19.2	115.5	115.5	131.3	129.3
Actuated g/C Ratio	0.12	0.12	0.72	0.72	0.82	0.81
v/c Ratio	0.76	0.38	0.58	0.11	0.56	0.95
Control Delay	89.8	13.8	12.8	2.2	18.4	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.8	13.8	12.8	2.2	18.4	18.6
LOS	F	B	B	A	B	B
Approach Delay	59.3		11.9			18.6
Approach LOS	E		B			B
90th %ile Green (s)	24.0	24.0	103.7	103.7	18.3	124.5
90th %ile Term Code	Max	Max	Coord	Coord	Gap	Coord
70th %ile Green (s)	22.4	22.4	110.1	110.1	13.5	126.1
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
50th %ile Green (s)	19.7	19.7	116.1	116.1	10.2	128.8
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	16.9	16.9	121.4	121.4	7.7	131.6
30th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
10th %ile Green (s)	12.8	12.8	126.2	126.2	7.0	135.7
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	164	0	349	4	18	727
Queue Length 95th (ft)	242	58	533	31	m75	#672
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	328	2554	1176	492	2860
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.33	0.58	0.11	0.35	0.95

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 18.6 Intersection LOS: B
Intersection Capacity Utilization 86.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	149	253	2718	266	222	1439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.092	
Satd. Flow (perm)	1770	1583	3539	1583	171	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		184		201		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	275	2954	289	241	1564
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	12.8	12.8	40.8	40.8	57.7	55.7
Actuated g/C Ratio	0.16	0.16	0.51	0.51	0.72	0.70
v/c Ratio	0.57	0.67	1.64	0.32	0.65	0.63
Control Delay	38.3	19.4	311.0	5.4	23.5	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	19.4	311.0	5.4	23.5	8.2
LOS	D	B	F	A	C	A
Approach Delay	26.4		283.8			10.2
Approach LOS	C		F			B
90th %ile Green (s)	18.5	18.5	36.0	36.0	11.5	50.0
90th %ile Term Code	Gap	Gap	Coord	Coord	Max	Coord
70th %ile Green (s)	14.6	14.6	36.5	36.5	14.9	53.9
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
50th %ile Green (s)	12.6	12.6	40.2	40.2	13.2	55.9
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	10.6	10.6	43.7	43.7	11.7	57.9
30th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
10th %ile Green (s)	7.8	7.8	47.5	47.5	10.7	60.7
10th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
Queue Length 50th (ft)	76	41	~1147	22	60	160
Queue Length 95th (ft)	124	108	#1335	71	m#163	297
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	586	1804	905	371	2463
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.47	1.64	0.32	0.65	0.63

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.64
Intersection Signal Delay: 173.3 Intersection LOS: F
Intersection Capacity Utilization 107.4% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	156	48	1350	128	106	2481
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.133	
Satd. Flow (perm)	1770	1583	3539	1583	248	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		52		124		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	170	52	1467	139	115	2697
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	20.0	26.0
Total Split (s)	29.5	29.5	95.5	95.5	35.0	130.5
Total Split (%)	18.4%	18.4%	59.7%	59.7%	21.9%	81.6%
Maximum Green (s)	24.0	24.0	91.0	91.0	31.0	124.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	19.9	19.9	117.9	117.9	130.6	128.6
Actuated g/C Ratio	0.12	0.12	0.74	0.74	0.82	0.80
v/c Ratio	0.78	0.21	0.56	0.12	0.41	0.95
Control Delay	90.6	16.2	11.1	1.8	6.8	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.6	16.2	11.1	1.8	6.8	18.2
LOS	F	B	B	A	A	B
Approach Delay	73.2		10.3			17.7
Approach LOS	E		B			B
90th %ile Green (s)	24.0	24.0	110.6	110.6	11.4	124.5
90th %ile Term Code	Max	Max	Coord	Coord	Gap	Coord
70th %ile Green (s)	23.4	23.4	114.3	114.3	8.3	125.1
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
50th %ile Green (s)	20.6	20.6	117.9	117.9	7.5	127.9
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	17.7	17.7	121.3	121.3	7.0	130.8
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	13.6	13.6	125.4	125.4	7.0	134.9
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	174	0	331	4	13	724
Queue Length 95th (ft)	257	42	457	27	m20	#724
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	265	281	2607	1199	497	2845
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.19	0.56	0.12	0.23	0.95

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 86.8%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SH 82 & Blake Ave

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	156	173	2708	277	142	1433
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		306	230	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.085	
Satd. Flow (perm)	1770	1583	3539	1583	158	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		184		211		
Link Speed (mph)	25		35			35
Link Distance (ft)	268		311			2160
Travel Time (s)	7.3		6.1			42.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	170	188	2943	301	154	1558
Turn Type	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Detector Phase	4	4	6	6	5	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	20.0	20.0	7.0	20.0
Minimum Split (s)	28.5	28.5	32.5	32.5	11.0	26.0
Total Split (s)	28.5	28.5	40.5	40.5	11.0	51.5
Total Split (%)	35.6%	35.6%	50.6%	50.6%	13.8%	64.4%
Maximum Green (s)	23.0	23.0	36.0	36.0	7.0	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0	3.5
All-Red Time (s)	2.0	2.0	1.0	1.0	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.5	4.5	4.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Min	Min	None	C-Min
Walk Time (s)	4.0	4.0	14.0	14.0		
Flash Dont Walk (s)	19.0	19.0	14.0	14.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	13.0	13.0	44.5	44.5	57.5	55.5
Actuated g/C Ratio	0.16	0.16	0.56	0.56	0.72	0.69
v/c Ratio	0.59	0.46	1.49	0.31	0.54	0.63
Control Delay	39.1	8.7	246.5	4.8	16.5	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	8.7	246.5	4.8	16.5	8.2
LOS	D	A	F	A	B	A
Approach Delay	23.1		224.1			9.0
Approach LOS	C		F			A
90th %ile Green (s)	17.9	17.9	36.0	36.0	12.1	50.6
90th %ile Term Code	Gap	Gap	Coord	Coord	Max	Coord
70th %ile Green (s)	15.0	15.0	42.2	42.2	8.8	53.5
70th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord

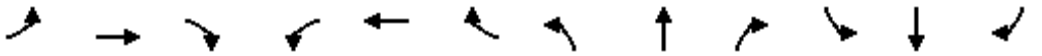
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
50th %ile Green (s)	13.0	13.0	45.3	45.3	7.7	55.5
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	10.9	10.9	48.1	48.1	7.0	57.6
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	8.0	8.0	51.0	51.0	7.0	60.5
10th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
Queue Length 50th (ft)	80	2	~1078	19	21	171
Queue Length 95th (ft)	131	51	#1329	73	77	300
Internal Link Dist (ft)	188		231			2080
Turn Bay Length (ft)				306	230	
Base Capacity (vph)	508	586	1969	974	285	2457
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.32	1.49	0.31	0.54	0.63

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.49			
Intersection Signal Delay: 141.2		Intersection LOS: F	
Intersection Capacity Utilization 103.0%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: SH 82 & Blake Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	361	14	443	48	6	11	131	838	12	13	1344	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	0.99	0.99				0.97	1.00		0.97
Frt			0.850		0.905				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1667	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.114	0.110		0.624			0.053			0.280		
Satd. Flow (perm)	202	195	1554	1150	1667	0	99	3539	1534	519	3539	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			342		12				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	6		3	6		3	6		3	6		3
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	204	203	482	52	19	0	142	911	13	14	1461	59
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	4	4	4					2	2		2	2
Act Effct Green (s)	35.1	35.1	35.1	12.7	12.7		99.7	94.1	80.3	87.7	80.3	94.1
Actuated g/C Ratio	0.22	0.22	0.22	0.08	0.08		0.62	0.59	0.50	0.55	0.50	0.59
v/c Ratio	4.64	4.83	0.79	0.57	0.13		0.69	0.44	0.02	0.04	0.82	0.06
Control Delay	1709.6	1779.4	28.2	93.7	39.2		72.5	15.2	0.0	9.3	32.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1709.6	1779.4	28.2	93.7	39.2		72.5	15.2	0.0	9.3	32.7	0.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	C	F	D		E	B	A	A	C	A
Approach Delay		813.9			79.1			22.7			31.2	
Approach LOS		F			E			C			C	
90th %ile Green (s)	22.5	22.5	22.5	18.6	18.6		19.6	91.8	78.8	6.6	78.8	91.8
90th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
70th %ile Green (s)	25.3	25.3	25.3	15.1	15.1		16.1	92.9	83.0	6.2	83.0	92.9
70th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	33.6	33.6	33.6	12.6	12.6		13.9	97.3	79.4	0.0	79.4	97.3
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	41.2	41.2	41.2	10.1	10.1		11.7	92.2	76.5	0.0	76.5	92.2
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	52.8	52.8	52.8	0.0	0.0		8.6	96.2	83.6	0.0	83.6	96.2
10th %ile Term Code	Max	Max	Max	Skip	Skip		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~377	~378	149	53	7		101	160	0	3	698	1
Queue Length 95th (ft)	#595	#595	#395	100	35		182	174	m0	m8	284	4
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	607	194	291		275	2080	823	337	1775	938
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	4.64	4.83	0.79	0.27	0.07		0.52	0.44	0.02	0.04	0.82	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 4.83	
Intersection Signal Delay: 225.1	Intersection LOS: F
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	20	256	48	30	13	440	1570	119	18	876	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.99	1.00	1.00		1.00		0.98	1.00		0.98
Frt			0.850		0.955				0.850			0.850
Flt Protected	0.950	0.968		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1713	1583	1770	1771	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.214	0.177		0.714			0.146			0.171		
Satd. Flow (perm)	378	313	1563	1329	1771	0	272	3539	1546	318	3539	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			257		14				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	1		1	1		1	2		2	2		2
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
Shared Lane Traffic (%)	40%											
Lane Group Flow (vph)	62	64	278	52	47	0	478	1707	129	20	952	79
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	6	6	6					1	1		1	1
Act Effct Green (s)	18.7	18.7	18.7	7.0	7.0		41.0	36.7	24.5	31.2	24.5	36.7
Actuated g/C Ratio	0.23	0.23	0.23	0.09	0.09		0.51	0.46	0.31	0.39	0.31	0.46
v/c Ratio	0.70	0.88	0.49	0.45	0.28		1.33	1.05	0.22	0.09	0.88	0.10
Control Delay	68.7	109.1	7.7	47.5	30.9		183.8	55.1	3.4	13.8	36.5	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	109.1	7.7	47.5	30.9		183.8	55.1	3.4	13.8	36.5	3.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	F	A	D	C		F	E	A	B	D	A
Approach Delay		33.1			39.7			78.8			33.6	
Approach LOS		C			D			E			C	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	19.8	19.8	19.8	7.0	7.0		8.2	36.7	24.5	0.0	24.5	36.7
30th %ile Term Code	Gap	Gap	Gap	Min	Min		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	10.9	10.9	10.9	0.0	0.0		29.6	58.1	24.5	0.0	24.5	58.1
10th %ile Term Code	Gap	Gap	Gap	Skip	Skip		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	28	31	8	25	16		~311	~534	10	6	258	2
Queue Length 95th (ft)	#93	#106	65	#62	48		m#369	m#716	m15	m18	#347	m12
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	99	82	599	116	167		359	1621	587	218	1083	797
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.78	0.46	0.45	0.28		1.33	1.05	0.22	0.09	0.88	0.10

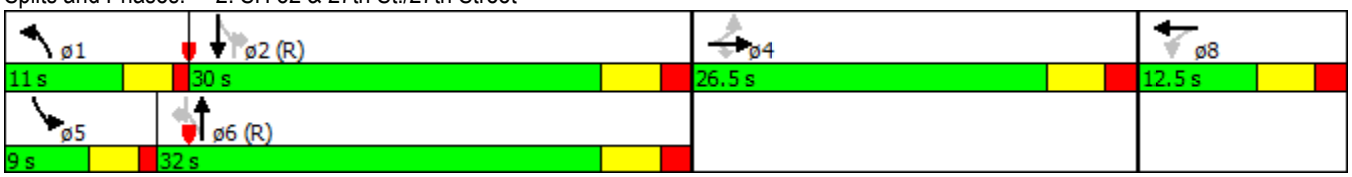
Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 60.7	Intersection LOS: E
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

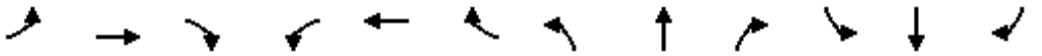
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	361	14	443	38	6	11	131	798	2	13	1304	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	0.99	0.99				0.97	1.00		0.97
Frt			0.850		0.905				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1667	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.106	0.102		0.624			0.057			0.298		
Satd. Flow (perm)	188	180	1554	1150	1667	0	106	3539	1534	553	3539	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			358		12				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	6		3	6		3	6		3	6		3
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	204	203	482	41	19	0	142	867	2	14	1417	59
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	4	4	4					2	2		2	2
Act Effct Green (s)	37.9	37.9	37.9	11.3	11.3		98.2	92.6	78.6	86.1	78.6	92.6
Actuated g/C Ratio	0.24	0.24	0.24	0.07	0.07		0.61	0.58	0.49	0.54	0.49	0.58
v/c Ratio	4.64	4.83	0.75	0.51	0.15		0.67	0.42	0.00	0.04	0.82	0.06
Control Delay	1699.9	1779.4	23.5	91.6	40.7		70.3	15.8	0.0	9.6	32.5	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1699.9	1779.4	23.5	91.6	40.7		70.3	15.8	0.0	9.6	32.5	0.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	C	F	D		E	B	A	A	C	A
Approach Delay		809.1			75.5			23.4			31.0	
Approach LOS		F			E			C			C	
90th %ile Green (s)	22.5	22.5	22.5	16.4	16.4		19.6	94.0	81.0	6.6	81.0	94.0
90th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
70th %ile Green (s)	30.5	30.5	30.5	13.3	13.3		16.4	89.5	79.3	6.2	79.3	89.5
70th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	39.3	39.3	39.3	11.1	11.1		14.3	93.1	74.8	0.0	74.8	93.1
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	43.2	43.2	43.2	8.9	8.9		11.8	91.4	75.6	0.0	75.6	91.4
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	54.1	54.1	54.1	0.0	0.0		8.7	94.9	82.2	0.0	82.2	94.9
10th %ile Term Code	Max	Max	Max	Skip	Skip		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~368	~370	122	42	7		102	166	0	4	697	1
Queue Length 95th (ft)	#600	#600	#364	84	35		177	155	m0	m7	259	4
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	641	194	291		278	2047	809	349	1738	924
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	4.64	4.83	0.75	0.21	0.07		0.51	0.42	0.00	0.04	0.82	0.06

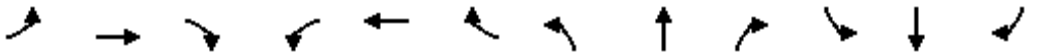
Intersection Summary	
Area Type:	Other
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 4.83	
Intersection Signal Delay: 230.1	Intersection LOS: F
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	20	256	33	30	13	440	1505	104	18	811	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.99	1.00	1.00		1.00		0.98	1.00		0.98
Frt			0.850		0.955				0.850			0.850
Flt Protected	0.950	0.968		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1713	1583	1770	1771	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.214	0.177		0.714			0.146			0.171		
Satd. Flow (perm)	378	313	1563	1329	1771	0	272	3539	1546	318	3539	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			278		14				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	1		1	1		1	2		2	2		2
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
Shared Lane Traffic (%)	40%											
Lane Group Flow (vph)	62	64	278	36	47	0	478	1636	113	20	882	79
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	6	6	6					1	1		1	1
Act Effct Green (s)	18.7	18.7	18.7	7.0	7.0		41.0	36.7	24.5	31.2	24.5	36.7
Actuated g/C Ratio	0.23	0.23	0.23	0.09	0.09		0.51	0.46	0.31	0.39	0.31	0.46
v/c Ratio	0.70	0.88	0.48	0.31	0.28		1.33	1.01	0.19	0.09	0.81	0.10
Control Delay	68.7	109.1	6.3	41.8	30.9		185.9	43.4	3.1	14.3	33.5	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	109.1	6.3	41.8	30.9		185.9	43.4	3.1	14.3	33.5	4.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	F	A	D	C		F	D	A	B	C	A
Approach Delay		32.2			35.7			72.0			30.7	
Approach LOS		C			D			E			C	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	19.8	19.8	19.8	7.0	7.0		8.2	36.7	24.5	0.0	24.5	36.7
30th %ile Term Code	Gap	Gap	Gap	Min	Min		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	10.9	10.9	10.9	0.0	0.0		29.6	58.1	24.5	0.0	24.5	58.1
10th %ile Term Code	Gap	Gap	Gap	Skip	Skip		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	28	31	0	17	16		~309	~494	6	7	251	2
Queue Length 95th (ft)	#93	#106	56	46	48		m#424	#742	m14	m18	#284	m12
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	99	82	615	116	167		359	1621	587	218	1083	797
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.78	0.45	0.31	0.28		1.33	1.01	0.19	0.09	0.81	0.10

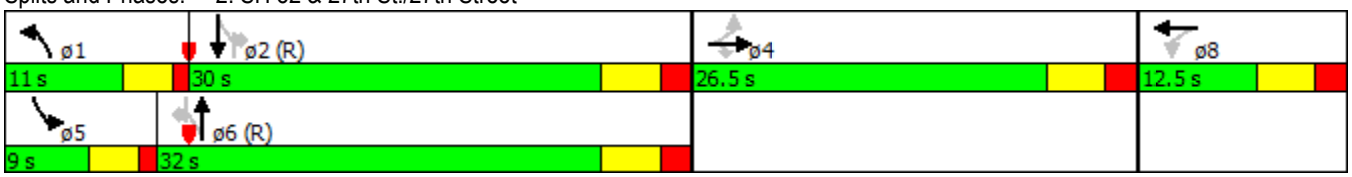
Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 55.9	Intersection LOS: E
Intersection Capacity Utilization 69.4%	ICU Level of Service C
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	361	15	443	66	9	16	131	838	20	15	1344	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	0.99	0.99				0.97	1.00		0.97
Frt			0.850		0.906				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1669	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.123	0.118		0.624			0.049			0.277		
Satd. Flow (perm)	218	209	1554	1150	1669	0	91	3539	1534	514	3539	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			317		17				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	6		3	6		3	6		3	6		3
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	204	204	482	72	27	0	142	911	22	16	1461	59
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	4	4	4					2	2		2	2
Act Effct Green (s)	32.5	32.5	32.5	15.3	15.3		97.2	91.5	77.8	85.4	77.8	91.5
Actuated g/C Ratio	0.20	0.20	0.20	0.10	0.10		0.61	0.57	0.49	0.53	0.49	0.57
v/c Ratio	4.64	4.86	0.85	0.66	0.15		0.71	0.45	0.03	0.05	0.85	0.06
Control Delay	1709.6	1800.5	35.7	95.5	35.2		79.4	16.0	0.1	9.9	35.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1709.6	1800.5	35.7	95.5	35.2		79.4	16.0	0.1	9.9	35.3	0.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	D	F	D		E	B	A	A	D	A
Approach Delay		823.9			79.1			24.0			33.8	
Approach LOS		F			E			C			C	
90th %ile Green (s)	22.5	22.5	22.5	22.5	22.5		19.7	87.7	74.8	6.8	74.8	87.7
90th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
70th %ile Green (s)	22.8	22.8	22.8	18.2	18.2		15.9	92.2	82.6	6.3	82.6	92.2
70th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	31.8	31.8	31.8	15.3	15.3		13.8	96.4	78.6	0.0	78.6	96.4
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	39.9	39.9	39.9	12.4	12.4		11.6	91.2	75.6	0.0	75.6	91.2
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	45.5	45.5	45.5	8.2	8.2		8.3	89.8	77.5	0.0	77.5	89.8
10th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~415	~417	184	74	10		105	154	0	4	706	2
Queue Length 95th (ft)	#590	#593	#442	127	41		187	176	0	m9	289	5
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	568	194	295		270	2023	802	327	1721	914
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	4.64	4.86	0.85	0.37	0.09		0.53	0.45	0.03	0.05	0.85	0.06

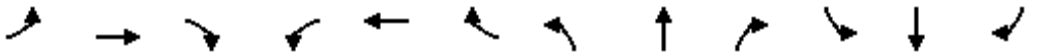
Intersection Summary	
Area Type:	Other
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 4.86	
Intersection Signal Delay: 227.4	Intersection LOS: F
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



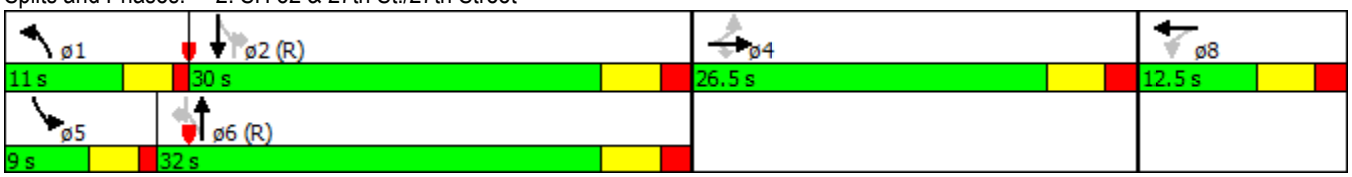
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	24	256	61	32	16	440	1570	140	23	876	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.99	1.00	0.99		1.00		0.98	1.00		0.98
Frt			0.850		0.951				0.850			0.850
Flt Protected	0.950	0.970		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1717	1583	1770	1763	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.211	0.170		0.711			0.146			0.171		
Satd. Flow (perm)	373	301	1563	1323	1763	0	272	3539	1546	318	3539	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			238		17				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	1		1	1		1	2		2	2		2
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
Shared Lane Traffic (%)	39%											
Lane Group Flow (vph)	63	67	278	66	52	0	478	1707	152	25	952	79
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	6	6	6					1	1		1	1
Act Effct Green (s)	19.0	19.0	19.0	7.1	7.1		40.6	36.3	24.5	31.1	24.5	36.3
Actuated g/C Ratio	0.24	0.24	0.24	0.09	0.09		0.51	0.45	0.31	0.39	0.31	0.45
v/c Ratio	0.72	0.94	0.50	0.56	0.30		1.36	1.06	0.26	0.12	0.88	0.10
Control Delay	71.0	126.5	8.9	55.5	30.5		196.0	58.5	4.5	13.9	36.4	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.0	126.5	8.9	55.5	30.5		196.0	58.5	4.5	13.9	36.4	3.8

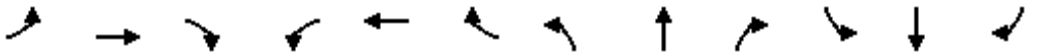
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	F	A	E	C		F	E	A	B	D	A
Approach Delay		37.8			44.5			83.1			33.4	
Approach LOS		D			D			F			C	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	20.5	20.5	20.5	7.5	7.5		7.0	35.5	24.5	0.0	24.5	35.5
30th %ile Term Code	Gap	Gap	Gap	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	11.4	11.4	11.4	0.0	0.0		29.1	57.6	24.5	0.0	24.5	57.6
10th %ile Term Code	Gap	Gap	Gap	Skip	Skip		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	29	33	15	32	17		~310	~535	18	8	255	2
Queue Length 95th (ft)	#96	#112	76	#87	50		m#363	m#706	m21	m21	#348	m12
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	97	79	585	117	171		351	1606	587	215	1083	791
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.85	0.48	0.56	0.30		1.36	1.06	0.26	0.12	0.88	0.10

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.36
Intersection Signal Delay: 63.8 Intersection LOS: E
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	361	15	443	47	9	16	131	798	6	15	1304	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	0.99	0.99				0.97	1.00		0.97
Frt			0.850		0.906				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1669	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.107	0.103		0.624			0.055			0.296		
Satd. Flow (perm)	189	182	1554	1150	1669	0	102	3539	1534	549	3539	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			344		17				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	6		3	6		3	6		3	6		3
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	204	204	482	51	27	0	142	867	7	16	1417	59
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	4	4	4					2	2		2	2
Act Effct Green (s)	37.4	37.4	37.4	12.5	12.5		97.5	91.8	77.9	85.5	77.9	91.8
Actuated g/C Ratio	0.23	0.23	0.23	0.08	0.08		0.61	0.57	0.49	0.53	0.49	0.57
v/c Ratio	4.64	4.86	0.77	0.57	0.18		0.68	0.43	0.01	0.05	0.82	0.06
Control Delay	1719.2	1800.4	25.9	93.5	37.9		73.3	15.9	0.0	9.9	33.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1719.2	1800.4	25.9	93.5	37.9		73.3	15.9	0.0	9.9	33.3	0.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	C	F	D		E	B	A	A	C	A
Approach Delay		820.8			74.3			23.8			31.8	
Approach LOS		F			E			C			C	
90th %ile Green (s)	22.5	22.5	22.5	18.4	18.4		19.6	91.9	79.0	6.7	79.0	91.9
90th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
70th %ile Green (s)	29.3	29.3	29.3	14.9	14.9		16.3	89.0	79.0	6.3	79.0	89.0
70th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	38.5	38.5	38.5	12.4	12.4		14.2	92.6	74.4	0.0	74.4	92.6
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	42.7	42.7	42.7	10.0	10.0		11.8	90.8	75.0	0.0	75.0	90.8
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	54.1	54.1	54.1	0.0	0.0		8.7	94.9	82.2	0.0	82.2	94.9
10th %ile Term Code	Max	Max	Max	Skip	Skip		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~370	~373	140	53	10		104	164	0	4	701	2
Queue Length 95th (ft)	#598	#601	#391	99	43		179	155	m0	m9	260	4
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	627	194	295		275	2031	802	345	1723	917
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	4.64	4.86	0.77	0.26	0.09		0.52	0.43	0.01	0.05	0.82	0.06

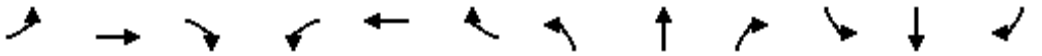
Intersection Summary	
Area Type:	Other
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 4.86	
Intersection Signal Delay: 232.4	Intersection LOS: F
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	24	256	40	32	16	440	1505	115	23	811	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00	0.99	1.00	0.99		1.00		0.98	1.00		0.98
Frt			0.850		0.951				0.850			0.850
Flt Protected	0.950	0.970		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1717	1583	1770	1763	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.211	0.170		0.714			0.146			0.171		
Satd. Flow (perm)	373	301	1563	1329	1763	0	272	3539	1546	318	3539	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			275		17				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
Confl. Peds. (#/hr)	1		1	1		1	2		2	2		2
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
Shared Lane Traffic (%)	39%											
Lane Group Flow (vph)	63	67	278	43	52	0	478	1636	125	25	882	79
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	6	6	6					1	1		1	1
Act Effct Green (s)	19.0	19.0	19.0	7.0	7.0		40.7	36.4	24.5	31.2	24.5	36.4
Actuated g/C Ratio	0.24	0.24	0.24	0.09	0.09		0.51	0.46	0.31	0.39	0.31	0.46
v/c Ratio	0.72	0.94	0.48	0.37	0.31		1.35	1.02	0.21	0.11	0.81	0.10
Control Delay	71.0	126.5	6.5	44.1	30.6		194.5	45.0	3.5	14.4	33.5	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.0	126.5	6.5	44.1	30.6		194.5	45.0	3.5	14.4	33.5	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	F	A	D	C		F	D	A	B	C	A
Approach Delay		36.1			36.7			74.6			30.7	
Approach LOS		D			D			E			C	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	20.5	20.5	20.5	7.0	7.0		7.5	36.0	24.5	0.0	24.5	36.0
30th %ile Term Code	Gap	Gap	Gap	Min	Min		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	11.4	11.4	11.4	0.0	0.0		29.1	57.6	24.5	0.0	24.5	57.6
10th %ile Term Code	Gap	Gap	Gap	Skip	Skip		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	29	33	1	21	17		~309	~494	10	9	251	2
Queue Length 95th (ft)	#96	#112	57	52	50		m#418	#742	m17	m21	#284	m12
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	97	79	613	116	169		354	1611	587	218	1083	793
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.85	0.45	0.37	0.31		1.35	1.02	0.21	0.11	0.81	0.10

Intersection Summary

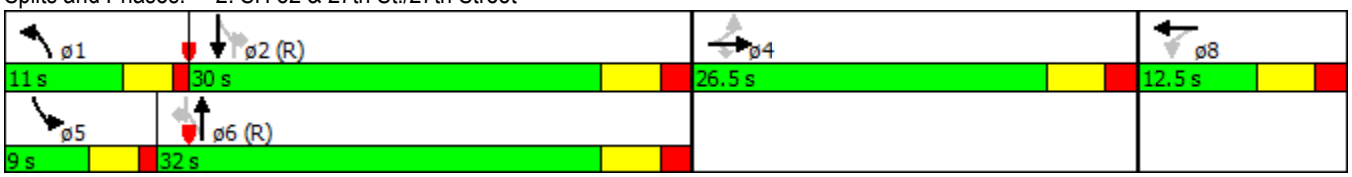
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 57.8 Intersection LOS: E
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15

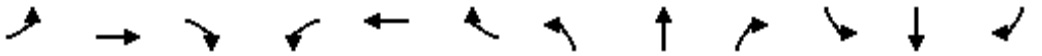
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	547	22	671	73	9	16	198	1270	18	20	2037	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.906				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1688	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.178	0.171		0.563			0.047			0.140		
Satd. Flow (perm)	315	303	1583	1049	1688	0	88	3539	1583	261	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			303		17				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	309	310	729	79	27	0	215	1380	20	22	2214	89
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	22.5	22.5	22.5	17.3	17.3		105.2	97.3	80.5	88.2	80.5	97.3
Actuated g/C Ratio	0.14	0.14	0.14	0.11	0.11		0.66	0.61	0.50	0.55	0.50	0.61
v/c Ratio	7.02	7.38	1.51	0.70	0.14		0.83	0.64	0.02	0.11	1.24	0.09
Control Delay	2765.8	2928.5	264.4	97.8	33.5		58.9	40.4	0.1	14.9	142.6	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2765.8	2928.5	264.4	97.8	33.5		58.9	40.4	0.1	14.9	142.6	6.1
LOS	F	F	F	F	C		E	D	A	B	F	A
Approach Delay		1450.5			81.4			42.3			136.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			D			F	
90th %ile Green (s)	22.5	22.5	22.5	25.4	25.4		22.1	84.3	69.5	7.3	69.5	84.3
90th %ile Term Code	Max	Max	Max	Gap	Gap		Max	Coord	Coord	Gap	Coord	Coord
70th %ile Green (s)	22.5	22.5	22.5	20.6	20.6		23.9	89.8	72.5	6.6	72.5	89.8
70th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	22.5	22.5	22.5	17.3	17.3		20.4	93.6	79.3	6.1	79.3	93.6
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	22.5	22.5	22.5	14.0	14.0		17.1	107.0	85.9	0.0	85.9	107.0
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	22.5	22.5	22.5	9.2	9.2		12.5	111.8	95.3	0.0	95.3	111.8
10th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~654	~625	~774	81	10		168	665	0	7	~1504	3
Queue Length 95th (ft)	#831	#837	#1031	136	40		#286	870	m0	m20	#1763	m38
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	483	177	298		283	2152	850	207	1780	994
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	7.02	7.38	1.51	0.45	0.09		0.76	0.64	0.02	0.11	1.24	0.09

Intersection Summary

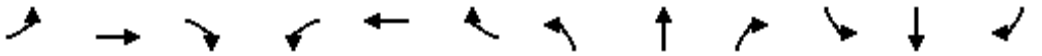
Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 7.38
Intersection Signal Delay: 435.5 Intersection LOS: F
Intersection Capacity Utilization 117.4% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



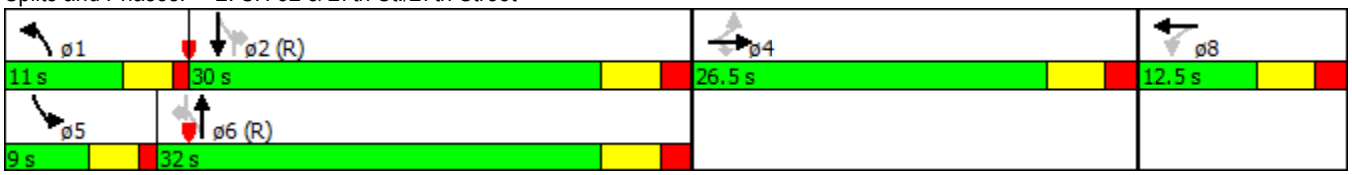
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	31	387	73	45	20	667	2379	180	27	1328	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.954				0.850			0.850
Flt Protected	0.950	0.968		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1713	1583	1770	1777	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.190	0.157		0.714			0.146			0.171		
Satd. Flow (perm)	336	278	1583	1330	1777	0	272	3539	1583	319	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			215		22				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	40%											
Lane Group Flow (vph)	95	98	421	79	71	0	725	2586	196	29	1443	121
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	21.0	21.0	21.0	7.0	7.0		38.7	34.4	24.5	31.1	24.5	34.4
Actuated g/C Ratio	0.26	0.26	0.26	0.09	0.09		0.48	0.43	0.31	0.39	0.31	0.43
v/c Ratio	1.08	1.36	0.73	0.68	0.41		2.35	1.70	0.33	0.13	1.33	0.16
Control Delay	154.3	259.7	21.7	66.0	33.2		624.3	334.1	4.2	12.3	182.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	154.3	259.7	21.7	66.0	33.2		624.3	334.1	4.2	12.3	182.9	5.3
LOS	F	F	C	E	C		F	F	A	B	F	A
Approach Delay		80.2			50.5			375.7			166.3	

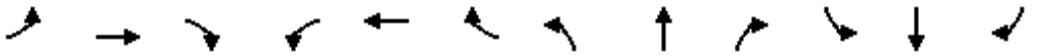
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			F			F	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
30th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	21.0	21.0	21.0	0.0	0.0		19.5	48.0	24.5	0.0	24.5	48.0
10th %ile Term Code	Max	Max	Max	Skip	Skip		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~56	~68	91	39	23		~570	~1033	27	9	~501	6
Queue Length 95th (ft)	#154	#166	#207	#107	63		m#362	m#696	m15	m15	#647	m41
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	88	72	574	116	175		309	1521	598	216	1083	774
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.36	0.73	0.68	0.41		2.35	1.70	0.33	0.13	1.33	0.16

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.35
Intersection Signal Delay: 279.5 Intersection LOS: F
Intersection Capacity Utilization 97.7% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street





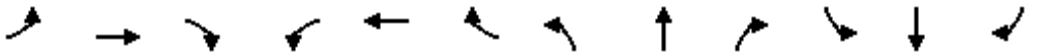
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	547	22	671	63	9	16	198	1230	8	20	1997	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.906				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1688	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.178	0.171		0.563			0.047			0.157		
Satd. Flow (perm)	315	303	1583	1049	1688	0	88	3539	1583	292	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			316		17				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	309	310	729	68	27	0	215	1337	9	22	2171	89
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	22.5	22.5	22.5	15.7	15.7		106.8	98.9	81.7	89.5	81.7	98.9
Actuated g/C Ratio	0.14	0.14	0.14	0.10	0.10		0.67	0.62	0.51	0.56	0.51	0.62
v/c Ratio	7.02	7.38	1.48	0.67	0.15		0.81	0.61	0.01	0.10	1.20	0.09
Control Delay	2765.8	2928.5	249.3	97.6	34.8		57.8	35.5	0.0	14.3	124.5	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2765.8	2928.5	249.3	97.6	34.8		57.8	35.5	0.0	14.3	124.5	6.1
LOS	F	F	F	F	C		E	D	A	B	F	A
Approach Delay		1442.3			79.8			38.4			118.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			D			F	
90th %ile Green (s)	22.5	22.5	22.5	23.2	23.2		24.3	86.5	69.5	7.3	69.5	86.5
90th %ile Term Code	Max	Max	Max	Gap	Gap		Max	Coord	Coord	Gap	Coord	Coord
70th %ile Green (s)	22.5	22.5	22.5	18.8	18.8		23.7	91.6	74.5	6.6	74.5	91.6
70th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
50th %ile Green (s)	22.5	22.5	22.5	15.7	15.7		20.4	95.2	80.9	6.1	80.9	95.2
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	22.5	22.5	22.5	12.5	12.5		17.1	108.5	87.4	0.0	87.4	108.5
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	22.5	22.5	22.5	8.2	8.2		12.5	112.8	96.3	0.0	96.3	112.8
10th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~654	~625	~749	70	10		167	619	0	7	~1434	3
Queue Length 95th (ft)	#831	#837	#1006	122	41		266	791	m0	m21	#1714	m39
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	494	177	298		289	2187	862	225	1807	1010
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	7.02	7.38	1.48	0.38	0.09		0.74	0.61	0.01	0.10	1.20	0.09

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 7.38
Intersection Signal Delay: 431.9 Intersection LOS: F
Intersection Capacity Utilization 116.3% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	31	387	58	45	20	667	2314	165	27	1263	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.954				0.850			0.850
Flt Protected	0.950	0.968		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1713	1583	1770	1777	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.190	0.157		0.714			0.146			0.171		
Satd. Flow (perm)	336	278	1583	1330	1777	0	272	3539	1583	319	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			233		22				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	40%											
Lane Group Flow (vph)	95	98	421	63	71	0	725	2515	179	29	1373	121
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	21.0	21.0	21.0	7.0	7.0		38.7	34.4	24.5	31.1	24.5	34.4
Actuated g/C Ratio	0.26	0.26	0.26	0.09	0.09		0.48	0.43	0.31	0.39	0.31	0.43
v/c Ratio	1.08	1.36	0.72	0.54	0.41		2.35	1.65	0.30	0.13	1.27	0.16
Control Delay	154.3	259.7	19.6	53.8	33.2		624.0	313.8	4.4	12.4	155.1	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	154.3	259.7	19.6	53.8	33.2		624.0	313.8	4.4	12.4	155.1	5.6
LOS	F	F	B	D	C		F	F	A	B	F	A
Approach Delay		78.8			42.9			363.4			140.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			F			F	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
30th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
30th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	21.0	21.0	21.0	0.0	0.0		19.5	48.0	24.5	0.0	24.5	48.0
10th %ile Term Code	Max	Max	Max	Skip	Skip		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~56	~68	81	31	23		~573	~1006	23	9	~461	6
Queue Length 95th (ft)	#154	#166	188	#82	63		m#392	m#732	m14	m17	#605	m43
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	88	72	587	116	175		309	1521	598	216	1083	774
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.36	0.72	0.54	0.41		2.35	1.65	0.30	0.13	1.27	0.16

Intersection Summary

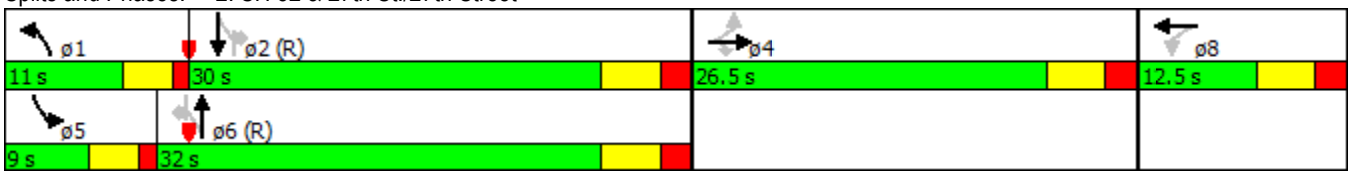
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.35
Intersection Signal Delay: 265.5 Intersection LOS: F
Intersection Capacity Utilization 95.9% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	547	23	671	91	12	21	198	1270	26	22	2037	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1684	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.178	0.171		0.563			0.049			0.134		
Satd. Flow (perm)	315	303	1583	1049	1684	0	91	3539	1583	250	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			282		23				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	309	311	729	99	36	0	215	1380	28	24	2214	89
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	22.5	22.5	22.5	19.8	19.8		102.7	94.9	78.4	86.0	78.4	94.9
Actuated g/C Ratio	0.14	0.14	0.14	0.12	0.12		0.64	0.59	0.49	0.54	0.49	0.59
v/c Ratio	7.02	7.40	1.57	0.76	0.16		0.84	0.66	0.03	0.12	1.28	0.09
Control Delay	2765.8	2939.1	292.1	100.6	30.5		60.3	42.5	0.7	16.2	157.7	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2765.8	2939.1	292.1	100.6	30.5		60.3	42.5	0.7	16.2	157.7	6.4
LOS	F	F	F	F	C		E	D	A	B	F	A
Approach Delay		1469.0			81.9			44.2			150.5	
Approach LOS		F			F			D			F	
90th %ile Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	22.5	22.5	22.5	24.1	24.1		23.4	86.2	69.5	6.7	69.5	86.2
70th %ile Term Code	Max	Max	Max	Gap	Gap		Max	Coord	Coord	Gap	Coord	Coord

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	22.5	22.5	22.5	20.3	20.3		20.4	90.5	76.3	6.2	76.3	90.5
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	22.5	22.5	22.5	16.6	16.6		17.1	104.4	83.3	0.0	83.3	104.4
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	22.5	22.5	22.5	11.2	11.2		12.5	109.8	93.3	0.0	93.3	109.8
10th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~654	~627	~814	102	12		168	670	0	8	~1543	3
Queue Length 95th (ft)	#831	#842	#1071	165	47		#303	871	m0	m22	#1764	m38
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	464	177	303		279	2098	831	197	1733	972
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	7.02	7.40	1.57	0.56	0.12		0.77	0.66	0.03	0.12	1.28	0.09

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 7.40
Intersection Signal Delay: 444.3 Intersection LOS: F
Intersection Capacity Utilization 117.4% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	35	387	86	47	23	667	2379	201	32	1328	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.951				0.850			0.850
Flt Protected	0.950	0.970		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1717	1583	1770	1771	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.190	0.154		0.689			0.140			0.163		
Satd. Flow (perm)	336	273	1583	1283	1771	0	261	3539	1583	304	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			203		24				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	39%											
Lane Group Flow (vph)	97	100	421	93	76	0	725	2586	218	35	1443	121
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	21.0	21.0	21.0	7.0	7.0		35.8	30.1	24.5	31.0	24.5	30.1
Actuated g/C Ratio	0.26	0.26	0.26	0.09	0.09		0.45	0.38	0.31	0.39	0.31	0.38
v/c Ratio	1.10	1.41	0.75	0.83	0.43		2.92	1.94	0.36	0.17	1.33	0.17
Control Delay	161.0	278.2	23.2	88.3	33.7		879.5	443.5	4.7	12.8	182.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.0	278.2	23.2	88.3	33.7		879.5	443.5	4.7	12.8	182.5	5.4
LOS	F	F	C	F	C		F	F	A	B	F	A
Approach Delay		86.1			63.8			506.0			165.3	
Approach LOS		F			E			F			F	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord

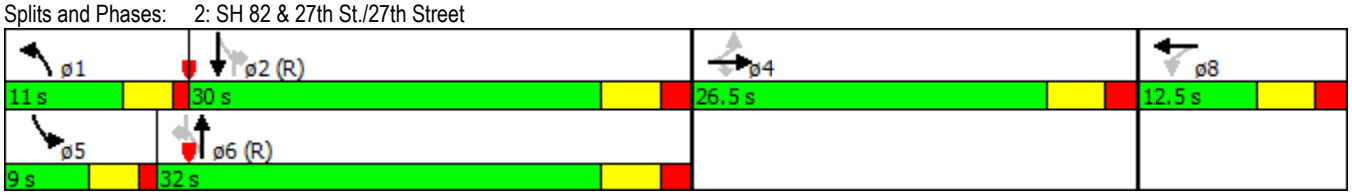
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
30th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
10th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~58	~71	98	47	25		~582	~1150	34	11	~502	6
Queue Length 95th (ft)	#156	#170	#234	#130	66		m#363	m#691	m18	m19	#646	m40
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	88	71	565	112	176		248	1331	598	209	1083	698
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.10	1.41	0.75	0.83	0.43		2.92	1.94	0.36	0.17	1.33	0.17

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.92
Intersection Signal Delay: 357.4 Intersection LOS: F
Intersection Capacity Utilization 97.8% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	547	23	671	72	12	21	198	1230	12	22	1997	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1692	1583	1770	1684	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.178	0.171		0.563			0.047			0.152		
Satd. Flow (perm)	315	303	1583	1049	1684	0	88	3539	1583	283	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			304		23				109			82
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	309	311	729	78	36	0	215	1337	13	24	2171	89
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	27.0	27.0	27.0	21.5	21.5		11.0	33.5	26.5	9.0	26.5	33.5
Total Split (s)	28.0	28.0	28.0	32.5	32.5		24.5	89.0	75.0	10.5	75.0	89.0
Total Split (%)	17.5%	17.5%	17.5%	20.3%	20.3%		15.3%	55.6%	46.9%	6.6%	46.9%	55.6%
Maximum Green (s)	22.5	22.5	22.5	27.0	27.0		20.5	83.5	69.5	6.5	69.5	83.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	22.5	22.5	22.5	17.2	17.2		105.3	97.4	80.6	88.4	80.6	97.4
Actuated g/C Ratio	0.14	0.14	0.14	0.11	0.11		0.66	0.61	0.50	0.55	0.50	0.61
v/c Ratio	7.02	7.40	1.51	0.70	0.18		0.83	0.62	0.02	0.11	1.22	0.09
Control Delay	2765.8	2939.1	264.3	97.6	32.1		59.7	37.7	0.0	14.9	132.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2765.8	2939.1	264.3	97.6	32.1		59.7	37.7	0.0	14.9	132.0	6.3
LOS	F	F	F	F	C		E	D	A	B	F	A
Approach Delay		1454.0			76.9			40.4			125.8	
Approach LOS		F			E			D			F	
90th %ile Green (s)	22.5	22.5	22.5	25.2	25.2		22.3	84.4	69.5	7.4	69.5	84.4
90th %ile Term Code	Max	Max	Max	Gap	Gap		Max	Coord	Coord	Gap	Coord	Coord
70th %ile Green (s)	22.5	22.5	22.5	20.5	20.5		23.9	89.8	72.6	6.7	72.6	89.8
70th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord

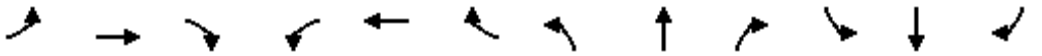
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	22.5	22.5	22.5	17.2	17.2		20.4	93.6	79.4	6.2	79.4	93.6
50th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Gap	Coord	Coord
30th %ile Green (s)	22.5	22.5	22.5	13.9	13.9		17.1	107.1	86.0	0.0	86.0	107.1
30th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	22.5	22.5	22.5	9.1	9.1		12.5	111.9	95.4	0.0	95.4	111.9
10th %ile Term Code	Max	Max	Max	Gap	Gap		Gap	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~654	~627	~772	80	12		168	630	0	7	~1453	3
Queue Length 95th (ft)	#831	#842	#1029	135	48		#285	794	m0	m23	#1714	m39
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	44	42	483	177	303		284	2153	851	219	1782	995
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	7.02	7.40	1.51	0.44	0.12		0.76	0.62	0.02	0.11	1.22	0.09

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 7.40
Intersection Signal Delay: 436.9 Intersection LOS: F
Intersection Capacity Utilization 116.3% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



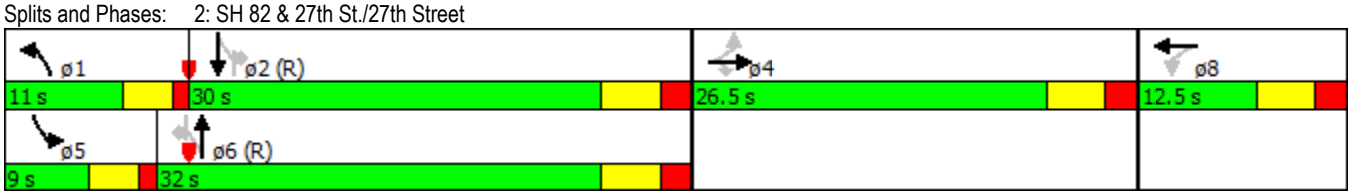
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	35	387	65	47	23	667	2314	176	32	1263	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.951				0.850			0.850
Flt Protected	0.950	0.970		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1717	1583	1770	1771	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.190	0.154		0.714			0.146			0.171		
Satd. Flow (perm)	336	273	1583	1330	1771	0	272	3539	1583	319	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			224		24				164			164
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		714			252			2160			1652	
Travel Time (s)		16.2			5.7			49.1			37.5	
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
Shared Lane Traffic (%)	39%											
Lane Group Flow (vph)	97	100	421	71	76	0	725	2515	191	35	1373	121
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	custom	pm+pt	NA	custom
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8			6		2	2		6
Detector Phase	4	4	4	8	8		1	6	2	5	2	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	20.0	20.0	5.0	20.0	20.0
Minimum Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	26.5	9.0	26.5	32.0
Total Split (s)	26.5	26.5	26.5	12.5	12.5		11.0	32.0	30.0	9.0	30.0	32.0
Total Split (%)	33.1%	33.1%	33.1%	15.6%	15.6%		13.8%	40.0%	37.5%	11.3%	37.5%	40.0%
Maximum Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.0	3.5	3.5	3.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5		4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min	C-Min	None	C-Min	C-Min
Walk Time (s)	4.0	4.0	4.0					14.0	4.0		4.0	14.0
Flash Dont Walk (s)	17.0	17.0	17.0					14.0	17.0		17.0	14.0
Pedestrian Calls (#/hr)	0	0	0					0	0		0	0
Act Effct Green (s)	21.0	21.0	21.0	7.0	7.0		38.3	32.6	24.5	31.1	24.5	32.6
Actuated g/C Ratio	0.26	0.26	0.26	0.09	0.09		0.48	0.41	0.31	0.39	0.31	0.41
v/c Ratio	1.10	1.41	0.73	0.61	0.43		2.35	1.74	0.32	0.16	1.27	0.16
Control Delay	161.0	278.2	20.7	59.4	33.7		628.2	354.9	4.7	12.8	155.1	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.0	278.2	20.7	59.4	33.7		628.2	354.9	4.7	12.8	155.1	5.7
LOS	F	F	C	E	C		F	F	A	B	F	A
Approach Delay		84.4			46.1			393.1			140.0	
Approach LOS		F			D			F			F	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
70th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
50th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
30th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	35.5	24.5	0.0	24.5	35.5
30th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Skip	Coord	Coord
10th %ile Green (s)	21.0	21.0	21.0	0.0	0.0		19.5	48.0	24.5	0.0	24.5	48.0
10th %ile Term Code	Max	Max	Max	Skip	Skip		Max	Coord	Coord	Skip	Coord	Coord
Queue Length 50th (ft)	~58	~71	86	35	25		~581	~1123	27	11	~460	6
Queue Length 95th (ft)	#156	#170	#195	#95	66		m#385	m#721	m16	m20	#606	m43
Internal Link Dist (ft)		634			172			2080			1572	
Turn Bay Length (ft)	110			110			300		264	416		280
Base Capacity (vph)	88	71	580	116	176		308	1442	598	216	1083	742
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	1.10	1.41	0.73	0.61	0.43		2.35	1.74	0.32	0.16	1.27	0.16

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.35
Intersection Signal Delay: 283.3 Intersection LOS: F
Intersection Capacity Utilization 96.0% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SH 82 & 27th St./27th Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	8	5	84	25	40	12	1123	76	48	1369	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00				0.98
Frt		0.946			0.908			0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1753	0	1770	1677	0	1770	3498	0	1770	3539	1583
Flt Permitted	0.711			0.601			0.130			0.157		
Satd. Flow (perm)	1322	1753	0	1117	1677	0	242	3498	0	292	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			41			8				88
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	1		1	1		1	1		2	2		1
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	14	0	91	70	0	13	1304	0	52	1488	208
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		2			1			1			2	1
Act Effct Green (s)	25.2	12.6		25.8	10.7		117.7	112.5		120.9	117.3	112.5
Actuated g/C Ratio	0.16	0.08		0.16	0.07		0.74	0.70		0.76	0.73	0.70
v/c Ratio	0.49	0.10		0.36	0.47		0.06	0.53		0.18	0.57	0.19
Control Delay	64.1	48.5		57.5	42.7		5.2	9.2		7.5	12.8	6.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.1	48.5		57.5	42.7		5.2	9.2		7.5	12.8	6.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	D		E	D		A	A		A	B	A
Approach Delay		62.5			51.1			9.1			11.9	
Approach LOS		E			D			A			B	
90th %ile Green (s)	19.4	24.3		16.1	21.0		6.5	94.6		8.5	96.6	94.6
90th %ile Term Code	Gap	Hold		Gap	Ped		Gap	Coord		Gap	Coord	Coord
70th %ile Green (s)	16.5	12.4		14.4	10.3		5.9	109.7		7.0	110.8	109.7
70th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
50th %ile Green (s)	16.8	12.4		12.6	8.2		0.0	111.9		6.6	122.5	111.9
50th %ile Term Code	Gap	Hold		Gap	Gap		Skip	Coord		Gap	Coord	Coord
30th %ile Green (s)	14.1	0.0		25.1	7.0		0.0	116.3		6.1	126.4	116.3
30th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	10.5	0.0		21.5	7.0		0.0	130.0		0.0	130.0	130.0
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	115	9		83	30		2	172		12	295	38
Queue Length 95th (ft)	161	31		124	79		m7	m276		33	620	97
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	263	241		260	255		278	2474		314	2597	1118
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.47	0.06		0.35	0.27		0.05	0.53		0.17	0.57	0.19

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 60.0% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	18	2	151	89	44	7	1524	46	50	802	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	1.00				0.98
Frt		0.986			0.950			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1834	0	1770	1761	0	1770	3523	0	1770	3539	1583
Flt Permitted				0.588			0.282			0.090		
Satd. Flow (perm)	1859	1834	0	1093	1761	0	525	3523	0	168	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			24			6				299
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	22	0	164	145	0	8	1707	0	54	872	299
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		6			1			1			3	1
Act Effct Green (s)	10.7	7.0		17.9	7.5		50.1	46.6		51.7	50.2	46.6
Actuated g/C Ratio	0.13	0.09		0.22	0.09		0.63	0.58		0.65	0.63	0.58
v/c Ratio	0.76	0.14		0.44	0.78		0.02	0.83		0.26	0.39	0.29
Control Delay	54.7	33.8		34.3	59.1		4.7	17.8		7.3	8.1	1.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	54.7	33.8		34.3	59.1		4.7	17.8		7.3	8.1	1.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		C	E		A	B		A	A	A
Approach Delay		52.4			45.9			17.7			6.5	
Approach LOS		D			D			B			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Ped		Max	Ped		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
50th %ile Green (s)	5.4	0.0		16.4	7.0		0.0	46.1		5.0	55.1	46.1
50th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	13.7	0.0		26.9	9.2		0.0	44.6		0.0	44.6	44.6
30th %ile Term Code	Gap	Skip		Hold	Max		Skip	Coord		Skip	Coord	Coord
10th %ile Green (s)	10.6	0.0		22.1	7.5		0.0	49.4		0.0	49.4	49.4
10th %ile Term Code	Gap	Skip		Hold	Gap		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~129	9		72	60		1	130		7	80	0
Queue Length 95th (ft)	#158	31		#130	#161		m1	m222		16	155	30
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	240	162		371	187		408	2075		210	2238	1032
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.76	0.14		0.44	0.78		0.02	0.82		0.26	0.39	0.29

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 18.3 Intersection LOS: B
Intersection Capacity Utilization 71.4% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

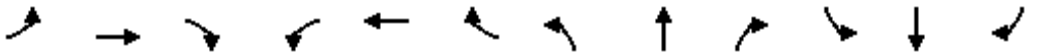
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	8	5	64	25	40	12	1103	56	48	1349	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00				0.98
Frt		0.946			0.908			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1753	0	1770	1677	0	1770	3510	0	1770	3539	1583
Flt Permitted	0.661			0.675			0.135			0.167		
Satd. Flow (perm)	1229	1753	0	1255	1677	0	251	3510	0	311	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			41			6				89
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	1		1	1		1	1		2	2		1
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	14	0	70	70	0	13	1260	0	52	1466	208
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		2			1			1			2	1
Act Effct Green (s)	25.8	13.8		24.6	10.7		117.7	112.5		120.9	117.2	112.5
Actuated g/C Ratio	0.16	0.09		0.15	0.07		0.74	0.70		0.76	0.73	0.70
v/c Ratio	0.49	0.09		0.28	0.47		0.05	0.51		0.18	0.57	0.19
Control Delay	64.2	46.9		55.5	42.7		5.2	9.1		7.4	12.7	6.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.2	46.9		55.5	42.7		5.2	9.1		7.4	12.7	6.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	D		E	D		A	A		A	B	A
Approach Delay		62.4			49.1			9.1			11.8	
Approach LOS		E			D			A			B	
90th %ile Green (s)	19.4	26.5		13.9	21.0		6.5	94.6		8.5	96.6	94.6
90th %ile Term Code	Gap	Hold		Gap	Ped		Gap	Coord		Gap	Coord	Coord
70th %ile Green (s)	16.6	14.5		12.4	10.3		5.9	109.5		7.1	110.7	109.5
70th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
50th %ile Green (s)	16.8	14.2		10.8	8.2		0.0	111.9		6.6	122.5	111.9
50th %ile Term Code	Gap	Hold		Gap	Gap		Skip	Coord		Gap	Coord	Coord
30th %ile Green (s)	14.1	0.0		25.1	7.0		0.0	116.3		6.1	126.4	116.3
30th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	10.5	0.0		21.5	7.0		0.0	130.0		0.0	130.0	130.0
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	115	9		63	30		2	161		12	288	38
Queue Length 95th (ft)	161	31		100	79		m7	m277		33	604	97
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	262	246		264	255		284	2481		327	2597	1118
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.47	0.06		0.27	0.27		0.05	0.51		0.16	0.56	0.19

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 14.4 Intersection LOS: B
Intersection Capacity Utilization 60.0% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	18	2	121	89	44	7	1489	16	50	767	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	1.00				0.98
Frt		0.986			0.950			0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1834	0	1770	1761	0	1770	3531	0	1770	3539	1583
Flt Permitted	0.665			0.524			0.297			0.090		
Satd. Flow (perm)	1237	1834	0	974	1761	0	553	3531	0	168	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			24			2				299
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	22	0	132	145	0	8	1635	0	54	834	299
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		6			1			1			3	1
Act Effct Green (s)	13.2	10.0		16.7	7.8		49.7	46.2		51.3	49.8	46.2
Actuated g/C Ratio	0.16	0.12		0.21	0.10		0.62	0.58		0.64	0.62	0.58
v/c Ratio	0.71	0.10		0.40	0.76		0.02	0.80		0.25	0.38	0.29
Control Delay	50.4	32.8		32.7	56.5		4.7	18.5		7.3	8.2	1.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	50.4	32.8		32.7	56.5		4.7	18.5		7.3	8.2	1.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		C	E		A	B		A	A	A
Approach Delay		48.5			45.2			18.4			6.5	
Approach LOS		D			D			B			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Ped		Max	Ped		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
50th %ile Green (s)	6.4	0.0		17.4	7.0		0.0	45.1		5.0	54.1	45.1
50th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	13.7	0.0		28.0	10.3		0.0	43.5		0.0	43.5	43.5
30th %ile Term Code	Gap	Skip		Hold	Gap		Skip	Coord		Skip	Coord	Coord
10th %ile Green (s)	10.6	22.1		0.0	7.5		0.0	49.4		0.0	49.4	49.4
10th %ile Term Code	Gap	Hold		Skip	Gap		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~118	9		56	60		1	128		7	79	0
Queue Length 95th (ft)	#141	31		#130	#161		m1	m220		16	147	30
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	258	231		326	192		422	2079		213	2229	1032
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.71	0.10		0.40	0.76		0.02	0.79		0.25	0.37	0.29

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 18.2 Intersection LOS: B
Intersection Capacity Utilization 69.4% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

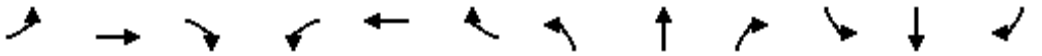
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	8	5	84	25	45	12	1128	76	50	1371	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00				0.98
Frt		0.946			0.903			0.990				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1753	0	1770	1667	0	1770	3498	0	1770	3539	1583
Flt Permitted	0.700			0.602			0.130			0.155		
Satd. Flow (perm)	1301	1753	0	1119	1667	0	242	3498	0	289	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			47			8				88
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	1		1	1		1	1		2	2		1
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	14	0	91	76	0	13	1309	0	54	1490	208
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		2			1			1			2	1
Act Effct Green (s)	25.3	12.7		25.9	10.7		117.6	112.4		120.9	117.2	112.4
Actuated g/C Ratio	0.16	0.08		0.16	0.07		0.74	0.70		0.76	0.73	0.70
v/c Ratio	0.49	0.10		0.36	0.49		0.06	0.53		0.19	0.57	0.19
Control Delay	64.1	48.5		57.5	41.0		5.2	9.2		7.6	12.9	6.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.1	48.5		57.5	41.0		5.2	9.2		7.6	12.9	6.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	D		E	D		A	A		A	B	A
Approach Delay		62.5			50.0			9.1			11.9	
Approach LOS		E			D			A			B	
90th %ile Green (s)	19.4	24.3		16.1	21.0		6.5	94.5		8.6	96.6	94.5
90th %ile Term Code	Gap	Hold		Gap	Ped		Gap	Coord		Gap	Coord	Coord
70th %ile Green (s)	16.5	12.5		14.4	10.4		5.9	109.5		7.1	110.7	109.5
70th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
50th %ile Green (s)	16.8	12.6		12.5	8.3		0.0	111.8		6.6	122.4	111.8
50th %ile Term Code	Gap	Hold		Gap	Gap		Skip	Coord		Gap	Coord	Coord
30th %ile Green (s)	14.1	0.0		25.1	7.0		0.0	116.3		6.1	126.4	116.3
30th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	10.5	0.0		21.5	7.0		0.0	130.0		0.0	130.0	130.0
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	115	9		83	30		2	176		12	297	38
Queue Length 95th (ft)	161	31		124	81		m6	m277		34	621	98
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	262	241		260	259		278	2473		312	2596	1117
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.47	0.06		0.35	0.29		0.05	0.53		0.17	0.57	0.19

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	18	2	151	89	47	7	1527	46	55	807	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	1.00				0.98
Frt		0.986			0.948			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1834	0	1770	1757	0	1770	3523	0	1770	3539	1583
Flt Permitted				0.588			0.286			0.087		
Satd. Flow (perm)	1859	1834	0	1093	1757	0	532	3523	0	162	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			26			6				299
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	22	0	164	148	0	8	1710	0	60	877	299
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		6			1			1			3	1
Act Effct Green (s)	9.6	7.0		16.3	7.1		51.7	48.2		53.3	51.8	48.2
Actuated g/C Ratio	0.12	0.09		0.20	0.09		0.65	0.60		0.67	0.65	0.60
v/c Ratio	0.85	0.14		0.49	0.82		0.02	0.80		0.29	0.38	0.28
Control Delay	67.9	33.8		36.5	65.7		4.7	16.2		7.5	7.4	1.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	67.9	33.8		36.5	65.7		4.7	16.2		7.5	7.4	1.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	C		D	E		A	B		A	A	A
Approach Delay		64.2			50.3			16.1			6.0	
Approach LOS		E			D			B			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Ped		Max	Ped		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
50th %ile Green (s)	5.4	0.0		16.4	7.0		0.0	46.1		5.0	55.1	46.1
50th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	7.8	0.0		18.8	7.0		0.0	52.7		0.0	52.7	52.7
30th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Skip	Coord	Coord
10th %ile Green (s)	10.6	0.0		22.2	7.6		0.0	49.3		0.0	49.3	49.3
10th %ile Term Code	Gap	Skip		Hold	Gap		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~129	9		72	61		1	130		8	81	0
Queue Length 95th (ft)	#158	31		#130	#164		m1	m218		18	157	30
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	214	162		336	180		423	2129		210	2292	1051
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.85	0.14		0.49	0.82		0.02	0.80		0.29	0.38	0.28

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 18.4	Intersection LOS: B
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	8	5	64	25	45	12	1108	56	50	1351	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00	0.99			1.00				0.98
Frt		0.946			0.903			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1753	0	1770	1667	0	1770	3510	0	1770	3539	1583
Flt Permitted	0.624			0.675			0.134			0.165		
Satd. Flow (perm)	1160	1753	0	1255	1667	0	250	3510	0	307	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			47			6				89
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	1		1	1		1	1		2	2		1
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	14	0	70	76	0	13	1265	0	54	1468	208
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		2			1			1			2	1
Act Effct Green (s)	25.8	13.9		24.7	10.7		117.6	112.4		120.8	117.2	112.4
Actuated g/C Ratio	0.16	0.09		0.15	0.07		0.74	0.70		0.76	0.73	0.70
v/c Ratio	0.50	0.09		0.28	0.49		0.05	0.51		0.18	0.57	0.19
Control Delay	64.4	46.9		55.4	41.0		5.1	9.1		7.5	12.7	6.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.4	46.9		55.4	41.0		5.1	9.1		7.5	12.7	6.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	D		E	D		A	A		A	B	A
Approach Delay		62.7			47.9			9.0			11.8	
Approach LOS		E			D			A			B	
90th %ile Green (s)	19.4	26.5		13.9	21.0		6.5	94.5		8.6	96.6	94.5
90th %ile Term Code	Gap	Hold		Gap	Ped		Gap	Coord		Gap	Coord	Coord
70th %ile Green (s)	16.6	14.6		12.4	10.4		5.9	109.4		7.1	110.6	109.4
70th %ile Term Code	Gap	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
50th %ile Green (s)	16.8	14.3		10.8	8.3		0.0	111.8		6.6	122.4	111.8
50th %ile Term Code	Gap	Hold		Gap	Gap		Skip	Coord		Gap	Coord	Coord
30th %ile Green (s)	14.1	0.0		25.1	7.0		0.0	116.3		6.1	126.4	116.3
30th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	10.5	0.0		21.5	7.0		0.0	130.0		0.0	130.0	130.0
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	115	9		63	30		2	160		12	290	38
Queue Length 95th (ft)	161	31		100	81		m6	m277		34	605	97
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	258	246		264	259		284	2480		324	2596	1118
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.48	0.06		0.27	0.29		0.05	0.51		0.17	0.57	0.19

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

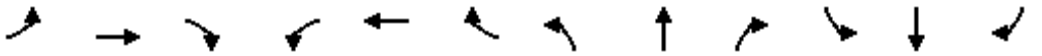
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	18	2	121	89	47	7	1492	16	55	772	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	1.00				0.98
Frt		0.986			0.948			0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1834	0	1770	1757	0	1770	3531	0	1770	3539	1583
Flt Permitted	0.661			0.563			0.299			0.088		
Satd. Flow (perm)	1229	1834	0	1046	1757	0	556	3531	0	164	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			26			2				299
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	22	0	132	148	0	8	1639	0	60	839	299
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		6			1			1			3	1
Act Effct Green (s)	12.9	10.0		15.7	7.1		50.7	47.2		52.3	50.8	47.2
Actuated g/C Ratio	0.16	0.12		0.20	0.09		0.63	0.59		0.65	0.64	0.59
v/c Ratio	0.73	0.09		0.43	0.82		0.02	0.79		0.29	0.37	0.29
Control Delay	52.3	32.8		33.5	65.7		4.9	16.8		7.8	7.7	1.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	52.3	32.8		33.5	65.7		4.9	16.8		7.8	7.7	1.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		C	E		A	B		A	A	A
Approach Delay		50.2			50.5			16.7			6.2	
Approach LOS		D			D			B			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Ped		Max	Ped		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
50th %ile Green (s)	6.3	0.0		17.3	7.0		0.0	45.2		5.0	54.2	45.2
50th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	12.2	0.0		23.2	7.0		0.0	48.3		0.0	48.3	48.3
30th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Skip	Coord	Coord
10th %ile Green (s)	10.6	22.2		0.0	7.6		0.0	49.3		0.0	49.3	49.3
10th %ile Term Code	Gap	Hold		Skip	Gap		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~119	9		56	61		1	127		8	80	0
Queue Length 95th (ft)	#142	31		#126	#164		m1	m217		18	148	30
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	251	232		308	180		429	2093		209	2245	1037
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.73	0.09		0.43	0.82		0.02	0.78		0.29	0.37	0.29

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 73.6% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.



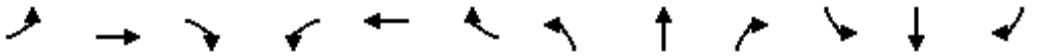
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	13	7	127	38	60	18	1702	115	73	2075	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.945			0.908			0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1760	0	1770	1691	0	1770	3507	0	1770	3539	1583
Flt Permitted	0.668			0.509			0.038			0.037		
Satd. Flow (perm)	1244	1760	0	948	1691	0	71	3507	0	69	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			41			8				88
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	22	0	138	106	0	20	1975	0	79	2255	314
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	23.6	11.5		28.5	11.9		114.6	108.1		120.6	114.5	108.1
Actuated g/C Ratio	0.15	0.07		0.18	0.07		0.72	0.68		0.75	0.72	0.68
v/c Ratio	0.80	0.17		0.51	0.65		0.18	0.83		0.56	0.89	0.29
Control Delay	86.2	51.0		62.9	61.2		9.9	27.9		38.5	25.2	8.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.2	51.0		62.9	61.2		9.9	27.9		38.5	25.2	8.7
LOS	F	D		E	E		A	C		D	C	A
Approach Delay		82.5			62.1			27.7			23.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			C			C	
90th %ile Green (s)	15.0	17.7		15.0	17.7		6.7	98.1		12.7	104.1	98.1
90th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord
70th %ile Green (s)	15.0	14.1		15.0	14.1		6.2	104.7		9.7	108.2	104.7
70th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord
50th %ile Green (s)	15.0	11.7		15.0	11.7		5.9	109.1		7.7	110.9	109.1
50th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord
30th %ile Green (s)	15.0	0.0		28.2	9.2		0.0	112.6		6.7	123.3	112.6
30th %ile Term Code	Max	Skip		Hold	Gap		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	14.7	0.0		25.7	7.0		0.0	115.9		5.9	125.8	115.9
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
Queue Length 50th (ft)	178	14		128	67		7	1025		28	979	83
Queue Length 95th (ft)	252	44		191	130		m8	m451		88	#1382	162
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	233	237		270	257		158	2371		164	2531	1097
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.80	0.09		0.51	0.41		0.13	0.83		0.48	0.89	0.29

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 29.5 Intersection LOS: C
Intersection Capacity Utilization 83.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	27	4	229	135	67	11	2310	69	76	1215	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.982			0.950			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1829	0	1770	1770	0	1770	3525	0	1770	3539	1583
Flt Permitted	0.952			0.488			0.153			0.082		
Satd. Flow (perm)	1773	1829	0	909	1770	0	285	3525	0	153	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			24			6				403
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	33	0	249	220	0	12	2586	0	83	1321	453
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	9.2	7.0		13.6	7.0		52.8	48.3		55.2	53.7	48.3
Actuated g/C Ratio	0.12	0.09		0.17	0.09		0.66	0.60		0.69	0.67	0.60
v/c Ratio	1.35	0.20		0.97	1.25		0.04	1.21		0.40	0.56	0.41
Control Delay	218.1	34.1		88.8	181.9		4.7	118.4		11.6	8.6	2.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	218.1	34.1		88.8	181.9		4.7	118.4		11.6	8.6	2.6
LOS	F	C		F	F		A	F		B	A	A
Approach Delay		198.4			132.5			117.9			7.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
50th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
50th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	46.5		5.0	55.5	46.5
30th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
10th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	55.5		0.0	55.5	55.5
10th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~137	14		~120	~128		1	~834		11	142	10
Queue Length 95th (ft)	#295	40		#258	#265		m1	m201		33	277	48
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	203	163		256	176		281	2130		206	2375	1115
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.35	0.20		0.97	1.25		0.04	1.21		0.40	0.56	0.41

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.35	
Intersection Signal Delay: 84.7	Intersection LOS: F
Intersection Capacity Utilization 101.7%	ICU Level of Service G
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	13	7	107	38	60	18	1682	95	73	2055	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.945			0.908			0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1760	0	1770	1691	0	1770	3511	0	1770	3539	1583
Flt Permitted	0.660			0.511			0.038			0.042		
Satd. Flow (perm)	1229	1760	0	952	1691	0	71	3511	0	78	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			41			6				89
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	22	0	116	106	0	20	1931	0	79	2234	314
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	23.7	11.6		28.4	11.9		114.6	108.1		120.6	114.5	108.1
Actuated g/C Ratio	0.15	0.07		0.18	0.07		0.72	0.68		0.75	0.72	0.68
v/c Ratio	0.80	0.16		0.43	0.65		0.18	0.81		0.53	0.88	0.29
Control Delay	86.2	50.9		60.1	61.2		10.4	28.6		32.1	24.6	8.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.2	50.9		60.1	61.2		10.4	28.6		32.1	24.6	8.7
LOS	F	D		E	E		B	C		C	C	A
Approach Delay		82.5			60.6			28.4			22.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			C			C	
90th %ile Green (s)	15.0	17.7		15.0	17.7		6.7	98.1		12.7	104.1	98.1
90th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord
70th %ile Green (s)	15.0	14.1		15.0	14.1		6.2	104.7		9.7	108.2	104.7
70th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord
50th %ile Green (s)	15.0	12.2		14.5	11.7		5.9	109.1		7.7	110.9	109.1
50th %ile Term Code	Max	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
30th %ile Green (s)	15.0	0.0		28.2	9.2		0.0	112.6		6.7	123.3	112.6
30th %ile Term Code	Max	Skip		Hold	Gap		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	14.7	0.0		25.7	7.0		0.0	115.9		5.9	125.8	115.9
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
Queue Length 50th (ft)	178	14		106	67		7	976		21	954	83
Queue Length 95th (ft)	252	44		163	130		m8	m497		81	#1359	161
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	233	237		270	257		158	2373		170	2531	1098
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.80	0.09		0.43	0.41		0.13	0.81		0.46	0.88	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 29.2		Intersection LOS: C	
Intersection Capacity Utilization 83.9%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	27	4	199	135	67	11	2275	39	76	1180	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.982			0.950			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1829	0	1770	1770	0	1770	3529	0	1770	3539	1583
Flt Permitted	0.952			0.488			0.163			0.082		
Satd. Flow (perm)	1773	1829	0	909	1770	0	304	3529	0	153	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			24			4				415
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	33	0	216	220	0	12	2515	0	83	1283	453
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	9.2	7.0		13.6	7.0		52.8	48.3		55.2	53.7	48.3
Actuated g/C Ratio	0.12	0.09		0.17	0.09		0.66	0.60		0.69	0.67	0.60
v/c Ratio	1.35	0.20		0.84	1.25		0.04	1.18		0.40	0.54	0.40
Control Delay	218.1	34.1		64.5	181.9		4.7	103.2		11.6	8.4	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	218.1	34.1		64.5	181.9		4.7	103.2		11.6	8.4	2.4
LOS	F	C		E	F		A	F		B	A	A
Approach Delay		198.4			123.7			102.7			7.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
50th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
50th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	46.5		5.0	55.5	46.5
30th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
10th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	55.5		0.0	55.5	55.5
10th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~137	14		~114	~128		1	~795		11	136	8
Queue Length 95th (ft)	#295	40		#215	#265		m1	m200		33	265	45
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	203	163		256	176		292	2131		206	2375	1119
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.35	0.20		0.84	1.25		0.04	1.18		0.40	0.54	0.40

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.35	
Intersection Signal Delay: 76.1	Intersection LOS: E
Intersection Capacity Utilization 99.7%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	13	7	127	38	65	18	1707	115	75	2077	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.945			0.905			0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1760	0	1770	1686	0	1770	3507	0	1770	3539	1583
Flt Permitted	0.623			0.513			0.038			0.036		
Satd. Flow (perm)	1160	1760	0	956	1686	0	71	3507	0	67	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			45			8				88
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	22	0	138	112	0	20	1980	0	82	2258	314
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	23.8	11.7		28.7	12.1		114.2	107.7		120.5	114.3	107.7
Actuated g/C Ratio	0.15	0.07		0.18	0.08		0.71	0.67		0.75	0.71	0.67
v/c Ratio	0.81	0.16		0.51	0.66		0.18	0.84		0.57	0.89	0.29
Control Delay	87.6	50.8		62.5	60.6		10.2	27.3		41.4	25.5	8.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	87.6	50.8		62.5	60.6		10.2	27.3		41.4	25.5	8.9
LOS	F	D		E	E		B	C		D	C	A
Approach Delay		83.7			61.6			27.2			24.1	
Approach LOS		F			E			C			C	
90th %ile Green (s)	15.0	18.0		15.0	18.0		6.7	97.5		13.0	103.8	97.5
90th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Max	Coord	Coord
70th %ile Green (s)	15.0	14.4		15.0	14.4		6.2	104.0		10.1	107.9	104.0
70th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	15.0	11.9		15.0	11.9		5.9	108.7		7.9	110.7	108.7
50th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord
30th %ile Green (s)	15.0	0.0		28.4	9.4		0.0	112.4		6.7	123.1	112.4
30th %ile Term Code	Max	Skip		Hold	Gap		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	14.7	0.0		25.7	7.0		0.0	115.8		6.0	125.8	115.8
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
Queue Length 50th (ft)	178	14		128	69		7	1033		33	988	84
Queue Length 95th (ft)	251	44		191	136		m8	m460		95	#1389	164
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	230	237		272	260		158	2363		163	2527	1094
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.09		0.51	0.43		0.13	0.84		0.50	0.89	0.29

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 29.5 Intersection LOS: C
Intersection Capacity Utilization 85.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	27	4	229	135	70	11	2313	69	81	1220	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.982			0.949			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1829	0	1770	1768	0	1770	3525	0	1770	3539	1583
Flt Permitted	0.952			0.488			0.152			0.082		
Satd. Flow (perm)	1773	1829	0	909	1768	0	283	3525	0	153	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			25			6				402
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	33	0	249	223	0	12	2589	0	88	1326	453
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	9.2	7.0		13.6	7.0		52.8	48.3		55.2	53.7	48.3
Actuated g/C Ratio	0.12	0.09		0.17	0.09		0.66	0.60		0.69	0.67	0.60
v/c Ratio	1.35	0.20		0.97	1.26		0.04	1.22		0.43	0.56	0.41
Control Delay	218.1	34.1		88.8	185.2		4.8	122.0		12.7	8.6	2.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	218.1	34.1		88.8	185.2		4.8	122.0		12.7	8.6	2.6
LOS	F	C		F	F		A	F		B	A	A
Approach Delay		198.4			134.4			121.5			7.3	
Approach LOS		F			F			F			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
50th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	46.5		5.0	55.5	46.5
30th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
10th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	55.5		0.0	55.5	55.5
10th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~137	14		~120	~130		2	~808		12	143	10
Queue Length 95th (ft)	#295	40		#258	#267		m1	m148		37	279	48
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	203	163		256	177		279	2130		206	2375	1115
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.35	0.20		0.97	1.26		0.04	1.22		0.43	0.56	0.41

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.35			
Intersection Signal Delay: 86.5		Intersection LOS: F	
Intersection Capacity Utilization 103.1%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	13	7	107	38	65	18	1687	95	75	2057	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.945			0.905			0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1760	0	1770	1686	0	1770	3511	0	1770	3539	1583
Flt Permitted	0.616			0.514			0.038			0.040		
Satd. Flow (perm)	1147	1760	0	957	1686	0	71	3511	0	75	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			45			6				89
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	22	0	116	112	0	20	1937	0	82	2236	314
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	25.0		9.0	25.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	19.0	25.0		19.0	25.0		14.0	102.0		14.0	102.0	102.0
Total Split (%)	11.9%	15.6%		11.9%	15.6%		8.8%	63.8%		8.8%	63.8%	63.8%
Maximum Green (s)	15.0	21.0		15.0	21.0		10.0	97.5		10.0	97.5	97.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	23.9	11.8		28.6	12.1		114.2	107.7		120.5	114.3	107.7
Actuated g/C Ratio	0.15	0.07		0.18	0.08		0.71	0.67		0.75	0.71	0.67
v/c Ratio	0.81	0.16		0.43	0.66		0.18	0.82		0.55	0.88	0.29
Control Delay	87.7	50.6		59.8	60.6		10.4	28.5		35.9	24.9	8.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	87.7	50.6		59.8	60.6		10.4	28.5		35.9	24.9	8.8
LOS	F	D		E	E		B	C		D	C	A
Approach Delay		83.8			60.2			28.4			23.3	
Approach LOS		F			E			C			C	
90th %ile Green (s)	15.0	18.0		15.0	18.0		6.7	97.5		13.0	103.8	97.5
90th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Max	Coord	Coord
70th %ile Green (s)	15.0	14.4		15.0	14.4		6.2	104.0		10.1	107.9	104.0
70th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	15.0	12.4		14.5	11.9		5.9	108.7		7.9	110.7	108.7
50th %ile Term Code	Max	Hold		Gap	Gap		Gap	Coord		Gap	Coord	Coord
30th %ile Green (s)	15.0	0.0		28.4	9.4		0.0	112.4		6.7	123.1	112.4
30th %ile Term Code	Max	Skip		Hold	Gap		Skip	Coord		Gap	Coord	Coord
10th %ile Green (s)	14.7	0.0		25.7	7.0		0.0	115.8		6.0	125.8	115.8
10th %ile Term Code	Gap	Skip		Hold	Min		Skip	Coord		Gap	Coord	Coord
Queue Length 50th (ft)	178	14		106	69		7	991		27	962	84
Queue Length 95th (ft)	251	44		163	136		m8	m472		89	#1365	163
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	229	237		272	260		158	2364		169	2527	1094
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.09		0.43	0.43		0.13	0.82		0.49	0.88	0.29

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 14 (9%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 29.4 Intersection LOS: C
Intersection Capacity Utilization 85.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SH 82 & 23rd St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	27	4	199	135	70	11	2278	39	81	1185	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	24		0	41		0	108		300	106		119
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.982			0.949			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1829	0	1770	1768	0	1770	3529	0	1770	3539	1583
Flt Permitted	0.952			0.488			0.162			0.082		
Satd. Flow (perm)	1773	1829	0	909	1768	0	302	3529	0	153	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			25			4				414
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		251			596			1652			518	
Travel Time (s)		5.7			13.5			37.5			11.8	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	275	33	0	216	223	0	12	2518	0	88	1288	453
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		6
Detector Phase	3	8		7	4		1	6		5	2	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		5.0	20.0		5.0	20.0	20.0
Minimum Split (s)	9.0	11.0		9.0	11.0		9.0	27.5		9.0	27.5	27.5
Total Split (s)	9.0	11.0		9.0	11.0		9.0	51.0		9.0	51.0	51.0
Total Split (%)	11.3%	13.8%		11.3%	13.8%		11.3%	63.8%		11.3%	63.8%	63.8%
Maximum Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.5		3.0	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.5		4.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	C-Min
Walk Time (s)		4.0			4.0			9.0			9.0	9.0
Flash Dont Walk (s)		17.0			17.0			14.0			14.0	14.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	9.2	7.0		13.6	7.0		52.8	48.3		55.2	53.7	48.3
Actuated g/C Ratio	0.12	0.09		0.17	0.09		0.66	0.60		0.69	0.67	0.60
v/c Ratio	1.35	0.20		0.84	1.26		0.04	1.18		0.43	0.54	0.40
Control Delay	218.1	34.1		64.5	185.2		4.9	105.3		12.7	8.4	2.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	218.1	34.1		64.5	185.2		4.9	105.3		12.7	8.4	2.5
LOS	F	C		E	F		A	F		B	A	A
Approach Delay		198.4			125.8			104.8			7.1	
Approach LOS		F			F			F			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Max		Max	Max		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
70th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
50th %ile Green (s)	5.0	7.0		5.0	7.0		0.0	46.5		5.0	55.5	46.5
50th %ile Term Code	Max	Max		Max	Max		Skip	Coord		Max	Coord	Coord
30th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	46.5		5.0	55.5	46.5
30th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Max	Coord	Coord
10th %ile Green (s)	5.0	0.0		16.0	7.0		0.0	55.5		0.0	55.5	55.5
10th %ile Term Code	Max	Skip		Hold	Max		Skip	Coord		Skip	Coord	Coord
Queue Length 50th (ft)	~137	14		~114	~130		2	~770		12	137	8
Queue Length 95th (ft)	#295	40		#215	#267		m1	m177		37	266	45
Internal Link Dist (ft)		171			516			1572			438	
Turn Bay Length (ft)	24			41			108			106		119
Base Capacity (vph)	203	163		256	177		291	2131		206	2375	1119
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.35	0.20		0.84	1.26		0.04	1.18		0.43	0.54	0.40

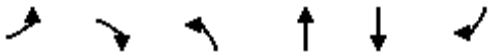
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 9 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.35			
Intersection Signal Delay: 77.3		Intersection LOS: E	
Intersection Capacity Utilization 103.1%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

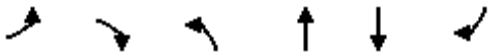
Splits and Phases: 3: SH 82 & 23rd St.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	8	7	51	51	27
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	9	8	55	55	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		90	33	37	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		90	33	37	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	99		99	93	93	97
cM capacity (veh/h)	1623		822	853	848	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	63	85
Volume Left	14	8	0
Volume Right	9	0	29
cSH	1623	849	917
Volume to Capacity	0.01	0.07	0.09
Queue Length 95th (ft)	1	6	8
Control Delay (s)	4.5	9.6	9.3
Lane LOS	A	A	A
Approach Delay (s)	4.5	9.6	9.3
Approach LOS		A	A

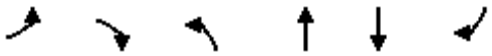
Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	113	12	19	86	82	27
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	123	13	21	93	89	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		326	252	259	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		326	252	259	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	92		96	84	85	97
cM capacity (veh/h)	1623		510	602	597	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	136	114	118
Volume Left	123	21	0
Volume Right	13	0	29
cSH	1623	583	672
Volume to Capacity	0.08	0.20	0.18
Queue Length 95th (ft)	6	18	16
Control Delay (s)	6.7	12.7	11.5
Lane LOS	A	B	B
Approach Delay (s)	6.7	12.7	11.5
Approach LOS		B	B

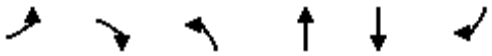
Intersection Summary			
Average Delay	10.1		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	23	8	7	1	1	37
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	9	8	1	1	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		95	54	59	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		95	54	59	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	98		99	100	100	96
cM capacity (veh/h)	1623		844	824	819	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	9	41
Volume Left	25	8	0
Volume Right	9	0	40
cSH	1623	841	1076
Volume to Capacity	0.02	0.01	0.04
Queue Length 95th (ft)	1	1	3
Control Delay (s)	5.4	9.3	8.5
Lane LOS	A	A	A
Approach Delay (s)	5.4	9.3	8.5
Approach LOS		A	A

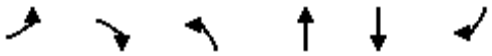
Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	128	12	19	6	2	42
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	13	21	7	2	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		332	285	291	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		332	285	291	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	91		96	99	100	96
cM capacity (veh/h)	1623		555	571	566	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	152	27	48
Volume Left	139	21	0
Volume Right	13	0	46
cSH	1623	559	1042
Volume to Capacity	0.09	0.05	0.05
Queue Length 95th (ft)	7	4	4
Control Delay (s)	6.8	11.8	8.6
Lane LOS	A	B	A
Approach Delay (s)	6.8	11.8	8.6
Approach LOS		B	A

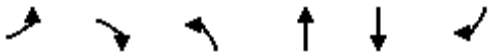
Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	27	15	24	1	1	46
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	16	26	1	1	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		117	67	75	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		117	67	75	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	98		97	100	100	95
cM capacity (veh/h)	1623		807	809	801	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	46	27	51
Volume Left	29	26	0
Volume Right	16	0	50
cSH	1623	807	1077
Volume to Capacity	0.02	0.03	0.05
Queue Length 95th (ft)	1	3	4
Control Delay (s)	4.7	9.6	8.5
Lane LOS	A	A	A
Approach Delay (s)	4.7	9.6	8.5
Approach LOS		A	A

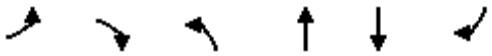
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	139	31	31	6	2	49
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	34	34	7	2	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		373	319	336	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		373	319	336	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	91		93	99	100	95
cM capacity (veh/h)	1623		514	542	530	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	185	40	55
Volume Left	151	34	0
Volume Right	34	0	53
cSH	1623	518	1042
Volume to Capacity	0.09	0.08	0.05
Queue Length 95th (ft)	8	6	4
Control Delay (s)	6.2	12.5	8.6
Lane LOS	A	B	A
Approach Delay (s)	6.2	12.5	8.6
Approach LOS		B	A

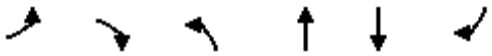
Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	13	19	51	51	32
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	14	21	55	55	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		102	40	47	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		102	40	47	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	99		97	93	93	97
cM capacity (veh/h)	1623		801	844	836	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	76	90
Volume Left	16	21	0
Volume Right	14	0	35
cSH	1623	832	917
Volume to Capacity	0.01	0.09	0.10
Queue Length 95th (ft)	1	8	8
Control Delay (s)	3.9	9.8	9.4
Lane LOS	A	A	A
Approach Delay (s)	3.9	9.8	9.4
Approach LOS		A	A

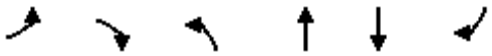
Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	118	26	28	86	82	30
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	128	28	30	93	89	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		348	271	285	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		348	271	285	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	92		94	84	85	97
cM capacity (veh/h)	1623		488	586	575	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	157	124	122
Volume Left	128	30	0
Volume Right	28	0	33
cSH	1623	558	658
Volume to Capacity	0.08	0.22	0.19
Queue Length 95th (ft)	6	21	17
Control Delay (s)	6.2	13.3	11.7
Lane LOS	A	B	B
Approach Delay (s)	6.2	13.3	11.7
Approach LOS		B	B

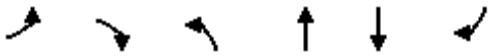
Intersection Summary			
Average Delay	10.0		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	195	18	29	9	4	64
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	212	20	32	10	4	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		505	434	443	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		505	434	443	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	87		92	98	99	94
cM capacity (veh/h)	1623		399	448	442	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	232	41	74
Volume Left	212	32	0
Volume Right	20	0	70
cSH	1623	410	1000
Volume to Capacity	0.13	0.10	0.07
Queue Length 95th (ft)	11	8	6
Control Delay (s)	7.0	14.8	8.9
Lane LOS	A	B	A
Approach Delay (s)	7.0	14.8	8.9
Approach LOS		B	A

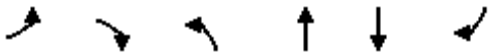
Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	25	13	11	52	52	46
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	14	12	57	57	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		140	61	68	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		140	61	68	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	98		98	93	93	95
cM capacity (veh/h)	1623		740	816	808	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	41	68	107
Volume Left	27	12	0
Volume Right	14	0	50
cSH	1623	801	918
Volume to Capacity	0.02	0.09	0.12
Queue Length 95th (ft)	1	7	10
Control Delay (s)	4.8	9.9	9.4
Lane LOS	A	A	A
Approach Delay (s)	4.8	9.9	9.4
Approach LOS		A	A

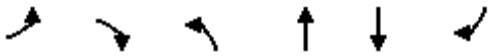
Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	180	18	29	89	84	49
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	196	20	32	97	91	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		500	401	411	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		500	401	411	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	88		91	80	80	95
cM capacity (veh/h)	1623		354	473	467	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	215	128	145
Volume Left	196	32	0
Volume Right	20	0	53
cSH	1623	437	591
Volume to Capacity	0.12	0.29	0.24
Queue Length 95th (ft)	10	30	24
Control Delay (s)	6.9	16.6	13.1
Lane LOS	A	C	B
Approach Delay (s)	6.9	16.6	13.1
Approach LOS		C	B

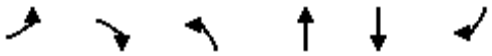
Intersection Summary			
Average Delay	11.3		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	35	13	11	2	2	56
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	14	12	2	2	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		145	83	90	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		145	83	90	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	98		98	100	100	94
cM capacity (veh/h)	1623		762	788	781	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	52	14	63
Volume Left	38	12	0
Volume Right	14	0	61
cSH	1623	766	1071
Volume to Capacity	0.02	0.02	0.06
Queue Length 95th (ft)	2	1	5
Control Delay (s)	5.3	9.8	8.6
Lane LOS	A	A	A
Approach Delay (s)	5.3	9.8	8.6
Approach LOS		A	A

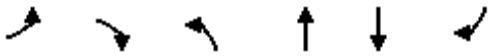
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	39	20	28	2	2	65
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	22	30	2	2	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		167	96	107	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		167	96	107	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	97		96	100	100	93
cM capacity (veh/h)	1623		728	774	763	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	64	33	73
Volume Left	42	30	0
Volume Right	22	0	71
cSH	1623	731	1071
Volume to Capacity	0.03	0.04	0.07
Queue Length 95th (ft)	2	3	5
Control Delay (s)	4.9	10.2	8.6
Lane LOS	A	B	A
Approach Delay (s)	4.9	10.2	8.6
Approach LOS		B	A

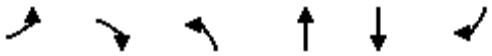
Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	206	37	41	9	4	71
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	224	40	45	10	4	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		547	468	488	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		547	468	488	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	86		88	98	99	93
cM capacity (veh/h)	1623		369	425	414	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	264	54	82
Volume Left	224	45	0
Volume Right	40	0	77
cSH	1623	378	999
Volume to Capacity	0.14	0.14	0.08
Queue Length 95th (ft)	12	12	7
Control Delay (s)	6.6	16.1	8.9
Lane LOS	A	C	A
Approach Delay (s)	6.6	16.1	8.9
Approach LOS		C	A

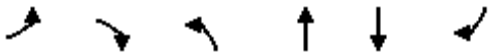
Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	27	18	23	52	52	51
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	20	25	57	57	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		152	68	78	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		152	68	78	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	98		97	93	93	95
cM capacity (veh/h)	1623		722	807	797	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	49	82	112
Volume Left	29	25	0
Volume Right	20	0	55
cSH	1623	779	918
Volume to Capacity	0.02	0.10	0.12
Queue Length 95th (ft)	1	9	10
Control Delay (s)	4.4	10.2	9.5
Lane LOS	A	B	A
Approach Delay (s)	4.4	10.2	9.5
Approach LOS		B	A

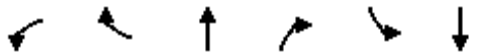
Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	185	32	38	89	84	52
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	201	35	41	97	91	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		522	420	437	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		522	420	437	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	88		88	79	80	95
cM capacity (veh/h)	1623		338	460	450	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	236	138	148
Volume Left	201	41	0
Volume Right	35	0	57
cSH	1623	415	579
Volume to Capacity	0.12	0.33	0.26
Queue Length 95th (ft)	11	36	25
Control Delay (s)	6.6	17.9	13.3
Lane LOS	A	C	B
Approach Delay (s)	6.6	17.9	13.3
Approach LOS		C	B

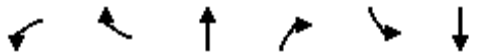
Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	10	62	11	10	76
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	11	67	12	11	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	178	73			79	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	178	73			79	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	806	988			1519	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	79	93
Volume Left	13	0	11
Volume Right	11	12	0
cSH	880	1700	1519
Volume to Capacity	0.03	0.05	0.01
Queue Length 95th (ft)	2	0	1
Control Delay (s)	9.2	0.0	0.9
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.9
Approach LOS	A		

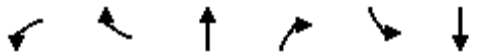
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	7	188	24	10	106
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	8	204	26	11	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	354	217			230	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354	217			230	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	638	822			1337	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	23	230	126
Volume Left	15	0	11
Volume Right	8	26	0
cSH	690	1700	1337
Volume to Capacity	0.03	0.14	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	10.4	0.0	0.7
Lane LOS	B		A
Approach Delay (s)	10.4	0.0	0.7
Approach LOS	B		

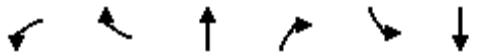
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	10	12	11	10	26
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	11	13	12	11	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	69	19			25	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	69	19			25	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	929	1059			1589	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	25	39
Volume Left	13	0	11
Volume Right	11	12	0
cSH	984	1700	1589
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (ft)	2	0	1
Control Delay (s)	8.7	0.0	2.1
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	2.1
Approach LOS	A		

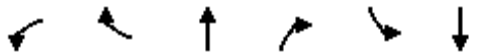
Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	7	108	24	10	26
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	8	117	26	11	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	180	130			143	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	180	130			143	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	803	919			1439	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	23	143	39
Volume Left	15	0	11
Volume Right	8	26	0
cSH	838	1700	1439
Volume to Capacity	0.03	0.08	0.01
Queue Length 95th (ft)	2	0	1
Control Delay (s)	9.4	0.0	2.1
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	2.1
Approach LOS	A		

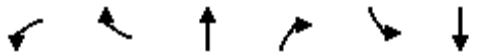
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	12	12	15	11	26
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	13	13	16	12	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	73	21			29	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	73	21			29	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	923	1056			1584	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	29	40
Volume Left	23	0	12
Volume Right	13	16	0
cSH	968	1700	1584
Volume to Capacity	0.04	0.02	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	8.9	0.0	2.2
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	2.2
Approach LOS	A		

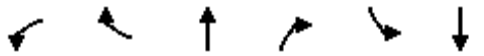
Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	21	8	108	35	12	26
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	9	117	38	13	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	191	136			155	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	191	136			155	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			99	
cM capacity (veh/h)	791	912			1425	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	155	41
Volume Left	23	0	13
Volume Right	9	38	0
cSH	821	1700	1425
Volume to Capacity	0.04	0.09	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	9.6	0.0	2.4
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	2.4
Approach LOS	A		

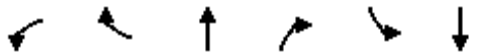
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	17	12	62	13	11	76
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	13	67	14	12	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	181	74			82	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	181	74			82	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	802	987			1516	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	82	95
Volume Left	18	0	12
Volume Right	13	14	0
cSH	870	1700	1516
Volume to Capacity	0.04	0.05	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	9.3	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	1.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	17	8	188	29	12	106
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	9	204	32	13	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	361	220			236	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	361	220			236	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			99	
cM capacity (veh/h)	631	820			1331	

