AGENDA
CITY OF GLENWOOD SPRINGS
SPECIAL CITY COUNCIL MEETING
JULY 23, 2020
101 W. 8TH STREET
7:00 PM

The agenda is subject to *change, including the addition of items 24 hours in advance or the deletion of items at any time.*
The order and times of agenda items listed are approximate and intended as a guideline for the City Council.

TIME	ITEM	**ZOOM INSTRUCTIONS**	ACTION

1. You are invited to a Zoom webinar.
When: Jul 23, 2020 07:00 PM Mountain Time (US and Canada)
Topic: 2020/07/23 Special Council Meeting

Please click the link below to join the webinar:
https://us02web.zoom.us/j/86796908286

Or iPhone one-tap :
US: +12532158782,,86796908286# or +13462487799,,86796908286#
Or Telephone:
Dial(for higher quality, dial a number based on your current location):
US: +1 253 215 8782 or +1 346 248 7799 or +1 669 900 6833 or +1 301 715 8592 or +1 312 626 6799 or +1 929 205 6099
Webinar ID: 867 9690 8286
International numbers available: https://us02web.zoom.us/u/kcs8BKJH8p

TIME	ITEM	**SPECIAL CITY COUNCIL MEETING**	ACTION
7:00PM	2.	Roll Call	
	3.	Pledge of Allegiance	
		ACTIONS AND/OR PRESENTATIONS	
7:05PM	4.	*CONTINUED FROM JULY 16 REGULAR CITY COUNCIL MEETING* Planning Item 04-20 Consideration of a Major Site/Architectural Plan Review, Rezoning from RH Residential High-Density to RT Residential Transitional for the construction of 100 Multifamily multi-family apartment and duplex units on approximately 5.74 acres (PIN 2185-153-04-001, 2185-153-02-008, and 2185-211-00-002)	Discussion and/or Action
	5.	*CONTINUED FROM JULY 16 REGULAR CITY COUNCIL MEETING* Ordinance No. 20, Series of 2020; An Ordinance of the City Council of the City of Glenwood Springs, Colorado, Rezoning Property Owned by Bell Rippy Glenwood, LLC Known as 2710 Blake Avenue, Glenwood Springs Colorado, from Residential High-Density(RH) to Residential Transitional (RT) Zoning (FIRST READING)	Discussion and/or Action
8:00PM	6.	Adjournment	

City Council
STAFF REPORT
City of Glenwood Springs
July 23, 2020

Agenda Item: *CONTINUED FROM JULY 16 REGULAR CITY COUNCIL MEETING*
Planning Item 04-20 Consideration of a Major Site/Architectural Plan Review, Rezoning from RH Residential High-Density to RT Residential Transitional for the construction of 100 Multifamily multi-family apartment and duplex units on approximately 5.74 acres (PIN 2185-153-04-001, 2185-153-02-008, and 2185-211-00-002)

Action Requested: **Action 1 –Ordinance No. 20, Series of 2020 Rezoning** – of 2710 Blake Avenue (PIN: 2185-211-00-002) from RH Residential High-Density to RT Residential Transitional.

Action 2 – Major Site/Architectural Plan Review – to allow for the construction of 100-unit multi-family apartment and duplex units.

Department: Economic and Community Development

Presented By: Trent Hyatt, Senior Planner

Background Info: The subject proposal was first considered by the Planning and Zoning Commission (Commission) at their 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 considered two variance requests, voting to approve one related to the location of interior parking lots adjacent to public rights-of-way while denying another related to the requirement for a minimum of two housing types for developments of this size. A recommendation for approval of the requested rezoning was also provided at the May 26 meeting. However, prior to acting on the Major Site/Architectural Plan Review application (City Council Action Item 2), 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 due to financing constraints. Therefore, the access and circulation neighborhood meeting was quickly scheduled and noticed for June 8. 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. Revisions associated with the site layout changes are depicted in the attachment tilted "June 17 2020 Revised/Option C Site Plans Elevations Landscaping Plans".

Option C also revises the layout and sizes of site buildings. Former building F, as depicted in the "April 28 2020 Original Triumph-Bell Rippy Civil Plan Set", 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 each Commission meeting related to the proposed are attached for your review. Additionally, a copy of the presentation and a recording of the June 8 neighborhood access and circulation 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 provided plans, reports, minutes, etc. are also included. As a response to requests for a site visit to the subject property, staff, has provided a drone video of the property to help City Council visualize the proposed layout here: https://www.youtube.com/watch?v=Kjky7BhJBbg&feature=youtu.be.

Issues:

Planning and Zoning Commission Discussion

As detailed above, most of the Commission's discussion surrounded the access/circulation/traffic (including future improvements to Blake Avenue and the opening of the Blake gate) associated with the development. However, the Commission spent their meetings discussing the location and design of site buildings and parking, landscaping and screening/retaining walls, open space and amenities, etc.

Planning and Zoning Commission Recommendations

On May 26, 2020, the Commission voted unanimously 7-0 to recommend **approval** of the Rezoning application to City Council. On June 23, 2020, the Commission voted unanimously 5-0 to recommend **approval** of the Major Site/Architectural Plan Review application to City Council.

Staff Recommendation:

Action Alternatives

Section 070.060.030(g)(1)d of the Code outlines the review and decision procedures for applications being considered by City Council stating, “The 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 – Rezoning – of 2710 Blake Avenue (PIN: 2185-211-00-002) from RH Residential High-Density to RT Residential Transitional.

Staff Recommendation

Staff recommends **approval** of the Rezoning application with the findings below.

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 2 – Major Site/Architectural Plan Review – to allow for the construction of 100-unit multi-family apartment and duplex units.

Action 2 – Major Site/Architectural Plan Review – to allow for the construction of 100-unit multi-family apartment and duplex units.

Staff Recommendation

Staff recommends **approval** with conditions of the Major Site/Architectural Plan Review application with the findings and conditions below.

Recommended Findings

1. The applicant 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.

Recommend Conditions

1. Prior to occupancy of any related residential units, the applicant adhere to the following:
a. 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.
b. The City shall open the Blake Avenue gate located south of the project site.
c. The applicant shall be responsible for improvements necessary to temporarily restrict access to one-way southbound on Blake Avenue, between 24th Street and 26th Street, until such time the City can obtain additional public input related to circulation and determine an alternative which is acceptable to the City Engineer and Public Works Director.
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 duplicate or irrelevant conditions as recommended by staff for the original site plan;
7. 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;
8. 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;

9. 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;

10. Prior to approval of a Construction Plans application, the applicant shall amend and obtain approval of CDOT access permits, as required.

July 15, 2020

To: Glenwood Springs City Council

This letter is regarding the planned residential development at the corner of Blake and Palmer Avenues. I have lived in the Oakhurst Townhomes for 13 years. I am in favor of this development for the following reasons:

- We need more affordable housing in our city. Period.
- The area is currently a blight on our community frequented by homeless people and young people up to no good.
- Palmer Avenue between 26th Street and the intersection with Blake is a dumping ground. Please see photos attached taken on the afternoon of 7/15/20.
- Development in that area will deter the dumping and the homeless camps.
- Development will force much needed street improvements. Please see photos of Blake Avenue and 26th Street attached. The conditions of these roads in this area is abominable and completely inexcusable for a city government to continually ignore this problem.
- Midland avenue is currently being improved, AGAIN. When are we going to have a city council in place who will have the guts to do the right thing and fix Blake? Please see photos for those of you who do not have the pleasure of traversing this "street" every day.

When I first bought my townhome, I thought it would be great to walk right out my back yard and hike with my dog up behind the Oakhurst townhomes. Not so much. I was put off by all the homeless camps and the plethora of trash left by these folks. I was intimidated and disgusted by the amount of debris. This includes the area where the development would be located.

Personally, I have not heard any logical reasons for denying approval of this development. Moreover, I find the arguments given to be questionable and sometimes morally repugnant. For example, I was approached by a neighbor to sign the petition against the development. Since she is a member of the HOA Board, I question if that is kosher to pressure other owners to sign a petition. She first asked my son who was in the front yard to sign it. He declined since he is only living here temporarily. She told him that did not matter and one of the neighbors had even signed her cats name to the petition. Since my son is registered to vote in Montana, I do not believe he should be counted. But maybe you include the cat…. When I went out to meet her, I told her I was in favor of that development. She tried to convince me to sign with the fact that the housing was for "low income" people and "those" people would be walking behind my house. If this is indicative of the type of people against this development, I would never wish to side with them on any issue. These same people were against the bus station at 27th and Grand. They felt it would bring in "undesirables" to the neighborhood. So not having a car makes you undesirable, I guess. I believe it is now an incredible asset to the community.

So, let us call a spade a spade here. When a white person in this area refers to "low income" and "those" people, they are talking about Hispanics. I am white and when I moved to the area 23 years ago, I was taken aback by the overt racism from most people here. I came from Los Angeles which is very well integrated. They obviously have their issues, but most people tend to know their audience. Here, since I am white, everyone just assumes I am a racist too and rarely holds back their derogatory comments about the Hispanic population. I am saddened by that.

Respectfully,

Doreen Herriott

Palmer Ave, east of 26th Street

















There is a nice crop of thistles on the proposed property too!





26th and Palmer Avenue



26th Street



26th Street



Blake and 26th



Blake Ave



From:	Catherine Fletcher
To:	Trent Hyatt
Subject:	FW: Blake gate
Date:	Friday, July 17, 2020 1:55:34 PM

From: Shelley Kaup <shelley.kaup@cogs.us>
Sent: Friday, July 17, 2020 1:49 PM
To: Catherine Fletcher <catherine.fletcher@cogs.us>
Subject: Fwd: Blake gate

Please submit her comments to record on Triumph Bell-Rippy
Thanks! Have a nice weekend
Shelley

Sent from my iPhone

Begin forwarded message:

> **From:** Joan Troth <jktroth@comcast.net>
> **Date:** July 17, 2020 at 10:33:21 AM MDT
> **To:** Shelley Kaup <shelley.kaup@cogs.us>
> **Subject: Blake gate**
>
> Hi Shelley
> Listening to the council meeting last night, I didn't hear whether or not the decision has been made about opening or moving the gate. I believe there is actually no possible way to reconcile
> the traffic impact of the huge development on the existing neighborhoods and Grand Avenue. Cannot Council please consider demanding a much smaller development there?
> Joan

From: Cheryl Cain
To: Trent Hyatt
Subject: Bell Rippy
Date: Sunday, July 19, 2020 9:58:33 AM

This project is not needed

Infrastructure is not addressed

Water needs are not addressed

Traffic impact is not addressed

Density if not addressed

Not needed Not wanted

Cheryl Cain
1801 Grand
Glenwood Springs co 81601

From:	Catherine Fletcher
To:	Trent Hyatt
Subject:	FW: Triumph Project and "the Blake Gate"
Date:	Monday, July 20, 2020 9:09:29 AM

Hi Trent:
Here you go.
Catherine

From: Debra Figueroa <debra.figueroa@cogs.us>
Sent: Monday, July 20, 2020 8:55 AM
To: Catherine Fletcher <catherine.fletcher@cogs.us>
Subject: Fwd: Triumph Project and 'the Blake Gate'

Catherine,

For the public record.

Thank you

Sent from my iPhone

Begin forwarded message:

> **From:** Sumner <sumnerschachter@gmail.com>
> **Date:** July 20, 2020 at 8:13:44 AM MDT
> **To:** Shelley Kaup <shelley.kaup@cogs.us>, Steve Davis <steve.davis@cogs.us>, Jonathan Godes <jonathan.godes@cogs.us>, Rick Voorhees <rick.voorhees@gmail.com>, Charlie Willman <charlie.willman@cogs.us>, Tony Hershey <tony.hershey@cogs.us>, Paula Stepp <paula.stepp@cogs.us>
> **Cc:** Debra Figueroa <debra.figueroa@cogs.us>
> **Subject: Fwd: Triumph Project and 'the Blake Gate'**
>
> Dear Council,
>
> I urge you and encourage you to keep through access closed between Walmart and 26th street. Move the existing gate to the south edge of 26th. It is a win/win for the town, the neighborhoods, the new development and CDOT and RFTA.
>
> The auto traffic from the new revised and improved Triumph project can access Hwy 82/Grand Ave. from either 27th or Blake/McDonalds. That is the preferred access by CDOT and using controlled access points. That allows Oakhurst residents to still access parking on Blake below their units

or enter and egress parking areas via 26th entering from the north. It protects 26th, Palmer and Blake (24th to 26th) from cut through and increased traffic. It helps to maintain the residential and quieter nature of these neighborhoods as well as maintain safety for children, residents, pedestrians and bicycles. It helps the City of Glenwood by reducing the pressure to bring Blake (24th to 26th) to city street standards and mitigating the need/promise of additional traffic calming in the area. Emergency access is still maintained by emergency control of the gate on Blake and the gate on Palmer. There is little or no downside--Blake/26th/25thEasy Street residents will have vehicle access to 82/Grand Ave. via 24th and 23rd rather than 27th. However, their neighborhoods and safety will be protected from additional cut through and new development auto traffic. Bicycle access and safety along Blake will be preserved and enhanced.

We have a highway as our 'main street'. It is designed to move a lot of traffic. That traffic has dramatically altered the character of our town. While we may not be able to control that traffic and must partner with CDOT in that case, we can control the flow and character of traffic in the rest of our town. The prior decision to open the Blake Gate was done with very little public input or transparency and seemingly as a surprising addition to the prior Bell Rippy proposal. The development proposal as well as the town has changed. We should also adapt to change. I believe we should do all we can to preserve and enhance the quality of our neighborhoods, to encourage pedestrian and bicycle traffic wherever possible and to continue to develop local public transit.

'Protect and Preserve our Quality of Life'
'Oppose any threats to livability and the environment of our community.'
MultiModal Options for a Vibrant Economy (MOVE)
Maintaining Glenwood Springs' small-town character
Developing and maintaining a robust, integrated,user friendly transportation system for all modes of travel...
Reducing the impacts of traffic on the resident individuals, businesses and cultural identity of Glenwood Springs
Fostering and encouraging the use of emerging alternative mobility options..

All of these (above) are from the city strategic plan and comp. plan and MOVE study and proposed Transportation Commission Vision statement and the Imagine Glenwood mission statement. They would seem to lend much more support to keeping a 'gate' rather than opening the residential areas to more traffic.

I had opposed the prior Bell Rippy proposal and have supported the revised Triumph proposal. I do, however, believe that a relocation of the

Blake Gate rather than an elimination of it, is a much better solution for all concerned.

Thank you.

Sumner Schachter
1204 Blake Ave.

--
Sumner
970-379-2002

From:	Catherine Fletcher
To:	Trent Hyatt
Subject:	FW: Sunny Acres Speed Limit
Date:	Monday, July 20, 2020 4:08:00 PM

Bell Rippy

From: Debra Figueroa <debra.figueroa@cogs.us>
Sent: Monday, July 20, 2020 4:00 PM
To: Catherine Fletcher <catherine.fletcher@cogs.us>; Jennifer Ooton <jenn.ooton@cogs.us>
Subject: Fwd: Sunny Acres Speed Limit

I think this counts as public comment?

Begin forwarded message:

> **From:** Suzanne Stewart <stewart.suzanne@comcast.net>
> **Date:** July 20, 2020 at 3:57:17 PM MDT
> **To:** Rick Voorhees <rick.voorhees@cogs.us>, Shelley Kaup <shelley.kaup@cogs.us>, Charlie Willman <charlie.willman@cogs.us>, Steve Davis <steve.davis@cogs.us>, Jonathan Godes <jonathan.godes@cogs.us>, Tony Hershey <tony.hershey@cogs.us>, Paula Stepp <paula.stepp@cogs.us>
> **Cc:** Terri Partch <terri.partch@cogs.us>, Matthew Langhorst <matthew.langhorst@cogs.us>, Debra Figueroa <debra.figueroa@cogs.us>
> **Subject: Fwd: Sunny Acres Speed Limit**
>
> Council members, while you are considering the Walmart / Blake gate issue, I'd like to bring this situation to your attention so you can relate to the impact traffic has on a neighborhood. Although different, there are similarities, most significantly - increasing car traffic in residential neighborhoods results in negatively effecting those that live there, walk their dogs and children and generally appreciate a sense of neighborhood peace and quiet.
>
> The Sunny Acre residents are fortunate to not have to deal with an open gate long-term, however, during this short time I will attest to the inconsiderate, speeding drivers in our small neighborhood circumstance - i wouldn't want the folks coming home from a hard day of work driving through here.
>
> Luck for us, Matt quickly dealt with Ray Schmahl's email. Thank you, Matt. Take a minute to read the following email chain.
>
> Thx, suz
>
> Suzanne M Stewart
> 970.456.2193 cell



Bell Rippy Apartment Homes

Major Site/Architectural Plan and Rezoning of 2710 Blake

City Council Meeting 7/16/2020

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
- Traffic Engineering: McDowell Engineering - Greg Schroeder
- Civil Design: Boundaries Unlimited - Deric Walter

Request from City Council Tonight

- Approval of Rezoning of 2710 Blake

- Approval of Major Site/Architectural Plan

Recap of the Entitlement Process

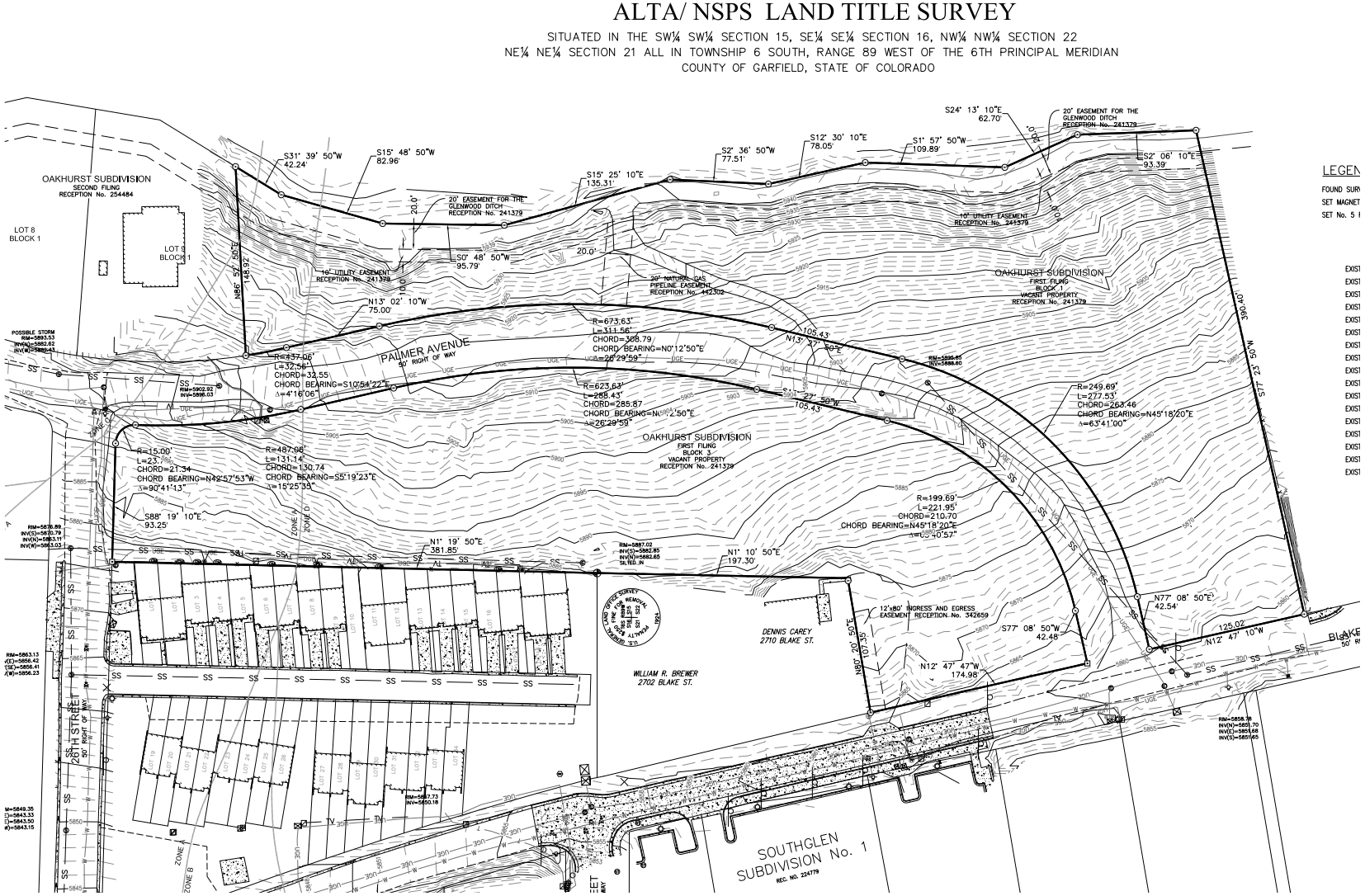
- Community Meeting – 2.4.2020
- P&Z #1 – 4.28.2020
- P&Z #2 – 5.5.2020
  - Approval of Parking Location Variance
  - Recommendation of Approval for Rezoning 2710 Blake Ave
- P&Z #3 – 5.28.2020
- Community Meeting – 6.8.2020
- P&Z #4 – 6.24.2020
  - Recommendation of Approval of Major Site/Architectural Plan

Site & Survey

Bell Rippy Aerial



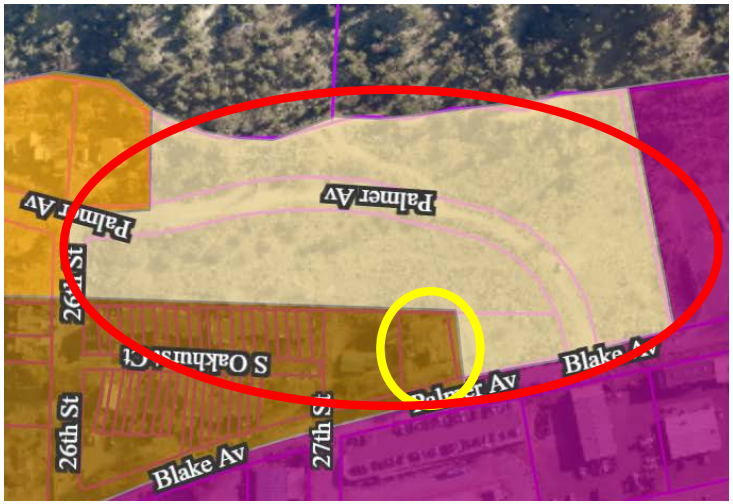
Survey and Flood Zone A Location



Rezoning of 2710 Blake Ave

Rezoning of 2710 Blake

Current Zoning



Comp Plan



- 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.

Rezoning of 2710 Blake – Overview of Criteria

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;

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.

Development Plan Evolution

Current Approved Major Development Permit



- 10 three-story buildings with 79 homes and 156 bedrooms. Mostly 2BR .
- Construction of the Palmer Avenue ROW to the COGS street design standards
- CDOT Access Permit received – Includes Blake Gate open with One-Way Blake
- Entitlements expire February 2021

Original Triumph Proposed Site Plan



- Added 2710 Blake to the Development
- 6 three-story buildings with 100 homes and 163 bedrooms. Mix of 1BR and 2BR.
- Construction of the Palmer Avenue ROW to the COGS street design standards with large retaining walls
- Building F Oriented Closer to Oakhurst TH
- Parking lot at the north end of Palmer with taller retaining walls

Overview of P&Z and Community Feedback on this Plan

- Minimize impacts on Oakhurst Townhomes
- More outdoor community open space
- Pedestrian and bike friendly design
- Onsite management office
- Parking and direct impacts on the neighborhood
- Minimize traffic impacts on the neighborhood
- Maintain neighborhood debris flow protections from the currently approved plan

Summary of Site Plan Modifications

Debris Flow Fence for neighborhood benefit still included in the plan



Eliminate Building F

Enlarge Building A&E.

Five total apartment buildings

Eliminate north parking lot and retaining walls to create neighborhood open space

Shift parking south and continue the fencing and landscape buffer for Oakhurst TH

Added duplex unit at north end of the site to relate to the Oakhurst TH and SF neighborhood

10’ Palmer bike path with with roll curbs for emergency access and significantly reduced retaining walls

Office at development entrance. Community Room at Central Location

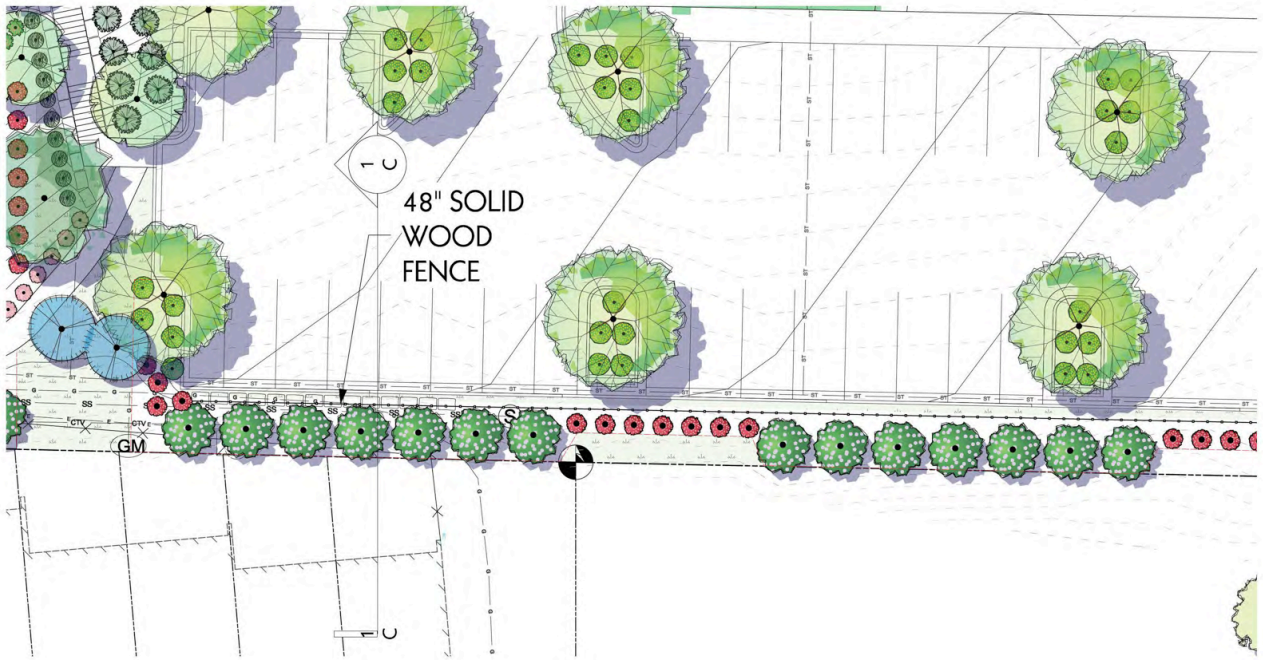
Plan Overview

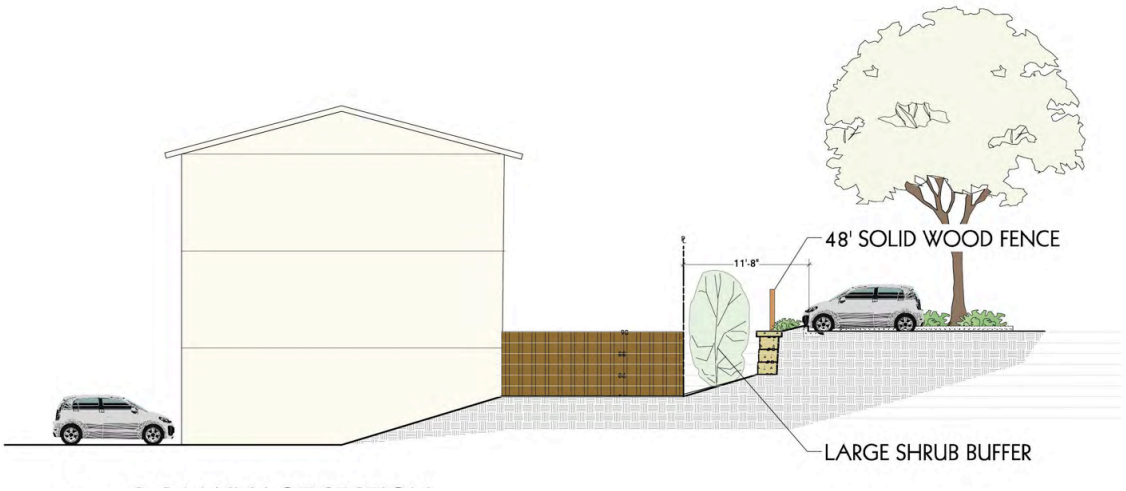
Proposed Development and Landscape Plan



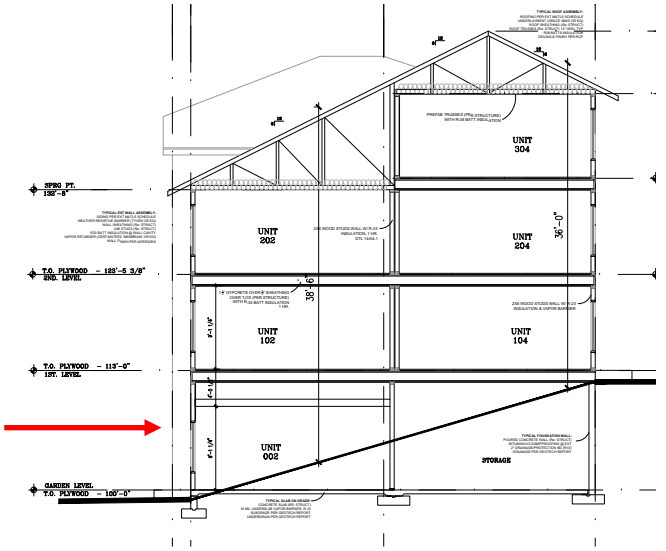
- 5 three-story apartment buildings, plus duplex building.
- 100 homes and 163 bedrooms. Mix of 1BR and 2BR.
- Palmer Ave. ROW primarily bike/pedestrian path with utilities. Only a city street to access our parking lots
- Onsite management office. Community room/café with private outdoor space
- Neighborhood open space at the north side of the site.

Sections & Landscape Buffers at Main Parking Lot

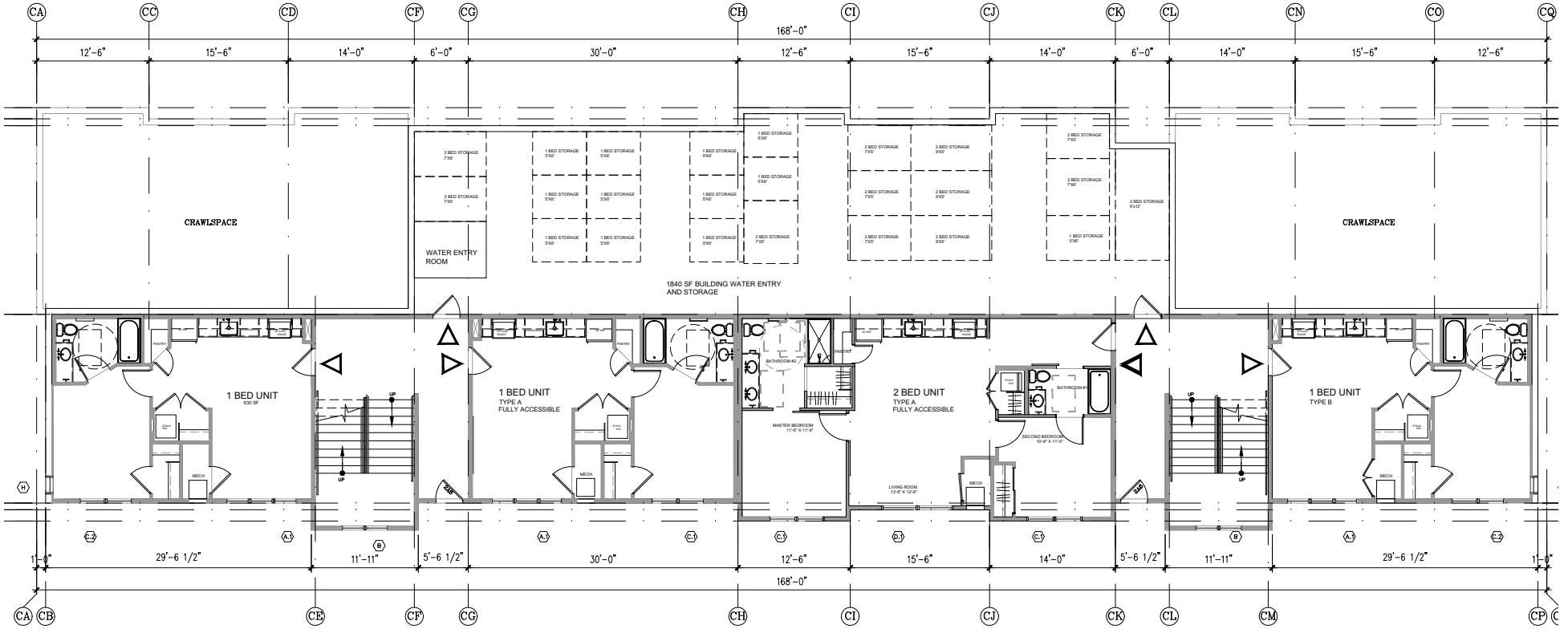




Apartment - Ground Floor Building Plan & Section

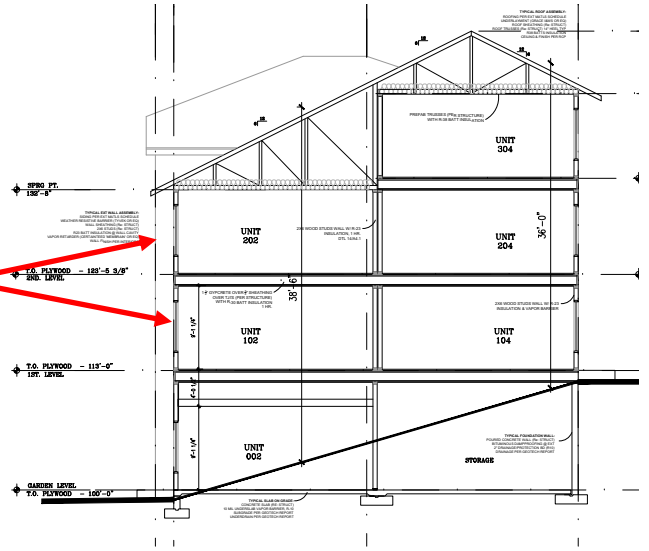


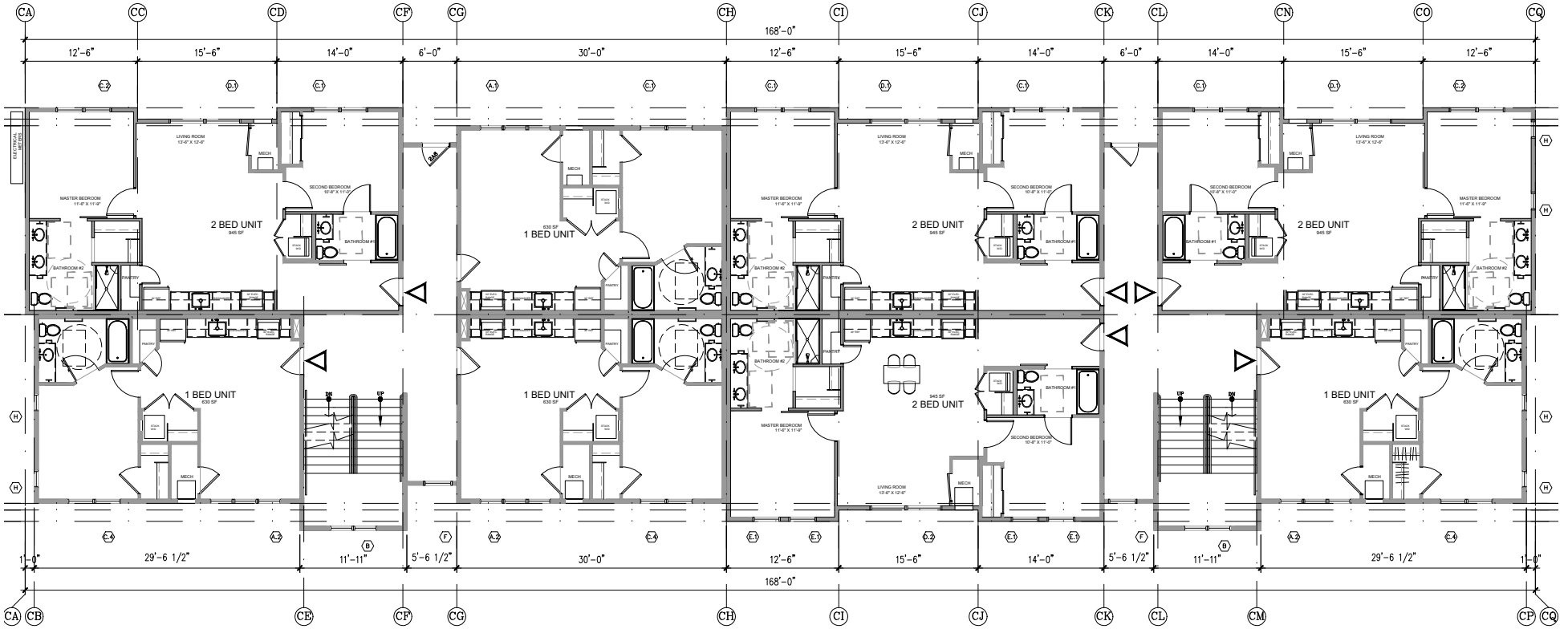
Ground Floor →



Apartment – Typical Floor Building Plan & Section

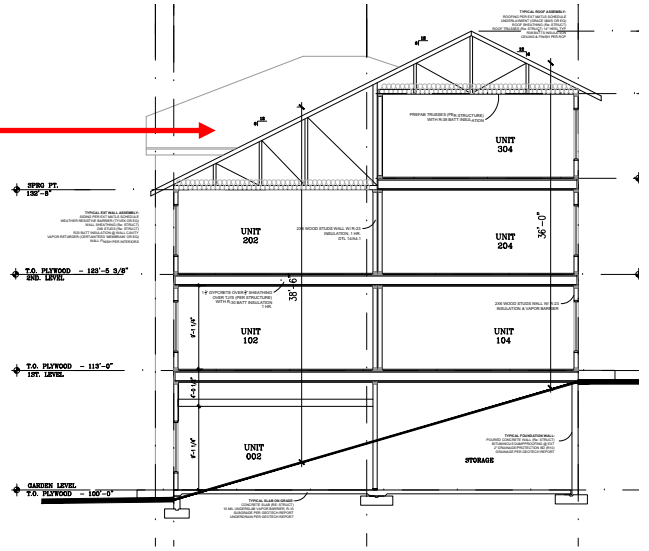
Typical Floor

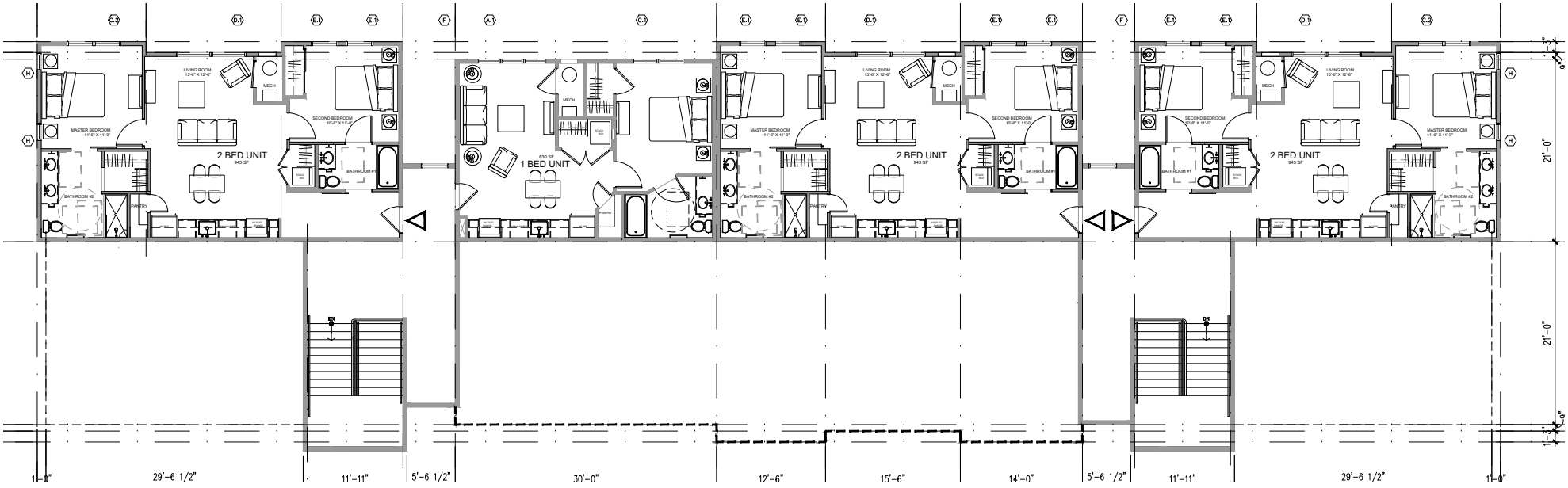




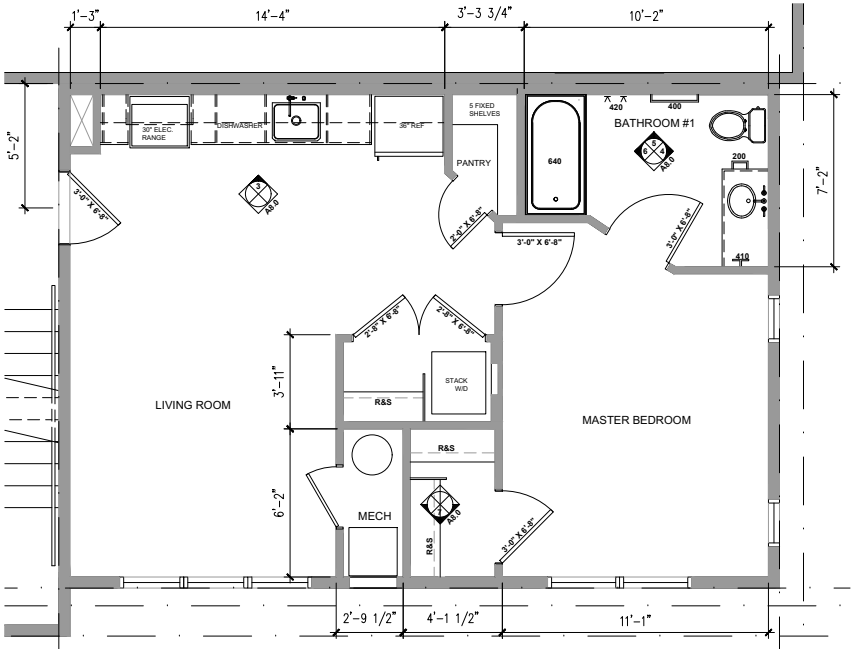
Apartment – Top Floor Building Plan & Section

Top Floor



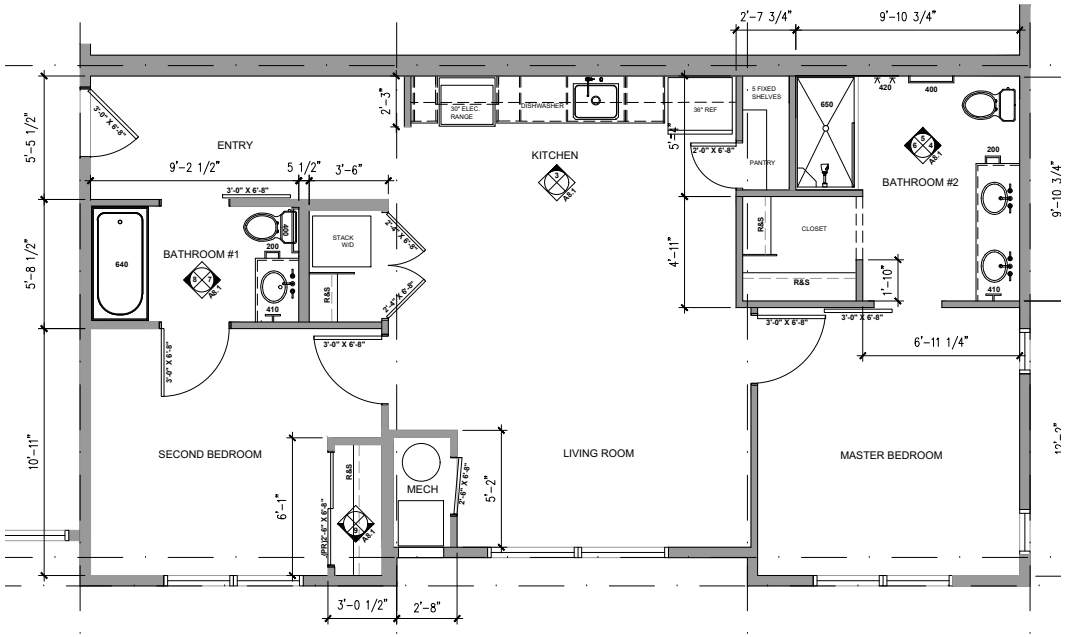


Apartment Unit Plans



1 TYPICAL ONE BEDROOM UNIT 630 SF + 30 SF STORAGE = 660 SF TOTAL

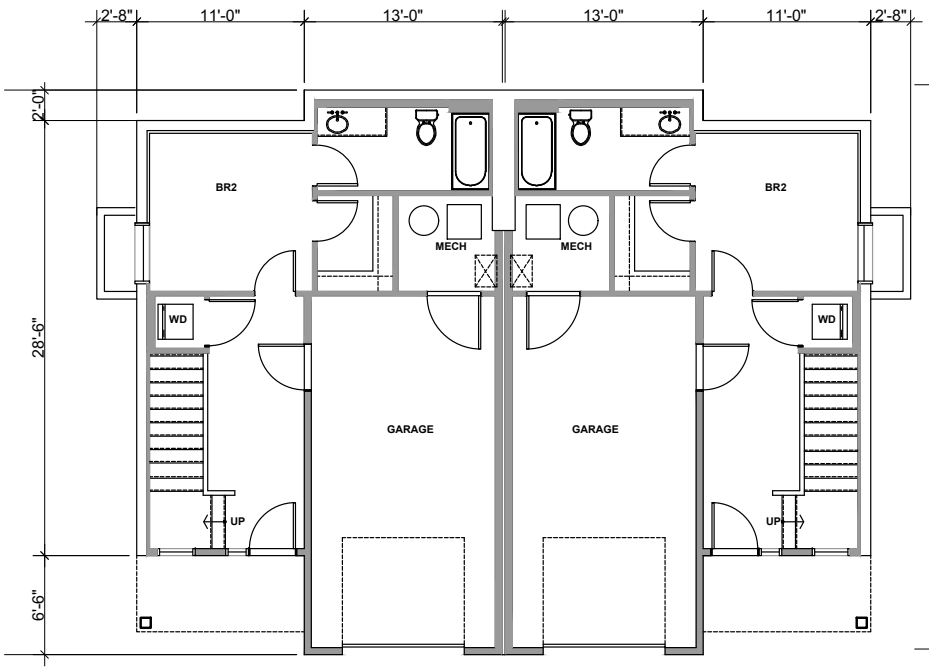
1/4" = 1'-0"



1 TYPICAL TWO BEDROOM UNIT 945 SF + 35 STORAGE = 980 SF TOTAL

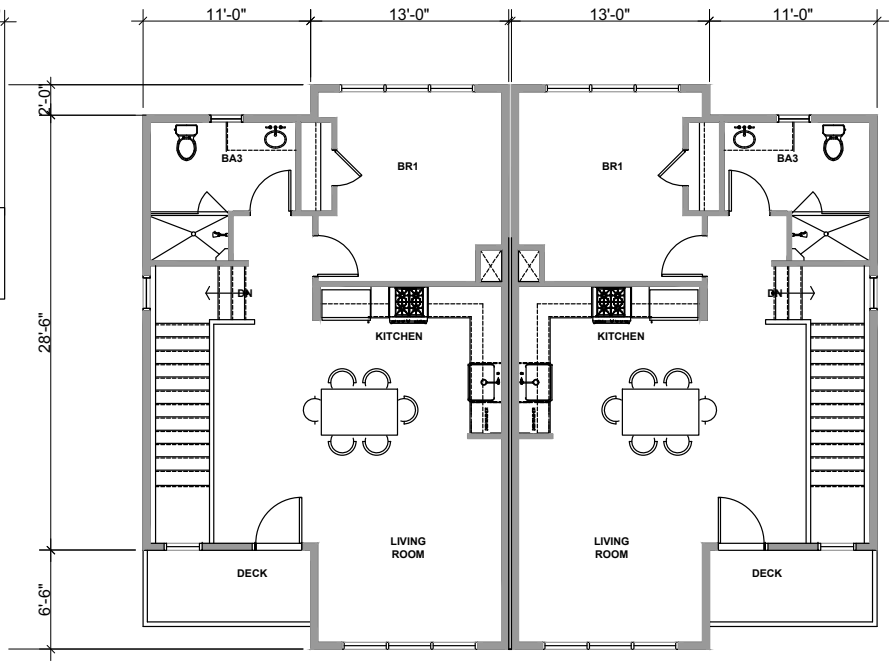
1/4" = 1'-0"

Duplex Plans



1 MAIN LEVEL PLAN

1/8" = 1'-0"

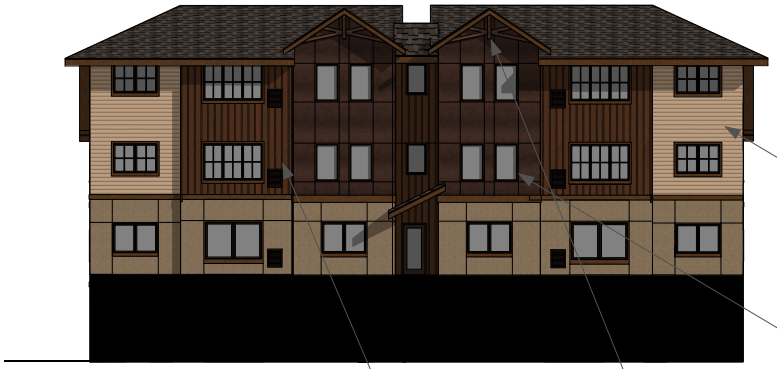


2 SECOND LEVEL PLAN

1/8" = 1'-0"

Material Samples & Colors

Design Scheme 1 - Building A/B/F Materials



EAST ELEVATION - BUILDING A

Scale: 1/8"=1'-0"



NORTH ELEVATION - BUILDING A

Scale: 1/8"=1'-0"



DARK SKY COMPLIANT LIGHTING



TAMKO ASPHALT SHINGLES, RUSTIC SLATE



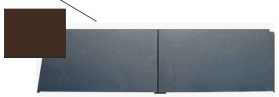
HARDIE T&G HORIZONTAL SIDING, SW - GINGER ROOT



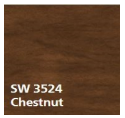
TIMBER TRUSSES, DARK BROWN



VYNIL WINDOWS AND DOORS, BRONZE COLOR



FLAT METAL PANEL, DARK BROWN



TRIMS AND FASCIA



HARDIE BOARD (1X12) AND BATTEN (1X4) SW-FRENCH ROAST



STUCCO WITH EXPANSIONS: LIGHT SAND FINISH, SW - DOUBLE LATTE



WEST ELEVATION - BUILDING A

Scale: 1/8"=1'-0"



SOUTH ELEVATION - BUILDING A

Scale: 1/8"=1'-0"

Design Scheme 1: Materials for A/B/F





ASPHALT SHINGLES





BOARD AND BATTEN COLOR

METAL PANEL COLOR

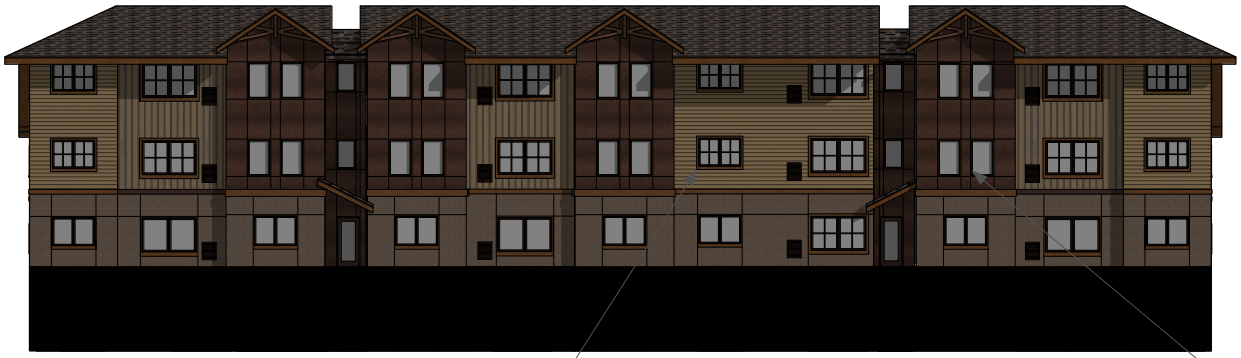




VINYL WINDOWS BRONZE

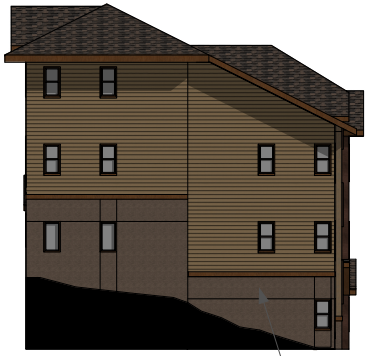


Design Scheme 2 - Building C/D/E Materials



EAST ELEVATION - BUILDING C

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



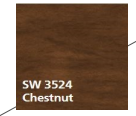
FLAT METAL PANEL, DARK BROWN



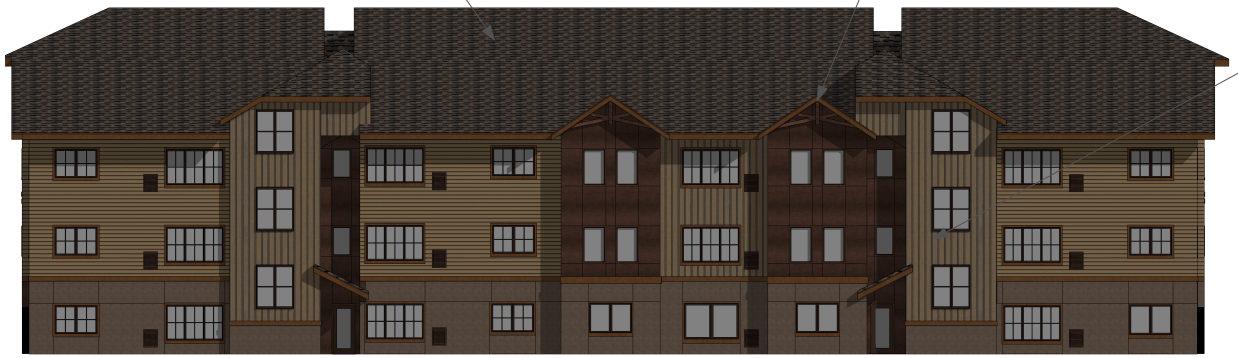
HARDIE BOARD (1X12) AND BATTEN (1X4) SW-RIVERWOOD



SYNTHETIC STUCCO SYSTEM: BUCKHORN



TRIMS AND FASCIA



WEST ELEVATION - BUILDING C

Scale: 1/8"=1'-0"

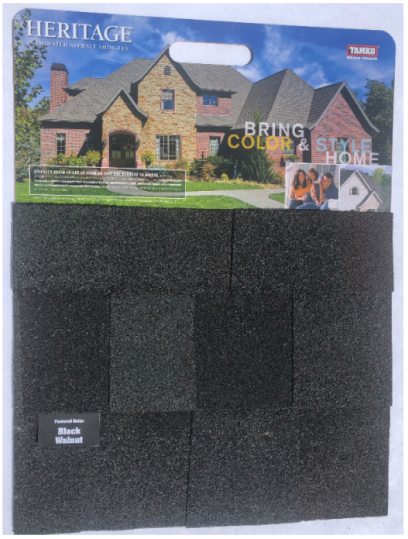


SOUTH ELEVATION - BUILDING C

Scale: 1/8"=1'-0"

Design Scheme 2: Materials for C/D/E





ASPHALT SHINGLES





BOARD AND BATTEN COLOR

METAL PANEL COLOR



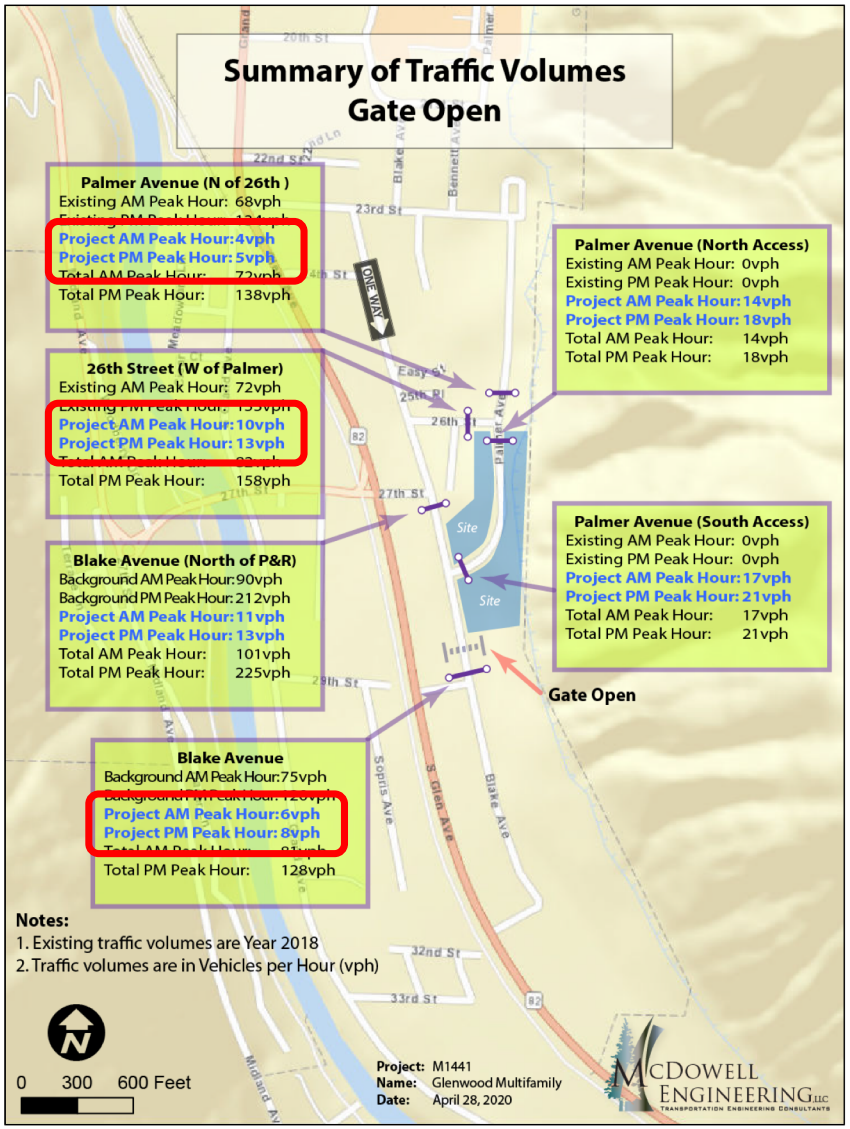
VINYL WINDOWS BRONZE



Traffic & Revised Traffic Management Plan

Traffic Impact Study Conclusions

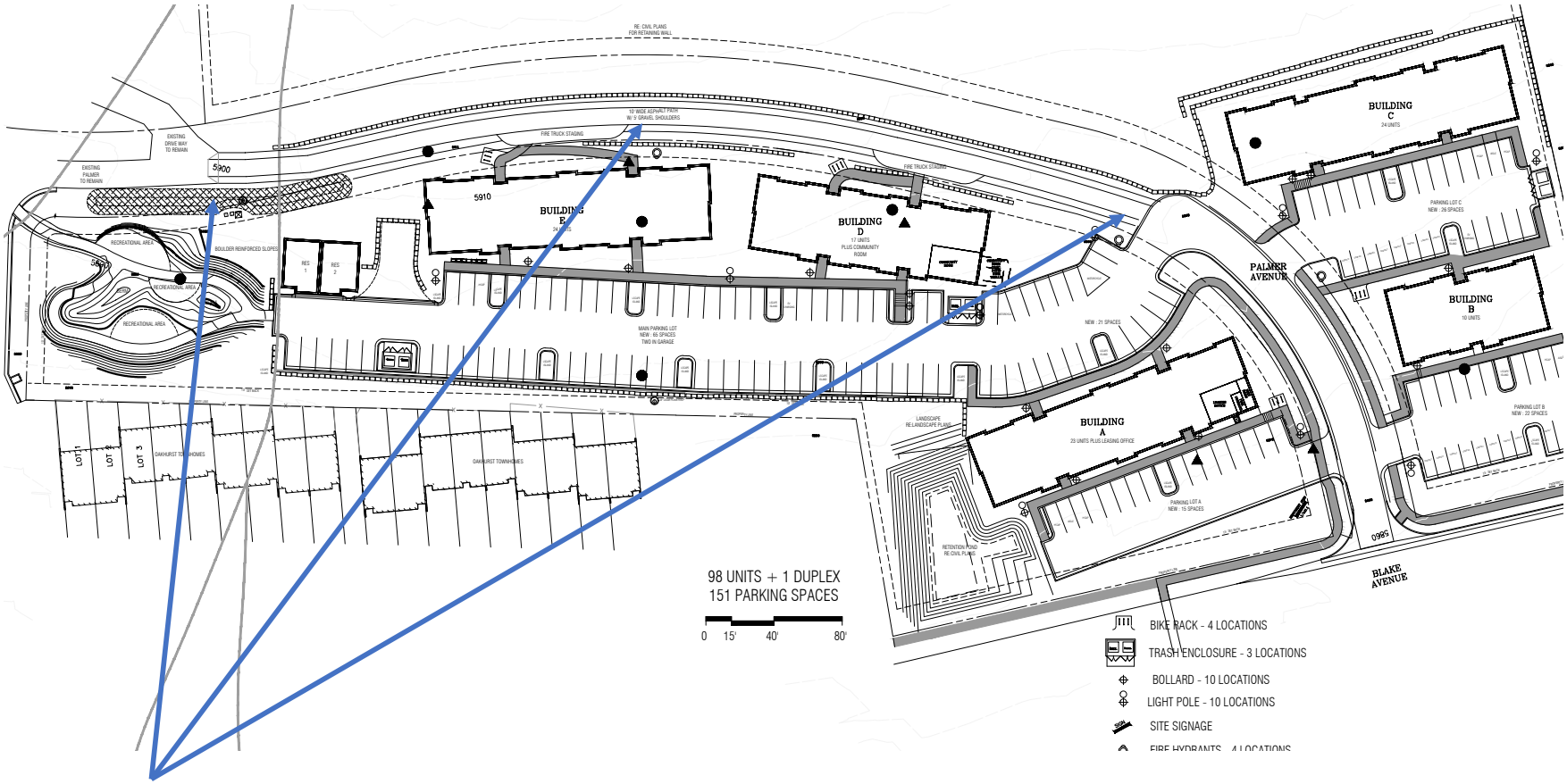
- Proposed building program generates less traffic than current approvals
  - Approved Plan
    - 79 Dwelling Units.
    - 10% Multimodal Trip Reduction (due to proximity to transit)
    - 543vpd Average Weekday Trips, 43vph AM Peak Hour, and 57vph PM Peak Hour
  - New Plan
    - 100 Dwelling Units.
    - 10% Multimodal Trip Reduction (due to proximity to transit)
    - 489vpd Average Weekday Trips, 30vph AM Peak Hour, and 38vph PM Peak Hour
    - Decrease due to update ITE 10th Edition
- CDOT Access Permit received for current approvals
- Traffic impacts <u>from this Project</u> on the surrounding neighborhood are minor - only 4 to 13 vph on existing neighborhood streets.
- Existing traffic volumes and congestion are source of increased traffic on neighborhood streets once the Blake Gate is opened.



Traffic Management Plan Evolution

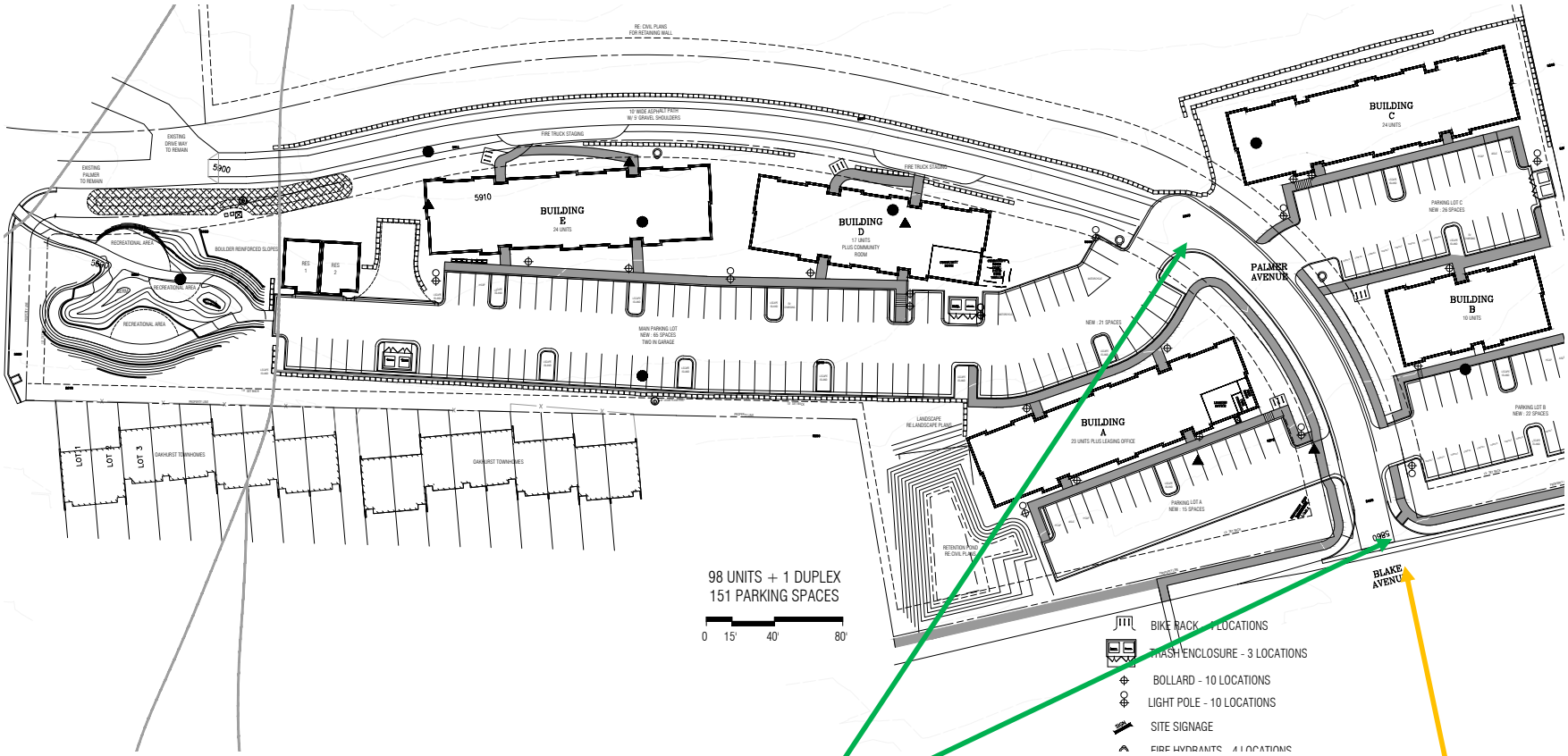
- Applicant brainstormed 7 different traffic concepts for consideration
- Worked with staff to zero-in on realistic options that would have staff support.
- Presented options at community meeting on June 8 for feedback from neighbors. Neighborhood preference the following
  - Current entitlements – One-way Blake south between 23rd and 26th
  - "C" – Redesign of Palmer Avenue through the site to discourage through-traffic
  - "A" – Neighborhood speed calming – e.g. speed bumps along Palmer Ave

Traffic Mitigation Option C:
Redesign of Palmer Avenue Through the Site



Majority of Palmer ROW converted to a bike/pedestrian path with utilities and emergency vehicle access

Traffic Mitigation Option C:
Redesign of Palmer Avenue Through the Site



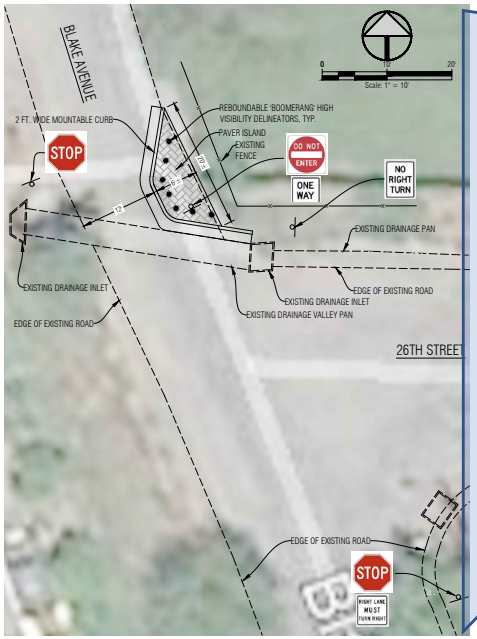
Majority of Palmer ROW converted to a bike/pedestrian path with utilities and emergency vehicle access

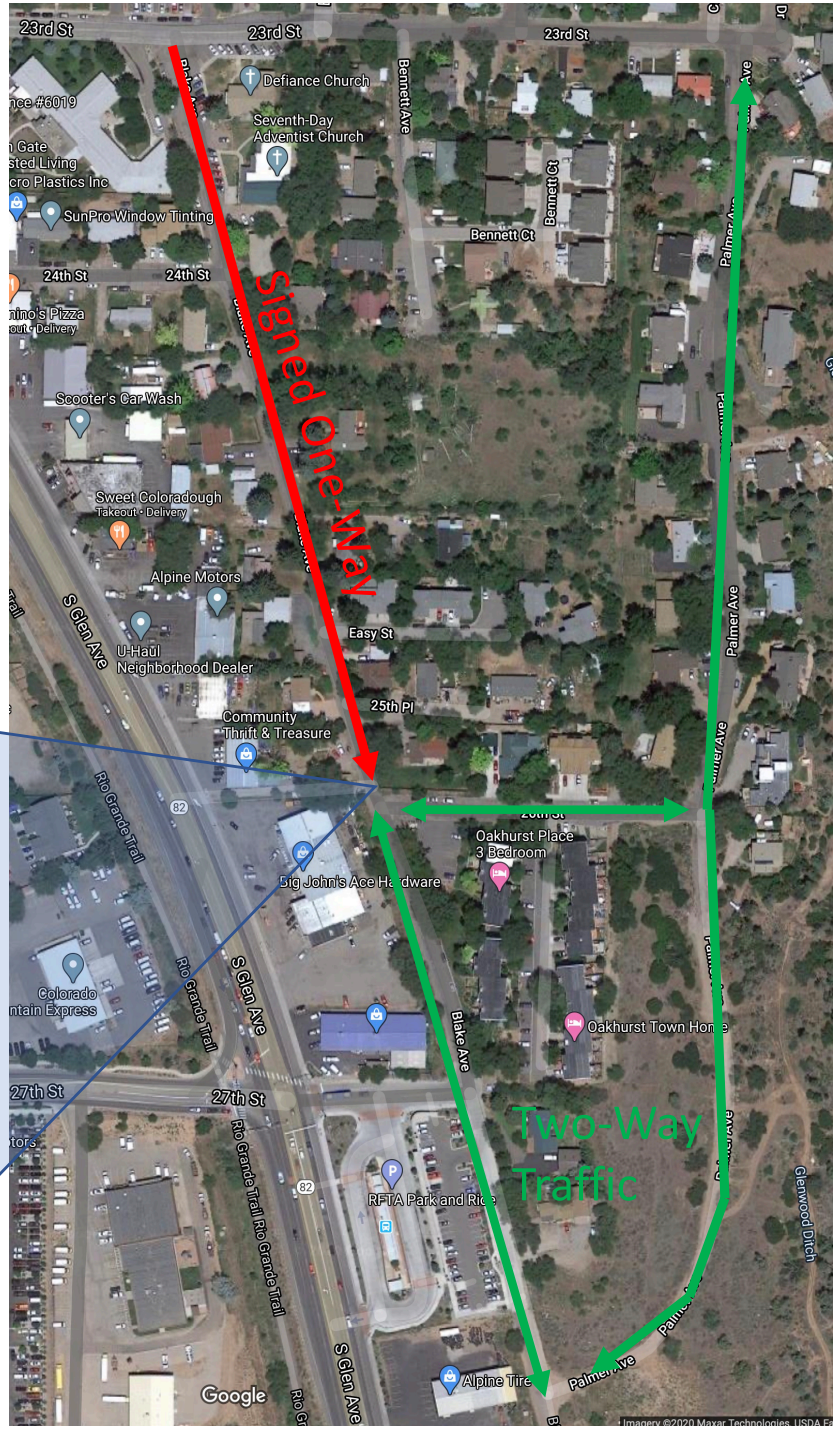
Palmer becomes a typical COGS street with sidewalk/curb/gutter at the south end of the site

All neighborhood traffic uses the Blake & Palmer intersection. No direct access from BR to the north into Oakhurst

Current Approvals Traffic Patter and Mitigation

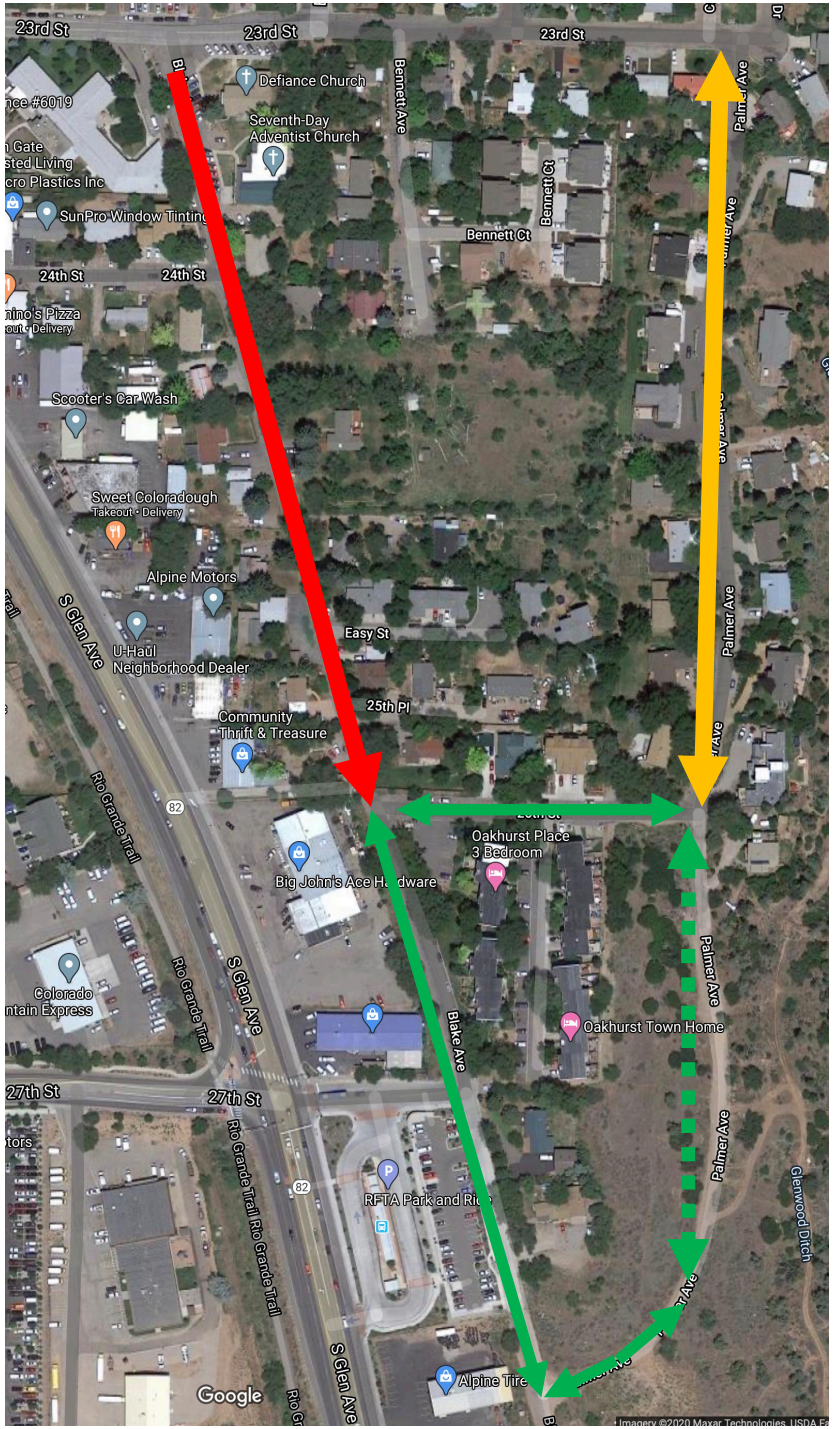
- Blake Gate Open
- Blake Street One-Way from 23rd to 26th.
- Improvements by the applicant.
- CDOT Access Permit received





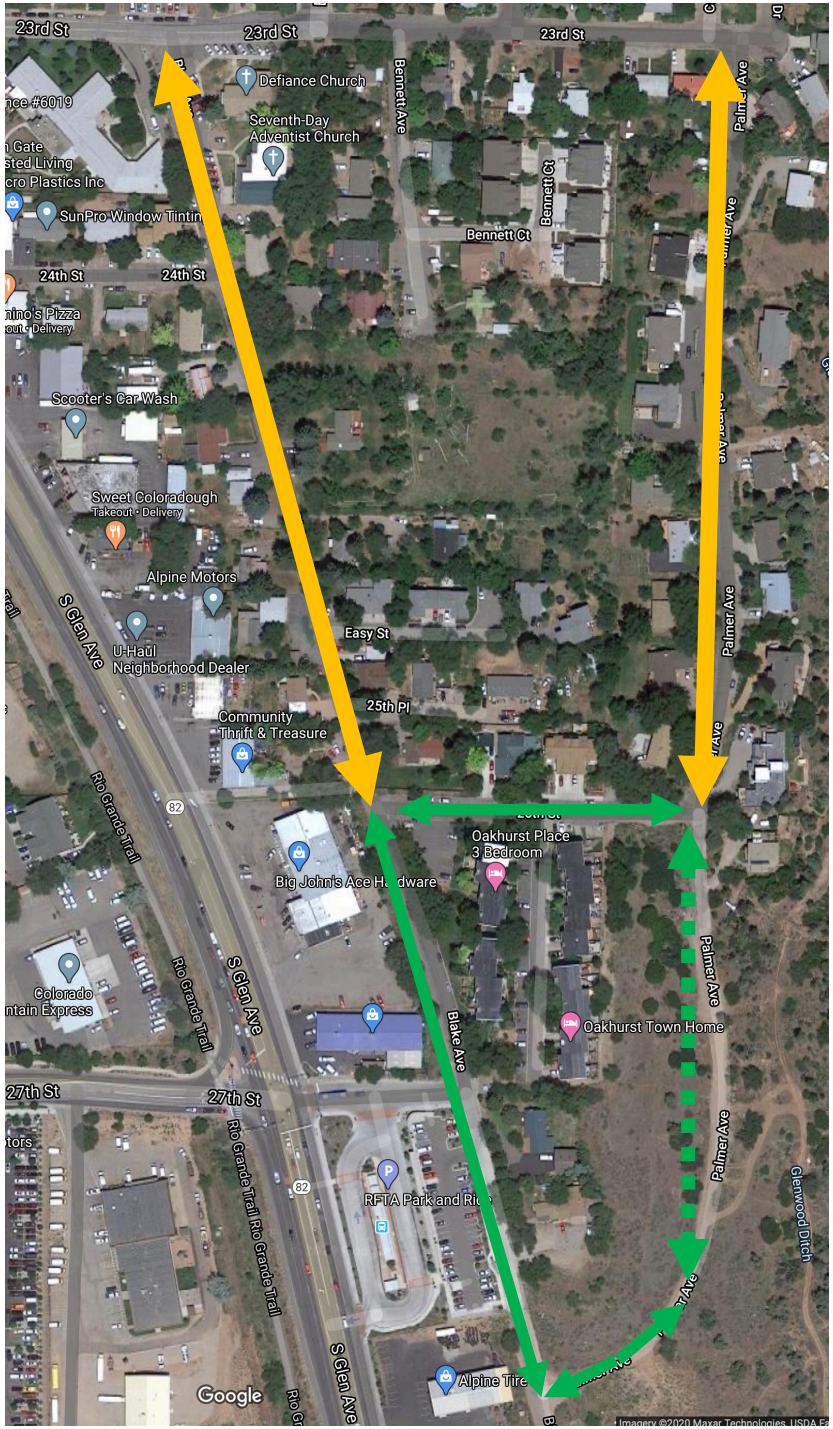
Summary of Applicants Proposed Traffic Mitigation Options

- Outlined in Triumph's June 17, 2020 Memo.
- Existing approvals with one-way Blake Ave. & Blake Gate open
- Add neighborhood speed calming with two sets of Speed Bumps along Palmer
- Redesign of Palmer Avenue Through the Site to prevent through-traffic
- Required improvements for the above paid for by the applicant.

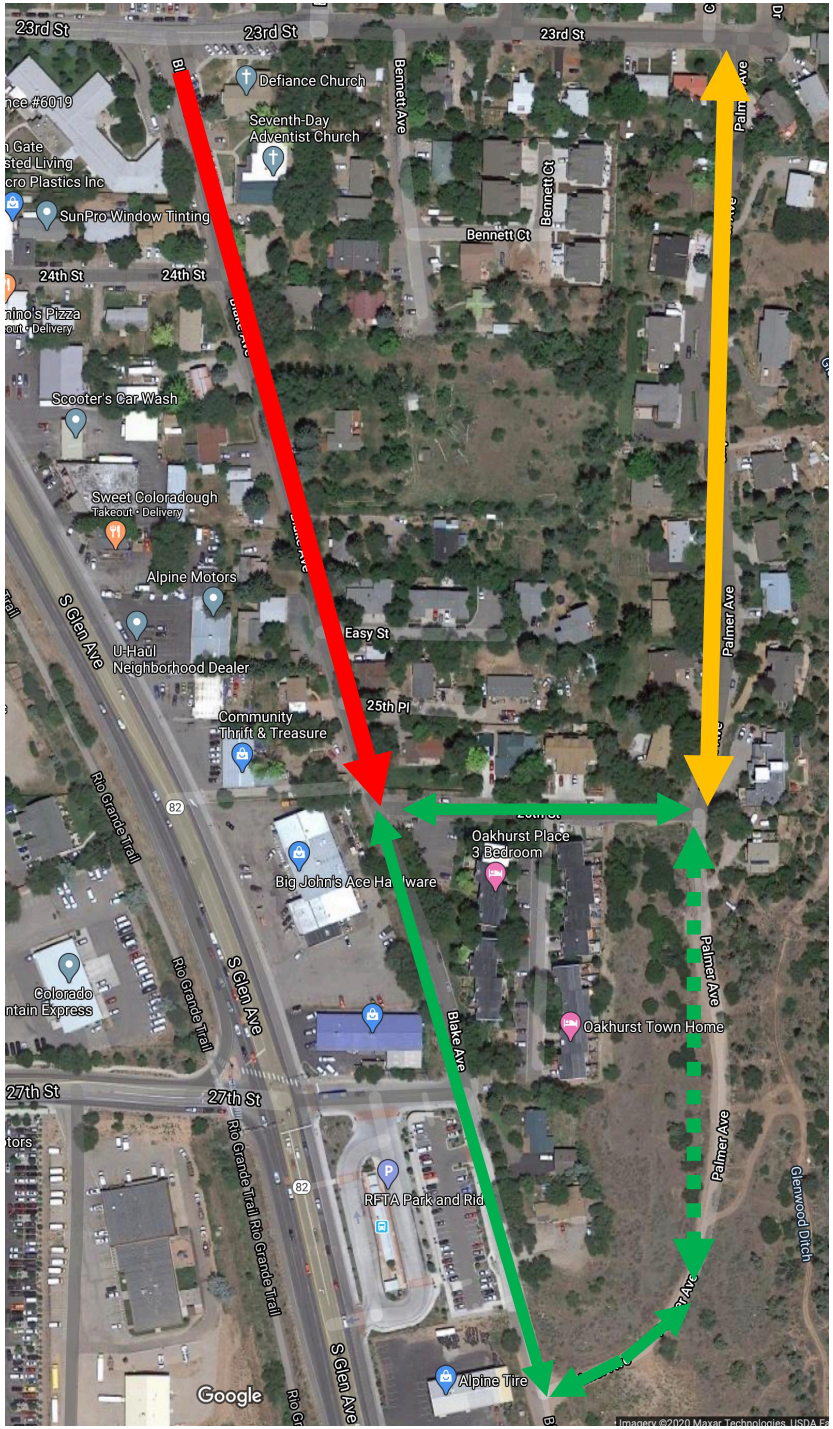


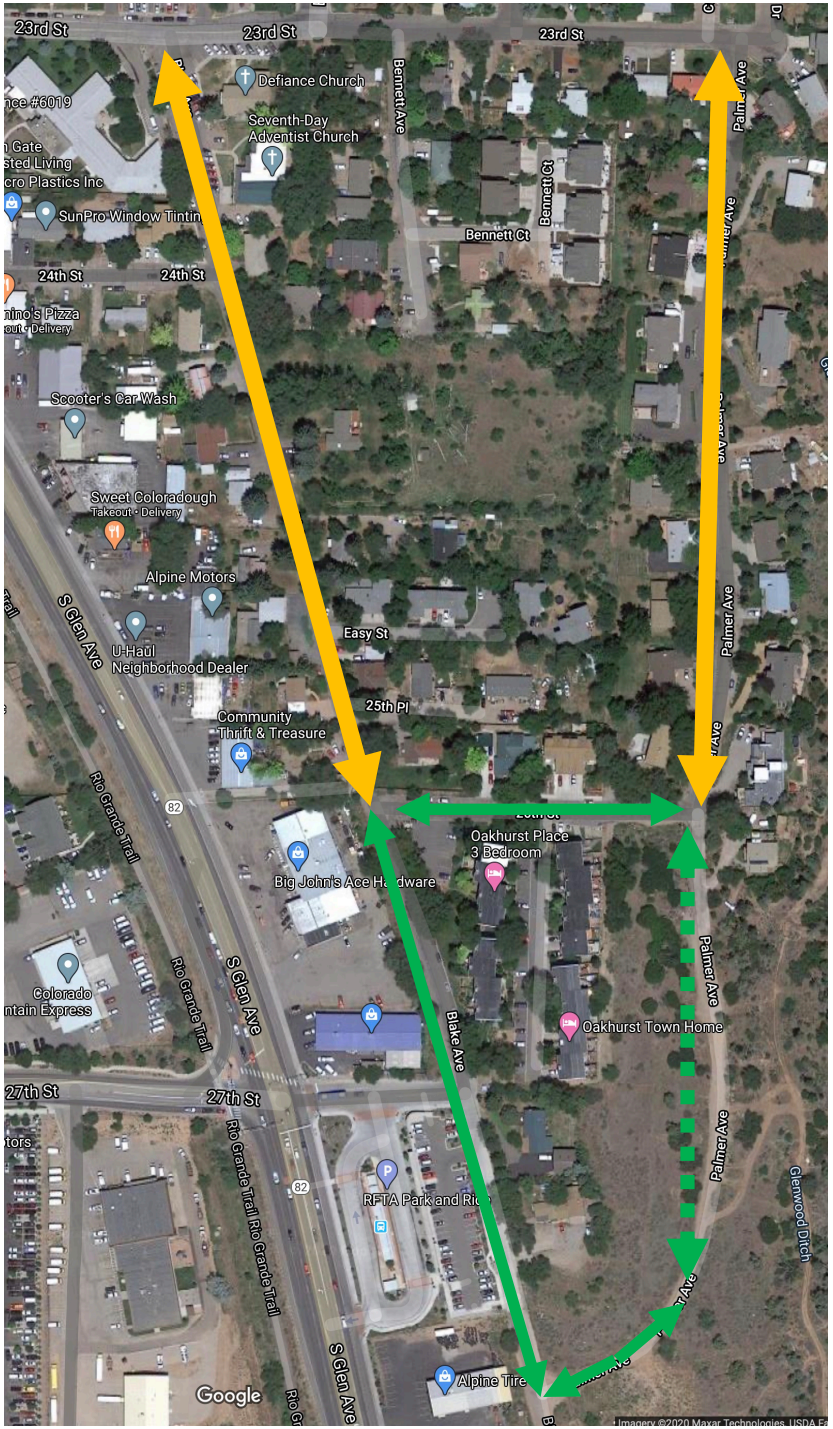
Summary of Staff Proposed Traffic Mitigation Options

- Blake Gate open
- Option A: Add neighborhood speed calming with two sets of Speed Bumps along Palmer Ave. & Blake Ave.
- Option C: Redesign of Palmer Avenue Through the Site to prevent through traffic
- Required improvements for the above paid for by the applicant.



Which Option is Better?





Parking & Property Management

Summary of Parking Counts

- Additional Site Plan Study – Added three parking spaces for total of 151 spaces from the initial proposal
- Parking in excess of Code by 11%
- Counts more than sufficient for managed apt. communities with proximity to transit and essential retail.

Bell Rippy Apartments & Duplex			
Parking Requirement			
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			151
Extra Parking Spaces to Code			15

Property Management

- Onsite property management office to control parking and trespassing
- Property manager living onsite
- Managed community where parking will be controlled via leases:
  - Leases to specify number of cars and residents for each unit
  - Assigned parking spaces and parking passes
  - Management tools such as charge for parking in excess of 1 space per unit
  - Onsite manager to police parking usage by residents and poachers

Recap of Zoning &
P&Z Comments Addressed

P&Z Comments/Questions from Prior Meeting

- ✓ Community input & buy-in on improved Traffic Management Plan
  - ✓ Minimize parking & traffic impacts on the neighborhood from the development
  - ✓ Minimize impacts of through-traffic on the neighborhood
- ✓ Remove Building F and minimize retaining wall impacts on Oakhurst TH
- ✓ More usable community open space
- ✓ Bike and pedestrian friendly design
- ✓ Addition of a housing type to meet zoning requirement
- ✓ Debris flow fence maintained from the currently approved plan
- ✓ Logical rental office and central community room location
- ✓ Onsite Property Management and leasing guidelines to control cars
- ✓ Applicant funds required offsite traffic improvements
- ✓ Parking counts that exceed requirements of municipal code

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 Multifamily	n/a		77	2BR	61	2BR
	2BR Multifamily	n/a		2	1BR	37	1BR
	Two-Family					2	Duplex
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	119,964	sf	49,635	sf	33,445	sf
						28%	of permitted
Landscape Area	Minimum Required	20%					
	Square Feet	49,989	sf	134,209	sf	102,085	sf
						204%	of required
Proposed Parking		136		179	spaces	151	spaces
Zoning Variances				5	variances	1	approved

Triumph-Bell Rippy

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

City Council

July 16, 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 review prior to building permit application

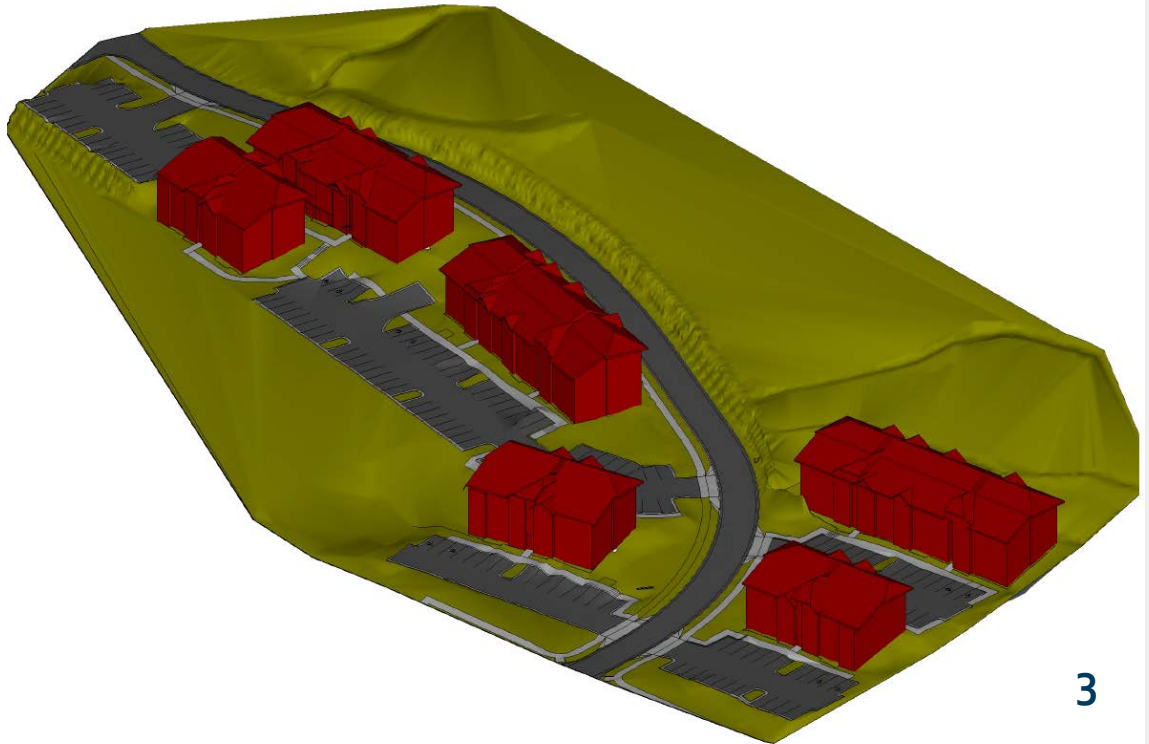
CITY OF GLENWOOD SPRINGS COLORADO

Background/Proposal

- 2018
  - Council approved similar yet separate proposal
    - 79 multi-family units
    - 10 buildings
- Current proposal- Triumph Development West
  - 100 multi-family and duplex units
  - 6 buildings (includes duplex)
  - Rezoning of newly added parcel at 2710 Blake Avenue RH to RT
  - Extension of Palmer Avenue
  - Significant common/open space improvements and landscaping



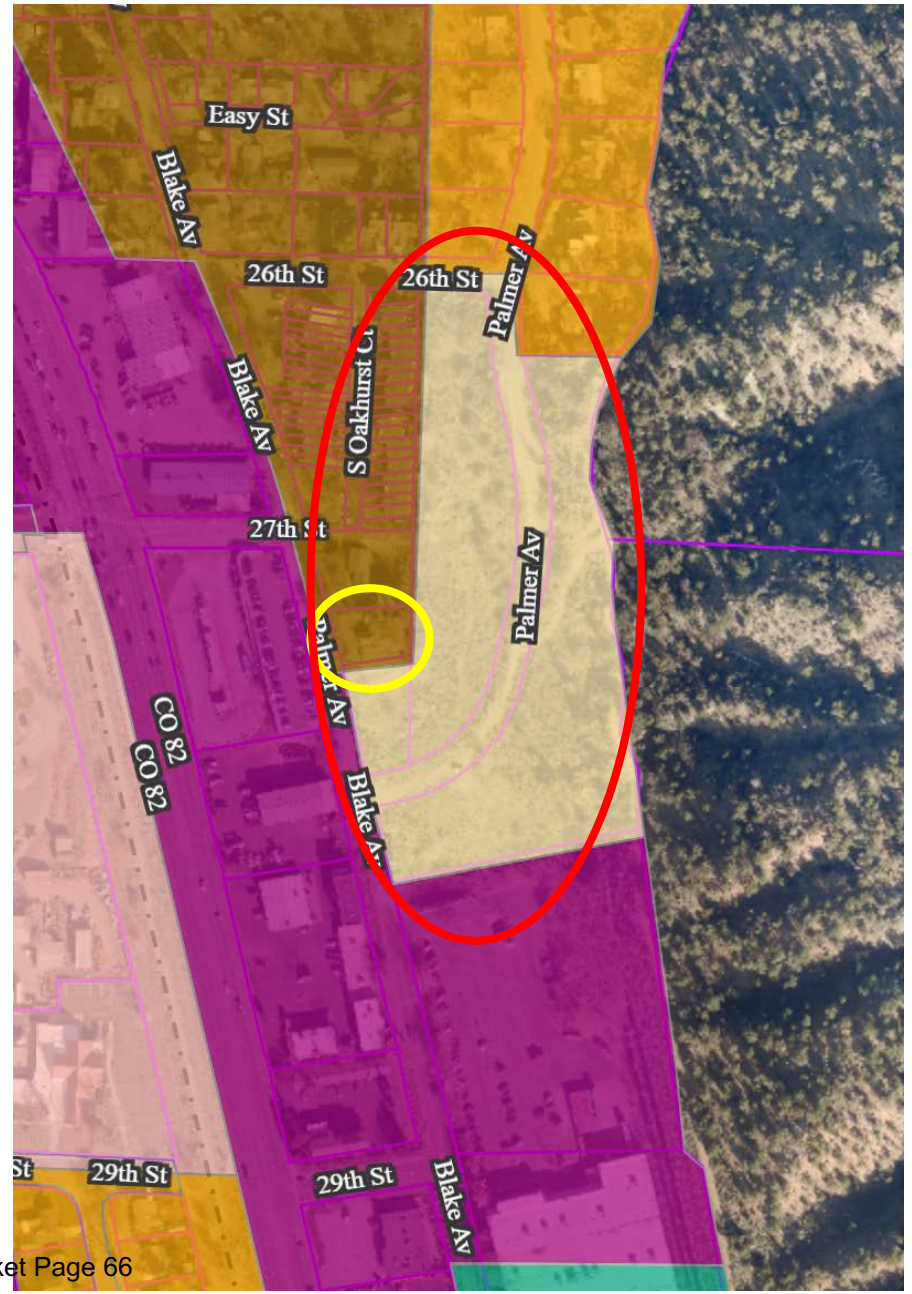
Existing northeast view (photo credit: Google Maps) and related perspective view



CITY OF GLENWOOD SPRINGS COLORADO

Zoning and Adjacent Land Uses

- 5.74 acres
  - RT Residential Transitional (tan)
  - RH Residential High-Density (brown)
  - Borders city boundary to the east
- Virtual Site Visit
  - Drone Footage on City's YouTube Channel



CITY OF GLENWOOD SPRINGS COLORADO

Planning and Zoning Commission

- Consideration
  - Approximately 9.5 hours
    - April 28, 2020
    - May 5, 2020
    - June 8, 2020 (did not include P&Z, additional 1.5 hours)
    - June 23, 2020
- Amendments by applicant
  - Option C
    - Street redesign
      - Elimination of a full extension of Palmer Avenue from 26th Street to Blake Avenue
      - Restricts access to the development site to the intersection of Palmer and Blake Avenues
      - Remainder of the Palmer Avenue R.O.W. limited to bicycles/pedestrians/fire/emergency access
    - Revises the layout and sizes of site buildings
    - Former building F removed
    - North parking lot converted to public park space
    - Duplex site just south of the new park space (per Commission's denial of related variance request)
    - 100 units still provided
- Recommendation
  - Unanimous (5-0) approval of Action Items 1 and 2
    - Findings and Conditions attached

CITY OF GLENWOOD SPRINGS COLORADO

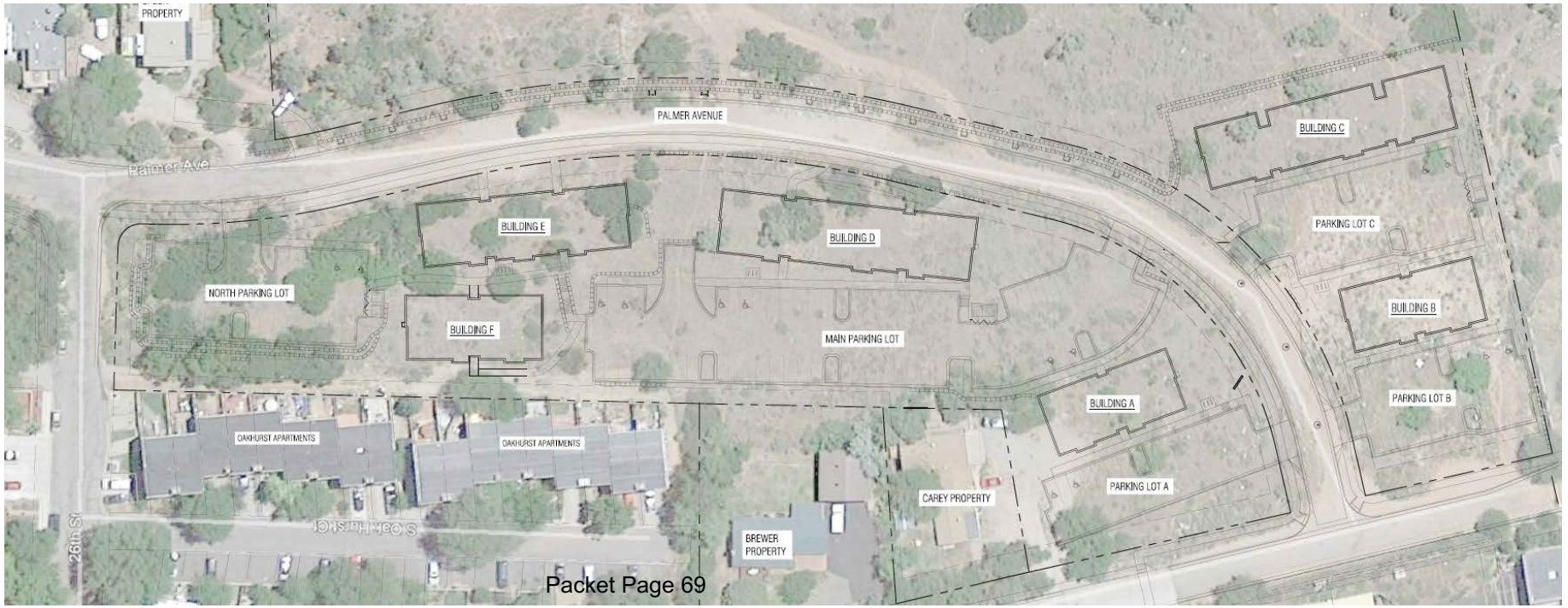
070.040 Development Standards

- 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
  - Active: public park at north end, ½ basketball court, numerous outdoor gathering spaces, an indoor community room
  - Passive: 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
- 151 (previously 148) proposed



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



Revised east elevation-Building A
(facades facing Palmer Avenue)



Former elevations-Buildings C (east) and E
(representative of colors/design



WEST ELEVATION - BUILDING E

Traffic Impacts

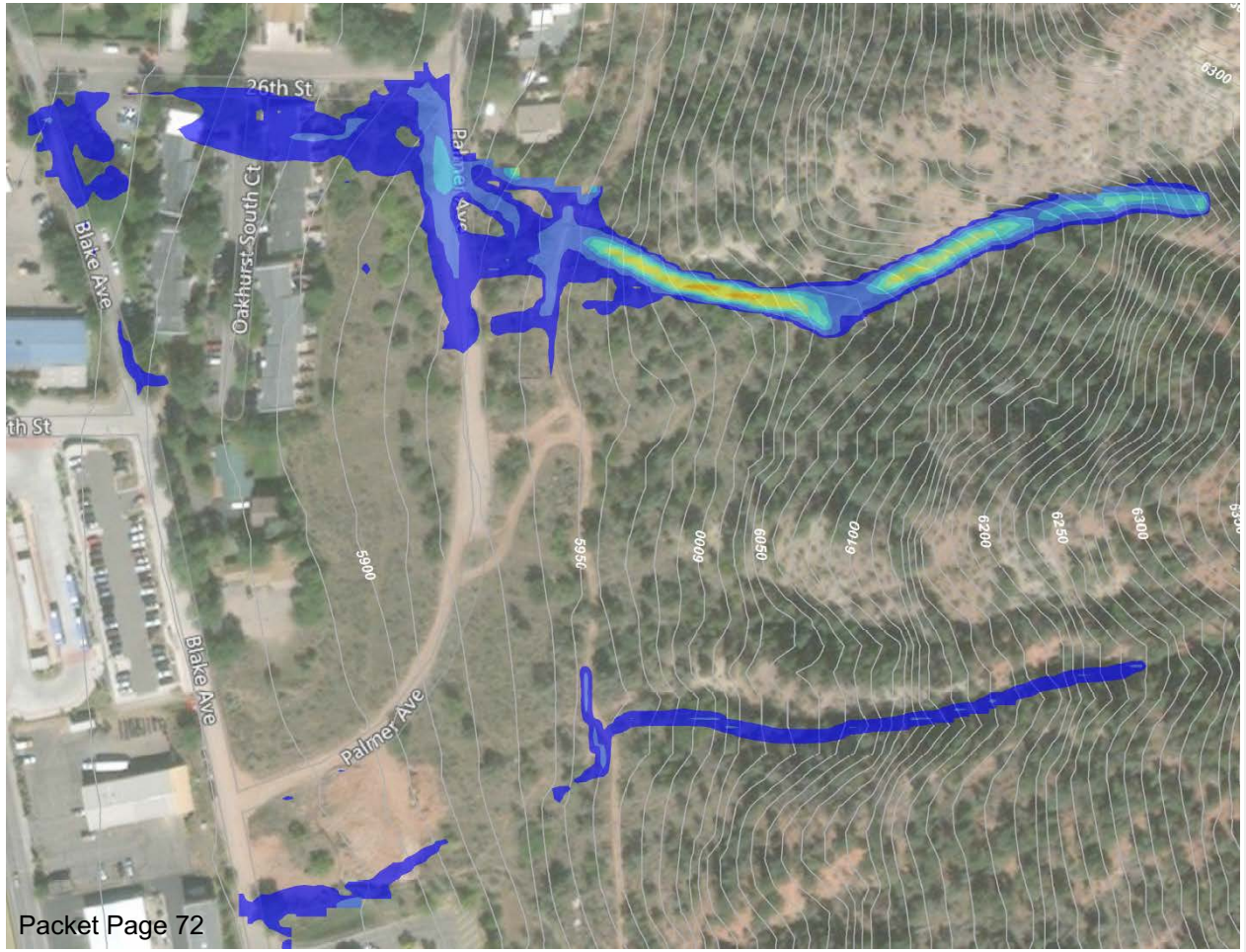
- Updated analysis by McDowell Engineering, LLC
  - Forecasts/analyzes project impacts on surrounding streets and intersections
  - 489 vehicle trips per day on an average weekday
    - 30 vehicle trips AM peak hour traffic
    - 38 vehicle trips PM peak hour traffic
  - Majority of impacts at the intersections of
    - 27th Street and Highway 82
    - Blake Street and Highway 82
  - CDOT access permits granted, requires revising
    - Intersection improvements not required by CDOT nor City Council prior
    - Temporary improvements to allow Blake one way south 24th to 26th
  - City to further discuss permanent circulation options/roadway improvements/traffic calming options with neighborhood

CITY OF GLENWOOD SPRINGS COLORADO

Debris Flow

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





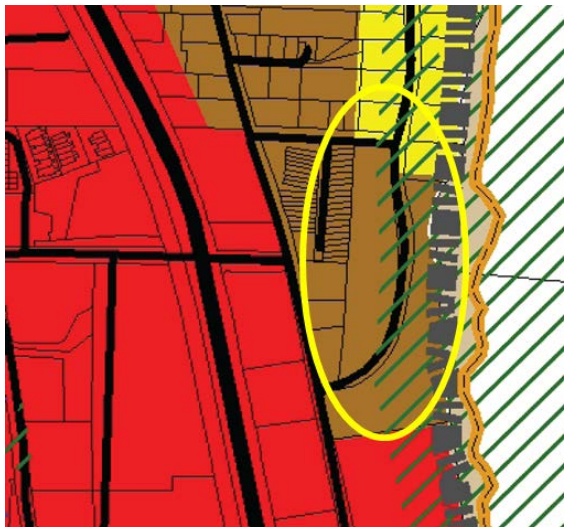
Relative Densities

- Proposed vs. Existing Multifamily Apartment Projects
  - Triumph - Bell Rippy
    - 1 per 2,500 square feet (100 units on 5.74 acres)
  - Lofts (three phases)
    - 1 per 697 square feet (274 units on 4.38 acres)
  - Six Canyon
    - 1 per 1,404 square feet (116 units on 3.74 acres)
    -
  - Glenwood Green
    - 1 per 2,120 square feet (60 units on 2.92 acres)

CITY OF GLENWOOD SPRINGS COLORADO

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 on specific property
    - Replaces an existing triplex with a stormwater detention area
    - RH allows a greater density 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
    - 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;
  - 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
  - N/A

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
    - Fire apparatus road longer than 150 feet without a turnaround
  - Engineering
    - 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
    - Need for the applicant to submit a full landscaping and irrigation plan.
  - Public Works
    - 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
  - Significant amount of comments attached to packet
  - Many neighbors shifted displeasure to appreciation for revisions
  - Still concerns with neighborhood circulation
    - Blake gate
    - One Way Blake Avenue, 23rd to 26th

CITY OF GLENWOOD SPRINGS COLORADO

Action Items 1-2 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
    - Findings and conditions on pages 23-25 of the July 16, 2020 City Council packet

PETITION: KEEP BLAKE AVENUE TWO-WAY

The undersigned city residents urge Glenwood Springs City Council to keep Blake Avenue between 24th and 26th Streets TWO-WAY now and in the future.