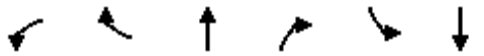
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	236	128
Volume Left	18	0	13
Volume Right	9	32	0
cSH	681	1700	1331
Volume to Capacity	0.04	0.14	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	10.5	0.0	0.9
Lane LOS	B		A
Approach Delay (s)	10.5	0.0	0.9
Approach LOS	B		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	22	11	164	36	15	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	12	178	39	16	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	274	198			217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	274	198			217	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			99	
cM capacity (veh/h)	707	843			1352	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	217	60
Volume Left	24	0	16
Volume Right	12	39	0
cSH	747	1700	1352
Volume to Capacity	0.05	0.13	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	10.1	0.0	2.2
Lane LOS	B		A
Approach Delay (s)	10.1	0.0	2.2
Approach LOS	B		

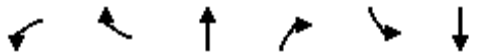
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	18	15	68	16	15	90
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	16	74	17	16	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	213	83			91	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	213	83			91	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			99	
cM capacity (veh/h)	767	977			1504	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	91	114
Volume Left	20	0	16
Volume Right	16	17	0
cSH	850	1700	1504
Volume to Capacity	0.04	0.05	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	9.4	0.0	1.1
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	1.1
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	22	11	244	36	15	120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	12	265	39	16	130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	448	285			304	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	448	285			304	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	561	754			1256	

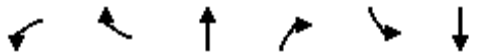
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	304	147
Volume Left	24	0	16
Volume Right	12	39	0
cSH	613	1700	1256
Volume to Capacity	0.06	0.18	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	11.2	0.0	1.0
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	1.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	28.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	18	15	18	16	15	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	16	20	17	16	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	104	28			37	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	104	28			37	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	98			99	
cM capacity (veh/h)	884	1047			1574	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	37	60
Volume Left	20	0	16
Volume Right	16	17	0
cSH	951	1700	1574
Volume to Capacity	0.04	0.02	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	8.9	0.0	2.1
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	2.1
Approach LOS	A		

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	27	17	18	20	16	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	18	20	22	17	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	109	30			41	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109	30			41	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			99	
cM capacity (veh/h)	879	1044			1568	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	48	41	61
Volume Left	29	0	17
Volume Right	18	22	0
cSH	936	1700	1568
Volume to Capacity	0.05	0.02	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.1	0.0	2.2
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	2.2
Approach LOS	A		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	29	12	164	47	17	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	13	178	51	18	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	284	204			229	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284	204			229	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	98			99	
cM capacity (veh/h)	696	837			1339	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	45	229	62
Volume Left	32	0	18
Volume Right	13	51	0
cSH	732	1700	1339
Volume to Capacity	0.06	0.13	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	10.2	0.0	2.4
Lane LOS	B		A
Approach Delay (s)	10.2	0.0	2.4
Approach LOS	B		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	23	17	68	18	16	90
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	18	74	20	17	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	216	84			93	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216	84			93	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			99	
cM capacity (veh/h)	763	976			1501	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	43	93	115
Volume Left	25	0	17
Volume Right	18	20	0
cSH	841	1700	1501
Volume to Capacity	0.05	0.05	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	9.5	0.0	1.2
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	1.2
Approach LOS	A		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	12	244	41	17	120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	13	265	45	18	130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	455	288			310	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	455	288			310	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	98			99	
cM capacity (veh/h)	555	752			1251	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	40	310	149
Volume Left	27	0	18
Volume Right	13	45	0
cSH	606	1700	1251
Volume to Capacity	0.07	0.18	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	11.4	0.0	1.1
Lane LOS	B		A
Approach Delay (s)	11.4	0.0	1.1
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	59	24	72	84	24	67
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	26	78	91	26	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			90		325	77
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			90		325	77
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		96	93
cM capacity (veh/h)			1505		634	984

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	90	170	99
Volume Left	0	78	26
Volume Right	26	0	73
cSH	1700	1505	859
Volume to Capacity	0.05	0.05	0.12
Queue Length 95th (ft)	0	4	10
Control Delay (s)	0.0	3.7	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	3.7	9.7
Approach LOS			A

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	53	17	108	166	42	188
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	18	117	180	46	204
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			76		482	67
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			76		482	67
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		91	79
cM capacity (veh/h)			1523		501	997

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	298	250
Volume Left	0	117	46
Volume Right	18	0	204
cSH	1700	1523	844
Volume to Capacity	0.04	0.08	0.30
Queue Length 95th (ft)	0	6	31
Control Delay (s)	0.0	3.4	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	3.4	11.0
Approach LOS			B

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	83	17	28	196	42	108
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	18	30	213	46	117
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			109		373	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			109		373	99
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	88
cM capacity (veh/h)			1482		615	956

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	109	243	163
Volume Left	0	30	46
Volume Right	18	0	117
cSH	1700	1482	827
Volume to Capacity	0.06	0.02	0.20
Queue Length 95th (ft)	0	2	18
Control Delay (s)	0.0	1.1	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	1.1	10.4
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	79	24	22	104	24	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	26	24	113	26	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			112		260	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			112		260	99
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	98
cM capacity (veh/h)			1478		717	957

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	112	137	45
Volume Left	0	24	26
Volume Right	26	0	18
cSH	1700	1478	800
Volume to Capacity	0.07	0.02	0.06
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	1.4	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	1.4	9.8
Approach LOS			A

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		23.4%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	80	25	22	107	26	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	27	24	116	28	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			114		265	101
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			114		265	101
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	98
cM capacity (veh/h)			1475		713	955

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	114	140	47
Volume Left	0	24	28
Volume Right	27	0	18
cSH	1700	1475	792
Volume to Capacity	0.07	0.02	0.06
Queue Length 95th (ft)	0	1	5
Control Delay (s)	0.0	1.4	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	1.4	9.8
Approach LOS			A

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	87	19	28	198	43	108
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	95	21	30	215	47	117
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			115		381	105
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			115		381	105
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		92	88
cM capacity (veh/h)			1474		608	950

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	115	246	164
Volume Left	0	30	47
Volume Right	21	0	117
cSH	1700	1474	819
Volume to Capacity	0.07	0.02	0.20
Queue Length 95th (ft)	0	2	19
Control Delay (s)	0.0	1.1	10.5
Lane LOS		A	B
Approach Delay (s)	0.0	1.1	10.5
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	60	25	72	87	26	67
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	27	78	95	28	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			92		330	79
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			92		330	79
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		96	93
cM capacity (veh/h)			1502		630	982

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	92	173	101
Volume Left	0	78	28
Volume Right	27	0	73
cSH	1700	1502	849
Volume to Capacity	0.05	0.05	0.12
Queue Length 95th (ft)	0	4	10
Control Delay (s)	0.0	3.6	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	3.6	9.8
Approach LOS			A

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	57	19	108	168	43	188
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	21	117	183	47	204
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			83		490	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			83		490	72
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		91	79
cM capacity (veh/h)			1515		496	990

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	83	300	251
Volume Left	0	117	47
Volume Right	21	0	204
cSH	1700	1515	835
Volume to Capacity	0.05	0.08	0.30
Queue Length 95th (ft)	0	6	32
Control Delay (s)	0.0	3.4	11.2
Lane LOS		A	B
Approach Delay (s)	0.0	3.4	11.2
Approach LOS			B

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	125	25	42	296	64	164
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	27	46	322	70	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			163		562	149
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			163		562	149
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		85	80
cM capacity (veh/h)			1416		472	897

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	163	367	248
Volume Left	0	46	70
Volume Right	27	0	178
cSH	1700	1416	716
Volume to Capacity	0.10	0.03	0.35
Queue Length 95th (ft)	0	2	39
Control Delay (s)	0.0	1.2	12.7
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	12.7
Approach LOS			B

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	100	36	83	138	36	75
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	39	90	150	39	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			148		459	128
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			148		459	128
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		93	91
cM capacity (veh/h)			1434		525	922

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	148	240	121
Volume Left	0	90	39
Volume Right	39	0	82
cSH	1700	1434	740
Volume to Capacity	0.09	0.06	0.16
Queue Length 95th (ft)	0	5	14
Control Delay (s)	0.0	3.2	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	3.2	10.8
Approach LOS			B

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	95	25	122	266	64	244
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	27	133	289	70	265
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			130		671	117
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			130		671	117
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		82	72
cM capacity (veh/h)			1455		383	935

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	130	422	335
Volume Left	0	133	70
Volume Right	27	0	265
cSH	1700	1455	720
Volume to Capacity	0.08	0.09	0.47
Queue Length 95th (ft)	0	8	62
Control Delay (s)	0.0	3.0	14.3
Lane LOS		A	B
Approach Delay (s)	0.0	3.0	14.3
Approach LOS			B

Intersection Summary			
Average Delay		6.8	
Intersection Capacity Utilization		52.7%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	120	36	33	158	36	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	39	36	172	39	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			170		393	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			170		393	150
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		93	97
cM capacity (veh/h)			1408		595	896

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	170	208	66
Volume Left	0	36	39
Volume Right	39	0	27
cSH	1700	1408	691
Volume to Capacity	0.10	0.03	0.10
Queue Length 95th (ft)	0	2	8
Control Delay (s)	0.0	1.5	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.5	10.8
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	121	37	33	161	38	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	132	40	36	175	41	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			172		398	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		398	152
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		93	97
cM capacity (veh/h)			1405		592	895

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	172	211	68
Volume Left	0	36	41
Volume Right	40	0	27
cSH	1700	1405	683
Volume to Capacity	0.10	0.03	0.10
Queue Length 95th (ft)	0	2	8
Control Delay (s)	0.0	1.5	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	1.5	10.9
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	129	27	42	298	65	164
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	140	29	46	324	71	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			170		570	155
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			170		570	155
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		85	80
cM capacity (veh/h)			1408		467	891

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	170	370	249
Volume Left	0	46	71
Volume Right	29	0	178
cSH	1700	1408	709
Volume to Capacity	0.10	0.03	0.35
Queue Length 95th (ft)	0	3	40
Control Delay (s)	0.0	1.2	12.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	12.8
Approach LOS			B

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	101	37	83	141	38	75
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	40	90	153	41	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			150		464	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			150		464	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		92	91
cM capacity (veh/h)			1431		522	920

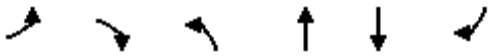
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	150	243	123
Volume Left	0	90	41
Volume Right	40	0	82
cSH	1700	1431	732
Volume to Capacity	0.09	0.06	0.17
Queue Length 95th (ft)	0	5	15
Control Delay (s)	0.0	3.2	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	3.2	10.9
Approach LOS			B

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	99	27	122	268	65	244
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	29	133	291	71	265
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			137		679	122
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		679	122
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		81	71
cM capacity (veh/h)			1447		379	929

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	137	424	336
Volume Left	0	133	71
Volume Right	29	0	265
cSH	1700	1447	712
Volume to Capacity	0.08	0.09	0.47
Queue Length 95th (ft)	0	8	64
Control Delay (s)	0.0	3.0	14.5
Lane LOS		A	B
Approach Delay (s)	0.0	3.0	14.5
Approach LOS			B

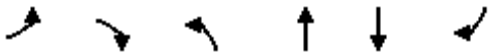
Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	2	13	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		1	1	2	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		1	1	2	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		99	100	100	100
cM capacity (veh/h)	1623		1022	895	894	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	14	0
Volume Left	0	14	0
Volume Right	2	0	0
cSH	1623	1022	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

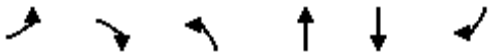
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	2	13	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		1	1	2	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		1	1	2	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		99	100	100	100
cM capacity (veh/h)	1623		1022	895	894	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	14	0
Volume Left	0	14	0
Volume Right	2	0	0
cSH	1623	1022	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

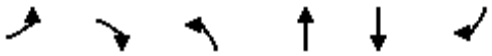
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	11	13	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	14	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		15	15	21	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		15	15	21	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		99	100	100	100
cM capacity (veh/h)	1623		999	877	871	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	14	0
Volume Left	4	14	0
Volume Right	12	0	0
cSH	1623	999	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	1.9	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.9	8.7	0.0
Approach LOS		A	A

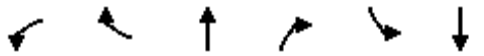
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	23	8	7	1	1	37
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	9	8	1	1	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)	252					
pX, platoon unblocked						
vC, conflicting volume	0		95	54	59	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		95	54	59	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	98		99	100	100	96
cM capacity (veh/h)	1623		844	824	819	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	9	41
Volume Left	25	8	0
Volume Right	9	0	40
cSH	1623	841	1076
Volume to Capacity	0.02	0.01	0.04
Queue Length 95th (ft)	1	1	3
Control Delay (s)	5.4	9.3	8.5
Lane LOS	A	A	A
Approach Delay (s)	5.4	9.3	8.5
Approach LOS		A	A

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	10	12	11	10	26
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	11	13	12	11	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	69	19			25	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	69	19			25	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	929	1059			1589	

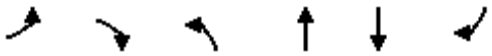
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	25	39
Volume Left	13	0	11
Volume Right	11	12	0
cSH	984	1700	1589
Volume to Capacity	0.02	0.01	0.01
Queue Length 95th (ft)	2	0	1
Control Delay (s)	8.7	0.0	2.1
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	2.1
Approach LOS	A		

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	83	12	23	98	14	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	13	25	107	15	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	596					
pX, platoon unblocked						
vC, conflicting volume			103		253	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			103		253	97
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			1489		723	960

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	103	132	27
Volume Left	0	25	15
Volume Right	13	0	12
cSH	1700	1489	811
Volume to Capacity	0.06	0.02	0.03
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	1.5	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	1.5	9.6
Approach LOS			A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	2	13	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		1	1	2	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		1	1	2	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		99	100	100	100
cM capacity (veh/h)	1623		1022	895	894	1085

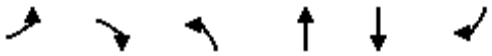
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	14	0
Volume Left	0	14	0
Volume Right	2	0	0
cSH	1623	1022	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

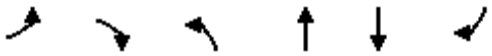
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	11	13	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	14	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		15	15	21	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		15	15	21	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		99	100	100	100
cM capacity (veh/h)	1623		999	877	871	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	14	0
Volume Left	4	14	0
Volume Right	12	0	0
cSH	1623	999	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	1.9	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.9	8.7	0.0
Approach LOS		A	A

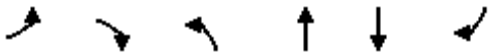
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	3	16	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	17	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		2	2	3	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		2	2	3	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		1021	894	892	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	3	17	0
Volume Left	0	17	0
Volume Right	3	0	0
cSH	1623	1021	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

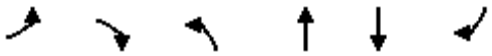
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	15	15	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	16	16	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		17	17	25	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		17	17	25	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		996	875	866	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	16	0
Volume Left	4	16	0
Volume Right	16	0	0
cSH	1623	996	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	1.5	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.5	8.7	0.0
Approach LOS		A	A

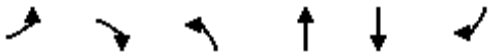
Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	3	16	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	17	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		2	2	3	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		2	2	3	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		1021	894	892	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	3	17	0
Volume Left	0	17	0
Volume Right	3	0	0
cSH	1623	1021	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

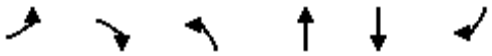
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	15	15	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	16	16	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		17	17	25	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		17	17	25	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		996	875	866	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	16	0
Volume Left	4	16	0
Volume Right	16	0	0
cSH	1623	996	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	1	0
Control Delay (s)	1.5	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.5	8.7	0.0
Approach LOS		A	A

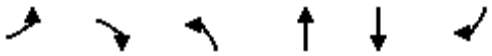
Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	4	20	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	4	22	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		2	2	4	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		2	2	4	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		1020	894	891	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	22	0
Volume Left	0	22	0
Volume Right	4	0	0
cSH	1623	1020	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

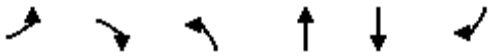
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	16	20	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	17	22	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		20	20	28	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		20	20	28	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		991	871	862	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	22	0
Volume Left	5	22	0
Volume Right	17	0	0
cSH	1623	991	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	1.7	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.7	8.7	0.0
Approach LOS		A	A

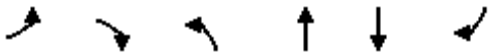
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	4	20	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	4	22	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		2	2	4	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		2	2	4	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		1020	894	891	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	4	22	0
Volume Left	0	22	0
Volume Right	4	0	0
cSH	1623	1020	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

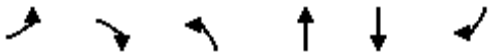
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	16	20	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	17	22	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		20	20	28	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		20	20	28	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		991	871	862	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	22	0
Volume Left	5	22	0
Volume Right	17	0	0
cSH	1623	991	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	1.7	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.7	8.7	0.0
Approach LOS		A	A

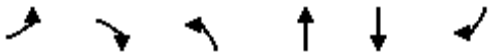
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	5	23	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	5	25	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		3	3	5	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		3	3	5	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		1019	893	890	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	5	25	0
Volume Left	0	25	0
Volume Right	5	0	0
cSH	1623	1019	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

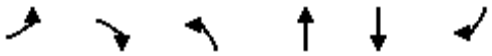
Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	20	22	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	22	24	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		22	22	33	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		22	22	33	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		988	869	857	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	24	0
Volume Left	5	24	0
Volume Right	22	0	0
cSH	1623	988	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	1.5	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.5	8.7	0.0
Approach LOS		A	A

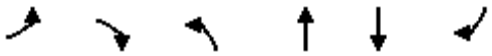
Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	5	23	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	5	25	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		3	3	5	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		3	3	5	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		1019	893	890	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	5	25	0
Volume Left	0	25	0
Volume Right	5	0	0
cSH	1623	1019	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	0.0	8.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	0.0
Approach LOS		A	A

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	20	22	0	0	0
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	22	24	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		22	22	33	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		22	22	33	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	100		98	100	100	100
cM capacity (veh/h)	1623		988	869	857	1085

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	24	0
Volume Left	5	24	0
Volume Right	22	0	0
cSH	1623	988	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	1.5	8.7	0.0
Lane LOS	A	A	A
Approach Delay (s)	1.5	8.7	0.0
Approach LOS		A	A

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Phone 970.255.8005

Huddleston-Berry
Engineering & Testing, LLC

FINAL GEOTECHNICAL AND GEOLOGIC HAZARDS INVESTIGATION GLENWOOD MULTIFAMILY GLENWOOD SPRINGS, COLORADO PROJECT#01402-0002

FORENZA CONTRACTING
PO BOX 2882
EDWARDS, COLORADO 81632

DECEMBER 2, 2017

Huddleston-Berry Engineering and Testing, LLC
640 White Avenue
Grand Junction, Colorado 81501

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FIGURES

Figure 1 – Site Location Map
Figure 2 – Site Plan

APPENDICES

Appendix A – UDSA NRCS Soil Survey Data
Appendix B – Boring and Test Pit Logs from Previous Investigation
Appendix C – Boring Logs from Current Investigation
Appendix D – Laboratory Testing Results from Previous Investigation
Appendix E – Laboratory Testing Results from Current Investigation

1.0 INTRODUCTION

As part of extensive development in Western Colorado, a new multi-family residential project is proposed in Glenwood Springs. As part of the development process, Huddleston-Berry Engineering and Testing, LLC (HBET) was retained by Forenza Contracting to conduct a final geotechnical investigation at the site.

1.1 Referenced Documents

Previous geotechnical investigation for the project was completed by CTL Thompson (CTL). The previous work is summarized in the following document:

- *Soils and Foundation Investigation, Oakhurst Subdivision, Palmer Avenue and Blake Street, Glenwood Springs, Colorado* by CTL Thompson for Archdiocesan Housing, Inc., July 1, 2010.

1.2 Scope

As discussed above, a geologic hazards and geotechnical investigation was conducted for the Glenwood Multifamily project in Glenwood Springs, Colorado. The scope of the investigation included the following components:

- Conducting a subsurface investigation to supplement the information in the referenced report.
- Providing recommendations for foundation type and subgrade preparation.
- Providing recommendations for bearing capacity.
- Providing recommendations for lateral earth pressure.
- Providing recommendations for pavements.
- Providing recommendations for drainage, grading, and general earthwork.
- Evaluating potential geologic hazards at the site.

The investigation and report were completed by a Colorado registered professional engineer in accordance with generally accepted geotechnical and geological engineering practices. This report has been prepared for the exclusive use of Forenza Contracting.

1.3 Site Location and Description

The site is located along Palmer Avenue between Blake Street and 26th Street and comprises approximately 6.4 acres. The project location is shown on Figure 1 – Site Location Map.

At the time of the investigation, the site was open with a slight to moderate general slope down to the west. However, steeper slopes were present east of the site rising to the east. Vegetation consisted primarily of grasses, weeds, and brush. The site was bordered to the north by existing residences and 26th Street, to the south by a Wal-Mart store, to the west by existing residences and Blake Street, and to the east by open land.

.

1.4 Proposed Construction

The proposed construction is anticipated to include ten multi story structures, utility installation, and paved parking areas. Improvements to Palmer Avenue will also be included in the construction.

2.0 GEOLOGIC SETTING

2.1 Soils

Soils data was obtained from the USDA Natural Resource Conservation Service Web Soil Survey. The data indicates that the soils at the site include Atencio-Azeltine complex, 1 to 3 percent slopes and Torrithorents-Rock outcrop complex, steep. Soil survey data is included in Appendix A.

Structure construction in the site soils is described as ranging from somewhat limited to very limited due to large stones, slope, and/or depth to hard bedrock. Road construction in the site soils is indicated to range from not limited to very limited due to large stones, slope, and/or depth to hard bedrock. Excavation in the site soils is indicated to range from somewhat limited to very limited due to unstable excavation walls, dust, large stones, depth to hard bedrock, and/or slope. The site soils are indicated to have a low potential for frost action, moderate to high risk of corrosion of steel, and low risk of corrosion of concrete.

2.2 Geology

According to the *Geologic Map of the Glenwood Springs Quadrangle, Garfield County, Colorado* (2008), the site is underlain by Quaternary debris flow deposits and colluvium. As indicated in the referenced report, the surface deposits may be underlain by Eagle Valley Evaporite bedrock. Also as indicated in the referenced report, the Eagle Valley Evaporite is succeptible to dissolution and this can result in sinkholes. However, the previous and current investigations did not indicate any evidence of sinkholes or other subsidence at the site. In addition, HBET is unaware of subsidence related damage to any structures in the immediate vicinity of the project site.

2.3 Groundwater

Groundwater was not encountered during the previous or current subsurface investigations.

2.4 Seismicity

As indicated in the referenced report, the site lies in area of generally low to moderate seismic risk. Based upon the results of the previous and current subsurface investigations, the site generally classifies as Site Class D in accordance with the International Building Code (IBC).

2.5 Radioactivity

As discussed in the referenced report, Radon gas may be present at the site due to the natural decal of elements in the subsurface. However, Radon gas detection and/or testing were beyond the scope of the previous or current investigations.

3.0 FIELD INVESTIGATION

3.1 Subsurface Investigation

The original subsurface investigation included two borings and five test pits and the current investigation included six borings. The locations of the borings and test pits are shown on Figure 2. Copies of the boring and test pit logs from the referenced report are included in Appendix B. Copies of the boring logs from the current investigation are included in Appendix C.

As indicated on the logs, the subsurface conditions at the site were slightly variable. However, the borings and test pits generally encountered red, moist, dense to very dense silty to clayey gravel soils with cobbles and boulders. The boring logs from the referenced report indicate that sandstone bedrock was encountered at depths of between 16.0 and 26.0 feet. However, HBET did not encounter any sandstone bedrock to the depth explored of 33.5 feet. As discussed previously, groundwater was not encountered in the subsurface during the previous or current investigations.

The frequency and size of boulders increase in the current borings below 18.0 to 21.0 feet. In general, HBET believes that the sandstone bedrock reported on the logs from the referenced report actually represents large boulders. HBET does not believe that sandstone bedrock is preset at this site to the depth explored.

3.2 Field Reconnaissance

The field reconnaissance included walking the site during the subsurface investigation. In general, the site was gently to moderately sloping. However, steeper slopes were present above the site to the east. At the time of the investigation, HBET did not observe any evidence of recent or active landslides, debris flows, rockfalls, sinkholes, etc.

4.0 LABORATORY TESTING

As indicated in the referenced report, laboratory testing was conducted on the soils at the site. Laboratory testing results from the referenced report are included in Appendix D.

In addition to the laboratory testing conducted as part of the preliminary geotechnical investigation, HBET conducted laboratory testing as part of the current investigation. The laboratory testing results from the current investigation are included in Appendix E.

The laboratory testing results indicate that the native soils are slightly plastic. In addition, the native soils were shown to be slightly to moderately collapsible with up to 5.3% collapse measured in the laboratory.

5.0 GEOLOGIC INTERPRETATION

5.1 Geologic Hazards

The primary geologic hazard identified on the site is the presence of moisture sensitive soils.

5.2 Geologic Constraints

In general, the primary geologic constraint to construction at the site is the presence of moisture sensitive soils.

5.3 Water Resources

No water supply wells were observed on the property. In general, with proper design and construction, the proposed construction is not anticipated to adversely impact surface water or groundwater.

5.4 Mineral Resources

Potential mineral resources in Western Colorado generally include gravel, uranium ore, and commercial rock products such as flagstone. As discussed previously, gravels were encountered at the site. However, based upon the size of the site and surrounding land use, HBET does not believe that the gravels at the site represent an economically recoverable resource.

6.0 CONCLUSIONS

Based upon the available data sources, field investigation, and nature of the proposed construction, HBET does not believe that there are any geologic conditions which should preclude construction at the site. However, foundations, pavements, and earthwork will have to consider the impacts of the moisture sensitive soils and at the site.

7.0 RECOMMENDATIONS

7.1 Foundations

Based upon the subsurface conditions and nature of the proposed construction, shallow and deep foundations may both be appropriate. Shallow foundations such as mat or ribbed slabs and deep foundations such as micro piles are both appropriate. The foundation alternatives are discussed in the following sections.

Shallow Foundations

In general, properly designed structural mat or ribbed slabs will provide some protection against differential movements. However, due to the stiffening effect of the ribs, ribbed slab foundations will provide more resistance to slab bending where differential soil settlement occurs below the foundations. For both shallow foundation alternatives, HBET concurs with the recommendation in the referenced report for 6 feet of structural fill below the foundations.

As indicated in the referenced report, the native soils, exclusive of topsoil, are generally suitable for reuse as structural fill. However, the soils should be screened to approximately 5-inch minus. Imported structural fill should consist of a granular, non-expansive, non-free draining material such as crusher fines or CDOT Class 6 base course. Unless it can be demonstrated that they are not free-draining, pit-run materials should not be used as structural fill.

Prior to placement of structural fill, it is recommended that the bottoms of the foundation excavations be scarified to a depth of 6 to 9-inches, moisture conditioned, and re-compacted to a minimum of 95% of the standard Proctor maximum dry density, within ±2% of the optimum moisture content as determined in accordance with ASTM D698. Structural fill should extend laterally beyond the edges of the foundations a distance equal to the thickness of structural fill. Structural fill should be moisture conditioned, placed in maximum 8-inch loose lifts, and compacted to a minimum of 100% of the standard Proctor maximum dry density for fine grained soils or modified Proctor maximum dry density for coarse grained soils, within ±2% of the optimum moisture content as determined in accordance with ASTM D698 or D1557, respectively.

For foundation building pads prepared as recommended with structural fill consisting of suitable native soils or imported granular materials, a maximum allowable bearing capacity of 2,000 psf is recommended. In addition, a modulus of subgrade reaction of 110 pci may be used for structural fill consisting of native soils and a modulus of 200 pci may be used for structural fill consisting of crusher fines or base course. It is recommended that the bottoms of exterior foundations be at least 36-inches below the final grade for frost protection

Micro Piles

For a micro pile foundation, it is generally recommended that micro piles have a minimum length of 35 feet. An allowable skin friction value of 1,000 psf may be used for the native gravel soils. However, skin friction should be disregarded along the upper 10 feet of the piles. To ensure friction capacity, pile load testing is strongly recommended. Grout used in the bond zone of the micro piles should have a minimum 28 day compressive strength of 3,000 psi.

In general, micro piles should be installed with a center-to-center spacing of greater than 3 feet. However, to the extent practical, smaller numbers of longer micro piles should be used in lieu of larger numbers of shorter piles. The longer the piles and larger the loads on the piles, the lower the risk of movement. The bottoms of grade beams should extend a minimum of 36-inches below the finished grade for frost protection.

7.2 Corrosion of Concrete

As indicated in the referenced report, water soluble sulfates were detected in the native soils in concentrations as high as 0.02%. This concentration of sulfates represents a negligible degree of potential sulfate attack. Therefore, sulfate resistant cement may not be required for construction at this site.

7.3 Flooring Systems and Exterior Flatwork

As discussed previously, collapsible soils are present at the site. Therefore, where micro-pile foundations are utilized, HBET recommends that framed floors or fully voided concrete slabs supported by micro-piles be utilized.

As outlined in the referenced report, it is recommended that exterior flatwork be constructed above 2 to 3 feet of structural fill with subgrade preparation, structural fill materials, and structural fill placement in accordance with the *Shallow Foundations* section of this report. Slabs-on-grade should not be tied-into or otherwise connected to the foundations in any manner.

7.4 Lateral Earth Pressures

Stemwalls or retaining walls should be designed to resist lateral earth pressures. For backfill consisting of screened native soils or imported granular, non-free draining, non-expansive material, we recommend that the walls be designed for an active equivalent fluid unit weight of 40 pcf in areas where no surcharge loads are present. An at-rest equivalent fluid unit weight of 50 pcf is recommended for braced walls. Lateral earth pressures should be increased as necessary to reflect any surcharge loading behind the walls.

7.5 Drainage

Site grading and drainage are critical to the performance of the foundations and slabs-on-grade. Grading around the structures should be designed to carry precipitation and runoff away from the structures. It is recommended that the finished ground surface drop at least twelve inches within the first ten feet away from the structures. However, where impermeable surfaces (i.e. pavements, sidewalks, etc.) are adjacent to the structures, the grade can be reduced to approximately 2.5-inches (ADA grade) within the first ten feet away from the structures. It is recommended that landscaping within ten feet of the structures include primarily desert plants with low water requirements. In addition, it is recommended that no automatic irrigation, including drip lines, be used within ten feet of foundations.

HBET recommends that surface downspout extensions be used which discharge a minimum of 10 feet from the structures or beyond the backfill zone, whichever is greater. However, if subsurface downspout drains are utilized, they should be carefully constructed of solid-wall PVC and should daylight at least 15 feet from the structures. In addition, an impermeable membrane is recommended below subsurface downspout drain lines to limit the potential for leaks in the subsurface drains to impact the structures. Dry wells should not be used.

In order to reduce the potential for surface moisture to impact the structures, perimeter foundation drains are recommended. In general, the perimeter foundation drains should consist of prefabricated drain materials or perforated pipe and gravel systems with the flowlines of the drains at the bottoms of the foundations (at the highest point). The perimeter drains should slope at a minimum of 1.0% to daylight or to sumps with pumps. The drains should also include an impermeable membrane at the base to limit the potential for moisture to infiltrate vertically down below the foundations.

7.6 Excavations and Earthwork

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. Therefore, trenching and excavations should be sloped back, shored, or shielded for worker protection in accordance with applicable OSHA standards. The native soils at the site generally classify as Type C soil with regard to OSHA's *Construction Standards for Excavations*. For Type C soils, the maximum allowable slope in temporary cuts is 1.5H:1V.

7.7 Pavements

The proposed construction is anticipated to include paved parking areas and improvements to Palmer Avenue. As indicated in the referenced report, the site soils classify as A-4 with regard to the American Association of State Highway and Transportation Officials (AASHTO). However, the native soils are collapsible. Therefore, the minimum recommended Resilient Modulus of 3,000 psi was used for the pavement design.

Automobile Parking Areas
EDLA = 5, Structural Number = 2.75

ALTERNATIVE	PAVEMENT SECTION (Inches)				
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	Concrete Pavement	TOTAL
A	3.0	9.0			12.0
B	4.0	7.0			11.0
C	3.0	6.0	6.0		15.0
Rigid Pavement		6.0		6.0	12.0

Palmer Avenue
EDLA = 30, Structural Number = 3.61

ALTERNATIVE	PAVEMENT SECTION (Inches)				
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	Rigid Pavement	TOTAL
A	3.0	17.0			20.0
B	4.0	14.0			18.0
C	3.0	6.0	15.0		24.0
Full Depth RP		6.0		6.0	12.0

Prior to roadway construction, the roadway prism should be stripped of all topsoil, fill, or other unsuitable materials. It is recommended that the subgrade soils be scarified to a depth of 12-inches; moisture conditioned, and recompacted to a minimum of 95% of the standard Proctor maximum dry density, within ±2% of optimum moisture as determined by AASHTO T-99.

Aggregate base course and subbase course should be placed in maximum 9-inch loose lifts, moisture conditioned, and compacted to a minimum of 95% and 93% of the maximum dry density, respectively, at -2% to +3% of optimum moisture content as determined by AASHTO T-180. In addition to density testing, base course should be proofrolled to verify subgrade stability.

It is recommended that Hot-Mix Asphaltic (HMA) pavement conform to CDOT grading SX or S specifications and consist of an approved 75 gyration Superpave method mix design. HMA pavement should be compacted to between 92% and 96% of the maximum theoretical density. An end point stress of 50 psi should be used. In addition, pavements should conform to local specifications.

The long-term performance of the pavements is dependent on positive drainage away from the pavements. Ditches, culverts, and inlet structures in the vicinity of paved areas must be maintained to prevent ponding of water on the pavement.

8.0 GENERAL

The recommendations included above are based upon the results of the subsurface investigation and on our local experience. These conclusions and recommendations are valid only for the proposed construction.

As discussed previously, the subsurface conditions at the site were slightly variable. However, the precise nature and extent of any subsurface variability may not become evident until construction. ***The recommendations contained herein are designed to reduce the risk and magnitude of movements and it is extremely critical that ALL of the recommendations herein be applied to the design and construction. However, HBET cannot predict long-term changes in subsurface moisture conditions and/or the precise magnitude or extent of volume change in the native soils. Where significant increases in subsurface moisture occur due to poor grading, improper stormwater management, utility line failure, excess irrigation, or other cause, during or after construction, significant movements are possible***.

In addition, the success of the pavements, structure foundations, slabs, etc. is critically dependent upon proper construction. Therefore, HBET should be retained to provide materials testing and engineering oversight during ***ALL*** phases of the construction to ensure conformance with the recommendations herein.

Huddleston-Berry Engineering and Testing, LLC is pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

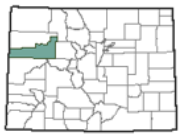
Respectfully Submitted:
Huddleston-Berry Engineering and Testing, LLC

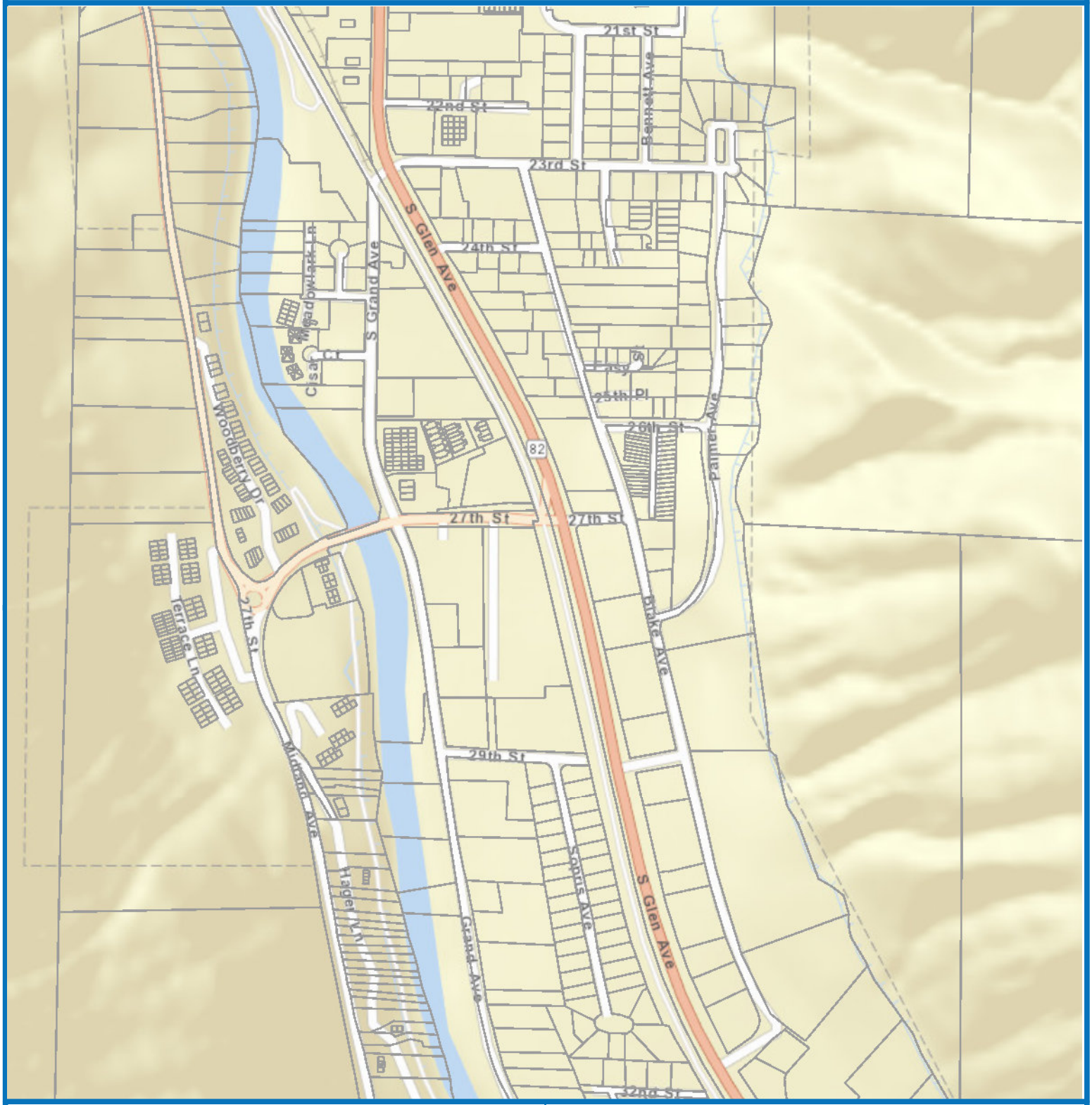
Michael A. Berry, P.E.
Vice President of Engineering

FIGURES

Garfield County Land Explorer

Garfield County, Colorado





Garfield County Land Explorer

Printed by Web User

1 inch = 752 feet

1 inch = 0.14 miles

0 0.1 0.2 0.4 Miles

N W E S

Garfield County Colorado

Garfield County www.garfield-county.com Colorado

Disclaimer

This is a compilation of records as they appear in the Garfield County Offices affecting the area shown. This drawing is to be used only for reference purposes and the County is not responsible for any inaccuracies herein contained.

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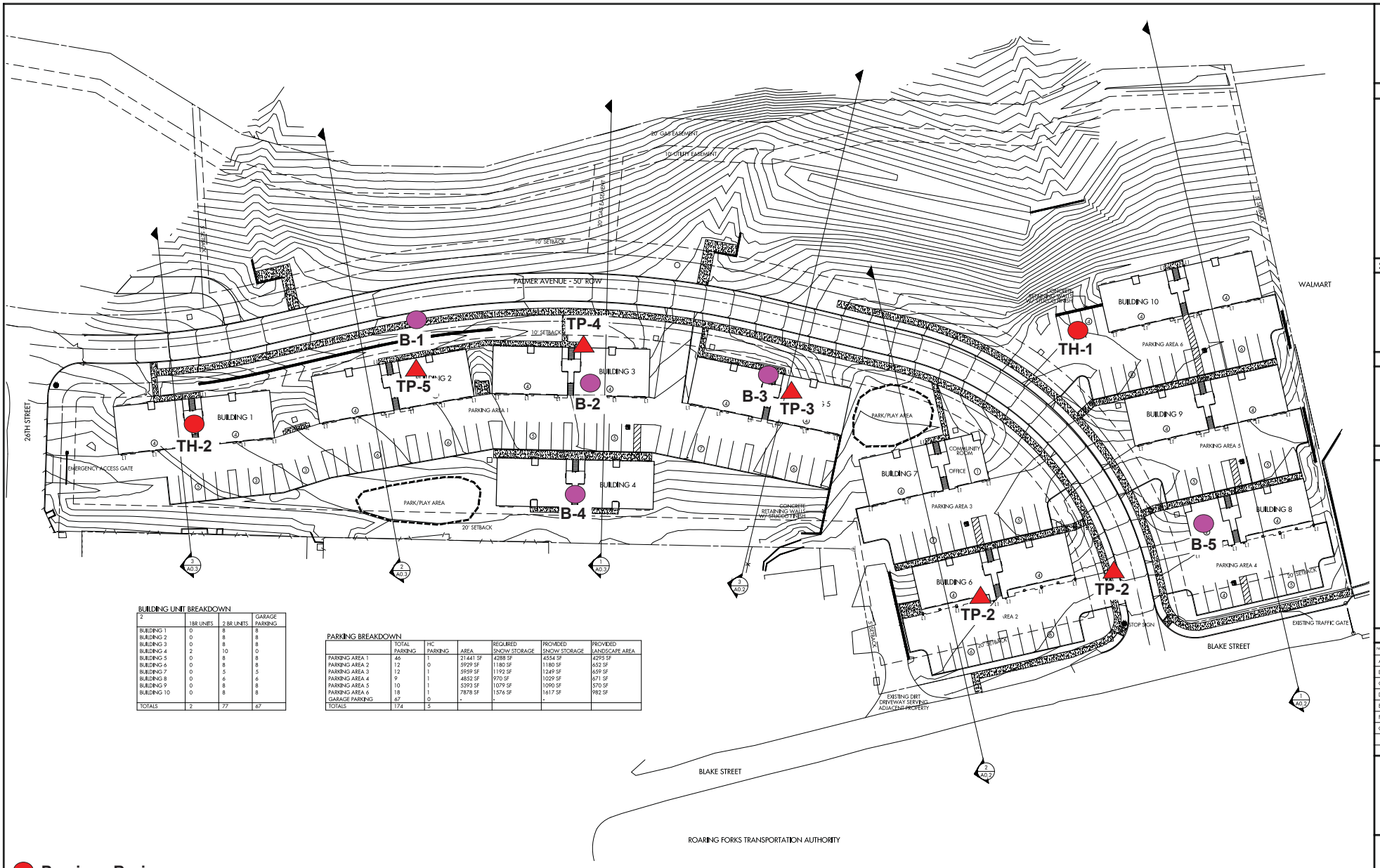
Printed: 12/1/2017 at 9:32:19 AM



BUILDING UNIT BREAKDOWN

2	1BR UNITS	2 BR UNITS	GARAGE PARKING
BUILDING 1	0	8	8
BUILDING 2	0	8	8
BUILDING 3	0	8	8
BUILDING 4	2	10	0
BUILDING 5	0	8	8
BUILDING 6	0	8	8
BUILDING 7	0	5	5
BUILDING 8	0	6	6
BUILDING 9	0	8	8
BUILDING 10	0	8	8
TOTALS	2	77	67

PARKING BREAKDOWN

	TOTAL PARKING	HC PARKING	AREA	REQUIRED SNOW STORAGE	PROVIDED SNOW STORAGE	PROVIDED LANDSCAPE AREA
PARKING AREA 1	46	1	21441 SF	4288 SF	4554 SF	4295 SF
PARKING AREA 2	12	0	5929 SF	1180 SF	1180 SF	652 SF
PARKING AREA 3	12	1	5959 SF	1192 SF	1249 SF	659 SF
PARKING AREA 4	9	1	4852 SF	970 SF	1029 SF	671 SF
PARKING AREA 5	10	1	5393 SF	1079 SF	1090 SF	570 SF
PARKING AREA 6	18	1	7878 SF	1576 SF	1617 SF	982 SF
GARAGE PARKING	67	0	-	-	-	
TOTALS	174	5				

- Previous Boring
- Previous Test Pit
- Current Boring

FIGURE 2
Site Plan

ARCHITECT

RA Architects, Inc
Architecture • Planning • Interior Design
P.O. Box 1805
Edwards, Colorado 81632
Phone – 970.376.4227
email – bobby@raiarch.com

STRUCTURAL

LANDSCAPE

NOTES

ISSUES

NO.	DESCRIPTION	DATE
A	Preliminary Bid	05.02.16
B	Conceptual Review	02.21.17
C	Planning Submittal	02.27.17
D	Planning Revisions	03.10.17
E	Planning Revisions	03.16.17
F	Planning Revisions	04.11.17
G	Revised Submittal	06.19.17

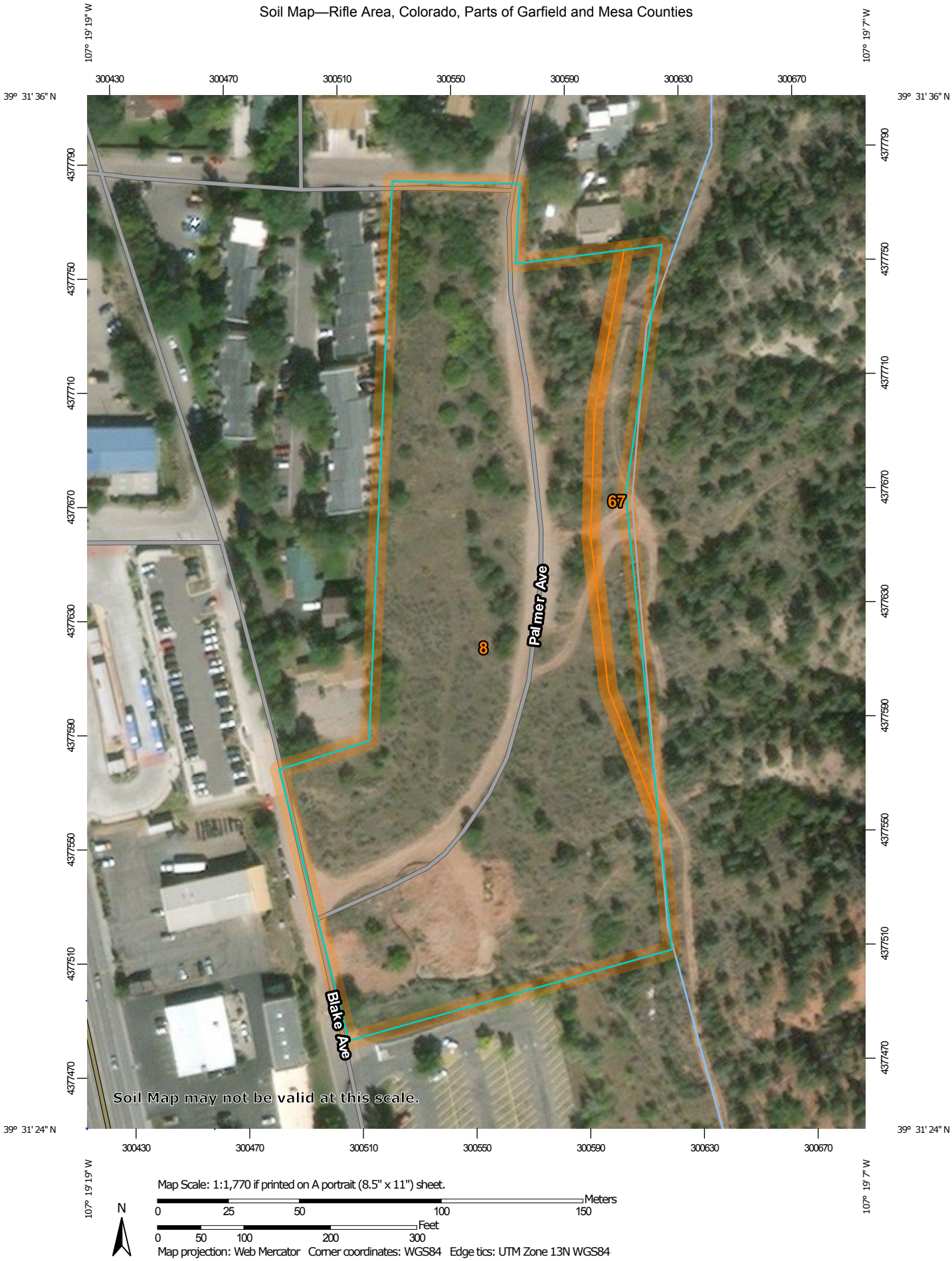
Glenwood Multifamily LLC Apartments

Palmer Ave and Blake Street
Glenwood Springs, CO

Architectural Site Plan

PROJECT NO: 15-217
DATE: June 19, 2017
DRAWN BY: rd
SCALE:
SHEET NO: A0.1

APPENDIX A
Soil Survey Data



Map Scale: 1:1,770 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 10, Oct 12, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 14, 2010—Mar 2, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Atencio-Azeltine complex, 1 to 3 percent slopes	6.3	91.3%
67	Torriorthents-Rock outcrop complex, steep	0.6	8.7%
Totals for Area of Interest		**6.9**	**100.0%**

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

8—Atencio-Azeltine complex, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: jnzd

Elevation: 5,000 to 7,000 feet
Farmland classification: Farmland of statewide importance

Map Unit Composition

Atencio and similar soils: 45 percent
Azeltine and similar soils: 45 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atencio

Setting

Landform: Alluvial fans, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 23 inches: gravelly sandy clay loam
H3 - 23 to 28 inches: gravelly sandy loam
H4 - 28 to 60 inches: extremely cobbly sand

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: Rolling Loam (R048AY298CO)
Hydric soil rating: No

Description of Azeltine

Setting

Landform: Terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear

Parent material: Mixed alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 18 inches: gravelly sandy loam
H2 - 18 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: Rolling Loam (R048AY298CO)
Hydric soil rating: No

Minor Components

Gravel pits

Percent of map unit: 10 percent
Landform: Alluvial fans, terraces
Landform position (three-dimensional): Tread
Hydric soil rating: No

67—Torriorthents-Rock outcrop complex, steep

Map Unit Setting

National map unit symbol: jnz5
Elevation: 5,800 to 8,500 feet
Mean annual precipitation: 10 to 15 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 80 to 105 days
Farmland classification: Not prime farmland

Map Unit Composition

Torriorthents, steep, and similar soils: 60 percent
Rock outcrop, steep: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Torriorthents, Steep

Setting

Landform: Mountainsides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainflank, base slope
Down-slope shape: Concave, convex
Across-slope shape: Concave, convex
Parent material: Stony, basaltic alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 4 inches: variable
H2 - 4 to 30 inches: fine sandy loam
H3 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 70 percent
Depth to restrictive feature: 4 to 30 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Rock Outcrop, Steep

Setting

Landform: Mountainsides
Landform position (three-dimensional): Free face
Down-slope shape: Convex
Across-slope shape: Convex

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 70 percent
Depth to restrictive feature: 0 inches to paralithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 10, Oct 12, 2017

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Dwellings and Small Commercial Buildings

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Dwellings and Small Commercial Buildings–Rifle Area, Colorado, Parts of Garfield and Mesa Counties							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8—Atencio-Azeltine complex, 1 to 3 percent slopes							
Atencio	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Large stones	0.01	Large stones	0.01	Large stones	0.01
Azeltine	45	Not limited		Not limited		Not limited	

Dwellings and Small Commercial Buildings–Rifle Area, Colorado, Parts of Garfield and Mesa Counties							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
67—Torriorthents-Rock outcrop complex, steep							
Torriorthents, steep	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop, steep	25	Not rated		Not rated		Not rated	

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 10, Oct 12, 2017

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Roads and Streets, Shallow Excavations, and Lawns and Landscaping

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Roads and Streets, Shallow Excavations, and Lawns and Landscaping–Rifle Area, Colorado, Parts of Garfield and Mesa Counties							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8—Atencio-Azeltine complex, 1 to 3 percent slopes							
Atencio	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.15	Large stones	0.01	Unstable excavation walls	0.12
		Dusty	0.07			Dusty	0.07
						Large stones	0.01
Azeltine	45	Somewhat limited		Not limited		Very limited	
		Droughty	0.99			Unstable excavation walls	1.00
		Low exchange capacity	0.50			Dusty	0.02
		Large stones content	0.20				
		Gravel content	0.10				
		Dusty	0.02				
67—Torriorthents-Rock outcrop complex, steep							
Torriorthents, steep	60	Not rated		Very limited		Very limited	
				Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
				Slope	1.00	Slope	1.00
						Dusty	0.05
						Unstable excavation walls	0.01
Rock outcrop, steep	25	Not rated		Not rated		Not rated	

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 10, Oct 12, 2017

Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

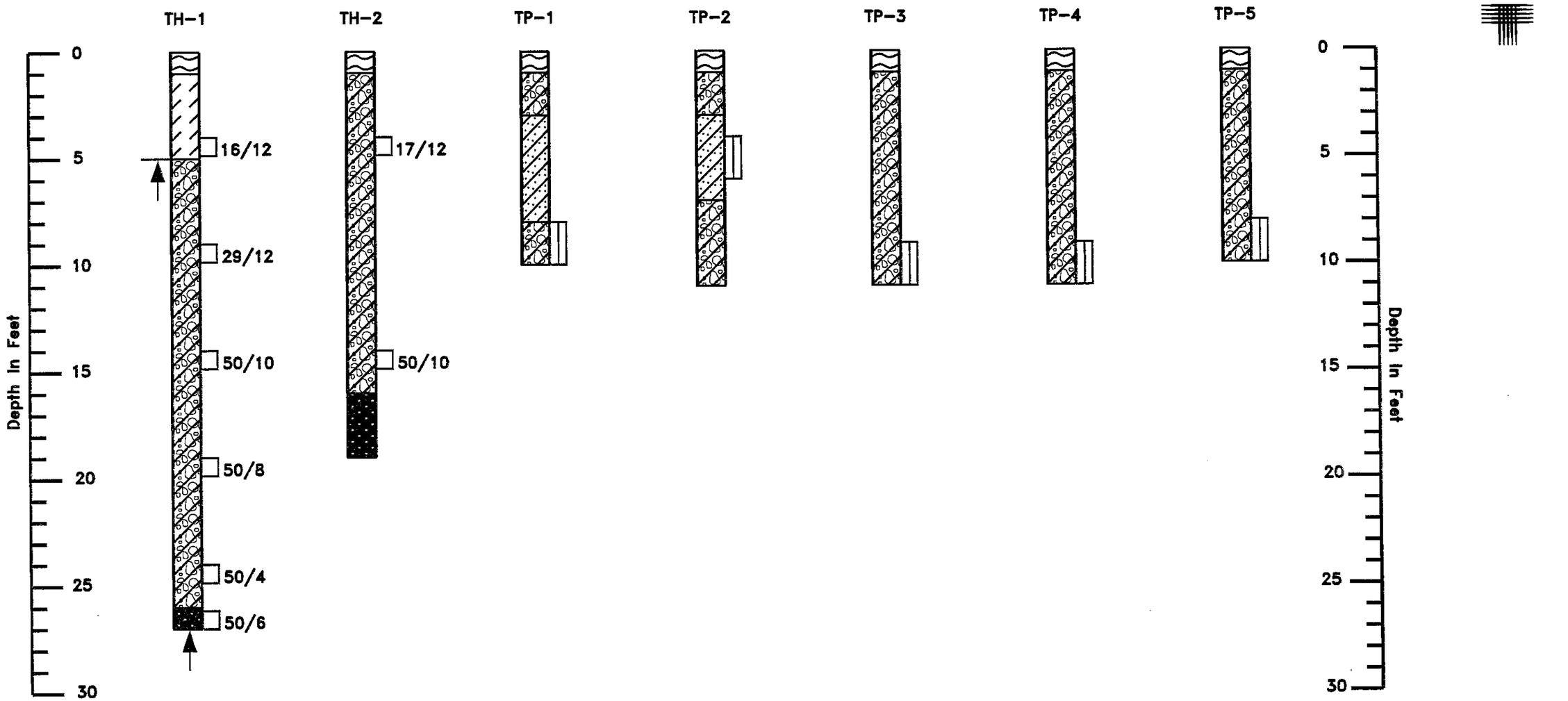
Report—Soil Features

Soil Features–Rifle Area, Colorado, Parts of Garfield and Mesa Counties									
Map symbol and soil name	**Restrictive Layer**				**Subsidence**		**Potential for frost action**	**Risk of corrosion**	
	Kind	**Depth to top**	**Thickness**	**Hardness**	**Initial**	**Total**		**Uncoated steel**	**Concrete**
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
		In	*In*		*In*	*In*			
8—Atencio-Azeltine complex, 1 to 3 percent slopes									
Atencio		—	—		0	—	Low	High	Low
Azeltine		—	—		0	—	Low	High	Low
67—Torriorthents-Rock outcrop complex, steep									
Torriorthents, steep	Lithic bedrock	4- 17-30	—	Indurated	0	—	Low	Moderate	Low
Rock outcrop, steep	Paralithic bedrock	0	—	Moderately cemented	0	—	None		

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 10, Oct 12, 2017

APPENDIX B
Boring and Test Pit Logs from Previous Investigation



SUMMARY LOGS OF EXPLORATORY BORINGS AND PITS

Project No. GS05471-120

Fig. 3

LEGEND:

Sandy clay "topsoil", organics, moist, brown.

Clay, sandy, occasional gravel, stiff, moist, rust. (CL)

Gravel, silty to clayey, cobbles and boulders, dense to very dense, slightly moist to moist, rust. (GM, GC)

Sand, silty to clayey, dense, slightly moist to moist, rust. (SM, SC)

Sandstone bedrock, very hard, moist, rust.

Drive sample. The symbol 16/12 indicates that 16 blows of a 140 pound hammer falling 30 inches were required to drive a 2.5 inch O.D. California sampler 12 inches.

Indicates bulk sample.

Indicates practical auger refusal.

NOTES:

1. Exploratory borings were drilled on June 4, 2010 with 4–inch diameter, solid–stem auger and a track–mounted drill rig. Exploratory pits were excavated with a backhoe on June 4, 2010. Borings and pits were backfilled immediately after drilling and excavation operations were completed.
2. Locations of exploratory borings and pits are approximate.
3. No free ground water was found in our exploratory borings or pits at the time of drilling or excavation
4. These exploratory borings and pits are subject to the explanations, limitations and conclusions as contained in this report.

SUMMARY LOGS OF EXPLORATORY BORINGS AND PITS

Project No. GS05471–120

Fig. 4

APPENDIX C
Boring Logs from Current Investigation

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

BORING NUMBER B-1

CLIENT Forenza Contracting
PROJECT NAME Glenwood Multifamily
PROJECT NUMBER 01402-0002
PROJECT LOCATION Glenwood Springs, CO
DATE STARTED 11/16/17 **COMPLETED** 11/17/17
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		Silty to Clayey GRAVEL with Cobbles and Boulders (gm-gc), red, moist, dense to very dense										
5			SS 1	83	26-28							
10			SS 2	67	17-17							
15			SS 3	67	12-17							
20		***More Dense Below 18 Ft										
25												
30			RC 1	17 (8)								
		Bottom of hole at 33.5 feet.										

GEOTECH BH COLUMNS 01402-0002 GLENWOOD MULTIFAMILY.GPJ GINT US LAB.GDT 12/2/17

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

BORING NUMBER B-2

CLIENT Forenza Contracting
PROJECT NAME Glenwood Multifamily
PROJECT NUMBER 01402-0002
PROJECT LOCATION Glenwood Springs, CO
DATE STARTED 11/16/17 **COMPLETED** 11/17/17
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		Silty to Clayey GRAVEL with Cobbles and Boulders (gm-gc), red, moist, dense to very dense										
5												
10												
15												
20		***Less Dense Below 21 Ft										
25												
30		Bottom of hole at 31.5 feet.										

GEOTECH BH COLUMNS 01402-0002 GLENWOOD MULTIFAMILY.GPJ GINT US LAB.GDT 12/2/17

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

BORING NUMBER B-3

CLIENT Forenza Contracting
PROJECT NAME Glenwood Multifamily
PROJECT NUMBER 01402-0002
PROJECT LOCATION Glenwood Springs, CO
DATE STARTED 11/16/17 **COMPLETED** 11/17/17
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		Silty to Clayey GRAVEL with Cobbles and Boulders (gm-gc), red, moist, dense to very dense										
			SS 1	75	14-16							
5												
10												
15												
		***More Dense Below 18 Ft	SS 2	0	50/1"							
20												
25												
30												
		Bottom of hole at 31.5 feet.										

GEOTECH BH COLUMNS 01402-0002 GLENWOOD MULTIFAMILY.GPJ GINT US LAB.GDT 12/2/17

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

BORING NUMBER B-4

CLIENT Forenza Contracting
PROJECT NAME Glenwood Multifamily
PROJECT NUMBER 01402-0002
PROJECT LOCATION Glenwood Springs, CO
DATE STARTED 11/16/17 **COMPLETED** 11/17/17
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		Silty to Clayey GRAVEL with Cobbles and Boulders (gm-gc), red, moist, dense to very dense										
			SS 1	67	28-23							
5												
10												
15			SS 2	50	28-32							
		***More Dense Below 18 Ft										
20												
25												
30												
		Bottom of hole at 31.5 feet.										

GEOTECH BH COLUMNS 01402-0002 GLENWOOD MULTIFAMILY.GPJ GINT US LAB.GDT 12/2/17

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

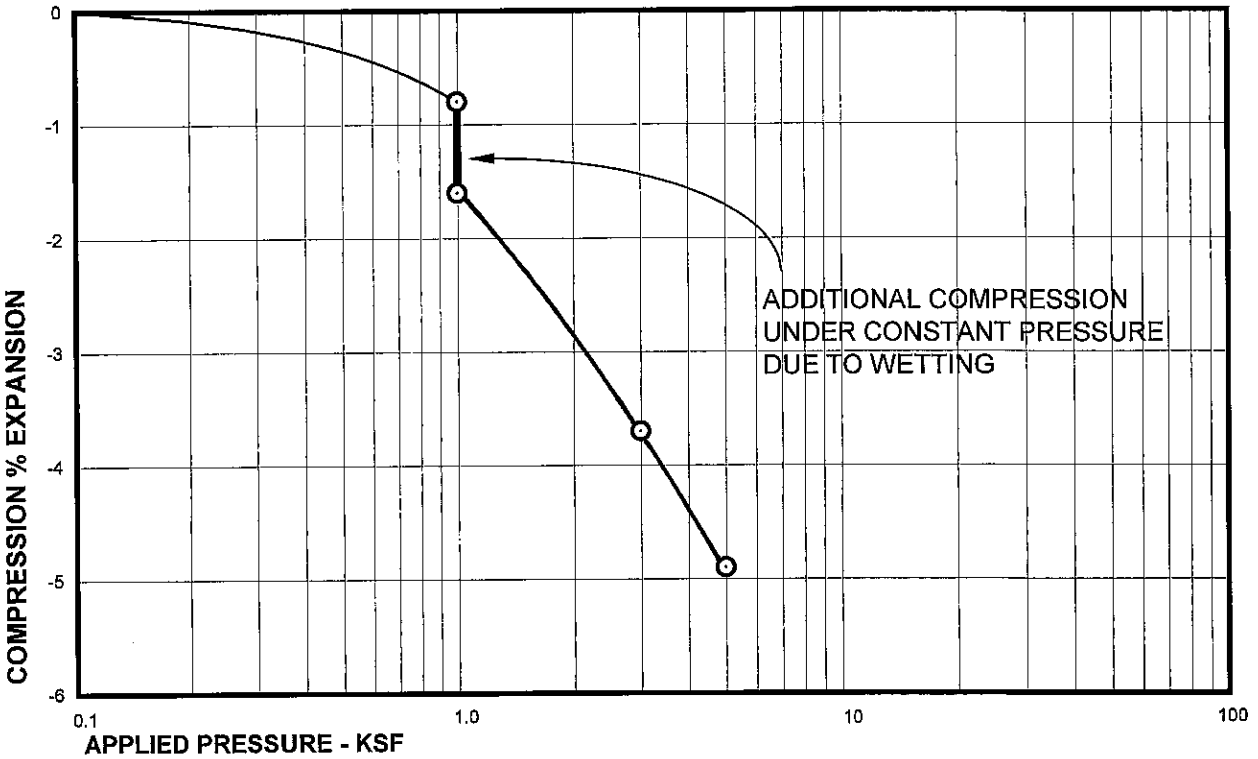
BORING NUMBER B-5

CLIENT Forenza Contracting
PROJECT NAME Glenwood Multifamily
PROJECT NUMBER 01402-0002
PROJECT LOCATION Glenwood Springs, CO
DATE STARTED 11/16/17 **COMPLETED** 11/17/17
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR S. McKracken
GROUND WATER LEVELS:
DRILLING METHOD Simco 2000 Truck Rig
AT TIME OF DRILLING dry
LOGGED BY CM **CHECKED BY** MAB
AT END OF DRILLING dry
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		Silty to Clayey GRAVEL with Cobbles and Boulders (gm-gc), red, moist, medium dense to dense										
			SS 1	89	15-9-18 (27)							
		Bottom of hole at 32.0 feet.										

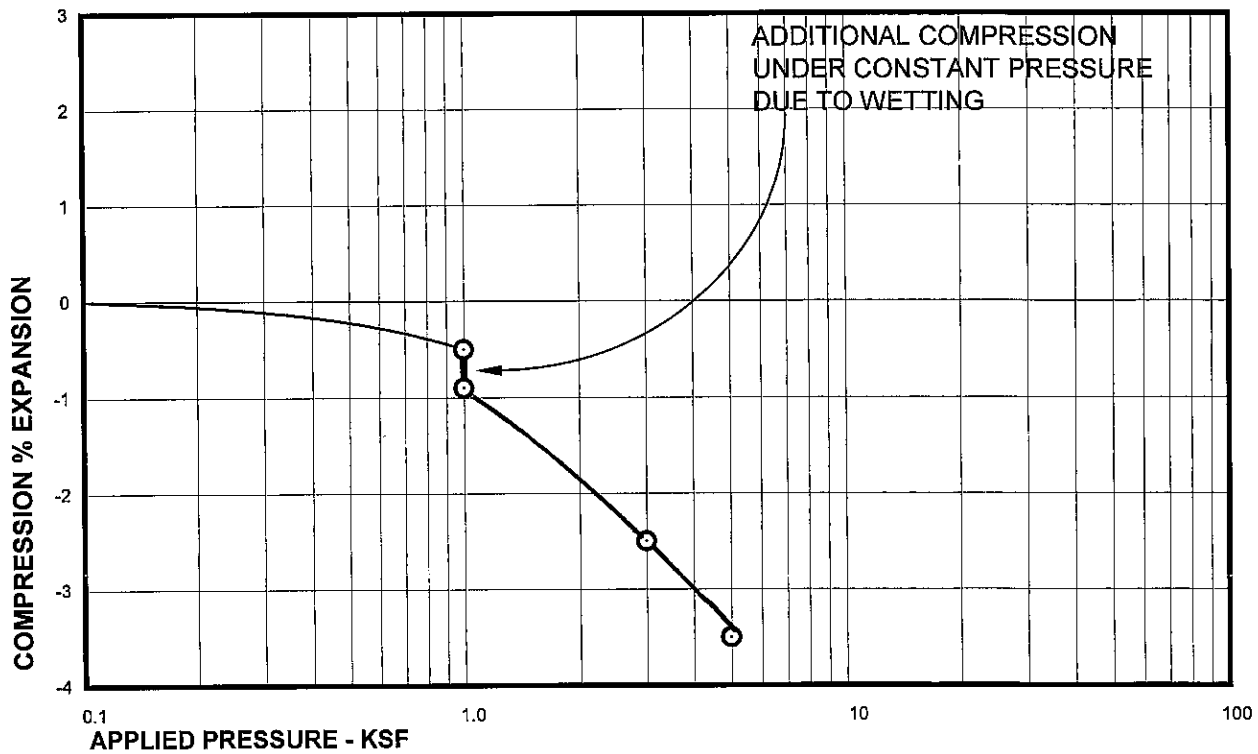
GEOTECH BH COLUMNS 01402-0002 GLENWOOD MULTIFAMILY.GPJ GINT US LAB.GDT 12/2/17

APPENDIX D
Laboratory Testing Results from Previous Investigation



Sample of SAND, CLAYEY (SC)
From TH-1 AT 14 FEET

DRY UNIT WEIGHT= 114 PCF
MOISTURE CONTENT= 3.1 %



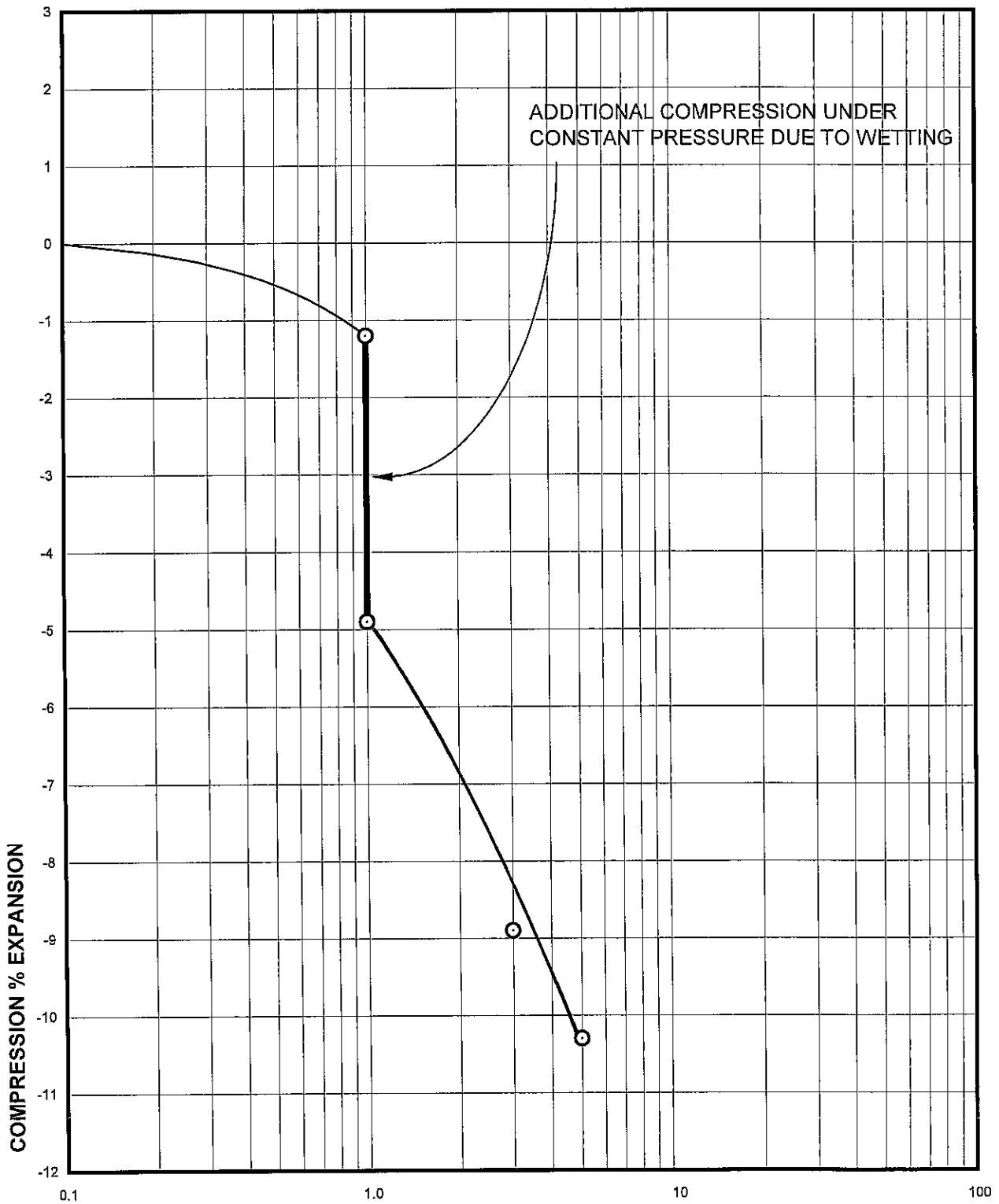
Sample of SAND, CLAYEY (SC)
From TH-1 AT 19 FEET

DRY UNIT WEIGHT= 127 PCF
MOISTURE CONTENT= 2.5 %

ARCHDIOCESAN HOUSING, INC.
OAKHURST SUBDIVISION
PROJECT NO. GS05471-120
S:\GS05471.000\120\6. Calcs\2010 swell

Swell Consolidation Test Results

FIG. A-1



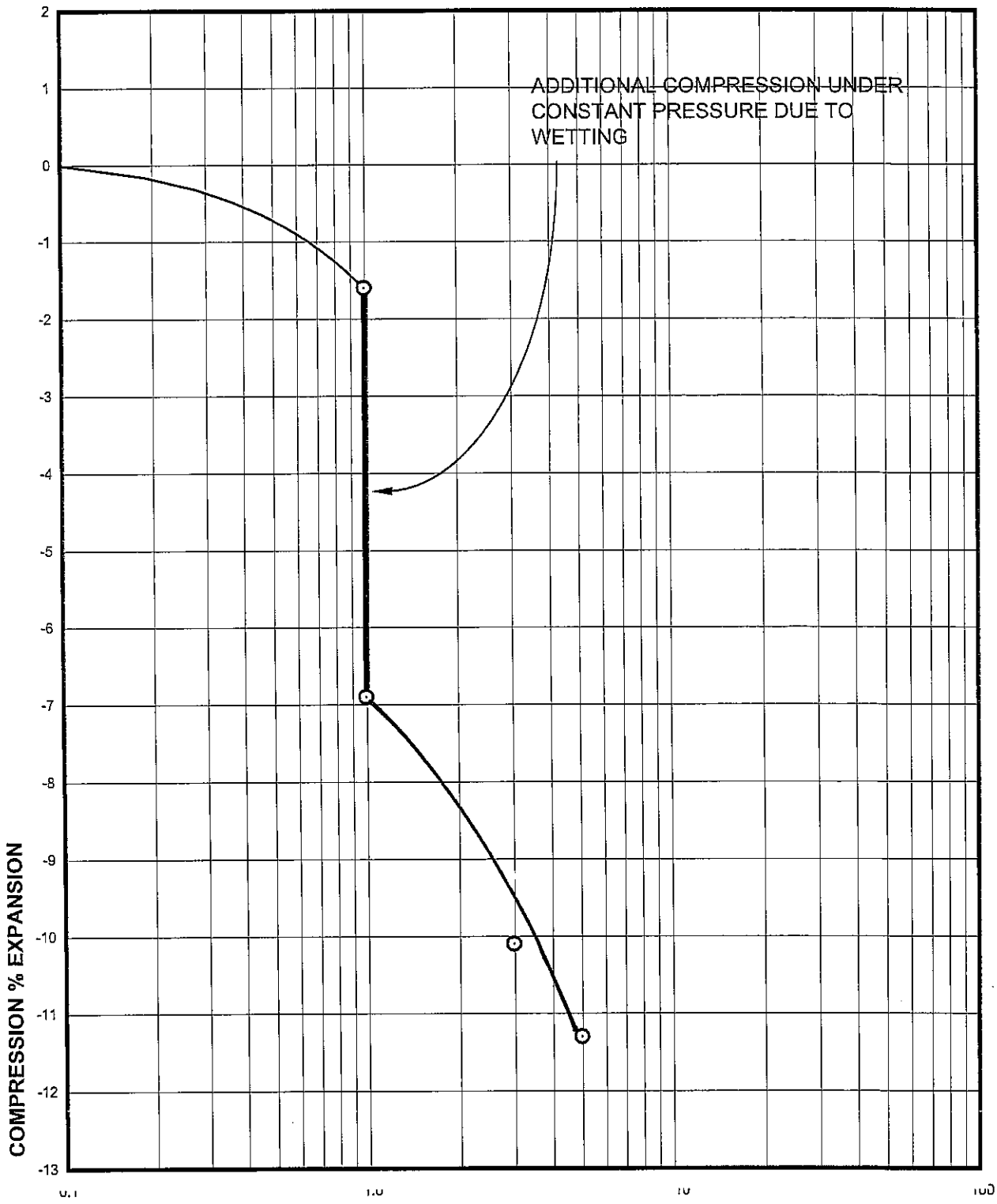
Sample of SAND, SILTY (SM)
From TH-1 AT 24 FEET

DRY UNIT WEIGHT= 123 PCF
MOISTURE CONTENT= 1.8 %

ARCHDIOCESAN HOUSING, INC.
OAKHURST SUBDIVISION
PROJECT NO. GS05471-120
S:\GS05471.000\120\6. Calcs\2010 swell

Swell Consolidation Test Results

FIG. A-2



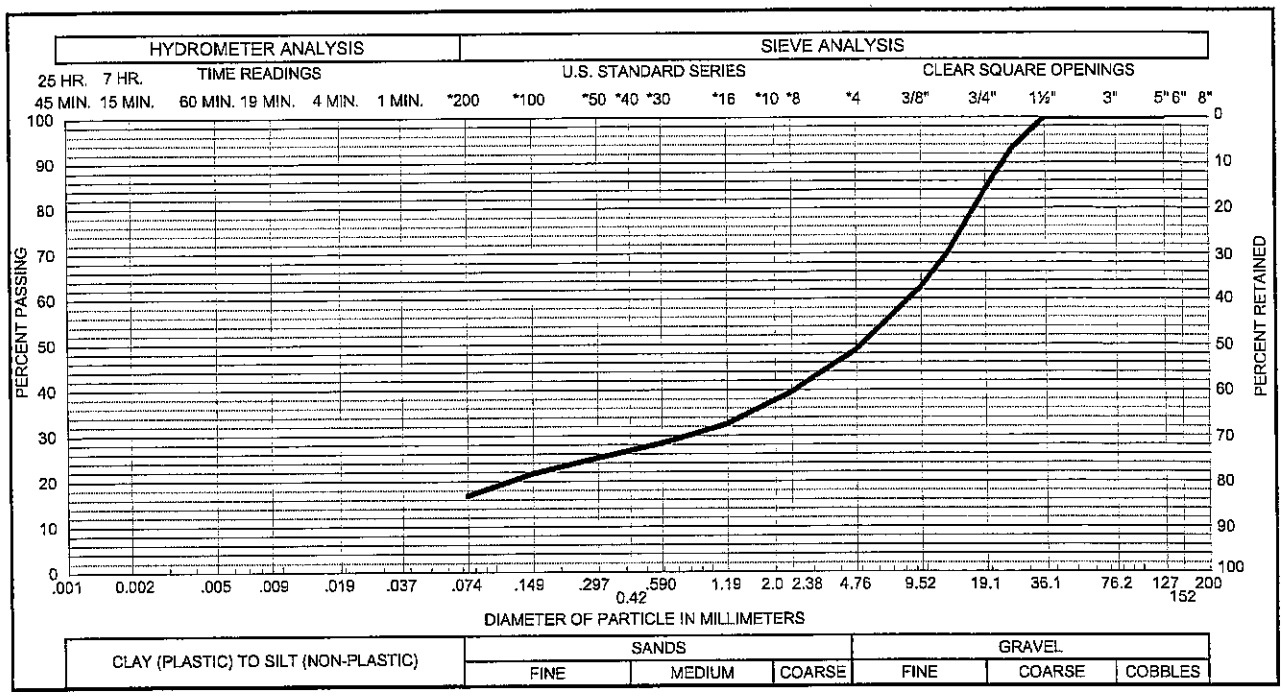
Sample of SAND, SILTY (SM)
From TH-1 AT 26 FEET

DRY UNIT WEIGHT= 109 PCF
MOISTURE CONTENT= 0.9 %

Swell Consolidation Test Results

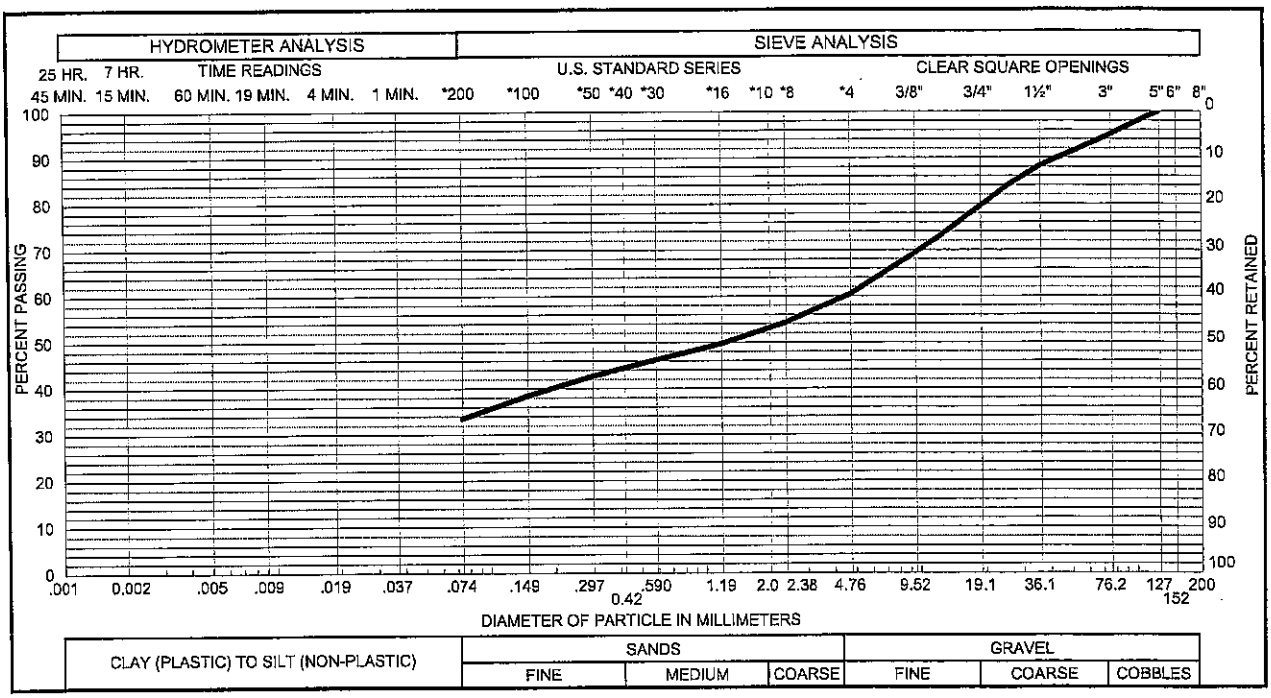
FIG. A-3

ARCHDIOCESAN HOUSING, INC.
OAKHURST SUBDIVISION
PROJECT NO. GS05471-120
S:\GS05471.000\120\6. Calcs\GS05471-120.Swell



Sample of GRAVEL, SILTY (GM)
From TH - 2 AT 4 FEET

GRAVEL 51 % SAND 32 %
SILT & CLAY 17 % LIQUID LIMIT %
PLASTICITY INDEX %



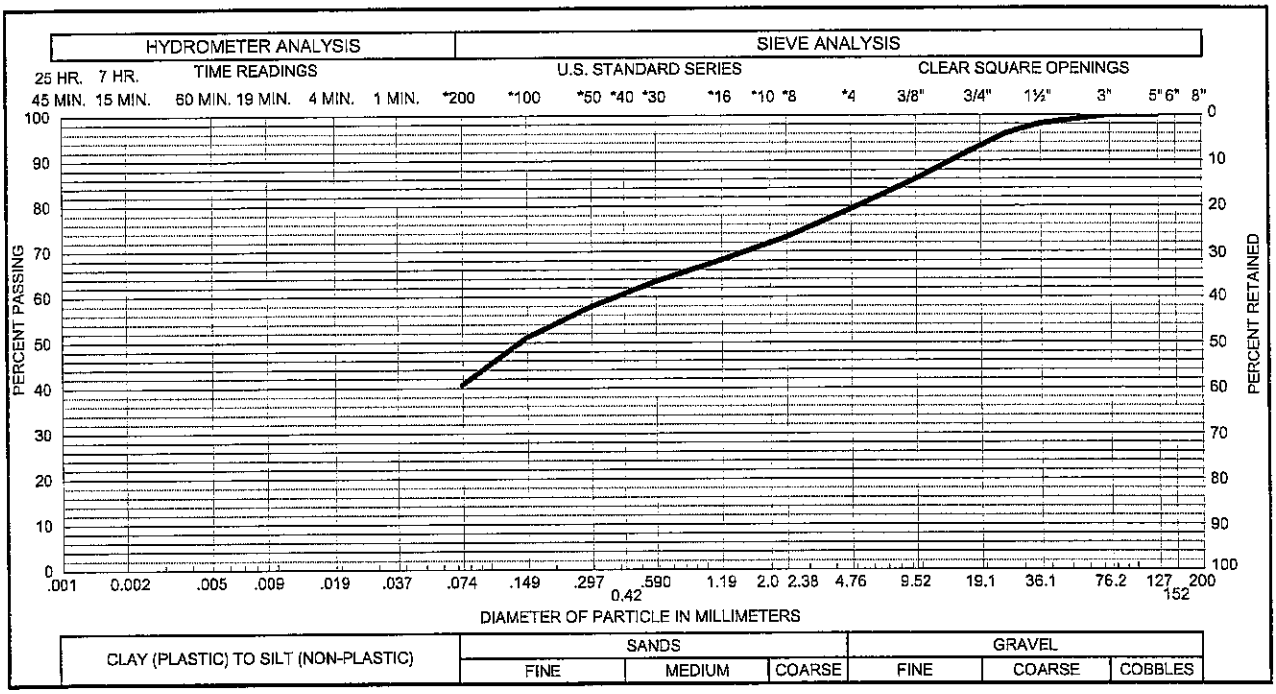
Sample of SILT, GRAVELLY (ML)
From TP - 1 AT 8-10 FEET

GRAVEL 40 % SAND 26 %
SILT & CLAY 34 % LIQUID LIMIT %
PLASTICITY INDEX %

ARCHDIOCESAN HOUSING, INC.
OAKHURST SUBDIVISION
PROJECT NO. GS05471-120
S:\GS05471.000\120\6. Calcs\GS05471-120.Gradation.xls

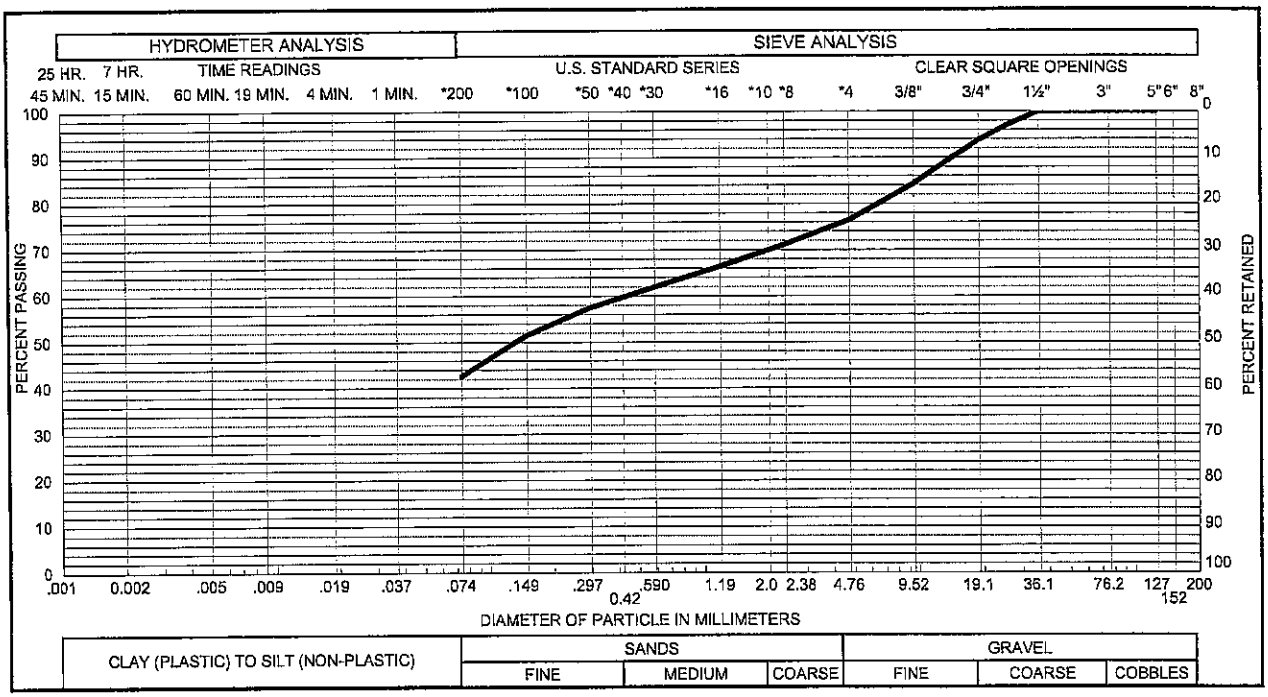
Gradation Test Results

FIG. A-4



Sample of SILT, GRAVELLY (ML)
From TP - 2 AT 4-6 FEET

GRAVEL 21 % SAND 38 %
SILT & CLAY 41 % LIQUID LIMIT %
PLASTICITY INDEX %



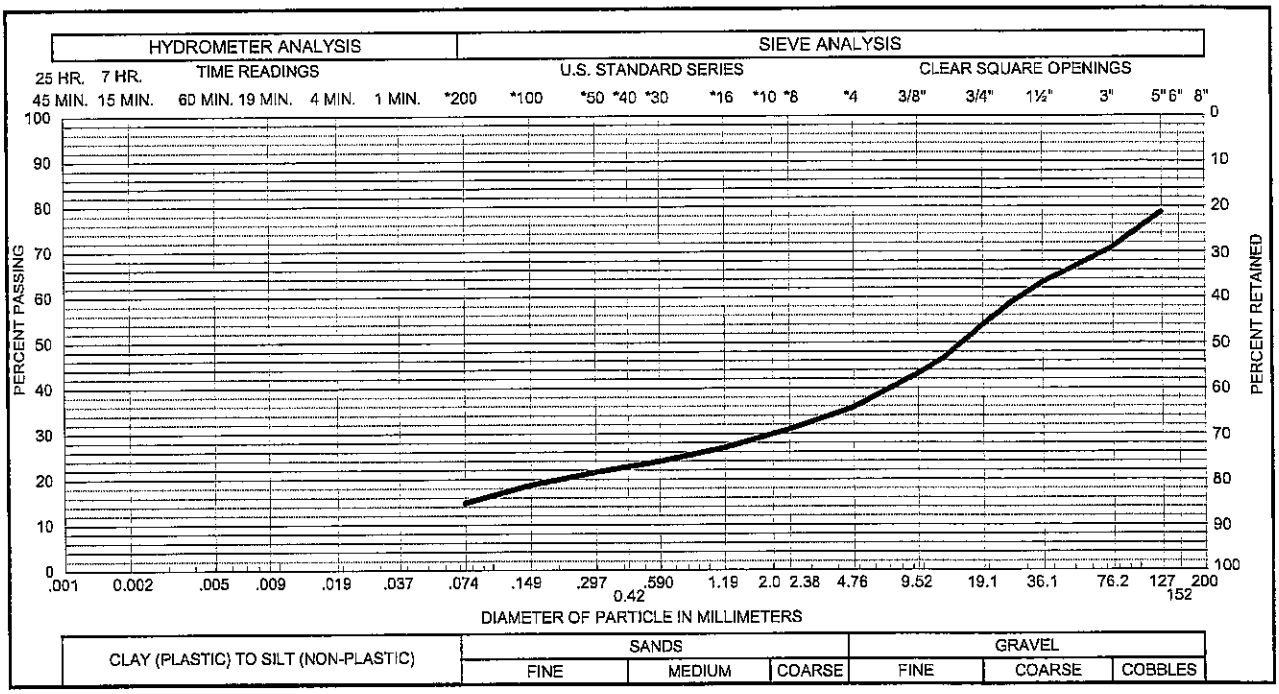
Sample of SILT, GRAVELLY (ML)
From TP - 3 AT 9-11 FEET

GRAVEL 24 % SAND 33 %
SILT & CLAY 43 % LIQUID LIMIT %
PLASTICITY INDEX %

ARCHDIOCESAN HOUSING, INC.
OAKHURST SUBDIVISION
PROJECT NO. GS05471-120
S:\GS05471.000\120\6. Calcs\GS05471-120.Gradation.xls

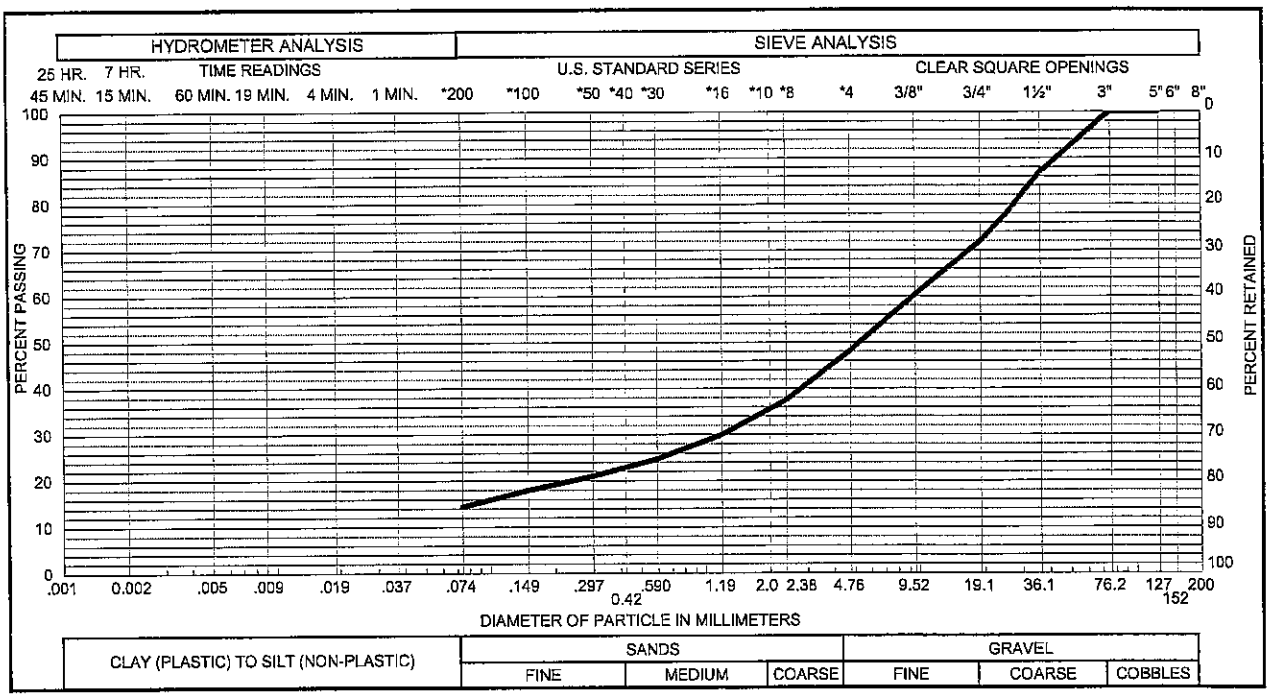
Gradation Test Results

FIG. A-5



Sample of SILT, GRAVELLY (ML)
From TP - 4 AT 9-11 FEET

GRAVEL 64 % SAND 21 %
SILT & CLAY 15 % LIQUID LIMIT ____ %
PLASTICITY INDEX ____ %



Sample of SILT, GRAVELLY (ML)
From TP - 5 AT 8-10 FEET

GRAVEL 52 % SAND 34 %
SILT & CLAY 14 % LIQUID LIMIT ____ %
PLASTICITY INDEX ____ %

ARCHDIOCESAN HOUSING, INC.
OAKHURST SUBDIVISION
PROJECT NO. GS05471-120
S:\GS05471.000\120\6. Calcs\GS05471-120.Gradation.xls

Gradation Test Results

FIG. A-6

TABLE A-I

SUMMARY OF LABORATORY TESTING
PROJECT NO. GS05471-120

LOT	DEPTH (FEET)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	ATTERBERG LIMITS		SWELL TEST RESULTS*	SOLUBLE SULFATES (%)	PERCENT GRAVEL (%)	PERCENT SAND (%)	PASSING NO. 200 SIEVE (%)	DESCRIPTION
				LIQUID LIMIT (%)	PLASTICITY INDEX (%)	SWELL (%)					
TH-1	4	3.4		NL	NP					21	SAND, CLAYEY (SC)
TH-1	14	3.1	114			-0.8					SAND, CLAYEY (SC)
TH-1	19	2.5	127			-0.4					SAND, CLAYEY (SC)
TH-1	24	1.8	123			-3.7					SAND, SILTY (SM)
TH-1	26	0.9	109			-5.3					SAND, SILTY (SM)
TH-2	4	3.7						51	32	17	GRAVEL, SILTY (GM)
TH-2	14	3.1	124	22	6		0.020			45	GRAVEL, SILTY (GM)
TP-1	8-10			23	4		0.000	40	26	34	SILT, GRAVELLY (ML)
TP-2	4-6			23	2		0.000	21	38	41	SILT, GRAVELLY (ML)
TP-3	9-11			24	3		0.000	24	33	43	SILT, GRAVELLY (ML)
TP-4	9-11			23	3		0.000	64	21	15	SILT, GRAVELLY (ML)
TP-5	8-10			22	1		0.000	52	34	14	SILT, GRAVELLY (ML)

* SWELL MEASURED WITH 1000 PSF APPLIED PRESSURE, OR ESTIMATED IN-SITU OVERBURDEN PRESSURE. NEGATIVE VALUE INDICATES COMPRESSION.

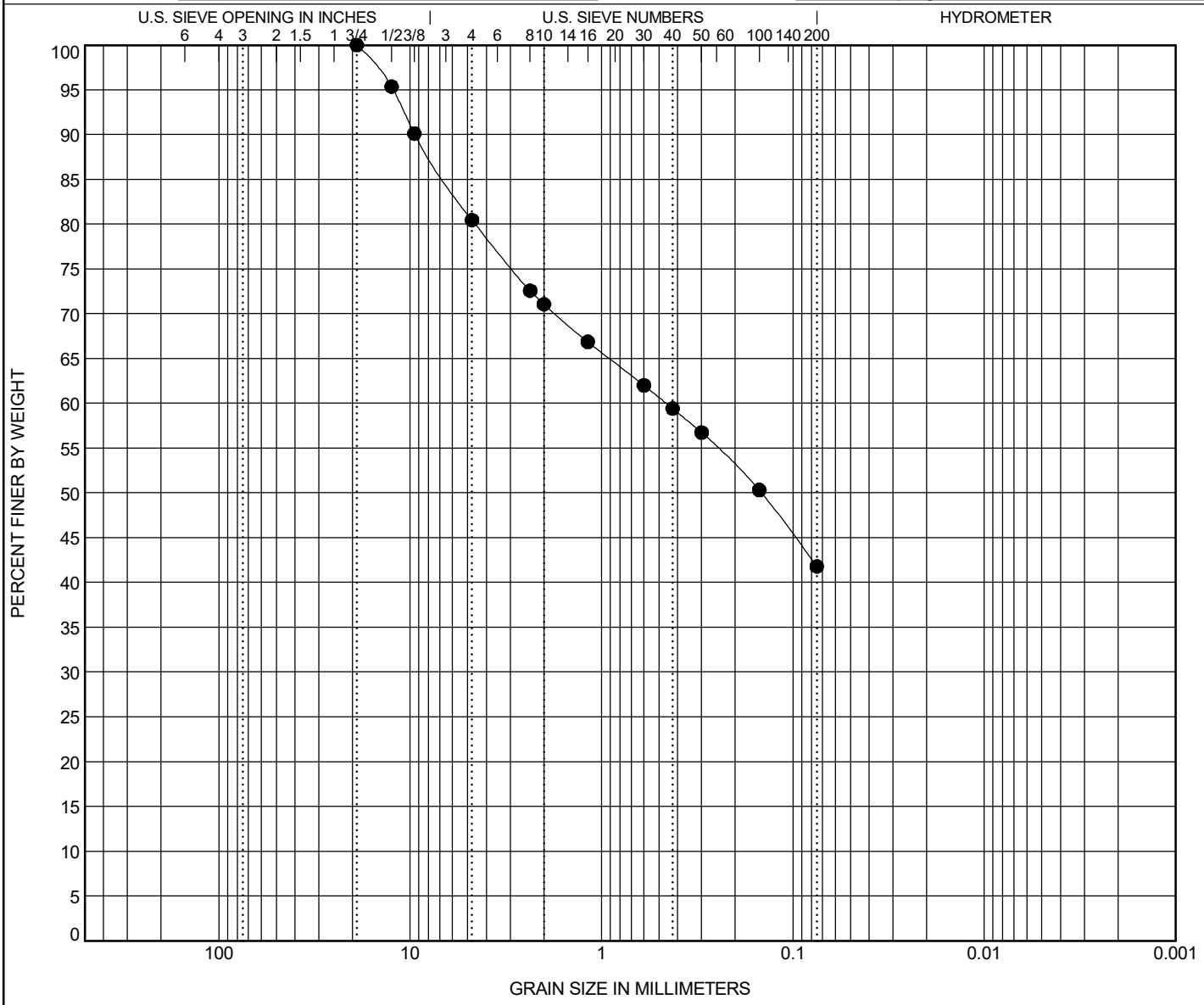
APPENDIX E
Laboratory Testing Results from Current Investigation

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

GRAIN SIZE DISTRIBUTION

CLIENT Forenza Contracting **PROJECT NAME** Glenwood Multifamily

PROJECT NUMBER 01402-0002 **PROJECT LOCATION** Glenwood Springs, CO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● **Cuttings**	**SILTY SAND with GRAVEL(SM)**	**26**	**23**	**3**		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **Cuttings**	**19**	**0.459**			**19.5**	**38.7**	**41.8**	

GRAIN SIZE 01402-0002 GLENWOOD MULTIFAMILY.GPJ GINT US LAB.GDT 12/2/17

November 21, 2017

City of Glenwood Springs
Attn: Terri Partch, City Engineer
101 West 8th Street
Glenwood Springs, CO 81601

RE: Glenwood Multifamily
Traffic Impacts of One-Way Blake Avenue from 23rd Street to 26th Street
Glenwood Springs, Colorado

Dear Terri:

In response to your inquiry regarding developing a comprehensive traffic solution for the neighborhood near Blake and Palmer Avenues between 23rd and 26th Streets, McDowell Engineering has prepared this letter to provide you with additional information on revised options and strategies.

Blake Avenue One-Way Configuration

Blake Avenue between 23rd and 26th Street is proposed to be reconfigured as southbound one way from 23rd to 26th Street. Traffic that previously used Blake Avenue northbound would now be routed to either Palmer Avenue to the east or SH 82 to the west to continue northbound. This configuration would also keep the majority of northbound commercial traffic off of Blake Avenue, and would primarily use SH 82, and to a lesser extent, Palmer Avenue. Based upon the circuitous re-routing to Palmer Avenue and the current traffic distribution, it was assumed that seventy percent of the re-directed traffic will utilize the SH 82 route.

RFTA Park and Ride Effects

The RFTA Park and Ride is adding a significant amount of the current traffic volume on Blake Avenue. This traffic is anticipated to be re-routed via SH 82 and Palmer Avenue in a similar distribution to the overall area traffic, as described above.

Gate Closure Options

Option A –Gate Closed (Existing Condition)

This option would keep the existing gate closed, replicating existing conditions. This option will not allow any of the commercial traffic to access Blake Street and will keep the distribution of this commercial traffic at its present locations, mainly at the Blake Avenue/SH 82 signal near the McDonald's entrance and 29th Street/SH 82.

Option B –Gate Open

This option would open the existing gate and would reconnect Blake Street to the south SH 82 connection near the McDonald's entrance. This option would support parallel routes through the south side of Glenwood Springs and would provide additional traffic flow and emergency access for the community. Local residential neighborhoods can better access the commercial areas without accessing SH 82. Opening the Blake Avenue gate will provide another parallel option for traffic, allowing for the completion of the gridded street network and dispersing traffic access to SH 82.

The gate configuration (open or closed) is not significantly impacted by the Glenwood Multifamily project traffic. The site generated traffic addition ranges from 2% to 14% of the anticipated Year 2040 total traffic on the adjacent street network.

Traffic Calming Options

A number of traffic calming options can be proposed to help manage traffic, speeds, and driver route choices. Curb extensions can be installed on 26th Street and/or Palmer Avenue to create a narrowing effect and visually differentiate smaller neighborhood streets. In addition, improved pedestrian crossings can create awareness of the multimodal nature of the neighborhood.

Speed bumps or humps are not recommended as they can impact emergency response times, cause street maintenance concerns, and cause driver aggravation. A series of speed humps or bumps is typically required to make a significant impact and for the installation to perform successfully.

The creation of these traffic calming options will create slower speeds and increase travel time throughout the area, which will deter drivers from cutting through the neighborhood and will promote using the SH 82 corridor.

Traffic Impacts

The anticipated traffic volumes on Blake Avenue, Palmer Avenue, 26th Street, and 23rd Street are depicted in the attached Figure 11A and Figure 12A and summarized in the table below.

Year 2040 Traffic Volumes (vph)	Blake Avenue One-Way Southbound from 23rd Street to 26th Street (Blake Avenue Gate CLOSED)			
	Blake Avenue SB One-Way (South of 23rd Street)	**Palmer Avenue (South of 23rd Street)**	**26th Street (East of Blake Ave.)**	**23rd Street (East of SH 82)**
Background Traffic	74	105	122	668
Site Traffic	2	7	20	12
Total Traffic	76	112	142	680
Year 2040 Traffic Volumes (vph)	**Blake Avenue One-Way Southbound from 23rd Street to 26th Street (Blake Avenue Gate OPEN)**			
	Blake Avenue SB One-Way (South of 23rd Street)	**Palmer Avenue (South of 23rd Street)**	**26th Street (East of Blake Ave.)**	**23rd Street (East of SH 82)**
Background Traffic	154	118	135	661
Site Traffic	2	7	20	12
Total Traffic	156	125	155	673

The above table shows that the site generated traffic adds a very small percentage of the overall traffic. With the southbound one-way configuration of Blake Avenue, opening the gate is anticipated to have little impact upon the neighborhood traffic volumes. Blake Avenue currently has 191 vph south of 23rd Street in its presently configured two-way street. Both proposed scenarios listed above result in less traffic on Blake Avenue.

State Highway Access Permit

With the proposed configurations (one-way Blake Street and opening the Blake Street gate), a new State Highway Access Permit will be required at the intersection of SH 82 and 27th Street. The anticipated total traffic volumes on the east leg of 27th Street exceed a twenty percent increase in the current State Highway Access Permit volume of 163dhv. With the gate closed, the site-generated traffic is anticipated to be 19.8% of the total Year 2040 traffic volume on the east leg of this intersection. With the gate open, the site-generated traffic is 10.5%.

The following table summarizes the percent increase of traffic from the current access permit volumes, the gate configuration, Blake Avenue lane configuration, and development impacts:

Condition	Gate	Development Traffic (dhv)	Total Year 2040 Traffic at SH 82 and 27th Street (dhv)	% Increase from Access Permit
Baseline Traffic (Two-way Blake), No Development Impacts	Closed	N/A	191	17.2%
One-way Blake, No Development Impacts	Closed	N/A	195	19.6%
One-way Blake, No Development Impacts	Open	N/A	272	66.8%
One-way Blake w/ Development	Closed	48	243	49.1%
One-way Blake w/ Development	Open	32	304	86.5%

Conclusions

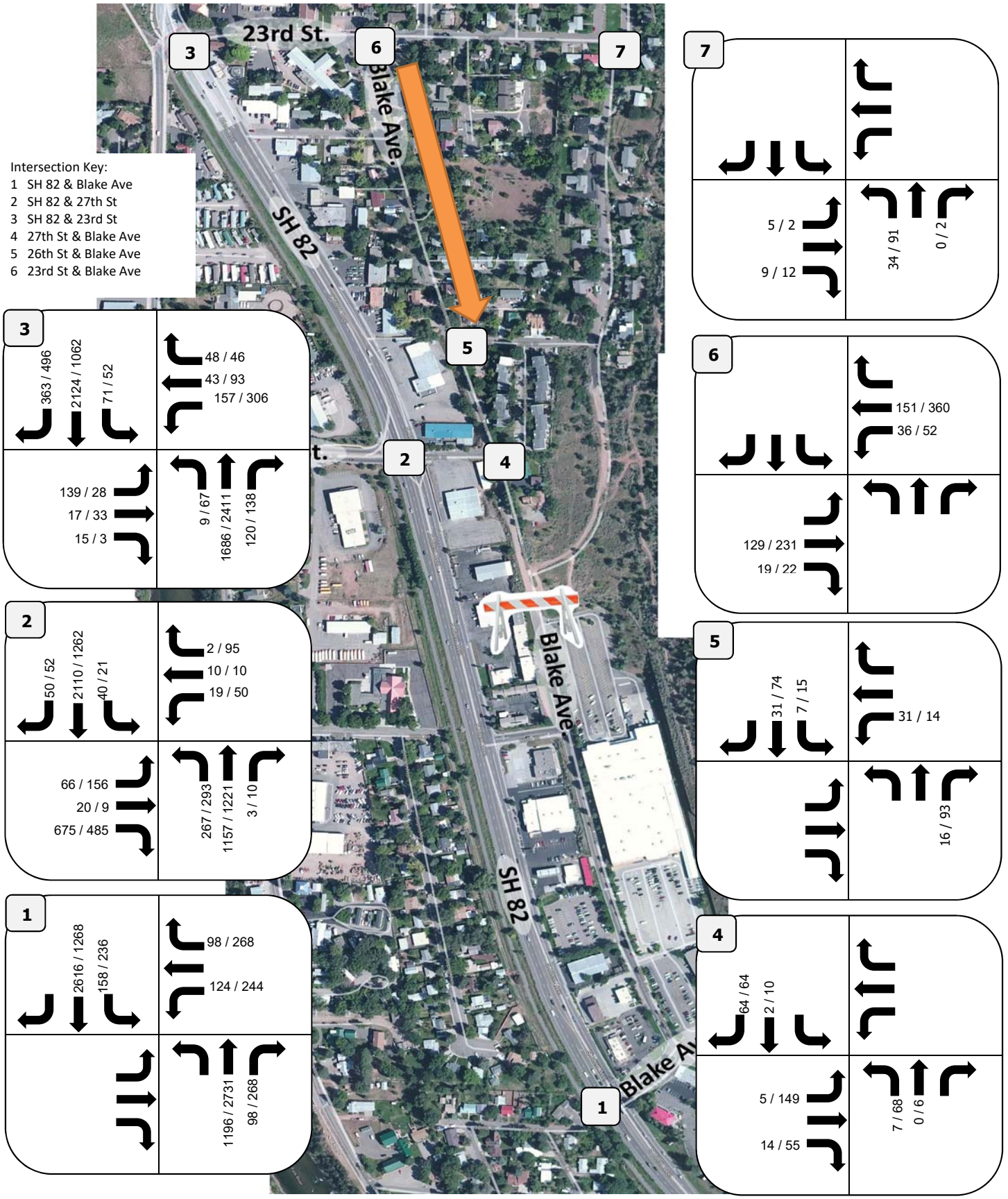
The proposed traffic volumes from the Glenwood Multifamily are not substantial compared to the background traffic volumes that presently exist. The creation of the one-way Blake Avenue configuration is not significantly impacted by the site traffic. Opening the Blake Avenue gate will provide another parallel option for traffic, allowing for the completion of the gridded street network and dispersing traffic access to SH 82.

Sincerely,
McDowell Engineering

Kari McDowell Schroeder, PE, PTOE
Traffic/Transportation Engineer

Encl: Figure 4A – Year 2040 Background Traffic – Blake Ave. Gate is Closed and Blake is One-Way SB Street from 23rd to 26th.
Figure 5A – Year 2040 Background Traffic – Blake Ave. Gate is Open and Blake is One-Way SB Street from 23rd to 26th.
Figure 7 – Project-Generated Traffic Assignment – Bake Ave. Gate Remains Closed
Figure 8 – Project-Generated Traffic Assignment – Bake Ave. Gate is Open
Figure 11 – Year 2040 Total Traffic – Blake Ave. Gate Remains Closed, Blake is Two-Way
Figure 11A - Year 2040 Total Traffic – Blake Ave. Gate is Closed and Blake is One-Way SB Street from 23rd to 26th.
Figure 12A – Year 2040 Total Traffic – Blake Ave. Gate is Open and Blake is One-Way SB Street from 23rd to 26th.

Figure 4A: Year 2040 Background Traffic - Blake Ave. Gate is Closed and Blake is One-Way Southbound Street from 23rd to 26th



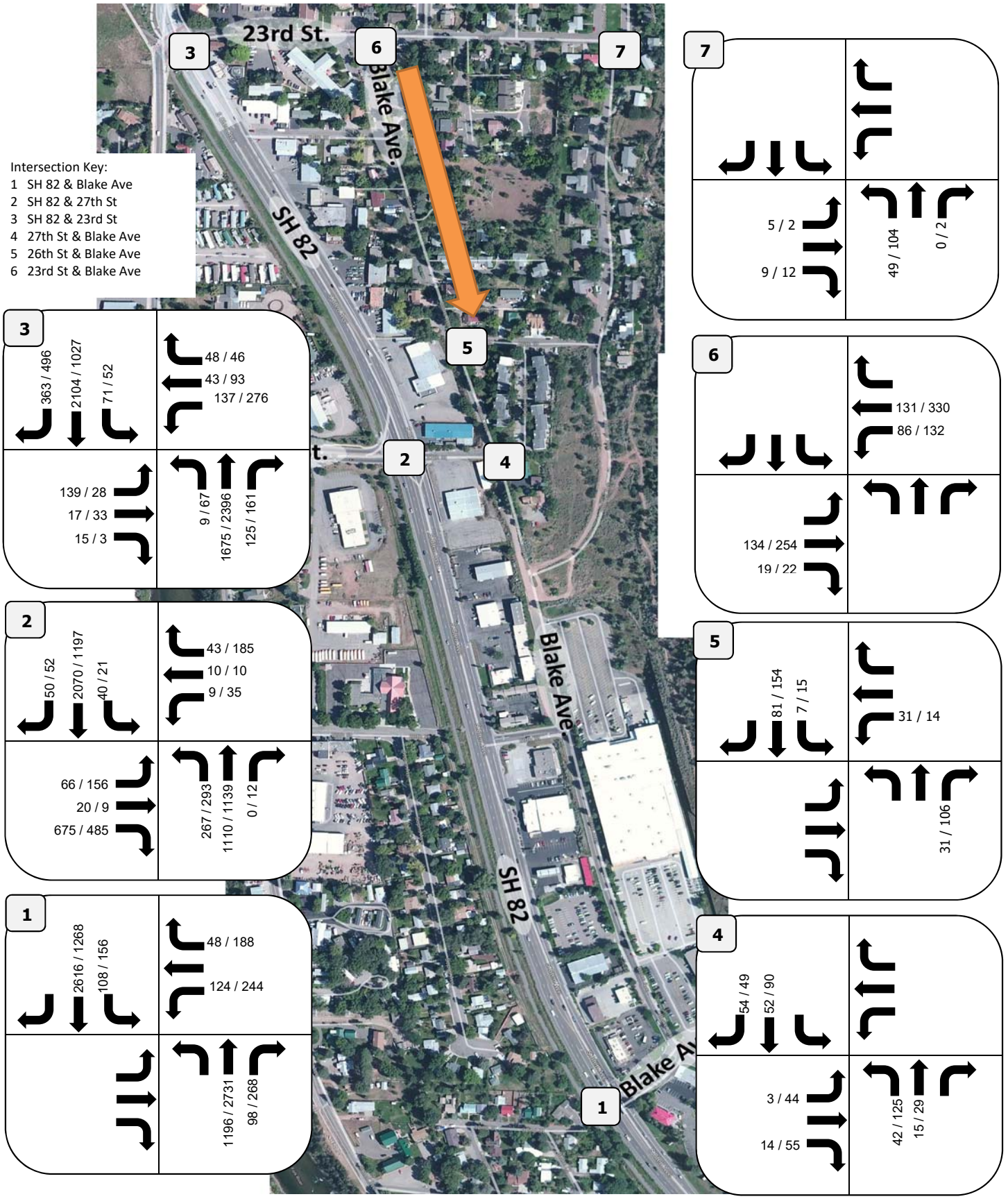
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

Figure 5A: Year 2040 Background Traffic - Blake Ave. Gate is Open and Blake is One-Way Southbound Street from 23rd to 26th



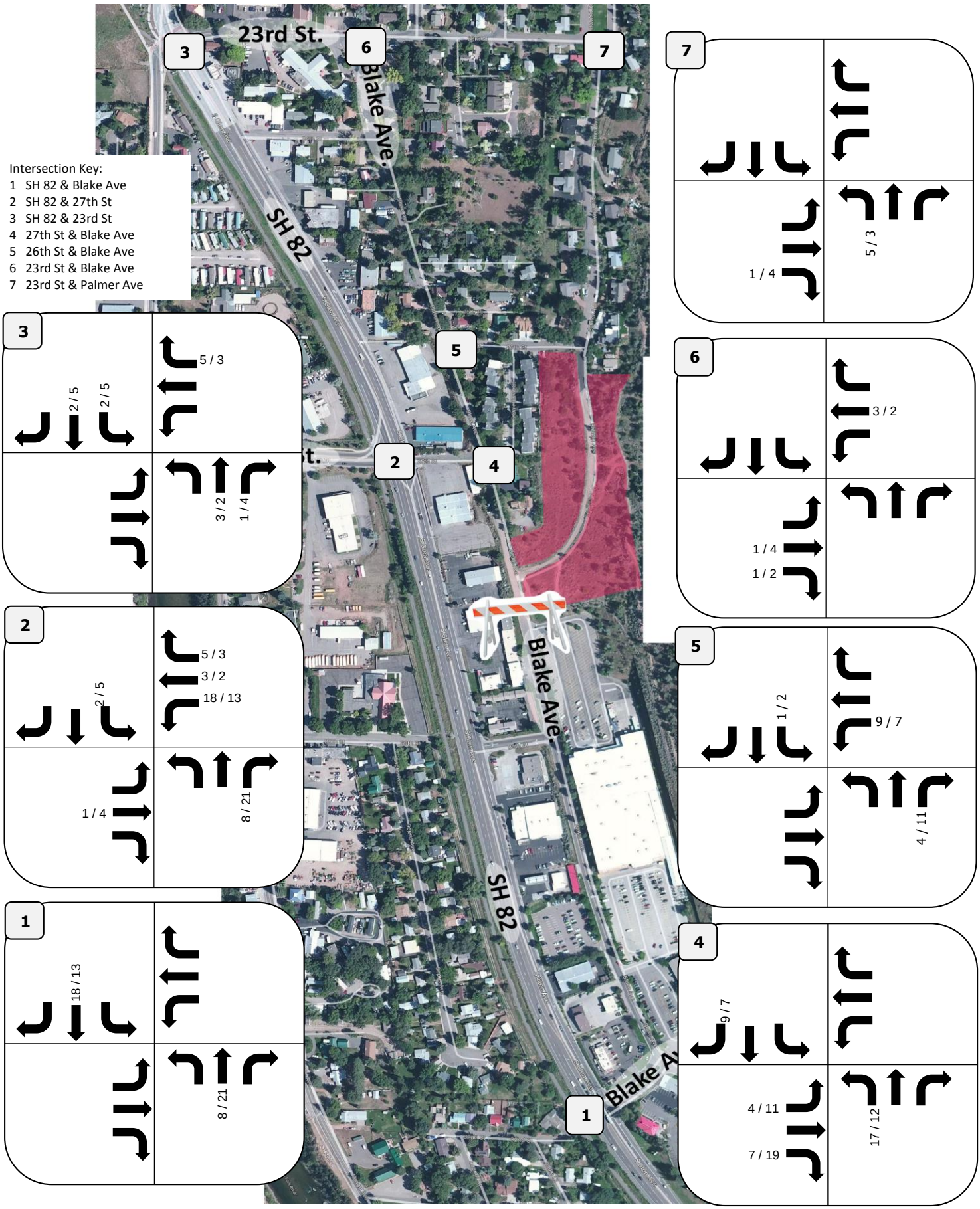
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

Figure 7: Project-Generated Traffic Assignment - Blake Ave. Gate Remains Closed



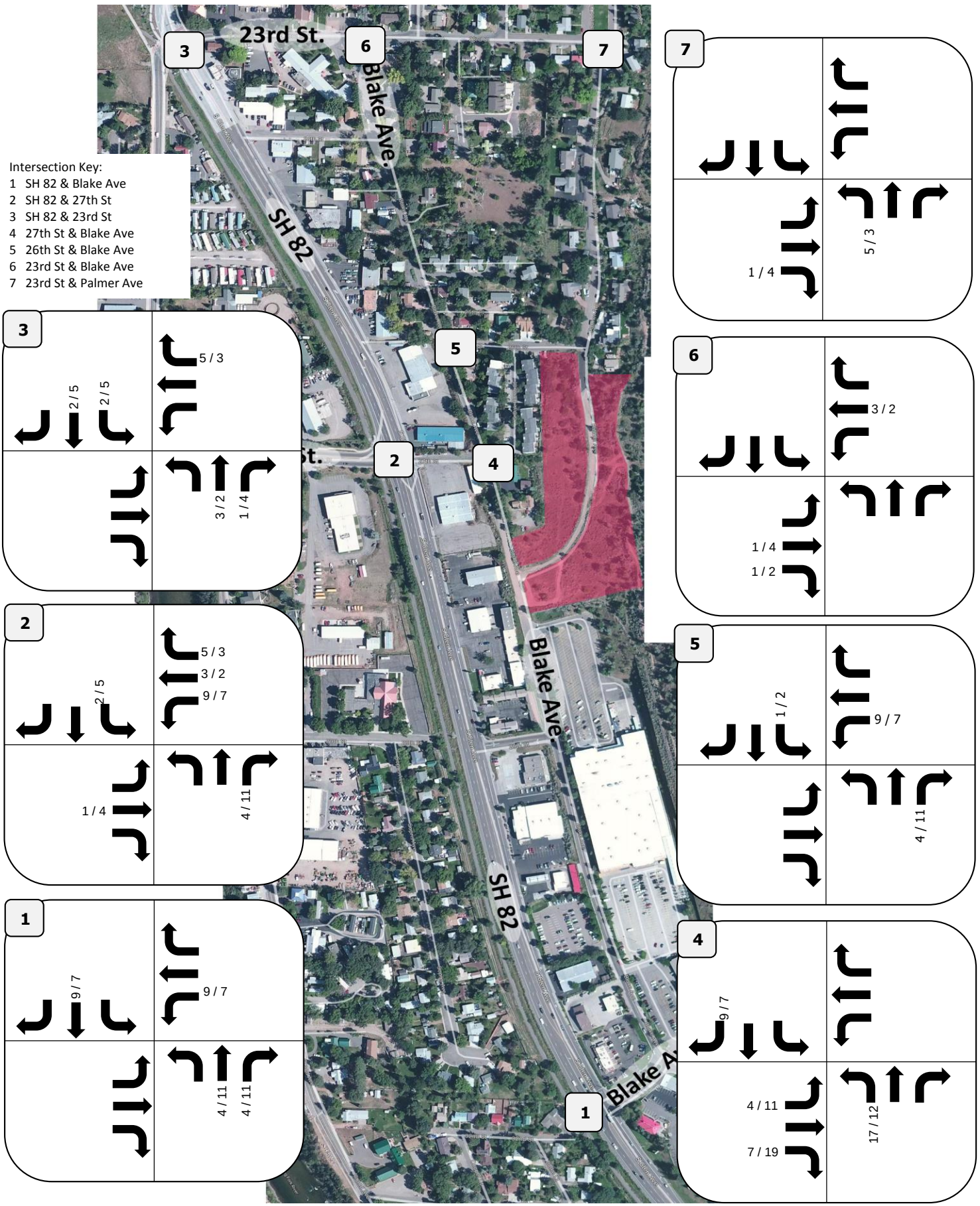
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

March 9, 2017

Figure 8: Project-Generated Traffic Assignment - Blake Ave. Gate is Opened



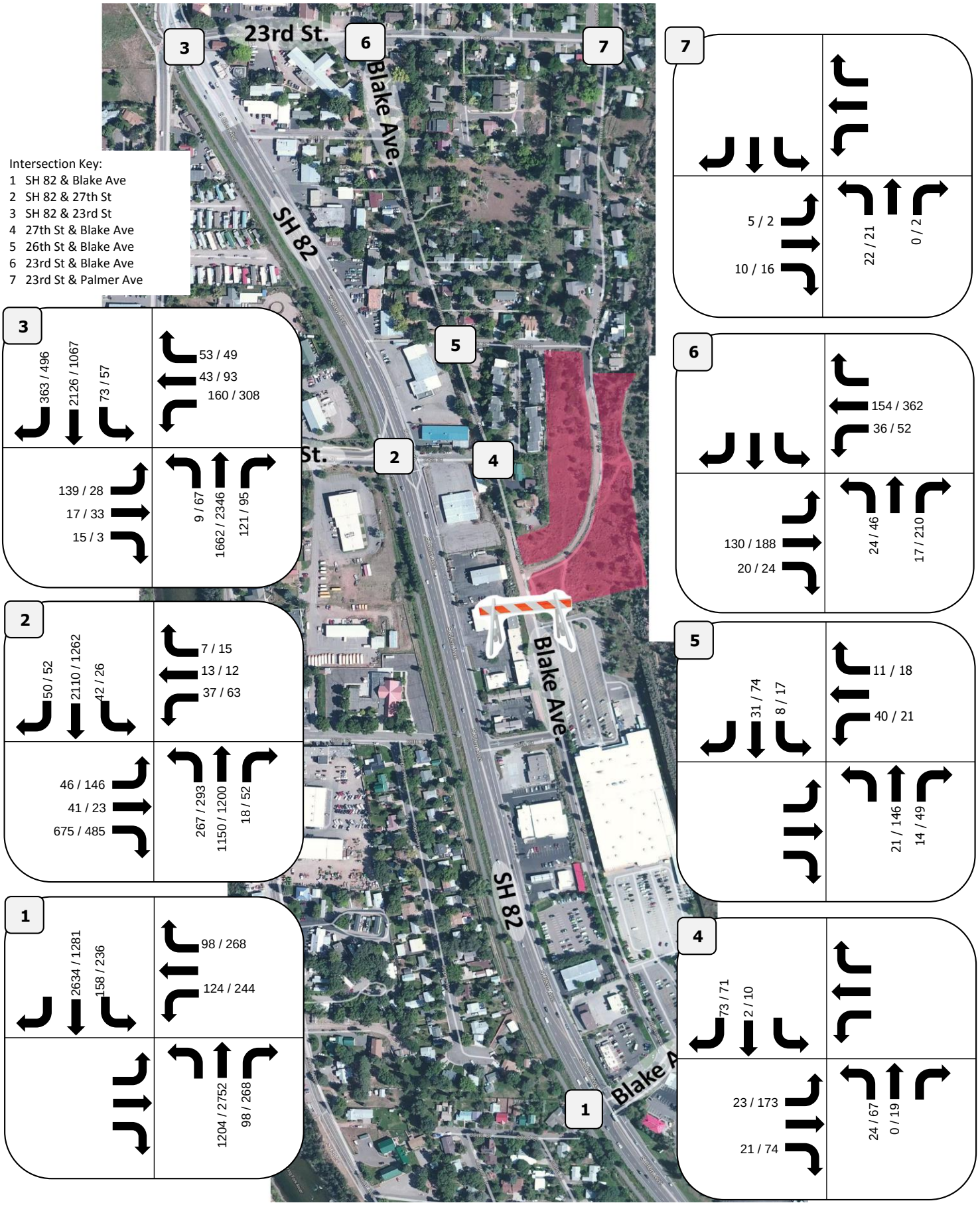
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

March 9, 2017

Figure 11: Year 2040 Total Traffic - Blake Ave. Gate Remains Closed, Blake is Two-Way



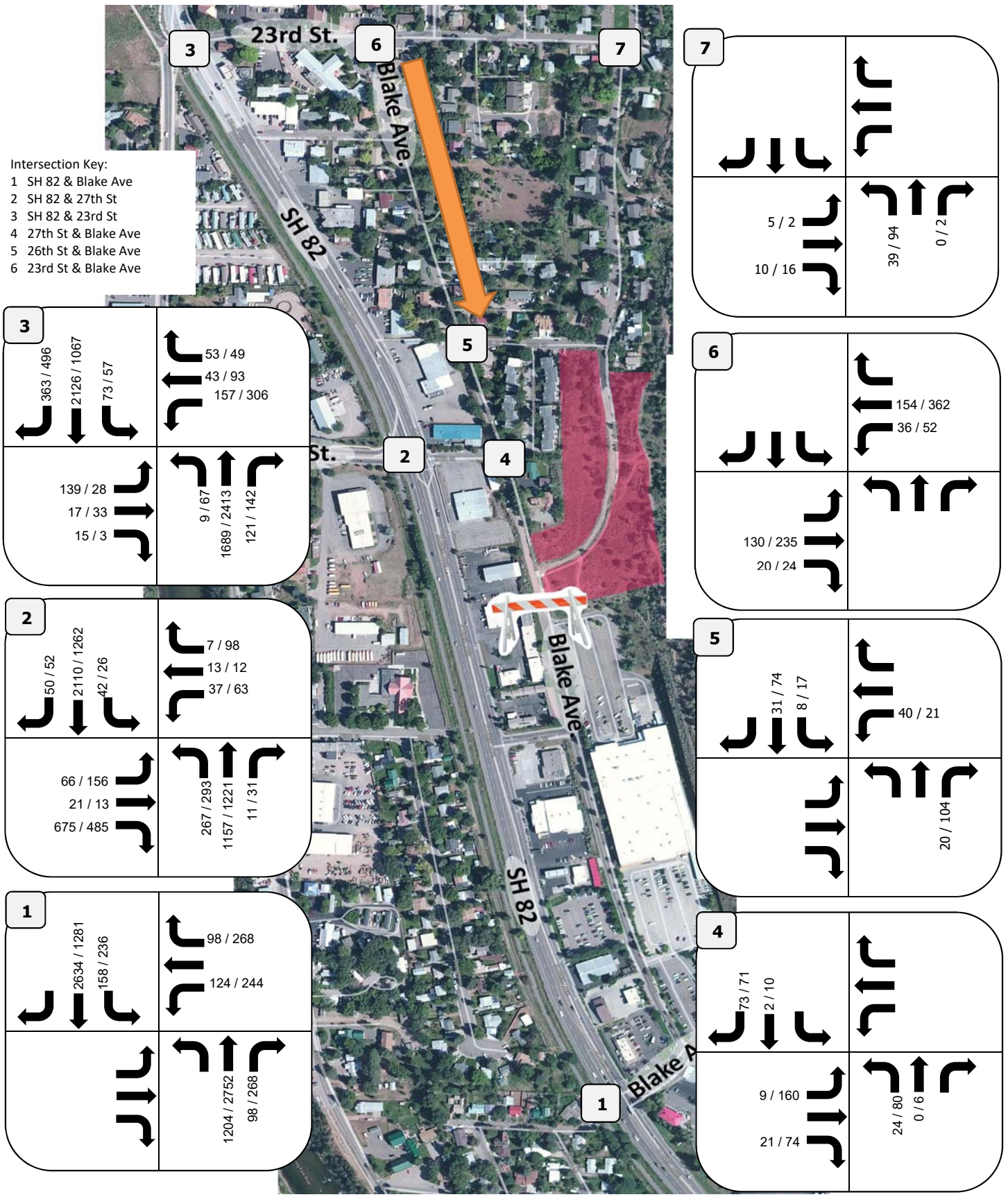
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

March 9, 2017

Figure 11A: Year 2040 Total Traffic - Blake Ave. Gate Remains Closed and Blake is One-Way Southbound Street from 23rd to 26th



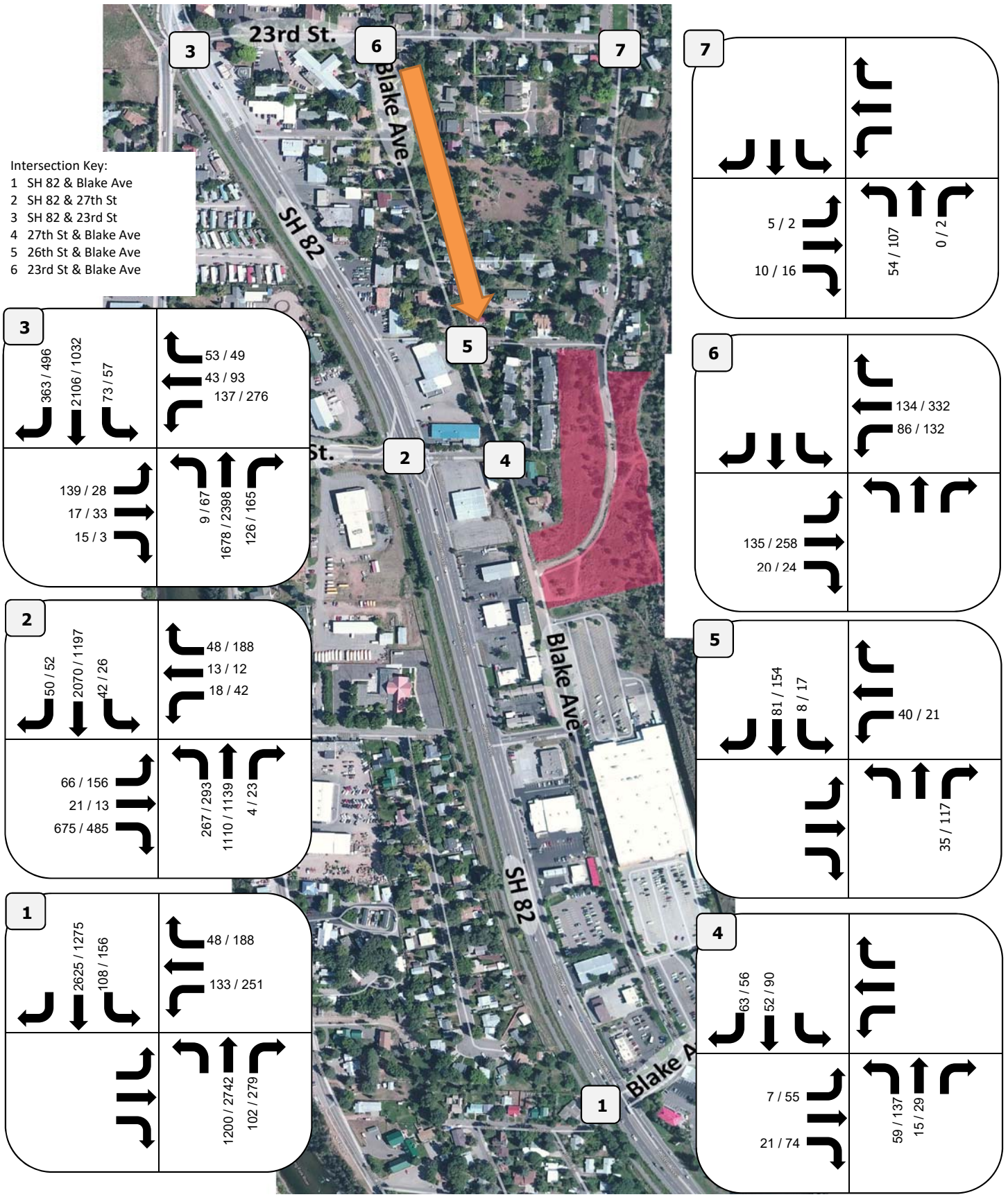
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

Figure 12A: Year 2040 Total Traffic - Blake Ave. Gate is Opened and Blake is One-Way Southbound Street from 23rd to 26th



Project Number: 1247
Prepared By: McDowell Engineering, KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

Planning and Zoning Commission Report

Date: June 23, 2020
To: Planning and Zoning Commission
From: Emery Ellingson, Planner I
Subject: #14-20– Discount Tire

REQUEST	Minor Site/Architectural Plan Review for construction of a 2,838 square foot addition to the existing 7,373 square foot building
APPLICANT	Steve Appel, Kinetic Design (formerly EI Design)
OWNER	Halle Properties, LLC
LOCATION	51537 Highway 6 (PIN: 2185-053-41-001 & -002)
ZONE	M1 Mixed Use Corridor
SURROUNDING LAND USES	North: Undeveloped lot/Residential South: CO Highway 6 Right-of-Way East: Commercial use West: Undeveloped lot and residential in development
LOT SIZE	Parcel 2185-053-41-001, 78,626 square feet (1.805 acres) Parcel 2185-053-41-002, 56,367 square feet (1.294 acres)

ACTION ITEM

Per Section 070.060.050(a)/Table 060.2 of the *Glenwood Springs Municipal Code* (Code), the Planning and Zoning Commission (Commission) is the reviewing body for Minor Site/Architectural Plan review applications which include 9 to 24 new dwelling units and/or 10,000 to 30,000 gross square feet of nonresidential space. The proposed 2,838 square foot addition results in a building with a total footprint of 10,211 square feet which is within the threshold for a Minor Site/Architectural Plan review. Pending approval with possible conditions, the applicant will still be required to submit a Construction Plan application for approval prior to submitting a building permit

Action 1 - Site/Architectural Plan Review – to allow for the construction of a 2,838 square foot addition to the existing 7,373 square foot store.

Staff recommendation: *Staff recommends **approval (with conditions)** of the Site/Architectural Plan Review with the findings and conditions on page 8.*

BACKGROUND/ANALYSIS

Proposal

The application was submitted by Steve Appel of Kinetic Design (formerly EI Design) on behalf of Halle Properties, LLC (Discount Tire). The proposal is to construct a 2,838 square foot addition to the existing 7,373 square foot store. The site is located within the M1 Mixed-Use Corridor zone district where automotive repair shop is a permitted by right use.

The space created by the addition will be utilized primarily for tire storage. This application was made in response to address a Code violation of Section 070.040.050(f)(1)b and Section 070.030.040(c)6 which apply to the use of shipping containers and outdoor storage. The addition would expand the building footprint to the north into an existing parking area and not result in the creation of additional impermeable surfaces. The application was submitted listing both parcels owned by Halle Properties, LLC shown in the photo below although the actual development will only occur on Parcel #2185-053-41-001.

Existing building show west and south elevations, outdoor storage area on north end (photo credit: Google Maps)

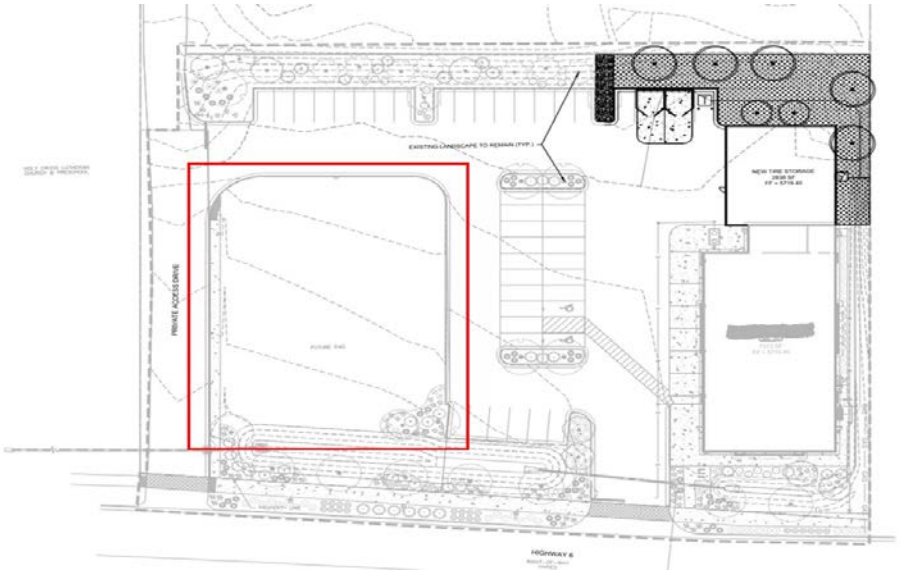
Previously on this property, Glenwood Springs City Council approved eight variances and a Major Development permit with conditions which allowed for the original construction of this store. This included a Development Agreement with the City of Glenwood Springs. Please see attached for the Development Agreement.

Development Standards

Section 070.040 of the *Glenwood Springs Municipal Code* (Code) outlines the development standards for all land use applications. Staff provides an overview of the various applicable standards below.

Common Open Space/Landscaping, Screening, and Retaining Walls

Properties within the M1 zone district are required to provide landscaping equal to 15% of the total site. For this site, the required amount of landscaping is 11,794 square feet and 32,457 square feet is provided. The provided landscape area includes a 12,377 square foot area which is considered a potential future development area. Excluding this area, the site still has 20,080 square feet of landscaping which meets requirements.



After review of the landscape plan of the entire site with the proposed addition, staff found several items that do not comply with Code. The site was evaluated using the landscape requirements which were previously recommend by Planning & Zoning Commission and will be considered by City Council at their June 18th, 2020 meeting. The table below shows that the proposed landscape plan does not provide the required number of shrubs or perennials. Code allows for substitutions at the rate of one shrub for five perennials and ten shrubs for one tree. However, Code does not currently allow excess trees to substitute for shrubs or perennials. This plan, although deficient in perennials and shrubs, has an excess of trees which provide a more long term benefit as they live longer and also provide shade which shrubs and perennials do not.

Proposed Landscape Plan & Requirements			
Plant Material	*Required*	*Proposed*	*Difference*
Trees	36	30	+6
Shrubs	118	106*	-12
Perennials	236	193	-43

*Number of proposed shrubs after removing the 7 one-gallon shrubs which do not meet the minimum Code requirement size of 5 gallon

Other items from the proposed landscape plan that did not meet Code requirements are as follows:

- Code requires that if provided, 10% of evergreen trees shall have a minimum height of 10'. The proposed landscape plan includes 7 evergreen trees described as Eastern Red Cedar with a minimum height of 6'.
- Code requires that shrubs shall be a minimum of five gallons in size. The landscape plan includes 7 Dwarf Oregon Grape shrubs which are shown as being 1 gallon in size and do not count towards meeting the number of shrubs required.

Off Street Parking and Loading

The applicant proposes to expand the building to the north into an existing parking area. As shown in the table below, the proposed number of parking spaces provided meets the off-street parking requirements. The addition will not affect any of the existing landscape islands, buffers, or ADA parking areas. The bicycle parking provided on site also complies with Code requirements.

OFF-STREET PARKING WITH PROPOSED ADDITION			
*Required Parking Spaces**	*Provided Parking Spaces*	*Excess Spaces*	*Spaces Indicated for Snow Storage***
30	42	12	9

*Code requires automotive repair shop to provide 1 space per 500 square feet plus 3 space per repair bay. Discount Tire has 3 repair bays.
**Code allows up to 10 percent of required off-street parking spaces and 100% of excess parking spaces to be used as snow storage

Nonresidential and Mixed-Use Site and Building Design

Section 070.040.090 of Code describes the design requirements for any new development within the City. The applicability section state that these design requirements only apply to additions and renovations where the total gross floor area of the proposed addition is 50% or more than that of the total gross floor area of the existing structure. This total gross floor area of this proposed addition is 38% of the total gross floor area of the existing structure. Therefore, the design standards of code are not requirements for this proposed project. The building elevations and designs are attached for review.

Staff reviewed the originally submitted designs found several design elements that would be considered non-compliant with Code. Specifically, elevations did not meet the requirements of Code Section 070.040.090(e)(2)a and Code Section 070.040.090(e)(4)a. These comments were provided to the applicant and the applicant provided updated designs which are compliant with Code. Please see attached for most recent versions of building elevations.

Code Section 070.040.090(e)(2) describes requirements for Building Elevations and states that no building shall exceed 30 feet in length without incorporating at least three of the following design elements:

- *Projections, recessions, or reveals*
- *Glazed windows or doors*
- *Change in texture and/or masonry*
- *Change in building, parapet, or roofline height*
- *Awnings, canopies, or marquees.*

Code Section 070.040.090(e)(4)a describes requirements for roof design. The Section states that no roofline along any building elevations shall exceed 50 feet in length without a visual variation

that incorporates

- *Projections, recessions, dormers that alter the vertical or horizontal plane of the roof by at least two feet; or*
- *Change in roof height of at least two feet*
- *Another architectural feature approved through the Alternative Equivalent Compliance process.*

Attached elevations show that the north roofline exceeds 50 feet in length without adequate visual variations and that the north building elevation exceeds 30 feet without incorporating the required number of design elements as required by code.

In addition, the original submitted plans list the trash enclosure height as 6'on the site plan and as 8' on the elevations. The applicant confirmed the trash enclosure height will be 6' which complies with Code.

Approval Criteria

A Major Site/Architectural Plan Review application must adhere to the approval criteria outlined in Section 070.060.050(6) of the Code as outlined in ***bold italics*** below. Other language is provided by staff.

a. The site/architectural plan is consistent with the general purpose and intent of this Code;

The proposal is consistent with the general purpose and intent of the Code regarding guarding against natural hazards, efficient development, compatible design, and addressing impacts.

b. The site/architectural plan is consistent with the dimensional, design, development, and all other standards of this Code;

As outlined above, staff found that the proposal is consistent with the dimensional, design, development, and all other standards of the Code except for the landscape plan, building elevation and rooflines. Applicant has already submitted changes to address the building elevation and rooflines.

c. The site/architectural plan is consistent with any previously approved plat, PUD, or any other precedent land use approval; and

The site plan/architectural plan is consistent with the previously approved Development Agreement from 2014.

d. The site/architectural plan is consistent with the Comprehensive Plan and other adopted City policies and plans.

The Comprehensive Plan identifies the site area as Mixed-use area for future use. The Mixed-Use designation is described as to allow *for a variety of uses including commercial, retail, office, restaurant, entertainment, and multi-family housing co-existing through design either in a horizontal or vertical fashion.* The current proposal complies with the map designations and descriptions.

Community goals and related objectives and strategies are outlined in the Executive Summary and subsequent chapters of the Comp Plan. These goals are outlined in the following table.

Comprehensive Plan Goal Supported	**Objective and Strategies**
Promote long-term, sustainable, diverse, economic development	-Direct development into a compact form: infill and redevelopment (Chapter 3, Page 34) -Maintain the role as regional center (Chapter 4, Page 54) -Retain role as a regional center (Chapter 7, Page 83)
Staff Comment: The proposed project allows this business to better serve its customers and helps promote a diverse economy and helps the City to maintain its status as a regional center.	
Maintain Glenwood Springs as the regional tourism, retail, commercial, and governmental center of Garfield County	-Attract diverse businesses and industries (Chapter 4, Page 50) -Maintain the role as regional center (Chapter 4, Page 54)
Staff Comment: The proposed project will allow this business to better serve its customers and resulting in helping the City maintain its role as a regional center.	
Preserve small town character while maintaining the livability of Glenwood Springs	-Ensure an attractive community (Chapter 4, pg. 50) -Make improvements that enhance the community quality of life (Chapter 4, pg. 50)
Staff Comment: This project was started in response to addressing a code enforcement violation for outdoor storage. This project will result in a site that will improve the visibility of the site and the Highway 6 corridor.	
Direct development to locations and building forms that are cost effective to serve	-Direct development into a compact form: infill and redevelopment (Chapter 3, Page 34) -Direct growth to areas where utilities and services can be provided efficiently (Chapter 7, Page 82) -Retain role as a regional center (Chapter 7, Page 83)
Staff Comment: This project proposes to further develop an existing site, making improvements more cost effective which supports associated goals list in the Comprehensive Plan.	
Support social diversity	-Attract diverse businesses and industries (Chapter 4, pg. 50) -Retain role as a regional center (Chapter 7,

	Page 83)
Staff Comment: The proposed project allows the business to better serve its customers and be able to contribute toward the City's effort to retain its role as a regional center which helps promote continued economic and social diversity.	

Reviewing Agency Comments
An overview of any comments received from referral agencies is provided below. Said comments are also attached.

Engineering – Comments received mentioned the possibility of requiring a new access permit from CDOT.

Colorado Department of Transportation – Comments received indicated that no new access permit would be required.

ACTION ALTERNATIVES AND STAFF RECOMMENDATION:

Section 070.060.030(g)(1)d outlines the review and decision procedures for applications being considered by the Commission and/or City Council stating, "[T]he applicable review body shall **approve, approve with conditions, or deny** the application **based on the applicable approval criteria** listed in the application-specific procedures. The body may also **continue** the hearing or **refer the application** to another authority as provided in 070.060.050(a)(2)c, Referral and Call-Up Procedures."

Action 1 - Site/Architectural Plan Review – to allow for the construction of a 2,838 square foot addition to the existing 7,373 square foot store

Staff Recommendation/Suggested Motion
Staff recommends **approval (with conditions)** of the Site/Architectural Plan Review with the following **findings** and **conditions**:

Recommended Findings:
1. The site/architectural plan is consistent with the general purpose and intent of this Code;
2. The site/architectural plan is consistent with the dimensional, design, development, and all other applicable standards of this Code;
3. The site/architectural plan is not in conflict with precedent land use approvals; and
4. The site/architectural plan is substantially consistent with the Comprehensive Plan and other adopted City policies and plans.

Recommended Conditions:
1. 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.

2. Prior to submitting a building or grading permit application, applicant shall submit Construction Plans per requirements of 070.060.050(c).
3. The applicant shall comply with/address all City staff comments related to specific Code requirements prior to approval of a Construction Plans application.
4. The applicant shall continue to comply with the current development agreement with the City.
5. Any future physical changes or improvements to the property or buildings on the parcel are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.

1260 Corona Pointe Ct.
STE 301
Corona, CA 92879
T 951-444-5642
www.EiDesignInc.com

May 11, 2020

City of Glenwood Springs
101 W. Eighth Street
Glenwood Springs, CO 81601

Attention: Emery Ellingson

Discount Tire
51537 Hwy. 6
Glenwood Springs, CO 81601

Re: Pre-Application Comment Responses

Mr. Ellingson,

Please see below responses to the Pre-Application comments.

1. This project will require a drainage letter. It appears that the proposed increase in impervious is minimal, but an engineer should verify and mitigate any increase. This letter should reference the original development's drainage report and include a copy of the final, stamped drainage report.
Response: The proposed improvements provide a net decrease in impervious area and therefore should not impact the existing drainage design. A drainage letter has been included in this submittal.

2. It is unlikely that this addition will require a new access permit, but the application should verify with CDOT. Access permits through CDOT include vehicular and drainage. Any increased drainage that is captured in the CDOT ROW would need their approval prior to development.
Response: We will coordinate with CDOT regarding any potential access permit. However, based on the traffic compliance letter provided the additional tire storage expansion to the existing building is not anticipated to add any additional trips to the project. If an access permit is required, we will pursue that accordingly.

3. Code states that a refuse container must be visually compatible with main structure. On the plans – refuse structure is listed as "CMU wall with cement plaster painted to match building color". How would this CMU on the refuse container compare, visually, to the CMU split face on the main structure?
Response: The refuse enclosure design will implement the same materials as the expansion and existing building. Please reference the included Materials Photos document.

4. Want to be able to review plans for fire suppression system on building when complete plans are submitted
Response: Will comply. Fire protection plans will be a part of the building submittal set.

Please feel free to contact me if you should have any questions or need anything else.

Best Regards,

Steve Appel, Project Manager, Ei Design
sappel@eicompanies.com
(951) 363-4467

Kimley»Horn

May 11, 2020

Halle Properties
20225 N. Scottsdale Road
Scottsdale, AZ 85255

Attn: Mr. Matt Johnson
Real Estate Development Assistant Manager

Re: Discount Tire Expansion
Glenwood Springs, Colorado
Traffic Study Letter

Dear Mr. Johnson:

Introduction
The purpose of this study is to provide a trip generation comparison to identify conformance with the original traffic study letter for the proposed expansion of an existing Discount Tire store located on the northeast corner of the Highway 6 and Country Road 135 (CR-135) intersection in Glenwood Springs, Colorado. Additionally, this study also includes highway information to evaluate the potential need for a CDOT Access Permit Application in association with this expansion project. The site presently includes an existing 7,373 square foot Discount Tire store and two vacant lots for future development. The existing Discount Tire is proposing an expansion to include additional storage space consisting of 2,838 square feet. A site plan is attached with this letter.

Existing Roadway Network
Regional access to Discount Tire is and will continue to be provided by Interstate 70 (I-70) while primary access is provided by Highway 6. Direct is and will continue to be provided by two full movement accesses located along the north side of Highway 6. These existing accesses will remain after the expansion project and future development is complete.

Highway 6 is a two-lane US Highway controlled by the Colorado Department of Transportation (CDOT); however, this segment of highway does not have a CDOT roadway classification. Highway 6 provides a double yellow striped centerline with a posted speed limit of 40 miles per hour adjacent to the project site.

Trip Generation
This development area was studied within the “Discount Tire – Glenwood Springs Level Two Traffic Study Letter” completed by Kimley-Horn and Associates, Inc. dated January 30, 2014. The trip generation of the proposed Discount Tire expansion and future Pads is compared with the trip generation for the uses evaluated in the original traffic study in the same development area. The original study included the existing 7,373 square foot Discount Tire and the assumed future development of an automobile care center and mini-warehouse storage facility. For the purposes of this analysis, the future Pads do not currently have specific development plans; therefore, the same uses from the original study were evaluated in the current proposal.

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed and existing land uses to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*[1] published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses.

Trip generation was previously based on the ITE Trip Generation, 9th Edition (current edition at time of original study) average rates that apply to Tire Store (ITE Code 848), Automobile Care Center (ITE 942), and Mini-Warehouse (ITE 151) for this development area. For the current proposal, ITE Trip Generation, 10th Edition (current edition) average rates were used for Tire Superstore (ITE Code 849), Automobile Care Center (ITE 942), and Mini-Warehouse (ITE 151). Since the overall building area of the expanded tire store is greater than 10,000 square feet, the Tire Superstore use equations are most applicable for this project with the 10th Edition of ITE Trip Generation. The following table summarizes the anticipated trip generation for the proposed development (trip generation calculations are attached) compared to the expected trip generation for the development previously studied (applicable documents from the original traffic study are also attached).

Discount Tire Expansion Glenwood Springs - Trip Generation Comparison

Land Use	Quantity	Units	Vehicle Trips					
			Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Original Traffic Study - ITE 9th Edition								
Tire Store (ITE 848)	7,373	Square Feet	13	8	21	13	18	31
Automobile Care Center (ITE 942)	5,000	Square Feet	7	4	11	8	8	16
Mini-Warehouse (ITE 151)	8,000	Square Feet	1	0	1	1	1	2
Original Traffic Study Total Trips			21	12	33	22	27	49
Current Proposal - ITE 10th Edition								
Tire Superstore (ITE 849)	10,211	Square Feet	9	5	14	10	12	22
Automobile Care Center (ITE 942)	5,000	Square Feet	7	4	11	8	8	16
Mini-Warehouse (ITE 151)	8,000	Square Feet	1	0	1	1	1	2
Current Proposal Total Trips			17	9	26	19	21	40
Net Change			-4	-3	-7	-3	-6	-9

As summarized in the table, the original traffic study for this development area identified 33 weekday trips occurring during the morning peak hour and 49 trips occurring during the afternoon peak hour. The currently proposed Discount Tire store with expansion and future Pads are anticipated to generate 26 trips during the weekday morning peak hour and 40 trips during the afternoon peak hour based on the Discount Tire being a Tire Superstore use and based on the updated ITE equations. Therefore, the proposed development is anticipated to generate traffic within the volume limits previously studied. Although the building square footage has increased in size, average rates for tire stores and tire superstores have decreased from the 9th Edition to the 10th Edition of ITE Trip Generation which produces lower

1 Institute of Transportation Engineers, *Trip Generation Manual*, Tenth Edition, Washington DC, 2017.

traffic generation estimates than previously studied. Otherwise, the same amount of trips are anticipated for this project with this expansion, as the building area is proposed to be used for tire storage.

CDOT Access Permit Analysis
The threshold for requiring an access permit along CDOT controlled roadways occurs when project traffic is anticipated to increase the existing access traffic volumes by more than 20 percent. Based on proposed development traffic projections, the proposed Discount Tire expansion is not anticipated to require a CDOT access permit as the proposed use is expected to generate less traffic than the existing uses studied within the same development building area. Therefore, it is believed that the existing CDOT Access Permits that were provided for the overall development of this site remain valid.

Summary and Conclusion
In summary, the proposed development project is anticipated to generate traffic within the volume limits previously studied. Therefore, the project is believed to be in traffic compliance with the original "Discount Tire – Glenwood Springs Level Two Traffic Study Letter" completed by Kimley-Horn and Associates, Inc. dated January 30, 2014, which included this development area. A new CDOT access permit should not be required in association with this project as development traffic is not expected to increase by more than 20 percent. If you have any questions or require anything further, please feel free to call me at (303) 228-2304.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

Curtis D Rowe

Curtis D. Rowe, P.E., PTOE
Vice President

Discount Tire Glenwood Springs Trip Generation Comparison

Land Use	Quantity	Units	Vehicle Trips					
			Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Original Traffic Study - ITE 9th Edition								
Tire Store (ITE 848)	7,373	Square Feet	13	8	21	13	18	31
Automobile Care Center (ITE 942)	5,000	Square Feet	7	4	11	8	8	16
Mini-Warehouse (ITE 151)	8,000	Square Feet	1	0	1	1	1	2
Original Traffic Study Total Trips			21	12	33	22	27	49
Current Proposal - ITE 10th Edition								
Tire Superstore (ITE 849)	10,211	Square Feet	9	5	14	10	12	22
Automobile Care Center (ITE 942)	5,000	Square Feet	7	4	11	8	8	16
Mini-Warehouse (ITE 151)	8,000	Square Feet	1	0	1	1	1	2
Current Proposal Total Trips			17	9	26	19	21	40
Net Change			-4	-3	-7	-3	-6	-9
Percentage Change			-19.0%	-25.0%	-21.2%	-13.6%	-22.2%	-18.4%

Kimley»Horn

Project	Discount Tire Glenwood Springs				
Subject	Trip Generation for Tire Superstore				
Designed by	JRP	*Date*	May 08, 2020	*Job No.*	
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Tire Superstore (849)

Independant Variable - 1000 Square Feet Gross Floor Area (X)
Gross Floor Area = 10,211 Square Feet
X = 10.211
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (800 Series Page 262)

Directional Distribution: 65% ent. 35% exit.
T = 1.34 (X)
T = 1.34 * 10.211
T = 14 Average Vehicle Trip Ends
9 entering 5 exiting

9 + 5 = 14

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 263)

Directional Distribution: 47% ent. 53% exit.
T = 2.11 (X)
T = 2.11 * 10.211
T = 22 Average Vehicle Trip Ends
10 entering 12 exiting

10 + 12 (*) = 22

Weekday (800 Series Page 261)

Average Weekday
T = 20.37 (X)
T = 20.37* 10.211
Directional Distribution: 50% entering, 50% exiting
T = 208 Average Vehicle Trip Ends
104 entering 104 exiting

104 + 104 = 208

Kimley»Horn

Project	Discount Tire Glenwood Springs				
Subject	Trip Generation				
Designed by	JRP	*Date*	May 08, 2020	*Job No.*	
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Automobile Care Center (942)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = 5,000

X = 5.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 283)

Directional Distribution: 66% ent. 34% exit.

T = 2.25 (X) T = 11 Average Vehicle Trip Ends

T = 2.25 * 5 7 entering 4 exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 284)

Directional Distribution: 48% ent. 52% exit.

T = 3.11 (X) T = 16 Average Vehicle Trip Ends

T = 3.11 * 5 8 entering 8 exiting

Weekday (10% K-Factor from PM Peak Hour)

Average Weekday

Directional Distribution: 50% entering, 50% exiting

T = 160 Average Vehicle Trip Ends

(T) = PM Peak Total / K Factor 0.1 80 entering 80 exiting

80 + 80 = 160

Kimley»Horn

Project	Discount Tire Glenwood Springs				
Subject	Trip Generation for Mini Warehouse				
Designed by	JRP	*Date*	May 08, 2020	*Job No.*	
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Average Rate Equations

Land Use Code - Mini-Warehouse (151)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)
Gross Floor Area = 8,000
X = 8.0
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 84)

Directional Distribution: 60% ent. 40% exit.
T = 0.10 (X) T = 1 Average Vehicle Trip Ends
T = 0.10 * 8 1 entering 0 exiting

1 + 0 = 1

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 85)

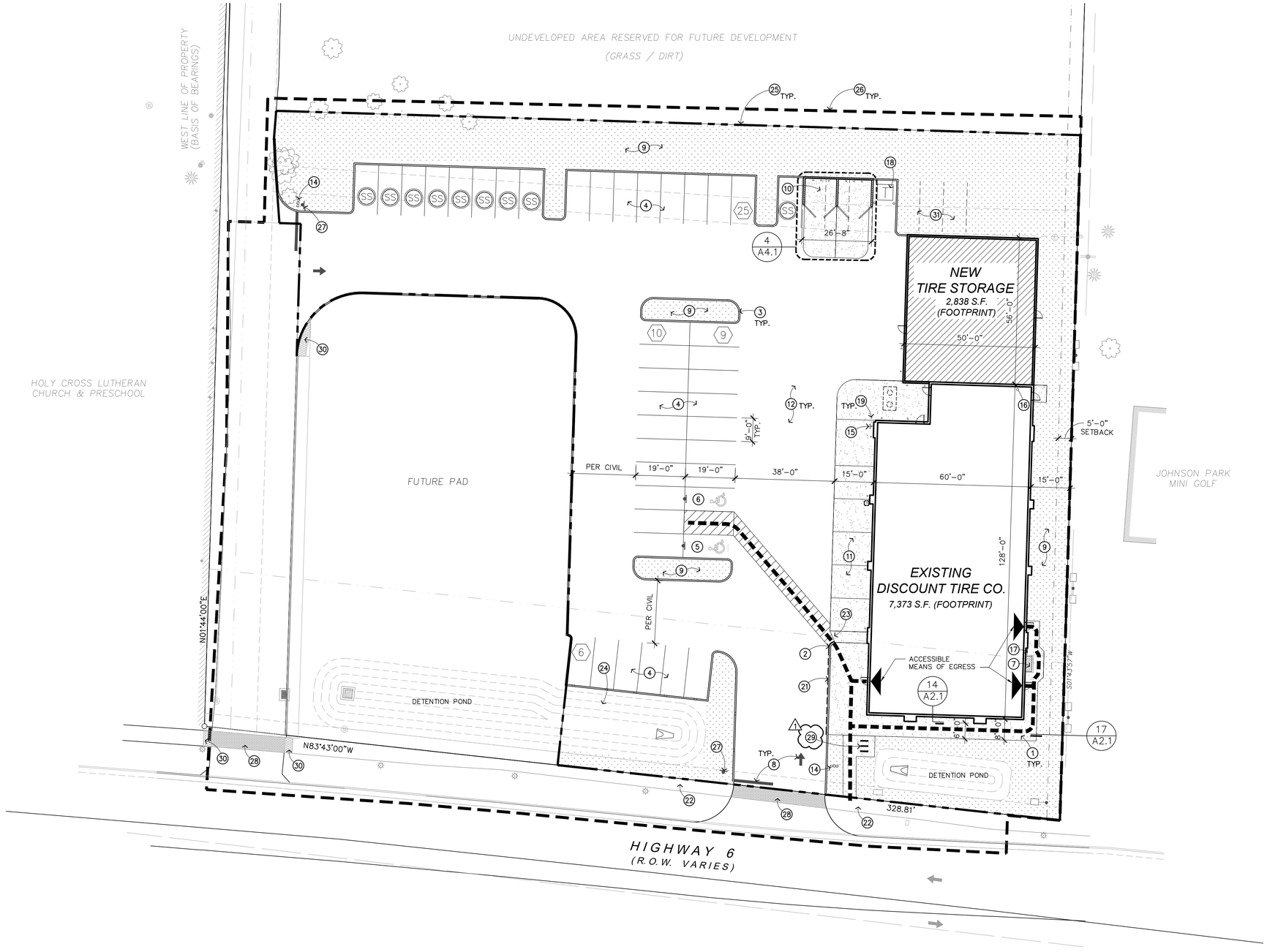
Directional Distribution: 47% ent. 53% exit.
T = 0.17 (X) T = 2 Average Vehicle Trip E 2
T = 0.17 * 8 1 entering 1 exiting

1 + 1 = 2

Weekday (100 Series Page 83)

Directional Distribution: 50% entering, 50% exiting
T = 1.51 (X) T = 14 Average Vehicle Trip Ends
T = 1.51 * 8 7 entering 7 exiting

7 + 7 = 14



SITE NOTES:

1. CONCRETE WALK W/ MED. BROOM FINISH – PROVIDE EXPANSION JOINT & CONTROL JOINT.
2. HANDICAP RAMP – SEE CIVIL DWGS.
3. STANDARD 6" CONCRETE CURB – SEE CIVIL DWGS.
4. PARKING STALL – REFER TO CIVIL DWGS.
5. HANDICAP VAN ACCESSIBLE PARKING SPACE WITH VAN ACCESSIBLE SIGN.
6. HANDICAP PARKING SPACE WITH SIGN.
7. ELECTRIC SERVICE ENTRY – SEE CIVIL DWGS. & ELECTRICAL DWGS.
8. PAINTED TRAFFIC ARROW / "STOP" BAR (COLOR: TRAFFIC WHITE) – SEE CIVIL DWGS.
9. LANDSCAPE ISLAND/AREA – SEE LANDSCAPE DWGS.
10. (*) TRASH ENCLOSURE W/ 6'–0" HIGH BLOCK WALL AND METAL GATE.
11. CONCRETE PAVEMENT – REFER TO CIVIL DWGS.
12. ASPHALT PAVEMENT – SEE CIVIL DWGS. REFER TO SOILS REPORT FOR RECOMMENDATIONS.
13. SAND/ OIL INTERCEPTOR – SEE PLUMBING DWGS.
14. FIRE HYDRANT – SEE CIVIL DWGS. & FIRE PROTECTION DWGS.
15. 3–WAY FIRE DEPARTMENT CONNECTION – SEE CIVIL AND FIRE PROTECTION DWGS. IF INSTALLED REMOTELY THEN BOLLARDS WILL BE REQUIRED FOR PROTECTION.
16. FIRE RISER WITH BACKFLOW PREVENTER ASSEMBLY – SEE CIVIL DWGS., FIRE SPRINKLER DWGS. AND PLUMBING DWGS.
17. GAS METER – SEE PLUMBING DWGS.
18. (*) ELECTRIC TRANSFORMER AND CONCRETE PAD WITH BOLLARDS – REFER TO CIVIL DWGS. & ELECTRICAL DWGS. ALSO REFER TO 8/A2.1 FOR BOLLARDS DETAIL (SIM.).
19. STEEL BOLLARD FILLED W/ CONCRETE. SEE 8/A2.1.
20. "INVERTED U" BIKE RACK – SEE CIVIL DWGS.
21. CONCRETE CURB PAINTED TRAFFIC YELLOW UNLESS SPECIFIED OTHERWISE BY FIRE DEPARTMENT.
22. EXISTING CONCRETE SIDEWALK – SEE CIVIL DWGS.
23. TRANSITION CURB. SEE 20/A2.1 AND CIVIL DWGS.
24. RESERVED
25. DISCOUNT TIRE SCOPE OF WORK – SEE CIVIL DWGS.
26. CONSTRUCTION LIMITS – SEE CIVIL DWGS.
27. STOP SIGN – SEE CIVIL DWGS.
28. BRICK PAVERS – SEE CIVIL DWGS.
29. BIKE RACK – SEE CIVIL DWGS.
30. DETECTIBLE WARNING PLATE – SEE CIVIL DWGS.
31. (N) LANDSCAPE

SITE LEGEND:

- LINE OF ACCESSIBLE PATH OF TRAVEL
- 6 — NUMBER OF PARKING STALL, TYP.
- SS — PARKING STALL W/IN DESIGNATED SNOW STORAGE AREA
- LANDSCAPING
- CONCRETE CURB PAINTED TRAFFIC YELLOW, UNLESS SPECIFIED OTHERWISE BY FIRE DEPARTMENT.
- DISCOUNT TIRE SCOPE OF WORK – SEE CIVIL DWGS.
- CONSTRUCTION LIMITS – SEE CIVIL DWGS.

NOTE:
SITE PLAN IS PROVIDED AS REFERENCE TO DETAILS PROVIDED IN THE ARCHITECTURAL DETAIL SHEET A2.1 FOR SITE IMPROVEMENTS, REFER TO PLANS PREPARED BY: KIMLEY-HORN, INC.

NORTH

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

SITE PLAN

DISCOUNT TIRE

THIS PLAN IS PROPERTY OF Ei DESIGN. THIS DRAWING IS LOANED WITHOUT OTHER CONSIDERATION THAN THE AGREEMENT AND CONDITION THAT IT IS NOT BE REPRODUCED, COPIED, OR OTHERWISE DISPOSED OF, DIRECTLY OR INDIRECTLY, AND IS NOT TO BE USED IN WHOLE OR IN PART TO ASSIST IN MAKING OR TO FURNISH ANY INFORMATION FOR THE MAKING OF DRAWINGS, PRINTS, APPARATUS OR PARTS THEREOF. THE ACCEPTANCE OF THIS DRAWING WILL BE CONSTRUED AS AN ACCEPTANCE OF THE FOREGOING CONDITIONS.

CONCEPTUAL SITE PLAN

51537 Highway 6
GLENWOOD SPRINGS, CO 81601

Ei DESIGN
Ei Design Inc.
1260 Corona Pointe,
Suite 301
Corona, CA 92879
951-251-0136 (T)
eidesigninc.com

BUILDING MODEL: ALT - 1R
REVISION: -
DATE: 03.31.20
SCALE: AS NOTED
PROJECT NUMBER: 70.0030871

Sheet No.
A2.0

Kimley-Horn
and Associates, Inc.

January 30, 2014

Suite 200
990 South Broadway
Denver, Colorado
80209

Daniel Roussin
State of Colorado Department of Transportation
Region 3 Traffic Section
222 S. Sixth St., Room 100
Grand Junction, Colorado 81501

Re: Proposed Discount Tire – Glenwood Springs
State Highway 70 Frontage Road and County Road 135
Glenwood Springs, Colorado
Revised Level Two Traffic Study – Access Permit Request

Dear Mr. Roussin:

This letter presents the results of a Level Two traffic study trip generation and auxiliary turn lane improvement identification for a proposed Discount Tire development per State of Colorado Department of Transportation (CDOT) requirements. The proposed site for the Discount Tire is located northeast of the State Highway 70 Frontage Road (070A-FR) and County Road 135 (CR-135) intersection, immediately east of the existing Holy Cross Lutheran Church in Glenwood Springs, Colorado. This traffic study provides an evaluation of the proposed project access which will serve Discount Tire and the remainder of the parcel for purposes of obtaining access permits for the driveways.

A restaurant, carwash, and auto accessory store are currently located on the site of the proposed Discount Tire. Redevelopment of the site is proposed to include a 7,373 square foot Discount Tire store. Discount Tire is proposed within the southeast portion of the site. Two additional lots will be available for future development on the property. For purposes of this study, it was assumed that Lot B, on the southwest portion of the site, would include a 5,000 square foot automobile care center, while Lot C, the northern portion of the site, would contain an 8,000 square foot mini-warehouse. A site plan is attached.

Three accesses are currently used by patrons of the existing businesses on site. The west access is also shared with Holy Cross Lutheran Church and residents of Valley View West Condominiums. The proposed access for the Discount Tire will include continued use of the west shared access as well as construction of a second access further east. The existing middle access will be closed with development of the project. Analysis of the access which included traffic volumes and turning movements was completed for the existing year (2013) as well as the twenty-year horizon of 2033 for purposes of obtaining access permits. **Figure 1** illustrates the vicinity of the proposed Discount Tire site with respect to the surrounding area of Glenwood Springs.

SH-70 Frontage Road is a CDOT maintained highway with a 40 mile per hour speed limit adjacent to the project with an access category of Frontage Road (F-R). The highway is undivided with one lane in each direction. The shared west access for the site operates

TEL 303 228 2300

Trip Generation for Discount Tire Center - Glenwood Springs

Land Use		Vehicle Trips								
Project	Size (sf)	Weekday AM Peak Hour			Weekday PM Peak Hour			Peak Hour of Generator		
		In	Out	Total	In	Out	Total	In	Out	Total
Discount Tire Co. (Tire Store 848)	7,373	13	8	21	13	18	31	17	20	37
Automobile Care Center (942)	5,000	7	4	11	8	8	16	9	9	18
Mini-Warehouse (151)	8,000	1	0	1	1	1	2	2	1	3
Total	20,373	21	12	33	22	27	49	28	30	58

As shown in the table, redevelopment of the existing uses to a Discount Tire, an automobile care center and a mini-warehouse is anticipated to generate 33 morning peak hour trips and 49 afternoon peak hour trips. For reference, the existing site uses to be removed with the project generate three (3) morning peak hour trips and 58 afternoon peak hour trips. So, although the morning peak hour trip generation for the site will increase, the afternoon peak hour trip generation of the site will decrease to about 85 percent of the current traffic volumes.

In addition, as requested by CDOT, peak hour of the generator volumes were calculated for the uses. Although in theory this seems like an applicable procedure, the peak hour of the generator times vary by different uses within a mixed- use development. However, in the case with this project, the two automotive uses are compatible and the peak hour of the generator could be applied. The tire store and automobile care center have a peak hour of generator reported for a Saturday. The min-warehouse use does not contain a peak hour of generator on a Saturday, so the highest weekday afternoon peak hour of generator was calculated and added to the Saturday data. This procedure is likely conservative.

Project trip distribution was determined based on the existing traffic volume counts and surrounding roads which will be used by those traveling to the proposed Discount Tire Store. Based on existing counts, it is anticipated that approximately half of the generated traffic will arrive and depart each to the west and east along SH-70 Frontage Road. Attached **Figure 6** illustrates the Discount Tire Store trip distribution. The trip generation described previously was multiplied by the trip distribution developed to determine the project traffic assignment shown in **Figure 7**. The project traffic assignment was added to the 2013 and 2033 background traffic volumes to determine the total existing and projected traffic with construction of the Discount Tire Store as shown in attached **Figures 8 and 9** respectively, with the shared access volumes of Holy Cross Lutheran Church and Valley View West Condominiums remaining, and applied to the peak hour of the generator assuming that traffic would generate the same, although likely much less traffic from these two existing uses during the Saturday peak hour of the generator.

Based on traffic projections, auxiliary turn lane requirements were calculated per the State of Colorado State Highway Access Code for SH-70 Frontage Road and the two proposed accesses. According to the State Highway Access Code for category F-R roadways with a 40 mile per hour speed limit, the following thresholds apply:

Kimley-Horn and Associates, Inc.

Project	Glenwood Springs Discount Tire				
Subject	Trip Generation for Tire Store				
Designed by	Mitchell Hess	*Date*	November 12, 2013	*Job No.*	096010010
Checked by	Curtis Rowe	*Date*	November 12, 2013	*Sheet No.*	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 9th Edition, Average Rate Equations

Land Use Code - Tire Store (848)
Independant Variable - 1000 Square Feet Gross Floor Area (X)
Gross Floor Area = 7,373 Square Feet
X = 7.373
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Page 1618)

T = 2.89 (X)
T = 2.89 * 7.373

Directional Distribution: 63% ent. 37% exit.
T = 21 Average Vehicle Trip Ends
13 entering 8 exiting
13 + 8 = 21

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 1619)

T = 4.15 (X)
T = 4.15 * 7.373

Directional Distribution: 43% ent. 57% exit.
T = 31 Average Vehicle Trip Ends
13 entering 18 exiting

13 + 18 (*) = 31

Weekday (page 1617)

Average Weekday
T = 24.87 (X)
T = 24.87* 7.373

Directional Distribution: 50% entering, 50% exiting
T = 184 Average Vehicle Trip Ends
92 entering 92 exiting

92 + 92 = 184

Peak Hour of Generator on a Saturday (page 1622)

T = 5.05 (X)
T = 5.05 * 7.373

Directional Distribution: 47% ent. 53% exit.
T = 37 Average Vehicle Trip Ends
17 entering 20 exiting

17 + 20 = 37

Kimley-Horn and Associates, Inc.

Project	Glenwood Springs Disount Tire Center				
Subject	Trip Generation				
Designed by	CDR	*Date*	December 16, 2013	*Job No.*	096010010
Checked by		*Date*		*Sheet No.*	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 9th Edition, Fitted Curve and Average Rate Equations

Land Use Code - Automobile Care Center (942)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)

Gross Floor Area = 5,000
X = 5.0
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 1975)

Directional Distribution: 66% ent. 34% exit.

T = 2.25 (X) T = 11 Average Vehicle Trip Ends
T = 2.25 * 5 7 entering 4 exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 1976)

Directional Distribution: 48% ent. 52% exit.

T = 3.11 (X) T = 16 Average Vehicle Trip Ends
T = 3.11 * 5 8 entering 8 exiting

PM Peak Hour of Generator (page 1978)

Directional Distribution: 49% ent. 51% exit.

T = 3.51 (X) T = 18 Average Vehicle Trip Ends
T = 3.51 * 5 9 entering 9 exiting

Kimley-Horn and Associates, Inc.

Project	Glenwood Springs Discount Tire Center				
Subject	Trip Generation for Mini Warehouse				
Designed by	CDR	*Date*	December 16, 2013	*Job No.*	096010.010
Checked by		*Date*		*Sheet No.*	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 9th Edition, Fitted Curve and Average Rate Equations

Land Use Code - Mini-Warehouse (151)
Independant Variable - 1000 Square Feet Gross Floor Feet (X)
Gross Floor Area = 8,000
X = 8.0
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 222)

Directional Distribution: 55% ent. 45% exit.
T = 0.14 (X)
T = 0.14 * 8
T = 1 Average Vehicle Trip Ends
1 entering 0 exiting
1 + 0 = 1

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 223)

Directional Distribution: 50% ent. 50% exit.
T = 0.26 (X)
T = 0.26 * 8
T = 2 Average Vehicle Trip Ends
1 entering 1 exiting
1 + 1 = 2

Weekday (page 221)

Directional Distribution: 50% entering, 50% exiting
T = 2.50 (X)
T = 2.50 * 8
T = 20 Average Vehicle Trip Ends
10 entering 10 exiting
10 + 10 = 20

Peak Hour of Generator on a Saturday (page 227)

Directional Distribution: 60% ent. 40% exit.
T = 0.40 (X)
T = 0.40 * 8
T = 3 Average Vehicle Trip Ends
2 entering 1 exiting
2 + 1 = 3

850319 06/17/2014 08:24:41 AM Page 1 of 2
Jean Alberico, Garfield County, Colorado
Rec Fee: $16.00 Doc Fee: $275.00 eRecorded

COG 10354
RECEIVED
JUN 24 2014
REAL ESTATE DEPT
from Legal Sw

WARRANTY DEED

THIS DEED is dated the 16th day of June, 2014, and is made between

Glen R. Miller and Elizabeth A. Miller

(whether one, or more than one), the "Grantor" of the County of Garfield and State of Colorado and

Halle Properties, L.L.C., an Arizona limited liability company

(whether one, or more than one), the "Grantee", whose legal address is By: Wilanna, Inc. c/o James Silhasek, Esq., 20225 North Scottsdale Road, Scottsdale, AZ 85255 of the County of Maricopa and State of Arizona.

WITNESS, that the Grantor, for and in consideration of the sum of ( ), 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 as follows:

A parcel of land situated in the NW1/4SW1/4 of Section 5, Township 6 South, Range 89 West of the Sixth Principal Meridian, lying Northerly of the Northerly right-of-way line of U.S. Highway 6&24, said parcel of land being more particularly described as follows:

Beginning at a point on said right-of-way line whence an iron post with a brass cap found in place and properly marked for the Southwest corner of Section 35, Township 5 South, Range 89 West of the 6th P.M. bears: N. 12° 48'00" W. 1600.05 feet;
Thence N. 83° 43'00' W. 331.45 feet along said right-of-way line;
Thence N. 01° 44'00" E. 398.70 feet;
Thence S. 88° 16'00" E. 330.40 feet;
Thence S. 01° 44'00" W. 425.00 feet to the point of beginning

EXCEPTING from the above described property the Westerly 2.63 feet of even width therefrom

County of Garfield, State of Colorado

also known by street address as: 51537 Highway 6 & 24, Glenwood Springs, CO 81601

TOGETHER with all and singular the hereditaments and appurtenances thereto 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 Grantees, and the Grantees' heirs and assigns forever.

The Grantor, for the Grantor and the Grantor's heirs 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:

General taxes for the year 2013 and subsequent years; and those specific exceptions described by reference to recorded documents as reflected in the Title Documents accepted by Grantee(s) in accordance with Section 8.1 (Record Title Matters) of the Contract to Buy and Sell Real Estate relating to the above described real property; distribution utility easements (including, cable TV); those specifically described rights of third parties not shown by the public records of which Grantee(s) has actual knowledge and which were accepted by Grantee(s) in accordance with Section 8.2 (Off Record Title Matters) and Section 9 (Current Survey Review) of the Contract to Buy and Sell Real Estate relating to the above described real property; inclusion of the Property within any special taxing district; the benefits and burdens and of any recorded declaration and party wall agreements, if any.

And the Grantor shall and will WARRANT THE TITLE AND DEFEND the above described premises, *but not any adjoining vacated street or alley*, if any, in the quiet and peaceable possession of the Grantees, and the heirs and assigns of the Grantees, against all and every person or persons lawfully claiming the whole or any part thereof.

IN WITNESS WHEREOF, the Grantor has executed this deed on the date set forth above.

Glen R. Miller

Elizabeth A. Miller

01330-30747

Recorded Electronically
ID 850317
County Garfield
Date 6-17-14
Time 8:24 am
Simplifile.com 800-460-5657

WARRANTY DEED

THIS DEED is dated the 16th day of June, 2014, and is made between

Glen R. Miller and Elizabeth A. Miller

(whether one, or more than one), the "Grantor" of the County of Garfield and State of Colorado and

Halle Properties, L.L.C., an Arizona limited liability company

(whether one, or more than one), the "Grantee", whose legal address is By: Wilanna, Inc. c/o James Silhasek, Esq., 20225 North Scottsdale Road, Scottsdale, AZ 85255 of the County of Maricopa and State of Arizona.

WITNESS, that the Grantor, for and in consideration of the sum of ( ), 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 as follows:

A parcel of land situated in the NW1/4SW1/4 of Section 5, Township 6 South, Range 89 West of the Sixth Principal Meridian, lying Northerly of the Northerly right-of-way line of U.S. Highway 6&24, said parcel of land being more particularly described as follows:

Beginning at a point on said right-of-way line whence an iron post with a brass cap found in place and properly marked for the Southwest corner of Section 35, Township 5 South, Range 89 West of the 6th P.M. bears: N. 12° 48'00" W. 1600.05 feet;
Thence N. 83° 43'00' W. 331.45 feet along said right-of-way line;
Thence N. 01° 44'00" E. 398.70 feet;
Thence S. 88° 16'00" E. 330.40 feet;
Thence S. 01° 44'00" W. 425.00 feet to the point of beginning

EXCEPTING from the above described property the Westerly 2.63 feet of even width therefrom

County of Garfield, State of Colorado

also known by street address as: 51537 Highway 6 & 24, Glenwood Springs, CO 81601

TOGETHER with all and singular the hereditaments and appurtenances thereto 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 Grantees, and the Grantees' heirs and assigns forever.

The Grantor, for the Grantor and the Grantor's heirs 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:

01330-30747

General taxes for the year 2013 and subsequent years; and those specific exceptions described by reference to recorded documents as reflected in the Title Documents accepted by Grantee(s) in accordance with Section 8.1 (Record Title Matters) of the Contract to Buy and Sell Real Estate relating to the above described real property; distribution utility easements (including, cable TV); those specifically described rights of third parties not shown by the public records of which Grantee(s) has actual knowledge and which were accepted by Grantee(s) in accordance with Section 8.2 (Off Record Title Matters) and Section 9 (Current Survey Review) of the Contract to Buy and Sell Real Estate relating to the above described real property; inclusion of the Property within any special taxing district; the benefits and burdens and of any recorded declaration and party wall agreements, if any.

And the Grantor shall and will WARRANT THE TITLE AND DEFEND the above described premises, *but not any adjoining vacated street or alley*, if any, in the quiet and peaceable possession of the Grantees, and the heirs and assigns of the Grantees, against all and every person or persons lawfully claiming the whole or any part thereof.

IN WITNESS WHEREOF, the Grantor has executed this deed on the date set forth above.

Glen R. Miller

Elizabeth A. Miller

State of Colorado
County of Garfield

The foregoing instrument was acknowledged before me this 16 day of June, 2014 by Glen R. Miller and Elizabeth A. Miller.

KARI ARNESON
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #20104023718
My Commission Expires July 15, 2018

Witness my hand and official seal.

Notary Public
My commission expires:

850320 06/17/2014 08:24:41 AM Page 1 of 1
Jean Alberico, Garfield County, Colorado
Rec Fee: $11.00 Doc Fee: $0.00 eRecorded

STATEMENT OF AUTHORITY
(38-30-172, C.R.S.)

1. This Statement of Authority relates to an entity named Wilanna, Inc., an Arizona Corporation

   And is executed on behalf of the entity pursuant to the provisions of Section 38-30-172 C.R.S.

2. The type of entity is a Corporation

3. The mailing address for the entity is:
   20225 North Scottsdale Road

   Scottsdale AZ 85255

4. The entity is formed under the laws of Arizona

5. The name of the person(s) authorized to execute instruments conveying, encumbering, or otherwise affecting title to real property on behalf of the entity is:

   James Silhasek, Agent

6. The authority of the foregoing person(s) to bind the entity is ☐ Not limited OR ☒ Limited as follows:
   As they pertain to this transaction.
7. Other matters concerning the manner in which the entity deals with interest in real property:

Dated this 12th day of June, 2014.

James Silhasek

State of Arizona

County of Maricopa

The foregoing instrument was acknowledged before me this 12 day of June 2014, by

James Silhasek as the

Agent of

Wilanna, Inc., an Arizona Corporation.

Stephanie Heffman
Notary Public
Maricopa County, Arizona
My Comm. Expires 02-19-18

Witness my hand and official seal.

Notary Public
My commission expires: 2/19/2018

01330-30747

Recorded Electronically
ID 850320
County Graham
Date 6-17-14
Time 8:34pm
Simplifile.com 800-460-5657

STATEMENT OF AUTHORITY
(38-30-172, C.R.S.)

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   As they pertain to this transaction.
7. Other matters concerning the manner in which the entity deals with interest in real property:

Dated this 12th day of June, 2014.

James Silhasek

State of Arizona

County of Maricopa

The foregoing instrument was acknowledged before me this 12 day of June, 2014, by

James Silhasek as the

Agent of

Wilanna, Inc., an Arizona Corporation.

Stephanie Heffman
Notary Public
Maricopa County, Arizona
My Comm. Expires 02-19-18

Witness my hand and official seal.

Notary Public
My commission expires: 2/19/2018

01330-30747

MINOR SITE/ARCHITECTURAL PLAN REVIEW 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 site/architectural plan 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	**Planning Application** – completed in full and signed by applicant and all property owners of record	√			√			
2	**Ownership** - provide proof of ownership such as Deed of Trust, Warranty Deed or Quit Claim Deed. Title commitment will not suffice	√			√			
3	**Public Noticing** – signed and notarized affidavit proof of public notice including mineral estate owner notification	√		Later in the process Around June 8th				
4	**Project Description** – narrative describing the project	√			√			
5	~~**Administrative Adjustment** – refer to the 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	~~**Variance** – refer to the Variance criteria and questionnaire page 15~~							
7	**Complete Plan Set including:**	0	1	1	√			
	Cover Sheet							
	Site Plan							
	Preliminary Grading Plan							
	Conceptual Architectural Plans							
	Preliminary Landscape Plan							
	~~Sample materials board~~							
	~~Lighting Plan~~							
8	**Engineering Reports including:**	2	0	0	√			
	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							
9	**Fee**	$ $1,150.00				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				
10	**Other Materials** (list other materials that will be required)							
	Photo Board - Exteriors				X			

1260 Corona Pointe Ct.
STE 301
Corona, CA 92879
T 951-444-5642
www.EiDesignInc.com

April 7th, 2020

City of Glenwood Springs
101 W. Eighth Street
Glenwood Springs, CO 81601

Attention: Emery Ellingson

Discount Tire
51537 Hwy. 6
Glenwood Springs, CO 81601

Re: Proposed Building Expansion

Mr. Ellingson,

Discount Tire is proposing to proceed with a building expansion to incorporate additional tire storage in order to eliminate the on-site storage of tires in shipping containers. The proposed expansion would be a 50'×56' (2838 SF) addition and would be comprised of metal racks for storage of rubber tires. This expansion/addition would be for a tire storage use only and would not include any sales, office or repair areas. Said expansion to be constructed on the North end of the existing building.

Included with this pre-application submittal are preliminary site plan, floor plan and elevations.

Please feel free to contact me if you should have any questions or need anything else.

Best Regards,

Steve Appel, Project Manager, Ei Design
sappel@eicompanies.com
(951) 363-4467

Kimley»Horn

To:	City of Glenwood Springs
From:	Bryce Christensen, P.E. Kimley-Horn and Associates, Inc.
Date:	May 12, 2020
Subject:	Final Drainage Conformance Letter for Discount Tire Building Expansion Project 51537 Highway 6, Glenwood Springs, CO Lot 1, Block 1 Halle Tract Minor Subdivision

General Location and Description

Kimley-Horn has prepared a drainage conformance letter for the proposed 2,838 SF building expansion for the existing Discount Tire Project. This site is located at Lot 1, Block 1 of the Halle Tract Minor Subdivision. This ±1.8-acre lot is comprised of an existing Discount Tire building with an associated parking lot, private drive aisles, landscaped islands, and sidewalks. There is an undeveloped future pad located on the western half of the site. The site is bounded by the undeveloped Lot 2, Block 1 to the north, an existing mini-golf establishment to the east, Highway 6 to the south, and a private drive to the west. This letter summarizes the existing and proposed drainage conditions for the subject tract.

The proposed Discount Tire building expansion consists of adding approximately 2,838 SF of building to house dead tire storage for the store's operations. It is anticipated that this expansion will be on the north side of the existing building causing some existing landscape area, parking, and a trash enclosure to be relocated. Subbasins A and B have been modified slightly due to the placement of the proposed building expansion. The overall basin boundary for the site that contributes to the existing stormwater detention pond located along the south property line will remain as is. Overall, there will be a net increase in pervious landscape area of 177+/- SF. Below is a summary of those changes in area.

Site	Area (sf)	Area (ac)	Landscape (sf)	Landscape (ac)	Roof (sf)	Roof (ac)	Pavement (sf)	Pavement (ac)	$I_{WEIGHTED}$
Existing	272,864	6.26	147,774	3.39	26,923	0.62	98,167	2.25	44.86%
Proposed	272,864	6.26	147,951	3.40	29,761	0.68	95,152	2.18	44.69%
Δ			+177	+0.01	+2,838	+0.06	-3,015	+0.09	-0.17%

It can be seen from the table that the land under direct impact from the project has altogether decreased imperviousness from 44.86% to 44.69% or by 0.17%. This is due to the increase of landscaped areas by 177 square feet from existing conditions. Refer to Appendix B for the Proposed Drainage Basin Map and Appendix C for the Composite C Value and Direct Runoff Calculations.

No new storm drain infrastructure is being proposed as part of this project. The site will continue to drain as it has historically to the dry well located in the southwest corner of the property.

The proposed Discount Tire building expansion will not negatively impact the existing drainage design or downstream developments.

Drainage Certification

This report for the drainage design of Discount Tire building expansion in Glenwood Springs was prepared by me in accordance with the provisions of the City of Glenwood Springs Drainage Design and Technical Criteria and was designed to comply with the provisions thereof. I understand that the City of Glenwood Springs does not, and will not, assume liability for drainage facilities designed by others.

Bryce Christensen, P.E.

_____

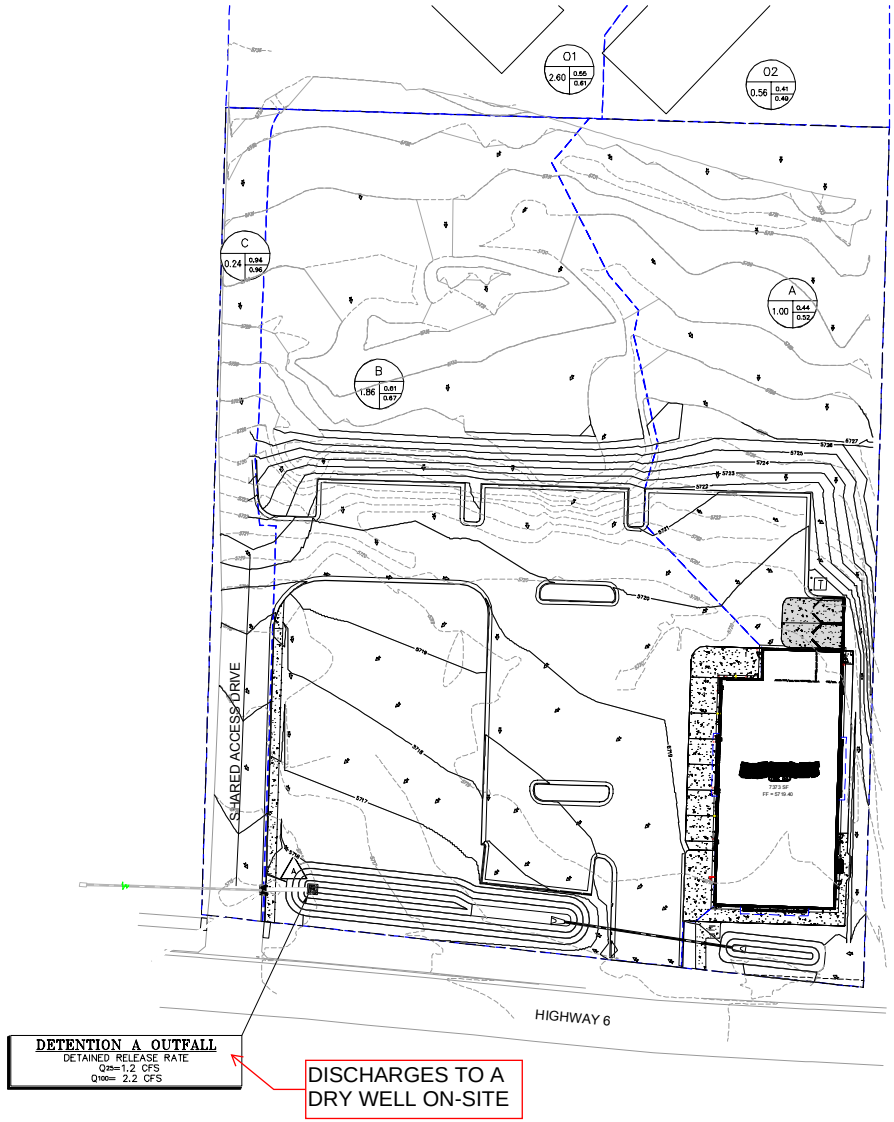
Registered Professional Engineer

State of Colorado No. 47935

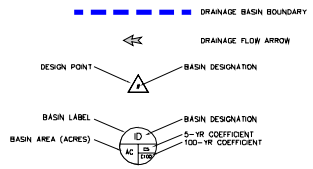
Appendices

A. Existing Overall Drainage Map Exhibit
B. Proposed Overall Drainage Map Exhibit
C. Composite C Value and Direct Runoff Calculations
D. FEMA Firms Map
E. Soils Map
F. Original Drainage Report
G. Dry Well Memo

ATTACHMENT A – EXISTING OVERALL DRAINAGE MAP EXHIBIT



LEGEND



FLOOD PLAIN IDENTIFICATION

BY SCALED MAP LOCATION AND GRAPHICAL REVIEW OF THE FLOOD INSURANCE RATE MAP NUMBER 08020514318, DATED JANUARY 3, 1986, THE SITE LIES WITHIN AN AREA CLASSIFIED AS ZONE C. AREAS CLASSIFIED AS ZONE C ARE CONSIDERED AREAS OF MINIMAL FLOOD HAZARD.