The proposed opening of Blake Gate is of great concern to ALL city residents of the neighborhoods north of the gate. The first home streets to be impacted include Palmer, Blake, Bennett Avenues and 23rd/Crestwood Streets. We residents already experience disturbing commuter and shopping traffic speeding through our home streets trying to bypass Grand Avenue gridlock. When the Blake Gate opens, this problem will grow exponentially.

Blake Avenue residents between 24th and 26th Streets have petitioned the city to make their section of Blake ONE-WAY South in order to protect their narrow home street from this onslaught. Doing so will funnel ALL this traffic, as well as their own northbound trips, onto Palmer, Bennett Avenues and upper 23rd Street. Solving only Blake Avenue's issue in this manner makes the problem much worse for their close neighbors.

The narrow aspect of Blake Avenue at least discourages both traffic and speeding, whereas the wider aspect of Palmer, Bennett and 23rd encourages speeding traffic.

To be practical and fair, ALL neighbors must share this challenging traffic burden, noise and speeding, that will come with an open Blake Gate. Please keep Blake Avenue TWO-WAY, now and in the future. Provide ALL neighborhoods impacted by this open gate with significant and effective traffic calming measures.

	Print Full Name	Print Street Address	Signature
1	Meghan Hegberg	2210 Bennett Ave	
2		2206	
3	Taylor Burns	2202 Bennett	
4	Rick Woolpert	2122 Bennett Ave.	
5	Catherine Woolpert	2122 Bennett Ave	
6	PETE BRADSHAW	2118 BENNETT AVE	
7	Laura Bradshaw	2118 Bennett Ave	
8	HIPOLITO Portillo	2110 BENETT AVE	

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	Print Full Name	Print Street Address	Signature
1	LARRY Billinger	2213 CRESTwood DR	
2	Noemi Kosmaski	702 23rd St.	
3	Krystof Kosmaski	702 23 St	
4	Ewa Kosmaski	702 23 st	Ewa Kosmaski
5	Maks Kosmaski	702 23 st	
6	Allen Willcuts	618 23rd St	
7	Josh Wilson	618 23rd St.	
8	Jason Hegsey	2210 Bennett Ave	

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	Print Full Name	Print Street Address	Signature
1	Francesca Roberts	2419 Palmer Ave Glenwood Springs	
2	Frank G. Martin	805 Crestwood Dr GWS, CO 81601	
3	Sharlene Salinas	806 23rd St GWS, CO 81601	
4	Patrick Carpenter	810 Crestwood Drive GWS, CO 81601	
5	Kim Cappuccio	810 Crestwood Drive GWS, CO 81601	
6	Robert Smith	818 Crestwood Dr GWS, CO 81601	
7	Renée S. Squier	811 Crestwood Dr. GWS CO 81601	
8	Dan Like	2207 Crestwood Drive	

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Print Full Name	Print Street Address	Signature
1 CHLOE COX	2504 Palmer Avenue	CC
2 RYAN ROBERTS	2419 PALMER AVE	
3 Richard HOLCOMB	2409 PALMER Ave	
4 LYNN B CARY	2405 PALMER AV	Lynn B Cary
5 WM H CHILDS	2405 PALMER AV	
6 Jamie Raehal	2314 Palmer Ave	
7 Jerry Raehal	2314 Palmer Ave	
8	804 23rd St.	LISA M. MANZANO

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	Print Full Name	Print Street Address	Signature
1	TRISH KRAMER	2501 Palmer Ave.	Trish Kramer
2	Ian Cox	2504 Palmer Ave	
3	William Lee	2502 Palmer Ave	
4	Cody Lyden	2415 Palmer Ave	
5	Jenni Lyden	2415 Palmer Ave	
6	Jan O'Connell	2409 Palmer Ave	Jan O'Connell
7	Ralph Smalley	2409 Palmer Ave	
8	Christine Smalley	2409 Palmer Ave.	

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	Print Full Name	Print Street Address	Signature
1	Scott Kramer	2501 Palmer	Scott Kramer
2	Todd Speck	2506 Palmer Ave.	Todd Speck
3	Elaine Speck	2506 Palmer Ave.	Elaine Speck
4	David Cox	2501 Palmer Ave	
5	Clare Roberts	2419 Palmer Ave	CSR
6	Erin Lee	2502 Palmer Ave.	Erin Lee
7	Marilyn Shettel	2417 Palmer Ave	Marilyn Shettel
8	Shelby Malehorn	2407 Palmer Ave	Shelby Malehorn

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	Print Full Name	Print Street Address	Signature
1	Ronald T. Carr	2103 Bennett Ave GWS, CO 81601	Ronald T. Carr
2	JOHN DRAGON	601 - 21ST ST.	
3	SHIRLEY HOSTETTLER	601 21st St.	Shirley Hostettler
4	Rene Gore / RENE GORE	601 21st St	Rene L. Gore
5	JAMES S. OSBORNE	601 21ST ST	
6	Donna Harris	2203 Bennett	
7	BRIAN HARRIS	2203 Bennet	
8	KIRBY SMITH	2420 PALMER	

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	Print Full Name	Print Street Address	Signature
1	Christine Bailey	2102 Bennett Ave Glenwood Spg	Christy Bailey
2	Joan Chovanec	2018 Palmer Ave Glwd Spgs CO 81601	Joan Chovanec
3	Peter Chovanec	2018 Palmer Ave Glenwood Spgs Co 81601	Peter Chovanec
4	Jane Lee	2111 Bennett	Jane Lee
5	William L. Wright	2121 Bennett Ave	William L. Wright
6	Cheryl Wright	2121 Bennett Ave	Cheryl Wright
7	Preston Williams	2404 Palmer Ave.	Preston Williams
8	Dave Malehorn	2407 Palmer Ave	Dave Malehorn

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	Print Full Name	Print Street Address	Signature
1	Brian Trujillo	2203 Crestwood Dr.	
2	Nigel Brett	2201 Crestwood	
3	Alison Brett	2201 Crestwood	A J Brett
4	David Chidiello	2417 Palmer Ave	David Chiarello
5	Matthew Brandt	714 23rd St	
6	Amber Brandt	714 23rd St	
7			
8			

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	Print Full Name	Print Street Address	Signature
1	Daniel Kramer	2501 Palmer ave GWS CO 81601	
2	Kelton Lee	2502 Palmer ave GWS CO 81601	
3	JOHN SHERMAN	2414 PALMER	PERMISSION GIVEN OVER THE PHONE AS THEIR ON A TRIP —
4	JAN SHERMAN	2414 PALMER	" " "
5	JAMES DOTTO	2418 PALMER AVE GWS	
6		2418 Palmer Ave GWS	
7	Linda Malcheron	2407 Palmer Ave	Linda Malcheron
8	CLARA TRUJILLO	2203 CRESTWOOD DR. GWS	

From: Catherine Fletcher
To: Trent Hyatt
Subject: FW: Bell-Rippy Development
Date: Thursday, July 16, 2020 10:27:13 AM

Here is another email

From: Shelley Kaup <shelley.kaup@cogs.us>
Sent: Thursday, July 16, 2020 10:26 AM
To: Debra Figueroa <debra.figueroa@cogs.us>
Cc: Catherine Fletcher <catherine.fletcher@cogs.us>
Subject: Fw: Bell-Rippy Development

Hi Catherine,

Can we please put the email into the record for public comment on this project?
Thanks,
Shelley

Shelley Kaup

Mayor Pro Tem

City of Glenwood Springs

970-948-9018

From: Joan Troth <jktroth@comcast.net>
Sent: Wednesday, July 15, 2020 12:12 PM
To: Steve Davis <steve.davis@cogs.us>; Paula Stepp <paula.stepp@cogs.us>; Charlie Willman <charlie.willman@cogs.us>; Jonathan Godes <jonathan.godes@cogs.us>; Rick Voorhees <rick.voorhees@cogs.us>; Shelley Kaup <shelley.kaup@cogs.us>; Tony Hershey <tony.hershey@cogs.us>
Subject: Bell-Rippy Development

Dear Members,
I'm writing as a 48-year resident of south Glenwood on Cooper Ct.
Through the years I've cherished our small town after growing up on the streets of Chicago. I've observed the statement on the city website "The City of Glenwood Springs desires to maintain its small town character."

Conversations here in town often include comments such as "What were those City Councils thirty years ago thinking when they decided against a bypass?" I'm thinking future residents hampered

by traffic backups will say ""How did City Council in 2020 decide it was okay to have high density apartment buildings at both ends of town?" We already deal with congestion on Grand Avenue
and city streets are simply inadequate to accommodate traffic created by residents of high-density housing along with the present population. It is not the responsibility of Glenwood Springs to
provide housing for up-valley employees.

Are you thinking of our "small-town character"? Please face reality and withdraw approval of the Bell-Rippy monstrosity at your Thursday meeting.
Joan Troth, 945-0668

From:	Julie Mao
To:	Trent Hyatt
Subject:	Comment/question about Bell Rippy proposed development
Date:	Wednesday, July 15, 2020 3:22:38 PM

Mr. Hyatt,

I live at the Oakhurst Townhomes in unit 8, so I will be directly adjacent to the proposed Bell Rippy development and specifically the parking area on the southwest side.

Will there be a visual and sound barrier between the parking spaces and the Oakhurst subdivision? The parking spots would directly face one of my bedrooms and my back yard, so a wall or solid fence would really help to block headlights beaming into my bedroom and noise disturbance into my yard (my dog would really appreciate it, too!).

Also, I know the topic of traffic volumes has received a lot of attention. Blake and 26th are in really rough shape currently. Driving these streets requires dodging potholes everywhere, and even though they have been patched in some (most?) years, the potholes re-appear every winter/spring. The addition of vehicle traffic from 98 apartments and 2 halves of a duplex is going to make road conditions much worse. Is the city planning to repave these roads (i.e., not just patch the holes)?

Thank you,
Julie Mao

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	Print Full Name	Print Street Address	Signature
1	Margaret E. Rowan	601 21st St. #206 GWS, CO. 81601	Margaret E. Rowan
2	WARREN Scott & CONNIE	601 21st #205	Warren Scott CONNIE Scott
3	Linda M Luke	601 21st #203	Linda Luke
4	Carolyn Arnold	601 21st 202	Carolyn Arnold
5	Lois Freman	601 21st St #303	Lois F Freeman
6	~~Judith S. Kess~~	~~601 21st #305~~	
7	Judith Kess	601 21st ST #305	Judith S. Kess
8	JOAN KAMANAKA Joan Kamanaka	601 21 #401	Joan K
9.	Helen L. DeLaPaz	601 21 #403	Helen L. DeLaPaz
0.	Kathy J. Lovitt	601 21st ST #404	Kathy J Lovitt

(Cake) (15 signatures)

FEIN 379-9596

11. Grace Schick 601-21st St #404 Grace A. Schick

12. Carol Craig 601 21 #201 Carol Craig

3. Virginia Miller 601 21st St apt #412 Virginia Miller

4. 601 21st St Glenwood Springs, Colo Apt 407 Sara Klasbe

5. Jerry Schick 2101A Blake Ave GWS CO 81601 Jerry Schick

From:	Catherine Fletcher
To:	Trent Hyatt
Subject:	FW: City Council Meeting 7-16-20
Date:	Wednesday, July 15, 2020 12:22:10 PM

From: Debra Figueroa <debra.figueroa@cogs.us>
Sent: Wednesday, July 15, 2020 9:02 AM
To: Catherine Fletcher <catherine.fletcher@cogs.us>
Subject: Fwd: City Council Meeting 7-16-20

For the record. Thank you

Begin forwarded message:

> **From:** Paula Stepp <paula.stepp@cogs.us>
> **Date:** July 15, 2020 at 8:51:28 AM MDT
> **To:** Debra Figueroa <debra.figueroa@cogs.us>
> **Subject: FW: City Council Meeting 7-16-20**
>
> Here's another to share
> Paula
>
> ---
>
> **From:** lcrfnd@rof.net <lcrfnd@rof.net>
> **Sent:** Tuesday, July 14, 2020 1:31 PM
> **To:** Tony Hershey <tony.hershey@cogs.us>
> **Cc:** Paula Stepp <paula.stepp@cogs.us>; Charlie Willman <charlie.willman@cogs.us>; Shelley Kaup <shelley.kaup@cogs.us>
> **Subject:** City Council Meeting 7-16-20
>
> I'm sending this e-mail to city council members concerning the upcoming vote at this weeks' council meeting concerning opening the Blake gate and making Blake one-way from 24th to 26st.
> I have lived at 2405 Palmer Ave since 1974 (longer than anyone else).
> If the Blake gate is opened and Blake is one-way from 24th to 26st all northbound traffic from the new development and overflow (to avoid traffic jams on Hwy 82/Glen Ave/Grand Ave) will divert up 26th to Palmer Ave, then to Bennett or Blake. Also lots of cars from the new development going to City Market will do the same thing to avoid traffic.
> This is not fair to the neighborhood which has many young children and is a quiet and enjoyable place to live.
> Another option would be to move the Blake gate to 26th which would help somewhat.
> I hope you take our neighborhood into consideration when voting on this matter.
> Thank you,
> Lynn Cary
> 2405 Palmer Ave
> Glenwood Springs, Co 81601

From:	Catherine Fletcher
To:	Trent Hyatt
Subject:	FW: Bell/Rippy development
Date:	Wednesday, July 15, 2020 12:22:00 PM

From: Debra Figueroa <debra.figueroa@cogs.us>
Sent: Wednesday, July 15, 2020 9:01 AM
To: Catherine Fletcher <catherine.fletcher@cogs.us>
Subject: Fwd: Bell/Rippy development

Catherine,

For the record. Thank you

Begin forwarded message:

> **From:** Paula Stepp <paula.stepp@cogs.us>
> **Date:** July 15, 2020 at 8:51:46 AM MDT
> **To:** Debra Figueroa <debra.figueroa@cogs.us>
> **Subject: FW: Bell/Rippy development**
>
> And more
>
> ---
>
> **From:** Ron Carr <rcarr@garfieldre2.net>
> **Sent:** Tuesday, July 14, 2020 11:53 AM
> **To:** Rick Voorhees <rick.voorhees@cogs.us>
> **Cc:** Steve Davis <steve.davis@cogs.us>; Shelley Kaup <shelley.kaup@cogs.us>; Paula Stepp <paula.stepp@cogs.us>; Tony Hershey <tony.hershey@cogs.us>; charlie.wilman@cogs.us
> **Subject:** Fwd: Bell/Rippy development
>
> ---------- Forwarded message ---------
> From: **Ron Carr** <rcarr@garfieldre2.net>
> Date: Tue, Jul 14, 2020 at 11:44 AM
> Subject: Bell/Rippy development
> To: <jonathan.Godes@cogs.us>
>
> This development is almost a go except for one small detail which could devastate the existing surrounding neighborhood. We have already witnessed how heavy northbound

traffic on Hwy. 82 tries to save time by filling up Blake, Bennett, Palmer, etc. to try to save time when going through Glenwood. This traffic will be even worse with this development in place.

The cure or fix would be to simply move the GATE from its existing location north to 26th Street. This would stop cars from getting off Hwy. 82 (where they belong) and filling up the neighborhood streets. It would also keep "Bumpy Blake" a safe narrow street for this neighborhood.

Just move the gate and it'll be the best for all concerned.

Thank you, Ron Carr
rcarr@garfieldre2.net

Sent from Garfield School District No. Re-2

From: Catherine Fletcher
To: Trent Hyatt
Subject: FW: Blake Ave
Date: Wednesday, July 15, 2020 12:21:51 PM

From: Debra Figueroa <debra.figueroa@cogs.us>
Sent: Wednesday, July 15, 2020 9:01 AM
To: Catherine Fletcher <catherine.fletcher@cogs.us>
Subject: Fwd: Blake Ave

Catherine,

For the record. Thank you

Begin forwarded message:

> **From:** Paula Stepp <paula.stepp@cogs.us>
> **Date:** July 15, 2020 at 8:52:26 AM MDT
> **To:** Debra Figueroa <debra.figueroa@cogs.us>
> **Subject: FW: Blake Ave**
>
> Please share this one too
>
> -----Original Message-----
> From: PETE Bradshaw <ptnlaura@msn.com>
> Sent: Sunday, July 12, 2020 7:54 PM
> To: Paula Stepp <paula.stepp@cogs.us>
> Subject: Blake Ave
>
> Dear Paula,
>
> I live on 23rd & Bennett Ave. I am very concerned about the possibility of opening the Blake Ave gate and making Blake Ave one way.
>
> When the bridge construction was happening, Bennett Ave became one of the "escape routes" for people to try to bypass grand Ave congestion. Our street became congested and speed limits were exceeded by many. If the gate is opened, this problem could become severe for us again. Already we have people racing down our street on their way to the hospital. We are a quiet neighborhood with many kids and elderly living on it. I believe safety would be an issue.
>
> I'm not sure of the benefits to opening the gate as the streets are already in a state of disrepair. Adding more cars to the problem will only cause more street issues. 23rd

street is a nightmare to drive on. Blake Avenue 23rd to 27th is absolutely terrible. 21st street which would be part of the exit route if this plan goes forward looks like it belongs in a 3rd world country. These streets are a nightmare with the number of cars already driving on them.

Please protect our neighborhood. We do not need additional traffic coming through. I believe this would be a very short sided decision if passed.

Thank you for your time.
Laura Bradshaw

From: Catherine Fletcher
To: Trent Hoart
Subject: FW: Blake Street Gate and traffic in the city"s neighborhoods
Date: Wednesday, July 15, 2020 12:21:03 PM

From: Debra Figueroa <debra.figueroa@cogs.us>
Sent: Wednesday, July 15, 2020 11:04 AM
To: Catherine Fletcher <catherine.fletcher@cogs.us>
Subject: Fwd: Blake Street Gate and traffic in the city's neighborhoods

For the record. Thank you

Begin forwarded message:

From: Paula Stepp <paula.stepp@cogs.us>
Date: July 15, 2020 at 10:50:27 AM MDT
To: Debra Figueroa <debra.figueroa@cogs.us>
Subject: FW: Blake Street Gate and traffic in the city's neighborhoods

This may have gone to all council members but please share
paula

From: Dave Malehorn <dave.malehorn@gmail.com>
Sent: Wednesday, July 15, 2020 10:43 AM
To: Dave Malehorn <dave.malehorn@gmail.com>
Subject: Blake Street Gate and traffic in the city's neighborhoods
Importance: High

Dear council members and city staff,

I implore you to NOT open highway 82 commuter traffic into the South Blake and Palmer neighborhoods. The streets that would be opened are in poor shape and/or not configured for heavy pedestrian and commuter traffic on the same pathway. (too narrow and no sidewalks). Once a neighborhood is derogated by traffic trying to avoid Grand Ave to save a few minutes, the damage will be done and the neighborhood character will be lost forever.

I propose we look at other options to allow egress from the Bell Rippy development and the 27th Street bus terminal without ruining the quiet neighborhoods that your constituents have come to appreciate and enjoy. Some suggestions are:

- Adopt the revised Bell Rippy plan to block car access onto Palmer
- Keep Blake Street 2 way to keep the traffic burden shared by both Palmer and Blake neighborhoods

-or-

- Make Blake Street one way south and move the Blake Street gate to the top of 26th street to create a cul-de-sac on the south end of Palmer.

The Blake Street gate was installed to protect the southeast neighborhoods, ***please*** work with the affected neighborhoods to continue the protections put in place some 30 years ago.

Respectfully,

Dave and Polly Malehorn
2407 Palmer Ave
Glenwood Springs, CO 81601
Dave.malehorn@gmail.com (970) 379-2872
Pmalehorn@gmail.com (970) 379-8540

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

Date: July 13, 2020

After meeting with Jennifer Ooton, assistant City Manager, and Terry Partch, our traffic engineer, for a walk-through of Palmer Avenue, and hearing that the Fire and Police Departments had approved the new Emergency Access Road/bike path along the Palmer Avenue right-of-way, I have concluded that the latest design of the Bell-Rippy/Triumph rental apartment development makes sense and helps to preserve the existing neighborhoods of Palmer, Bennett, Crestwood, 23rd Street and Blake Avenues. I very much support the revised site plan.

I am opposed to making the short section of Blake Avenue from 24th to 26th Street ONE-WAY, as are the roughly 80+ neighbors who signed the petition presented to the city this week. A one-way configuration of that section of Blake will simply force all northbound traffic from that neighborhood and from the shopping center and Hwy 82 up through 26th Street, along Palmer Ave, down upper 23rd and over onto Bennett Avenue neighborhoods. I think we need to keep Blake TWO-WAY along with the rest of the neighborhood so that the traffic burden is shared on both Blake and Palmer. Once the Blake Gate is open, this existing traffic burden will rise exponentially. Protecting one street and making a bad situation worse for another just doesn't make sense.

Finally, I believe the traffic issues that opening the Blake Gate will supposedly address, can be accomplished AND neighborhoods north of the

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

gate can still be protected by the promise made when the Gate was erected 30 years ago by MOVING the Gate north to 26th Street. 26th is ridiculously steep and cannot even have sidewalks because of it. This narrow street will become the thru-street to Palmer->23rd->Bennett->Blake by-pass that speeding commuters take now to avoid Grand Avenue traffic. Keep the Gate at 26th to keep commuters on Grand and out of family neighborhoods until they reach I-70.

Thank you for protecting our neighborhoods and homes at the same time as you lead the city in growth and development of business. This balance is critical to quality of life in our town.

Sincerely,

Scott B. Kramer

Trish Hulings Kramer
2501 Palmer Avenue
Glenwood Springs, CO 81601
Kramers85@comcast.net, 970309-7646

DATE: July 13, 2020

TO: Glenwood Springs City Council

FROM: Trish Hulings Kramer
2501 Palmer Avenue
Glenwood Springs, CO 81601

RE: 1) **Support** for Triumph/Bell-Rippy revised site plan
2) **Opposition** to making Blake Avenue ONE-WAY from 24th to 26th Street
3) Last Ditch **plea to move the Blake Gate** to south side of Blake at 26th to protect ALL Valley floor neighborhoods north of the Gate from Hwy 82 commuter and shopper traffic.

1) I have participated with our neighbors in all P&Z meetings on the proposed Triumph/Bell-Rippy development, as well as every other developer's attempt to build on this property in the last 10 years. All of the various site plans showed a non-stop two-lane Palmer Avenue built on the original, very poorly designed existing city right-of-way. This singular tunnel-vision approach would result in Hwy 82, shopper and new development traffic racing down Palmer Avenue for northbound trips. This OCCURS NOW WITH THE BLAKE GATE IN PLACE. Triumph really heard us and P&Z commissioners and creatively revised the site plan in a manner that makes the new neighborhood safer, adds amenities to the entire area (park) and eliminates the raceway of a 'new' Palmer Avenue section. We understand city fire/police have passed on the Emergency Access/Bike Path design. I wholeheartedly support the revised plan and am finally comfortable with the proposed development.

2) Sadly, because the city seems intent upon opening the Blake Gate at the conclusion of construction of this neighborhood, the neighbors north of the Gate are facing a huge increase in what is already very unsafe, disturbing, noisy speeding traffic from commuters and shoppers trying to avoid Hwy 82 traffic, particularly from 3 to 7pm each evening but through-out the day as well. From 26th to 7th Street, we homeowners all deal with speeders who roll stop signs and gun engines. Blake Avenue residents in our neighborhood have petitioned to make their 2-block section ONE-WAY in order to protect them from this traffic assault. Unfortunately, this makes Palmer Avenue the default route for **ALL** the traffic they want to avoid including their OWN northbound trips. Their narrow street, pot holes and all, at least discourage speeding. Palmer's wider aspect gives commuters and shoppers apparent permission to speed down our

long street. Drivers then roll the stop sign at 23rd, race over onto Bennett and then 21st and onto Blake without ever stopping until 19th Street. I strongly oppose making Blake ONE-WAY. If that Gate has to be opened, ALL of our home streets need to bear this odious burden. And, all of our

Trish Hulings Kramer
2501 Palmer Avenue
Glenwood Springs, CO 81601
Kramers85@comcast.net, 970309-7646

streets need serious traffic calming measures to protect our home safety from speeding commuters who don't give a damn except to get where they are going quickly.

3) Finally, that blasted Gate! It was put up for a reason and that reason still exists, only way WAY WORSE than ever imagined when WalMart was built. I understand why CDOT and RFTA want the Blake Gate gone, in order to spread traffic over 3 intersections, because 27th is already so problematic (bus station, bridge, etc.) This traffic challenge AND keeping the original Blake Gate promise to neighbors north of the gate can be solved simply by moving the Gate north to 26th Street. 26th Street is narrow, very steep – so steep that sidewalks to protect pedestrians is not possible. It should not have MORE traffic! Oakhurst residents can use Palmer to access Hwy 82 and Grand Ave., as they do now. Blake Avenue residents can use 24th and 23rd. Palmer residents, the same. 27th/29th Streets and far south Blake Ave/Hwy 82 intersections at McDonalds can service shoppers and commuters. RFTA buses will have full S. Blake and Hwy 82 access. As a city councilperson once said, "We owe people a trip through our town…. But we don't owe them a fast trip!" Please, please protect our neighborhoods near the gate and all of the valley floor homeowners north from even more speeding commuter traffic wherever and whenever you possibly can.

Thank you for your consideration. Thank you for protecting our neighborhoods at the same time as you lead the city in growth and development of business. This is our home and our sanctuary. We neighbors feel pretty desperate about this traffic assault. Our fate is in your hands.

Sincerely,

Trish Hulings Kramer

From:	Debra Figueroa
To:	Catherine Fletcher
Cc:	Trent Hyatt; Jennifer Ooton
Subject:	Fwd: Planning Item 04-20 - Bell-Rippy Major Site/Architectural Plan Review & Rezoning
Date:	Wednesday, July 15, 2020 7:53:06 AM

Catherine - can we please make this part of the record? Thank you.

Begin forwarded message:

From: Paula Stepp <paula.stepp@cogs.us>
Date: July 15, 2020 at 7:48:27 AM MDT
To: Debra Figueroa <debra.figueroa@cogs.us>
Subject: Fwd: Planning Item 04-20 - Bell-Rippy Major Site/Architectural Plan Review & Rezoning

Please forward to council members.
Paula
Get Outlook for iOS

From: Kirby Smith <ksakirby@aol.com>
Sent: Wednesday, July 15, 2020 12:03 AM
To: Paula Stepp
Subject: Planning Item 04-20 - Bell-Rippy Major Site/Architectural Plan Review & Rezoning

Dear Councilwoman Stepp,

I was raised in Glenwood and my wife and I own our home at 2420 Palmer Ave. (which was built by my family in 1976). We've enjoyed this unique Glenwood neighborhood for over 44 years; and intend to call this home for many years to come.

We're not opposed to change. Therefore we would support the Triumph-Bell-Rippy development with the following conditions:

1. That the approved plan consists of the recently proposed site layout and street redesign referred to as Option C.
2. The street redesign includes an elimination of a full extension of Palmer Avenue from 26th Street to Blake Avenue.
3. That the site plan restricts access to the development site to the intersection of Palmer and Blake Avenues only; with the remainder of the street construction in the Palmer Avenue right-of-way, above and to the north of driveway aisles, to be limited to a bicycle and pedestrian path; allowing fire/emergency access only.
4. The plan approval requires the developer to provide the addition of speed bumps on both Blake and Palmer Avenues between 23rd and 26th Streets.
5. That Blake Ave. and Palmer Ave. both remain open to two-way traffic between 23rd and 26th Streets.

We appreciate the time and effort that the City Council and planning and engineering staff has put forth to listen to the surrounding neighbors and to work with the developer and neighborhood interests to achieve what appears to be reasonable solution that all can live with.

Please share our comments with your other council members, and the City staff.

Thank you, Kirby & Suzanne Smith
2420 Palmer Avenue
Glenwood Springs, CO 81601

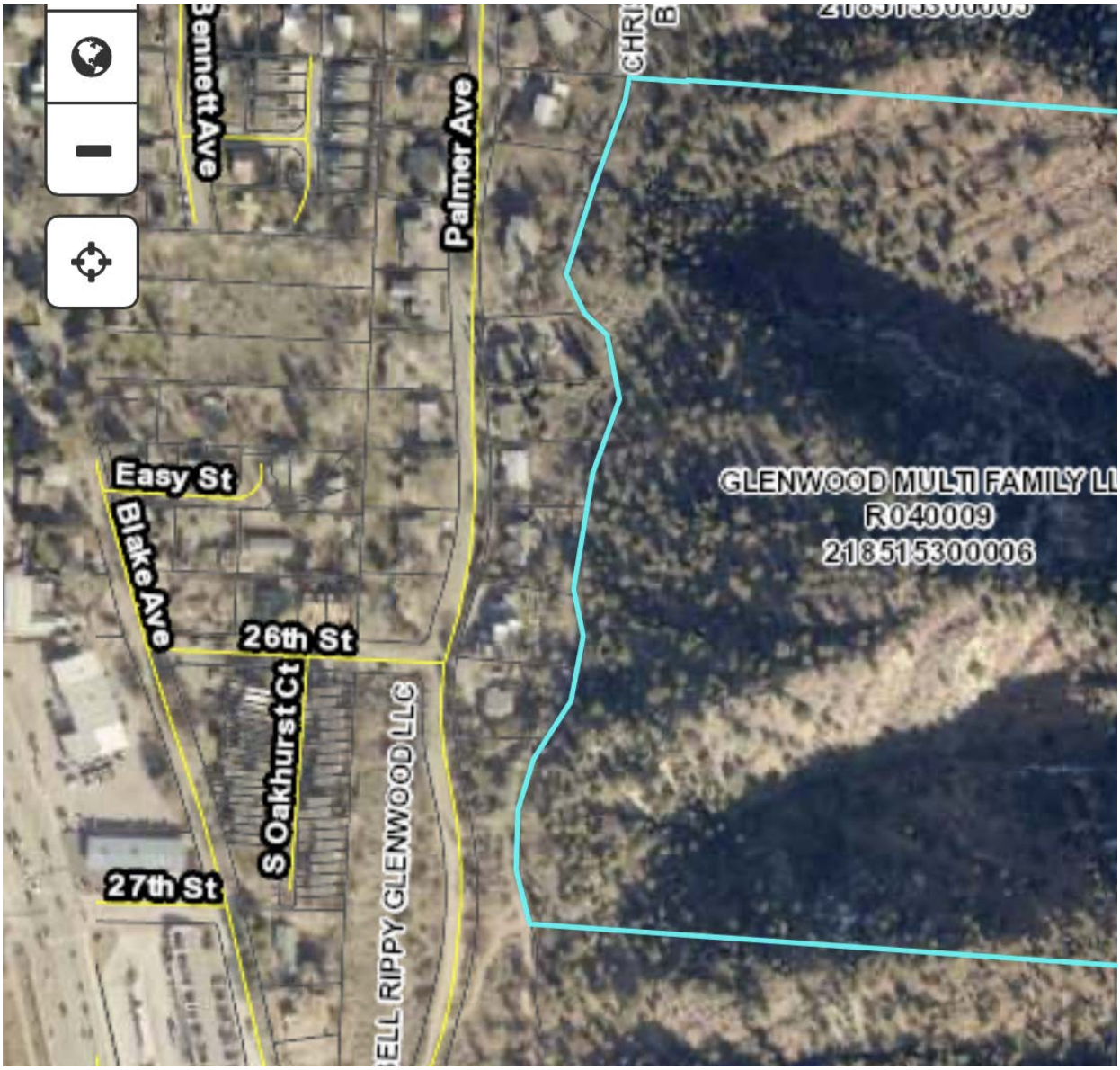
From: David Forenza
To: Trent Hyatt
Subject: Easement required
Date: Monday, July 13, 2020 9:47:48 AM

Hi Trent,

With the upcoming approvals for the Bell Rippy Glenwood LLC for the apartments I would like to request an easement be established between those parcels and the Glenwood Multi family llc parcels that are on the Hillside currently they are land locked. As you know and in fact everyone is aware by the City and county officials etc. that the hillside has homeless folks living and setting camp up there. It is in everyone's best interest that an access is gained for safety and well-being of the community. Under previous conditions of approval an easement was required for the home at 2710 Blake ave for access. The easement that should be required for the parcels attached are
Crucial for emergency access and maintenance access. Thank you.

Glenwood multi family LLC
David Forenza, manager




Bennett Ave
Palmer Ave
Easy St
Blake Ave
26th St
S Oakhurst Ct
27th St
GLENWOOD MULTI FAMILY LL
R040009
218515300006

From: Carol Turtle
To: Trent Hyatt
Subject: Opinion | I've Seen a Future Without Cars, and It's Amazing - The New York Times
Date: Friday, July 10, 2020 11:43:07 AM

Hi Trent,

I couldn't help myself and had to send this article to you about a visionary future. I'm sure you probably have already read it, but if not, there may be some interesting ideas here. Maybe they don't apply to Blake Street, but I found it so fascinating. You are working with a team of very creative people right now, including the developer. The solution for Palmer illustrated this clearly. Impressive. Now, if we could just keep thinking outside the box and come up with something just as amazing for Blake Avenue, that would be even better, not just for people who own properties on Blake, but for the City of Glenwood Springs. If anyone could come up with a better way for how to park more cars and encourage walking and biking, it's this team. Now is the perfect opportunity. Please pass this link on to the P&A members, and thank you for all of your time and efforts. Best, Carol Turtle

https://www.nytimes.com/2020/07/09/opinion/ban-cars-manhattan-cities.html

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

MINUTES
City of Glenwood Springs
Planning and Zoning Commission
Regular Meeting
June 23, 2020
Zoom
6:00PM

1. **Roll Call**

Present at roll call were Commissioners:	Marco Dehm, George Shaver, Carolyn Cipperly, Kathryn Grosccup, Sumner Schachter
Absent at roll call were Commissioners:	Amber Wissing, Ingrid Wussow, Ben West, Dean Kinkel
Also present were:	Jenn Ooton Asst. City Manager, Gretchen Ricehill Asst. Economic/Community Development Director, Terri Parch City Engineer, Trent Hyatt Senior Planner, Anna Itenberg City Attorney, Emery Ellingson Planner I, Jessica Bowser Asst. City Engineer, Matt Langhorst Public Works Director

2. **Receipt of Minutes- Receipt of May 26, 2020 minutes.**

Commissioner Shaver made the motion to receive the May 26, 2020 minutes. Commissioner Schachter seconded the motion.

Motion passed unanimously

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

DRAFT

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)*

Applicant: Triumph Development
Owner: Bell Rippy Glenwood, LLC
Location: Adjacent to Palmer Avenue between Blake and 26th
Zone: RH Residential High-Density and RT Residential Transitional

Trent Hyatt provided an update on the progression of the review of the application. Hyatt summarized that the application was first heard on April 28th, 2020 and was continued to the May 5th meeting to allow for more public input. The May 5th meeting was cut short due to an internet outage and was continued to the May 26th meeting. At the May 26th meeting the Commission requested that staff hold a neighborhood meeting to gather more input regarding the project and proposal.

Hyatt stated that a neighborhood meeting was held on Monday, June 8th with the neighborhood to discuss options for the neighborhood regarding traffic circulation and other concerns. Hyatt indicated that there were approximately 20 individuals in attendance at this meeting. The new site plan that resulted from this meeting included, as summarized by Hyatt, the elimination of a building, expanded footprint of other buildings, changes to Palmer Avenue by creating a non-through street, adding emergency access and pedestrian access to only the upper section of Palmer, and changes to existing parking areas. Hyatt indicated that the proposed changes and input from this meeting were all contained in the staff report.

Commissioner Schachter expressed his opinion on the new proposal's improvements to the transportation network. City Engineer Terri Partch addressed Schachter's concerns and stated that staff conducted a site visit to investigate possible improvement options. Partch suggested that Blake could be signed one way southbound until improvements occurred and stated some concerns that traffic coming off Highway 82 could funnel to Palmer.

Commissioner Grosscup also expressed concerns about the status of the Blake gate being open in conjunction with this project. Commissioner Shaver asked for the width of the right-of-way of Blake between 24th and 26th Street. Assistant Engineer Jessica Bowser confirmed that the right-of-way was 50'. Terri Partch confirmed that the asphalt at that part of Blake was approximately 20'. Shaver asked if the right-of-way extended near the houses on that street, which Partch confirmed. Partch mentioned the possibility of a temporary one-way on Blake and explained that if that would be a permanent change, that additional solutions would be considered. Shaver also asked if speed bumps would be considered for Blake. Partch explained that temporary speed bumps which can be installed for a summer and removed during the winter could be an option. Trent Hyatt also explained that there was concern from the neighborhood about possible effects of creating a one-way street in the neighborhood.

Commissioner Cipperly expressed concern about two-way traffic on Blake Avenue and the dangerous environment for pedestrians in that area. Cipperly also asked about any previous City Council direction to make Blake one way.

Commissioner Shaver asked if the one-way on Blake would extend from 24th or 23rd. Terri Partch confirmed that a one-way for this project would likely extend from 24th to 26th rather than from 23rd to 26th.

Commissioner Schachter asked if the local transportation plan had a draft and Partch confirmed there was a draft that would go before City Council at an upcoming meeting. Partch also indicated that any plan regarding turning Blake into a one-way street would likely require more public input, specifically to involve more of the Palmer neighborhood in the discussion.

Commissioner Dehm asked if there were any previous documents that prohibited the removal or alteration of the Blake Gae. Assistant City Engineer Jessica Bowser confirmed that nothing had been documented or recorded during the installation of the Blake Gate to prohibit the removal or alteration of the Blake Gate.

Commissioner Dehm asked if Staff would have issues with the reconfigured plan. Partch explained that Palmer was not on a schedule for improvements and explained the situations that would likely trigger that being added to that schedule such as a rapid increase in property value in the area.

Dehm then invited the applicants to share their comments.

Michael O'Connor from Triumph Development, LLC presented on the changes to the plan based on the results of the previous Planning & Zoning meeting and neighborhood meeting held on June 8th. provided a summary of the questions and comments from Planning & Zoning and public feedback that would be addressed.

O'Connoer explained how a traffic management plan was created by combining staff and public input, which resulted in the creation of four different options for traffic management. These four options that were created included:

- Existing current entitlements
- Option A: Neighborhood speed calming with speed bumps
- Option B: Coupled one-way streets with striped pedestrian and bike lane on Blake southbound and Palmer northbound
- Option C: Redesign of Palmer Avenue through the site.

At the public meeting held on June 8th, there was substantial support for the current plan with support for adding speed calming on Palmer as well as redesigning Palmer through the site.

Mike Foster, Triumph West Architecture, spoke to explain proposed site plan modifications which include the following changes:

- Elimination of Building F resulting in five apartment buildings with a total of 98 units
- Decrease in size of Building B from 12 units to 10 units
- Enlargement of Buildings A & E
- Addition of a duplex building to replace Building F
- Elimination of north parking lot to be replaced with green space

- Enhanced landscape buffers between the project and existing Oakhurst townhomes
- Reconstruction of Palmer Avenue within the site including 10' bike path
- Location of Community Room and management office

O'Connor also explained that with the change in units and parking configuration that the property now exceeds parking requirements by 11%. O'Connor stated that there will be a property manager on-site that will manage community parking through tools such as lease requirements, assigned parking, and paid parking. O'Connor also provided Commission a summary table of how the proposed plan compares to the previously approved plan. O'Connor continued to explain that since this project is based in an opportunity zone, that the project was under a time constraint due to financing requirements and deadlines. O'Connor concluded by thanking Commission for their time and expressed the opinion that the new proposed plan was superior to previous versions.

Stephanie Copeland, Triumph Development, voiced support for the proposed plan of the applicant.

Commissioner Grosscup asked how peak hour traffic would impact this site and if there would be queuing up at the entrance. Grosscup asked to confirm that the park part of the design would be open to the public and maintained by the applicant. Grosscup also asked about the surface of the proposed bike trail. O'Connor confirmed that the park would be open to the public and maintained by the applicant and that the bike trail surface was still under consideration. Grosscup also asked to confirm the one-way status of Blake Avenue. O'Connor confirmed that the proposal was to have Blake be one-way.

Commissioner Shaver asked the applicant to confirm about a specific area on the site plan that was indicated by cross-hatching. O'Connor explained that area was an additional debris flow area. Shaver also asked about designated snow storage areas. Foster explained that there were existing snow storage areas which would be included in the final plan. Shaver also asked about coordination with other Departments including Fire and Emergency. Hyatt confirmed that final plans would need to receive approval from those Departments and were in support of the general details of the plan.

Community Development Director Jen Ooton asked for Commission to clarify if the condition to designate a one-way street on Blake would be temporary or permanent.

Commissioner Schachter asked to confirm that the condition of approval would include one-way Blake.

Commissioner Dehm asked for clarification if approval of the proposed project tonight would be the resulting development. Hyatt explained that the vested right of the previous approval expires January 2021 and believed that either the proposed plan or the previously approved plan could be developed by the applicant. City Attorney Anna Itenberg explained that this proposal could not have a condition placed on it that would undo the approval of the previous plan. Michael O'Connor confirmed that the proposed plan was what the applicant would be looking to build. Stephanie Copeland also confirmed that the proposed project, in its most recent version, is what the applicant was looking to build.

Dehm also asked to confirm that this plan would result in the removal of the Blake Gate which was confirmed by Hyatt.

Dehm stated that public comment portion had already been closed and that there would be no additional public comment on the item.

Commissioner Schachter made a motion to pass with the findings and conditions of the revised suggested motions and staff report from June 23rd with a modification that Condition of Approval #1 include that Blake from 24th to 26th be made one-way south bound until a more permanent solution is devised. Commissioner Cipperly seconded the motion. Commissioner Shaver asked about the finding and conditions listed in the staff report.

Motion was called to a vote. Commissioner Grosscup, Shaver, Cipperly, Schacher, and Dehm voted to approve the motion.

Motion passed 5-0

5. New Items

a. *14-20 Consideration of a Minor Site/Architectural Plan Review for a 2,838 square foot expansion of an existing commercial building (PIN: 2185-053-41-001 and 002)*

Applicant: Kinetic Design (formerly EI Design)
Owner: Halle Properties, LLC
Location: 51537 Highway 6
Zone: M1 Mixed Use Corridor

Planner I Emery Ellingson briefly explained the proposed project and proposed location.

Commisisoner Dehm opened the discussion to the applicant for questions. Steve Appel, 1260 Corona Point Court, Corona, CA, representing Kinetic Design explained the extension of the building was to create more space for tire storage. This extension would result in moving the current transformer and trash enclosure. Appel also noted that this addition would result in the removal of some storage containers currently used for tire storage, which is a zoning code violation.

Commissioner Dehm asked if the proposed addition would match the existing building's design, which was confirmed by the applicant.

Commissioner Grosscup asked staff regarding the procedure of Planning & Zoning Commission in reviewing this application since the existing building was less than 10,000 square feet. Emery Ellingson explained that because the addition created a building that was over 10,000 square feet that would require it to go before Planning & Zoning Commission. Grosscup stated that in the future, it might be a good idea to reconsider this requirement in code revisions as this project was a basic build out addition.

Commissioner Cipperly asked for confirmation about changes to the building design had been addressed. Emery Ellingson explained that under code, since this addition was less than 50% of the original footprint, the applicant is not required as condition of approval to meet all design requirements.

Gretchen Ricehill commented that changing the language on square foot threshold for additions that push a building over 10,000 square feet would be a future code revision amendment.

Commissioner Schachter had a question regarding the landscape plan about the number of trees

indicated in the landscape plan as indicated in the staff report. Emery Ellingson confirmed that there were 36 proposed trees in the landscape plan and 30 trees were required by code.

Commissioner Dehm opened the discussion for public comment.

Anne Leuter, 51579 Highway 6, asked about the development of the back lot on the property as they had received public notice regarding this application.

Bryce Christensen, 1600 Kerns Road, Snowmass, CO representing Kimley-Horn explained that the back lot on the property was not for sale or part of the property.

Commissioner Dehm closed the public comment portion.

Commissioner Grosscup made a motion to approve the item. Motion was seconded by Commissioner Schachter.

Motion was called to a vote. Commissioner Grosscup, Shaver, Cipperly, Schacher, and Dehm voted to approve the motion.

Motion passed 5-0

At approximately 7:45 PM, Commissioner Dehm called for a five-minute recess.

b. *30-20 Consideration of a Location & Extent Review application for construction of an 1,800 sf covered storage building, a 5-bay 2,250 s.f. garage storage building, a 3,200 s.f. temporary canvas covered buildings, 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
    Location: 811 Airport Road and is legally described as a 61.735 acre tract in Section 22 & 27, twp 6, Range 89, Garfield County, Colorado
    Zone: IL- Light Industrial

Assistant Director Ricehill explained that this application is a location and extent review that this is an opportunity for Planning & Zoning Commission to review projects by public entities. Ricehill described the status and use of the area, colloquially known as “The Boneyard”. Ricehill explained the City proposal to add buildings as described in the application for use by City departments.

The current use of the property is office, sign shop, and outdoor storage. The application calls for the following improvements:

- Covered storage
- 5-bay garage/storage
- Canvas-covered temporary storage
- 20 x 20 concrete pad
- Extension of existing fence

Ricehill stated that the proposed use does conform to the future land use map shown in the Comprehensive Plan and that the proposed project complied with zoning district standards. Ricehill also explained that the proposal does not meet the nonresidential design standards, fencing standards, or landscaping. Ricehill proposed approval with suggested conditions as listed in the staff report.

Commissioner Cipperly asked to confirm which buildings on the site plan were existing compared to a photograph from the staff report. Ricehill confirmed which buildings were in the photos compared to the site plan.

Commissioner Schachter asked if this project was related to existing excavation on south end of the airport. Matt Langhorst, Public Works explained that some of the vegetation on the site had been removed and there was some reworking of the northeast corner of the site as preliminary site preparation. Commissioner Schacter also asked if these improvements were intended to be temporary or permanent in the face of possible future development and improvements associated with the airport and South Bridge. Matt Langhorst explained that regardless of surrounding development that the functions of these buildings would be to supply storage that will be lost with the elimination of the MOC. Commissioner Schachter also asked if this application were approved if it could be criticized as an example of the City not following its own standards.

Commissioner Grosscup asked how many staff would be based at the site. Matt Langhorst explained that there would be 12 staff members based on site as well as additional employees visiting the site to utilize the storage. Langhorst also explained that if and when the South Bridge improvements were completed, the road to access this site would not be a part of that project and that the gate to the access to the site would allow for a semi-trailer to be able to enter and exit the facility.

Commissioner Shaver commented that there seemed to be a double standard in terms of this project not adhering to code design requirements. Shaver also asked if there were concerns over the capacity of the road to accommodate heavy vehicle traffic. City Engineer Terri Partch explained that the road is currently maintained by Public Works and that this proposed project would not cause a large impact on the road. Partch also mentioned that there will be future road improvements in the area as part of the South Bridge project. Shaver also asked how permanent some of these improvements would be given the possibility of future development.

Commissioner Dehm opened the public comment portion of the meeting.

Greg Rippy, 213 Creekside Court, Glenwood Springs, and owner 61 116 Road, a property across the road from this development. Rippy expressed general support for the project and had questions about the existence of temporary storage containers in use on a City site. Rippy had questions why the Airport and other private entities had not been able to use similar temporary storage containers.

Commissioner Dehm closed the public comment portion of the meeting.

Commissioner Cipperly asked to confirm the location of project in comparison to the proposed road of the South Bridge project. Cipperly had concerns about how close this site would be to the new road, which would be an entrance to Glenwood Springs and stated some concerns about the visuals of the site.

Commissioner Schachter stated, in response to the public comment, that he did not recall the current Planning & Zoning Commission considering any temporary storage containers at the Airport.

Jenn Ooton mentioned that there was a planned joint session with City Council and the Airport Commission which would discuss hanger space and other storage space. Ooton explained that was scheduled for the month of August.

Commissioner Dehm asked for an update on the status of the South Bridge project. Terri Partch explained that the project was starting preliminary design processes in cooperation with CDOT and anticipated that plans would be complete sometime in 2021. Dehm also asked if the reason why most of these buildings were temporary was due to budget restraints, which was confirmed by Matt Langhorst. Langhorst also explained that the temporary storage containers would be painted and be made to look more like buildings rather than a plain storage container on the site.

Commissioner Schachter asked if there would be any difficulty to approve with a condition to recognize that approval would be conditional on the applicant to return to review for compliance with code. Jen Ooton explained that it could be a condition to revisit this application again within a specific timeframe. Schachter explained that the condition would not necessarily require the project to meet code, but at least an additional review within a five year period since this application has been submitted under emergency circumstances given City finances and the physical condition of the MOC building.

Commissioner Grosscup explained that this project, in comparison to the previous location and extent review at Devereux, was different due to its location and that Grosscup did not find as much of an issue with the compliance issues in terms of design. Grosscup stated that this location is out of the way and it is likely that if this were a private applicant, that some concessions on design could be made. Langhorst commented that budget was a severe constraint with the project which is why the proposal does not fully meet all design requirements.

Commissioner Shaver asked if the location and extent review was required for the temporary buildings already on site. Langhorst explained that those structures were placed in response to the short timeline of having to relocate from the MOC. Langhorst explained that they did not go through location and extent but did have a permit to install.

Commissioner Shaver made a motion to approve the item with all findings and conditions listed in the staff report with the additional condition that the application be required for another review within five years. Commissioner Schachter seconded the motion.

Grosscup asked to confirm about the additional condition and Schacter explained that the condition would require a re-application. City Attorney Anna Itenberg also asked about the specifics of the condition as well.

Commissioner Cipperly asked if the north and west fences should be required to have wind slats for additional screening as they face the road. Commissioner Shaver expressed support for the additional condition to require applicant to come back within five years. Commissioner Dehm expressed support for the application given the current state of the MOC and budget constraints.

Motion was called to a vote. Commissioner Grosscup, Shaver, Cipperly, Schacher, and Dehm voted to approve the motion.

Motion passed 5-0

6. Commissioner Comments

Commissioner Cipperly commented that it will be interesting to see within five years how the development around the area will progress. Cipperly also expressed thanks to all involved with the Bell-Rippy project. Commissioner Schachter stated support for another future joint workshop with Planning & Zoning Commission with the Housing Commission. Schachter also asked about future development in West Glenwood. Commissioner Grosscup stated that part of the reason behind the Bell-Rippy development was due to their location within an opportunity zone and was glad to see additional housing coming to the community. Commissioner Shaver stated appreciation to the applicant of the Bell-Rippy development for making such an effort to gather public input and incorporate it with their application. Commissioner Dehm also expressed appreciation of all parties involved with the Bell-Rippy application for their patience and willingness to adapt the application. Commissioner Dehm also expressed support for a future joint workshop on housing. Dehm also expressed a desire to have a discussion on the existing variance criteria.

Jen Ooton expressed appreciation for everyone involved with the Bell-Rippy application. Jen Ooton also invited commission members to join the City listening session on COVID-19.

7. Adjournment

Meeting was adjourned at 9:03 PM.

DRAFT

TRIUMPH

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.

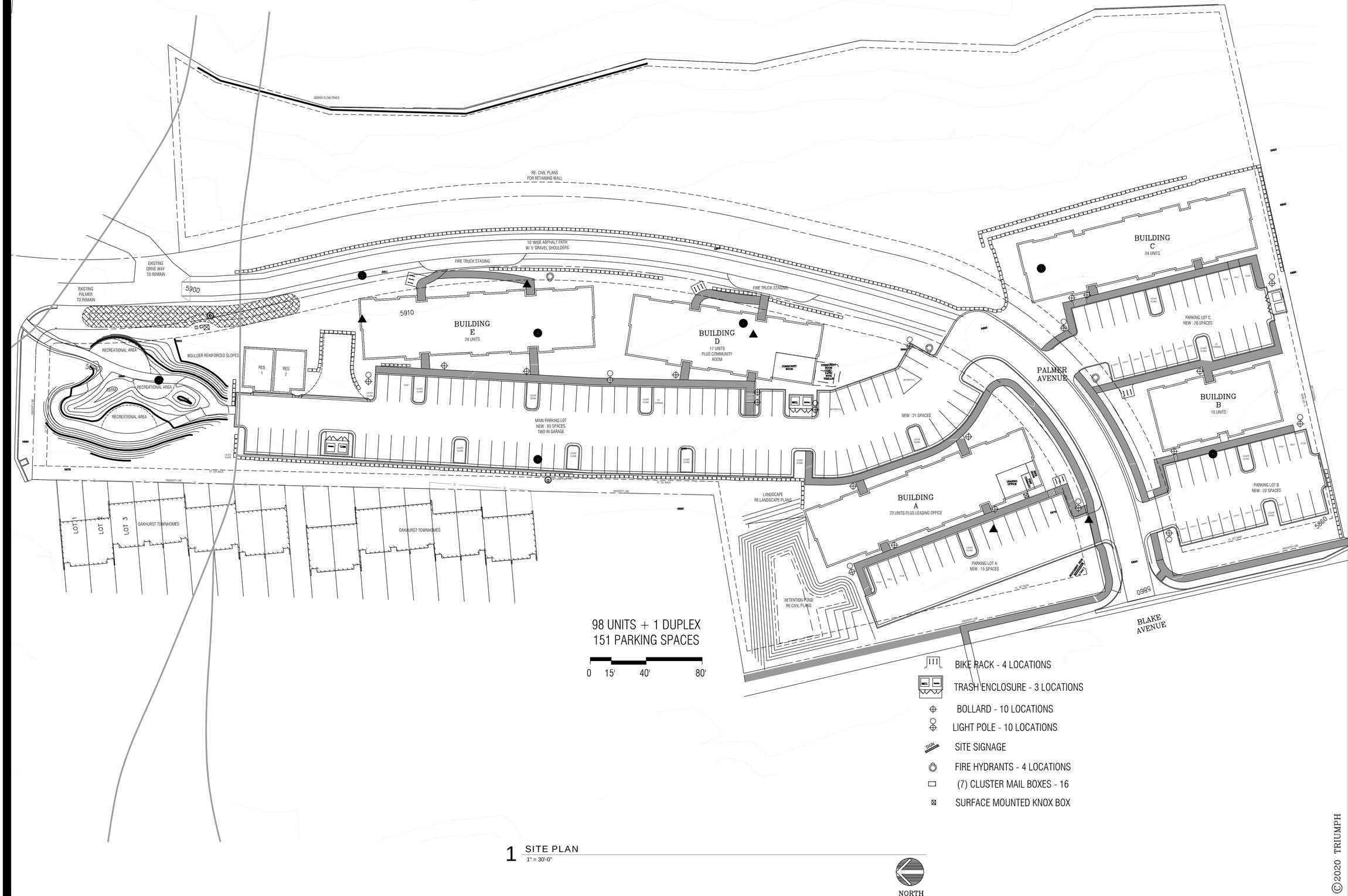
   Several participants with residences on and near Palmer supported the idea of speed control measures along Palmer, and no one opposed this alternative.

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

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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

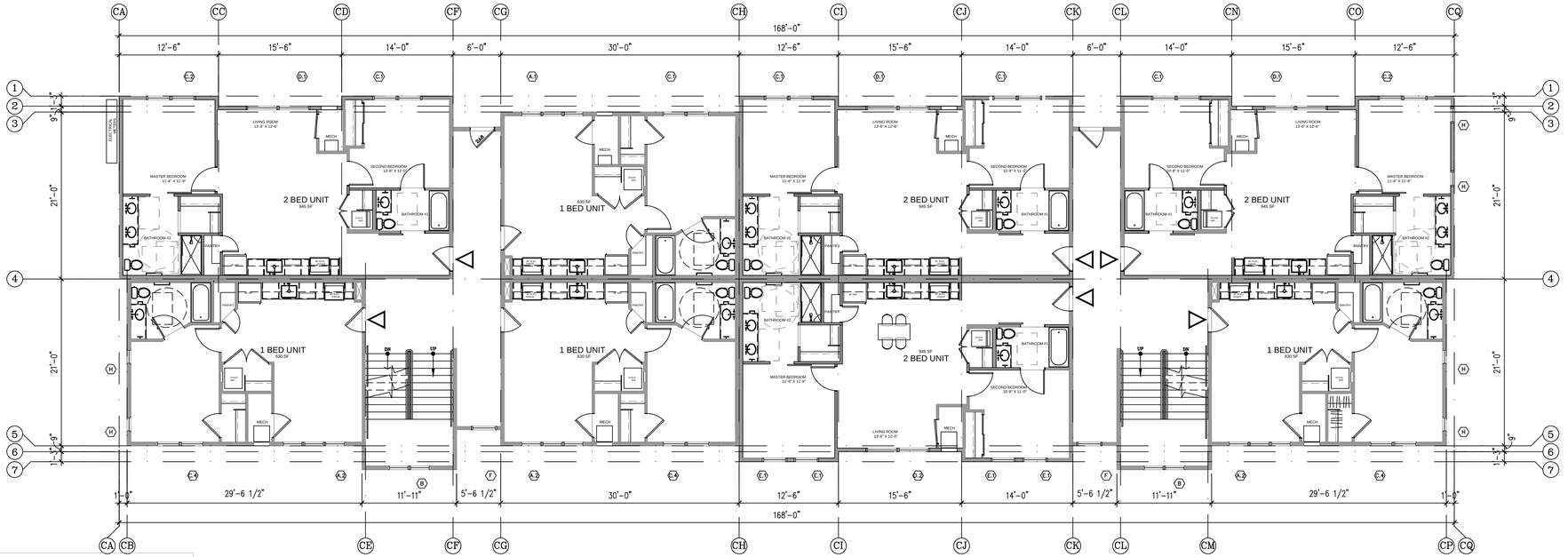
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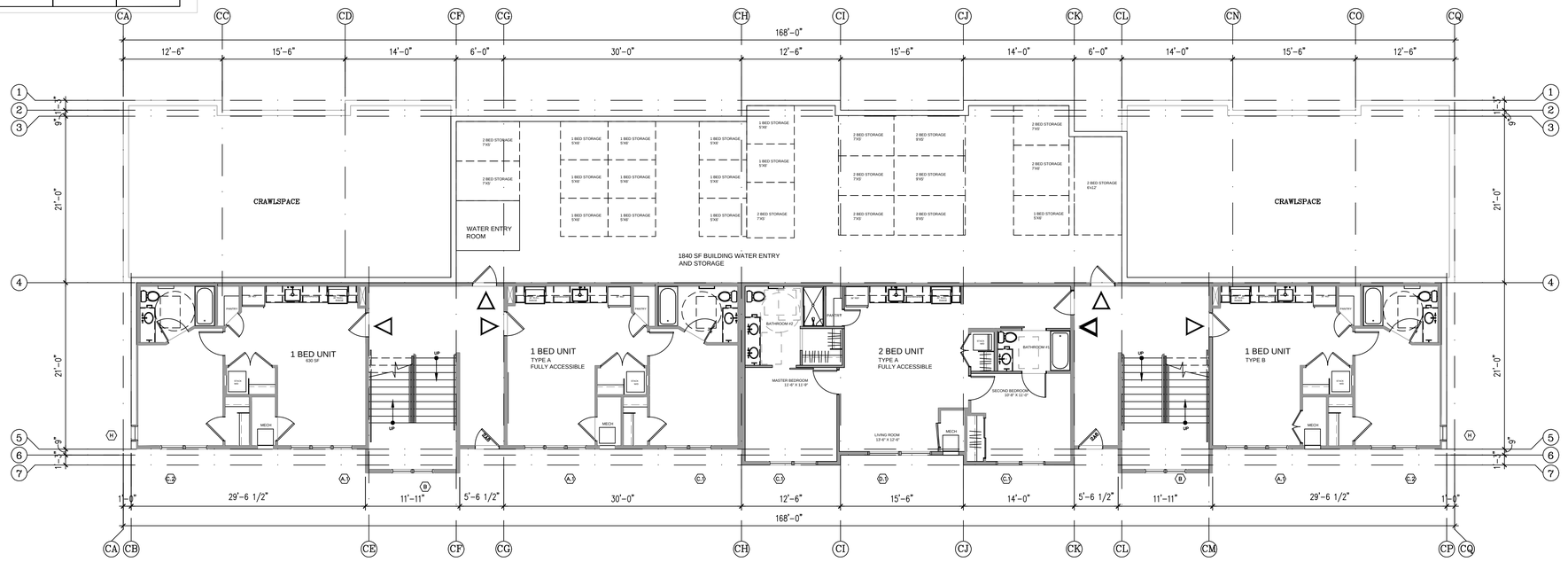
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BELL RIPPY APARTMENTS

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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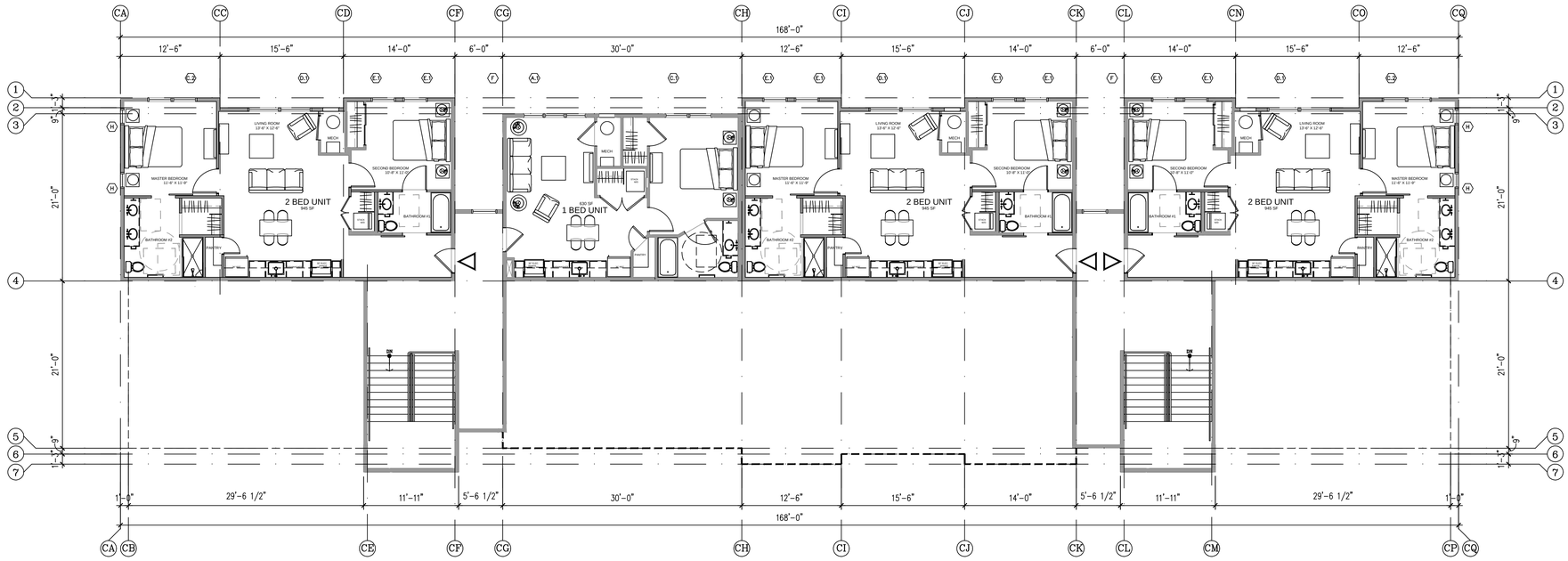
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revised PLAN SUBMISSION
4-20-20
DD
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5.1.20
MAJOR SITE
ARCHITECTURAL
revised PLAN SUBMISSION
6-16-20

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BUILDING
A
PLANS

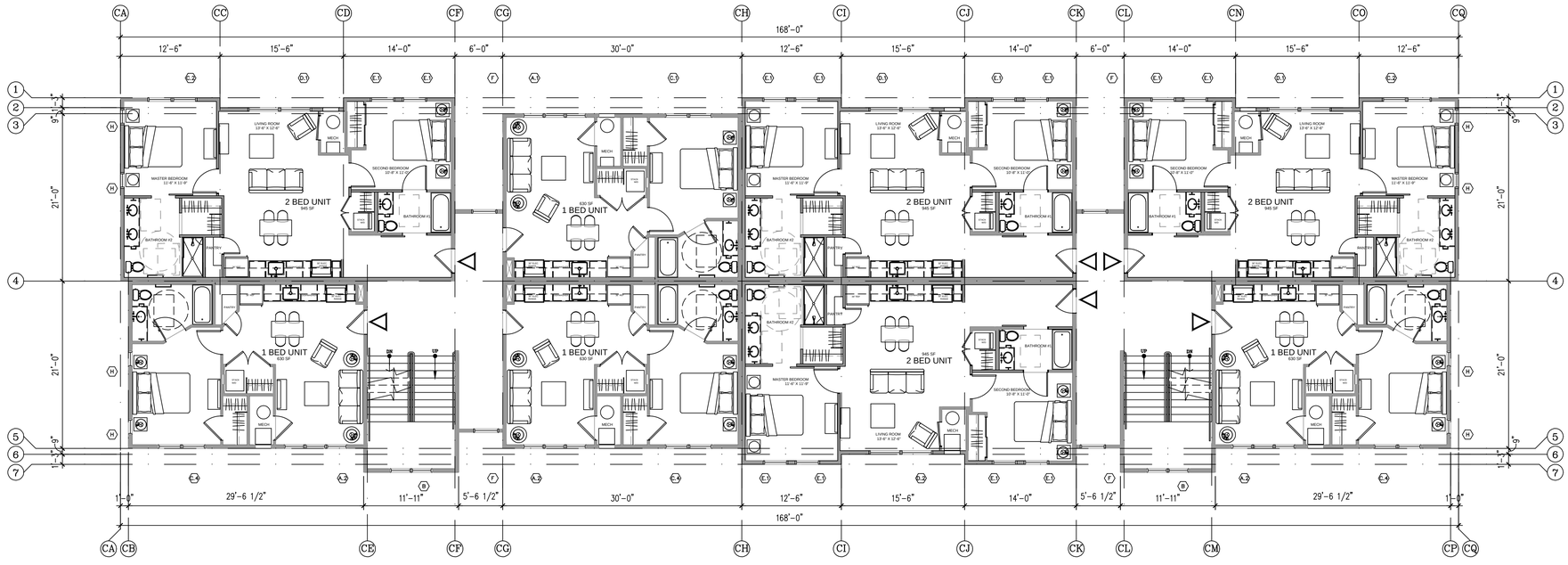
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4 BUILDING A - THIRD LEVEL PLAN
1/8" = 1'-0"



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

APARTMENT BUILDINGS - SCHEMATIC PLANS

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revised PLAN SUBMISSION 6-16-20

Sheet title
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Sheet AA2.1



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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Sheet title: BUILDING ELEVATIONS

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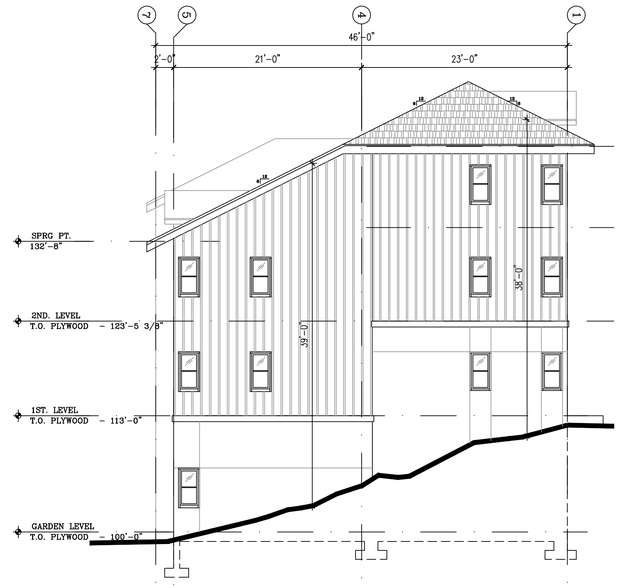
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BUILDING A - EXTERIOR FINISH SCHEDULE

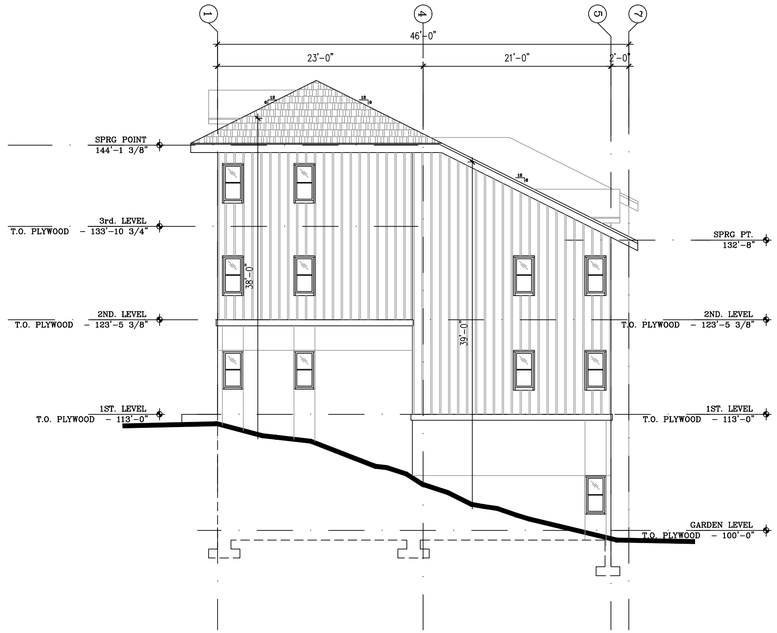
TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL 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 $\frac{4}{4}$ 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 @ ENTRY	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.

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



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

BUILDING A - ELEVATIONS

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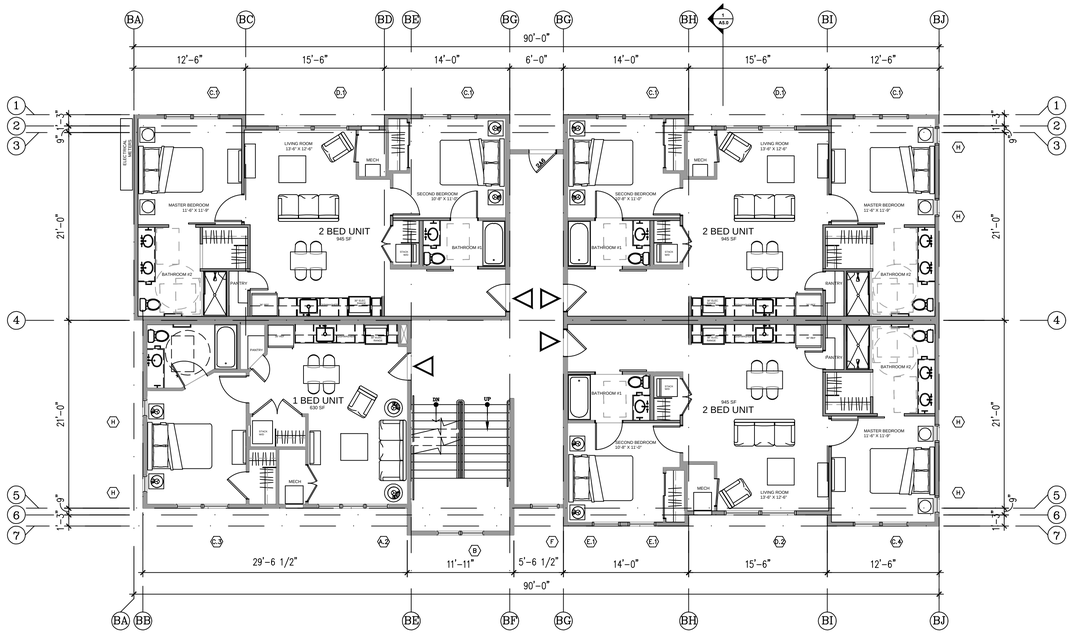
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MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20
DD PRICING PACKAGE 5-11-20
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 6-16-20

Sheet title: BUILDING ELEVATIONS

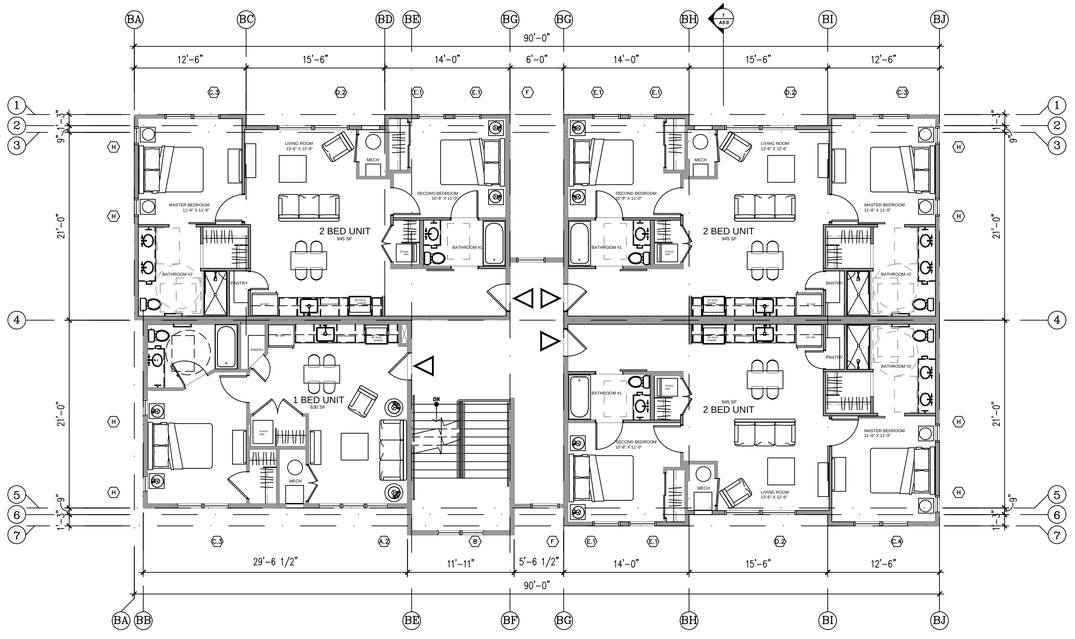
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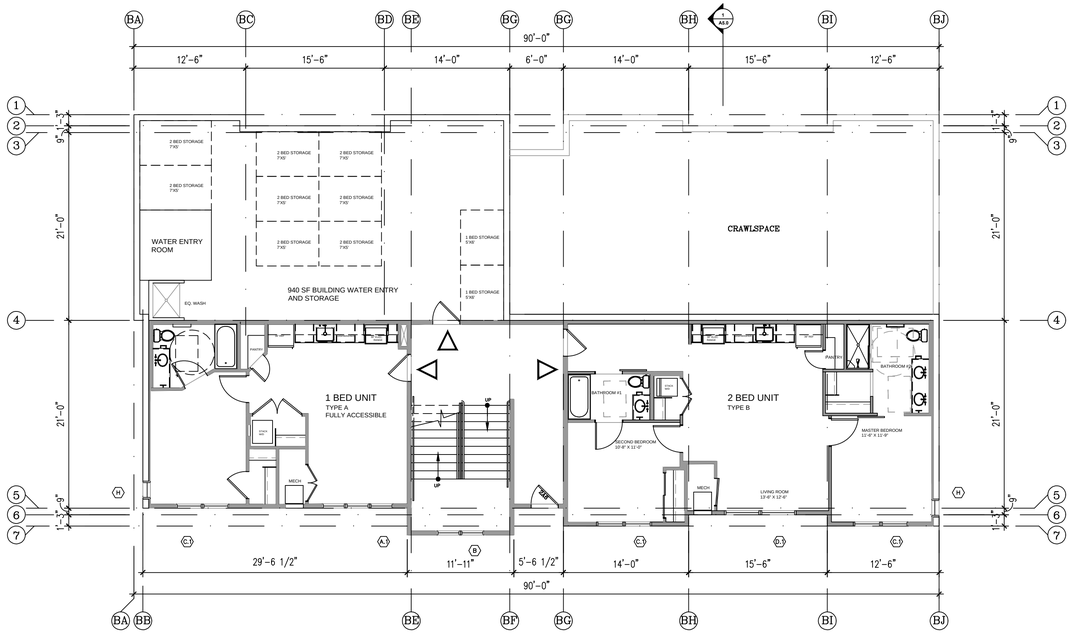
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2 BUILDING B - FIRST LEVEL PLAN
1/8" = 1'-0"



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

Sheet title
SCHEMATIC BUILDING B PLANS

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Project No:
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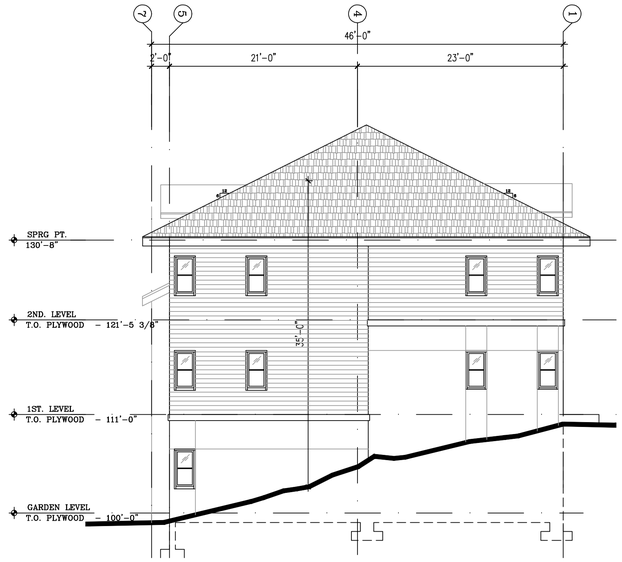
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BUILDING B - EXTERIOR FINISH SCHEDULE

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. 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.

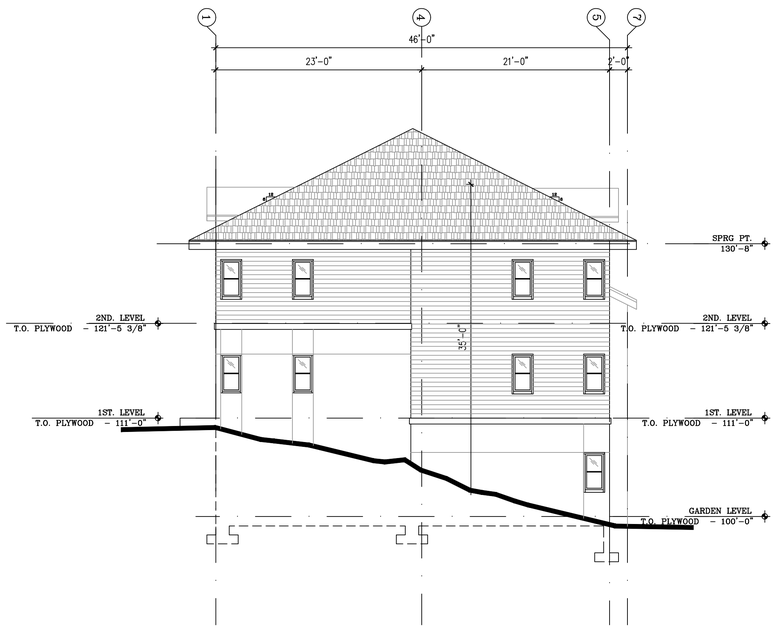
4. THESE ELEVATIONS ARE CONCEPTUAL IN NATURE, INDIVIDUAL BUILDING ELEVATIONS MAY VARY BUT WILL BE EVALUATED FOR COMPLIANCE WITH DESIGN STANDARDS CONTAINED WITHIN TITLE 070 OF THE GLENWOOD SPRINGS MUNICIPAL CODE AT THE TIME OF SUBMITTING A BUILIDNG PERMIT APPLICATION.



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



1 BUILDING - 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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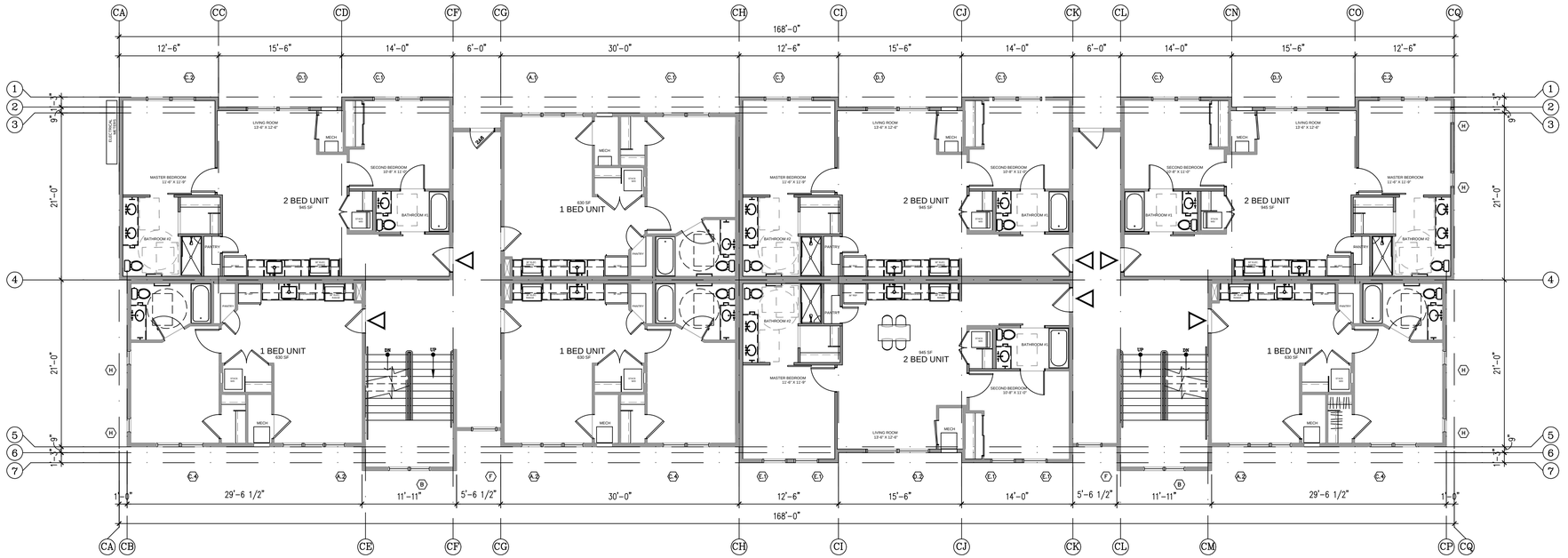
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MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 6-16-20

Sheet title: BUILDING ELEVATIONS

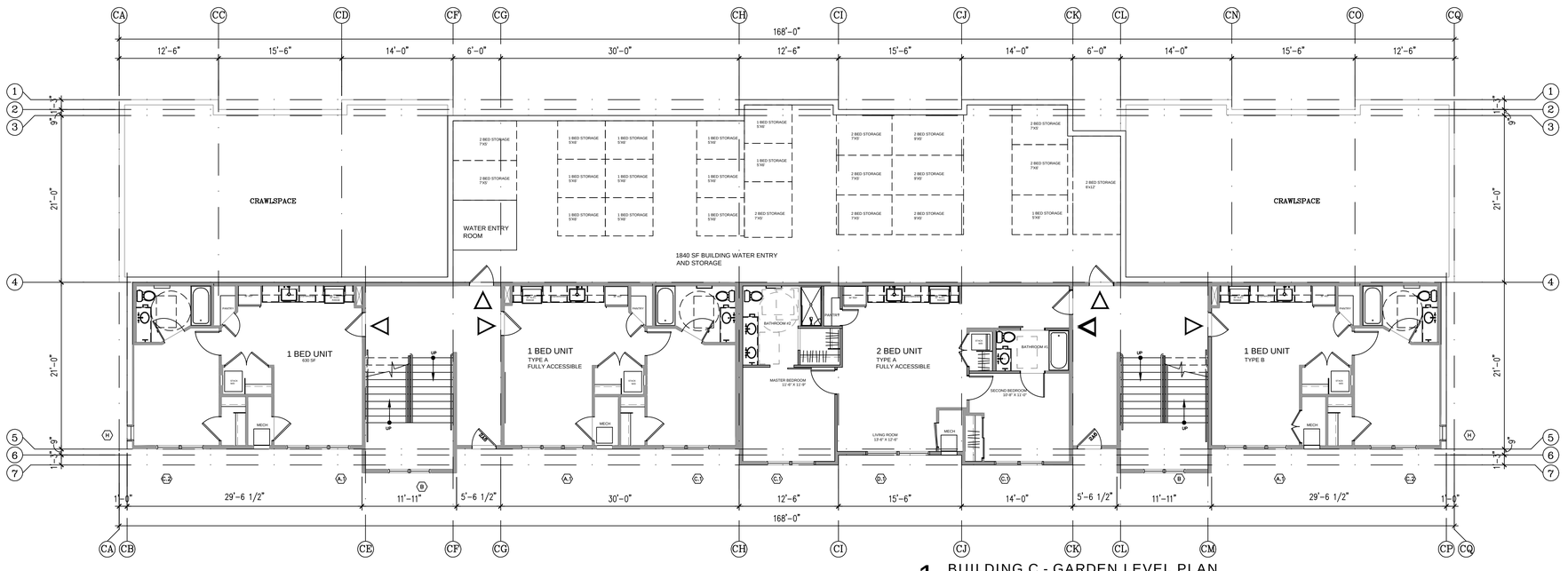
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Project No:
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Checked by: MEF

Sheet AB4.0



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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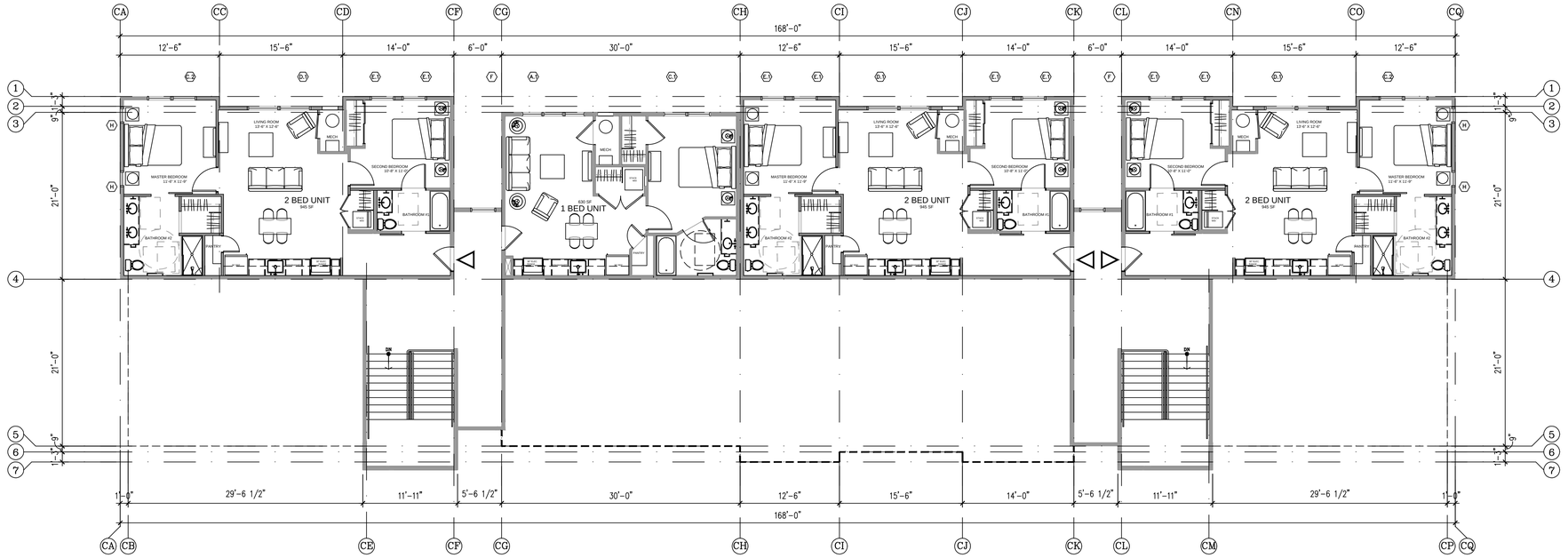
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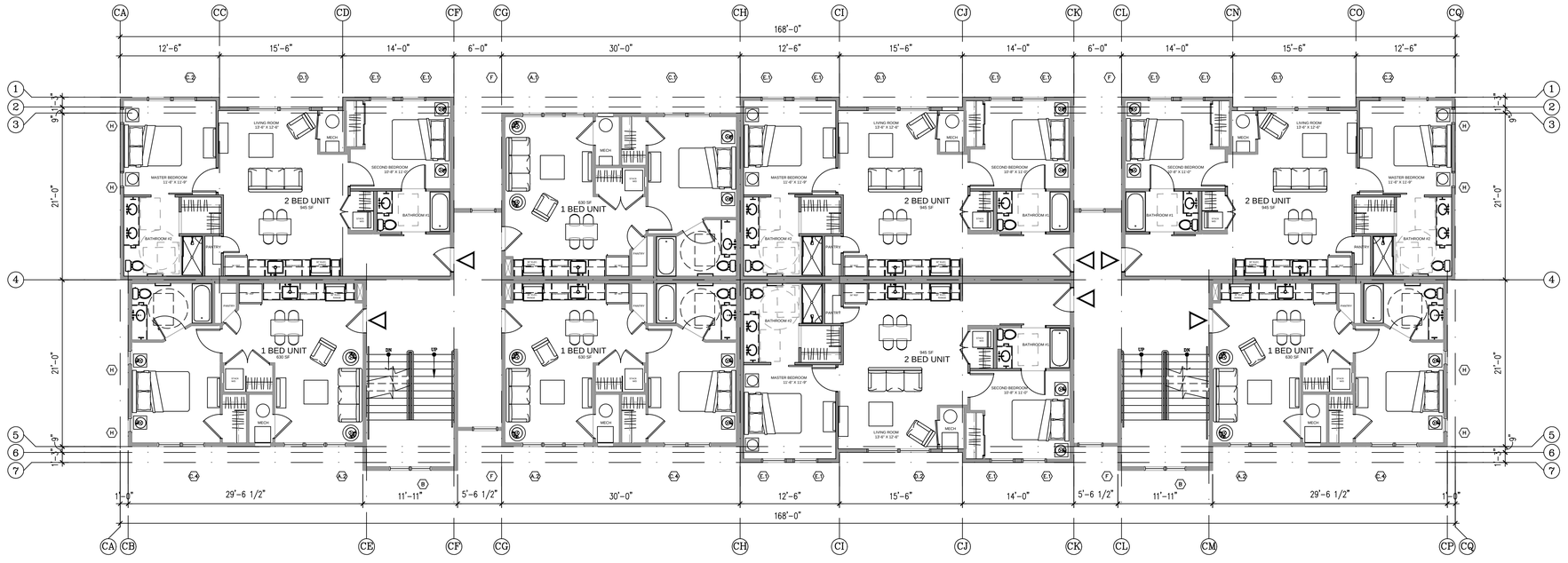
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Sheet AC2.0



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



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

APARTMENT BUILDINGS - SCHEMATIC PLANS

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Sheet title
SCHEMATIC BUILDING C PLANS

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Checked by: MEF

Sheet AC2.1

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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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.

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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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BELL RIPPY NEIGHBORHOOD
GLENWOOD SPRINGS COLORADO

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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Project No:
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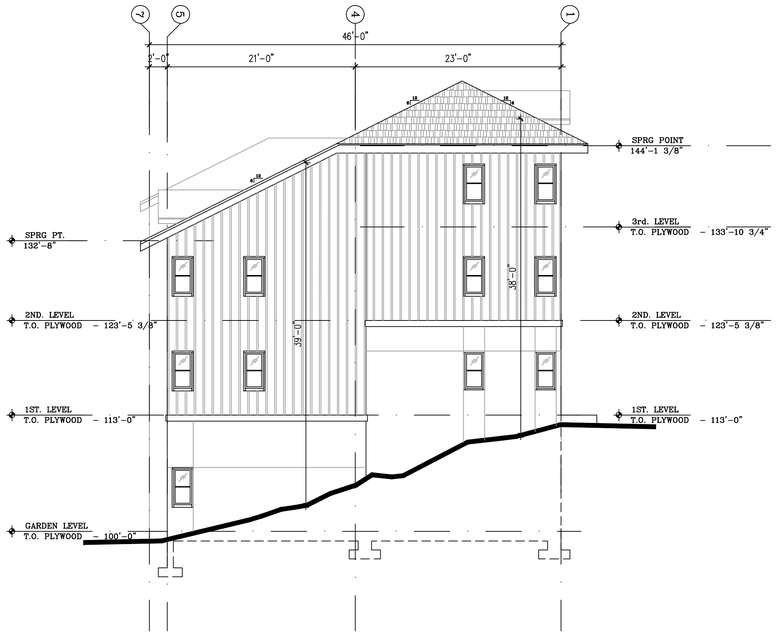
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BUILDING C - EXTERIOR FINISH SCHEDULE

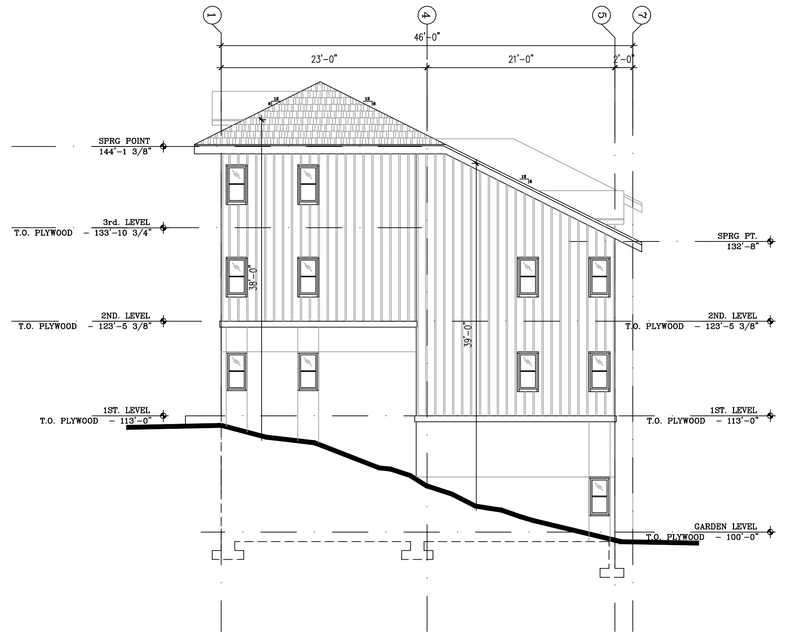
TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL 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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3 SOUTH ELEVATION
1/8" = 1'-0"



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

BUILDING C - ELEVATIONS

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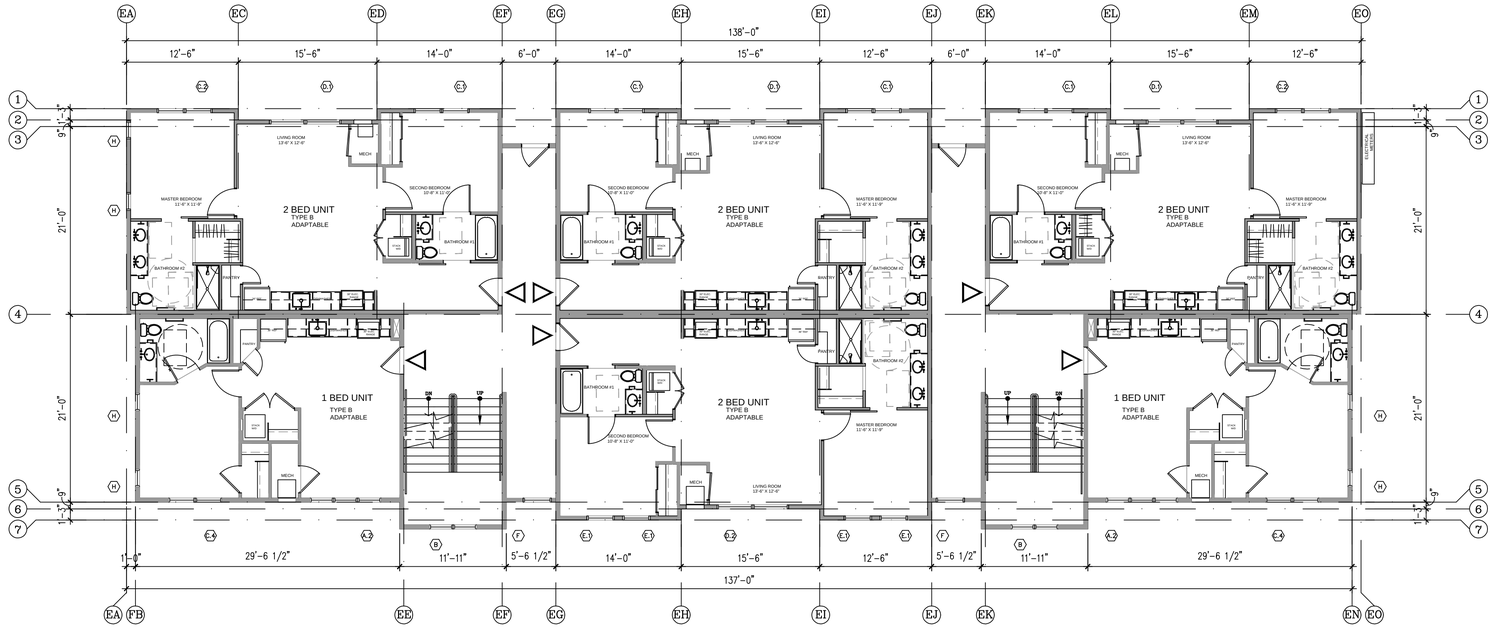
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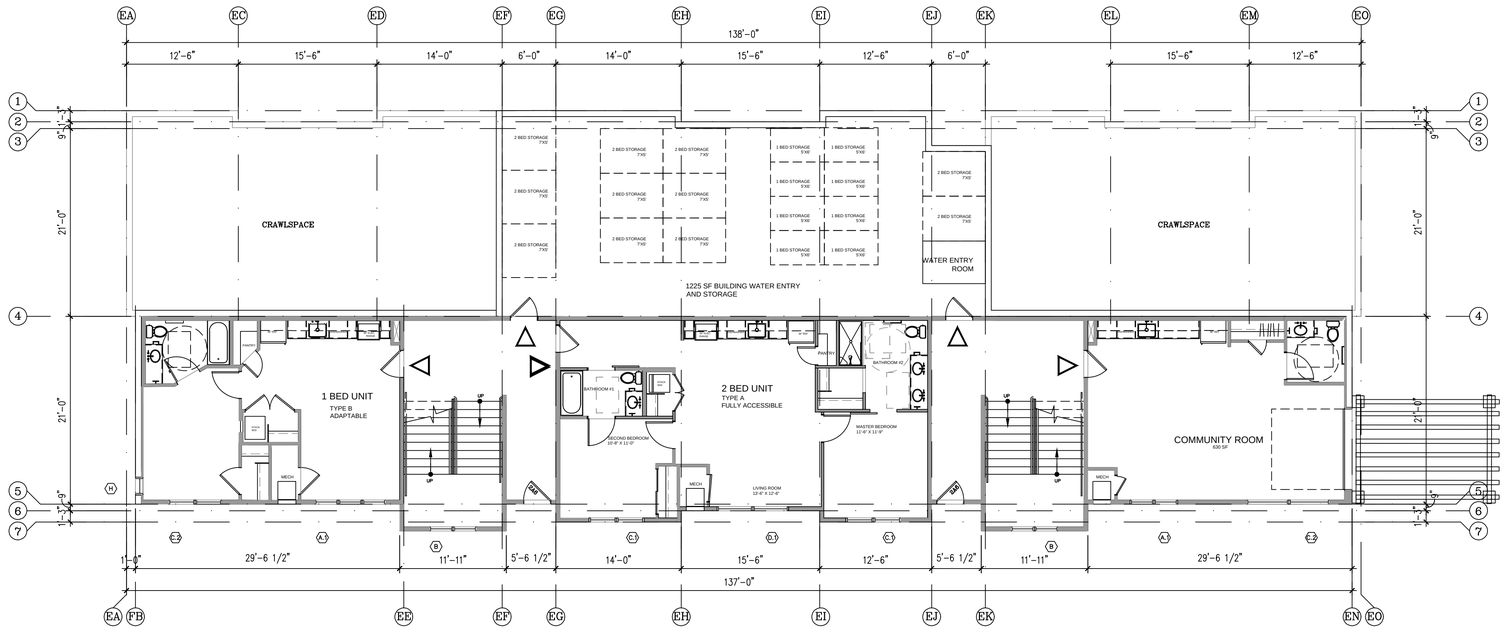
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2 BUILDING D - FIRST LEVEL PLAN
1/8" = 1'-0"



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

APARTMENT BUILDINGS - SCHEMATIC PLANS

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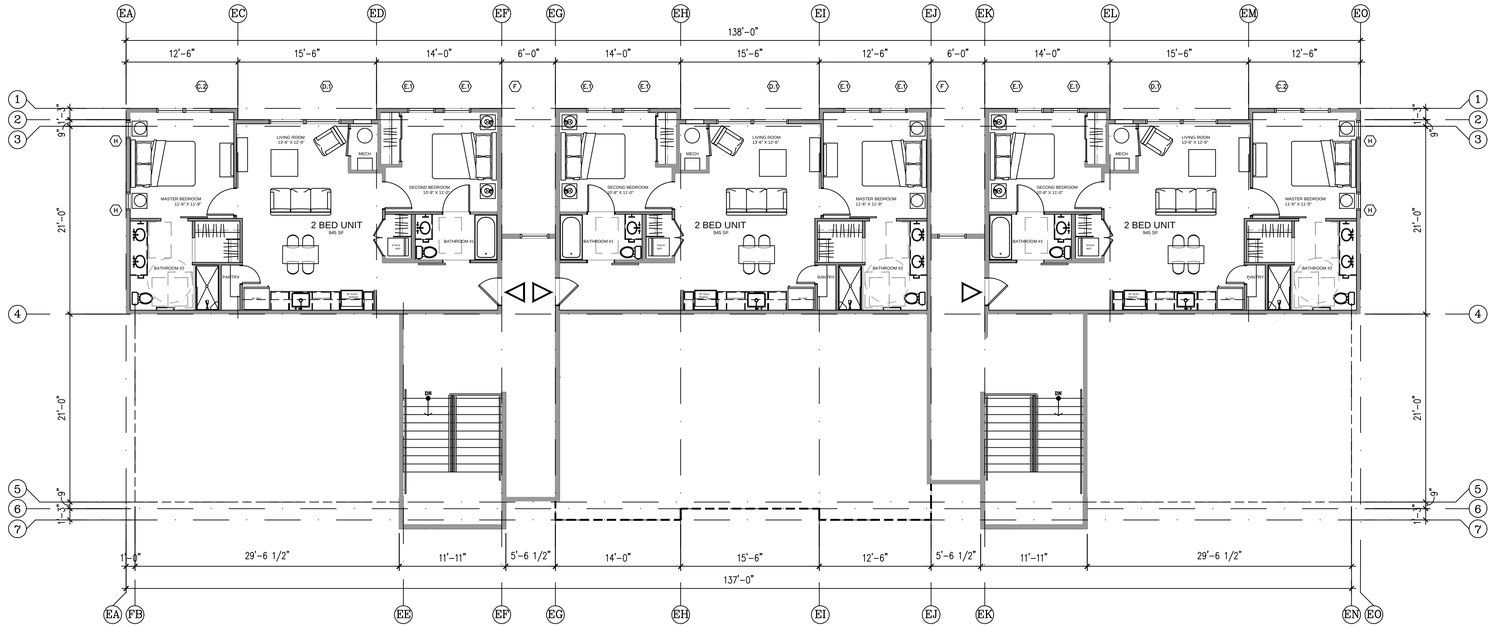
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SCHEMATIC BUILDING D PLANS

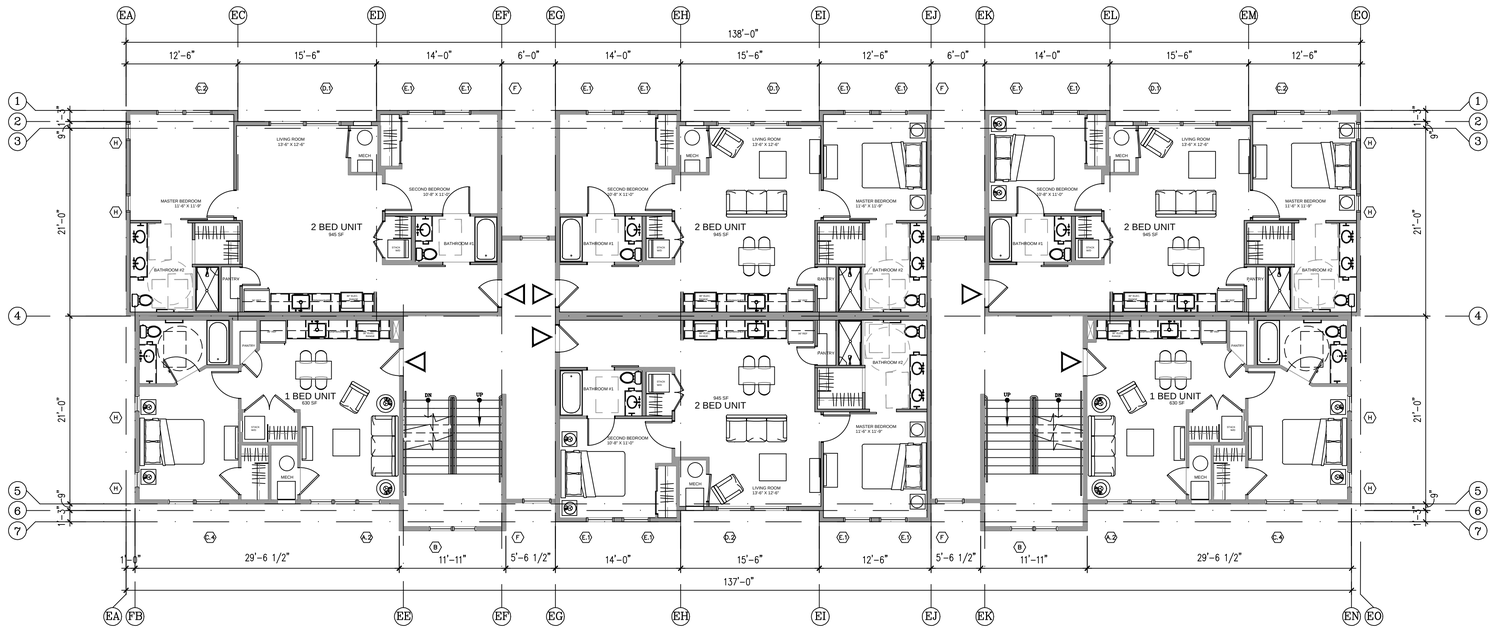
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4 BUILDING D - THIRD LEVEL PLAN
1/8" = 1'-0"



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

APARTMENT BUILDINGS - SCHEMATIC PLANS

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



2 EAST 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 - 4/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	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
W01	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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BUILDING D - ELEVATIONS

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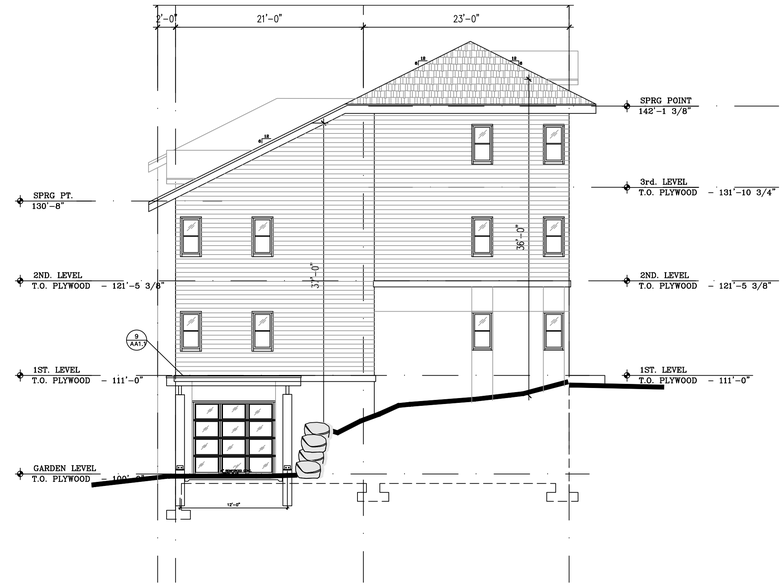
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BUILDING D - EXTERIOR FINISH SCHEDULE

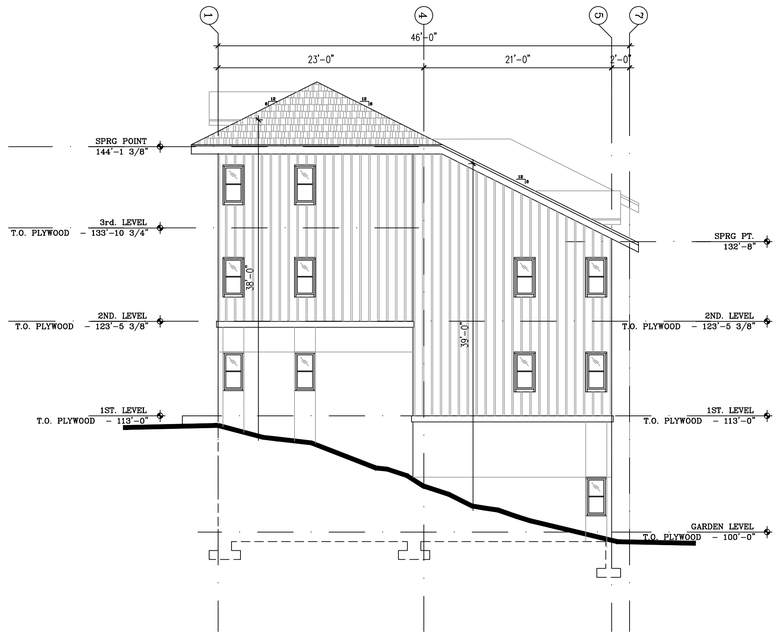
TAG	ITEM	MATERIAL	COLOR
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F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S3	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 5/16" X 7 1/4" 6" EXPOSED - @ WINDOW / 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 4/4 RUSTIC 3.5" RAILS 4/4 RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
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WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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3 SOUTH ELEVATION
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BUILDING D - ELEVATIONS

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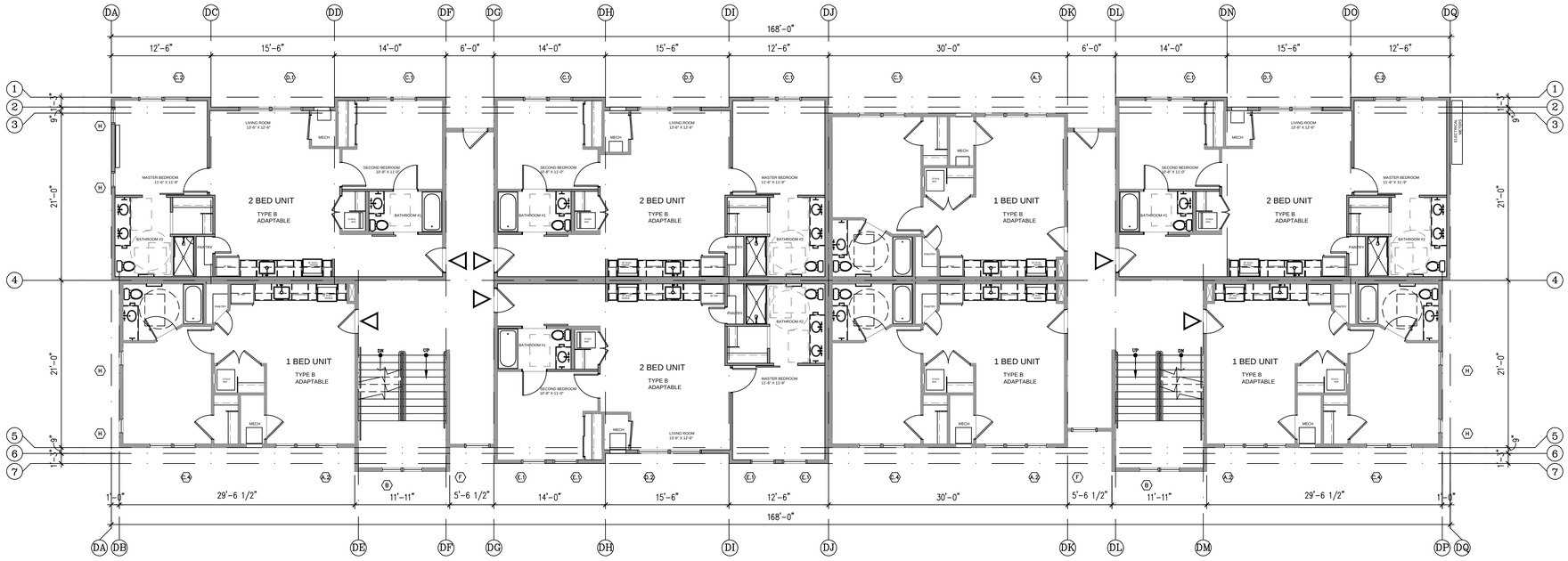
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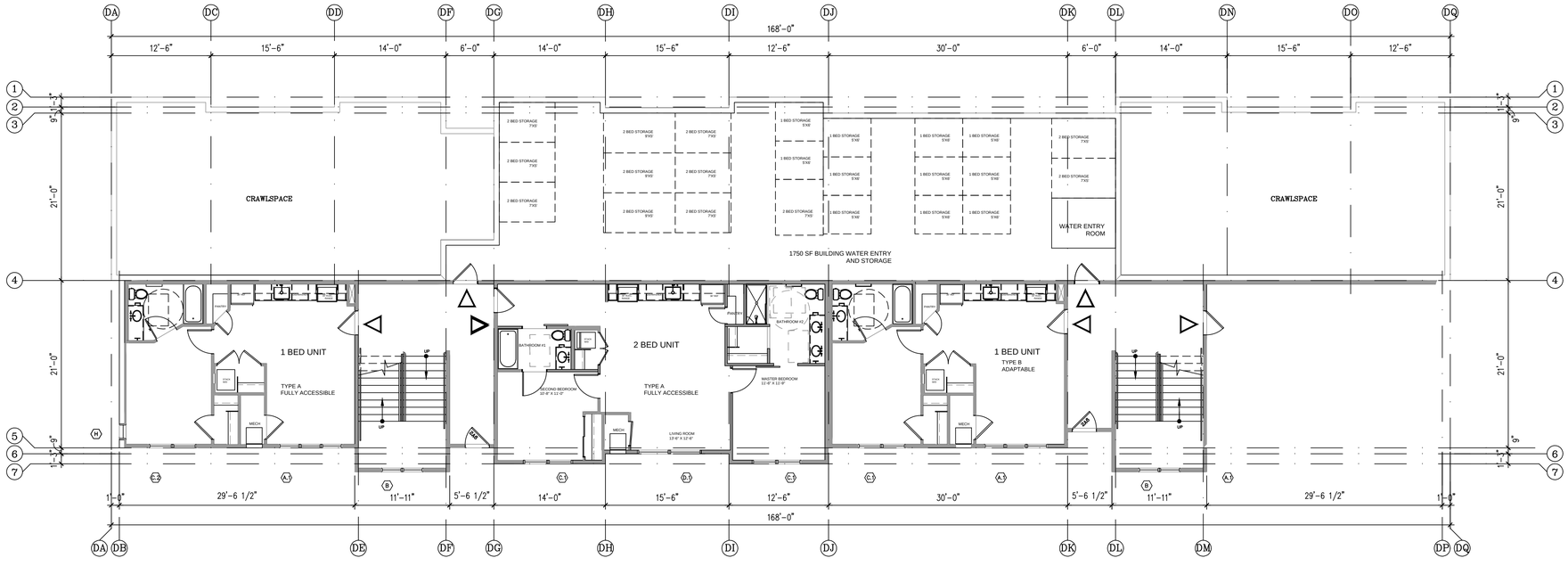
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2 BUILDING E - FIRST LEVEL PLAN

1/8" = 1'-0"



1 BUILDING E - GARDEN LEVEL PLAN

1/8" = 1'-0"

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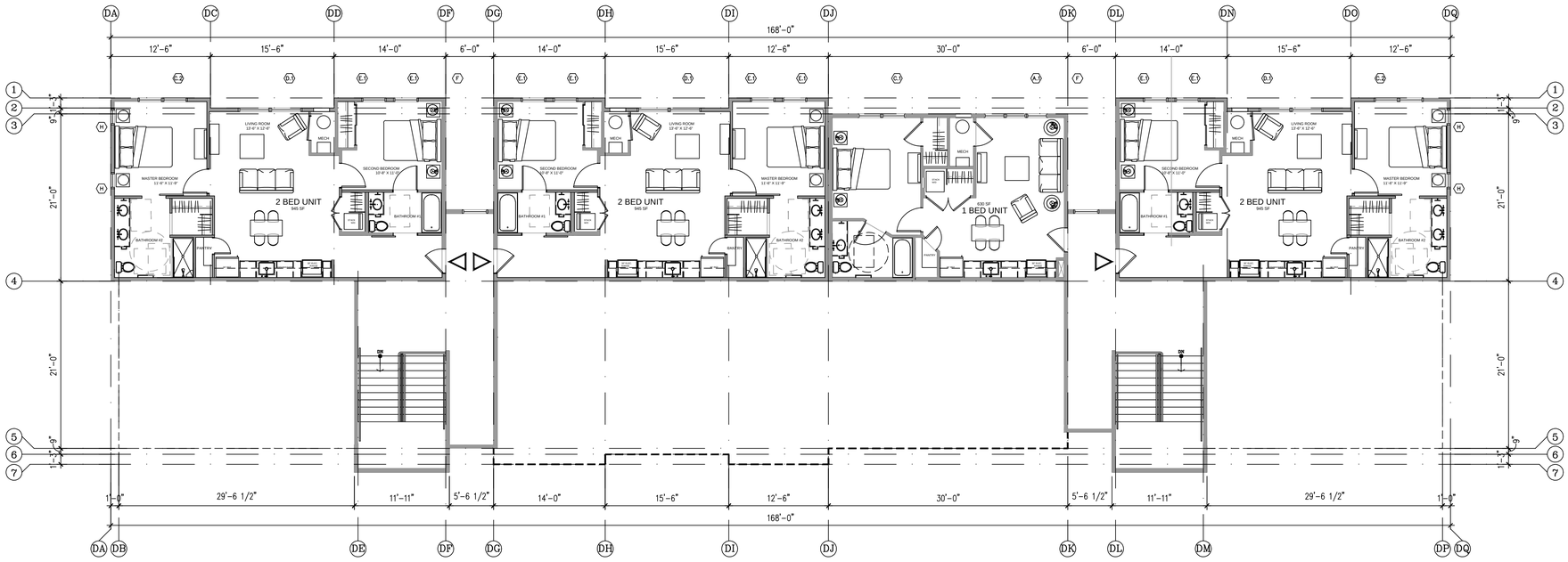
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SCHEMATIC BUILDING E PLANS

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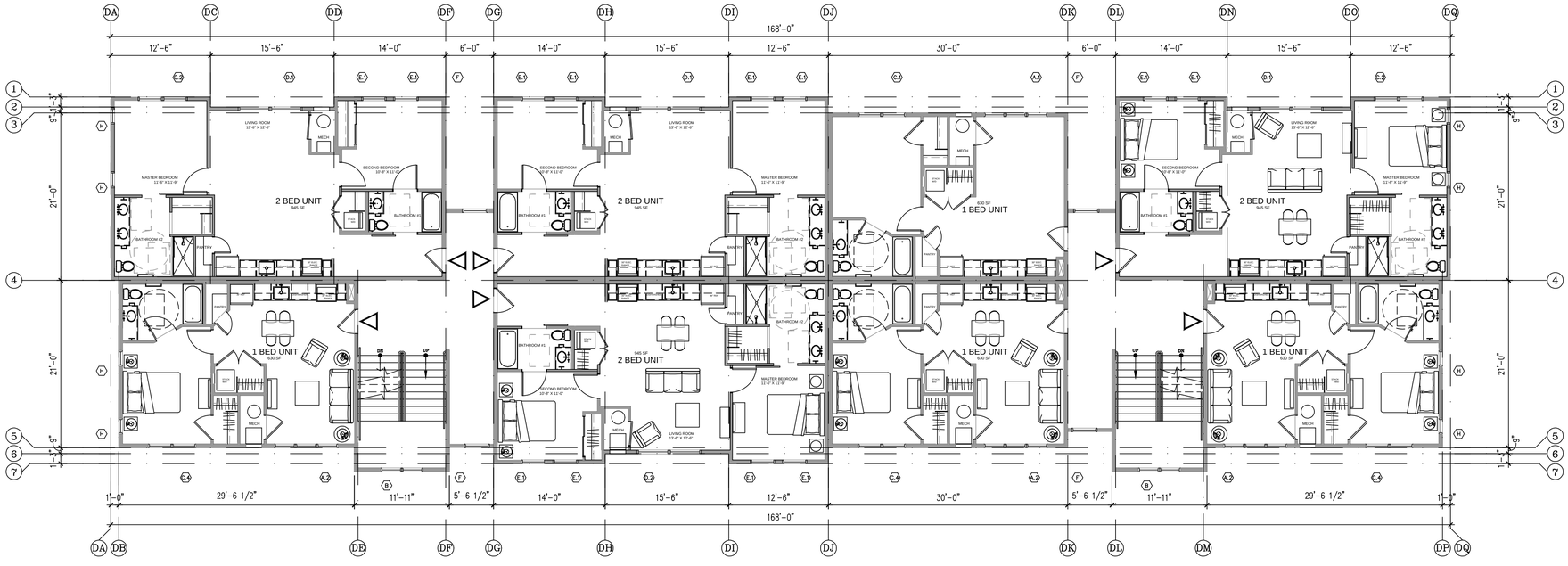
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4 BUILDING E - THIRD LEVEL PLAN
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3 BUILDING E - SECOND LEVEL PLAN
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BUILDING E - EXTERIOR FINISH SCHEDULE

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BUILDING E - ELEVATIONS

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GLENWOOD SPRINGS COLORADO

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

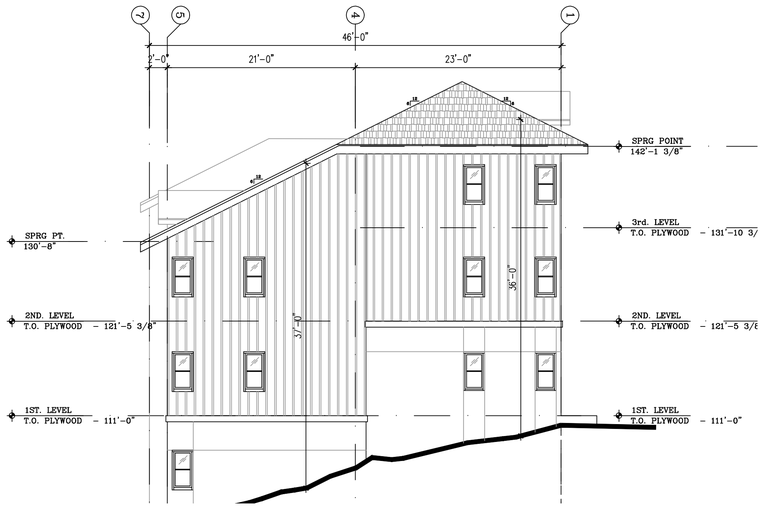
Sheet AE4.0

BUILDING E - EXTERIOR FINISH SCHEDULE

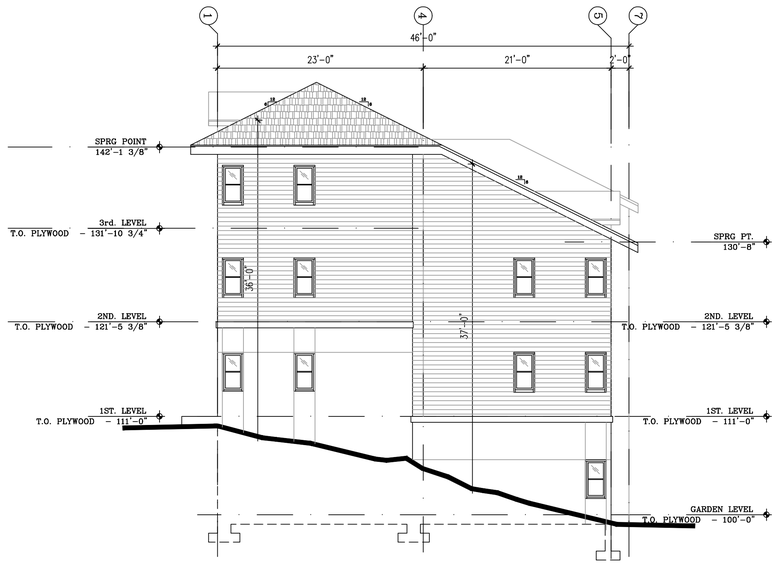
TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - 1/2" 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	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

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"



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

BUILDING E - ELEVATIONS

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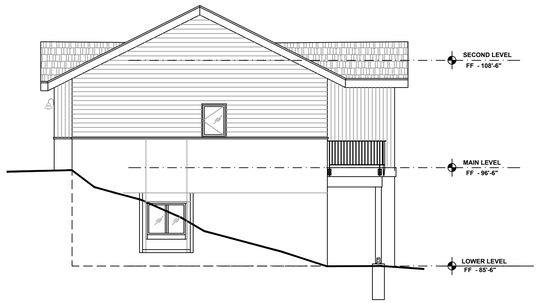
Sheet title: BUILDING ELEVATIONS

Stamp

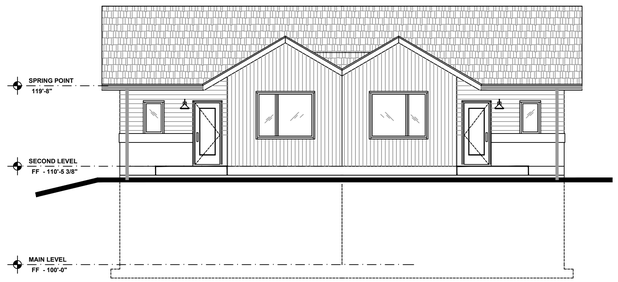
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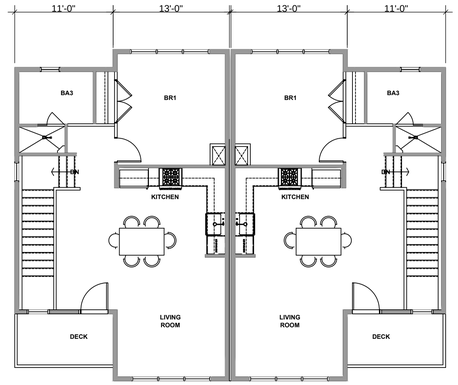
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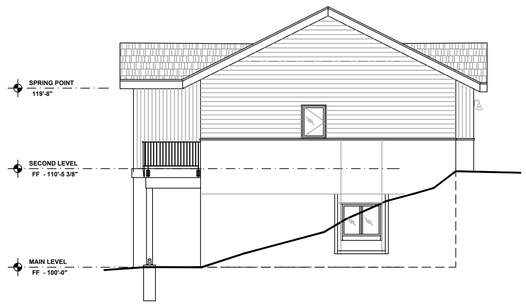
6 NORTH ELEVATION
1/8" = 1'-0"



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



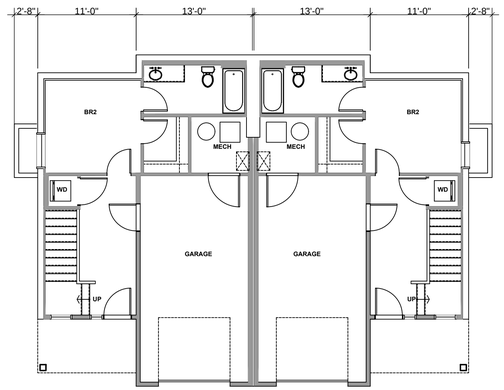
2 SECOND LEVEL PLAN
1/8" = 1'-0"



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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BELL RIPPY
NEIGHBORHOOD
GLENWOOD SPRINGS COLORADO

Revisions:
MAJOR SITE
APPLICATION/FINAL
PLAN PRE-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

PALMER AVE.

OFFSITE STORMWATER DEFLECTION BERM

BIKE RACKS

BUILDING E
24 UNITS

BUILDING D
17 UNITS
PLUS COMMUNITY ROOM

BUILDING C
24 UNITS

GARDENS AT ENTRY AREAS

PARKING LOT C
NEW : 26 SPACES

TRASH

RES 1

RES 2

1/2 COURT BASKETBALL

SEATING AREA

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

NEW : 21 SPACES

BUILDING B
10 UNITS

PARKING LOT B
NEW : 23 SPACES

BUILDING A
23 UNITS PLUS LEASING OFFICE

ACCENT PARKING ENTRIES

PROJECT SIGN

PARKING LOT A
NEW : 15 SPACES

STORMWATER DETENTION

BLAKE AVENUE

26TH. STREET

ZONE A

ZONE D

MIXED EVERGREEN, ORNAMENTAL TREES BUFFER

LARGE SHRUB BUFFER OVER UTILITY EASEMENTS

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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GLENWOOD SPRINGS COLORADO

Revisions: DD SET

Sheet title: MASTER LANDSCAPE PLAN

Stamp

Date: 06/15/2020
Project No:
Drawn by: OSLA
Checked by: 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: 06/15/2020
Project No:
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Sheet L1.1



LEGEND

- SHADE TREES
- EVERGREEN TREES
- ORNAMENTAL TREES
- SHRUBS
- ORNAMENTAL GRASSES
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- 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:
Drawn by: OSLA
Checked by: SG

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.

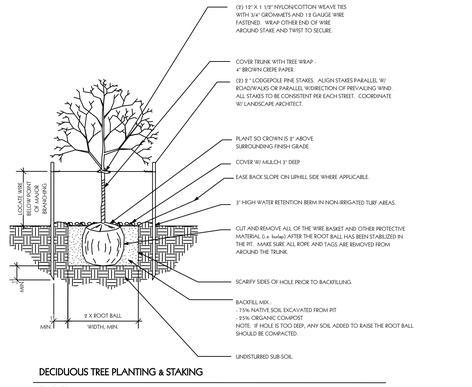
6. All shrub bed areas shall be mulched with wood bark mulch over weed barrier fabric to a depth of 4". Perennials and groundcover areas shall be mulched with a 3" layer of shredded bark mulch. No weed barrier in perennial/annual areas.

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.

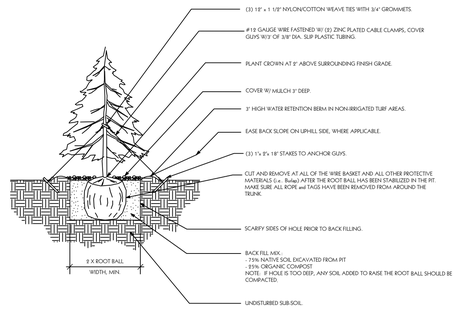
9. Contractor shall verify all material quantities prior to installation. Actual number of plant symbols shall have priority over the quantity designated.

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



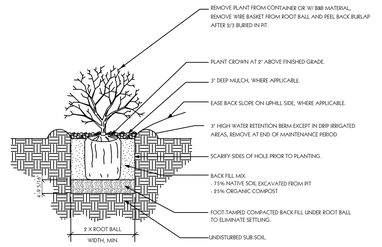
DECIDUOUS TREE PLANTING & STAKING

SCALE: NTS



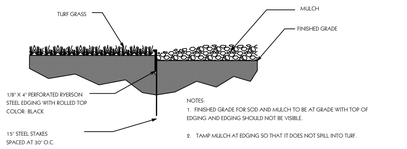
EVERGREEN TREE PLANTING & STAKING

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**

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.

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

MINUTES
City of Glenwood Springs
Planning and Zoning Commission
Regular Meeting
May 5, 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 February 25, 2020 minutes.**

   At previous meeting Commissioner Grosscup had requested a review of the minutes.

   Motion: Commissioner Dehm made a motion to receive the minutes, seconded by Commissioner Schachter. Motion passed with Shaver and Schachter abstaining.

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

DRAFT

4. New Items –

a. 11-20 Consideration of various amendments to Municipal Code Title 070 Sections 070.030, 070.040 and 070.070 regarding Use Regulations; Accessory Uses; Hillside Development; Landscaping, Screening and Fencing; Off-street Parking; Residential Site and Building Design Storage requirements; Signs; and Rules of Construction and Definitions

Assistant Community Development Director presented on the proposed changes to the municipal code. The following changes to the municipal code were proposed by Ricehill:

- Change to Code 070.030.020(e) Table of Allowed Uses. Proposal to create a new zoning use for "Craft Manufacturing" and propose to add it to all current commercial and industrial zoning categories. This use would include smaller manufacturing uses such as cabinetry, blacksmithing, and other small manufacturing uses.
- Change to Code 070.030.040 Accessory Uses and Structures. Proposal to allow backyard chickens as an allowed accessory use in Planned Unit Developments (PUD) unless specifically identified as a prohibited use in the PUD.
- Change to Code 070.040.050 Landscaping, Screening, Fencing. Proposal to reduce the amount of shrubs and perennials required in development proposals. Proposed to go back to previous code requirements for shrubs and perennials. Also proposed to reduce amount of required landscaping in I2 and I1 districts, as it is currently 20% which is greater than commercial zoning districts.
- Change to Code 070.040.050(f)(2)b Landscaping, Screening, and Fencing: Fence Standards and Fence materials. Proposal to amend code to allow chain link fencing in front and side yards in industrial zone districts if plants are added to base of fence when bordering public right-of-way.
- Change to Code 070.040.080(e) Residential Site and Building Design – Residential Building Design and Character. Proposal to correct formatting and change required storage for multifamily developments from 100 square feet per unit to a requirement of 1 cubic foot of storage per 3 square feet of gross floor area per unit.
- Change to Code 070.040.110 Signs. Proposal to add signs that are not visible from the public way to be added to list of signs not requiring a permit. Proposal to remove electronic message signs from the code per previous Council direction.
- Change to Code 070.040.060(h) Parking and Loading Area Use and Design. Proposal to require same number of trees per parking spaces and allow more flexibility with configuration of landscaping areas to be more flexible with installations of bioswales and rain gardens.

Commissioner Wussow asked how striking electronic messages from the code would affect existing electronic message board signs. Ricehill confirmed that those signs would be considered legal non-conforming signs going forward.

Commissioner Cipperly asked to clarify the required location of the landscaping screening for the chain link fencing in industrial area. Commissioner Dehm asked if landscape screening could be placed in public right of way.

DRAFT

Commissioner Grosscup asked if signs not visible from the public way would require a sign permit, and whether that would have any effect on sign lighting. Commissioner Wissing had questions regarding craft manufacturing and how it would relate to a mixed use or residential zone and home occupation uses and what scale of manufacturing was intended by the definition.

Commissioner Schachter asked to clarify the definition of bioswales. Commissioner Cipperly had a question about the tree islands and if those spaces could be permeable surfaces. The Commission requested clarification of the intent of shading a parking lot.

The Commission asked that 3-d printing be added to the craft manufacturing definition.

Chairman Dehm opened public comment. No public comments.

Commissioner Grosscup moved to approve item 11-20, motion with the noted modifications and clarifications, seconded by Commissioner Wussow. Commissioner Wussow asked if there was a need to modify any of the amendments, if that would be possible to do at a later meeting regarding these amendments.

Motion carried unanimously.

5. Continued Items from April 28, 2020

a. *07-20 Consideration of a request to Rezone a parcel from RH-Residential High Density to M2-Mixed Use Commercial Central Core zone district. The property is Lot 11B, Glenwood Meadows No. to a Minor Re-subdivision of Glenwood Meadows No 4 Lot Line Adjustment, County of Garfield, State of Colorado (PIN 2185-081-41-004)*

Assistant Director Ricehill indicated that since this issue was discussed at the previous meeting, there had been no submitted public comments.

Commissioner Dehm opened public comments. No public comments.

Commissioner Schachter made a motion to approve the request with the findings and conditions listed on page 8 of the staff report. Commissioner Shaver seconded the motion.

Motion carried unanimously.

b. *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)*

Senior Planner Trent Hyatt provided an update as several items had been added to the application packet to address comments from the public and Planning Commission at the previous meeting. One question that was addressed by the applicant was the revision of a site plan showing parking options for electric vehicles. Additional drawings showing elevations between the existing Oakhurst Townhomes and proposed development were also added.

Public comments received between the previous meeting and 5/5/2020 were also added to the application packet. The following public comments were read into the record:

- David Turtle, no address given, expressed concerns over the effect of increased traffic on Blake and Palmer, especially given the current physical condition of the streets. Requested that Planning & Zoning deny the application.
- Lisa Menzano, 23rd & Palmer, expressed concern over scale of project and would prefer the space to remain open. Request Planning & Zoning to deny application
- Christine Smalley, no address given, expressed concerns over the amount of parking provided, increased traffic, and lack of sidewalks. Requested that Planning & Zoning deny the application.
- Janet & Richard O'Connell, 2409 Palmer Avenue, expressed concerns that current roads will not support future development and expressed concerns over parking, traffic, sidewalks. Requested that Planning & Zoning deny the application.
- Joan Troth, 3202 Cooper Court, expressed concerns over the scale of the project and size of the buildings, increased traffic, and decreased home values in the neighborhood. Requested that Planning & Zoning deny the application.
- Sara Simms, representing Mountain Valley Developmental Services, located at 2503 Palmer Avenue. Mountain Valley Developmental Services operates a home at this property for individuals with intellectual and development disabilities. Simms expressed concern that this project would increase traffic density in the neighborhood and expressed concern over the safety of the home's residents. Requested that the applicant extend street improvements through the neighborhood and increase safety measures for pedestrians in the neighborhood.
- Elaine Speck, 2506 Palmer Avenue, expressed concerns regarding density of the project and increased traffic in the neighborhood. Speck also suggested that the project application was tabled until after the COVID-19 crisis.
- Laura Speck, 2506 Palmer Avenue, requested Planning & Zoning Commission deny or postpone the decision on the application citing that many residents have been unable to follow the project or express their concerns adequately due to the online formats. Also expressed concerns over project density and proposed parking lot which would face the Speck residence. In addition, also expressed concern over possible change to their driveway configuration due to changes to Palmer. Speck also suggested that the project remove the north parking lot, reduce the number of units, and install adequate parking signage.
- Public comment received on behalf of multiple residents of the neighboring Oakhurst Townhomes including Laurie Nelson of Oakhurst #34, Dulce Ramirez of Oakhurst #33, Bianca Ramirez of Oakhurst #33, Bradley Rice of Oakhurst #10, Brandy Rice of Oakhurst #10, Unidentified of Oakhurst #10, Drake Timroth of Oakhurst #7, Kristen Levey #7, Unidentified #7, Steve [unknown last name]#28, Erica Crampton #28, Marie Dohm #4, George Dana #1, Shelly Lott #19, Joan Guilianelli #15, Brianna Millspaugh #18, Zachary Apke #18, Daisy Apke #18. This letter expressed concerns over increased traffic,

parking, physical condition of neighborhood roads, and project density.

- Annie Hoghuag, 678 Country Road 127, owner of 519 Easy Street. Annie expressed concerns over the amount of parking provided in the project. Requested that the City reconsider parking requirements.
- Dave Malehorn, 2407 Palmer Avenue, expressed concern over the project density, lack of sidewalks in the neighborhoods, neighborhood road conditions, parking, snow removal plan, and potential overall impact of the development on the neighborhood. This public comment had additional attachments that were unable to be read into record.
- A public comment from Allison Brett, 2201 Crestwood Drive, was submitted in the form of a Powerpoint. The presentation was shown by sharing a screen over Zoom. The slides were then read by the presentation author. Brett expressed concerns regarding traffic spillover and potential pollution from Highway 82 due to opening the Blake Gate, potential increased traffic, current road conditions, and pedestrian safety
- Joan Guilainelli, Oakhurst Townhomes, Unit #15 expressed concern over project density, physical proximity to Oakhurst and lack of fence, and decrease of open space in the neighborhood.
- Lynette Marie Lacerda, 285 Mikala Lane, New Castle, Colorado and former resident of 1814 Ouray Road, Glenwood Springs, Colorado. Lynette expressed concern over parking for the project.
- Ryan Roberts, 2419 Palmer Avenue, expressed concerns over the public involvement in the project especially concerning the capacity of residents of the neighborhood to communicate with one another and engage with the City given the current health crisis. Roberts suggested that the meeting and decision be postponed to a future date.
- A. David Cox & Cynthia Green, 2504 Palmer Avenue, submitted concerns regarding the public input process and expressed that the hearing should be delayed until an in person public hearing can be held. Concerns were also expressed regarding project density, parking, and rezoning of property at 2710 Blake as part of the project. Also questioned if these units were needed citing other multi-family developments in Glenwood Springs.
- Erin and William Lee, 2402 Palmer Avenue expressed concerns over the public input of the project and how COVID-19 limits communication regarding meaningful conversations about this project. Requested to postpone a decision until more personal forms of communication and meetings can occur.
- George Dana, Oakhurst Townhomes, expressed concerns over project size and density, parking, traffic, flood debris control, water flow, fencing, light pollution, pedestrian safety, snow removal, and open space. Requested Planning and Zoning to deny application.
- Lynn B Cary, 2405 Palmer expressed concerns regarding traffic, gating Palmer, increased density and inadequate parking.
- Scott Kramer, 2501 Palmer Avenue, expressed concerns regarding current road conditions, pedestrian safety, traffic overflow from Highway 82, opening of Blake Gate, and concern over public input process and use of Zoom platform during COVID-19.

Commissioner Dehm then opened the public comment to any meeting attendees.

- Frank Martin, 805 Crestwood Drive. Prior to comments Martin disclosed that he is the spouse of City Council member Paula Stepp and that his comments reflect his own

opinions. Expressed concerns over current conditions of Palmer Avenue and possible increase in traffic.

- Jamie Raehal, 2314 Palmer Avenue, expressed concerns that the City of Glenwood Springs Transportation Commission was not involved in these discussions as traffic, parking, and other transportation concerns have been a focal point of public input.

- Shelly Lott, Oakhurst Townhomes #19, expressed concern over the roads in the neighborhood and the access to the development. Suggested making the development a cul-de-sac pushing traffic through the Blake gate rather than connecting to Palmer.
- Elaine Speck, 2506 Palmer, expressed concern over public input process and requested that the decision be postponed.
- Annie Hoghaug, 678 County Road 127 and owner of a property at 519 Easy Street expressed concerns regarding project density, traffic, local road conditions, and possible effect of the development on the neighborhood.
- Dave Malehorn, 2407 Palmer, expressed concern regarding public input process and suggested that any decision with the project be postponed.
- Cody Lyden, 2415 Palmer, expressed that he was in agreement with the general sentiment of the neighborhood such as concerns regarding traffic, project density, and local road conditions.

Commissioner Dehm closed the public comment period.

Michael O'Connor, Triumph Development West, addressed the following questions from the public and Planning & Zoning Commission from the previous meeting.

- Restricted Public Access to Uphill Open Space: O'Conner explained that the uphill open space would be separated from the development by a 420' debris flow fence and multiple retaining walls which would provide physical separation.
- Neighborhood Traffic Impacts: Greg Schroeder, McDowell Engineering spoke on the possible traffic impact on the neighborhood from this project. Stated that they had received a CDOT access permit and that estimated increase in traffic as a direct result of this development would be 4 to 13 vehicles per hour based on studies. Schroeder also stated that the traffic studies were also peer-reviewed by engineers at CDOT. O'Connor stated that traffic calming measures have been considered for Palmer including one-way designation, signage, and speed bumps.
- Parking Counts and Management: O'Connor stated that their parking plan meets City Code and is not requesting a variance for parking. Also explained that leases for the unit will require tenant to specify number of cars and residents to each unit as managed by an onsite manager and that assigned numbered parking will be used.
- Site Sections and Landscape Buffers at Oakhurst Townhomes: Mike Foster, the landscape architect for the project, further described the landscape plan along with elevations showing the development and its spatial relation to the existing Oakhurst Townhomes. Foster also explained that the light poles for this project would be placed as far as possible away from the Oakhurst Townhomes.
- Controlling Trespassing through Neighbor Properties: O'Connor mentioned that the planned landscaping would provide a physical deterrent to cutting through the Oakhurst property.
- Pedestrian Circulation and Palmer Avenue Typical Section: Foster explained that there

would be a continuous sidewalk on both sides of Palmer as part of the site plan. There would also be additional sidewalk added on Blake as part of the project as well. Foster explained more about the Palmer street design showing sidewalks and landscaping.

- Green Building Elements: Foster explained that they would be pursuing National Green Building Certification as a component of HUD Loan process.
- EV Charging Parking Spaces: Plan will include infrastructure for future EV parking spaces.
- Material Samples and Colors: Foster provided visual examples to demonstrate the colors and materials that would be used for the project.
- Palmer Avenue Construction: O'Connor also addressed the reconstruction of the driveway on the Speck property showing pictures of the current site. The reconstruction of Palmer Avenue to meet City standards would require to create a new driveway on the property with an easement.
- Compliance with Zoning: O'Conner provided further clarification and information as to how the project complies with the current zoning requirements. O'Connor also explained specifically what the variances are for this project.

O'Connor explained that applicant would be willing to include the following items to the plan as condition of approval: privacy fencing on west side of parking area, traffic calming techniques along Palmer Avenue, and working with adjacent landowner on construction of a new driveway.

O'Connor concluded comments and discussion moved to questions from the Planning & Zoning Commission.

Commissioner Dehm proposed a brief recess before continuing the meeting.

Commissioner Dehm reconvened the meeting for questions for the applicant and staff.

Commissioner Shaver asked the applicant about the ratio of compact to standard size parking. Applicant explained that according to the plan that there were 20 compact parking spaces. Shaver also asked staff how any variances previously approved on the property would apply to the current project. Trent Hyatt explained that variances are granted in connection with a specific site plan and since this development has a different site plan that the previous project variances do not apply to this project.

Commissioner Schachter asked applicant regarding the summary of traffic volumes as compiled by McDowell Engineering. Schachter asked how traffic would move if there was only one access route to the site from the south and not connect Palmer through the site. Greg Schroeder, McDowell Engineering, explained that typical best practice road design encourages more access points for traffic flow and emergency response. Schachter expressed concern about the traffic flow in the area with the project. Schachter also had questions about open space requirements, especially the active space requirement. Mike Foster explained that the community room for the site, including outdoor space helped meet that requirement as well as space between Buildings D & E.

Schachter also about the potential for debris flow damages to Palmer or surrounding neighborhoods. Jessica Bower, Assistant City Engineer, explained that there will be a maintenance agreement between the development and the City which includes debris flow inspections and standards to be met. Bowser also explained that the proposed design of the project mitigates risk by installing a debris flow fence.

Commissioner Grosscup asked the applicant regarding the number of spaces in the north parking lot that face the Oakhurst Townhomes. Mike Foster explained that there were 24 total spaces in the north parking lot with 14 spaces facing west. Grosscup also asked how development would manage tenants parking additional vehicles in the neighborhood after exceeding their allotted spaces. Grosscup had questions for staff regarding traffic speed, which Terri Partch confirmed would be 25 MPH. Grosscup also asked if any street improvements are planned in the neighborhood. Terri Partch explained that improvements to Blake between 23rd and 26th has been planned for the near future.

At approximately 9:45 PM, there was a disruption as many meeting participants lost access to the Zoom meeting space. There was an internet outage which caused many participants lost access to the Zoom meeting space.

City Attorney Anna Itenberg clarified that without a quorum of commissioners, that the meeting could not legally proceed and advised to wait to see if any other members of the commission could join.

Commissioner Wussow asked if it would be possible to use e-mail to decide to continue the meeting. Anna Itenberg clarified that e-mail was not mentioned in Code.

A quorum of Commissioners returned to the Zoom meeting.
Commissioner Schachter, Dehm, Wussow, and Cipperly were able to rejoin the Zoom meeting. Anna Copeland, Triumph Development West, asked if public comment would be reopened if the meeting was set to continue at a future date. Dehm confirmed that public comment portion had already been closed.

Commissioner Schachter made a motion to continue item 04-20 to the next Planning & Zoning Commission meeting on Tuesday, May 26th. The motion was seconded by Commissioner Cipperly.

Motion passed by Schachter, Dehm, Wussow, and Cipperly. Commissioners Shaver, Grosscup, and Wissing were not present to vote due to internet outage.

Commissioner Schachter made a motion to continue item 06-20 to the next Planning & Zoning Commission meeting on Tuesday, May 26th. The motion was seconded by Commissioner Wussow.

Motion passed by Schachter, Dehm, Wussow, and Cipperly. Commissioners Shaver, Grosscup, and Wissing were not present to vote due to internet outage.

6. Director Comments

Director was not available for comments as was not able to connect to the meeting.

7. Adjournment

Meeting was adjourned at 10:13 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

April 16, 2020

Dear Planning + Zoning

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 Ripley 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

Lisa M Morgan

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 Cleland #10
7. Drake Timroth #7
8. Kristen Levey #7
9. Drew Meeks #7
10. Steve Price #28
11. Ericka Crampton #28
12. Marie Dohm #4
13. George Dana #1
14. Shelly Lott #19 Oakhurst
15. Joan Giuliano #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?

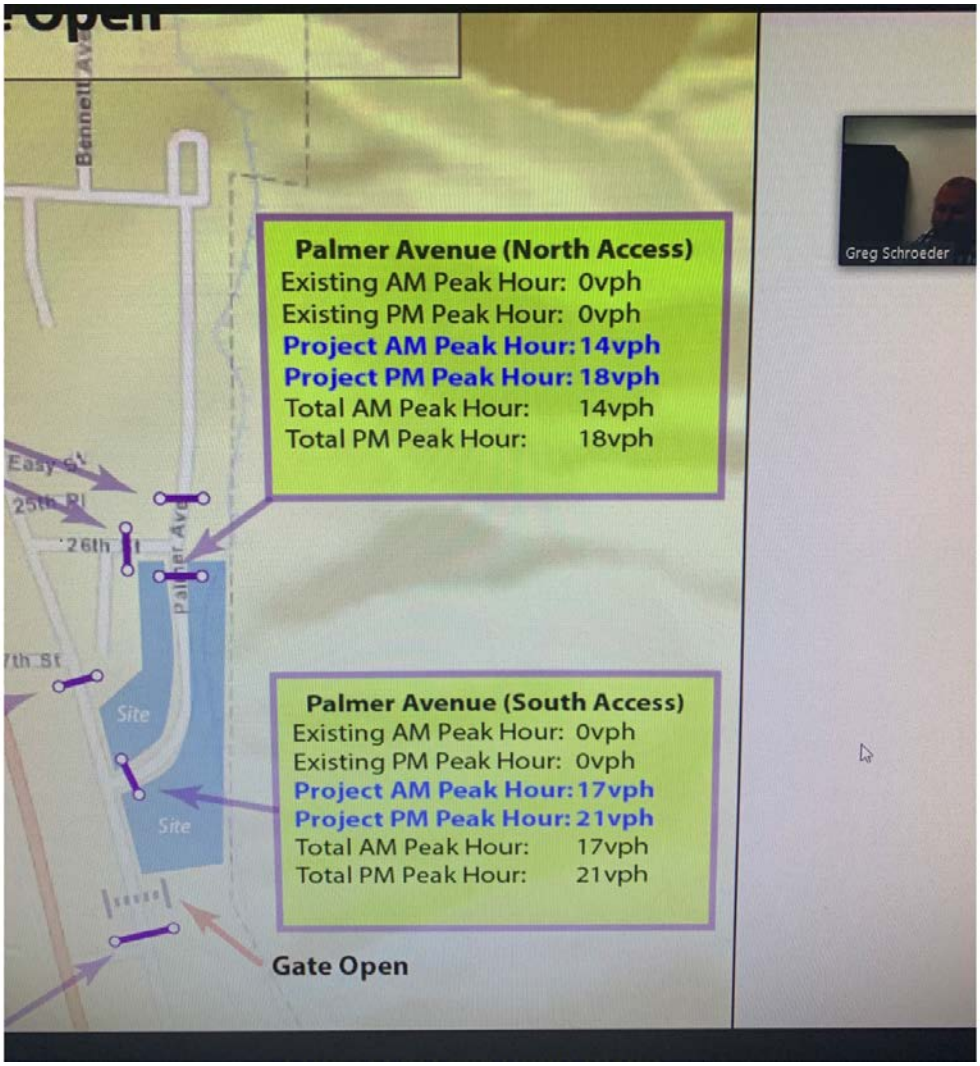
- **Traffic in the adjacent neighborhoods**

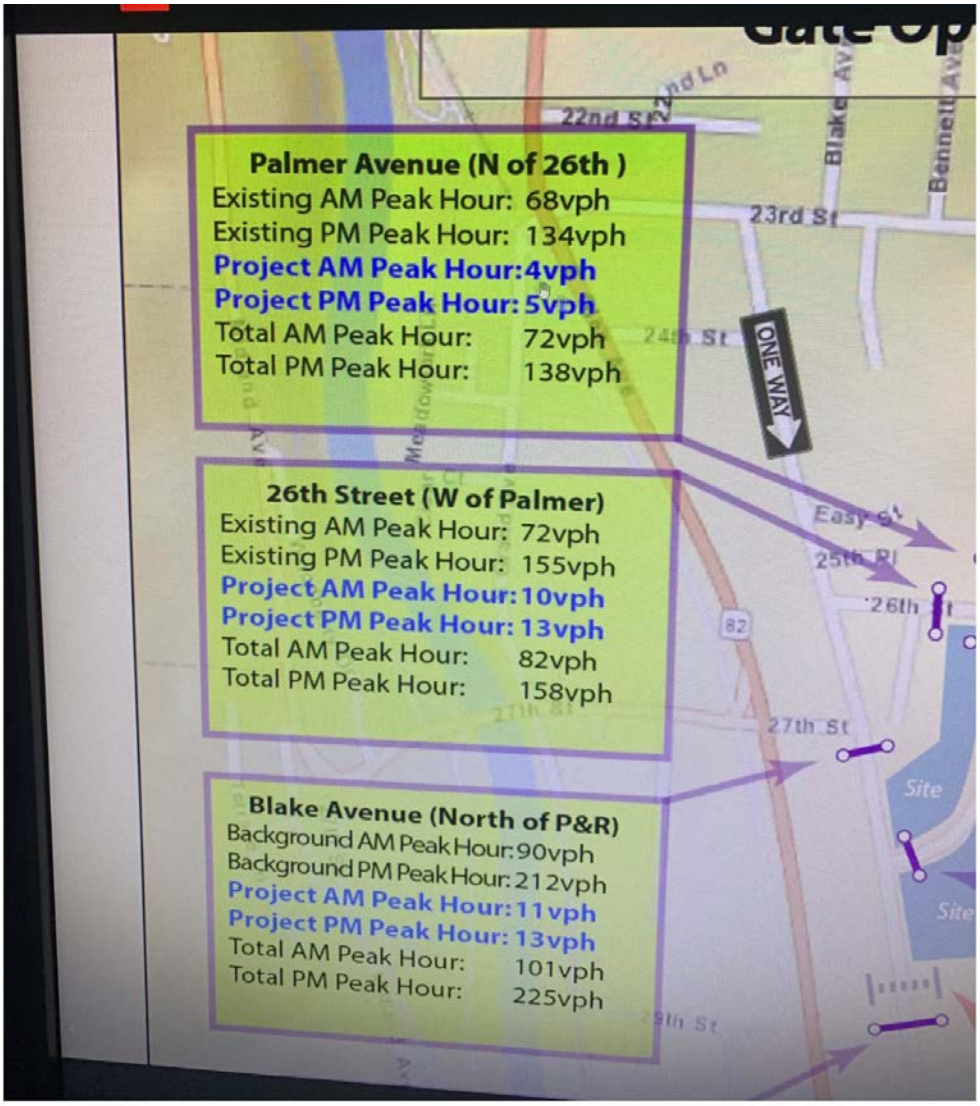
  In a letter to the City of Glenwood Springs dated November 21, 2017 from McDowell Engineering LLC (attached) several points were made about the traffic impacts from the Bell Rippy development

    - 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
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

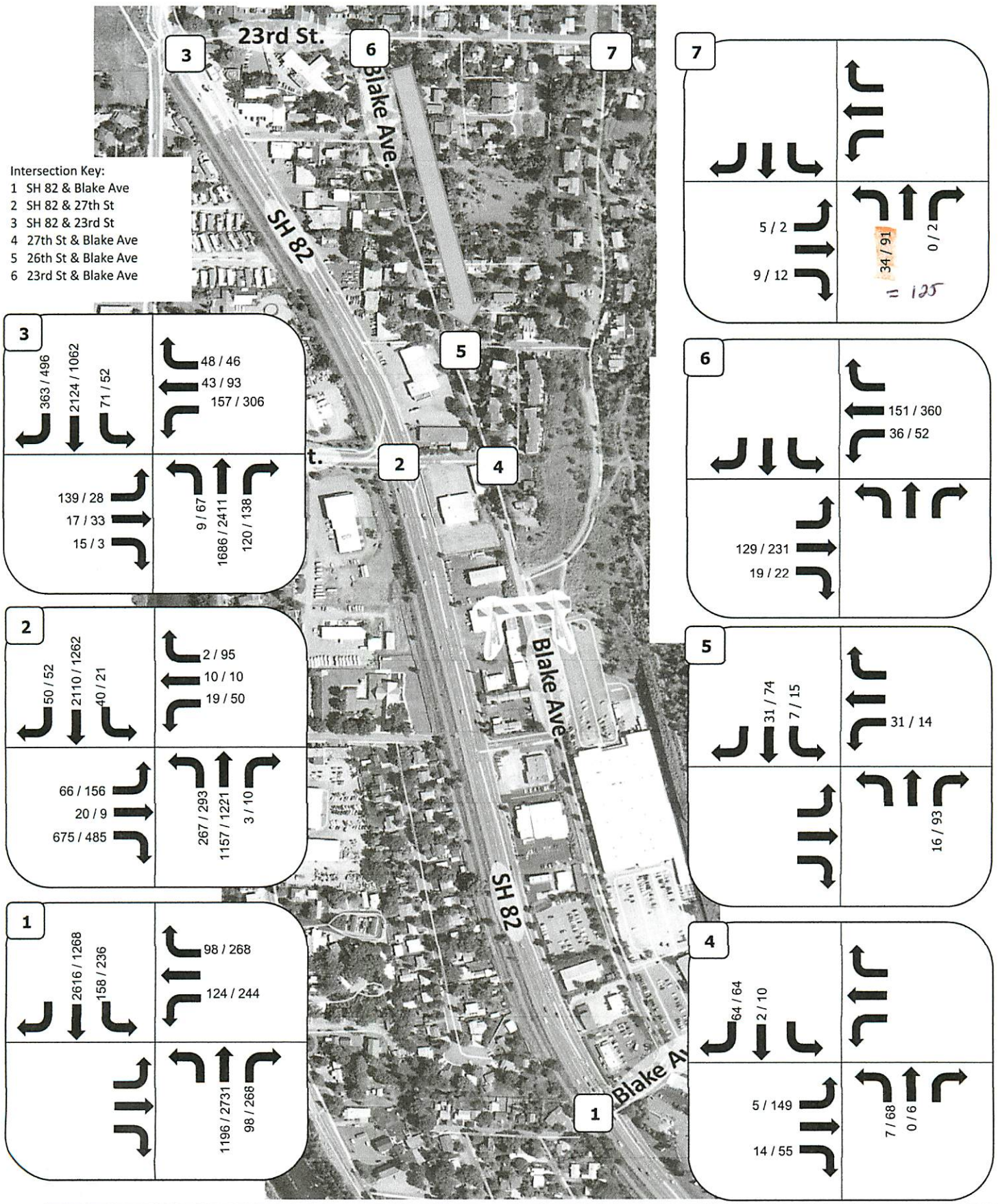
The proposed traffic volumes from the Glenwood Multifamily are not substantial compared to the background traffic volumes that presently exist. The creation of the one-way Blake Avenue configuration is not significantly impacted by the site traffic. Opening the Blake Avenue gate will provide another 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

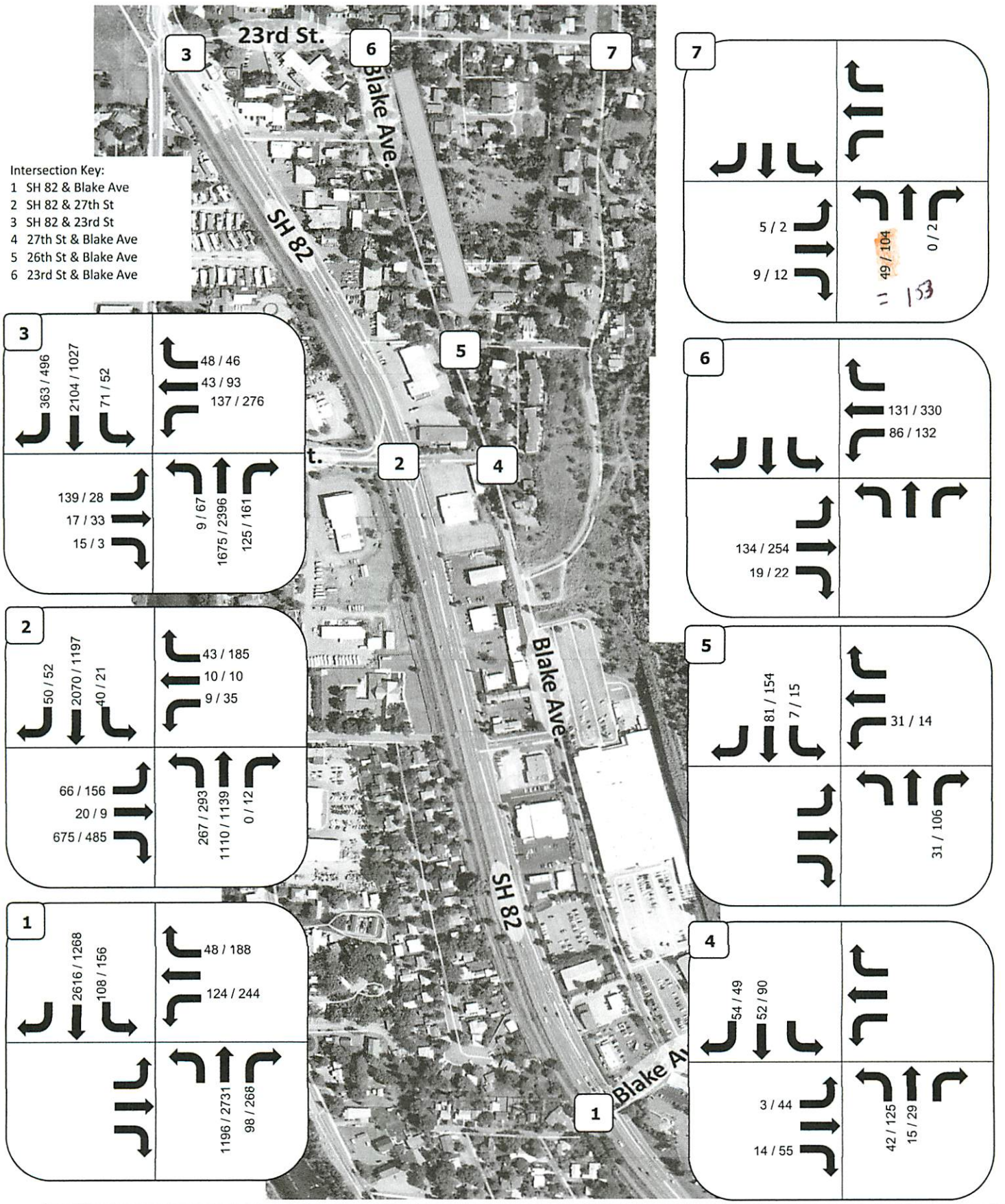
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AM/PM Volumes = XX / XX vph

October 30, 2017

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



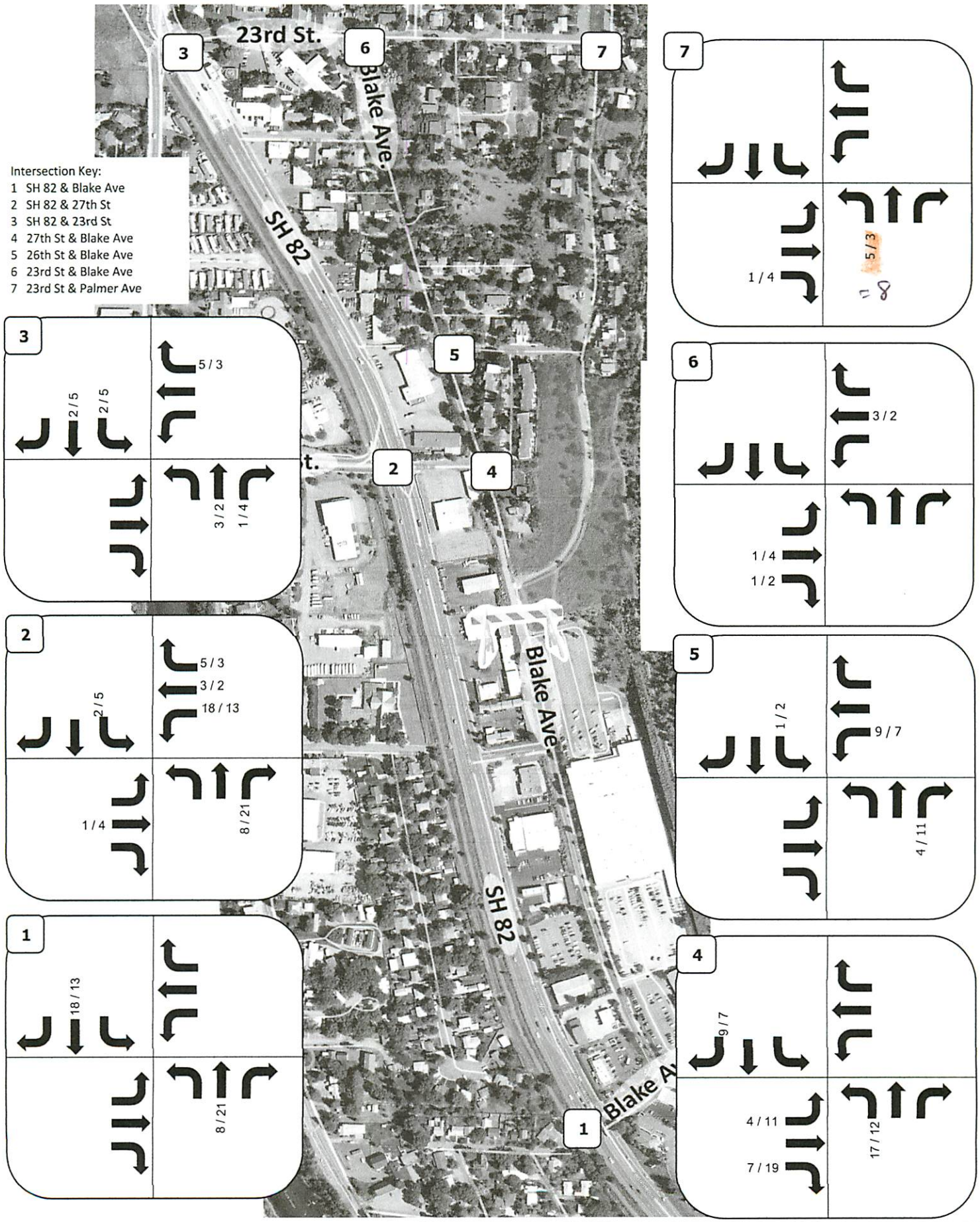
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

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October 30, 2017

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



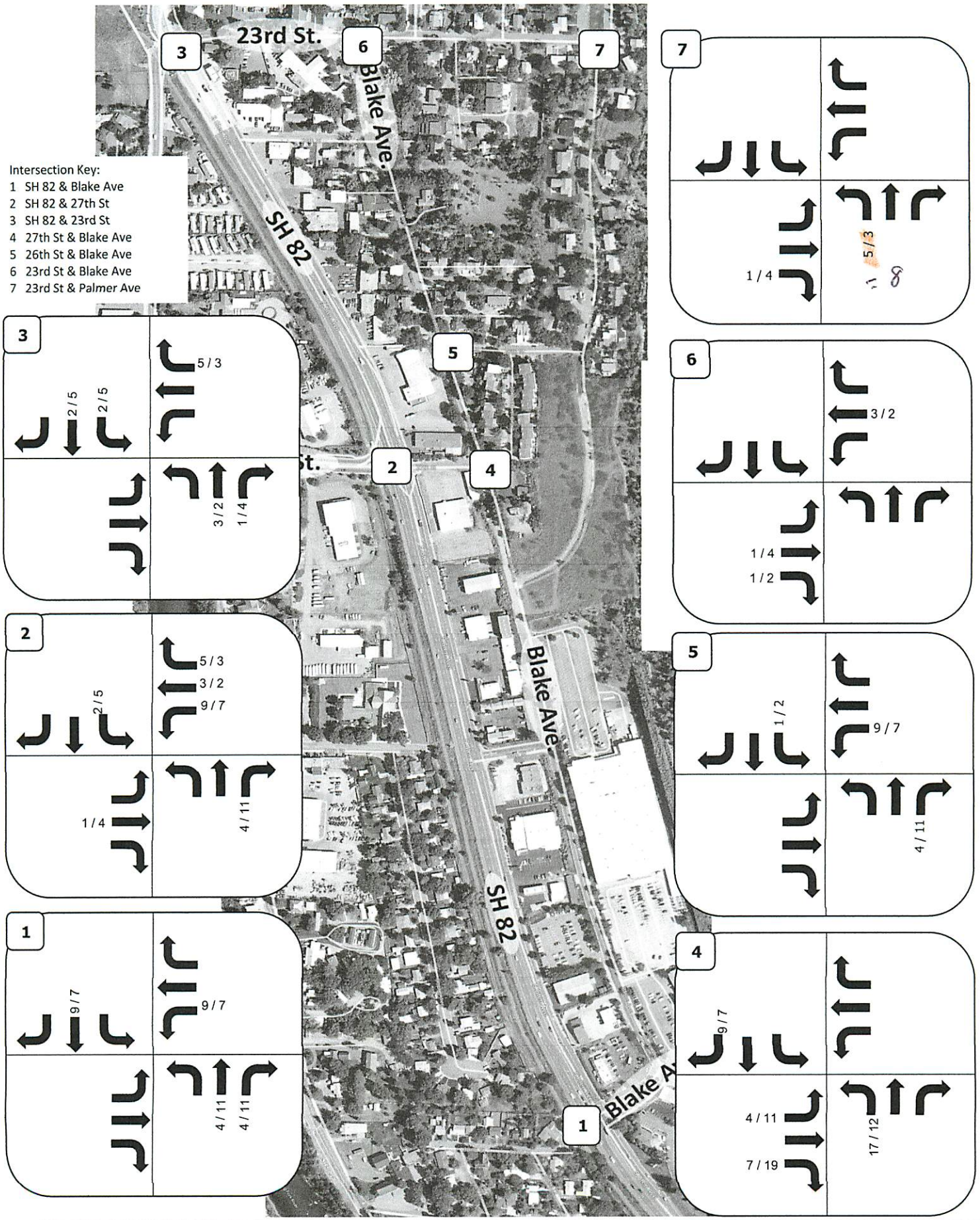
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

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March 9, 2017

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



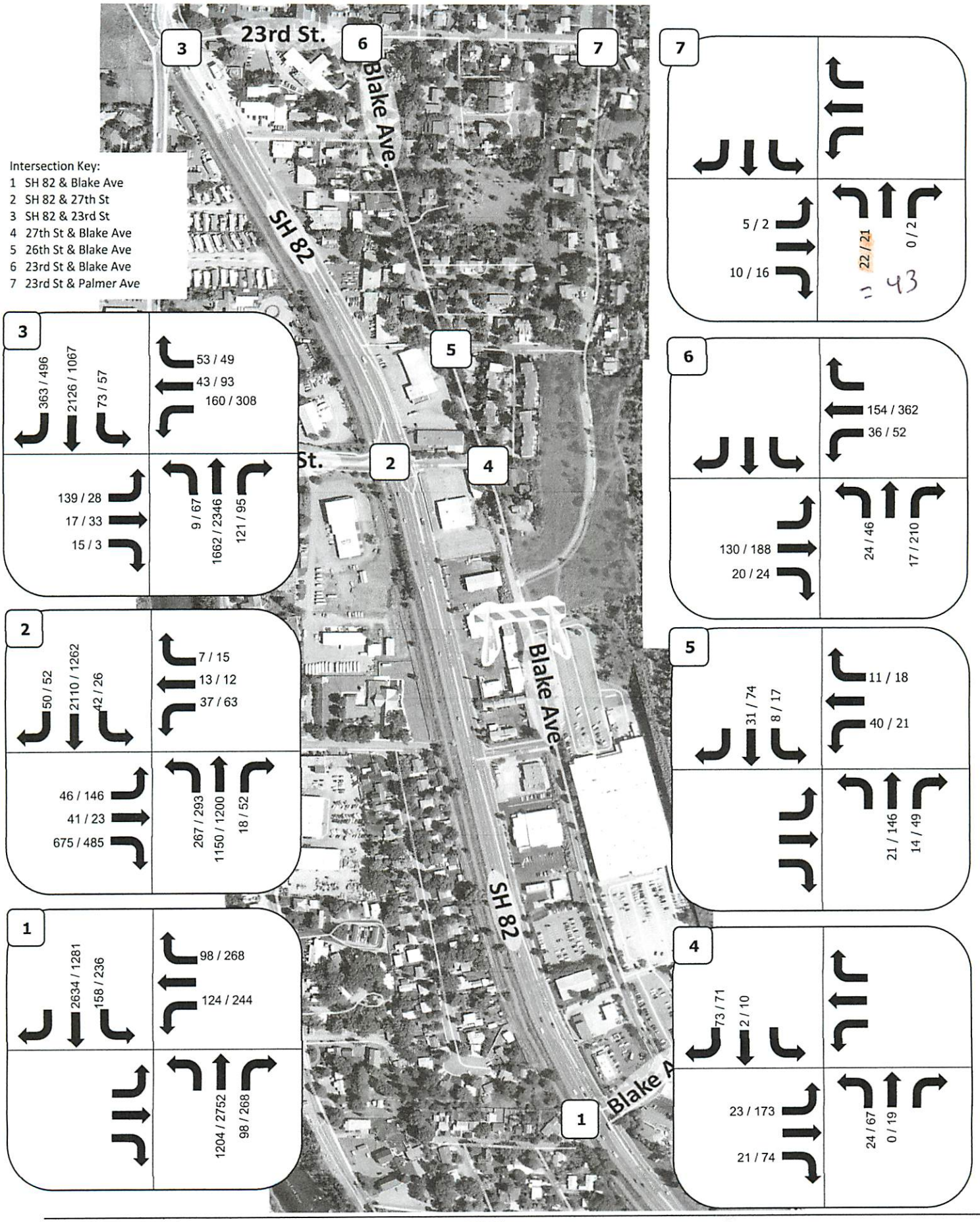
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

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March 9, 2017

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



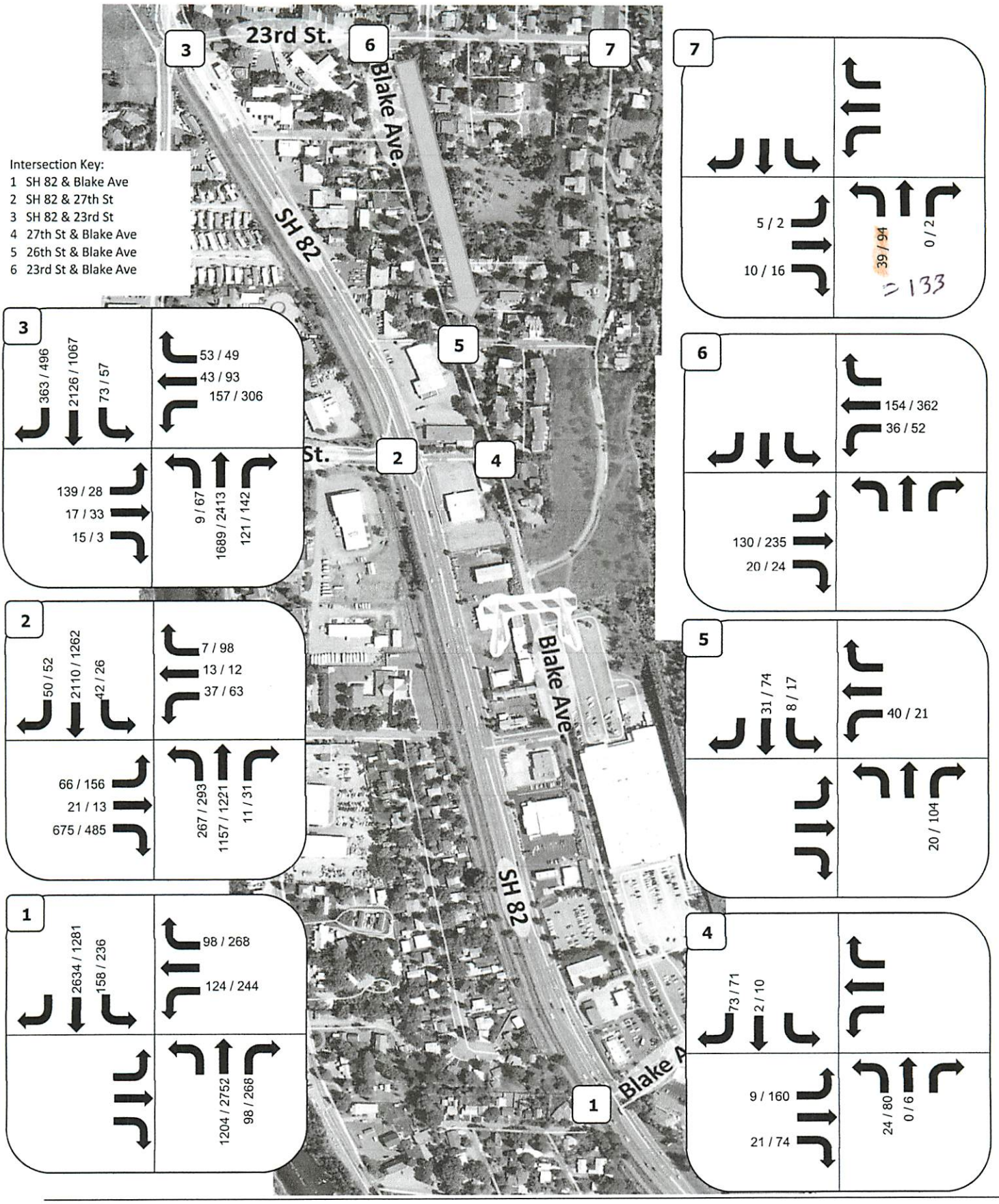
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Bell Rippy, Glenwood Springs, Colorado

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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



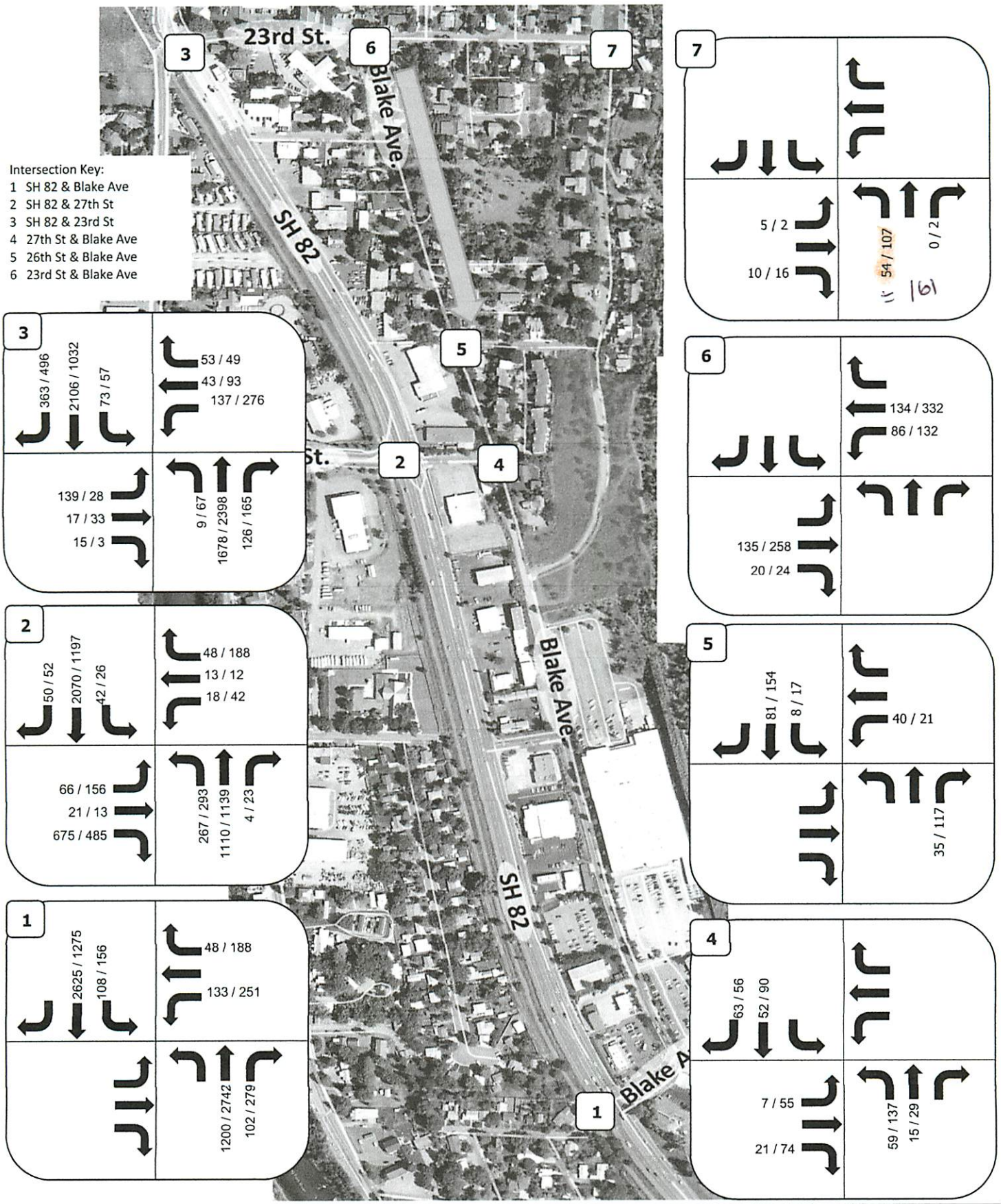
Project Number: 1247
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AM/PM Volumes = XX / XX vph

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.

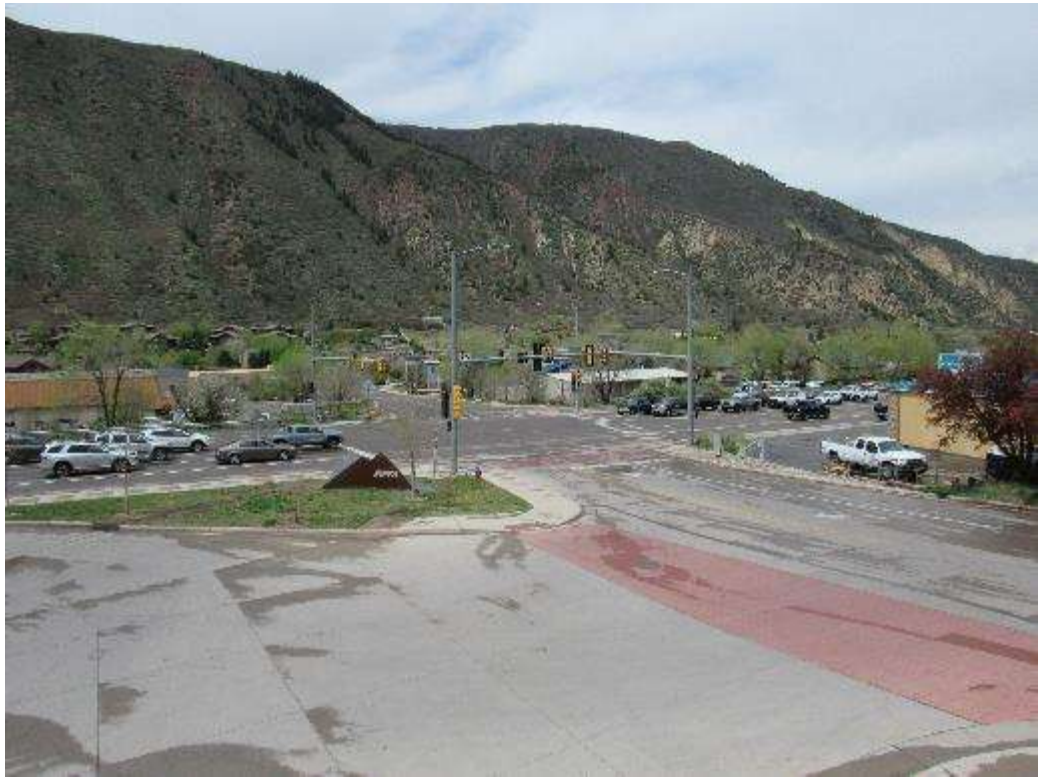
Consequently…

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?

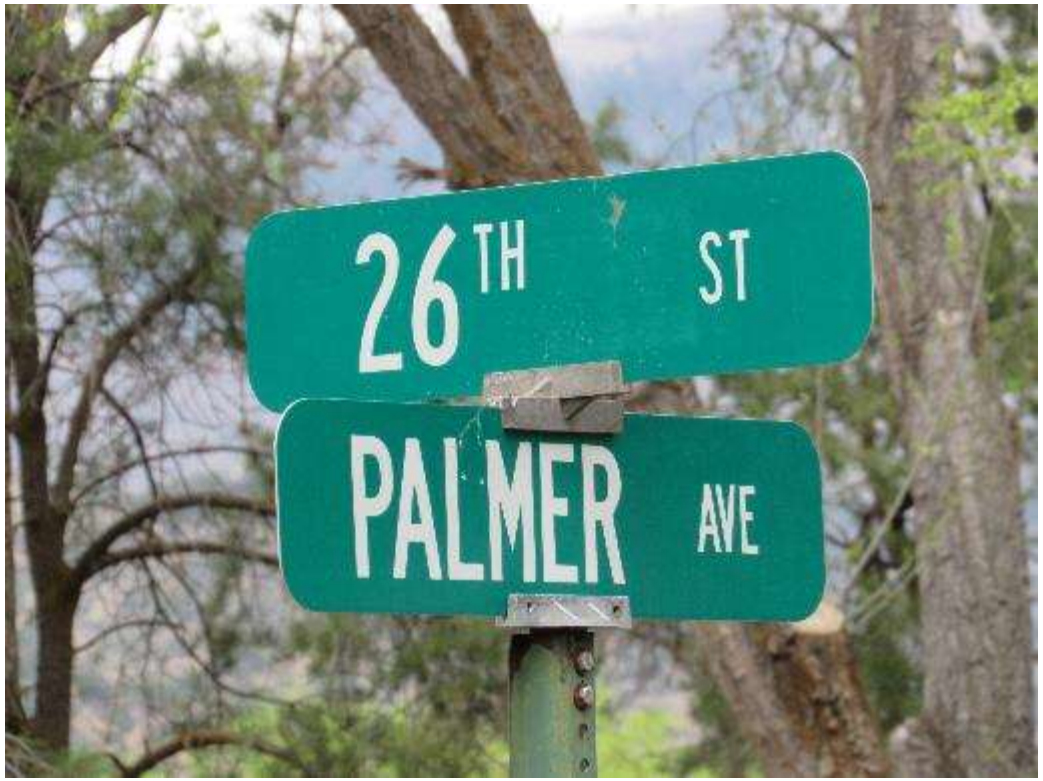
Oakhurst Townhomes – single entrance and exit onto 26th Street, which is destined to become a busy road.



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?



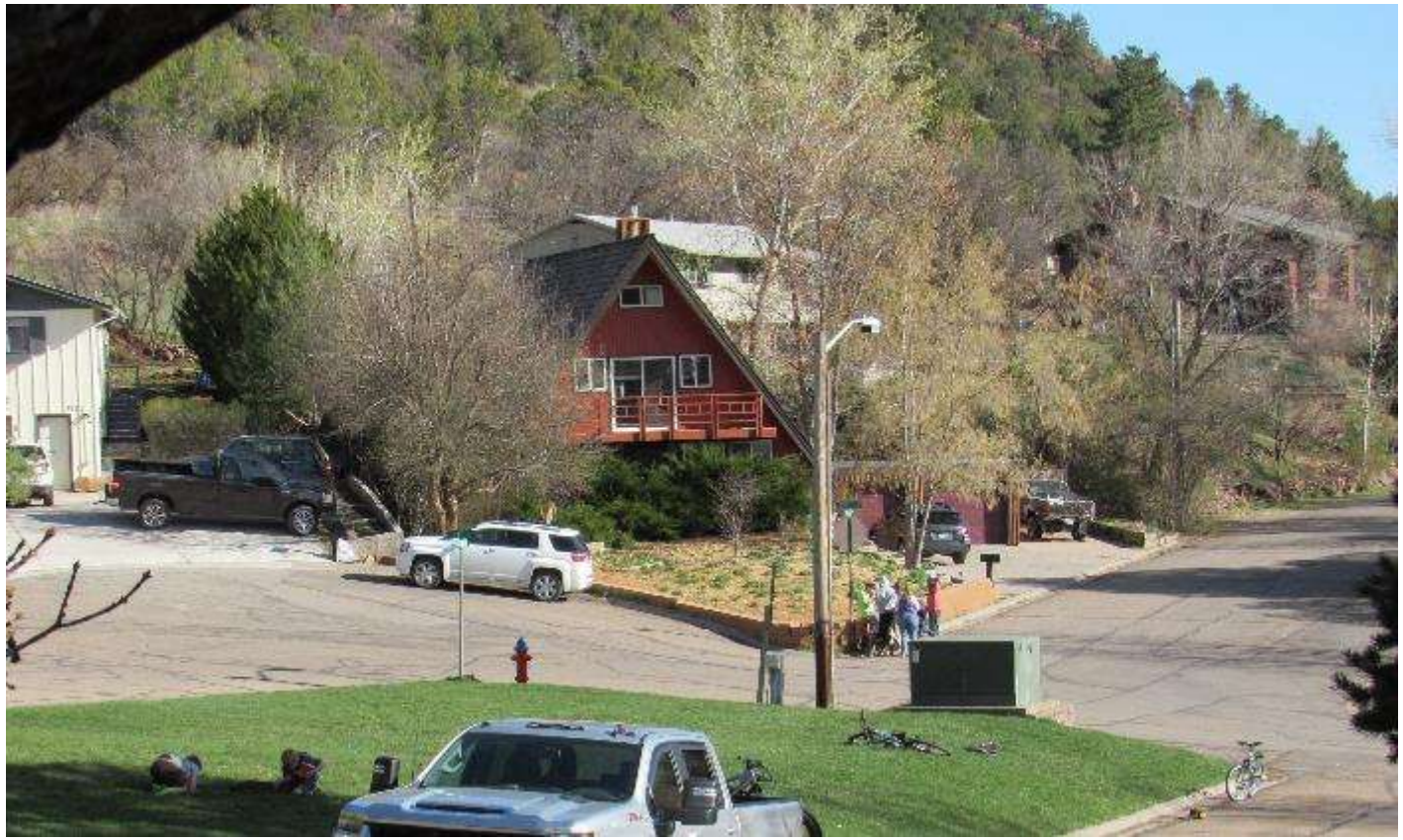


Air quality in the entire area will deteriorate because additional traffic will travel along Bennett past Valley View Hospital in the same way that commuter traffic does now.
Why has there been no mention of effects upon air quality?
Why is the City's air quality data so meagre?
How do commissioners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

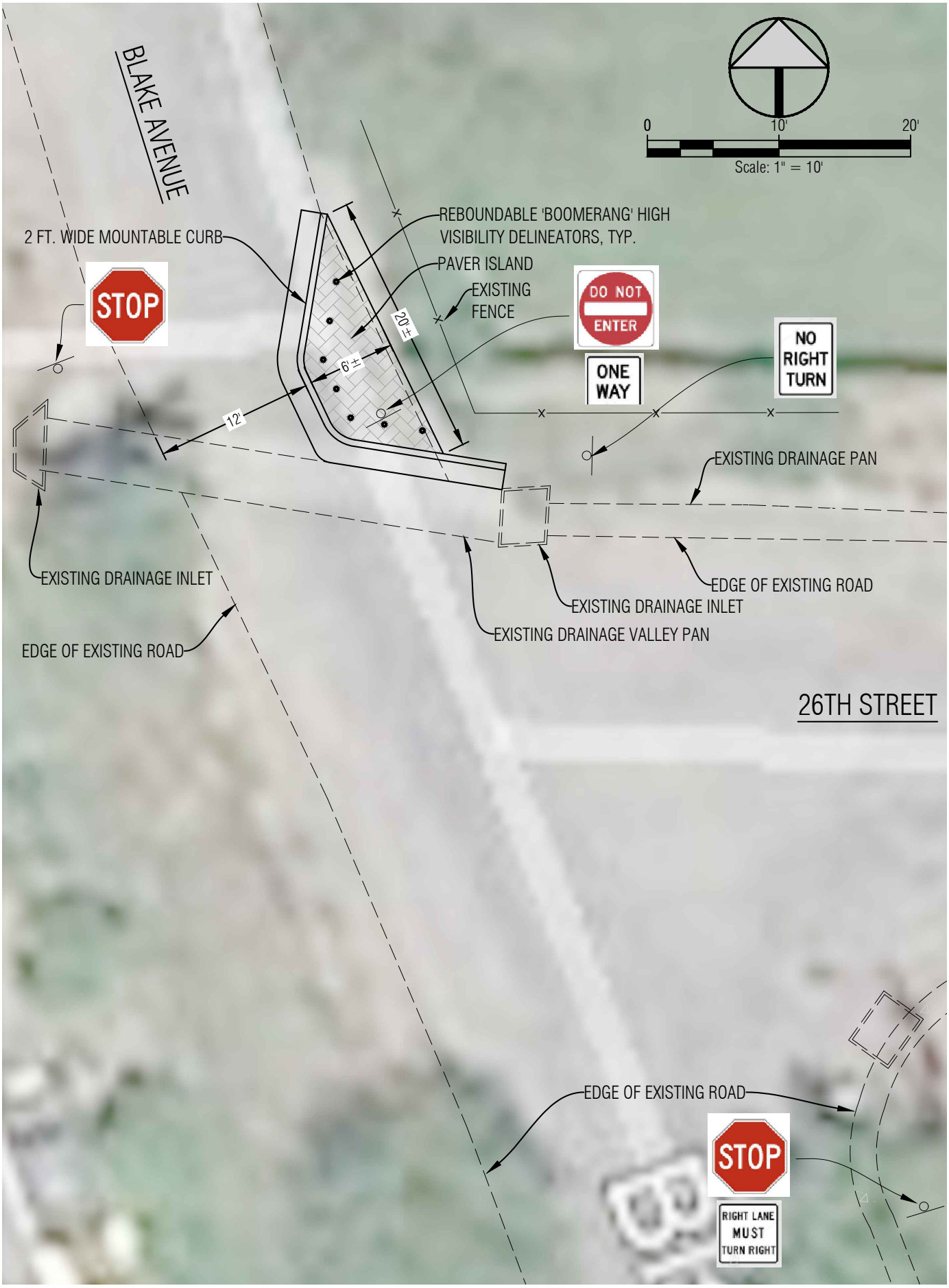
③ A FEW OF THE FOLKS I TALKED TO HEARD COMMENTS TO THE FACT THAT THERE IS VERY LITTLE OPPOSITION THIS TIME. * THIS COULDN'T BE FURTHER FROM THE TRUTH *
I ENCOURAGED THEM TO PUT THERE THOUGHTS IN WRITING AND GET THOSE THOUGHTS TO CITY HALL

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

To the City of Glenwood Springs regarding the traffic impacts and circulation surrounding the proposed Triumph Bell Rippy project and the opening of the 'Blake Gate':

At the Glenwood Springs Community Development meeting regarding traffic mitigation options for the area nearby the proposed development, the developer stated "the neighborhood's safety should not be significantly compromised [by the development]".

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 as is, and especially our local children and animals and those of us walking our pets. Adding significantly higher two-way traffic volume will preclude any semblance of safe pedestrian and bicycle usage. The ROW width is not standard and is not physically wide enough to support a full road reconstruction with standard drive lanes, curb and gutter, sidewalks and drainage improvements.

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.

Two-way traffic on this section of Blake Avenue with an open Blake Gate will only increase traffic through the neighborhood and severely compromise alternate modes of transportation (i.e. walking & biking) and be devastating to the sense of neighborhood as well as the safety of our children. An open Blake Gate and two-way traffic along this section of Blake Ave will be an open invitation to bypass northbound Highway 82 traffic and to hop onto Blake Ave at McDonalds and just stay on it all the way through town!

Increasing traffic and allowing this portion of Blake to become even more of a Highway 82 bypass than it currently is, 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.

The prior approval of the multi-family project two years ago came with the condition that this section of Blake Avenue be designated as one-way south. We urge P&Z and Council to maintain this condition when they approve of the Triumph Bell Rippy project.

Assuming one day the road may be upgraded, the future design should be for a single lane with a bicycle lane 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.

Petition to designate Blake Avenue as One-way south between 24th and 26th Streets when the Blake Gate at Walmart is opened.

Petition summary and background	Approvals for the Triumph Bell Rippy multi-family project will also result in the Walmart Blake Gate being opened, thereby increasing traffic and increasing safety issues within a 15 MPH road and neighborhood.
Action petitioned for	We, the undersigned, are concerned citizens who urge our leaders to act now to mitigate the increased traffic and safety issues by designating Blake Avenue as One-way south between 24th and 26th Streets when the Blake Gate is opened.

Printed Name	Signature	Address	Comment	Date
DAVID J. TURTLE		2429 BLAKE AVE 501 EASY ST.	ONE WAY TRAFFIC WITH SIDEWALKS AND BIKE PATH	6/17/20
Carol Turtle		501 Easy St.	Need Bike Path + Sidewalks to reduce car traffic + Conform to City's intermodal Connectivity Plan	6-17-20
Mary R Rose	Mary R. Rose	2615 Blake # 8	I AM 93 YEARS OLD AND NEED A SIDEWALK TO SAFELY WALK TO WALMART	6/18/20
Irene Cuevas	I. Cuevas	2430 Blake		6/17/20
Lowell HAAG	Lowell Haag	2430 Blake Ave B		6-18-20
JOSE GARCIA	JOSE GARCIA	2430 BLAKE AVE A		6/17/20
Holly & Caleb	Holly & Caleb	2430 Blake A	Fix the Road	6/17/20
Jeffrey Jensen		2517 Blake A	I Need you to fix My Car - Potholes bad	6/18/20
Tara Elliott	Tara Elliott	2510 Blake av.	our yard is torn up because of the road	6/18/20
WILLIAM M SAPPINGTON	William M. Sappington	2421 Blake ave	Pedestrian safety is big issue. Speeding also issue	6/18/20
Ken Klatt		2429 Blake Ave	one way only!	6/20/20
Ryan Newberry		2426 Blake	Fix the Road!	6/21/20
AARON SKEAR		2424 Blake Ave	Fix the Road!	

Petition to designate Blake Avenue as One-way south between 24th and 26th Streets when the Blake Gate at Walmart is opened.

Petition summary and background	Approvals for the Triumph Bell Rippy multi-family project will also result in the Walmart Blake Gate being opened, thereby increasing traffic and increasing safety issues within a 15 MPH road and neighborhood.
Action petitioned for	We, the undersigned, are concerned citizens who urge our leaders to act now to mitigate the increased traffic and safety issues by designating Blake Avenue as One-way south between 24th and 26th Streets when the Blake Gate is opened.

Printed Name	Signature	Address	Comment	Date
Gail Hostetler	Gail Hostetler	2102 Grand Ave	no sidewalks on streets in winter many children playing	6-20-20
Matthew Shedden		2701 Blake Ave	We need a safe walk	6-20-20
defiance church	defiance leadership	2306 Blake ave	-so many kids w/ school @ church-?SDA	6-20-20
Lois Wilmoth	Lois Wilmoth	2413 Blake Ave	keep the neighborhood safe	6-20-20
Eleanor Baker	Eleanor Baker	2509 Blake Ave	Kids and dogs bikes wheel chairs ect	6-20-20
David Moya		2509 Blak Ave	dogs wheel chairs	6-20-20
Joy White		509 25th Pl. Glenwood Springs	the road is not sufficient for a two way	6-20-2020
Hugo Romero		506 23th place	To much Traffi and Kids like to play on the road	
W. Matthew Elliott		2510 Blake Ave.	to much traffic already	6-20-2020
Stephanie Kuehn		2402 Blake Ave	too much traffic poor road condition	6/20/20
Jaqueline Jimenez		2409 Blake ave	~~Jaqueline~~ I have kids and dogs	

Petition to designate Blake Avenue as One-way south between 24th and 26th Streets when the Blake Gate at Walmart is opened.

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Printed Name	Signature	Address	Comment	Date
MARY ANN E Taylor	Mary Anne Taylor	2418 Blake Ave	Totally against 2 way traffic	6/14/20
PAUL G. TAYLOR	Paul G. Taylor	2418 BLAKE AVE.	" "	6-14-2020
Martha Harris	Martha Harris	2501 Blake Ave	2 way traffic will ruin our neighborhood - unsafe for children, bikes, ways etc. This will significantly compromise our neighborhood ~~development of Bell~~ Rippy!	6-19-2020
PHIL HARRIS	Phil Harris	2501 BLAKE AVE	24 YEAR OWNER - MAKE THIS ONE WAY & NOT SACRIFICE THE NEIGHBORHOOD (15 MPH) FOR HIGHWAY 82 BYPASS CONNECTIVITY!	6/20/20

Petition to designate Blake Avenue as One-way south between 24th and 26th Streets when the Blake Gate at Walmart is opened.

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Printed Name	Signature	Address	Comment	Date
Robert Monte		521 EASY St.		6-20-20
Julie Hartman	Julie Hartman	521 easy St.		6.20.20

Petition to designate Blake Avenue as One-way south between 24th and 26th Streets when the Blake Gate at Walmart is opened.

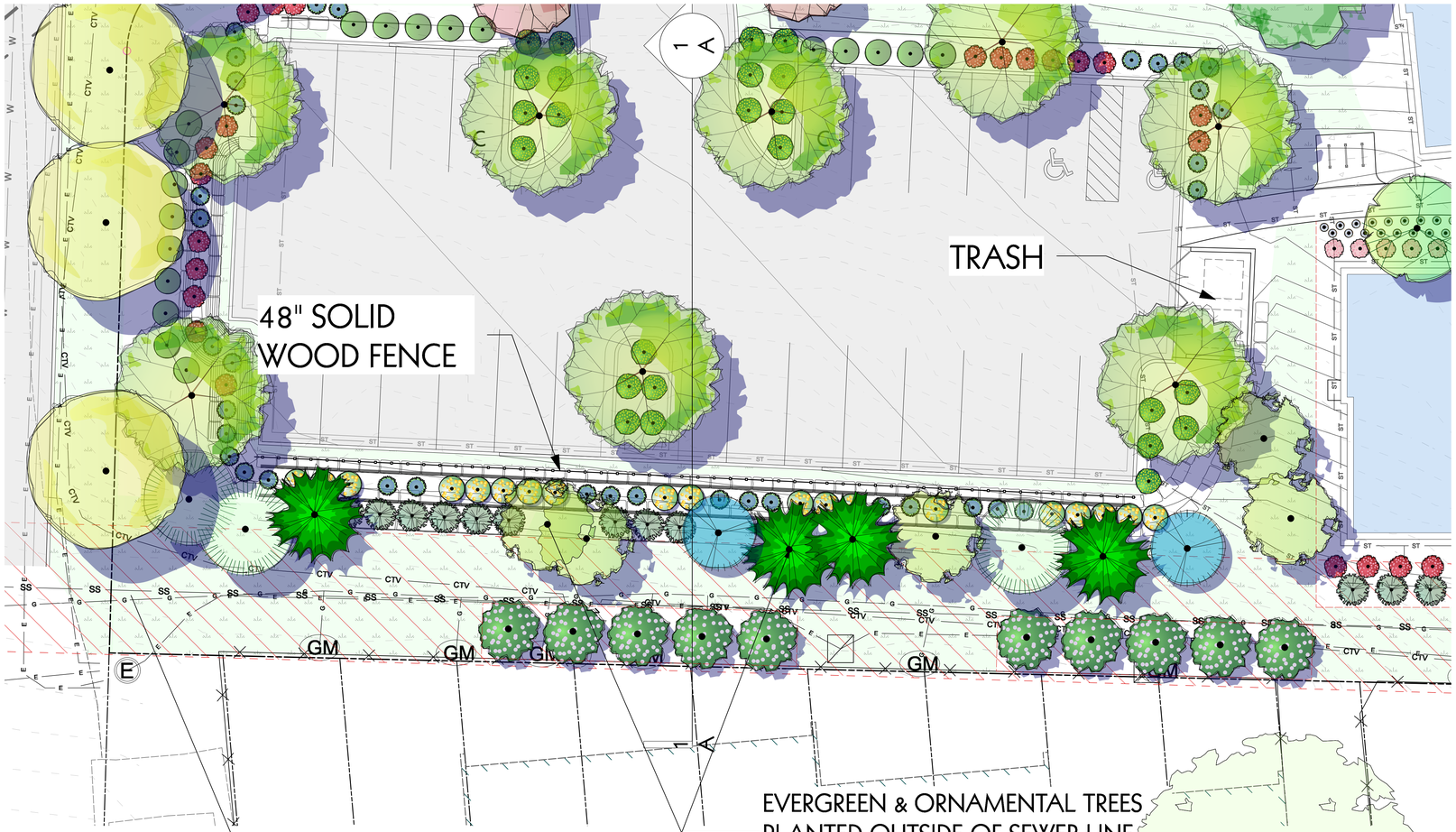
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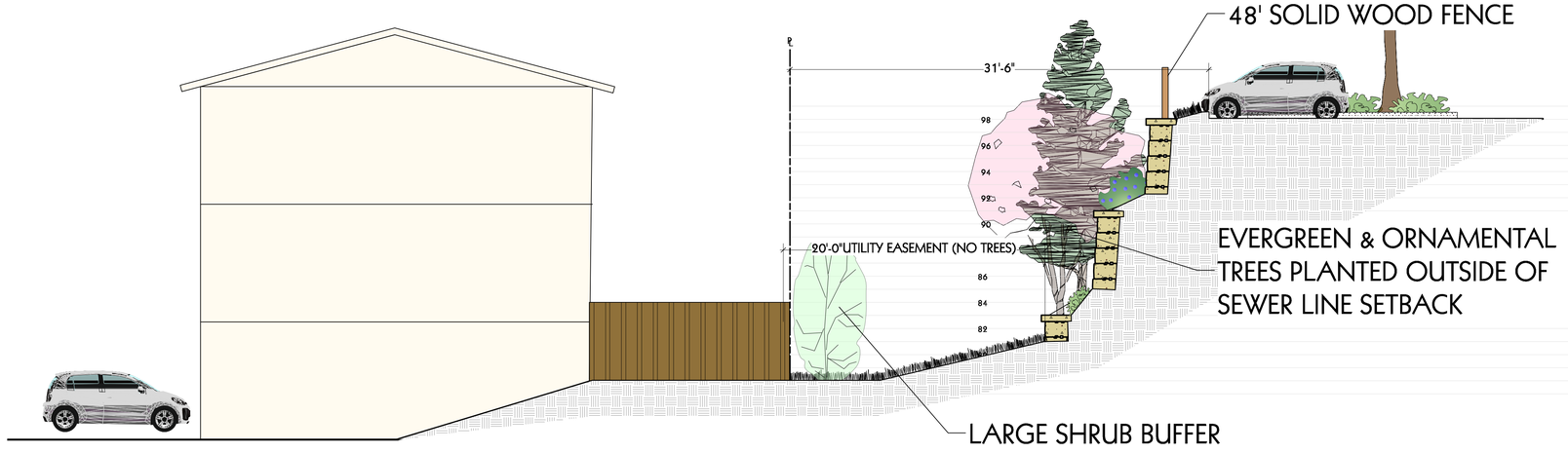
Printed Name	Signature	Address	Comment	Date
NEIL GOLUBA		ASPENWOOD APARTMENTS 417 E. 23RD STREET GWS, CO	AS MANAGER OF ASPENWOOD APARTMENTS	6/18/20

26th Streets when the Blake Gate at Walmart is opened.