Rainfall Intensity

IDF - Intensity, Duration, Frequency Data

Time Intensity Frequency Tabulation

TIME	2 YR	10 YR	25 YR	100 YR
5	2.11	4.07	5.16	6.64
10	1.55	2.98	3.78	4.85
15	1.26	2.42	3.07	3.95
30	0.82	1.51	1.88	2.38
60	0.51	0.86	1.05	1.31
120	0.30	0.48	0.58	0.72

Note:
Intensity values utilized as published from the NOAA Atlas 14, Volume 8, Version 2; Glenwood Springs, CO Station ID: 05-3359

NOTE

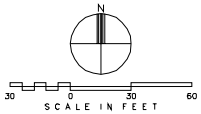
SUB-BASIN 'A' INCLUDES THE AREA IN BASIN 'R' (7,373 SF – BUILDING AREA)

SUB-BASIN 'O1' AND 'O2' ARE OFF-SITE BASINS THAT ARE ONLY BEING ACCOUNTED FOR BYPASS FLOW

SUB-BASIN 'C' IS THE SHARED ACCESS DRIVE THAT IS ONLY BEING ACCOUNTED FOR BYPASS FLOW

Site Runoff Summary - Proposed Conditions

DESIGN POINT	DRAIN BASIN	AREA Ac	Q25 CFS	Q100 CFS	Q25 CFS	Q100 CFS
A	A	1.00	0.7	1.0	1.5	2.3
B	B	1.86	2.2	3.0	4.2	6.0
C	C	0.24	0.7	0.9	1.2	1.5
O1	O1	2.60	2.9	4.1	5.9	8.5
O2	O2	0.56	0.4	0.5	0.9	1.3
		6.26	6.8	9.5	13.7	19.5

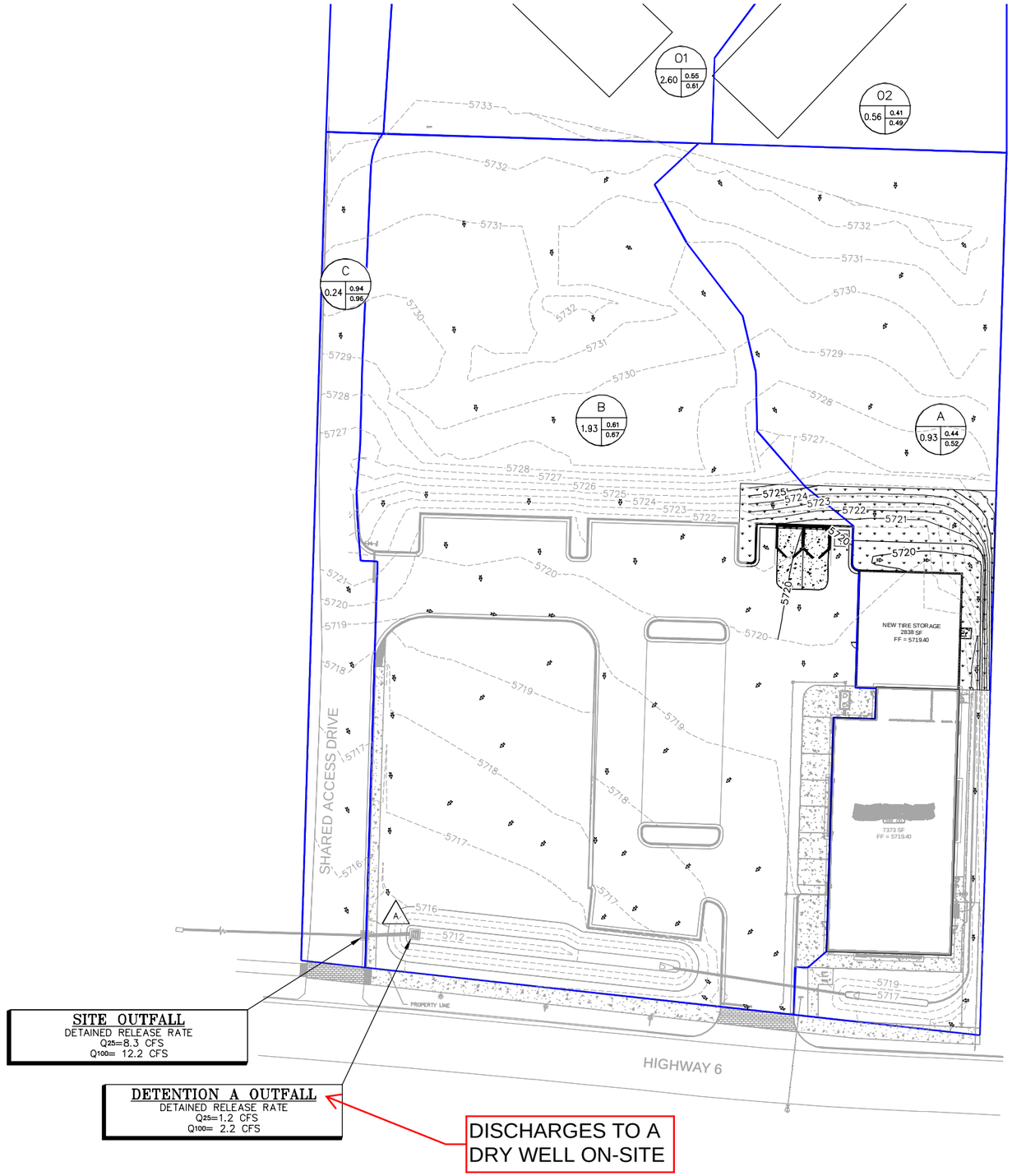


EXISTING OVERALL DRAINAGE MAP EXHIBIT

Kimley»Horn

© 2011 KIMLEY-HORN AND ASSOCIATES, INC.

ATTACHMENT B – PROPOSED OVERALL DRAINAGE MAP EXHBIIT



LEGEND

DRAINAGE BASIN BOUNDARY

DRAINAGE FLOW ARROW

= BASIN DESIGNATION

AC = AREA IN ACRES

C = RUNOFF COEFICIENT

A = DESIGN POINT

FLOOD PLAIN IDENTIFICATION

BY SCALED MAP LOCATION AND GRAPHICAL REVIEW OF THE FLOOD INSURANCE RATE MAP NUMBER 08007I1431C, DATED OCTOBER 15, 1985, THE SITE LIES WITHIN AN AREA CLASSIFIED AS ZONE C. AREAS CLASSIFIED AS ZONE C ARE CONSIDERED AREAS OF MINIMAL FLOOD HAZARD.

Rainfall Intensity

IDF - Intensity, Duration, Frequency Data

Time Intensity Frequency Tabulation

TIME	2 YR	10 YR	25 YR	100 YR
5	2.11	4.07	5.16	6.64
10	1.55	2.98	3.78	4.85
15	1.26	2.42	3.07	3.95
30	0.82	1.51	1.88	2.38
60	0.51	0.86	1.05	1.31
120	0.30	0.48	0.58	0.72

Note:
Intensity values utilized as published from the NOAA Atlas 14, Volume 8, Version 2; Glenwood Springs, CO Station ID: 05-3359

NOTE

SUB-BASIN 'A' INCLUDES THE AREA IN BASIN 'R' (10,211 SF - BUILDING AREA)

SUB-BASIN 'O1' AND 'O2' ARE OFF-SITE BASINS THAT ARE ONLY BEING ACCOUNTED FOR BYPASS FLOW

EXISTING VS PROPOSED FLOWS

	Area (Ac)	Q2 (CFS)	Q5 (CFS)	Q100 (CFS)
Existing	6.26	6.62	8.88	17.11
Proposed	6.26	6.59	8.84	17.06

N

30 0 30 60

SCALE IN FEET

PROPOSED OVERALL DRAINAGE MAP

MAY 11, 2020

© 2011 KIMLEY-HORN AND ASSOCIATES, INC.
C:\Civil\Projects\2021 - 072 Glenwood Springs - 1 Project Files\Engineering\Original\Drainage\Drainage Maps\Proposed Drainage Map_Expanded.dwg, May 12, 2020, 2:28pm

ATTACHMENT C – COMPOSITE C VALUE AND DIRECT RUNOFF CACLULATIONS

DISCOUNT TIRE GLENWOOD SPRINGS

Site	Area (sf)	Area (ac)	Landscape (sf)	Landscape (ac)	Roof (sf)	Roof (ac)	Pavement (sf)	Pavement (ac)	$I_{WEIGHTED}$	C_5	C_{10}	C_{100}
Exitsing	272,864	6.26	147,774	3.39	26,923	0.62	98,167	2.25	44.86%	0.44	0.49	0.61
Proposed	272,864	6.26	147,951	3.40	29,761	0.68	95,152	2.18	44.69%	0.44	0.48	0.61
Δ			+177	+0.00	+2838	+0.07	-3015	-0.07	-0.17%			

Land Use	**I**	**C_5**	**C_{10}**	**C_{100}**
Landscape (C and D Soils, 2-7% Slopes)	0%	0.08	0.15	0.35
Roof	90%	0.73	0.75	0.81
Paved Streets	100%	0.90	0.92	0.96

DISCOUNT TIRE GLENWOOD SPRINGS

5-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATION				DIRECT RUNOFF		
	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs
Existing	6.26	0.44	5.0	2.7508	2.41	6.62
Proposed	6.26	0.44	5.0	2.7364	2.41	6.59

$$I = \frac{28.5\ P_1}{(10 + T_c)^{0.786}} \qquad (5.5)$$

Where:

I = rainfall intensity (inches per hour)
P_1 = one-hour rainfall depth (inches) from Figures RA-1 through RA-6 in USDCM, Volume 1
T_c = time of concentration (minutes).

10-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATION				DIRECT RUNOFF		
	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs
Existing	6.26	0.49	5.0	3.0457	2.92	8.88
Proposed	6.26	0.48	5.0	3.0315	2.92	8.84

100-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATION				DIRECT RUNOFF		
	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs
Existing	6.26	0.61	5.0	3.8514	4.44	17.11
Proposed	6.26	0.61	5.0	3.8392	4.44	17.06

P1 DELINEATIONS USED ARE SHOWN VIA THE GRAPH BELOW:

Rainfall Intensity

IDF - Intensity, Duration, Frequency Data

Time Intensity Frequency Tabulation

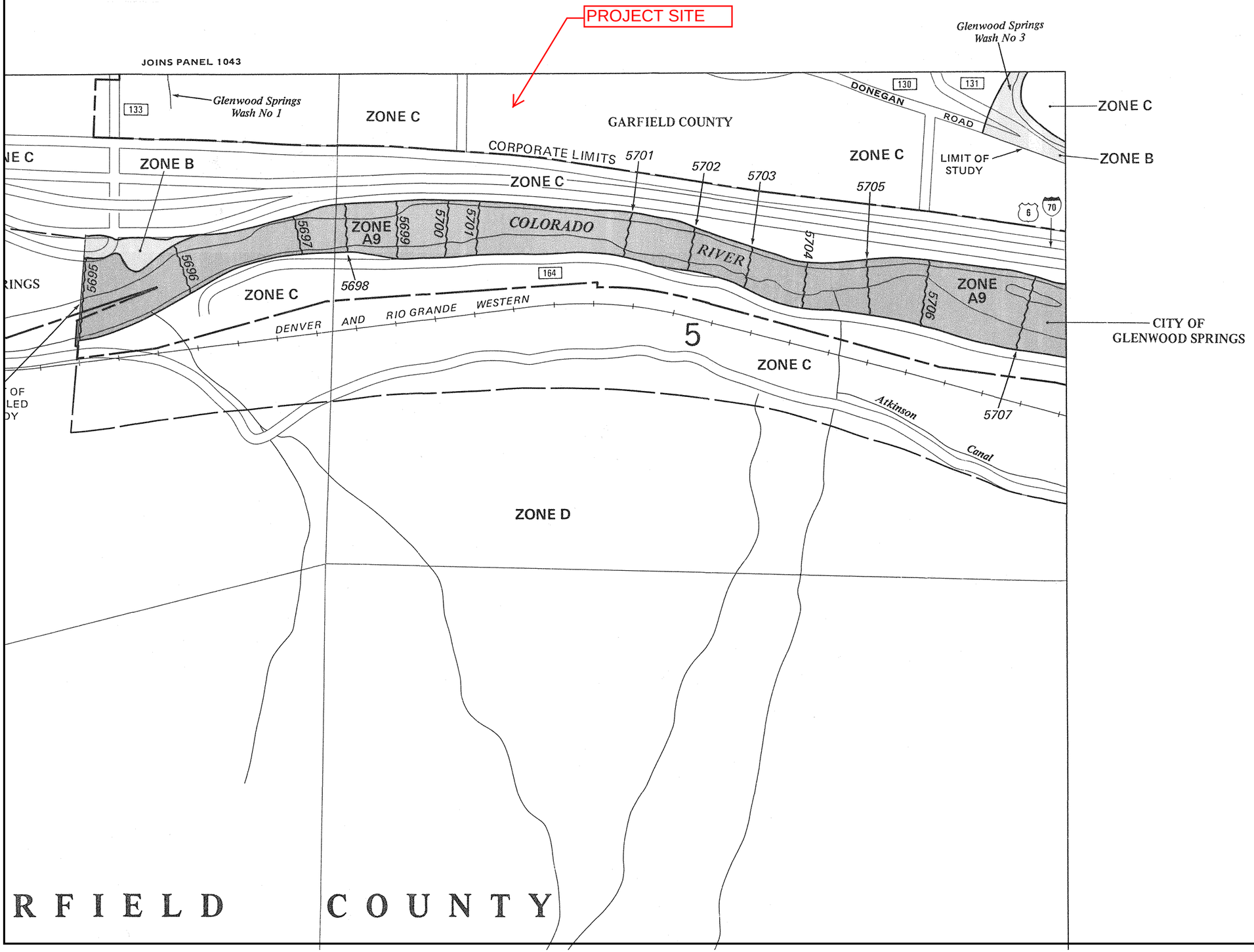
TIME	5 YR	10 YR	25 YR	100 YR
5	3.22	4.07	5.16	6.64
10	2.35	2.98	3.78	4.85
15	1.92	2.42	3.07	3.95
30	1.21	1.51	1.88	2.38
60	0.71	0.86	1.05	1.31
120	0.41	0.48	0.58	0.72

NOTE: Intensity values utilized as published from the NOAA Atlas 14, Volume 8, Version 2; Glenwood Springs, CO Station ID: 05-3359

Tc is being used for comparison purposes only and calculated runoff is depicted for comparison purposes to show a net decrease in runoff is anticipated due to a decrease in imperviousness. Drainage basin boundaries have not been substantially modified.

	Area (Ac)	Q2 (CFS)	Q5 (CFS)	Q100 (CFS)
Existing	6.26	6.62	8.88	17.11
Proposed	6.26	6.59	8.84	17.06

ATTACHMENT D – FEMA FIRMS MAP



APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
GLENWOOD SPRINGS,
COLORADO
GARFIELD COUNTY

PANEL 1431 OF 1900
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
080071 1431 C

MAP REVISED:
OCTOBER 15, 1985

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

ATTACHMENT E – SOILS MAP

Hydrologic Soil Group—Rifle Area, Colorado, Parts of Garfield and Mesa Counties

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 7, Dec 23, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2011—Sep 3, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Rifle Area, Colorado, Parts of Garfield and Mesa Counties (CO683)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Atencio-Azeltine complex, 1 to 3 percent slopes	B	3.1	100.0%
Totals for Area of Interest			**3.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

ATTACHMENT F – ORIGINAL APPROVED DRIANGE REPORT

DRAINAGE REPORT

Discount Tire

51537 Highway 6
Glenwood Springs, Colorado

Prepared for:

Discount Tire
20225 N. Scottsdale Road
Scottsdale, AZ 85255

Prepared by:

Kimley-Horn and Associates, Inc.
990 South Broadway – Suite 200
Denver, Colorado 80209

Project #09010010
May 25, 2014

Kimley»Horn

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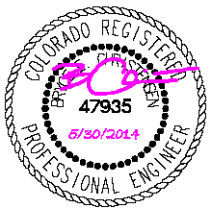
PREPARER CERTIFICATION

This Drainage Report (the Report) has been prepared by me, or under my direct supervision, in substantial accordance with the requirements of the City of Glenwood Springs and Colorado Department of Transportation.



Bryce E. Christensen, PE
Registered Professional Engineer, State of Colorado, No. 47935

INTRODUCTION

The intent of this Drainage Report (the Report) is to summarize the applicable design criteria and proposed storm drainage considerations related to the Discount Tire development (the Site) located in the City of Glenwood Springs, Colorado (the City).

The drainage concepts outlined herein have been provided to demonstrate compliance with the City of Glenwood Springs Drainage Requirements (as per code Section 070.030.040) while utilizing Urban Drainage Design Methods.

SITE LOCATION AND DESCRIPTION

DESCRIPTION OF EXISTING DEVELOPMENT

The existing development consists of a ±3.1 acre parcel which is currently being used as an automotive repair, trailer rental, restaurant facility and car wash. A large portion of the north half of the site is currently undeveloped. The developed portion of the site is mostly impervious with very little interior landscaping. Existing improvements on the site consist of one building with an attached garage and two (2) large sheds as well a car wash facility with three (3) bays and an automatic drive-thru wash area with an office. The site includes paved access drives with associated parking and three (3) driveway connections to Highway 6. Chain-link fence surrounds the back half of the old auto repair building which is currently being used as a storage yard for old vehicles, trailers, automotive parts, etc.

The Project is generally bounded by the following:

North: Valley View Apartments (Existing Multi-Family Residential Development)
East: Johnson's Mini-Golf
South: Highway 6 / Interstate 70
West: Holy Cross Lutheran Church

There are no known major drainage ways or drainage facilities located within the Site. There are no known major irrigation facilities (ditches, canals, etc.) located within the Site.

EXISTING STORM SEWER INFRASTRUCTURE

As identified in the ALTA survey provided by Calvada Surveying, Inc. there is an existing drainage inlet located in the southwest corner of the property with a sump invert of 4.25 feet below existing grade. Based on conversations and a site meeting with City staff there is an 18" outfall pipe from this location to the west that eventually ties into the existing CDOT drainage system along Highway 6. The only other drainage infrastructure that appears to be located on this site includes a shallow inlet with a 12" corrugated metal pipe just west of the easternmost driveway connection to Highway 6. Based on the existing topography it appears that most of the stormwater run-off sheet flows across the site and leaves the property along the south property line.

EXISTING FLOOD PLAIN DELINEATION

By scaled map location and graphical review only of the Flood Insurance Rate Map Panel Number 0802051431B, dated January 3, 1986, this Site lies within an area classified as Zone C. Areas classified as Zone C are considered areas of minimal flood hazard, usually depicted by Flood Insurance Rate Maps as areas outside of the 100-year and 500-year flood plain. A copy of the Flood Insurance Rate Map has been included within the Appendix A of this Report for further reference.

EXISTING SOIL CLASSIFICATION

According to the Unified Soil Classification system the existing subgrade soil falls into the CL, Al range and classifies the subgrade soil as poor.

The Natural Resources Conservation Service Web Soil Survey determines the site soils to contain Atencio-Azeltine complex with 1 to 3 percent slopes.

Soil Types were identified through the United States Department of Agriculture Soil Conservation Services. The predominant Hydrologic Soil Group for onsite soils may be classified as NRCS Soil Type B. This is the type that will be used for runoff calculations utilized in this report.

DESCRIPTION OF PROPOSED DEVELOPMENT

Proposed development consists of the re-development of ±1.85 acres of an overall ±3.1 acre site identified by the ALTA survey provided by Calvada Surveying, Inc. dated January 14, 2014. Development of the Site will consist of the following:

Proposed Commercial Redevelopment

Development of the Site consists of the southern ±1.79 acres of the existing property at 51537 Highway 6 in Glenwood Springs, CO. While the Discount Tire build out area will only comprise of approximately 1.24 acres (including access drives and parking), the remainder of the Site will be laid out to provide areas for future development. The northern half of the site will remain undeveloped while a small portion of the southwest corner of the property (approximately 0.56 acres) will be rough graded for a future building pad. The majority of the existing site improvements will be removed for the development of a new 7,373 SF Discount Tire facility with associated parking, paved site circulation, landscaping, lighting, and utility improvements.

Proposed Site Outfall Conditions (the Site)

The proposed outfall conditions include the use of proposed curb inlet connected to the existing 18" outfall pipe that flows to the west. A control structure will connect to the back of the proposed curb inlet (refer to the Paving and Grading Plan for layout). The outfall pipe is existing and will remain and the sites primary outfall as the site detains the 25 year storm event.

DRAINAGE DESIGN CRITERIA

STORM DRAINAGE DESIGN CRITERIA

Applicable design criteria which was utilized in the design and analysis of the proposed Site drainage considerations consists of the City of Glenwood Springs - Storm Drainage Criteria per section 070.030.040 of the City's Municipal Code (the City Criteria) and the Urban Drainage Flood Control District (UDFCD) - Urban Storm Drainage Criteria Manual (the UDFCD Manual). Due to the fact that the City does not have distinct details or in-depth criteria on storm drainage design the primary resource for the drainage design of this site will consist of the Urban Storm Drainage Criteria.

Proposed storm drainage facilities will be designed to substantially comply with the City Criteria and the UDFCD Manual. Site drainage is impacted and constrained by existing topography, existing outfall locations, and adjacent properties via the Shared Access Road along the west side of the property. Further detail regarding proposed drainage patterns may be referenced in the Drainage Facility Design Section of this report.

HYDROLOGIC DESIGN CRITERIA

Hydrologic design criteria utilized to analyze runoff conditions consists of the Rational Method as approved by the City Criteria. An overview of the Rational Method is outlined below with a brief synopsis of the relevant criteria which was utilized in design calculations.

Rational Method Discharge Equation: $Q = CIA$

- Q = Discharge: Calculated Discharge in Cubic Feet per Second (CFS)
- C = Runoff Coefficient: Runoff Coefficients were calculated utilizing Runoff Coefficients in accordance with Table RO-5 of the UDFCD Manual.
- I = Rainfall Intensity: Rainfall Intensity values were pulled from NOAA Atlas 14, Volume 8, Version 2; Glenwood Springs #2 Station ID: 05-3359. Values provided are in Inches per Hour (In/Hr).
- A = Basin Area: Tributary Basin Areas were determined based upon proposed site grading and drainage characteristics in Acres (Ac).

Runoff conditions and analysis utilized in the preparation of this Report consist of design intervals as outlined by the following:

Water Quality Treatment
- Initial Storm Event (UDFCD V3 Fig SQ-2)

Historic and Developed Runoff Conditions
- Storm: 25-year Storm Event

HYDRAULIC DESIGN CRITERIA

Hydraulic design criteria utilized in the analysis of proposed drainage systems consists of provisions as outlined within the City Criteria and the UDFCD Manual as follows:

Inlet Hydraulics
Applicable design methods utilized to size proposed storm sewer inlets will consist of published manufacturer inlet specifications or available nomographs.

Storm Sewer Hydraulics
Applicable storm sewer hydraulic analysis design methods consist of FlowMaster modeling software based upon Manning's Equation, direct runoff, and time of concentration calculations for respective design point tributary areas.

WATER QUALITY TREATMENT CRITERIA

Water quality design criteria utilized in the analysis of the proposed water quality system consists of the following criteria as referenced within Volume 3, Figure SQ-2 of the UDFCD Manual.

$$\text{WQ Watershed Inches} = a * (0.91i^3 - 1.19i^2 + 0.078i)$$

$$\text{WQCV} = (\text{WQCV} / 12) * (\text{Area})$$

i = Composite Tributary Imperviousness (%)
Area = Area (Acres)
a = Drain Time (Hours)

DETENTION STORAGE AND RELEASE CRITERIA

Applicable design criteria utilized to determine the required onsite Detention Storage and Release Rates consists of the Modified FAA Method as outlined within the UDFCD Manual and standard Release Rates as outlined within the Criteria.

Storage Volume and Release Rates utilized in the preparation of this Report are based upon design intervals as outlined by the following:

Water Quality Treatment
- Initial Storm Event (UDFCD V3 Fig SQ-2)

Historic and Developed Runoff Conditions
- Storm: 25-year Storm Event

DRAINAGE FACILITY DESIGN

GENERAL DRAINAGE CONCEPT

Drainage facilities associated with the previously identified site improvements consist of standard sheet and conveyed flow patterns through the use of onsite building roof drains, vegetated swales, and onsite storm sewer piping that outfall into the proposed onsite detention system. Due to existing topography and limited site improvements along the Shared Access Road, the runoff from west (Shared Access Road) and limited portions of existing offsite runoff that flow onto the site via the Shared Access Road will be

collected in a proposed curb inlet and discharged directly into the existing outfall pipe to the west. An overview of the site Sub Basins is provided in further detail below.

HYDROLOGIC DESIGN

Developed runoff conditions for onsite drainage facilities were calculated utilizing the previously referenced Hydrologic Criteria and may be further described as follows:

Drainage Area A
The "A" Sub Basin consists of onsite runoff from the primarily undeveloped area in the northeast quadrant of the property, the proposed building as well as a small area of the proposed parking lot north of the Discount Tire Building including the area east of the building. This basin is conveyed via sheet flow, vegetated landscape swale, and onsite storm sewer facilities to their point of conveyance within the main Detention Pond located near the south property line.

Drainage Area B
The "B" Sub Basin consists of onsite runoff from the western half of the undeveloped portion of the property as well as the majority of the Discount Tire parking area including the future parcel area. This basin is conveyed via sheet flow to the south and east across the parking lot where the runoff enters its point of treatment within the main Detention Pond located near the south property line through a series of curb-cuts. The curb-cuts allow the storm water to be conveyed to the pervious landscape area and eventually the pond.

Drainage Area C (Includes Off-site Area from Adjacent Properties)
The "C" Sub Basin consists of offsite runoff and runoff from the Shared Access Drive that stretches the depth of the subject development along the west property line. Areas adjacent to this access road from the north and west are captured within this basin. Runoff within this basin follows its historical path to the south and enters a proposed subsurface drainage structure where it connects with the existing public storm sewer outfall to the west.

Drainage Area O1 (Includes Off-site Area from Adjacent Properties)
The "O1" Sub Basin consists of offsite runoff from the properties to the north consisting of the Valley View Apartments and the hillside below Donegan Road. "O1" specifically accounts for the western portion of the Valley View Apartment property. Runoff within this basin generally follows its existing path to the south and enters a proposed subsurface drainage structure where it connects with the existing public storm sewer outfall to the west (Design Point A).

Drainage Area O2 (Includes Off-site Area from Adjacent Properties)
The "O2" Sub Basin consists of offsite runoff from the properties to the north consisting of the Valley View Apartments and the hillside below Donegan Road. "O2" specifically accounts for the eastern portion of the Valley View Apartment property. Runoff within this basin generally follows its existing path to the south where it is then conveyed to the proposed subsurface drainage structure (Design Point A).

HYDRAULIC DESIGN

Hydraulic analysis consisting of storm sewer inlet and pipe sizing with respect to anticipated site runoff characteristics was completed for onsite storm sewer facilities as follows:

Storm Sewer Inlet Design
Storm water run-off is conveyed across the site via sheet flow and partial concentrated conveyance to a stormwater detention pond located at the south property line. The proposed onsite storm sewer inlet and control structure have been evaluated utilizing published manufacturer inlet specifications. FlowMaster software was used to size the orifice and weir dimensions on the control structure that regulate the discharge rate (Q_{25} and Q_{100}) from the site. Associated sizing calculations are provided within the appendices of this Report.

Storm Sewer Pipe Design
The proposed onsite storm sewer system has been designed to accommodate the 25-year storm event. Due to the nature of the storm sewer system, FlowMaster modeling software based upon Manning's

Equation has been utilized to evaluate pipe capacity. Associated pipe capacity calculations may be referenced within the appendices of this report.

DETENTION ANALYSIS

Onsite Detention Storage was designed to comply with the previously identified requirements within the City Criteria and the UDFCD Manual. It is widely accepted within many municipalities that adhere to UDFCD in Colorado (and use of UDFCD is accepted by the City of Glenwood Springs as confirmed via email) to provide detention for the required storm event. Due to the previously identified runoff patterns the Modified FAA Method was utilized to evaluate the required incremental Storage Volume and Release Rates based upon standard calculations and adjustments for tributary capture areas and undetained site runoff as follows:

Required Volume*

Drainage Areas	$A_{TRIBUTARY}$	$I_{COMPOSITE}$	V_{25} + ½ WQ
A + B + O2	3.42 Ac	41%	4,408 CF

Required Release Rate (Regulated)*

Drainage Area	$A_{TRIBUTARY}$	Q_{25}
A + B + O2	3.42 Ac	1.2 CFS

*Shared Access Road (Basin 'C') and Basin 'O1,' a 2.84 AC area of offsite runoff will be collected and discharged via the existing outfall pipe to the west. This area is not included in the required volume or required release rate calculations. It will only be quantified for bypass flow.

Allowable release rates, as identified above, will be regulated through a control structure and orifice release system based upon a storage volume depth. Corresponding orifice sizing calculations and control structure details may be referenced within the appendices of this report.

Bypass Flow*

Drainage Area	$A_{TRIBUTARY}$	Q_{25}	Q_{100}
C + O1	2.84 Ac	7.1 CFS	10.0 CFS

SITE OUTFALL ANALYSIS

As identified herein, cumulative release rates from the Discount Tire development have been reviewed with respect to comparison of the existing, historical and proposed runoff conditions. Following is a brief summary of the site release rates with existing runoff conditions.

Proposed Site Outfall Release Rate

Drainage Area	$A_{TRIBUTARY}$	Q_{25}	Q_{100}
A + B + O1	3.42 Ac	1.2 CFS	2.2 CFS
C + O2 (Bypass Flow)	2.84 Ac	7.1 CFS	10.0 CFS
	6.26 Ac	8.3 CFS	12.2 CFS

Site Outfall Existing vs. Post Developed Runoff Comparison

Drainage Area	Q_{25}	Q_{100}
Developed Site Outfall[A]	8.3 CFS	12.2 CFS
Existing Site Outfall[B]	8.3 CFS	12.2 CFS
Net	0 CFS	0 CFS

A. Required Site Outfall release rates are representative calculated release rates for the proposed development.

B. Design Site Outfall release rates are representative of the designed release rates of the onsite drainage system (Existing Conditions Drainage Plan Design Point E2). A portion of the pre-development site area discharges at Existing Site Outfall E1. Since this discharge point (E1) is not being used in the post-development layout, the pond release rate and corresponding volume have been adjusted to maintain historic release rates for Basins A and B as well as existing bypass conditions for Basins O1, O2 and C at the cumulative site discharge point (Design Point A).

CONCLUSION

SUMMARY

Proposed developed topography and storm sewer conveyance facilities will generally follow existing drainage patterns to their point of collection and conveyance to the proposed Detention Facility located near the southern property line. Outfall from the proposed Detention Facility will be regulated in accordance with the allowable site release rates as determined herein.

Proposed stormwater conveyance, water quality and detention improvements associated with the Site have been designed in substantial accordance with applicable City of Glenwood Springs, CDOT, and Urban Drainage and Flood Control District criteria and are not anticipated to adversely affect the existing storm sewer facilities to which they discharge.

REFERENCES

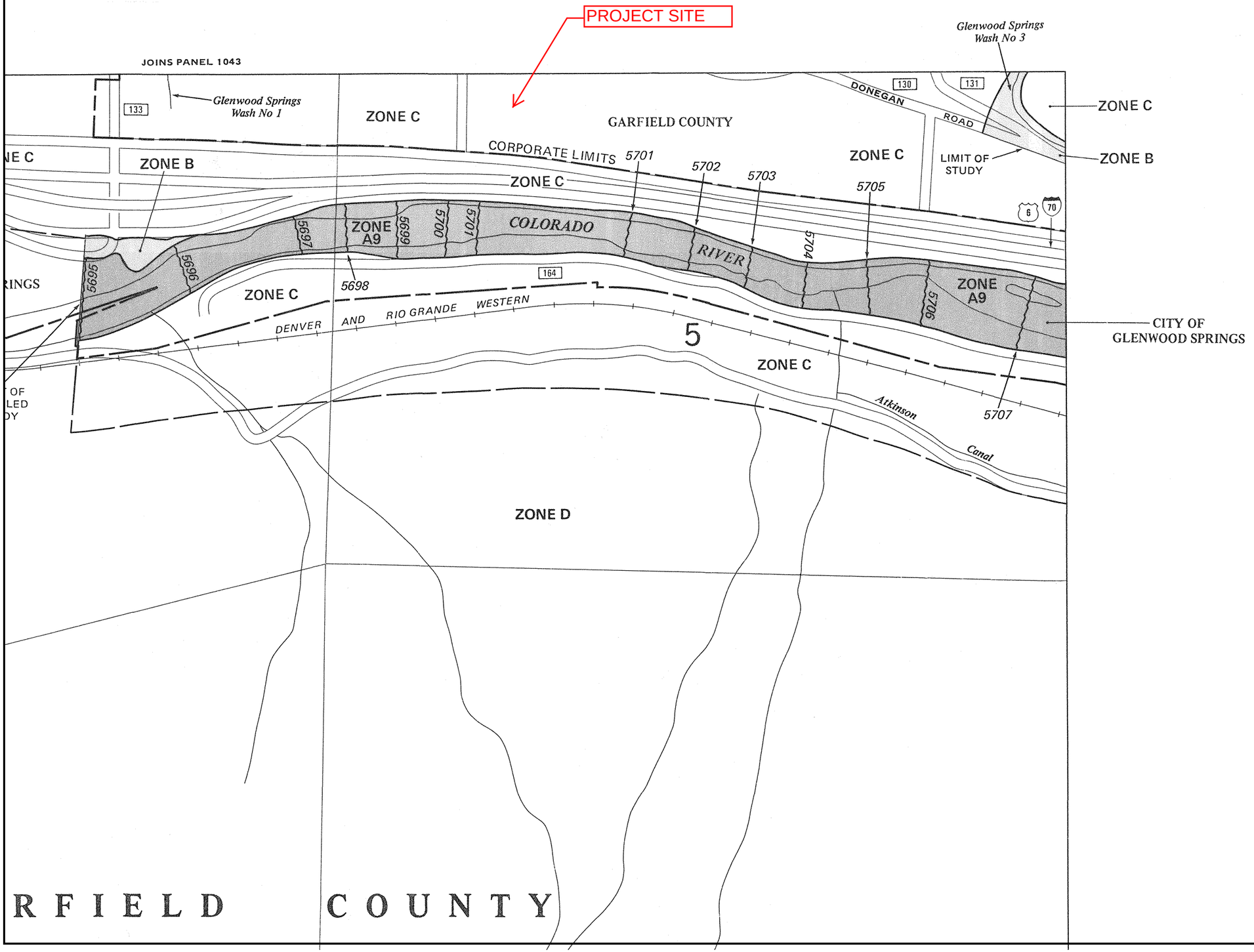
City of Glenwood Springs Municipal Code - Storm Drainage Criteria (Section 070.030.040 Drainage)
Provided by the City of Glenwood Springs, Current through Ordinance No. 26 Series of 2013

Urban Storm Drainage Criteria Manual - Volumes 1-3
Provided by the Urban Drainage and Flood Control District, Current Revision April, 2008.

NOAA's National Weather Service; Atlas 14, Volume 8, Version 2
Provided by http://www.nws.noaa.gov/oh/hdsc/index.html

USDA, Natural Resources Conservation Service, Web Soil Survey
Provided by http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

APPENDIX A – FEMA FLOOD PLAIN DESIGNATION



APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
GLENWOOD SPRINGS,
COLORADO
GARFIELD COUNTY

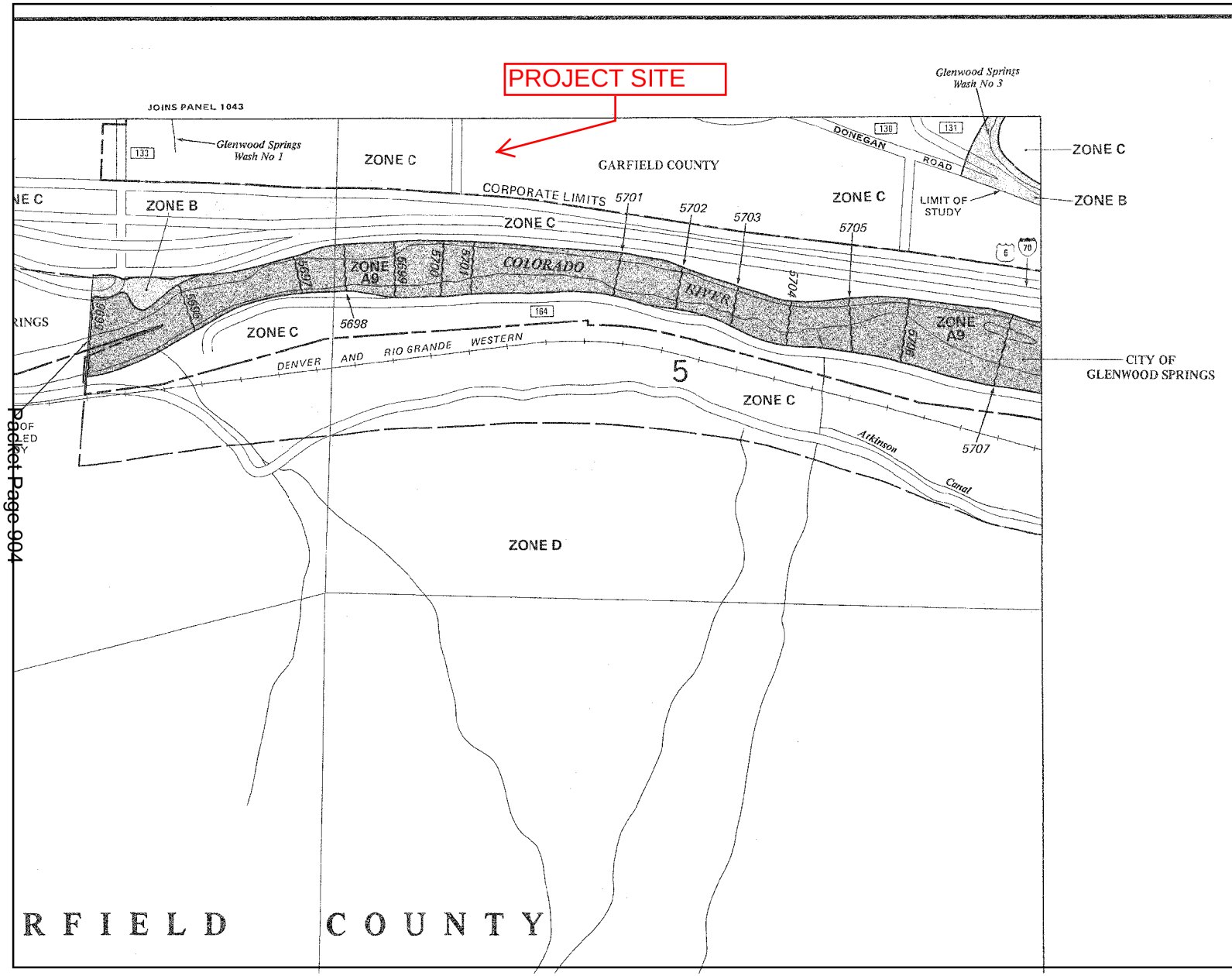
PANEL 1431 OF 1900
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
080071 1431 C

MAP REVISED:
OCTOBER 15, 1985

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE IN FEET

500 0 500

KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A1
Zone Designations	ZONE A6
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX B – REFERENCE DATA

NOAA Atlas 14, Volume 8, Version 2
GLENWOOD SPGS #2
Station ID: 05-3359
Location name: Glenwood Springs, Colorado, US*
Latitude: 39.5181°, Longitude: -107.3172°
Elevation:
Elevation (station metadata): 5880 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**1.39** (1.10-1.80)	**2.11** (1.67-2.74)	**3.22** (2.54-4.18)	**4.07** (3.19-5.32)	**5.16** (3.84-6.88)	**5.93** (4.32-8.05)	**6.64** (4.66-9.28)	**7.28** (4.90-10.5)	**8.04** (5.18-12.0)	**8.54** (5.41-13.1)
10-min	**1.02** (0.810-1.32)	**1.55** (1.22-2.00)	**2.35** (1.86-3.05)	**2.98** (2.34-3.89)	**3.78** (2.81-5.03)	**4.34** (3.16-5.90)	**4.85** (3.41-6.79)	**5.33** (3.58-7.69)	**5.89** (3.80-8.79)	**6.26** (3.96-9.62)
15-min	**0.832** (0.660-1.08)	**1.26** (0.996-1.63)	**1.92** (1.51-2.48)	**2.42** (1.90-3.16)	**3.07** (2.28-4.09)	**3.53** (2.57-4.79)	**3.95** (2.78-5.52)	**4.34** (2.91-6.26)	**4.79** (3.09-7.14)	**5.09** (3.22-7.82)
30-min	**0.570** (0.452-0.738)	**0.822** (0.652-1.06)	**1.21** (0.954-1.57)	**1.51** (1.18-1.96)	**1.88** (1.40-2.50)	**2.14** (1.56-2.91)	**2.38** (1.67-3.32)	**2.59** (1.74-3.74)	**2.84** (1.83-4.24)	**3.00** (1.90-4.61)
60-min	**0.381** (0.303-0.493)	**0.510** (0.404-0.660)	**0.707** (0.559-0.918)	**0.860** (0.675-1.12)	**1.05** (0.784-1.40)	**1.19** (0.867-1.61)	**1.31** (0.923-1.83)	**1.43** (0.959-2.06)	**1.56** (1.01-2.32)	**1.64** (1.04-2.52)
2-hr	**0.239** (0.192-0.304)	**0.304** (0.244-0.388)	**0.405** (0.324-0.518)	**0.484** (0.384-0.622)	**0.583** (0.440-0.766)	**0.653** (0.483-0.874)	**0.718** (0.512-0.988)	**0.777** (0.529-1.10)	**0.846** (0.552-1.24)	**0.892** (0.570-1.35)
3-hr	**0.186** (0.151-0.235)	**0.226** (0.183-0.286)	**0.288** (0.232-0.365)	**0.336** (0.269-0.429)	**0.399** (0.305-0.521)	**0.445** (0.332-0.592)	**0.488** (0.351-0.667)	**0.528** (0.363-0.746)	**0.577** (0.380-0.843)	**0.611** (0.393-0.916)
6-hr	**0.122** (0.100-0.152)	**0.139** (0.114-0.173)	**0.167** (0.136-0.208)	**0.190** (0.154-0.238)	**0.222** (0.174-0.289)	**0.247** (0.188-0.326)	**0.272** (0.199-0.370)	**0.298** (0.208-0.418)	**0.332** (0.222-0.480)	**0.358** (0.233-0.528)
12-hr	**0.075** (0.063-0.092)	**0.086** (0.071-0.105)	**0.104** (0.086-0.127)	**0.119** (0.098-0.147)	**0.140** (0.111-0.180)	**0.157** (0.121-0.204)	**0.174** (0.129-0.233)	**0.192** (0.136-0.265)	**0.216** (0.146-0.308)	**0.234** (0.154-0.340)
24-hr	**0.046** (0.039-0.055)	**0.053** (0.044-0.063)	**0.064** (0.054-0.078)	**0.074** (0.062-0.090)	**0.088** (0.071-0.112)	**0.100** (0.078-0.128)	**0.111** (0.083-0.147)	**0.123** (0.088-0.168)	**0.139** (0.095-0.196)	**0.152** (0.101-0.217)
2-day	**0.027** (0.023-0.032)	**0.031** (0.027-0.037)	**0.038** (0.032-0.045)	**0.044** (0.037-0.052)	**0.052** (0.043-0.065)	**0.059** (0.047-0.075)	**0.066** (0.050-0.086)	**0.073** (0.053-0.098)	**0.084** (0.058-0.116)	**0.092** (0.061-0.129)
3-day	**0.020** (0.018-0.024)	**0.023** (0.020-0.027)	**0.028** (0.024-0.033)	**0.033** (0.028-0.039)	**0.039** (0.032-0.048)	**0.044** (0.035-0.055)	**0.049** (0.037-0.063)	**0.054** (0.039-0.072)	**0.061** (0.043-0.084)	**0.067** (0.045-0.093)
4-day	**0.017** (0.014-0.019)	**0.019** (0.016-0.022)	**0.023** (0.020-0.027)	**0.026** (0.023-0.031)	**0.031** (0.026-0.038)	**0.035** (0.028-0.043)	**0.039** (0.030-0.050)	**0.043** (0.032-0.057)	**0.049** (0.034-0.066)	**0.053** (0.036-0.073)
7-day	**0.011** (0.010-0.013)	**0.013** (0.011-0.015)	**0.015** (0.013-0.018)	**0.017** (0.015-0.020)	**0.020** (0.017-0.024)	**0.023** (0.018-0.028)	**0.025** (0.019-0.031)	**0.027** (0.020-0.035)	**0.030** (0.022-0.041)	**0.033** (0.023-0.045)
10-day	**0.009** (0.008-0.010)	**0.010** (0.009-0.012)	**0.012** (0.011-0.014)	**0.014** (0.012-0.016)	**0.016** (0.013-0.019)	**0.017** (0.014-0.021)	**0.019** (0.015-0.024)	**0.021** (0.015-0.027)	**0.023** (0.016-0.031)	**0.025** (0.017-0.034)
20-day	**0.006** (0.006-0.007)	**0.007** (0.006-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)	**0.010** (0.009-0.012)	**0.011** (0.009-0.013)	**0.012** (0.010-0.015)	**0.013** (0.010-0.017)	**0.014** (0.010-0.019)	**0.015** (0.011-0.021)
30-day	**0.005** (0.005-0.006)	**0.006** (0.005-0.006)	**0.007** (0.006-0.007)	**0.007** (0.006-0.008)	**0.008** (0.007-0.010)	**0.009** (0.008-0.011)	**0.010** (0.008-0.012)	**0.011** (0.008-0.013)	**0.011** (0.008-0.015)	**0.012** (0.009-0.016)
45-day	**0.004** (0.004-0.005)	**0.005** (0.004-0.005)	**0.005** (0.005-0.006)	**0.006** (0.005-0.007)	**0.007** (0.006-0.008)	**0.007** (0.006-0.009)	**0.008** (0.006-0.010)	**0.009** (0.007-0.011)	**0.009** (0.007-0.012)	**0.010** (0.007-0.013)
60-day	**0.004** (0.003-0.004)	**0.004** (0.004-0.004)	**0.005** (0.004-0.005)	**0.005** (0.005-0.006)	**0.006** (0.005-0.007)	**0.007** (0.005-0.008)	**0.007** (0.006-0.008)	**0.007** (0.006-0.009)	**0.008** (0.006-0.010)	**0.008** (0.006-0.011)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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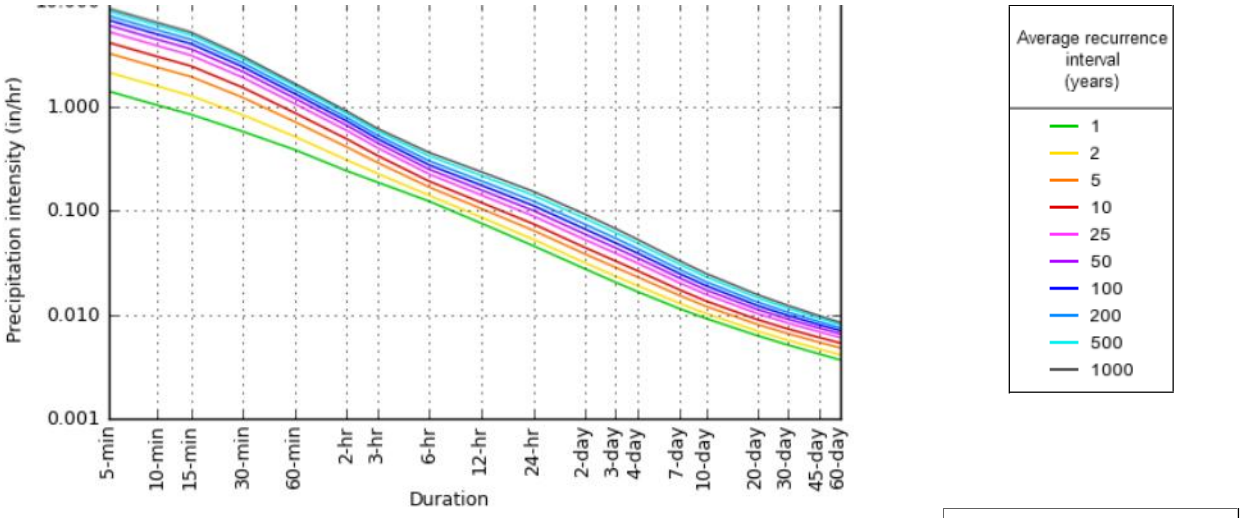
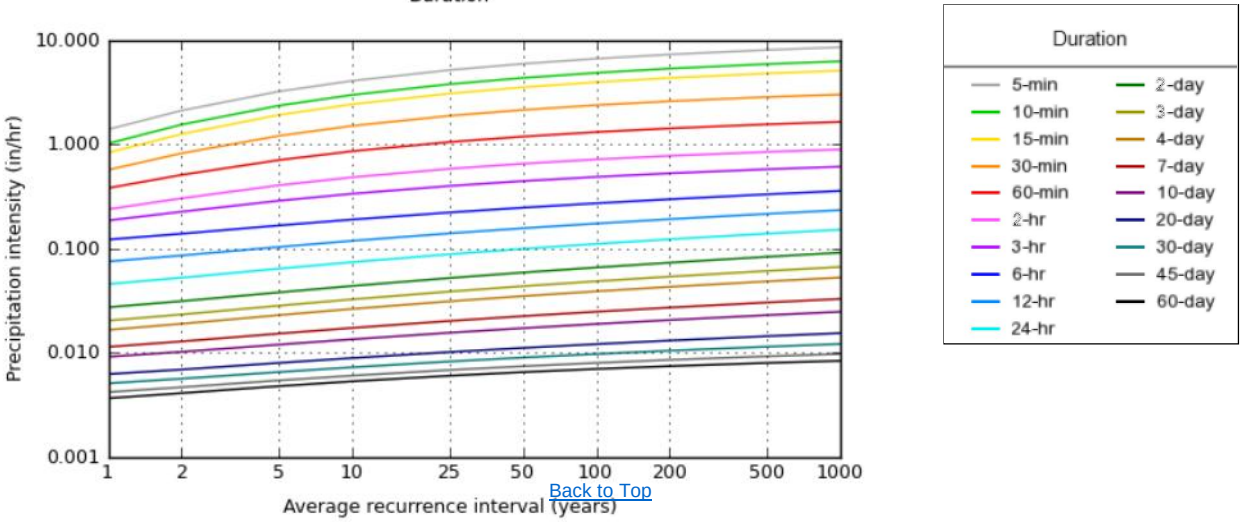
PF graphical





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Maps & aerials

NOAA Atlas 14, Volume 8, Version 2 Created (GMT): Thu Feb 27 22:31:54 2014

Small scale terrain

Large scale terrain

Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Hydrologic Development
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Hydrologic Soil Group—Rifle Area, Colorado, Parts of Garfield and Mesa Counties

Map Scale: 1:796 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 7, Dec 23, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2011—Sep 3, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Rifle Area, Colorado, Parts of Garfield and Mesa Counties (CO683)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Atencio-Azeltine complex, 1 to 3 percent slopes	B	3.1	100.0%
Totals for Area of Interest			**3.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

APPENDIX C – EXISTING CONDITIONS HYDROLOGIC COMPUTATIONS

Rainfall Intensity

IDF - Intensity, Duration, Frequency Data

Time Intensity Frequency Tabulation

TIME	5 Yr	10 YR	25 YR	100 YR
5	3.22	4.07	5.16	6.64
10	2.35	2.98	3.78	4.85
15	1.92	2.42	3.07	3.95
30	1.21	1.51	1.88	2.38
60	0.71	0.86	1.05	1.31

Note:
Intensity Values per NOAA Atlas 14 - Volume 8 - Version 2
Glenwood Springs, Colorado (CO Station ID 05-3359)

Composite Basin Calculations - Existing Conditions

Landuse	I	C_5	C_{10}	C_{25}	C_{100}
Landscape	0%	0.08	0.15	0.25	0.35
Roof	90%	0.73	0.75	0.78	0.81
Paved	100%	0.90	0.92	0.94	0.96

Basin Designation	A_{TOTAL} (AC)	A_{TOTAL} (SF)	$A_{LANDSCAPE}$ (SF)	A_{ROOF} (SF)	A_{PAVED} (SF)	$I_{WEIGHTED}$	C_5	C_{10}	C_{25}	C_{100}
EXA	1.44	62,726	62,726	0	0	0%	0.08	0.15	0.25	0.35
EXB	1.42	61,855	61,855	0	0	0%	0.08	0.15	0.25	0.35
EXC	0.24	10,329	0	0	10,329	100%	0.90	0.92	0.94	0.96
O1	2.60	113,300	61,425	13,550	38,325	45%	0.44	0.48	0.55	0.61
O2	0.56	24,510	17,510	6,000	1,000	26%	0.27	0.33	0.41	0.49
	6.26	272,720	203,516	19,550	49,654					

Notes:
1. Sub basins EXA and EXB evaluated with respect to historic runoff conditions.
2. Sub basins O1, O2 and EXC Evaluated with respect to existing runoff conditions.
3. Sub basins O1 and O2 evaluated based upon field observation and available aerial and USGS mapping.

Time of Concentration - Existing Conditions

DESIGN POINT	DRAIN BASIN	SUB-BASIN DATA AREA SF	AREA AC	NRCS Soil Type	I %	C(5)	INITIAL / OVERLAND TIME T(i) Length FT	Slope %	T(i) MIN	CONVEYED TRAVEL TIME T(t) Length FT	Slope %	Coefficient	Velocity FPS	T(t) MIN	T(c) CHECK (URBANIZED BASINS) T(c) (MIN)	TOTAL LENGTH	L/180+10	FINAL T(c) (MIN)
E1	EXA	62,726	1.44	B	0%	0.15	425	3.5%	23.6	0	2.0%	7	1.0	0.0	23.6	425	12.4	12.4
E2	EXB	61,855	1.42	B	0%	0.15	450	3.5%	24.3	0	3.0%	7	1.2	0.0	24.3	450	12.5	12.5
E2	EXC	10,329	0.24	B	100%	0.92	25	4.0%	1.0	400	4.0%	20	4.0	1.7	2.7	425	12.4	5.0
E2	O1	113,300	2.60	B	45%	0.48	150	15.0%	5.6	900	4.0%	20	4.0	3.8	9.4	1050	15.8	9.4
E1	O2	24,510	0.56	B	26%	0.33	150	15.0%	7.0	400	2.0%	15	2.1	3.1	10.2	550	13.1	10.2
			6.26															

Watercourse Coefficient

Forest & Meadow	2.5
Fallow or Cultivation	5.0
Short Grass Pasture & Lawns	7.0
Nearly Bare Ground	10.0
Grassed Waterway	15.0
Paved Area and Shallow Gutter	20.0

CIA Runoff Calculations

5-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
E1	EXA	1.44	0.08	12.4	0.12	2.15	0.2						
E2	EXB	1.42	0.08	12.5	0.11	2.14	0.2						
E2	EXC	0.24	0.90	5.0	0.21	3.22	0.7						
E2	O1	2.60	0.44	9.4	1.13	2.59	2.9						
E1	O2	0.56	0.27	10.2	0.15	2.34	0.4						
		6.26					4.5						

CIA Runoff Calculations

10-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
E1	EXA	1.44	0.15	12.4	0.22	2.72	0.6						
E2	EXB	1.42	0.15	12.5	0.21	2.70	0.6						
E2	EXC	0.24	0.92	5.0	0.22	4.07	0.9						
E2	O1	2.60	0.48	9.4	1.25	3.27	4.1						
E1	O2	0.56	0.33	10.2	0.18	2.96	0.5						
		6.26					6.7						

CIA Runoff Calculations

25-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
E1	EXA	1.44	0.25	12.4	0.36	3.44	1.2						
E2	EXB	1.42	0.25	12.5	0.35	3.43	1.2						
E2	EXC	0.24	0.94	5.0	0.22	5.16	1.2						
E2	O1	2.60	0.55	9.4	1.42	4.15	5.9						
E1	O2	0.56	0.41	10.2	0.23	3.76	0.9						
		6.26					10.4						

CIA Runoff Calculations

100-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
E1	EXA	1.44	0.35	12.4	0.50	4.43	2.2						
E2	EXB	1.42	0.35	12.5	0.50	4.40	2.2						
E2	EXC	0.24	0.96	5.0	0.23	6.64	1.5						
E2	O1	2.60	0.61	9.4	1.59	5.33	8.5						
E1	O2	0.56	0.49	10.2	0.27	4.82	1.3						
		6.26					15.7						

Site Runoff Summary

DESIGN POINT	DRAIN BASIN	AREA Ac	Q_5 CFS	Q_{10} CFS	Q_{25} CFS	Q_{100} CFS
E1	EXA	1.44	0.2	0.6	1.2	2.2
E2	EXB	1.42	0.2	0.6	1.2	2.2
E2	EXC	0.24	0.7	0.9	1.2	1.5
E2	O1	2.60	2.9	4.1	5.9	8.5
E1	O2	0.56	0.4	0.5	0.9	1.3
		6.26	4.5	6.7	10.4	15.7

APPENDIX D – PROPOSED HYDROLOGIC COMPUTATIONS

Rainfall Intensity

IDF - Intensity, Duration, Frequency Data

Time Intensity Frequency Tabulation

TIME	5 Yr	10 YR	25 YR	100 YR
5	3.22	4.07	5.16	6.64
10	2.35	2.98	3.78	4.85
15	1.92	2.42	3.07	3.95
30	1.21	1.51	1.88	2.38
60	0.71	0.86	1.05	1.31

Note:
Intensity Values per NOAA Atlas 14 - Volume 8 - Version 2
Glenwood Springs, Colorado (CO Station ID 05-3359)

Composite Basin Calculations - Proposed Conditions

Landuse	I	C_5	C_{10}	C_{25}	C_{100}
Landscape	0%	0.08	0.15	0.25	0.35
Roof	90%	0.73	0.75	0.78	0.81
Paved	100%	0.90	0.92	0.94	0.96

Basin Designation	A_{TOTAL} (AC)	A_{TOTAL} (SF)	$A_{LANDSCAPE}$ (SF)	A_{ROOF} (SF)	A_{PAVED} (SF)	$I_{WEIGHTED}$	C_5	C_{10}	C_{25}	C_{100}
A	1.00	43,569	29,633	7,373	6,563	30%	0.31	0.37	0.44	0.52
B	1.86	81,156	39,206	0	41,950	52%	0.50	0.55	0.61	0.67
C	0.24	10,329	0	0	10,329	100%	0.90	0.92	0.94	0.96
O1	2.60	113,300	61,425	13,550	38,325	45%	0.44	0.48	0.55	0.61
O2	0.56	24,510	17,510	6,000	1,000	26%	0.27	0.33	0.41	0.49
	6.26	272,864	147,774	26,923	98,167					

Time of Concentration - Proposed Conditions

DESIGN POINT	SUB-BASIN DATA: DRAIN BASIN	AREA SF	AREA AC	NRCS Soil Type	I %	C(5)	INITIAL / OVERLAND TIME T(i): Length FT	Slope %	T(i) MIN	CONVEYED TRAVEL TIME T(t): Length FT	Slope %	Coefficient	Velocity FPS	T(t) MIN	T(c) CHECK (URBANIZED BASINS): T(c) (MIN)	TOTAL LENGTH	L/180+10	FINAL T(c) (MIN)
A	A	43,569	1.00	B	30%	0.37	175	2.0%	14.1	300	2.0%	15	2.1	2.4	16.5	475	12.6	12.6
B	B	81,156	1.86	B	52%	0.55	175	3.0%	9.3	200	3.0%	20	3.5	1.0	10.2	375	12.1	10.2
C	C	10,329	0.24	B	100%	0.92	25	4.0%	1.0	400	4.0%	20	4.0	1.7	2.7	425	12.4	5.0
O1	O1	113,300	2.60	B	45%	0.48	150	15.0%	5.6	900	4.0%	20	4.0	3.8	9.4	1050	15.8	9.4
O2	O2	24,510	0.56	B	26%	0.33	150	15.0%	7.0	400	2.0%	15	2.1	3.1	10.2	550	13.1	10.2
			6.26															

Watercourse Coefficient

Forest & Meadow	2.5
Fallow or Cultivation	5.0
Short Grass Pasture & Lawns	7.0
Nearly Bare Ground	10.0
Grassed Waterway	15.0
Paved Area and Shallow Gutter	20.0

CIA Runoff Calculations - Proposed Conditions

5-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
A	A	1.00	0.31	12.6	0.31	2.12	0.7						
B	B	1.86	0.50	10.2	0.94	2.33	2.2						
C	C	0.24	0.90	5.0	0.21	3.22	0.7						
O1	O1	2.60	0.44	9.4	1.13	2.59	2.9						
O2	O2	0.56	0.27	10.2	0.15	2.34	0.4						
		6.26					6.8						

CIA Runoff Calculations - Proposed Conditions

10-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
A	A	1.00	0.37	12.6	0.37	2.68	1.0						
B	B	1.86	0.55	10.2	1.02	2.95	3.0						
C	C	0.24	0.92	5.0	0.22	4.07	0.9						
O1	O1	2.60	0.48	9.4	1.25	3.27	4.1						
O2	O2	0.56	0.33	10.2	0.18	2.96	0.5						
		6.26					9.5						

CIA Runoff Calculations - Proposed Conditions

25-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
A	A	1.00	0.44	12.6	0.44	3.41	1.5						
B	B	1.86	0.61	10.2	1.13	3.75	4.2						
C	C	0.24	0.94	5.0	0.22	5.16	1.2						
O1	O1	2.60	0.55	9.4	1.42	4.15	5.9						
O2	O2	0.56	0.41	10.2	0.23	3.76	0.9						
		6.26					13.7						

CIA Runoff Calculations - Proposed Conditions

100-Year Design Storm Runoff Calculations

(Rational Method Procedure)

BASIN INFORMATON				DIRECT RUNOFF					TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA Ac	RUNOFF COEFF	T(c) Min	C x A	I In/Hr	Q CFS	Q CFS	T(c) Min	SUM C x A	I In/Hr	Q CFS	REMARKS
A	A	1.00	0.52	12.6	0.52	4.38	2.3						
B	B	1.86	0.67	10.2	1.24	4.81	6.0						
C	C	0.24	0.96	5.0	0.23	6.64	1.5						
O1	O1	2.60	0.61	9.4	1.59	5.33	8.5						
O2	O2	0.56	0.49	10.2	0.27	4.82	1.3						
		6.26					19.5						

Site Runoff Summary - Proposed Conditions

DESIGN POINT	DRAIN BASIN	AREA Ac	Q_5 CFS	Q_{10} CFS	Q_{25} CFS	Q_{100} CFS
A	A	1.00	0.7	1.0	1.5	2.3
B	B	1.86	2.2	3.0	4.2	6.0
C	C	0.24	0.7	0.9	1.2	1.5
O1	O1	2.60	2.9	4.1	5.9	8.5
O2	O2	0.56	0.4	0.5	0.9	1.3
		6.26	6.8	9.5	13.7	19.5

APPENDIX E – HYDRAULIC INLET COMPUTATIONS

APPENDIX F – HYDRAULIC STORM SEWER ANALYSIS

APPENDIX G – WATER QUALITY AND DETENTION SYSTEM OVERVIEW

DETENTION VOLUME BY THE MODIFIED FAA METHOD

Project: Discount Tire Glenwood Springs

Basin ID: Basin A, Basin B, Basin O1

(For catchments less than 160 acres only. For larger catchments, use hydrograph routing method)
(NOTE: for catchments larger than 90 acres, CUHP hydrograph and routing are recommended)

Determination of MINOR Detention Volume Using Modified FAA Method

Design Information (Input):

Catchment Drainage Imperviousness	I_a =	41.00	percent
Catchment Drainage Area	A =	3.420	acres
Predevelopment NRCS Soil Group	Type =	B	A, B, C, or D
Return Period for Detention Control	T =	25	years (2, 5, 10, 25, 50, or 100)
Time of Concentration of Watershed	Tc =	10	minutes
Allowable Unit Release Rate	q =	0.35	cfs/acre
One-hour Precipitation	P_1 =	1.05	inches
Design Rainfall IDF Formula $i = C_1 * P_1/(C_2+T_c)^{C_3}$			
Coefficient One	C_1 =	28.50	
Coefficient Two	C_2 =	10	
Coefficient Three	C_3 =	0.789	

Determination of Average Outflow from the Basin (Calculated):

Runoff Coefficient	C =	0.43	
Inflow Peak Runoff	Qp-in =	4.11	cfs
Allowable Peak Outflow Rate	Qp-out =	**1.20**	cfs
Mod. FAA Minor Storage Volume =		3,058	**cubic feet**
Mod. FAA Minor Storage Volume =		**0.070**	**acre-ft**

5 <- Enter Rainfall Duration Incremental Increase Value Here (e.g. 5 for 5-Minutes)

Rainfall Duration minutes (input)	Rainfall Intensity inches / hr (output)	Inflow Volume acre-feet (output)	Adjustment Factor "m" (output)	Average Outflow cfs (output)	Outflow Volume acre-feet (output)	Storage Volume acre-feet (output)
5	3.53	0.036	1.00	1.20	0.008	0.028
10	2.82	0.057	1.00	1.20	0.016	0.041
15	2.36	0.072	0.84	1.01	0.021	0.051
20	2.04	0.083	0.76	0.90	0.025	0.058
25	1.81	0.092	0.70	0.84	0.029	0.063
30	1.63	0.099	0.67	0.80	0.033	0.066
35	1.48	0.105	0.65	0.77	0.037	0.068
40	1.37	0.111	0.63	0.75	0.041	0.069
45	1.27	0.116	0.61	0.73	0.046	0.070
50	1.18	0.120	0.60	0.72	0.050	0.070
55	1.11	0.124	0.59	0.71	0.054	0.070
60	1.05	0.127	0.59	0.70	0.058	0.069
65	0.99	0.131	0.58	0.69	0.062	0.069
70	0.94	0.134	0.57	0.69	0.066	0.068
75	0.90	0.137	0.57	0.68	0.070	0.066
80	0.86	0.139	0.56	0.67	0.074	0.065
85	0.82	0.142	0.56	0.67	0.078	0.063
90	0.79	0.144	0.56	0.67	0.083	0.062
95	0.76	0.146	0.55	0.66	0.087	0.060
100	0.73	0.149	0.55	0.66	0.091	0.058
105	0.71	0.151	0.55	0.66	0.095	0.056
110	0.68	0.153	0.55	0.65	0.099	0.053
115	0.66	0.154	0.54	0.65	0.103	0.051
120	0.64	0.156	0.54	0.65	0.107	0.049
125	0.62	0.158	0.54	0.65	0.111	0.047
130	0.61	0.160	0.54	0.65	0.116	0.044
135	0.59	0.161	0.54	0.64	0.120	0.042
140	0.57	0.163	0.54	0.64	0.124	0.039
145	0.56	0.164	0.54	0.64	0.128	0.036
150	0.55	0.166	0.53	0.64	0.132	0.034
155	0.53	0.167	0.53	0.64	0.136	0.031
160	0.52	0.169	0.53	0.64	0.140	0.028
165	0.51	0.170	0.53	0.64	0.144	0.026
170	0.50	0.171	0.53	0.63	0.149	0.023
175	0.49	0.173	0.53	0.63	0.153	0.020
180	0.48	0.174	0.53	0.63	0.157	0.017
185	0.47	0.175	0.53	0.63	0.161	0.014
190	0.46	0.176	0.53	0.63	0.165	0.011
195	0.45	0.177	0.53	0.63	0.169	0.008
200	0.44	0.178	0.53	0.63	0.173	0.005
205	0.43	0.179	0.52	0.63	0.177	0.002
210	0.42	0.181	0.52	0.63	0.182	-0.001
215	0.42	0.182	0.52	0.63	0.186	-0.004
220	0.41	0.183	0.52	0.63	0.190	-0.007
225	0.40	0.184	0.52	0.63	0.194	-0.010
230	0.40	0.185	0.52	0.63	0.198	-0.013
235	0.39	0.186	0.52	0.62	0.202	-0.017
240	0.38	0.187	0.52	0.62	0.206	-0.020
245	0.38	0.187	0.52	0.62	0.210	-0.023
250	0.37	0.188	0.52	0.62	0.215	-0.026
255	0.37	0.189	0.52	0.62	0.219	-0.029
260	0.36	0.190	0.52	0.62	0.223	-0.033
265	0.36	0.191	0.52	0.62	0.227	-0.036
270	0.35	0.192	0.52	0.62	0.231	-0.039
275	0.35	0.193	0.52	0.62	0.235	-0.042
280	0.34	0.194	0.52	0.62	0.239	-0.046
285	0.34	0.194	0.52	0.62	0.243	-0.049
290	0.33	0.195	0.52	0.62	0.247	-0.052
295	0.33	0.196	0.52	0.62	0.252	-0.056
300	0.32	0.197	0.52	0.62	0.256	-0.059
305	0.32	0.198	0.52	0.62	0.260	-0.062

Mod. FAA Minor Storage Volume (cubic ft.) = 3,058
Mod. FAA Minor Storage Volume (acre-ft.) = 0.0702

Determination of MAJOR Detention Volume Using Modified FAA Method

Design Information (Input):

Catchment Drainage Imperviousness	I_a =	41.00	percent
Catchment Drainage Area	A =	3.420	acres
Predevelopment NRCS Soil Group	Type =	B	A, B, C, or D
Return Period for Detention Control	T =	100	years (2, 5, 10, 25, 50, or 100)
Time of Concentration of Watershed	Tc =	10	minutes
Allowable Unit Release Rate	q =	0.64	cfs/acre
One-hour Precipitation	P_1 =	1.31	inches
Design Rainfall IDF Formula $i = C_1 * P_1/(C_2+T_c)^{C_3}$			
Coefficient One	C_1 =	28.50	
Coefficient Two	C_2 =	10	
Coefficient Three	C_3 =	0.789	

Determination of Average Outflow from the Basin (Calculated):

Runoff Coefficient	C =	0.50	
Inflow Peak Runoff	Qp-in =	5.96	cfs
Allowable Peak Outflow Rate	Qp-out =	**2.20**	cfs
Mod. FAA Major Storage Volume =		3,684	**cubic feet**
Mod. FAA Major Storage Volume =		**0.085**	**acre-ft**

Rainfall Duration minutes (input)	Rainfall Intensity inches / hr (output)	Inflow Volume acre-feet (output)	Adjustment Factor "m" (output)	Average Outflow cfs (output)	Outflow Volume acre-feet (output)	Storage Volume acre-feet (output)
5	4.41	0.052	1.00	2.20	0.015	0.037
10	3.51	0.083	1.00	2.20	0.030	0.052
15	2.95	0.104	0.84	1.85	0.038	0.066
20	2.55	0.120	0.76	1.66	0.046	0.074
25	2.26	0.133	0.70	1.55	0.053	0.080
30	2.03	0.144	0.67	1.47	0.061	0.083
35	1.85	0.153	0.65	1.42	0.068	0.084
40	1.70	0.161	0.63	1.38	0.076	0.085
45	1.58	0.168	0.61	1.35	0.084	0.084
50	1.48	0.174	0.60	1.32	0.091	0.083
55	1.39	0.180	0.59	1.30	0.099	0.081
60	1.31	0.185	0.59	1.29	0.106	0.078
65	1.24	0.190	0.58	1.27	0.114	0.076
70	1.18	0.194	0.57	1.26	0.121	0.073
75	1.12	0.198	0.57	1.25	0.129	0.069
80	1.07	0.202	0.56	1.24	0.137	0.065
85	1.03	0.206	0.56	1.23	0.144	0.061
90	0.99	0.209	0.56	1.22	0.152	0.057
95	0.95	0.212	0.55	1.22	0.159	0.053
100	0.92	0.216	0.55	1.21	0.167	0.049
105	0.88	0.219	0.55	1.21	0.174	0.044
110	0.85	0.221	0.55	1.20	0.182	0.039
115	0.83	0.224	0.54	1.20	0.190	0.034
120	0.80	0.227	0.54	1.19	0.197	0.030
125	0.78	0.229	0.54	1.19	0.205	0.024
130	0.76	0.232	0.54	1.19	0.212	0.019
135	0.74	0.234	0.54	1.18	0.220	0.014
140	0.72	0.236	0.54	1.18	0.227	0.009
145	0.70	0.238	0.54	1.18	0.235	0.003
150	0.68	0.241	0.53	1.17	0.243	-0.002
155	0.66	0.243	0.53	1.17	0.250	-0.008
160	0.65	0.245	0.53	1.17	0.258	-0.013
165	0.63	0.247	0.53	1.17	0.265	-0.019
170	0.62	0.248	0.53	1.17	0.273	-0.024
175	0.61	0.250	0.53	1.16	0.280	-0.030
180	0.59	0.252	0.53	1.16	0.288	-0.036
185	0.58	0.254	0.53	1.16	0.296	-0.042
190	0.57	0.256	0.53	1.16	0.303	-0.048
195	0.56	0.257	0.53	1.16	0.311	-0.054
200	0.55	0.259	0.53	1.16	0.318	-0.060
205	0.54	0.260	0.52	1.15	0.326	-0.066
210	0.53	0.262	0.52	1.15	0.333	-0.072
215	0.52	0.263	0.52	1.15	0.341	-0.078
220	0.51	0.265	0.52	1.15	0.349	-0.084
225	0.50	0.266	0.52	1.15	0.356	-0.090
230	0.49	0.268	0.52	1.15	0.364	-0.096
235	0.49	0.269	0.52	1.15	0.371	-0.102
240	0.48	0.271	0.52	1.15	0.379	-0.108
245	0.47	0.272	0.52	1.15	0.387	-0.114
250	0.46	0.273	0.52	1.14	0.394	-0.121
255	0.46	0.275	0.52	1.14	0.402	-0.127
260	0.45	0.276	0.52	1.14	0.409	-0.133
265	0.44	0.277	0.52	1.14	0.417	-0.140
270	0.44	0.278	0.52	1.14	0.424	-0.146
275	0.43	0.280	0.52	1.14	0.432	-0.152
280	0.43	0.281	0.52	1.14	0.440	-0.159
285	0.42	0.282	0.52	1.14	0.447	-0.165
290	0.41	0.283	0.52	1.14	0.455	-0.171
295	0.41	0.284	0.52	1.14	0.462	-0.178
300	0.40	0.286	0.52	1.14	0.470	-0.184
305	0.40	0.287	0.52	1.14	0.477	-0.191

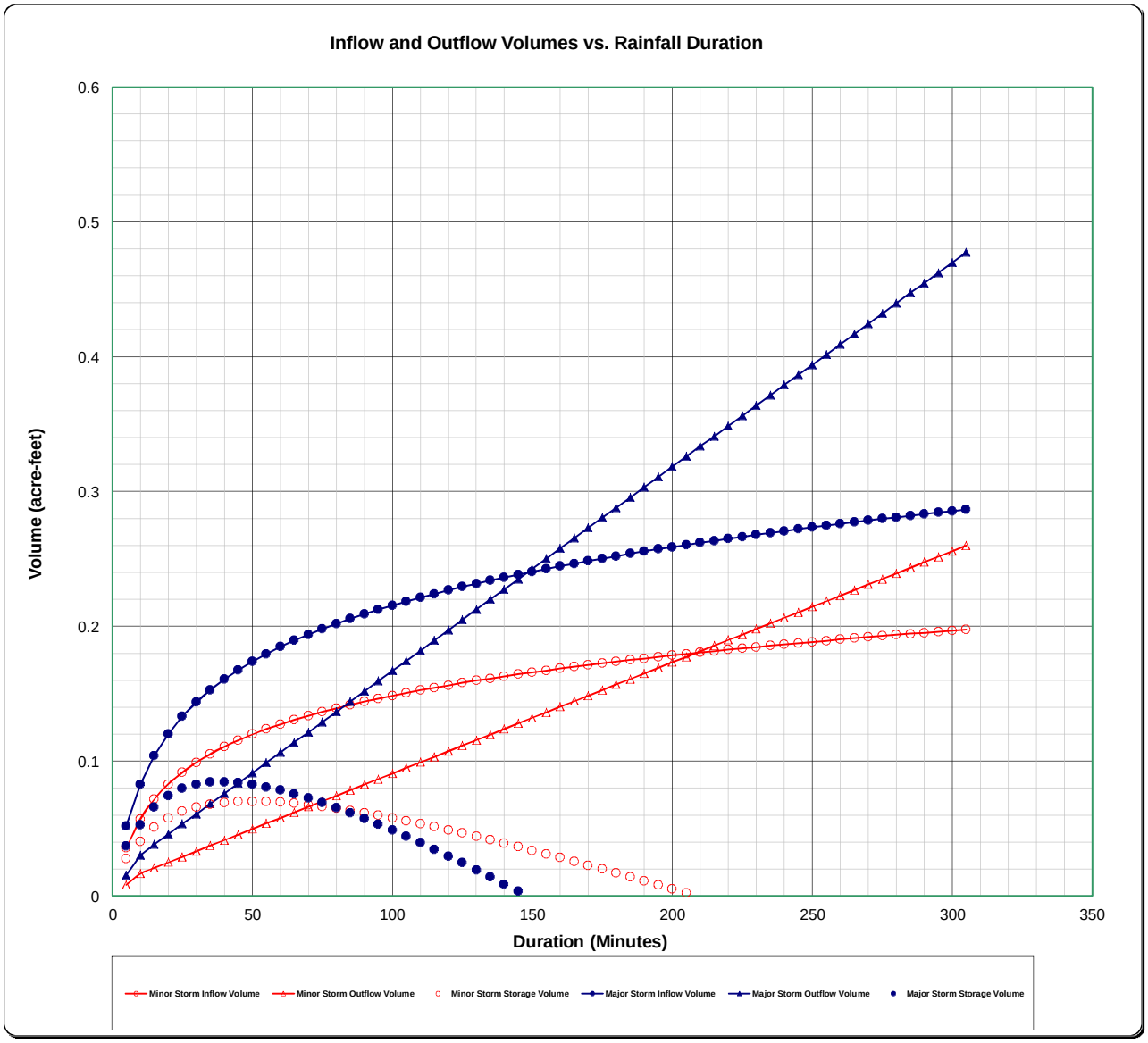
Mod. FAA Major Storage Volume (cubic ft.) = 3,684
Mod. FAA Major Storage Volume (acre-ft.) = 0.0846

UDFCD DETENTION BASIN VOLUME ESTIMATING WORKBOOK Version 2.34, Released November 2013

DETENTION VOLUME BY THE MODIFIED FAA METHOD

Project: Discount Tire Glenwood Springs

Basin ID: Basin A, Basin B, Basin O1



Kimley»Horn

990 South Broadway - Suite 200
Denver, Colorado 80209

Project:	Discount Tire Glenwood Springs	Prepared By:	BC
Project Number:	96010010	Checked By:	GMK
Date:	May 20, 2014		

Detention Summary

	Water Surface Elevation (FT)	Volume (CF)	Release Rate (CFS)
Water Quality Capture Volume	5,714.3	2,718	-
25-Year + 1/2 WQCV	5,715.0	4,408	1.40
100-Year	5,715.3	5,061	
25-Year Freeboard	5,716.0	-	-

Provided Pond Volume Summary

Pond Elevation (FT)	Incremental Area (SQ-FT)	Incremental Volume (CF)	Cumulative Volume (CF)	
5711.5	0	0	0	
5712.0	202	51	51	
5712.5	595	199	250	
5713.0	987	395	645	
5713.5	1,416	601	1,246	
5714.0	1,845	815	2,061	
5714.5	2,302	1,037	3,098	
5715.0	2,759	1,265	4,363	25 YR
5715.5	3,244	1,501	5,864	
5716.0	3,729	1,743	7,607	FREEBOARD

Kimley»Horn

990 South Broadway - Suite 200
Denver, Colorado 80209

Project:	Discount Tire Glenwood Springs	Prepared By:	BC
Project Number:	96010010	Checked By:	GMK
Date:	May 20, 2014		

Detention A Storage Volume

Contributing Basin Characteristics

	Area (AC)	Impervious (%)
Site Area =	3.42	41.0%

Water Quality Capture Volume

UDFCD V3 Fig SQ-2 — WQ Watershed Inches = $a*(0.91i^3-1.19i^2+.078i)$

$a_6 = 0.7$ (6-Hr Drain Time)
$a_{12} = 0.8$ (12-Hr Drain Time)
$a_{24} = 0.9$ (24-Hr Drain Time)
$a_{40} = 1.0$ (40-Hr Drain Time)

UDFCD Sec. 4.4.2 — WQCV = (WQCV/12)*(Area)

WQCV Impervious (Site) =	41.0%		
a =	1.0		
WQ Watershed Inches (Site) =	**0.182**		
WQCV Area (Site) =	3.42		
WQ Capture Volume (Site) =	**0.052**	**AC-FT**	
WQCV Sediment Factor =	1.2		
WQ Design Volume (Site)=	**0.062**	**AC-FT**	

Site WQ Volume
2,718 CF

25-Year Detention

Detention Volume by the Modified FAA Method

Mod FAA Major Storage Volume =	**0.070**	**AC-FT**	**25-Yr Detention Volume** **3,049 CF**

WQ Capture Volume =	**2,718 CF**
25-Yr Detention + 1/2 Water Quality Volume =	**4,408 CF**

Kimley»Horn

990 South Broadway - Suite 200
Denver, Colorado 80209

Project: Discount Tire Glenwood Springs
Project Number: 96010010
Date: May 20, 2014

Prepared By: BC
Checked By: GMK

Water Quality Release Calculations

INPUT

Required Drain Time	40	Hours
Orifice Diameter	0.350	Inches
Discharge Coefficient	0.60	
# of Columns	1	
# of Rows	1	

Staged WQ Volume	Corresponding Pond Volume	WSEL (FT)	Stage Depth (FT)	Staged Volume (FT)	Incremental Volume (FT)
Stage 0	Pond Bottom	11.50	-	0	0
Stage 1	Bottom 1/4	12.20	0.70	130	130
Stage 2	Bottom 1/2	12.90	0.70	566	436
Stage 3	Bottom 3/4	13.60	0.70	1,409	843
Stage 4	Full Depth	14.30	0.70	2,718	1,309
					2,718

Top Down	Staged Release	1 Water Surface Elevation (ft)	2 Orifice Invert Elevation (ft)	3 Depth to Orifice Invert (ft)	4 Depth to Orifice Centroid (ft)	5 Orifice Diameter (ft)	6 Orifice Area (ft^2)	7 Orifice Discharge Coefficient (C_d)	8 Single Column Orifice Discharge (cfs)	9 Number of Columns	10 Discharge Per Stage (cfs)	11 Incremental Staged WQ Volume (cf)	12 Release Time (hr)
	Stage 4	14.30	13.60	0.70	0.69	0.0292	0.0007	0.60	0.003	1	0.003		
		14.30	12.90	1.40	1.39	0.0292	0.0007	0.60	0.004	1	0.004		
		14.30	12.20	2.10	2.09	0.0292	0.0007	0.60	0.005	1	0.005		
		14.30	11.50	2.80	2.79	0.0292	0.0007	0.60	0.005	1	0.005		
									0.016		0.016	1,309	22.09
	Stage 3	13.60	12.90	0.70	0.69	0.0292	0.0007	0.60	0.003	1	0.003		
		13.60	12.20	1.40	1.39	0.0292	0.0007	0.60	0.004	1	0.004		
		13.60	11.50	2.10	2.09	0.0292	0.0007	0.60	0.005	1	0.005		
									0.011		0.011	843	21.10
	Stage 2	12.90	12.20	0.70	0.69	0.0292	0.0007	0.60	0.003	1	0.003		
		36.80	11.50	25.30	25.29	0.0292	0.0007	0.60	0.016	1	0.016		
									0.019		0.019	436	6.43
	Stage 1	12.20	11.50	0.70	0.69	0.0292	0.0007	0.60	0.003	1	0.003	130	
									0.003		0.003	130	13.56
												Total Drain Time =	**41.09**

Worksheet for 25-YR DISCHARGE

Project Description

Solve For	Opening Width

Input Data

Discharge	1.20	ft³/s
Headwater Elevation	15.00	ft
Centroid Elevation	14.55	ft
Tailwater Elevation	14.30	ft
Discharge Coefficient	0.60	
Opening Height	0.50	ft

Results

Opening Width	0.74	ft
Headwater Height Above Centroid	0.45	ft
Tailwater Height Above Centroid	-0.25	ft
Flow Area	0.37	ft²
Velocity	3.23	ft/s

Worksheet for 25-YR DISCHARGE @ 100-YR

Project Description

Solve For	Discharge

Input Data

Headwater Elevation	15.30	ft
Centroid Elevation	14.55	ft
Tailwater Elevation	14.30	ft
Discharge Coefficient	0.60	
Opening Width	0.74	ft
Opening Height	0.50	ft

Results

Discharge	1.54	ft^3/s
Headwater Height Above Centroid	0.75	ft
Tailwater Height Above Centroid	-0.25	ft
Flow Area	0.37	ft^2
Velocity	4.17	ft/s

Worksheet for 100-YR DISCHARGE

Project Description

Solve For	Opening Width

Input Data

Discharge	0.66	ft³/s
Headwater Elevation	15.30	ft
Centroid Elevation	15.15	ft
Tailwater Elevation	15.00	ft
Discharge Coefficient	0.60	
Opening Height	0.30	ft

Results

Opening Width	1.18	ft
Headwater Height Above Centroid	0.15	ft
Tailwater Height Above Centroid	-0.15	ft
Flow Area	0.35	ft²
Velocity	1.86	ft/s

Worksheet for 18" Outfall Pipe - Pressure

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Pressure 1	2.17	psi
Pressure 2	0.65	psi
Elevation 1	5710.80	ft
Elevation 2	5710.11	ft
Length	145.00	ft
Roughness Coefficient	0.010	
Diameter	1.50	ft

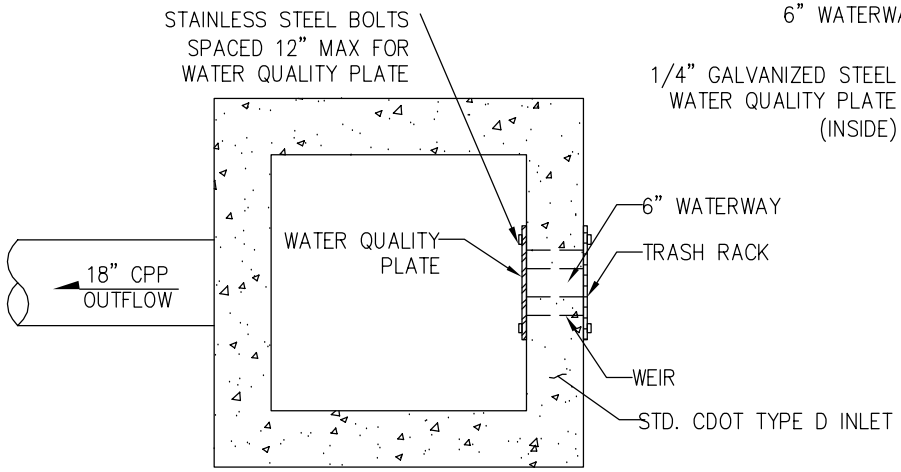
Results

Discharge	23.23	ft^3/s
Headloss	4.20	ft
Energy Grade 1	5718.49	ft
Energy Grade 2	5714.29	ft
Hydraulic Grade 1	5715.81	ft
Hydraulic Grade 2	5711.61	ft
Flow Area	1.77	ft^2
Wetted Perimeter	4.71	ft
Velocity	13.14	ft/s
Velocity Head	2.69	ft
Friction Slope	0.02894	ft/ft

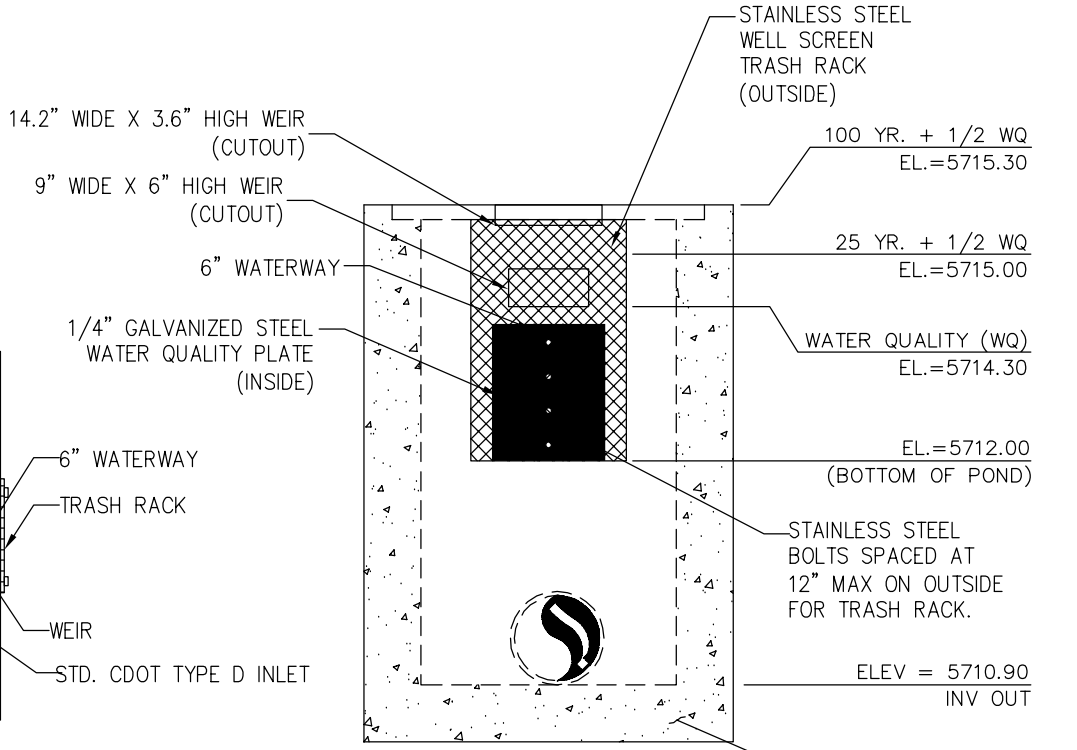
Messages

Notes

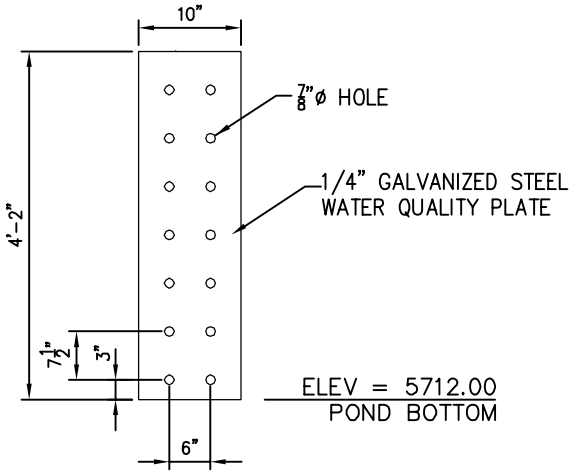
This analysis has been run to obtain the maximum outfall capacity of the 18" pipe with 5 feet of head (2.17 psi = full pond).



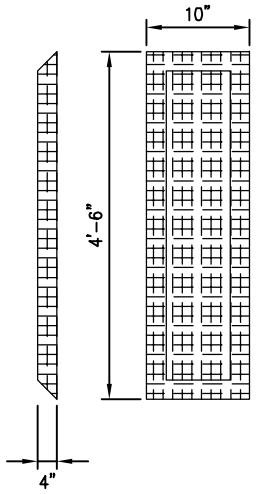
TOP VIEW



FRONT VIEW



WATER QUALITY PLATE
NOT TO SCALE

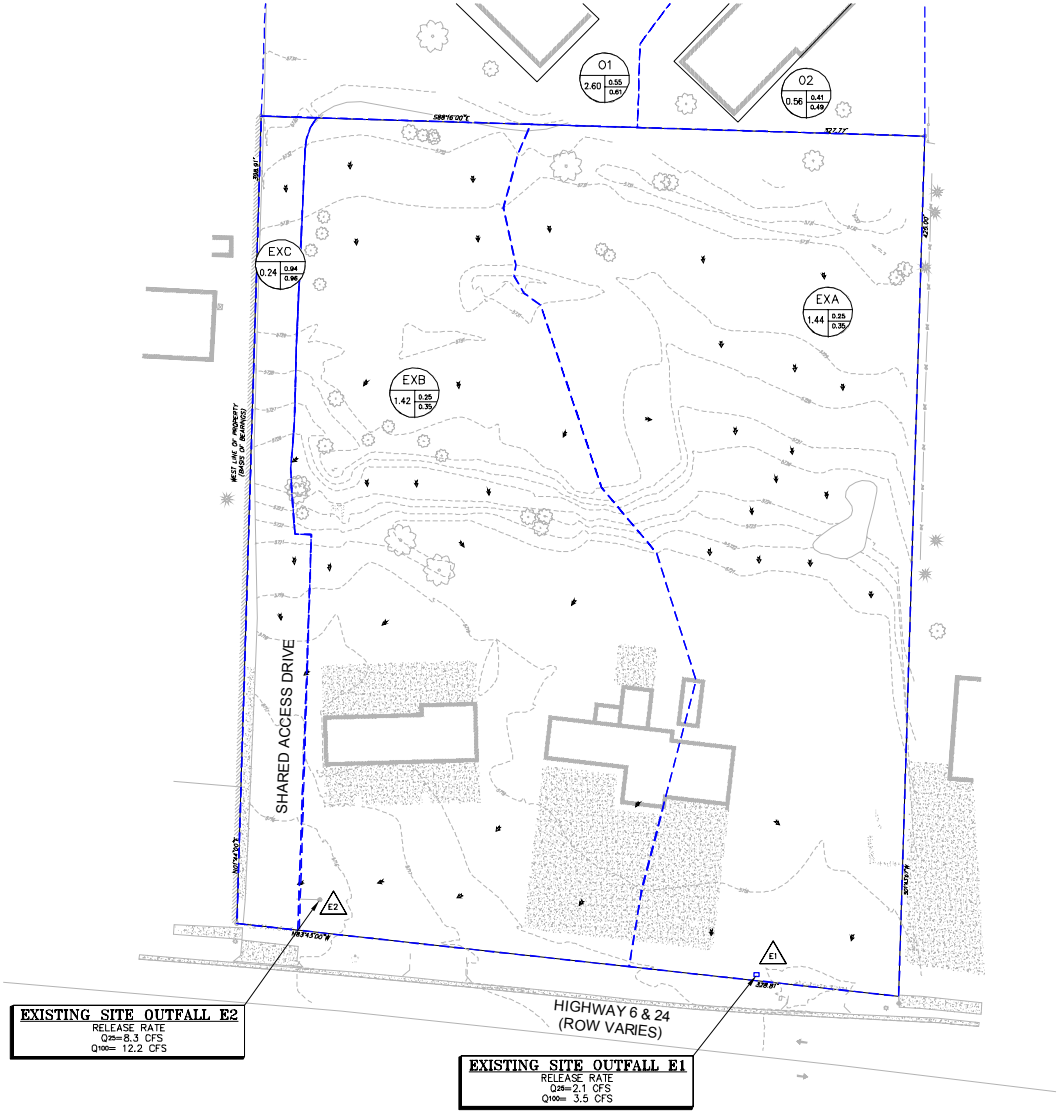


TRASH RACK
NOT TO SCALE

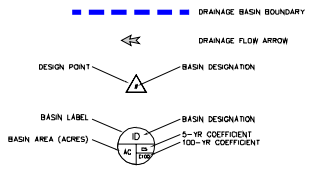
TRASH RACK DETAILS	
SCREEN #93 VEE WIRE SLOT OPENING	0.139"
SUPPORT ROD TYPE	#156 VEE
SUPPORT ROD ON-CENTER, SPACING	3/4"
TOTAL SCREEN THICKNESS	0.31"
CARBON STEEL FRAME TYPE	3/8" x 1.0" FLAT BAR

CONTROL STRUCTURE DETAIL
NOT TO SCALE

APPENDIX H – EXISTING CONDITIONS DRAINAGE PLAN



LEGEND

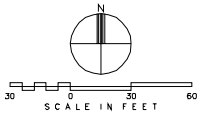


FLOOD PLAIN IDENTIFICATION

BY SCALED MAP LOCATION AND GRAPHICAL REVIEW OF THE FLOOD INSURANCE RATE MAP NUMBER 08020S1431B, DATED JANUARY 3, 1986, THE SITE LIES WITHIN AN AREA CLASSIFIED AS ZONE C. AREAS CLASSIFIED AS ZONE C ARE CONSIDERED AREAS OF MINIMAL FLOOD HAZARD.