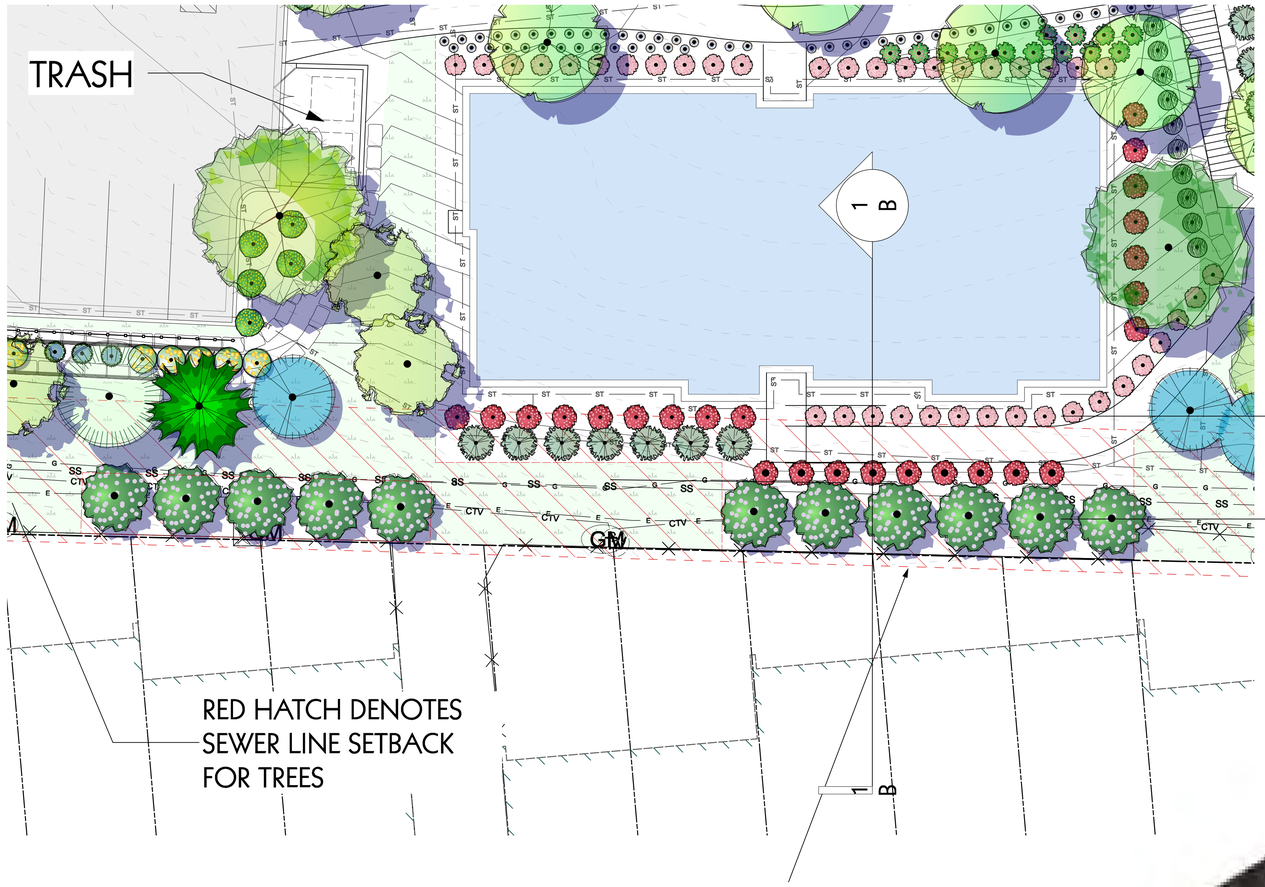
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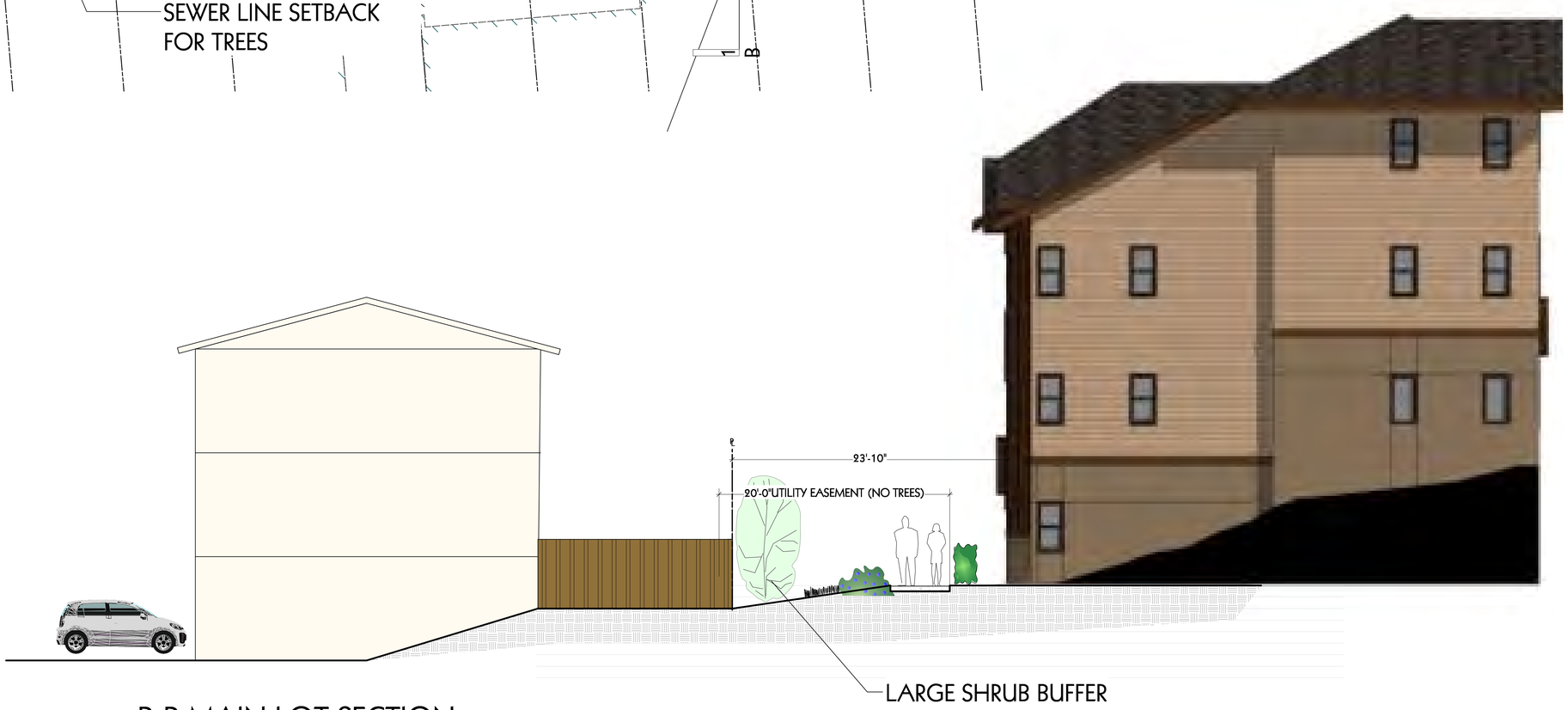
Printed Name	Signature	Address	Comment	Date
THOMAS FRIEDMAN		513 BAY ST. GLS - OWNER		6/19/20
KRISTINA CLANEY		108 CLOVERLEAF AVE GLS - OWNER of 513 BAY ST GLS		6/19/20



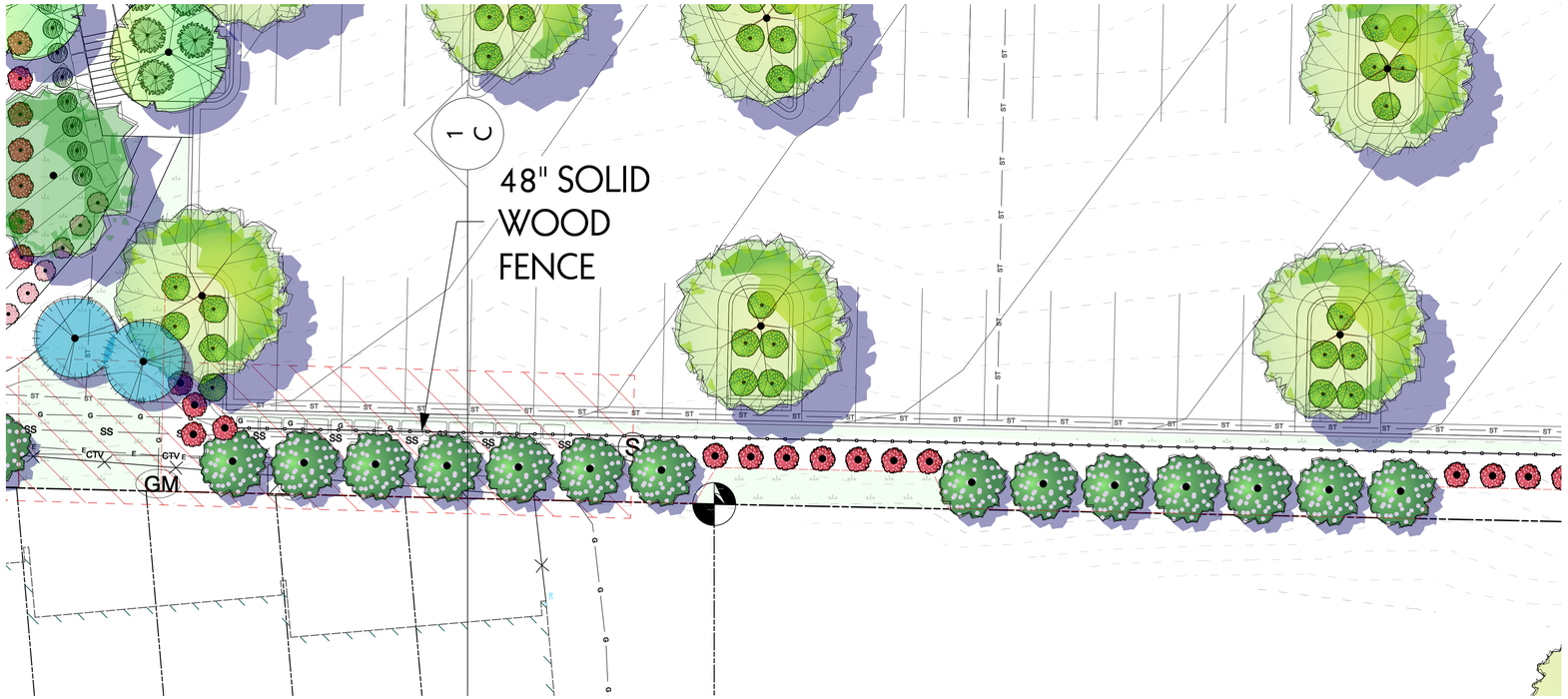


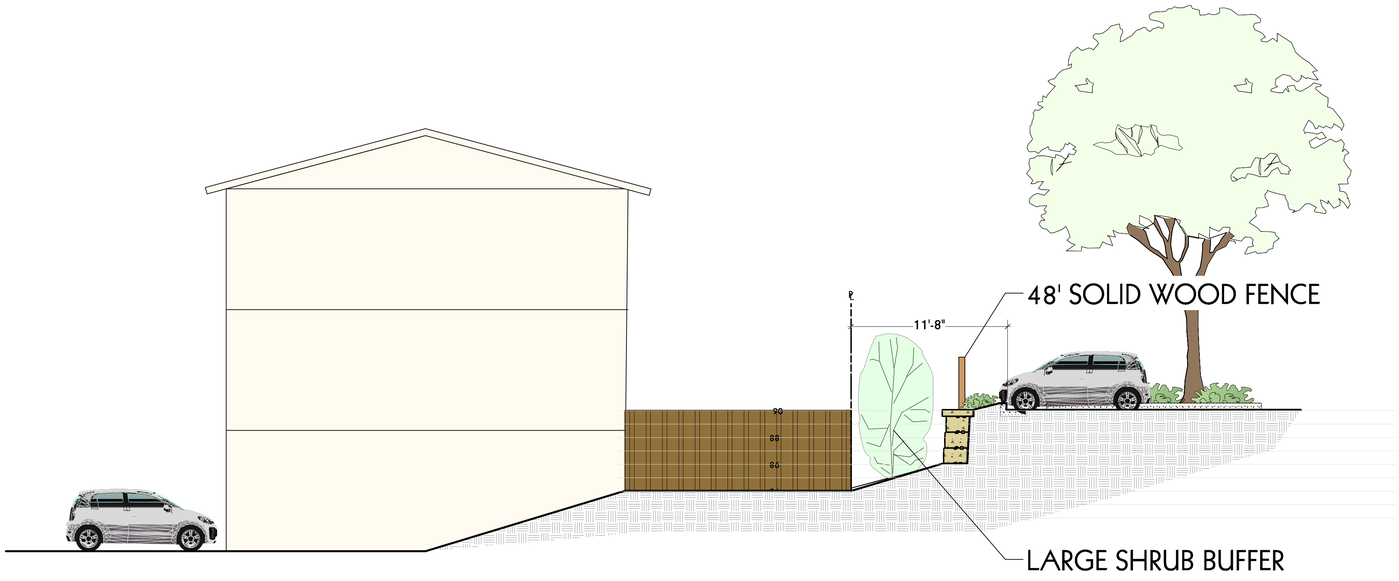
A-A NORTH LOT SECTION





B-B MAIN LOT SECTION





C-C MAIN LOT SECTION

BELL RIPPY NEIGHBORHOOD

OVERALL SITE PLAN



Boundaries Unlimited Inc.
Civil Engineering
Surveying
& Beyond
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

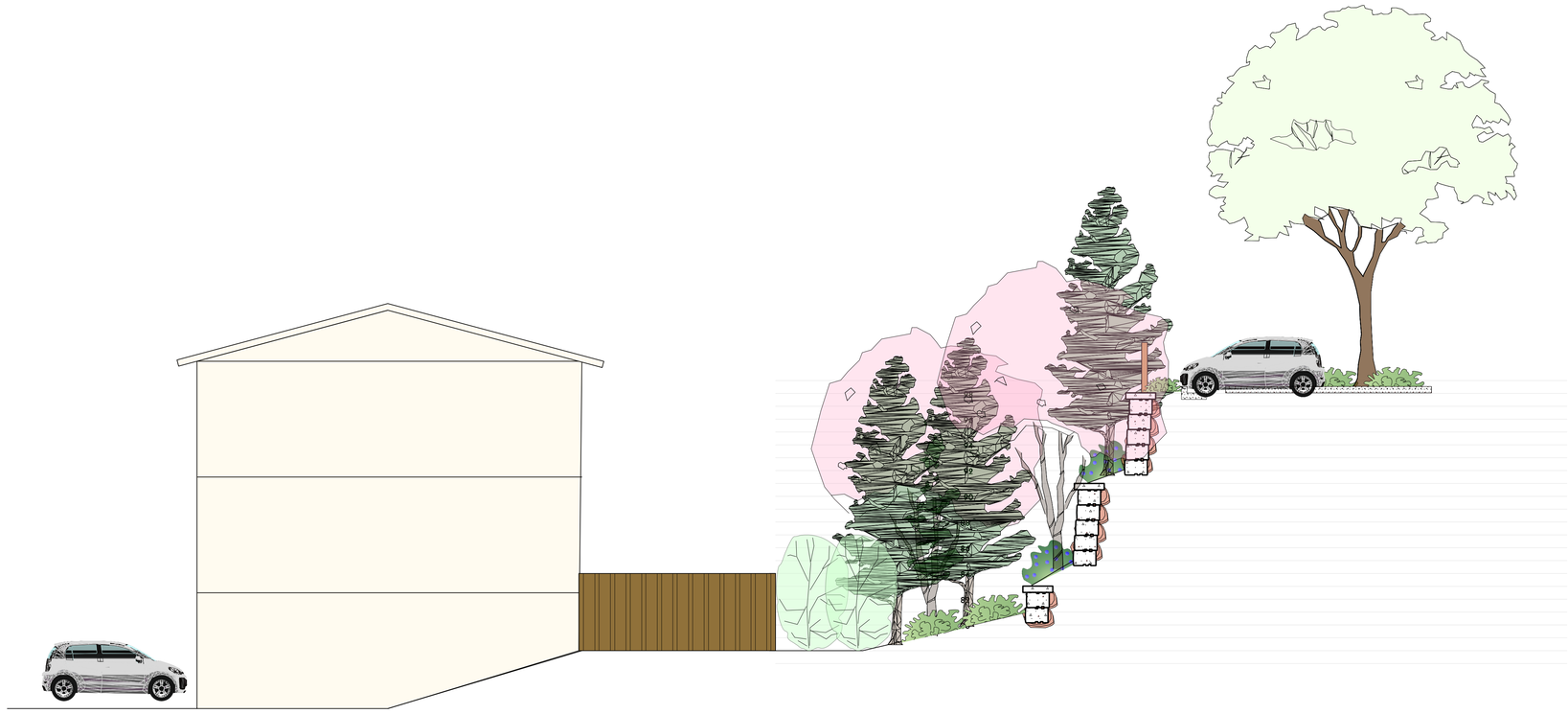
No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

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

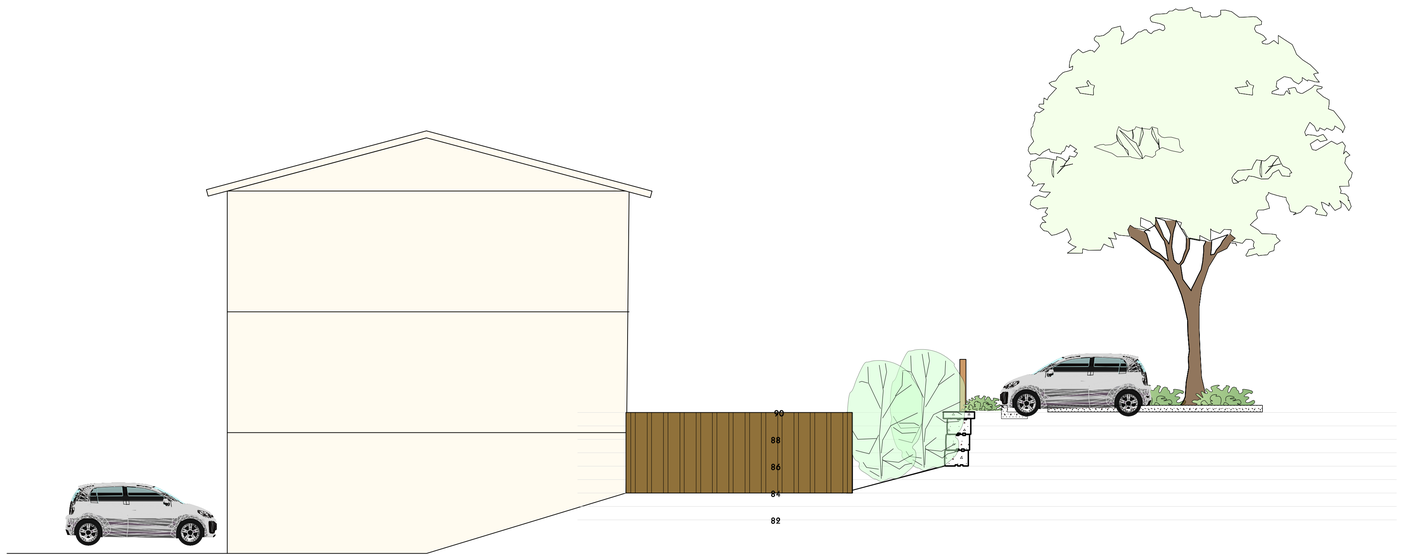
Sheet
C.1

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

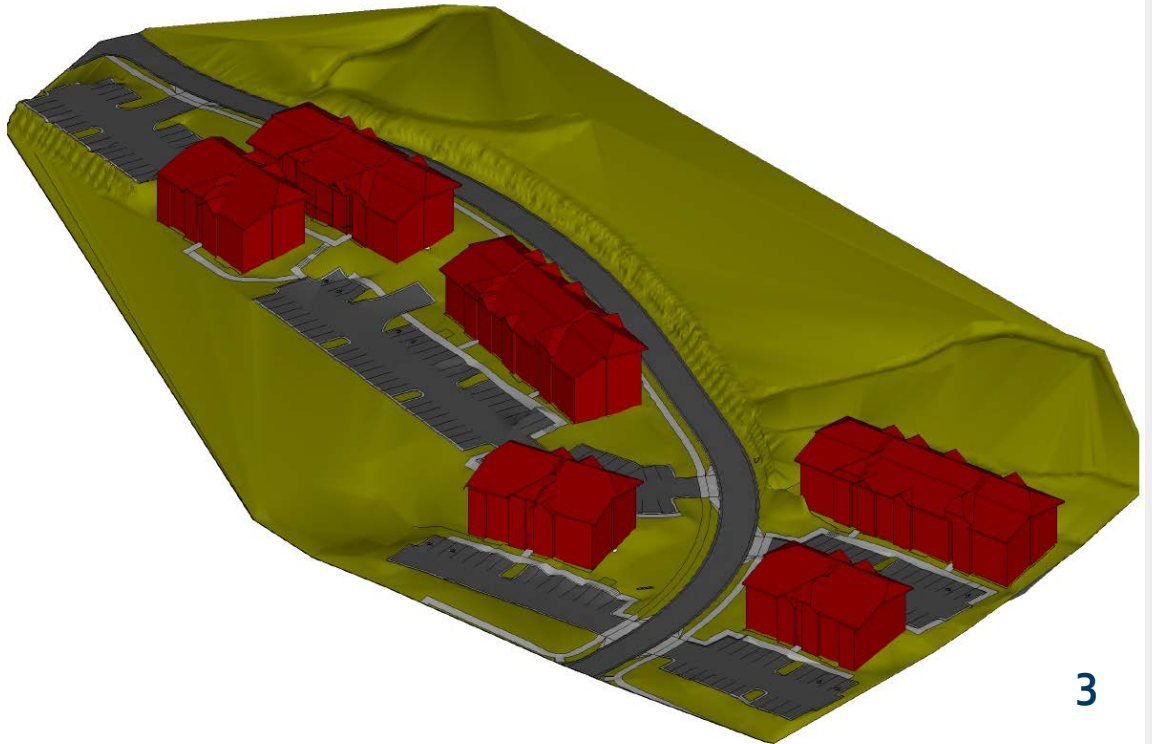
CITY OF GLENWOOD SPRINGS COLORADO

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



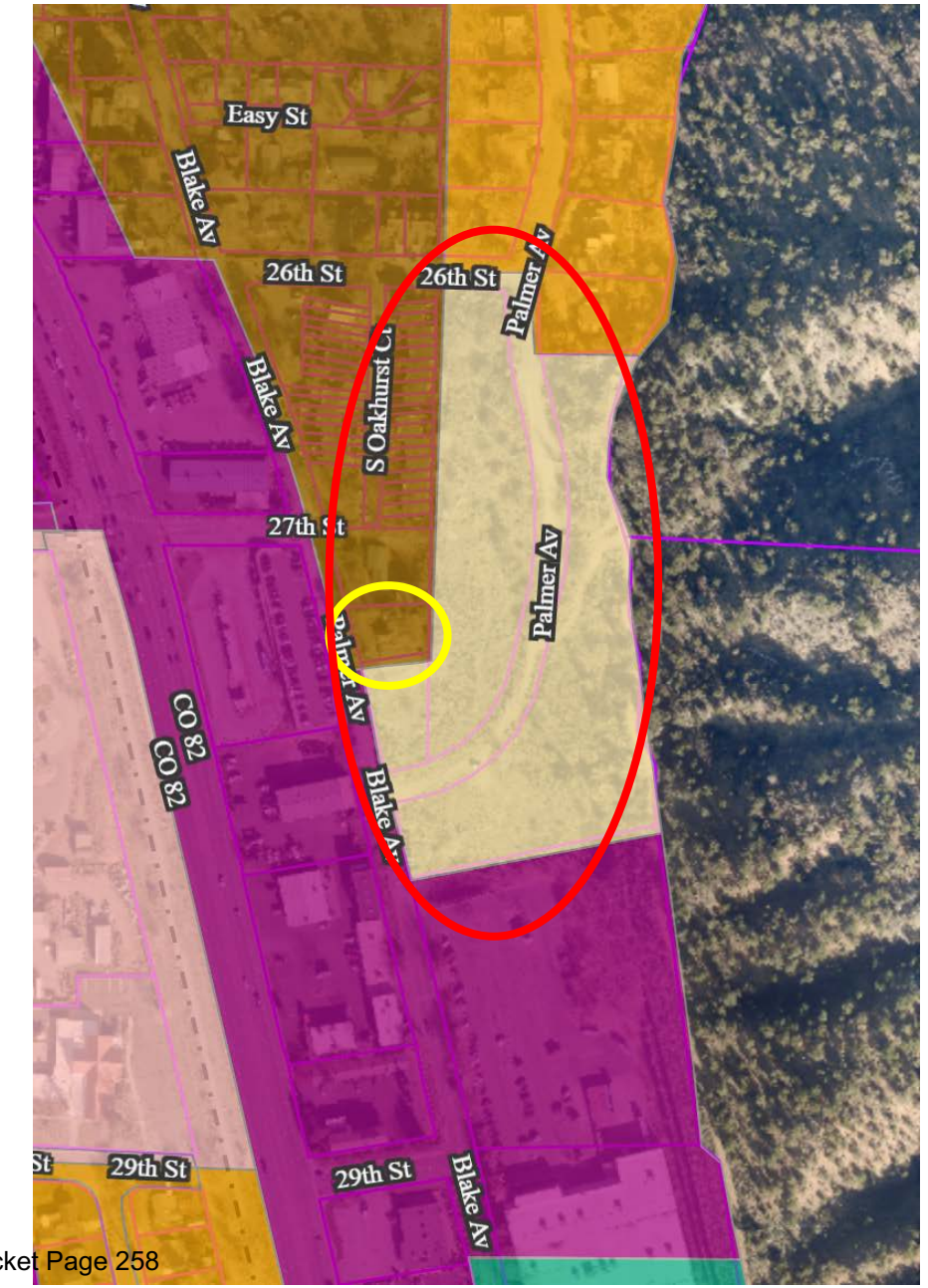
Existing northeast view (photo credit: Google Maps) and related perspective view



CITY OF GLENWOOD SPRINGS COLORADO

Zoning and Adjacent Land Uses

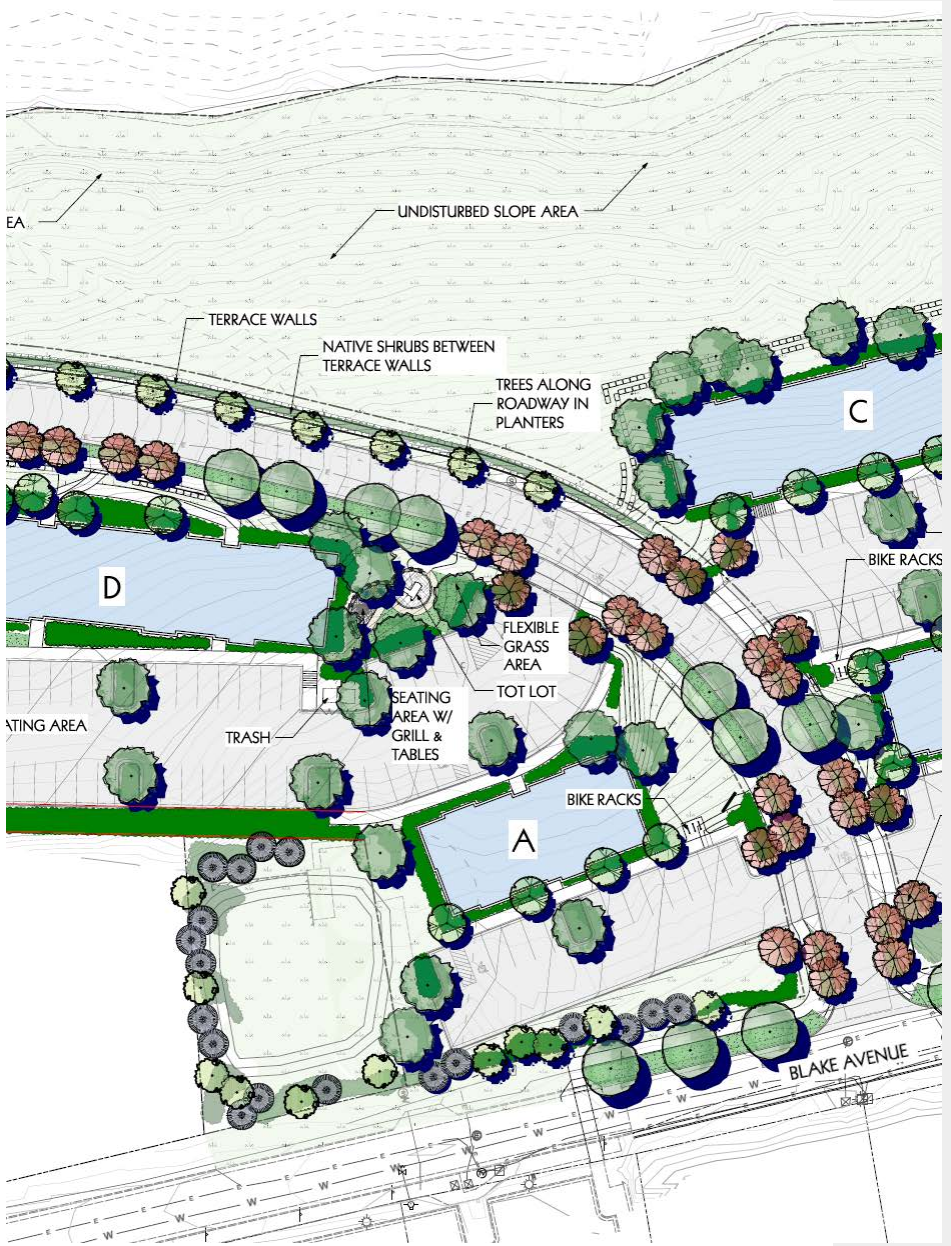
- 5.74 acre
  - RT Residential Transitional (tan)
  - RH Residential High-Density (brown)
  - Borders city boundary to the east



CITY OF GLENWOOD SPRINGS COLORADO

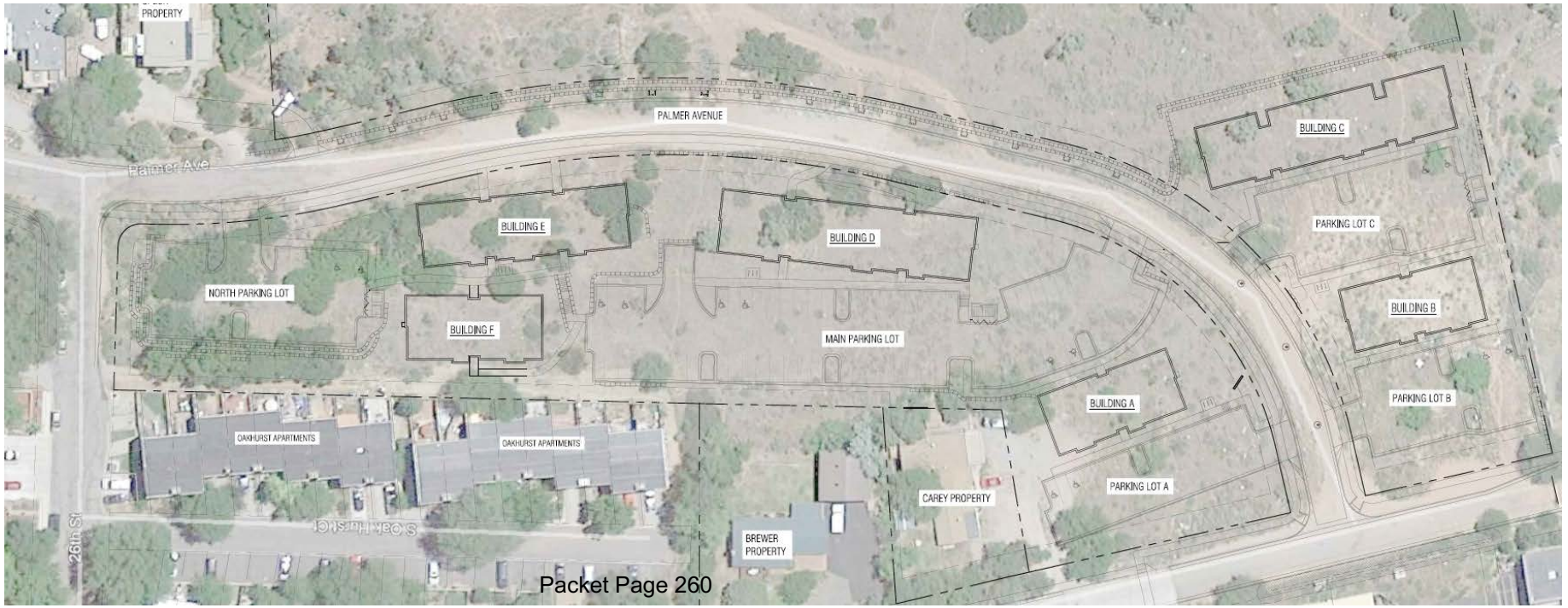
070.040 Development Standards

- 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

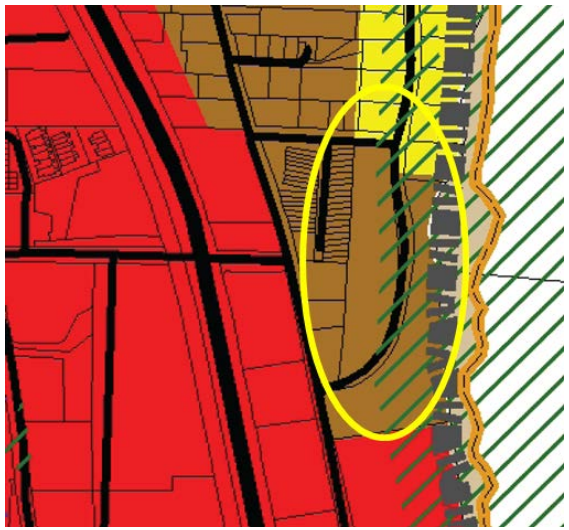
- iv. The variance requested does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation for which the variance is sought;
  - Consistent with the general purpose and intent of the Code
    - natural hazards,
    - efficient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

MINUTES
City of Glenwood Springs
Planning and Zoning Commission
Regular Meeting
April 28, 2020
Zoom
6:00PM

1. Roll Call

Present at roll call were Commissioners:	Amber Wissing, Marco Dehm, Kathryn Grosscup, Carolyn Cipperly, Ingrid Wussow, George Shaver, and Sumner Schachter
Absent:	None.
Also present were:	Jenn Ooton, Asst. City Manager, Director Gretchen Ricehill, Asst. 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 from the Feb. 25, 2020 meeting
Commissioner Grosscup pointed out on page 3 of the minutes, that Dr. Salmen's comments were not provided in their entirety and asked that staff review the tape.

Motion: Commissioner Grosscup made a motion to continue the minutes to the next meeting, seconded by Commissioner Wissing. Motion carried unanimously.

3. Comments from citizens appearing for items not on the agenda.

Laura Speck asked whether the topic of homeless was going to come up during the course of the meeting, and said that she would recommend no further development be approved until the situation is addressed. Chairman Dehm suggested that Ms. Speck make that comment during Planning Item 04-20 later in the agenda.

Lynette-Marie (no last name given) – Asked if the Framing Expressions/marijuana application was on the agenda. Commissioner Dehm said that is item 5B.

4. Continued Items –

a. 07-20 Consideration of a request to Rezone a parcel from RH-Residential High Density to M2-mixed use commercial central core zone district. The property is Lot 11B, Glenwood Meadows No. to a Minor Resubdivision of Glenwood Meadows No 4 Lot Line Adjustment, County of Garfield, State of Colorado (PIN 2185-081-41-004)

Asst. Director Ricehill provided an overview of the project for rezoning Lot 11B, which is a 0.4 acre parcel of land located on the southeast corner of Wulfsohn Road and Flat Tops View Drive, from RH-residential high density (formerly R/3) to M2-mixed use downtown core (formerly C/2). She pointed out that this item requires hearings before Planning Commission and City Council, said that staff believes that the application meets the criteria for rezoning and recommended approval of the application.

Commissioner Grosscup asked what the height difference is between the two zoning districts. Ms. Ricehill said that is 40 feet for both zoning districts.

Commissioner Shaver asked about the evolution of the lot configuration. Ms. Ricehill explained that there were lot boundary adjustments on the adjacent Lofts properties and the configuration of Flat Tops View Drive that resulted in the specific configuration of lot 11B.

Chairman Dehm asked about a building design and future plans for the project and whether those details would be part of a future application. Ms. Ricehill said that would be submitted sometime in the future, and the review procedure for a site/architectural review would be determined by the size of the building proposal in the future.

Chris Hawkins, Alpine Planning LLC, 523 Clinton St., Suite 2, Ridgeway, presented his request for the rezoning, explaining that the western sliver of the parcel already has a split zoning, and that his clients would determine a future proposal for the parcel after the rezoning.

Commissioner Dehm asked if the applicants would be developing the lot, and Mr. Hawkins said that the proposal was moving forward with the approval of the land owner, and if the contract didn't close that the current property owner supports the new zoning and would move forward from there.

Commissioner Dehm then opened the public hearing.

Trish (no last name given) said that she didn't have a question, but was checking the raise-hand function.

Breanna Millspaugh, 2600 S. Oakhurst, Unit 18 questioned why it is being encouraged not to deny the application.

Chairman Dehm then closed the public hearing, and reminded the public that the hearing would be kept open for people to provide additional time to comment.

Commissioner Schachter moved to continue the item to May 5. The motion was seconded by Commissioner Wussow. The motioned passed unanimously.

5. New 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)

Senior Planner Trent Hyatt presented the item, stating that the applicant, Triumph Development West, LLC, proposes to construct 100 multi-family apartment units in six separate buildings on approximately 5.74 acres. He also provided information about the procedure for the action items before the Commission including two variances, the rezoning of 2710 Blake Avenue from RH Residential High-Density to RT Residential Transitional, and the proposal for the Major Site/Architectural Plan. Mr. Hyatt pointed out that this Action Items 1-2 would be decided at the Planning Commission level and that Action Items 3-4 require hearings before Planning Commission and City Council.

Questions to staff from commissioners addressed circulation, the previous approval's condition related to the one-way configuration of Blake, the code's allowable parking reduction due to the site's proximity to transit, how the parking lot relates to the adjacent Oakhurst Townhomes, the details of snow removal, if the drainage facility could only be used for retention, what number of architectural features are required to provide four-sided architecture/achieve sufficient variation, what off-site improvements can be required of the applicant and whether there was a full landscaping plan within the application.

Commissioner Schachter asked about what off-site improvements could be required of the applicant. Mr. Hyatt said that anything that is considered a potential impact of the development can be recommended to City Council, and Assistant City Attorney Anna Itenberg agreed.

Commissioner Grosscup then asked if the Blake Gate was assumed to be opened, and Mr. Hyatt said, yes, that the traffic analysis assumes that the gate would be opened.

Assistant City Engineer Jessica Bowser answered the question about the sizing of the detention – noting that due to expense that the drainage would not be oversized. She confirmed that the city requested that the traffic analysis was modeled with the gate open.

Michael O'Connor, Triumph Development West provided a presentation on the proposed project and introduced all members of the development team. Mr. O'Connor briefly described opportunity zones and how it applies to the property and project in addition to the development team's history of completing similar projects. O'Connor also summarized the previously approved projects on the site and how they compare to their proposed plan, mentioning the proposed project did not have any buildings in the flood zone.

Architect, Mike Foster, Triumph Development, 12 Vail Road Suite 700, Vail, CO further discussed the proposed project and site plan. Mr. Foster discussed the layout of the site, fire truck access, architectural features, and grade changes on the site. In addition, Foster also highlighted that 50% of the units were adaptable for ADA access. He also described the visual screening of the site's border with Oakhurst Townhomes as well as in front of the main parking area.

Greg Schroeder, representing McDowell Engineering, 241 Broadway Street, Eagle, CO presented on traffic design on the site. Schroeder mentioned that much direction was taken from a February 2018 Council meeting which promoted opening the Blake Avenue gate and making Blake Avenue a one-way street to reduce through traffic. Schroeder also referenced that the previous traffic design and plan was approved by CDOT and that the proposed development has a lower traffic impact compared to previously approved plans.

Michael O'Connor provided a short summary of the proposed project application and addressed the parking counts and feedback from the February community meeting. O'Conner described how the proposed parking complies with code.

Commissioner Schachter had multiple questions on how the traffic was measured and potential impacts on the neighborhood, especially along Palmer Avenue. Commissioner Schachter also asked about the possibility of the City abandoning Palmer to be a private road. O'Connor indicated that the option to take over Palmer had been considered but the process did not fit well with the project's timeline.

Commissioner Grosscup had questions about the site plan regarding walkability, parking access, and amenities offered including if on-site management would be offered. O'Connor explained that the size of this development would likely result in an on-site property manager. Stephanie Copeland, from Four Points Funding, the equity partner in the project and owner of the property, also added that an on-site manager was important to the operation of the project.

Commissioner Shaver had several questions about the elevation of the site and how it relates to the nearby Oakhurst Townhomes. Architect Mike Foster explained the difference between elevations and the entries into buildings on the site plan. Commissioner Shaver also asked if there would be more detailed landscaping plans in the future.

Commissioner Wussow asked if there were any 'green' initiatives for the project such as sustainable building materials or community garden space. Mike Foster mentioned that they were in the process of researching solar panels on the roof and EV parking. Foster also explained that they were in the process of pursuing HUD certification, which has its own sustainability requirements. Commissioner Wussow also requested a sample of building materials for the next meeting.

Commissioner Wissing asked about potential sidewalks along Blake Avenue.
Mike Foster explained that the updated site plan will continue sidewalk for the entire length of the property to the north. Commissioner Cipperly also had questions about sidewalks along Palmer as well as questions about potential pedestrian traffic through the site.

Chairman Dehm opened the public hearing.

Breanna Millspaugh, 2600 S. Oakhurst, Unit 18, said that she is very concerned about the project. She said that at the neighborhood meeting that a fence between the two properties was discussed, and that the project as presented does not have a fence. People will still be able to come through the Oakhurst property. There are serious parking problems at Oakhurst and that the 1.5 parking spaces for this project is not adequate. She also asked what is affordable housing and said that affordable housing does not exist in this Valley.

Tom Doogan, said that the project is not affordable housing, it is additional housing. We have huge growth that needs to be accepted, and we are in dire need of additional housing. He said he was supportive of one more thought for traffic flow to do a one-way street that would exit on the southside by Wal-Mart, and make the traffic flow to the south.

Jerry Raehal, 2314 Palmer Ave, wanted to state that he is not opposed to growth and has real concern about the plan. Believes that there are variances not mentioned, including that the increase in the traffic will require the reclassification of Palmer to a collector. He expressed concern that the project will create walkability to nowhere without sidewalks other than within the development. He said that the assigned parking would make parking overflow into the neighborhood and said that when traffic is backed up on 82, that the traffic will flow onto Palmer.

Jamie Raehal, 2314 Palmer Ave., said that she disagrees with the traffic study and expressed concern for the safety of her neighborhood, noting that the Blake Street Gate opening would create flow through traffic to Palmer. It will have a negative impact on the goals within the long-range transportation plan, other than traffic onto the highway. She said that the development will create single-use streets, instead of multi-modal streets. She applauded the city for the traffic calming program, but that it is not a reason to rush the decision here.

Laura Speck, representing her family's home at 2506 Palmer Avenue, which she described as the last house on the road. She stated that this is the first time that she had heard that the driveway would be affected by the plan and would require compensation and privacy amenities. She said that they would be potentially be looking out onto a parking lot, fencing or retaining wall. There are too many questions that need to be addressed before this project should be allowed.

Trish Kramer, 2501 Palmer Avenue, said that her overall impression of the project that it is an improvement over the previous proposal, however, her concerns remain unaddressed regarding parking and traffic. She brought up a question about the width of the road and whether parking would be allowed on the extension of Palmer Avenue. She said that she thought there needed to be a plan for snow removal that did not include taking up parking. She stated that reduced vehicle use is different from reduced vehicle ownership, and she thought the parking reduction was unrealistic. She said that the traffic study didn't take into account the increased crowding on 82 resulting in increased crowding onto side streets in Glenwood Springs. She said that we're facing a 10-year period of economic stressors, and said that she doesn't see the city being able to address street maintenance.

Ralph Scmalley, 2409 Palmer Ave., said that he doesn't have a concern with adding housing in the area, but thought the added traffic on Palmer Avenue. Traffic summary was not precise, but it brought up a good point that the traffic in the p.m. is caused by the backup on 82. People use Palmer already, and that would increase if Blake were made one-way. He said he has concerns about the traffic at the 23rd intersection with 82.

Shelly Lott, 2600 S. Oakhurst, #19, President for the Oakhurst Townhomes. She asked what is retaining the earth above the north parking lot and the lot next to it. She said the developers moved the buildings toward Wal-Mart and left the flood zones open for the homeowners below. She noted that the Oakhurst Townhomes are family homes, and that this development is being built right above. She said that they are not able to assure us that the townhomes will be protected. She said that she wanted more research.

Mike Foster addressed the questions regarding the fencing between Oakhurst and the site. Foster explained that the project was still open to fencing but that further discussion with Oakhurst and additional residential neighboring area. Foster also addressed snow storage on the property that these issues would be addressed in a snow removal and storage plan as part of the building permit. Foster also explained that there will be debris fencing above the site. Assistant City Engineer Jessica Bowser provided comments on the debris fencing and explained that the applicant would be required as part of site review to prove that any development does exacerbate any existing drainage issues.

Commissioner Grosscup made a motion to continue Planning Item 04-20 to the May 5, 2020, agenda. Commissioner Shaver seconded the motion, which passed unanimously.

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

Mr. Hyatt explained that the applicant, John Dyet, doing business as Kind Castle, proposes the interior remodel of an existing approximately 738 square foot unit (currently occupied by a framing business) in the commercial strip located at 2114 Grand to accommodate the retail sale of cannabis and related products. He said that as a special use review, Planning Commission is a recommending body to City Council.

Mark Maysich, 2005 East Ballard Avenue, Silt, CO 81652. Deferred to John Dyet.

John Dyet, East 4th Street, Parachute, CO, 81635. Dyet elaborated on the application summary provided by Trent Hyatt. Dyet explained that their flagship location is in Parachute and they are looking to expand to six other stores based on current success of Parachute location. Dyet explained their security practices and that they have never had any issues with odor or other compliance issues.

Brian Cole 1723 Riverbend Way noted that he is a cannabis user and this he believes that Glenwood Springs has a plethora of choices for marijuana and that it has had a negative impact on visitors and travelers, and the mentality that we are a pot town. He said that the traffic area near the Starbucks and gas station is very overwhelming. He said that he didn't support the application.

Lynette-Marie Lacerda, 285 Mikala Ln, New Castle, said she is in opposition to the application and said that there is not enough parking. She expressed concern that there will be increased traffic, and that Glenwood Springs has one framing shop, and that she didn't think we need another marijuana store.

Haley Carmer, Garfield and Hecht, noted that her firm represents the Cedar Lodge Motel, which is adjacent to property. She brought up concerns related to parking, traffic and odor. The existing commercial in the building already has some overflow parking going onto the Cedar Lodge's property when there isn't enough space. She said that the parking is inadequate in number and configuration. She raised issues related to being able to see due to the location of the sign, the lack of a landscape buffer, wafting smells back and forth, and the state of the building potentially being a cause for odor to come from the building.

Virginia Gera, 122 Tanager Drive, part owner of Framing Expressions, said that she does not feel that there is a need for another marijuana shop given the number in Glenwood, noted that they are the only frame shop, doesn't believe this project is infill because the space is currently being used, raised the issue of odor reaching other parts of the building, raised the issue of parking, and pointed out people stayed 4.5 hours in a meeting to express how strongly they are opposed.

Corey Gera, 122 Tanager Drive, said the proposal makes it seem as if the business isn't active, brought up that parking is a big issue, and said that the proposal is pushing out an active business. She urged Planning Commission to deny the permit.

Barbara Koziol Speaking on behalf of the owners of the Cedar Lodge, 2102 Grand Avenue, brought up concerns about health and safety of the neighborhood, brought up odor, said that there is a common wall between the retail and residential with small children, and that everyone would have the potential to smell the marijuana. This would carry over into the parking lot of the lodge and that there isn't a reason for another marijuana shop. She brought up the proximity to two air conditioning units for the lodge and that guests checking in would potentially smell things and that there is a potential impact to 22 guest rooms. Parking space is a big concern because just the employees would take up the parking. Requested the Planning Commission deny.

Chelsea Sullivan, 1699 Riverbend, don't need another marijuana store in our city, we are established and have a very good community, and another marijuana store is not what we want especially in the middle of town. It is a bad decision on Glenwood Springs; part to encourage another marijuana store to be here.

Todd Leahy, 1028 Blake Avenue, said that he heard a common theme tonight that Glenwood Springs doesn't need another marijuana store. He said that he had done a lot of research on John before he decided to put him as a tenant in one of his properties, had visited Parachute and felt that store was like a high-end jewelry store. He said he had taken a lot of phone calls from interested marijuana operators wanting this site, so he checked John out thoroughly. He said that the free market should decide what stores make it and which ones won't. He said that there isn't any reason within the staff report for a denial.

Applicant John Dyet responded to comments and concerns that they would be very respectful

of potential new neighbors, especially addressing odor issues. Mr. Dyet explained that very few locations in Glenwood Springs meet the ordinance requirements for this use. Mr. Dyet also explained that he would be willing to help the framing store to find a new location.

Mark Maysich also responded to several comments. Maysich explained that the parking would be adequate and used the example of their Parachute store, which has less than 8 spaces. Maysich also spoke about security measures including cameras on site as well as a potential easement that would alleviate traffic flow on the property.

Commissioner Grosscup had several questions regarding how many dispensaries had been permitted in Glenwood and how many stores were currently operating. Commissioner Cipperly mentioned that there were some Fire Department comments on emergency access behind the building and that this was a concern.

Commissioner Grosscup made a motion to continue Planning Item 06-20 to May 5, 2020, that was seconded by Commissioner Schachter. The motion passed unanimously

c. 11-20 Consideration of various amendments to Municipal Code Title 070 Sections 070.030, 070.040 and 070.070 regarding Use Regulations; Accessory Uses; Hillside Development; Landscaping, Screening and Fencing; Off-street Parking; Residential Site and Building Design Storage requirements; Signs; and Rules of Construction and Definitions.

Commissioner Grosscup made a motion to continue the item to the May 5, 2020 meeting. The motion was seconded by Commissioner Shaver. The motion passed unanimously.

6. Adjournment 10:59 PM

DRAFT



Bell Rippy Apartment Homes

Major Site/Architectural Plan Review with Variances

& Rezoning of 2710 Blake Ave

Planning & Zoning Commission Meeting - 4.28.20

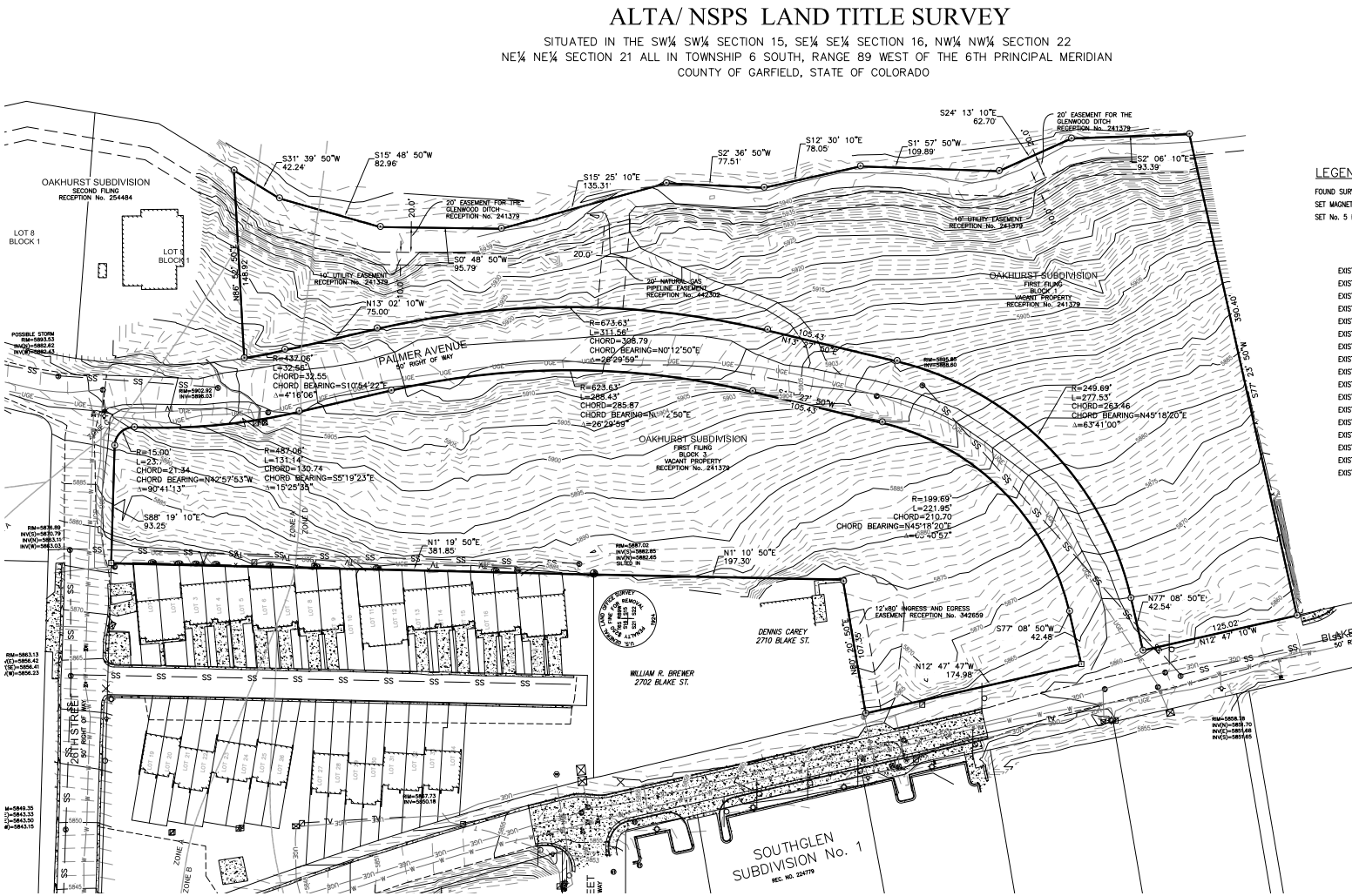
Development Team

- 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

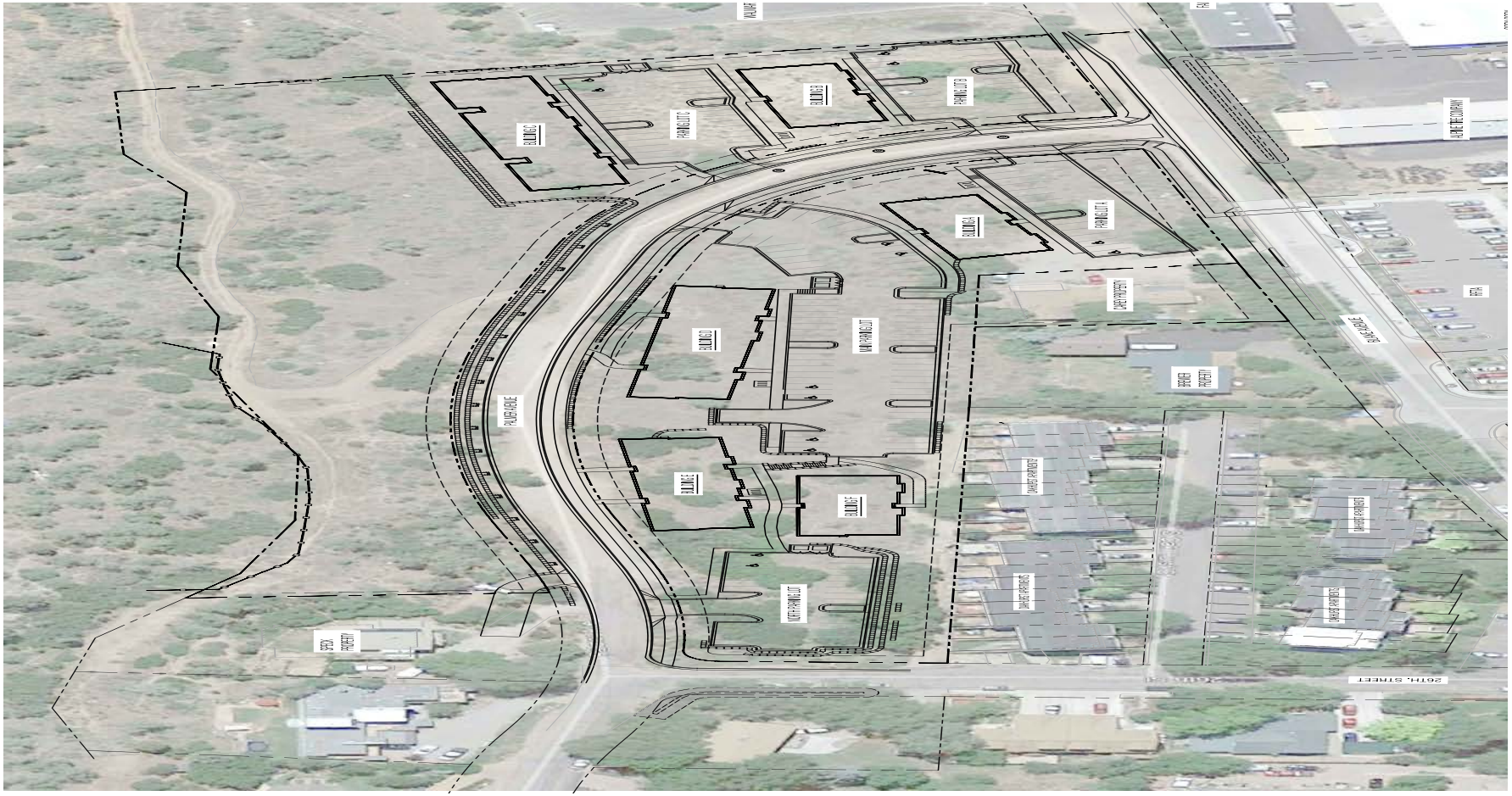
- 10 three-story buildings buildings with 79 homes and 156 bedrooms. Mostly 2BR
- Construction of the Palmer Avenue ROW to the COGS design standards, along with debris flow mitigation
- CDOT Access Permit received for the proposed traffic pattern

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

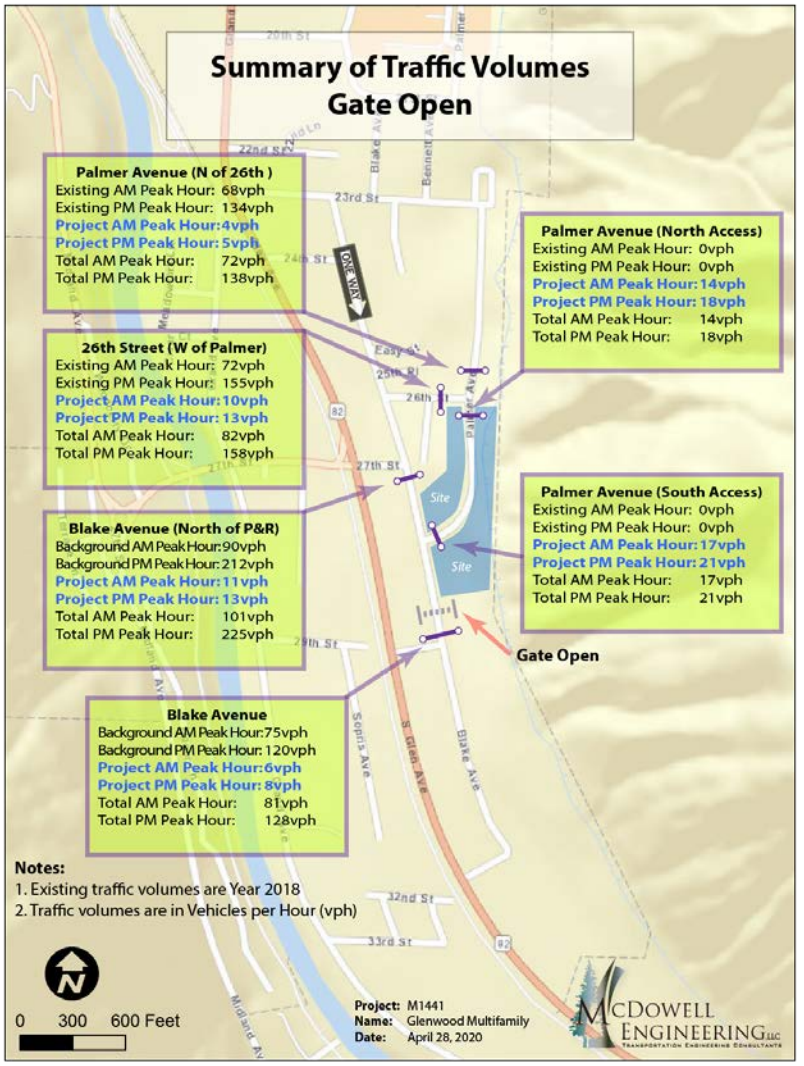


Site and Architectural Design Presentation
Mike Foster, Triumph West Architecture

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

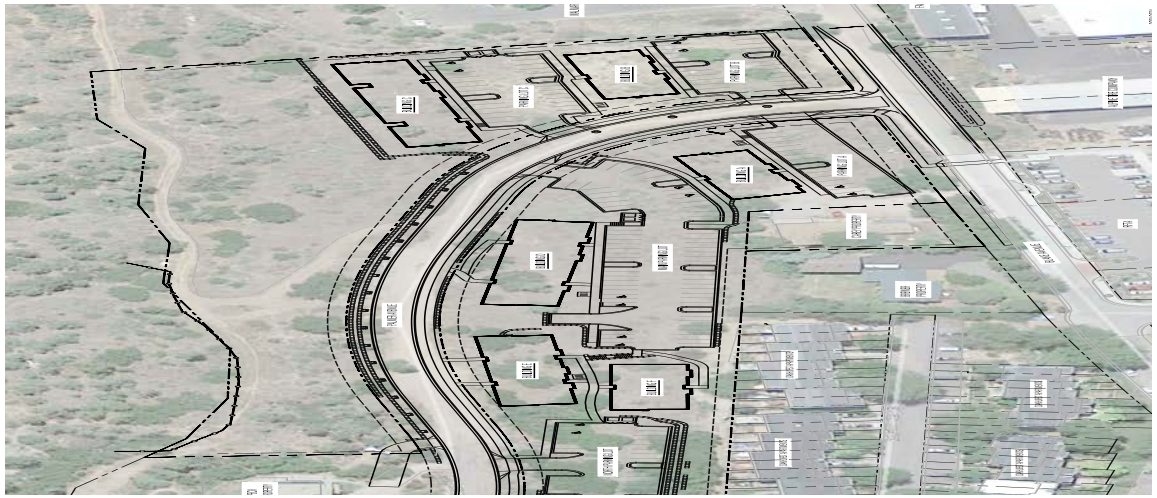
- Proposed construction of Palmer to COGS standards – drops grade as much as 9 feet
- Retaining walls vs. significant uphill site excavation to preserve highly visible native landscape
- Construction of 400’ debris flow fence for the benefit of the entire neighborhood
- Site plan that discourages access 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

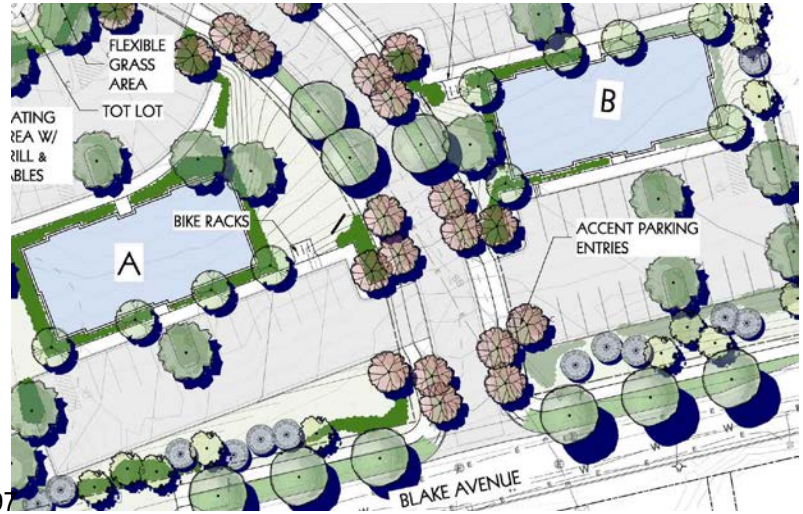
- Section 70.040.080(e)(3) the *GSMC* requiring developments with three acres to provide at least two housing types.
- Site grade and engineering requirements for the Palmer Avenue engineering standards drive a development plan with a condensed footprint that minimizes uphill development disturbances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



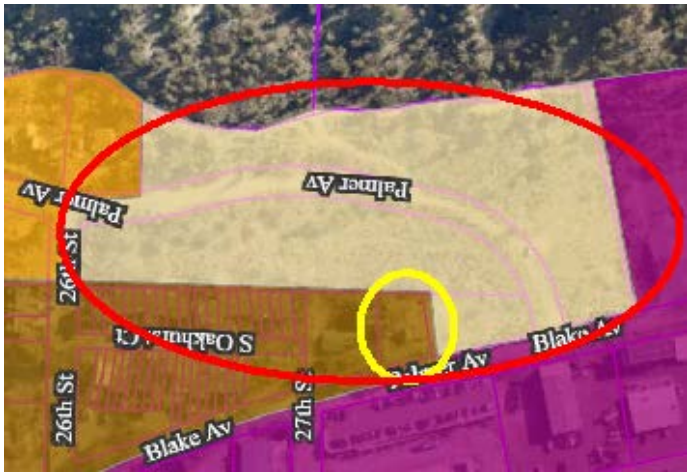
Zoning Variance #2 – Parking Internal to Site

- 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

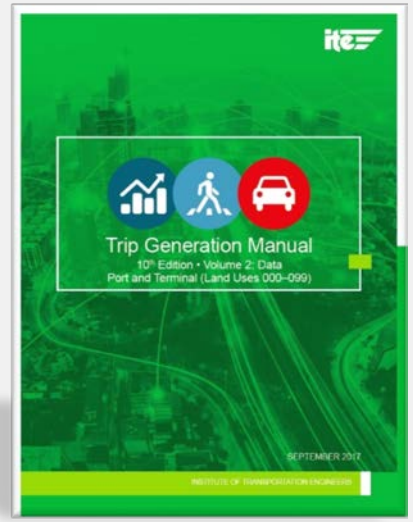
April 28, 2020

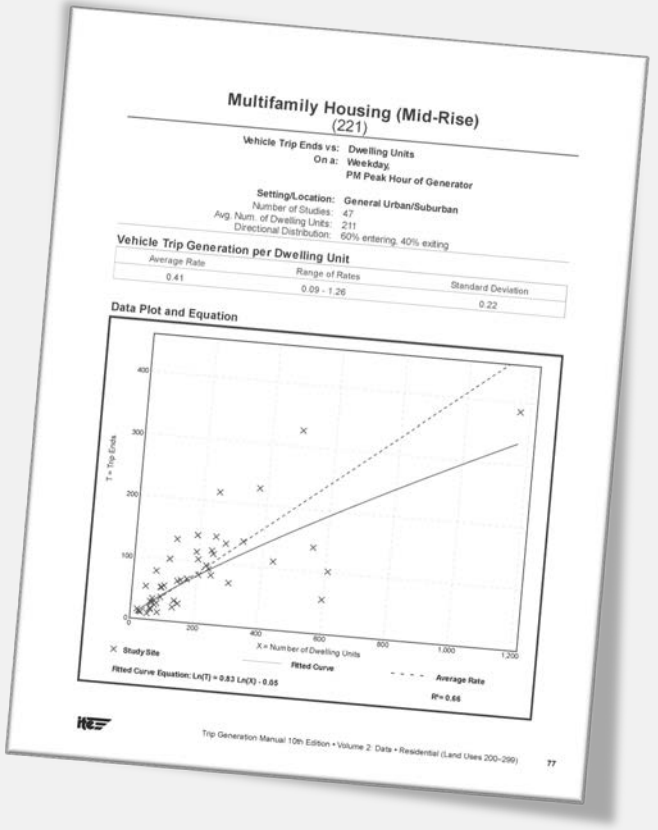
TRAFFIC UPDATE

- 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

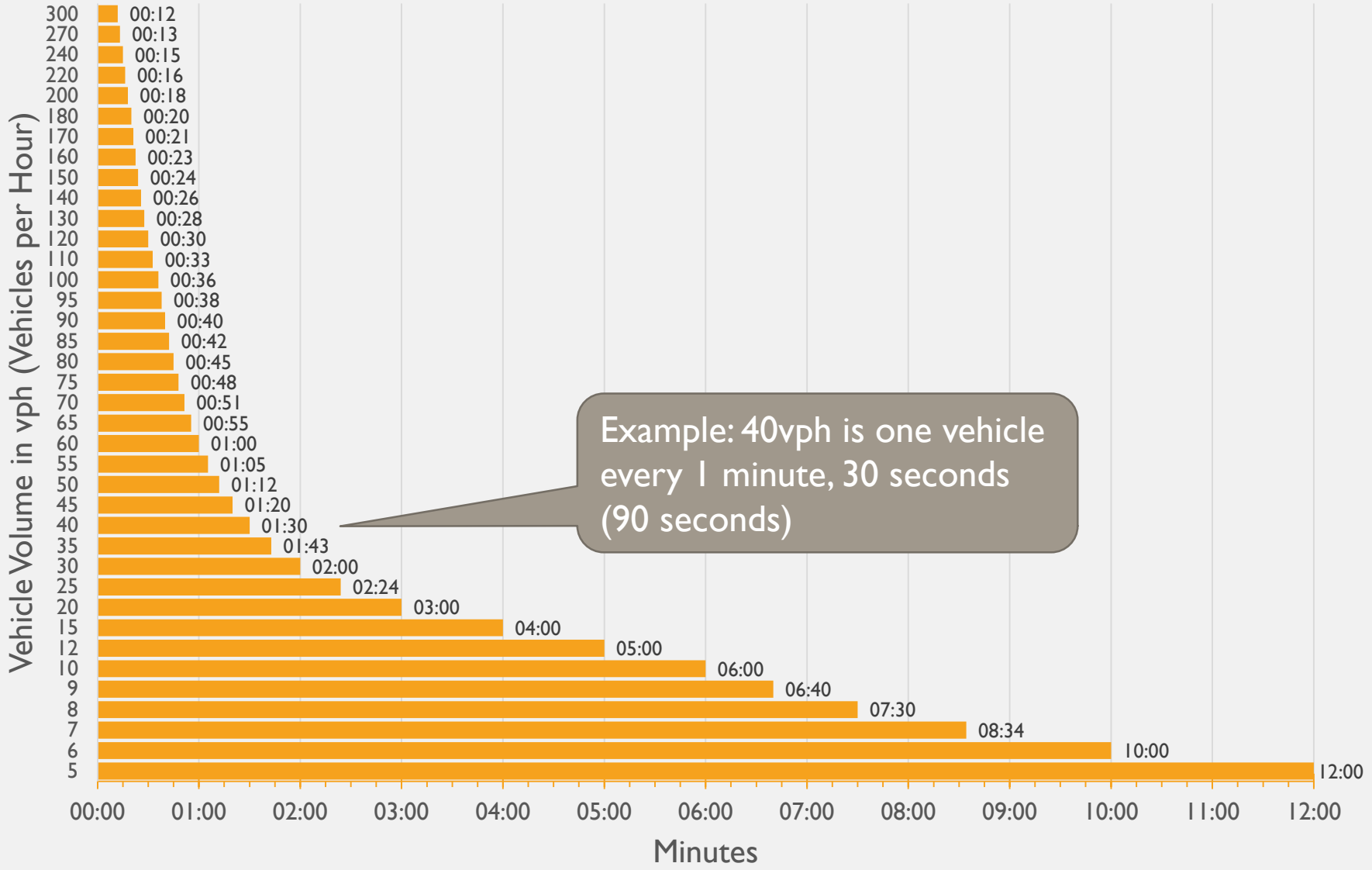
- ITE Trip Generation Manual, 10th Edition
- 3000+ pages of traffic trip generation studies





Vehicle Volumes

Average Number of Minutes Between Vehicles



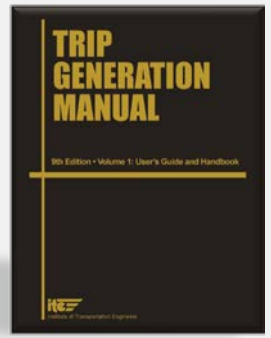
TRAFFIC VOLUME / TRIP GENERATION COMPARISON

- 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

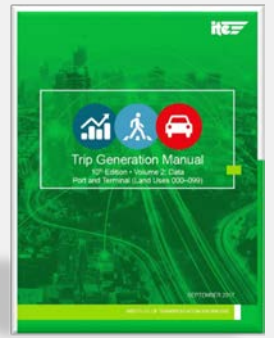
- This Development Proposal
- Trip Generation
  - 100 Dwelling Units.
  - 10% Multimodal Trip Reduction (due to proximity to transit)
  - 489vpd Average Weekday Trips, 30vph AM Peak Hour, and 38vph PM Peak Hour

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

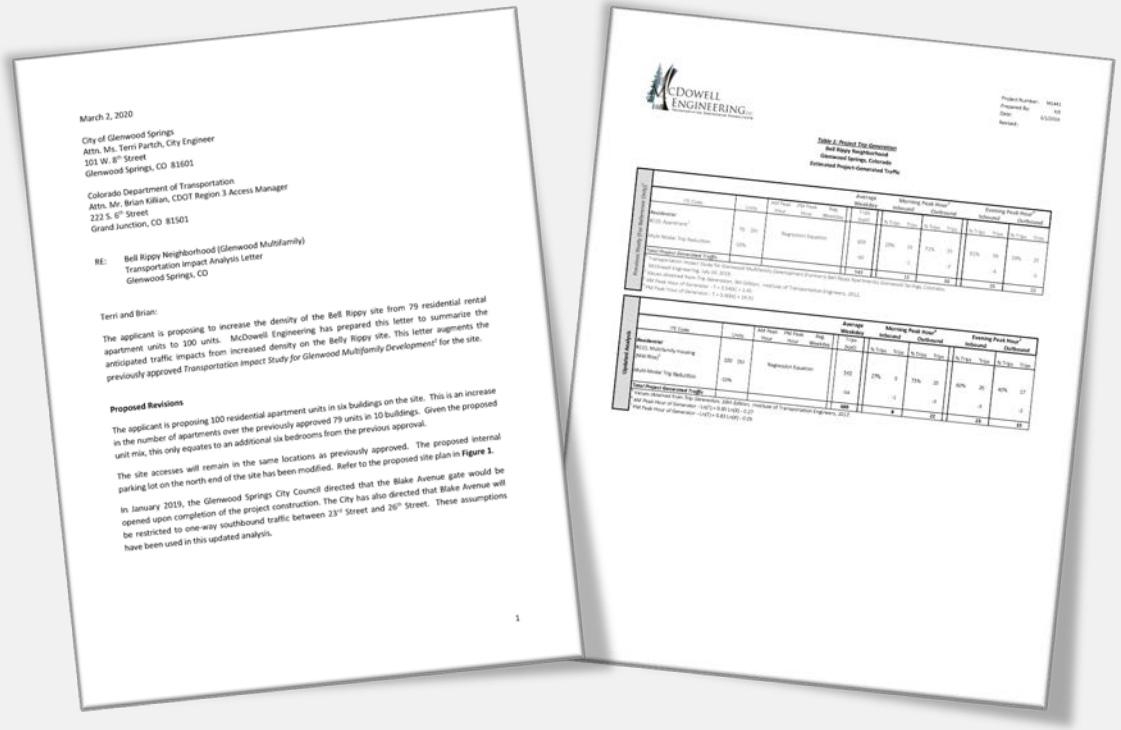


- This Proposal
  - Revised Application submitted 2019/2020
  - Used ITE Trip Generation 10th Edition
    - More Data Points
    - Better Land Use Distinctions
    - Published in September 2017
    - Land Use #221, Multifamily Housing (Mid-Rise)
  - Memorandum to City, March 2020



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.

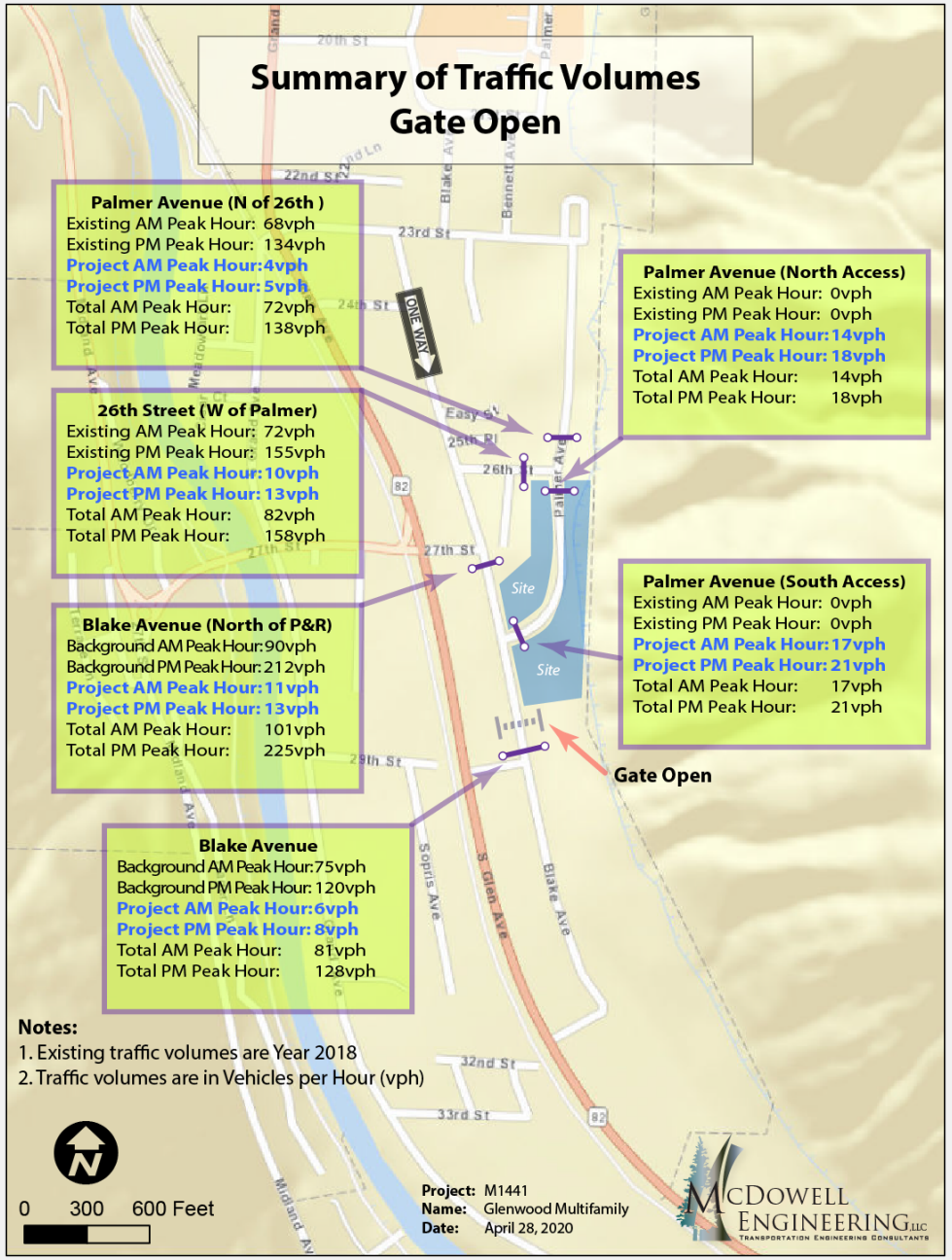
Proposed Revisions

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.

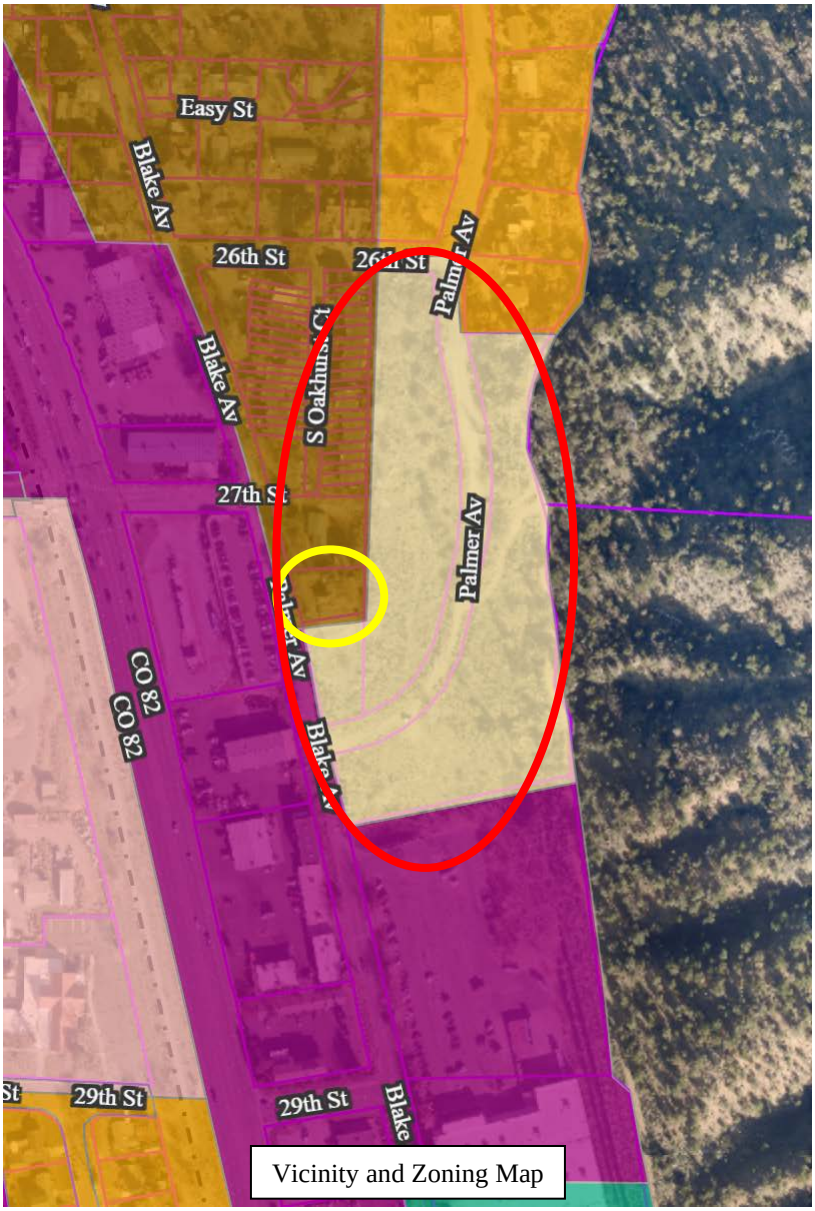
<u>Staff recommendation</u>: *Staff recommends **approval (with conditions)** of the Major Site/Architectural Plan Review with the findings and conditions on pages 13-14.*

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.

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



Vicinity and Zoning Map

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

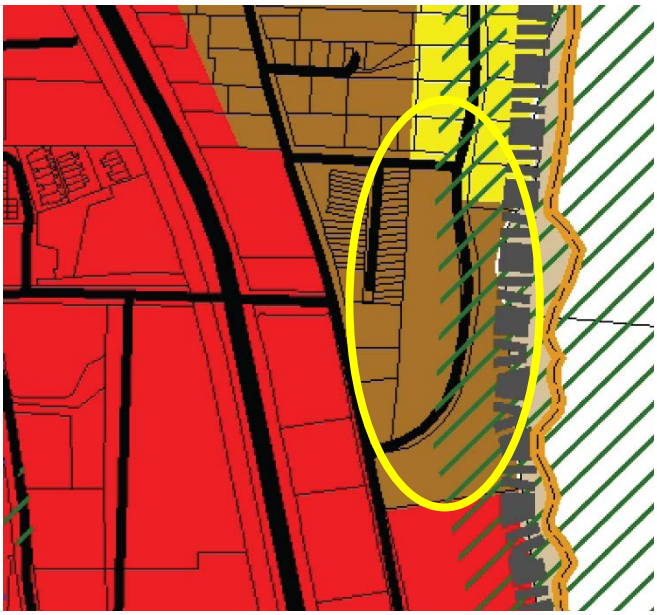
As mentioned above, the vast majority of the site is zoned RT -Residential Transitional. However, the parcel located at 2710 Blake Avenue (PIN: 2185-211-00-002), which is the location of an existing triplex, is currently zoned RH-Residential High Density. To maintain consistency, the applicant proposed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

TRIUMPH

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

Owner:
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303.517.9256

Traffic Engineering:
McDowell Engineering Transportation Engineering
Kari J. McDowell Schroeder
kari@mcdowelleng.com
970.6230788

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).

TRIUMPH

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;*

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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.

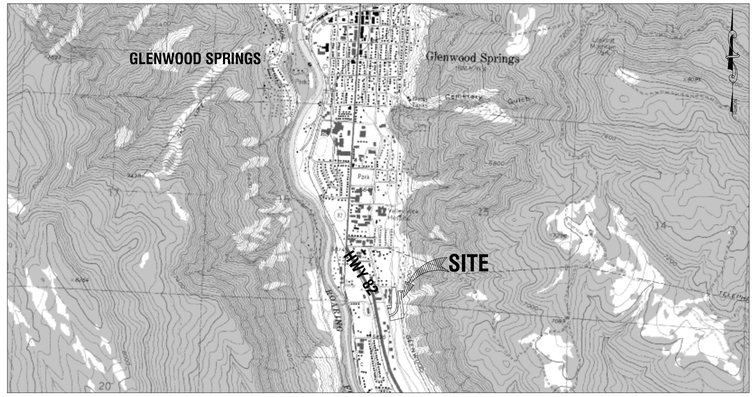
ABBREVIATIONS

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

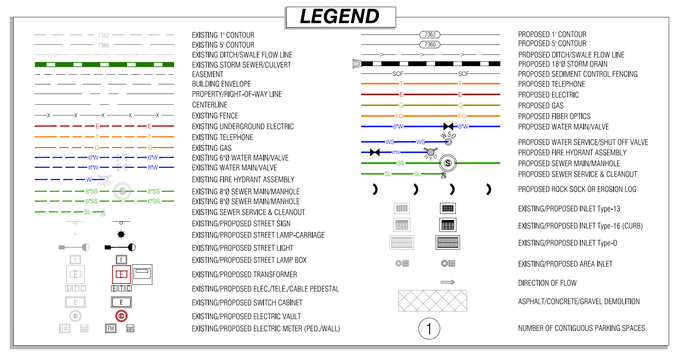


VICINITY MAP
Scale: 1"=2000'

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 EQUIPMENT. 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 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. ALL EROSION CONTROL FABRIC SHALL BE NORTH AMERICAN GREEN SC250 OR ENGINEER APPROVED EQUAL UNLESS SPECIFIED DIR

BELL RIPPY NEIGHBORHOOD

OVERALL SITE PLAN



Boundaries Unlimited Inc.
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Surveying
& Beyond
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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

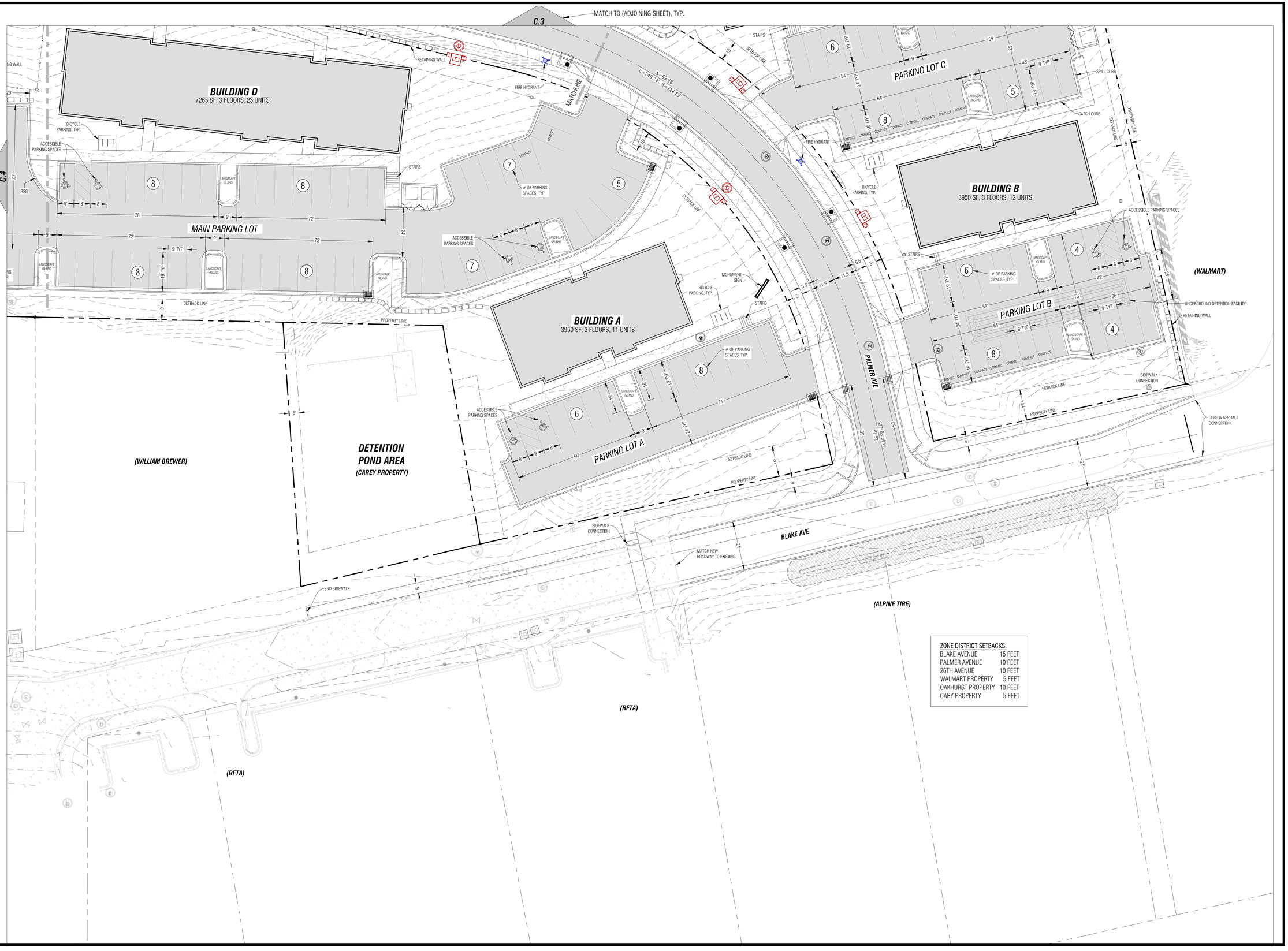
No.	Date	Revision	By
1.	4.20.20	CITY COMMENTS TO 30% SUBMITTAL	PH
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PROJECT NO.
20002
Designer:
DJW
Drafter:
BUI
Date:
3/03/20

Sheet
C.1

File Name: 20002-c-cover.dwg

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VAIL, COLORADO 81657
970 479-9990

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

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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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VAIL, COLORADO 81657
970 479-9990

NORTH

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

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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
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File Name: 20002 c-site.dwg

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(SPECK FAMILY TRUST)

PROPERTY LINE

DEBRIS CONTROL FENCE, TYP.

DEBRIS FENCE GRAVEL ACCESS

4X2' BLOCK PLANTER BOXES EVERY 30', TYP.

4' FACE TO FACE

RETAINING WALL

MATCHLINE

C.3

PALMER AVE

Δ=26.50
L=300.00', R=648.63'

PROPOSED RELOCATED DRIVEWAY TO REPLACE EXISTING DRIVEWAY ACCESS

S13° 02' 10"E
75.00

FIRE HYDRANT

RETAINING WALL

Δ=20.46
L=165.01', R=462.06'

SETBACK LINE

BUILDING E
6000 SF, 3 FLOORS, 18 UNITS

RETAINING WALL

BICYCLE PARKING, TYP.

FIRE TRUCK TURNAROUND

ACCESSIBLE PARKING SPACES

STAIRS

26TH STREET

OF PARKING SPACES, TYP.

ACCESSIBLE PARKING SPACES

FIRE HYDRANT

NORTH PARKING LOT

BUILDING F
3950 SF, 3 FLOORS, 12 UNITS

MAIN PARKING LOT

LANDSCAPE ISLAND

OF PARKING SPACES, TYP.

CRUSHER FINES WALKWAY

RETAINING WALL

PROPERTY LINE

SETBACK LINE

PROPERTY LINE

(OAKHURST APARTMENTS)

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

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Site Plan

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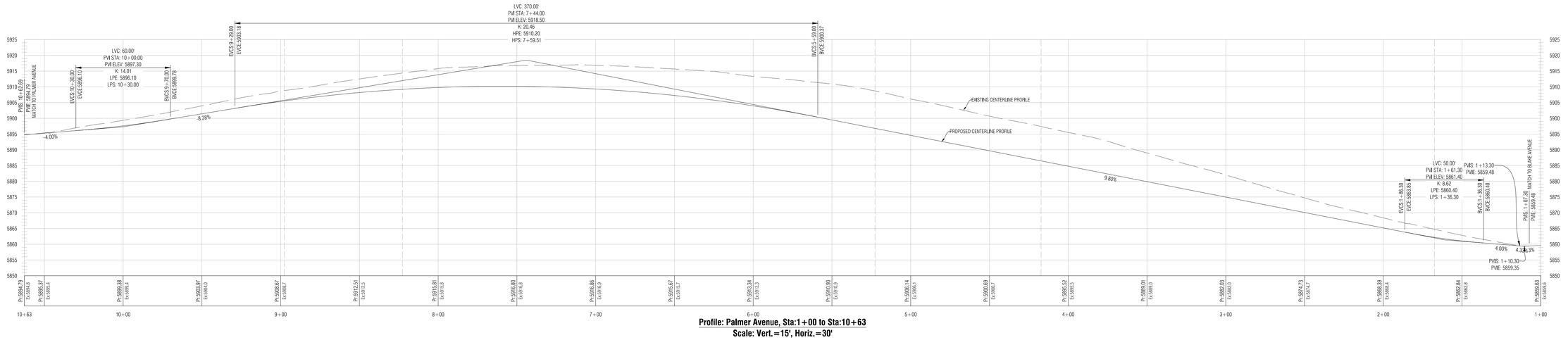
No.	Date	Revision	By
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PROJECT NO.
20002
Designer:
DJW
Drafter:
BUI
Date:
3/03/20

Sheet
C.4

File Name: 20002 c-site.dwg





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

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Engineer or Surveyor Seal

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

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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Palmer Avenue Plan & Profile

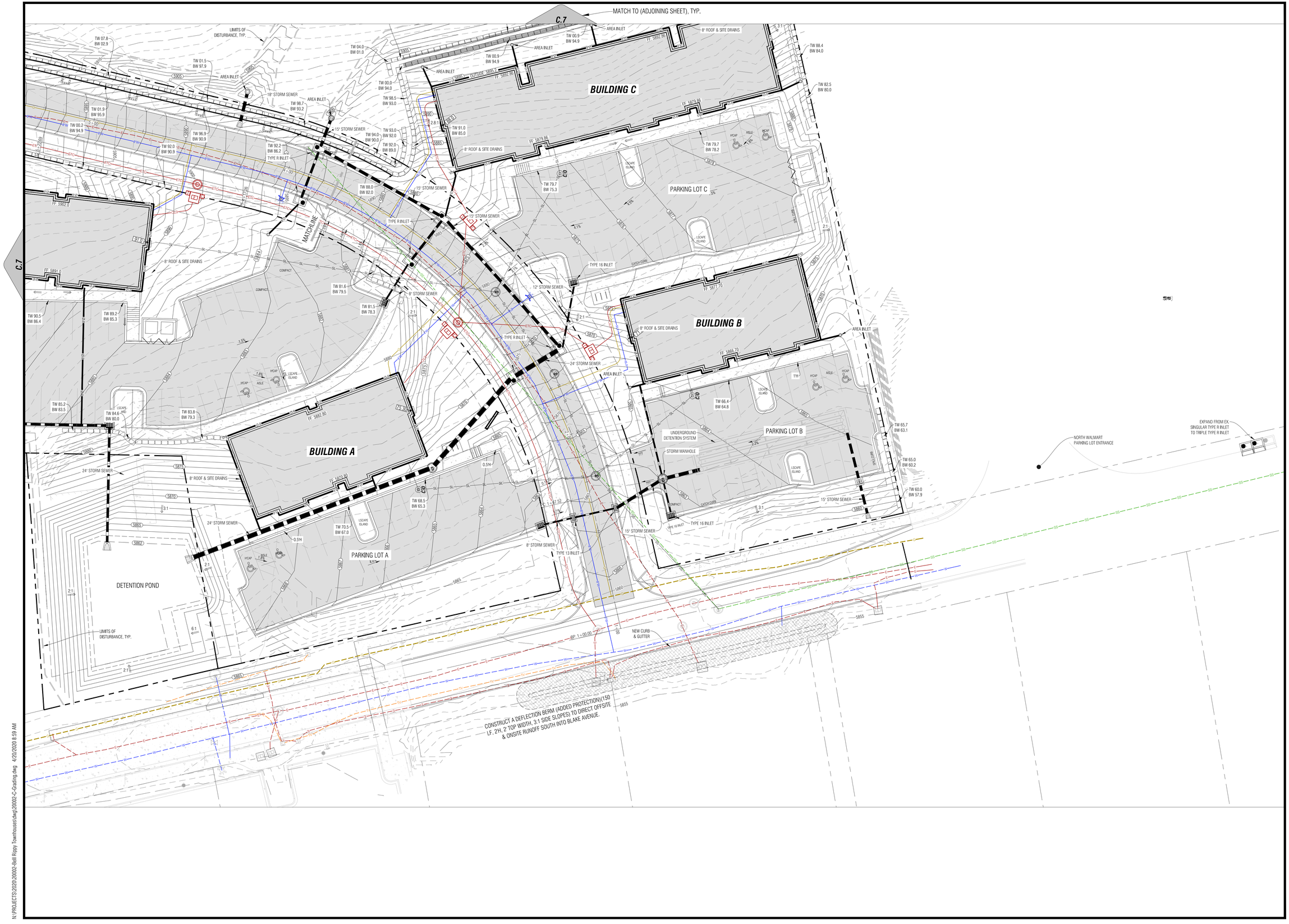
30% Review Set - Major Site Plan Submission

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

Sheet
C.5

File Name: 20002 c-base.dwg



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Civil Engineering
Surveying
& Beyond
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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 20' 40'
Scale: 1" = 20'

811
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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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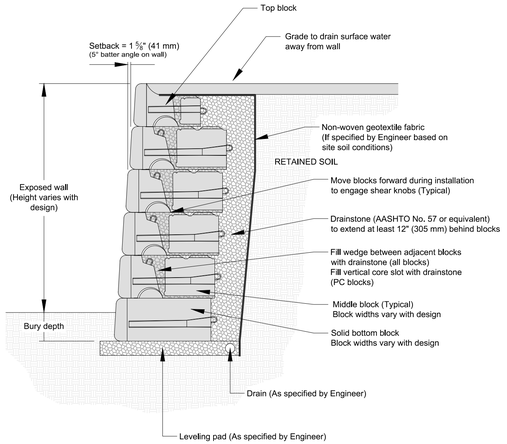
PROJECT NO. 20002
Designer: DJW
Drafter: BUI
Date: 3/03/20

Sheet C.6

File Name: 20002-c-grading.dwg

Typical Gravity Wall Section above Palmer Avenue.

(Actual wall to be determined)



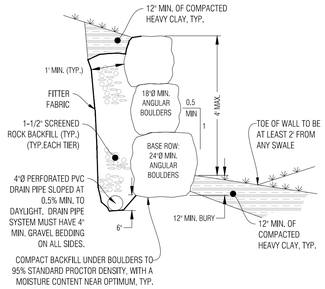
This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer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

RED ROCK
05481 US 31 SOUTH, CHARLEVOIX, MI 49720
(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.

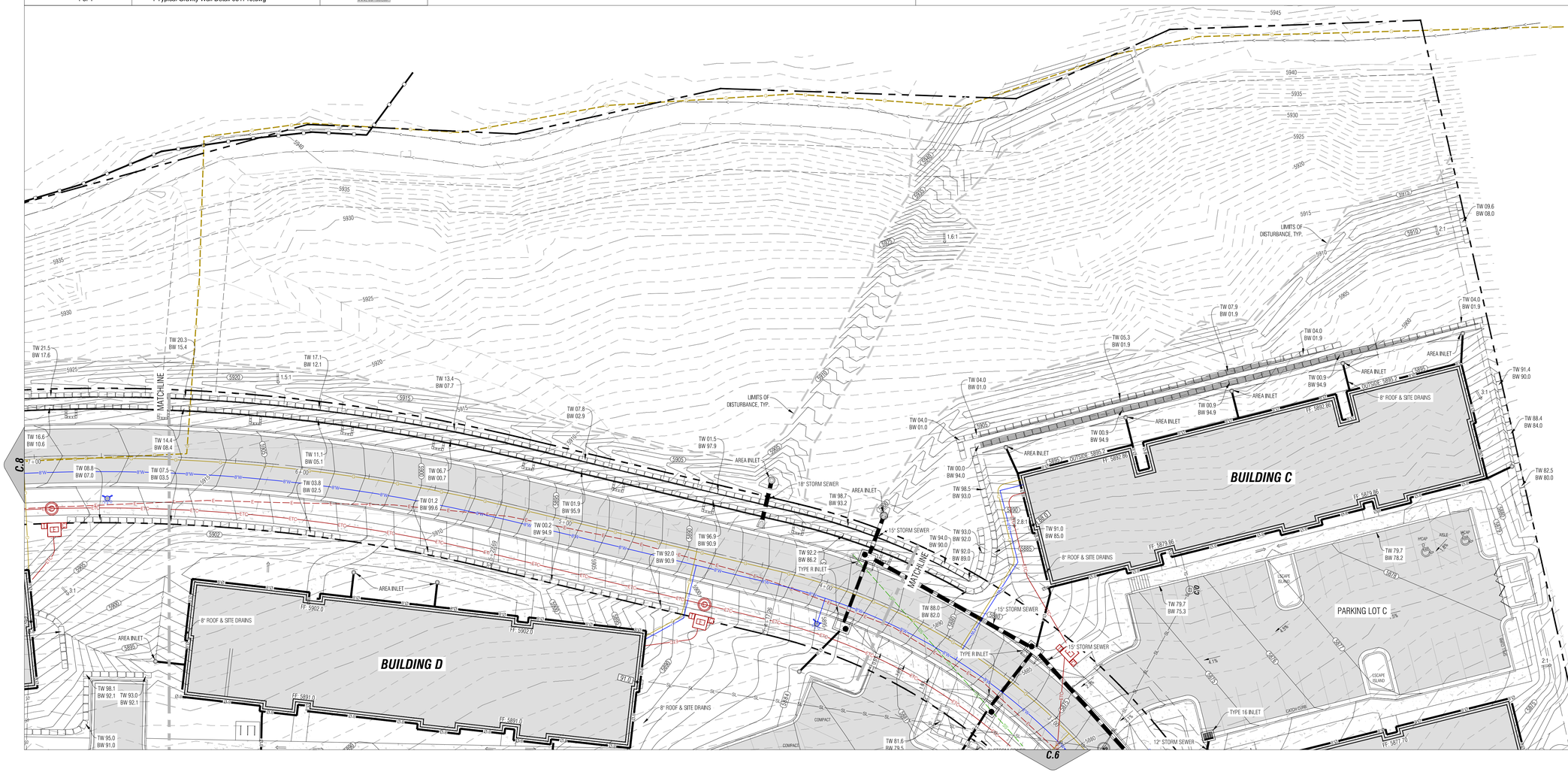
(Actual wall to be determined)

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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NORTH

0 20' 40'

Scale: 1" = 20'

811
Know what's below.
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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Grading & Drainage Plan

30% Review Set - Major Site Plan Submission

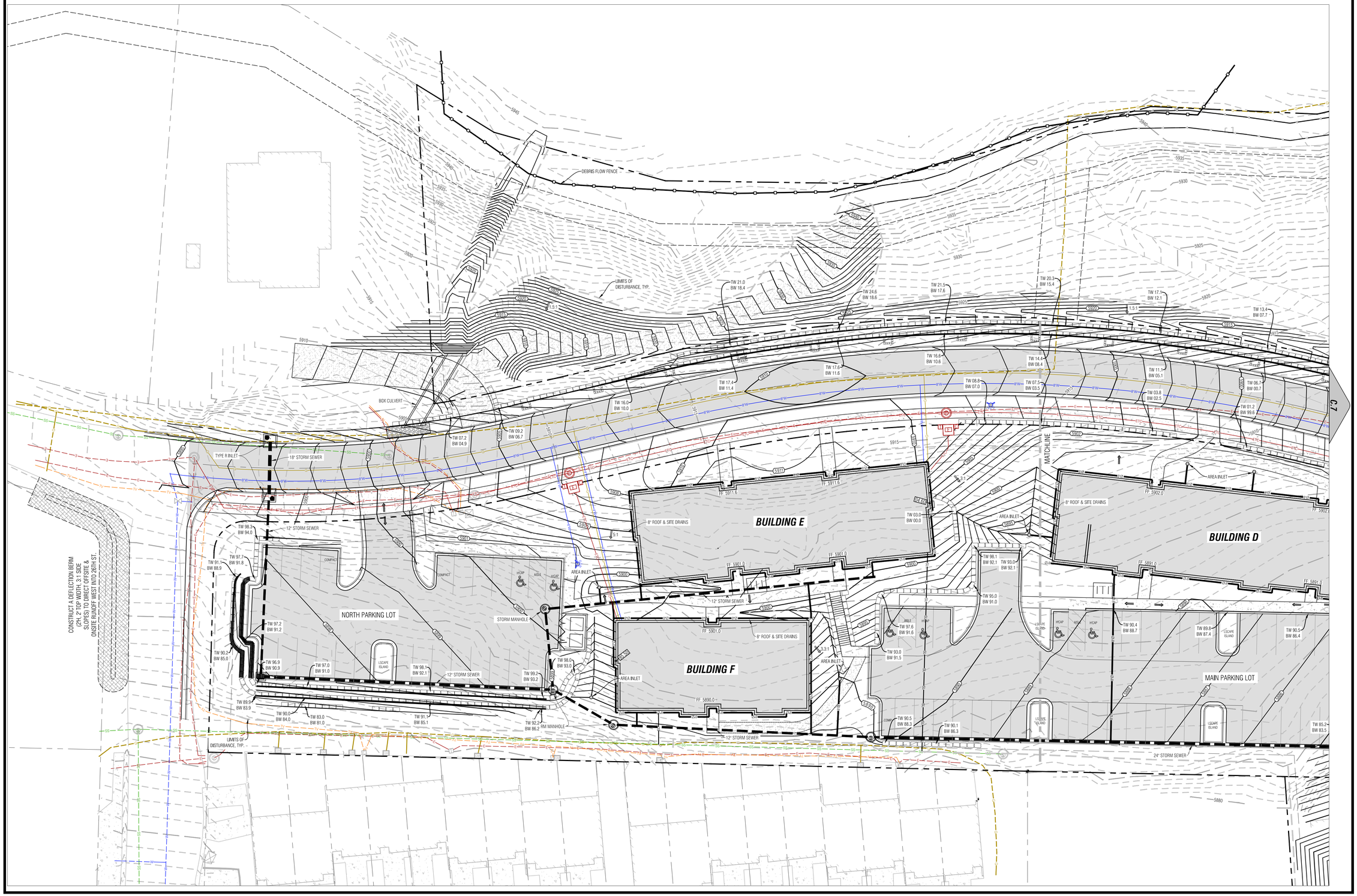
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PROJECT NO.: 20002
Designer: DJW
Drafter: BUI
Date: 3/03/20

Sheet: C.7

File Name: 20002-c-grading.dwg

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970 479-9990

NORTH

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

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Know what's below.
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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Grading & Drainage Plan

30% Review Set - Major Site Plan Submission

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

Sheet
C.8

File Name: 20002-c-grading.dwg

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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
BUILDING C
WATER SERVICE, FIRE SPRINKLER SERVICE, ELECTRIC, GAS & COMMUNICATION SERVICES
SEWER SERVICE LOCATION
INSTALL FIRE HYDRANT
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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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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GLENWOOD SPRINGS, COLORADO

Bell Rippy Neighborhood

Overall Utility Plan

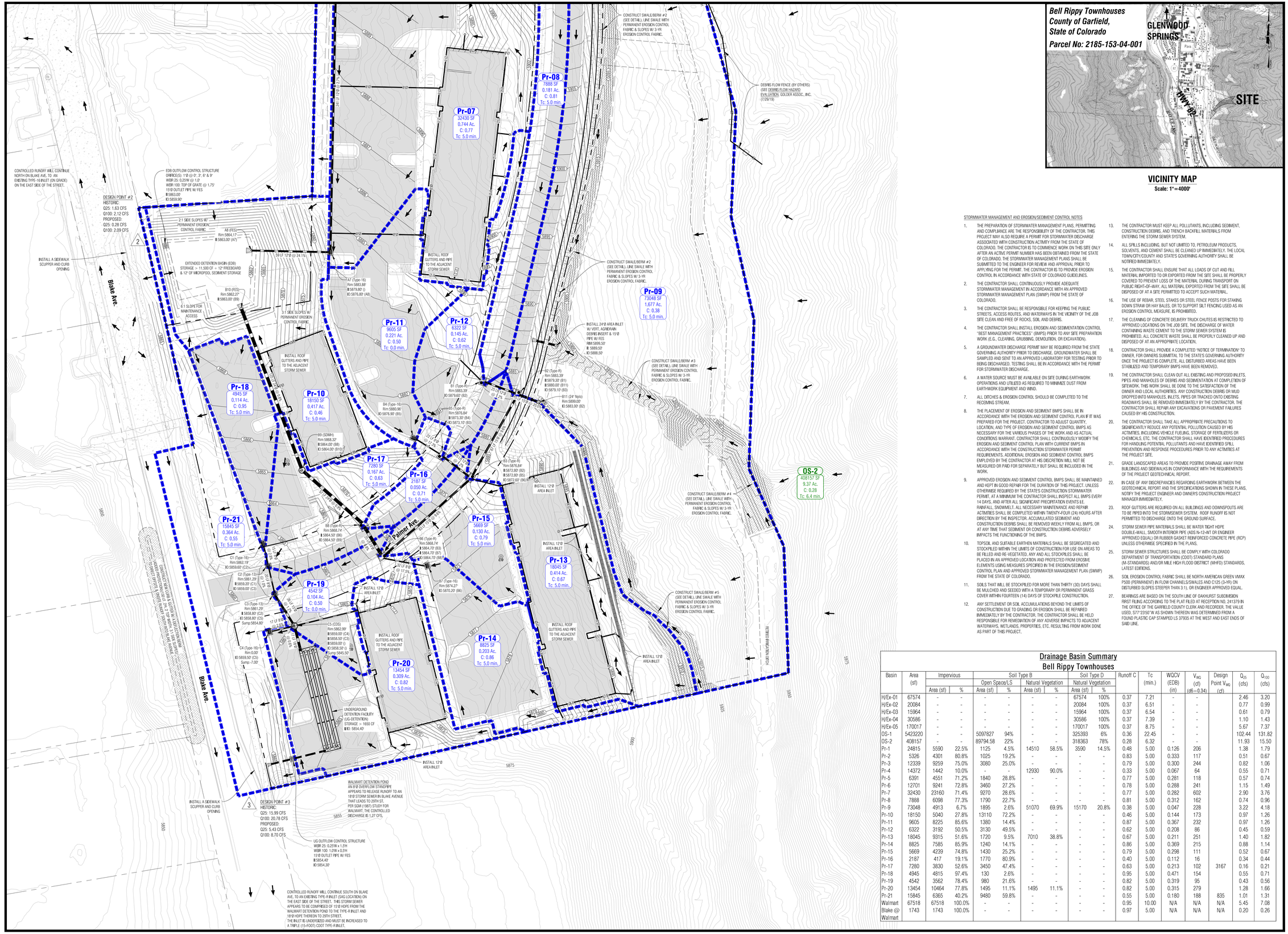
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PROJECT NO. 20002
Designer: DJW
Drafter: BUI
Date: 3/03/20

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 Surveying & Beyond
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
970 479-5990

NORTH
0 10' 20'
Scale: 1" = 10'

811
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.			
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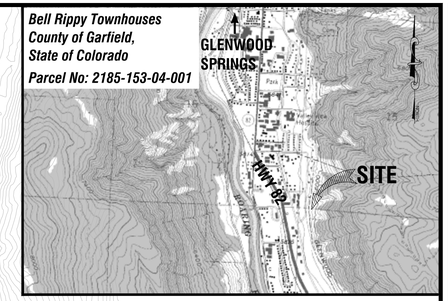
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Designer: ***DJW***
Drafter: ***BUI***
Date: ***3/03/20***

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

A9 (SDMH)
Rim:5900.15'
I: 5894.40' (A10)
O: 5894.20' (A8)

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:5893.85'
I: 5889.10' (A4)
O: 5888.90' (A6)

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.

CUT IN SWALE BEHIND THE FENCE TO DIRECT RUNOFF TO SWALE/BERM #1

Pr-02
5326 SF
0.122 Ac.
C: 0.83
Tc: 5.0 min.

Pr-05
6391 SF
0.147 Ac.
C: 0.77
Tc: 5.0 min.

117 LF 12"Ø @ 2.1%

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

OS-1
5423220 SF
124.5 Ac.
C: 0.36
Tc: 22.5 min.

CUT IN SWALE BEHIND THE FENCE TO DIRECT RUNOFF TO SWALE/BERM #1

CONSTRUCT SWALE/BERM #2 (SEE DETAIL), LINE SWALE WITH PERMANENT EROSION CONTROL FABRIC & SLOPES W/ 3-YR EROSION CONTROL FABRIC.

241 LF 24"Ø @ 2.1%

Pr-08
7888 SF
0.181 Ac.
C: 0.81
Tc: 5.0 min.

Pr-07
32430 SF
0.744 Ac.