Site Runoff Summary - Existing Conditions

DESIGN POINT	DRAIN BASIN	AREA Ac	Q_5 CFS	Q_{10} CFS	Q_{25} CFS	Q_{100} CFS
EXA	EXA	1.44	0.2	0.6	1.2	2.2
EXB	EXB	1.42	0.2	0.6	1.2	2.2
EXC	EXC	0.24	0.7	0.9	1.2	1.5
O1	O1	2.60	2.9	4.1	5.9	8.5
O2	O2	0.56	0.4	0.5	0.9	1.3
		6.26	4.5	6.7	10.4	15.7



EXISTING DRAINAGE PLAN

MAY 30, 2014

Kimley»Horn

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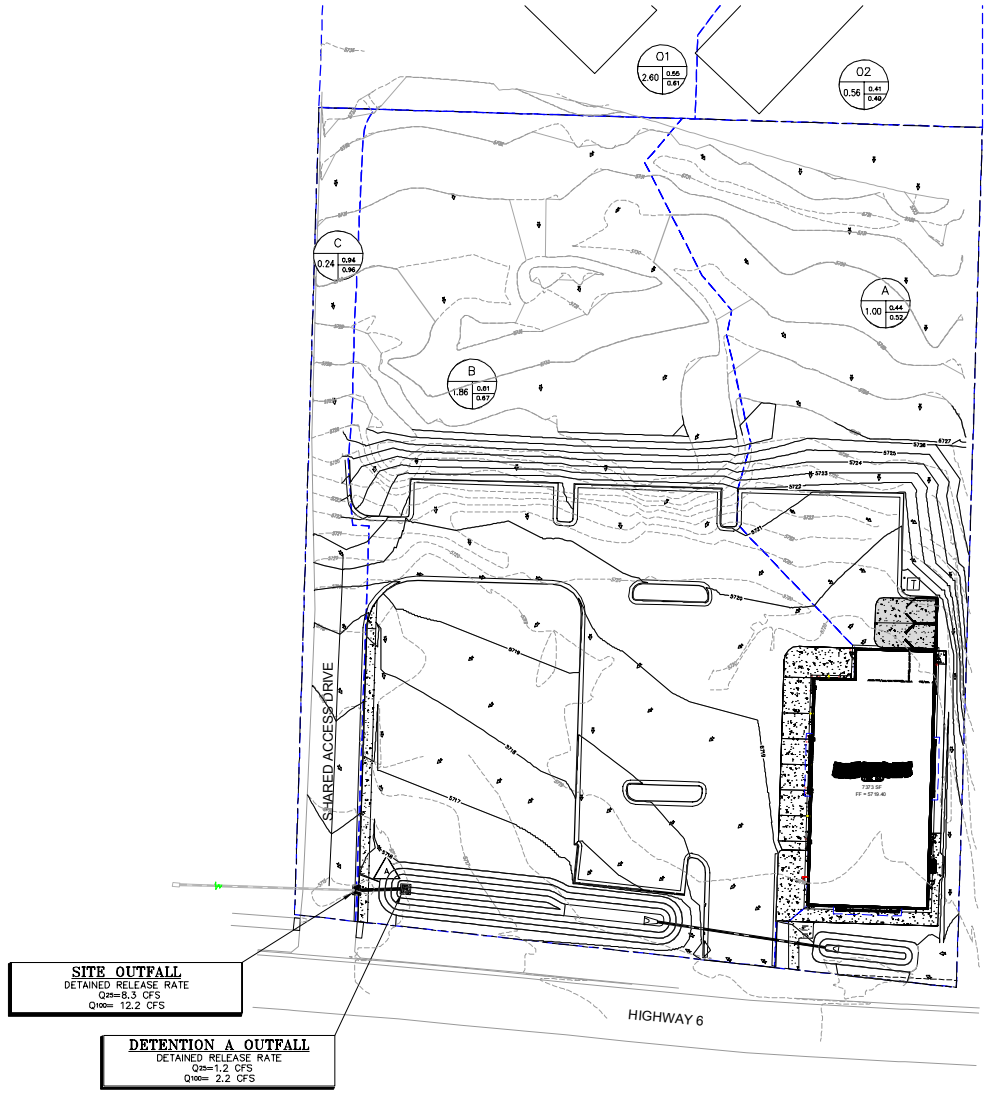
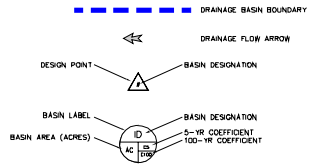
APPENDIX I – PROPOSED DRAINAGE PLAN



SITE OUTFALL
DETAINED RELEASE RATE
Q_{25}= 8.3 CFS
Q_{100}= 12.2 CFS

DETENTION A OUTFALL
DETAINED RELEASE RATE
Q_{25}=1.2 CFS
Q_{100}= 2.2 CFS

LEGEND



FLOOD PLAIN IDENTIFICATION

BY SCALED MAP LOCATION AND GRAPHICAL REVIEW OF THE FLOOD INSURANCE RATE MAP NUMBER 08020514318, DATED JANUARY 6, 1986, THE SITE LIES WITHIN AN AREA CLASSIFIED AS ZONE C. AREAS CLASSIFIED AS ZONE C ARE CONSIDERED AREAS OF MINIMAL FLOOD HAZARD.

Rainfall Intensity

IDF - Intensity, Duration, Frequency Data

Time Intensity Frequency Tabulation

TIME	2 YR	10 YR	25 YR	100 YR
5	2.11	4.07	5.16	6.64
10	1.55	2.98	3.78	4.85
15	1.26	2.42	3.07	3.95
30	0.82	1.51	1.88	2.38
60	0.51	0.86	1.05	1.31
120	0.30	0.48	0.58	0.72

Note:
Intensity values utilized as published from the NOAA Atlas 14, Volume 8, Version 2; Glenwood Springs, CO Station ID: 05-3359

NOTE

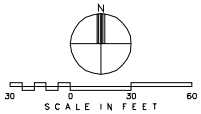
SUB-BASIN 'A' INCLUDES THE AREA IN BASIN 'R' (7,373 SF – BUILDING AREA)

SUB-BASIN 'O1' AND 'O2' ARE OFF-SITE BASINS THAT ARE ONLY BEING ACCOUNTED FOR BYPASS FLOW

SUB-BASIN 'C' IS THE SHARED ACCESS DRIVE THAT IS ONLY BEING ACCOUNTED FOR BYPASS FLOW

Site Runoff Summary - Proposed Conditions

DESIGN POINT	DRAIN BASIN	AREA Ac	Q_5 CFS	Q_{10} CFS	Q_{25} CFS	Q_{100} CFS
A	A	1.00	0.7	1.0	1.5	2.3
B	B	1.86	2.2	3.0	4.2	6.0
C	C	0.24	0.7	0.9	1.2	1.5
O1	O1	2.60	2.9	4.1	5.9	8.5
O2	O2	0.56	0.4	0.5	0.9	1.3
		6.26	6.8	9.5	13.7	19.5



PROPOSED DRAINAGE PLAN

MAY 30, 2014

Kimley»Horn

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ATTACHMENT G – DRY WELL MEMO

Kimley»Horn

DRY WELL MEMORANDUM

To:	City of Glenwood Springs
From:	Bryce E. Christensen, P.E.
	Kimley-Horn and Associates, Inc.
Date:	April 8, 2015
Subject:	Discount Tire 51537 Highway 6 Glenwood Springs, CO

The original project design called for one detention pond with an outlet structure that would discharge into the existing 18" storm drain. During construction, it was discovered that the inverts of the existing storm drain are higher than anticipated, and a connection is not feasible. A drywell percolation system is now proposed to drain the detention pond.

A percolation test was performed by Yeh and Associates, Inc. on March 16, 2015, resulting in an average rate of 10 minutes per inch (see attached). A single drywell constructed in accordance with the modified City of Aspen detail (see attached) will percolate ~4,825 cubic feet of stormwater during a 48-hour period (see attached calculations). This volume exceeds the required 4,408 cubic feet of required stormwater detention.

This design does not take into account the percolation from the pond bottom or from the base of the drywell.

Based on discussions with City Staff, it is anticipated that a maintenance agreement would be executed that would require the property owner to maintain the drywell and keep it in good working order.

It is anticipated that the proposed curb inlet located within the Shared Access Drive at the southwest corner of the property will connect to an existing 18" drainage pipe that runs along the south property line (refer to Exhibit A). An emergency spillway will be provided at the southwest corner of the detention basin to provide relief during extreme rain events. The spillway will direct excess runoff to the curb inlet in the Shared Access Drive.

Please take a moment to review the proposed plan revisions and let me know if you have any questions. Thanks.

Yeh and Associates, Inc.
Consulting Engineers & Scientists

March 18, 2015 Project No. 215-040

Mr. Bryce Christensen, P.E. (Bryce.Christensen@kimley-horn.com)
Kimley-Horn & Associates, Inc.
990 S. Broadway #450
Denver, CO 80209

Subject: Percolation Test Rate for Proposed Drywell, Discount Tire, Glenwood Springs, Colorado

Dear Mr. Christensen,

As requested, a representative from Yeh and Associates performed a percolation test for the proposed drywell at the subject site. The study was conducted in accordance with our proposal 2015-P076 dated March 16, 2015.

Proposed Construction: Drywell design was not known at the time of our test. We assume a concrete drywell with a perforated section and gravel around the perimeter of the well. The proposed drywell is to replace an existing drywell in the southwest corner of the project site that was removed during construction. The drywell should be designed to accept surface runoff on the subject site, as well as additional runoff from surrounding areas (Photo 1) unless grading can be diverted.

Subsurface Conditions: The subsurface conditions at the proposed drywell location were referenced to the base of the existing fire hydrant in the southwest corner of the lot. The subsoils encountered below about 4 ½ feet of fill material, consisted of variable dark brown to brown silty sandy clay soils to a depth of approximately 8 feet (Photo 2). Soil from 8 feet to the depth of the excavation consisted of light brown to tan silty gravelly sand. Results of a gradation analysis performed on a sample of silty gravelly sand excavated from the percolation test hole were pending at the time of this letter and will be given in a subsequent revision. No free water was observed in the test hole at the time of excavation and the soils were moist. We recommend that the bottom of the proposed drywell penetrate into the native light brown / tan silty gravelly sand layer for construction.

Percolation Testing: A percolation test was conducted on March 16, 2015 to evaluate feasibility of a drywell disposal system at the site. The hand dug test hole for the percolation test was approximately 12 inches in diameter and 29 inches deep, at the bottom of the proposed drywell pit. The percolation test results are presented in Table 1. The percolation test results averaged about 10 minutes per inch.

This report has been prepared for the exclusive use by our client for design purposed. We are not responsible for technical interpretations by others of our information.

If you have any questions or if we may be of further assistance, please let us know.

Sincerely,

YEH AND ASSOCIATES, INC.

Scott W. Richards, P.E.
Colorado Northwest Region Manager

Photo 1. Southwest corner of property during rainfall event.

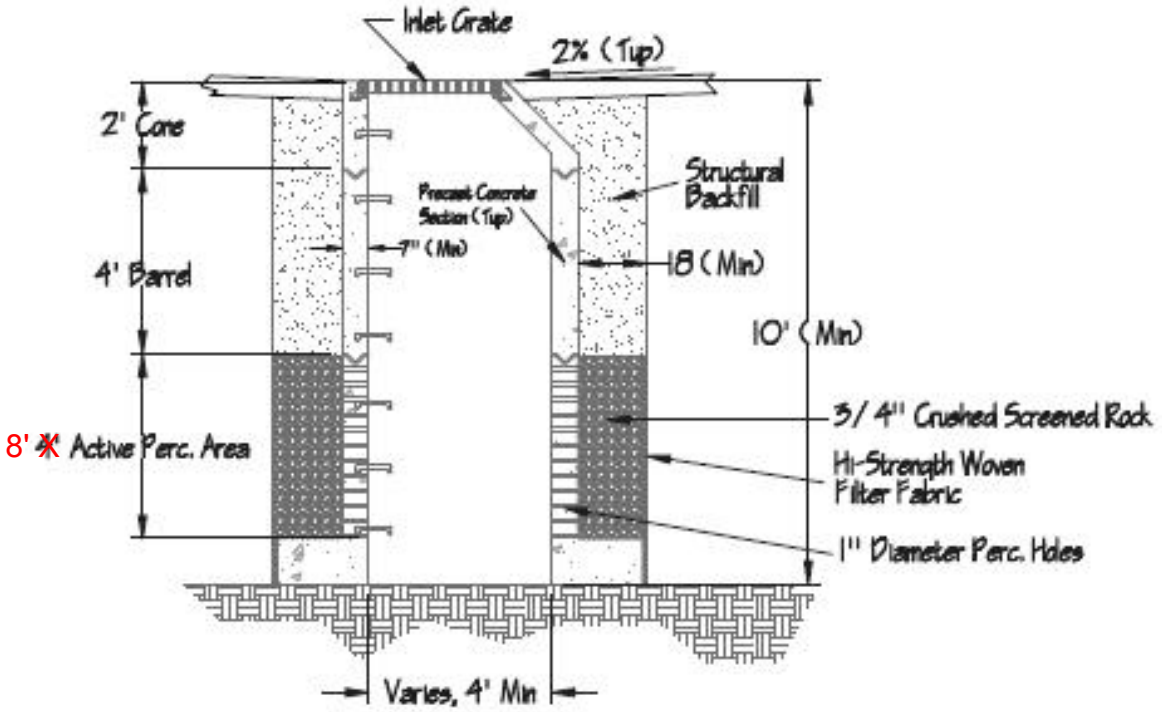
Photo 2. Proposed drywell location and percolation test pit.

YEH AND ASSOCIATES
TABLE 1
PERCOLATION TEST RESULTS

JOB NO. 215-040

HOLE NO.	HOLE DEPTH (INCHES BELOW A 9 FOOT DEPTH)	LENGTH OF INTERVAL (MIN)	WATER DEPTH AT START OF INTERVAL (INCHES)	WATER DEPTH AT END OF INTERVAL (INCHES)	DROP IN WATER LEVEL (INCHES)	AVERAGE PERCOLATION RATE (MIN./INCH)
1	29 3/4	5	14	15 ½	1 ½	
			15 ½	16 ½	1	5
			16 ½	17 ¾	1 ¼	4
			17 ¾	18 ¾	1	5
			18 ¾	19 ½	¾	7
			19 ½	20 ¼	¾	7
			20 ¼	21	¾	7
			21	21 ½	½	10
			21 ½	22	½	10
			22	22 ½	½	10
			22 ½	23	½	10

Note: Percolation test holes were hand dug in the bottom of a catchment trench in the southwest corner of the property at the proposed drywell location on March 16, 2015. Percolation tests were conducted on March 16, 2015. The average percolation rate was based on the last three readings of the test.



Notes:

1. Drywell design is to be considered when other drainage options prove unfeasible.
2. Drywell diameter and depth must be based on professional hydraulic calculations (taking into account runoff volume and the surrounding soil's percolation rate).
3. Drywells may not be placed in City ROW or in City Easements.
4. Drywells must be cleaned periodically and as often as necessary to keep them performing at maximum capacity.
5. ¾" screened rock (wrapped in woven filter geotextile) is required to transition from drywell to native fill.

Figure 8.70 Typical "Detention Only" Dry Well

Project Name: Discount Tire - Glenwood Springs

Project #: 096010010

Date: April 8, 2015

Prepared By: Dan Skeehan

DRYWELL CALCULATIONS

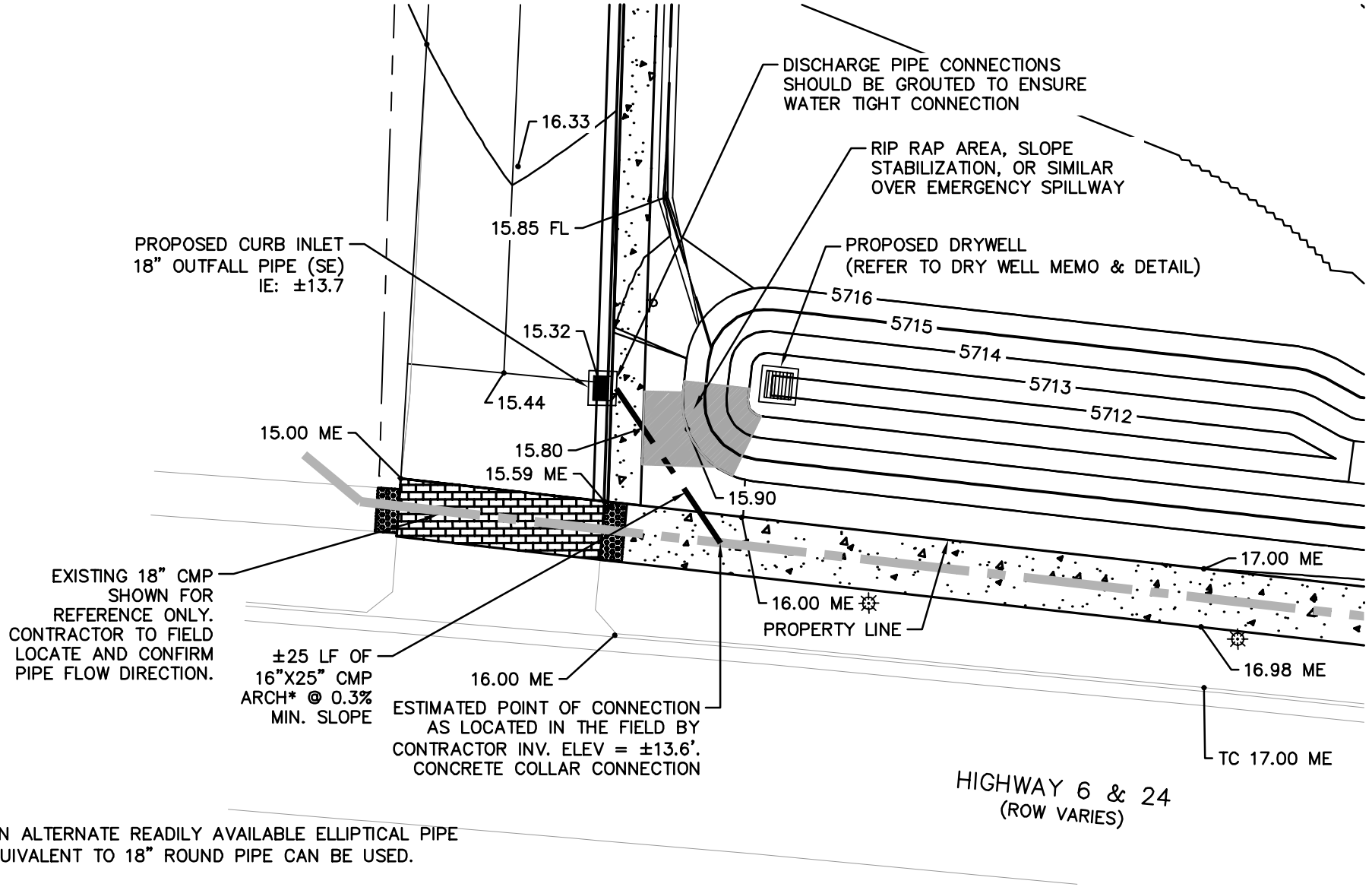
Infiltration Rate = (1 / Field Test Data) x (60/12)
Drywell Perc Rate = (Infiltration Rate x Drywell Percolation Area) / 3600
48 Hour Perc Volume = Factored Perc Rate x 48 x 3600

Basin	*Test Number*	*Field Test Data (min/inch)*	*Infiltration Rate (cf/hr/sf)*	*Active Percolation Area (sf)*	*Basin Percolation Rate (cfs)*	*48-Hour Perc Vol (cf)*	*Volume Required (cf)*
A	1	10	0.50	201.1	0.03	4825	4408

BASIN AREA CALCULATIONS

Active Percolation Area Calc = 2 x pi x hydraulic radius x active percolation area height
Hydraulic Radius = chamber radius + structure thickness + rock layer

Drwell	*Hydraulic Radius (ft)*	*Active Percolation Area Height (ft)*	*Active Percolation Area (sf)*
1	4	8	201.1



*AN ALTERNATE READILY AVAILABLE ELLIPTICAL PIPE EQUIVALENT TO 18" ROUND PIPE CAN BE USED.

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

EXHIBIT A

STORM SEWER MODIFICATION FOR CURB INLET CONNECTION

4/02/2015

Kimley»Horn

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990 SOUTH BROADWAY, SUITE 200, DENVER, 80209
PHONE: 303-228-2300

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Geotechnical Engineering Report

Proposed Discount Tire – COD 10354

51620 Highway 6

Glenwood Springs, Colorado

January 7, 2014

Terracon Project No. 25135106

Prepared for:

AMEC Environmental & Infrastructure, Inc.
Phoenix, Arizona

Prepared by:

Terracon Consultants, Inc.
Wheat Ridge, Colorado

Offices Nationwide Established in 1965
Employee-Owned terracon.com

Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

January 7, 2014

AMEC Environment & Infrastructure, Inc.
4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

Attn: Dave Klann, P.E.
P: 602-733-6033
E: david.klann@amec.com

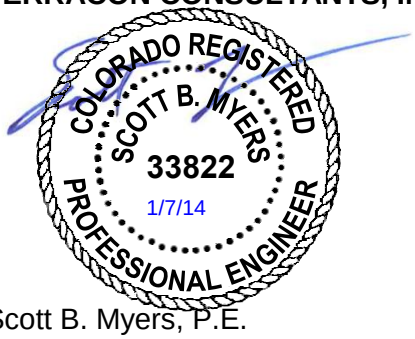
Re: Geotechnical Engineering Services
Proposed Discount Tire – COD 10354
51620 Highway 6
Glenwood Springs, Colorado
Terracon Project No. 25135106

Mr. Klann:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering exploration for the above referenced project. This study was performed in general accordance with Subcontract Work Order and PO No. C013700199, dated October 4, 2013. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slab and pavement recommendations for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
TERRACON CONSULTANTS, INC.



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Enclosures
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EXECUTIVE SUMMARY

A geotechnical engineering exploration has been performed for the proposed Discount Tire to be located at 51620 Highway 6 in Glenwood Springs, Colorado. Based on the information obtained from our subsurface exploration and the laboratory testing completed, the site appears suitable for the proposed construction; however, the following geotechnical conditions will need to be considered:

- Up to about 6 feet of fill was encountered on the subject site. We do not possess any information regarding whether the fill was placed under the observation of a geotechnical engineer. In our opinion, the existing fill should not be used to support foundations or slab-on-grade construction without complete removal and modification. We anticipate portions of the existing fill can be reused as new fill for support of shallow foundations, slabs-on-grade, provided any deleterious fill materials are removed and some movement can be tolerated. Some removal and replacement may be required if unsuitable or soft materials are exposed.

- In our opinion, the proposed building could be supported by a shallow spread footing foundation system bearing on a zone of properly moisture treated and compacted fill, provided the owner can tolerate some risk of movement.

- If the owner is willing to accept some risk of movement and the existing fill and native soils are modified as recommended in this report, slabs-on-grade may be utilized for the interior floor system. If the owner cannot tolerate movement, interior floors should be designed as a structural floor.

- It has been our experience that portions of subgrade materials below existing pavements/hardscape will likely be relatively moist to nearly saturated and yielding to unstable. This phenomenon is most likely due to moisture collecting in the subgrade through cracks or seams in the pavements/hardscape and not drying due to the presence of the pavements/hardscape. After removal of pavements/hardscape, unstable subgrade materials will need to be stabilized prior to construction of new pavements. We anticipate the subgrade can be stabilized by scarifying the subgrade soils to a depth of about 12 inches, processing the scarified subgrade soils, allowing the soils to dry, and compacting the subgrade materials in-place. If scarifying and drying is performed, several days may be required before the subgrade is stable enough for recompaction and paving, depending on the weather. However, more aggressive stabilization methods such as removal and replacement or by other means are discussed in this report.

- If the owner is willing to accept some risk of movement, exterior flatwork and pavements could be supported on partially modified fill materials, as recommended in this report.

- The 2009 International Building Code, Table 1613.5.2 IBC seismic site classification for this site is C.

- The amount of movement associated with foundations, slabs-on-grade and pavements, etc. will be related to the wetting of the underlying clay fill. Therefore, it is imperative the recommendations outlined in the "Grading and Drainage" section of this report be followed to reduce potential movement. Moisture conditioning and/or replacement of the on-site fill materials and/or native soils should follow the recommendations outlined in the "Earthwork" section of this report.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and this report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **GENERAL COMMENTS** should be read for an understanding of the report limitations.

GEOTECHNICAL ENGINEERING REPORT
PROPOSED DISCOUNT TIRE – COD 10354
51620 HIGHWAY 6
GLENWOOD SPRINGS, COLORADO

Terracon Project No. 25135106
January 7, 2014

1.0 INTRODUCTION

A geotechnical engineering report has been completed for the proposed Discount Tire to be located at 51620 Highway 6 in Glenwood Springs, Colorado.

As part of our geotechnical subsurface exploration, eight (8) borings (Boring Nos. 1 to 5 and P1 to P3) were drilled at the site to varying depths of about 5 to 22 feet below the existing grade. The Boring Logs and the Boring Location Plan are included in Appendix A of this report.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Earthwork
- Grading and drainage
- Seismic considerations
- Foundation design and construction
- Floor slab design and construction
- Pavement design and construction

Three (3) additional borings (Boring Nos. E1 to E3) were drilled as part of an environmental exploration of the site. The results of the environmental exploration are presented under a separate cover.

2.0 PROJECT INFORMATION

2.1 Project Description

Item	Description
Site layout	See Appendix A, Exhibit A-2, Boring Location Plan
Proposed construction	We understand the proposed development will consist of construction of a single-story building with an approximate footprint of about 8,000 square feet. We anticipate basement construction will not be incorporated in the building.
Anticipated foundation system	Spread footing foundations

Item	Description
Maximum loads	Columns: 50 to 100 kips (assumed) Walls: 2 to 4 klf (assumed) Floor slabs: 125 psf max (assumed)
Grading	We assume maximum fills and cuts will be on the order of about 2 to 3 feet or less to bring the site to construction grade.
Cuts and fills	We anticipate maximum fills on the order of about 1 to 3 feet will be required to bring the sites to construction grade.
Free-standing retaining walls	Site walls up to 4 feet (assumed)
Below grade construction	Not reported as part of site development.
Excavation depth	3 feet (assumed)
Infrastructure	Installation of underground utilities within about 5 feet of finished site grades. Access drives and parking areas will also be constructed as part of the development of the subject.

2.2 Site Location and Description

Item	Description
Location	The proposed Discount Tire will be located within the 51620 Highway 6 in Glenwood Springs, Colorado.
Current Development	The southern half of the site is currently occupied by a car wash and vehicle service facility. The northern half of the site is undeveloped.
Adjacent development	North: Multi-family residential development East: Commercial development West: Commercial development South: State Highway 6 followed by Interstate I-70 and the Colorado River.
Current ground cover	Ground cover on the site appears to consist of asphalt for the southern portion of the site and grass and weeds on the northern portion of the site.
Existing topography	The southern half of the site is generally level with an elevation difference of about 4 feet while the northern half of the site slopes is moderately sloping down towards the south with an elevation difference of about 13 feet.

3.0 SUBSURFACE CONDITIONS

3.1 Typical Profile

Based on the results of the borings, subsurface conditions encountered on the project site can be generalized as follows:

Material Description	Approximate Depth to Bottom of Stratum below Existing Site Grade	Density / Consistency / Hardness
Asphalt	About 4 to 6 inches, Not encountered in Boring Nos. P1 to P3	N/A
Existing fill consisting of lean clay with varying amounts of sand and gravel	About 4 to 6 feet, Not encountered in Boring Nos. 5, P1, P2 and P3	Medium stiff to very stiff
Native soils consisting of lean clay with varying amounts sand	About 3-1/2 to 4-1/2 feet, encountered in Boring Nos. P1 to P3, only	Very stiff
Native soils consisting of silty sand and gravel with varying amounts of clay and cobble (It is possible this material is a highly weathered sandstone)	About 8 to 22 feet, Maximum depth explored in Boring Nos. 1, 5 and P1	Very loose to dense
Bedrock consisting of sandstone	About 20 feet, Maximum depth explored in Boring Nos. 2, 3, 4, P2 and P3	Very hard

* - Practical drill rig refusal was encountered in Boring Nos. 1 at 13 feet, 2 at 15 feet, 5 at 22 feet and P1 at 8 feet.

Subsurface conditions encountered at the boring locations are indicated on the individual Boring Logs attached in Appendix A. Stratification boundaries indicated on the Boring Logs represent the approximate depths of changes in material and soil and rock type, the transition between materials may be gradual.

Laboratory testing indicates the clay fill and native clay soils have a low expansion potential. Native sand and gravel soils have a low collapse potential. However, the native soils have low unit weights which can be indicative of soils with moderate to high collapse potential. The tested samples have the following physical and engineering properties:

Boring No.	Depth (ft.)	Fines Content (%)	Liquid Limit (%)	Plasticity Index (%)	Expansion/ Consolidation (%)[1]
1	4				-0.3
2	2	89	32	12	
2	9				+0.1
3	4	14	NP[3]	NV[3]	
3	9				-0.7
4	14				-0.6
5	4				-0.3
5	14	40	NP[3]	NV[3]	
P1	2				+0.8[2]
P2	2				-0.6[2]
P3	4	24	NP[3]	NV[3]	-1.2[2]

[1] Expansion/consolidation testing was performed under a 500 psf surcharge load
[2] Expansion/consolidation testing was performed under a 200 psf surcharge load
[3] NV – No value, NP – Non-plastic

Laboratory testing for water soluble sulfate concentrations indicated negligible levels of about 7 and 40 mg/l. A summary of the laboratory test results is included in Appendix B.

3.2 Groundwater

The borings were observed while drilling and after completion for the presence and level of groundwater. The groundwater levels are noted on the Boring Logs included in Appendix A, and are summarized below.

Boring No.	Depth to groundwater while drilling (ft.)	Depth to groundwater at least one day after drilling (ft.)*
1	None encountered	- *
2	None encountered	- *
3	None encountered	- *
4	None encountered	- *
5	21	- *
P1	None encountered	- *
P2	None encountered	- *
P3	None encountered	- *

* Due to safety concerns, borings were backfilled immediately after drilling.

These observations represent groundwater conditions at the time of the field exploration, and may not be indicative of other times or at other locations. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions, and other factors.

Zones of perched and/or trapped groundwater may also occur at times in the subsurface soils overlying bedrock, on top of the bedrock surface or within permeable fractures in the bedrock materials. The location and amount of perched water is dependent upon several factors including hydrologic conditions, type of site development, irrigation demands on or adjacent to the site, fluctuations in water features, seasonal and weather conditions.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

Based on subsurface conditions encountered in the borings, the site appears suitable for the proposed construction from a geotechnical point of view provided certain precautions and design and construction recommendations outlined in this report are followed. We have identified geotechnical conditions that could impact design and construction of the proposed structures and other site improvements.

4.1.1 Existing Fill

Up to about 6 feet of fill was encountered on the subject site. We do not possess any information regarding whether the fill was placed under the observation of a geotechnical engineer.

Support of the structures foundation and associated flatwork on or above existing fill materials is discussed in this report. However, even with the recommended construction testing services, there is an inherent risk for the owner that expansive fill or unsuitable material within or buried by the fill will not be discovered. This risk cannot be eliminated without completely removing the existing fill, but can be reduced by thorough exploration and testing.

Terracon's services did not include delineating the horizontal or vertical extent of the existing fill material. There exists the potential for construction debris and/or domestic trash to be encountered within the fill on other portions of the site. Based upon the boring log data, the

potential is considered to be low to moderate. This could be verified by additional geotechnical exploration or evaluation at the site. If additional exploration is not performed, the owner should make allowances for such conditions to exist in the preparation of the project budget and/or construction plans. Based on the condition of the existing fill, we strongly recommend that the construction budget for this project be based on complete removal and replacement of the existing fill with a suitable import material.

Based upon field test data and our experience, it is our opinion the existing clay fill materials should not be used to support foundations and floor slabs without complete removal and modification and within pavement areas without partial removal and modification. Portions of the existing fill materials can to re-used as structural fill, provided deleterious materials are not present and these materials are properly processed, moisture conditioned and recompacted.

4.1.2 Expanisve/Collapsible Soils and Bedrock

Laboratory testing indicates the clay fill and native clay soils have a low expansion potential. Native sand and gravel soils have a low collapse potential. However, the native soils have low unit weights which can be indicative of soils with moderate to high collapse potential. This report provides recommendations to help mitigate the effects of soil collapse and expansion. However, even if these procedures are followed, some movement and cracking in the structures and flatwork should be anticipated. The severity of cracking and other damage such as uneven floor slabs will probably increase if any modification of the site results in excessive wetting or drying of the expansive clay soils. Eliminating the risk of movement and distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction.

4.1.3 Existing Structures

We understand the existing buildings and pavements on the site will be demolished and removed. Demolition of the existing buildings should include the removal of foundation systems and loose backfill found adjacent to the structures. Drilled piers, if encountered, should be truncated a minimum 3 feet below new foundations, slab or pavement construction elevations. All materials derived from the demolition of the structures, exterior flatwork and pavements should be removed from the site and should not be allowed for use in any on-site fills, unless the materials are properly processed and meet the criteria presented in the “Import Material Specifications” section of this report.

4.1.4 Structural Recommendations

Based upon the results of the field exploration and laboratory testing program, it is our opinion, the proposed building could be supported by a spread footing foundation system bearing on a zone properly moisture treated and compacted fill provided the owner willing to accept some risk of movement.

If the owner is willing to accept some risk of movement and the existing fill and native soils are modified as recommended in this report, slabs-on-grade may be utilized for the interior floor system. If the owner cannot tolerate movement, interior floors should be designed as a structural floor.

Provided the owner is willing to accept a risk of movement, exterior slabs and pavements may be supported on partially modified fill materials, as recommended in this report.

Design and construction recommendations for the foundation system and other earth connected phases of the project are outlined in subsequent sections.

4.2 Earthwork

The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. All earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include overexcavation operations, observation and testing of engineered fills, subgrade preparation, and other geotechnical conditions exposed during the construction of the project.

4.2.1 Site Preparation

Strip and remove existing fills, vegetation and other deleterious materials from proposed building areas. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

It has been our experience that portions of subgrade materials below existing pavements/hardscape will likely be relatively moist to nearly saturated and yielding to unstable. This phenomenon is most likely due to moisture collecting in the subgrade through cracks or seams in the pavements/hardscape and not drying due to the presence of the pavements/hardscape. After removal of pavements/hardscape, unstable subgrade materials will need to be stabilized prior to construction of new pavements. We anticipate the subgrade can be stabilized by scarifying the subgrade soils to a depth of about 12 inches, processing the scarified subgrade soils, allowing the soils to dry, and compacting the subgrade materials in-place. If scarifying and drying is performed, several days may be required before the subgrade is stable enough for recompaction and paving, depending on the weather. However, more aggressive stabilization methods such as removal and replacement or by other means are discussed in the report.

The existing buildings will be demolished and removed prior to construction of the new buildings. Demolition of the existing buildings should include the removal of foundation systems and loose backfill found adjacent to the structures. Drilled piers (if present) should be truncated a minimum of 3 feet below proposed planned foundation, slab or pavement construction elevations. The contractor should consider surveying existing pier locations (if piers are

present) so new construction does not encounter abandoned pier locations. Any existing utilities to be abandoned should either be completely removed or properly grouted.

Stripped materials consisting of vegetation, unsuitable fills and organic materials should be wasted from the site or used to revegetate landscaped areas or exposed slopes after completion of grading operations.

The site should be initially graded to create a relatively level surface to receive fill and to provide for a relatively uniform thickness of fill beneath the proposed structure. All exposed areas which will receive fill, once properly cleared, should be scarified to a minimum depth of 12 inches, conditioned to near optimum moisture content and compacted. It is imperative the moisture content of prepared materials be protected from moisture loss. Additional fill placed on fills previously placed after a period of time should be checked for moisture content.

Although evidence of underground facilities such as grease pits, septic tanks, cesspools, existing foundations and basements was not observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. However, cobbles and boulders may be encountered within excavations which may require the use of heavy-duty excavation equipment.

Depending upon depth of excavation and seasonal conditions, groundwater may be encountered in excavations on the site. . Pumping from sumps may be utilized to control water within excavations, if necessary.

Unstable soils may be encountered and the stability of subgrade soils may be affected by precipitation, repetitive construction traffic or other factors. If unstable conditions are encountered or develop during construction, workability may be improved by overexcavation of wet zones and mixing these soils with crushed gravel or recycled concrete and recompaction. Use of lime, fly ash, kiln dust, cement or geotextiles could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction. Lightweight excavation equipment may be required to reduce subgrade pumping.

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required maintaining stability of both the excavation sides and bottoming. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

4.2.2 Material Types

Fill type [1]	USCS classification	Acceptable location for placement
On-site sand and gravel soils	SM, GM	On-site sand soils are considered suitable for reuse as compacted fill below foundation, slab and pavement areas.
On-site clay soils	CL	On-site clay soils are considered suitable for reuse as compacted fill below foundation, slab and pavement areas.
Imported soils	Varies	Imported soils meeting the gradation outlined herein can be considered acceptable for use as engineered fill beneath foundations and slabs.

1. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the geotechnical engineer for evaluation.
2. Debris, if encountered, should be processed to maximum size of 3 inches and blended with on-site soils prior to reuse.

Imported soils (if required) should meet the following material property requirements:

Gradation	Percent finer by weight (ASTM C136)
6”	100
3”	70-100
No. 4 Sieve	50-100
No. 200 Sieve	10-70

- Liquid Limit .....30 (max)
- Plastic Limit .....15 (max)
- Maximum Expansive Potential (%)..... 1.0*

*Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at optimum water content. The sample is confined under a 200 psf surcharge and submerged.

Consideration could be given to reusing the on-site asphalt pavement and/or concrete slab materials provided the materials are properly processed and blended with on-site materials. In order to reuse the asphalt and/or concrete, the materials should be processed to a maximum size of 3-inches and blended with the on-site soils at a ratio of 30 percent asphalt/concrete to 70 percent soil. This blended material can be used in both building and parking areas.

4.2.3 Compaction Requirements

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift.

Item	Description
Fill lift thickness	8-inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6-inches in loose thickness when hand-guided equipment (i.e. jumping jack, plate compactor) is used
Compaction requirements[1]	Minimum of 95% of the material's standard Proctor maximum dry density for slabs and general fill. Minimum of 98% of the standard Proctor maximum dry density (ASTM D698) below foundations.
Processing of asphalt/concrete	To a soil like-consistency with particle sizes of 3 inches or less
Moisture content cohesive soil (clay)	+1 to +4 % of the optimum moisture content 0 to +2% of the optimum moisture content in pavement areas
Moisture content cohesionless soil (sand and gravel)	-3 to +3 % of the optimum moisture content

1. We recommend engineered fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
2. Specifically, moisture levels should be maintained low enough to allow for satisfactory compaction to be achieved without the fill material pumping when proofrolled.
3. Moisture conditioned clay soils should not be allowed to dry out. A loss of moisture within these materials could result in an increase in the materials expansive potential. Subsequent wetting of these materials could result in undesirable movement.
4. Processed asphalt or concrete (if used) should be processed to a maximum size of 3-inches in diameter. Additional testing methods may be required at the time of placement in order to determine acceptable compaction effort.

4.2.4 Excavation and Trench Construction

Excavations into the subsurface soils will encounter a variety of conditions. Excavations into the clay fill may remain relatively stable for a short amount of time during construction. However, caving soils are likely when excavating into sand soils. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

Soils penetrated by the proposed excavations may vary significantly across the site. The soil classifications are based solely on the materials encountered in the exploratory borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual

conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

As a safety measure, it is recommended that all vehicles and soil piles be kept to a minimum lateral distance from the crest of the slope equal to no less than the slope height. The exposed slope face should be protected against the elements.

4.2.5 Grading and Drainage

All grades must be adjusted to provide positive drainage away from the structure during construction and maintained throughout the life of the proposed project. Infiltration of water into utility or foundation excavations must be prevented during construction. Landscaped irrigation adjacent to the foundation system should be minimized or eliminated. Water permitted to pond near or adjacent to the perimeter of the structure (either during or post-construction) can result in significantly higher soil movements than those discussed in this report. As a result, any estimations of potential movement described in this report cannot be relied upon if positive drainage is not obtained and maintained, and water is allowed to infiltrate the fill and/or subgrade.

Exposed ground should be sloped at a minimum of 10 percent grade for at least 10 feet beyond the perimeter of the structure, where possible. The use of swales, chases and/or area drains may be required to facilitate drainage in unpaved areas around the perimeter of the structures. Backfill against footings, exterior walls and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration. After construction and prior to project completion, we recommend that verification of final grading be performed to document that positive drainage, as described above, has been achieved.

Flatwork and pavements will be subject to post construction movement. Maximum grades practical should be used for paving and flatwork to prevent areas where water can pond. In addition, allowances in final grades should take into consideration post-construction movement of flatwork, particularly if such movement would be critical. Where paving or flatwork abuts the structure, care should be taken that joints are properly sealed and maintained to prevent the infiltration of surface water.

Planters located adjacent to the structure should preferably be self-contained. Sprinkler mains and spray heads should be located a minimum of 5 feet away from the building line. Roof drains should discharge on pavements or be extended away from the structure a minimum of 5 feet through the use of splash blocks or downspout extensions. A preferred alternative is to have the roof drains discharge to storm sewers by solid pipe or daylighted to a detention pond or other appropriate outfall.

It is recommended that all permanent cut and fill slopes in soil materials be made no steeper than 3 horizontal (H) to 1 vertical (V). Steeper slopes, including areas where retaining walls are

planned, should be evaluated for slope stability. The recommended 3H:1V slopes are based on experience with slopes in soils such as those at this site. The 3H:1V slopes are also widely used by state and local government agencies. However, the use of 3H:1V slopes does not guarantee that slope failures will not occur. It is recommended that all exposed earth slopes be seeded to provide protection against erosion. Seeded slopes should be protected with erosion mats until the vegetation is established.

4.2.6 Earthwork Construction Considerations

Upon completion of grading operations, care should be taken to maintain the moisture content of the subgrade prior to construction of foundations, floor slabs, pavements, etc. Construction traffic over prepared subgrade should be avoided to the extent practical. Excessive traffic could increase compaction and reduce moisture content within the subgrade. Subsequent wetting of these on-site clay soils will result in undesirable movement if the clays undergo some moisture content loss.

The site should also be graded to prevent ponding of surface water on prepared subgrade or in excavations. Excessive wetting of the on-site clay will reduce the soils ability to support fills and/or structures. If the subgrade becomes significantly wetted, the affected area should be removed, allowed to dry to near optimum moisture content and should be properly compacted at the recommended moisture content. If the subgrade should become frozen, desiccated, saturated, or disturbed, the affected material should be removed or these materials should be scarified, moisture conditioned, and recompacted prior to foundation, floor slab and pavement construction.

Although the exposed subgrade is anticipated to be relatively stable upon initial exposure, unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. Should unstable subgrade conditions develop, stabilization measures will need to be employed. Options for subgrade stabilization can include removal of unsuitable material and replacement with approved fill material. An alternative can include the use of TX-140 Tensar geogrid or equivalent overlain by Colorado Department of Transportation (CDOT) Class 5 or 6 aggregate base course. The depth of aggregate base course will depend on the severity of unstable soils.

Trees or other vegetation whose root systems have the ability to remove excessive moisture from the subgrade and foundation soils should not be planted next to the structure. Trees and shrubbery should be kept away from the exterior edges of foundations, a distance at least equal to 1.5 times their expected mature height.

Terracon should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during overexcavation operations, subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of building floor slabs.

4.2.7 Soluble Sulfate Test Results

The following table lists the results of laboratory soluble sulfate testing. These values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Boring No.	Sample Depth (feet)	Soluble Sulfate[1] (mg/l)
3	4	7
P3	4	40

1. Results of soluble sulfate testing indicate that samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 4.3.1 of the ACI Design Manual. The results of the testing indicate ASTM Type I Portland Cement is suitable for project concrete on and below grade. However, if there is no (or minimal) cost differential, use of ASTM Type II Portland Cement is recommended for additional sulfate resistance of construction concrete. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

4.3 Foundations

Based upon the results of the field exploration and laboratory testing program, it is our opinion the proposed building could be supported by a spread footing foundation system constructed on a zone of properly moisture treated and compacted fill, provided the owner is willing to accept some risk of movement.

4.3.1 Spread Footing Design Recommendations

Provided some movement can be tolerated, a spread footing foundation system could be used to support the proposed building bearing on modified existing fill and native soils. Design recommendations for a spread footing foundation system are presented in the following paragraphs.

Description	Value
Amount of overexcavation below foundation	7 feet and all existing fill must be removed[1,2]
Maximum net allowable bearing pressure	2,500 psf
Coefficient against sliding (Allowable)	0.3
Estimated movement	About 1 inch

1. Spread footings may be constructed on a zone of properly moisture conditioned and compacted fill. All existing fill below spread footings must be removed and replaced with properly moisture treated and compacted fill.
2. Overexcavation should extend laterally at least 8 inches beyond the edges of the footings for each foot of overexcavation depth below footing base elevation.
3. Exterior footings should be placed a minimum of 36 inches below finished grade for frost protection and to provide confinement for the bearing soils.

4. Interior footings should bear a minimum of 12 inches below finished grade in heated areas.
5. Finished grade is the lowest adjacent grade for perimeter footings and floor level for interior footings.

Footings should be proportioned on the basis of equal total dead load pressure to reduce differential movement between adjacent footings. Total movement resulting from the provided structural loads is estimated to be on the order of about 1 inch. Differential movement should be on the order of 1/2 to 3/4 of the estimated total movement over a distance of about 40 feet. Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction and throughout the life of the structure. Failure to maintain the proper drainage as recommended in the "Grading and Drainage" section of this report will nullify the movement estimates provided above.

4.3.2 Construction Considerations

Spread footings should be supported by a minimum of a 7 foot zone of properly moisture conditioned and compacted structural fill. In addition, all existing fill must be removed and replaced with structural fill prior to construction of foundations. Structural fill should be moisture conditioned and compacted as recommended in the "Compaction Requirements" section of this report.

All soils beneath footings should be moisture conditioned and compacted. The moisture content and compaction of subgrade soils should be maintained until foundation construction.

Footings, foundations and masonry walls should be reinforced and detailed as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities in masonry walls is recommended.

We do not anticipate that unstable soil conditions will be encountered in the base of the footing excavations. However, if unstable conditions are encountered, these will need to be stabilized prior to the placement of structural fill or constructing the footings. The use of angular rock, recycled concrete and/or gravel pushed into the yielding subgrade are generally considered suitable means of stabilizing soft soils below foundations. Alternatively, the use of geogrid materials in conjunction with gravel have also been successfully used to stabilize soft soil conditions below foundations.

If unstable soil conditions are encountered, a representative from our office should observe the conditions to provide site specific recommendations.

4.4 Seismic Considerations

Based on our subsurface exploration and laboratory testing, it is our opinion that the soils have a low risk of liquefaction. The following table presents the seismic site classification based on the 2009 International Building Code:

Code Used	Site Classification
2009 International Building Code (IBC) [1]	C

1. In general accordance with the *2009 International Building Code,* Table 1613.5.2.
2. The 2009 International Building Code (IBC) requires a site soil profile determination extending a depth of 100 feet for seismic site classification. The current scope does not include the required 100 foot soil profile determination. The deep boring for the project extended to a maximum depth of about 25 feet and this seismic site class definition considers that similar conditions exist below the maximum depth of the subsurface exploration. Additional exploration to deeper depths could be performed to confirm the conditions below the current depth of exploration; however, based upon our experience we do not think this is necessary.

4.5 Interior Floors

Slab-on-grade floors may be utilized for the interior floor systems, provided the existing fill materials and native soils are modified (as discussed previously) and/or replaced, and provided some slab movement can be tolerated. If very little movement can be tolerated, structural floors, supported independent of the subgrade materials, are recommended. A minimum 12-inch crawlspace or void space should be used for structural floor construction.

Modification of the existing clay fill materials and native soils should consist of overexcavation to a minimum depth of about 10 feet below slab subgrade elevation, moisture conditioning and recompaction and/or replacement with non- to low expansive imported fill materials. The moisture content and compaction of subgrade soils should be maintained until slab construction is completed.

4.5.1 Interior Floor Design Recommendations

Even when bearing on properly reprocessed and compacted fills, movement of the slab-on-grade floor system is possible should the subgrade soils undergo an increase in moisture content. We estimate movement of about 1 inch is possible. If the owner cannot accept the risk of slab movement, a structural floor should be used. If conventional slab-on-grade is utilized, the subgrade soils should be prepared as outlined in the “Earthwork” section of this report.

For structural design of concrete slabs-on-grade, a modulus of subgrade reaction of 100 pounds per cubic inch (pci) may be used for point or limited area loads for floors supported on modified on-site soils.

Additional floor slab design and construction recommendations are as follows:

- Positive separations and/or isolation joints should be provided between slabs and all foundations, columns or utility lines to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- Interior trench backfill placed beneath slabs should be compacted in accordance with recommended specifications outlined below.
- The use of a vapor retarder should be considered beneath concrete slabs on grade that will be covered with wood, tile, carpet or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer and slab contractor should refer to ACI 302 for procedures and cautions regarding the use and placement of a vapor retarder.
- Floor slabs should not be constructed on frozen subgrade.
- Other design and construction considerations, as outlined in Section 302.1R of the *ACI Design Manual*, are recommended.

4.5.2 Interior Floor Construction Considerations

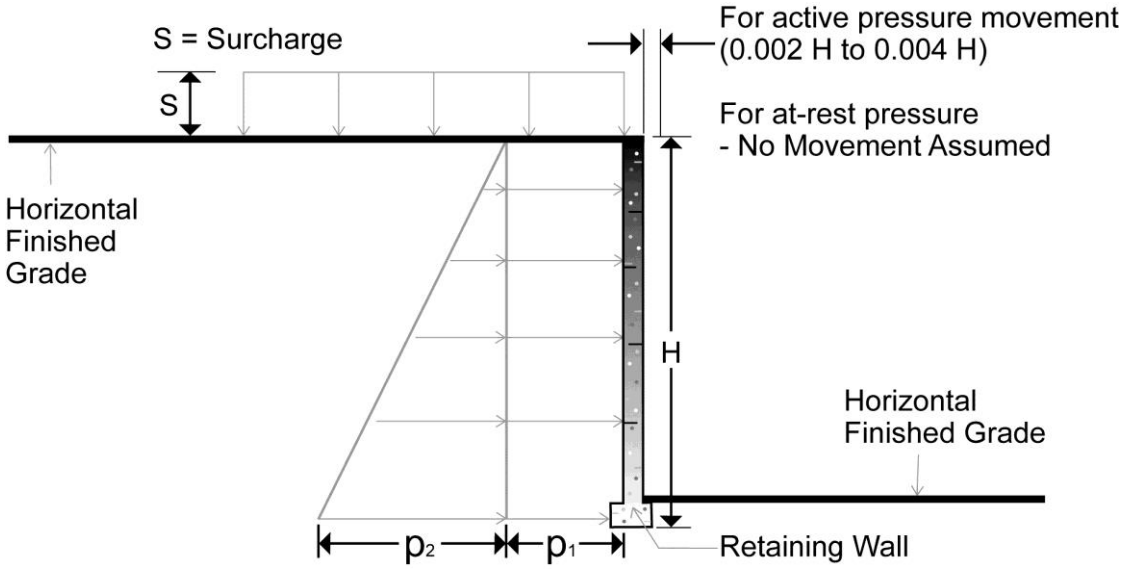
The existing fill and native soils below interior slabs-on-grade should be modified to a minimum depth of 10 feet by being overexcavated, properly moisture conditioned and compacted back to grade. Fill below slabs-on-grade should meet the material properties and compaction criteria presented in the “Compaction Requirements” section of this report.

Movements of slab-on-grades using the above recommendations will likely be reduced and tend to be more uniform. The estimate outlined in the previous section assumes that the other recommendations in this report are followed. Additional movement could occur should the subsurface soils become wetted to significant depths, which could result in potential excessive movement causing uneven floor slabs and severe cracking. This could be due to over watering of landscaping, poor drainage, improperly functioning drain systems, and/or broken utility lines. Therefore, it is imperative that the recommendations outlined in the “Grading and Drainage” section of this report be followed.

4.6 Lateral Earth Pressures

Site walls less than 4 feet in height may be necessary for development of the subject site. Reinforced concrete walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will

be influenced by structural design of the walls, conditions of wall restraint, methods of construction, compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.



EARTH PRESSURE COEFFICIENTS

Earth Pressure Conditions	Coefficient For Backfill Type	Equivalent Fluid Density (pcf)	Surcharge Pressure, p_1 (psf)	Earth Pressure, p_2 (psf)
Active (Ka)	Granular - 0.33	40	(0.33)S	(40)H
	Lean Clay - 0.47	60	(0.47)S	(60)H
At-Rest (Ko)	Granular - 0.50	60	(0.50)S	(60)H
	Lean Clay - 0.64	80	(0.64)S	(80)H
Passive (Kp)	Granular - 3.0	360	---	---
	Lean Clay - 2.1	250	---	---

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 **H** to 0.004 **H**, where **H** is wall height
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance.
- Uniform surcharge, where S is surcharge pressure
- In-situ soil backfill weight a maximum of 120 pcf

- Horizontal backfill, compacted to at least 95 percent of standard Proctor maximum dry density
- Loading from heavy compaction equipment not included
- No hydrostatic pressures acting on wall
- No dynamic loading
- No safety factor included in soil parameters

To control hydrostatic pressure behind earth-retaining walls we recommend that a drain be installed below the foundation of the wall with a collection pipe leading to a reliable discharge. If this is not possible, then combined hydrostatic and lateral earth pressures should be calculated for lean clay backfill using an equivalent fluid weighing 90 and 100 pcf for active and at-rest conditions, respectively. For granular backfill, an equivalent fluid weighing 85 and 90 pcf should be used for active and at-rest, respectively. These pressures do not include the influence of surcharge, equipment or floor loading, which should be added. Heavy equipment should not operate within a distance closer than the exposed height of retaining walls to prevent lateral pressures more than those provided.

4.7 Exterior Slabs-on-Grade

Exterior slabs-on-grade and flatwork constructed on the existing clay fill and native soils will have a moderate risk of movement. To reduce the risk of movement, we recommend at least 3 feet of the existing fill material and native soils below exterior flatwork be modified. Modification of the existing fill materials and native soils should consist of overexcavation of the existing fill and native soils to a depth of at least 3 feet, moisture conditioning and recompaction or replacement with non-expansive imports soils.

For structural design of exterior concrete slabs-on-grade, a modulus of subgrade reaction of 100 pci may be used for point or limited area loads for exterior slabs-on-grade at this site.
Additional slab design and construction recommendations are as follows:

- Positive separations and/or isolation joints should be provided between slabs and all foundations, columns or utility lines to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- Slabs should not be constructed on frozen subgrade.
- Other design and construction considerations, as outlined in Section 302.1R of the *ACI Design Manual*, are recommended.

4.8 Retaining Wall Design and Construction

We anticipate site walls less than 4 feet in height may be necessary for development of the subject site. All exposed areas which will receive fill, once properly cleared and benched, should be scarified to a minimum of 8 inches, conditioned to near optimum moisture content and compacted.

Site walls may consist of conventional cantilever or gravity concrete walls or Mechanically Stabilized Earth (MSE) walls with segmental block facing units. Conventional cantilever or gravity concrete walls should be constructed on 3 feet of modified on-site soils, as recommended for exterior flatwork. Conventional cantilever or gravity concrete walls constructed on 3 feet of modified on-site soils may be designed using an allowable bearing pressure of 2,500 psf.

Provided the owner is willing to accept some risk of movement, MSE walls may be constructed on the existing clay fill or native soils. MSE walls constructed on the existing clay fill or native soils may be designed using an allowable bearing pressure of 2,500 psf.

The amount of movement of MSE walls will depend on the amount of existing fill that remains below the walls. Movement of MSE walls on the order of 2 inches is possible at this site.

If the owner is willing to accept the risk of movement, the following design parameters may be used for design of MSE retaining walls:

Materials	Total Unit Weight, γ_{total} (pcf)	Angle of Internal Friction, Φ (degrees)
Clay Materials – Foundation and Retained	100	24
Sand Soils – Foundation and Retained	110	30
Imported Granular Soils* – Foundation and Retained	120	30
Imported Granular Soils – CDOT Class 1 – Foundation and Retained	125	34

* Imported granular soils should meet or exceed the criteria outlined in the “Earthwork” section of this report.

Based upon the engineering properties of the on-site clay fill and native soils, we recommend that an imported free-draining granular soil will be used in the reinforced zone behind the walls. We recommend the on-site soils not be placed within the reinforced zone of the MSE retaining walls. Properties of granular backfill materials to be used in the reinforced zone should be determined with additional laboratory testing including direct shear testing. We should be contacted to confirm and verify the design parameters outlined above once preliminary wall designs have been established through additional field exploration and/or laboratory testing.

We recommend "wet" utilities not be placed within the reinforced zone of the MSE retaining walls. In addition, we should be provided with final designs to assess and evaluate global stability issues of the walls prior to construction.

4.9 Retaining Wall Drainage

To reduce hydrostatic loading retaining walls, a subsurface drain system should be placed behind the walls. The drain system should consist of free-draining granular soils containing less than 10 percent fines (by weight) passing a No. 200 sieve placed adjacent to the wall. The free-draining granular material should be graded to prevent the intrusion of fines or encapsulated in a suitable filter fabric. A drainage system consisting of either weep holes or perforated drain lines (placed near the base of the wall) should be used to intercept and discharge water which would tend to saturate the backfill. Where used, drain lines should be embedded in a uniformly graded filter material and provided with adequate clean-outs for periodic maintenance. As an alternative, a prefabricated drainage structure, such as geocomposite, may be used as a substitute for the granular backfill adjacent to the wall.

4.10 Pavement Design and Construction

Pavement design for the project has been based on the procedures outlined by the Asphalt Institute (AI) and the American Concrete Institute (ACI). If improvements to public roadways are anticipated, a pavement design report meeting the City of Glenwood Springs specifications will need to be prepared for submittal, subsequent to final grading.

4.10.1 Design Traffic

We assumed the following design parameters for Asphalt Institute flexible pavement thickness design:

- Automobile Parking Areas
  - Parking stalls and parking lots for cars and pick-up trucks, up to 200 stalls
- Main Traffic Corridors
  - Parking lots with a maximum of 25 trucks per day
- Subgrade Soil Characteristics
  - USCS Classification – CL (Poor Subgrade)

We assumed the following design parameters for ACI rigid pavement thickness design based upon the average daily truck traffic (ADTT):

- Automobile Parking Areas
  - ACI Category A-1: Automobile parking with an ADTT of 1 over 20 years
- Main Traffic Corridors
  - ACI Category B: Commercial entrance and service lanes with an ADTT of 25 over 20 years

- Subgrade Soil Characteristics
  - USCS Classification – CL
- Concrete modulus of rupture value of 600 psi

The above automobile traffic areas correspond to an Equivalent (18 kip) Daily Load Applications (EDLA) of about 3 and the main traffic corridors correspond to an EDLA of about 10. We should be contacted to confirm and/or modify the recommendations contained herein if actual traffic volumes differ from the assumed values shown above.

We should be contacted to confirm and/or modify the recommendations contained herein if actual traffic volumes differ from the assumed values shown above.

4.10.2 Subgrade Soils

Based on a subgrade soil Unified Soil Classification of CL, AI classifies the subgrade soil as poor. Due to the presence of fill materials and expansive clay, we recommend overexcavating to a depth of at least 3 feet, moisture conditioning and recompacting the material to reduce potential swell/expansion of the subgrade soils.

4.10.3 Recommended Minimum Pavement Sections and Materials

Recommended alternatives for flexible and rigid pavements are summarized for each traffic area as follows:

Traffic Area	Alternative	Recommended Pavement Thickness (inches)			
		Asphalt Concrete Surface	Aggregate Base Course	Portland Cement Concrete	Total
Automobile Parking (AI Class I and ACI Category A)	A	6			6
	B	4	8		12
	C[1]			5*	5*
Main Traffic Corridors (AI Class III and ACI Category B)	A	7-1/2			7-1/2
	B	5-1/2	10		15-1/2
	C[1]			6	6

1. The minimum pavement section thickness per AASHTO.

* Minimum pavement section thickness per ACI

For areas subject to concentrated and repetitive loading conditions such as dumpster pads, truck delivery docks and ingress/egress aprons, we recommend using a portland cement concrete pavement with a thickness of at least 7 inches underlain by at least 4 inches of crushed stone. Prior to placement of the crushed stone, the areas should be thoroughly proofrolled. For dumpster pads, the concrete pavement area should be large enough to support the container and tipping axle of the refuse truck.

For analysis of pavement costs, the following specifications should be considered for each pavement component:

Pavement Component	Colorado Department of Transportation Criteria
Asphalt Concrete Surface	Grading S or SX
Aggregate Base Course	Class 5 or 6
Portland Cement Concrete	Class P

4.10.4 Drainage Adjacent to Pavements

Clay subgrade materials will expand and/or lose stability with increases in moisture content. Therefore, to reduce pavement distress due to wetting of the subgrade in areas of water intensive landscaping or other nearby water sources (or if aggregate base course is used) located adjacent to pavements, we recommend edge drains be considered. The drain system should consist of a properly sized pipe embedded in free-draining material directed to a suitable outfall such as an underdrain or storm sewer.

4.10.5 Construction Considerations

Site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, or rainfall. As a result, the pavement subgrade may not be suitable for pavement construction and corrective action will be required. The subgrade should be carefully evaluated at the time of pavement construction for signs of disturbance or excessive rutting. If disturbance has occurred, pavement subgrade areas should be reworked, moisture conditioned, and properly compacted to the recommendations in this report immediately prior to paving.

We recommend the pavement areas be rough graded and then thoroughly proof rolled with a loaded tandem axle dump truck prior to final grading and paving. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills. All pavement areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to paving.

The placement of a partial pavement thickness for use during construction is not recommended without a detailed pavement analysis incorporating construction traffic. In addition, if the actual traffic varies from the assumptions outlined above, we should be contacted to confirm and/or modify the pavement thickness recommendations outlined above.

4.10.6 Compliance

Recommendations for pavement design and construction presented in this report depend upon compliance with recommended material specifications. To assess compliance, observation and testing should be performed under the observation of the geotechnical engineer.

4.10.7 Pavement Performance

Future performance of pavements constructed on the native sand soils and underlying clay at this site will be dependent upon several factors, including:

- Maintaining stable moisture content of the subgrade soils both before and after pavement construction.
- Providing for a planned program of preventative maintenance.

Since the clay fill on the site has shrink/swell characteristics, pavements could crack in the future because of expansion of the bedrock when subjected to an increase in moisture content. The cracking, while not desirable, does not necessarily constitute structural failure of the pavement, provided that timely maintenance, such as crack sealing is performed. Excessive movement and cracking could result if the subgrade soils are allowed to dry out before paving and subsequently become rewetted.

The performance of all pavements can be enhanced by minimizing excess moisture, which can reach the subgrade soils. The following recommendations should be considered at minimum:

- Site grading at a minimum 2 percent grade onto or away from the pavements.
- Water should not be allowed to pond behind curbs.
- Compaction of any utility trenches for landscaped areas to the same criteria as the pavement subgrade.
- Sealing all landscaped areas in or adjacent to pavements to minimize or prevent moisture migration to subgrade soils.
- Placing compacted cohesive backfill against the exterior side of curb and gutter.
- Placing curb, gutter and/or sidewalk directly on subgrade soils without the use of base course materials.
- Placing shoulder or edge drains in pavement areas adjacent to water sources.

Preventative maintenance should be planned and provided for an ongoing pavement management program in order to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment.

Preventative maintenance consists of both localized maintenance (e.g. crack sealing and patching) and global maintenance (e.g. surface sealing). Preventative maintenance is usually the first priority when implementing a planned pavement maintenance program and provides the highest return on investment for pavements.

5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A

FIELD EXPLORATION

Field Exploration Description

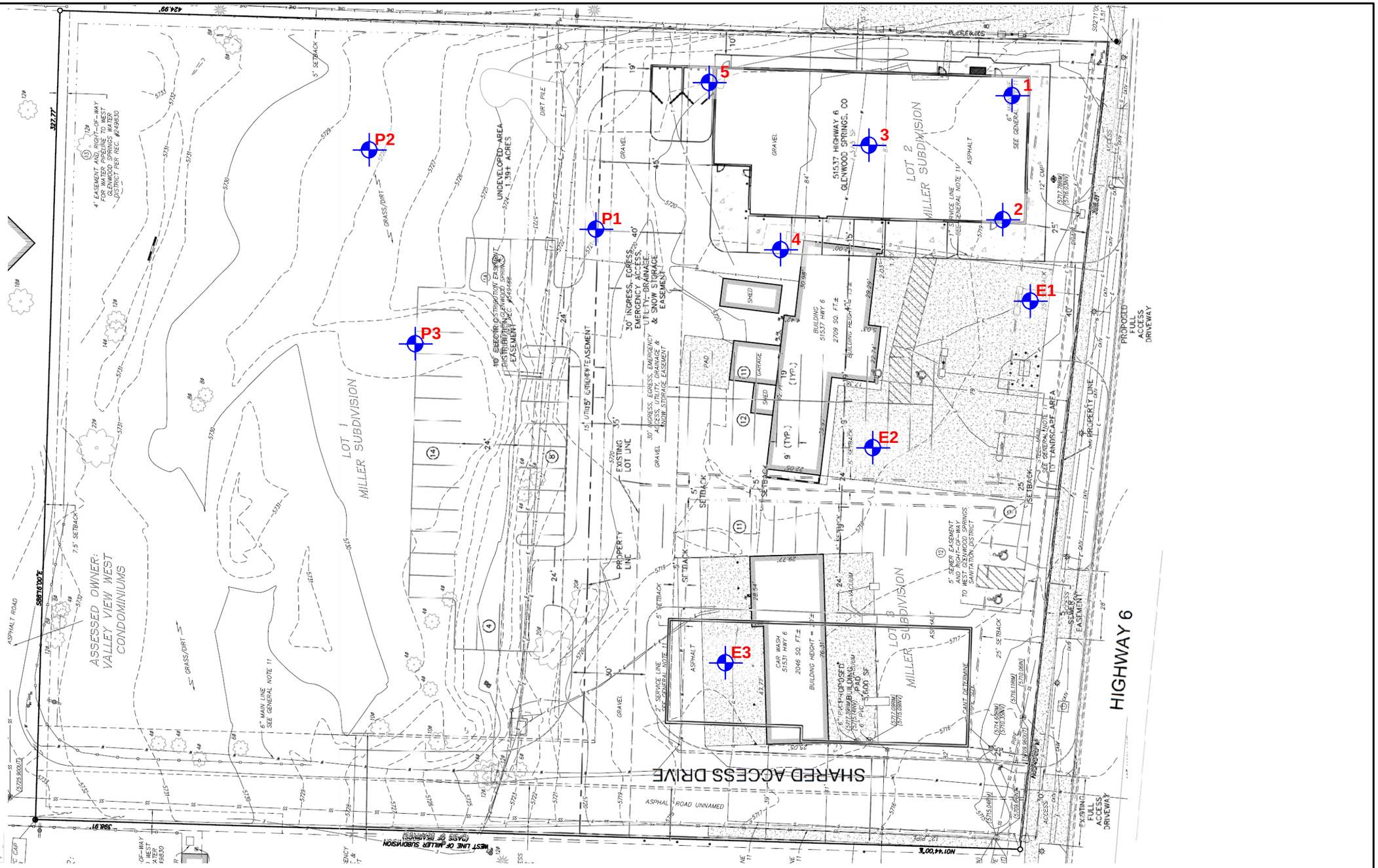
The locations of borings were based on the provided site plan. The borings were located in the field by measuring with a wheel from property lines and/or existing site features. The accuracy of the boring locations should only be assumed to the level implied by the methods used.

The borings were drilled with a Geoprobe track-mounted drill rig with solid-stem augers. During the drilling operations, lithologic logs of the borings were recorded by the field engineer. Relatively undisturbed samples were obtained at selected intervals utilizing a 3-inch outside diameter ring barrel sampler (RS) and a 2-1/2 inch outside diameter split-spoon sampler (SS). Penetration resistance values were recorded in a manner similar to the standard penetration test (SPT). This test consists of driving the sampler into the ground with a 140-pound hammer free-falling through a distance of 30 inches. The number of blows required to advance the ring-barrel sampler 12 inches (18-inches for standard split-spoon samplers, final 12-inches are recorded) or the interval indicated, is recorded and can be correlated to the standard penetration resistance value (N-value). The blow count values are indicated on the boring logs at the respective sample depths, ring barrel sample blow counts are not considered N-values.

A CME automatic SPT hammer was used to advance the samplers in some of the borings performed on this site. A greater efficiency is typically achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. Published correlations between the SPT values and soil properties are based on the lower efficiency cathead and rope method. This higher efficiency affects the standard penetration resistance blow count value by increasing the penetration per hammer blow over what would be obtained using the cathead and rope method. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The standard penetration test provides a reasonable indication of the in-place density of sandy type materials, but only provides an indication of the relative stiffness of cohesive materials since the blow count in these soils may be affected by the soils moisture content. In addition, considerable care should be exercised in interpreting the N-values in gravelly soils, particularly where the size of the gravel particle exceeds the inside diameter of the sampler.

Groundwater measurements were obtained in the borings at the time of drilling. Due to safety reasons, borings were backfilled immediately after measuring the initial groundwater levels. The borings were backfilled with auger cuttings and patched with asphalt. Some settlement of the backfill and patches may occur and should be repaired as soon as possible.


P1
P2
P3
1
2
3
4
5
E1
E2
E3
LOT 1
MILLER SUBDIVISION
LOT 2
MILLER SUBDIVISION
LOT 3
MILLER SUBDIVISION
51537 HIGHWAY 6
GLENWOOD SPRINGS, CO
BUILDING
51537 HWY 6
2709 SQ. FT.±
CAR WASH
51531 HWY 6
2046 SQ. FT.±
PROPOSED
BUILDING
PAD
5,600 SF
UNDEVELOPED AREA
1.39± ACRES
ASSESSED OWNER:
VALLEY VIEW WEST
CONDOMINIUMS
PROPOSED
FULL
ACCESS
DRIVEWAY
EXISTING
FULL
ACCESS
DRIVEWAY
SHARED ACCESS DRIVE
HIGHWAY 6
ASPHALT ROAD UNNAMED
ASPHALT ROAD
PROPERTY LINE
EXISTING
LOT LINE
GRAVEL
ASPHALT
GRASS/DIRT
DIRT PILE
SHED
PAD
GARAGE
SETBACK
5' SETBACK
7.5' SETBACK
25' SETBACK
30' INGRESS, EGRESS, EMERGENCY ACCESS, UTILITY, DRAINAGE & SNOW STORAGE EASEMENT
15' UTILITY EASEMENT
10' ELECTRIC DISTRIBUTION EASEMENT
4' EASEMENT AND RIGHT-OF-WAY FOR INTERSTATE WEST
5' SEWER EASEMENT AND RIGHT-OF-WAY TO GLENWOOD SPRINGS SANITATION DISTRICT
SEE GENERAL NOTE 11
SEE GENERAL NOTE 1
SEE GENERAL NOTE 11
SEE GENERAL NOTE 11
6" MAIN LINE
SEE GENERAL NOTE 11
2" SERVICE LINE
SEE GENERAL NOTE 11
1" SERVICE LINE
SEE GENERAL NOTE 11
SEE GENERAL NOTE 11
SEE GENERAL NOTE 11

BORING LOG NO. 1

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5719 (Ft.)

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.5	5718.5	**ASPHALT**, (About 6 inches)
		FILL - LEAN CLAY (CL), brown, medium stiff
6.0	5713	**SILTY SAND (SM)**, fine to coarse grained, with gravel and cobbles, tan, (possibly highly weathered silty sandstone)
13.0	5706	***Refusal at 13 Feet***

DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		12	3-6		22	102		
5		12	3-4	-0.3 @ 500 psf	19	89		
10		12						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings and patched with asphalt

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered while drilling

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

BORING LOG NO. 2

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5719 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.5	5718.5	**ASPHALT**, (About 6 inches)										
		FILL - LEAN CLAY (CL), brown, medium stiff to stiff										
						12	3-3		23	99	32-20-12	89
						12	5-11		24	99		
6.0	5713		5									
		SILTY SAND, fine to coarse grained, with clay, gravel and cobbles, tan, loose, (possibly highly weathered silty sandstone)										
						12	6-7	+0.1 @ 500 psf	32	86		
13.0	5706		10									
		SILTY SANDSTONE, fine grained, tan, very hard, weakly cemented										
15.0	5704					3	50/3"					
		Refusal at 15 Feet	15									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings and patched with asphalt

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered while drilling

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

BORING LOG NO. 3

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5719 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.5	5718.5	**ASPHALT**, (About 6 inches)
		FILL - SANDY LEAN CLAY (CL), with gravel, brown, very stiff
4.5	5714.5	**SILTY SAND**, fine to coarse grained, with gravel and cobbles, light brown, very loose to medium dense, (possibly highly weathered silty sandstone)
18.0	5701	**SILTY SANDSTONE**, fine to medium grained, light brown, very hard, weakly cemented
20.0	5699	***Boring Terminated at 20 Feet***

DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		12	9-13		10	75		
					38	77	NP	14
5								
		12	8-12	-0.7 @ 500 psf	11	83		
10								
		12	3-2					
15								
		3	50/3"					
20								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings and patched with asphalt

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered while drilling

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

BORING LOG NO. 4

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5719 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.3	5718.5	**ASPHALT**, (About 4 inches)
		FILL - SANDY LEAN CLAY (CL), brown, medium stiff
4.0	5715	
		SILTY SAND, fine to coarse grained, with gravel and cobbles, brown to light brown, loose to medium dense, (possibly highly weathered silty sandstone)
18.0	5701	
		SILTY SANDSTONE, fine to coarse grained, with gravel, brown, very hard, weakly cemented
20.0	5699	
		Boring Terminated at 20 Feet

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
			12	3-2					
5			12	7-10		9	82		
10			12	8-15		9	87		
15			12	5-6	-0.6 @ 500 psf	26	85		
20			11	17-50/5"					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings and patched with asphalt

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered while drilling

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

BORING LOG NO. 5

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5720 (Ft.)

DEPTH	ELEVATION (Ft.)
0.4	5719.5
22.0	5698

ASPHALT, (About 5 inches)

SILTY GRAVEL, fine to coarse grained, with sand and cobbles, brown to light brown, very loose to dense, (possibly highly weathered silty sandstone)

Refusal at 22 Feet

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
			12	3-3		8	79		
			12	6-15	-0.3 @ 500 psf	7	107		
5									
			12	45-30					
10									
			12	1/12"		21		NP	40
15									
			12	1-12					
20	▽								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings and patched with asphalt

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *21 feet while drilling*

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

BORING LOG NO. P1

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5721 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	LEAN CLAY (CL), with sand, brown, very stiff										
					12	4-22	+0.8 @ 200 psf	11	120		
3.5	5717.5										
	SILTY SAND, fine to coarse grained, with gravel and cobbles, light brown, loose, (possibly highly weathered silty sandstone)										
		5			12	4-4		1			
8.0	5713										
	Refusal at 8 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered while drilling

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

BORING LOG NO. P2

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5728 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SANDY LEAN CLAY (CL), brown, very stiff										
					12	11-17	-0.6 @ 200 psf	4	89		
4.5	5723.5										
5.0	**SILTY SANDSTONE**, fine to medium grained, light brown, very hard, weakly cemented 5723	5			12	6-50/4"		6	92		
	Boring Terminated at 5 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered while drilling

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

BORING LOG NO. P3

PROJECT: Proposed Discount Tire - COD 10354

CLIENT: AMEC Environmental & Infrastructure, Inc.

SITE: 51620 Highway 6
Glenwood Springs, Colorado

LOCATION See Exhibit A-2

Surface Elev.: 5729 (Ft.)

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SANDY LEAN CLAY (CL), brown, very stiff										
						12	8-12					
4.0	5725											
		SILTY GRAVEL, fine to coarse grained, with sand and cobbles, light brown, loose				12	4-14	-1.2 @ 200 psf	3	103	NP	24
			5									
8.0	5721											
		SILTY SANDSTONE, fine to medium grained, light brown, very hard, moderately cemented				5	50/5"					
10.0	5719		10									
		Boring Terminated at 10 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem auger

Abandonment Method:
Backfilled with auger cuttings

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered while drilling

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

Boring Started: 12/17/2014 | Boring Completed: 12/17/2014

Drill Rig: Geoprobe | Driller:

Project No.: 25135106 | Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25135106.GPJ TERRACON_STD_TEMPLATE.GDT 1/7/14

APPENDIX B

LABORATORY TESTING

Laboratory Testing

Samples retrieved during the field exploration were returned to the laboratory for observation by the project geotechnical engineer, and were classified in general accordance with the Unified Soil Classification System described in Appendix C.

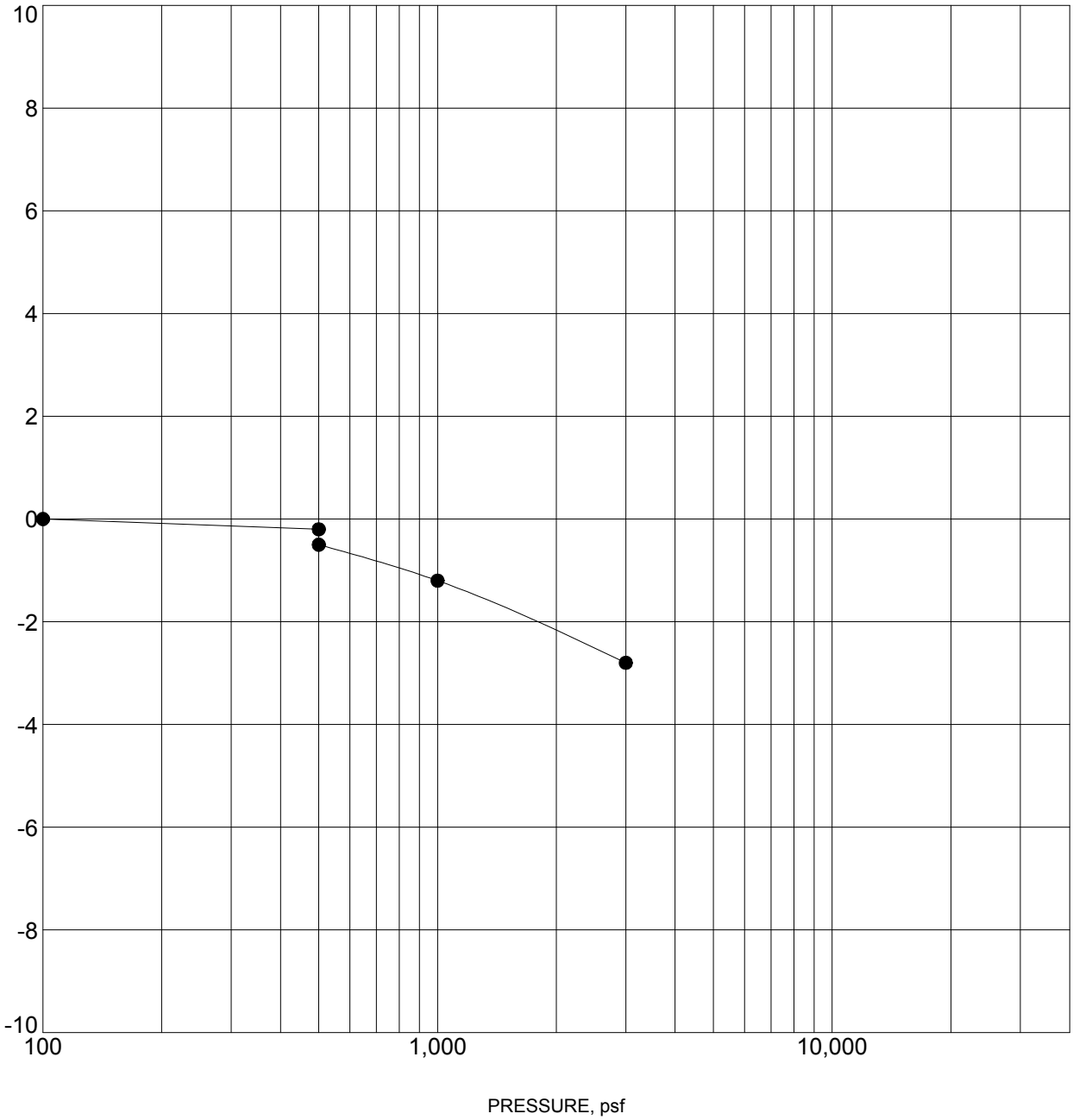
An applicable laboratory-testing program was formulated to determine engineering properties of the subsurface materials. Following the completion of the laboratory testing, the field descriptions were confirmed or modified as necessary, and Boring Logs were prepared. These logs are included in Appendix A.

Laboratory test results are included in Appendix B. These results were used for the geotechnical engineering analyses and the development of foundation and earthwork recommendations. All laboratory tests were performed in general accordance with the applicable local or other accepted standards.

Selected soil samples were tested for the following engineering properties:

- Water content
- Dry density
- Grain size
- Atterberg limits
- Swell/consolidation
- Water soluble sulfate content

SWELL CONSOLIDATION TEST



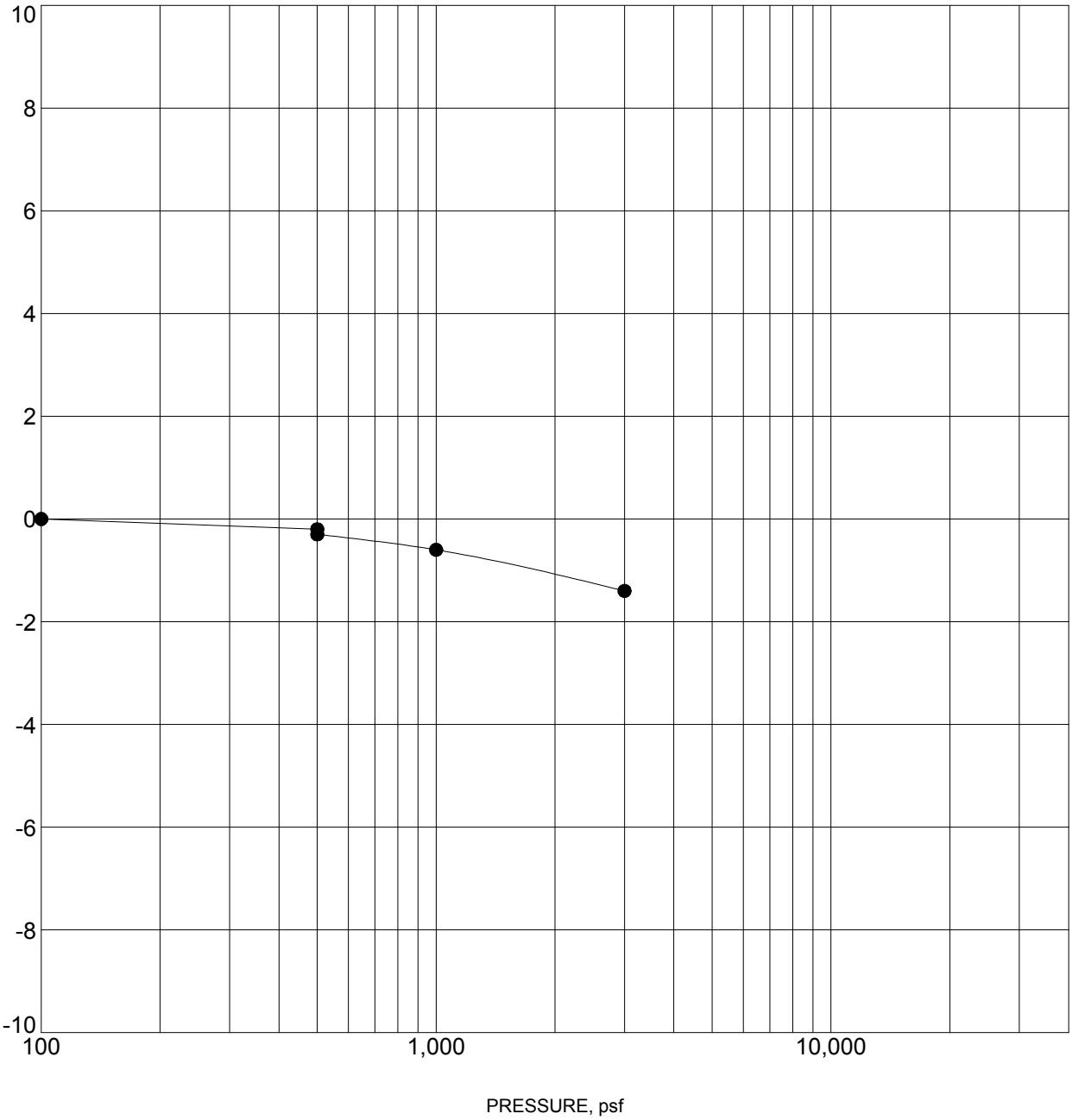
Specimen Identification			Classification	γ_d, pcf	WC, %
●	1	4.0 ft	FILL, LEAN CLAY	89	19

NOTES:

PROJECT: Proposed Discount Tire - COD 10354	Terracon	PROJECT NUMBER: 25135106
SITE: 51620 Highway 6 Glenwood Springs, Colorado	10625 W I-70 Frontage Road N., Ste. 3 Wheat Ridge, Colorado	CLIENT: AMEC Environmental & Infrastructure, Inc.
		EXHIBIT: B-2

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

SWELL CONSOLIDATION TEST



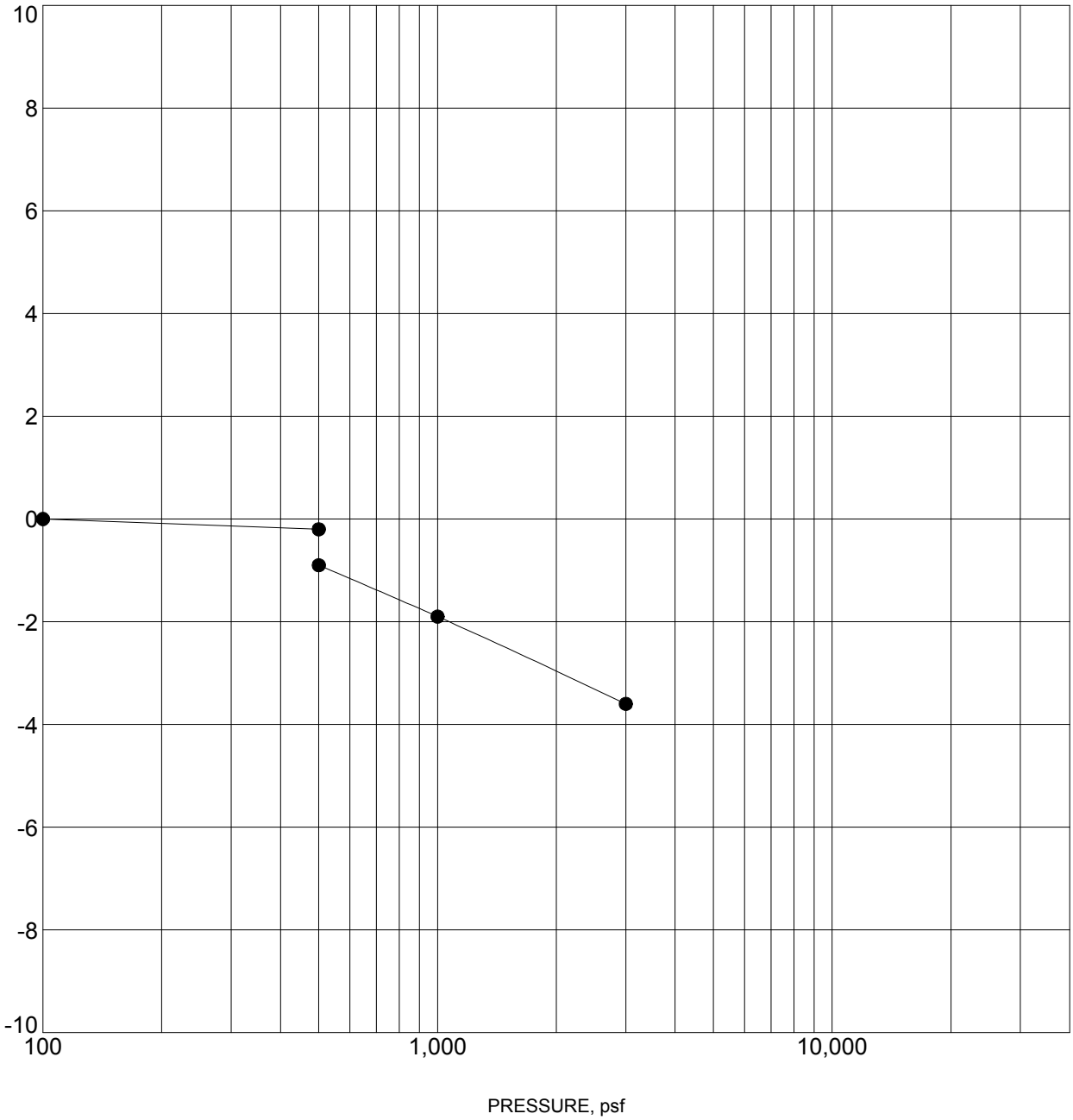
Specimen Identification			Classification	γ_d, pcf	WC, %
●	2	9.0 ft	SILTY SAND WITH GRAVEL	86	32

NOTES:

PROJECT: Proposed Discount Tire - COD 10354	Terracon	PROJECT NUMBER: 25135106
SITE: 51620 Highway 6 Glenwood Springs, Colorado	10625 W I-70 Frontage Road N., Ste. 3 Wheat Ridge, Colorado	CLIENT: AMEC Environmental & Infrastructure, Inc.
		EXHIBIT: B-3

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

SWELL CONSOLIDATION TEST



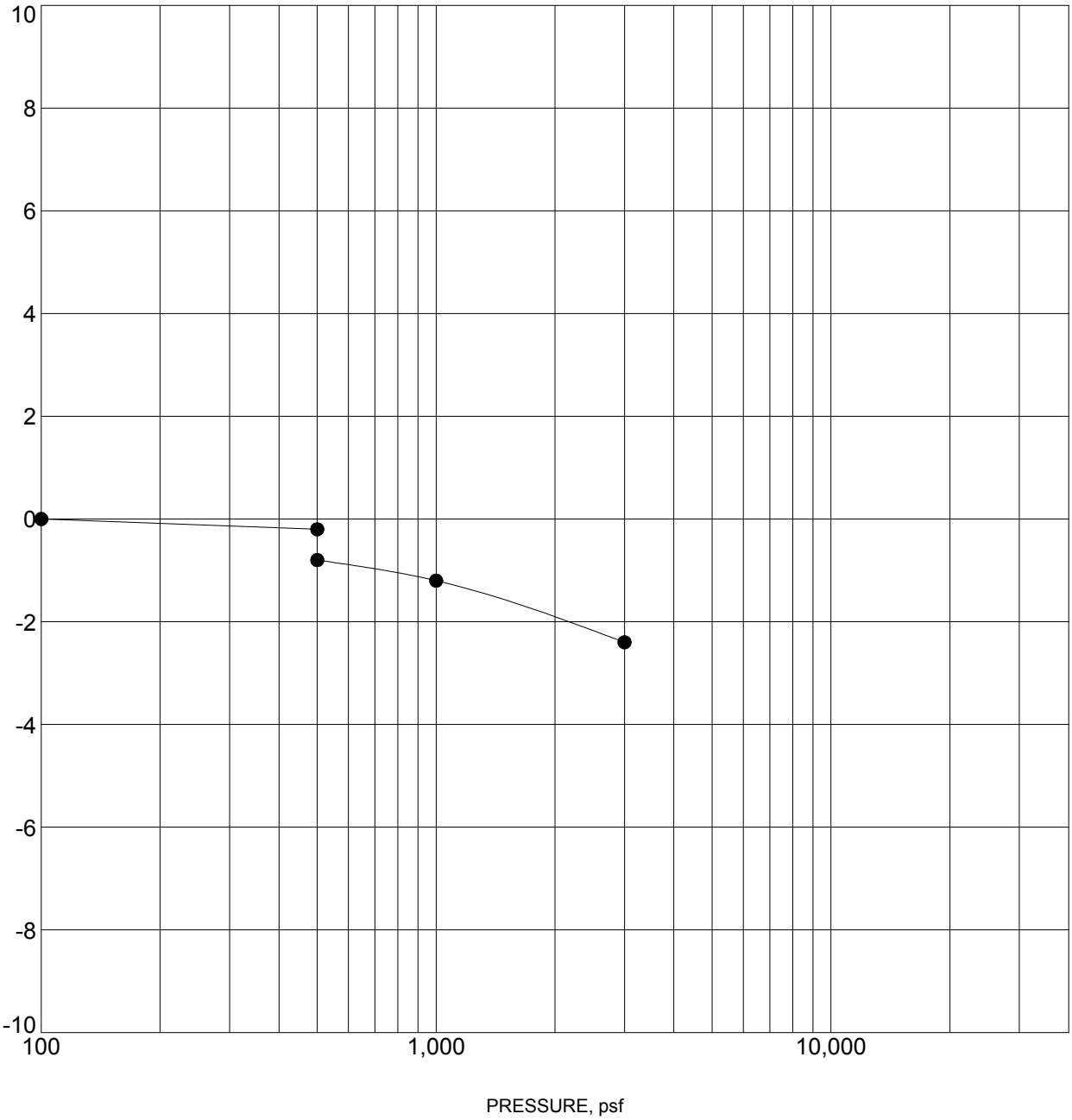
Specimen Identification			Classification	γ_d, pcf	WC, %
●	3	9.0 ft	SILTY SAND WITH GRAVEL	83	11

NOTES:

PROJECT: Proposed Discount Tire - COD 10354	Terracon	PROJECT NUMBER: 25135106
SITE: 51620 Highway 6 Glenwood Springs, Colorado	10625 W I-70 Frontage Road N., Ste. 3 Wheat Ridge, Colorado	CLIENT: AMEC Environmental & Infrastructure, Inc.
		EXHIBIT: B-4

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

SWELL CONSOLIDATION TEST



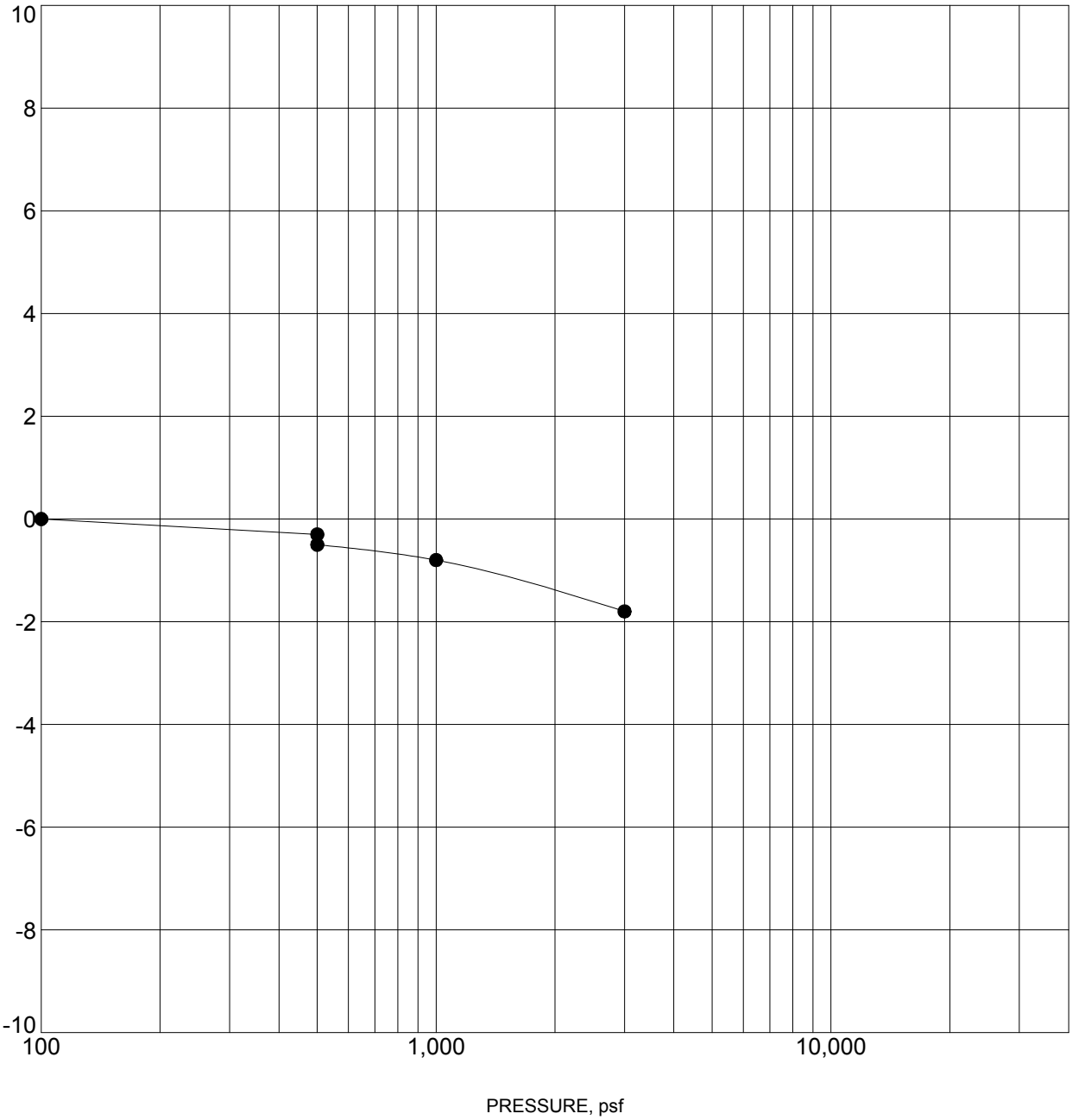
Specimen Identification			Classification	γ_d, pcf	WC, %
●	4	14.0 ft	SILTY SAND WITH GRAVEL	85	26

NOTES:

PROJECT: Proposed Discount Tire - COD 10354	Terracon	PROJECT NUMBER: 25135106
SITE: 51620 Highway 6 Glenwood Springs, Colorado	10625 W I-70 Frontage Road N., Ste. 3 Wheat Ridge, Colorado	CLIENT: AMEC Environmental & Infrastructure, Inc.
		EXHIBIT: B-5