DEBRIS FLOW FENCE (BY OTHERS) (SEE DEBRIS FLOW HAZARD EVALUATION, GOLDER ASSOC., INC. (7/29/19)

5850 5855 5860 5865 5870 5875 5880 5885 5890 5895 5900 5905 5910 5915

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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
970 479-5990

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

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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***

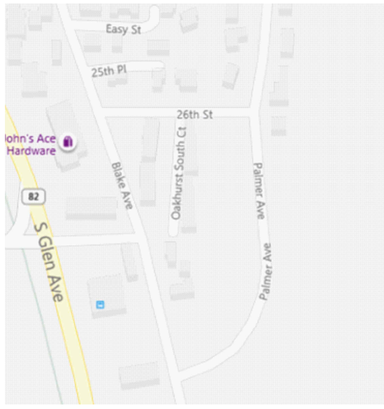
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BELL RIPPY APARTMENTS

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	5	5
	total	36	60

PARKING LOT ISLANDS:		1 TREE/ISLAND		5 SHRUBS/ISLAND		
		REQUIRED	PROVIDED	REQUIRED	PROVIDED	
		19	18	93	93	
	total project	233	217	815	961	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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Vail Office
12 Vail Road,
suite 700
Vail, CO 81657
Tel: 970.479.9990
www.triumphdev.com

BELL RIPPY
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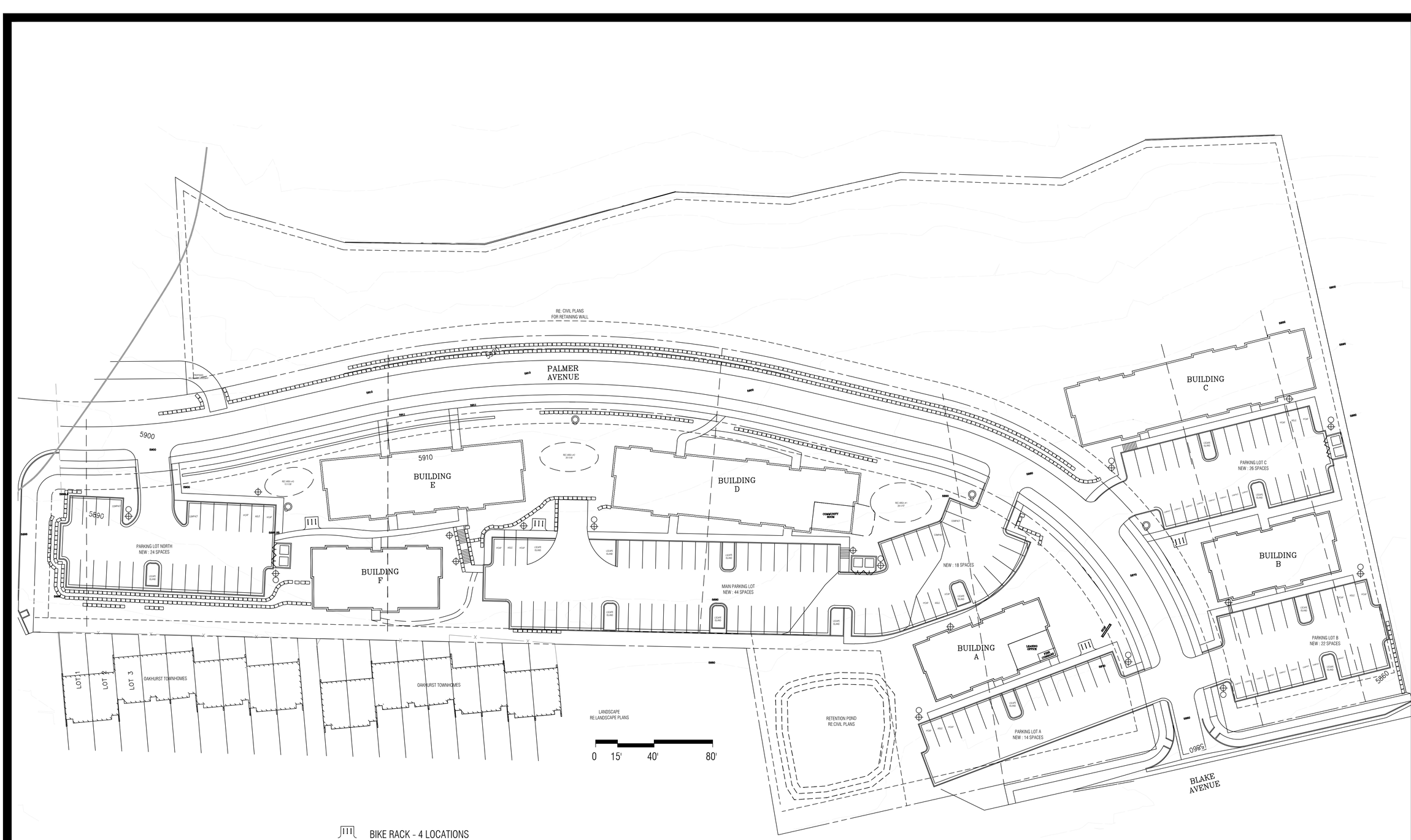
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MAJOR SITE ARCHITECTURAL PLAN RE-SUBMISSION 4-21-20

Sheet title: COVER SHEET

Stamp

Date: 4/21/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AA0.0



BIKE RACK - 4 LOCATIONS

TRASH ENCLOSURE - 3 LOCATIONS

BOLLARD - 10 LOCATIONS

LIGHT POLE - 11 LOCATIONS

SIGN SITE SIGNAGE

FIRE HYDRANTS - 4 LOCATIONS

1 SITE PLAN
1" = 30'-0"

NORTH

SITE PLAN

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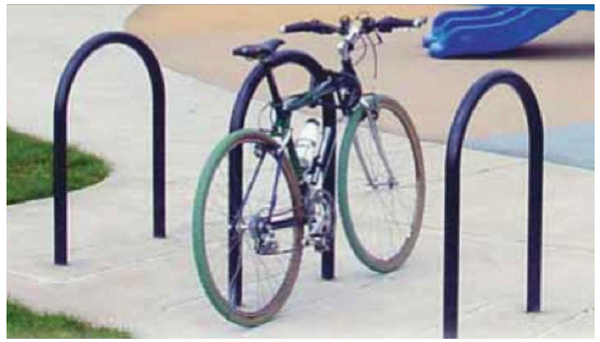
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ARCHITECTURAL
PLAN SUBMISSION
3-3-20

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SITE
PLAN

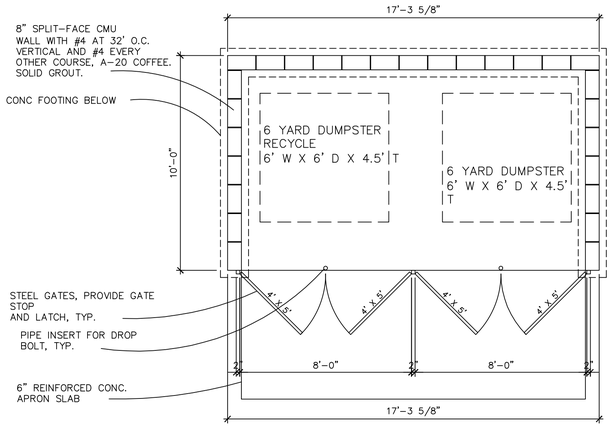
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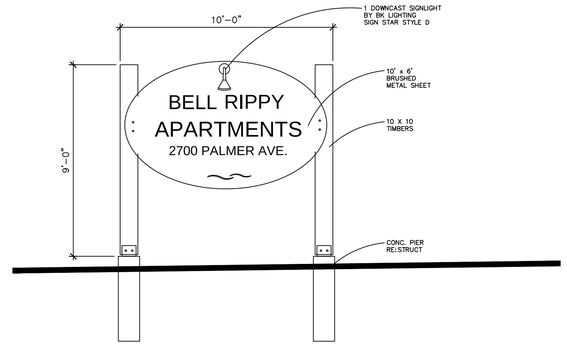
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7 BIKE RACKS
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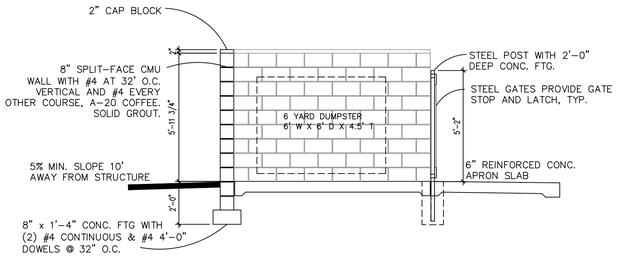
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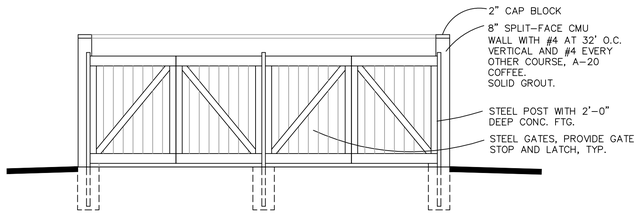
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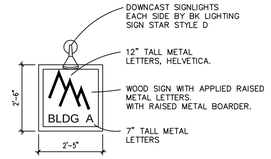
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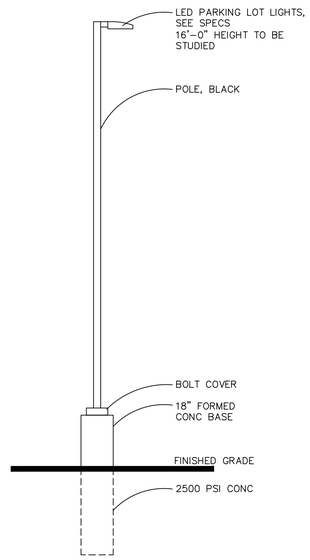
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N.T.S.



6 TRASH ENCLOSURE ELEVATION
N.T.S.



2 BUILDING SIGNAGE
N.T.S.



3 PARKING LOT LIGHTING
N.T.S.

SITE - ACCESSORIES

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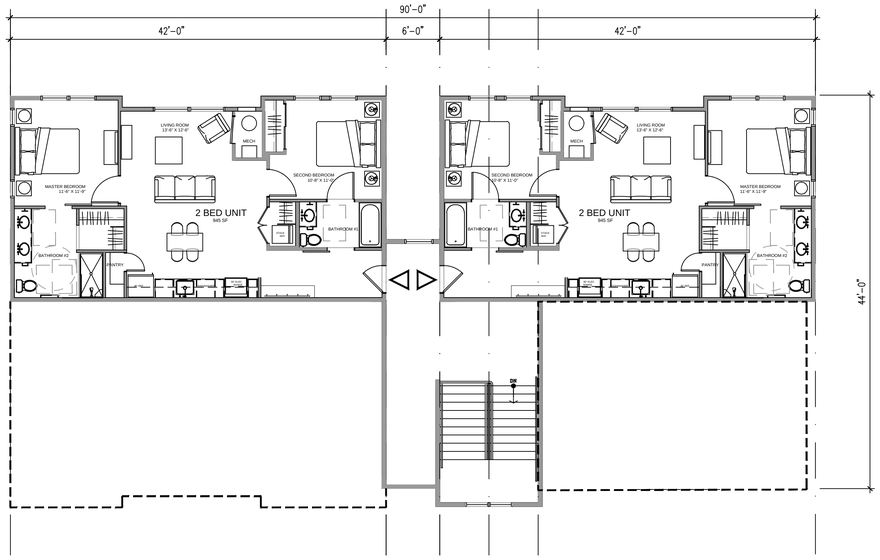
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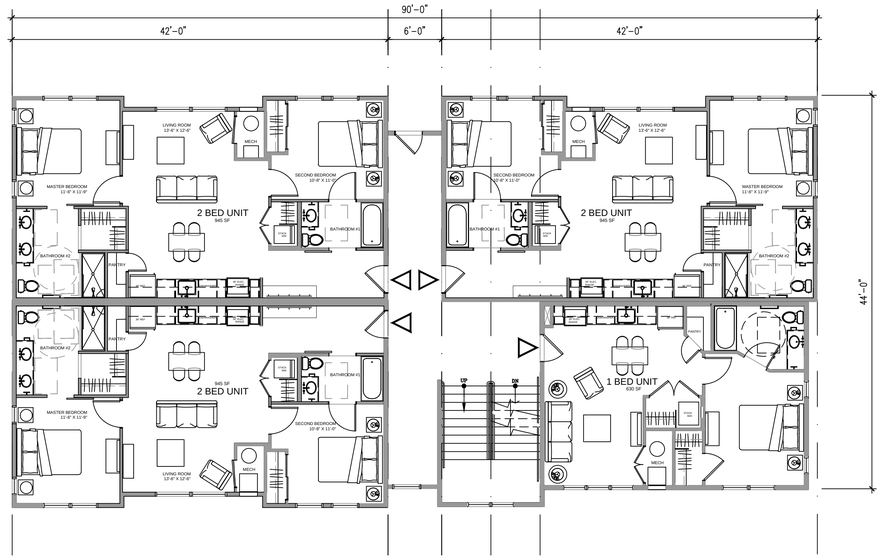
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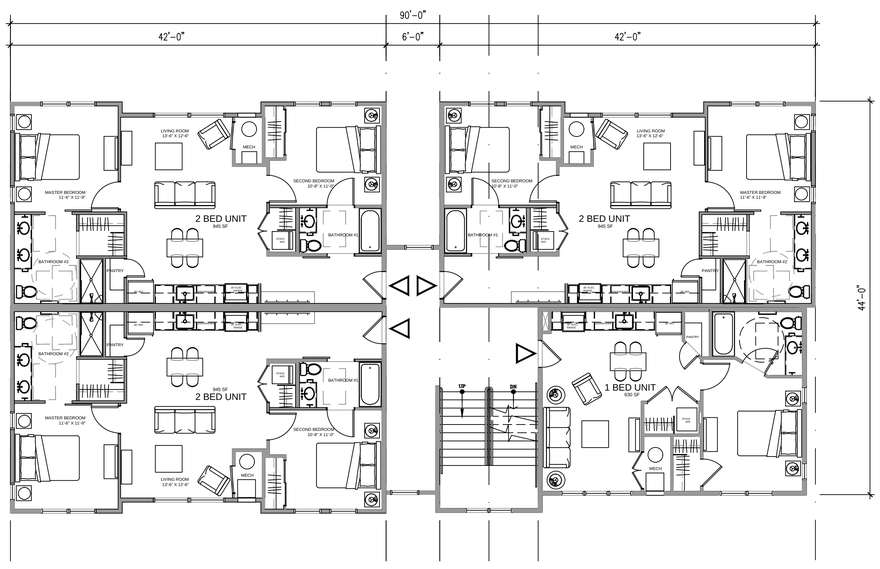
4 BUILDING A - THIRD LEVEL PLAN
1/8" = 1'-0"



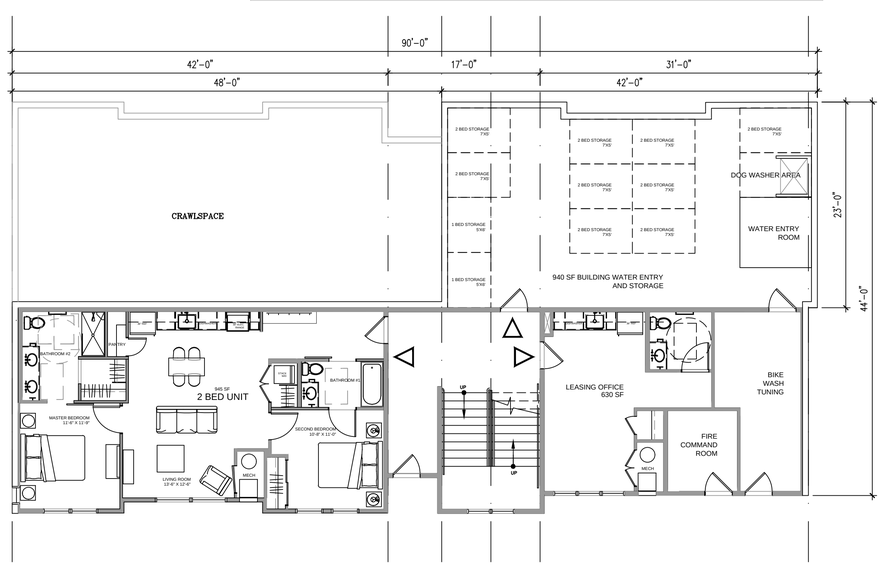
2 BUILDING A - FIRST LEVEL PLAN
1/8" = 1'-0"

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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Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION revised 4-20-20

Sheet title
SCHEMATIC BUIDLING A PLANS

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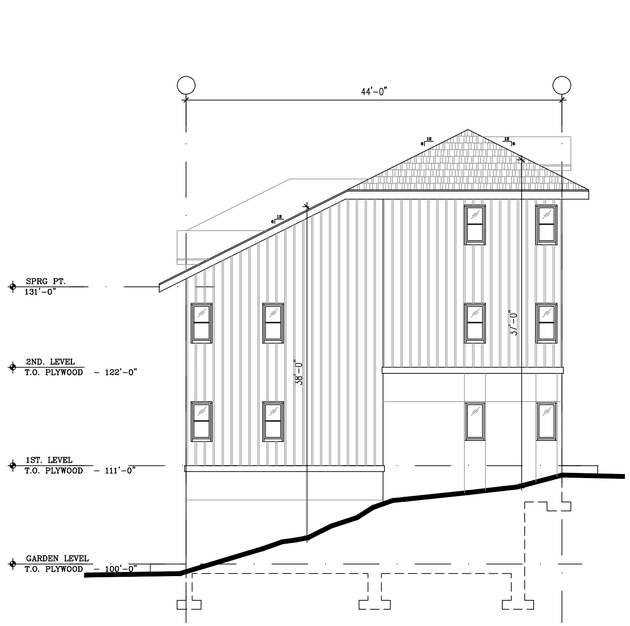
Sheet AA2.0

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 - 1/2 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENTRY	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.

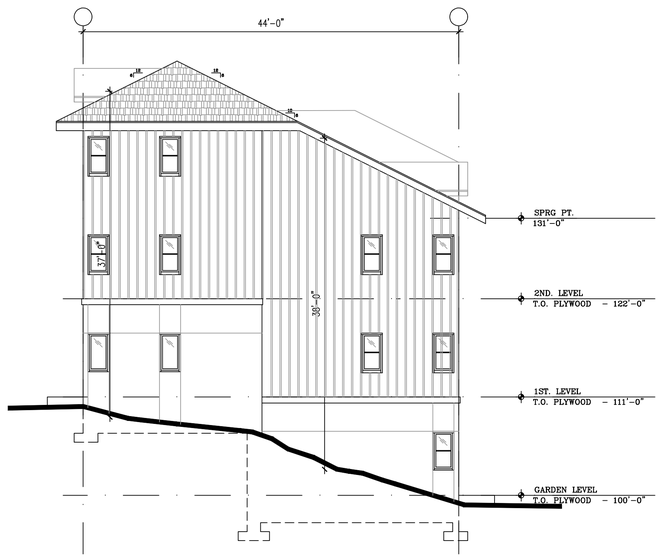
4. THESE ELEVATIONS ARE CONCEPTUAL IN NATURE, INDIVIDUAL BUILDING ELEVATIONS MAY VARY BUT WILL BE EVALUATED FOR COMPLIANCE WITH DESIGN STANDARDS CONTAINED WITHIN TITLE 070 OF THE GLENWOOD SPRINGS MUNICIPAL CODE AT THE TIME OF SUBMITTING A BUILIDNG PERMIT APPLICATION.



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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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 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

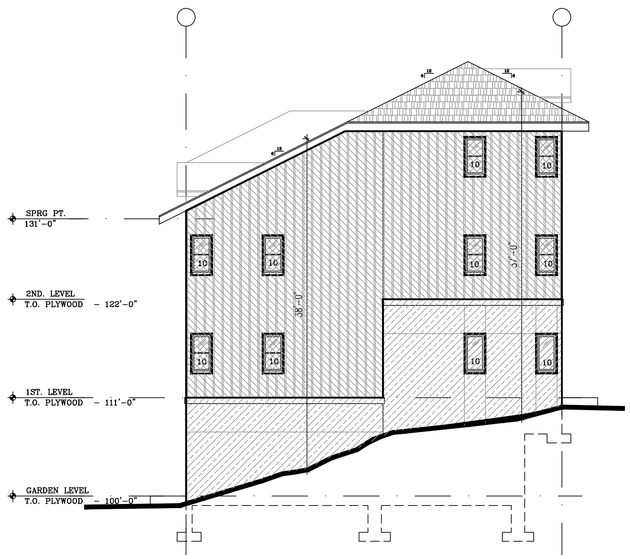
SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	100 SF	7.1%
NET STUCCO	438 SF	31.1%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

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

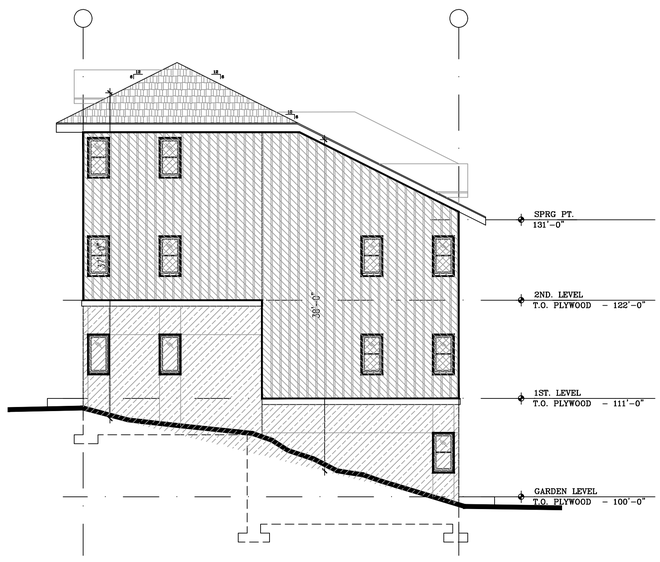
1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS



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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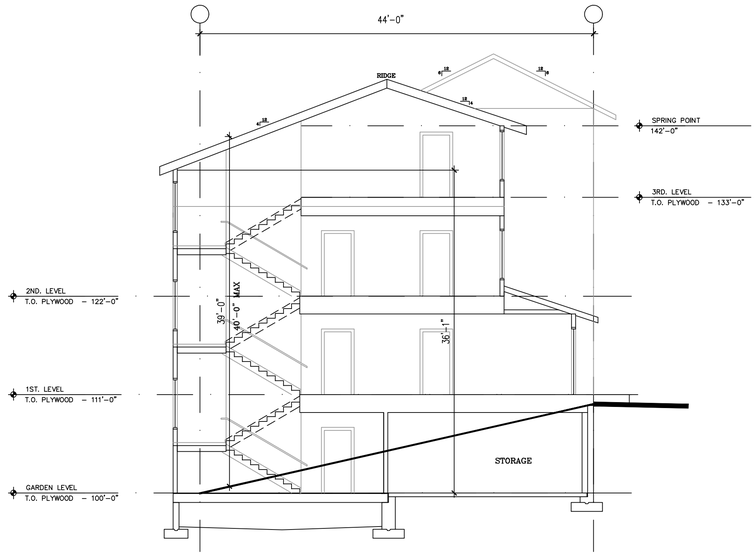
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN RESUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS
MATERIAL CALCS

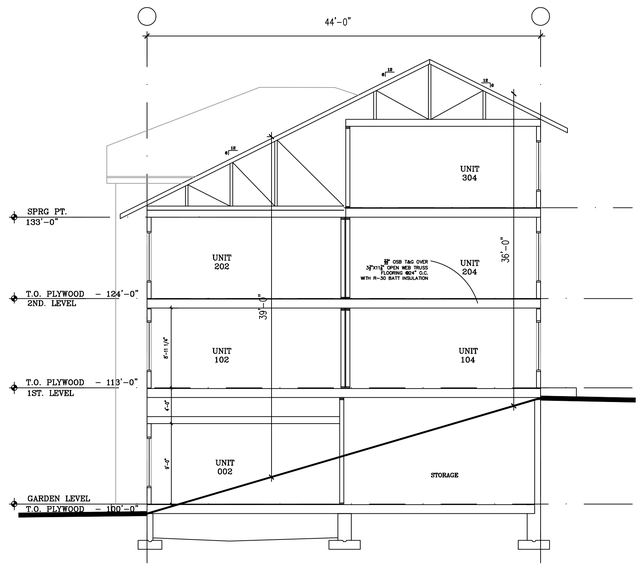
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Sheet AA3.1



1 BUILDING SECTION - STAIR
1/8" = 1'-0"



2 TYPICAL BUILDING SECTOIN
1/8" = 1'-0"

BUILDING SECTIONS

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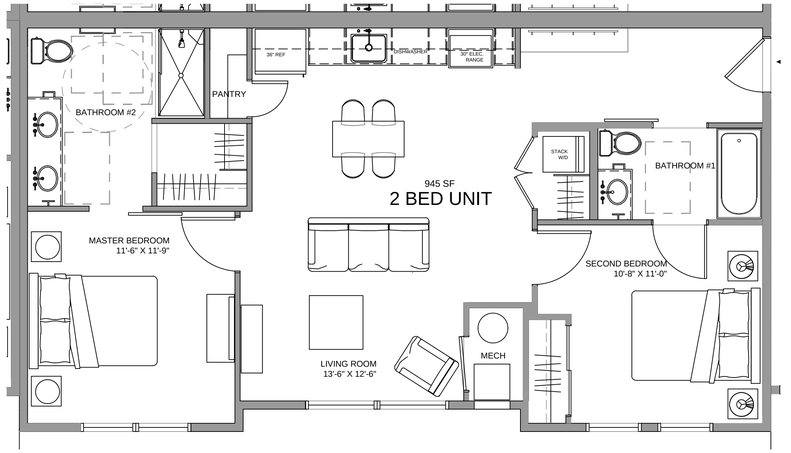
Revisions:
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Sheet title
BUILDING SECTIONS

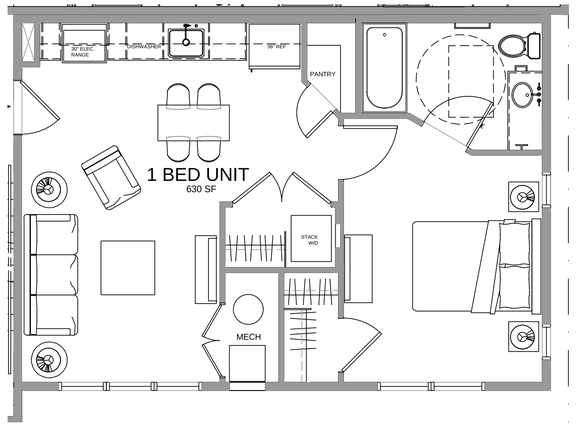
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Sheet AA5.0



1 TYPICAL TWO BEDROOM UNIT
1/4" = 1'-0"



2 TYPICAL ONE BEDROOM UNIT
1/4" = 1'-0"

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Revisions:
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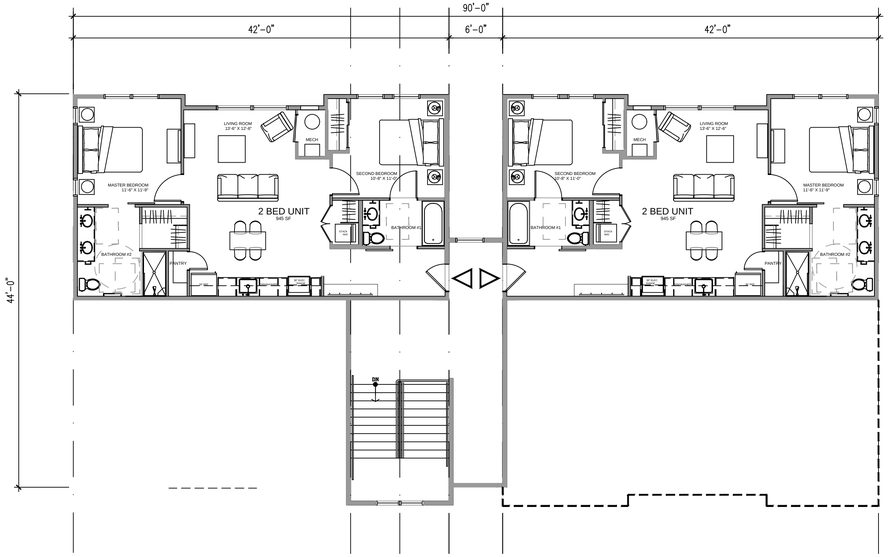
Sheet title
SCHEMATIC UNIT PLANS

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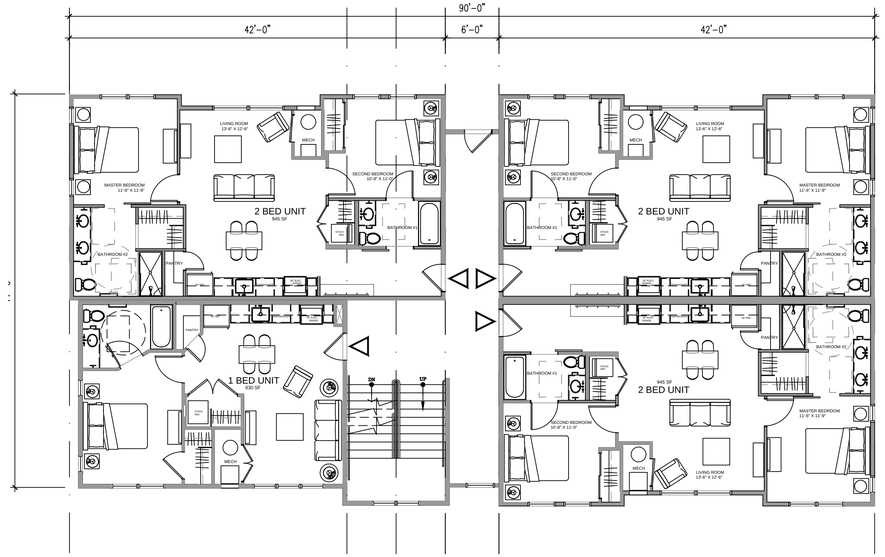
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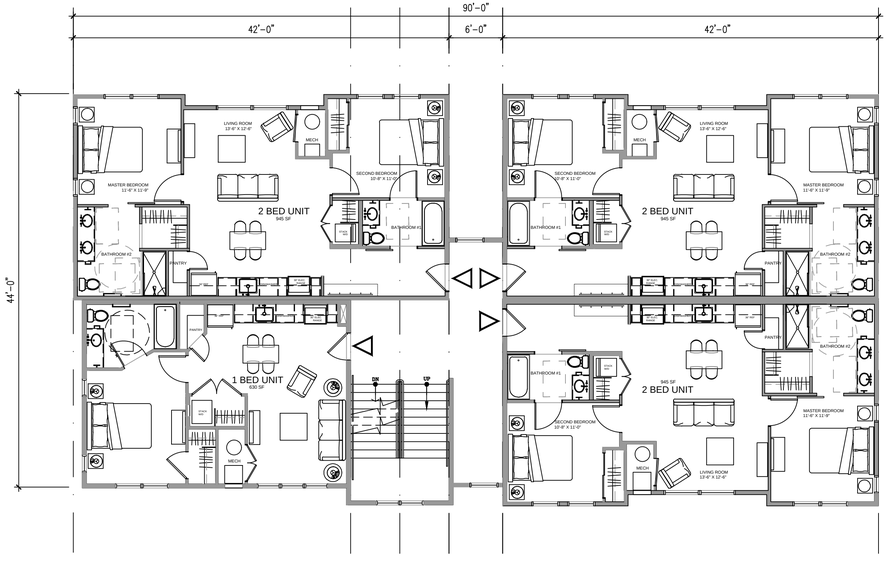
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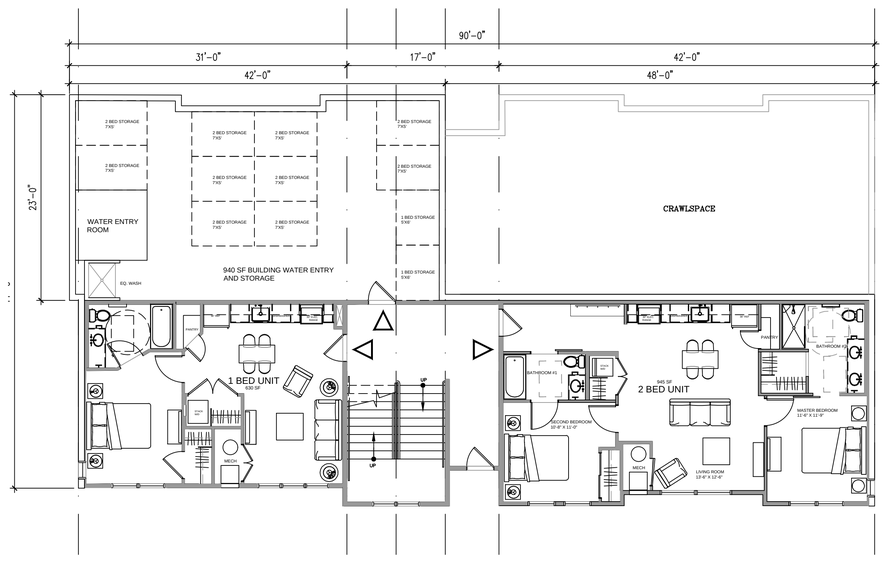
4 BUILDING B - THIRD LEVEL PLAN
1/8" = 1'-0"



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"

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SCHEMATIC BUILDING B PLANS

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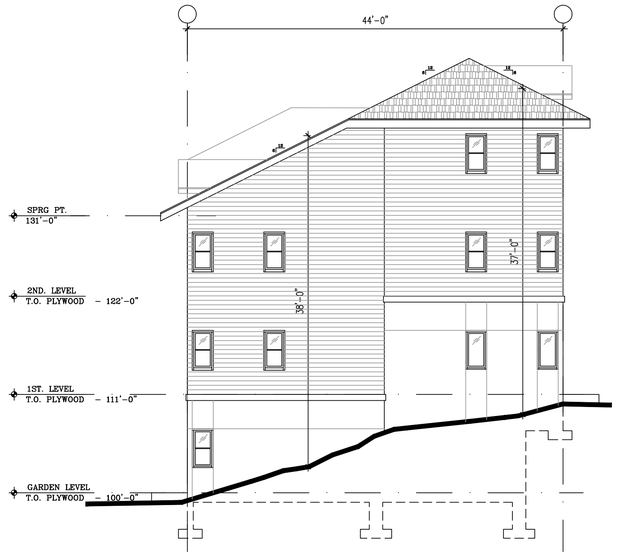
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BUILDING B - EXTERIOR FINISH SCHEDULE

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 - 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 - 1/4 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ ENDS	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.

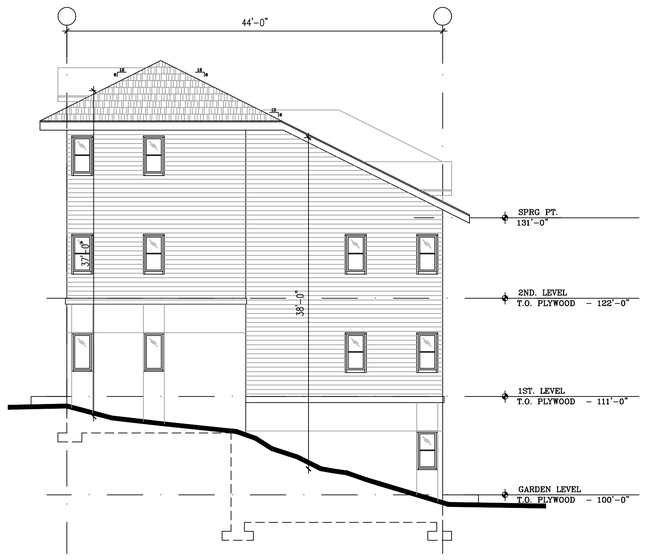
4. THESE ELEVATIONS ARE CONCEPTUAL IN NATURE, INDIVIDUAL BUILDING ELEVATIONS MAY VARY BUT WILL BE EVALUATED FOR COMPLIANCE WITH DESIGN STANDARDS CONTAINED WITHIN TITLE 070 OF THE GLENWOOD SPRINGS MUNICIPAL CODE AT THE TIME OF SUBMITTING A BUILDING PERMIT APPLICATION.



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:
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MAJOR SITE ARCHITECTURAL PLAN 2nd SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS

Stamp

Date: 4/17/2020
Project No:
Drawn by: MEF
Checked by: MEF

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

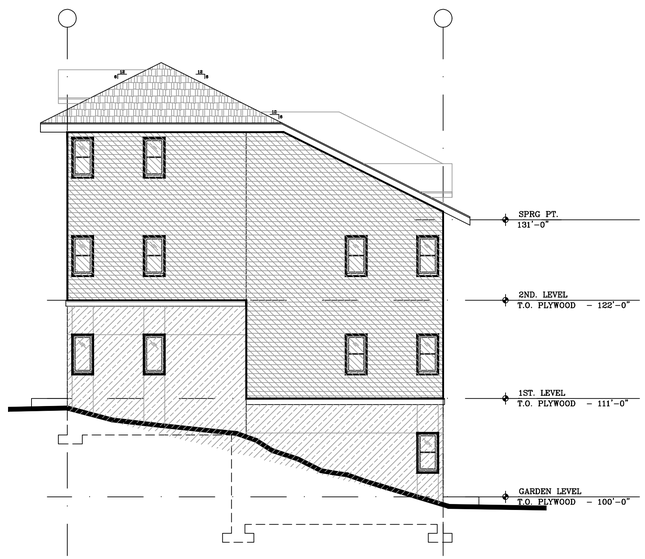
1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS



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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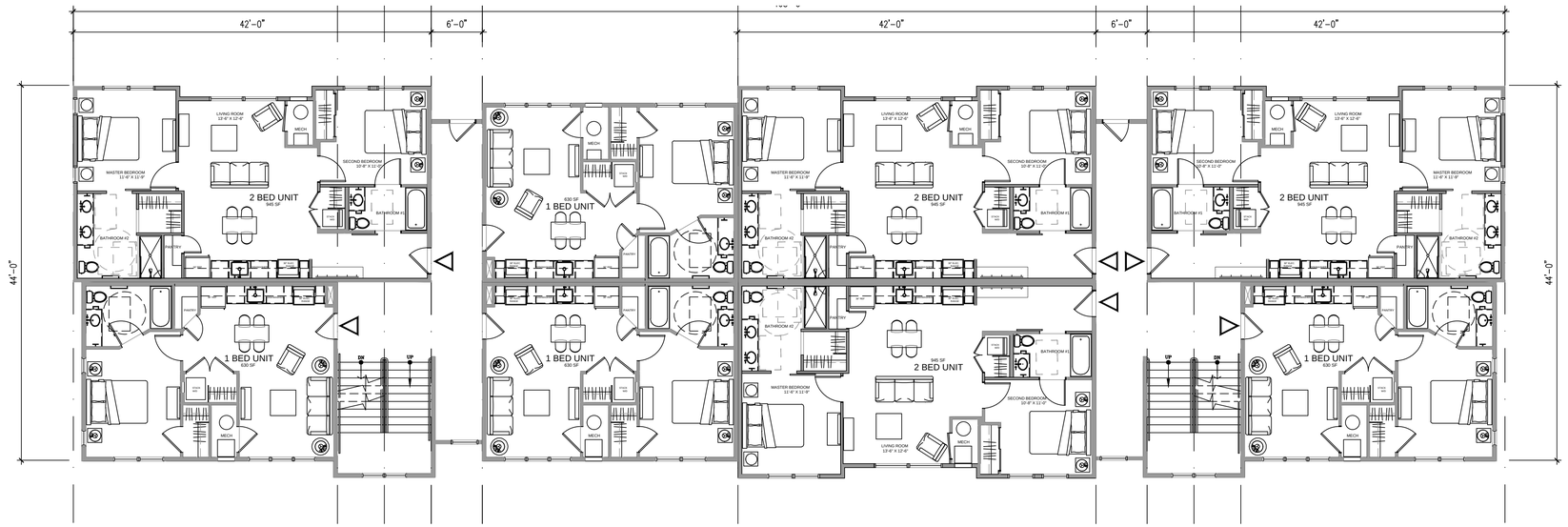
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
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Sheet title
BUILDING ELEVATIONS MATERIAL CALCS

Stamp

Date: 4/20/2020
Project No:
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Sheet AB3.1



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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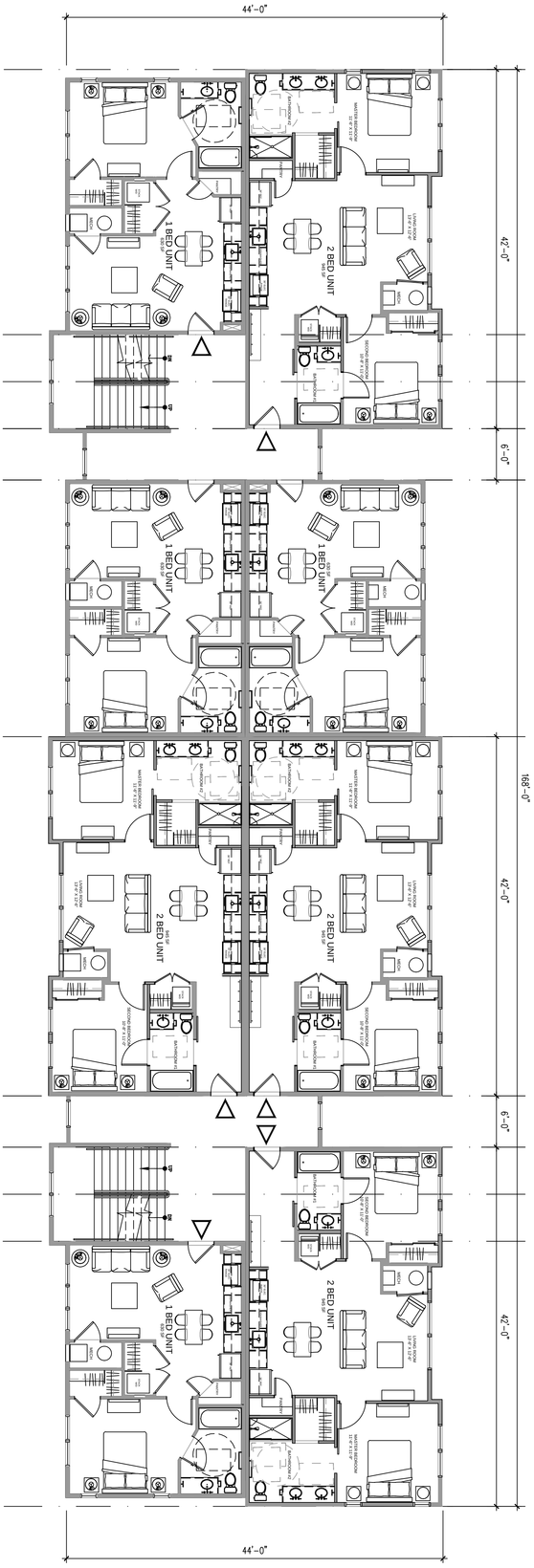
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION revised 4-20-20

Sheet title
SCHEMATIC BUILDING C PLANS

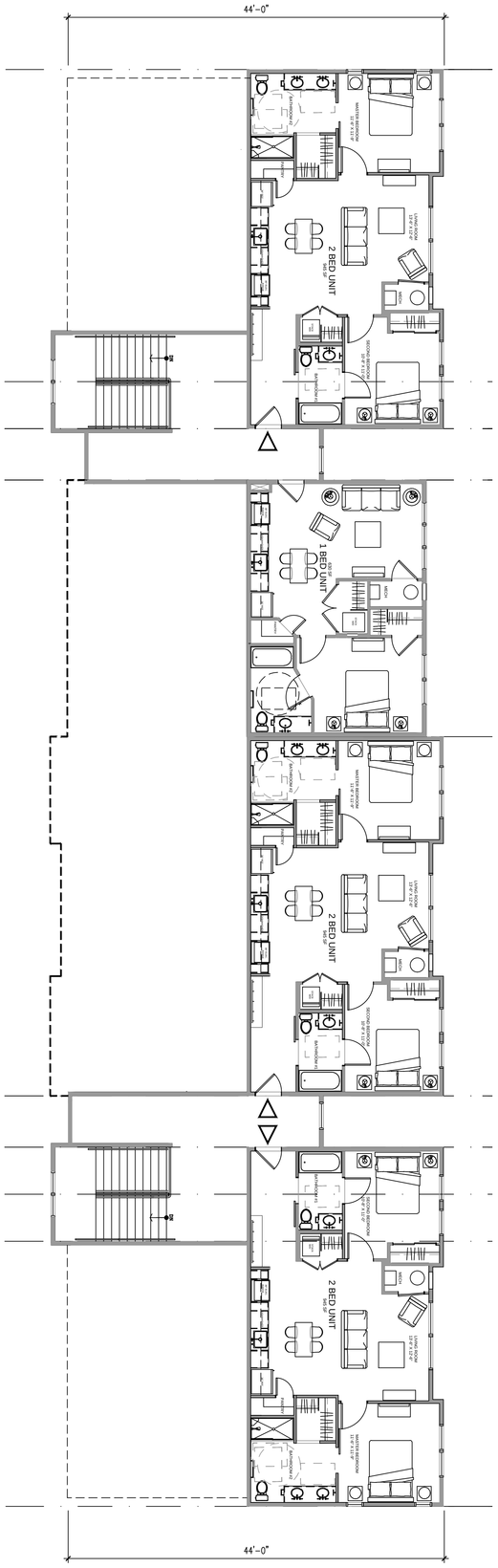
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3 BUILDING C - SECOND LEVEL PLAN
1/8" = 1'-0"



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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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 AC3.0

BUILDING C - EXTERIOR FINISH SCHEDULE

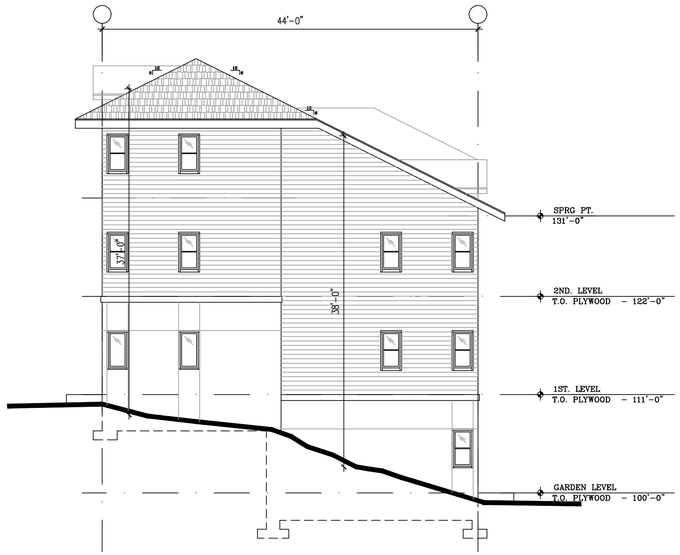
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F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL LAP SIDING	FIBER CEMENT LAP SIDING - $\frac{3}{8}$" X 7 $\frac{1}{4}$" 6" EXPOSED - @ WINDOW / DOOR INFILL	LEEWOOD
S3	BOARD AND BATTEN	FIBER CEMENT VERT SIDING 3.5" OVER FIBER CEMENT PLANKS - CEDAR MILL	HARBOR MIST
S2	STUCCO	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 $\frac{4}{4}$ RUSTIC 3.5" RAILS $\frac{4}{4}$ RUSTIC 5.5" HEAD AND SILL	FRENCH ROAST
T2	SIDING TRIM	FIBER CEMENT - $\frac{3}{4}$ RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ GABLE	FIBER CEMENT - $\frac{3}{4}$ RUSTIC 9.25" / 11.25"	FRENCH ROAST
T4	INSIDE CORNER TRIM	FIBER CEMENT - $\frac{3}{4}$ RUSTIC 3.5"	FRENCH ROAST
T5	OUTSIDE CORNER TRIM	FIBER CEMENT - $\frac{3}{4}$ RUSTIC 5.5"	FRENCH ROAST
T6	FRIEZE TRIM	FIBER CEMENT - $\frac{3}{4}$ 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

Stamp

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:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 2-21-20
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS MATERIAL CALCS

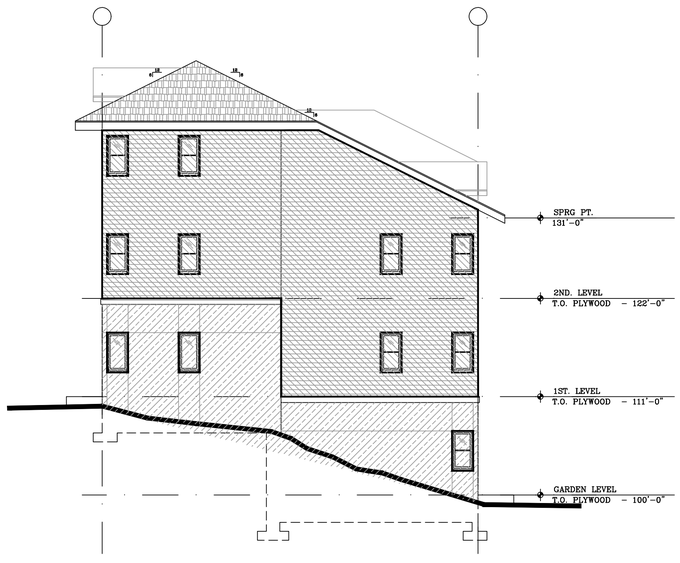
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Project No:
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Sheet AC3.2



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



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

BUILDING C - ELEVATIONS

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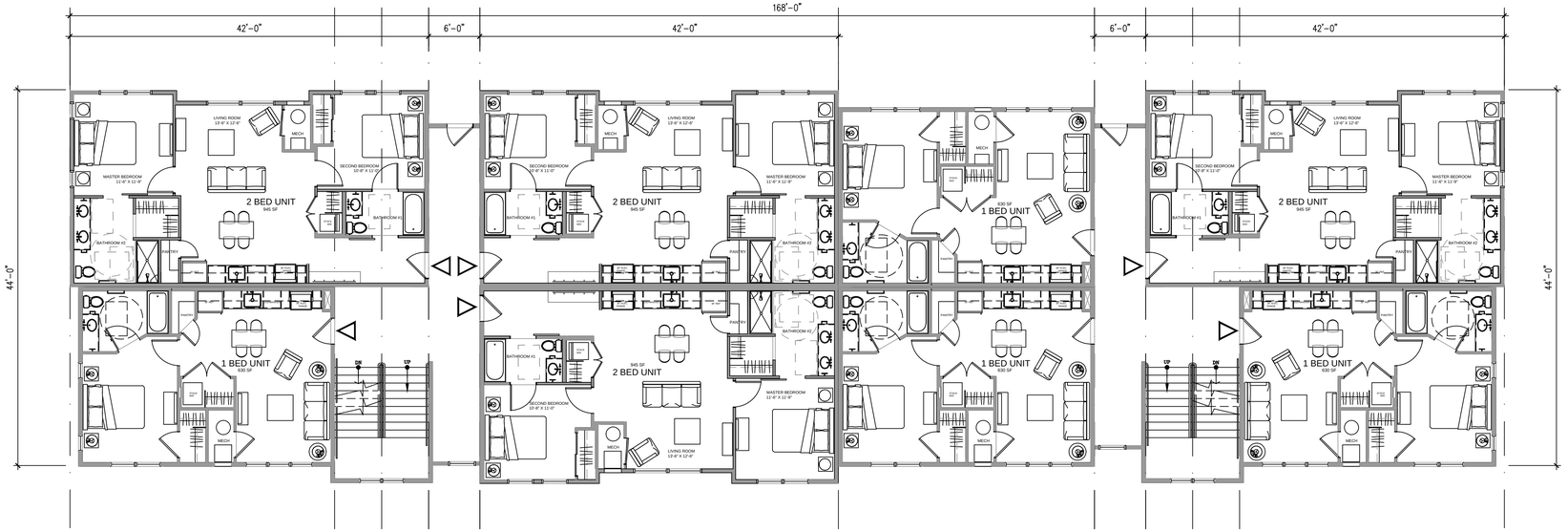
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN RESUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS
MATERIAL CALCS

Stamp

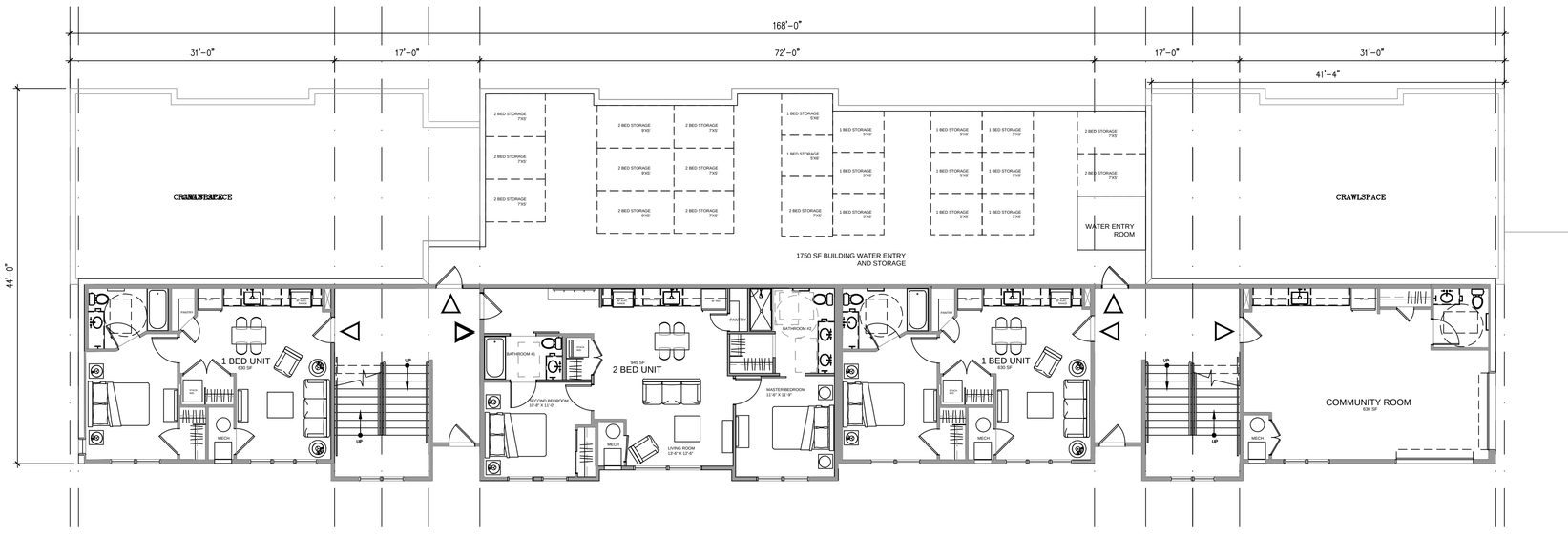
Date: 4/20/2020
Project No:
Drawn by: MEF
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Sheet AC3.3



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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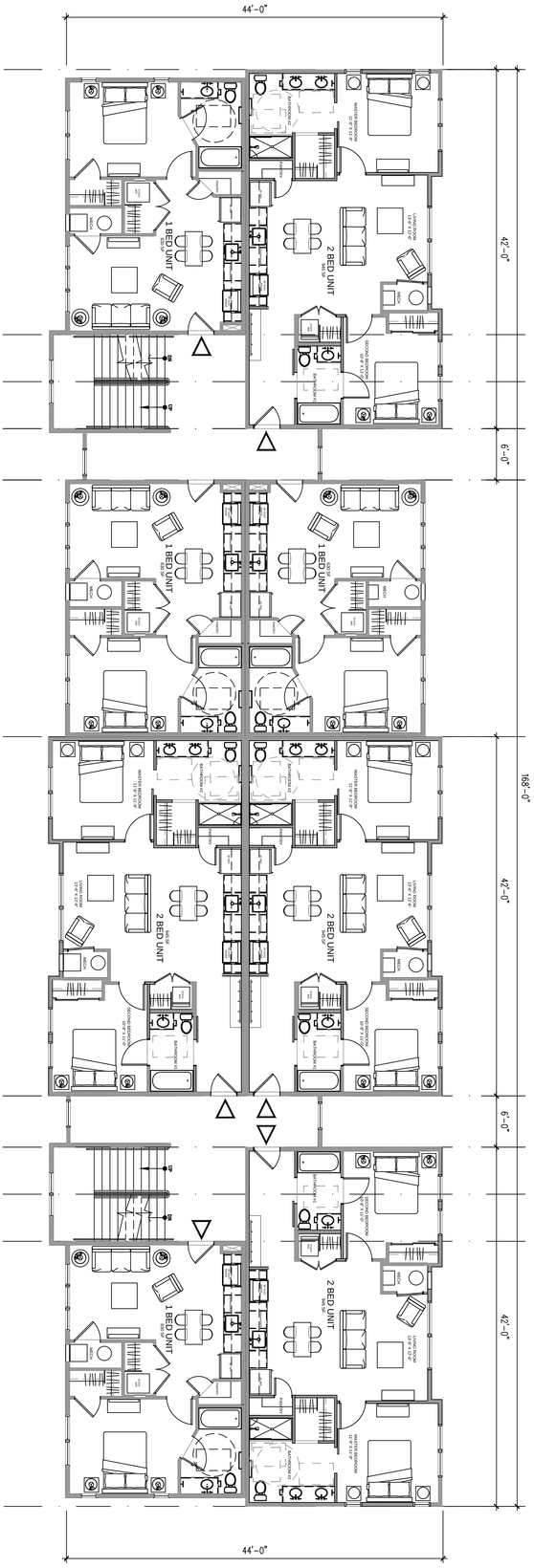
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 5-15-20
MAJOR SITE ARCHITECTURAL revised PLAN SUBMISSION 4-20-20

Sheet title
SCHEMATIC BUILDING D PLANS

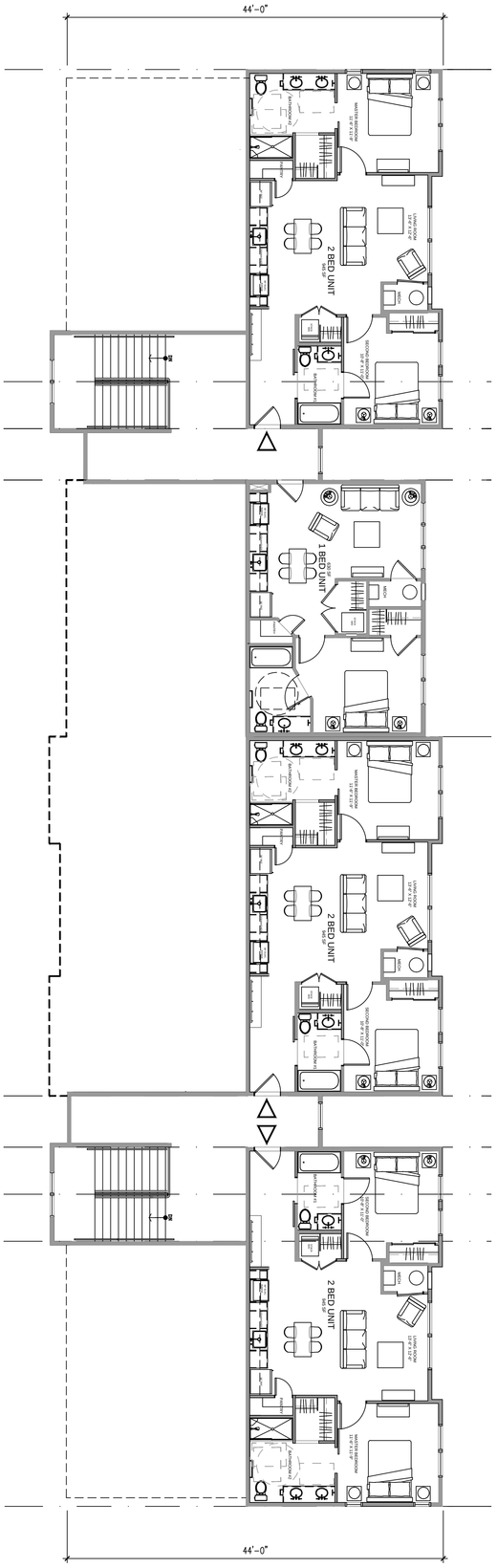
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Sheet AD2.0



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



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

APARTMENT BUILDINGS - SCHEMATIC PLANS

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revised MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 4-20-20

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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 - 1/2 RUSTIC 5.5"	FRENCH ROAST
T3	HORIZONTAL SIDING TRIM @ GABLE	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
W01	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 D - ELEVATIONS

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MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 4-20-20

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BUILDING ELEVATIONS

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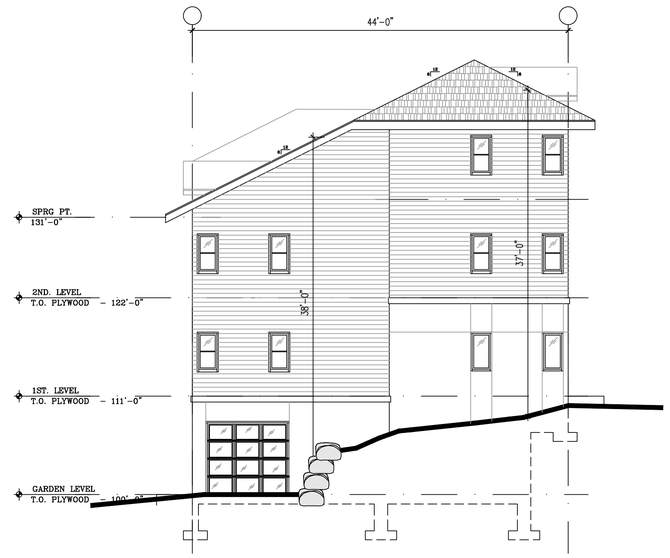
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BUILDING D - EXTERIOR FINISH SCHEDULE

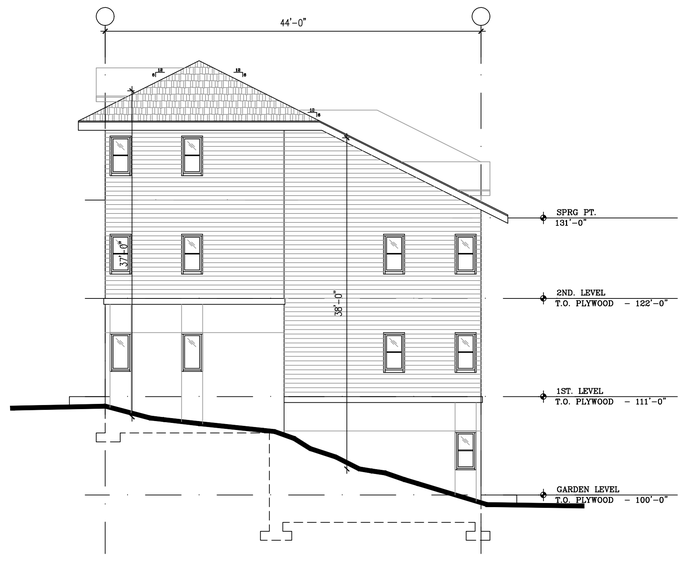
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T4	INSIDE CORNER TRIM	FIBER CEMENT - 3/4 RUSTIC 3.5"	FRENCH ROAST
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T6	FRIEZE TRIM	FIBER CEMENT - 3/4 RUSTIC 5.5"	FRENCH ROAST
WD1	TRUSSES	HEAVY TIMBER	SW - 3524 CHESTNUT

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



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

BUILDING 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
Checked by: MEF

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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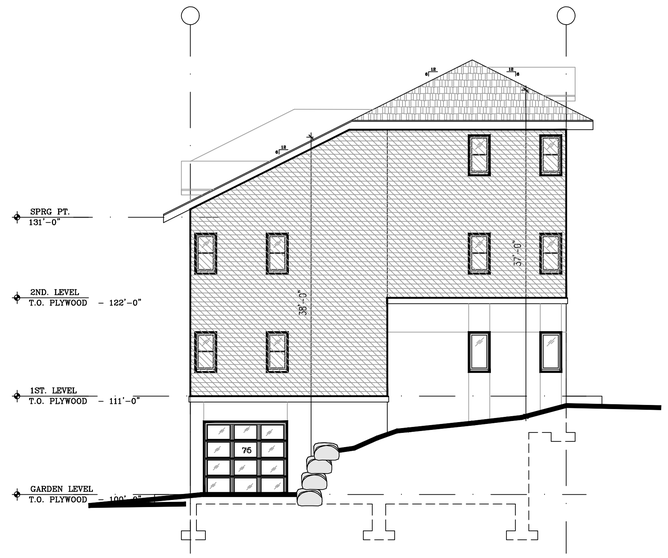
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN re-SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS MATERIAL CALCS

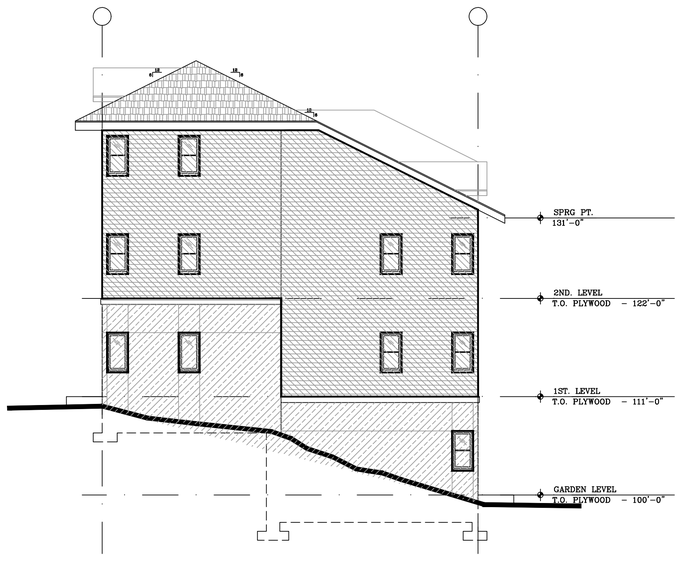
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3 SOUTH ELEVATION
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4 WEST ELEVATION
1/8" = 1'-0"

BUILDING D - ELEVATIONS

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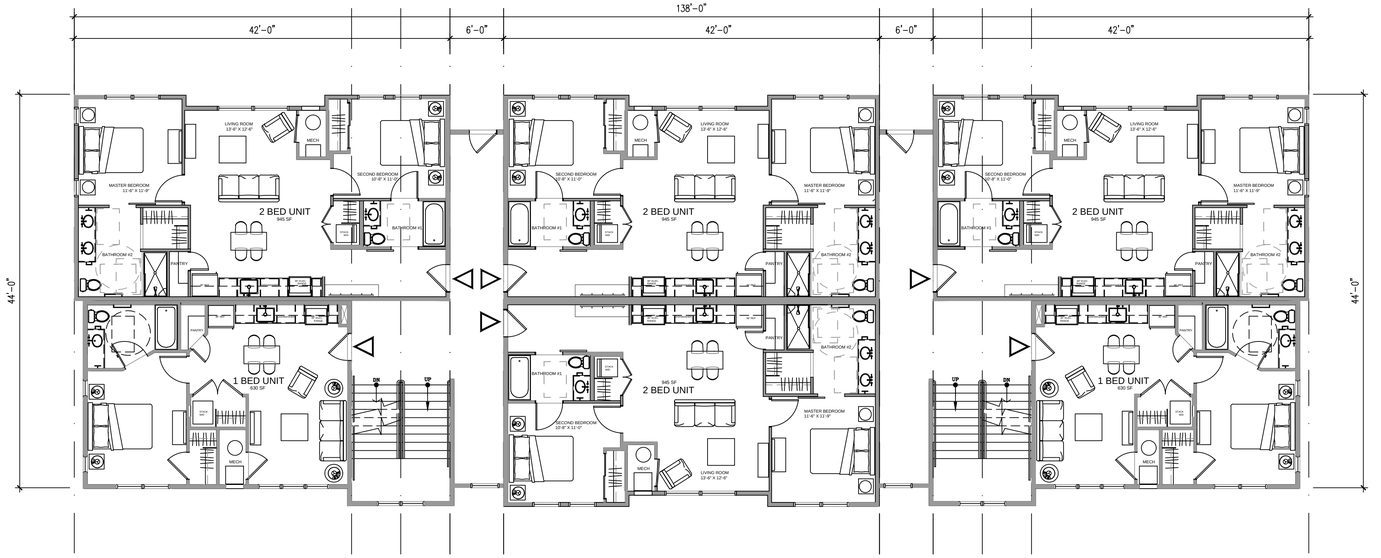
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN RESUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS
MATERIAL CALCS

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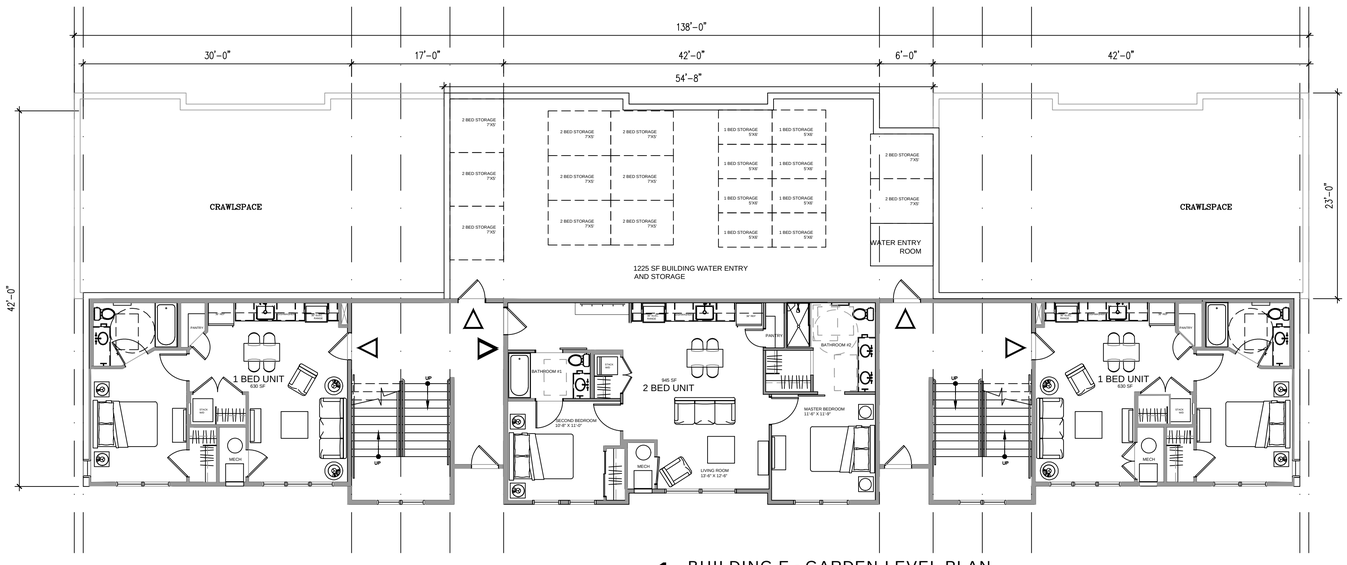
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2 BUILDING E - FIRST LEVEL PLAN

1/8" = 1'-0"



1 BUILDING E - GARDEN LEVEL PLAN

1/8" = 1'-0"

APARTMENT BUILDINGS - SCHEMATIC PLANS

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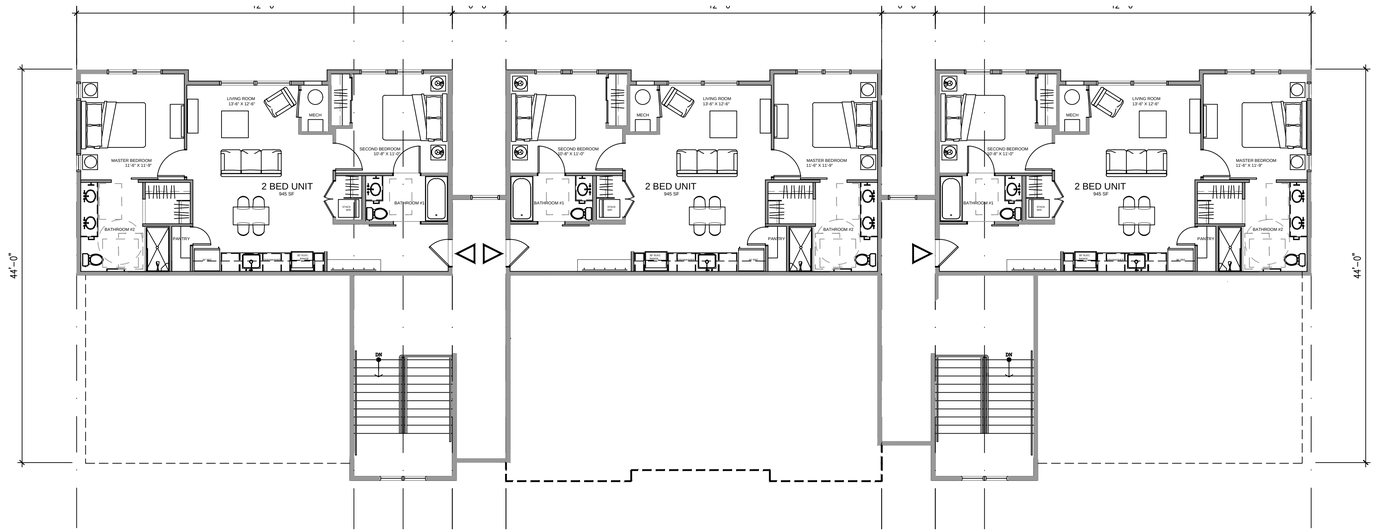
Revisions:
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Sheet title
SCHEMATIC BUILDING E PLANS

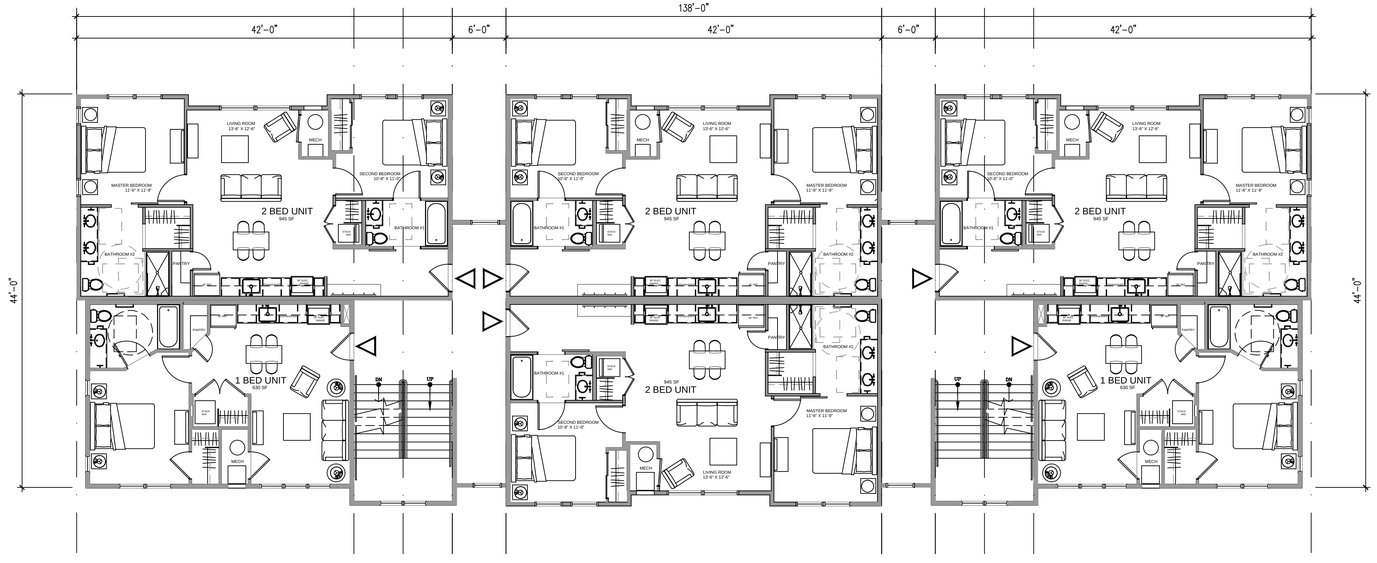
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4 BUILDING E - THIRD LEVEL PLAN
1/8" = 1'-0"



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

APARTMENT BUILDINGS - SCHEMATIC PLANS

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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	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 @ ENDS	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.



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



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

BUILDING E - ELEVATIONS

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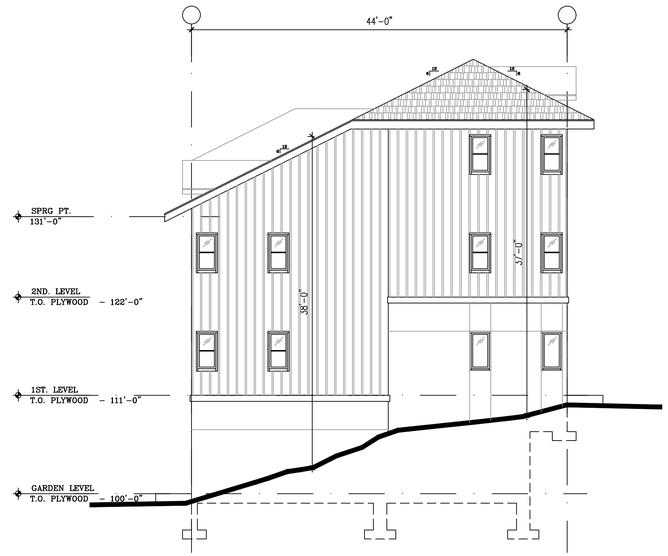
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BUILDING E - EXTERIOR FINISH SCHEDULE

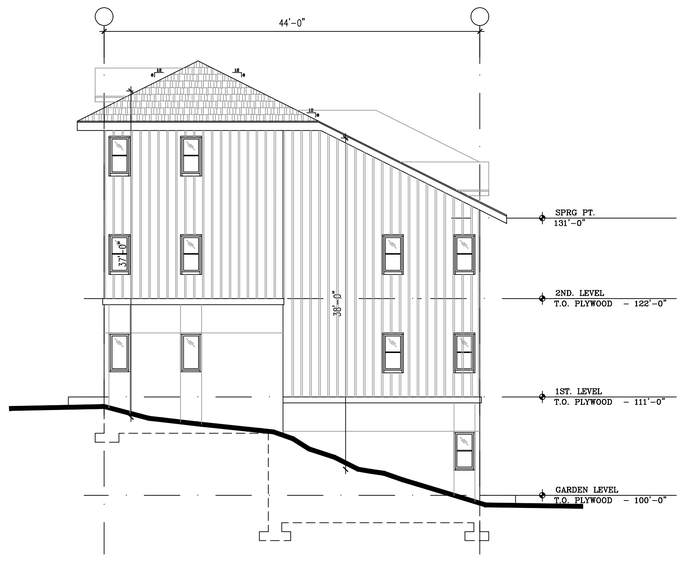
TAG	ITEM	MATERIAL	COLOR
R1	PRIMARY ROOF	TAMKO 30 YR - HERITAGE (CLASS A REQUIRED)	BLACK WALNUT
D1	DRIP EDGE	ALUMINUM (PREFINISHED)	MATCH ADJACENT ROOF
F1	FASCIA @ R1	FIBER CEMENT BOARDS - 5/4 RUSTIC x 9.25"	FRENCH ROAST
F3	SOFFIT	FIBER CEMENT SOFFIT PANELS - VENTED CEDARMILL	FRENCH ROAST
S1	HORIZONTAL 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	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
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.



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



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

BUILDING E - ELEVATIONS

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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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BUILDING ELEVATIONS
MATERIAL CALCS

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

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

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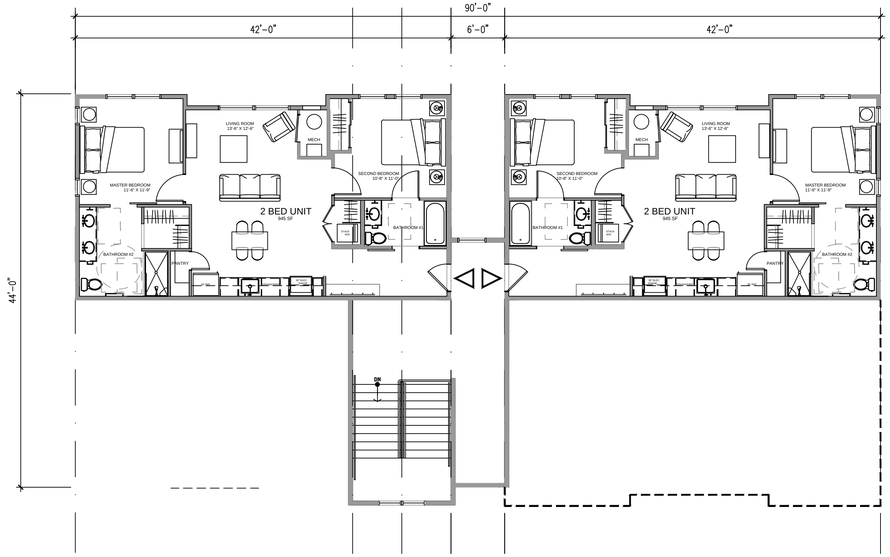
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BUILDING ELEVATIONS
MATERIAL CALCS

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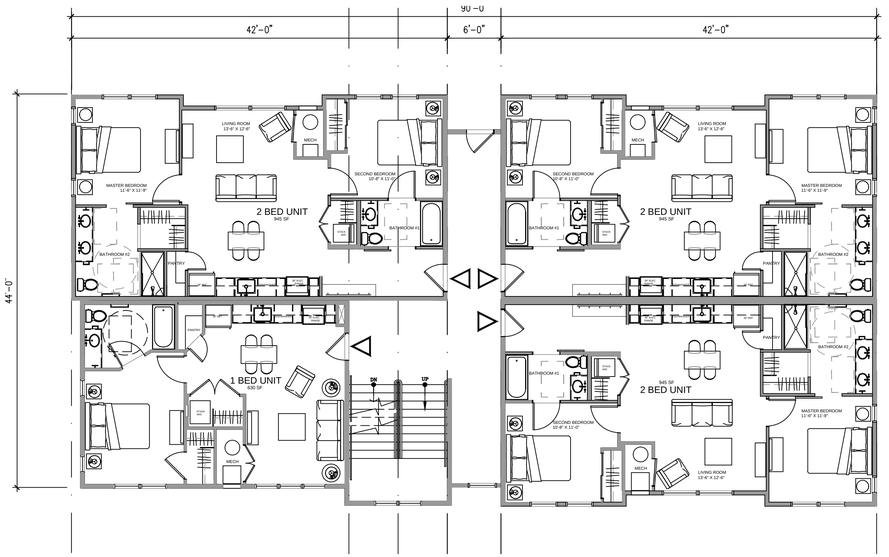
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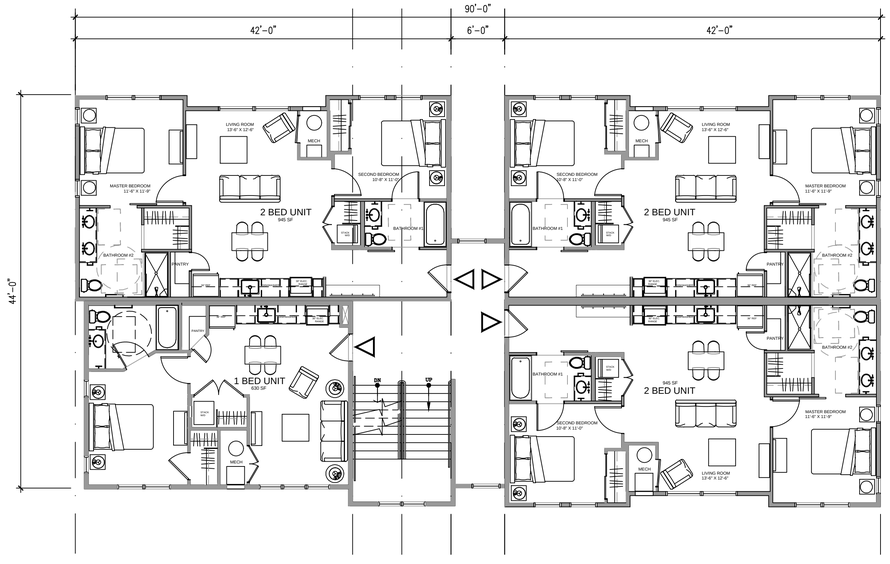
4 BUILDING F - THIRD LEVEL PLAN

1/8" = 1'-0"



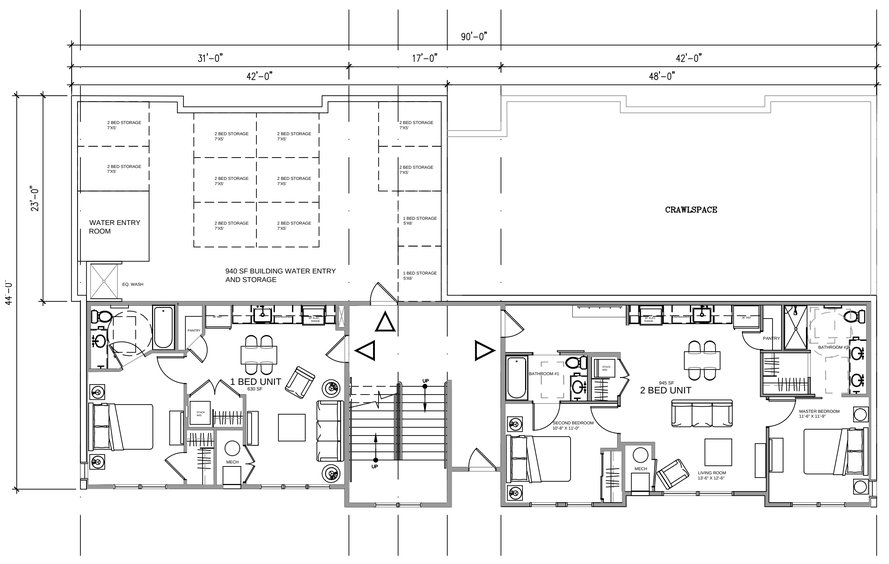
2 BUILDING F - FIRST LEVEL PLAN

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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SCHEMATIC BUILDING F PLANS

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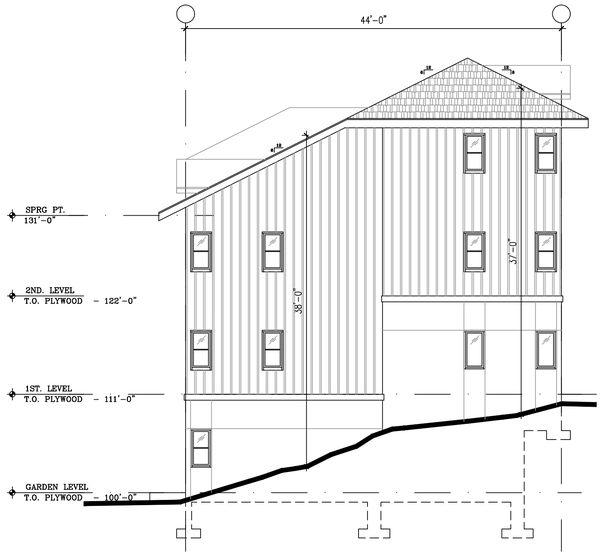
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BUILDING F - EXTERIOR FINISH SCHEDULE

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

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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.

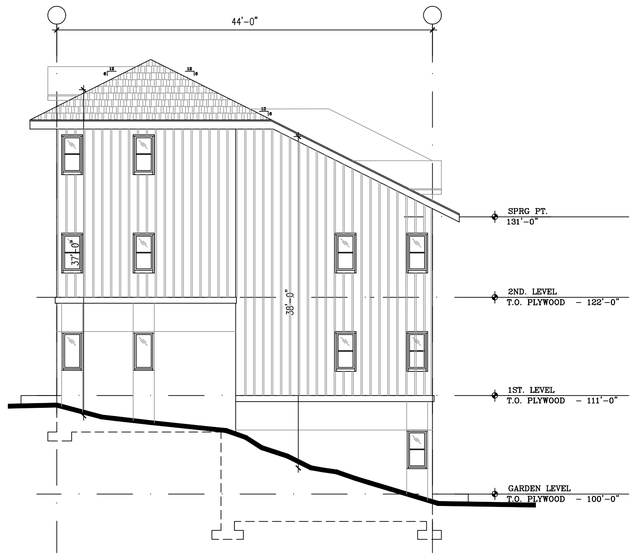
4. THESE ELEVATIONS ARE CONCEPTUAL IN NATURE, INDIVIDUAL BUILDING ELEVATIONS MAY VARY BUT WILL BE EVALUATED FOR COMPLIANCE WITH DESIGN STANDARDS CONTAINED WITHIN TITLE 070 OF THE GLENWOOD SPRINGS MUNICIPAL CODE AT THE TIME OF SUBMITTING A BUILDING PERMIT APPLICATION.



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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12 Vail Road,
suite 7000
Vail, CO 81657
Tel: 970.479.9990
www.triumphdev.com

BELL RIPPY
NEIGHBORHOOD
GLENWOOD SPRINGS COLORADO

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
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

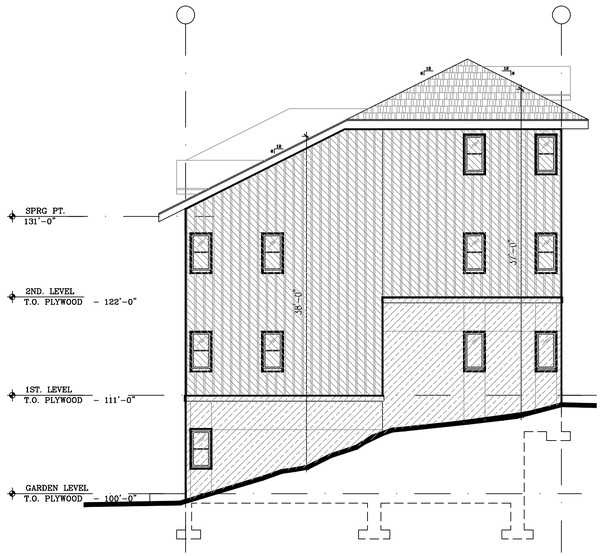
SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS OF WALL	1410 SF	NA
NET GLAZING	110 SF	7.8%
NET STUCCO	428 SF	30.6%
NET CEMENTITIOUS BOARDS	872 SF	61.8%
NET METAL PANEL	N/A	N/A

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
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

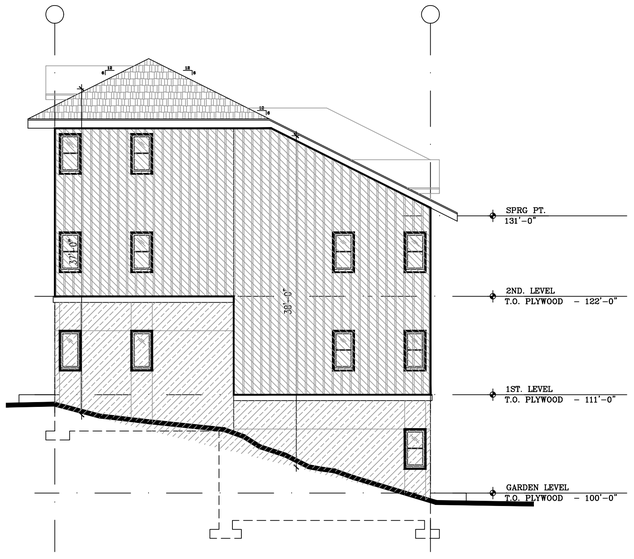
1. EXCLUDES ROOF FORMS, FASCIA AND SIMILAR FEATURES.
2. INCLUDES GLAZED WINDOWS AND DOORS



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



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



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



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

BUILDING F - ELEVATIONS

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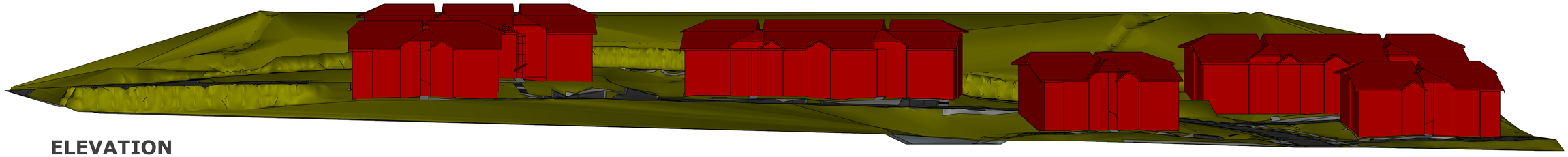
Revisions:
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 3-3-20
MAJOR SITE ARCHITECTURAL PLAN SUBMISSION 4-20-20

Sheet title
BUILDING ELEVATIONS
MATERIAL CALCS

Stamp

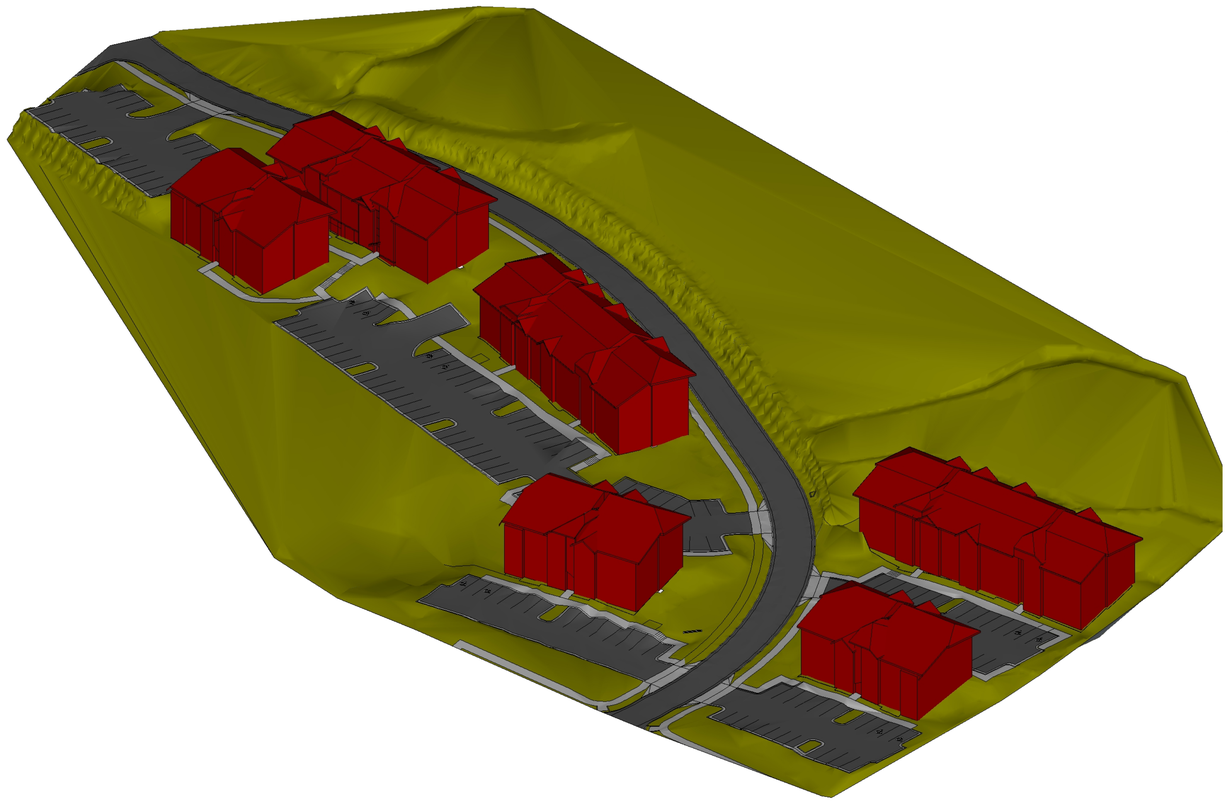
Date: 4/20/2020
Project No:
Drawn by: MEF
Checked by: MEF

Sheet AF3.1



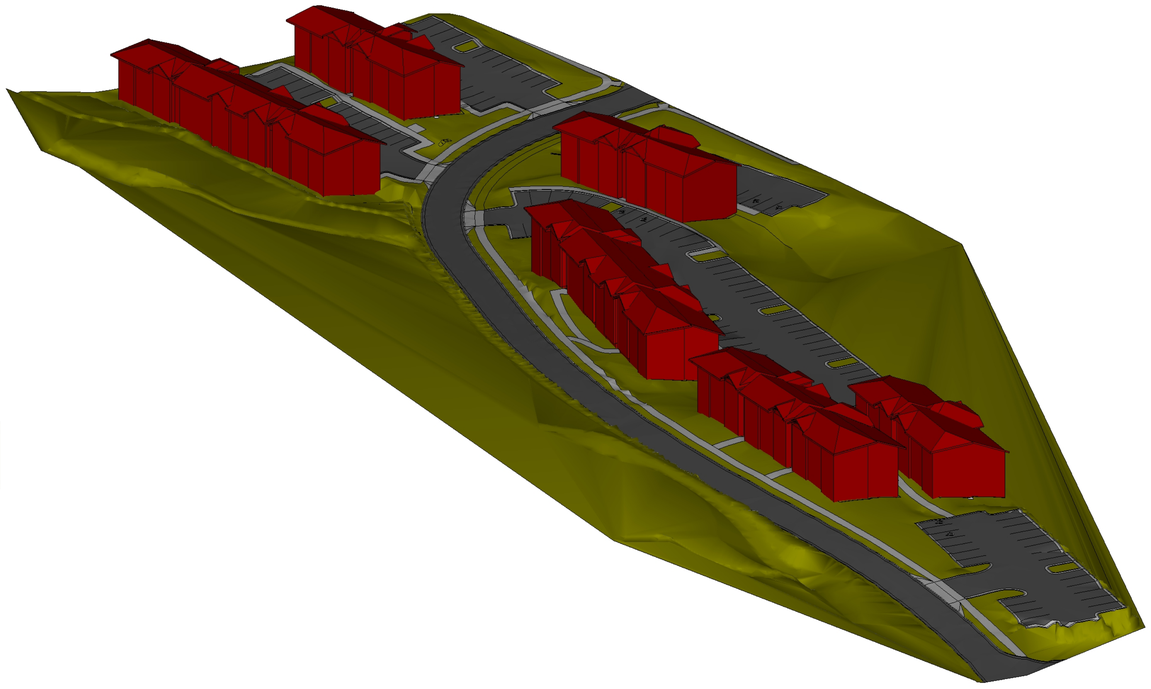
ELEVATION

Scale: 1"=30'-0"



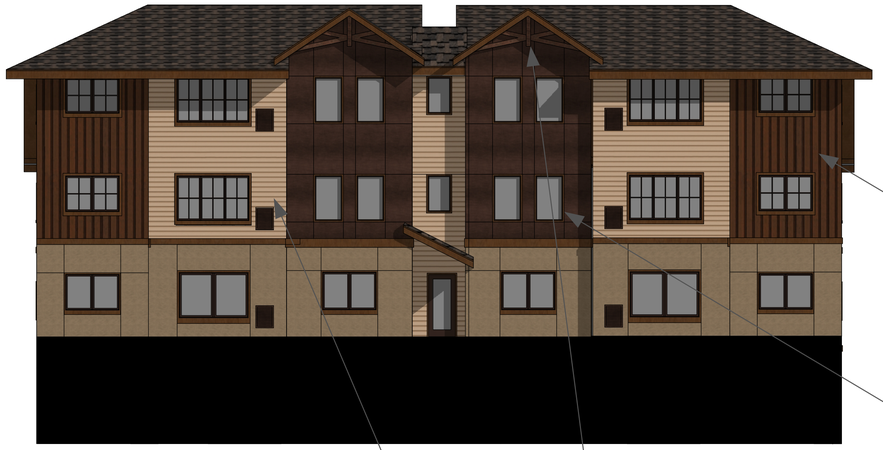
PERSPECTIVE 1

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



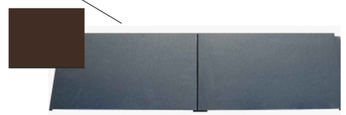
HARDIE T&G HORIZONTAL SIDING, SW - GINGER ROOT



TIMBER TRUSSES, DARK BROWN



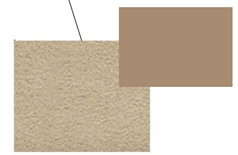
VYNIL WINDOWS AND DOORS, BRONZE COLOR



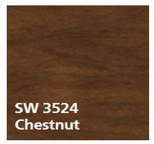
FLAT METAL PANEL, DARK BROWN



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"



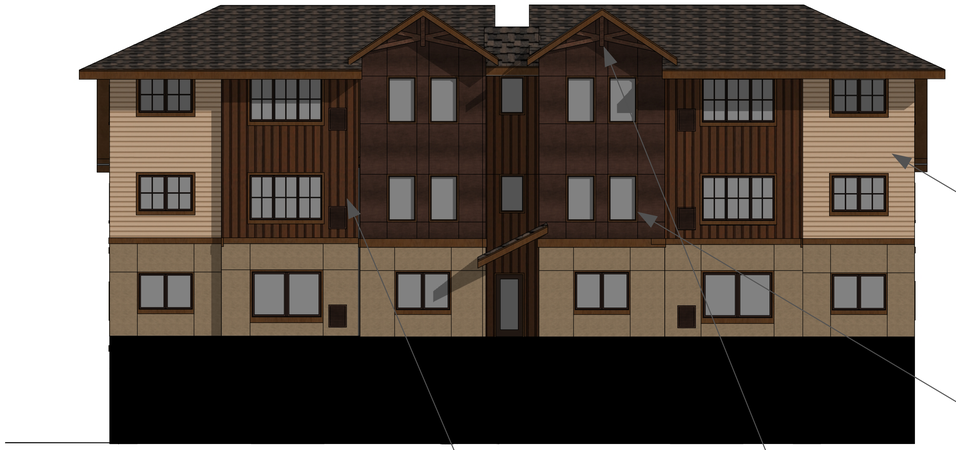
SOUTH ELEVATION - BUILDING A

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



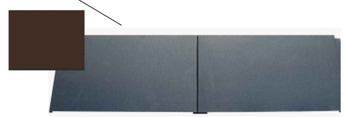
HARDIE T&G HORIZONTAL SIDING, SW - GINGER ROOT



TIMBER TRUSSES, DARK BROWN



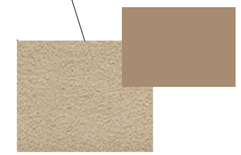
VYNIL WINDOWS AND DOORS, BRONZE COLOR



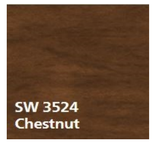
FLAT METAL PANEL, DARK BROWN



HARDIE BOARD (1X12) AND BATTEN (1X4) SW-FRENCH ROAST



STUCCO WITH EXPANSIONS: LIGHT SAND FINISH, SW - DOUBLE LATTE



TRIMS AND FASCIA



WEST ELEVATION - BUILDING B

Scale: 1/8"=1'-0"



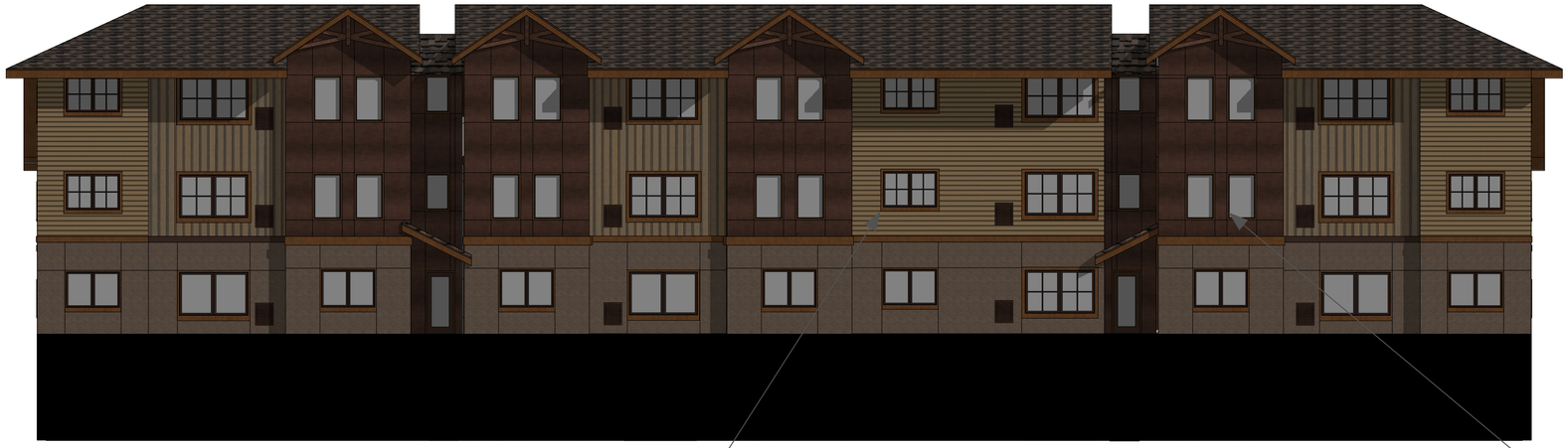
SOUTH ELEVATION - BUILDING B

Scale: 1/8"=1'-0"



EAST ELEVATION - BUILDING B

Scale: 1/8"=1'-0"



NORTH ELEVATION - BUILDING C

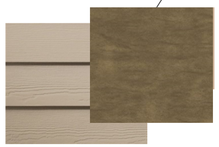
Scale: 1/8"=1'-0"



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



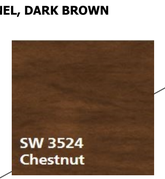
FLAT METAL PANEL, DARK BROWN



HARDIE BOARD (1X12) AND BATTEN (1X4) SW-RIVERWOOD



SYNTHETIC STUCCO SYSTEM: BUCKHORN

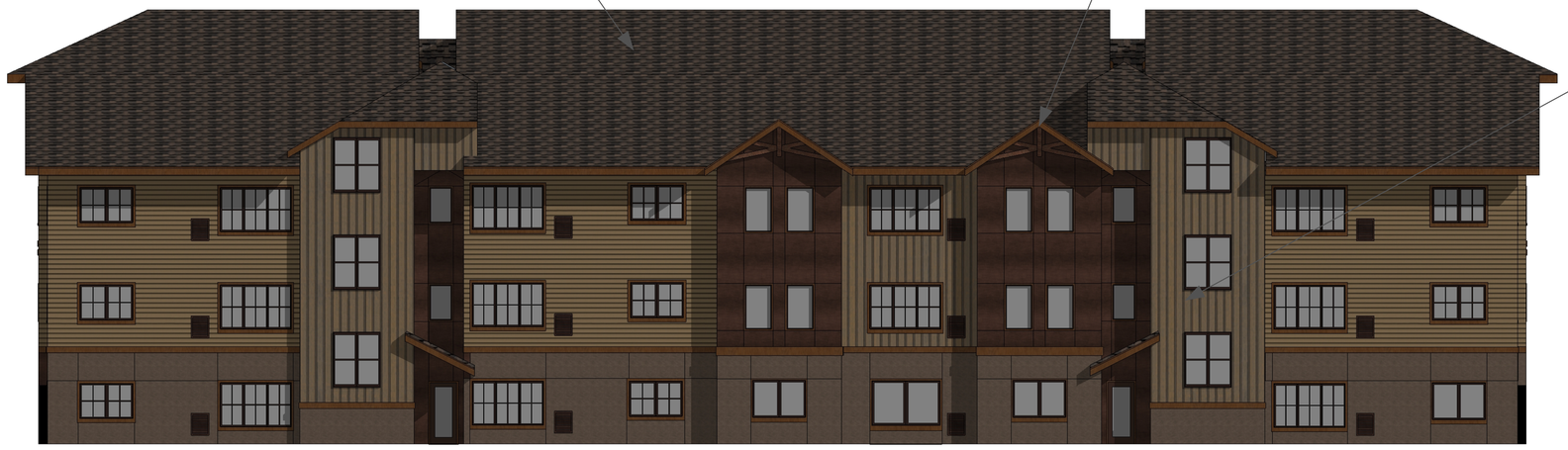


TRIMS AND FASCIA



WEST ELEVATION - BUILDING C

Scale: 1/8"=1'-0"



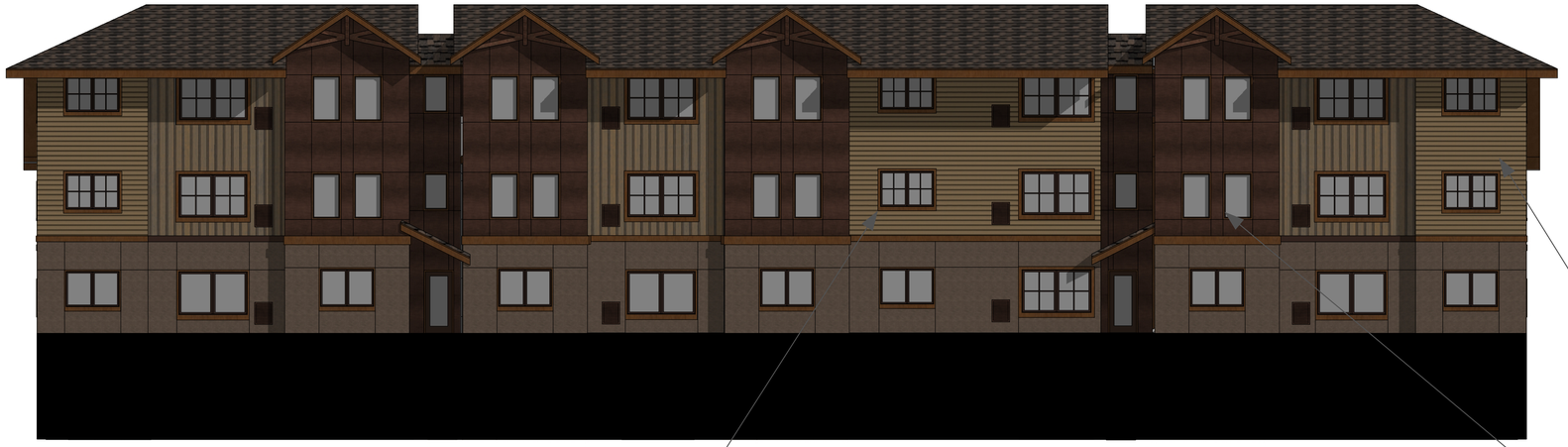
SOUTH ELEVATION - BUILDINGS C

Scale: 1/8"=1'-0"



EAST ELEVATION - BUILDING C

Scale: 1/8"=1'-0"



NORTH ELEVATION - BUILDING D

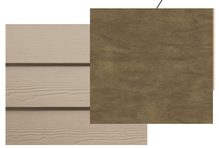
Scale: 1/8"=1'-0"



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



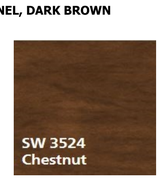
FLAT METAL PANEL, DARK BROWN



HARDIE BOARD (1X12) AND BATTEN (1X4) SW-RIVERWOOD



SYNTHETIC STUCCO SYSTEM: BUCKHORN

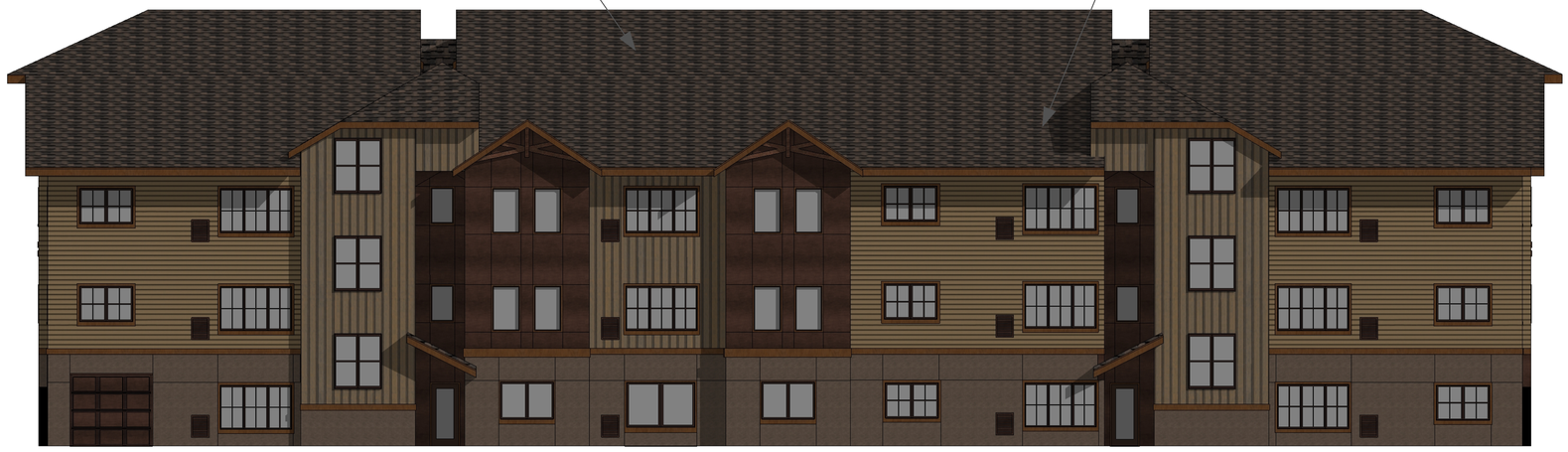


TRIMS AND FASCIA



WEST ELEVATION - BUILDING D

Scale: 1/8"=1'-0"



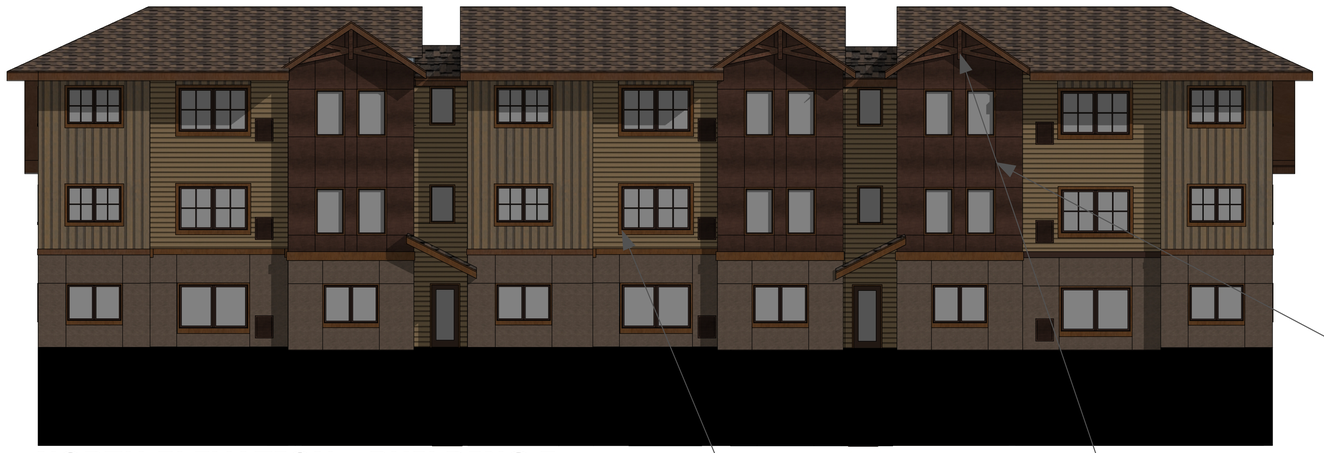
SOUTH ELEVATION - BUILDINGS D

Scale: 1/8"=1'-0"



EAST ELEVATION - BUILDING D

Scale: 1/8"=1'-0"



NORTH ELEVATION - BUILDING E

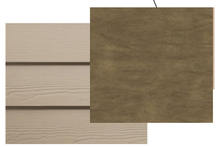
Scale: 1/8"=1'-0"



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



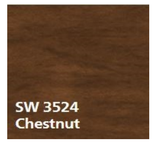
FLAT METAL PANEL, DARK BROWN



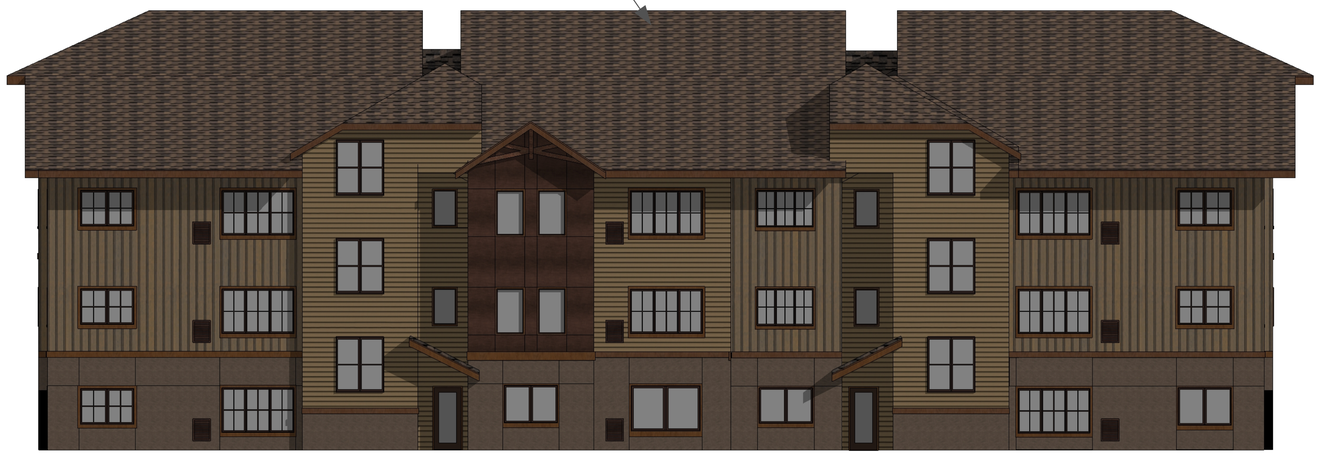
HARDIE BOARD (1X12) AND BATTEN (1X4) SW-RIVERWOOD



SYNTHETIC STUCCO SYSTEM: BUCKHORN



TRIMS AND FASCIA



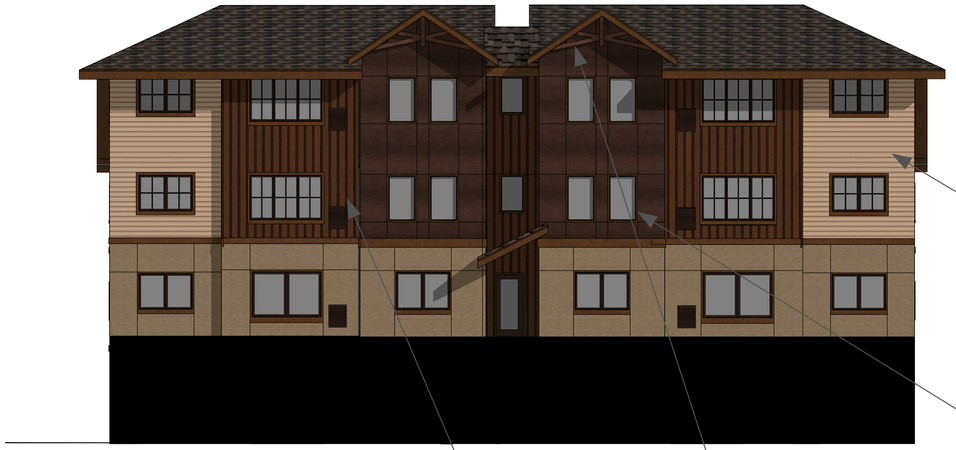
SOUTH ELEVATION - BUILDING E

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



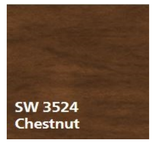
TIMBER TRUSSES, DARK BROWN



VYNIL WINDOWS AND DOORS, BRONZE COLOR



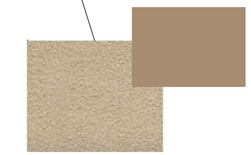
FLAT METAL PANEL, DARK BROWN



TRIMS AND FASCIA



HARDIE BOARD (1X12) AND BATTEN (1X4) SW-FRENCH ROAST



STUCCO WITH EXPANSIONS: LIGHT SAND FINISH, SW - DOUBLE LATTE



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.