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

SWELL CONSOLIDATION TEST



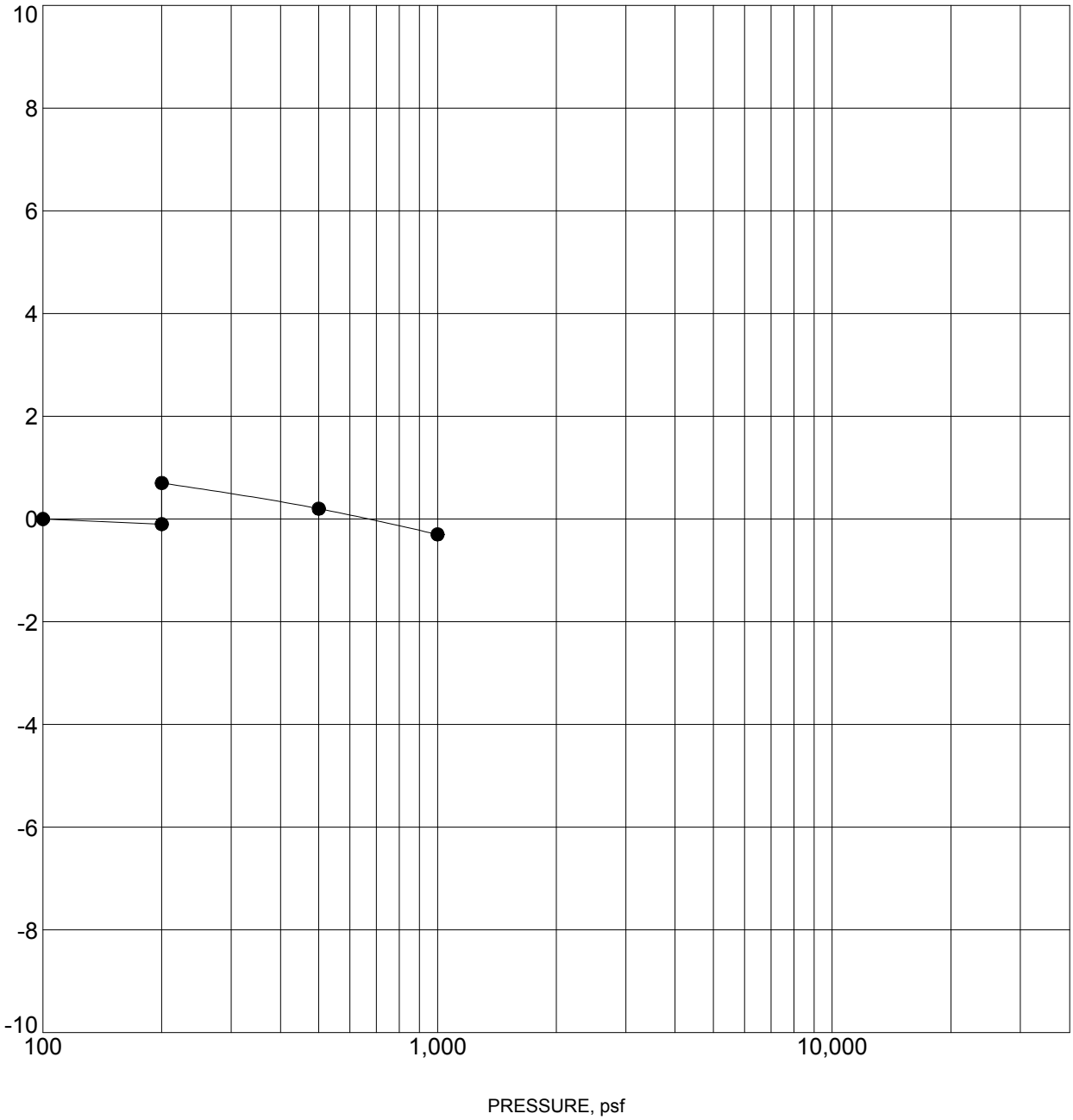
Specimen Identification		Classification	γ_d, pcf	WC, %
● 5	4.0 ft	SILTY GRAVEL WITH SAND	87	14

NOTES:

PROJECT: Proposed Discount Tire - COD 10354	Terracon	PROJECT NUMBER: 25135106
SITE: 51620 Highway 6 Glenwood Springs, Colorado	10625 W I-70 Frontage Road N., Ste. 3 Wheat Ridge, Colorado	CLIENT: AMEC Environmental & Infrastructure, Inc.
		EXHIBIT: B-6

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

SWELL CONSOLIDATION TEST



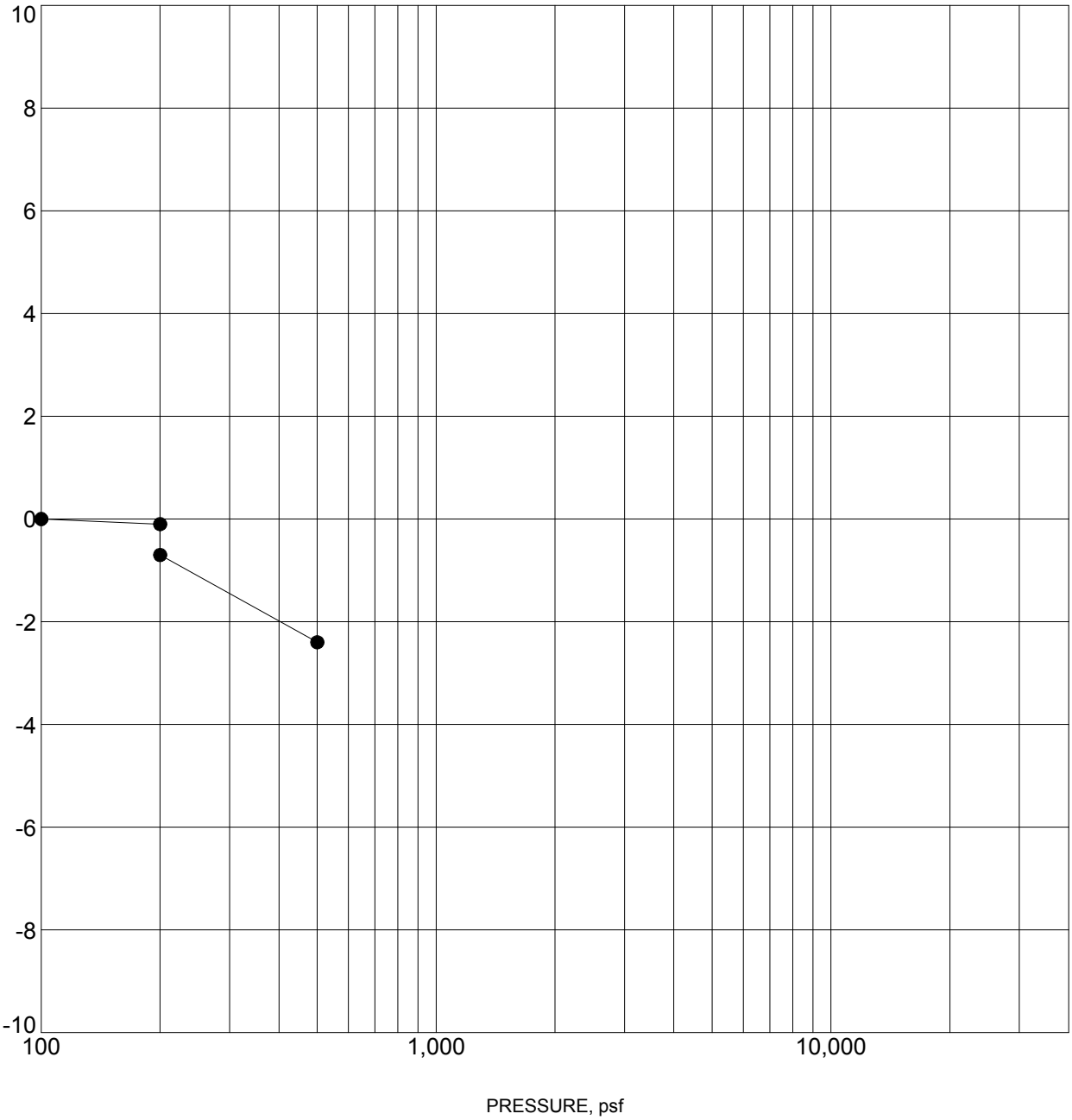
Specimen Identification		Classification	γ_d, pcf	WC, %
● P1 2.0 ft		LEAN CLAY	120	11

NOTES:

PROJECT: Proposed Discount Tire - COD 10354	Terracon	PROJECT NUMBER: 25135106
SITE: 51620 Highway 6 Glenwood Springs, Colorado	10625 W I-70 Frontage Road N., Ste. 3 Wheat Ridge, Colorado	CLIENT: AMEC Environmental & Infrastructure, Inc.
		EXHIBIT: B-7

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

SWELL CONSOLIDATION TEST



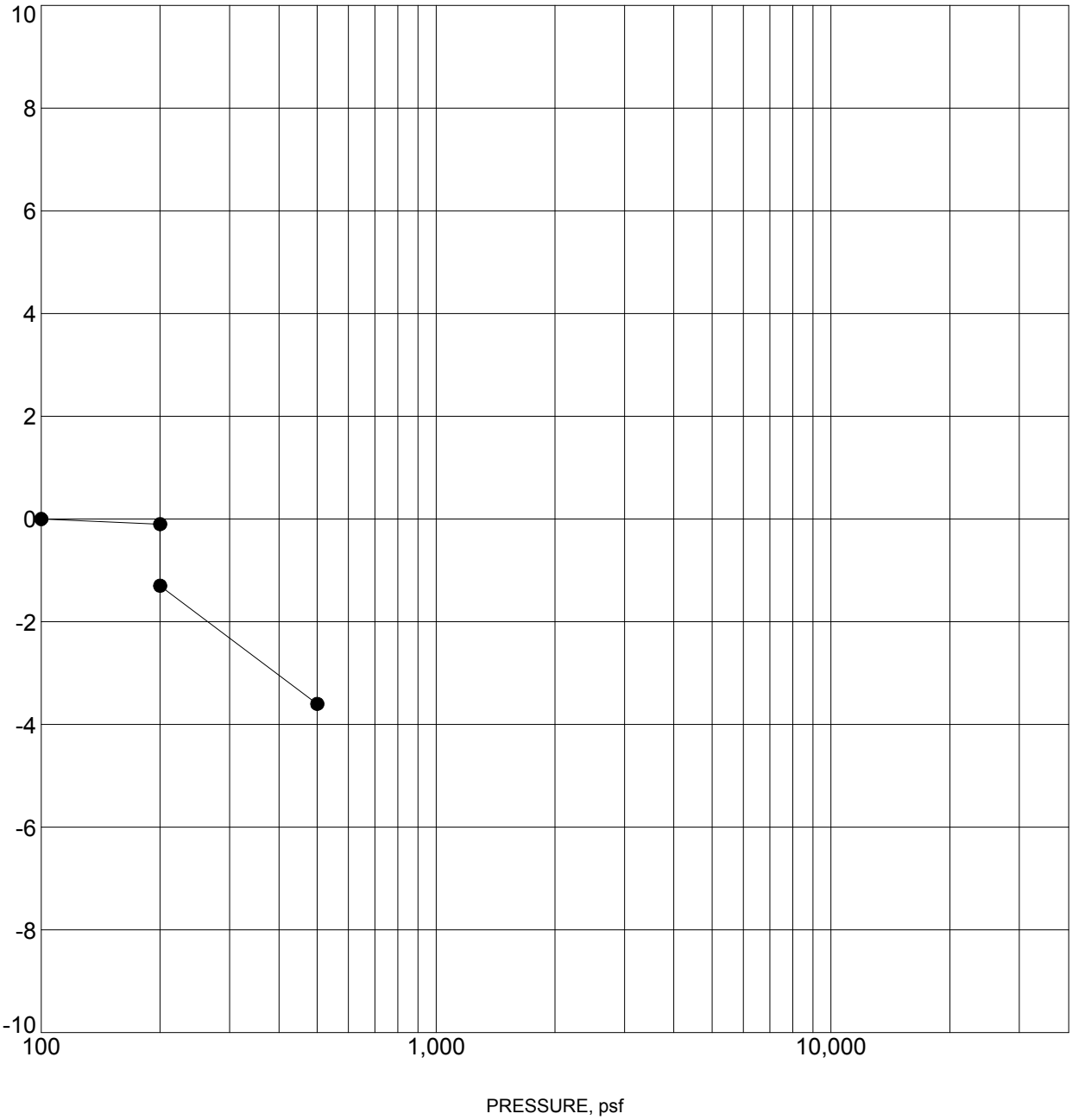
Specimen Identification		Classification	γ_d, pcf	WC, %
●	P2 2.0 ft	SANDY LEAN CLAY	89	4

NOTES: Disturbed sample

PROJECT: Proposed Discount Tire - COD 10354	Terracon	PROJECT NUMBER: 25135106
SITE: 51620 Highway 6 Glenwood Springs, Colorado	10625 W I-70 Frontage Road N., Ste. 3 Wheat Ridge, Colorado	CLIENT: AMEC Environmental & Infrastructure, Inc.
		EXHIBIT: B-8

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

SWELL CONSOLIDATION TEST



Specimen Identification			Classification	γ_d, pcf	WC, %
●	P3	4.0 ft	SILTY GRAVEL WITH SAND	103	3

NOTES: Disturbed sample

PROJECT: Proposed Discount Tire - COD 10354

SITE: 51620 Highway 6
Glenwood Springs, Colorado

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

PROJECT NUMBER: 25135106

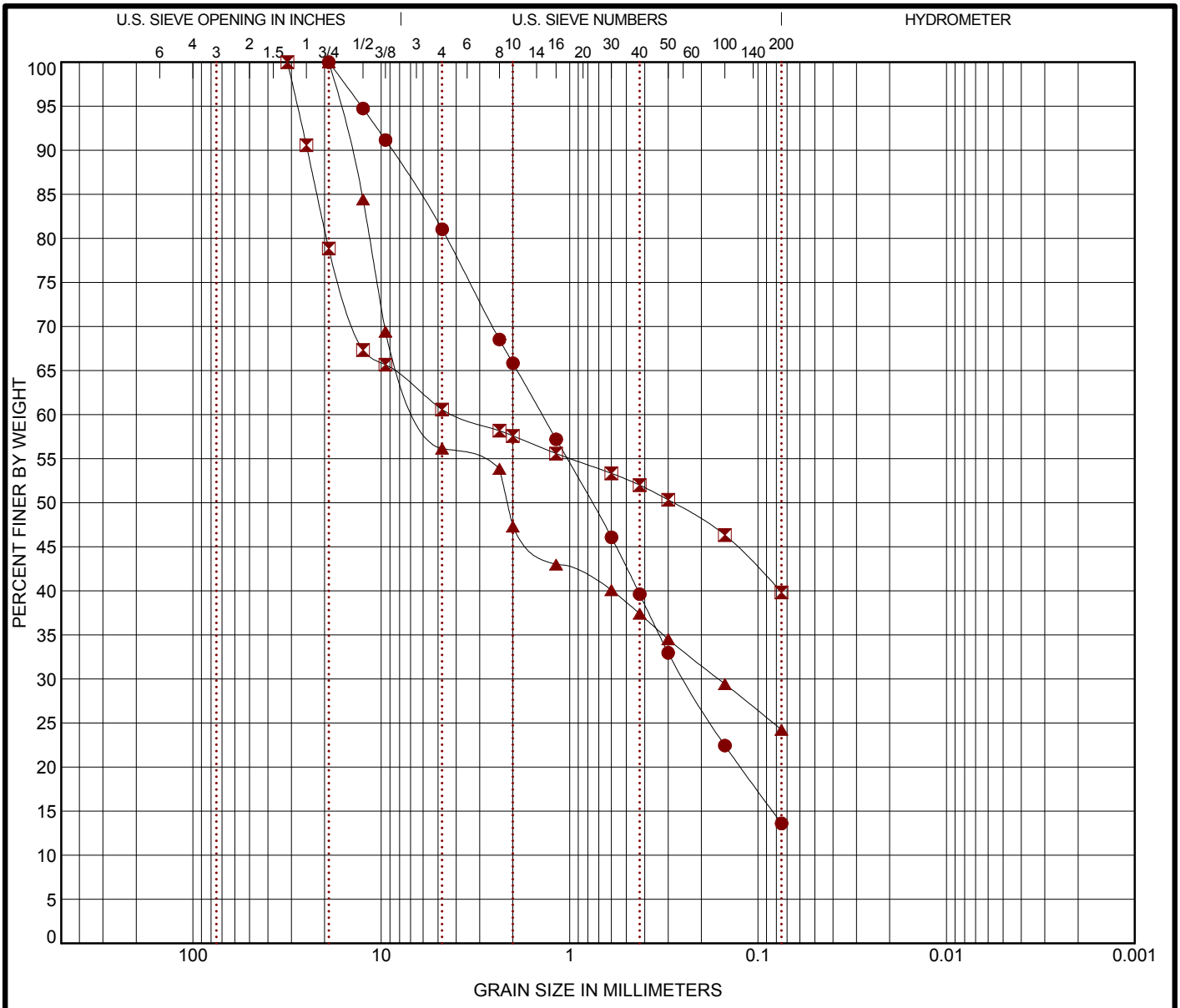
CLIENT: AMEC Environmental & Infrastructure, Inc.

EXHIBIT: B-9

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. TC_CONSOL_STRAIN-USCS-NO ASTM 25135106.GPJ TERRACON2012.GDT 1/7/14

GRAIN SIZE DISTRIBUTION

ASTM D422



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth	USCS Classification	AASHTO Classification	LL	PL	PI	Cc	Cu
●	3	4.0	SILTY SAND with GRAVEL(SM)	0(A-1-b)	NP	NP	NP		
⊠	5	14.0	SILTY GRAVEL with SAND(GM)	0(A-4)	NP	NP	NP		
▲	P3	4.0	SILTY GRAVEL WITH SAND	SILTY GRAVEL WITH SAND	NP	NP	NP		

	Boring ID	Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Silt	%Clay
●	3	4.0	19	1.4	0.247		19.0	67.4	13.6	
⊠	5	14.0	31.5	4.012			39.4	20.7	39.8	
▲	P3	4.0	19	5.807	0.162		43.8	31.9	24.2	

PROJECT: Proposed Discount Tire - COD 10354

SITE: 51620 Highway 6
Glenwood Springs, Colorado

Terracon
10625 W I-70 Frontage Road N., Ste. 3
Wheat Ridge, Colorado

PROJECT NUMBER: 25135106

CLIENT: AMEC Environmental & Infrastructure, Inc.

EXHIBIT: B-10

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS & AASHTO COMBINED 25135106.GPJ TERRACON2012.GDT 1/7/14

SUMMARY OF LABORATORY TEST RESULTS

Proposed Discount Tire - COD 10354, Glenwood Springs, Colorado

Terracon Project No. 25135106

Boring No.	Depth (ft.)	USCS Soil Classification	Initial Dry Density (pcf)	Initial Water Content (%)	Swell/Consolidation		Particle Size Distribution, Percent Passing by Weight					Atterberg Limits		Water Soluble Sulfates (mg/l)	Remarks
					Surcharge (ksf)	Swell (%)	3/4"	#4	#16	#40	#200	LL	PI		
1	2	CL	102	22											4
1	4	CL	89	19	0.5	-0.3									3, 4
2	2	CL	99	23							89	32	12		4, 5
2	4	CL	99	24											4
2	9	SM	86	32	0.5	+0.1									3, 4
3	2	CL	75	10											4
3	4	SM	77	38			100	81	57	40	14	NV	NP	7	4
3	9	SM	83	11	0.5	-0.7									3, 4
4	4	SM	82	9											4
4	9	SM	87	9											4
4	14	SM	85	26	0.5	-0.6									3, 4
5	2	GM	79	8											4
5	4	GM	107	7	0.5	-0.3									3, 4
5	14	GM		21			100	61	56	52	40	NV	NP		4
P1	2	CL	120	11	0.2	+0.8									3, 4
P1	4	SM		1											4

Notes:
Initial Dry Density, Initial Water Content, and Swell/Consolidation values obtained from undisturbed samples unless otherwise noted
* = Partially disturbed sample
- = Compression/settlement
NV = no value
NP = non-plastic

REMARKS

1 Remolded Compacted density (approximately 96% of ASTM D698 maximum density at 2% above optimum moisture content)
2 Remolded Compacted density (approximately 95% of ASTM D1557 maximum density near optimum)
3 Submerged to approximate saturation
4 Dry density and/or moisture content determined from one ring of a multi-ring sample
5 Minus #200 Only

Exhibit B-11

Terracon

SUMMARY OF LABORATORY TEST RESULTS

Proposed Discount Tire - COD 10354, Glenwood Springs, Colorado

Terracon Project No. 25135106

Boring No.	Depth (ft.)	USCS Soil Classification	Initial Dry Density (pcf)	Initial Water Content (%)	Swell/Consolidation		Particle Size Distribution, Percent Passing by Weight					Atterberg Limits		Water Soluble Sulfates (mg/l)	Remarks
					Surcharge (ksf)	Swell (%)	3/4"	#4	#16	#40	#200	LL	PI		
P2	2	CL	89	4	0.2	-0.6									3, 4
P2	4		92	6											4
P3	4	GM	103	3	0.2	-1.2	100	56	43	37	24	NV	NP	40	3, 4

Notes:
Initial Dry Density, Initial Water Content, and Swell/Consolidation values obtained from undisturbed samples unless otherwise noted
* = Partially disturbed sample
- = Compression/settlement
NV = no value
NP = non-plastic

REMARKS
1 Remolded Compacted density (approximately 96% of ASTM D698 maximum density at 2% above optimum moisture content)
2 Remolded Compacted density (approximately 95% of ASTM D1557 maximum density near optimum)
3 Submerged to approximate saturation
4 Dry density and/or moisture content determined from one ring of a multi-ring sample
5 Minus #200 Only

Exhibit B-12

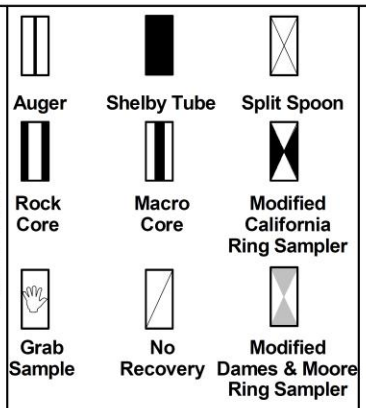
Terracon

APPENDIX C
SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



WATER LEVEL

- Water Initially Encountered
- Water Level After a Specified Period of Time
- Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
N	N value
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance				BEDROCK		
Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Ring Sampler Blows/Ft.	Standard Penetration or N-Value Blows/Ft.	Descriptive Term (Consistency)
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3	< 30	< 20	Weathered
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4	30 - 49	20 - 29	Firm
Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	5 - 7	5 - 9	50 - 89	30 - 49	Medium Hard
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 14	10 - 18	90 - 119	50 - 79	Hard
Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42	> 119	>79	Very Hard
			Hard	> 8,000	> 30	> 42			

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] 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.

[D] 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

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.

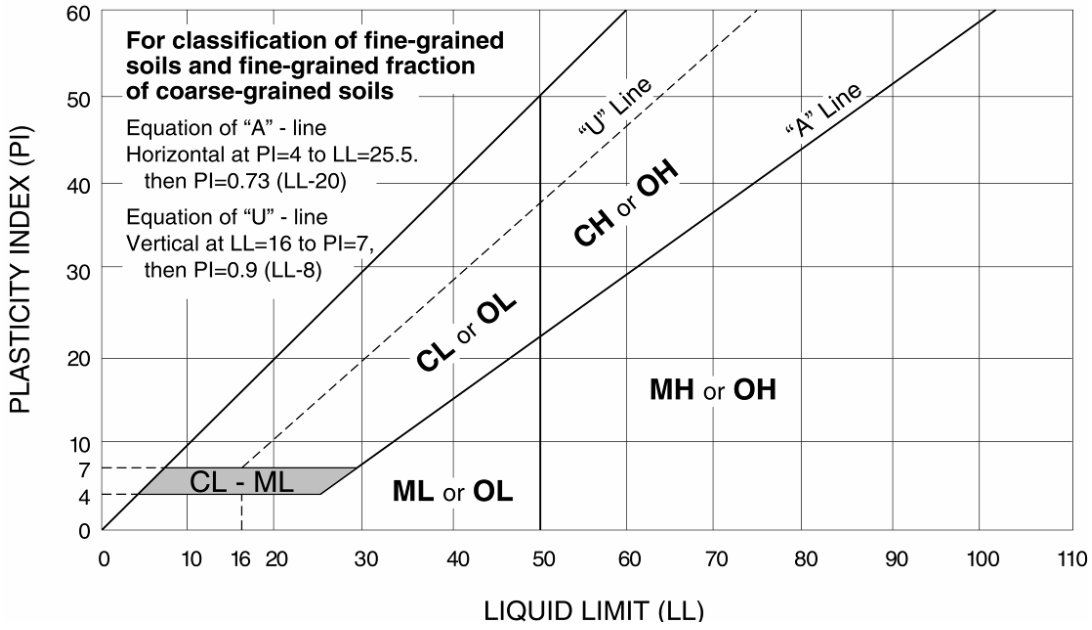


Exhibit C-2

DESCRIPTION OF ROCK PROPERTIES

WEATHERING

Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Severe	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very severe	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete	Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

HARDNESS (for engineering description of rock – not to be confused with Moh's scale for minerals)

Very hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately hard	Can be scratched with knife or pick. Gouges or grooves to ¼ in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

Joint, Bedding, and Foliation Spacing in Rock [a]		
Spacing	**Joints**	**Bedding/Foliation**
Less than 2 in.	Very close	Very thin
2 in. – 1 ft.	Close	Thin
1 ft. – 3 ft.	Moderately close	Medium
3 ft. – 10 ft.	Wide	Thick
More than 10 ft.	Very wide	Very thick

a. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.

Rock Quality Designator (RQD) a	
RQD, as a percentage	**Diagnostic description**
Exceeding 90	Excellent
90 – 75	Good
75 – 50	Fair
50 – 25	Poor
Less than 25	Very poor

a. RQD (given as a percentage) = length of core in pieces 4 in. and longer/length of run.

Joint Openness Descriptors	
Openness	**Descriptor**
No Visible Separation	Tight
Less than 1/32 in.	Slightly Open
1/32 to 1/8 in.	Moderately Open
1/8 to 3/8 in.	Open
3/8 in. to 0.1 ft.	Moderately Wide
Greater than 0.1 ft.	Wide

References: American Society of Civil Engineers. Manuals and Reports on Engineering Practice - No. 56. Subsurface Investigation for Design and Construction of Foundations of Buildings. New York: American Society of Civil Engineers, 1976. U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.

LAND USE APPLICATION

City of Glenwood Springs
Economic and Community Development Dept.
101 West 8th Street
Glenwood Springs, CO 81601
970-384-6411

Ordinance Amendments		Development Permits	
Rezoning	☐	Site/Architectural Plan Review	
Rezoning to Planned Unit Development (PUD)	☐	Administrative	☐
Annexation	☐	Minor	✔
Condominiumization	☐	Major	☐
Annexation	☐	Master Plan	☐
Street Vacation	☐	Construction Plans	☐
	☐	Location & Extent	☐
Subdivisions		Right of Way Encroachment License	☐
Minor Subdivision	☐	Floodplain Development Permit	☐
Preliminary Plat	☐		☐
Final Plat	☐	**Flexibility and Relief Procedures**	
Vacation of Right-of-Way	☐	Variance	☐
		Administrative Adjustment	☐
		Appeal	☐

Applicant/Property Owner Information:			
Applicant		Owner	
Steve Appel, Project Manager, Ei Design		Halle Properties, L.L.C.	
Relationship to Owner		Owner	
Owner Architect of Record		Discount Tire	
Applicant Address		Owner Address	
1260 Corona Pointe Ct. Suite 301	Corona, CA 92879	20225 N. Scottsdale Rd.	Scottsdale, AZ 85255
Phone (951) 363-4467	Email Address sappel@eicompanies.com	Phone (480) 606-6000	Email Address matthew.johnson@discounttire.com

Property Information:	
Address	Parcel Number
51537 Hwy. 6 Glenwood Springs, CO 81601	218505341001 & 218505341002
Subdivision	Lot and Block Number
Halle Tract Minor	Lot 2, Block 1
Zone District M1 – Mixed Use Corridor	Existing Land Use Retail Sales with Vehicle Servicing

General Project Description:
Building expansion of an existing Discount Tire store to add a tire storage area to accommodate the additional tires stored in containers on site.

Signatures:		
The owner or applicant must be present at the hearing. All public hearings must be property 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 application. (Attach additional incorporation documents if necessary.) I declare under the penalty of perjury that the above information is true and correct to the best of my knowledge.	Applicant	Date 4-9-20
	Owner	Date 04/07/2020
	Owner	Date

MATERIALS PHOTOS

EXISTING BUILDING LOOKING EAST

EXISTING BUILDING LOOKING NORTHEAST

MATERIALS PHOTOS

INTEGRAL CMU BLOCK “WORSTED TAN”

INTEGRAL COLOR BRICK VENEER “RICHFIELD BLEND”

MATERIALS PHOTOS

E.I.F.S ACCENT BAND

“BURGUNDY”

E.I.F.S ACCENT BAND

“ANTIQUE WHITE”

DEVELOPMENT AGREEMENT BY AND BETWEEN THE CITY OF GLENWOOD SPRINGS AND HALLE PROPERTIES, L.L.C. RELATING TO DEVELOPMENT OF THE DISCOUNT TIRE STORE

THIS DEVELOPMENT AGREEMENT ("Agreement") is entered into as of this _____ day of _____, 2014 by and between the CITY OF GLENWOOD SPRINGS, a Colorado home rule city ("City"), and HALLE PROPERTIES, L.L.C., an Arizona limited liability company ("Owner").

RECITALS:

1. Owner has a legal interest in certain real property located at 51537 Highway 6, Glenwood Springs, Colorado ("Property"), more particularly described in Exhibit A attached hereto and incorporated herein.

2. Owner was applicant and contract purchaser of the Property at the time of the planning application, which purchase was finalized on June 16, 2014.

3. Owner intends to construct a 7,400 square foot building for a Discount Tire store ("Development") with approvals as more particularly described in Recital 6 of this Agreement.

4. The City has determined that this Development is an appropriate use for the Property and, therefore, desires to enter into this Agreement. This Agreement establishes planning principles, standards and procedures to eliminate uncertainty in planning and to guide the orderly progress of the Development consistent with the City's Comprehensive Plan, Land Use Plan, and the Glenwood Springs Municipal Code.

5. The Owner shall receive, by this Agreement, assurance that it may proceed with the Development on the Property in accordance with the "Current Approvals" (defined below), and therefore desires to enter into this Agreement.

6. The City has taken various planning actions relating to the Development on the Property (collectively "Current Approvals"). These actions include, without limitation, the following:

   (a) Major Development Approval, as issued by City Council on May 15, 2014;
   (b) Design variance from the requirement that an intersection of an access way with a public street be located no closer than 15 feet to a side lot line (Municipal Code Section 070.050.100(1)e);
   (c) Design variance from the requirement to provide landscaped islands within parking blocks at a rate of one (1) island per eight (8) parking spaces (Municipal Code Section 070.150.080(d)(4)b);
   (d) Design variance from the requirement to install driveway medians (Municipal Code Section 070.050.100(1)b);
   (e) Design variance from providing off-street parking over the required minimum (Municipal Code Section 070.150.070(3)1c);
   (f) Design variance from providing no more than one access point from an arterial or collector street (Municipal Code Section 070.030.090(b));
   (g) Design variance from the requirement not to exceed 30 feet in length on the west building elevation without providing glazed windows and doors that comprise at least 30% of the elevation (Municipal Code Section 070.150.060(b)(1));
   (h) Design variance from the requirement to provide at least two design elements for primary customer entrances on the east and west building elevations (Municipal Code Section 070.150.060(b)(1)); and

(i) Design variance from the requirement not to exceed 30 feet without providing a visual variation along the roofline on the east and west building elevations (Municipal Code Section 070.150.060(b)(1)c).

7. Each Party acknowledges that it is entering into this Agreement voluntarily.

NOW, THEREFORE, in consideration of the premises, covenants, and provisions set forth herein, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

Section 1. EFFECTIVE DATE AND TERM.

1.1. Effective Date. This Agreement shall be effective from the date of the Major Development Approval.

1.2. Term. The term of this Agreement ("Term") shall commence upon the Effective Date and continue for three (3) years.

Section 2. DEFINITIONS.

"Approval Date" shall mean the effective date of this Agreement.

"Council" shall mean the City Council of the City of Glenwood Springs.

"Current Approvals" shall have the meaning set forth in Recital 6 of this Agreement.

"Owner" shall have that meaning set forth in the preamble, and shall further include, unless otherwise provided, Owner's successors, heirs, assigns, and transferees.

"Effective Date" shall have that meaning set forth in Section 1.1 of this Agreement.

"Municipal Code" or "Code" shall mean the Municipal Code of the City of Glenwood Springs as it may be amended from time to time.

Section 3. OBLIGATIONS OF OWNER.

The following are the conditions of the Current Approvals which include all of the site work for the road circulation, pedestrian features, transit, water, sewer, irrigation, geological hazards, drainage, etc.

3.1 The Development shall comply with the requirements of the Municipal Code except where specific variances have been granted. The materials and verbal and written representations by the Owner or its representatives shall be considered conditions of approval.

3.2 Prior to issuance of a building permit, the Owner shall:

a. obtain a storm water permit from the State of Colorado;

b. obtain an access permit from the Colorado Department of Transportation;

c. Ensure that there is a note in the construction drawings or separate instructions to contractors indicating that any concrete pavers and street lights that are removed from the Highway 6 right-of-way shall be returned to the City;

d. Pay to the City of Glenwood Springs all improvement and development fees that are due. These fees include but may not be limited to water, fire, building plan review, and building permit. An exact accounting of the ffes due will be itemized on the building permit application. The Owner shall also pay any sewer fees that are due to the West Glenwood Sanitation District prior to issuance of a building permit;

e. The Public Works Department shall review/approve the revised auto turn analysis that the Owner submitted April 16, 2014. The Owner shall address any additional comments or concerns about this auto turn analysis and make further revisions as needed. Staff notes that revisions may include the need to widen the shared access driveway apron to accommodate delivery truck trailers. Revisions may also require moving one city street light;

f. Submit an irrigation plan for Community Development Department review and approval; and

g. Provide the Community Development Department with 24x36 inch mylars of the approved, revised development plans.

3.3 Prior to construction, the Owner shall arrange and attend a pre-construction meeting. Attendees shall include the Owner's contractor(s), representatives from the City's Public Works Department, Electric Department, Water/Wastewater Department, Community Development Department, Building Department, and others as required.

3.4 Prior to issuance of a Certificate of Occupancy, the Owner shall:

a. provide as-built drawings of the project .dwg and AutoCad format and on CD;

b. dedicate to the City of Glenwood Springs, as necessary, easement(s) for underground electric facilities that are currently outside of the existing easements and for access to transformers;

c. dedicate to the City of Glenwood Springs easement(s) for areas around the fire hydrants for the purpose of maintenance; and

d. grant the City of Glenwood Springs a pedestrian easement where needed along Highway 6.

3.5 Prior to installation of signs on the Property, the Owner shall submit a sign permit application that complies with the Municipal Code requirements for signs.

3.6 Contractors shall be licensed to work in the City of Glenwood Springs.

3.7 Parking lot lights shall be turned off at 10 p.m. or one (1) hour after the close of business, whichever is later.

Section 4. SECURITY FOR PUBLIC IMPROVEMENTS.

In order to secure the construction of the Public Improvements, Owner shall upon execution of this Agreement or prior to application for a Building Permit, furnish the City with a certificate or other evidence, in good and sufficient form approved by the City Attorney, of a bond, irrevocable letter of credit or other surety to secure the performance and completion of the Public Improvements, in an amount equal to the estimated costs of said improvements as set forth on Exhibit B.

Upon completion of the Public Improvements constructed by the Owner, the Owner shall have the Owner's Civil Engineer certify, in writing, to the City Engineer that the improvements were installed in compliance with the approved plans and specifications, and will provide written as-built drawings for such improvements in both reproducible mylar and electronic formats upon acceptance by the City of the Public Improvements. Upon completion of the improvements and written request, the City shall authorize the release of the security provided by the Owner.

Section 5. STANDARDS, LAWS AND PROCEDURES.

5.1. Vested Rights, Permitted Uses, Applicable Law.

(a) Vested Rights. Owner shall have the vested right to develop the Development on the Property pursuant to the Current Approvals in accordance with and subject to the provisions of C.R.S. §24-68-101 et seq., provided however that Owner shall have three (3) years to complete the improvements.

(b) Permitted Uses, Etc. The permitted uses of the Development on the Property and the density and intensity of use of the Development on the Property, the maximum height, bulk and size of proposed buildings, provisions for reservation or dedication of land for public purposes and the location of public improvements, the location of public utilities, and other terms and conditions of development applicable to the Development on the Property, shall be as set forth in the Current Approvals.

(c) Applicable Law. The rules, regulations, official policies, standards and specifications applicable to the Development on the Property ("Applicable Law") shall be those rules, regulations, official policies, standards and specifications, including City ordinances and resolutions, in force and effect on the Approval Date, including without limitation, all duly adopted uniform construction codes. It is acknowledged that pursuant to C.R.S. §24-68-105, the City may adopt subsequent regulations of general applicability that may apply to the Development on the Property.

5.2. State and Federal Law. This Agreement shall not preclude the application to Owner of changes in laws, regulations, plans or policies, to the extent that such changes are specifically mandated and required by changes in state or federal laws or regulations ("Changes in the Law"). In the event Changes in the Law prevent or preclude compliance with one or more provisions of this Agreement, such provisions of the Agreement shall be modified or suspended, or performance thereof delayed, as may be necessary, to comply with the Changes in the Law, and the City and Owner shall take action as may be reasonably required in good faith to meet the intent of this Agreement.

Section 6. INSPECTION

The City may enter any portion of the Development for the purpose of making inspections to determine whether the Owner is in compliance with the obligations set forth in this Agreement. If the City determines that any improvements as set forth in this Agreement have not been constructed and installed as required, the City shall furnish the Owner with a list of specific deficiencies. Except as provided in Section 4 above and in respect to any structure for which a building permit has been issued, the City shall not be required to issue any certificate of occupancy so long as the listed deficiencies remain. If the City determines the Owner has not cured the deficiencies within thirty (30) days after presentation of the list to the Owner, the City may, but need not, cause such additional work to be done as it deems necessary to complete any Public Improvements or to cure any listed deficiencies. Owner shall be liable to the City for the entire cost of such additional work, whether performed by the City's employees or by others at the direction of the City. If the Owner does not pay the City the cost of such additional work including, as may be appropriate, the cost the City expended for materials, for services of those not employed by the City, and for the apportioned cost of wages and benefits paid for by the City for hours of the City employees, then the City may, upon ten (10) days notice to the Owner, have a lien against all or any part of the Property. The City may certify the amount of such lien to the Garfield County Treasurer for collection, enforcement and remittance of general property taxes or assessments. In addition, if attorney's fees are incurred by the City to enforce this Agreement, they shall be paid by the Owner.

Section 7. UTILITY AND DRAINAGE EASEMENTS.

All utility and drainage easements shall be accessible to the City at all times. In the event any structure is constructed which obstructs partially or wholly City access to said easements, the City retains the right to remove such obstruction at the sole cost of the Owner. The City shall not be responsible for any costs associated with the replacement of said obstructions. The easements shown on the Plat shall be modified to show the actual "as built" placement of utilities.

Section 8. IMPROVEMENT FEES.

The Owner shall be responsible for the payment of all applicable improvement and impact fees in accordance with the City's Municipal Code.

Section 9. AMENDMENT.

This Agreement may be amended from time to time, in whole or in part, by mutual written consent of the parties or their successors in interest. Any amendment to this Agreement that would, in the opinion of the Community Development Director, result in a material modification to the Current Approvals shall require additional development review pursuant to the City's Municipal Code.

Section 10. DEFAULT; TERMINATION.

10.1. Default and Termination. Any failure by either party to perform any term or provision of this Agreement, which failure continues uncured for a period of thirty (30) days following written notice of such failure from the other party, unless such period is extended by written mutual consent, shall constitute a default under this Agreement. Any notice given pursuant to the preceding sentence shall specify the nature of the alleged failure and, where appropriate, the manner in which said failure satisfactorily may be cured. If the nature of the alleged failure is such that it cannot reasonably be cured within such thirty (30) day period, then the commencement of the cure within such time period, and the diligent prosecution to completion of the cure thereafter, shall be deemed to be a cure within such thirty (30) day period. Upon the occurrence of a default under this Agreement, the non-defaulting party may take action pursuant to the Code or institute legal proceedings to enforce the terms of this Agreement. If the default is cured, then no default shall exist and the noticing Party shall take no further action.

10.2. Enforced Delay; Extension of Time of Performance. Notwithstanding anything to the contrary contained herein, neither Party shall be deemed to be in default where delays in performance or failures to perform are due to, and a necessary outcome of war, insurrection, strikes or other labor disturbances, walk-outs, riots, floods, earthquakes, fires, casualties, acts of God, restrictions imposed or mandated by other governmental entities, enactment of conflicting state or federal laws or regulations, new or supplemental environmental regulations, or similar basis for excused performance which is not within the reasonable control of the Party to be excused. Upon the request of either Party hereto, an extension of time, including an extension of applicable contract dates, for such cause shall be granted in writing for the period of the enforced delay, or longer as may be mutually agreed upon.

Section 11. DEFENSE AND INDEMNITY.

11.1. Owner's Actions. Owner shall hold harmless and indemnify City and its elected and appointed officers, agents, employees, and representatives from claims, costs, and liabilities for any personal injury, death, or physical damage (including inverse condemnation) which arises directly or indirectly, as a result of the construction of the Development, or of operations performed under this Agreement, by Owner or by Owner's contractors, subcontractors, agents or employees, whether such operations were performed by Owner or any of Owner's contractors, subcontractors, or any one or more persons directly or indirectly employed by, or acting as agent for, Owner or any of Owner's contractors or subcontractors.

11.2. City's Actions. Nothing in this section shall be construed to mean that Owner shall indemnify or hold the City or its elected and appointed representatives, officers, agents and employees harmless from any claims of personal injury, death or property damage arising from, or alleged to arise from any act or omission of the City with regard to improvements that have been offered for dedication and accepted by City for maintenance. Nothing contained herein is intended to nor shall be construed as a waiver of the City's governmental immunity under state or federal law.

Section 12. NO AGENCY, JOINT VENTURE OR PARTNERSHIP.

It is specifically understood and agreed to by and between the parties that: (1) the subject Development is a private development; (2) the City has no interest or responsibilities for, or due to, third parties concerning any improvements until such time, and only until such time, that the City accepts the same pursuant to the provisions of this Agreement or in connection with the Current Approvals; (3) Owner shall have full power

over and exclusive control of construction of the Development on the Property herein described, subject only to the limitations and obligations of Owner under the Current Approvals; and (4) the City and Owner hereby renounce the existence of any form of agency relationship, joint venture or partnership between City and Owner and agree that nothing contained herein or in any document executed in connection herewith shall be construed as creating any such relationship between City and Owner.

Section 13. MISCELLANEOUS.

13.1. Incorporation of Recitals and Introductory Paragraph. The recitals contained in this Agreement, and the introductory paragraph preceding the recitals, are hereby incorporated into this Agreement as is fully set forth herein.

13.2. Severability. If any term or provision of this Agreement, or the application of any term or provision of this Agreement to a particular situation, is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining terms and provisions of this Agreement, or the application of this Agreement to other situations, shall continue in full force and effect unless amended or modified by mutual consent of the parties.

13.3. Other Necessary Acts. Each party shall execute and deliver to the other all such other further instruments and documents as may be reasonably necessary to carry out the Current Approvals and to provide and secure to the other party the full and complete enjoyment of its rights and privileges hereunder.

13.4. Construction. Each reference in this Agreement to any of the Current Approvals shall be deemed to refer to the Current Approval as it may be amended from time to time pursuant to the provisions of this Agreement, whether or not the particular reference refers to such possible amendment. This Agreement has been reviewed and revised by legal counsel for both City and Owner, and no presumption or rule that ambiguities shall be construed against the drafting party shall apply to the interpretation or enforcement of this Agreement.

13.5. Other Miscellaneous Terms. The singular shall include the plural; the masculine gender shall include the feminine; “shall” is mandatory; “may” is permissive.

13.6. Covenants Running with the Land. All of the provisions contained in this Agreement constitute covenants running with the land. Each covenant herein to act or refrain from acting is for the benefit of or a burden upon the Property.

13.7. Remedies. Either party may, in addition to any other rights or remedies, institute an equitable action to cure, correct, or remedy any default, enforce any covenant or agreement herein, enjoin any threatened or attempted violation thereof, enforce by specific performance the obligations and rights of the parties hereto, or to obtain any remedies consistent with the foregoing and the purpose of this Agreement.

13.8. Colorado Law. This Agreement shall be construed and enforced in accordance with the laws of the State of Colorado.

13.9. Attorneys’ Fees. In the event of any litigation or arbitration between the parties regarding an alleged breach of this Agreement, the prevailing party shall be entitled to reasonable attorneys’ fees.

Section 14. NOTICES.

Any notice or communication required hereunder between the City and Owner must be in writing, and may be given either personally or by registered or certified mail, return receipt requested. If given by registered or certified mail, such notice or communication shall be deemed to have been given and received on the first to occur of (i) actual receipt by any of the addressees designated below as the party to whom notices are to be sent, or (ii) five (5) days after a registered or certified letter containing such notice, properly addressed, with postage prepaid, is deposited in the United States mail. If

personally delivered, a notice shall be deemed to have been given when delivered to the party to whom it is addressed. Any party may at any time, by giving ten (10) days written notice to the other party, designate any other address in such notice or communication shall be given. Such notices or communications shall be given to the parties at their addresses set forth below:

If to City, to:
City Manager
City of Glenwood Springs
101 West 8th Street
Glenwood Springs, CO 81601

With Copy to:
City Attorney
City of Glenwood Springs
101 West 8th Street
Glenwood Springs, CO 81601

If to Owner, to:
Halle Properties, L.L.C.
20225 N. Scottsdale Road
Scottsdale, AZ 85255

Section 15. ENTIRE AGREEMENT, COUNTERPARTS AND EXHIBITS.

This Agreement including exhibits constitute in full, the final and exclusive understanding and agreement of the parties and supersedes all negotiations or previous agreements between the Parties with respect to all or any part of the subject matter hereof. All waivers of the provisions of this Agreement shall be in writing and signed by the appropriate authorities of the City and the Owner. This Agreement may be executed in counterparts, including any facsimile copies, each of which shall be deemed an original and all of which together shall constitute one and the same instrument. The following exhibits are attached to this Agreement and incorporated herein for all purposes:

Exhibit A - Legal Description
Exhibit B - Estimate of Public Improvements Costs

Section 16. RECORDATION OF DEVELOPMENT AGREEMENT.

Upon full execution of this Agreement, it shall be recorded with the Garfield County, Colorado Clerk and Recorder's Office.

IN WITNESS WHEREOF, this Agreement has been entered into by and between the City and Owner as of the date and year first above written.

CITY OF GLENWOOD SPRINGS

_____
Leo R. McKinney, Mayor

_____
Ann Green, Deputy City Clerk

APPROVED AS TO FORM:

_____
Janette H. Shute, City Attorney

HALLE PROPERTIES, L.L.C.

By: _____
Name: _____
Title: _____

STATE OF ARIZONA)
) ss.
COUNTY OF _____)

The foregoing Development Agreement was acknowledged before me this _____ day of _____, 2014 by _____ as _____ of Halle Properties, L.L.C.

Witness my hand and official seal. _____
Notary Public

My commission expires: _____

LEGAL DESCRIPTION

A PARCEL OF LAND SITUATED IN THE NW1/4SW1/4 OF SECTION 5, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN, LYING NORTHERLY OF THE NORTHERLY RIGHT-OF-WAY LINE OF U.S. HIGHWAY 6 & 24, SAID PARCEL OF LAND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON SAID RIGHT-OF-WAY LINE WHENCE AN IRON POST WITH A BRASS CAP FOUND IN PLACE AND PROPERLY MARKED FOR THE SOUTHWEST CORNER OF SECTION 35, TOWNSHIP 5 SOUTH, RANGE 89 WEST OF THE 6TH P.M. BEARS: N. 12°48'00" W. 1600.05 FEET;
THENCE N. 83°43'00"W. 331.45 FEET ALONG SAID RIGHT-OF-WAY LINE;
THENCE N. 01°44'00"E. 398.70 FEET;
THENCE S. 88°16'00"E. 330.40 FEET;
THENCE S. 01°44'00"W. 425.00 FEET TO THE POINT OF BEGINNING

EXCEPTING FROM THE ABOVE DESCRIBED PROPERTY THE WESTERLY 2.63 FEET OF EVEN WIDTH THEREFROM COUNTY OF GARFIELD. STATE OF COLORADO

EXHIBIT A

Engineer's Estimate - Improvements within Hwy 6 ROW
51537 Highway 6 , Glenwood Springs, CO

Engineer's Opinion of Probable Costs for off-site improvements within the Highway 6 right-of-way at the proposed Discount Tire site in Glenwood Springs, CO. Improvements require the following: Pavement Demolition, Paving, Street Light (Pole) Removal/Relocation and Landscaping

DEMOLITION	Unit	Quantity	Unit Cost	Total
REMOVE EXISTING 6" CURB AND GUTTER	LF	90	$4.00	$360.00
REMOVE EXISTING CONCRETE DRIVEWAY	SF	690	$2.50	$1,725.00
REMOVE LIGHT POLE AND FIXTURE (RETURN TO CITY)	EA	1	$200	$200.00
REMOVE SIDEWALK	SF	1,555	$2.50	$3,887.50
SUBTOTAL DEMOLITION WORK				**$6,172.50**

SITE WORK	Unit	Quantity	Unit Cost	Total
RELOCATED LIGHT POLES & CONDUIT	EA	3	$1,500.00	$4,500.00
SUBTOTAL SITE WORK				**$4,500.00**

EROSION CONTROL	Unit	Quantity	Unit Cost	Total
EROSION CONTROL	LS	1	$2,000.00	$2,000.00
INCLUDES: PERIMETER CONTROL, INLET PROTECTION, STOCK PILE STABILIZATION, ETC.				
SUBTOTAL EROSION CONTROL				**$2,000.00**

PAVING AND DRAINAGE	Unit	Quantity	Unit Cost	Total
ASPHALT REPAIR (ALONG NEW CURB & GUTTER)	SF	125	$8.00	$1,000.00
CONCRETE DRIVEWAY	SY	40	$75.00	$3,000.00
CONCRETE SIDEWALK	SF	2,090	$4.00	$8,360.00
6" CURB AND GUTTER	LF	125	$18.00	$2,250.00
TRUNCATED DOMES (ADA WARNING PLATES)	EA	2	$450.00	$900.00
PAVERS	SF	520	$10.00	$5,200.00
SUBTOTAL PAVING AND DRAINAGE				**$20,710.00**

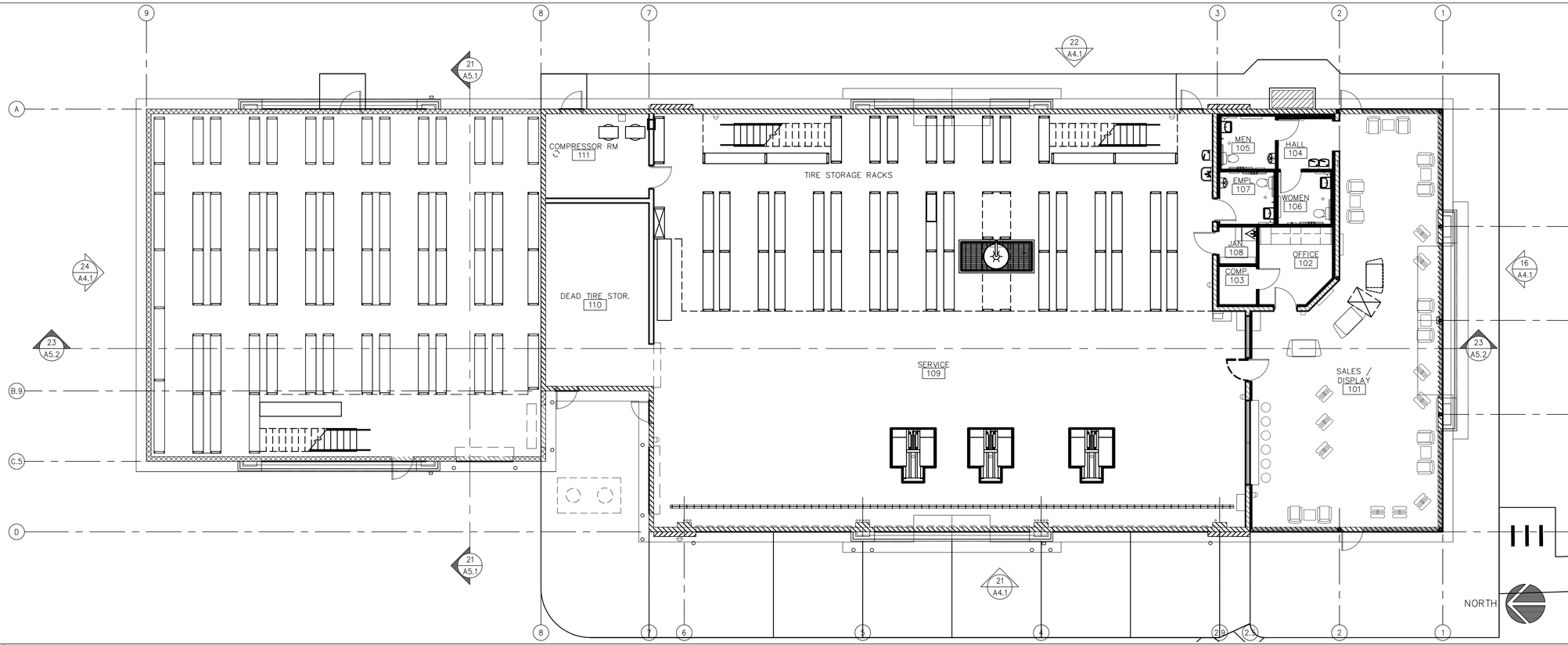
LANDSCAPE	Unit	Quantity	Unit Cost	Total
LANDSCAPE (NO TREES DUE TO UTILITIES)	LS	1	$3,250.00	$3,250.00
IRRIGATION (MODIFY EXISTING/EXTEND)	LS	1	$1,750.00	$1,750.00
SUBTOTAL LANDSCAPE				**$5,000.00**

SUB-TOTAL	**$38,382.50**

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Bryce E. Christensen, P.E.
Colorado License #47935

EXHIBIT B



23 1ST FLOOR PLAN

SCALE: 1/8" = 1'-0"

3 KEY NOTES

1. FLOOR DRAIN/SINK. SEE PLUMBING DRAWINGS.
2. CONCRETE APRON, MEDIUM BROOM FINISH. APRON TO BE FLUSH WITH PAVEMENT. REFER TO DETAIL 12 / A2.1 AND CIVIL DRAWINGS.
3. FIRE EXTINGUISHER LOCATION. WALL MOUNT. CONFIRM LOCATION AND TYPE WITH FIRE MARSHALL.
4. RECESSED LIFT AREA W/ FLOOR DRAINS SHALL HAVE A 1/4" PER FOOT SLOPE.
5. FLAT TIRE REPAIR TANK. SEE MANUFACTURER'S INFORMATION FOR SIZE AND INSTALLATION INSTRUCTIONS.
6. CONC. FILLED STEEL PIPE BOLLARDS. SEE DETAIL 8 / A2.1.
7. STEEL TIRE STORAGE RACK SYSTEM BY OWNER, PER MANUFACTURER.
8. STAIR TO MEZZANINE FLOOR. STEEL STAIR IS PART OF TIRE STORAGE RACK SYSTEM. SEE NOTE 7 AND DTL. 12 / A8.1.
9. COMPRESSOR LOCATION(S)
10. RECESSED VEHICLE LIFT. RECESS AND UNDER SLAB FEATURES PROVIDED BY GENERAL CONTRACTOR. LIFT PROVIDED BY AND INSTALLED BY OWNER.
11. ROLL DOWN COILING DOOR.
12. TRENCH DRAIN. REFER TO PLUMBING DRAWINGS.
13. ELECTRICAL SERVICE ENTRANCE SECTION – ELECTRICAL CABINET ON 4" THK. RAISED CONC. PAD. CONFIRM LOCATION WITH ELECTRICAL AND CIVIL DWGS.
14. CONCRETE SLAB. VERIFY WITH SITE LAYOUT PLAN.
15. FOR ALL INTERIOR, SLAB–ON–GRADE FLOORS, WHETHER TO RECEIVE THIN–SET TILE APPLICATION, OR POLISHED FLOOR FINISH SHALL MEET FF40 FLATNESS AND FL30 LEVEL CRITERIA. THIS REQUIREMENT INCLUDES THE RESTROOMS. RESTROOM FLOOR DRAINS SHALL BE LEVEL AND AT SAME HEIGHT AS TILE. FINISHED SLAB TO BE PROTECTED WITH 1"–2" SAND DURING CONSTRUCTION AS NOTED IN THE PROJECT MANUAL, SECTION 03300.
16. TRACER WIRE ACCESS HATCH. SEE DETAIL 23 / A2.1.
17. LANDSCAPE AREA. VERIFY WITH SITE PLAN AND LANDSCAPE PLAN.
18. TIRE CONVEYOR.
19. FIRE EXTINGUISHER LOCATION. MOUNT FULLY RECESSED IN WALL. CONFIRM LOCATION AND TYPE WITH FIRE MARSHALL.
20. FIRE RISER BY FIRE SPRINKLER CONTRACTOR – UNDER SEPARATE PERMIT.
21. SAND/ OIL INTERCEPTOR – SEE PLUMBING DWGS.
22. THROUGH WALL TRANSFER FAN ABOVE, PER MECHANICAL DWGS. REFER TO REFLECTED CEILING PLAN AND BUILDING SECTIONS FOR MORE INFORMATION.
23. CONCRETE SECTION TO BE REINFORCED WITH #3 REBARS AT 18" O.C. BOTH WAYS, CENTERED IN CONCRETE. U.N.O. – REFER TO CIVIL PLANS & SOILS REPORT.
24. LINE OF SOFFIT ABOVE – SEE EXTERIOR ELEVATION.
25. FALSE STOREFRONT SYSTEM (EQUAL PIECES) – SEE EXTERIOR ELEVATION.
26. OUTSIDE HORN–STROBE – REFER TO FIRE PROTECTION PLAN.

21 WALL TYPE LEGEND

1. **INSULATED CMU WALL**
   8" CMU, INSULATED. LIGHT WEIGHT CMU WITH PERLITE FILL, ATTACHED WITH METAL FURRING AND RIGID INSULATION (THICKNESS AS REQUIRED FOR ENVELOPE COMPLIANCE CERTIFICATE, AND TO STRUCTURAL DRAWINGS FOR STEEL REINFORCING SPECIFICATIONS. NOTE: HEIGHT OF EXTERIOR CMU WALLS IS AS NOTED IN ELEVATIONS AND SECTIONS, BUT HEIGHT OF INTERIOR CMU WALLS IS 9'–4" A.F.F.
2. **UNINSULATED CMU WALL**
   8" CMU, UNINSULATED. REFER TO STRUCTURAL DRAWINGS FOR STEEL REINFORCING SPECIFICATIONS. NOTE: HEIGHT OF EXTERIOR CMU WALLS IS AS NOTED IN ELEVATIONS AND SECTIONS.
3. **4" NON–RATED INTERIOR PARTITION WALL**
   3 5/8" MTL. STUDS @ 16" O.C. WITH 5/8" GYP. BD. EACH SIDE TO 6" ABOVE ADJACENT FINISH CEILING ON 1ST FLOOR AND TO ROOF DECK ON MEZZANINE LEVEL. BRACE WALLS TO STRUCTURE ABOVE. USE WATER RESISTANT GYP. BD. AT RESTROOMS.
4. **6" PLUMBING WALL**
   6" MTL. STUDS @ 16" O.C. WITH ONE LAYER OF WATERPROOFING AND 5/8" GYP. BD. EACH SIDE (AS APPLIES) TO 6" ABOVE ADJACENT FINISH CEILING.
5. **6" NON–RATED INTERIOR PARTITION WALL**
   6" MTL. STUDS @ 16" O.C. TO ROOF DECK. BRACE WALLS TO STRUCTURE ABOVE. REFER TO DETAIL 21, SHEET A7.2 FOR TYPE OF INSULATION.
6. **8" INTERIOR WALL**
   8" MTL. STUDS @ 16" O.C. WITH 5/8" GYP. BD. TO 6" ABOVE ADJACENT FINISH CEILING ON 1ST FLOOR AND TO ROOF DECK ON MEZZANINE LEVEL. BRACE WALLS TO STRUCTURE ABOVE.

NOTE:
1. ALL CONCEALED CMU (THAT WHICH IS FURRED OUT OR HIDDEN WITHIN CEILING PLENUMS) SHALL BE STANDARD CMU.
2. ALL FURRED WALLS TO BE "Z" FURRING.

17 DOOR SCHEDULE

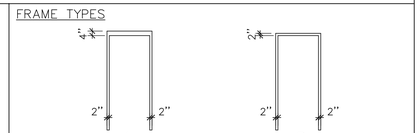
DR. #	WIDTH	HEIGHT	TH.	MATERIAL	DOOR TYPE	DOOR FINISH	FRAME FINISH	FRAME TYPE	HEAD	JAMB	HDWRE. GROUP	REMARKS
101	3'–0"	7'–0"	–	ALUMINUM	E	FACTR'Y	FACTR'Y	–	–	–	1	DOOR FRAME IS INTEGRAL PART OF STOREFRONT SYSTEM.
102	3'–0"	7'–0"	–	ALUMINUM	E	FACTR'Y	FACTR'Y	–	–	–	1	DOOR FRAME IS INTEGRAL PART OF STOREFRONT SYSTEM.
103	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	A	4 / A6.1	4 / A6.1	7	
104	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	B	PAINT	PAINT	B	2 / A6.1	2 / A6.1	4	
105	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	B	2 / A6.1	2 / A6.1	6	
106	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	B	2 / A6.1	2 / A6.1	6	
107	3'–0"	7'–0"	–	ALUMINUM	A	FACTR'Y	FACTR'Y	B	–	–	1	DOUBLE–SWING DOOR
108	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	A	4 / A6.1 (SIM.)	4 / A6.1 (SIM.)	6	
109	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	A	4 / A6.1 (SIM.)	4 / A6.1 (SIM.)	5	
110	22'–0"	12'–0"	–	STEEL	C	PAINT	–	–	–	3 / A6.1	–	DO NOT PAINT INTERIOR OR DOOR TRACK. G/C TO COORDINATE INSTALLATION.
111	22'–0"	12'–0"	–	STEEL	C	PAINT	–	–	–	3 / A6.1	–	PAINT DOOR AND FRAME TO MATCH DOMINANT ADJACENT SURFACE COLOR.
112	22'–0"	12'–0"	–	STEEL	C	PAINT	–	–	–	3 / A6.1	–	DOORS 110, 111, AND 112 HAVE R–VALUE OF 9.1, AND DOOR 113 HAS R–VALUE OF 8.1.
113	9'–4"	8'–0"	–	STEEL	D	PAINT	–	–	–	3 / A6.1 (SIM.)	–	WIND LOAD: XXX MPH
114	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	A	4 / A6.1	4 / A6.1	3	PAINT DOOR AND FRAME TO MATCH ADJACENT MASONRY
115	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	A	4 / A6.1	4 / A6.1	3	PAINT DOOR AND FRAME TO MATCH ADJACENT MASONRY
116	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	A	4 / A6.1	4 / A6.1	2	PAINT DOOR AND FRAME TO MATCH ADJACENT MASONRY
117	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	B	PAINT	PAINT	A	SIM. TO 4 / A6.1	SIM. TO 4 / A6.1	5	PAINT DOOR AND FRAME TO MATCH ADJACENT MASONRY.
118	–	–	–	–	–	–	–	–	–	–	–	NOT USED
119	6'–0"	7'–4"	–	STEEL	D	FACTR'Y	–	–	–	–	–	DO NOT PAINT INTERIOR OR DOOR TRACK. PAINT DOOR AND FRAME TO MATCH ADJACENT MASONRY. G/C TO COORDINATE INSTALLATION.
120	3'–0"	7'–0"	1 3/4"	STEEL	F	PAINT	PAINT	A	4 / A6.1	4 / A6.1	3	PAINT DOOR AND FRAME TO MATCH ADJACENT MASONRY
201	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	B	2 / A6.1	2 / A6.1	5	
202	3'–0"	7'–0"	1 3/4"	HOLLOW METAL	F	PAINT	PAINT	B	2 / A6.1	2 / A6.1	4	

GENERAL NOTES

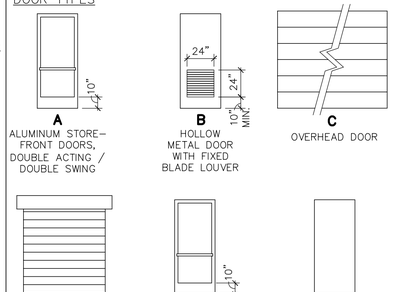
1. SUPPLY HANDICAPPED SIGNS AT ENTRANCES / EXITS INCLUDING RESTROOMS, PER ADA REQUIREMENTS, SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH SIDE OF THE DOOR (WHERE THERE IS NO WALL SPACE TO THE LATCH SIDE OF THE DOOR, SIGNS SHALL BE PLACED ON THE NEAREST ADJACENT WALL). MOUNTING HEIGHT SHALL BE 60" A.F.F. TO THE CENTERLINE OF THE SIGN. MOUNTING LOCATION FOR SUCH SIGNAGE SHALL BE SO THAT A PERSON MAY APPROACH WITHIN 3" OF SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF A DOOR.
2. DOORS #101 AND 102 SHALL BE PROVIDED WITH A READILY VISIBLE, DURABLE SIGN ON OR ADJACENT TO THE DOOR STATING THE FOLLOWING, "THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED". THE SIGN SHALL BE IN LETTERS NOT LESS THAN ONE INCH (1") HIGH ON A CONTRASTING BACKGROUND.
3. ALL INTERIOR AND EXTERIOR HOLLOW METAL FRAMES SHALL BE 16 GA. COLD ROLLED, WELDED.
4. ALL DOOR HARDWARE TO BE LEVER STYLE, OPERABLE WITH ONE HAND AND NOT REQUIRING TIGHT PINCHING OR GRASPING PER CABO / ANSI A117.1 AND ALL LOCAL AND A.D.A. ACCESSIBILITY CODES AS THEY APPLY.
5. ALL DOORS TO BE OPERABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.
6. THE OPENING FORCE FOR ALL INTERIOR DOORS SHALL NOT EXCEED 5 POUNDS. FOR DOORS WITH CLOSERS, THE SWEEP PERIOD OF THE CLOSER SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 70 DEGREES THE DOOR WILL TAKE AT LEAST 3 SECONDS TO MOVE TO A POINT 3" FROM THE LATCH, MEASURED TO THE LEADING EDGE OF THE DOOR.
7. DOOR HANDLES, LATCHES, PULLS, AND ALL OTHER OPERATING DEVICES SHALL BE INSTALLED NO LOWER THAN 34" A.F.F. AND NO HIGHER THAN 48" A.F.F.
8. ENSURE ALL DOOR REQUIREMENTS ARE MET, WHENEVER ADA OR AHJ.
9. THE MAXIMUM THRESHOLD DIMENSION SHALL NOT EXCEED ONE HALF INCH WITH A 1:2 BEVELED EDGE.
10. INSTALL BURGLAR PROTECTION PLATES OVER STRIKE SIDE OF EXTERIOR HOLLOW METAL DOORS 114, 115, 116, AND 120.
11. OVERHEAD DOORS TO INCLUDE 3" TRACK WITH 1:12 PITCH, 15" RADIUS AND CHAIN HOIST.
12. ALL INTEGRAL COLOR CMU, INCLUDING BRICK, AND STACKED STONE, TO BE SEALED PER PROJECT MANUAL SECTION 07190.
13. ALL THREE STOREFRONT DOORS SHALL HAVE INTERNAL CLOSERS.
14. DOORS 114, 115, 116 & 120 TO BE FACTORY PREPPED FOR SECURITY DOOR LOCKS.

DOOR AND FRAME TYPES

FRAME TYPES



DOOR TYPES



DOOR HARDWARE GROUPS

HARDWARE 1: DOORS 101, 102, AND 107 (SALES/DISPLAY DOORS)
BY STOREFRONT SUBCONTRACTOR

HARDWARE 2: DOOR 116 (REAR DOOR)

3 EA	HINGES	BB1199 NRP	632	HAGER
1 EA	EXIT LOCK	D25 RHO	626	SCHLAGE
1 EA	CLOSER	4041 CUSH–N STOP	689	LCN
1 EA	KICKPLATE	12 X 34	630	HAGER
1 EA	KICKPLATE	12 X 35	630	HAGER
1 EA	LOCKGUARD	1625	626	PRECISION
1 EA	THRESHOLD	413	ALUM	NATIONAL GUARD
1 EA	SWEEP	200N	ALUM	NATIONAL GUARD
1 EA	WEATHERSTRIP	160S	ALUM	NATIONAL GUARD
1 EA	DRIP EDGE	346	ALUM	PEMKO

HARDWARE 3: DOORS 114, 115, AND 120 (SIDE DOOR, DEAD TIRE STORAGE, & COMPRESSOR ROOM)

3 EA	HINGES	BB1199NRP	632	HAGER
1 EA	STOREROOM LOCK	D80PD RHO	626	SCHLAGE
1 EA	CLOSER	4041 CUSH–N STOP	689	LCN
1 EA	KICKPLATE	12 X 34	630	HAGER
1 EA	KICKPLATE	12 X 35	630	HAGER
1 EA	LOCKGUARD	1625	626	PRECISION
1 EA	THRESHOLD	413	ALUM	NATIONAL GUARD
1 EA	SWEEP	200N	ALUM	NATIONAL GUARD
1 EA	WEATHERSTRIP	160S	ALUM	NATIONAL GUARD
1 EA	DRIP EDGE	346	ALUM	PEMKO

NOTE: DOOR 115 TO HAVE PANIC HARDWARE.

HARDWARE 4: DOORS 104 AND 202 (COMPUTER ROOM & 2ND FLOOR STORAGE #2)

3 EA	HINGES	BB1168	626	HAGER
1 EA	STOREROOM LOCK	D80PD RHO	626	SCHLAGE
1 EA	CLOSER	4041	689	LCN
1 EA	KICKPLATE	12 X 34	630	HAGER
1 EA	KICKPLATE	12 X 35	630	HAGER
1 SET	SEAL	5050	BRN	NATIONAL GUARD

NOTE: DOOR CLOSERS TO BE INSIDE ROOMS 103 AND 202.

HARDWARE 5: DOORS 109, 117 AND 201 (JANITOR, FIRE RISER / COMPRESSOR AND 2ND FLOOR STORAGE #1)

3 EA	HINGES	BB1168	626	HAGER
1 EA	PASSAGE	D10S RHO	626	SCHLAGE
1 EA	CLOSER	4041 CUSH–N STOP	689	LCN
1 EA	KICKPLATE	12 X 34	630	HAGER
1 EA	KICKPLATE	12 X 35	630	HAGER
1 SET	SEAL	5050	BRN	NATIONAL GUARD

NOTE: DOORS 109 AND 117 GET A KICK–DOWN HOLD–OPEN.
NOTE: DOOR CLOSER FOR DOOR 109 TO BE INSIDE ROOM 108, DOOR CLOSER FOR DOOR 117 TO BE INSIDE ROOM 111 AND DOOR CLOSER FOR 201 TO BE INSIDE ROOM 201.

HARDWARE 6: DOORS 105, 106 & 108 (MENS, WOMENS & EMPLOYEES ROOM)

3 EA	HINGES	BB1168	626	HAGER
1 EA	PRIVACY	D40S RHO	626	SCHLAGE
1 EA	CLOSER	4041 CUSH–N STOP	689	LCN
1 EA	KICKPLATE	12 X 34	630	HAGER
1 EA	KICKPLATE	12 X 35	630	HAGER
1 SET	SEAL	5050	BRN	NATIONAL GUARD
1 EA	KICK–DOWN HOLD–OPEN			

NOTE: DOOR 105, 106 & 108 GETS A DOORSTOP (243F, 626, HAGER).
NOTE: DOOR CLOSER FOR DOOR DOOR 105 TO BE INSIDE ROOM 105, DOOR CLOSER FOR DOOR 106 TO BE INSIDE ROOM 106 AND DOOR CLOSER FOR DOOR 108 TO BE INSIDE HALLWAY 104.

HARDWARE 7: DOOR 103 (OFFICE)

3 EA	HINGES	BB1168	626	HAGER
1 EA	STOREROOM LOCK	D80PD RHO	626	SCHLAGE
1 EA	CLOSER	4041	689	LCN
1 EA	KICKPLATE	12 X 34	630	HAGER
1 EA	KICKPLATE	12 X 35	630	HAGER
1 SET	SEAL	5050	BRN	NATIONAL GUARD

NOTE: DOOR CLOSER FOR DOOR 103 TO BE INSIDE ROOM 102.

NO.	REVISION	DATE

KD
Kinetic Design
1260 Corona Pointe Court Suite 301
Corona, CA. 92879
Main. 951.547.1165 Web. kineticdesign.build

CONSULTANT

DISCOUNT TIRE

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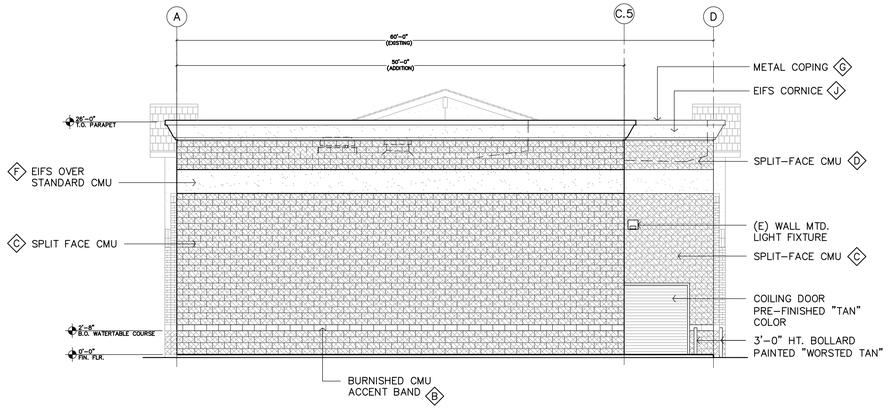
51537 HIGHWAY 6
GLENWOOD SPRINGS
CO 81601

STORE NUMBER: CO002
PROJECT MANAGER: MATT JOHNSON
PREPARED BY: PAKO PIMSAGUAN
PH: (714) 385–1835
FAX:(714) 385–1834
DRAWN BY: LB

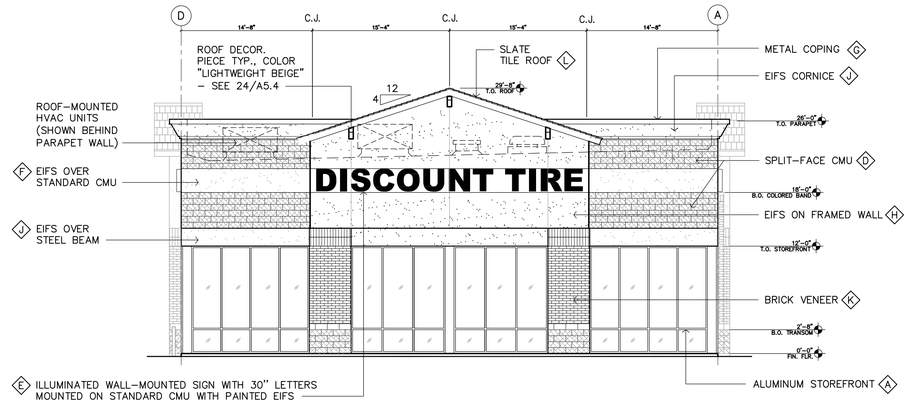
SHEET TITLE:
1ST FLOOR PLAN
DOOR SCHEDULE
WALL TYPE LEGEND
KEY NOTES

DATE: 03/31/2020

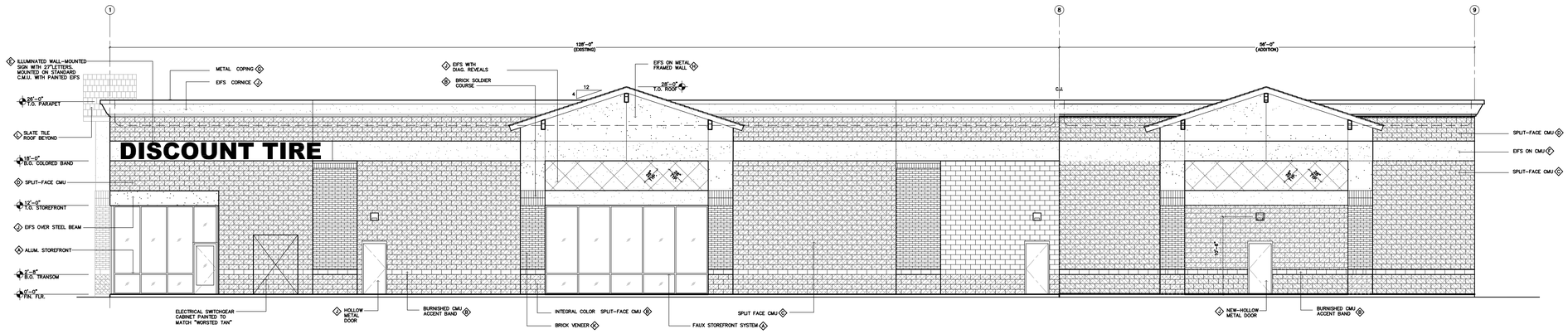
SHEET NUMBER: A3.1



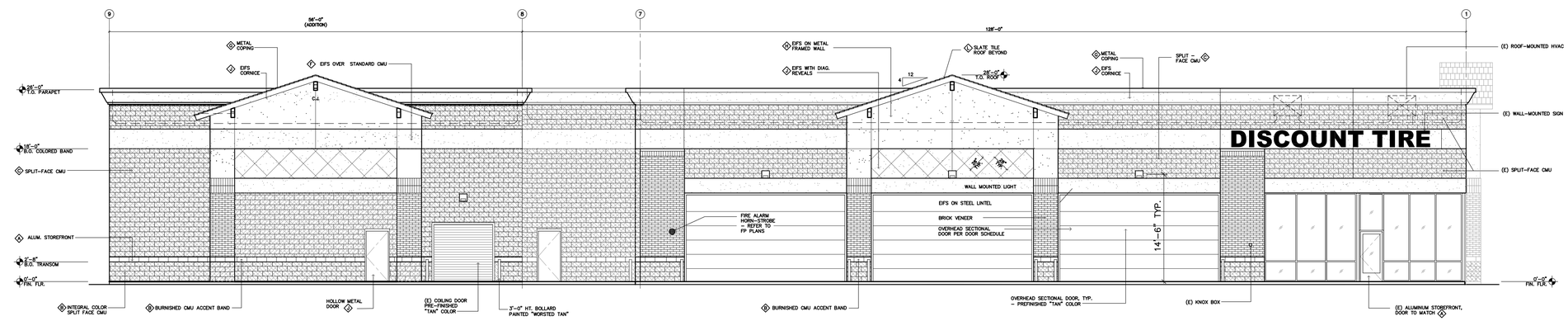
NORTH ELEVATION SCALE: 1/8" = 1'-0"



SOUTH ELEVATION SCALE: 1/8" = 1'-0"



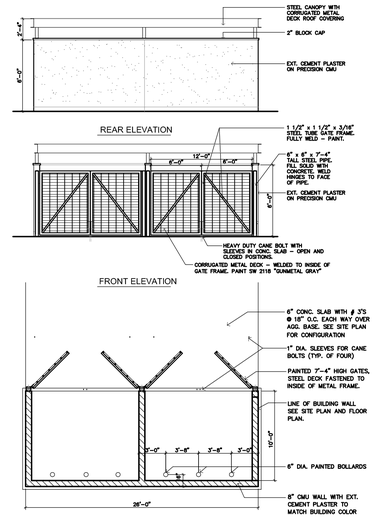
EAST ELEVATION SCALE: 1/8" = 1'-0"



WEST ELEVATION SCALE: 1/8" = 1'-0"

FINISH LEGEND

- A ANODIZED ALUMINUM STOREFRONT SYSTEM MANUFACTURER'S STANDARD COLOR TO MATCH "BANNER RED"
- B INTEGRAL COLOR C.M.U. (SPLIT–FACE OR BURNISHED AS NOTED) TO MATCH "WORSTED TAN"
- C GRAY SPLIT–FACE C.M.U. PAINTED TO MATCH "WORSTED TAN"
- D GRAY SPLIT–FACE C.M.U. PAINTED TO MATCH SW6092 "LIGHTWEIGHT BEIGE"
- E PAINT – SHERWIN WILLIAMS #6119 "ANTIQUE WHITE"
- F E.I.F.S. BAND PAINTED TO MATCH "BURGUNDY"
- G METAL COPING – FACTORY PAINTED / INTEGRAL COLOR TO MATCH "SIERRA TAN" COLOR
- H PAINT – SHERWIN WILLIAMS SW6092 "LIGHTWEIGHT BEIGE"
- J PAINT – SHERWIN WILLIAMS TO MATCH "WORSTED TAN"
- K BRICK VENEER – FACE BRICK BY QUIK–BRIK "RICHFIELD"
- L CONCRETE ROOF TILE–EAGLE ROOFING PRODUCTS BEL–AIR ,NO. 4697



TRASH ENCLOSURE & ELEV.

SCALE: 1/8" = 1'-0"

DISCOUNT TIRE

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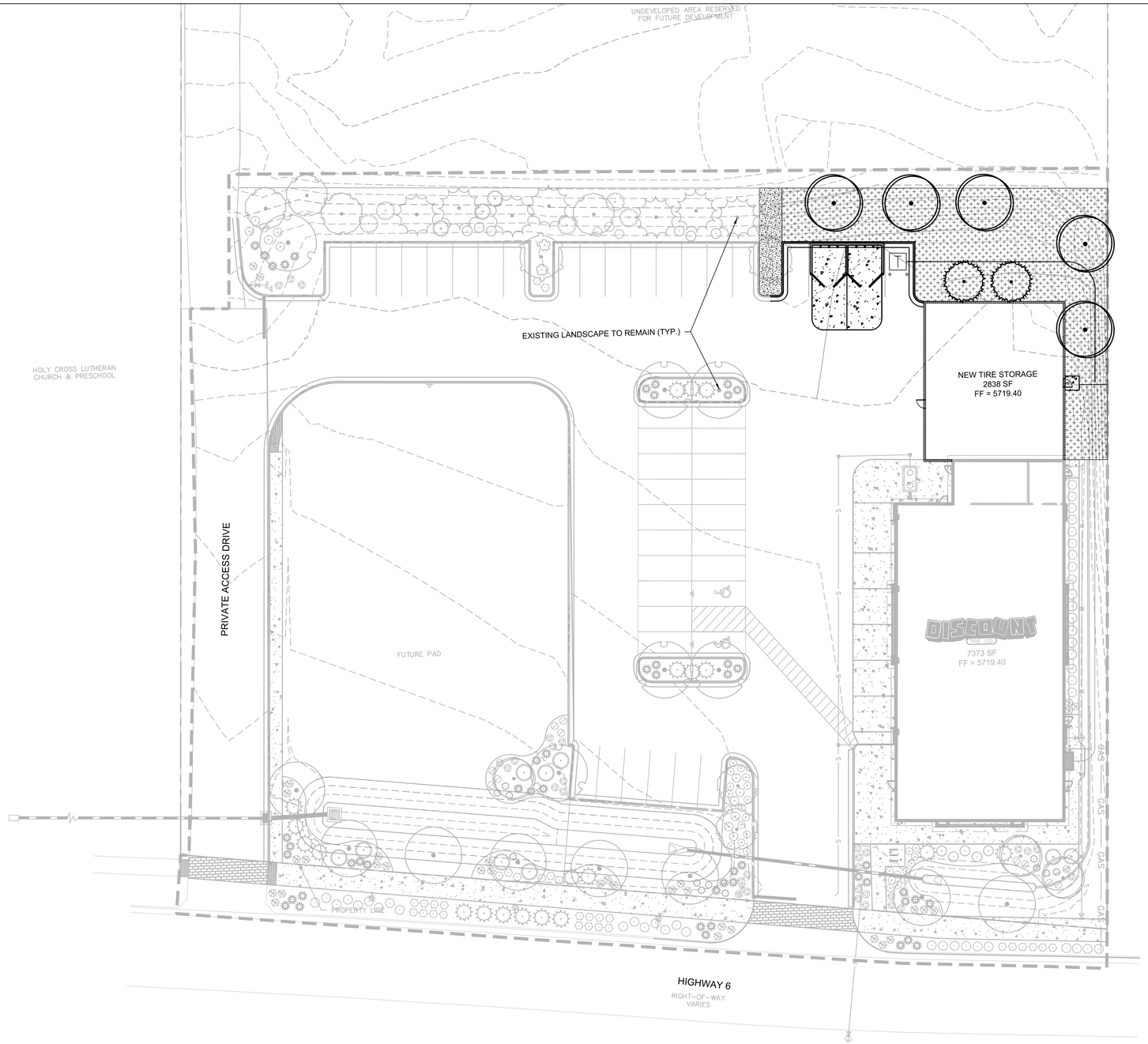
PROPOSED ELEVATIONS

51537 Highway 6
GLENWOOD SPRINGS, CO 81601

KD
Kinetic Design
1260 Corona Pointe Court Suite 301
Corona, CA. 92879
Main. 951.547.1165 Web. kineticdesign.build

BUILDING MODEL ALT - 1R
REVISION -
DATE 06.06.20
SCALE AS NOTED
PROJECT NUMBER 70.0030871

Sheet No.
A4.1



PROPOSED PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE
	GD	5	GYMNOCLADUS DIOICA 'ESPRESSO'	KENTUCKY COFFEETREE	B & B	2.5" CAL MIN	
	JB	2	JUNIPERUS VIRGINIANA 'BURKII'	BURK RED CEDAR	B & B		6' HT MIN

GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	SIZE	SPACING
	KB	4,431 SF	KEN-TEX BLUEGRASS	KEN-TEX HYBRID BLUEGRASS	SOD		
	MW	303 SF	MULCH	DOUBLE SHREDDED HARDWOOD MULCH	-		

EXISTING PLANTING SCHEDULE

WATER USE	SYM	COMMON NAME / BOTANICAL NAME	SIZE & COND.
DECIDUOUS CANOPY TREES			
LOW	KCT	KENTUCKY COFFEETREE GYMNOCLADUS DIOICUS	2.5"–3" CAL.
MOD	PAT	PATMORE ASH FRAXINUS PENNSYLVANICA 'PATMORE'	2.5"–3" CAL.
EVERGREEN TREES			
LOW	ERC	EASTERN RED CEDAR JUNIPERUS VIRGINIANA 'BURKII'	MIN. 6' HT.
DECIDUOUS ORNAMENTAL TREES			
MOD	WKH	WINTER KING HAWTHORN CRATAEGUS VIRIDIS 'WINTER KING'	2"–2.5" CAL.
LOW	NPP	NEWPORT PLUM PRUNUS CERASIFERA 'NEWPORT'	2"–2.5" CAL.
MOD	SPR	SPRING SNOW CRABAPPLE MALUS 'SPRING SNOW'	2"–2.5" CAL.
DECIDUOUS SHRUBS 5'–7' SPREAD			
MOD	IDO	ISANTI DOGWOOD CORNUS SERICEA 'ISANTI'	5 GAL.
LOW	KOR	DWARF KOREAN LILAC SYRINGA MEYERI 'PALIBIN'	5 GAL.
DECIDUOUS SHRUBS 2'–5' SPREAD			
LOW	CPB	CRIMSON PYGMY BARBERRY BERBERIS THUNGERGII 'CRIMSON PYGMY'	5 GAL.
LOW	RUS	RUSSIAN SAGE PEROVSKIA ATRIPLICIFOLIA	5 GAL.
LOW	ALP	ALPINE CURRANT RIBES ALPINUM	5 GAL.
LOW	GFS	GOLDFLAME SPIREA SPIRAEA JAPONICA 'GOLDFLAME'	5 GAL.
EVERGREEN SHRUBS			
LOW	SEA	SEAGREEN JUNIPER JUNIPERUS X MEDIA 'SEA GREEN'	5 GAL.
LOW	GRP	DWARF OREGON GRAPE MAHONIA REPENS	1 GAL.
GRASSES			
LOW	THR	NASSELLA TENUISSIMA THREAD GRASS	1 GAL.
MOD	DFG	DWARF FOUNTAIN GRASS PENNISETUM ALOPECUROIDES 'HAMELN'	1 GAL.
PERENNIALS			
MOD	SHL	SHOWY LUPINE LUPINUS POLYPHYLLUS	1 GAL.
MOD	RMP	ROCKY MOUNTAIN PENSTEMON AQUILEGIA CAERULEA	1 GAL.
MOD	DLF	DAYLILY 'FIRE KING' HEMEROCALLIS SP. 'FIRE KING'	1 GAL.
MOD	DLS	DAYLILY 'STELLA D'ORO' HEMEROCALLIS SP. 'STELLA D'ORO'	1 GAL.
MOD	TIC	TICKSEED 'EARLY SUNRISE' COREOPSIS 'EARLY SUNRISE'	1 GAL.
MOD	RMC	ROCKY MOUNTAIN COLUMBINE AQUILEGIA CAERULEA	1 GAL.

811 Know what's **below.** **Call** before you dig.

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NO.	REVISION	DATE

Kimley»Horn
4582 S. ULSTER ST. #1500
DENVER, COLORADO 80237 (303) 228–2300

NORTH
GRAPHIC SCALE IN FEET
0 10 20 40

DISCOUNT TIRE CO.

MINOR SITE PLAN
51537 HIGHWAY 6
GLENWOOD SPRINGS
CO, 81601

JOB NUMBER: 96010023
PROJECT MANAGER:
BRYCE CHRISTENSEN, P.E.
DRAWN BY:
JRK
REVIEWED BY: DATE:
BC 05/11/2020

SHEET TITLE:
PRELIMINARY LANDSCAPE PLAN
SHEET DESIGNATION:
L1.0

GENERAL NOTES:

1. WE CERTIFY TO THE BEST OF OUR KNOWLEDGE AND BELIEF THAT THE DESIGN OF THIS PROJECT COMPLIES WITH THE APPLICABLE PROVISIONS OF THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT OF 2010.

2. ALL EXITS TO BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE.

3. MANUALLY OPERATED EDGE OR SURFACE MOUNTED FLUSH BOLTS ARE PROHIBITED.

4. STUD PARTITIONS TO BE ANCHORED TO RESIST A LATERAL LOAD OF 5 P.S.F. OR AS LOCAL STORM RATINGS REQUIRE, WHICHEVER IS GREATER.

5. ALL INTERIOR OR EXTERIOR GLASS SUBJECT TO HUMAN IMPACT SHALL CONFORM TO STANDARDS SET FORTH BY THE SAFETY STANDARD FOR ARCHITECTURAL GLAZING MATERIALS, TITLE 16 CFR, PART 1201, AS ISSUED BY THE CONSUMER PRODUCT SAFETY COMMISSION, EFFECTIVE JULY, 1972, INCLUDING ALL AMENDMENTS.

6. INTERIOR WALLS AND CEILING FINISHES SHALL COMPLY WITH REQUIREMENTS SET IN TABLE 803.5 AS LISTED BELOW:

	M	S-1
VERTICAL EXITS & PASSAGEWAYS:	B	C
EXIT ACCESS CORRIDORS & OTHER EXITWAYS:	C	C
ROOMS AND ENCLOSED SPACES:	C	C

7. THE CONTRACTOR SHALL INSPECT THE PREMISES IMMEDIATELY TO CHECK EXISTING WORKING CONDITIONS. SHOULD CONTRACTOR FIND CONDITIONS WHICH HE BELIEVES WOULD IMPEDE HIS WORK, THEN SUCH CONDITIONS MUST BE REPORTED IMMEDIATELY TO THE ARCHITECT. FAILURE TO SO ADVISE WILL CONSTITUTE NOTICE THAT THE CONTRACTOR IS FULLY SATISFIED WITH THE EXISTING CONDITIONS AND THAT HE INTENDS TO PERFORM HIS OBLIGATIONS WITH NO ALLOWANCE EITHER IN TIME OR MONEY FOR ANY IMPEDIMENTS TO HIS WORK.

8. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY DISCREPANCIES PRIOR TO WORK BEING STARTED AND FOLLOW UP IN WRITING WITHIN TWO WORKING DAYS.

9. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD. IF DIMENSIONAL ERRORS OCCUR OR CONDITIONS NOT COVERED IN THE DRAWINGS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE OWNER BEFORE COMMENCING THAT PORTION OF THE WORK.

10. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND ORDINANCES.

11. ALL MANUFACTURED ARTICLES, MATERIALS, AND EQUIPMENT SHALL BE APPLIED, INSTALLED, CONNECTED, ERECTED, CLEANED, AND CONDITIONED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATIONS OR INSTRUCTIONS UNLESS HEREINAFTER SPECIFIED TO THE CONTRARY.

12. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING HIS BEST SKILL AND ATTENTION. HE SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION AND / OR INSTALLATION, MEANS, METHODS, TECHNIQUES, AND PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

13. DIMENSIONS TAKE PRECEDENCE OVER SCALE ON THE CONSTRUCTION DOCUMENTS. DO NOT SCALE DRAWINGS.

14. ALL WORK SHALL BE EXECUTED IN A NEAT AND WORKMANLIKE MANNER, ACCEPTABLE TO THE OWNER.

15. WHEN WORK NOT SPECIFICALLY CALLED OUT IS REQUIRED TO COMPLETE THE PROJECT, IT SHALL BE PROVIDED AND BE OF THE BEST MATERIALS, AND WORKMANSHIP.

16. UNLESS OTHERWISE SPECIFICALLY NOTED, THE CONTRACTOR SHALL PROVIDE ALL PAY FOR ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, CONSTRUCTION EQUIPMENT, AND MACHINERY, TRANSPORTATION, AND OTHER FACILITIES AND SERVICES NECESSARY FOR THE PROJECT IN A "LIEN FREE" CONDITION. EVIDENCE OF PAYMENT TO ALL BUILDING TRADES AND SUPPLIERS SHALL BE PROVIDED, AS INDICATED IN THE PROJECT MANUAL.

17. THE OWNER SHALL PAY ALL FEES FOR PERMITS, ETC. NECESSARY FOR PROPER COMPLETION OF THE WORK, UNLESS NOTED OTHERWISE.

18. THE CONTRACTOR WARRANTS TO THE OWNER THAT ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT WILL BE NEW, UNLESS OTHERWISE SPECIFIED, AND THAT ALL WORK WILL BE GOOD QUALITY, FREE FROM DEFECTS AND FAULTS, AND IN ACCORDANCE WITH THESE CONSTRUCTION DOCUMENTS. ALL WORK NOT SO CONFORMING TO THESE STANDARDS MAY BE CONSIDERED DEFECTIVE. IT IS UNDERSTOOD THAT NO INFERIOR OR NON-CONFORMING WORK OR MATERIALS WILL BE ACCEPTED WHETHER DISCOVERED AT THE TIME THEY ARE INCORPORATED INTO THE WORK OR AT ANY TIME BEFORE OR AFTER FINAL ACCEPTANCE. IF REQUIRED BY THE OWNER, THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT.

19. THE WARRANTIES AND GUARANTEES PROVIDED IN THE CONSTRUCTION DOCUMENTS SHALL BE IN ADDITION TO AND NOT IN LIMITATION OF ANY OTHER WARRANTY OR GUARANTY OR REMEDY REQUIRED BY LAW OR BY THE CONSTRUCTION DOCUMENTS.

20. MASONRY SIZES SHOWN ON THE DRAWINGS SHALL BE NOMINAL.

21. PROVIDE PROTECTIVE COATINGS WHERE DISSIMILAR METALS MAKE CONTACT.

22. ALL WALL PENETRATIONS THROUGH EXTERIOR WALLS SHALL BE SEALED.

23. UNLESS NOTED OTHERWISE, ELECTRICAL CONDUITS, PLUMBING LINES, AND MECHANICAL PIPING SHALL BE CONCEALED AND FRAMING SHALL BE OF ADEQUATE DIMENSION TO ACCOMPLISH THIS WITHOUT UNNECESSARY CHANGES IN THE WALL PLANE.

24. PROVIDE 2x BLOCKING (OR LARGER AS NECESSARY) FOR ALL WALL MOUNTED HARDWARE. COORDINATE THE LOCATION OF ALL BLOCKING WITH THE INSTALLATION GUIDELINES PROVIDED. COORDINATE BLOCKING FOR WHEEL DISPLAY WITH THE OWNER.

25. INTERIOR FINISH SURFACES SHALL NOT BE INSTALLED UNTIL THE BUILDING IS WEATHER-TIGHT.

26. ALL SURFACES EXPOSED TO VIEW SHALL BE FINISHED AS SPECIFIED.

27. ALL MECHANICAL, ELECTRICAL, PLUMBING, AND SPECIAL SYSTEMS, PIPING, CONDUIT, EQUIPMENT, DUCTS, ETC. SHALL RUN CONCEALED BEHIND FINISHED SURFACES UNLESS NOTED OTHERWISE. ALL PIPING SHALL RUN PARALLEL OR PERPENDICULAR TO THE BUILDING STRUCTURE AND, IF EXPOSED IN THE SERVICE AREA, SHALL BE PAINTED TO MATCH THE ADJACENT SURFACE.

28. TYPICAL DETAILS MAY NOT BE CUT ON PLANS, BUT SHALL APPLY UNLESS NOTED OTHERWISE. GENERAL CONTRACTOR SHALL COORDINATE ALL TRADES AND METHODS OF CONSTRUCTION AS REQUIRED FOR COMPLETION OF THE PROJECT WITH THE INTENT OF THESE DOCUMENTS.

29. CONSTRUCTION DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF ON A CONTINUOUS SCHEDULE. THE SITE SHALL BE MAINTAINED "NEAT" IN APPEARANCE. THE GENERAL CONTRACTOR SHALL PROVIDE A TRASH DUMPSTER ON THE SITE INTO WHICH THE OWNER CAN PLACE PACKING MATERIAL AND TRASH RESULTING FROM OWNER FURNISHED EQUIPMENT.

30. VERIFY LOCATIONS OF ALL UTILITIES PRIOR TO EXCAVATION OR TRENCHING. GENERAL CONTRACTOR IS RESPONSIBLE FOR REPAIR OR REPLACEMENT OF DAMAGED UTILITIES.

31. PROVIDE AND COORDINATE BLOCK-OUTS, SLEEVES, INSETS, BOLTS, ANCHOR PLATES, ETC., FOR ALL TRADES, PRIOR TO PLACING CONCRETE OR MASONRY.

32. ALL PRODUCTS LISTED BY I.C.B.O. NUMBER SHALL BE INSTALLED PER THE REPORT AND MANUFACTURER'S WRITTEN INSTRUCTIONS. PRODUCT SUBSTITUTION SHALL ALSO HAVE I.C.B.O. APPROVED EVALUATION REPORT OR BE APPROVED AND LISTED BY OTHER NATIONALLY RECOGNIZED TESTING AGENCY.

33. FOR ALL INTERIOR, SLAB-ON-GRADE FLOORS, WHETHER TO RECEIVE THIN-SET TILE APPLICATION, OR POLISHED FLOOR FINISH SHALL MEET FF40 FLATNESS AND FL30 LEVEL CRITERIA. THIS REQUIREMENT INCLUDES THE RESTROOMS. RESTROOM FLOOR DRAINS SHALL BE LEVEL AND AT SAME HEIGHT AS TILE. FINISHED SLAB TO BE PROTECTED WITH 1"-2" SAND DURING CONSTRUCTION AS NOTED IN THE PROJECT MANUAL, SECTION 03300. BLEMISHES TO BE REPAIRED BEFORE POLISHING PER SECTION 03300 OF THE PROJECT MANUAL.

34. PROVIDE BUILDING ADDRESS: TWO SETS OF 12" HIGH LETTERS, LEGIBLE FROM THE ADJACENT PUBLIC ROADWAY, OR AS REQUIRED BY LOCAL FIRE PREVENTION DEPARTMENT. GENERAL CONTRACTOR TO PROVIDE TEMPORARY JOB SITE ADDRESS, OWNER TO PROVIDE PERMANENT ADDRESS SIGNAGE AS PART OF BUILDING SIGNAGE.

35. PROVIDE GAS AND ELECTRICAL METER LABELS - MINIMUM 1" HIGH LETTERS.

36. ALL WOOD PROVIDED ON THE JOB SHALL BE FIRE RETARDANT-TREATED (F.R.T.).

37. CONTRACTOR SHALL CONTACT ALL LOCAL UTILITY PROVIDERS AND INCLUDE ALL NECESSARY WORK FOR A COMPLETE WORKING SYSTEM. THIS INCLUDES, BUT IS NOT LIMITED TO, UNDERGROUND TRENCHING, PIPING, TRANSFORMER PAD, CONCRETE VAULTS, CONDUITS, PULL LINES, JUNCTION BOXES, PEDESTALS, MANHOLES, CONNECTIONS, TAPS, BACKFLOW PREVENTERS, ENCLOSURES, VALVES, FITTINGS, METER PITS, AND METERS. CONTRACTOR SHALL PROVIDE A SCHEDULE OF COSTS FOR THE ABOVE ITEMS. OWNER SHALL REIMBURSE G.C. FOR UTILITY TAP FEES.

38. ALL SPRINKLER APPROVALS, WHEN REQUIRED, ARE NOT INCLUDING UNDER THIS REVIEW BUT ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR MUST MAKE SEPARATE SUBMITTAL TO THE DEPARTMENT OF PUBLIC SAFETY, FIRE PREVENTION DEPARTMENT, ETC., AS NECESSARY.

39. FIRE SPRINKLER SYSTEMS DESIGN AND SHOP DRAWINGS SHALL BE SUBMITTED TO LOCAL FIRE DEPARTMENT FOR APPROVAL UNDER A SEPARATE PERMIT PRIOR TO FABRICATION AND INSTALLATION.

SPRINKLER DESIGN CRITERIA:

(1) TIRE STORAGE ARRANGEMENT SHALL CONSIST OF SINGLE AND DOUBLE ROW FIXED RACK STORAGE. TIRES ARE STORED ON TREAD, WITHOUT PALLETS OR SHELVES. MAXIMUM STORAGE HEIGHT SHALL BE 18 FEET ABOVE FINISHED FLOOR. THE TOP OF STORAGE TO SPRINKLER DEFLECTOR SHALL BE NOT LESS THAN 3 FEET.

(2) PILING METHOD: SINGLE, DOUBLE AND MULTI-ROW FIXED RACK

PILING HEIGHT: 12 FEET TO 20 FEET.
AREA OF APPLICATION: 3,000 SQ. FT. STORAGE WITHOUT PALLETS OR SHELVES, ON-SIDE OR ON-TREAD.

40. PLEASE NOTE THAT IT IS THE POLICY OF DISCOUNT TIRE COMPANY TO MAINTAIN STRICT CONFIDENTIALITY DURING THE BIDDING PROCESS. A BID LIST WILL NOT BE DISCLOSED TO GENERAL CONTRACTORS, SUB-CONTRACTORS OR VENDERS. PLANS OR INFORMATION CONCERNING THE PROJECT SHALL NOT BE DISTRIBUTED TO ANY CONTRACTOR'S INFORMATION SERVICES SUCH AS DODGE REPORTS, OR PLAN ROOMS OR ANY PARTY NOT SPECIFICALLY INVITED TO PARTICIPATE IN THE PROJECT.

41. CONTRACTOR SHALL BE RESPONSIBLE FOR HIRING A LOCAL BRACING FIRM TO PRODUCE A BRACING PLAN WHICH WILL BE SUFFICIENT TO BRACE THE WALLS AGAINST ALL LOCAL FACTORS OF CLIMATE AND WEATHER, AND FOR SENDING ONE COPY OF THIS BRACING PLAN TO THE PROJECT ARCHITECT AND TO THE STRUCTURAL ENGINEER OF RECORD. THIS BRACING PLAN SHALL BE SEALED BY AN ENGINEER REGISTERED IN THE STATE OF JURISDICTION.

DISCOUNT® TIRE

LOCATION MAP
GLENWOOD, CO

NORTH

OWNER
HALLE PROPERTIES, LLC
DISCOUNT TIRE COMPANY – CONSTRUCTION DEPARTMENT
20225 N. SCOTTSDALE ROAD
SCOTTSDALE, ARIZONA 85255
(480) 606-6000
(480) 606-4370 (FAX)
REPRESENTATIVE: DAN WAINWRIGHT

CONSTRUCTION ADMINISTRATION
KATHY PETERS
DISCOUNT TIRE COMPANY – CONSTRUCTION DEPARTMENT
20225 N. SCOTTSDALE ROAD
SCOTTSDALE, ARIZONA 85255
(480) 606-5854
(480) 606-4370 (FAX)

ARCHITECT
EI DESIGN INC.
1260 CORONA POINTE COURT
CORONA, CA 92879
(951) 363-4467
CONTACT: STEVE APPEL
SAPPEL@EICOMPANIES.COM

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
990 S. BROADWAY, SUITE 200
DENVER, CO 80209
(303) 228-2339
CONTACT: BRYCE CHRISTENSEN

TIRE STORAGE RACKING
RED RIVER RACK COMPANY
2710 STONE CREEK LANE
CORINTH, TEXAS 76210
(940) 612-2242
CONTACT: ANDREW PLOEGER

FIRE SPRINKLER SYSTEM
EJ ENGINEERING GROUP, INC.
21505 N. 78th AVE., SUITE 125
PEORIA, AZ 85382
(623) 362-1400 EXT. 105
CONTACT: JOHN ECHEVERRI

7 PROJECT TEAM

PROJECT INFORMATION:

PROJECT LOCATION:	51537 HIGHWAY 6 GLENWOOD SPRING, CO 81601
SITE AREA:	3.01 ACRES
ZONING:	C-1 (LIMITED COMMERCIAL)
PARKING PROVIDED:	
VEHICLE PARKING	40 STANDARD SPACES 2 ACCESSIBLE SPACES 42 TOTAL SPACES
BICYCLE PARKING	3 SPACES
DESIGN CODES:	2019 INTERNATIONAL BUILDING CODE 2019 NATIONAL ELECTRIC CODE 2019 INTERNATIONAL MECHANICAL CODE 2019 INTERNATIONAL PLUMBING CODE 2019 INTERNATIONAL FIRE CODE 2019 INTERNATIONAL ENERGY CODE
OCCUPANCY TYPE:	M / S-1 NON-SEPARATED - THE WORK PERFORMED IS LIMITED TO REPAIR AND INSTALLATION OF TIRES AND WHEELS. THE USE OF OPEN FLAME OR WELDING IS NOT REQUIRED.
CONSTRUCTION TYPE:	II B (FULLY-SPRINKLERED) NO ATTIC AREA OVER 9,000 S.F.

BUILDING AREA:

BASE ALLOWABLE:	12,500 SF. PER FLOOR ALLOWABLE AREA PER TABLE 503 X 3 (FOR SPRINKLER SYSTEM) = 37,500 SF. TOTAL ALLOWABLE FLOOR AREA
PROPOSED (NET AREA):	7,373.34 S.F. (GROUND FLOOR) 2,180.22 S.F. (MEZZ. LEVEL) 9,553.56 S.F. TOTAL BLDG. AREA

OCCUPANCY LOAD: GROUND FLOOR

'M' OCCUPANCY			
SALES / DISPLAY	1210.54 @ 1 PERSON / 30 S.F.	= 41	PERSONS
OFFICE	108.99 @ 1 PERSON / 100 S.F.	= 2	PERSONS
COMPUTER	29.51 @ 1 PERSON / 300 S.F.	= 1	PERSONS
HALL	57.63 @ 1 PERSON / N/A S.F.	= 0	PERSONS
MEN	56.79 @ 1 PERSON / N/A S.F.	= 1	PERSONS
WOMEN	54.39 @ 1 PERSON / N/A S.F.	= 1	PERSONS
EMPLOYEE	56.00 @ 1 PERSON / N/A S.F.	= 1	PERSONS
JANITOR	28.50 @ 1 PERSON / 300 S.F.	= 1	PERSONS
'S-1' OCCUPANCY			
SERVICE	4791.91 @ 1 PERSON / 100 S.F.	= 48	PERSONS
DEAD TIRE STORAGE	381.33 @ 1 PERSON / 300 S.F.	= 2	PERSONS
COMPRESSOR ROOM	176.00 @ 1 PERSON / 300 S.F.	= 1	PERSONS
	6,951.59 S.F.	99	PERSONS

OCCUPANCY LOAD: MEZZANINE LEVEL

'S-1' OCCUPANCY			
STORAGE 1	176.72 @ 1 PERSON / 300 S.F.	= 1	PERSONS
STORAGE 2	244.38 @ 1 PERSON / 300 S.F.	= 1	PERSONS
STORAGE 3	592.89 @ 1 PERSON / 300 S.F.	= 2	PERSONS
WALKING GRATE	1199.40 @ 1 PERSON / 300 S.F.	= 4	PERSONS
	2,213.39 S.F.	8	PERSONS
GRAND TOTALS:	9,164.98 S.F.	107	PERSONS

A1.0 GENERAL NOTES / ABBREVIATIONS / VICINITY MAP / PROJECT INFORMATION / PROJECT TEAM / SHEET INDEX
C1.0 PRELIMINARY GRADING PLAN
L1.0 PRELIMINARY LANDSCAPE PLAN
A2.0 SITE PLAN
A3.1 1ST FLOOR PLAN / DOOR SCHEDULE / WALL TYPE LEGEND / KEY NOTES
A4.1 EXTERIOR ELEVATIONS / DETAILS / COLOR / PAINT NOTES / GENERAL FINISH NOTES

14 VICINITY MAP

N.T.S.

AB	ANCHOR BOLT	EJ	EXPANSION JOINT	I.B.O.	INSTALLED BY OWNER	SES	SERVICE ELECTRICAL SECTION
ABC	AGGREGATE BASE COURSE	ELEC	ELECTRICAL	INT	INTERIOR	SHT MTL	SHEET METAL
A.C.T	ACOUSTIC CEILING TILE	EQUIP.	EQUIPMENT	JST BRG	JOIST BEARING	SIM	SIMILAR
ADA	AMERICANS WITH DISABILITIES ACT	EXIST.	EXISTING	JT	JOINT	STL	STEEL
AFF	ABOVE FINISH FLOOR	EXP	EXPANSION	LAM.	LAMINATE	STRL	STRUCTURAL
AHJ	AUTHORITY HAVING JURISDICTION	EXT	EXTERIOR	MCJ	MASONRY CONTROL JOINT	SUSP	SUSPENDED
ALUM	ALUMINUM	FBO	FURNISHED BY OWNER	MECH	MECHANICAL	T&G	TONGUE AND GROOVE
BLDG	BUILDING	FEC	FIRE EXTINGUISHER CABINET	MFR	MANUFACTURER	T.O.B.	TOP OF BEAM
B.O.	BOTTOM OF	FF	FINISH FLOOR	MIN	MINIMUM	T.O.C.	TOP OF CONCRETE
C.I.P.	CAST-IN-PLACE	FFE	FURNITURE, FIXTURES & EQUIPMENT	M.O.	MASONRY OPENING	T.O.D.	TOP OF DECK
CJ	CONTROL JOINT	FIN.	FINISH	MTL	METAL	T.O.J.	TOP OF JOIST
CLG	CEILING	F.O.M.	FACE OF MASONRY	N.I.C.	NOT IN CONTRACT	T.O.M.	TOP OF MASONRY
CMU	CONCRETE MASONRY UNIT	FRP	FIBERGLASS-REINFORCED PLASTIC	N.T.S.	NOT TO SCALE	T.O.R.D.	TOP OF ROOF DECK
CT	CERAMIC TILE	FRT	FIRE RETARDANT-TREATED	O.C.	ON CENTER	T.O.W.	TOP OF WINDOW
COL	COLUMN	GA	GAUGE	O.F.	OWNER FURNISHED	TYP.	TYPICAL
CONC	CONCRETE	GALV.	GALVANIZED	O.F.O.	OVERFLOW OUTLET	U.N.O.	UNLESS NOTED OTHERWISE
CONT	CONTINUOUS	GL	GLASS	O.H.	OVERHEAD	VB	VAPOR BARRIER
CONTR	CONTRACTOR	G.S.N.	GENERAL STRUCTURAL NOTES	PNL	PANEL	VCT	VINYL COMPOSITION TILE
CPT.	CARPET	GYP BD	GYPSUM BOARD	PTRS	PREFABRICATED TIRE RACK SYSTEM	V.I.F.	VERIFY IN FIELD
DET	DETAIL	HM	HOLLOW METAL	PVC	POLYVINYL CHLORIDE	VAR	VARIES
DIA	DIAMETER	HORIZ	HORIZONTAL	R.D.	ROOF DRAIN	VERT	VERTICAL
DR	DOOR	HR	HOUR	RDO	ROOF DRAIN OUTLET	V.P.	VENEER PILASTERS
DTC	DISCOUNT TIRE COMPANY	IAW	IN ACCORDANCE WITH	REINF	REINFORCING	WD	WOOD
EDF	ELECTRIC DRINKING FOUNTAIN	I.C.B.O.	INTERNATIONAL COUNCIL BUILDING OFFICIALS	RM	ROOM	W.F.B.	WIDE FLANGE BEAM
EIFS	EXT. INSULATION & FINISH SYSTEM			RUB.	RUBBER	W.P.J.	WEAKEN PLANE JOINT (SAW CUT)

21 GENERAL NOTES

13 ABBREVIATIONS

5 PROJECT INFORMATION

1 SHEET INDEX

NO.	REVISION	DATE

EI DESIGN
1260 Corona Pointe, Ste 301
Corona, CA 92879

CONSULTANT

DISCOUNT® TIRE

DISCLAIMER:

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF DISCOUNT TIRE COMPANY AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT WAS PREPARED. PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH.

51537 HIGHWAY 6
GLENWOOD SPRINGS
CO 81601

STORE NUMBER:
COGO2

PROJECT MANAGER:
MATT JOHNSON

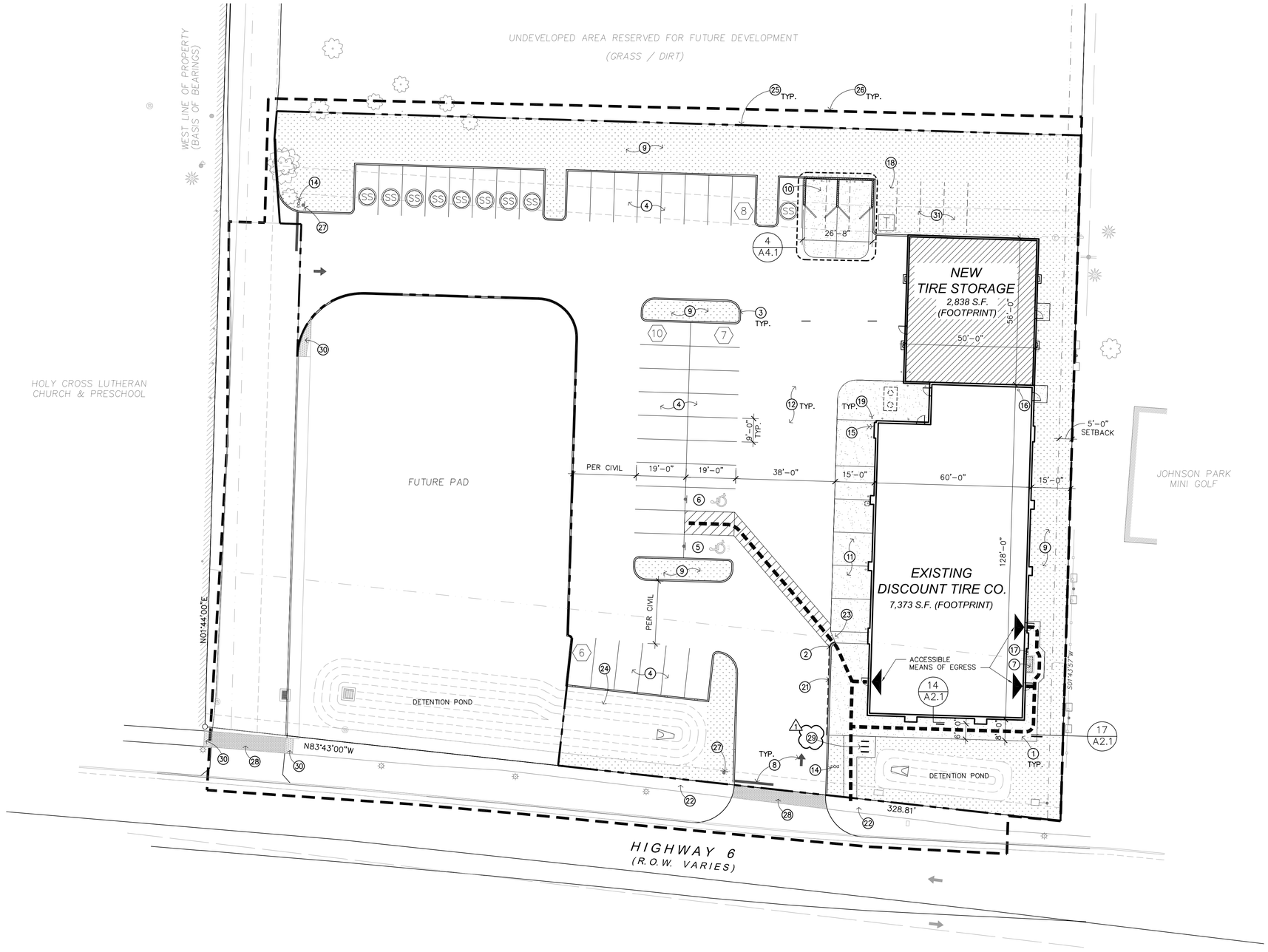
PREPARED BY:
PAKO PIMSAGUAN
PH: (714) 385-1835
FAX:(714) 385-1834

DRAWN BY:
LB

SHEET TITLE:
GENERAL NOTES
ABBREVIATIONS
VICINITY MAP
PROJECT INFORMATION
PROJECT TEAM
SHEET INDEX

DATE: 03/31/2020

SHEET NUMBER:
A1.0



SITE PLAN

SITE NOTES:

1. CONCRETE WALK W/ MED. BROOM FINISH – PROVIDE EXPANSION JOINT & CONTROL JOINT.
2. HANDICAP RAMP – SEE CIVIL DWGS.
3. STANDARD 6" CONCRETE CURB – SEE CIVIL DWGS.
4. PARKING STALL – REFER TO CIVIL DWGS.
5. HANDICAP VAN ACCESSIBLE PARKING SPACE WITH VAN ACCESSIBLE SIGN.
6. HANDICAP PARKING SPACE WITH SIGN.
7. ELECTRIC SERVICE ENTRY – SEE CIVIL DWGS. & ELECTRICAL DWGS.
8. PAINTED TRAFFIC ARROW / "STOP" BAR (COLOR: TRAFFIC WHITE) – SEE CIVIL DWGS.
9. LANDSCAPE ISLAND/AREA – SEE LANDSCAPE DWGS.
10. (*) TRASH ENCLOSURE W/ 6'–0" HIGH BLOCK WALL AND METAL GATE.
11. CONCRETE PAVEMENT – REFER TO CIVIL DWGS.
12. ASPHALT PAVEMENT – SEE CIVIL DWGS. REFER TO SOILS REPORT FOR RECOMMENDATIONS.
13. SAND/ OIL INTERCEPTOR – SEE PLUMBING DWGS.
14. FIRE HYDRANT – SEE CIVIL DWGS. & FIRE PROTECTION DWGS.
15. 3–WAY FIRE DEPARTMENT CONNECTION – SEE CIVIL AND FIRE PROTECTION DWGS. IF INSTALLED REMOTELY THEN BOLLARDS WILL BE REQUIRED FOR PROTECTION.
16. FIRE RISER WITH BACKFLOW PREVENTER ASSEMBLY – SEE CIVIL DWGS., FIRE SPRINKLER DWGS. AND PLUMBING DWGS.
17. GAS METER – SEE PLUMBING DWGS.
18. (*) ELECTRIC TRANSFORMER AND CONCRETE PAD WITH BOLLARDS – REFER TO CIVIL DWGS. & ELECTRICAL DWGS. ALSO REFER TO 8/A2.1 FOR BOLLARDS DETAIL (SIM.).
19. STEEL BOLLARD FILLED W/ CONCRETE. SEE 8/A2.1.
20. "INVERTED U" BIKE RACK – SEE CIVIL DWGS.
21. CONCRETE CURB PAINTED TRAFFIC YELLOW UNLESS SPECIFIED OTHERWISE BY FIRE DEPARTMENT.
22. EXISTING CONCRETE SIDEWALK – SEE CIVIL DWGS.
23. TRANSITION CURB. SEE 20/A2.1 AND CIVIL DWGS.
24. RESERVED
25. DISCOUNT TIRE SCOPE OF WORK – SEE CIVIL DWGS.
26. CONSTRUCTION LIMITS – SEE CIVIL DWGS.
27. STOP SIGN – SEE CIVIL DWGS.
28. BRICK PAVERS – SEE CIVIL DWGS.
29. BIKE RACK – SEE CIVIL DWGS.
30. DETECTIBLE WARNING PLATE – SEE CIVIL DWGS.
31. (N) LANDSCAPE

SITE LEGEND:

- LINE OF ACCESSIBLE PATH OF TRAVEL
- 6 — NUMBER OF PARKING STALL, TYP.
- SS — PARKING STALL W/IN DESIGNATED SNOW STORAGE AREA
- LANDSCAPING
- CONCRETE CURB PAINTED TRAFFIC YELLOW, UNLESS SPECIFIED OTHERWISE BY FIRE DEPARTMENT.
- DISCOUNT TIRE SCOPE OF WORK – SEE CIVIL DWGS.
- CONSTRUCTION LIMITS – SEE CIVIL DWGS.

NOTE:
SITE PLAN IS PROVIDED AS REFERENCE TO DETAILS PROVIDED IN THE ARCHITECTURAL DETAIL SHEET A2.1 FOR SITE IMPROVEMENTS, REFER TO PLANS PREPARED BY: KIMLEY-HORN, INC.

NORTH

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

DISCOUNT TIRE

THIS PLAN IS PROPERTY OF EI DESIGN. THIS DRAWING IS LOANED WITHOUT OTHER CONSIDERATION THAN THE AGREEMENT AND CONDITION THAT IT IS NOT BE REPRODUCED, COPIED, OR OTHERWISE DISPOSED OF, DIRECTLY OR INDIRECTLY, AND IS NOT TO BE USED IN WHOLE OR IN PART TO ASSIST IN MAKING OR TO FURNISH ANY INFORMATION FOR THE MAKING OF DRAWINGS, PRINTS, APPARATUS OR PARTS THEREOF. THE ACCEPTANCE OF THIS DRAWING WILL BE CONSTRUED AS AN ACCEPTANCE OF THE FOREGOING CONDITIONS.

CONCEPTUAL SITE PLAN

51537 Highway 6
GLENWOOD SPRINGS, CO 81601

KD
Kinetic Design
1260 Corona Pointe Court Suite 301
Corona, CA. 92879
Main. 951.547.1165 Web. kineticdesign.build

BUILDING MODEL	ALT - 1R
REVISION	-
DATE	06.06.20
SCALE	AS NOTED
PROJECT NUMBER	70.0030871

Sheet No.

A2.0

CITY OF GLENWOOD SPRINGS

Engineering Department

Engineering Department
Jessica Bowser,
Asst. City Engineer

Date: May 27, 2020

To: Community Development

Re: Discount Tire Addition Pre-Application

Please see the following engineering comments for Discount Tire Addition Pre-Application.

Items to be addressed prior to Grading/Building Permit issuance:

1. It is unlikely that this addition will require a new access permit, but the application should verify and/or update their permit with CDOT. Access permits through CDOT include vehicular and drainage.

Information only/Requirements Prior to Certificate of Occupancy:

1. The City will require a maintenance plan and agreement with the development for the detention and debris system/s, ***if not already in place***. If the system/s are not being maintained property and having a negative effect on downstream facilities, the City will need access to perform the maintenance and back charge the facility owner.

2. Site improvements will require a certification letter from the design engineer that verifies that all improvements were constructed per plan.

3. Record (as-built) drawings will be required to be submitted to the City along with electronic drawings (CAD).

Emery Ellingson

From: Gretchen E Ricehill
Sent: Thursday, June 4, 2020 11:01 AM
To: Emery Ellingson
Subject: FW: Discount Tire (Glenwood Springs) - Building Expansion/Access Permit Coordination

Emery
Forwarding info from CDOT re: discount tire.
g

From: Killian - CDOT, Brian <brian.killian@state.co.us>
Sent: Thursday, June 4, 2020 10:32 AM
To: Christensen, Bryce <Bryce.Christensen@kimley-horn.com>
Cc: Bunnell - CDOT, Mark <mark.bunnell@state.co.us>; Kandis Aggen - CDOT <kandis.aggen@state.co.us>; Gretchen E Ricehill <gretchen.ricehill@cogs.us>; Jessica Bowser <jessica.bowser@cogs.us>
Subject: Re: Discount Tire (Glenwood Springs) - Building Expansion/Access Permit Coordination

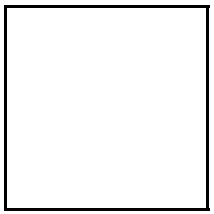
Bryce,

CDOT concurs that no access permit is needed. Thanks for the analysis and information.

Please let me know if you have any questions.

Thanks,

Brian Killian
Region 3 Access Manager
Traffic & Safety



P 970-683-6284 | C 970-210-1101 | F 970-683-6290
222 S. 6th St, Room 100 Grand Junction, CO 81501
brian.killian@state.co.us | www.codot.gov | www.cotrip.org

On Tue, Jun 2, 2020 at 5:15 PM Christensen, Bryce <Bryce.Christensen@kimley-horn.com> wrote:

> Brian -
>
> Good evening. I'm working on building expansion project at the Discount Tire development in Glenwood Springs. Specifically located at 51537 Hwy 6. This project is for an expansion of the existing building (approximately 2,838 SF) for dead tire storage. Currently, Discount Tire is utilizing several Conex Containers out in their parking lot. We have submitted our Minor Site Plan Amendment application to the City of Glenwood Springs and would like to coordinate this now with CDOT as well.
>
> Attached is the completed traffic study compliance letter for the Discount Tire expansion project. Based on the new ITE Trip Generation 10th Edition, and the increased tire store size being greater than 10,000 square feet, we are now into the "Tire Superstore" code use instead of "Tire Store". Both of those modifications mean that the Discount Tire, with the expansion, generates less traffic than previously studied. We added a note that since the expanded building area is for storage, traffic volumes shouldn't increase over existing.
>
> Furthermore, even with the building expansion we are reducing the amount of impervious area by adding additional landscape area. We will still be utilizing the existing dry well that has been operating since the development was built. No new stormwater runoff will be introduced to the CDOT ROW.
>
> We believe a CDOT access permit should not be required for this project. Can you please review and let me know if you have any questions? If you concur, could you please confirmation that could be shared with the City Planner? Please let me know if you have any questions and thanks for all your time and consideration to this project.
>
> *Best Regards,*
>
> **Bryce Christensen, P.E.**
>
> **Kimley-Horn** | 16 Kearns Road, Suite 301-C, Snowmass Village, CO 81615
> Direct: 303 228 2339 | Mobile: 801 599 6545 | www.kimley-horn.com

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Planning & Zoning Commission Staff Report

Date: June 23, 2020
To: Planning & Zoning Commission
From: Gretchen Ricehill, Asst. Director Community Development Dept.
Subject: #30-20- Location & Extent Review – City of Glenwood Springs – 811 Airport Road

REQUEST	Consideration of a Location & Extent Review application for construction of an 1,800 s.f. covered storage building, a 5-bay 2,250 s.f. garage/storage building, a 3,200 s.f. temporary canvas covered building, and temporary mobile and storage units. The application includes moving and extending an existing chain link fencing on the north property line and constructing a concrete pad for street sweeper use.
APPLICANT	City of Glenwood Springs, Public Works Department
OWNER	City of Glenwood Springs
ZONE	I1-Light Industrial
LOCATION:	811 Airport Road
SURROUNDING LAND USES	North: Airport; Storage South: Storage; Vacant East: Airport Operations West: Industrial/Commercial/Office
LOT SIZE	62 acres

ACTION ITEM SUMMARY

Action 1: Consideration of a Location & Extent Review application for construction of a an 1,800 s.f. covered storage building, a 5-bay 2,250 s.f. garage/storage building, a 3,200 s.f. temporary canvas covered building, and temporary mobile and storage units. The application includes moving and extending an existing chain link fencing on the north property line and constructing a concrete pad for street sweeper use.

Staff Recommendation: Staff recommends that the Planning and Zoning Commission **approve** the Location & Extent Review application **with findings and conditions on page 6 of this report**.

PROJECT SUMMARY

Due to structural issues at the Municipal Operations Center (MOC), the City of Glenwood Springs is in the process of permanently relocating all of its operations housed there which includes Fleet, Parks Operations, Electric, Streets, and the Special Work Action Team (SWAT).

Earlier this year, the Planning and Zoning Commission considered and approved a Location and Extent application for improvements to 2222 Devereux Road, a property that the city purchased to house portions of Fleet, SWAT, and Street Department operations.

This Location and Extent application considers improvements to an existing, city-owned storage area at the Airport, commonly known as the “boneyard” to house Streets and SWAT department operations, as well as storage for Electric and Parks departments.

The site consists of roughly 2.6 acres and is currently occupied by a temporary office for the Streets/SWAT departments; a Streets sign shop; two temporary storage containers; and outside material storage. The proposal is to expand the area to a total of approximately 3.35 acres by extending the existing fence. The site will then be divided into two lots (note: this will not be a legal division but simply dividing the existing area by installing a fence). The south lot will be gated and used for outside storage, much as it is today. The northern lot will contain building improvements including:

- A covered 1800 sf storage building that is open on one side;
- A 5-bay 2250 sf garage/storage building;
- A temporary 40’x 80’ canvas roofed building;

Additionally, the city proposes constructing a 20’ x 20’ concrete pad which will be used as a clean out area for the city’s street sweeper.

Below are current photos of the property.

“Boneyard” showing the existing temporary mobile buildings

Airport Rd looking north. Photos above and below showing “boneyard” and exterior storage.

Review Process & Approval Criteria:

The Planning and Zoning Commission considers Location and Extent Review applications for all public and quasi-public special districts based on whether the application is consistent with applicable Comprehensive Plan goals and policies, consistency with the general purpose and intent of the Municipal Code and how well the application minimizes adverse impacts to health, safety and welfare of

inhabitants of surrounding areas and the city. Below in bold font are the criteria and staff analysis of the proposed improvements.

i. Is consistent with the Comprehensive Plan and other City plans and policies.
The applicant's narrative provided a detailed discussion of how this project conformed to goals of the Comprehensive Plan. Included were the goals:
Direct Development to Locations and Forms that are Cost-effective to Serve

- The City's Streets and SWAT departments will be operating from this Airport location and the recently approved location on Devereux Road. The dual locations allow both departments to cover the entire city in a more timely, effective manner than being in one central location.
- The existing infrastructure and capacities at the Airport property meet the city's needs and the proposed improvements fit within the site.

Address Transportation Needs and Provide Multiple Convenient Travel Choices by locating development in ways to reduce traffic congestion, assure safe and efficient movement of people and goods, and provide equal access to community facilities.

- The applicant noted that this Airport location coupled with the Devereux Road site spaces out to and from traffic, rather than concentrating in one location. Additionally, the Airport site is in proximity to a fire department (Four Mile Rd), city water tank, and when South Bridge is constructed, the site will allow direct access to Highway 82.

Values and Vision for Public Utilities and Services - Providing efficient public utilities and services is essential to quality of life, livability and to cost-effective growth.

- The applicant notes that the Streets and SWAT departments are key to providing service to other city departments as well as to the general public. The Airport Road location allows for quick department response to regular and emergency repairs when needed, in the southern areas of the city.

Staff adds that the proposed improvements also conform to the Comprehensive Plan's future land use map shown at right. The property is classified as industrial (purple) which accommodates heavy commercial, light industrial, and industrial uses such as manufacturing, warehousing and distributing, and indoor/outdoor storage.

ii. Is consistent with the general purpose and intent of this Code.
The proposed improvements comply with the Title 070.020 zoning district standards for setback, building height; and with 070.030 for land uses allowed in the I/1-Light Industrial zone. Regarding landscaping, the Code requires that properties in the I/1 zone provide 20% of the site as landscaping. In this case, the "boneyard" site is part of the larger 62-acre Airport property, which would require over 12

acres of landscape area. The "boneyard" site will be used for large truck and vehicle circulation, as well as for small and large equipment/material storage. Currently sage and other native species populate and border the property. Staff believes that at the current time, it would be in appropriate and out of character of the area to introduce groomed landscaping that would need irrigation. Staff believes that the area, or portions thereof, will most likely be improved when South Bridge is constructed.

With regard to architectural design: Staff found that the proposed project does not meet the non-residential design standards, section 070.040.090. Namely, building elevations that exceed 30 feet in length are required to provide three design treatments that are selected from a list. Acceptable design treatments include building articulation (24-inch minimum wall plane difference); window/door glazing (30% of elevation, minimum) change in material texture; awnings/canopies; and change in building height. Unlike the Devereux location where buildings were visible from a public right of way and were dressed with stacked stone wainscoting, the City does not propose decorative architectural treatments on the "boneyard" buildings. Staff believes that because this property is located on a dead-end road, and because it is immediately adjacent to similarly unadorned buildings and structures (on and off Airport property), strict compliance with the architectural standards would be out of character with the surrounding area.

The proposed project also does not meet section 070.040.050, fencing requirements. The proposal includes the extension of an existing chain link security fence that surrounds the property. Section 070.040.050 of the Code allows coated chain link when located in rear and side yards but, chain link is currently not allowed in a front yard. The City proposes extending the existing galvanized chain link along the north and east sides of the "boneyard" property. Staff has no issues with extending this chain link fencing as there is limited public access and views to this section of the Airport property.

Finally, the project is not a adding a sidewalk along Airport Road per the requirements of 070.040.070(f)(1). The Code requires an 8-foot wide sidewalk in non-residential zoning districts. Although plans are not fully developed, Staff expects that a sidewalk will be constructed along Airport Road when it is improved for the South Bridge construction project.

Although not in strict compliance with all aspects of the Development Code as noted above, the project is found to be consistent with the Code's general purpose and intent provisions namely, it protects the public health, safety, and welfare of the city and implements the policies, goals and strategies adopted by the City including those set forth in the Comprehensive Plan.

iii. Minimizes adverse impacts to the health, safety, and welfare of the inhabitants of the surrounding areas and the city.

The proposed project does not negatively impact surrounding properties or the health, safety and welfare of the city's inhabitants.

REVIEWING AGENCY COMMENTS

Although no formal, written comments were received, this project has been developed with regular input from all applicable City Departments.

REQUIRED ACTIONS

Action 1: Consideration of a Location & Extent Review application for construction of an 1,800 s.f. covered storage building, a 5-bay 2,250 s.f. garage/storage building, a 3,200 s.f. temporary canvas covered building, and temporary mobile and storage units. The application includes moving and

extending an existing chain link fencing on the north property line and constructing a concrete pad for street sweeper use.

Action Alternatives
The Planning and Zoning Commission may approve, approve with conditions, deny or continue this application to a future hearing with a request for additional specific information which it finds necessary to determine compliance with the Municipal Code and city goals and policies.

Staff Recommendation: Staff recommends that the Planning and Zoning Commission **approve** the Location & Extent Review application **with suggested findings and conditions on page 6 of this report**.

Suggested Findings:
1. The proposal is consistent with the Comprehensive Plan and other City plans and policies;
2. The proposal is consistent with the general purpose and intent of this Code; and
3. The proposal minimizes adverse impacts to the health, safety, and welfare of the inhabitants of the surrounding areas and the city.

Suggested Conditions:
1. The applicant/owner 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.
2. Prior to construction, applicant/owner shall submit building and/or grading permit, as required.
3. The applicant/owner shall provide exterior building color samples for Community Development Director review and approval at the time of building permit submission. The proposed colors shall be earth-tone.
4. The applicant/owner shall provide lighting manufacturer information for all exterior lighting. Lighting shall be reviewed and approved by the Community Development Director prior to installation.
5. Any future physical changes to or improvements on the property are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.

LAND USE APPLICATION

City of Glenwood Springs
Economic and Community Development Dept.
101 West 8th Street
Glenwood Springs, CO 81601
970-384-6411

Ordinance Amendments		Development Permits	
Rezoning	☐	Site/Architectural Plan Review	
Rezoning to Planned Unit Development (PUD)	☐	Administrative	☐
Annexation	☐	Minor	☐
Condominiumization	☐	Major	☐
Annexation	☐	Master Plan	☐
Street Vacation	☐	Construction Plans	☐
	☐	Location & Extent	✔
Subdivisions		Right of Way Encroachment License	☐
Minor Subdivision	☐	Floodplain Development Permit	☐
Preliminary Plat	☐		☐
Final Plat	☐	**Flexibility and Relief Procedures**	
Vacation of Right-of-Way	☐	Variance	☐
		Administrative Adjustment	☐
		Appeal	☐

Applicant/Property Owner Information:			
Applicant		Owner	
City of Glenwood Springs Public Works		City of Glenwood Springs	
Relationship to Owner		Owner	
Department			
Applicant Address		Owner Address	
101 W. 8th Street		101 W. 8th Street	
Phone 970-384-6400	Email Address matthew.langhorst@cogs.us	Phone 970-384-6400	Email Address matthew.langhorst@cogs.us

Property Information:			
Address		Parcel Number	
811 Airport Road		2185-527-100-050	
Subdivision		Lot and Block Number	
Zone District	Light Industrial - L1	Existing Land Use	Airport Property and Storage Yard

General Project Description:
Repair of existing building, installation of 6' tall security fencing, construction of 5 bay garage/shop building, vehicle storage, material storage facility, fuel/gas facility and wash bay facility.

Signatures:		
The owner or applicant must be present at the hearing. All public hearings must be property 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 application. (Attach additional incorporation documents if necessary.) I declare under the penalty of perjury that the above information is true and correct to the best of my knowledge.		
	Applicant	Date
	Owner	Date
	Owner	Date

Location and Extent Review Application Narrative

The City of Glenwood Springs is moving its Parks, Fleet, Electric, SWAT and Streets Departments out of their current location at 2301 Wulfsohn Road, known as the MOC, due to structural issues at the facility. The new location that has been chosen for a majority of the Streets and SWAT department to move to is the existing "Boneyard" location on the south end of the City's airport property. This lot is located at 811 Airport Road and within its existing fence line encompasses approximately 2.58 acres of land in total. As of this L&E submission the existing site house's a Streets/SWAT office building, a Streets sign shop and two temporary storage container buildings. The plan for the site is to expand the fenced area out to approximately 3.35 acres, running the north boundary fence approximately 25' off of the edge of Airport Road/116 Road and tying back into the existing fence line location along Airport Road/163 Road. Then the overall lot will be broken into two lots with the northern portion being approximately 1.86 acres and the Sothern portion being 1.49 acres. This will allow for more storage interior to the fencing, break the different site operations into two safe location for the departments to work within and allow for a temporary 40'x80' building to be constructed to house the Electric Departments equipment, some of which needs to be kept under cover due to its electronics and rigging.

The southern portion of the site as you can see on the site plan will be gated off and still occupied by the electric and parks department for outside storage as it is used today. The actual area being occupied by Streets and SWAT is the northing section including the 1.86 acres dedicated mainly for these two departments.

Current total building area on the site is 8,048SF of indoor capacity. We are proposing to add a covered storage building that is open on one side, a 5 bay garage/storage building and a temporary 40'x80' canvas covered building for the Electric Department to utilized until they have a final site/building to work from.

One other site improvement being proposed, but without a final design location is a sweeper cleanout area. This cleanout will encompass a concrete pad in the 20'x20' approximate sizing that will be hooked to an oil/sand separator, settling tank and then a drywell with sand in the bottom of it to make sure that all required pollutants are being removed from the water prior to it entering the native soil materials on the site.

Most of the City is aware of the reason that these departments have looked for new homes. The current Municipal Operations Center (MOC) is settling at a destabilizing rate and the cost of repairs to the building are beyond the cost of moving departments to other locations and settling back down at these new and geologically stable locations. The "new" site being proposed is on river rock and has been utilized by the City for city operations for many years. Prior to any final building construction occurring a Geotech report will be completed so that any permanent building foundations/slabs can be designed properly for a long-life span.

With this site being Streets/SWATs main facility and their secondary facility being located at 2222 Devereux Road along with Fleet, this will allow streets to react to situations quicker with materials, equipment and staff on both ends of the City. If we located the entirety of the Streets/SWAT Departments at the Airport location and an issue came up along Midland Avenue between 27th Street and 4 Mile, our crews would have a 32-mile trip to get to work without South Bridge being constructed. With two locations, we can react to situations quicker and even set up plowing operations faster in the wintertime. This is a win for the City, but it comes at a cost that was not anticipated in 2020.

The site planning includes the existing buildings, proposed temporary buildings and new buildings that will meet the nature of the surrounding uses. The site currently as chain link and deer fence surrounding it, we will be adding chain link to expand the site, but we will add either wind screen or slats to block the view of the yard from the outside roadway alignments. This will allow us to keep equipment, vehicles, materials and city facilities under a safe lock and key. Staff is requesting that the new and existing facility changes/updates not be held to the City

esthetic code but be allowed to be as cost effectively constructed as possible, while still melding a blend of structure/design that complement the surrounding uses. There are three new structures being proposed on the site as noted earlier in this report. Due to the existing vegetation and the location of this site at the very south end of the City boundary and away from residential and surrounded by county commercial facilities the new structures will not be brought up to the full esthetic code of the City to save money and fit into the surrounding structures designs.

How this site planning meets the Comprehensive Plan for the City

The City was in need for a facility that met the requirements of a Streets and SWAT Department, which includes the need for an Office building, sign shop, large garage type facility with adequately sized doors, open storage, covered temporary storage, power supply meeting equipment needs, fiber optic capacity, a large lot for storage of materials and vehicles and localized location for all departments to be able to access the site conveniently. The 811 Airport Road site meets all of these requirements without much change to the existing site. The Comprehensive plan defines what the City is looking for in development of sites within the City, and list below are notable points on how the 811 Airport Road site meets the direction the plan wants development to unfold.

- The comprehensive plan calls out to "Direct Development to Locations and Forms that are Cost-effective to Serve" which is what this site does for the City. The infrastructure and capacities of the site meet the needs of the City well, and the changes that would need to be constructed fit within the site acreage and do not affect the utility capacities within the site.
- The comprehensive plan calls out to "Address Transportation Needs and Provide Multiple Convenient Travel Choices" by locating development in ways to reduce traffic congestion, assure safe and efficient movement of people and goods, and provide equal access to community facilities. The existing site accomplishes this in several ways. The site location spaces it out enough from the 2222 Devereux Road facility that it helps space out the traffic that will need to come to this facility versus 2222 Devereux Road, it puts the site near a fire department location, water tank location and when South Bridge is built it will allow direct access to Highway 82 for deliveries and circulation.
- The Comprehensive plan calls out "Values and Vision for Public Utilities and Services", by providing efficient public utilities and services essential to quality of life, livability and to cost-effective growth. The Streets and SWAT Departments are a vital cog in the workings of all city departments by helping maintain the streets, storm water facilities, metal and concrete facilities within the City. The Airport Road location makes the departments readily available to all departments for quick response for regular and emergency repairs as they are needed. Without these two Departments the Utility and Parks Departments would not be able to function efficiently on a daily basis. Case in point, the Streets Department and Fleet Department worked hand in hand in early October 2019 to outfit all the Streets trucks with plowing and sanding equipment in an emergency with an unusual snowstorm heading our way. With great success, the two departments got enough equipment up and running that the snow storm, and second following storm event did not affect the functioning of the City or its residents travel. This facility will allow the two departments to expand their upfitting capacity and area as needed in situations like this, in a second convenient location, and keep our City up and running and safe for all.

Exhibits:

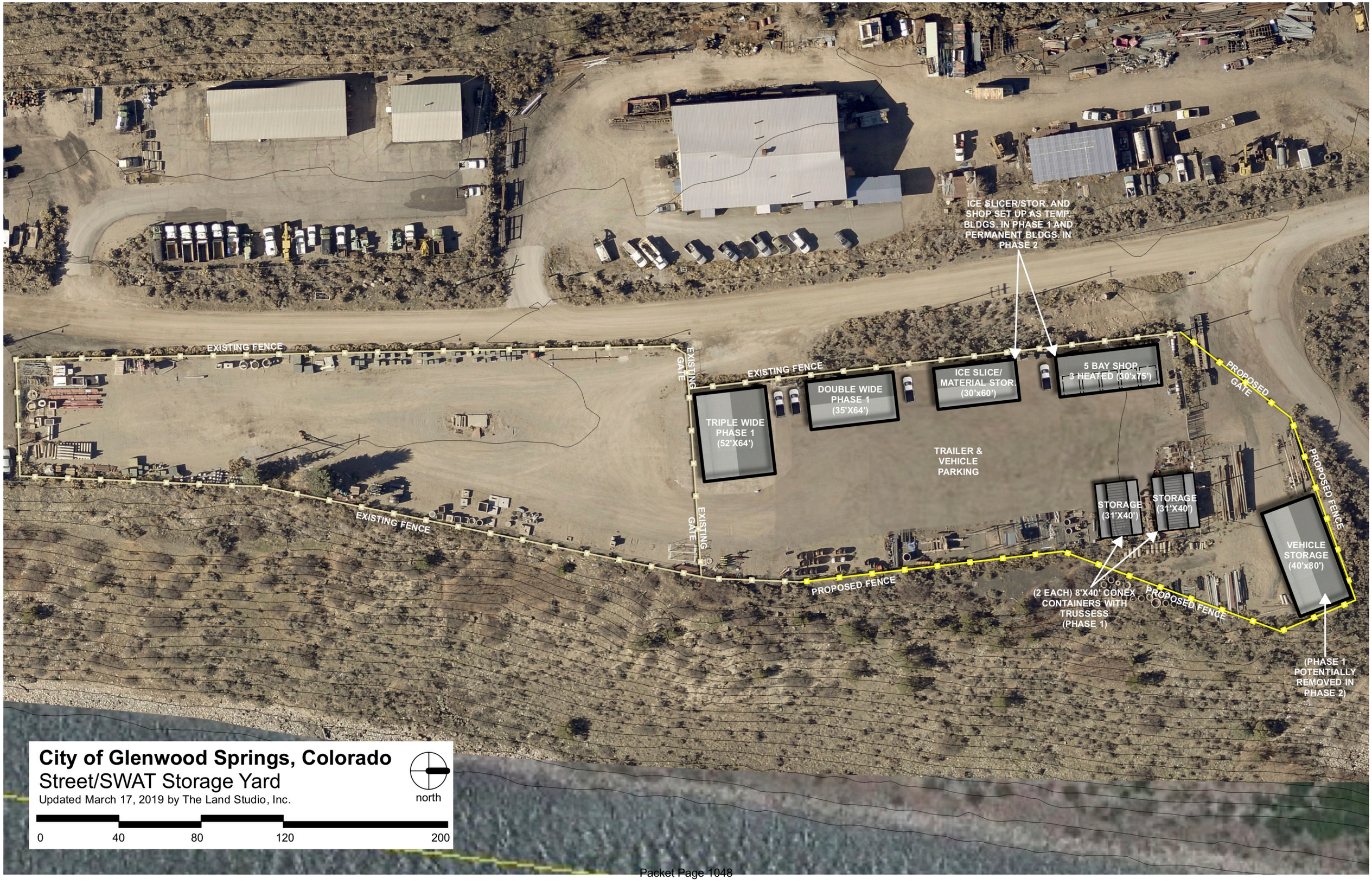
Exhibit A: Existing and Proposed Site Plan

Exhibit B: Streets Office Building Plans

Exhibit C: Streets Sign Shop Plans

Exhibit D: Proposed Garage Floor Plan and Elevations

Exhibit E: Proposed Material Storage Structure. This structure will be 60’ in width versus the shop 45’, this is a carryover from the Fleet L&E submittal.


ICE SLICER/STOR. AND SHOP SET UP AS TEMP. BLDGS. IN PHASE 1 AND PERMANENT BLDGS. IN PHASE 2
EXISTING FENCE
EXISTING GATE
EXISTING FENCE
TRIPLE WIDE PHASE 1 (52'X64')
DOUBLE WIDE PHASE 1 (35'X64')
ICE SLICE/ MATERIAL STOR. (30'x60')
5 BAY SHOP 3 HEATED (30'x75')
PROPOSED GATE
PROPOSED FENCE
TRAILER & VEHICLE PARKING
STORAGE (31'X40')
STORAGE (31'X40')
EXISTING FENCE
EXISTING GATE
PROPOSED FENCE
(2 EACH) 8'X40' CONEX CONTAINERS WITH TRUSSESS (PHASE 1)
PROPOSED FENCE
VEHICLE STORAGE (40'x80')
(PHASE 1 POTENTIALLY REMOVED IN PHASE 2)
City of Glenwood Springs, Colorado
Street/SWAT Storage Yard
Updated March 17, 2019 by The Land Studio, Inc.
north
0
40
80
120
200

DEALER:
AMERICAN PORTABLE BUILDINGS
PROJECT:
GLENWOOD SPRINGS CONST OFFICE
35X64(60)
19-144

DRAWING INDEX

SHEET 1: SPECIFICATIONS AND CONDITIONS
SHEET 2: FLOOR PLAN, FLOOR PLAN LEGEND
SHEET 3: ELEVATIONS
SHEET 4: ELECTRICAL PLAN, ELECTRICAL LEGEND, ELECTRICAL CALCS AND ELECTRICAL NOTES
SHEET 5: HVAC PLAN AND REFLECTED CEILING PLAN
SHEET 6: BUILDING CROSS-SECTION
SHEET 7: SUGGESTED BLOCKING PLAN AND PLUMBING SCHEMATICS

FRAME / CHASSIS:

Frame Type:	Outrigger
Quantity:	(3) EA
Size:	126012
Type:	Outrigger and crossmember @ 48 in. O.C. main beams to be 99 1/2 in. O.C.
Beam Size:	12 in. Jr. I-beam
Axles:	(5) 6000# rated with (5) brake
Hitch:	Detachable underslung
Tires:	8x14.5 14 ply rated

FLOOR CONSTRUCTION:

Floor Joist:	2X10 #2 SYP equal or better
Joist:	16 in. O.C.
Floor:	Single layer 3/4 in. T&G Sturd-I-Floor plywood. Hold back decking (2 1/4) inches at each side of mateline
Insulation:	R-38HD unfaced fiberglass batt (Net R-36)
Bottom:	Mobilflex or equal

Floor Covering Type 1:

2120 SF 1/8in. commercial grade tile. Tile to be CHECKERBOARD AND 50% OFFSET.
Hold back tile (4 1/2) inches at each side of the matelines.
Color to be: (___)

EXTERIOR WALL CONSTRUCTION:

Framing:	2X6 #2 SYP equal or better @ 16 in. O.C. w/ double 2X6 #2 SYP equal or better top plate and single 2X6 #2 SYP or better bottom plate. (3-2x6 header with (2) 1/2 in. shim at all exterior openings unless otherwise noted)
Insulation:	R-21 Kraft back fiberglass batt
Siding Type:	7/16 in. LP Smartside panel vertical siding with house wrap underlayment.
	Siding body color: (___)
	Corner trim color: (___)
	Door & window trim color: (___)
	Bottom horizontal trim color: (___)
	Intermediate horizontal trim color: (___)
	Top horizontal trim color: (___)
	Covering height: 8 ft.
Wall Covering 1:	1/2 in. vinyl covered gypsum w/wrapped battens
	Color to be: (HAMPTON GRAY, RUFF STUFF WHITE, OR RUFF STUFF FROST).
Sidewall Height:	See cross section for heights
Wall Covering 2:	Standard White FRP panels over 1/2 in. MR Board @ Restroom
	Covering height: 4 ft.
Skirting:	NONE

Additional Exterior Wall Items Included in Quoted Price:

Item 1: Nailing strips for mateline with white plastic close up at 48 in. o.c. vertically and horizontally along matelines required by the state of Colorado.

INTERIOR WALL CONSTRUCTION:

Framing:	2X4 #2 SYP equal or better @ 16 in. o.c. w/double 2X4 #2 SYP equal or better top plates and single 2X4 #2 SYP or better bottom plate
	Overall height: 8 ft.
Wall Covering 1:	1/2 in. vinyl covered gypsum w/wrapped battens.
	Color to be: (HAMPTON GRAY, RUFF STUFF WHITE, OR RUFF STUFF FROST)
	Covering height: 8 ft.
Wall Covering 2:	Standard White FRP panels over 1/2 in. MR Board @ Restroom
	Covering height: 4 ft.
Base Trim:	4 in. vinyl cove. Color to be: (___)
Window Trim:	Interior window trim color to be: (GRAY, FROST OR WHITE)
Hold Back Gyp:	Hold back gypsum at matelines to first stud (YES or NO)

Additional Interior Wall Items Included in Quoted Price:

Item 1: Restroom walls to extend to rafters, (Approx 10 ft.)

ROOF CONSTRUCTION:

Roof Type:	Transverse ridge
Rafter size:	2X10 #2 SYP equal or better
Spacing:	16 in. O.C.
Mate Beam:	Multi-layer laminated plywood
Height:	30 in. to 37 1 1/2 in. to 30 in.
Length:	60 ft.
No. of Layers:	4
No. of Beams:	4
Ceiling:	2120 SF 2 ft. x 4 ft. Standard T-Grid @ 7'-10" (Mineral Fiber Tile #769) installed at factory, held back at matelines. Completion of ceiling installation on-site by others; not in Indicom's scope.
Insulation:	R-38HD unfaced fiberglass batt with support netting
Sheathing 1:	7/16 in. OSB with Mulehide "FR" adhesive
Roofing:	45 mil black single ply EPDM

EXTERIOR/INTERIOR DOORS:

(SEE DOOR SCHEDULE)

WINDOWS:

(SEE WINDOW SCHEDULE)

ELECTRICAL:

Type	Qty	Note	Description
Elec Service	1		120/240V. 60 HZ. single phase
Elec Panel	1	100 amp	1 PH w/100 main breaker. Exterior mount NEMA 3R
Elec Panel	2	125 amp	1 PH w/125 main breaker. Exterior mount NEMA 3R
Elec Raceway	1		E.M.T. thin wall conduit with separate green ground and neutrals
Lights	2	13W	Compact fluorescent exterior with photocell
Lights	15	2-Lamps	48 in. diffused fluorescent recessed lay-in with electronic ballast & T-8 lamps
Lights	6	4-Lamps	48 in. diffused fluorescent recessed lay-in with electronic ballast & T-8 lamps
Receptacle	1		20a/125v GFCI protected 'WR' rated heat tape receptacle below unit with weatherproof cover
Receptacle	1		20a/125v GFCI 'WR' rated exterior receptacle with weatherproof in-use extra duty cover
Receptacle	28		20a/125v duplex
Phone/Comm.	18	3/4 in.	Single gang box stubbed above ceiling with EMT conduit
Occupancy Sensor	2		Ceiling mounted occupancy sensor (Legrand CI 305 W/ BZ 50 power pack)
Device Color	1		Color to be: (WHITE OR IVORY)

PLUMBING:

Type	Qty	Note	Description
Supply	1		PEX
DWV System	1		Poly vinyl chloride schedule 40
Water Closet	1		Handicap elongated tank type with shut off valve
Lavatory	1		19 in. X 17 in. white vitreous wall hung with ADA handles and shut off valves
Water Heater	1	M-20L	Insta-Hot (Electric - 240V) with a 170 Leonard tempering valve with access panel
Paper Holder	1		Single roll chrome wall mount
Grab Bars	1		Ea.
Grab Bars	1		Set(s)
Mirror	1		18 in. X 36 in. with clips

HVAC:

Type	Qty	Note	Description
HVAC Unit Type	3	36VP 3 Ton cooling with 15-KW electric	End mount unit (Extend condensate to below bottom trim). Color to be: (GRAY OR BEIGE)
T-Stat	3	(TH4110D1007)	Programmable T-Stat(s) (Honeywell 4000 series)
Exhaust Fan	1	110 CFM	Ceiling mounted
Heat Duct	1	11x9 and 18x9	Foil faced fiberglass, 1-1/2 in. thick (R-6.5)
Supply Boot	3	SB-2	First 4 ft. to be metal with insulation wrap
Fittings	2	E-6	18 in. X 18 in. 45 deg elbow
Diffusers	15		24 in. x 24 in. 4-way lay-in adjustable damper
R/A Grills	12		24 in. x 24 in. Perforated lay-in
R/A Grills	3	30 in. x 14 in.	Stamped face return air grill
Duct System	1		Ducted supply with wall jump returns and return air grill at unit

CABINETS:

Type	Qty	Note	Description
Shelving	1	Color: White	4 LF of wire 1-tier shelving

MANUFACTURER:

MANUFACTURE & ADDRESS	INDICOM BUILDING, INC. 721 N. Burleson Blvd.
(FOR WARRANTY INFORMATION)	BURLESON, TX. 76028 IHM - 47 LAIB-M00002

DESIGN CRITERIA / LOADS:

NO OF MODULES.	3
BUILDING SQ.FT.	2120
TYPE OF CONSTRUCTION.	VB
OCCUPANCY USE GROUP.	B
OCCUPANCY LOAD.	21
FLOOR LIVE LOAD.	50 psf. (2000 lb concentrated) (100 psf. @ corridor)
ROOF SNOW LOAD.	15 psf.
ROOF LIVE LOAD.	20 psf.
ROOF DEAD LOAD.	10 psf.
WIND LOAD.	108 MPH (Vasd) EXP. C 140 MPH (Vult) EXP. C
OCCUPANCY/RISK CATG.	II
SEISMIC DESIGN CATEGORY.	C
PERMISSIBLE GAS TYPE.	N/A

NAME AND DATE OF CODES;

CO: 2018 IBC, 2018 IPC, 2018 IMC, 2015 IECC, 2018 IFC, 2017 NEC AND ICC/ANSI a117.1-2009

SPECIAL CONDITIONS AND OR LIMITATIONS:

THE OWNER SHALL BE RESPONSIBLE TO INSTALL AN APPROVED AND LISTED COMPONENT IN ACCORDANCE WITH ASTM E 1996 OR ASTM E 1886 FOR THE PROTECTION OF ALL EXTERIOR OPENINGS (WINDOWS, DOORS AND LOUVERS) WHEN THIS STRUCTURE IS LOCATED IN A WIND BORNE DEBRIS REGION IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE SECTION 1609.1.2. PRIOR TO FINAL INSPECTION AND OCCUPANCY.

NOT INCLUDED IN SCOPE OF WORK:

1. PORCHES, STEPS, AND RAMPS TO BE SUPPLIED AND INSTALLED BY OTHERS IN ACCORDANCE WITH THE IBC
2. PORTABLE FIRE EXTINGUISHERS TO BE SUPPLIED AND INSTALLED ON SITE BY OWNER IN ACCORDANCE WITH SECTION 906 OF THE IBC
3. ACCESSIBLE DRINKING FOUNTAIN TO BE PROVIDED ON SITE BY OWNER LOCATED WITHIN 500 FEET ON AN ACCESSIBLE ROUTE
4. ADDITIONAL HANDICAP TOILET FACILITIES PROVIDED IN ADJACENT BUILDING ON THE SAME PROPERTY LOCATED WITHIN 500 FEET ON AN ACCESSIBLE ROUTE
5. SERVICE SINK PROVIDED IN ADJACENT BUILDING ON THE SAME PROPERTY
6. ANY REQUIRED FIRE/SMOKE DETECTION AND/OR SUPPRESSION TO BE INSTALLED BY OTHERS ON SITE IN ACCORDANCE WITH THE IBC AND THE IFC

IDENTIFICATION:

NOTE: DATA PLATE, PFS LABEL AND ALL STATE DECALS (EXCEPT TX) TO BE LOCATED ON PANEL BOX DOOR OR SHALL BE PLACED ON THE INTERIOR SIDE OF THE EXTERIOR WALL @ THE HITCH END ABOVE THE T-GRID LOCATION. TDLR DECAL TO BE LOCATED ON THE HITCH END INTERIOR WALL ABOVE T-GRID.

NOTES:

1. SITE PLAN NOT AVAILABLE AT THIS TIME. BUILDING DESIGNED TO HAVE FIRE SEPARATION DISTANCE GREATER THAN 10 FT. IN ACCORDANCE WITH THE IBC

INDICOM BUILDINGS, INC
721 N. BURLESON BLVD - BURLESON, TX 76028
PH 817-447-1213 FAX 817-447-2751

SUNBELT MODULAR, INC.
AMTEX | INDICOM | PHOENIX | M.B. STEEL | AMERI-FAB

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DEALER: AMERICAN PORTABLE BUILDINGS

PROJECT: GLENWOOD SPRINGS CONST OFFICE

PROJECT: 19-144

STATES: CO

SERIAL NUMBERS: 19B632-634

DRAWN BY: BDG

PLOT DATE: 11/1/2019

REV # / DATE:

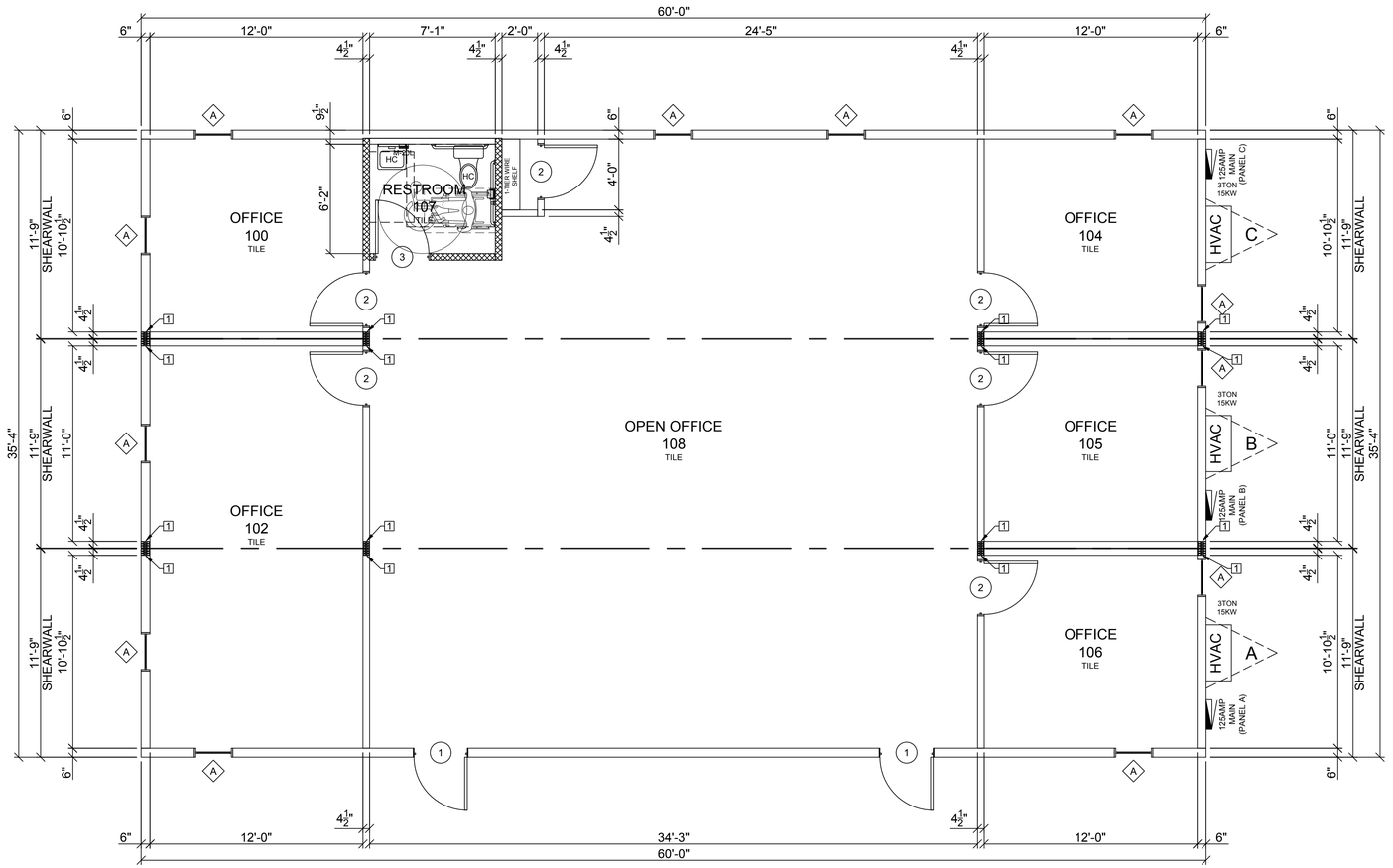
R. MARK STEELE, P.E.
CORPORATE ENGINEER
SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
PHOENIX, AZ. 85029
(602) 327-4769

☐ APPROVED
☐ APPROVED EXCEPT AS NOTED
☐ REVISE AND RESUBMIT

BY: _____ DATE: _____

"PLEASE REVIEW DRAWINGS AND SPECIFICATIONS CAREFULLY. WHILE EVERY EFFORT IS MADE TO ASSURE THE DRAWINGS REFLECT THE EXPECTATIONS AND QUOTATION, THE FINAL CONSTRUCTION WILL BE BASED SOLELY ON THE SPECIFICATIONS AND DRAWINGS APPROVED."

SHEET: 1 *OF* 7



1 FLOOR PLAN

1/4"=1'-0"

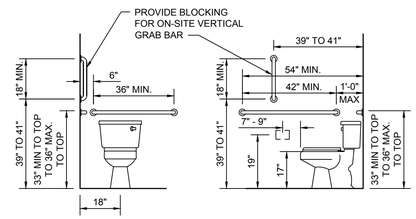
SQUARE FOOTAGE - 2120 S.F.
OCCUPANCY LOAD = 21

FLOOR PLAN LEGEND

HC	HANDICAP ELONGATED TANK TYPE WATER CLOSET WITH SHUT OFF VALVE
	36" GRAB BAR
	42" GRAB BAR
	18" VERTICAL GRAB BAR
	TOILET PAPER DISPENSER
	LAVATORY 19" X 17" WHITE VITREOUS WALL HUNG WITH ADA HANDLES WITH SHUT OFF VALVES
M-20L	INSTA-HOT ELECTRIC WATER HEATER WITH A 170 LEONARD TEMPERING VALVE AND ACCESS PANEL
	INDICATES FULL HEIGHT WALL TO BOTTOM OF RAFTERS

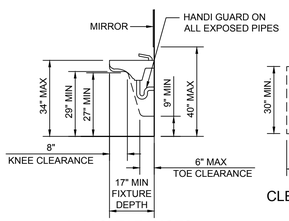
FASTENING SCHEDULE

LOCATIONS	TYPE	FASTENING
SIDEWALLS	NO PLYWOOD	NONE
ENDWALLS (SHEARWALLS)	NO PLYWOOD	NONE
INTERIOR (SHEARWALLS)	NO PLYWOOD	NONE
ROOF DECKING	7/16" OSB	(UNBLOCKED ROOF) (2 3/8"x0.113" DIA. NAIL) @ 6" O.C. AT SUPPORTED EDGES AND 6" O.C. AT INTERMEDIATE RAFTERS
SIDING (SIDEWALLS)	7/16" LP SMART PANEL VERTICAL SIDING	(2 1/4"x0.099" DIA. NAIL) @ 6" O.C. AT STUDS AND 6" O.C. AT INTERMEDIATE STUDS
SIDING (ENDWALLS)	7/16" LP SMART PANEL VERTICAL SIDING	(2 1/4"x0.099" DIA. NAIL) @ 6" O.C. AT STUDS AND 6" O.C. AT INTERMEDIATE STUDS

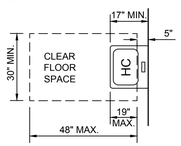


HANDICAPPED WATER CLOSET FRONT VIEW

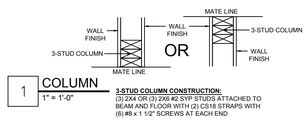
HANDICAPPED WATER CLOSET SIDE VIEW



LAV CLEARANCES



CLEAR FLOOR SPACE AT COUNTERTOP LAVATORIES



1 COLUMN

1" = 1'-0"

3-STUD COLUMN CONSTRUCTION:
(3) 2X4 DR (3) 2X6 #2 SYP STUDS ATTACHED TO BEAM AND FLOOR WITH (2) CS18 STRAPS WITH (6) #8 x 1 1/2" SCREWS AT EACH END

DOORS:

Qty	NO.	Type	Jamb	Glazing	Size	Rough Opening	U-Factor	Color	Closer	Deadbolt	Hardware	Fire Rating	Keying	Notes
2	1	TELSTAR INSULATED 20 GA.	18 GA.	10X10 TEMPERED WINDOW (OBSCURED GLASS WHERE REQUIRED)	36 x 80	36 1/4"x80 1/4"	.14	COLOR:_____	HYDRAULIC CLOSER (12641)	STANDARD DEADBOLT, TELL BRAND, GRADE 2, DB2051	PASSAGE LEVER, TELL BRAND, GRADE 2 (LC2475CTL)	N/A	ALIKE OR SEPARATE	N/A
6	2	6 PANEL PAINTED HOLLOW CORE	WITH WOOD JAMB	N/A	36 x 80	38"x81 1/2"	N/A	COLOR: IBI GRAY	N/S	N/A	PASSAGE LEVER, TELL BRAND, GRADE 2 (LC2475CTL)	N/A	N/A	FLOOR MOUNT STOPS
1	3	6 PANEL PAINTED HOLLOW CORE	WITH WOOD JAMB	N/A	36 x 80	38"x81 1/2"	N/A	COLOR: IBI GRAY	N/S	N/A	PRIVACY LEVER, TELL BRAND, GRADE 2 (LC2476CTL)	N/A	N/A	FLOOR MOUNT STOPS

WINDOWS:

Qty	NO.	Type	Glazing	Size	Rough Opening	U-Factor	SHGC	Mini-Blind	Notes
12	A	VINYL VERTICAL SLIDER WITH 20 IN SASH. COLOR TO BE: (WHITE, CLAY OR PEBBLESTONE)	CLEAR, DUAL GLAZED, LOW-E	24"X52"	23 3/4"X51 3/4"	.33	.22	N/A	TOP OF WINDOW AT 6'-8" AFF

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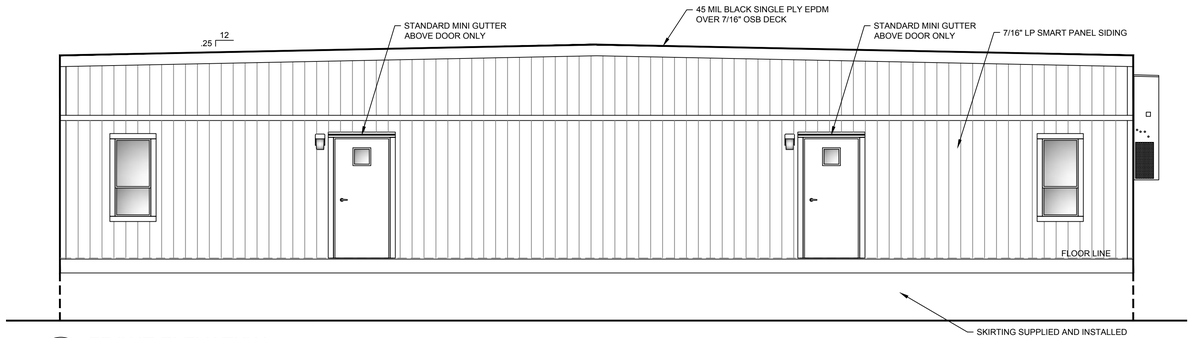
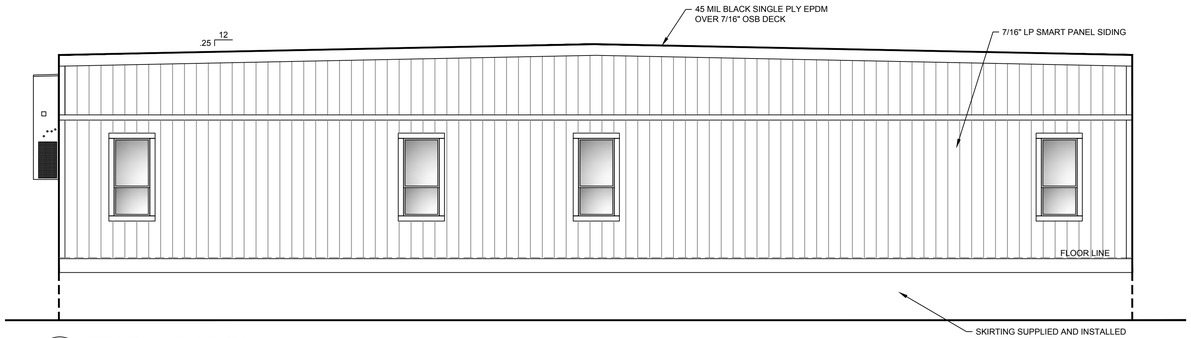
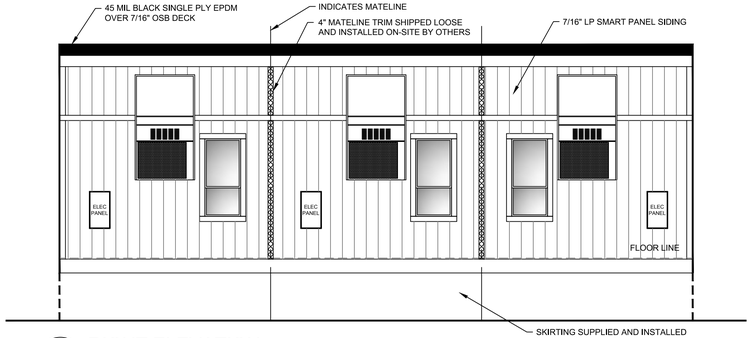
SHEET:
2
OF
7



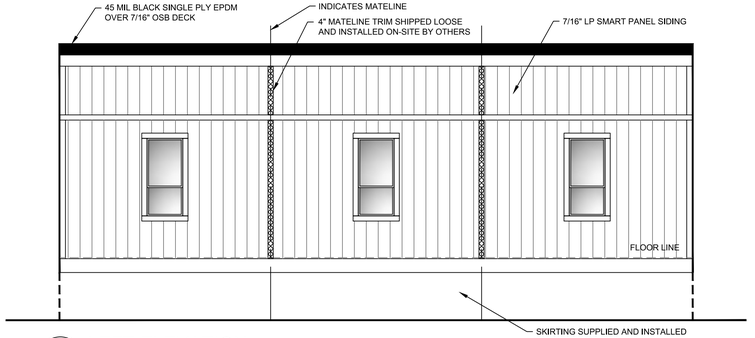
1 FRONT ELEVATION
1/4"=1'-0"



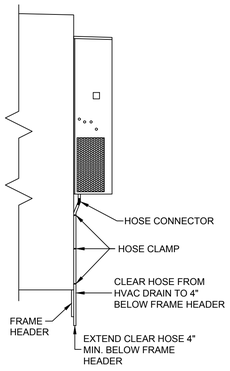
2 REAR ELEVATION
1/4"=1'-0"



3 RIGHT ELEVATION
1/4"=1'-0"



4 LEFT ELEVATION
1/4"=1'-0"



INDICOM BUILDINGS, INC
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DEALER:
AMERICAN PORTABLE BUILDINGS

PROJECT:
GLENWOOD SPRINGS CONST OFFICE

PROJECT: 19-144

STATES:
CO

SERIAL NUMBERS:
19B632-634

DRAWN BY:
BDG

PLOT DATE:
11/1/2019

REV # / DATE:

R. MARK STEELE, P.E.
CORPORATE ENGINEER
SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
PHOENIX, AZ. 85029
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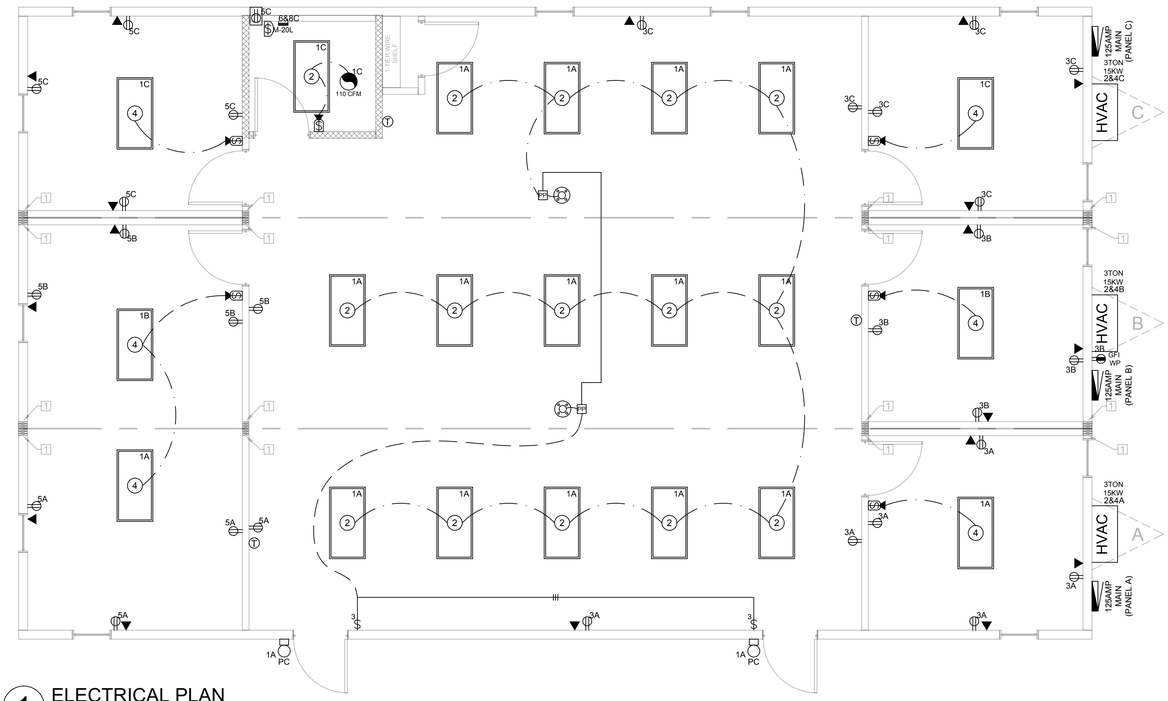

1 ELECTRICAL PLAN

1/4"=1'-0"

ELEC LEGEND

2	2X4 FLUORESCENT 2 LAMP DIFFUSED LAY-IN LIGHT FIXTURE (INPUT WATTAGE = 56)
4	2X4 FLUORESCENT 4 LAMP DIFFUSED LAY-IN LIGHT FIXTURE (INPUT WATTAGE = 113)
PC	COMPACT FLUORESCENT EXTERIOR LIGHT w/PHOTOCELL (INPUT WATTAGE = 13)
$3	THREE WAY LIGHT SWITCH @ 46" AFF
	OCCUPANCY OR VACANCY SENSOR SWITCH @ 46" AFF
$	DISCONNECT SWITCH WITH RED SWITCH PLATE FOR WH
PD	CEILING OCCUPANCY SENSORS WITH POWER PACK MOUNTED AT DROP CEILING
110 CFM	CEILING MOUNTED EXHAUST FAN
	ELECTRICAL PANEL BOX (SEE PLANS AND PANEL SCHEDULES FOR SIZES)
	20a/125v DUPLEX RECEPTACLE @ 15" AFF
GFI WP	20a/125v GFCI 'WR' RATED EXT. RECEPTACLE w/WEATHERPROOF IN-USE EXTRA DUTY COVER @ 15" AFF
GFI +42	20a/125v GFCI PROTECTED DUPLEX RECEPTACLE
	20a/125v GFCI PROTECTED 'WR' RATED HEAT TAPE RECEPTACLE BELOW UNIT w/WEATHERPROOF COVER
▲	2X4 J-BOX W/ 3/4" CONDUIT STUBBED ABOVE T-GRID FOR PHONE /DATA JACK BY OTHERS @ 15" AFF
T	PROGRAMMABLE THERMOSTAT MOUNTED @ 48" AFF TO CENTER

NOTE:
1: ALL AFF DIMENSIONS ARE TO THE BOTTOM OF THE DEVICE BOX UNLESS NOTED "TO CENTER"
2: BLANK COVERS SHALL BE ADDED TO ANY J-BOX THAT IS FOR FUTURE USE

125 AMP 120/240 1 PHASE
PANEL WITH 125 AMP MAIN BREAKER (NEMA 3R)

WS	Description	Circuit	BRK	A	B	BRK	Circuit	Description	WS
1	Main Breaker		125	9660		90	2	HVAC Unit 3 Ton w/15KW 90A	3
1	Main Breaker		2		9660	2	4		3
12	Lights	1	20	1036		0	6	Space	###
12	Receptacles	3	20		1080	0	8	Space	###
12	Receptacles	5	20	900		0	10	Space	###
###	Space	7	0		0	0	12	Space	###
				11596	10740	Total			

ELECTRICAL CALCULATION: *PANEL* **A**

GENERAL LIGHTING:

1036	LIGHTS x 125%	= 1295	watts
11	RECEPTACLES	= 1980	watts
1	HVAC UNITS	= 19320	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
22595	watts divide by 240volts =	94.15	AMPS TOTAL

TYPE OF PANEL: LOAD CENTER

125 AMP 120/240 1 PHASE
PANEL WITH 100 AMP MAIN BREAKER (NEMA 3R)

WS	Description	Circuit	BRK	A	B	BRK	Circuit	Description	WS
1	Main Breaker		100	9660		90	2	HVAC Unit 3 Ton w/15KW 90A	3
1	Main Breaker		2		9660	2	4		3
12	Lights	1	20	226		0	6	Space	###
12	Receptacles	3	20		900	0	8	Space	###
12	Receptacles	5	20	720		0	10	Space	###
###	Space	7	0		0	0	12	Space	###
				10606	10560	Total			

ELECTRICAL CALCULATION: *PANEL* **B**

GENERAL LIGHTING:

226	LIGHTS x 125%	= 282.5	watts
9	RECEPTACLES	= 1620	watts
1	HVAC UNITS	= 19320	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
21223	watts divide by 240volts =	88.43	AMPS TOTAL

TYPE OF PANEL: LOAD CENTER

125 AMP 120/240 1 PHASE
PANEL WITH 125 AMP MAIN BREAKER (NEMA 3R)

WS	Description	Circuit	BRK	A	B	BRK	Circuit	Description	WS
1	Main Breaker		125	9660		60	2	HVAC Unit 3 Ton w/15KW 90A	6
1	Main Breaker		2		9660	2	4		6
12	Lights	1	20	438		20	6	M-20L Insta Water Heater 20A	12
12	Receptacles	3	20	2400	1080	2	8		12
12	Receptacles	5	20	900	2400	0	10	Space	###
###	Space	7	0	0		0	12	Space	###
				13398	13140	Total			

ELECTRICAL CALCULATION: *PANEL* **C**

GENERAL LIGHTING:

438	LIGHTS x 125%	= 547.5	watts
11	RECEPTACLES	= 1980	watts
1	HVAC UNITS	= 19320	watts
1	WATER HEATER	= 4800	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
26648	watts divide by 240volts =	111	AMPS TOTAL

TYPE OF PANEL: LOAD CENTER

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DEALER:
AMERICAN PORTABLE BUILDINGS

PROJECT:
GLENWOOD SPRINGS CONST OFFICE

PROJECT: 19-144

STATES:
CO

SERIAL NUMBERS:
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SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
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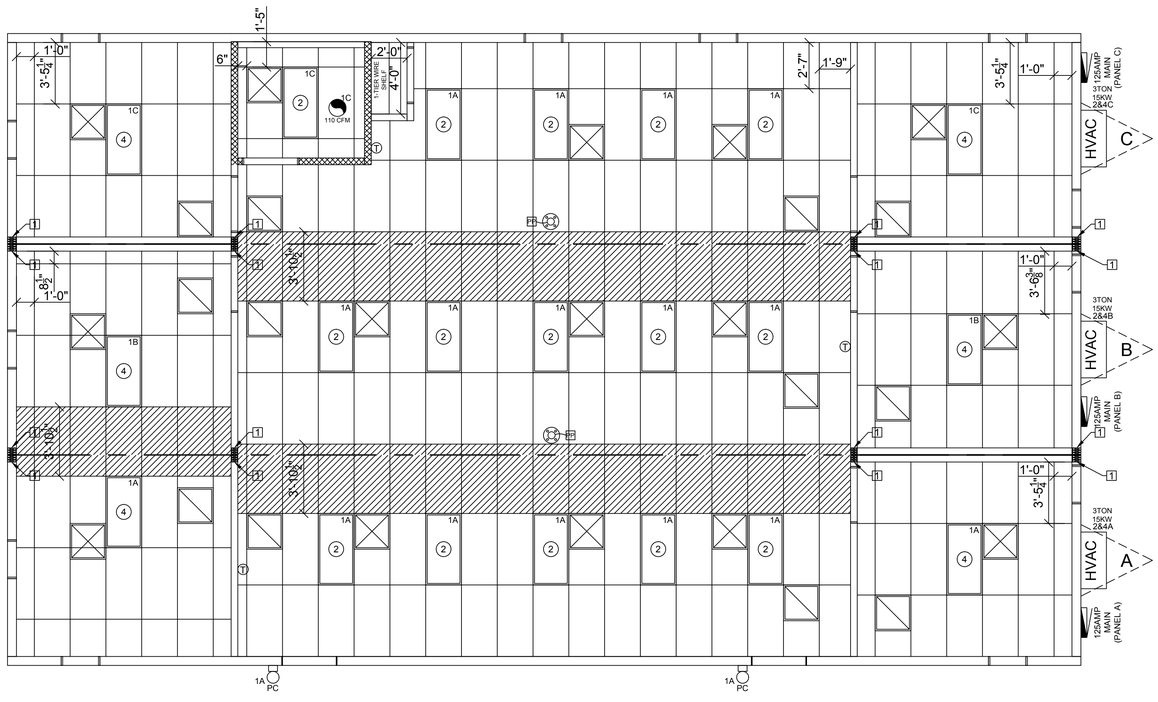
1 HVAC PLAN
1/4"=1'-0"



2 REFLECTED CEILING PLAN
1/4"=1'-0"

HVAC LEGEND

HVAC	BARD HVAC UNIT WITH ELECTRIC HEAT STRIP (SEE HVAC PLAN FOR SIZES)
	FLEX DUCT
	24 X 24 4-WAY LAY-IN DIFFUSER WITH R-42 RADIAL DAMPER
	24 X 24 PERFORATED LAY-IN R/A GRILLE

NOTE: ALL MECHANICAL VENTS (EXHAUST FANS) MUST TERMINATE MIN. 10 FEET HORIZONTALLY AWAY FROM ANY AIR INTAKE OPENING UNLESS IT IS AT LEAST 3 FEET ABOVE THE TOP OF SUCH OPENING. EXHAUST FAN SHALL TERMINATE THRU ROOF UNLESS OTHERWISE NOTED.

MECHANICAL VENTILATION

Vbz = (RP Pz) + (Ra Az)

AREA (Az)			2120	S.F.
OCCUPANCY LOAD (Pz)			21	
OUTSIDE AIR REQUIRED (RP)	5 CFM X	21 (P2)	105	CFM
AREA OUTDOOR AIRFLOW RATE (Ra	0.06 X (Az)		127	CFM
AIRFLOW RATE (Vbz)			232	CFM
TOTAL CFM AVAILABLE			3300	CFM
FRESH AIR MAKE-UP	232 /	3300	7%	

STANDARD WITH BARD UNIT IS A BAROMETRIC DAMPER WHICH PROVIDES UP TO 25% OF OUTSIDE FRESH AIR. A CRV REPLACES THE BAROMETRIC DAMPER AND THE CRV PROVIDES UP TO 50% OF OUTSIDE FRESH AIR.

*MECHANICAL VENTILATION SHALL BE PROVIDED AS REQ'D. IN ACCORDANCE w/TABLE 403.3 OF THE IMC CODE OR NATURAL MEANS OF VENTILATION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 402 OF THE IMC CODE.

CEILING LEGEND

	INDICATES T-GRID SUSPENDED CEILING INSTALLED @ FACTORY
	INDICATES SUSPENDED CEILING HOLD-BACK @ MATELINES, TO BE COMPLETED ON-SITE BY OTHERS

INDICOM BUILDINGS, INC
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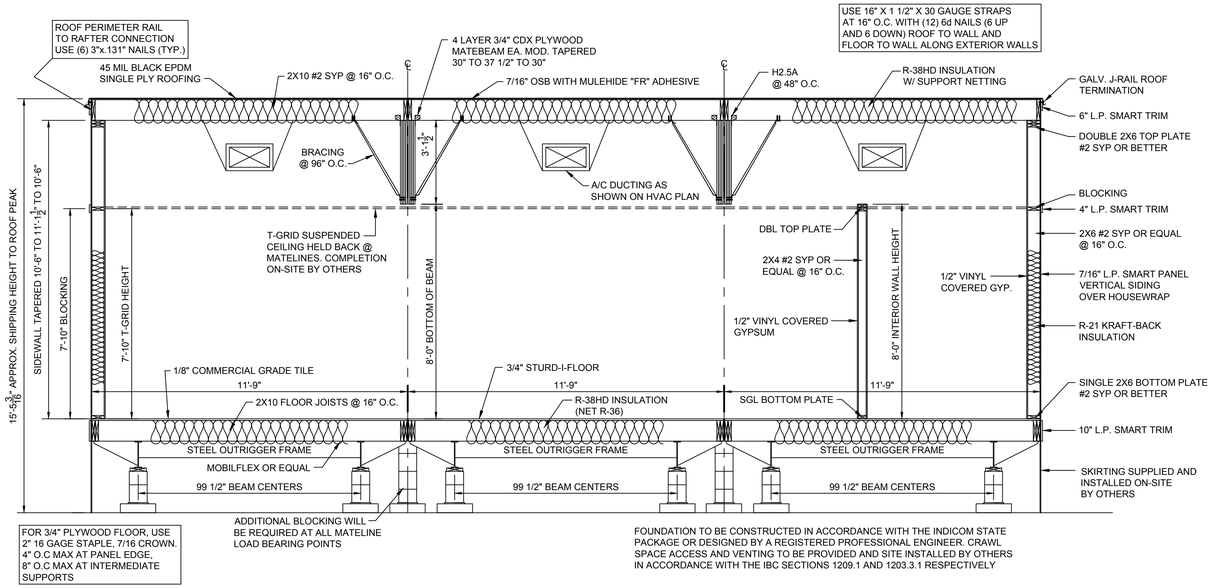
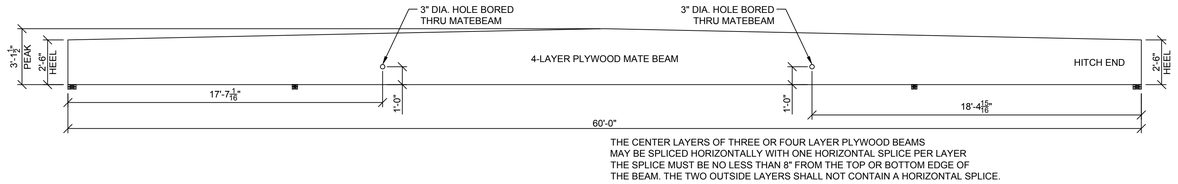
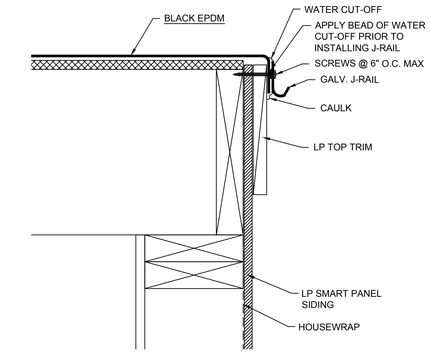


1 BUILDING CROSS SECTION
3/8"=1'-0"

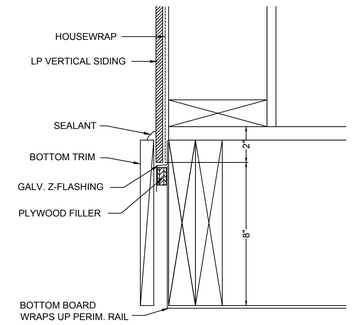


THE CENTER LAYERS OF THREE OR FOUR LAYER PLYWOOD BEAMS MAY BE SPLICED HORIZONTALLY WITH ONE HORIZONTAL SPLICE PER LAYER THE SPLICE MUST BE NO LESS THAN 8" FROM THE TOP OR BOTTOM EDGE OF THE BEAM. THE TWO OUTSIDE LAYERS SHALL NOT CONTAIN A HORIZONTAL SPLICE.

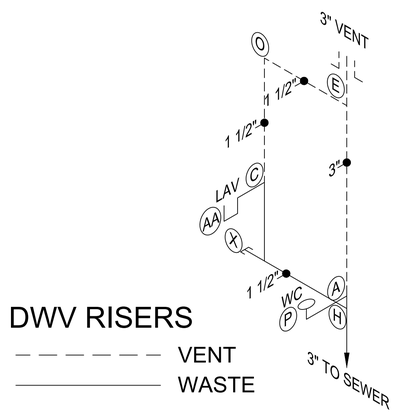
2 MATELINE DETAIL
1/4"=1'-0"



3 LP AT EPDM ROOF DETAIL
N.T.S.

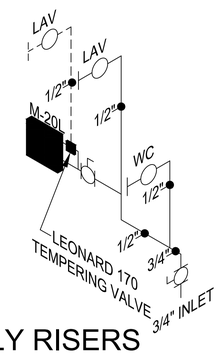


4 LP AT FLOOR DETAIL
N.T.S.



DWV RISERS
- — — — — — VENT
——————— WASTE

PLUMBING LEGEND	
DWV FITTINGS	
A	3" SAN TEE
C	1 1/2" SAN TEE
E	3"x3"x1 1/2" SAN TEE
H	3"x3"x1 1/2" LTTY (LONG SWEEP)
O	1 1/2" - 90° ELBOW
P	3" - 90° LONG SWEEP
AA	1 1/2" P-TRAP



SUPPLY RISERS
——————— COLD WATER SUPPLY
— — — — — — HOT WATER SUPPLY

LEGEND:

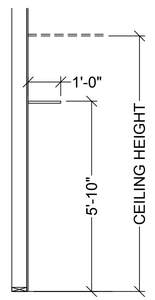
SHUT OFF VALVE AT EACH FIXTURE

SHUT OFF VALVE

SIZING BASED ON TABLE E201.1 PRESSURE RANGE 40 TO 49 PSI AND MAXIMUM DEVELOPED LENGTH OF 20 FT.