101 West 8th Street, Glenwood Springs, CO 81601 (970) 384-6434 FAX (970) 945-8582
jessica.bowser@cogs.us

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.

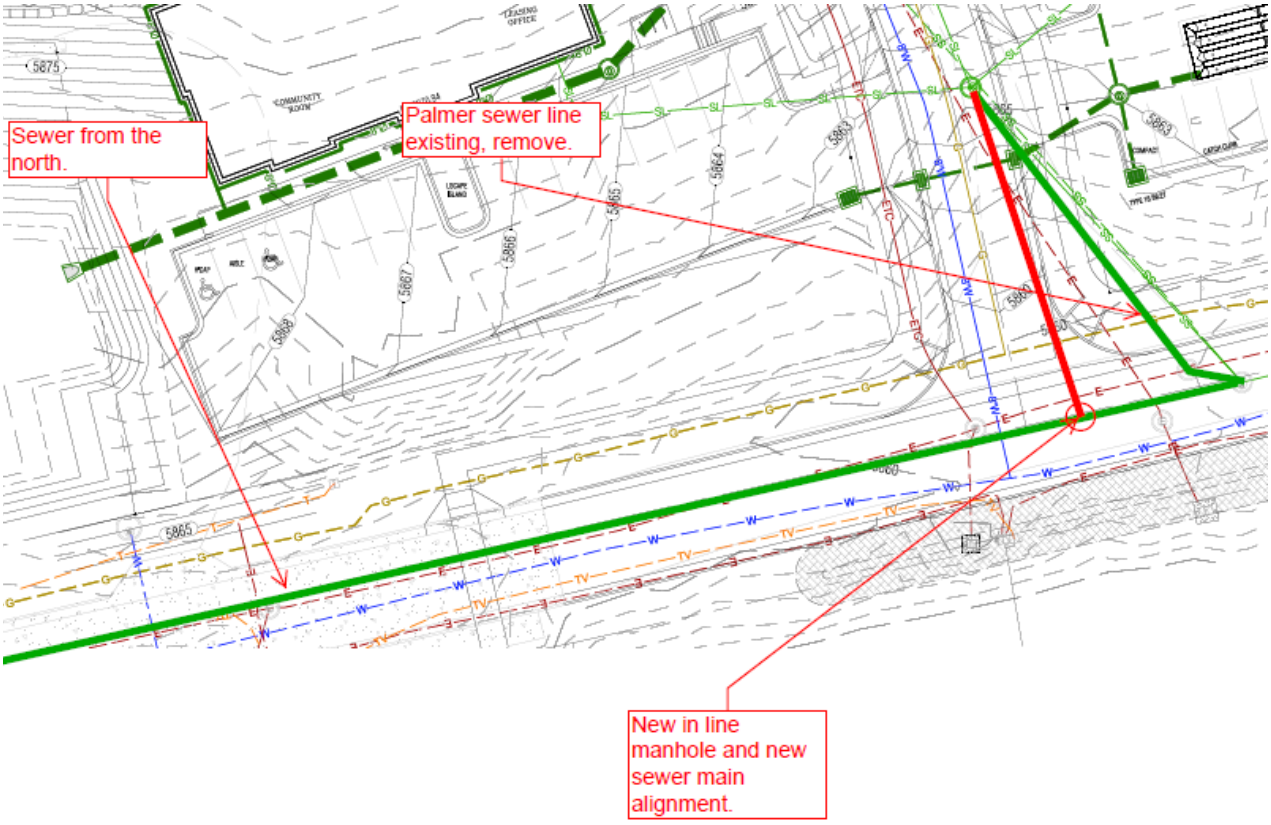
3. Site Plan:

    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

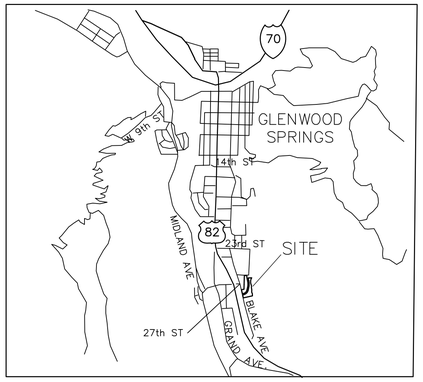
19. Include any plottable offsite (i.e., appurtenant) easements or servitudes disclosed in documents provided to or obtained by the surveyor as a part of the survey pursuant to Sections 5 and 6 (and applicable selected Table A items) (client to obtain necessary permissions).
- shown hereon

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

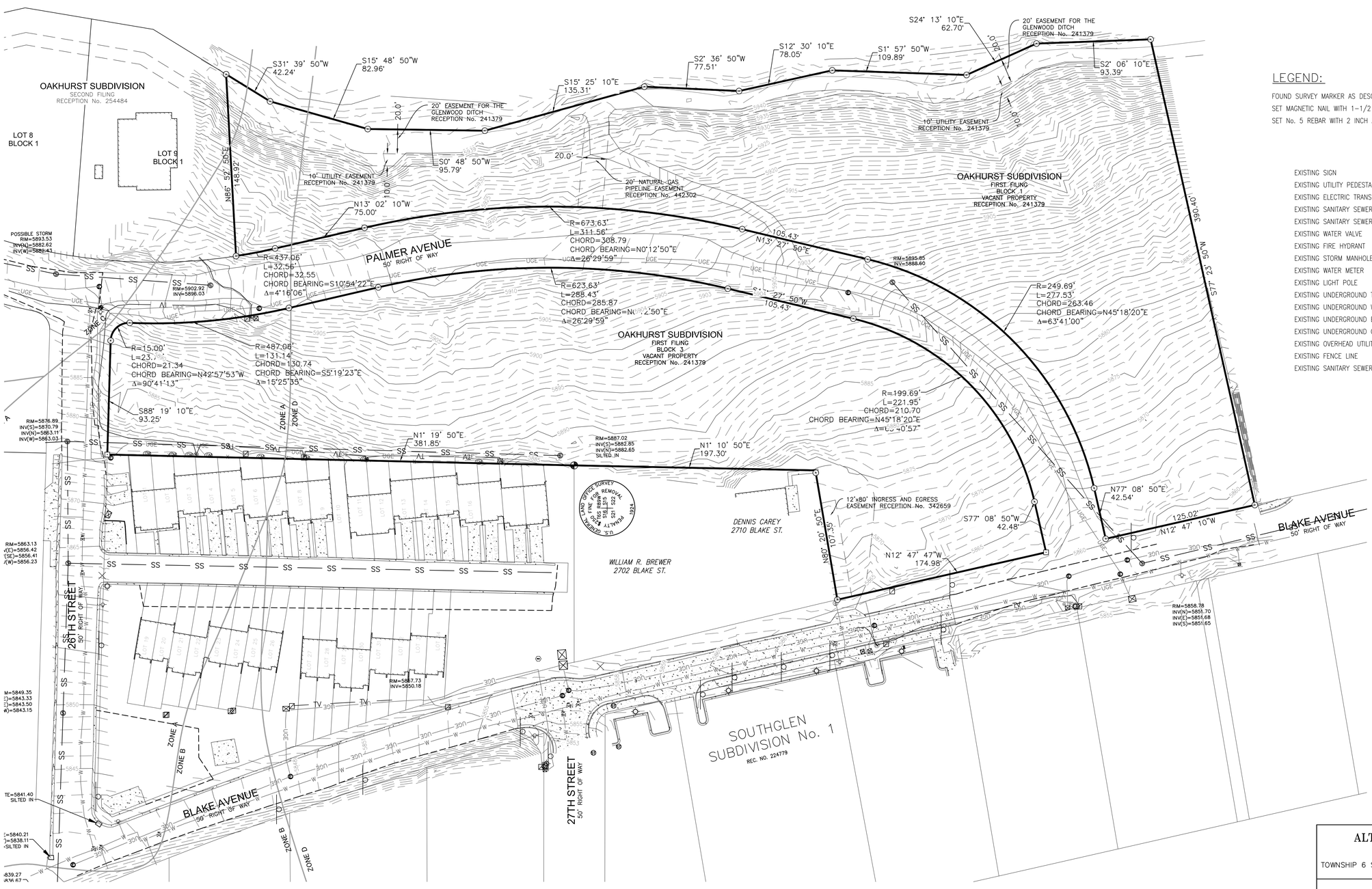
JOB #: 2019159 FIELD WORK: PC
DATE: 12/16/19 DRAWING NAME: ALTA DRAWN BY: PC

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



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

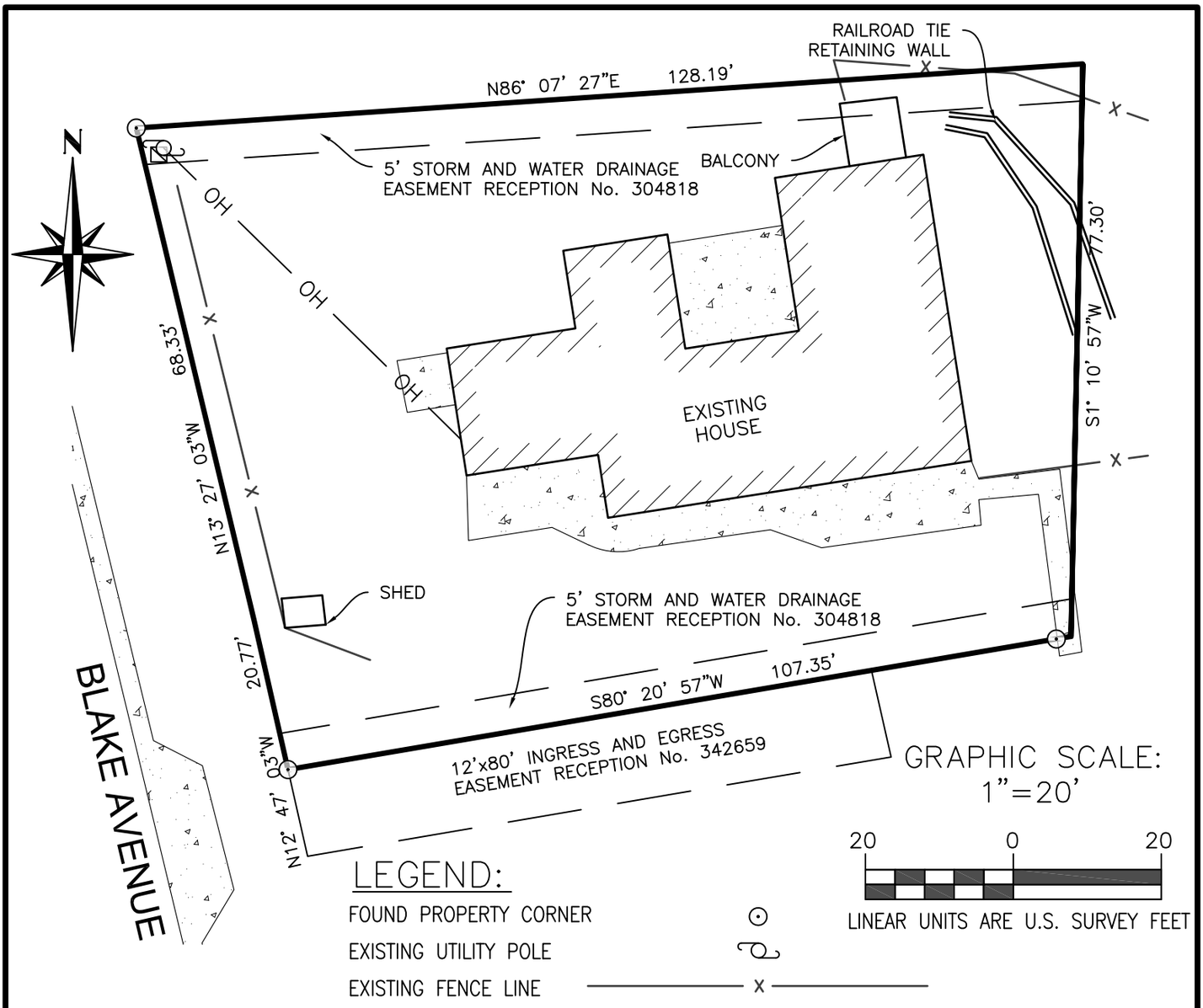
ALTA/NSPS LAND TITLE SURVEY

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;

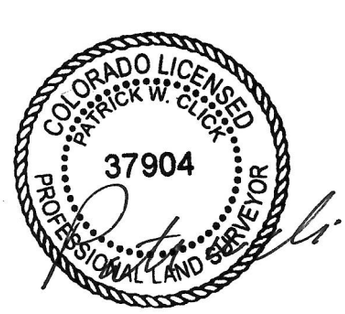
thence South 01°11' West 197.30 feet along the East line of said Section 21, thence South 80°21'West 107.35 feet to the True Point of Beginning; thence North 80°21'East 80.00 feet; thence South 12°47'East 12.00 feet; thence South 80°21'West 80.00 feet to the easterly line of Blake Street extension; thence 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: 2/28/2020
Project No:
Drawn by: MEF
Checked by: MEF

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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.

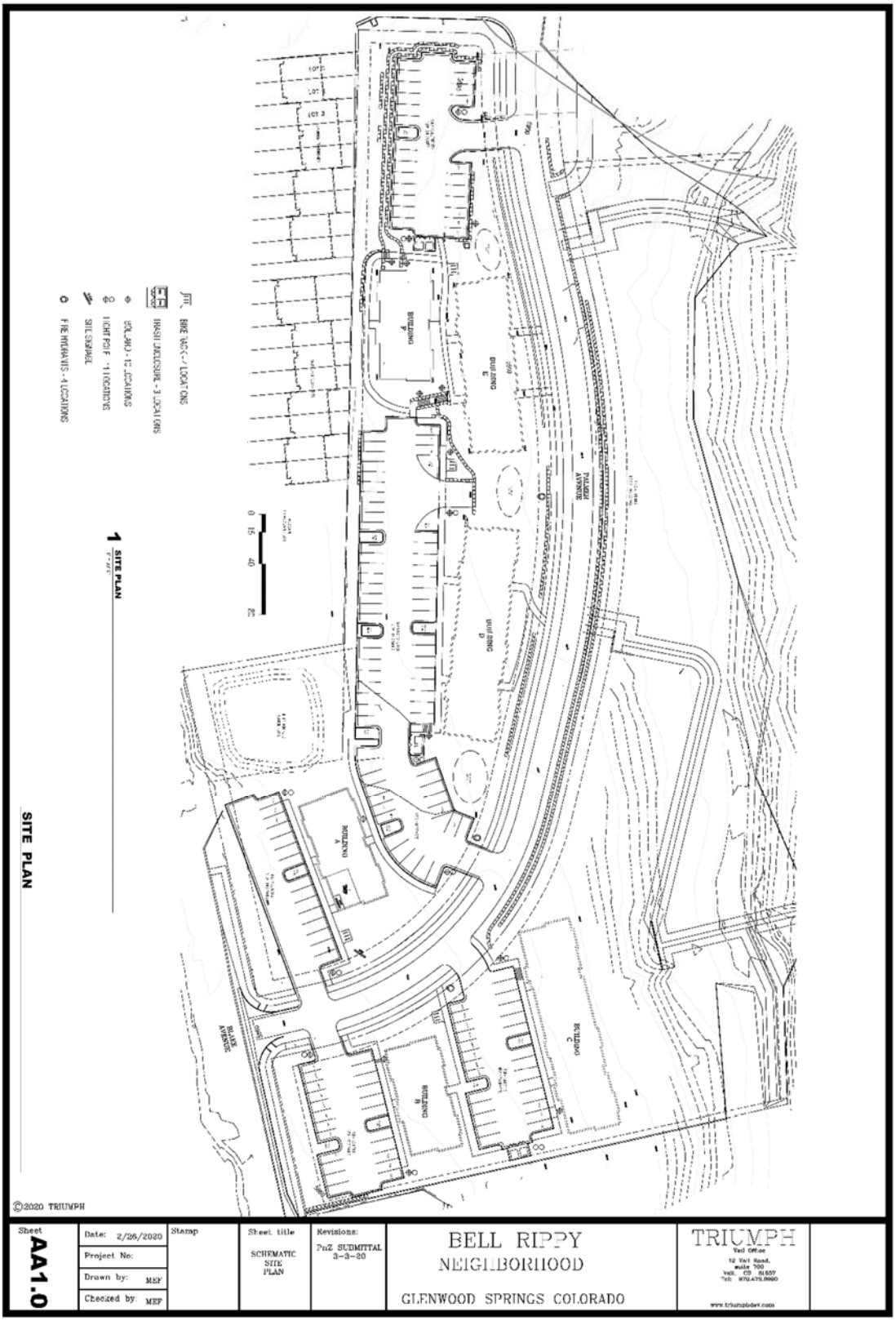
Proposed Revisions

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

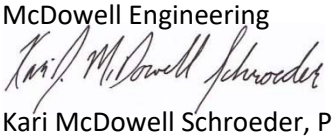
CDOT issued Access Permits to the City of Glenwood Springs on August 22, 2019 for the intersections of State Highway 82 and 27th Street (Permit #319104) and the intersection of State Highway 82 and Blake Avenue (Permit #319105). These permits included the previous (higher) volume of traffic anticipated 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

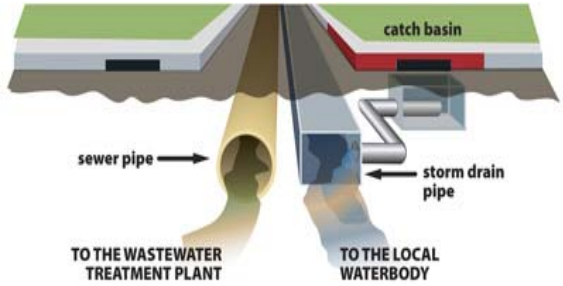
For more information on CDOT Water Quality Program:

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

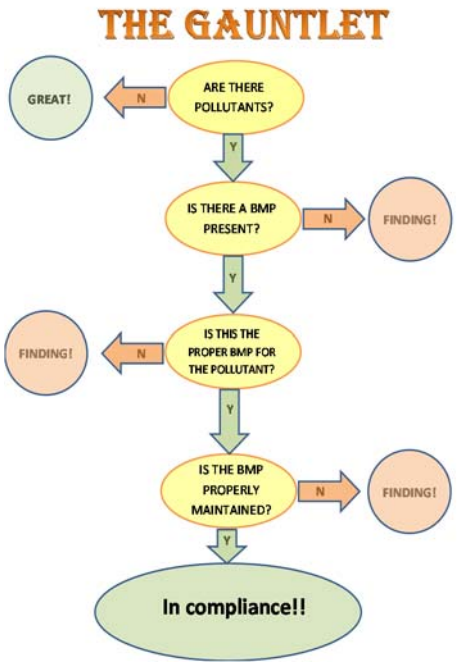


As part of the permit, CDOT has several different programs to prevent pollutants from entering into the storm drain system:

- 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.	State Highway No / Mp / Side	Permit Fee	Date of Transmittal	Region / Section / Patrol / Name	Local Jurisdiction
319105	082A / 2.190 / Left	$100.00	08/22/2019	3 / 02 / 2K12 Alan Hayes	Glenwood Springs

The Permittee(s): The Applicant(s):

City of Glenwood Springs
101 W 8th St
Glenwood Springs, Colorado 81601
(970) 384-6388

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.

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

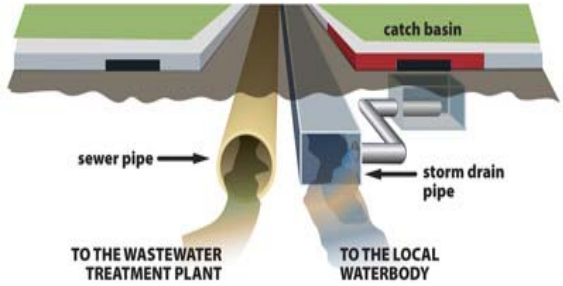
For more information on CDOT Water Quality Program:

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

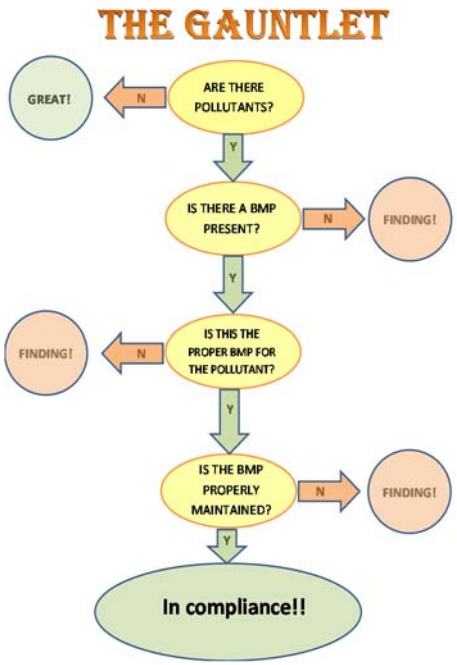


As part of the permit, CDOT has several different programs to prevent pollutants from entering into the storm drain system:

- 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.

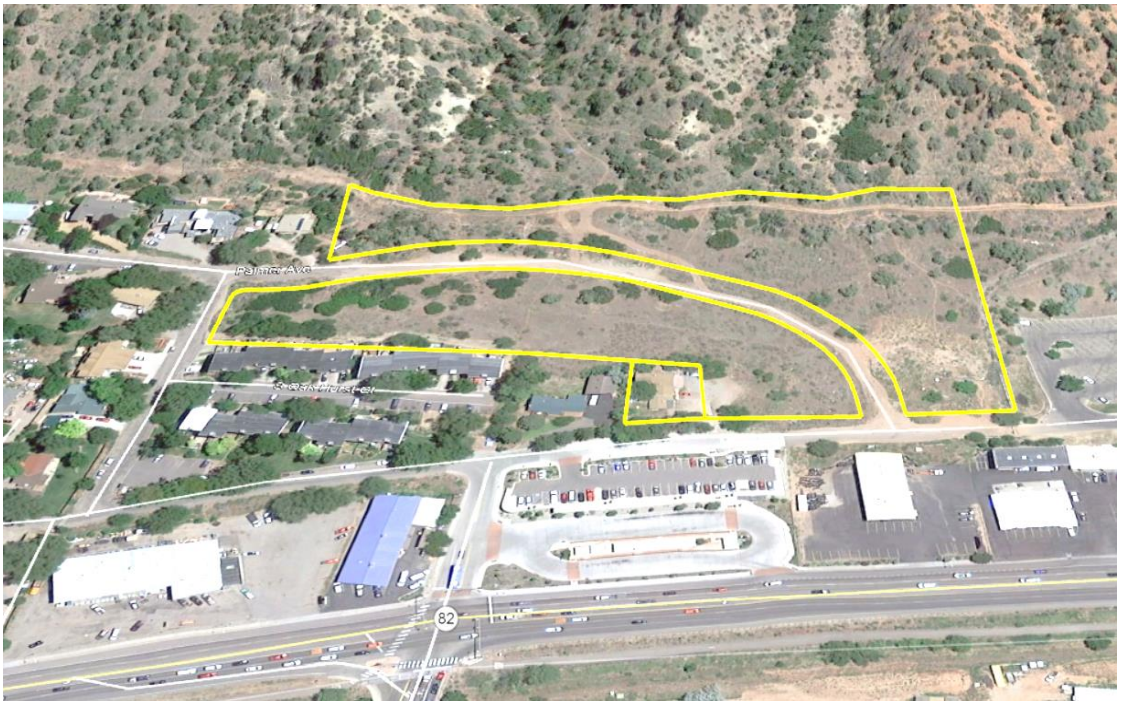
Boundaries Unlimited Inc.

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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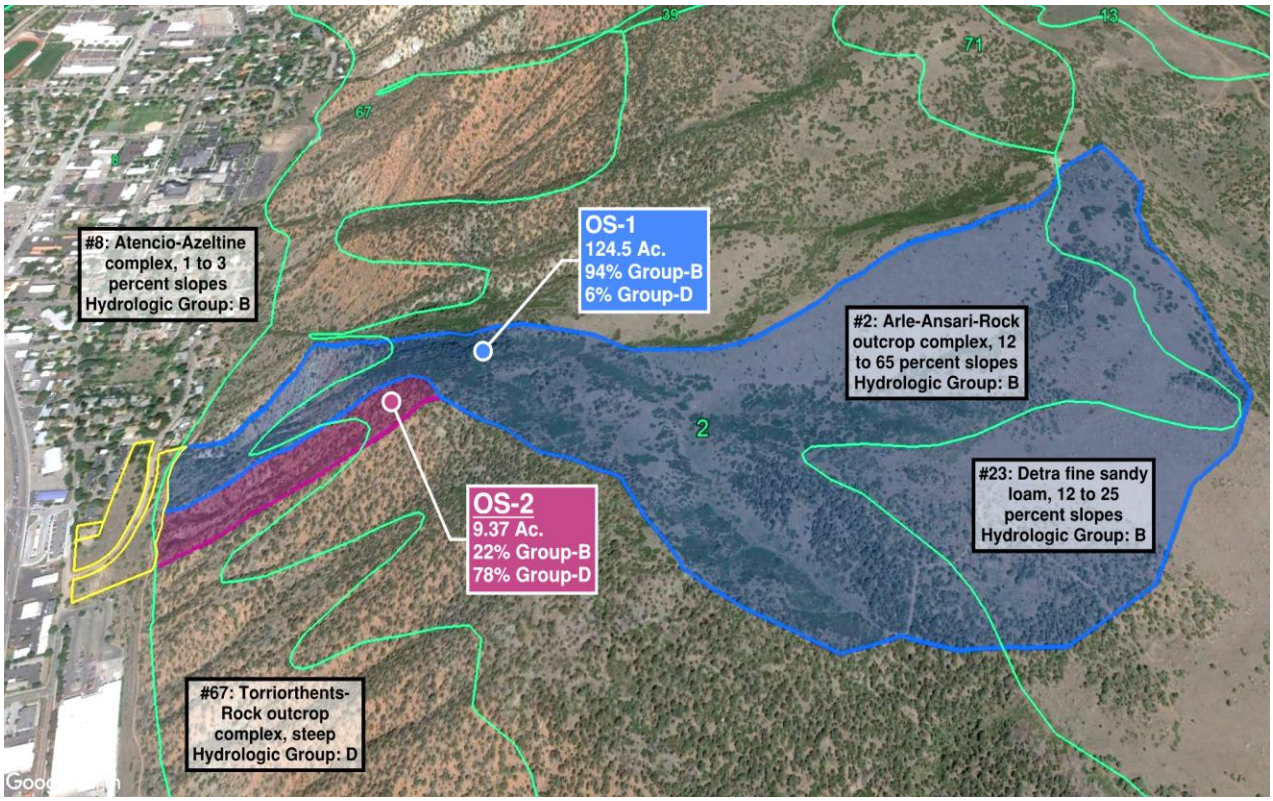


Figure 1: Existing Drainage Basins

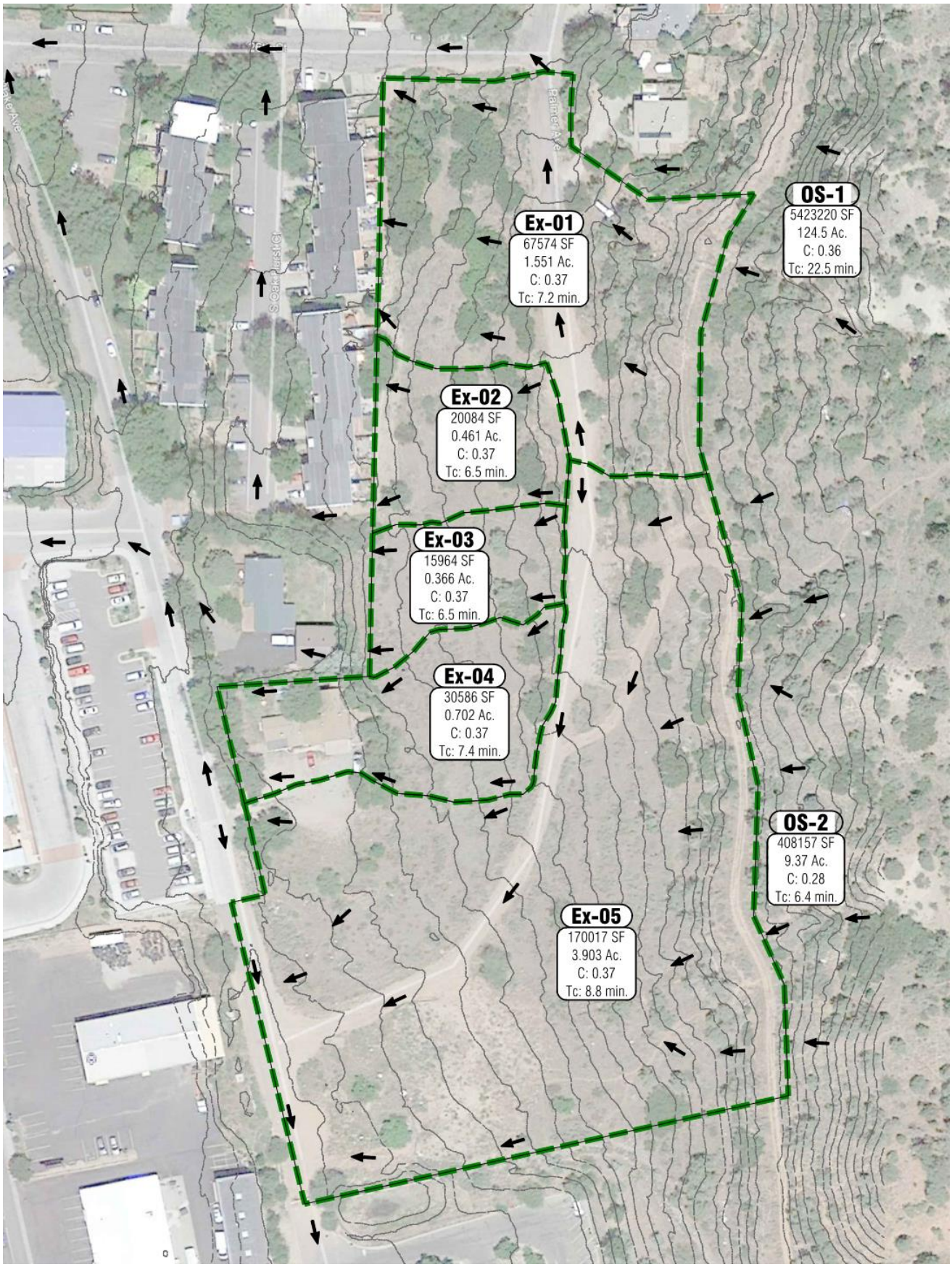


Figure 2: Existing Drainage Basins

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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.

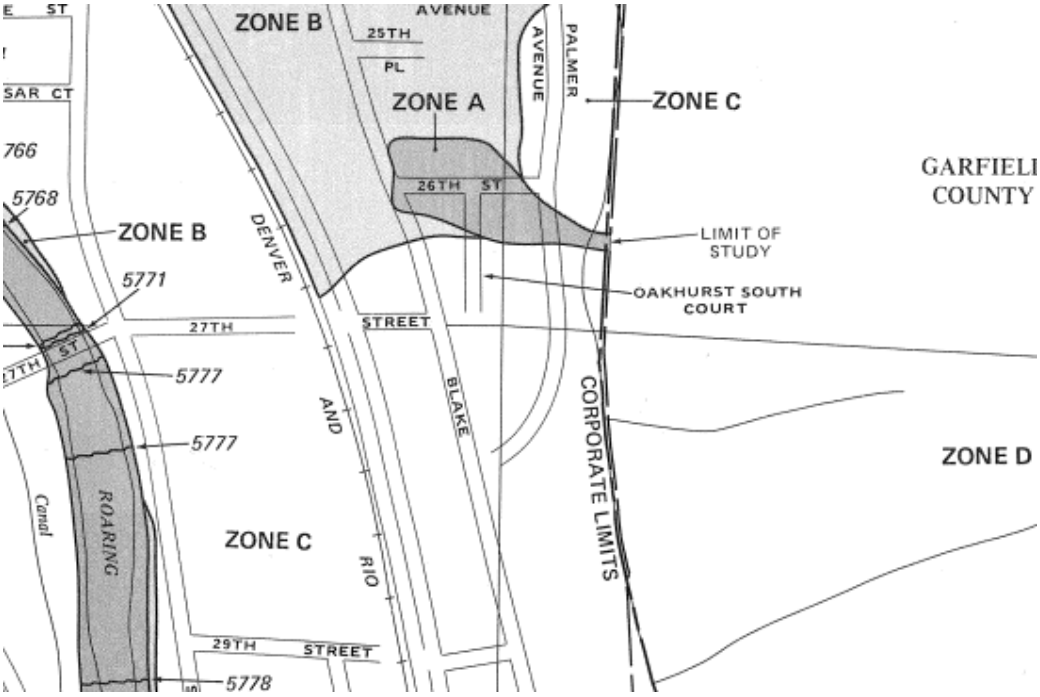


Figure 3: Existing Drainage Basins

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).

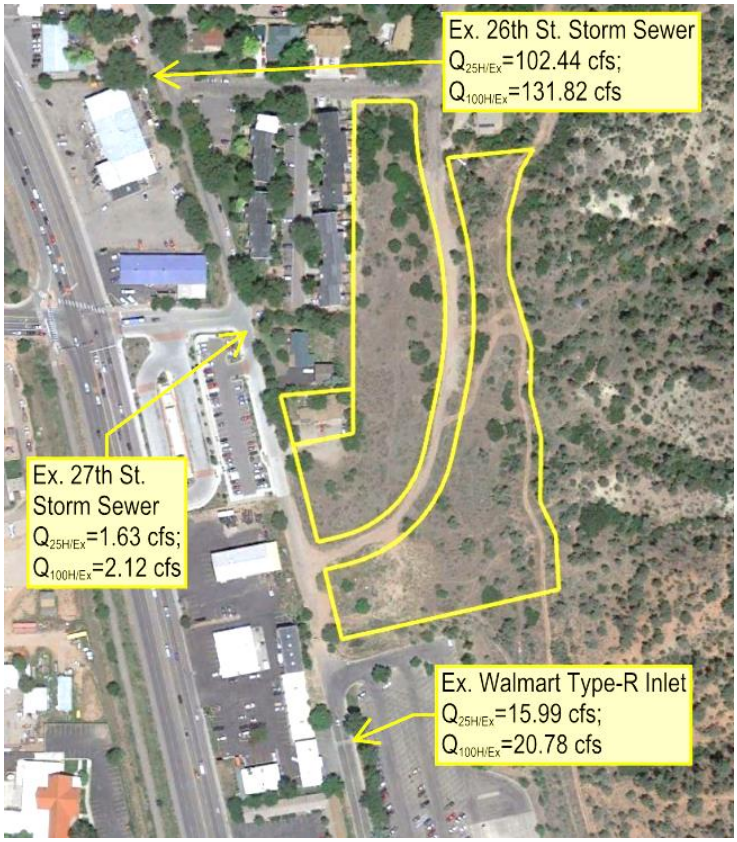


Figure 4: Outfalls/Design Points

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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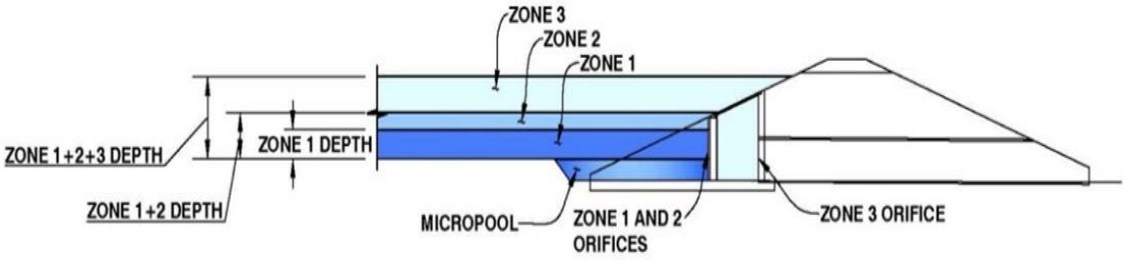


Figure 5: Extended Detention with 3 zones

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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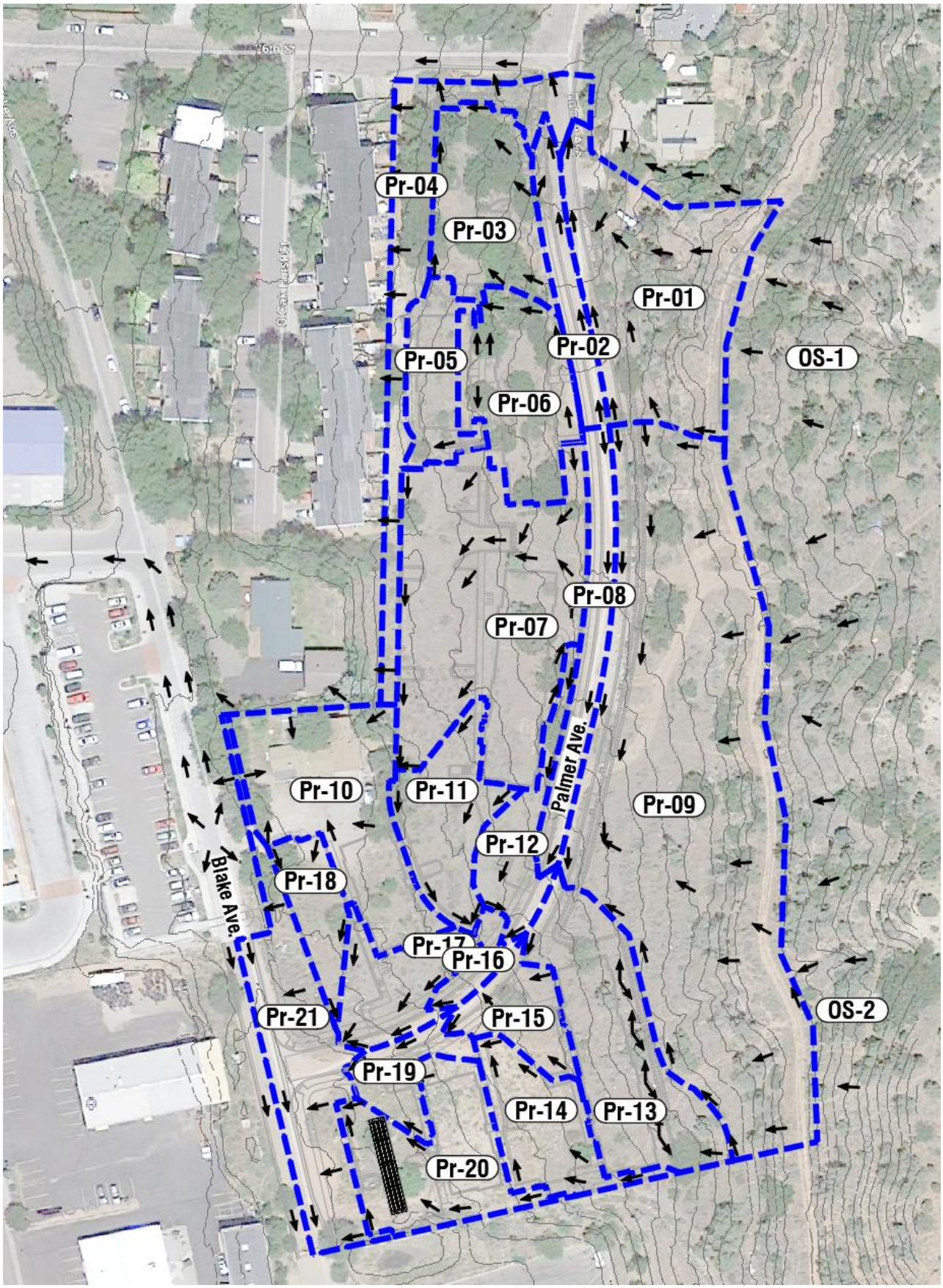


Figure 6: Proposed Drainage Basins

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.

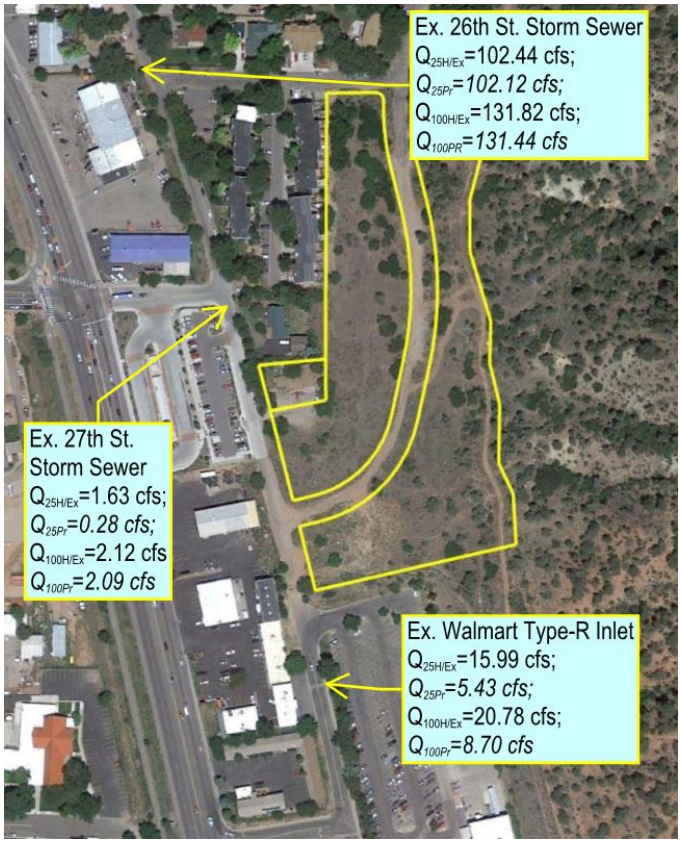


Figure 7: Outfall/Design Point Comparison

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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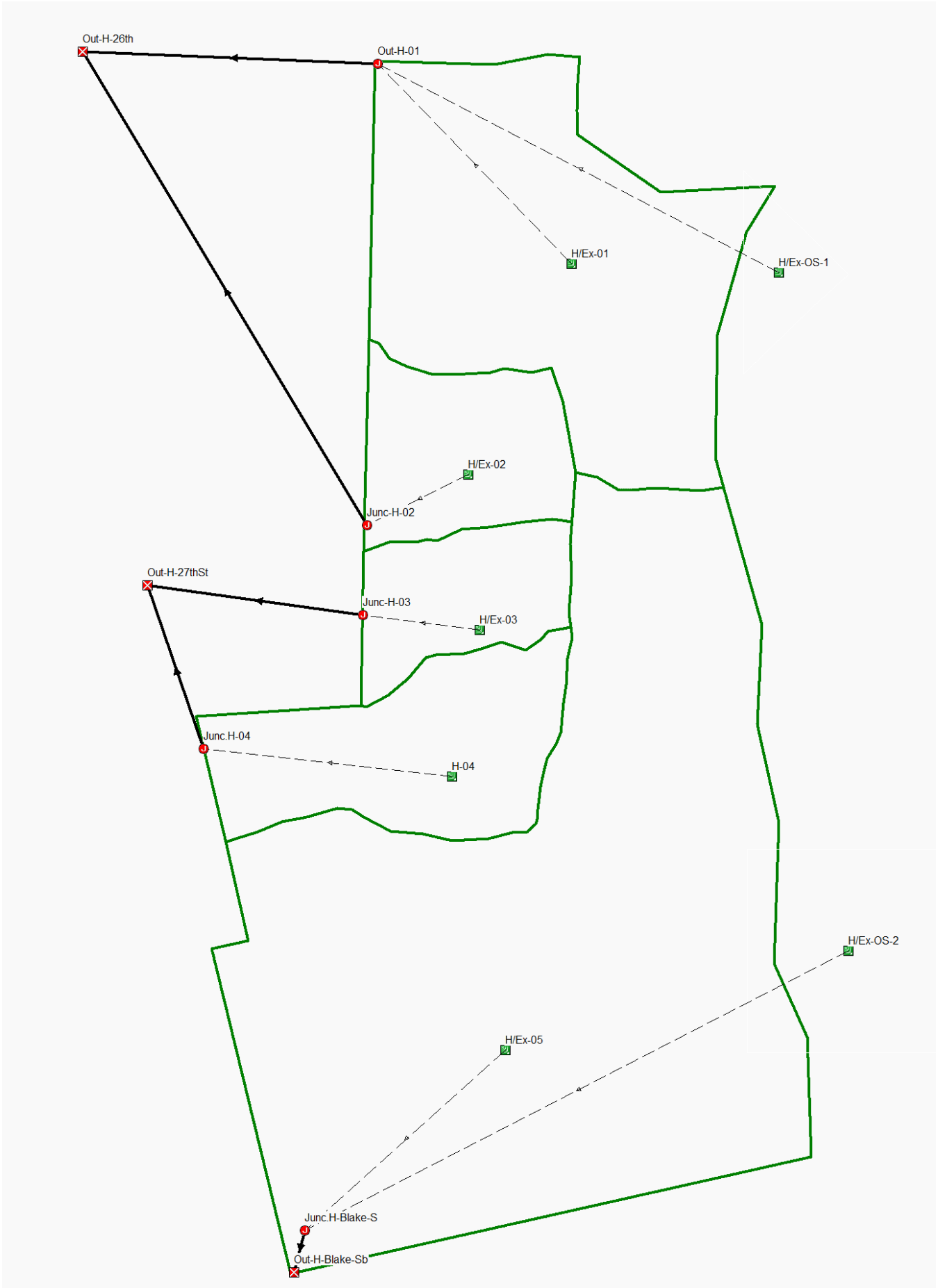
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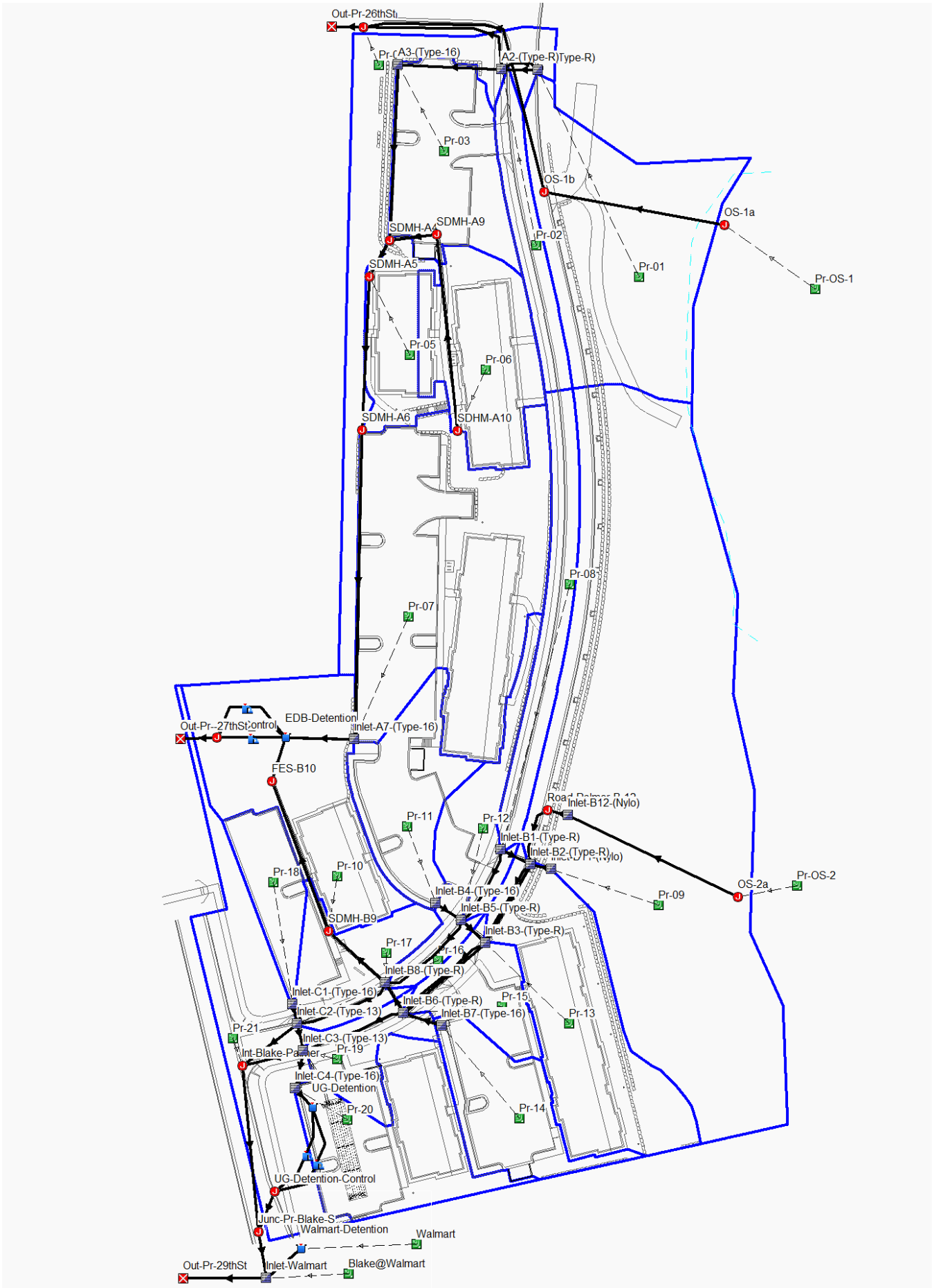
Appendix

- *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*

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
Blake @ Walmart	1743	1743	100.0%	-	-	-	-	-	-	0.97	5.00	-	-	-	0.20	0.26


Out-H-26th
Out-H-01
H/Ex-01
H/Ex-OS-1
H/Ex-02
Junc-H-02
Out-H-27thSt
Junc-H-03
H/Ex-03
Junc.H-04
H-04
H/Ex-OS-2
H/Ex-05
Junc.H-Blake-S
Out-H-Blake-Sb


Out-Pr-26thSt
A2-(Type-R)Type-R)
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 (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (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 :

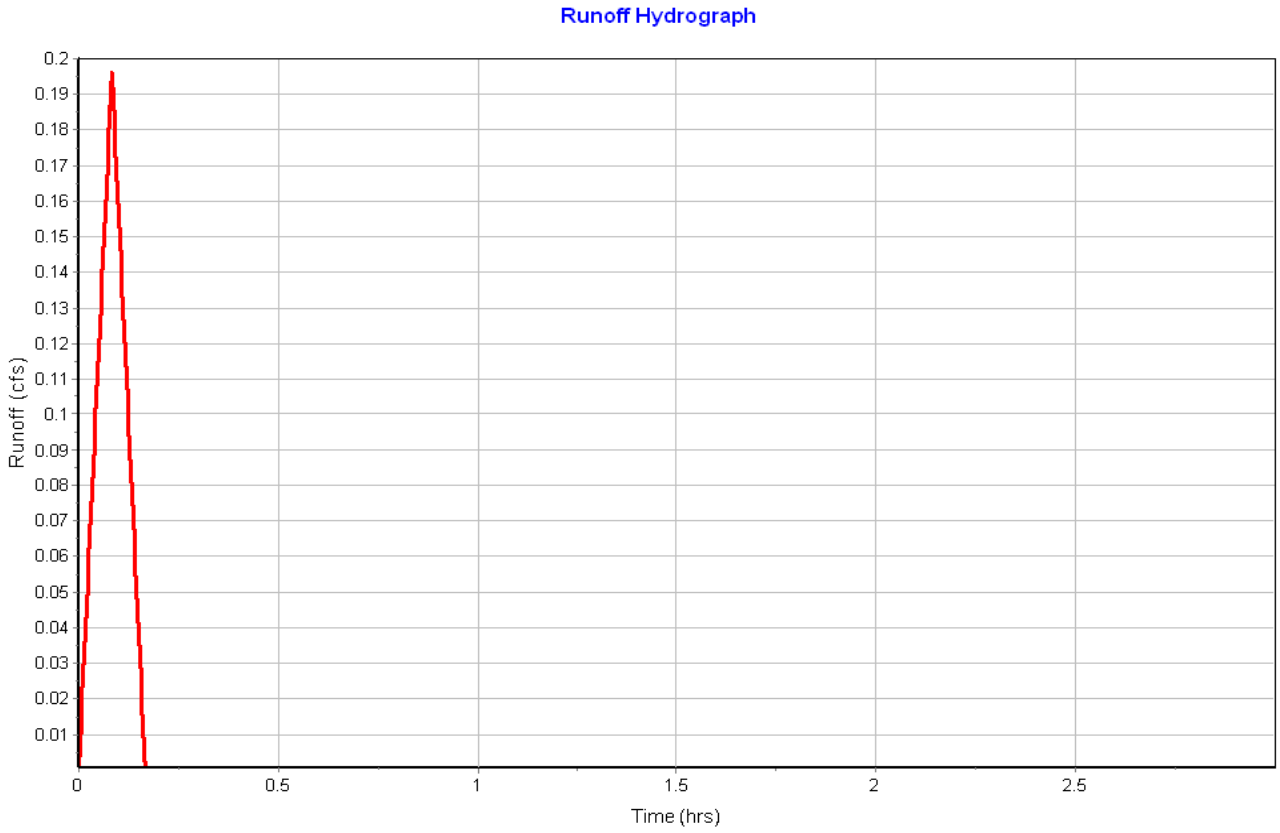
Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

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

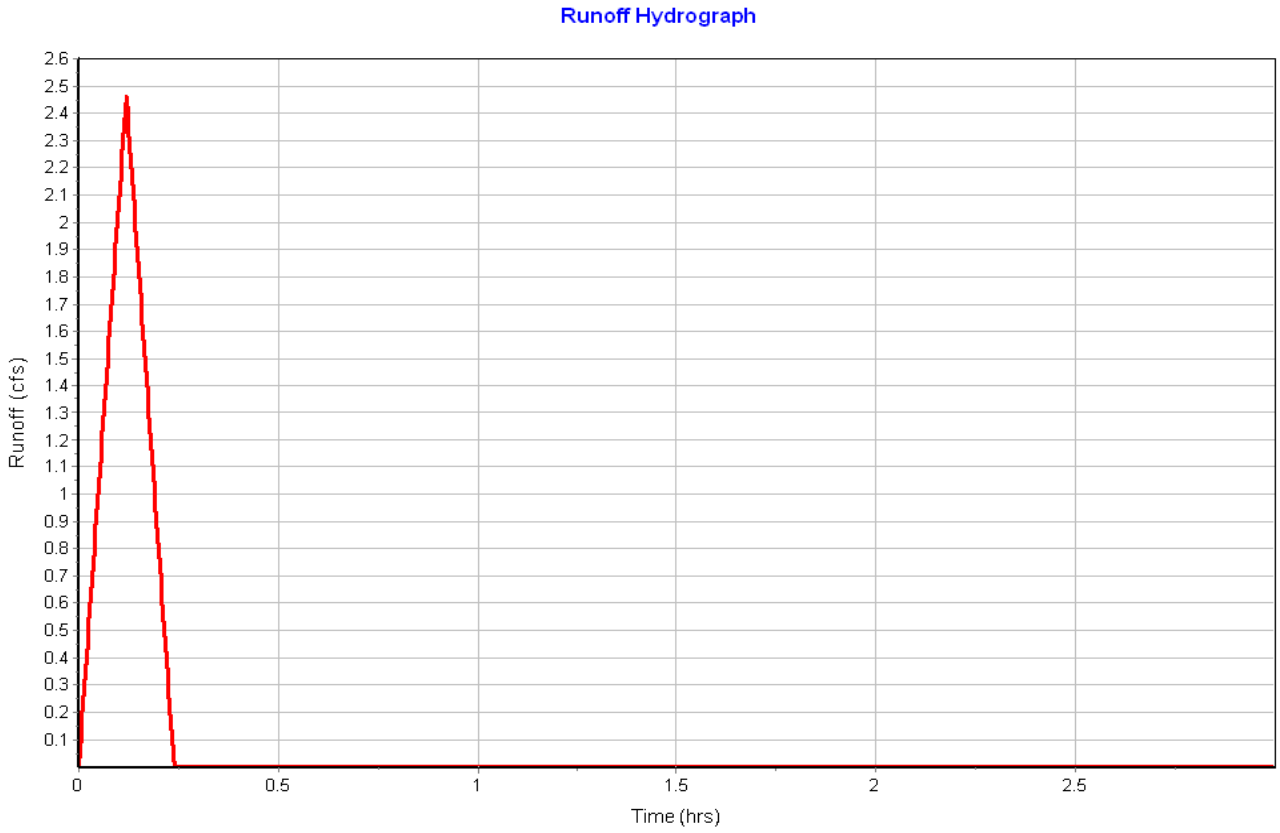
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	440	0.00	0.00
Slope (%) :	9.6	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	5.00	0.00	0.00
Computed Flow Time (min) :	1.47	0.00	0.00

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

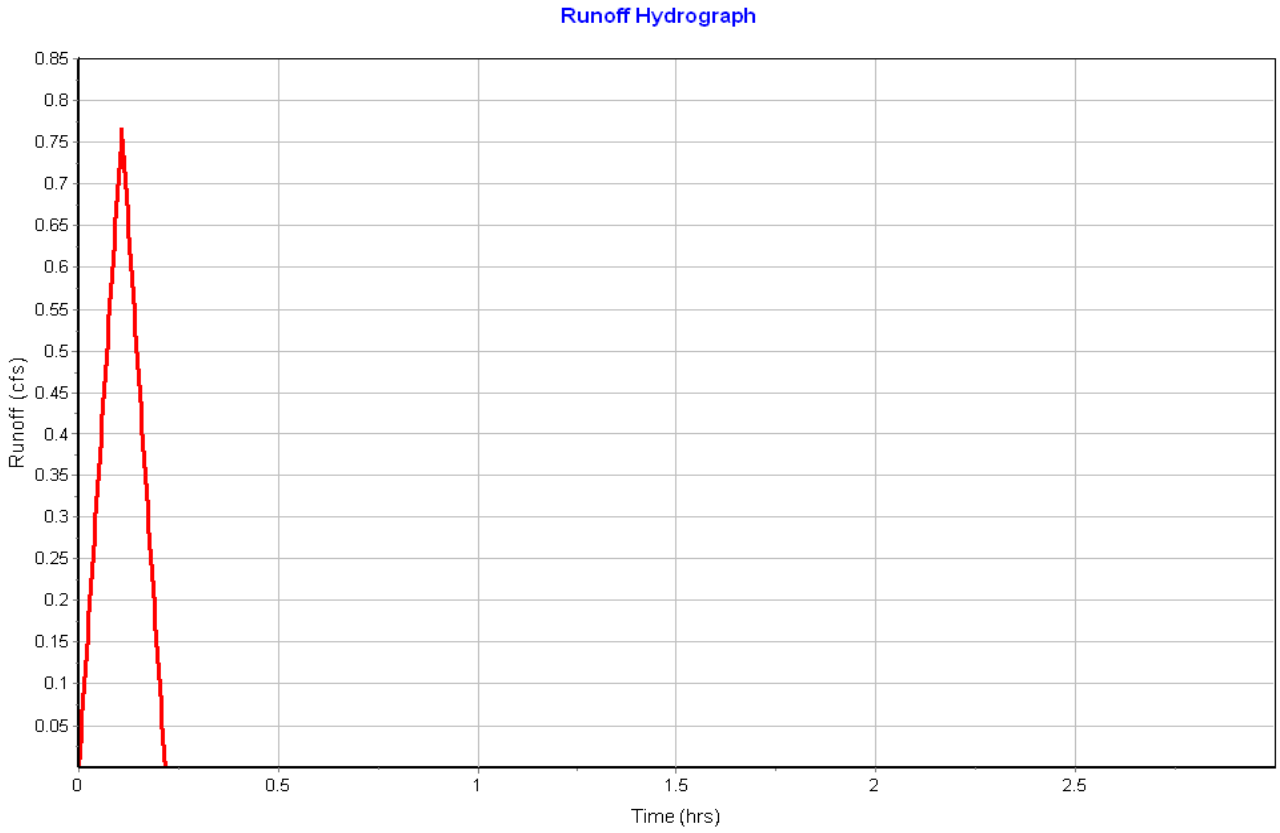
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	75	0.00	0.00
Slope (%) :	16	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	4.00	0.00	0.00
Computed Flow Time (min) :	0.31	0.00	0.00

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

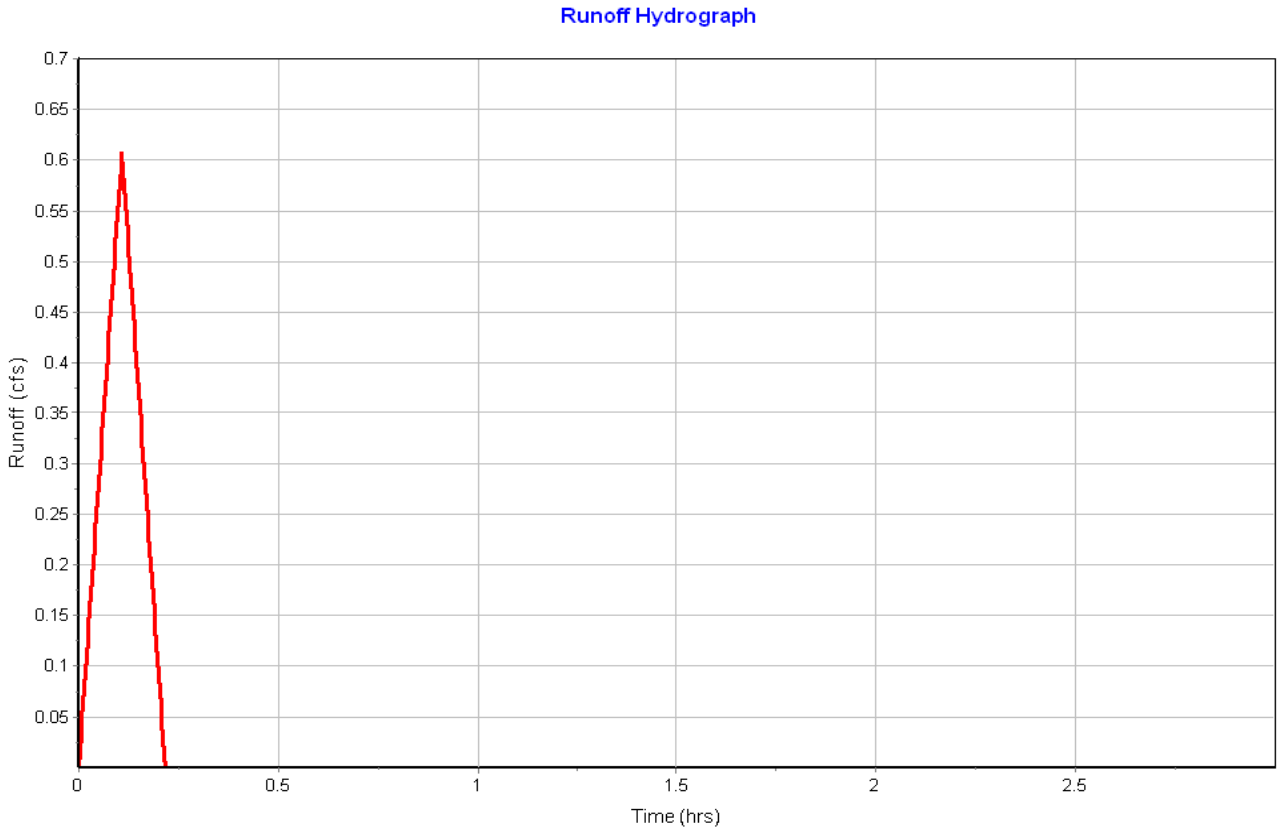
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	70	0.00	0.00
Slope (%) :	11.5	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.39	0.00	0.00
Computed Flow Time (min) :	0.34	0.00	0.00

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

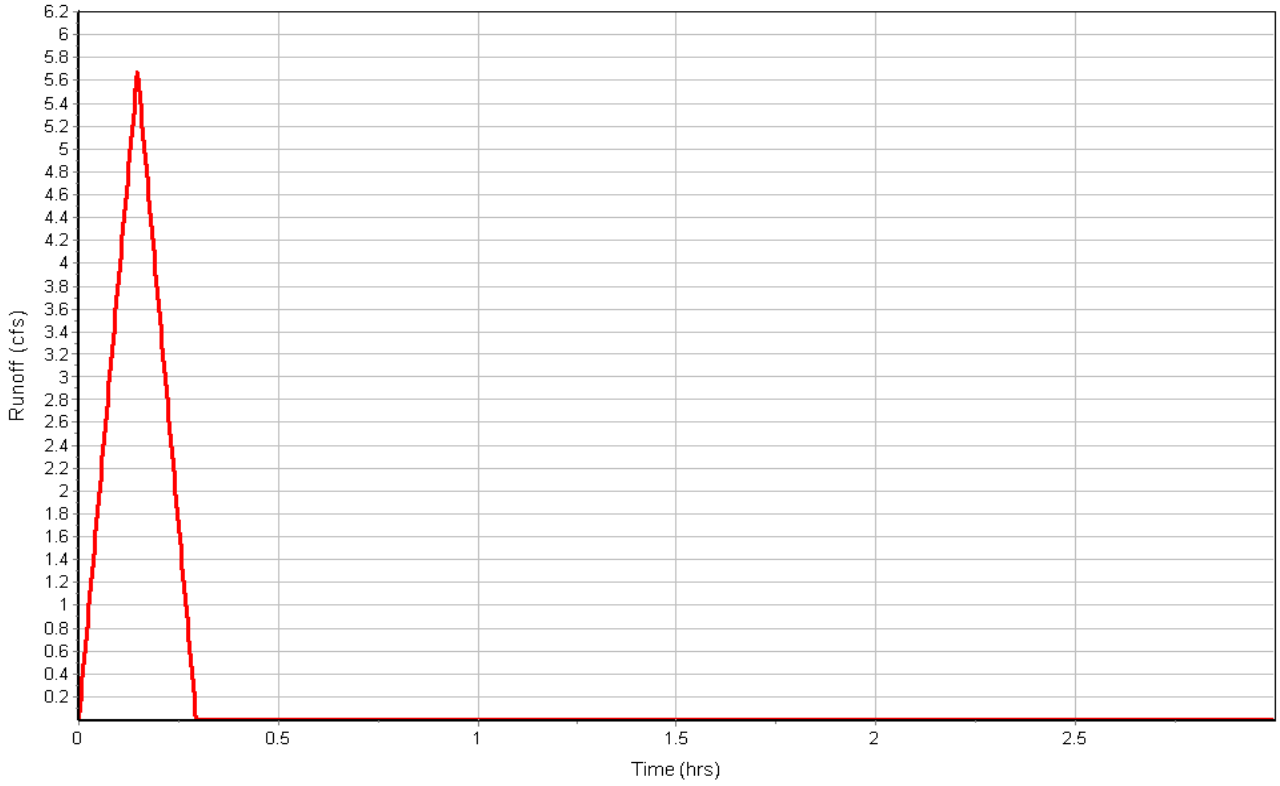
Total TOC (min) 8.75

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

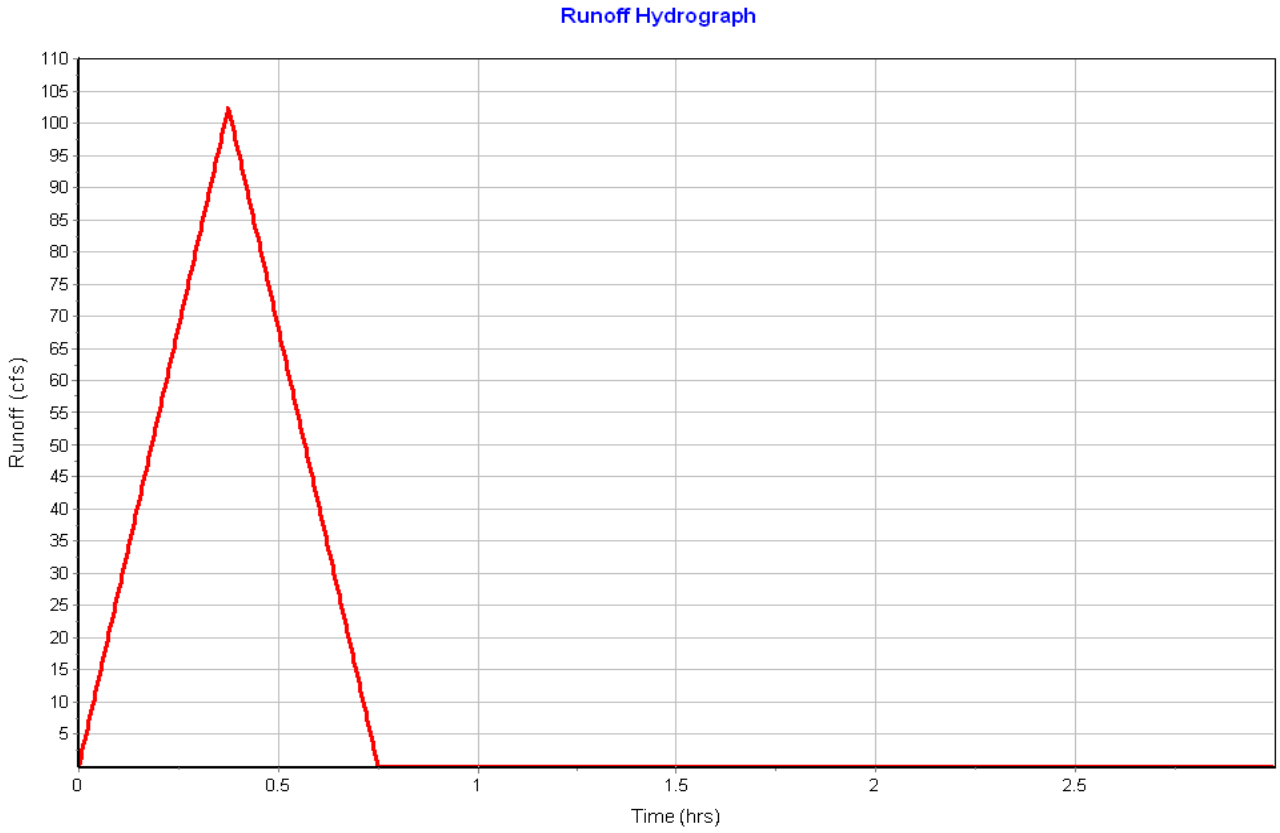
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	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

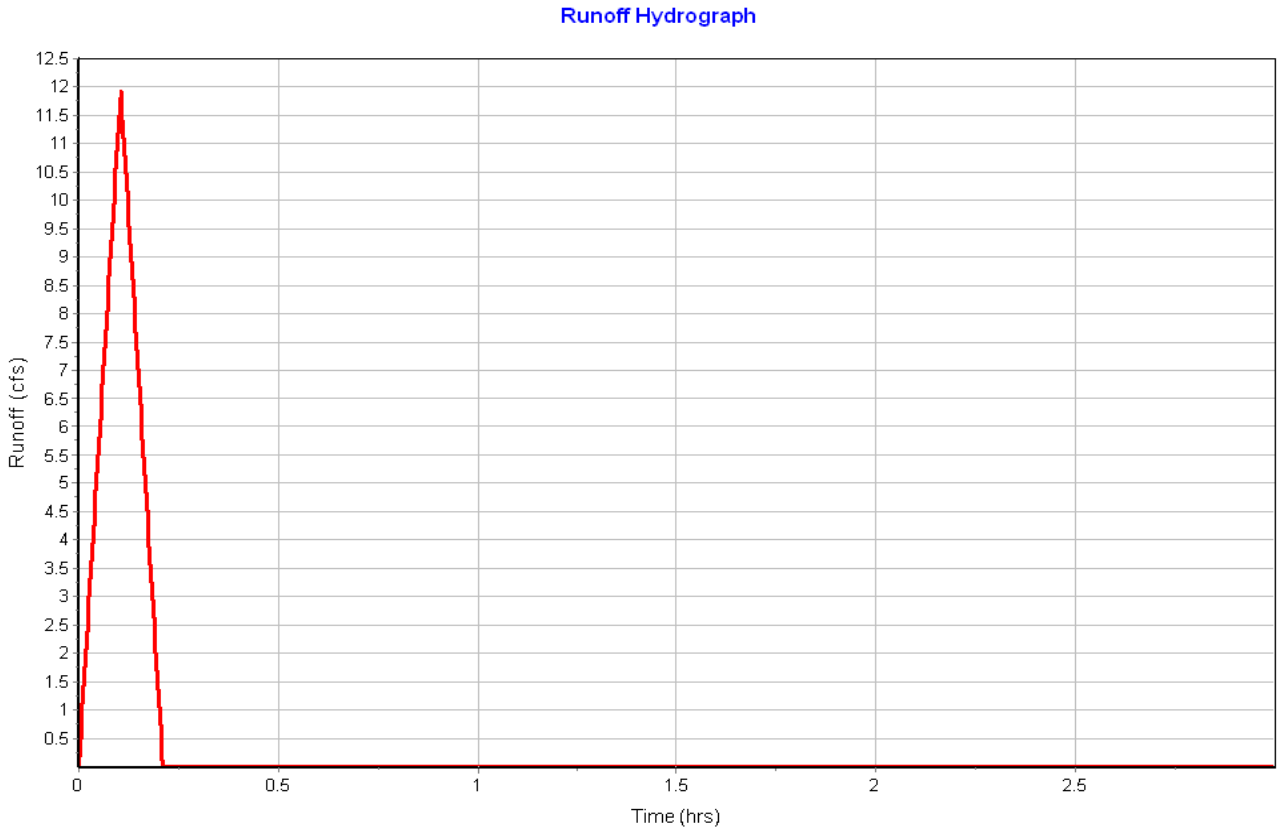
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

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

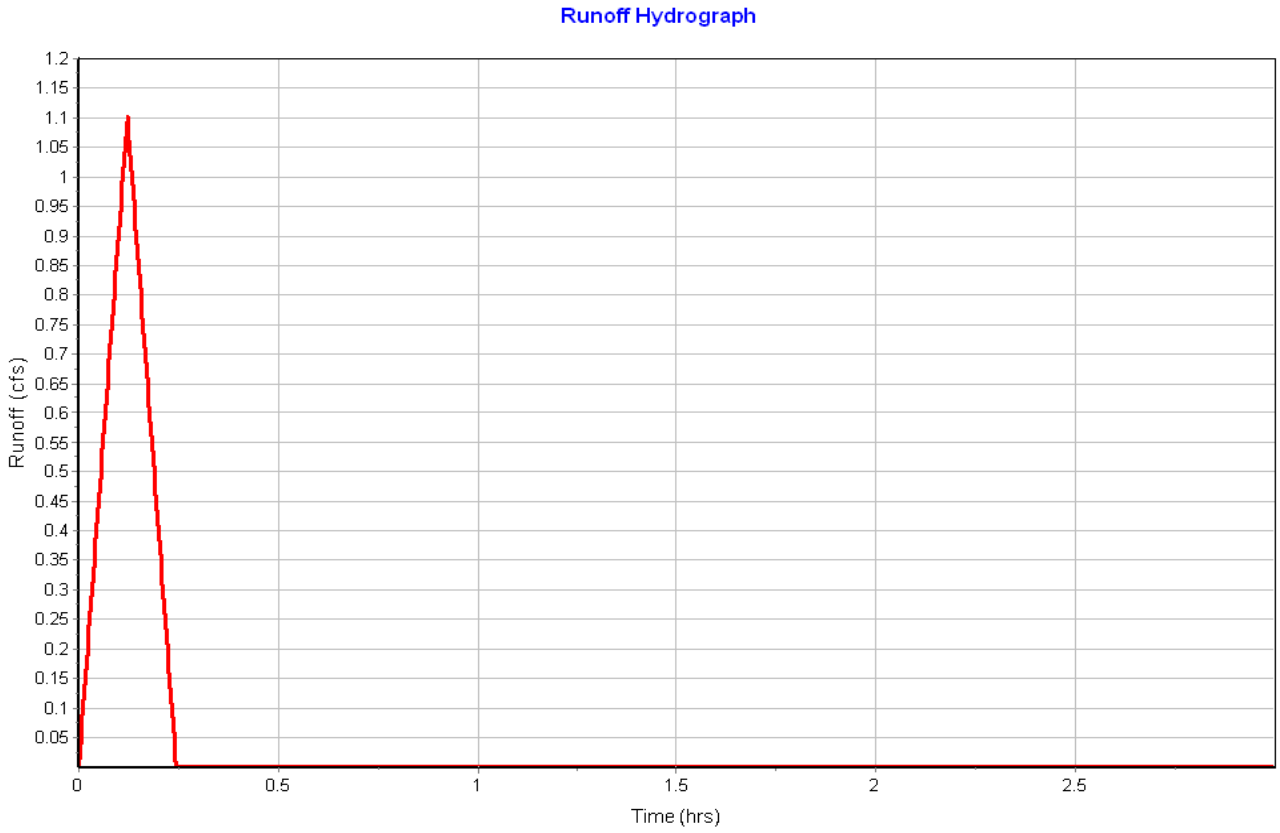
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	140	110	0.00
Slope (%) :	15	3.7	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	3.10	0.00
Computed Flow Time (min) :	0.60	0.59	0.00