NOTES:

1. ALL PLUMBING VENTS MUST TERMINATE MIN. 10 FEET HORIZONTALLY AWAY FROM ANY AIR INTAKE OPENING UNLESS IT IS AT LEAST 3 FEET ABOVE THE TOP OF SUCH OPENING.
2. DRAIN PANS AND T&P PRESSURE RELIEF VALVES REQUIRE SEPARATE 3/4" DRAINS WHICH ARE STUBBED THRU FLOOR BY IBI AT FACTORY. DISCHARGE PIPING TO BE RAN TO AN APPROVED LOCATION ON-SITE BY OTHERS. OPTION CAN RUN TO FLOOR DRAIN WITH AIR GAP.
3. ALL DRAIN VALVES FOR WATER HEATER OR STORAGE TANKS CONFORM TO ASSE 1005.
4. ALL IBI TANKLESS WATER HEATERS ARE FACTORY SET @ 110°
5. ALL SUPPLY PIPES ARE INSTALLED IN THE FLOOR UNLESS OTHERWISE NOTED. ANY SUPPLY PIPES UNDER THE FLOOR SHALL BE INSULATED ON-SITE BY OTHERS PER IECC SECTION C404.4.
6. (CO) SLOPE WATER LINES DOWN AT TEMPERING VALVE SO THAT WATER WILL NOT BE TRAPPED WHEN BUILDING IS NOT IN USE.
7. ALL SUPPLY PIPES SHALL BE INSULATED.
   HOT WATER / TEMPERED PIPES UP TO 1-1/2" DIA WITH 1" MIN THICK INSULATION
   COLD WATER PIPES UP TO 1-1/2" DIA WITH 1/2" MIN THICK INSULATION



(1) 12" DEEP CLOSET WIRE SHELF HEIGHT

5 WIRE SHELF DETAIL
N.T.S.

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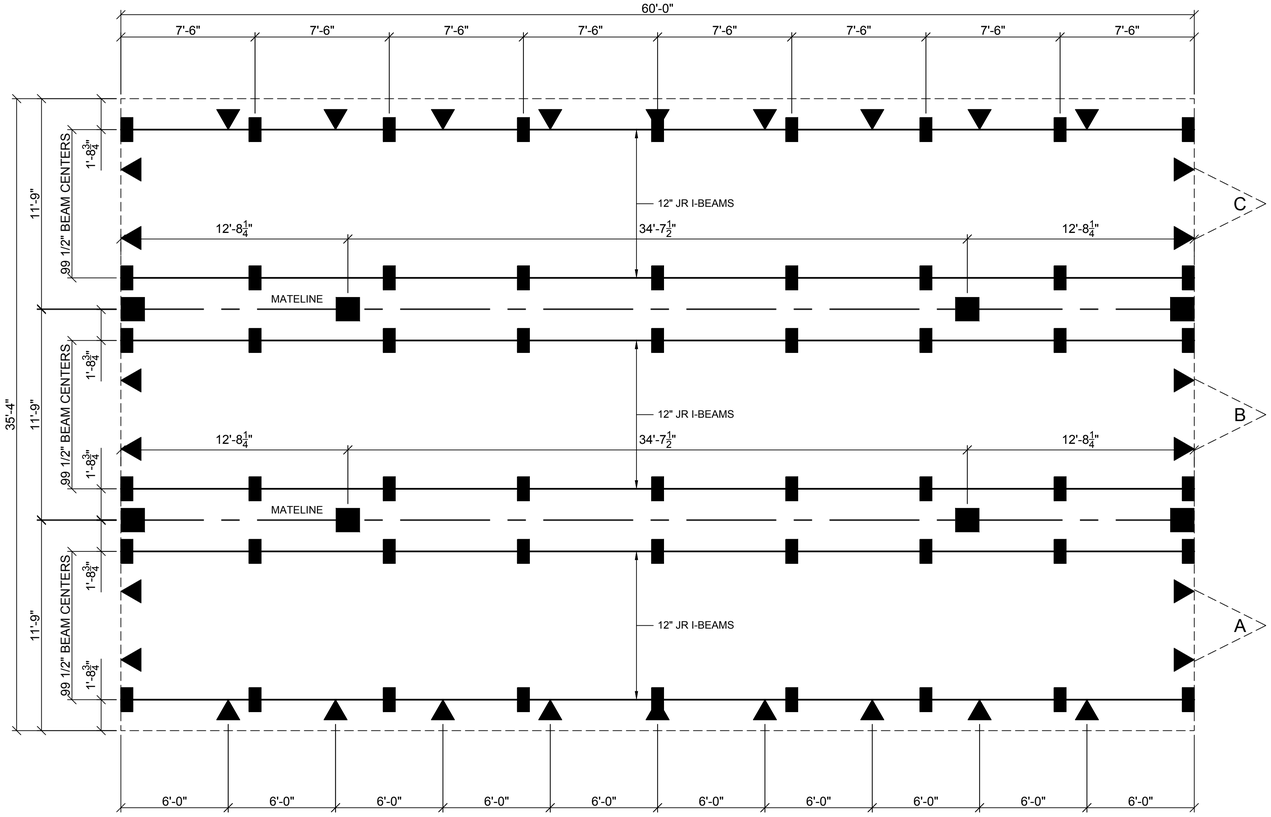
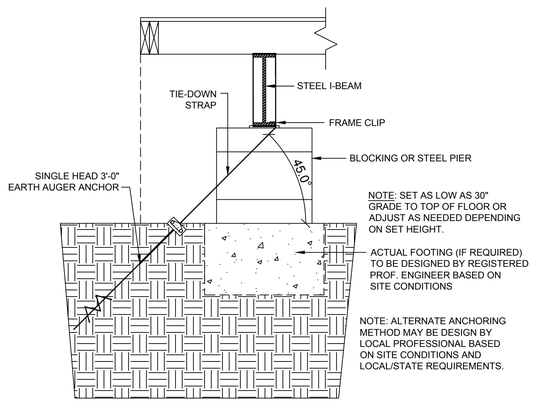


1 SUGGESTED BLOCKING PLAN
1/4"=1'-0"

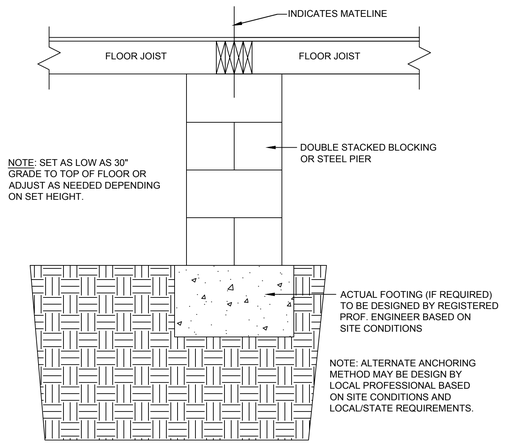
--- INDICATES SUGGESTED MAXIMUM I-BEAM BLOCKING SPACING - PIERS AND FOOTINGS DESIGNED BY LOCAL PROFESSIONAL IN ACCORD. WITH ALL LOCAL AND STATE REQUIREMENTS BASED ON SITE CONDITIONS.

--- INDICATES REQUIRED MATELINE BLOCKING LOCATION - PIERS AND FOOTINGS DESIGNED BY LOCAL PROFESSIONAL IN ACCORD. WITH ALL LOCAL AND STATE REQUIREMENTS BASED ON SITE CONDITIONS.

--- INDICATES REQUIRED FRAME-TIE GROUND ANCHOR (MIN. 4725 LBS. HOLDING STRENGTH) LOCATION FOR ALL WIND LOADS - NOTE: ALTERNATE ANCHORING DESIGN MAY BE MADE BY REGISTERED PROFESSIONAL ENGINEER.



2 SUGGESTED ANCHORING METHOD
1"=1'-0"



3 SUGGESTED BLOCKING @ MATELINE
1"=1'-0"

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SHEET:
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OF
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DRAWING INDEX

SHEET 1: SPECIFICATIONS AND CONDITIONS
SHEET 2: FLOOR PLAN, FLOOR PLAN LEGEND
SHEET 3: ELEVATIONS
SHEET 4: ELECTRICAL PLAN, ELECTRICAL LEGEND, ELECTRICAL CALCS AND ELECTRICAL NOTES
SHEET 5: HVAC PLAN AND REFLECTED CEILING PLAN
SHEET 6: BUILDING CROSS-SECTION
SHEET 7: SUGGESTED BLOCKING PLAN AND PLUMBING SCHEMATICS

DEALER:
AMERICAN PORTABLE BUILDINGS
PROJECT:
GLENWOOD SPRINGS SIGN SHOP
24X64(60)
19-145

FRAME / CHASSIS:

Frame Type:	Outrigger
Quantity:	(2) EA
Size:	126012
Type:	Outrigger and crossmember @ 48 in. O.C. main beams to be 99 1/2 in. O.C.
Beam Size:	12 in. Jr. I-beam
Axles:	(5) 6000# rated with (5) brake
Hitch:	Detachable underslung
Tires:	8x14.5 14 ply rated

FLOOR CONSTRUCTION:

Floor Joist:	2X10 #2 SYP equal or better
Joist:	16 in. O.C.
Floor:	Single layer 3/4 in. T&G Sturd-I-Floor plywood. Hold back decking (2 1/4) inches at each side of mateline
Insulation:	R-38HD unfaced fiberglass batt (Net R-36)
Bottom:	Mobilflex or equal

Floor Covering Type 1:
1412 SF 1/8in. commercial grade tile. Tile to be CHECKERBOARD AND 50% OFFSET.
Hold back tile (4 1/2) inches at each side of the matelines.
Color to be: (___)

EXTERIOR WALL CONSTRUCTION:

Framing:	2X6 #2 SYP equal or better @ 16 in. O.C. w/ double 2X6 #2 SYP equal or better top plate and single 2X6 #2 SYP or better bottom plate. (3-2x6 header with (2) 1/2 in. shim at all exterior openings unless otherwise noted)
Insulation:	R-21 Kraft back fiberglass batt
Siding Type:	7/16 in. LP Smartside panel vertical siding with house wrap underlayment.
	Siding body color: (___)
	Corner trim color: (___)
	Door & window trim color: (___)
	Bottom horizontal trim color: (___)
	Intermediate horizontal trim color: (___)
	Top horizontal trim color: (___)
	Covering height: 8 ft.
Wall Covering 1:	1/2 in. vinyl covered gypsum w/wrapped battens
	Color to be: (HAMPTON GRAY, RUFF STUFF WHITE, OR RUFF STUFF FROST).
Sidewall Height:	See cross section for heights
Wall Covering 2:	Standard White FRP panels over 1/2 in. MR Board @ Restroom
	Covering height: 4 ft.
Skirting:	NONE

Additional Exterior Wall Items Included in Quoted Price:
Item 1: Nailing strips for mateline with white plastic close up at 48 in. o.c. vertically and horizontally along matelines required by the state of Colorado.

INTERIOR WALL CONSTRUCTION:

Framing:	2X4 #2 SYP equal or better @ 16 in. o.c. w/double 2X4 #2 SYP equal or better top plates and single 2X4 #2 SYP or better bottom plate
	Overall height: 8 ft.
Wall Covering 1:	1/2 in. vinyl covered gypsum w/wrapped battens.
	Color to be: (HAMPTON GRAY, RUFF STUFF WHITE, OR RUFF STUFF FROST)
	Covering height: 8 ft.
Wall Covering 2:	Standard White FRP panels over 1/2 in. MR Board @ Restroom
	Covering height: 4 ft.
Base Trim:	4 in. vinyl cove. Color to be: (___)
Window Trim:	Interior window trim color to be: (GRAY, FROST OR WHITE)
Hold Back Gyp:	Hold back gypsum at matelines to first stud (YES or NO)

Additional Interior Wall Items Included in Quoted Price:
Item 1: Restroom walls to extend to rafters, (Approx 10 ft.)

ROOF CONSTRUCTION:

Roof Type:	Transverse ridge
Rafter size:	2X10 #2 SYP equal or better
Spacing:	16 in. O.C.
Mate Beam:	Multi-layer laminated plywood
Height:	30 in. to 37 1 1/2 in. to 30 in.
Length:	60 ft.
No. of Layers:	4
No. of Beams:	4
Ceiling:	1412 SF 2 ft. x 4 ft. Standard T-Grid @ 7'-10" (Mineral Fiber Tile #769) installed at factory, held back at matelines. Completion of ceiling installation on-site by others; not in Indicom's scope.
Insulation:	R-38HD unfaced fiberglass batt with support netting
Sheathing 1:	7/16 in. OSB with Mulehide "FR" adhesive
Roofing:	45 mil black single ply EPDM

EXTERIOR/INTERIOR DOORS:
(SEE DOOR SCHEDULE)

WINDOWS:
(SEE WINDOW SCHEDULE)

ELECTRICAL:

Type	Qty	Note	Description
Elec Service	1		120/240V. 60 HZ. single phase
Elec Panel	2	125 amp	1 PH w/125 main breaker. Exterior mount NEMA 3R
Elec Raceway	1		E.M.T. thin wall conduit with separate green ground and neutrals
Lights	2	13W	Compact fluorescent exterior with photocell
Lights	10	2-Lamps	48 in. diffused fluorescent recessed lay-in with electronic ballast & T-8 lamps
Lights	4	4-Lamps	48 in. diffused fluorescent recessed lay-in with electronic ballast & T-8 lamps
Receptacle	1		20a/125v GFCI protected 'WR' rated heat tape receptacle below unit with weatherproof cover
Receptacle	18		20a/125v duplex
Receptacle	1		20a/125v GFCI 'WR' rated exterior receptacle with weatherproof in-use extra duty cover
Phone/Comm.	14	3/4 in.	Single gang box stubbed above ceiling with EMT conduit
Occupancy Sensor	1		Ceiling mounted occupancy sensor (Legrand CI 305 W/ BZ 50 power pack)
Device Color	1		Color to be: (WHITE OR IVORY)

PLUMBING:

Type	Qty	Note	Description
Supply	1		PEX
DWV System	1		Poly vinyl chloride schedule 40
Water Closet	1		Handicap elongated tank type with shut off valve
Lavatory	1		19 in. X 17 in. white vitreous wall hung with ADA handles and shut off valves
Water Heater	1	M-20L	Insta-Hot (Electric - 240V) with a 170 Leonard tempering valve with access panel
Paper Holder	1		Single roll chrome wall mount
Grab Bars	1		Ea.
Grab Bars	1		Set(s)
Mirror	1		18 in. X 36 in. with clips

HVAC:

Type	Qty	Note	Description
HVAC Unit Type	2	36VP 3 Ton cooling with 15-KW electric	End mount unit (Extend condensate to below bottom trim). Color to be: (GRAY OR BEIGE)
T-Stat	2	(TH4110D1007)	Programmable T-Stat(s) (Honeywell 4000 series)
Exhaust Fan	1	110 CFM	Ceiling mounted
Heat Duct	1	11x9 and 18x9	Foil faced fiberglass, 1-1/2 in. thick (R-6.5)
Supply Boot	2	SB-2	First 4 ft. to be metal with insulation wrap
Fittings	2	E-6	18 in. X 18 in. 45 deg elbow
Diffusers	10		24 in. x 24 in. 4-way lay-in adjustable damper
R/A Grills	8		24 in. x 24 in. Perforated lay-in
R/A Grills	2	30 in. x 14 in.	Stamped face return air grill
Duct System	1		Ducted supply with wall jump returns and return air grill at unit

CABINETS:

Type	Qty	Note	Description
Shelving	1	Color: White	4 LF of wire 1-tier shelving

MANUFACTURER:

MANUFACTURE & ADDRESS	INDICOM BUILDING, INC. 721 N. Burleson Blvd.
(FOR WARRANTY INFORMATION)	BURLESON, TX. 76028 IHM - 47 LAIB-M00002

DESIGN CRITERIA / LOADS:

NO OF MODULES.	2
BUILDING SQ.FT.	1412
TYPE OF CONSTRUCTION.	VB
OCCUPANCY USE GROUP.	B
OCCUPANCY LOAD.	14
FLOOR LIVE LOAD.	50 psf. (2000 lb concentrated) (100 psf. @ corridor)
ROOF SNOW LOAD.	15 psf.
ROOF LIVE LOAD.	20 psf.
ROOF DEAD LOAD.	10 psf.
WIND LOAD.	108 MPH (Vasd) EXP. C 140 MPH (Vult) EXP. C
OCCUPANCY/RISK CATG.	II
SEISMIC DESIGN CATEGORY.	C
PERMISSIBLE GAS TYPE.	N/A

NAME AND DATE OF CODES;
CO: 2018 IBC, 2018 IPC, 2018 IMC, 2015 IECC, 2018 IFC, 2017 NEC AND ICC/ANSI a117.1-2009

SPECIAL CONDITIONS AND OR LIMITATIONS:

THE OWNER SHALL BE RESPONSIBLE TO INSTALL AN APPROVED AND LISTED COMPONENT IN ACCORDANCE WITH ASTM E 1996 OR ASTM E 1886 FOR THE PROTECTION OF ALL EXTERIOR OPENINGS (WINDOWS, DOORS AND LOUVERS) WHEN THIS STRUCTURE IS LOCATED IN A WIND BORNE DEBRIS REGION IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE SECTION 1609.1.2. PRIOR TO FINAL INSPECTION AND OCCUPANCY.

NOT INCLUDED IN SCOPE OF WORK:

1. PORCHES, STEPS, AND RAMPS TO BE SUPPLIED AND INSTALLED BY OTHERS IN ACCORDANCE WITH THE IBC
2. PORTABLE FIRE EXTINGUISHERS TO BE SUPPLIED AND INSTALLED ON SITE BY OWNER IN ACCORDANCE WITH SECTION 906 OF THE IBC
3. ACCESSIBLE DRINKING FOUNTAIN TO BE PROVIDED ON SITE BY OWNER LOCATED WITHIN 500 FEET ON AN ACCESSIBLE ROUTE
4. ADDITIONAL HANDICAP TOILET FACILITIES PROVIDED IN ADJACENT BUILDING ON THE SAME PROPERTY LOCATED WITHIN 500 FEET ON AN ACCESSIBLE ROUTE
5. SERVICE SINK PROVIDED IN ADJACENT BUILDING ON THE SAME PROPERTY
6. ANY REQUIRED FIRE/SMOKE DETECTION AND/OR SUPPRESSION TO BE INSTALLED BY OTHERS ON SITE IN ACCORDANCE WITH THE IBC AND THE IFC

IDENTIFICATION:

NOTE: DATA PLATE, PFS LABEL AND ALL STATE DECALS (EXCEPT TX) TO BE LOCATED ON PANEL BOX DOOR OR SHALL BE PLACED ON THE INTERIOR SIDE OF THE EXTERIOR WALL @ THE HITCH END ABOVE THE T-GRID LOCATION. TDLR DECAL TO BE LOCATED ON THE HITCH END INTERIOR WALL ABOVE T-GRID.

NOTES:

1. SITE PLAN NOT AVAILABLE AT THIS TIME. BUILDING DESIGNED TO HAVE FIRE SEPARATION DISTANCE GREATER THAN 10 FT. IN ACCORDANCE WITH THE IBC

INDICOM BUILDINGS, INC
721 N. BURLESON BLVD - BURLESON, TX 76028
PH 817-447-1213 FAX 817-447-2751
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DEALER:
AMERICAN PORTABLE BUILDINGS

PROJECT:
GLENWOOD SPRINGS SIGN SHOP

PROJECT: 19-145

STATES:
CO

SERIAL NUMBERS:
19B635-636

DRAWN BY:
BDG

PLOT DATE:
11/1/2019

REV # / DATE:

R. MARK STEELE, P.E.
CORPORATE ENGINEER
SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
PHOENIX, AZ. 85029
(602) 327-4769

☐ APPROVED
☐ APPROVED EXCEPT AS NOTED
☐ REVISE AND RESUBMIT

BY: _____ DATE: _____

"PLEASE REVIEW DRAWINGS AND SPECIFICATIONS CAREFULLY. WHILE EVERY EFFORT IS MADE TO ASSURE THE DRAWINGS REFLECT THE EXPECTATIONS AND QUOTATION, THE FINAL CONSTRUCTION WILL BE BASED SOLELY ON THE SPECIFICATIONS AND DRAWINGS APPROVED."

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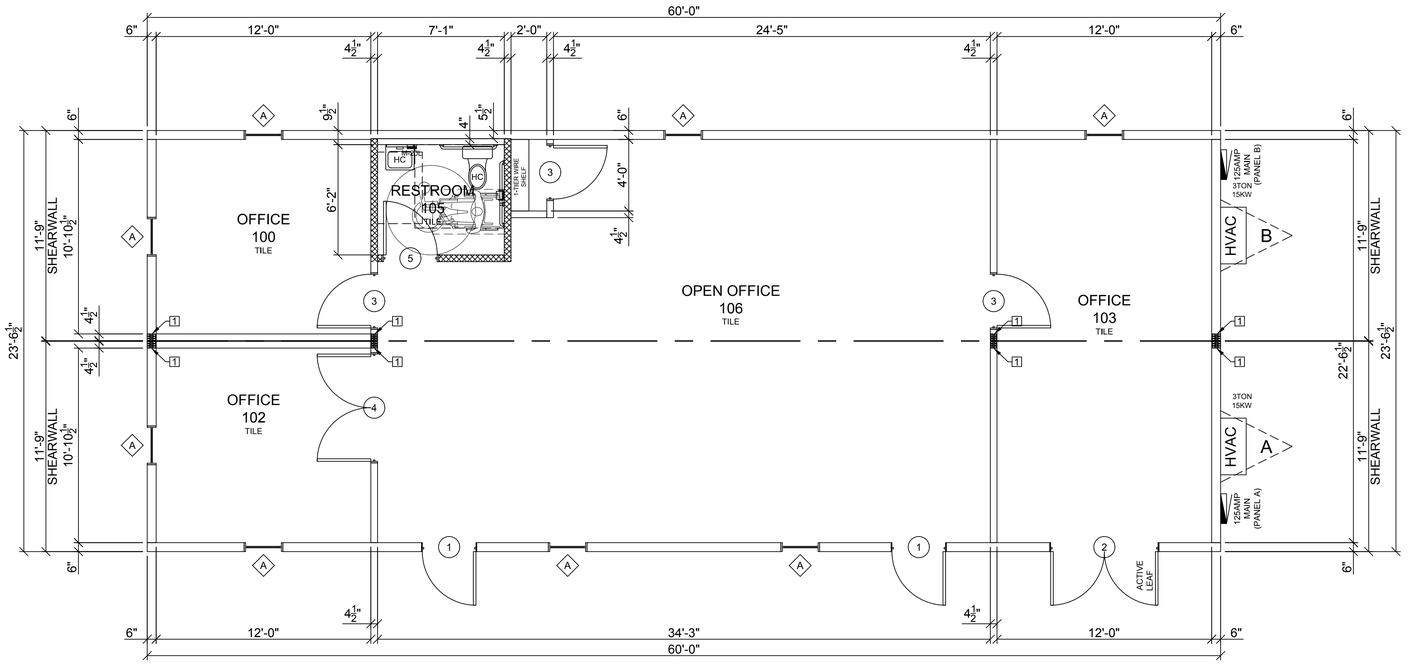


1 FLOOR PLAN

1/4"=1'-0"

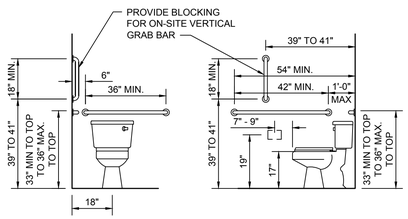
SQUARE FOOTAGE - 1412 S.F.
OCCUPANCY LOAD = 14

FLOOR PLAN LEGEND

HC	HANDICAP ELONGATED TANK TYPE WATER CLOSET WITH SHUT OFF VALVE
	36" GRAB BAR
	42" GRAB BAR
	18" VERTICAL GRAB BAR
	TOILET PAPER DISPENSER
	LAVATORY 19" X 17" WHITE VITREOUS WALL HUNG WITH ADA HANDLES WITH SHUT OFF VALVES
M-20L	INSTA-HOT ELECTRIC WATER HEATER WITH A 170 LEONARD TEMPERING VALVE AND ACCESS PANEL
	INDICATES FULL HEIGHT WALL TO BOTTOM OF RAFTERS

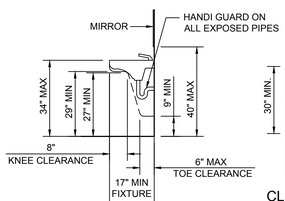
FASTENING SCHEDULE

LOCATIONS	TYPE	FASTENING
SIDEWALLS	NO PLYWOOD	NONE
ENDWALLS (SHEARWALLS)	NO PLYWOOD	NONE
INTERIOR (SHEARWALLS)	NO PLYWOOD	NONE
ROOF DECKING	7/16" OSB	(UNBLOCKED ROOF) (2 3/8"x0.113" DIA. NAIL) @ 6" O.C. AT SUPPORTED EDGES AND 6" O.C. AT INTERMEDIATE RAFTERS
SIDING (SIDEWALLS)	7/16" LP SMART PANEL VERTICAL SIDING	(2 1/4"x0.099" DIA. NAIL) @ 6" O.C. AT STUDS AND 6" O.C. AT INTERMEDIATE STUDS
SIDING (ENDWALLS)	7/16" LP SMART PANEL VERTICAL SIDING	(2 1/4"x0.099" DIA. NAIL) @ 6" O.C. AT STUDS AND 6" O.C. AT INTERMEDIATE STUDS



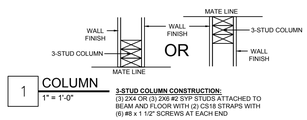
HANDICAPPED WATER CLOSET FRONT VIEW

HANDICAPPED WATER CLOSET SIDE VIEW



LAV CLEARANCES

CLEAR FLOOR SPACE AT COUNTERTOP LAVATORIES



3-STUD COLUMN CONSTRUCTION:
(3) 2X4 OR (3) 2X6 #2 SYP STUDS ATTACHED TO BEAM AND FLOOR WITH (2) CS18 STRAPS WITH (6) #8 x 1 1/2" SCREWS AT EACH END

DOORS:

Qty	NO.	Type	Jamb	Glazing	Size	Rough Opening	U-Factor	Color	Closer	Deadbolt	Hardware	Fire Rating	Keying	Notes
2	1	TELSTAR INSULATED 20 GA.	18 GA.	10X10 TEMPERED WINDOW (OBSCURED GLASS WHERE REQUIRED)	36 x 80	36 1/4"x80 1/4"	.14	COLOR:_____	HYDRAULIC CLOSER (12641)	STANDARD DEADBOLT, TELL BRAND, GRADE 2, DB2051	PASSAGE LEVER, TELL BRAND, GRADE 2 (LC2475CTL)	N/A	ALIKE OR SEPARATE	N/A
1	2	TELSTAR DBL. INSULATED 20 GA.	18 GA.	10X10 TEMPERED WINDOW (OBSCURED GLASS WHERE REQUIRED)	72 x 80	72 1/4"x80 1/4"	.14	COLOR:_____	HYDRAULIC CLOSER (12641)	STANDARD DEADBOLT, TELL BRAND, GRADE 2, DB2051	PASSAGE LEVER, TELL BRAND, GRADE 2 (LC2475CTL)	N/A	ALIKE OR SEPARATE	REMOVABLE MULLION
3	3	6 PANEL PAINTED HOLLOW CORE	WITH WOOD JAMB	N/A	36 x 80	38"x81 1/2"	N/A	COLOR: IBI GRAY	N/S	N/A	PASSAGE LEVER, TELL BRAND, GRADE 2 (LC2475CTL)	N/A	N/A	FLOOR MOUNT STOPS
1	4	6 PANEL PAINTED HOLLOW CORE	WITH WOOD JAMB	N/A	72 x 80	74"x81 1/2"	N/A	COLOR: IBI GRAY	N/A	N/A	PASSAGE LEVER, TELL BRAND, GRADE 2 (LC2475CTL)	N/A	N/A	FLOOR MOUNT STOPS AND HEAD AND FOOT BOLTS
1	5	6 PANEL PAINTED HOLLOW CORE	WITH WOOD JAMB	N/A	36 x 80	38"x81 1/2"	N/A	COLOR: IBI GRAY	N/S	N/A	PRIVACY LEVER, TELL BRAND, GRADE 2 (LC2476CTL)	N/A	N/A	FLOOR MOUNT STOPS

WINDOWS:

Qty	NO.	Type	Glazing	Size	Rough Opening	U-Factor	SHGC	Mini-Blind	Notes
8	A	VINYL VERTICAL SLIDER WITH 20 IN. SASH. COLOR TO BE: (WHITE, CLAY OR PEBBLESTONE)	CLEAR, DUAL GLAZED, LOW-E	24"X52"	23 3/4"X51 3/4"	.33	.22	N/A	TOP OF WINDOW AT 6'-8" AFF

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DEALER:
AMERICAN PORTABLE BUILDINGS

PROJECT:
GLENWOOD SPRINGS SIGN SHOP

PROJECT: 19-145

STATES:
CO

SERIAL NUMBERS:
19B635-636

DRAWN BY:
BDG

PLOT DATE:
11/1/2019

REV # / DATE:

R. MARK STEELE, P.E.
CORPORATE ENGINEER
SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
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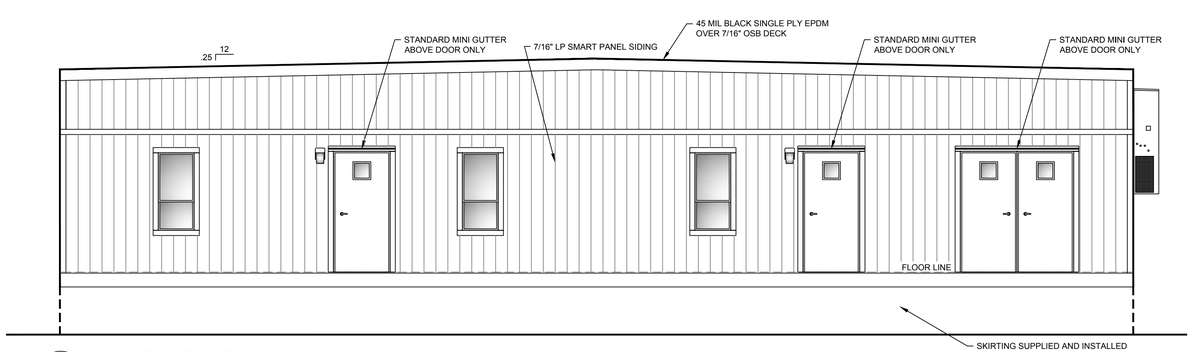
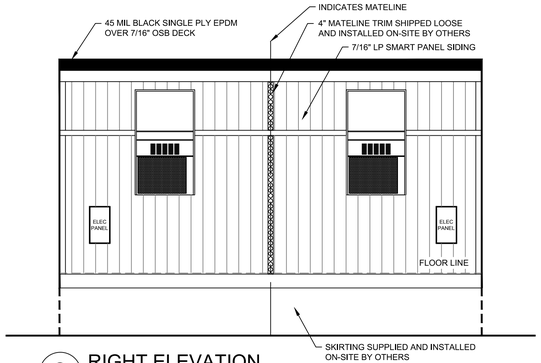
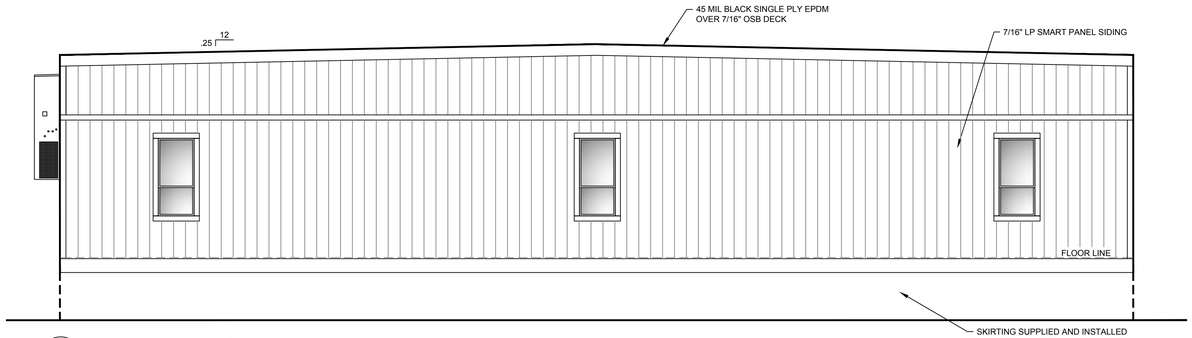


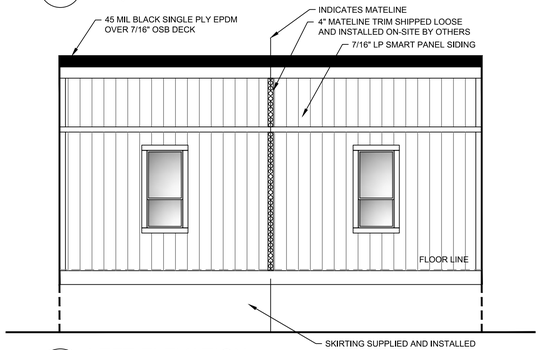
1 FRONT ELEVATION
1/4"=1'-0"



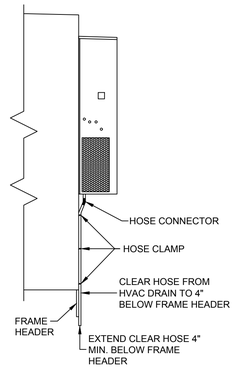
3 RIGHT ELEVATION
1/4"=1'-0"



2 REAR ELEVATION
1/4"=1'-0"



4 LEFT ELEVATION
1/4"=1'-0"



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DEALER:
AMERICAN PORTABLE BUILDINGS

PROJECT:
GLENWOOD SPRINGS SIGN SHOP

PROJECT: 19-145

STATES:
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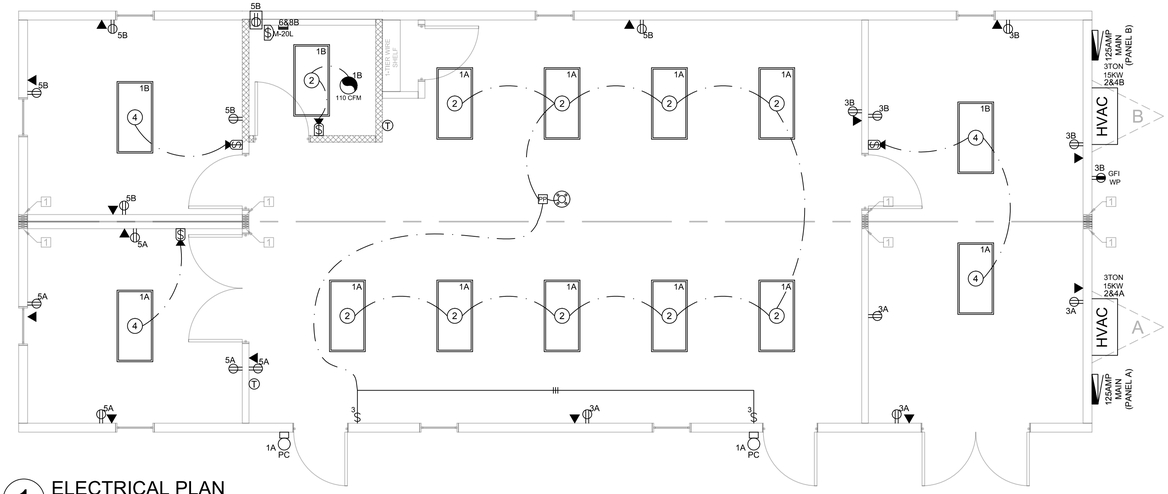

1 ELECTRICAL PLAN
1/4"=1'-0"

ELEC LEGEND	
(2)	2X4 FLUORESCENT 2 LAMP DIFFUSED LAY-IN LIGHT FIXTURE (INPUT WATTAGE = 56)
(4)	2X4 FLUORESCENT 4 LAMP DIFFUSED LAY-IN LIGHT FIXTURE (INPUT WATTAGE = 113)
PC	COMPACT FLUORESCENT EXTERIOR LIGHT w/PHOTOCELL (INPUT WATTAGE = 13)
$3	THREE WAY LIGHT SWITCH @ 46" AFF
	OCCUPANCY OR VACANCY SENSOR SWITCH @ 46" AFF
$	DISCONNECT SWITCH WITH RED SWITCH PLATE FOR WH
PS	CEILING OCCUPANCY SENSORS WITH POWER PACK MOUNTED AT DROP CEILING
110 CFM	CEILING MOUNTED EXHAUST FAN
	ELECTRICAL PANEL BOX (SEE PLANS AND PANEL SCHEDULES FOR SIZES)
	20a/125v DUPLEX RECEPTACLE @ 15" AFF
GFI WP	20a/125v GFCI 'WR' RATED EXT. RECEPTACLE w/WEATHERPROOF IN-USE EXTRA DUTY COVER @ 15" AFF
GFI +42	20a/125v GFCI PROTECTED DUPLEX RECEPTACLE
	20a/125v GFCI PROTECTED 'WR' RATED HEAT TAPE RECEPTACLE BELOW UNIT w/WEATHERPROOF COVER
▲	2X4 J-BOX W/ 3/4" CONDUIT STUBBED ABOVE T-GRID FOR PHONE /DATA JACK BY OTHERS @ 15" AFF
T	PROGRAMMABLE THERMOSTAT MOUNTED @ 48" AFF TO CENTER

NOTE:
1: ALL AFF DIMENSIONS ARE TO THE BOTTOM OF THE DEVICE BOX UNLESS NOTED "TO CENTER"
2: BLANK COVERS SHALL BE ADDED TO ANY J-BOX THAT IS FOR FUTURE USE

125 AMP 120/240 1 PHASE
PANEL WITH 125 AMP MAIN BREAKER (NEMA 3R)

WS	Description	Circuit	BRK	A	B	BRK	Circuit	Description	WS
1	Main Breaker		125	9660		90	2	HVAC Unit 3 Ton w/15KW 90A	3
1	Main Breaker		2		9660	2	4		3
12	Lights	1	20	756		0	6	Space	###
12	Receptacles	3	20		900	0	8	Space	###
12	Receptacles	5	20	900		0	10	Space	###
###	Space	7	0		0	0	12	Space	###
				11316	10560	Total			

ELECTRICAL CALCULATION: *PANEL* **A**

GENERAL LIGHTING:

756	LIGHTS x 125%	= 945	watts
10	RECEPTACLES	= 1800	watts
1	HVAC UNITS	= 19320	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
22065	watts divide by 240volts =	91.94	AMPS TOTAL

TYPE OF PANEL: LOAD CENTER

125 AMP 120/240 1 PHASE
PANEL WITH 125 AMP MAIN BREAKER (NEMA 3R)

WS	Description	Circuit	BRK	A	B	BRK	Circuit	Description	WS
1	Main Breaker		125	9660		60	2	HVAC Unit 3 Ton w/15KW 90A	6
1	Main Breaker		2		9660	2	4		6
12	Lights	1	20	438		20	6	M-20L Insta Water Heater 20A	12
				2400					
12	Receptacles	3	20		1080	2	8		12
					2400				
12	Receptacles	5	20	1080		0	10	Space	###
				0					
###	Space	7	0		0	0	12	Space	###
				13578	13140	Total			

ELECTRICAL CALCULATION: *PANEL* **B**

GENERAL LIGHTING:

438	LIGHTS x 125%	= 547.5	watts
12	RECEPTACLES	= 2160	watts
1	HVAC UNITS	= 19320	watts
1	WATER HEATER	= 4800	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
0		= 0	watts
26828	watts divide by 240volts =	111.8	AMPS TOTAL

TYPE OF PANEL: LOAD CENTER

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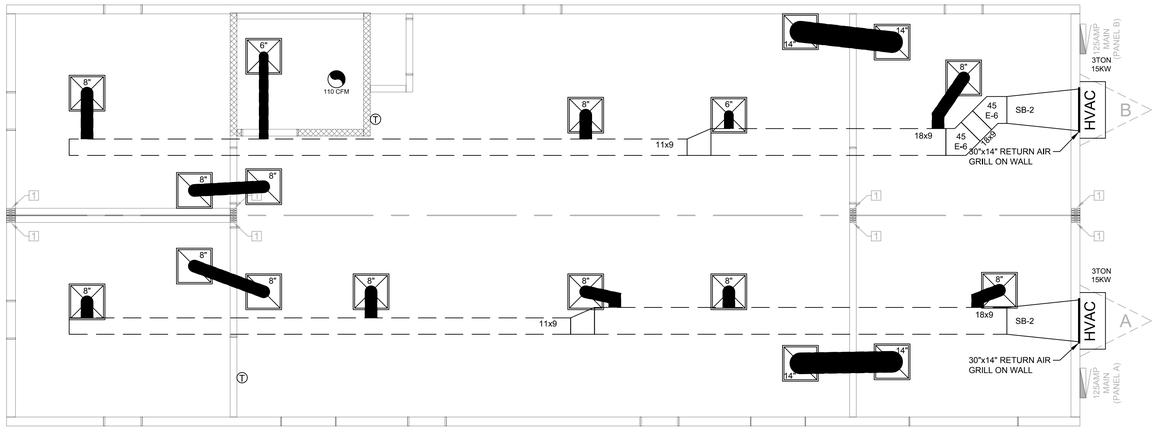
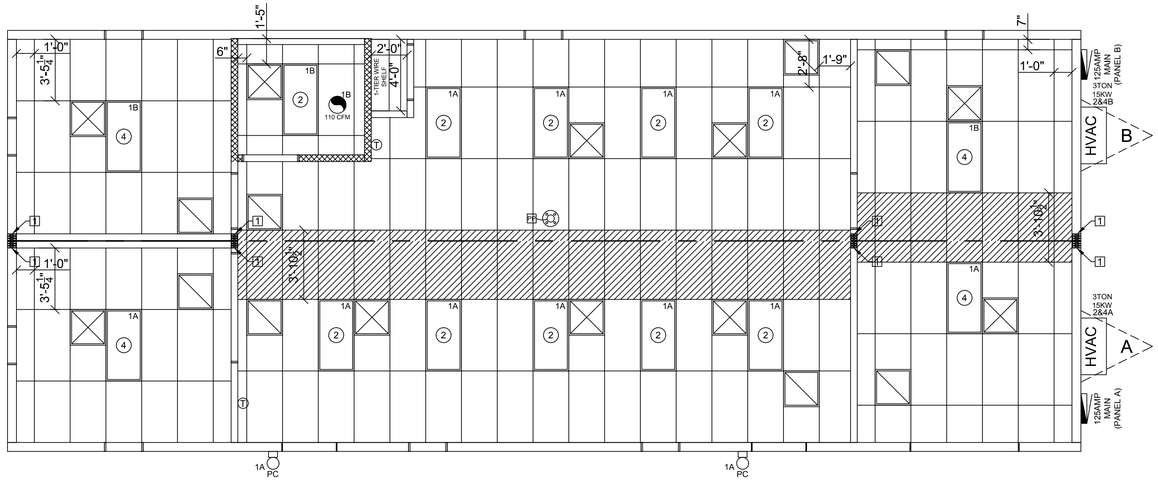


1 HVAC PLAN
1/4"=1'-0"



2 REFLECTED CEILING PLAN
1/4"=1'-0"

HVAC LEGEND

HVAC	BARD HVAC UNIT WITH ELECTRIC HEAT STRIP (SEE HVAC PLAN FOR SIZES)
	FLEX DUCT
	24 X 24 4-WAY LAY-IN DIFFUSER WITH R-42 RADIAL DAMPER
	24 X 24 PERFORATED LAY-IN R/A GRILLE

NOTE: ALL MECHANICAL VENTS (EXHAUST FANS) MUST TERMINATE MIN. 10 FEET HORIZONTALLY AWAY FROM ANY AIR INTAKE OPENING UNLESS IT IS AT LEAST 3 FEET ABOVE THE TOP OF SUCH OPENING. EXHAUST FAN SHALL TERMINATE THRU ROOF UNLESS OTHERWISE NOTED.

MECHANICAL VENTILATION

Vbz = (Rp Pz) + (Ra Az)

AREA (Az)			1412	S.F.
OCCUPANCY LOAD (Pz)			14	
OUTSIDE AIR REQUIRED (Rp)	5 CFM X	14 (Pz)	70	CFM
AREA OUTDOOR AIRFLOW RATE (Ra	0.06 X (Az)		85	CFM
AIRFLOW RATE (Vbz)			155	CFM
TOTAL CFM AVAILABLE			2200	CFM
FRESH AIR MAKE-UP	155 /	2200	7%	

STANDARD WITH BARD UNIT IS A BAROMETRIC DAMPER WHICH PROVIDES UP TO 25% OF OUTSIDE FRESH AIR. A CRV REPLACES THE BAROMETRIC DAMPER AND THE CRV PROVIDES UP TO 50% OF OUTSIDE FRESH AIR.

*MECHANICAL VENTILATION SHALL BE PROVIDED AS REQ'D. IN ACCORDANCE w/TABLE 403.3 OF THE IMC CODE OR NATURAL MEANS OF VENTILATION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 402 OF THE IMC CODE.

CEILING LEGEND

	INDICATES T-GRID SUSPENDED CEILING INSTALLED @ FACTORY
	INDICATES SUSPENDED CEILING HOLD-BACK @ MATELINES, TO BE COMPLETED ON-SITE BY OTHERS

INDICOM BUILDINGS, INC
721 N. BURLESON BLVD - BURLESON, TX 76028
PH 817-447-1213 FAX 817-447-2751
SUNBELT MODULAR, INC.
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DEALER: AMERICAN PORTABLE BUILDINGS

PROJECT: GLENWOOD SPRINGS SIGN SHOP

PROJECT: 19-145

STATES: CO

SERIAL NUMBERS: 19B635-636

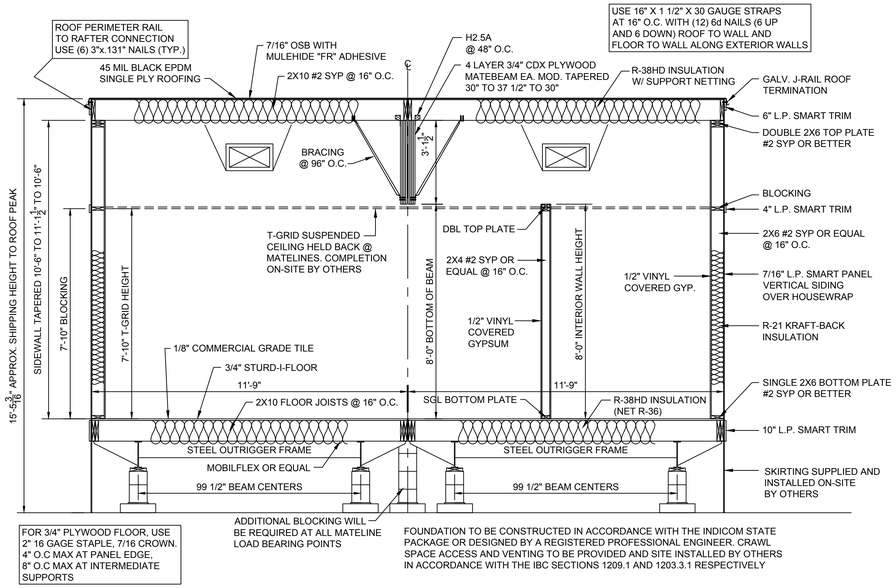
DRAWN BY: BDG

PLOT DATE: 11/1/2019

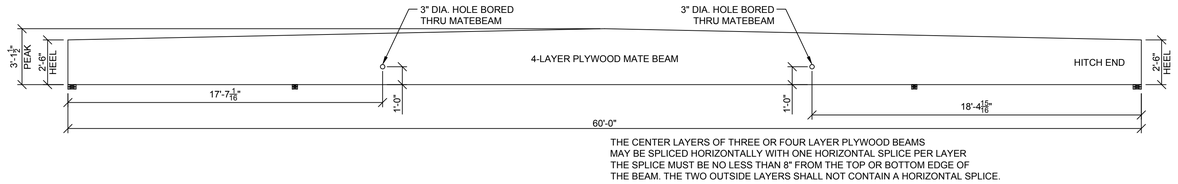
REV # / DATE:

R. MARK STEELE, P.E.
CORPORATE ENGINEER
SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
PHOENIX, AZ. 85029
(602) 327-4769

SHEET: 5 *OF* 7

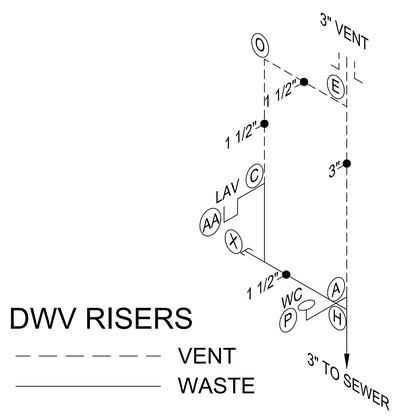


1 BUILDING CROSS SECTION
3/8"=1'-0"



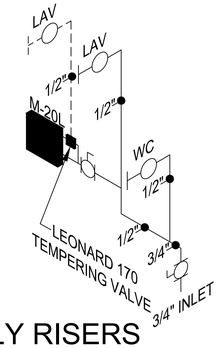
THE CENTER LAYERS OF THREE OR FOUR LAYER PLYWOOD BEAMS MAY BE SPLICED HORIZONTALLY WITH ONE HORIZONTAL SPLICE PER LAYER THE SPLICE MUST BE NO LESS THAN 8" FROM THE TOP OR BOTTOM EDGE OF THE BEAM. THE TWO OUTSIDE LAYERS SHALL NOT CONTAIN A HORIZONTAL SPLICE.

2 MATELINE DETAIL
1/4"=1'-0"



DWV RISERS
- – – – – – VENT
——— WASTE

PLUMBING LEGEND	
DWV FITTINGS	
A	3" SAN TEE
C	1 1/2" SAN TEE
E	3"x3"x1 1/2" SAN TEE
H	3"x3"x1 1/2" LTTY (LONG SWEEP)
O	1 1/2" - 90° ELBOW
P	3" - 90° LONG SWEEP
AA	1 1/2" P-TRAP



SUPPLY RISERS
——— COLD WATER SUPPLY
– – – – – – HOT WATER SUPPLY

LEGEND:

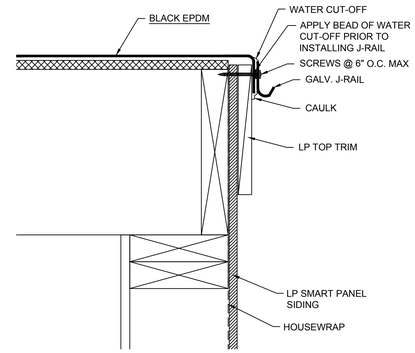
SHUT OFF VALVE AT EACH FIXTURE

SHUT OFF VALVE

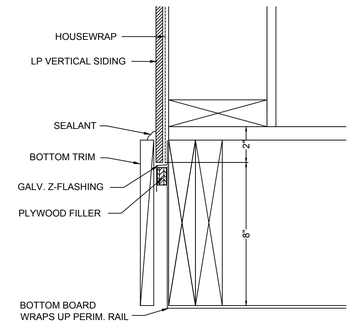
SIZING BASED ON TABLE E201.1 PRESSURE RANGE 40 TO 49 PSI AND MAXIMUM DEVELOPED LENGTH OF 20 FT.

NOTES:

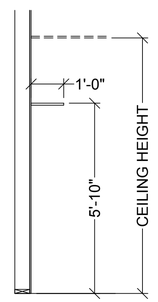
1. ALL PLUMBING VENTS MUST TERMINATE MIN. 10 FEET HORIZONTALLY AWAY FROM ANY AIR INTAKE OPENING UNLESS IT IS AT LEAST 3 FEET ABOVE THE TOP OF SUCH OPENING.
2. DRAIN PANS AND T&P PRESSURE RELIEF VALVES REQUIRE SEPARATE 3/4" DRAINS WHICH ARE STUBBED THRU FLOOR BY IBI AT FACTORY. DISCHARGE PIPING TO BE RAN TO AN APPROVED LOCATION ON-SITE BY OTHERS. OPTION CAN RUN TO FLOOR DRAIN WITH AIR GAP.
3. ALL DRAIN VALVES FOR WATER HEATER OR STORAGE TANKS CONFORM TO ASSE 1005.
4. ALL IBI TANKLESS WATER HEATERS ARE FACTORY SET @ 110°
5. ALL SUPPLY PIPES ARE INSTALLED IN THE FLOOR UNLESS OTHERWISE NOTED. ANY SUPPLY PIPES UNDER THE FLOOR SHALL BE INSULATED ON-SITE BY OTHERS PER IECC SECTION C404.4.
6. (CO) SLOPE WATER LINES DOWN AT TEMPERING VALVE SO THAT WATER WILL NOT BE TRAPPED WHEN BUILDING IS NOT IN USE.
7. ALL SUPPLY PIPES SHALL BE INSULATED.
   HOT WATER / TEMPERED PIPES UP TO 1-1/2" DIA WITH 1" MIN THICK INSULATION
   COLD WATER PIPES UP TO 1-1/2" DIA WITH 1/2" MIN THICK INSULATION



3 LP AT EPDM ROOF DETAIL
N.T.S.



4 LP AT FLOOR DETAIL
N.T.S.



(1) 12" DEEP CLOSET WIRE SHELF HEIGHT

5 WIRE SHELF DETAIL
N.T.S.

INDICOM BUILDINGS, INC
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DEALER:
AMERICAN PORTABLE BUILDINGS

PROJECT:
GLENWOOD SPRINGS SIGN SHOP

PROJECT: 19-145

STATES:
CO

SERIAL NUMBERS:
19B635-636

DRAWN BY:
BDG

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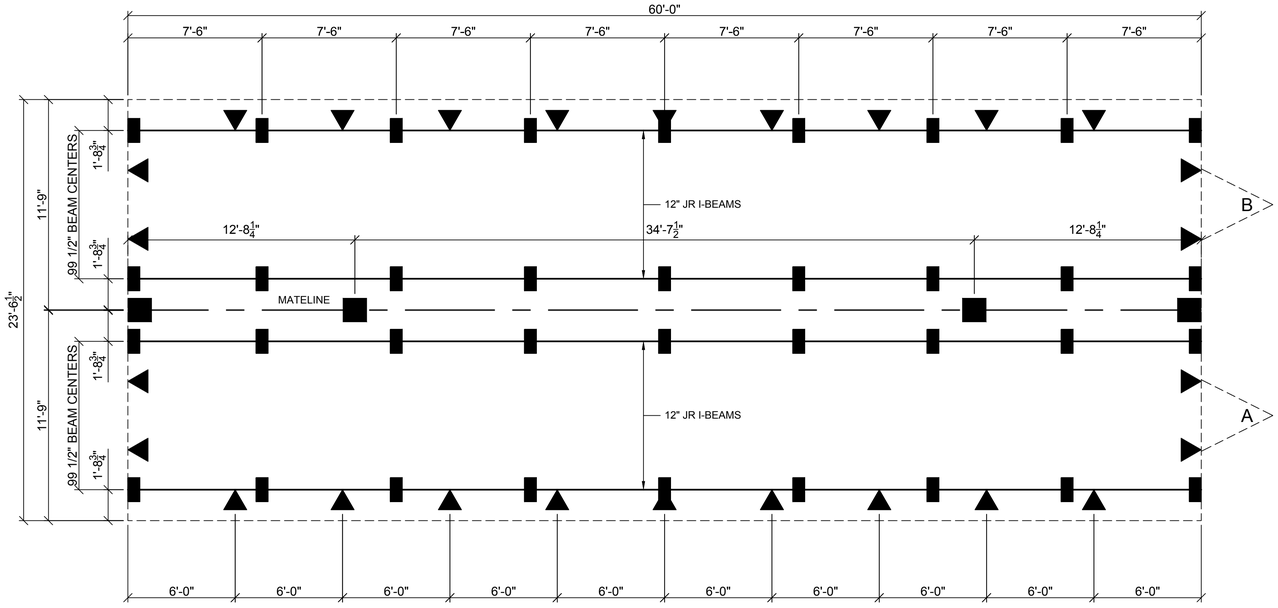
CORPORATE ENGINEER
SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
PHOENIX, AZ. 85029
(602) 327-4769

SHEET:
6
OF
7

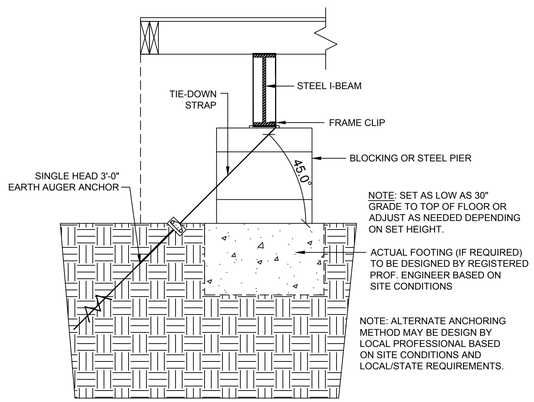


1 SUGGESTED BLOCKING PLAN
1/4"=1'-0"

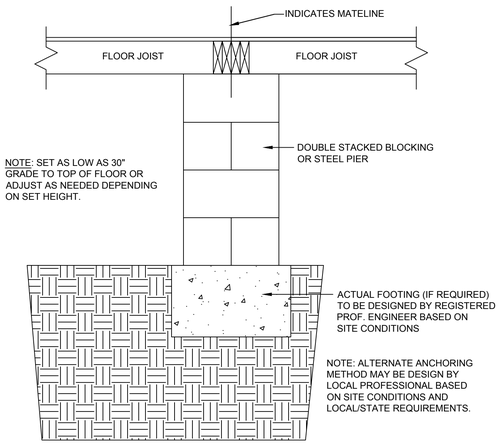
--- INDICATES SUGGESTED MAXIMUM I-BEAM BLOCKING SPACING - PIERS AND FOOTINGS DESIGNED BY LOCAL PROFESSIONAL IN ACCORD. WITH ALL LOCAL AND STATE REQUIREMENTS BASED ON SITE CONDITIONS.

--- INDICATES REQUIRED MATELINE BLOCKING LOCATION - PIERS AND FOOTINGS DESIGNED BY LOCAL PROFESSIONAL IN ACCORD. WITH ALL LOCAL AND STATE REQUIREMENTS BASED ON SITE CONDITIONS.

--- INDICATES REQUIRED FRAME-TIE GROUND ANCHOR (MIN. 4725 LBS. HOLDING STRENGTH) LOCATION FOR ALL WIND LOADS - NOTE: ALTERNATE ANCHORING DESIGN MAY BE MADE BY REGISTERED PROFESSIONAL ENGINEER.



2 SUGGESTED ANCHORING METHOD
1"=1'-0"



3 SUGGESTED BLOCKING @ MATELINE
1"=1'-0"

INDICOM BUILDINGS, INC
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AMERICAN PORTABLE BUILDINGS

PROJECT:
GLENWOOD SPRINGS SIGN SHOP

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CO

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19B635-636

DRAWN BY:
BDG

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R. MARK STEELE, P.E.
CORPORATE ENGINEER
SUNBELT MODULAR, INC
2432 W. PEORIA AVE. #1246
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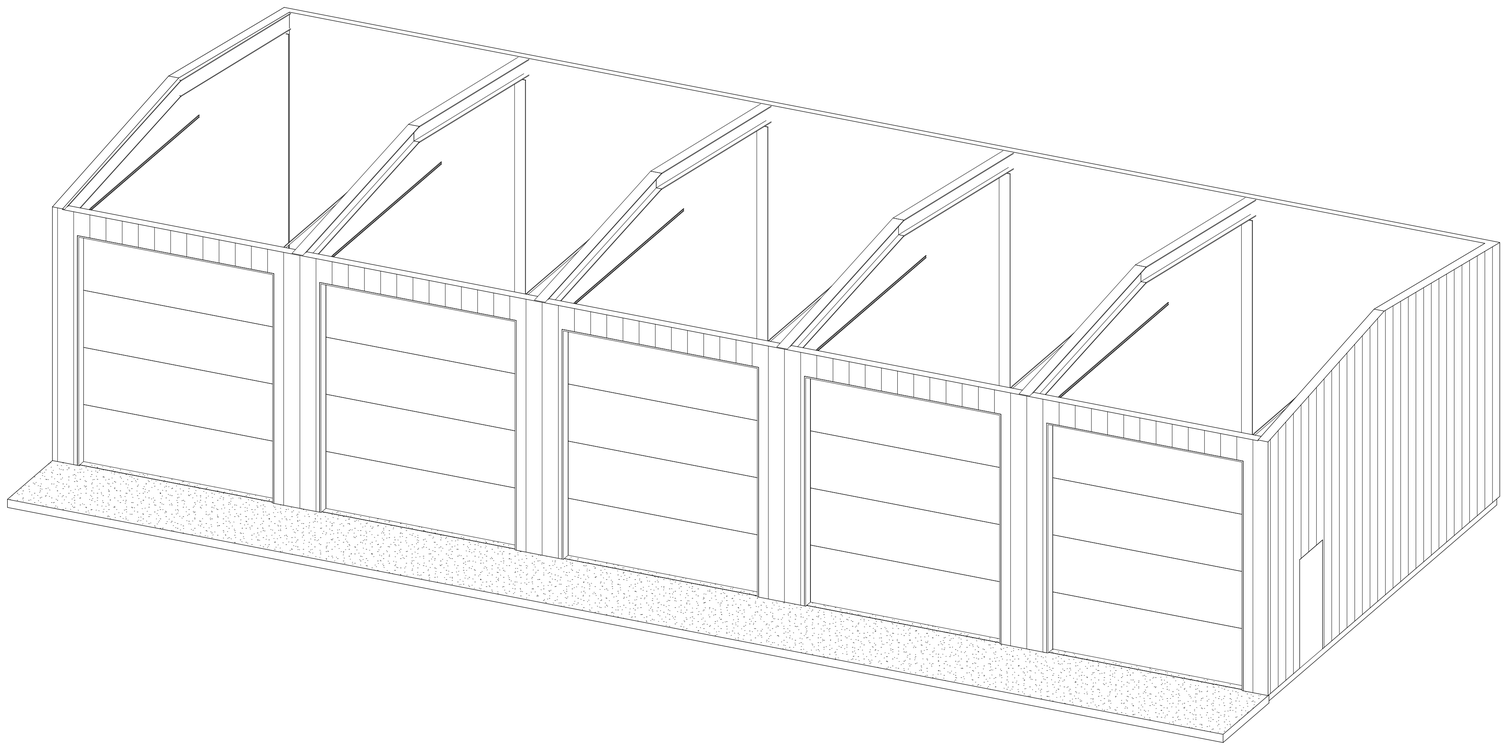
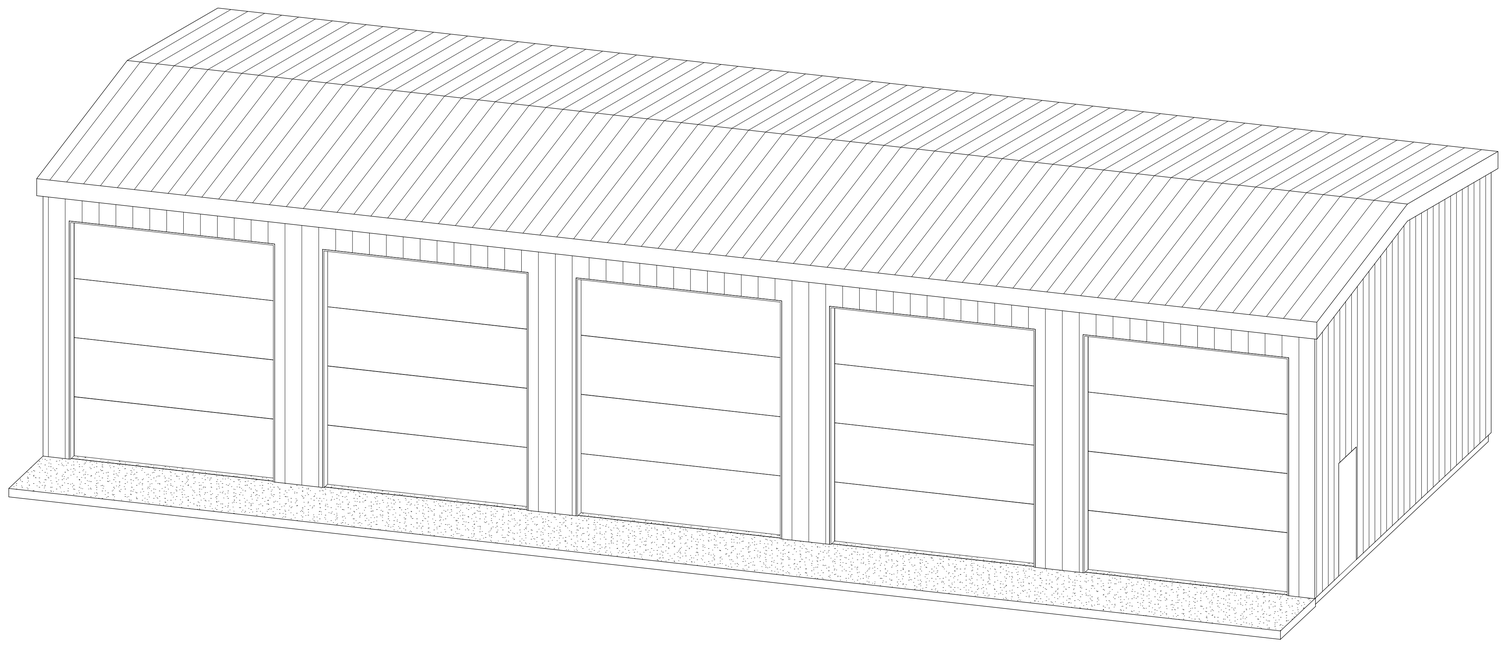
(602) 327-4769

SHEET:
7
OF
7



2 3D 2



1 3D 1

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80 Sagewood Court, Basalt, Colorado 81621
Phone (970) 618-0220

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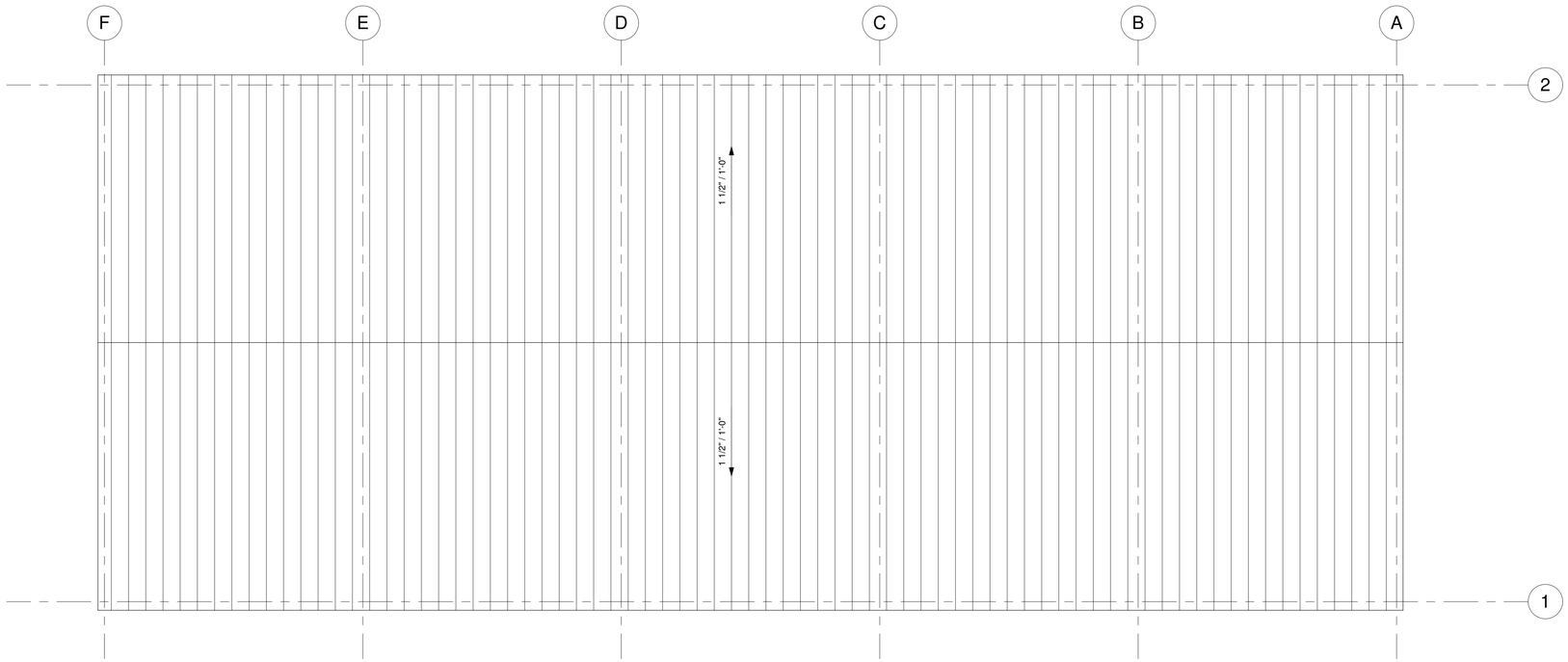
10/28/19	Preliminary

City of Glenwood Springs Covered Storage
2222 Devereaux Road
Glenwood Springs CO

Designed By: BLS	Checked By: ML

TITLE
3D

SHEET
A0

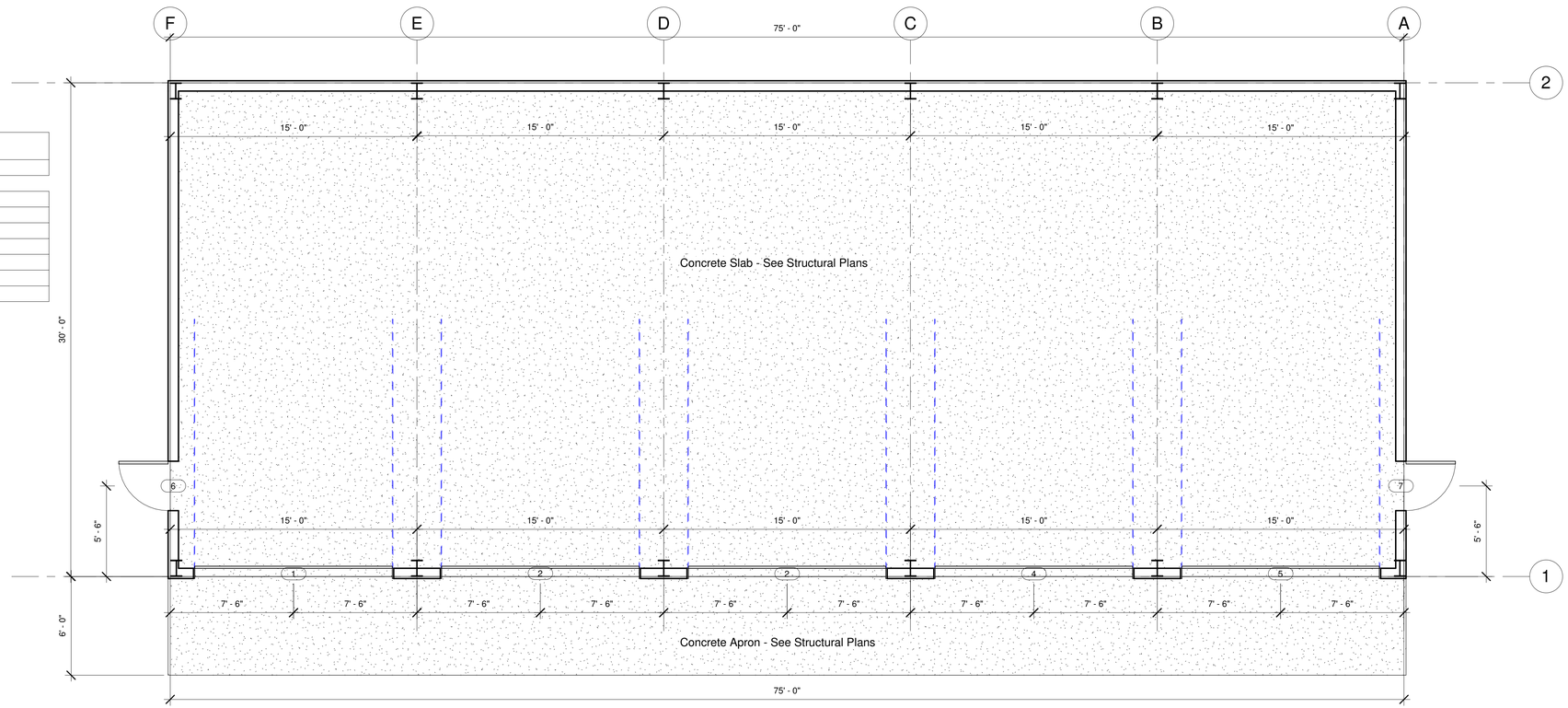


3 Roof Plan
1/4" = 1'-0"

GENERAL NOTES:
- FLOOR DESIGN LOAD - 125 PSF LIVE LOAD
- WIND DESIGN LOAD - 110 MPH EXPOSURE B
- TRUSS/ROOF DESIGN LOAD - 50 PSF GROUND SNOW LOAD, MIN.
- ALL CONSTRUCTION SHALL COMPLY WTH THE IBC, IPC, IMC, IFGC, IFC 2015 & THE IECC 2009 AS ADOPTED & AMENDED BY THE CITY OF GLENWOOD SPRINGS, AND, THE NEC AS ADOPTED & AMENDED BY THE CITY OF GLENWOOD SPRINGS
- VERIFY REQUIREMENTS FOR FIRE SUPPRESSION & ALARM SYSTEMS WITH THE GLENWOOD SPRINGS FIRE DEPARTMENT & PROVIDE PLANS AS REQUIRED BY THE FIRE DEPARTMENT AS A DEFERRED SUBMITTAL
- TYPE OF CONSTRUCTION : IIB, NON-SPRINKLERED
- OCCUPANCY CLASSIFICATION : S-2 PARKING GARAGE
- SQ. FT. BUILDING - 2250 SQ. FT.
- OCCUPANT LOAD - 2250/00 = 11
- DISTANCE TO PROPERTY LINES: DESIGN ASSUMES MINIMUM 25' FROM PROPERTY LINE OR CENTER OF R.O.W. GARAGE DOORS SIDE MINIMUM 10' DISTANCE FROM PROPERTY LINE OR CENTER OF R.O.W. ON OTHER SIDES
  FIRE RESISTANCE EXTERIOR WALLS - NON RATED
  OPENINGS IN EXTERIOR WALLS: NON-RATED
- BUILDING TO BE HEATED WITH DIRECT VENT OVERHEAD GAS OR ELECTRIC UNIT HEATERS. SEE IECC NOTES, PLANS, AND DETAILS.
-SEE IECC NOTES, PLANS, AND DETAILS FOR INSULATION, WINDOW AND DOOR SPECIFICATIONS, AND OTHER ENERGY RELATED ITEMS
-PLUMBING, ELECTRICAL, MECHANICAL, AND HVAC BY OWNER AND PROJECT MEP ENGINEER AS REQUIRED BY OWNER AND BUILDING DEPARTMENT.
- PROVIDE ILLUMINATED EXIT SIGNS AND EXIT ILLUMINATION AT ALL EXITS AS REQUIRED BY OWNER, IBC 2015, AND FIRE DEPARTMENT
- PROVIDE FIRE EXTINGUISHERS AS REQUIRED BY FIRE DEPARTMENT
- GLAZING IN HAZARDOUS LOCATIONS SHALL BE SAFETY GLAZING PER SEC. 2406 IBC 2015, I
- INTERIOR FINISHES SHALL BE CLASS C OR BETTER AND COMPLY WITH SEC. 803. TABLE 803.11. IBC 2015. REFER TO METAL BUILDING MANUFACTRURER PLANS.
- INSULATION SHALL COMPLY WITH SEC. 720, 807 IBC 2015, IECC 2009
- MECHANICAL VENTILATION OF VEHICLE EXHAUST SHALL BE PROVIDED PER IBC SEC. 406.4.2, 405.8.2 DESIGN TO BE PROVIDED BY PROJECT MECHANICAL ENGINEER AS REQUIRED BY OWNER AND BUILDING DEPARTMENT.
- GUTTERS, DOWN SPOUTS, AND SNOW SLIDES TO BE INSTALLED ON UPPER ROOFS OF FRONT AND REAR ELEVATIONS AS REQUIRED BY OWNER AND / OR ENGINEER. SEE DESIGN BY GUTTER SUPPLIER &/OR GUTTER INSTALLER.
- PROVIDE SITE DRAINAGE AWAY FROM BUILDING PER SOILS REPORT AND CIVIL ENGINEERING PLANS
- SLOPE SLAB TO DRAIN TO GARAGE DOORS PER ENGINEER PLANS. VERIFY SLOPE PITCH WITH OWNER.

2 Notes 1
1/2" = 1'-0"

Door Schedule						
Mark	Count	Family	Width	Height	Description	Comments
1	1	Door-Garage-Flush_Panel	12' - 0"	14' - 0"		
2	1	Door-Garage-Flush_Panel	12' - 0"	14' - 0"		
2	1	Door-Garage-Flush_Panel	12' - 0"	14' - 0"		
4	1	Door-Garage-Flush_Panel	12' - 0"	14' - 0"		
5	1	Door-Garage-Flush_Panel	12' - 0"	14' - 0"		
6	1	Door-Single-Panel	3' - 0"	6' - 8"		
7	1	Door-Single-Panel	3' - 0"	6' - 8"		



1 Level 1
1/4" = 1'-0"

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80 Sagewood Court, Basalt, Colorado 81621
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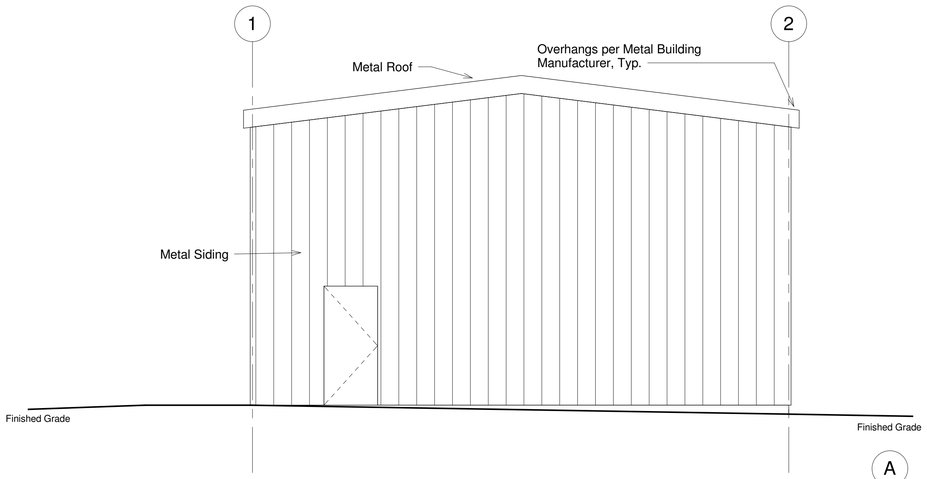
ISSUE DATES
10/28/19 Preliminary

City of Glenwood Springs Covered Storage
2222 Devereaux Road
Glenwood Springs CO

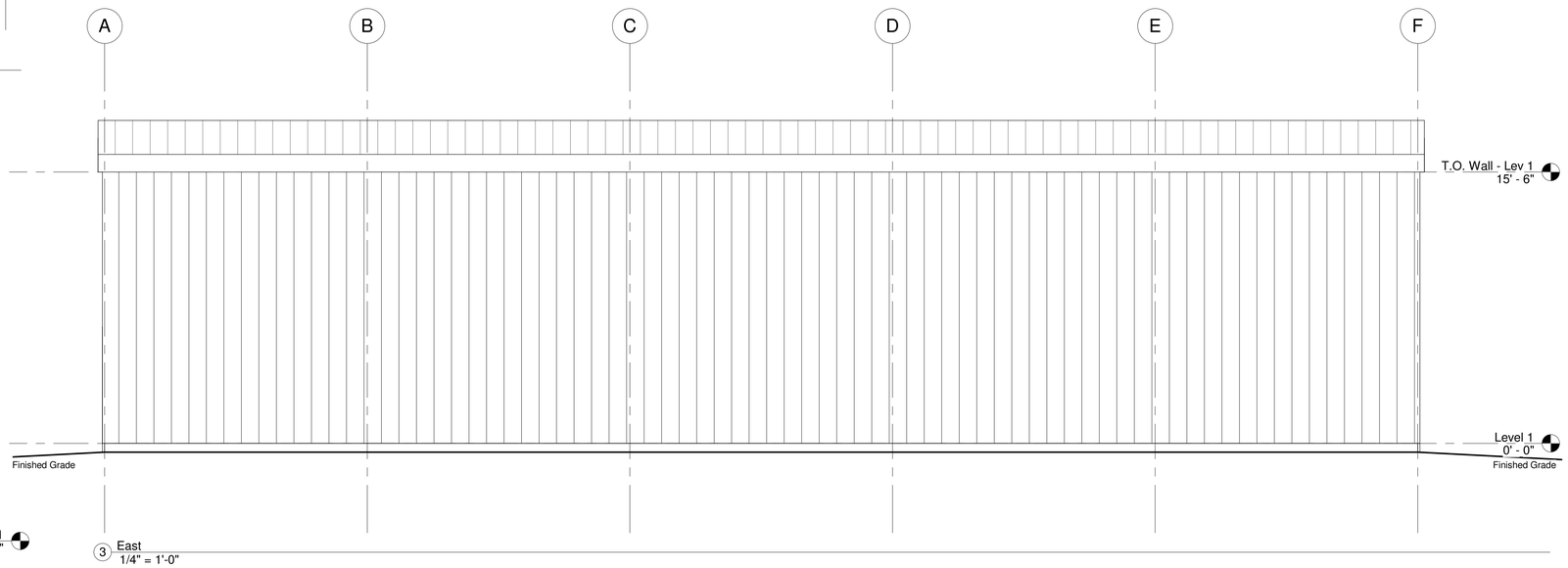
Designed By: BLS
Checked By: ML

TITLE
Floor Plan - Schedule - Notes

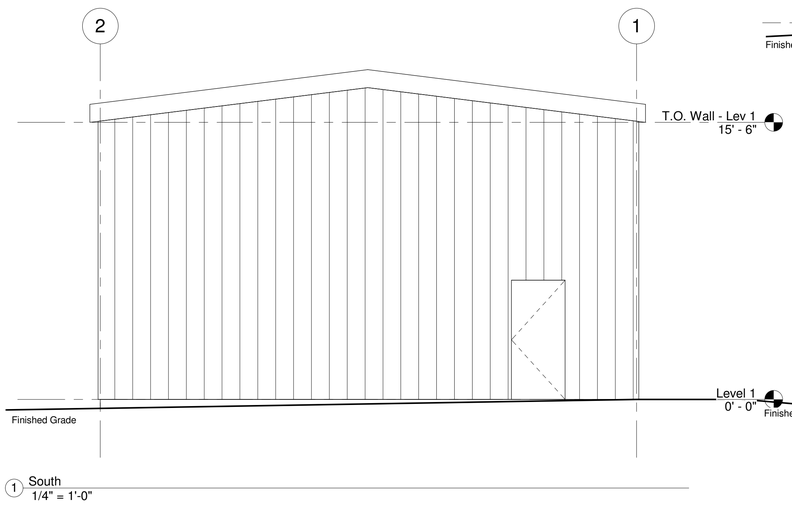
SHEET
A1



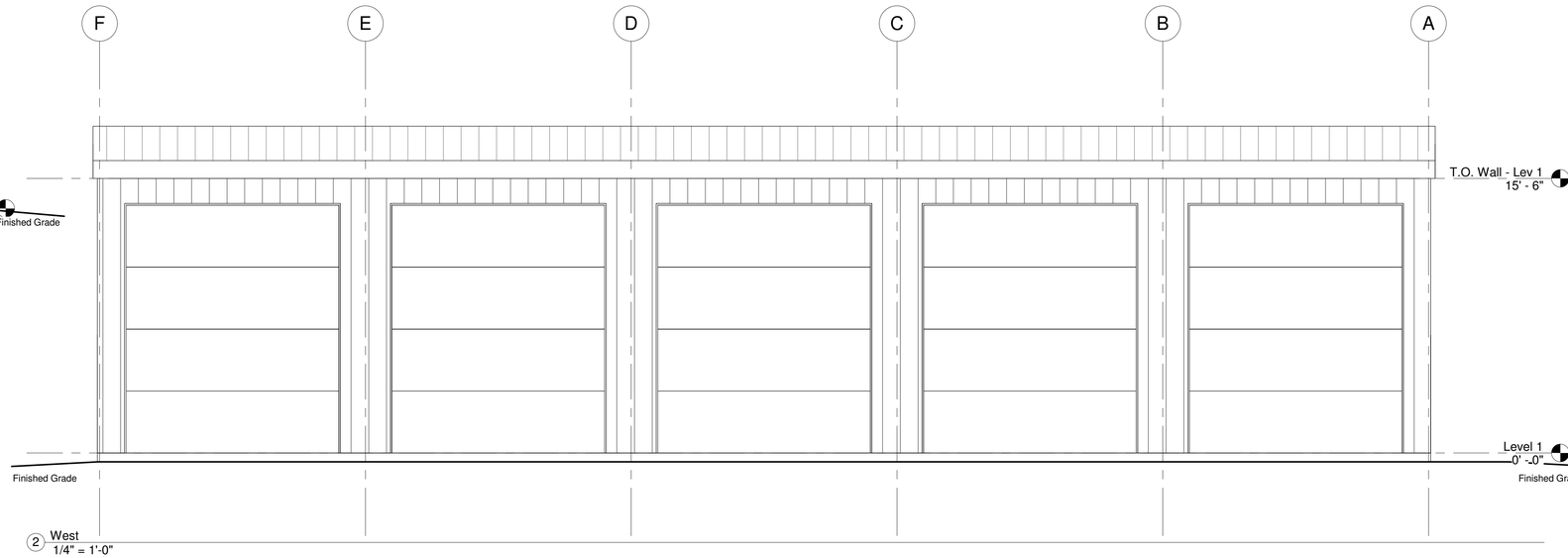
4 North
1/4" = 1'-0"



3 East
1/4" = 1'-0"



1 South
1/4" = 1'-0"



2 West
1/4" = 1'-0"

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ISSUE DATES
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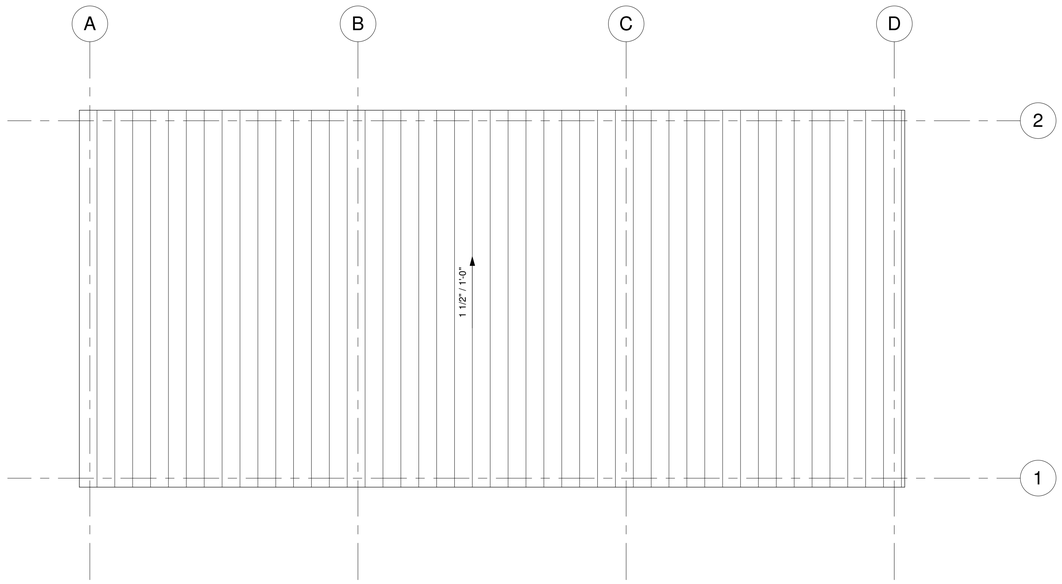
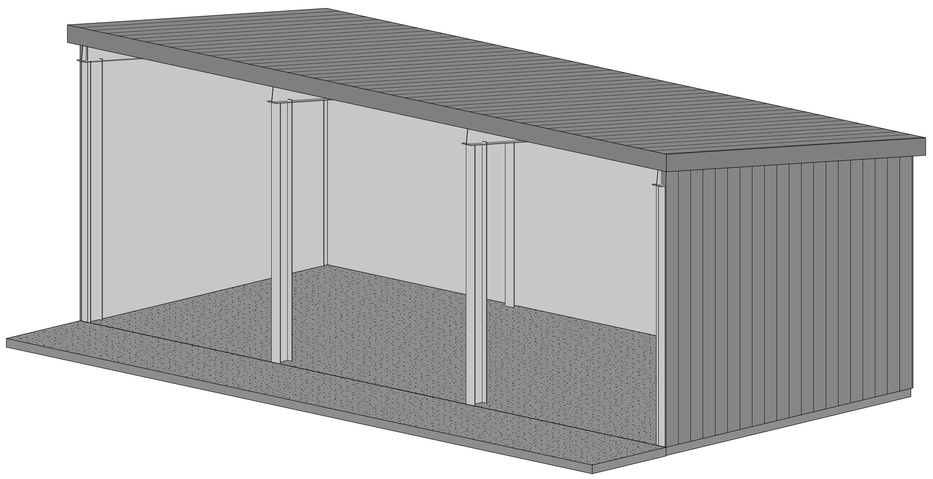
Checked By: BE, JC

TITLE
Elevations

SHEET
A2



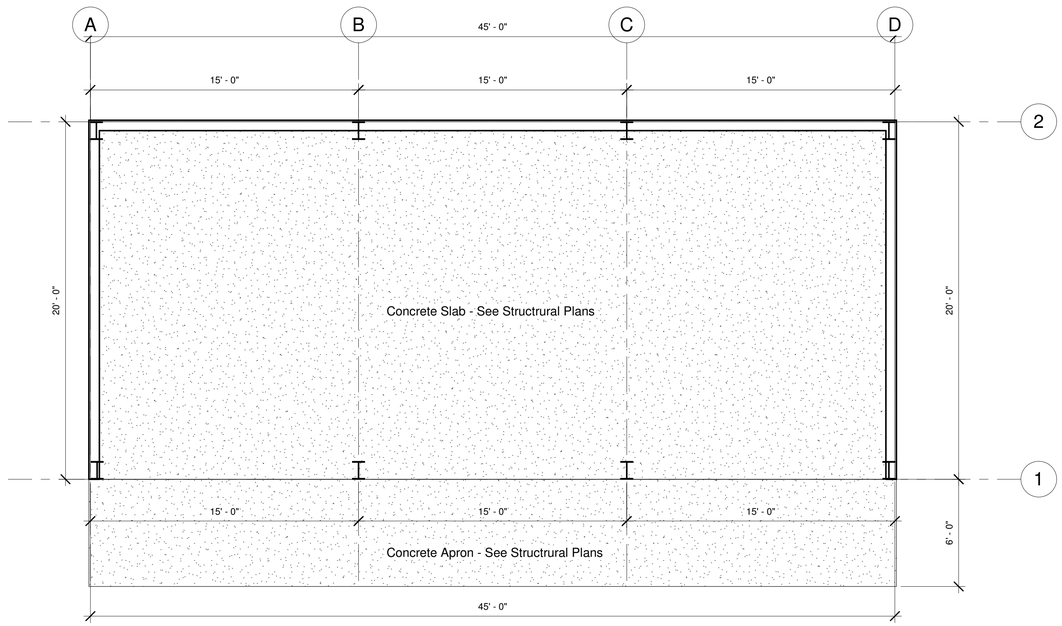
4 Roof Plan
1/4" = 1'-0"



2 3D 1

GENERAL NOTES:
- FLOOR DESIGN LOAD - 125 PSF LIVE LOAD
- WIND DESIGN LOAD - 110 MPH EXPOSURE B
- TRUSS/ROOF DESIGN LOAD - 50 PSF GROUND SNOW LOAD, MIN.
- ALL CONSTRUCTION SHALL COMPLY WITH THE IBC, IPC, IMC, IFGC, IFC 2015 & THE IECC 2009 AS ADOPTED & AMENDED BY THE CITY OF GLENWOOD SPRINGS, AND, THE NEC AS ADOPTED & AMENDED BY THE CITY OF GLENWOOD SPRINGS
-VERIFY REQUIREMENTS WITH THE GLENWOOD SPRINGS FIRE DEPARTMENT FOR FIRE SUPPRESSION & ALARM SYSTEMS. PROVIDE PLANS AS REQUIRED BY THE FIRE DEPARTMENT AS A DEFERRED SUBMITTAL
- TYPE OF CONSTRUCTION : IIB, NON-SPRINKLERED
- OCCUPANCY CLASSIFICATION : S-1 STORAGE
- SQ. FT. BUILDING - 900 SQ. FT.
- OCCUPANT LOAD - 900/500 = 2
- DISTANCE TO PROPERTY LINES: DESIGN ASSUMES MINIMUM 25' FROM PROPERTY LINE OR CENTER OF R.O.W. GARAGE DOORS SIDE. MINIMUM 10' DISTANCE FROM PROPERTY LINE OR CENTER OF R.O.W. ON OTHER SIDES
FIRE RESISTANCE EXTERIOR WALLS - NON RATED
OPENINGS IN EXTERIOR WALLS: NON-RATED
-PLUMBING, ELECTRICAL, MECHANICAL, AND HVAC BY OWNER AND PROJECT MEP ENGINEER AS REQUIRED BY OWNER AND BUILDING DEPARTMENT.
- PROVIDE FIRE EXTINGUISHERS AS REQUIRED BY FIRE DEPARTMENT
- GLAZING IN HAZARDOUS LOCATIONS SHALL BE SAFETY GLAZING PER SEC. 2406 IBC 2015, IEBC 2015
- INTERIOR FINISHES SHALL BE CLASS C OR BETTER AND COMPLY WITH SEC. 803. TABLE 803.11. IBC 2015, REFER TO METAL BUILDING MANUFACTRURER PLANS.
- GUTTERS, DOWN SPOUTS, AND SNOW SLIDES TO BE INSTALLED ON ROOFS AS REQUIRED BY OWNER AND SOILS REPORT. DESIGN PROVIDED BY GUTTER SUPPLIER &/OR GUTTER INSTALLER AS REQUIRED.
- PROVIDE SITE DRAINAGE AWAY FROM BUILDING PER SOILS REPORT AND CIVIL ENGINEERING PLANS
- SLOPE SLAB TO DRAIN TO GARAGE DOORS PER ENGINEER PLANS. VERIFY SLOPE PITCH WITH OWNER.

3 Notes 1
1/2" = 1'-0"



1 Level 1
1/4" = 1'-0"

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ISSUE DATES
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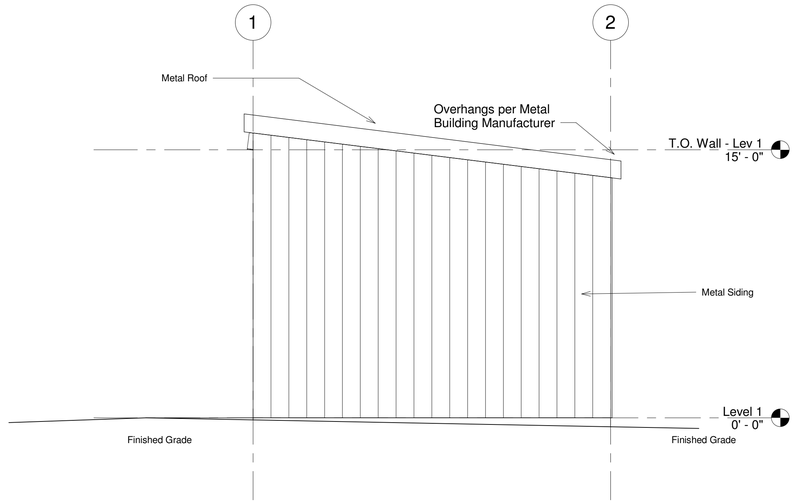
City of Glenwood Springs Covered Storage
2222 Devereaux Road
Glenwood Springs CO

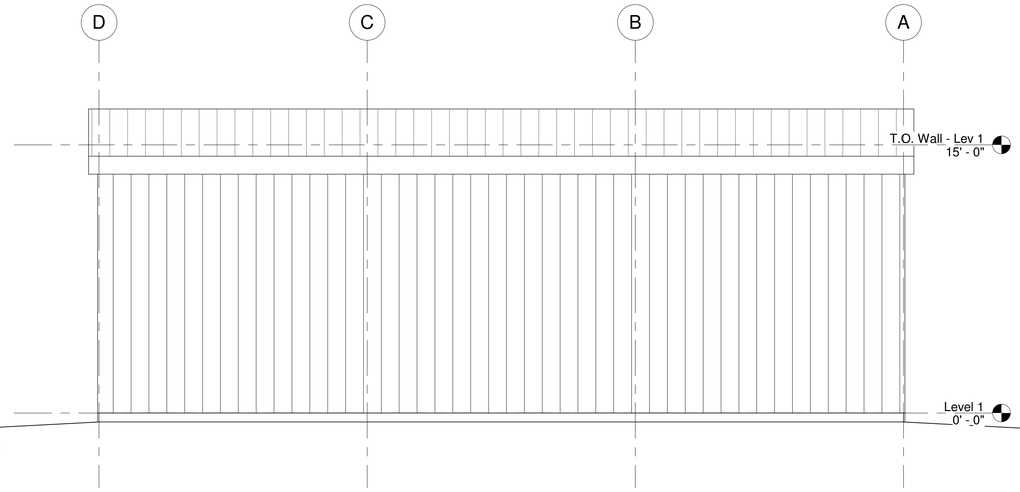
Designed By: BLS
Checked By: ML

TITLE
Floor Plan - 3D - Roof Plan - Notes

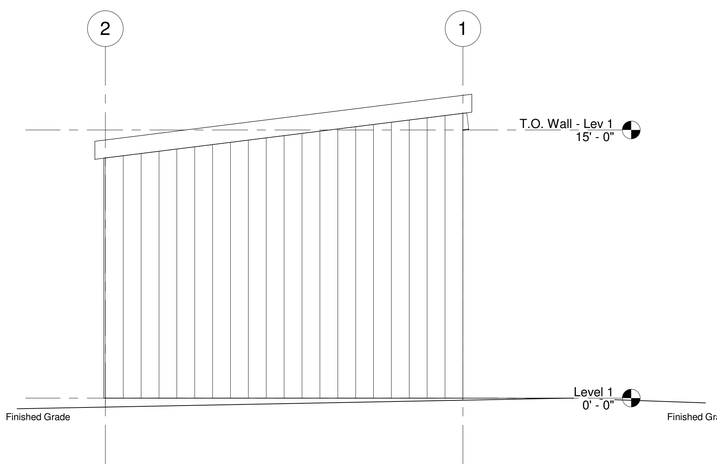
SHEET
A1



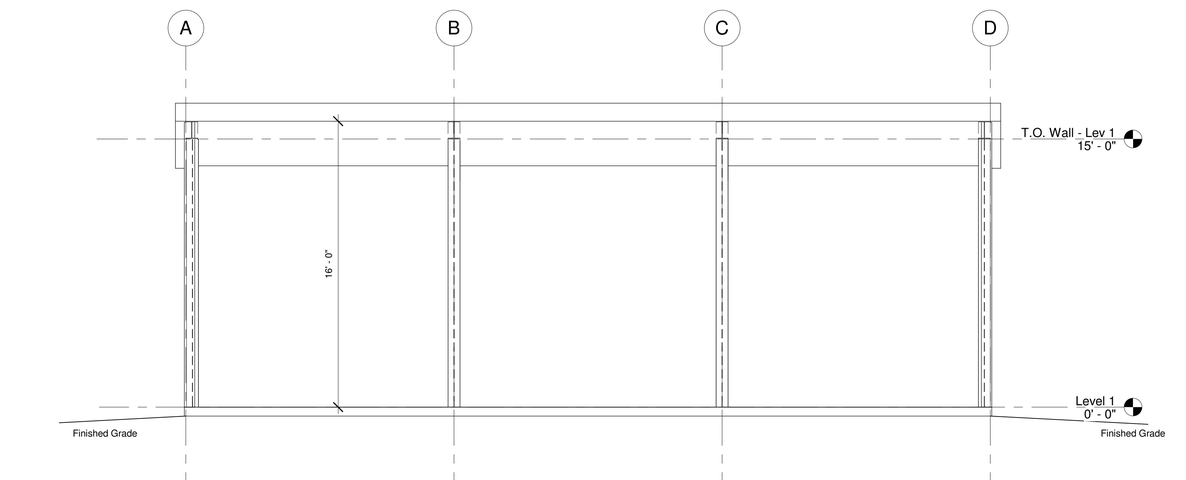
4 West
1/4" = 1'-0"



3 South
1/4" = 1'-0"



1 East
1/4" = 1'-0"



2 North
1/4" = 1'-0"

CADFISH LLC
CAD Drafting, Design, Planning, Construction Management
80 Sagewood Court, Basalt, Colorado 81621
Phone (970) 618-0220

ISSUE DATES
10/28/19 Preliminary

City of Glenwood Springs Covered Storage
2222 Devereaux Road
Glenwood Springs CO

Designed By: BLS
Checked By: ML

TITLE
Elevations

SHEET
A2