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

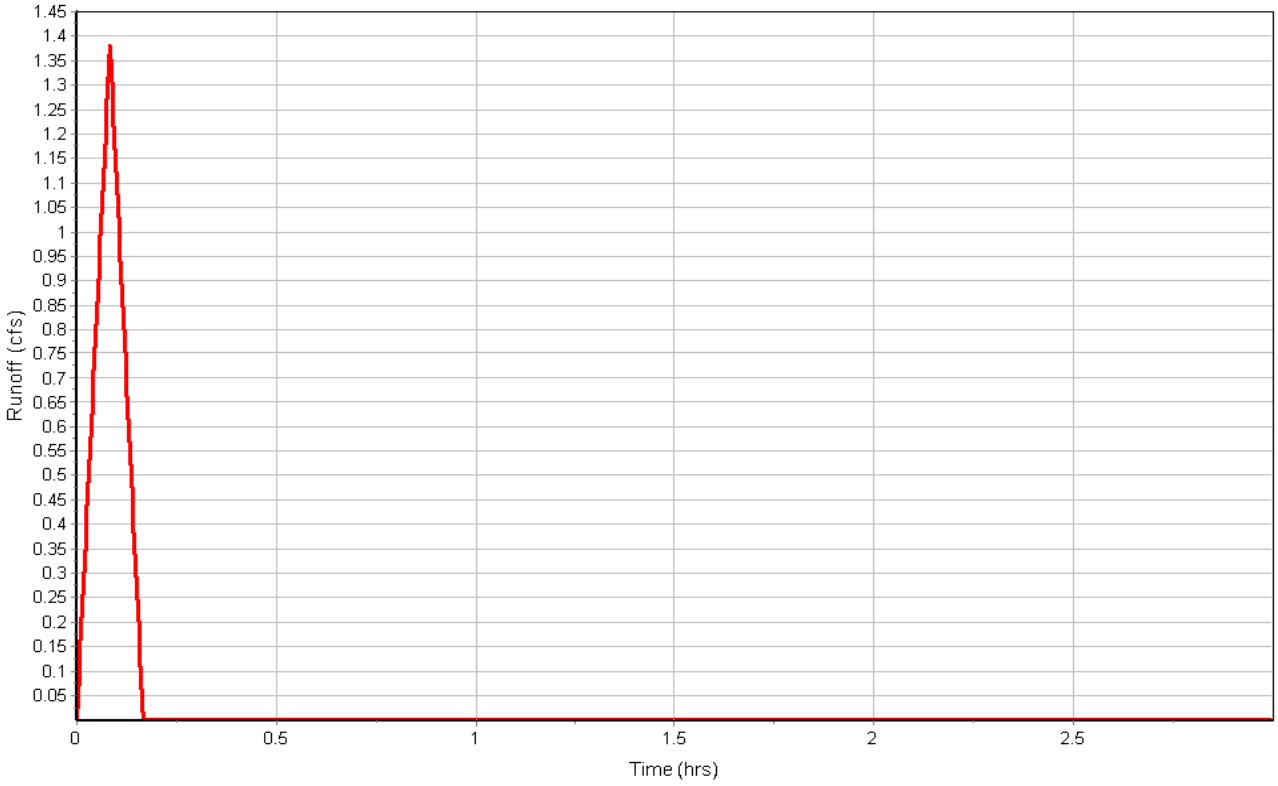
User-Defined TOC override (minutes): 5

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

Runoff Hydrograph



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

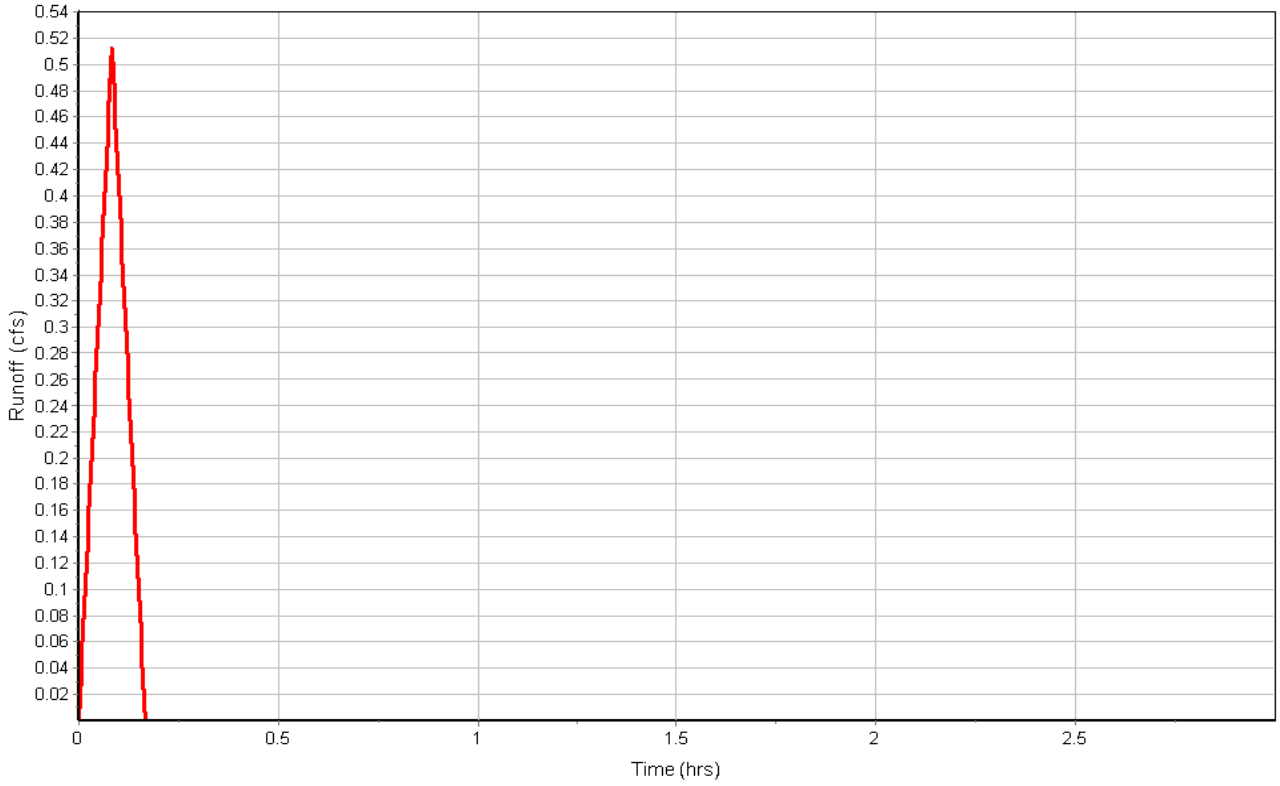
User-Defined TOC override (minutes): 5

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

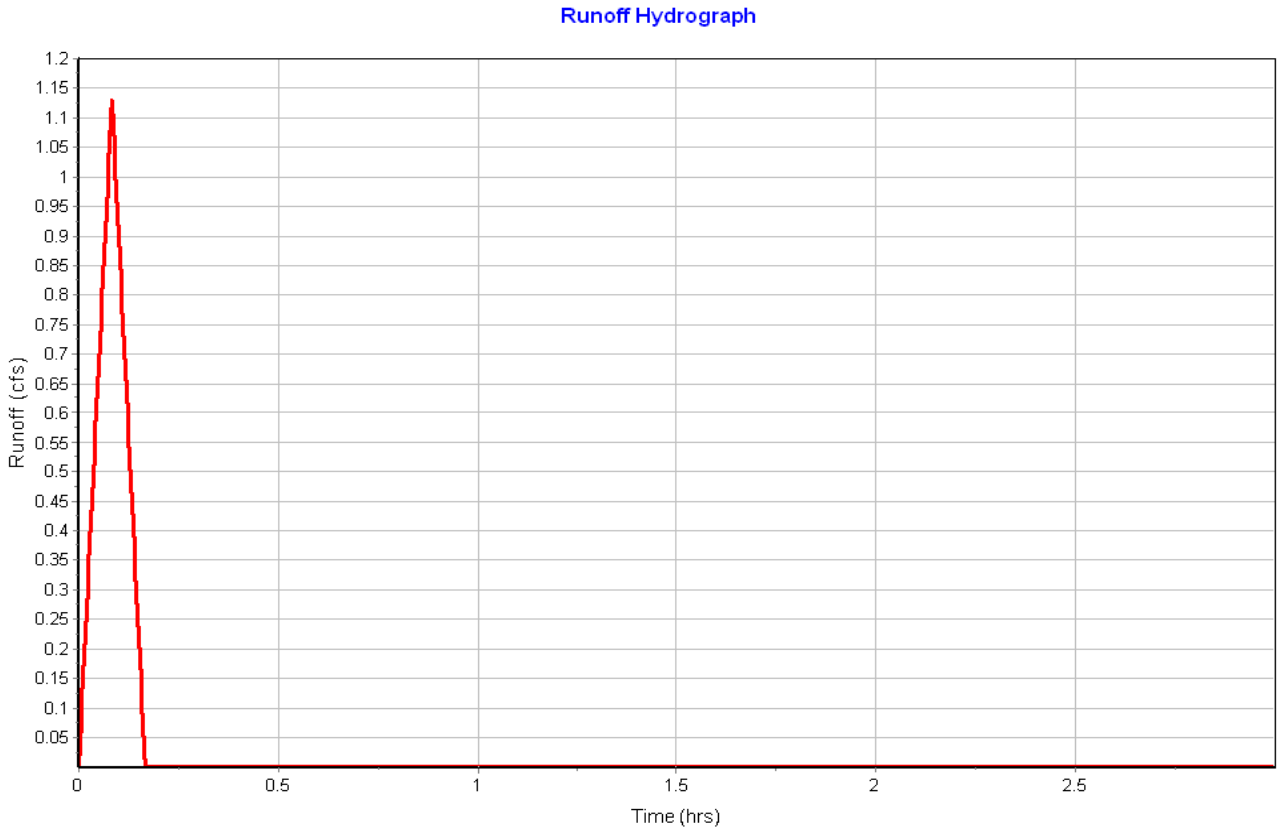
Time of Concentration

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

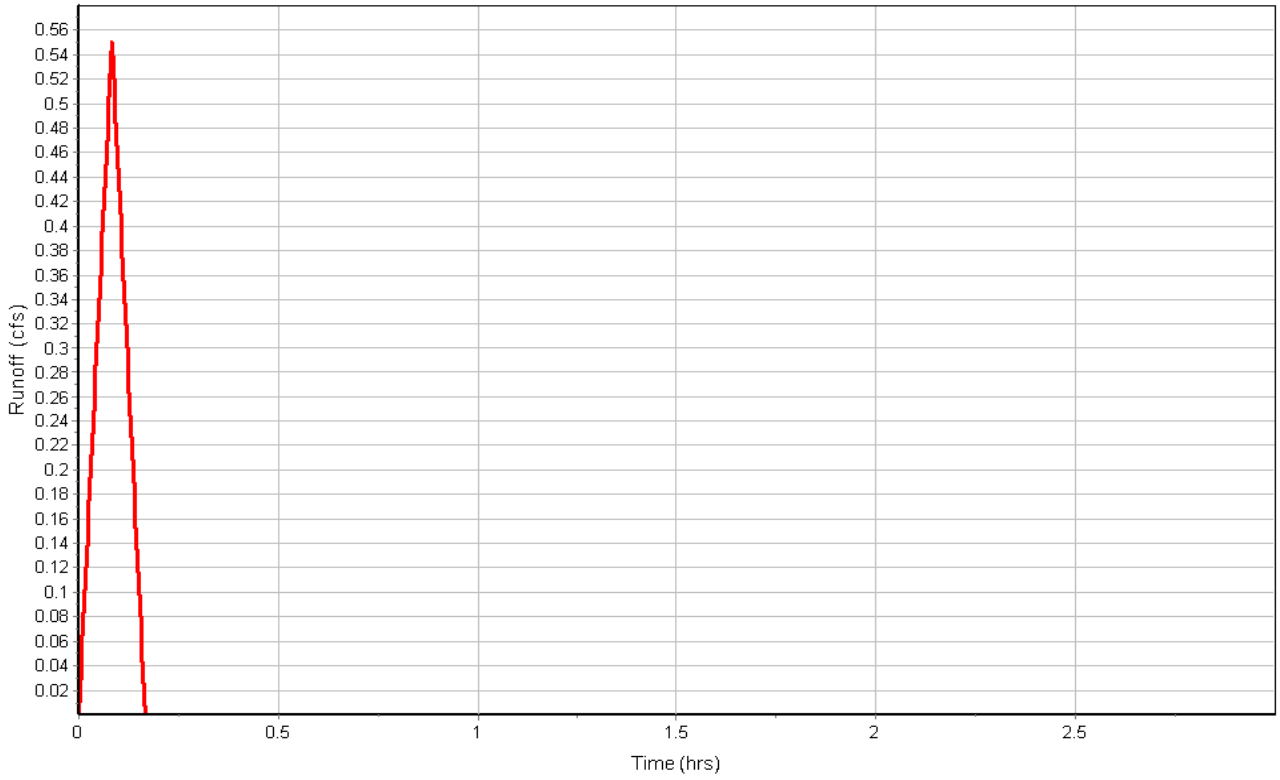
User-Defined TOC override (minutes): 5

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

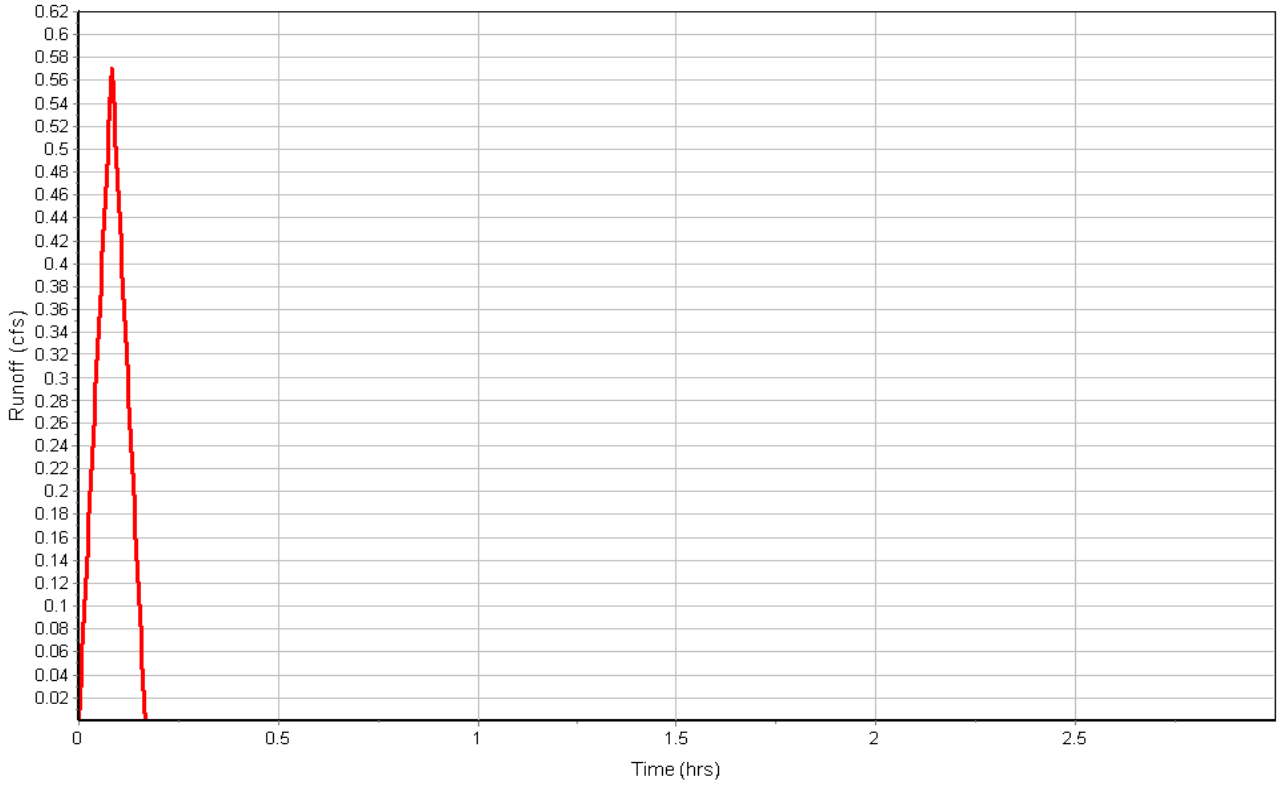
User-Defined TOC override (minutes): 5

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

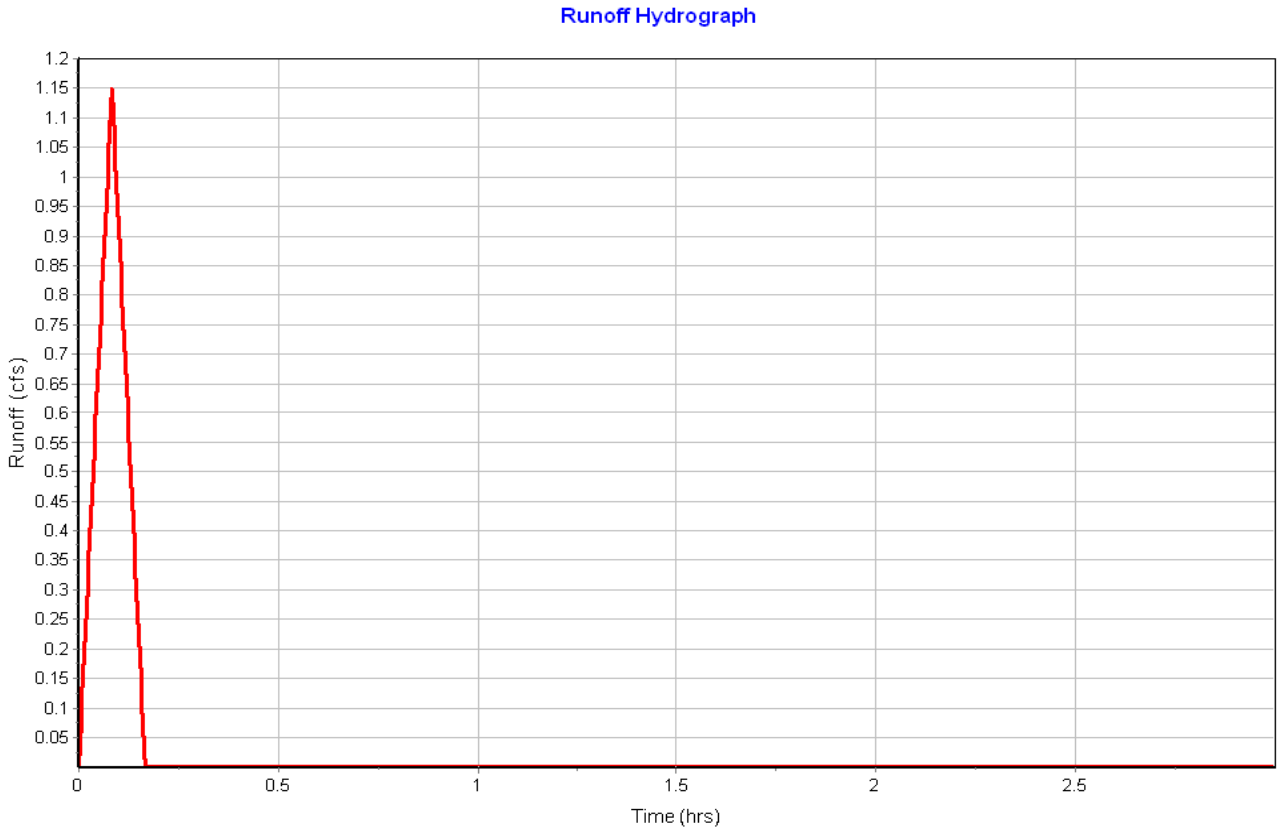
Time of Concentration

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



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

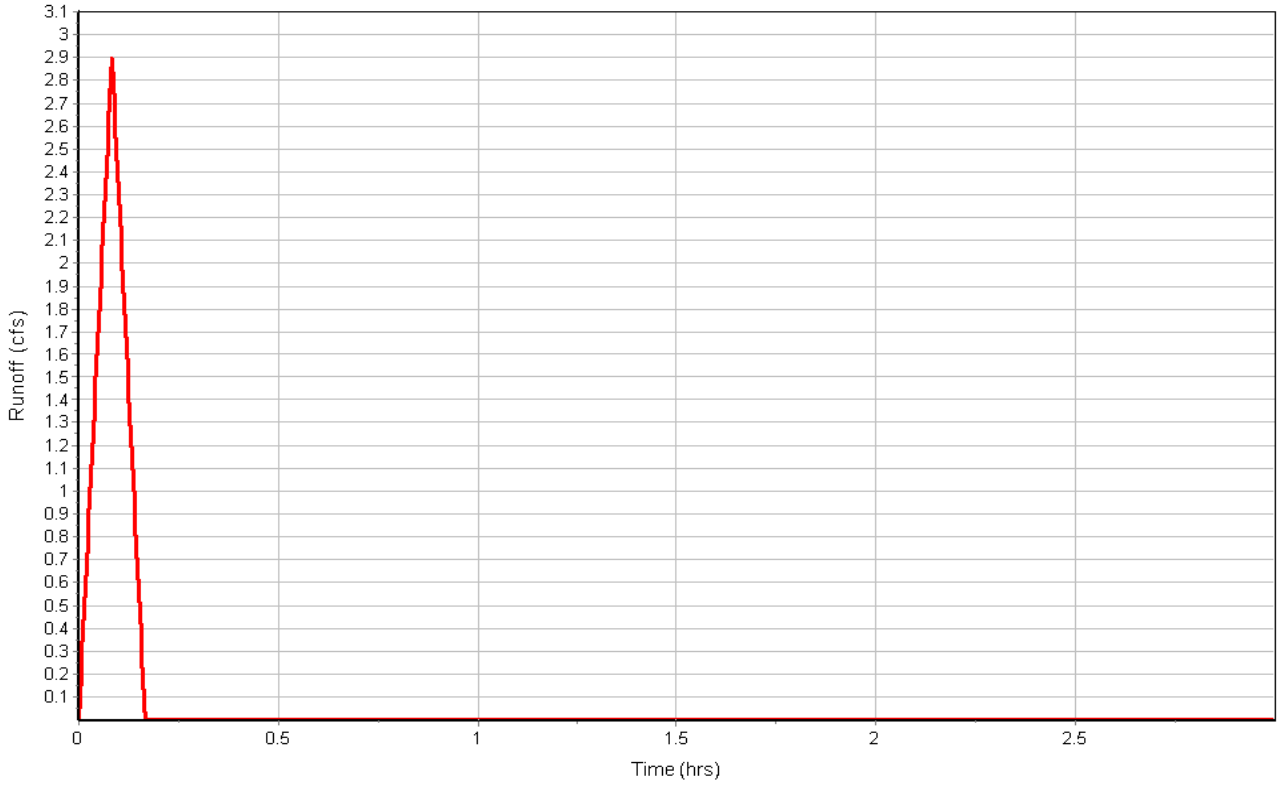
User-Defined TOC override (minutes): 5

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

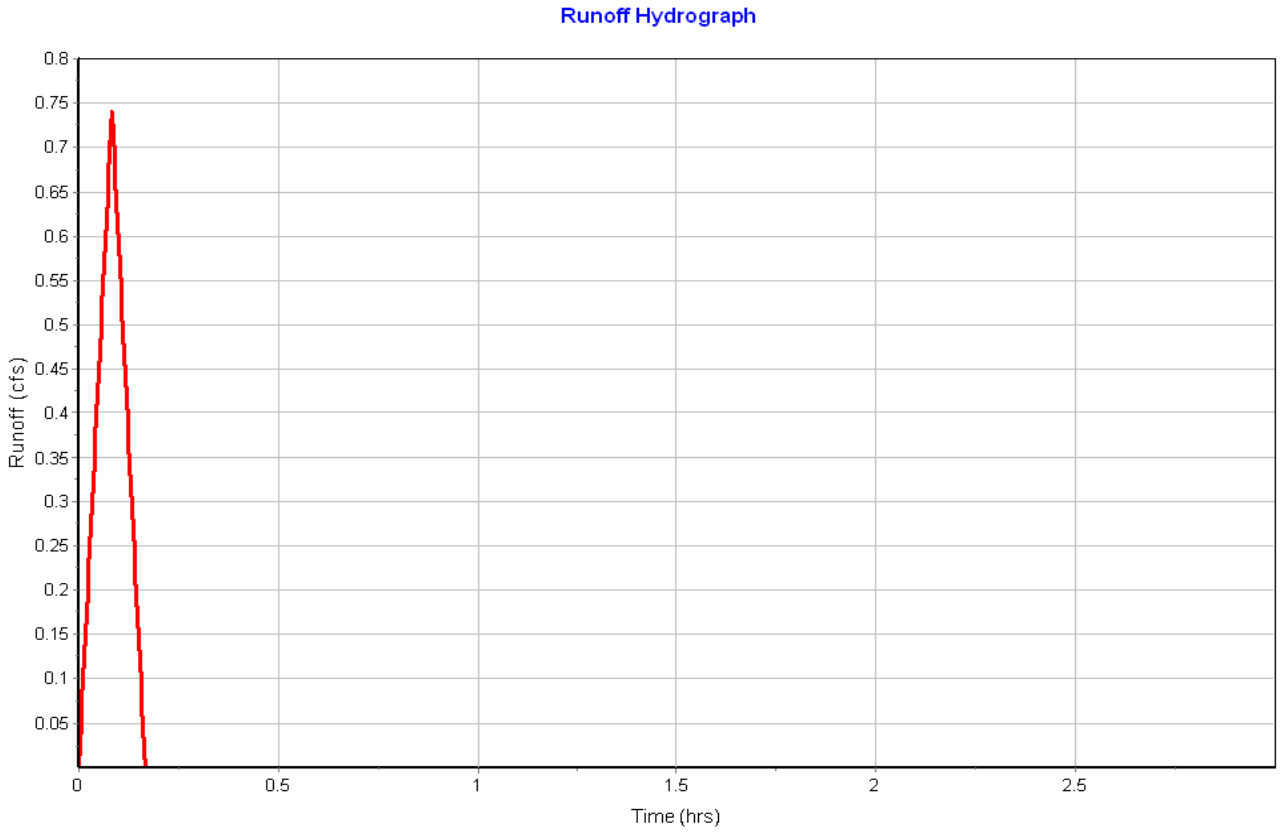
Time of Concentration

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

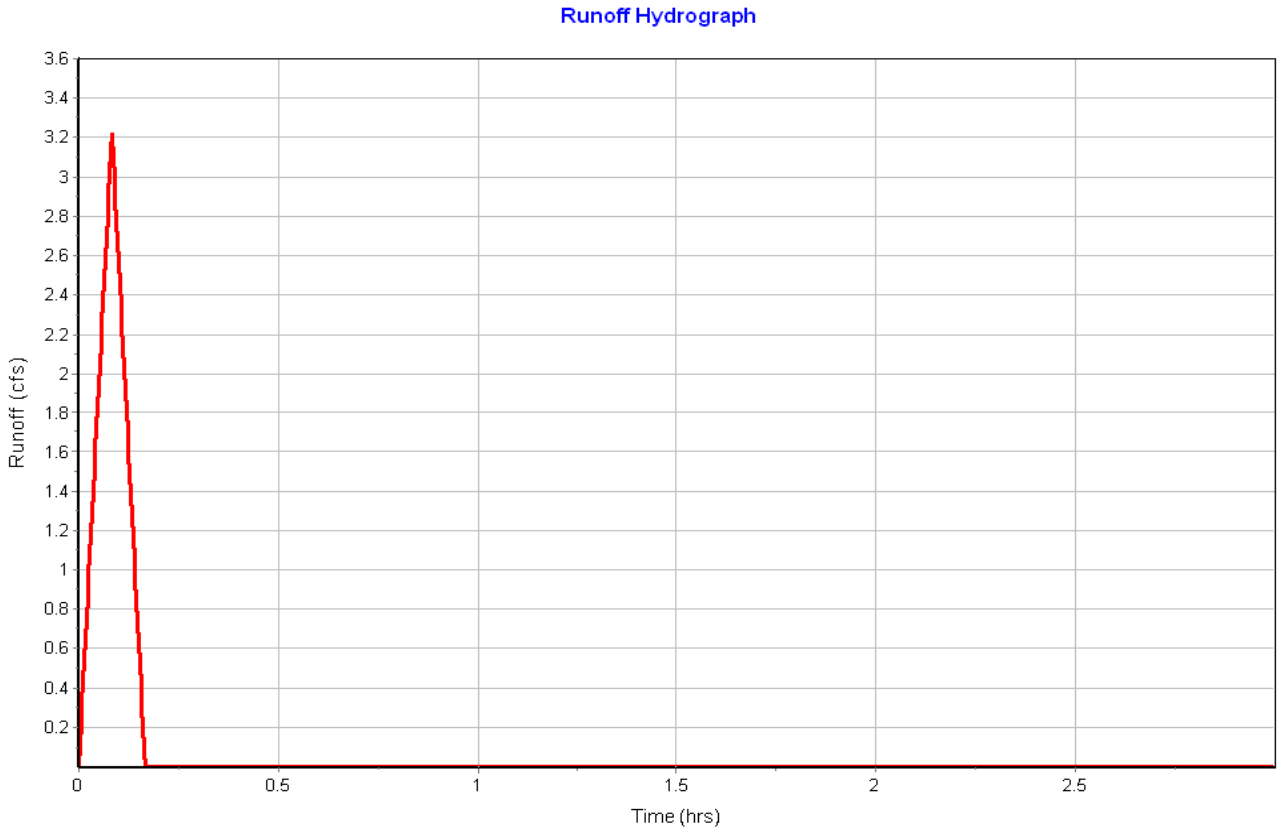
Time of Concentration

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

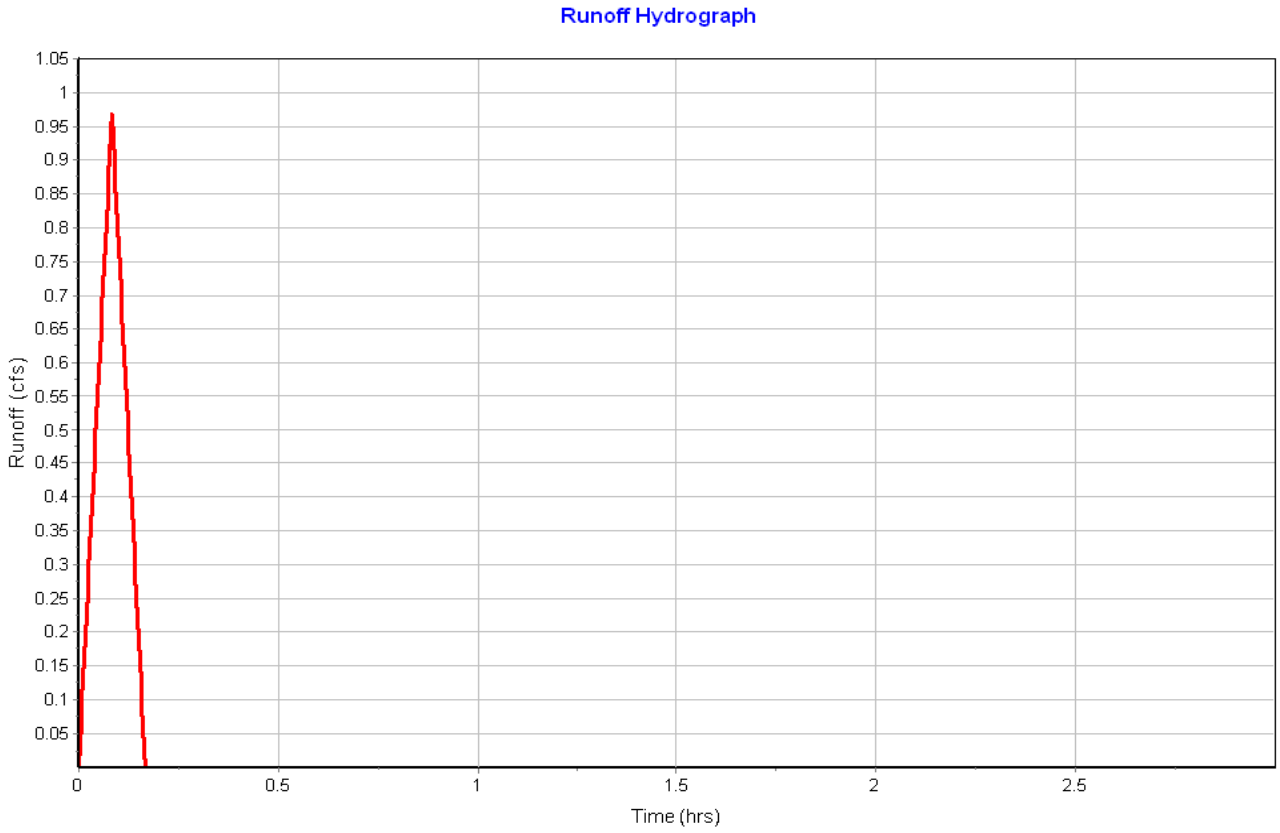
Time of Concentration

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

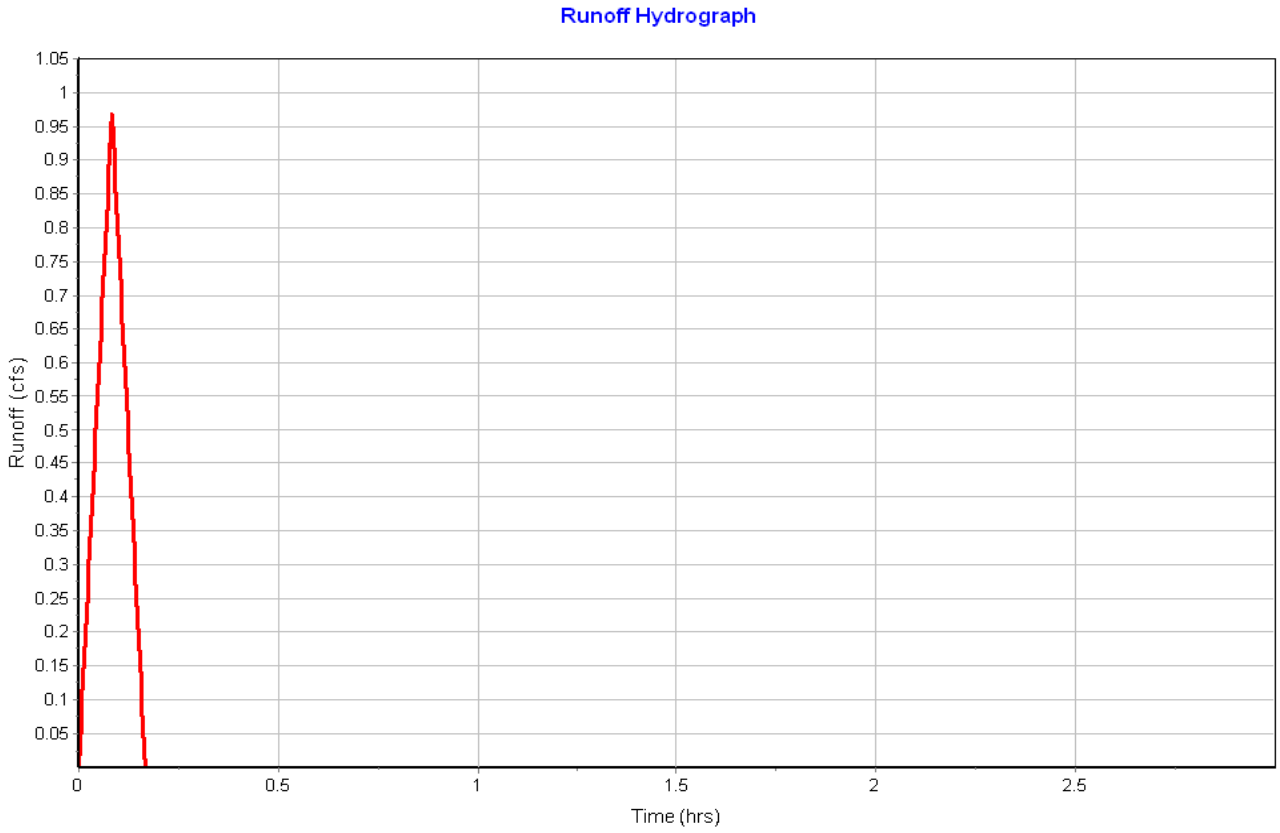
Time of Concentration

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

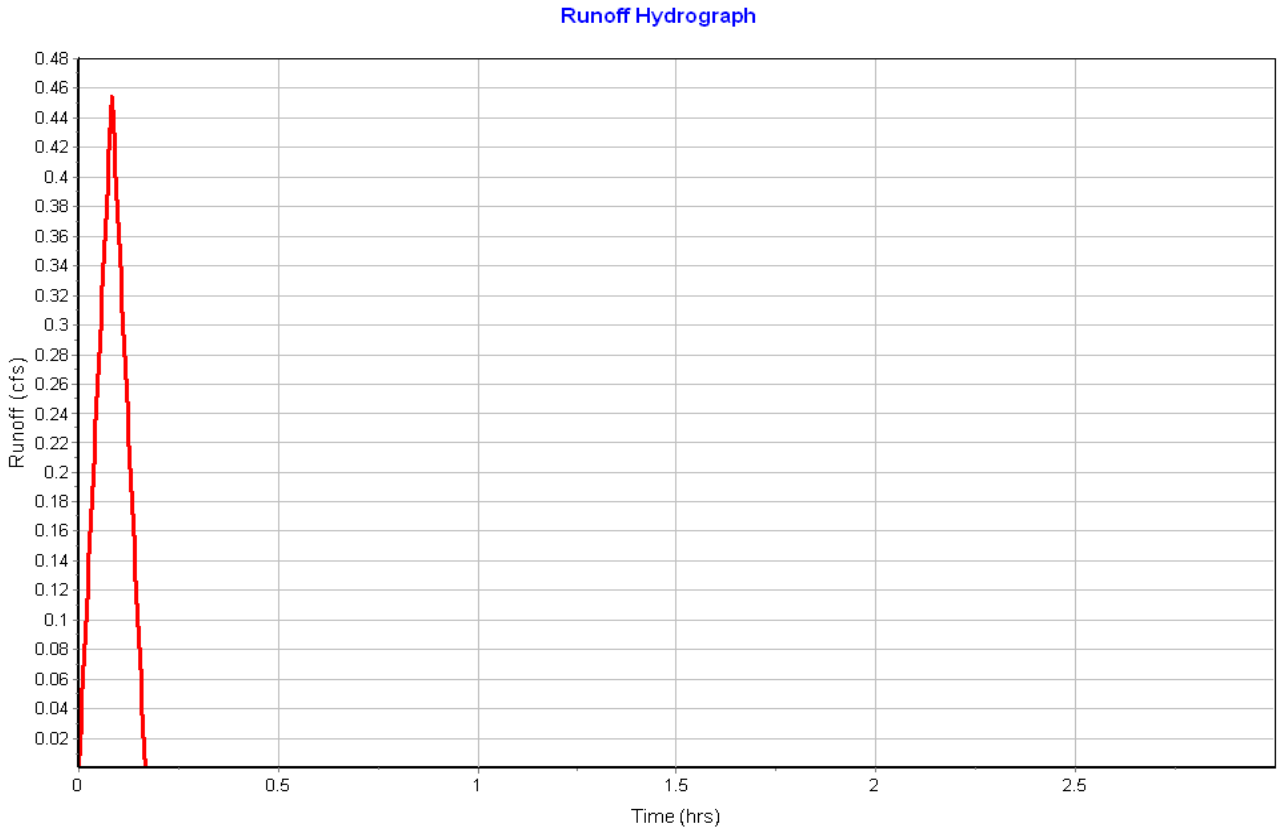
Time of Concentration

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

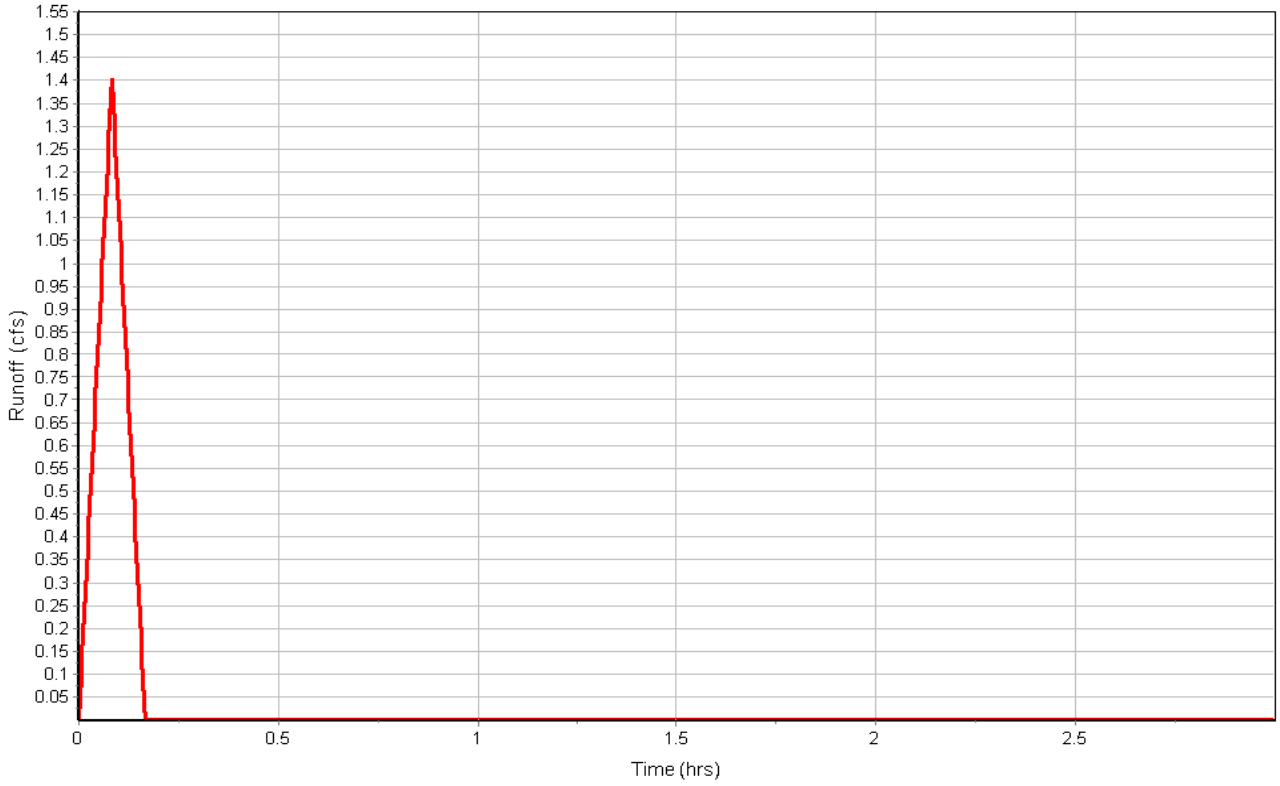
User-Defined TOC override (minutes): 5

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

Runoff Hydrograph



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

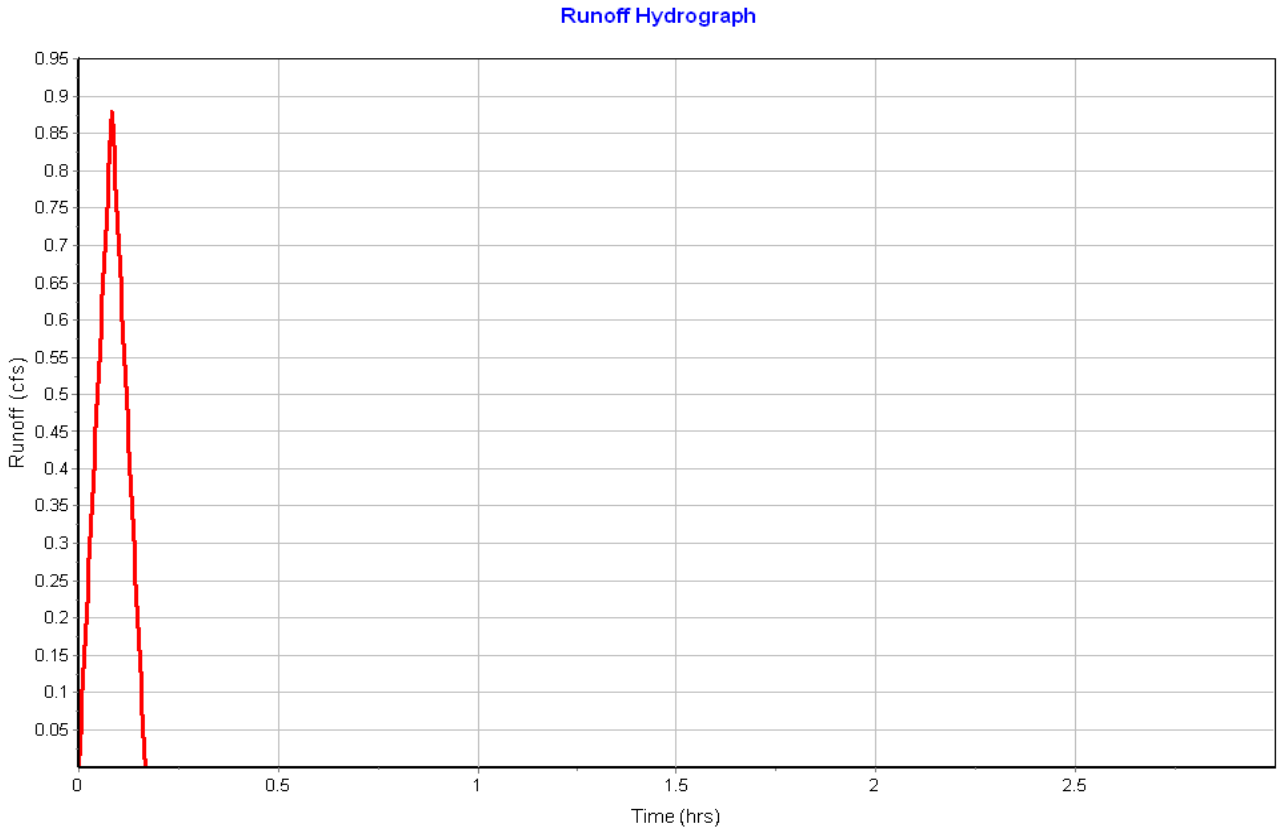
Time of Concentration

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



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

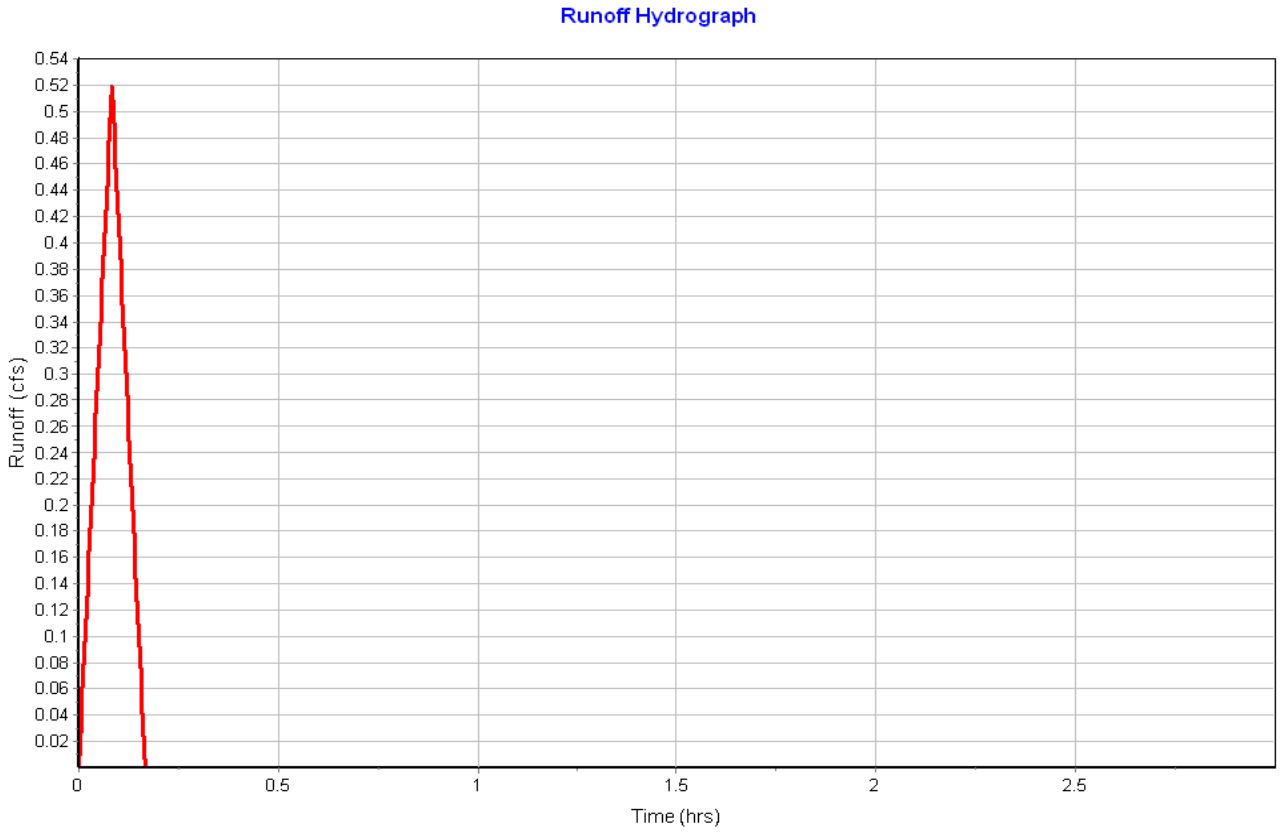
Time of Concentration

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

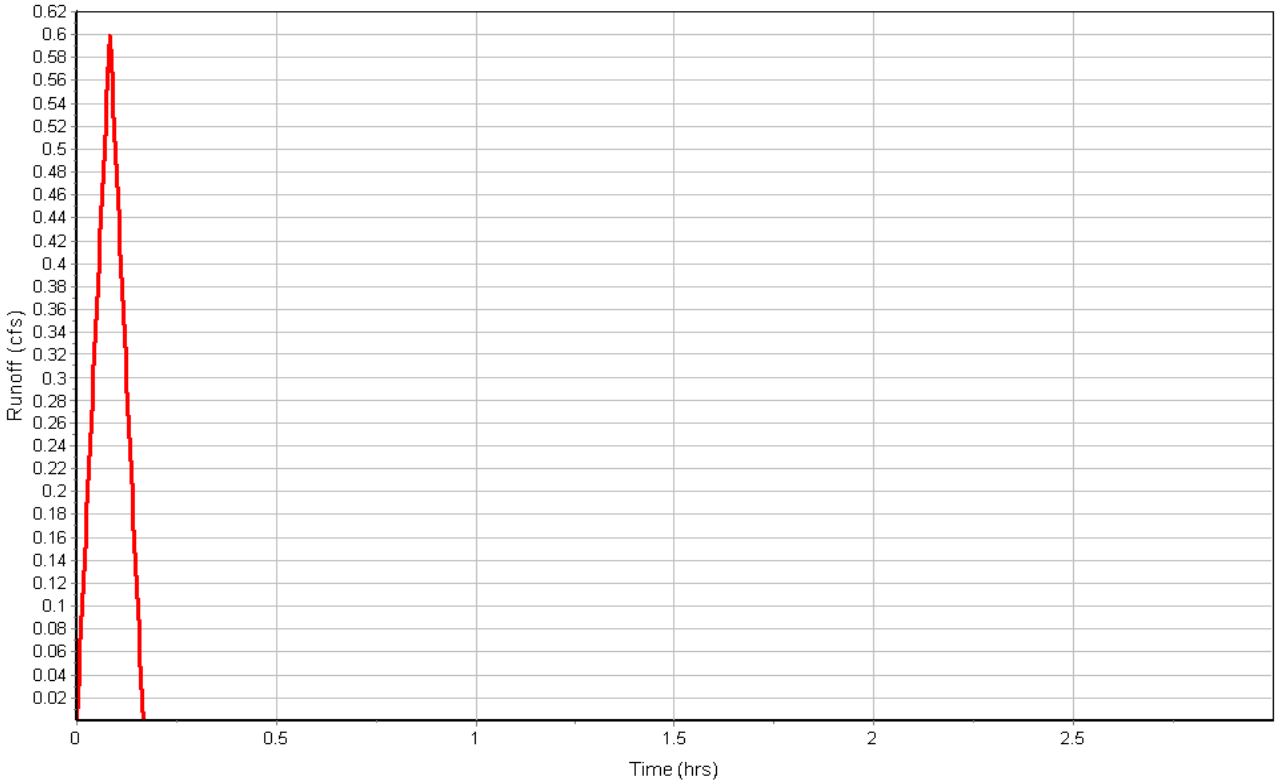
User-Defined TOC override (minutes): 5

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

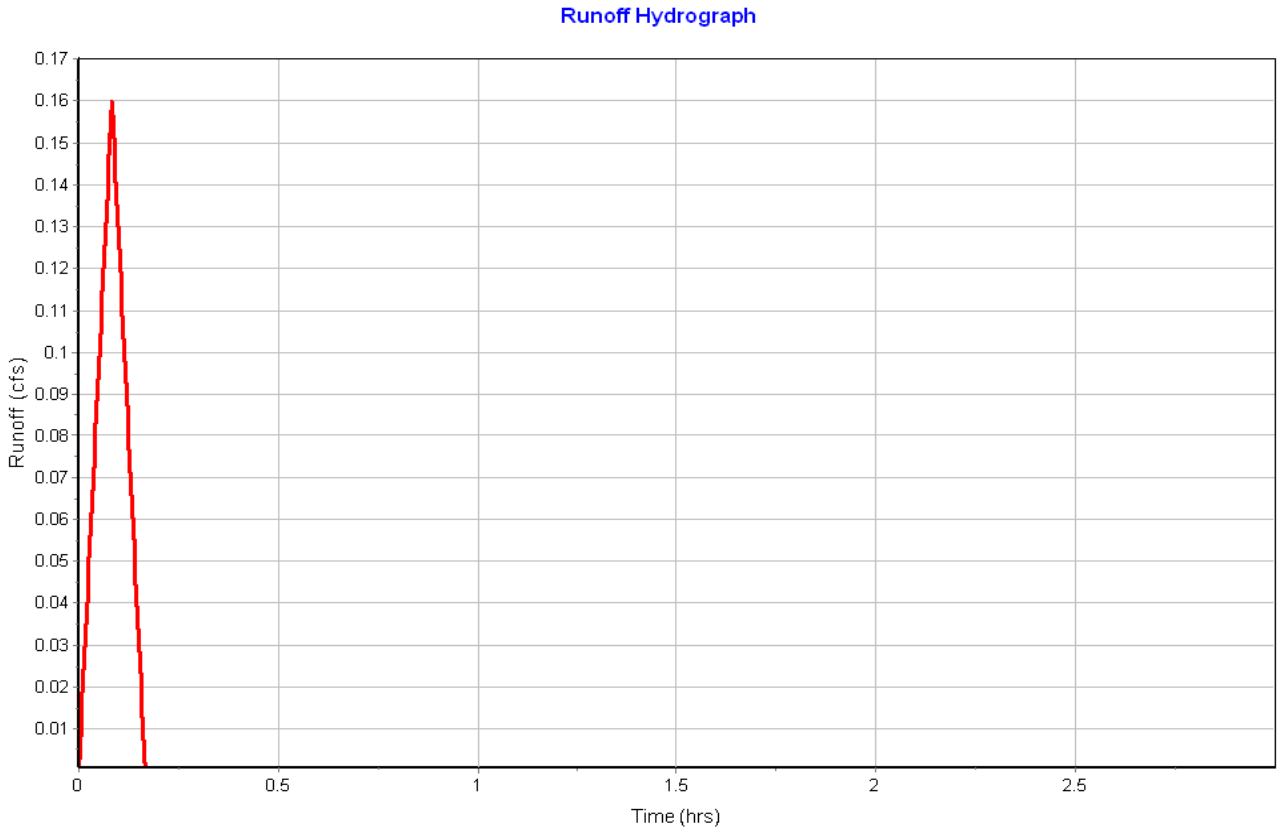
Time of Concentration

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

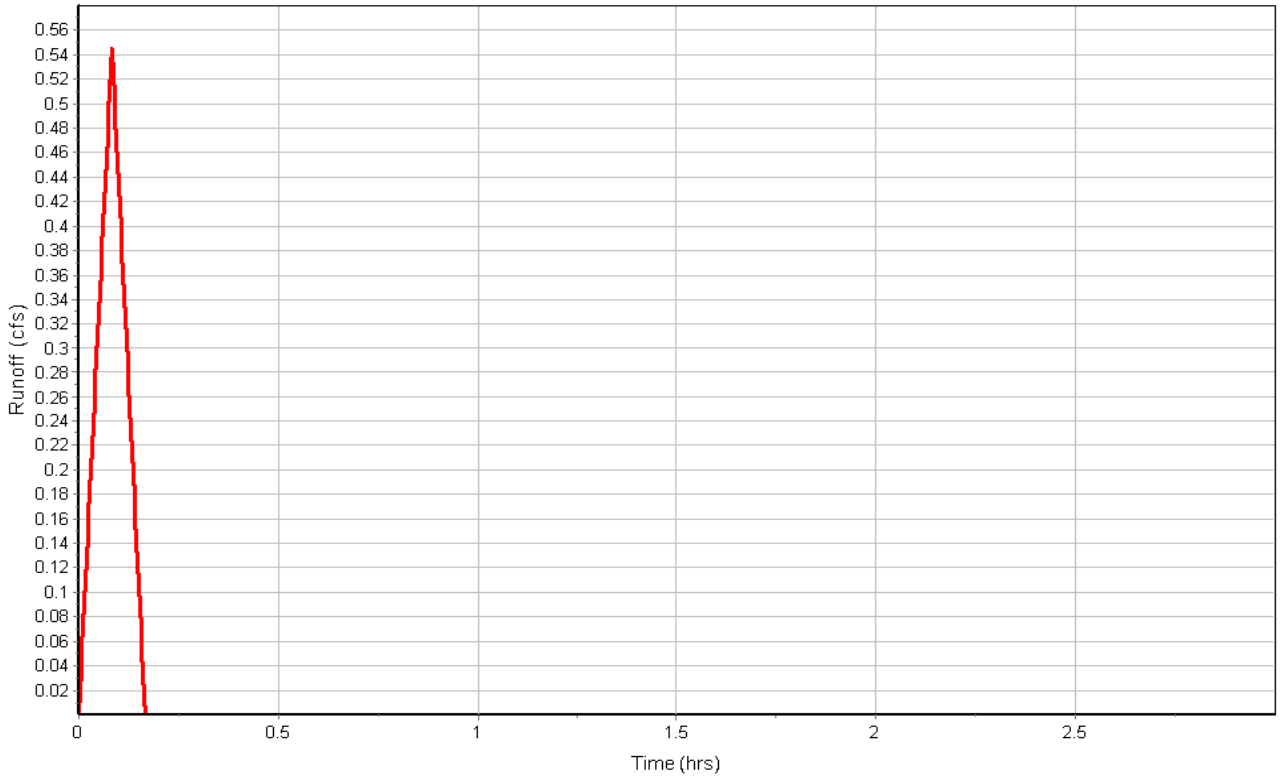
User-Defined TOC override (minutes): 5

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

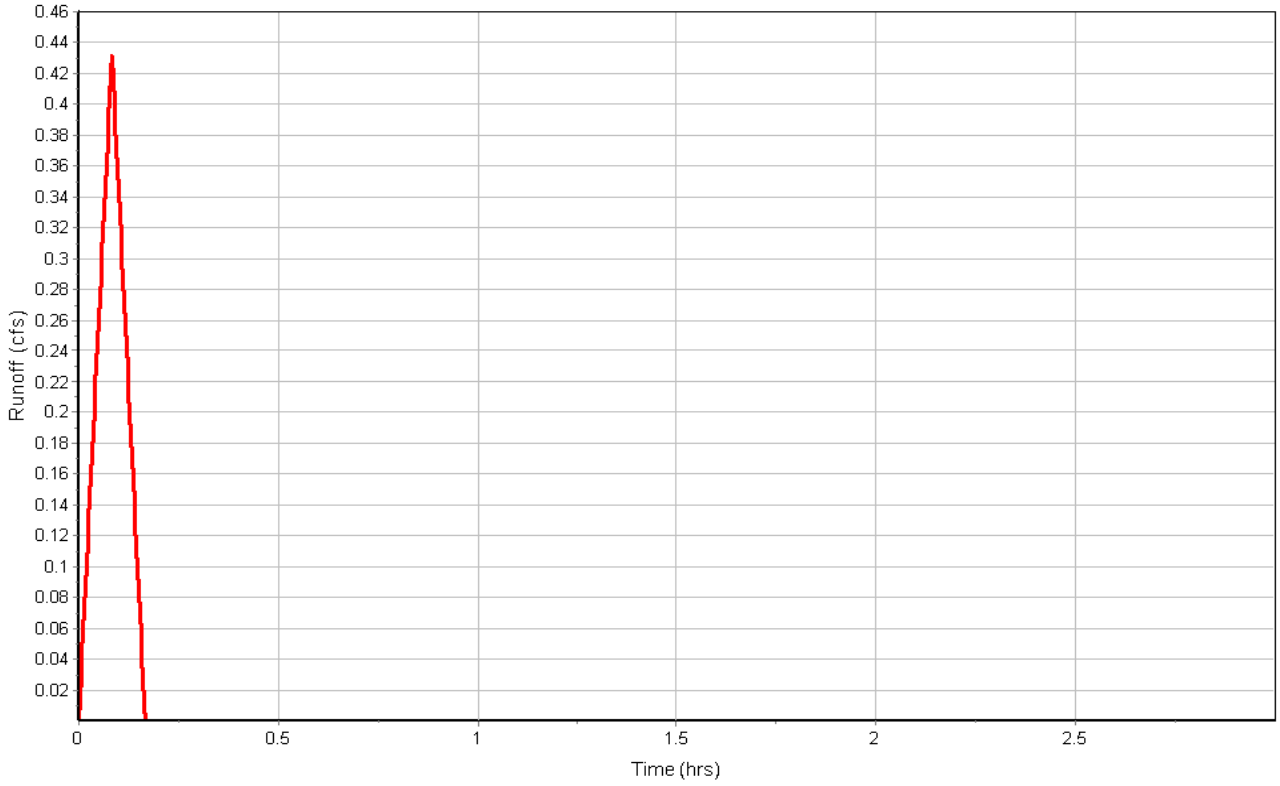
User-Defined TOC override (minutes): 5

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

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

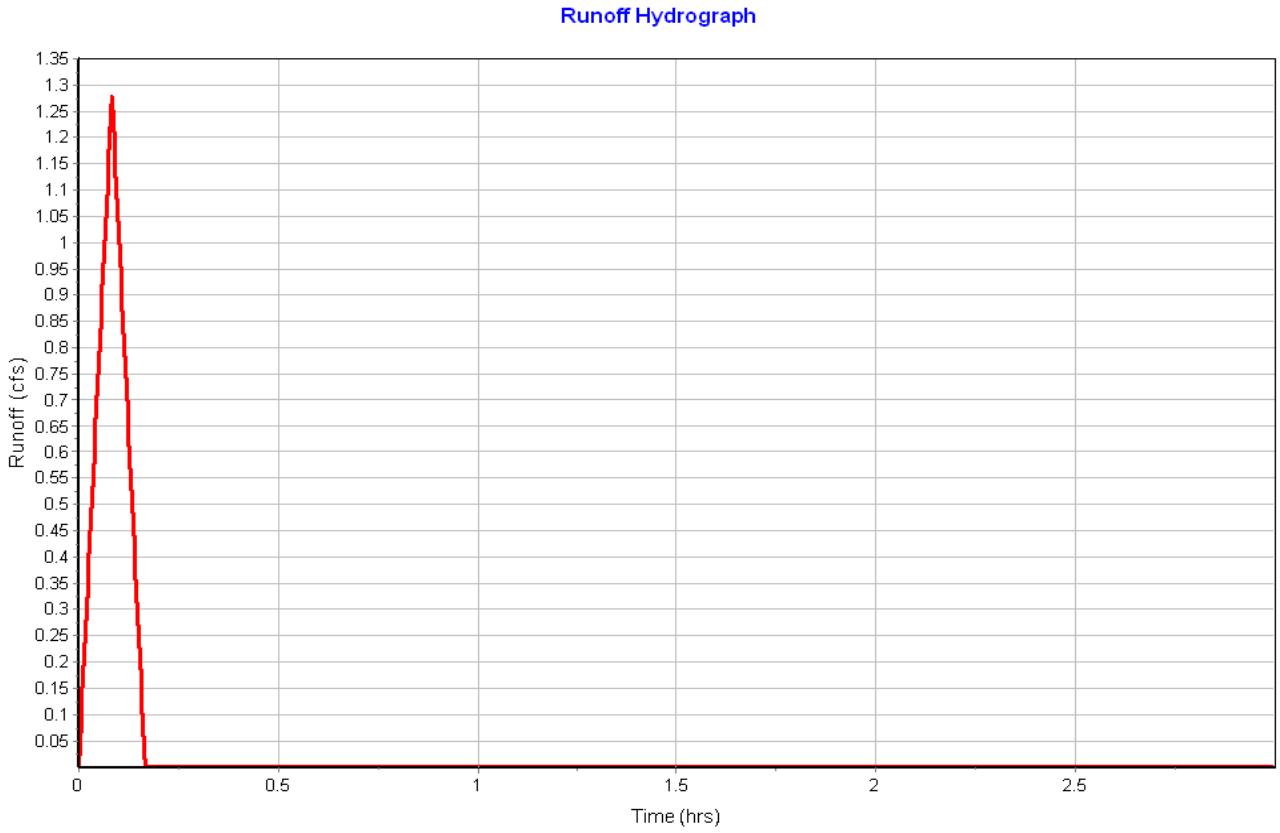
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.42
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

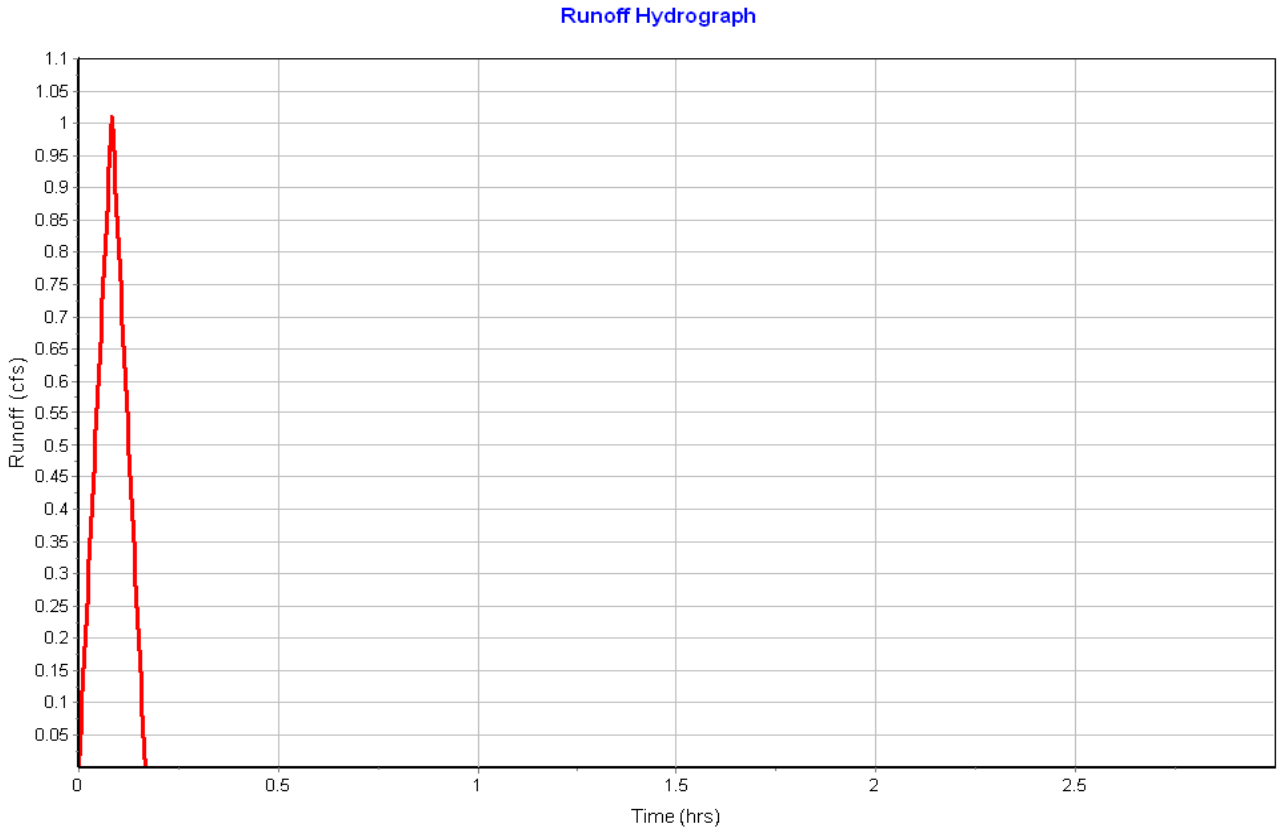
Time of Concentration

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

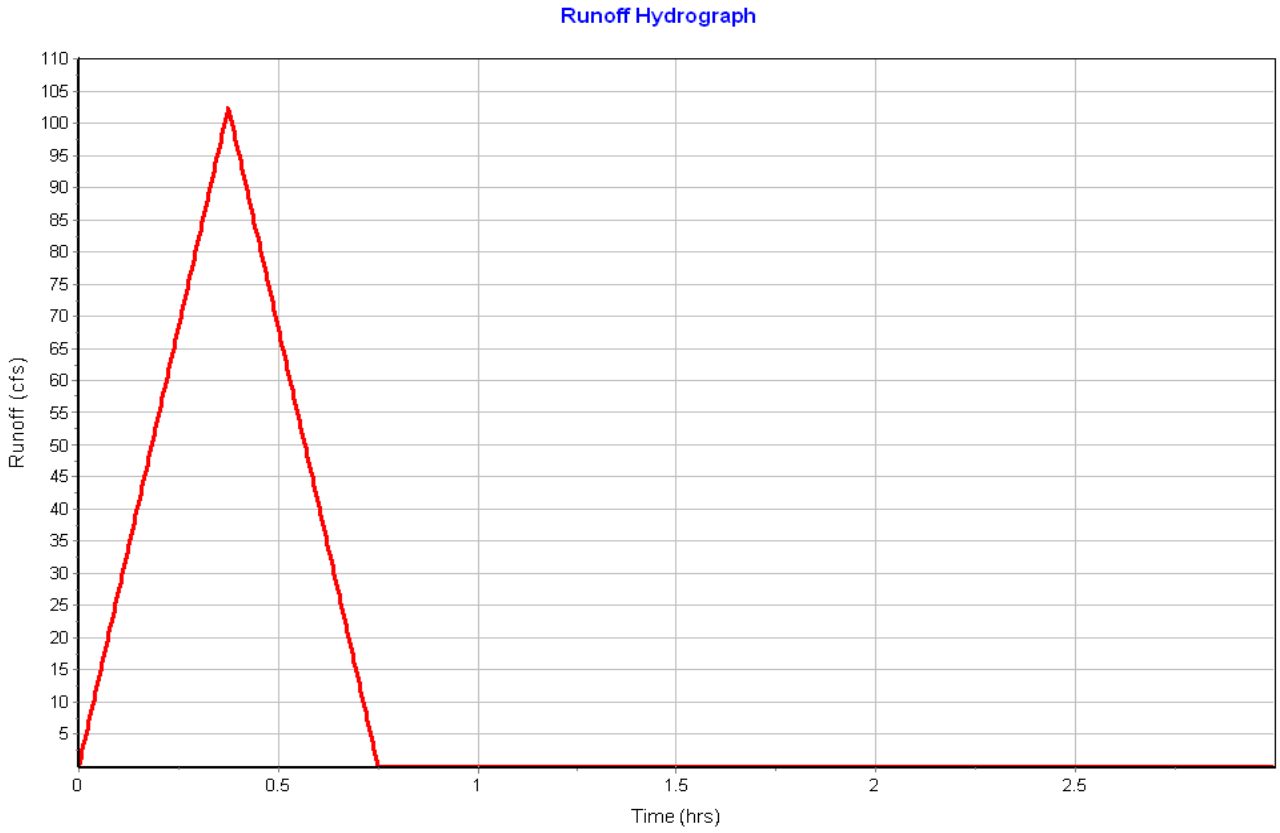
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	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

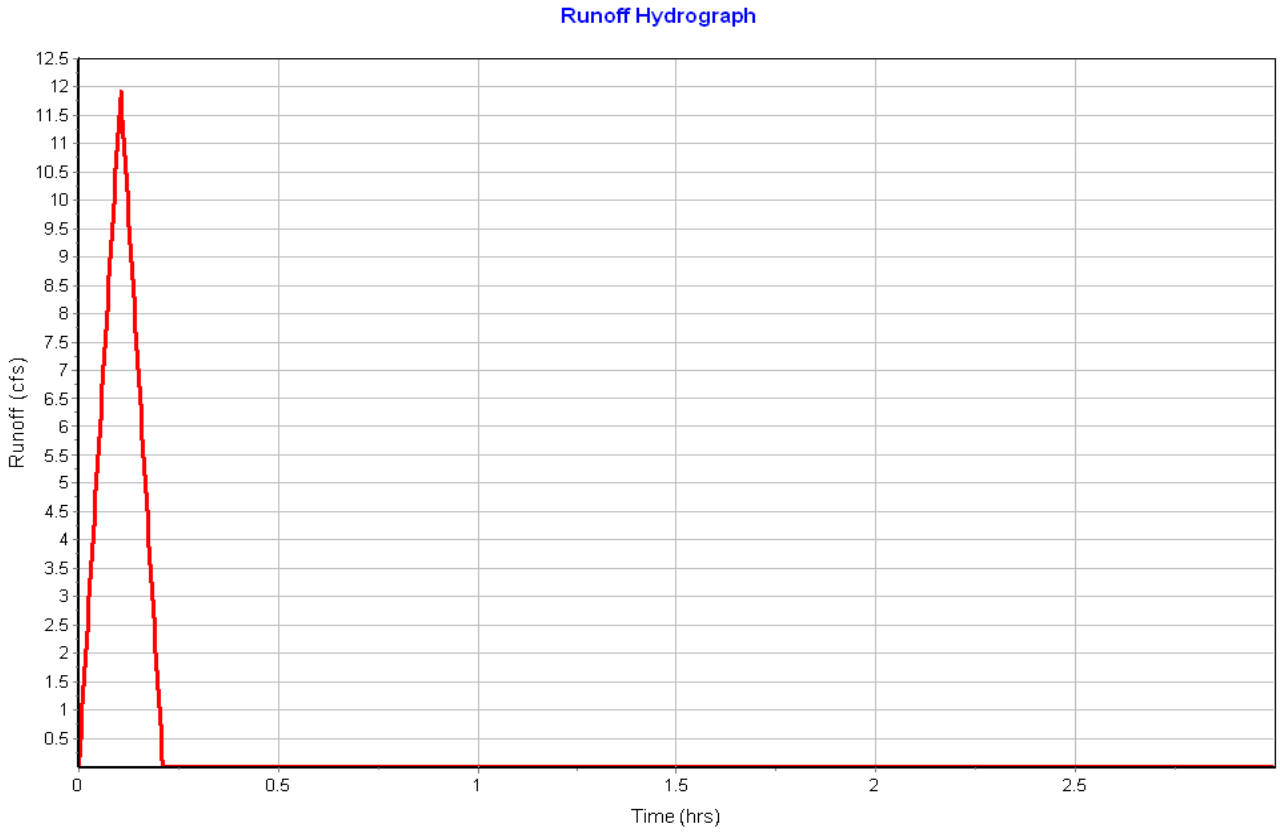
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

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

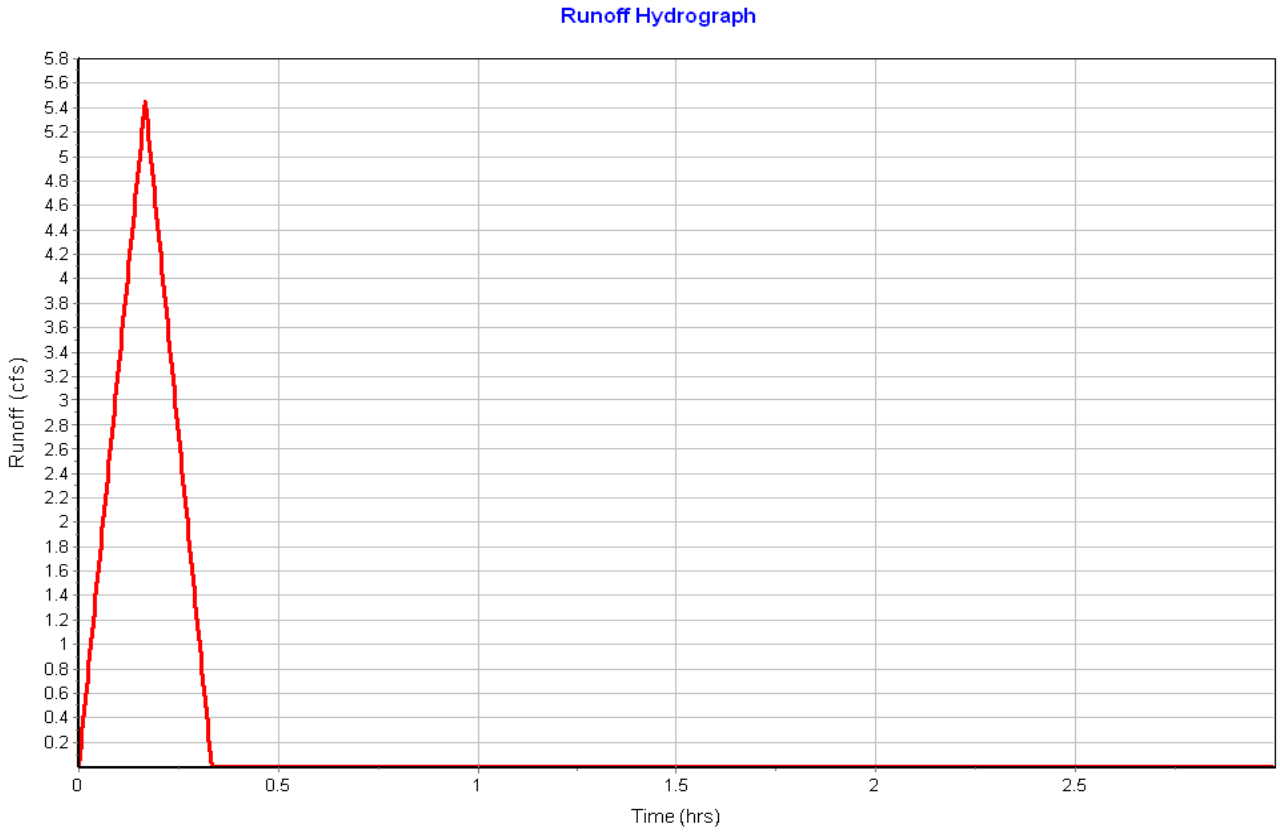
Time of Concentration

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 (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	0.160	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

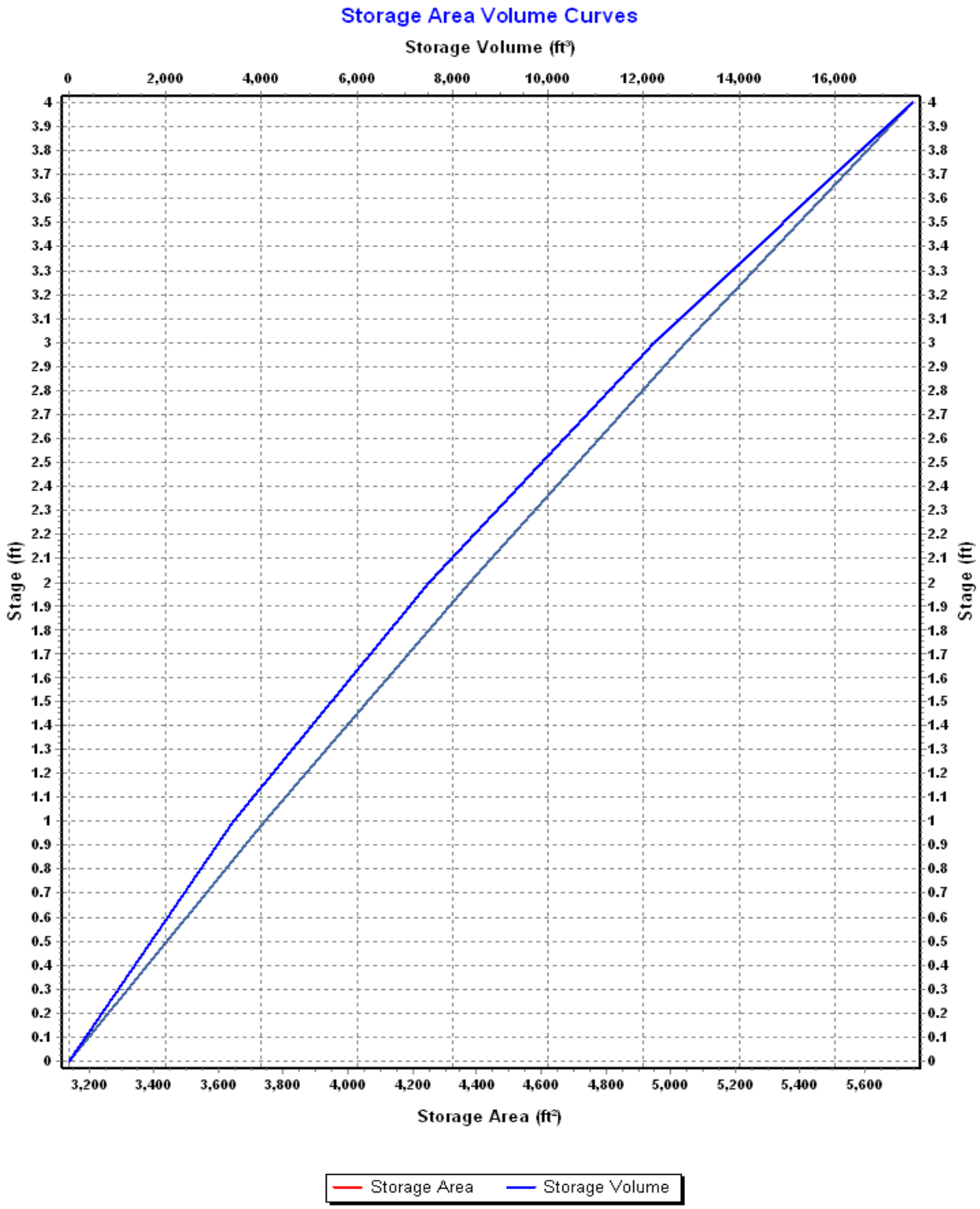
Input Data

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)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9
4
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 (ft²)
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

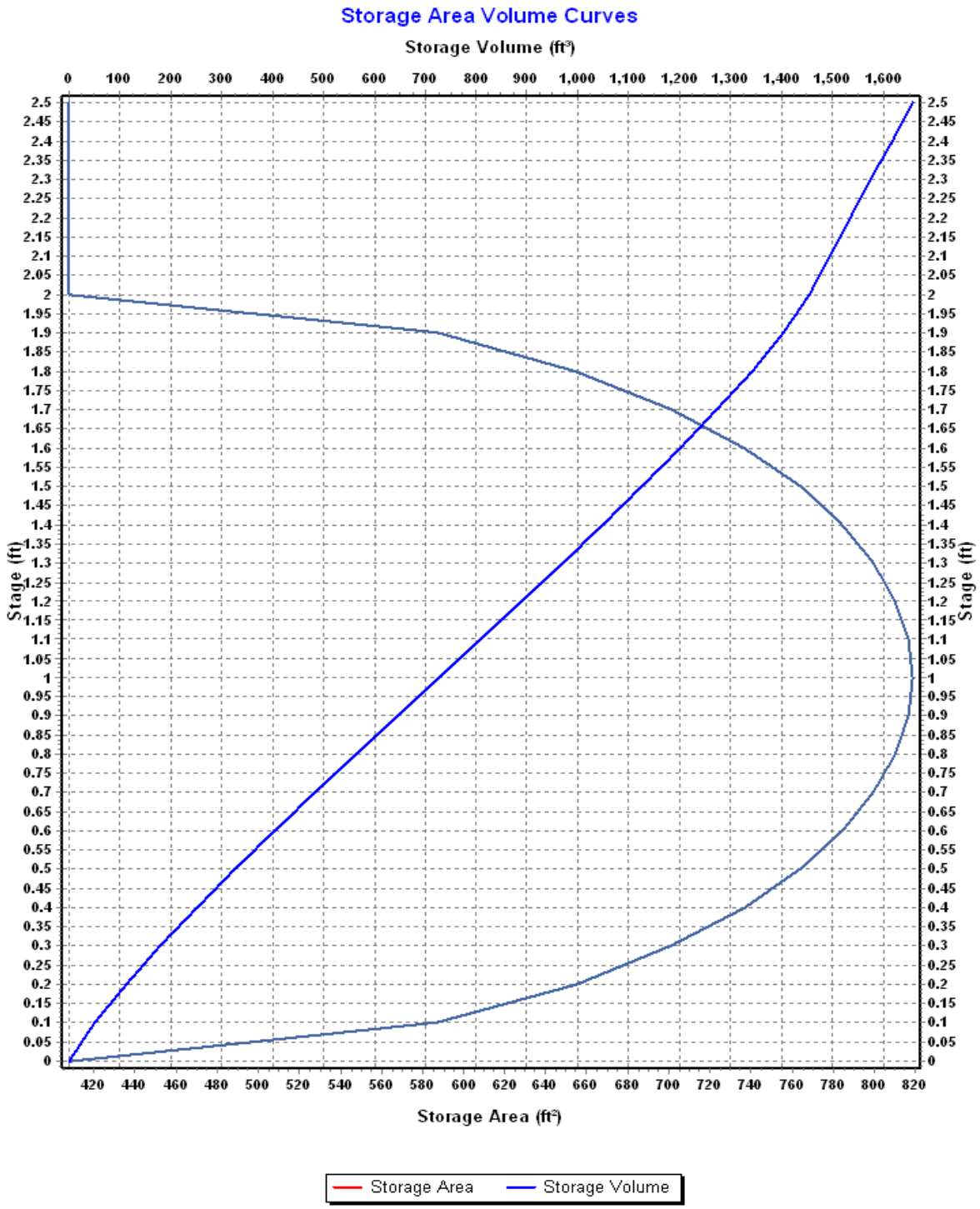
Input Data

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

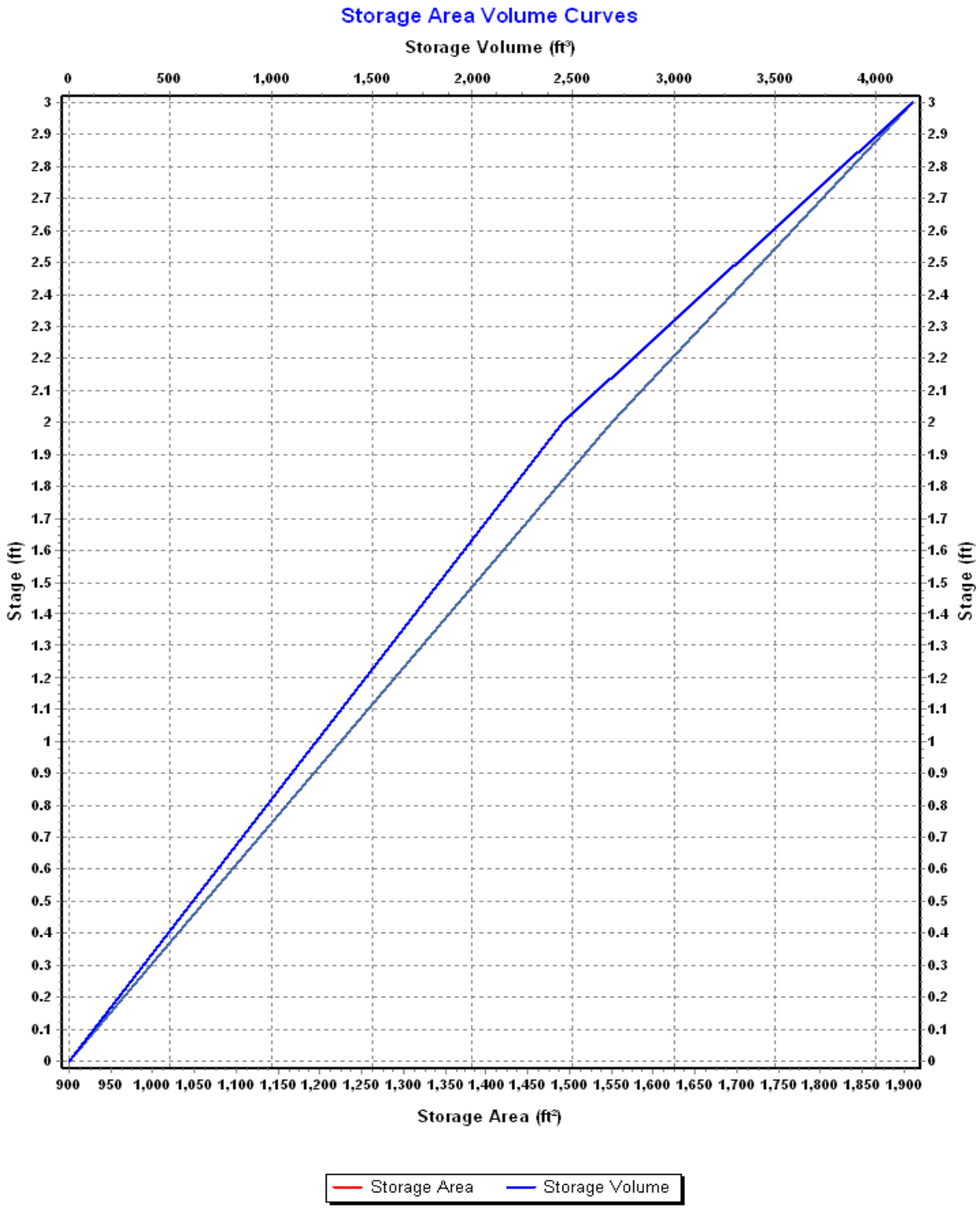
Input Data

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)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
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 (ft²)
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 (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	1.790	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

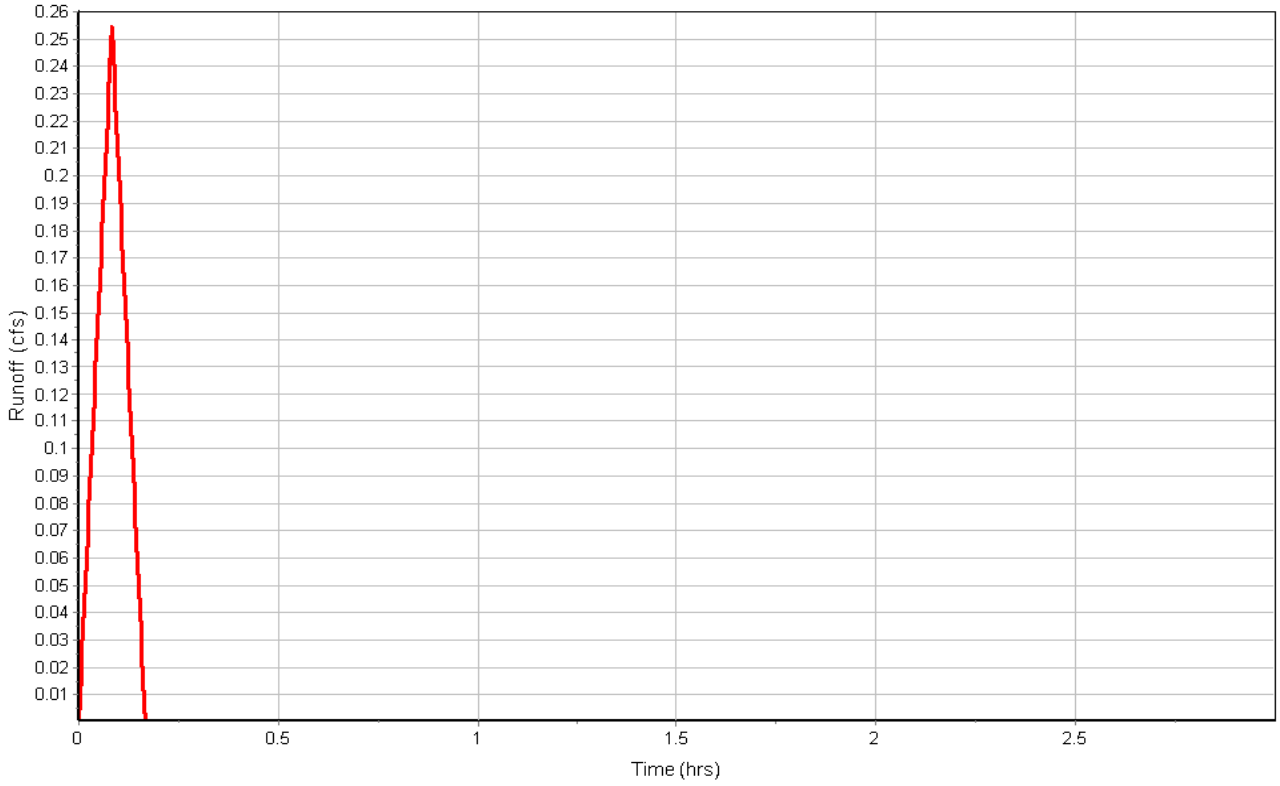
User-Defined TOC override (minutes): 5

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



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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

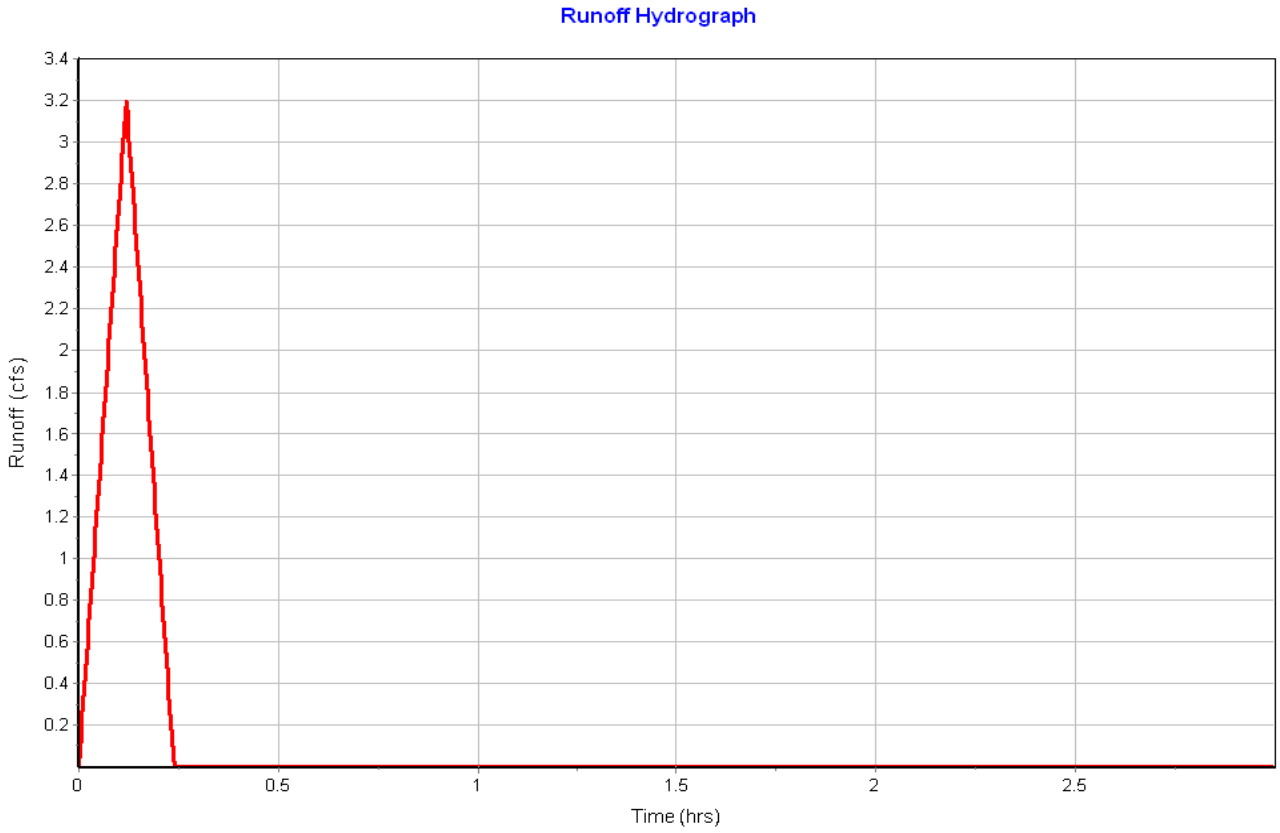
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	440	0.00	0.00
Slope (%) :	9.6	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	5.00	0.00	0.00
Computed Flow Time (min) :	1.47	0.00	0.00

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

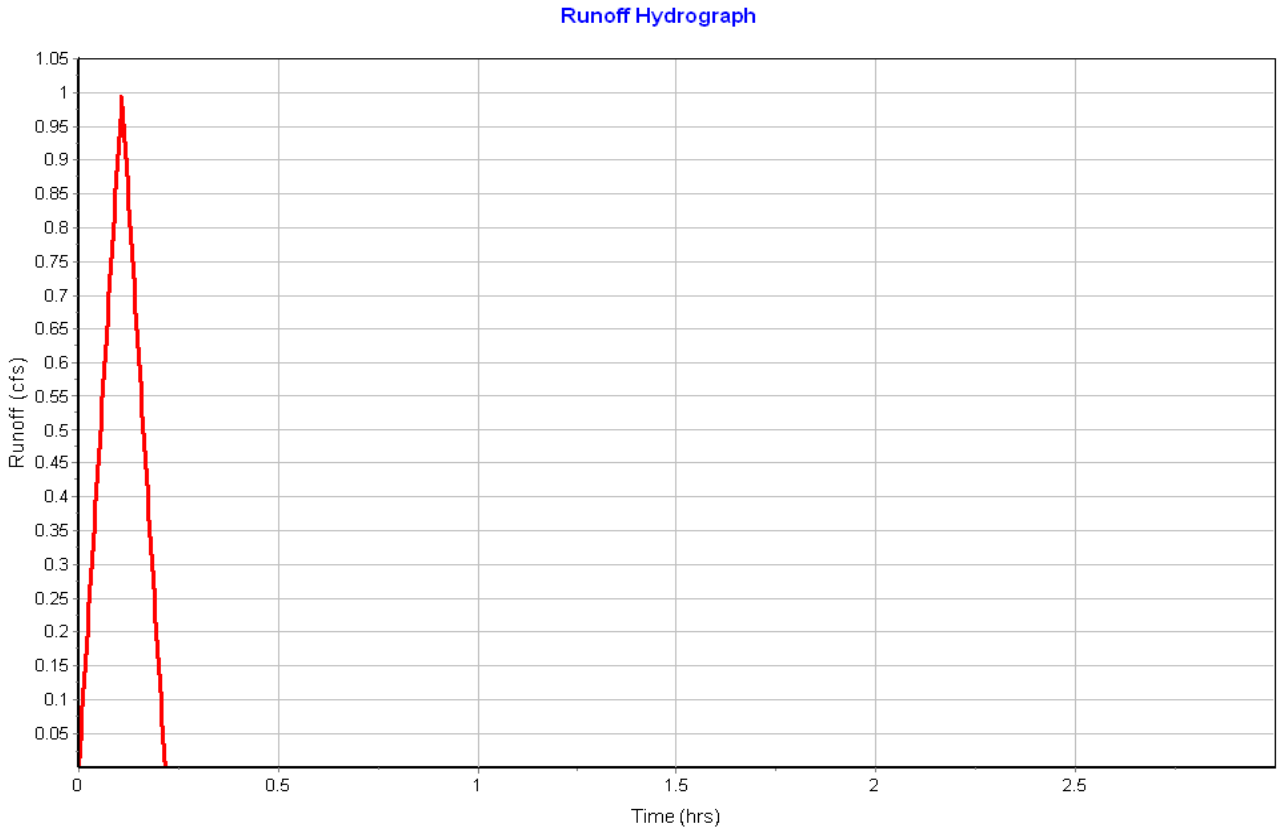
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	75	0.00	0.00
Slope (%) :	16	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	4.00	0.00	0.00
Computed Flow Time (min) :	0.31	0.00	0.00

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

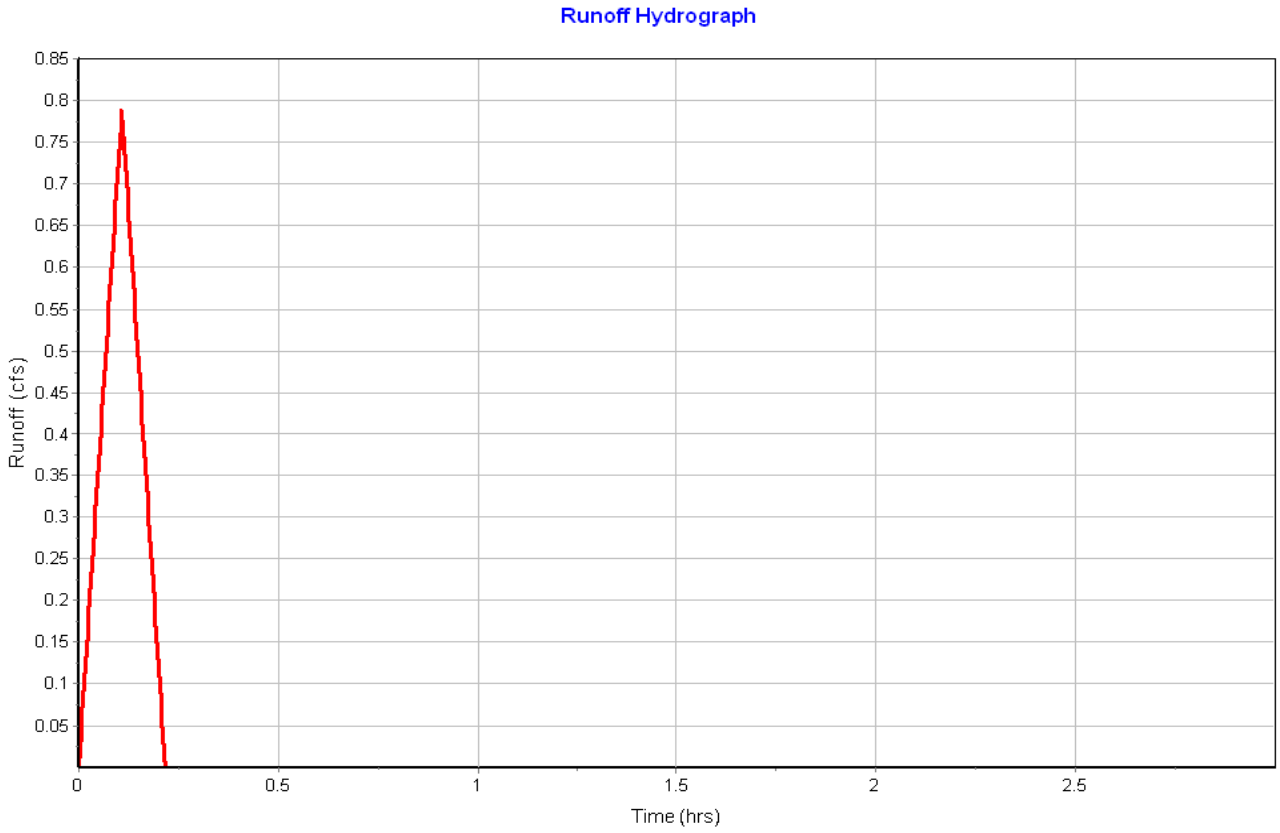
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	70	0.00	0.00
Slope (%) :	11.5	0.00	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.39	0.00	0.00
Computed Flow Time (min) :	0.34	0.00	0.00

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

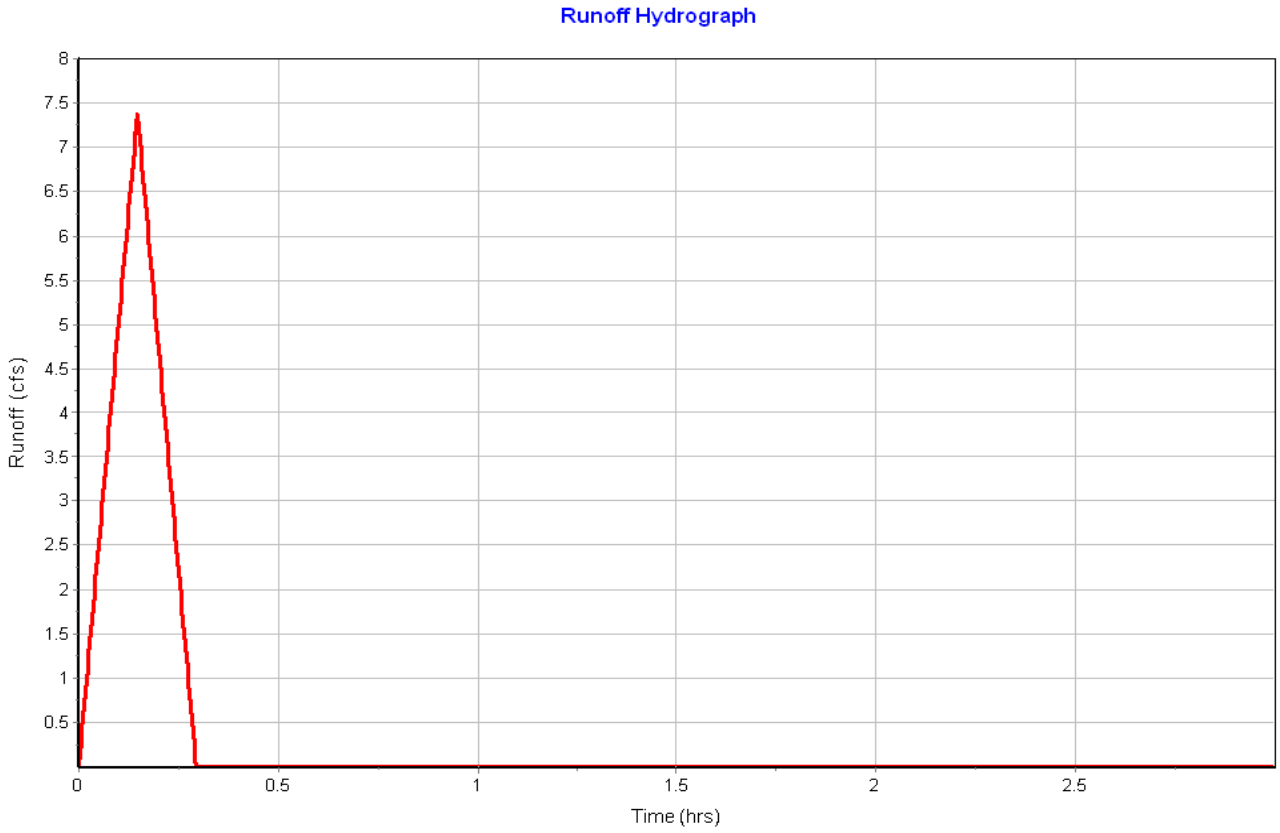
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	560	140	0.00
Slope (%) :	10	1.5	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	5.10	1.98	0.00
Computed Flow Time (min) :	1.83	1.18	0.00

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

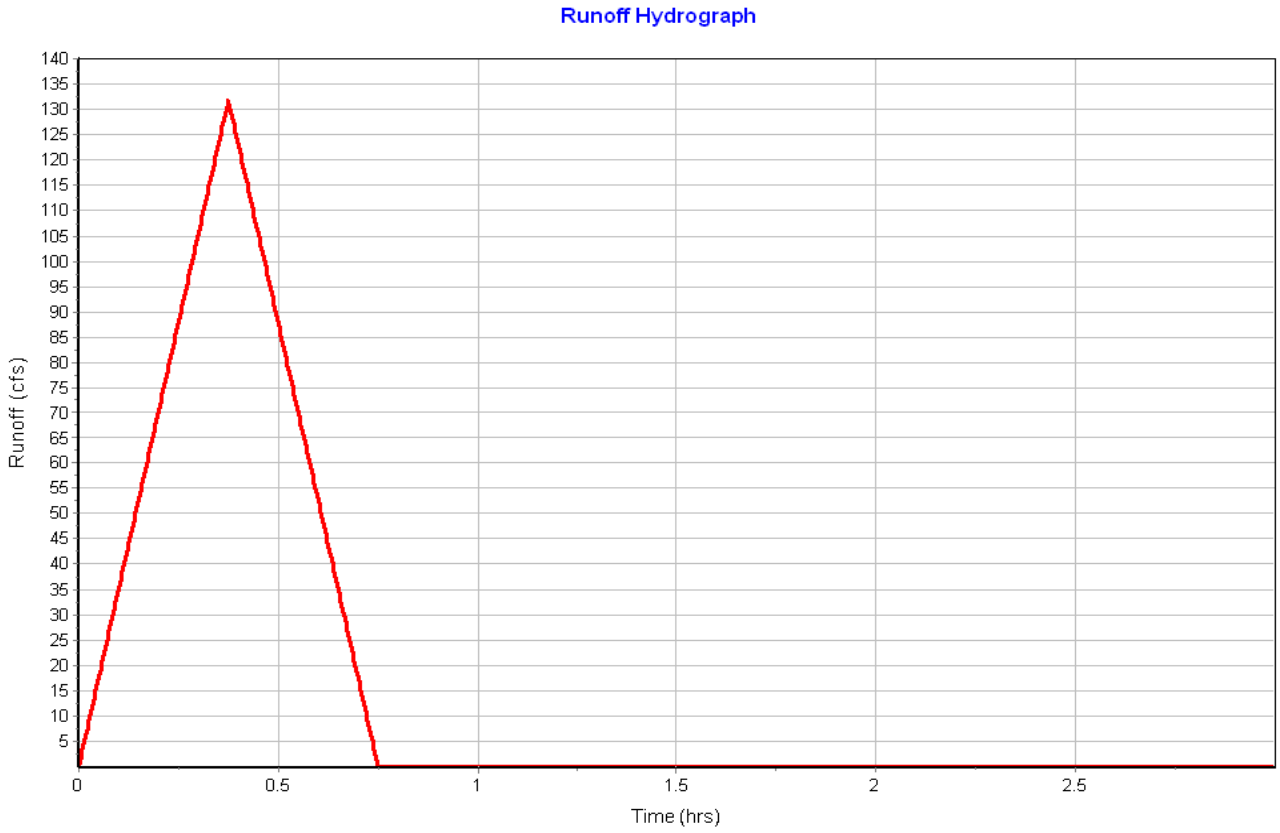
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	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

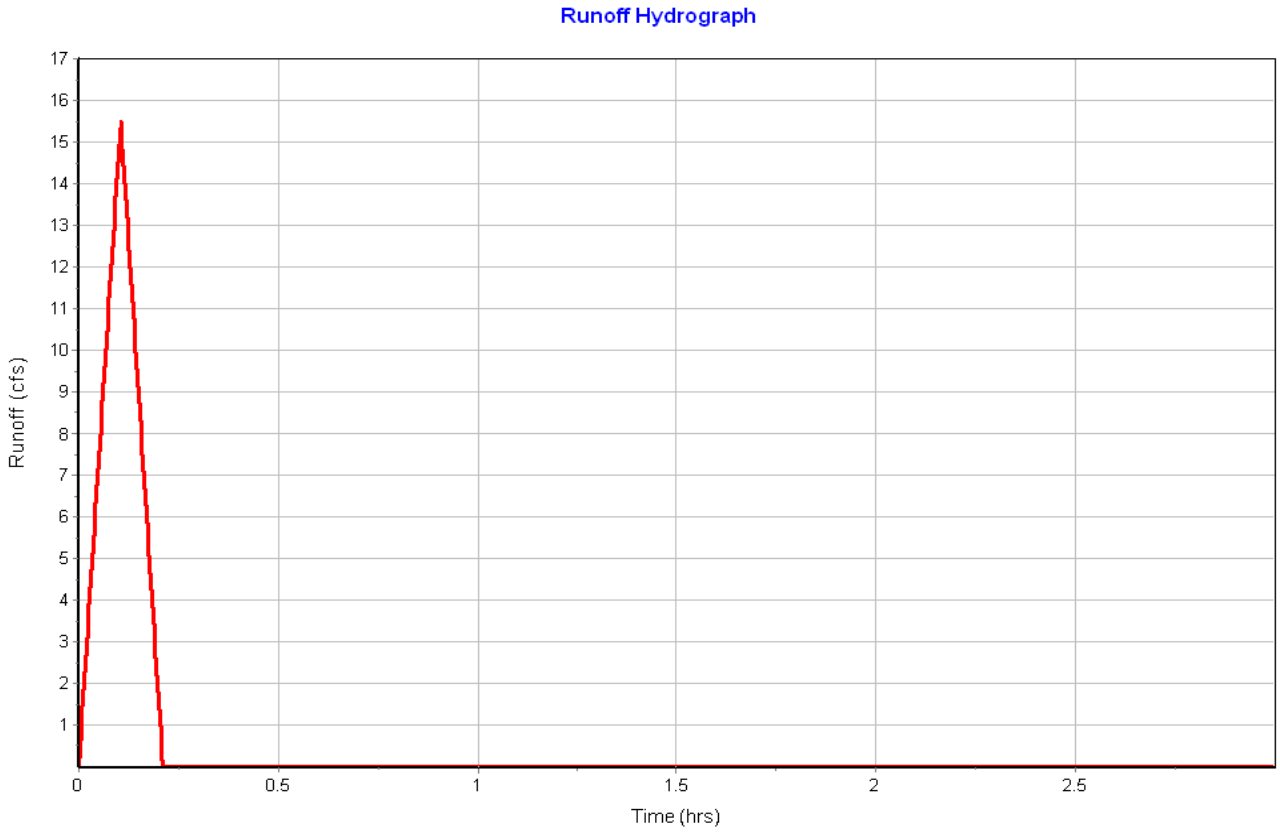
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

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

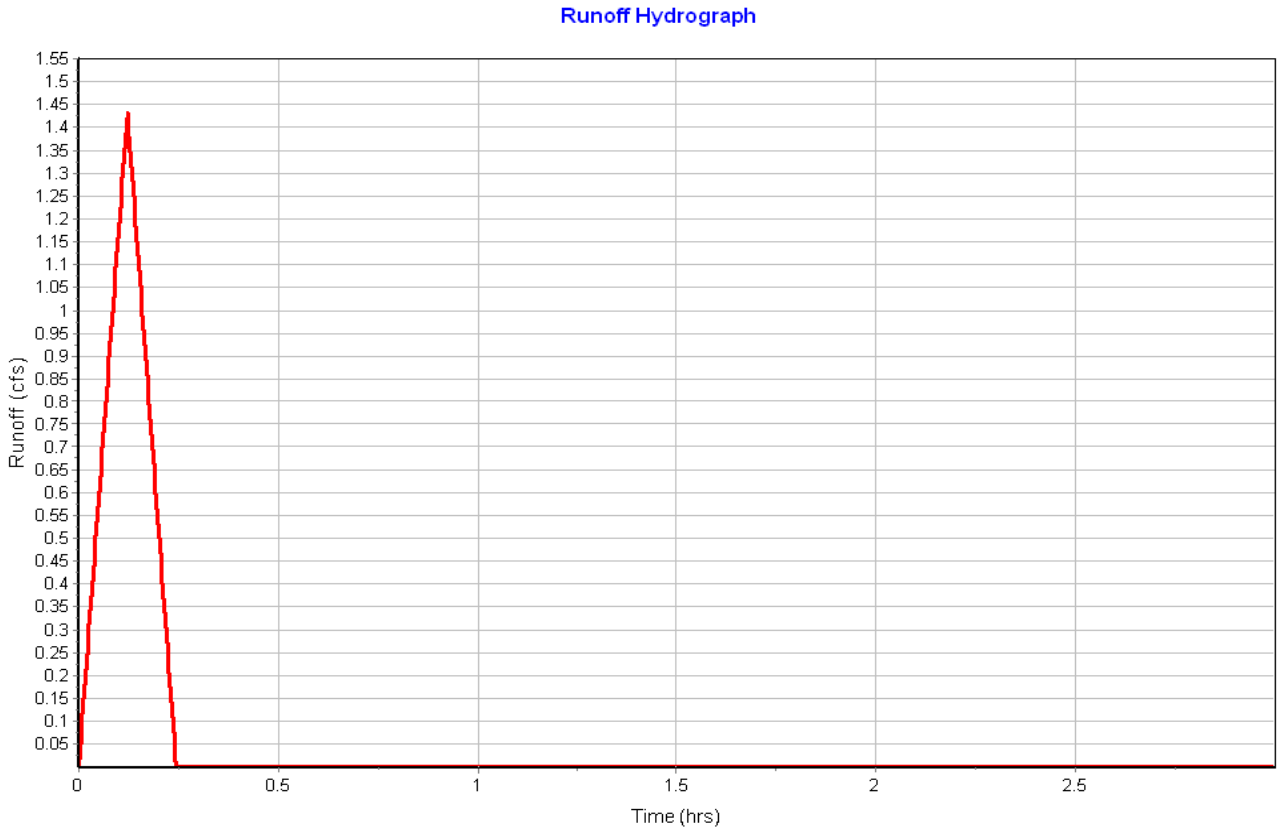
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	140	110	0.00
Slope (%) :	15	3.7	0.00
Surface Type :	Bare & untilled	Unpaved	Unpaved
Velocity (ft/sec) :	3.87	3.10	0.00
Computed Flow Time (min) :	0.60	0.59	0.00

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

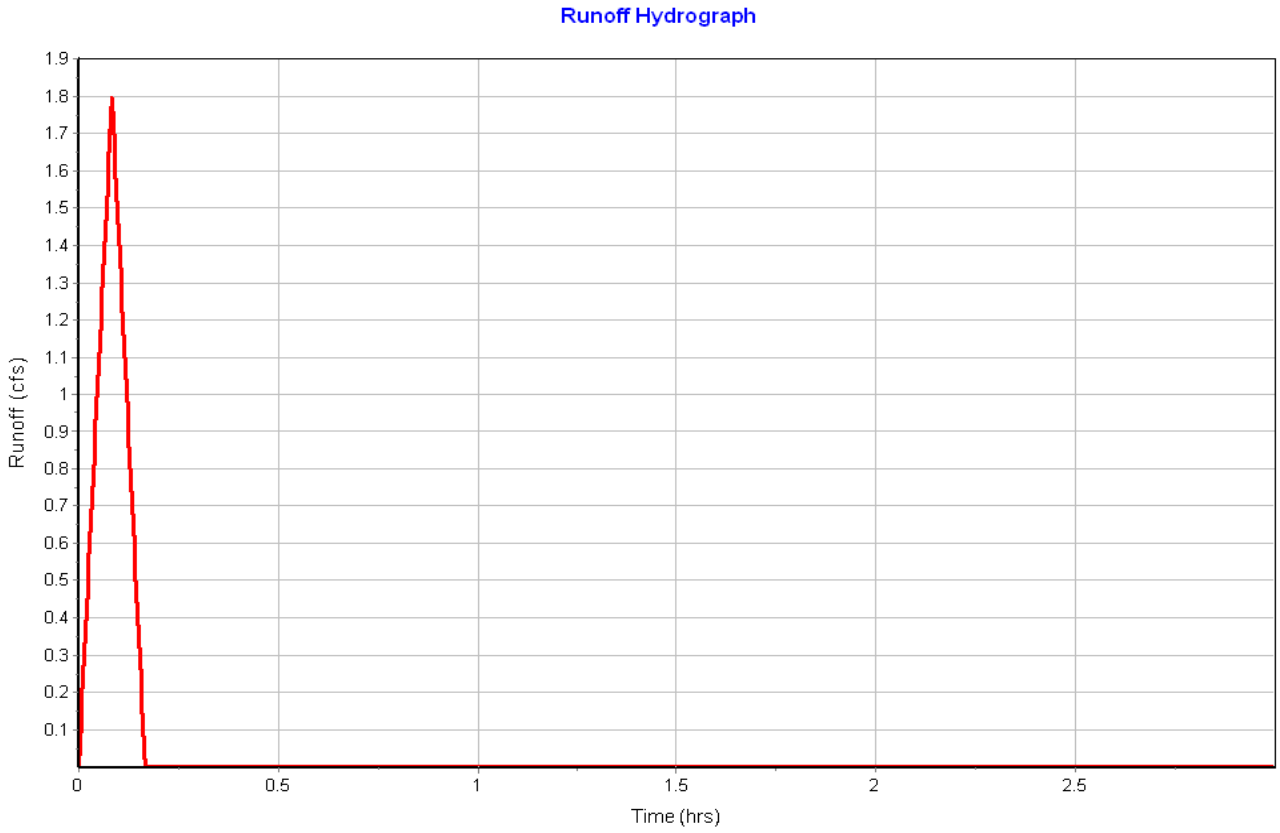
Time of Concentration

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

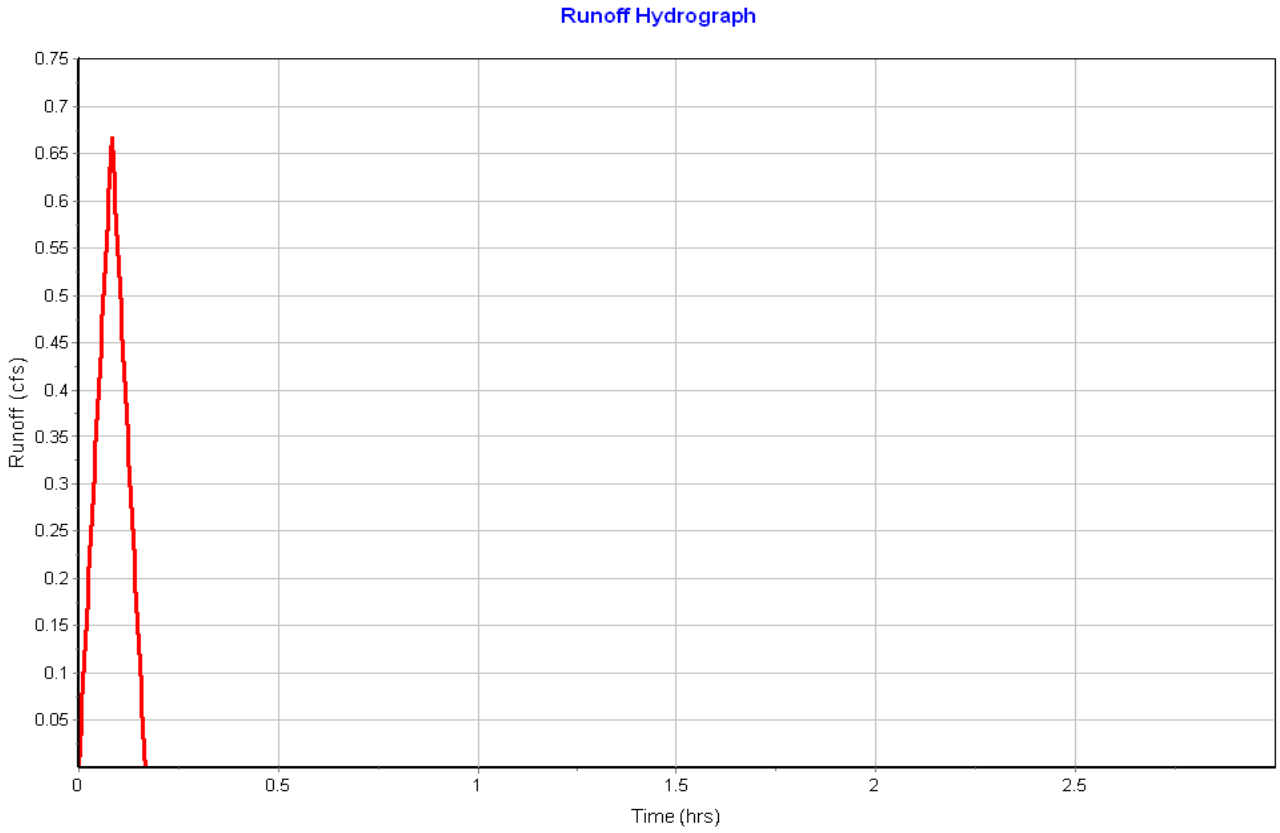
Time of Concentration

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

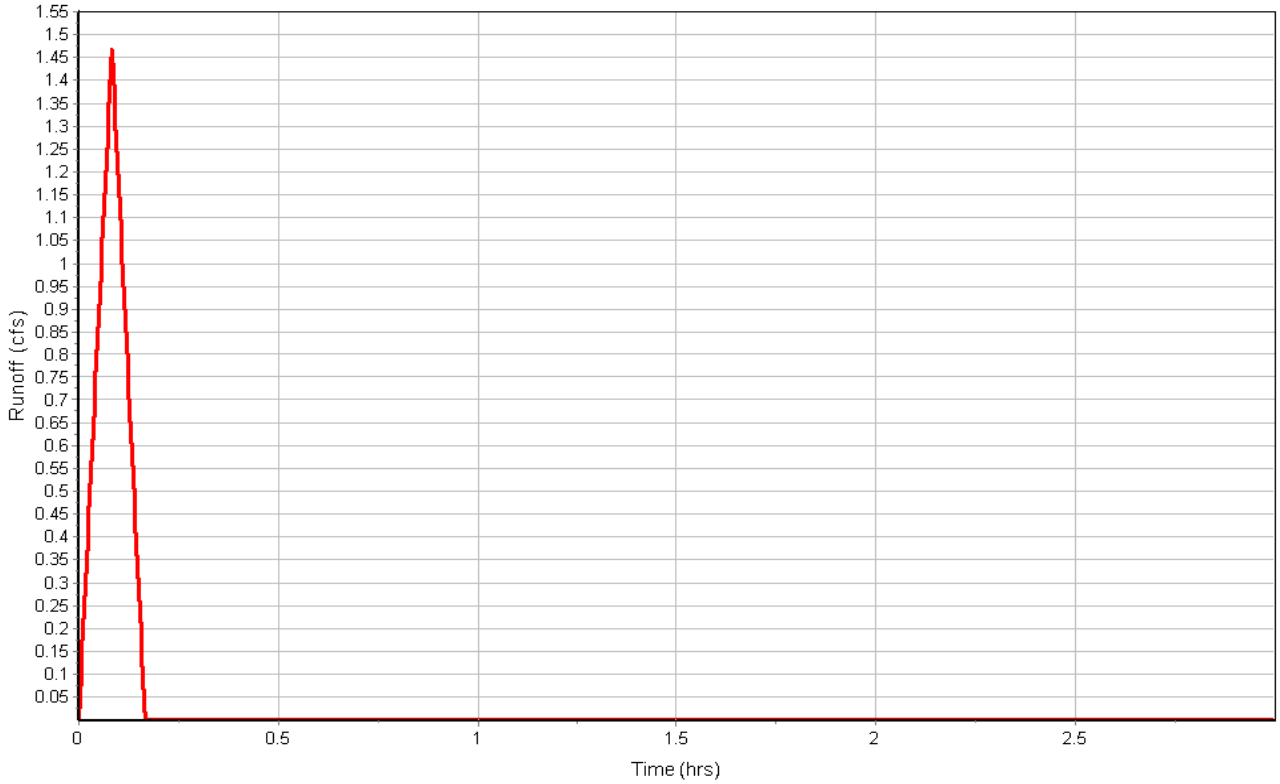
User-Defined TOC override (minutes): 5

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

Runoff Hydrograph



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

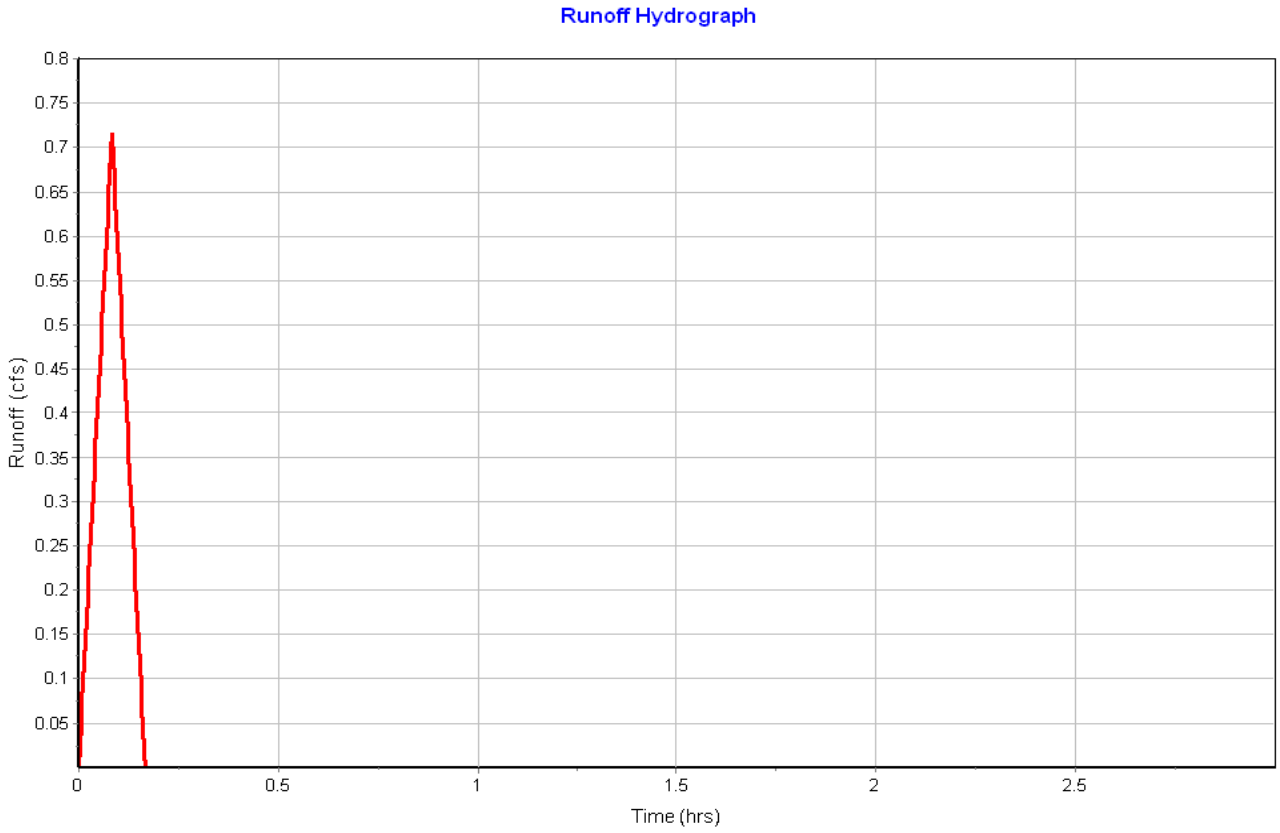
Time of Concentration

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

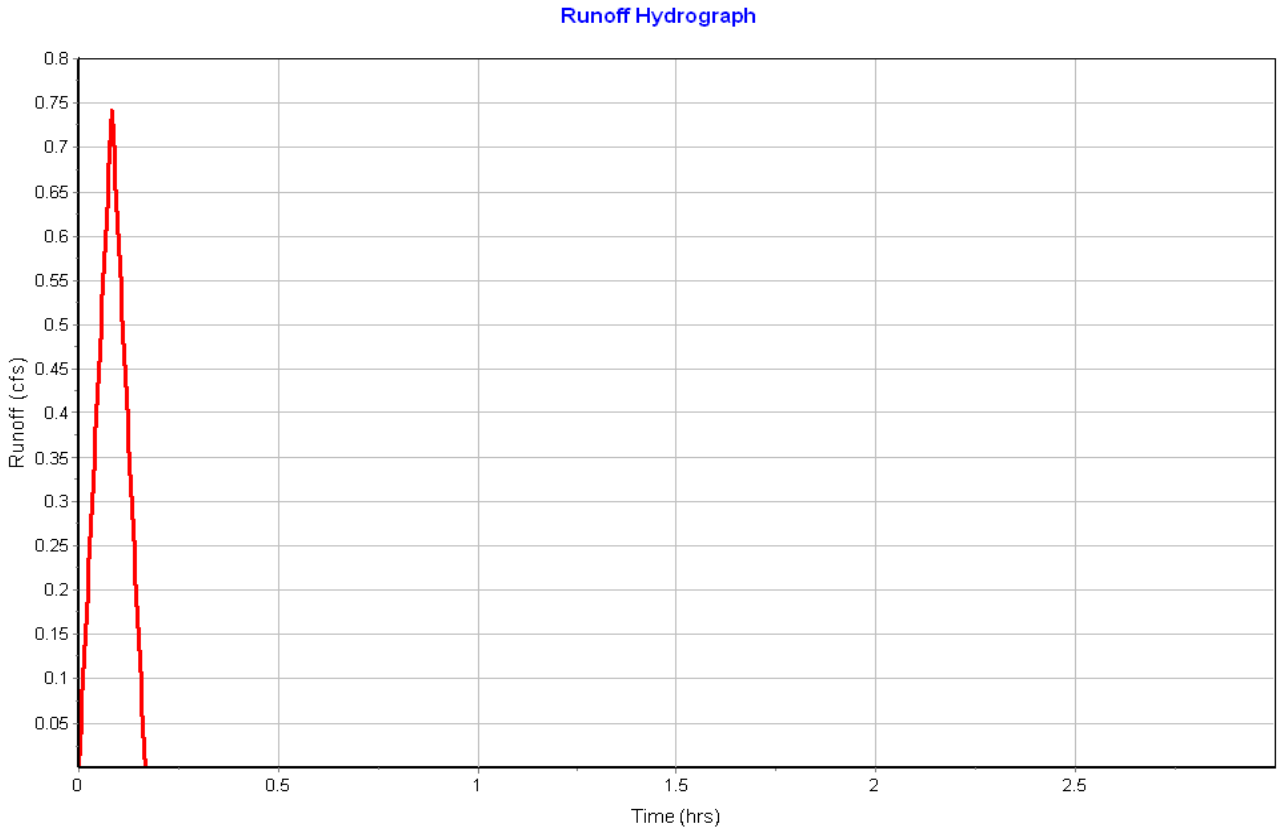
Time of Concentration

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

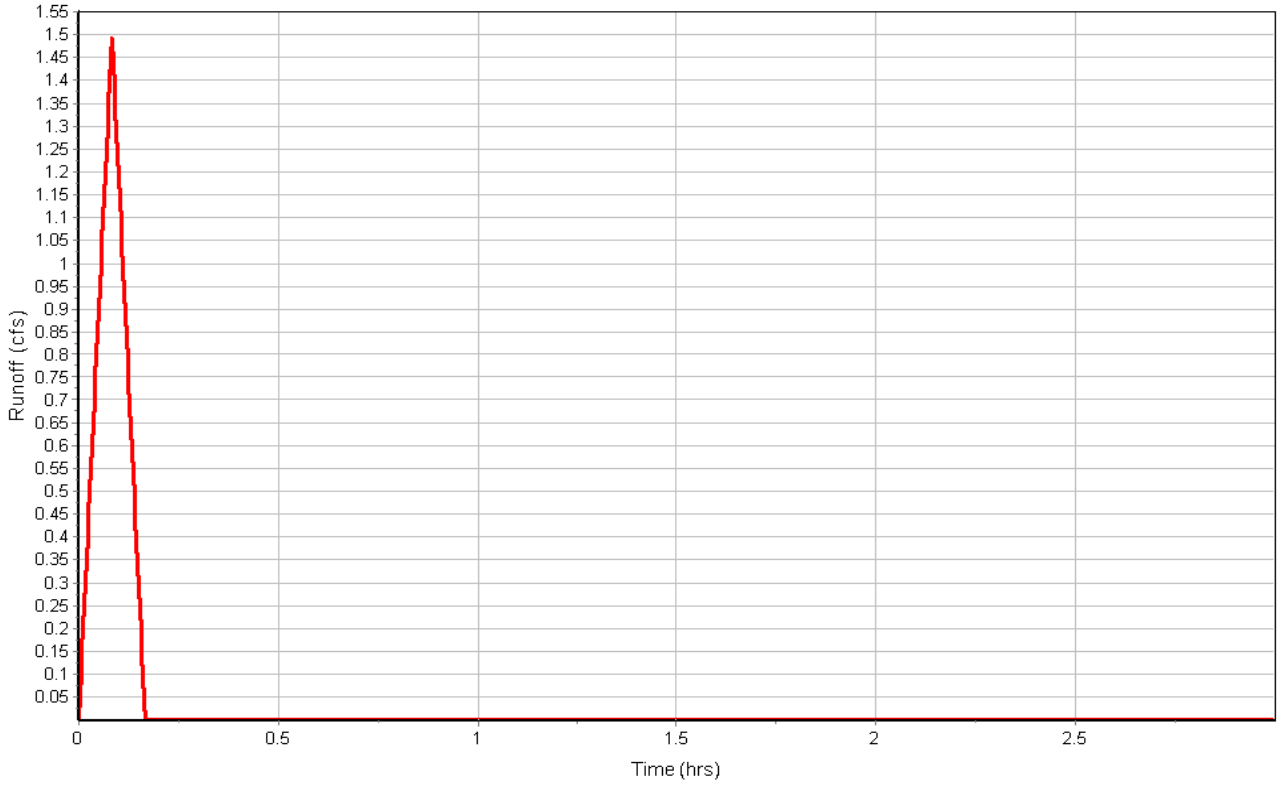
User-Defined TOC override (minutes): 5

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

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

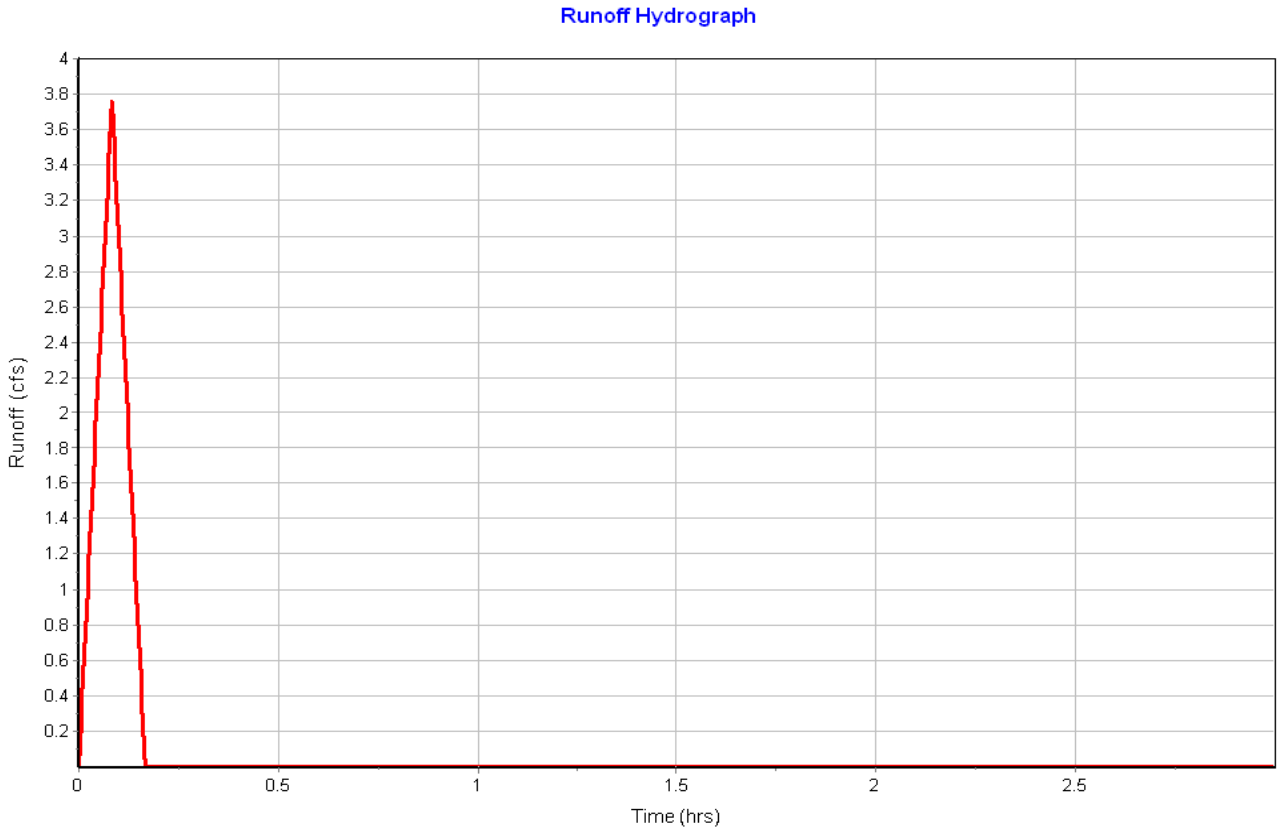
Time of Concentration

User-Defined TOC override (minutes): 5

Subbasin Runoff Results

Total Rainfall (in) 0.55
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

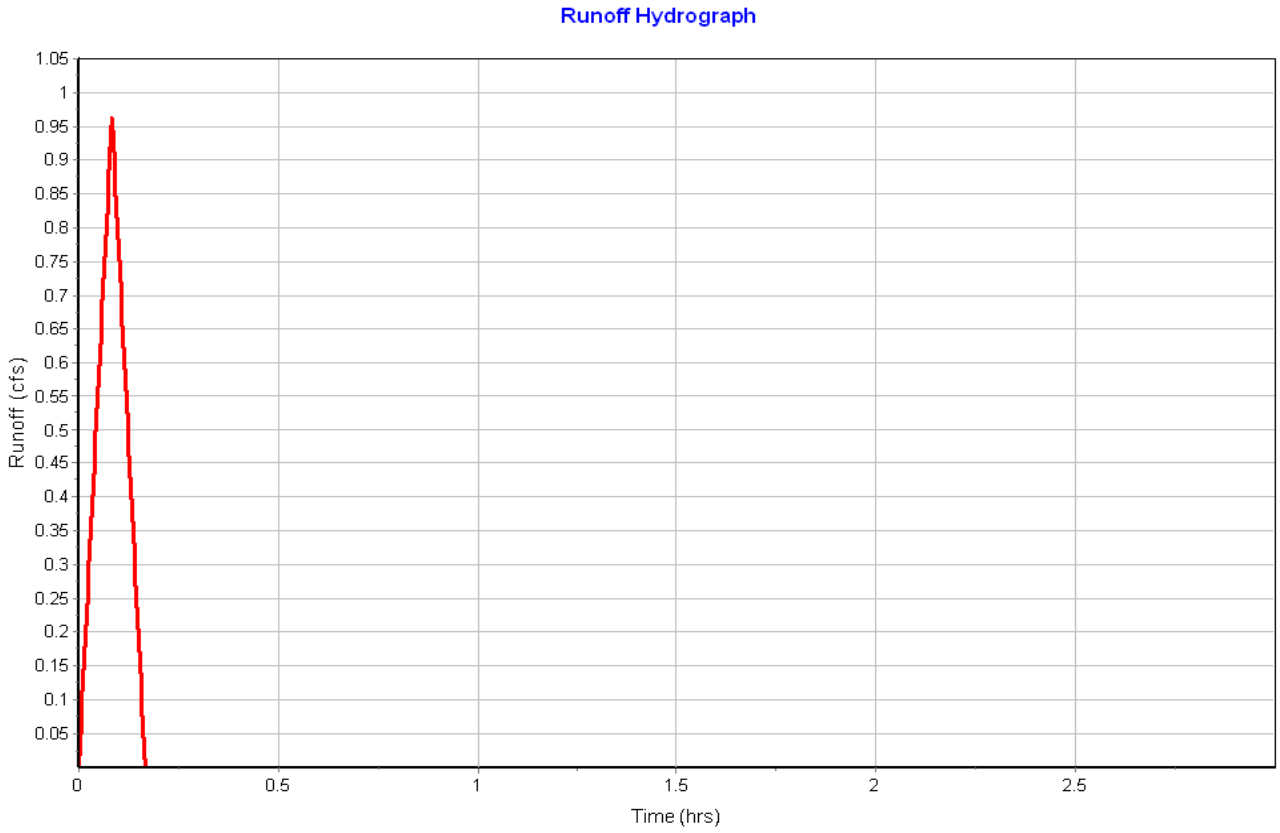
Time of Concentration

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

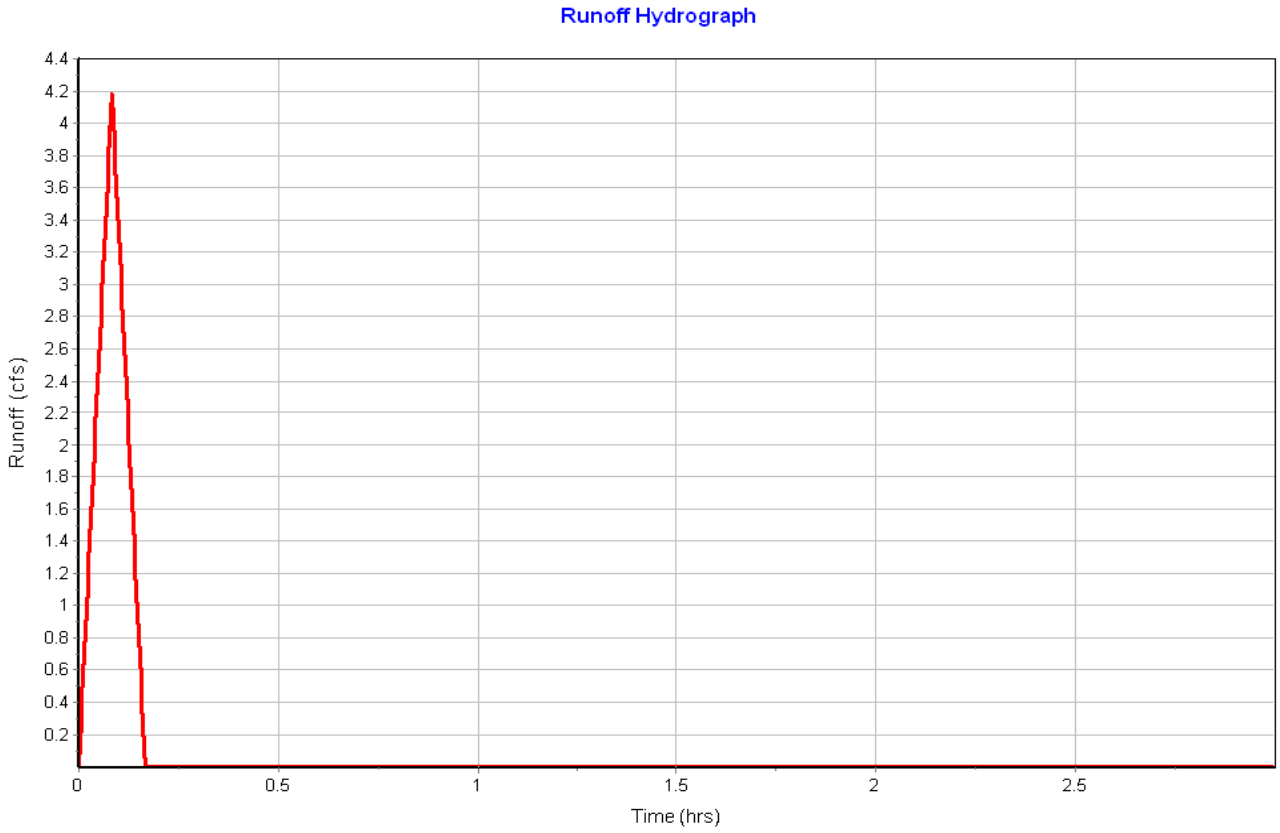
Time of Concentration

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

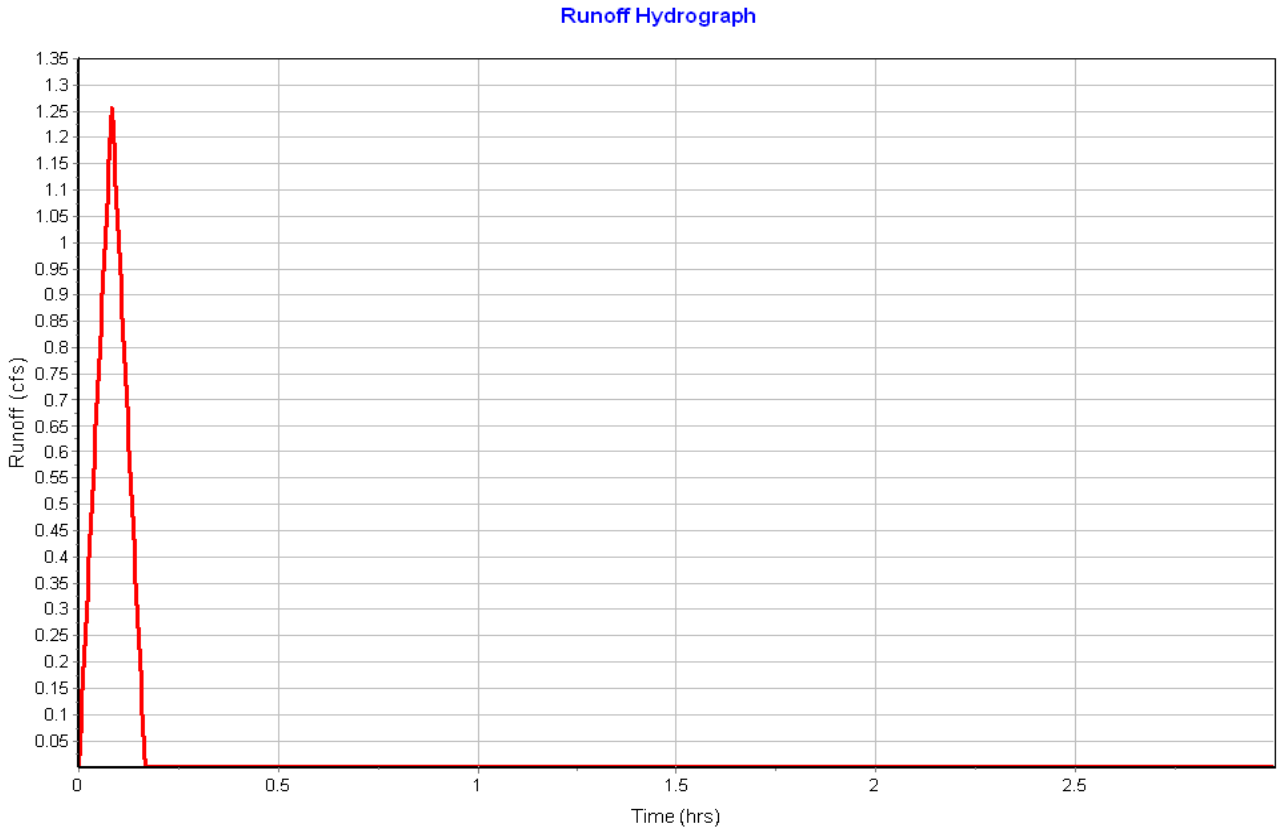
Time of Concentration

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

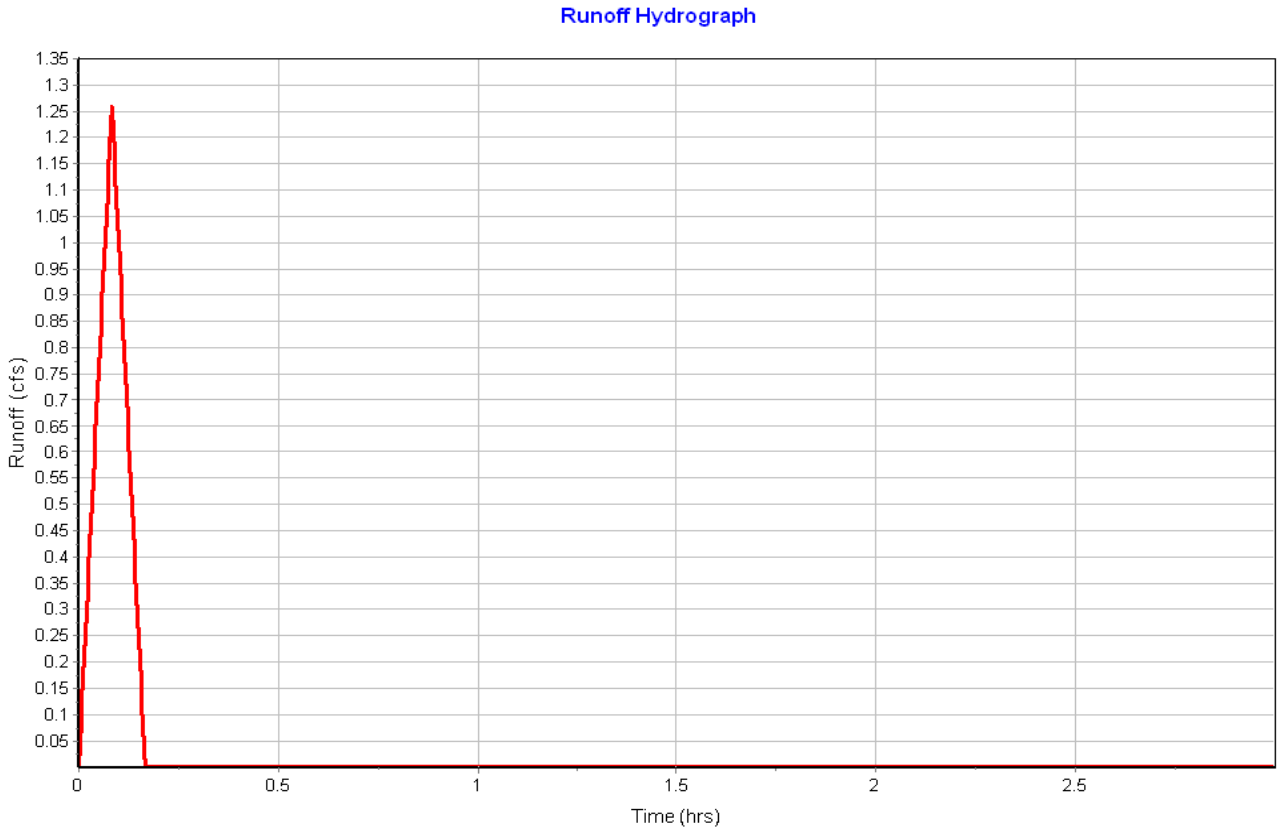
Time of Concentration

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

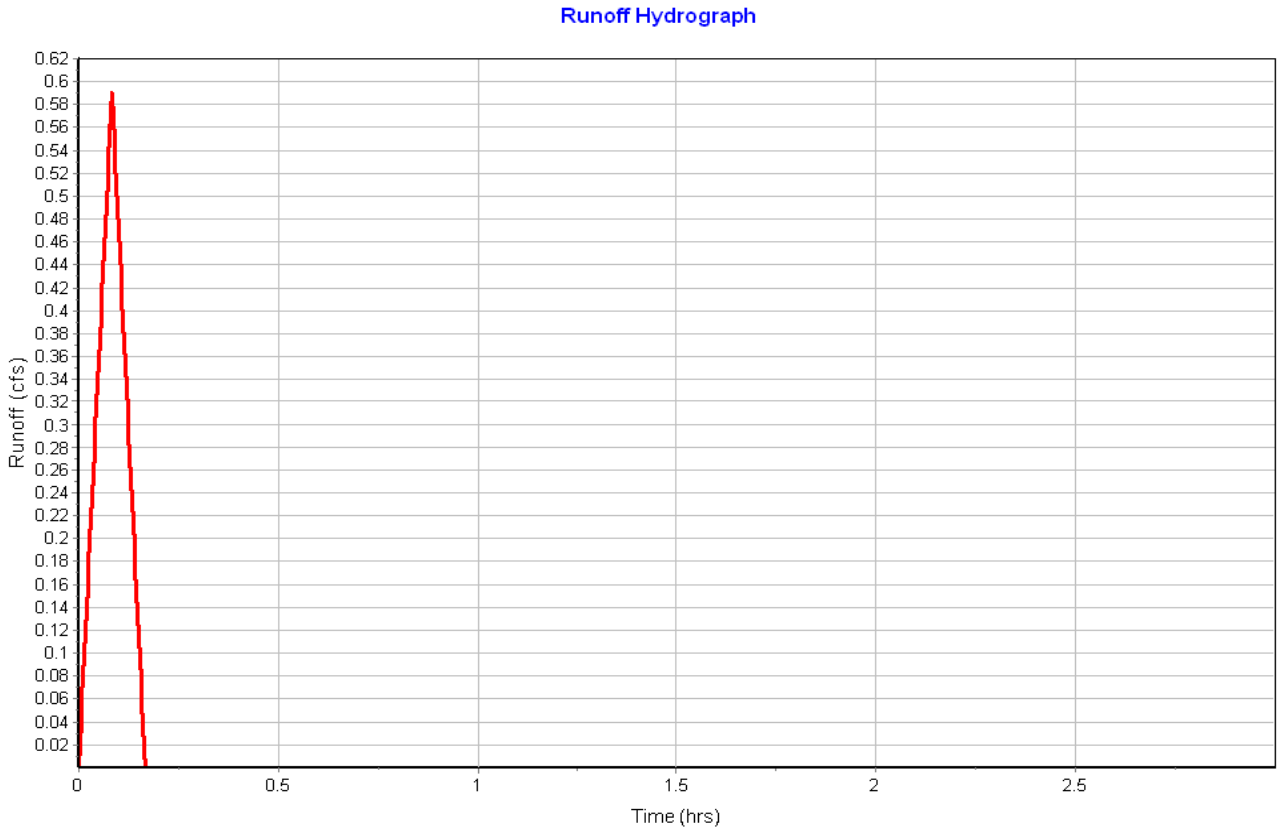
Time of Concentration

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

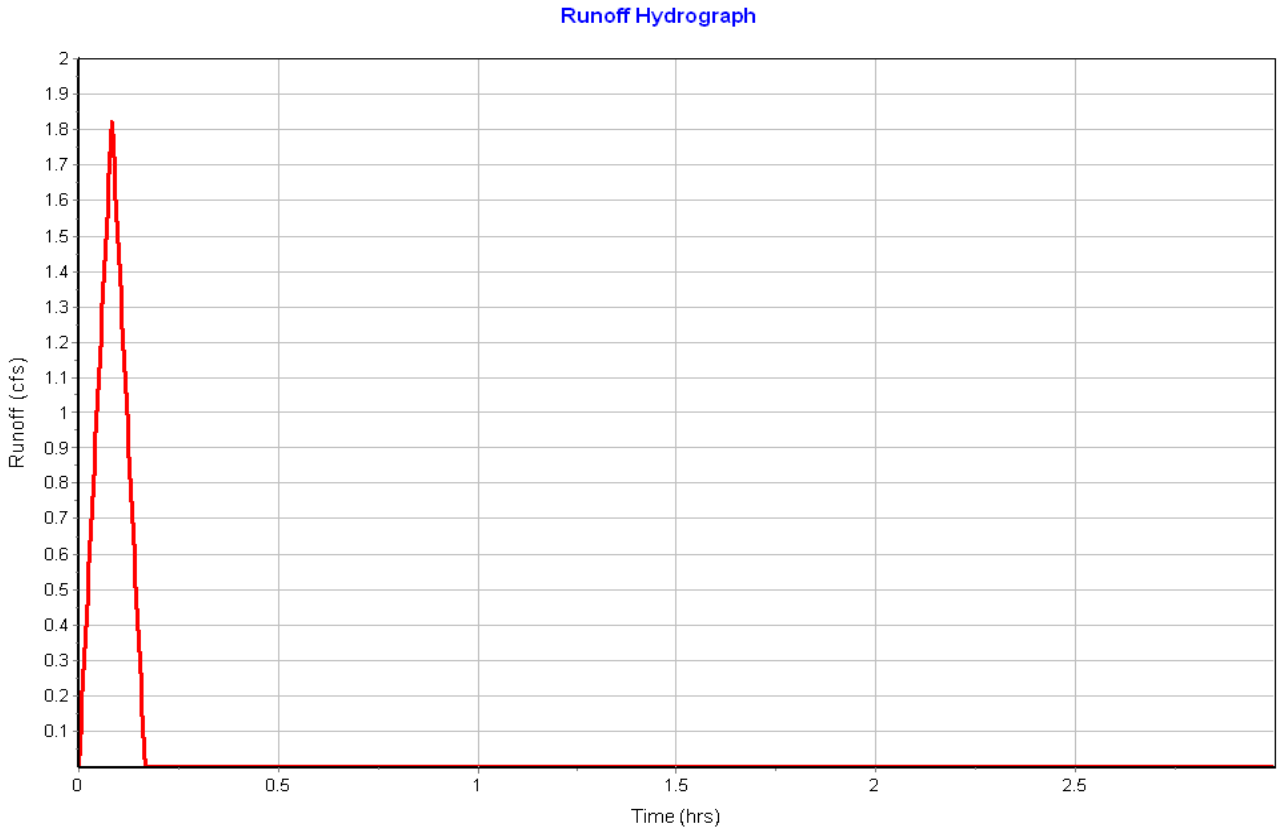
Time of Concentration

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

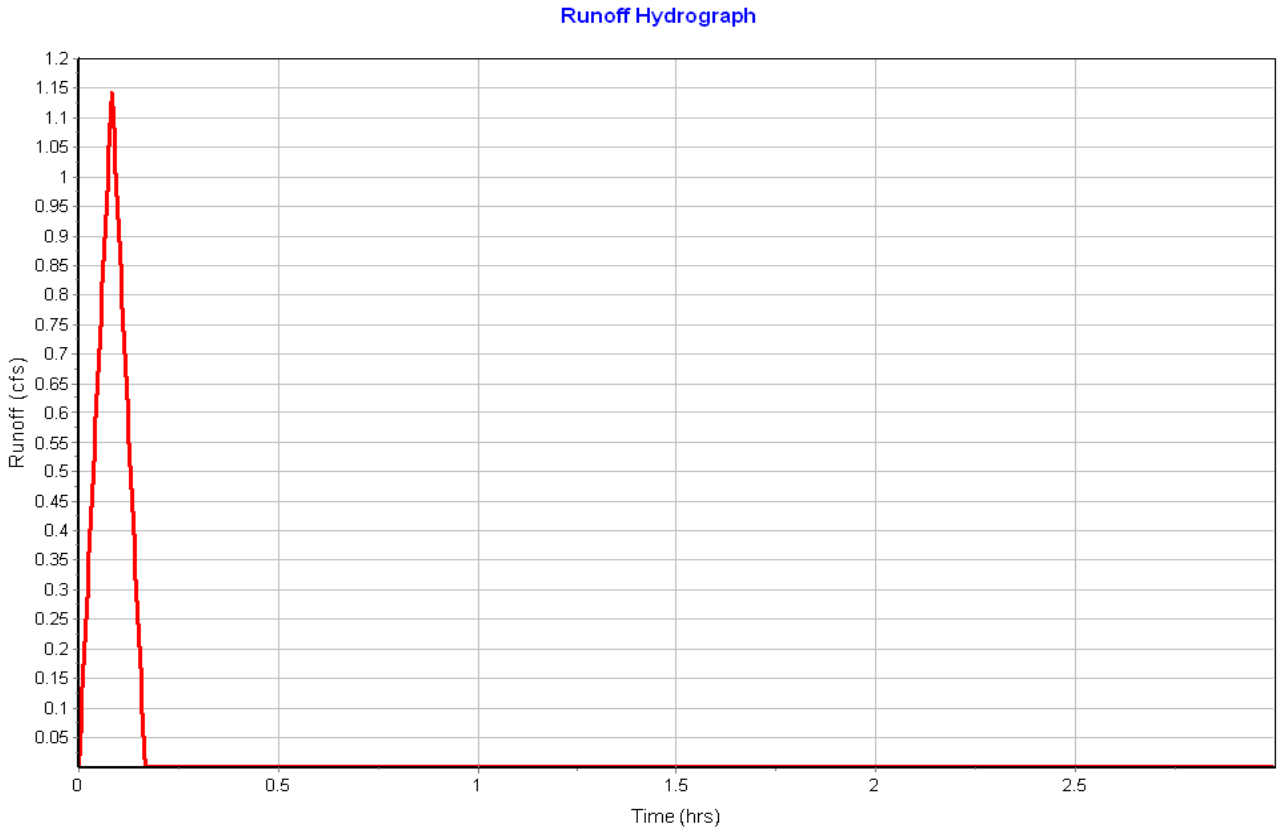
Time of Concentration

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

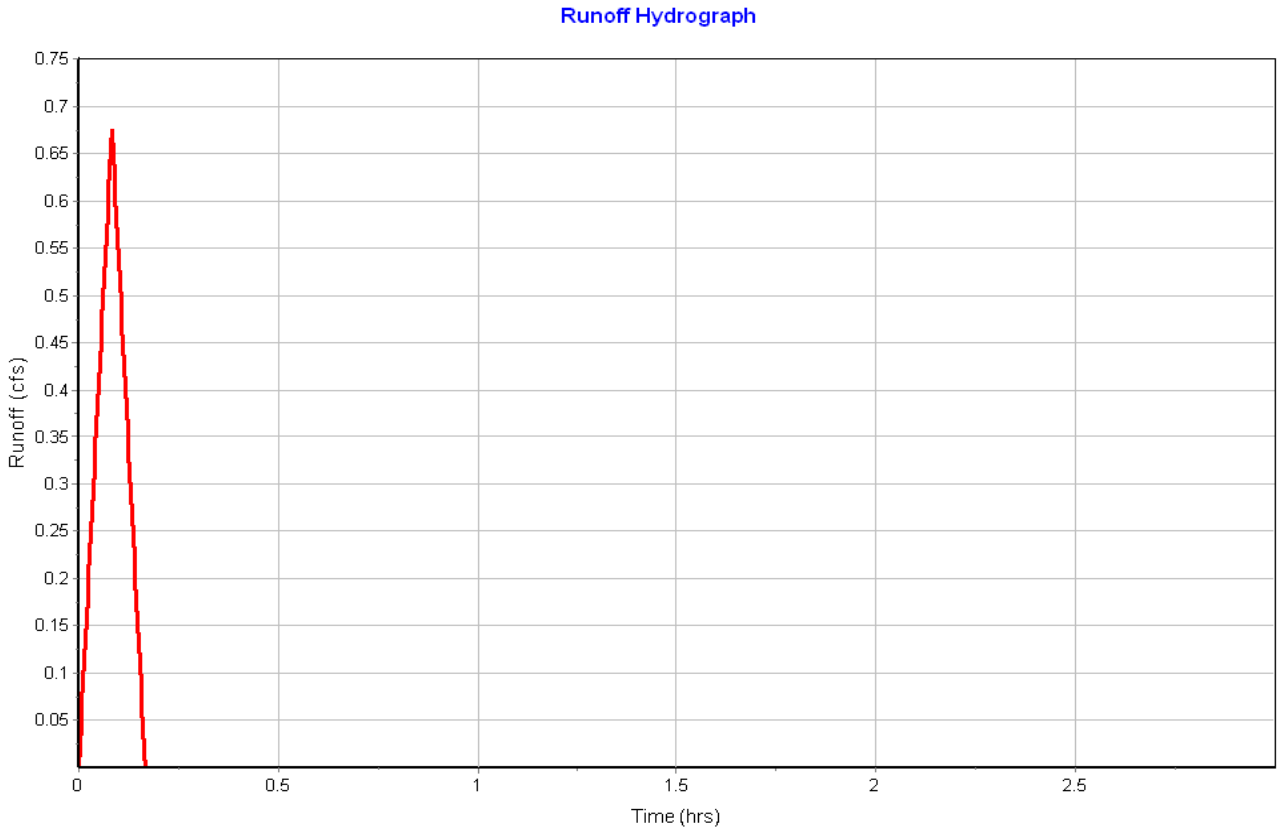
Time of Concentration

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

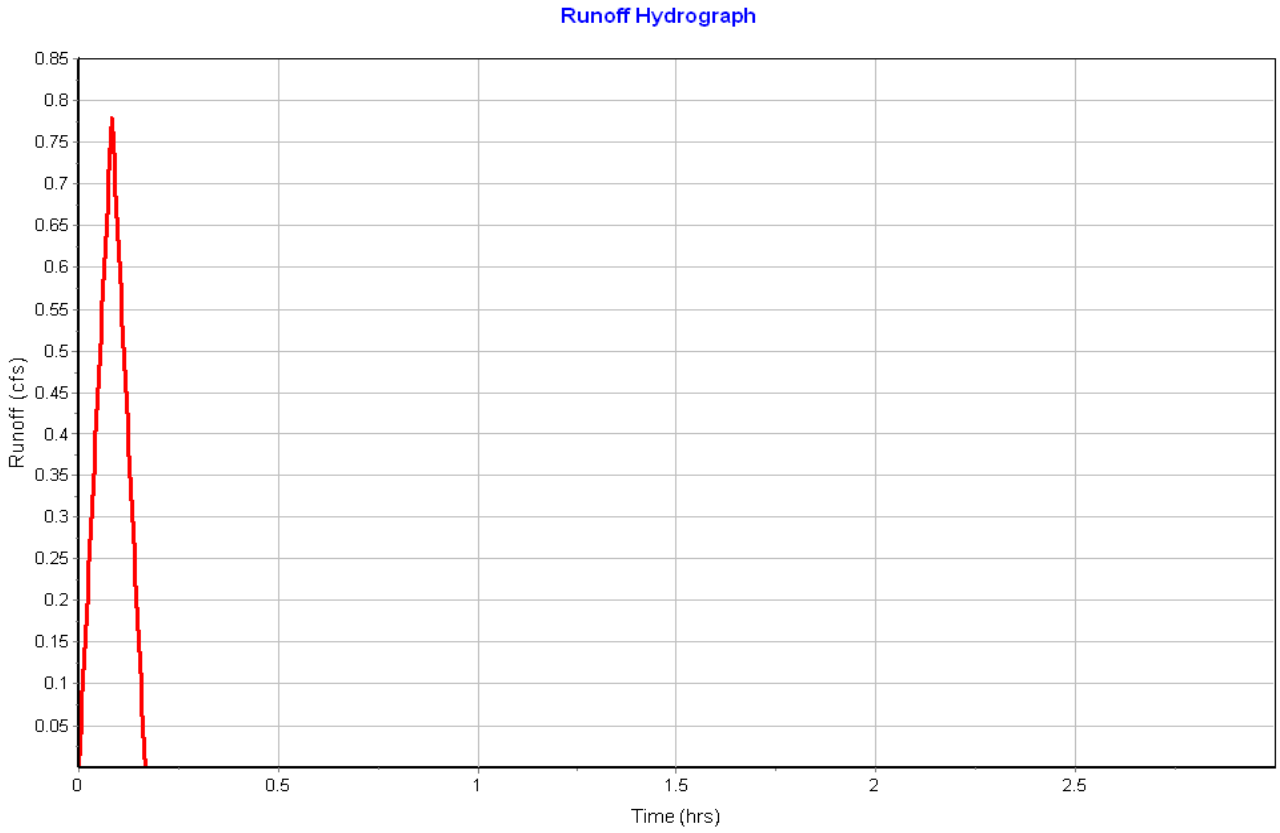
Time of Concentration

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

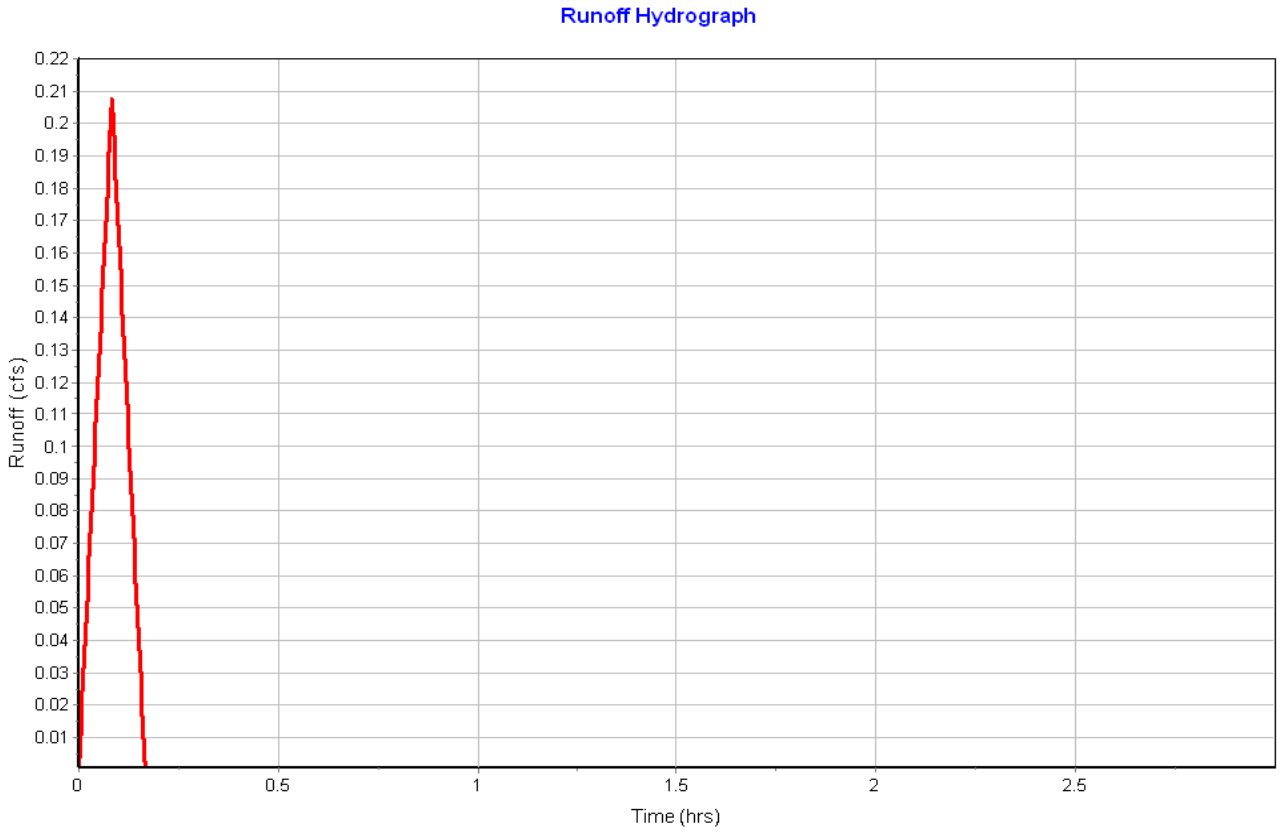
Time of Concentration

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

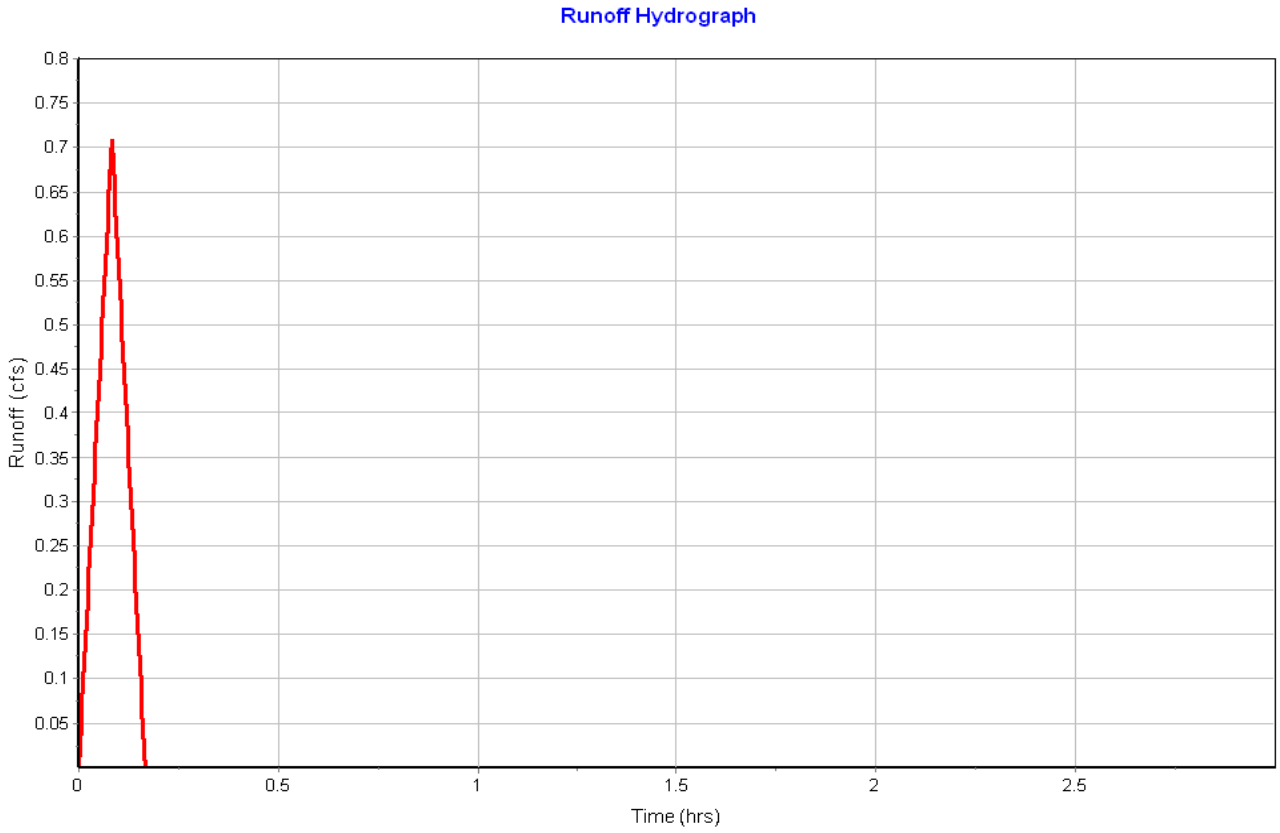
Time of Concentration

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

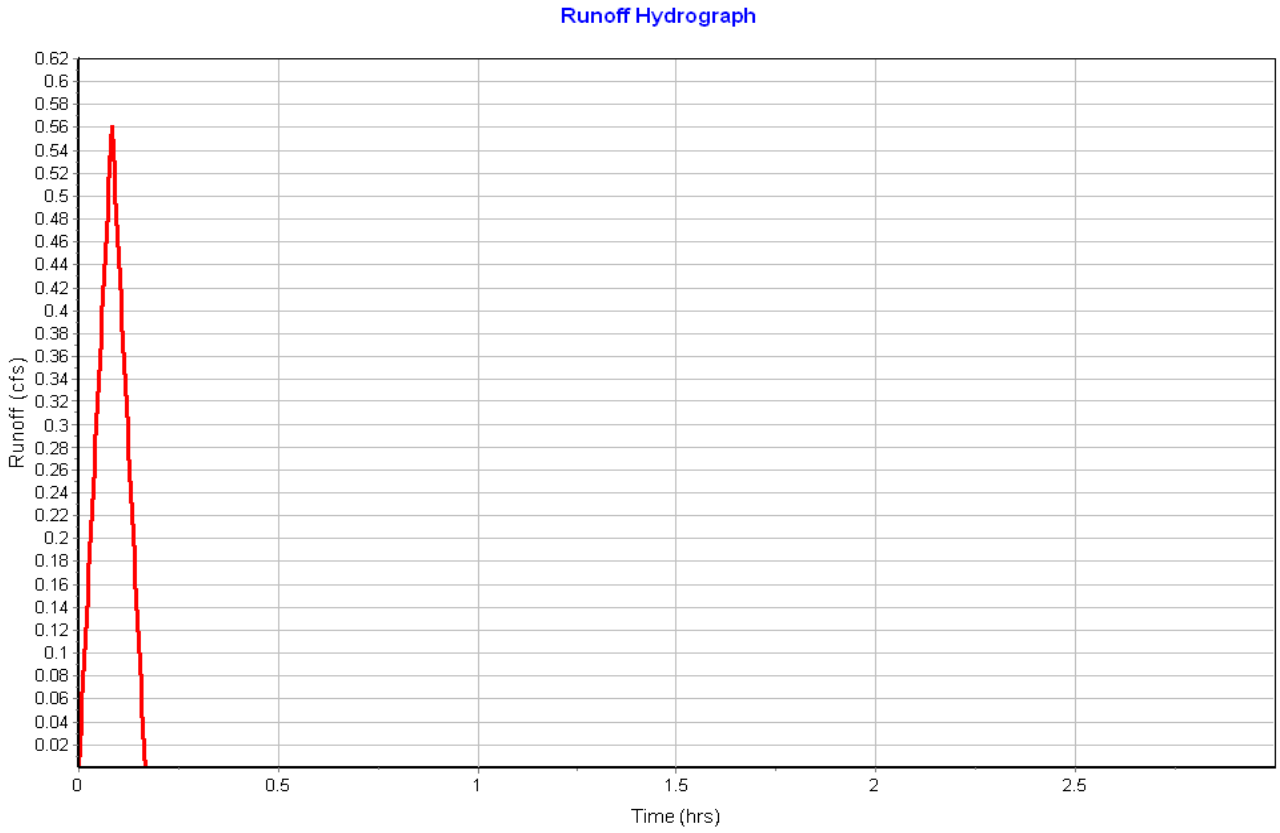
Time of Concentration

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



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

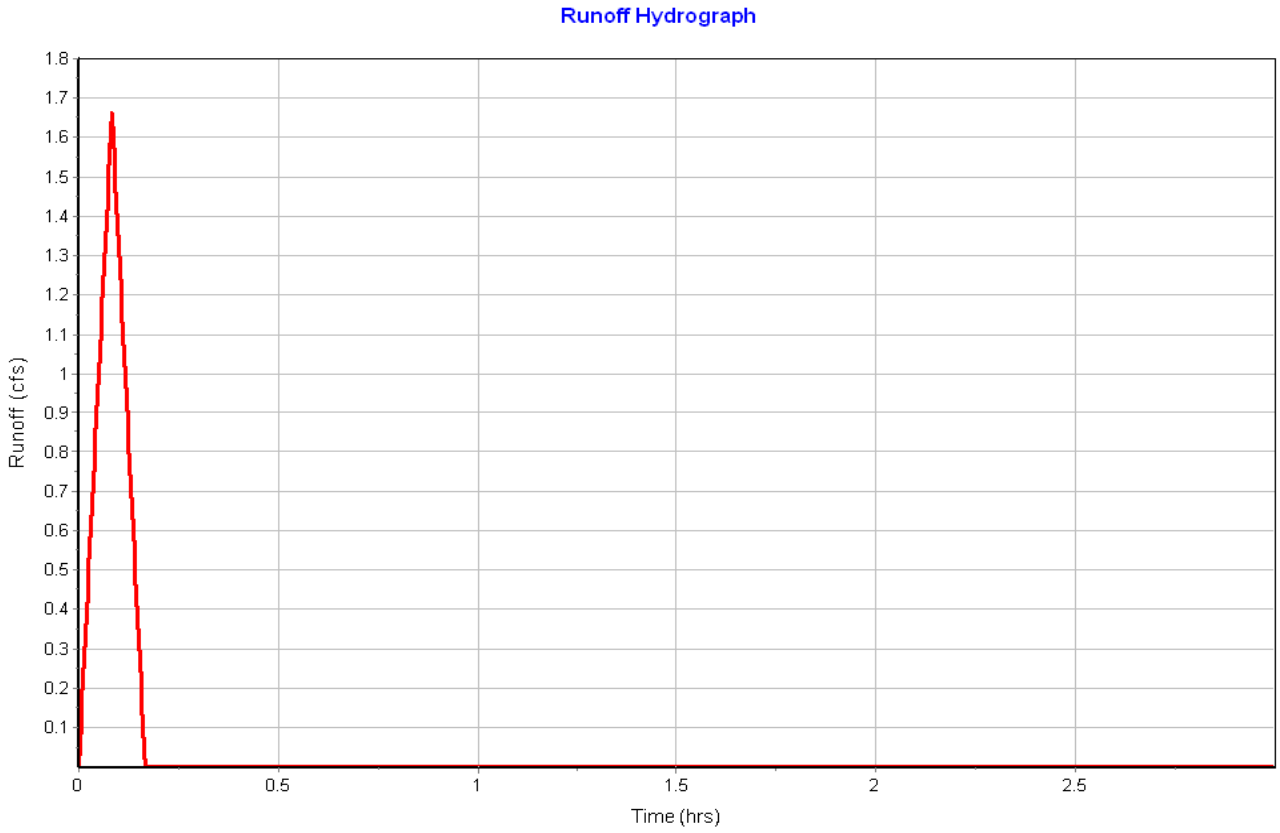
Time of Concentration

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

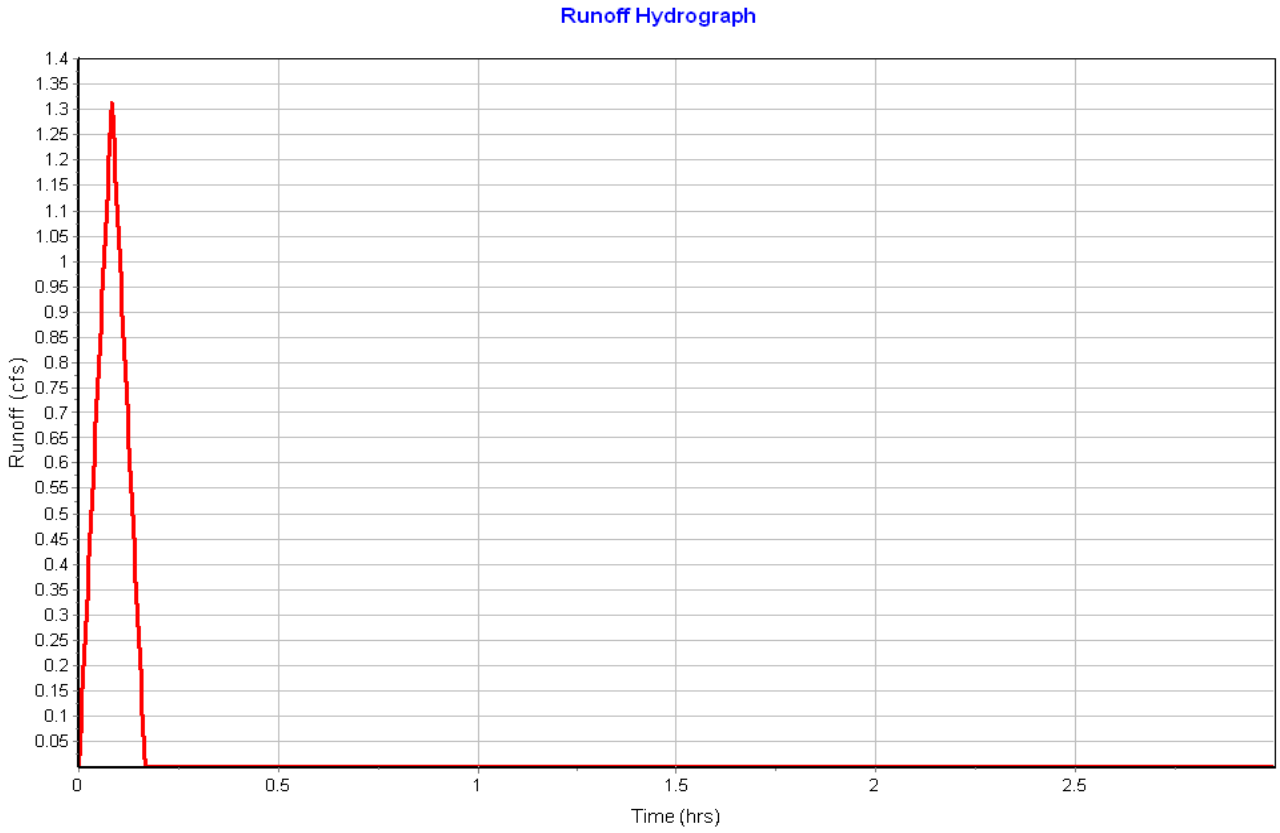
Time of Concentration

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

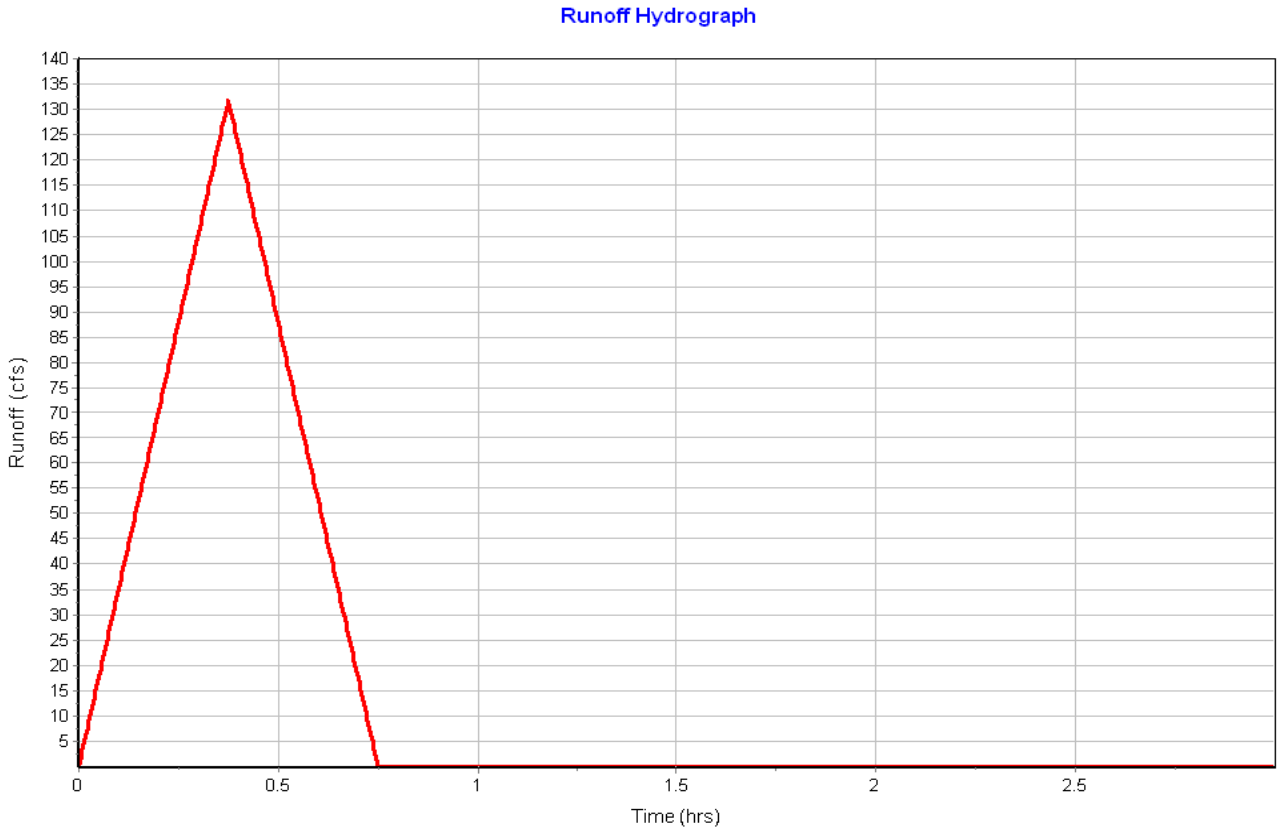
Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.030	0.00	0.00
Flow Length (ft) :	2200	0.00	0.00
Channel Slope (%) :	33	0.00	0.00
Cross Section Area (ft²) :	62.5	0.00	0.00
Wetted Perimeter (ft) :	23	0.00	0.00
Velocity (ft/sec) :	55.56	0.00	0.00
Computed Flow Time (min) :	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

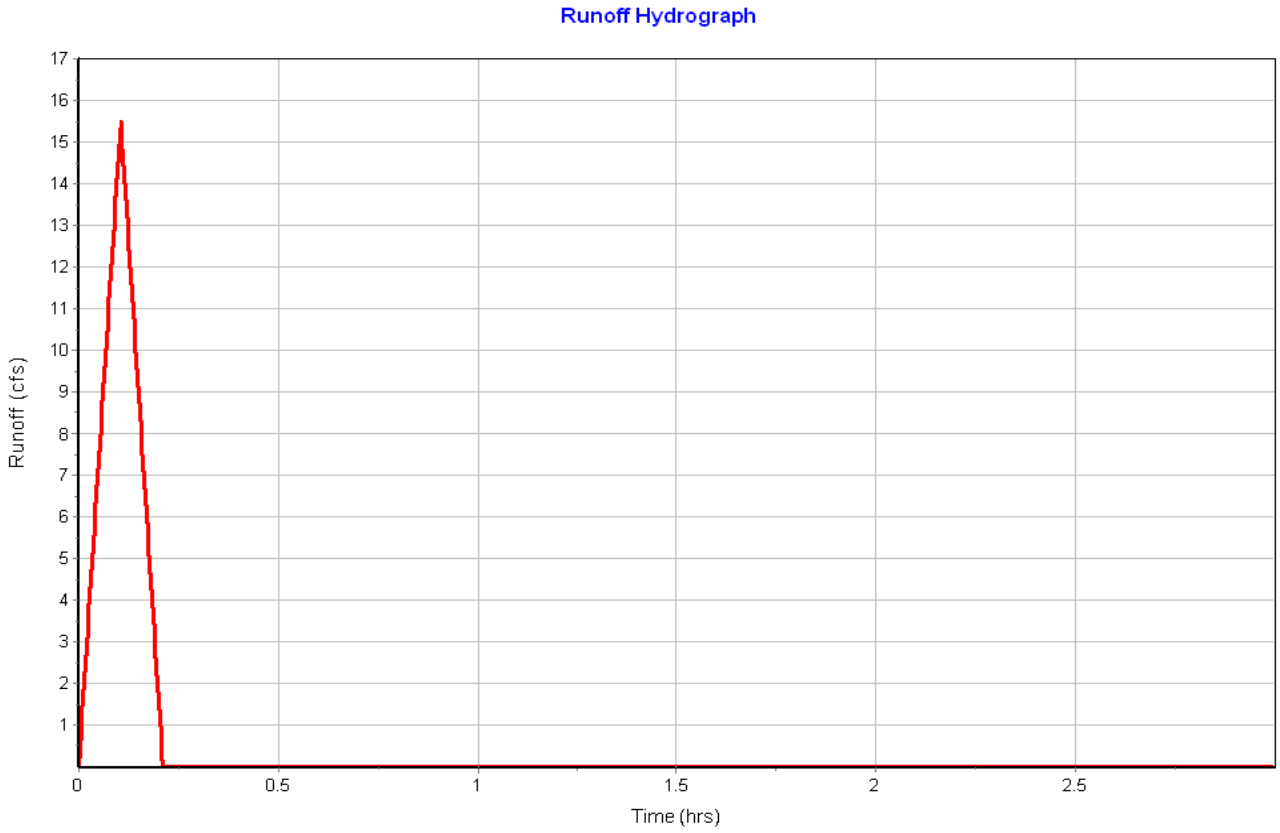
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	1360	0.00	0.00
Slope (%) :	53	0.00	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	11.75	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

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

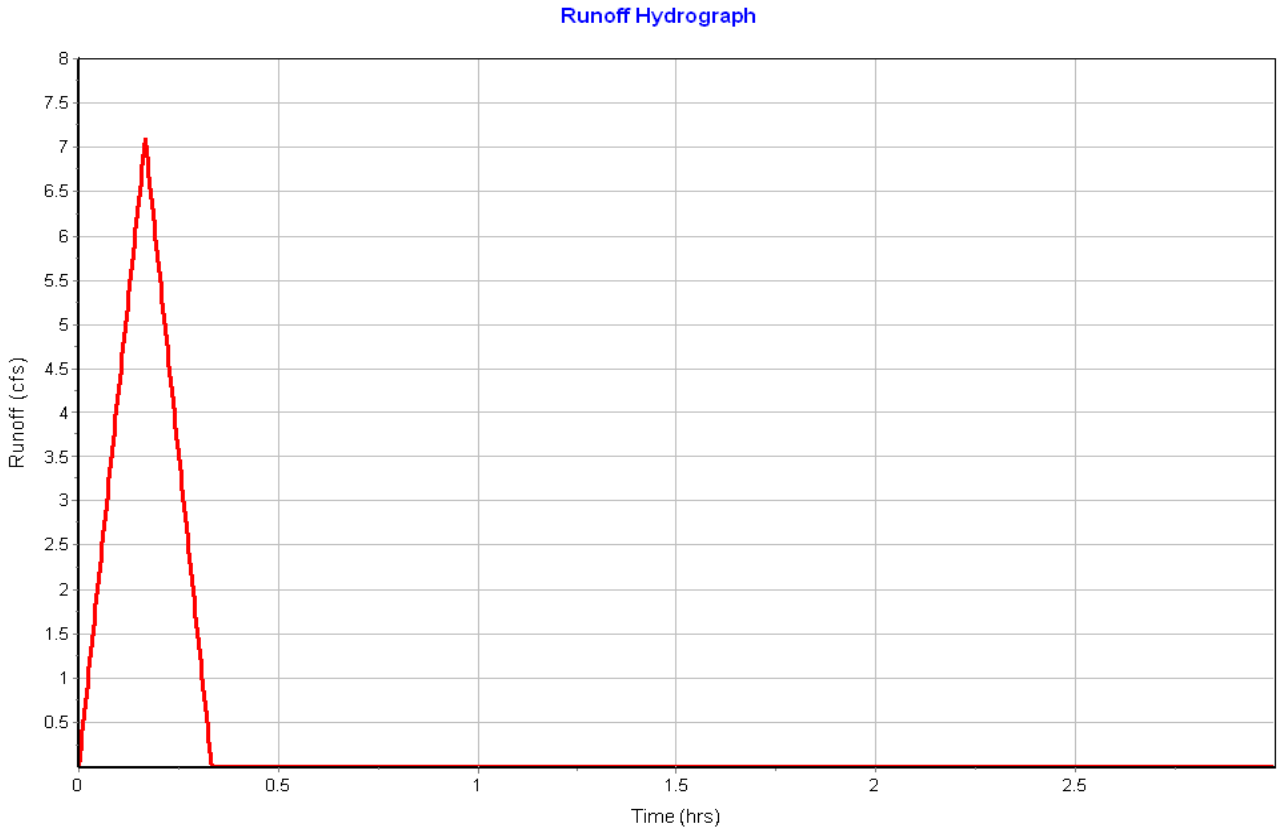
Time of Concentration

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

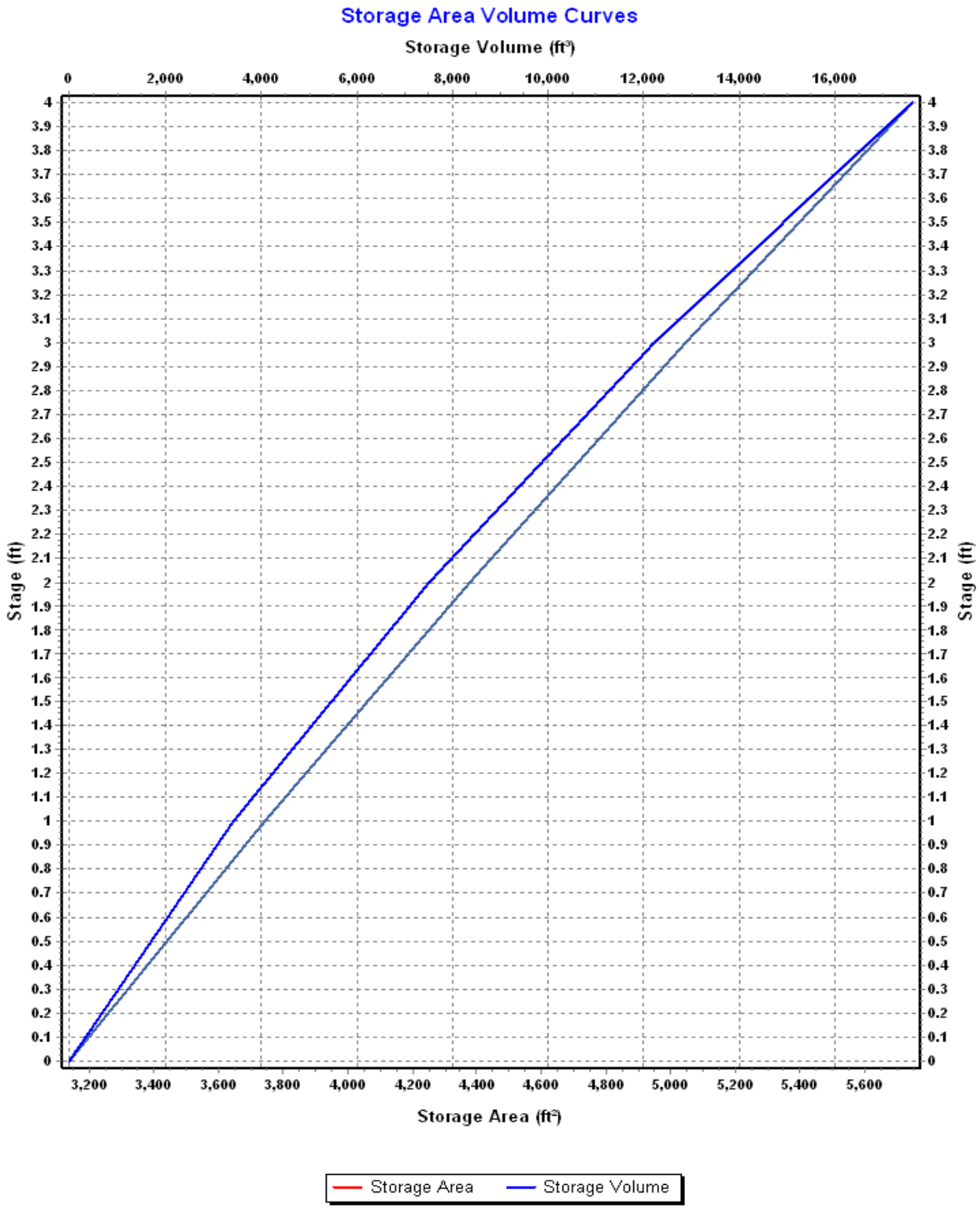
Input Data

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

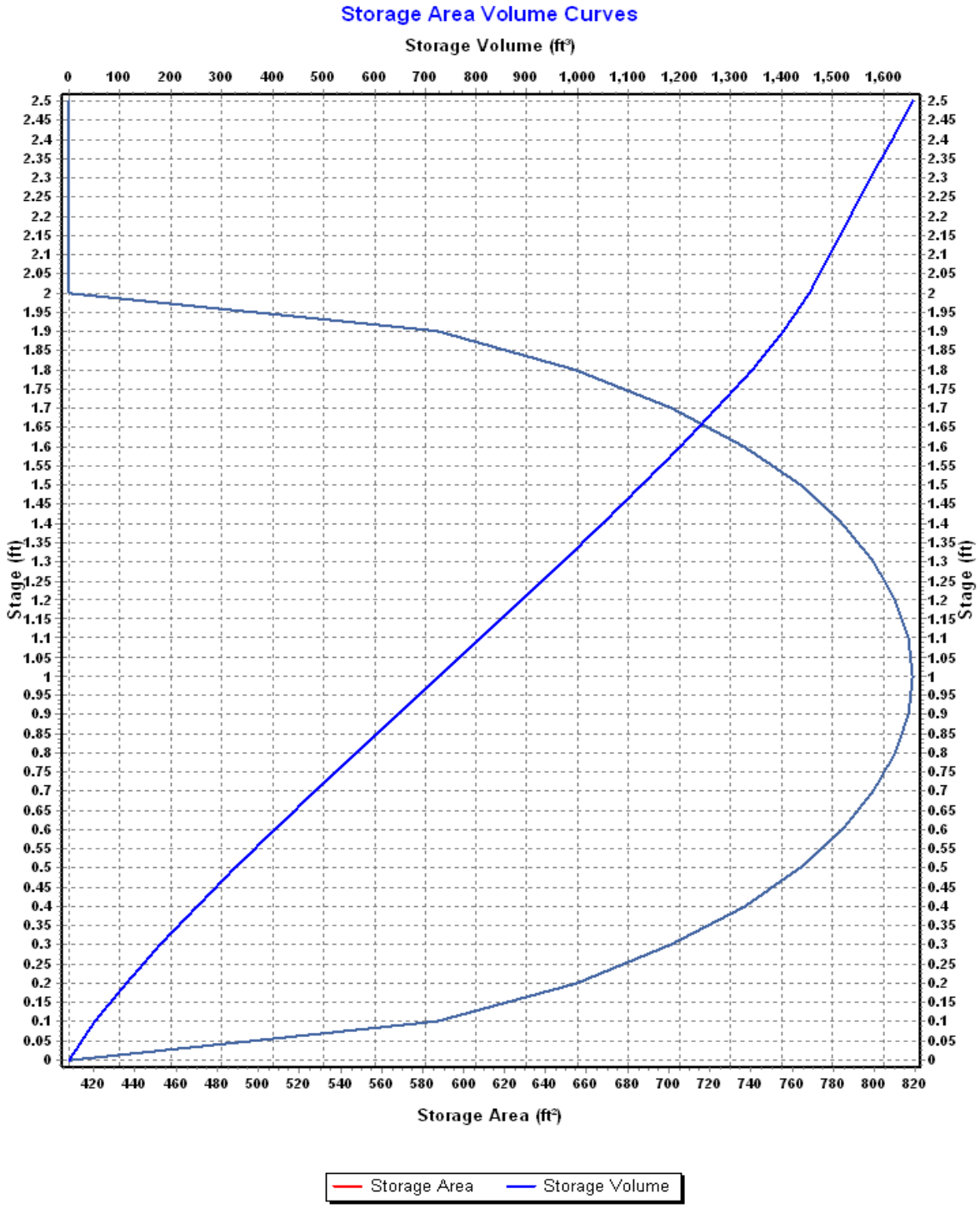
Invert Elevation (ft)	5858.40
Max (Rim) Elevation (ft)	5861.40
Max (Rim) Offset (ft)	3.00
Initial Water Elevation (ft)	5858.40
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

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

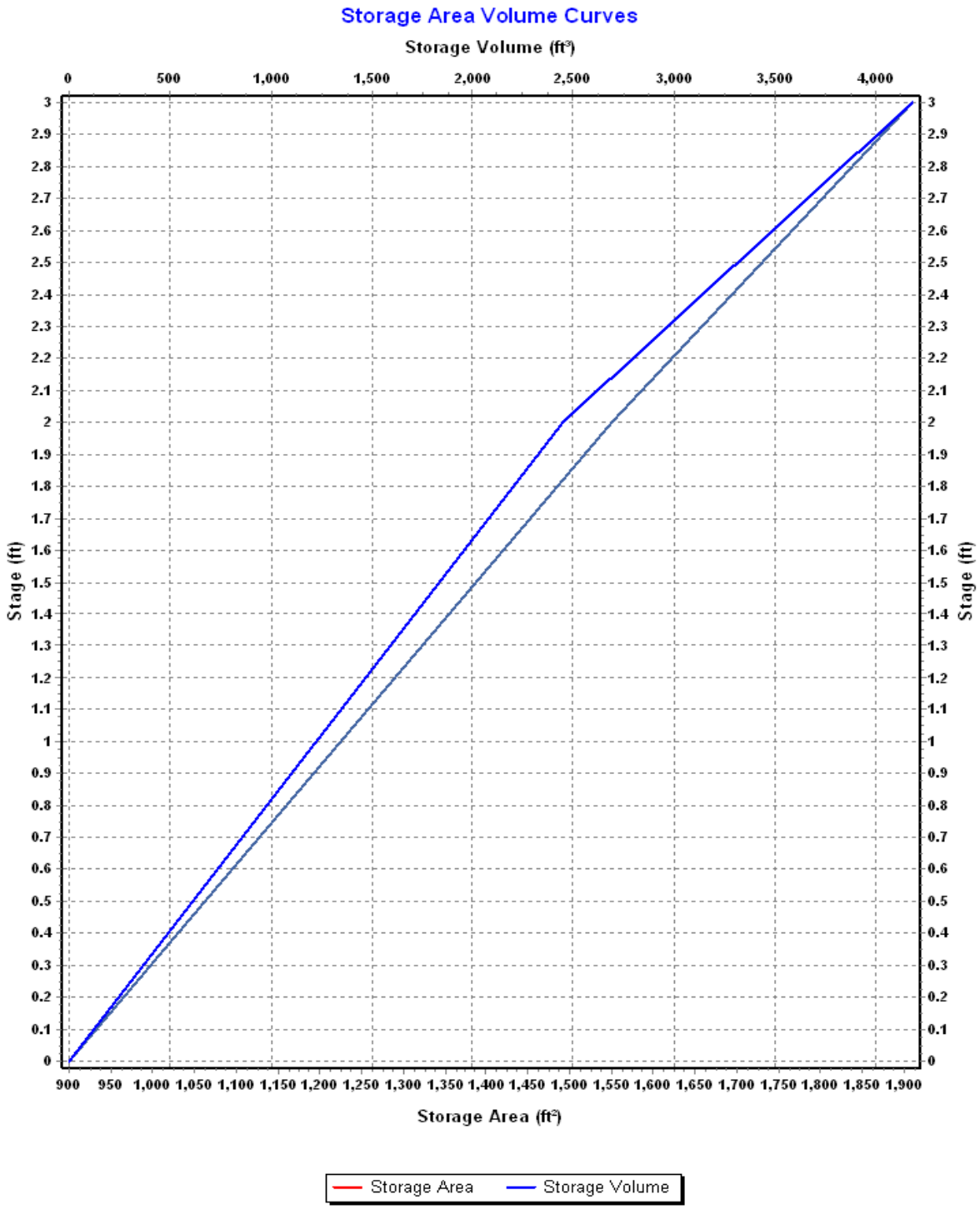
Invert Elevation (ft)	5852.00
Max (Rim) Elevation (ft)	5855.00
Max (Rim) Offset (ft)	3.00
Initial Water Elevation (ft)	5852.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

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.

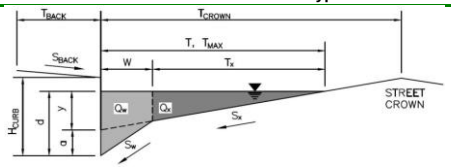
Version 4.05 Released March 2017

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'

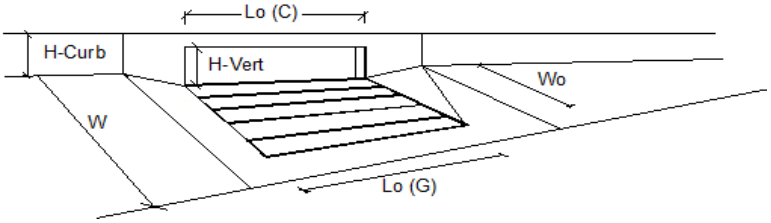
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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



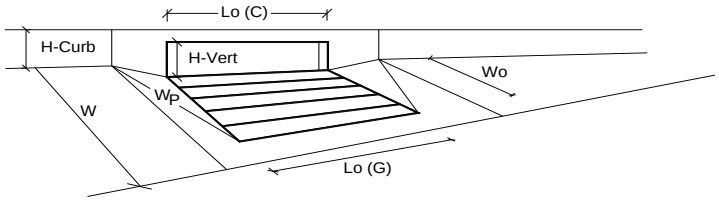
	Design Information (Input)		MINOR	MAJOR	
	Type of Inlet	Type =	CDOT Type R Curb Opening		
Warning 1	Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	2.0	2.0	inches
	Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
	Length of a Single Unit Inlet (Grate 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



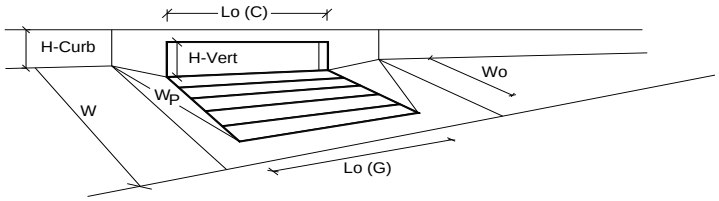
		MINOR	MAJOR	
Design Information (Input)				
Type of Inlet (Denver No. 16 Combination)	Type =	Denver No. 16 Combination		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	2.00	2.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (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

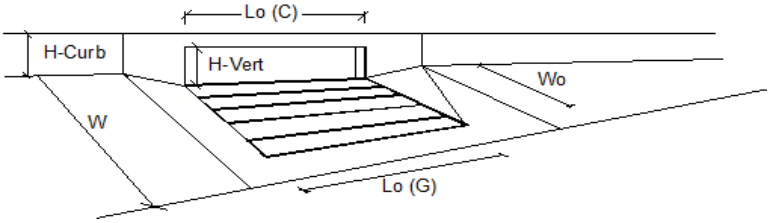


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	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	

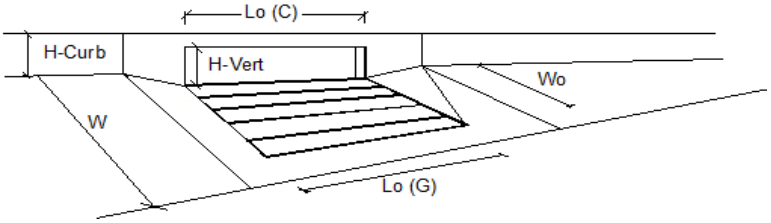
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR STORM'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.3**	**1.5**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**3.7**	**6.5**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**26**	**18**	**%**

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**	**%**

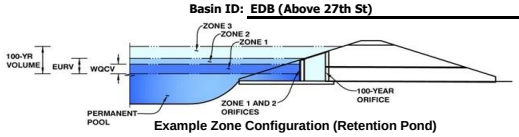
This is used to estimate the inlet capacity of a CDOT Type-16 Combination Inlet on grade with longitudinal slope of 2%.

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		

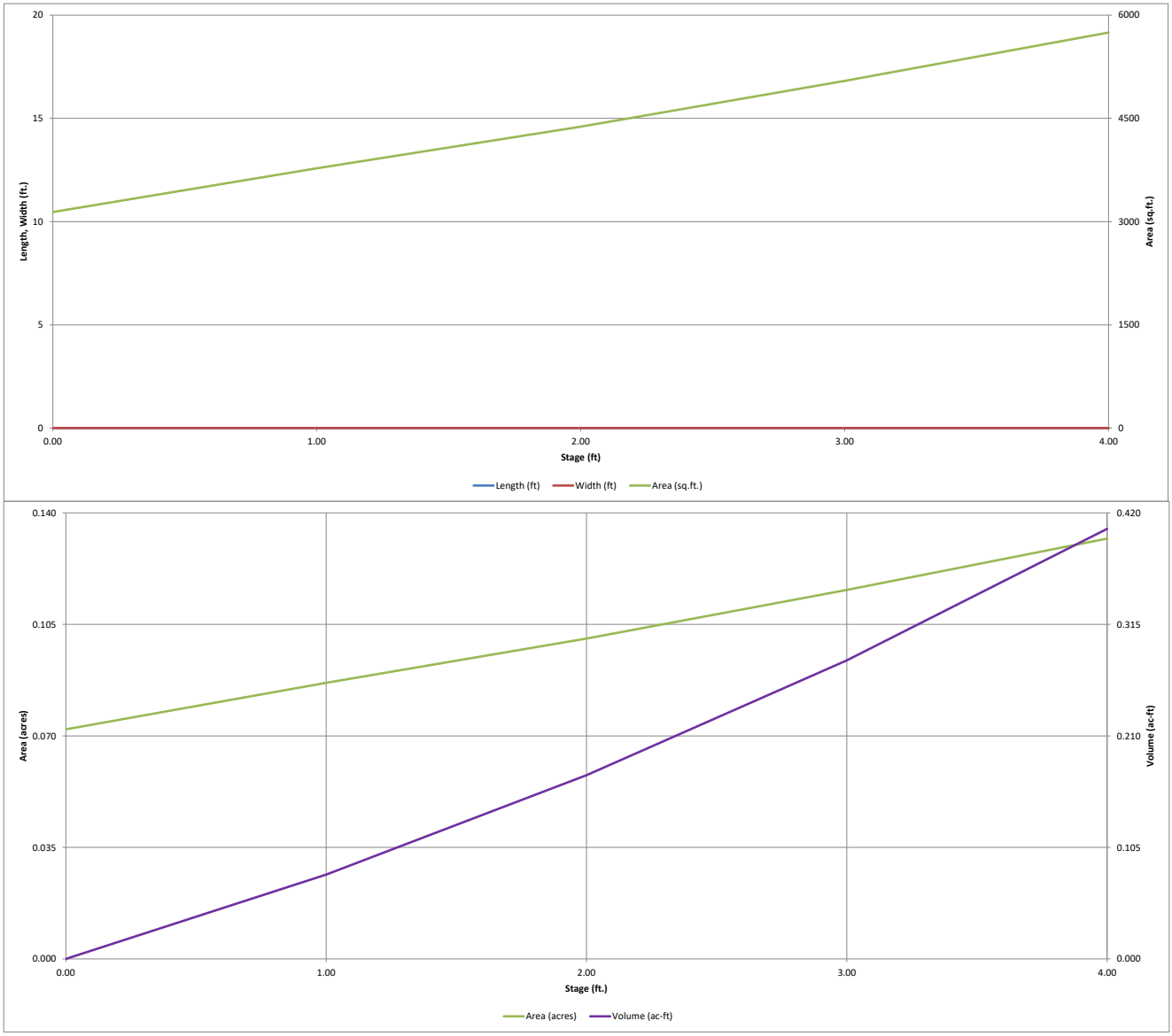
Define Zones and Basin Geometry

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.)

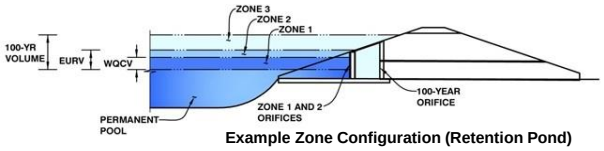
0.140
0.105
0.070
0.035
0.000
0.420
0.315
0.210
0.105
0.000
Area (acres)
Volume (ac-ft)
0.00
1.00
2.00
3.00
4.00
Stage (ft.)
Area (acres)
Volume (ac-ft)

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)

Depth at top of Zone using Orifice Plate = 3.00 ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = N/A inches

Orifice Plate: Orifice Area per Row = N/A inches

Calculated Parameters for Plate

WQ Orifice Area per Row = N/A ft^2

Elliptical Half-Width = N/A feet

Elliptical Slot Centroid = N/A feet

Elliptical Slot Area = N/A ft^2

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	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

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	
Overflow Weir Front Edge Height, Ho =	1.75	2.50	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	0.25	2.50	feet
Overflow Weir Grate Slope =	0.00	0.00	H:V
Horiz. Length of Weir Sides =	N/A	2.50	feet
Overflow Grate Open Area % =	100%	70%	%, grate open area/total area
Debris Clogging % =	0%	50%	%

Calculated Parameters for Overflow Weir

	Zone 2 Weir	Zone 3 Weir	
Height of Grate Upper Edge, H_t =	N/A	2.50	feet
Overflow Weir Slope Length =	N/A	2.50	feet
Grate Open Area / 100-yr Orifice Area =	N/A	12.53	
1 erflow Grate Open Area w/o Debris =	N/A	4.38	ft^2
Overflow Grate Open Area w/ Debris =	N/A	2.19	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	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 Pipe Diameter =	8.00	8.00	inches
Restrictor Plate Height Above Pipe Invert =	8.00	8.00	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 2 Restrictor	Zone 3 Restrictor	
Outlet Orifice Area =	0.35	0.35	ft^2
Outlet Orifice Centroid =	0.33	0.33	feet
Half-Central Angle of Restrictor Plate on Pipe =	3.14	3.14	radians

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

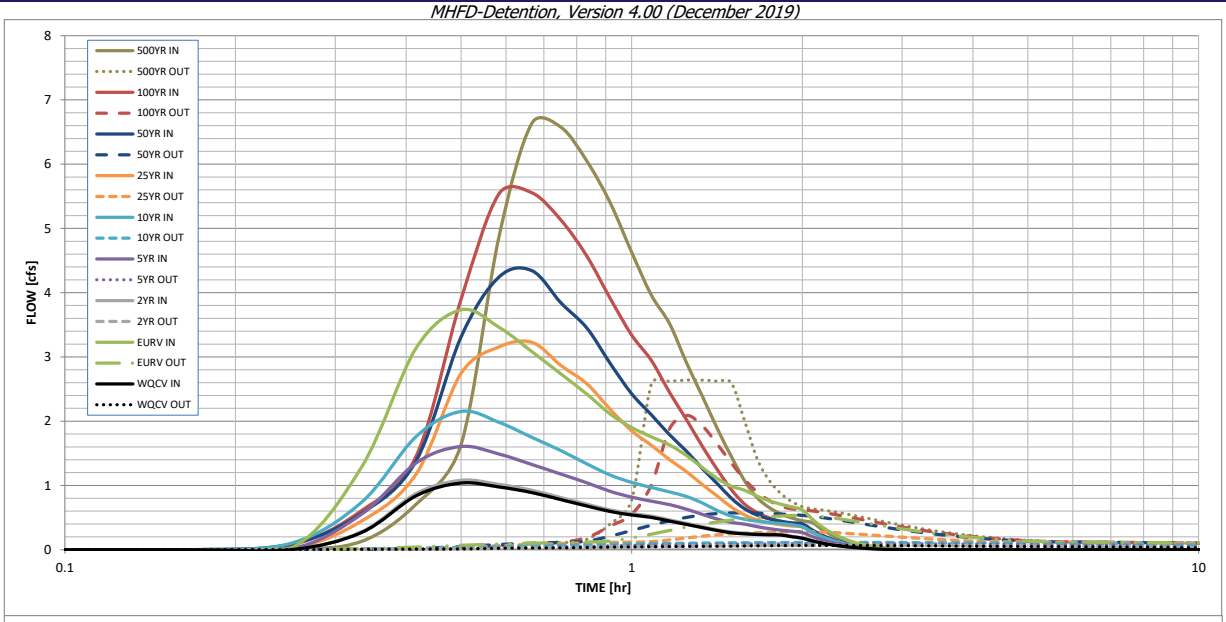
Routed Hydrograph Results

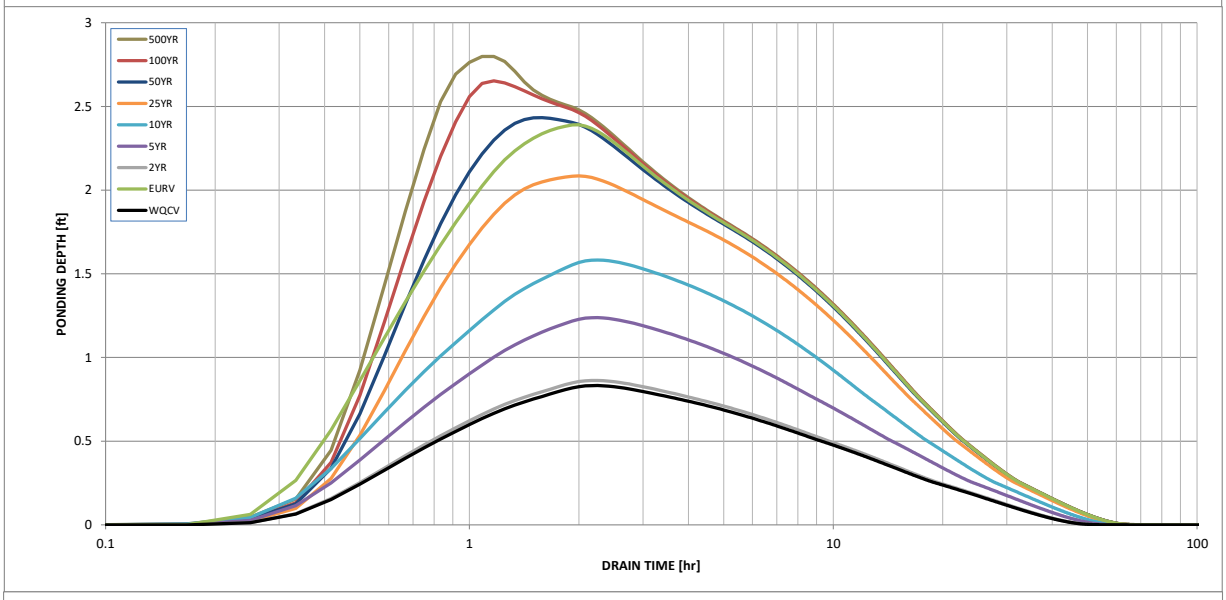
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

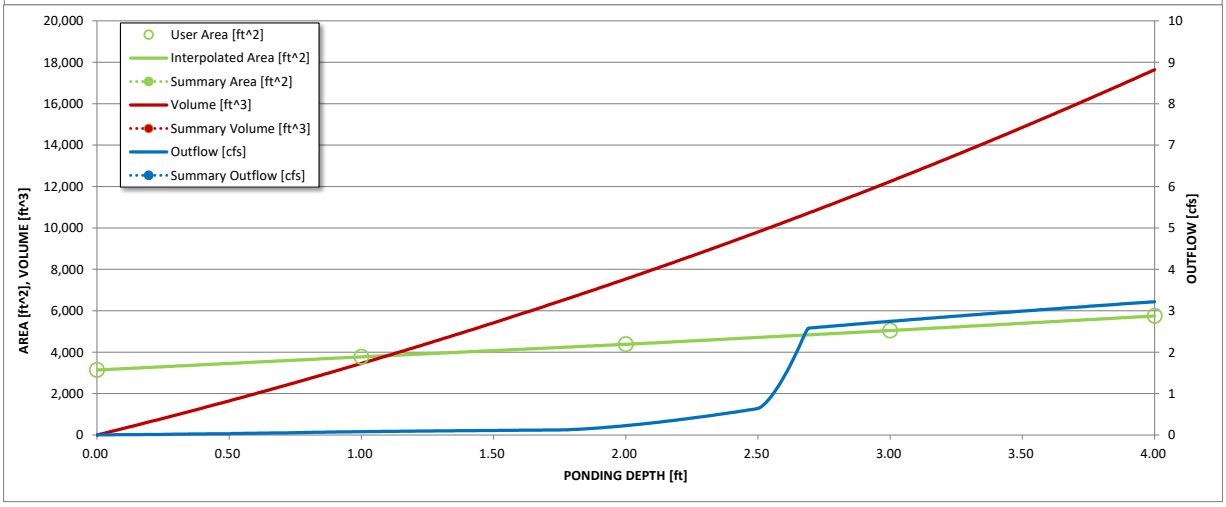
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	1.07	0.51	0.71	0.86	1.05	1.19	1.32	1.45
CUHP Runoff Volume (acre-ft) =	0.074	0.265	0.077	0.114	0.149	0.210	0.269	0.339	0.401
Inflow Hydrograph Volume (acre-ft) =	0.074	0.264	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

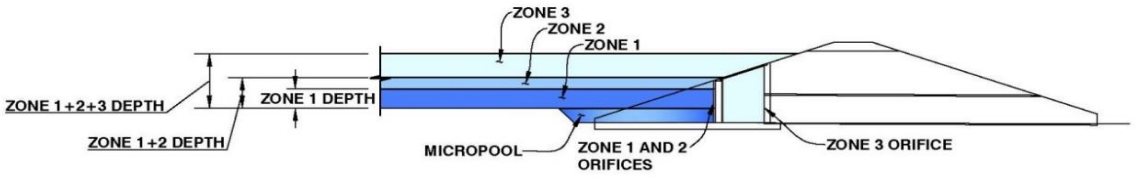
MHFD-Detention, Version 4.00 (December 2019)



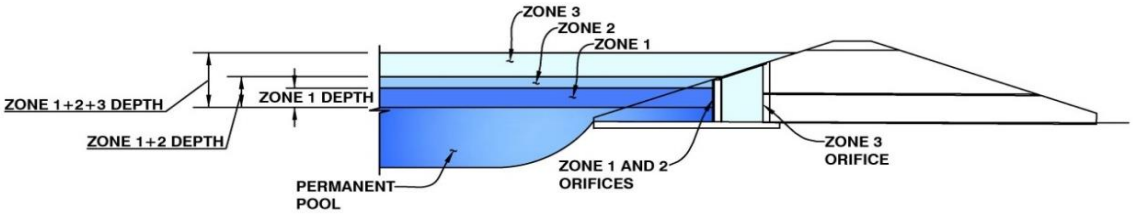




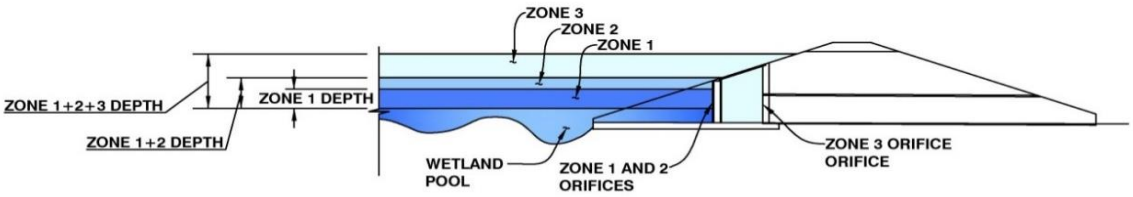
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			



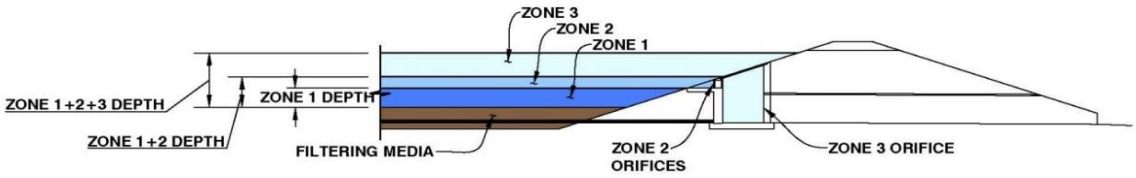
EXTENDED DETENTION BASIN WITH 3 ZONES



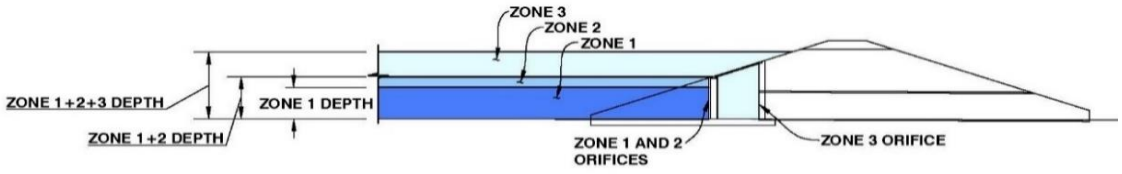
RETENTION POND WITH 3 ZONES



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

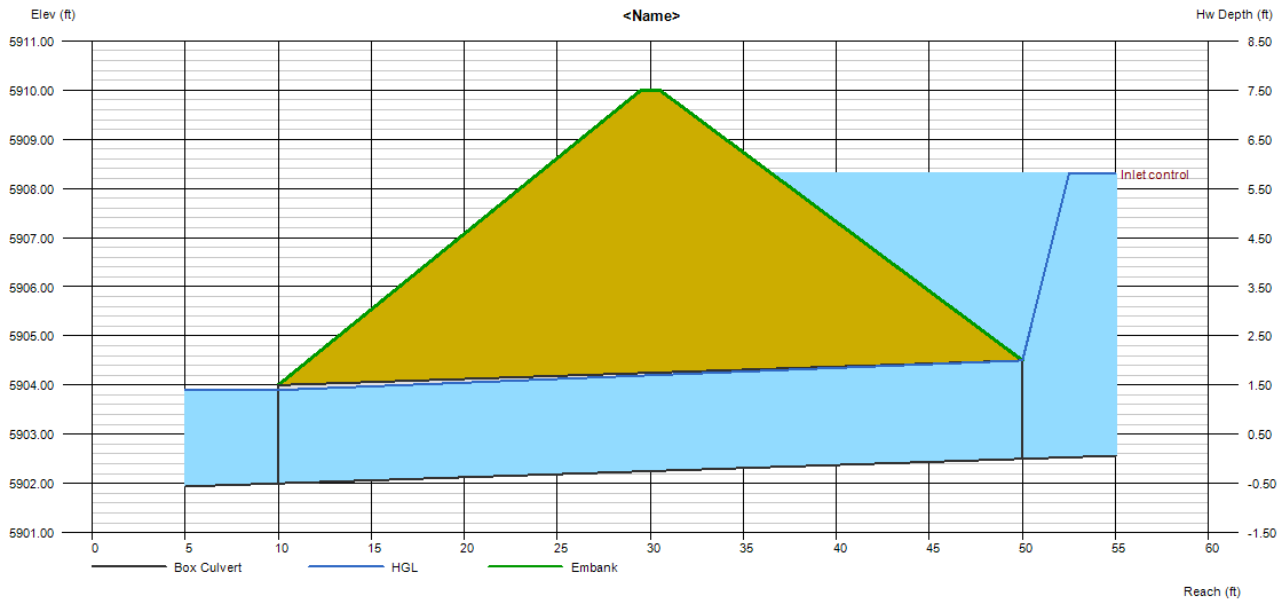
Top Elevation (ft)	=	5910.00
Top Width (ft)	=	1.00
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	0.00
Qmax (cfs)	=	132.00
Tailwater Elev (ft)	=	Critical

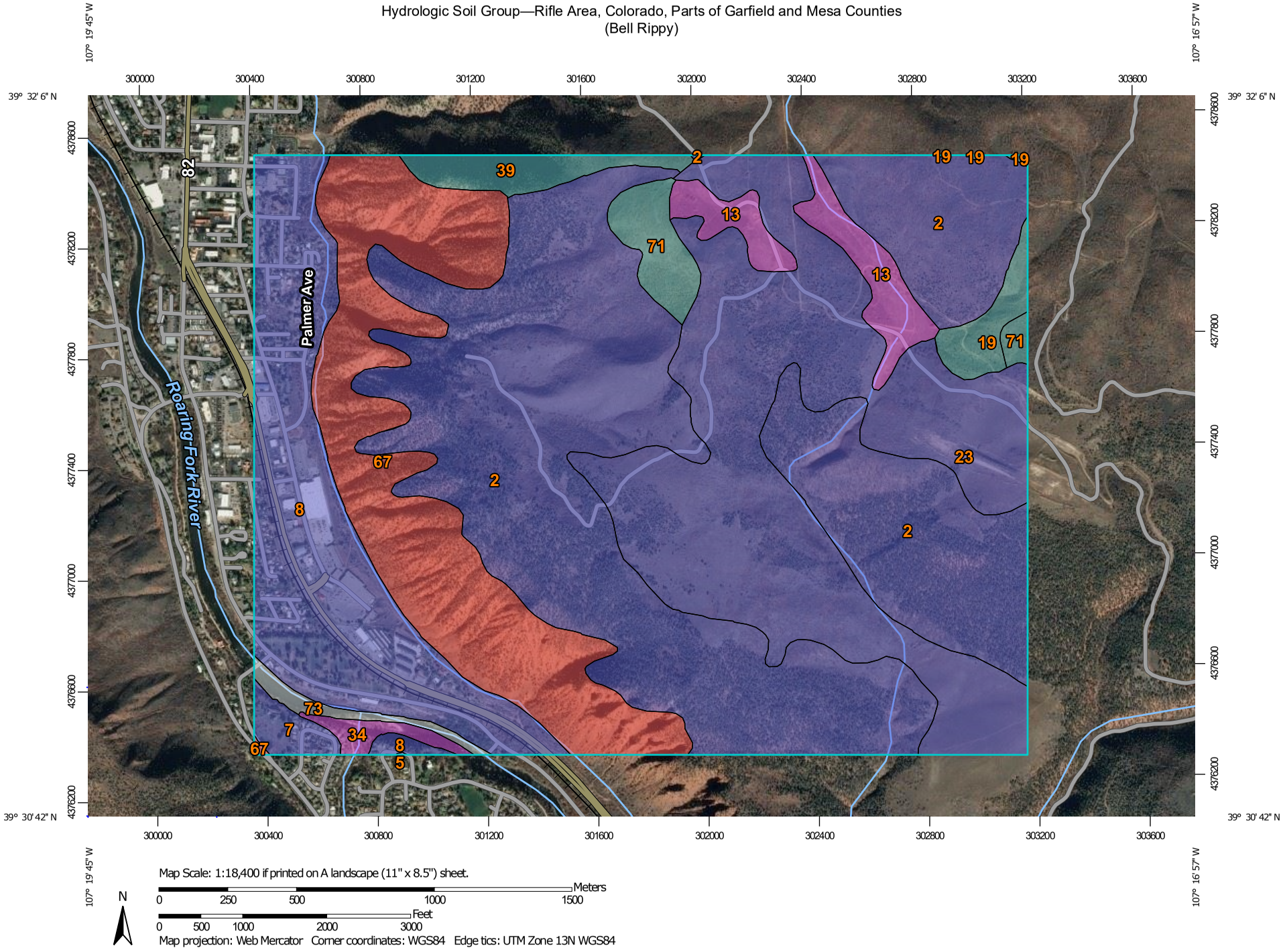
Highlighted

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.

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.

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.

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'

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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

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.)

ZONE A
ZONE D

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%

@ 2.1%

Pr-02
5326 SF
0.122 Ac.
C: 0.83
Tc: 5.0 min.

Match D.3

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NORTH
0 15' 30'
Scale: 1" = 30'

Main Street Improvements Project

Silt, Colorado

Proposed Drainage Construction Set

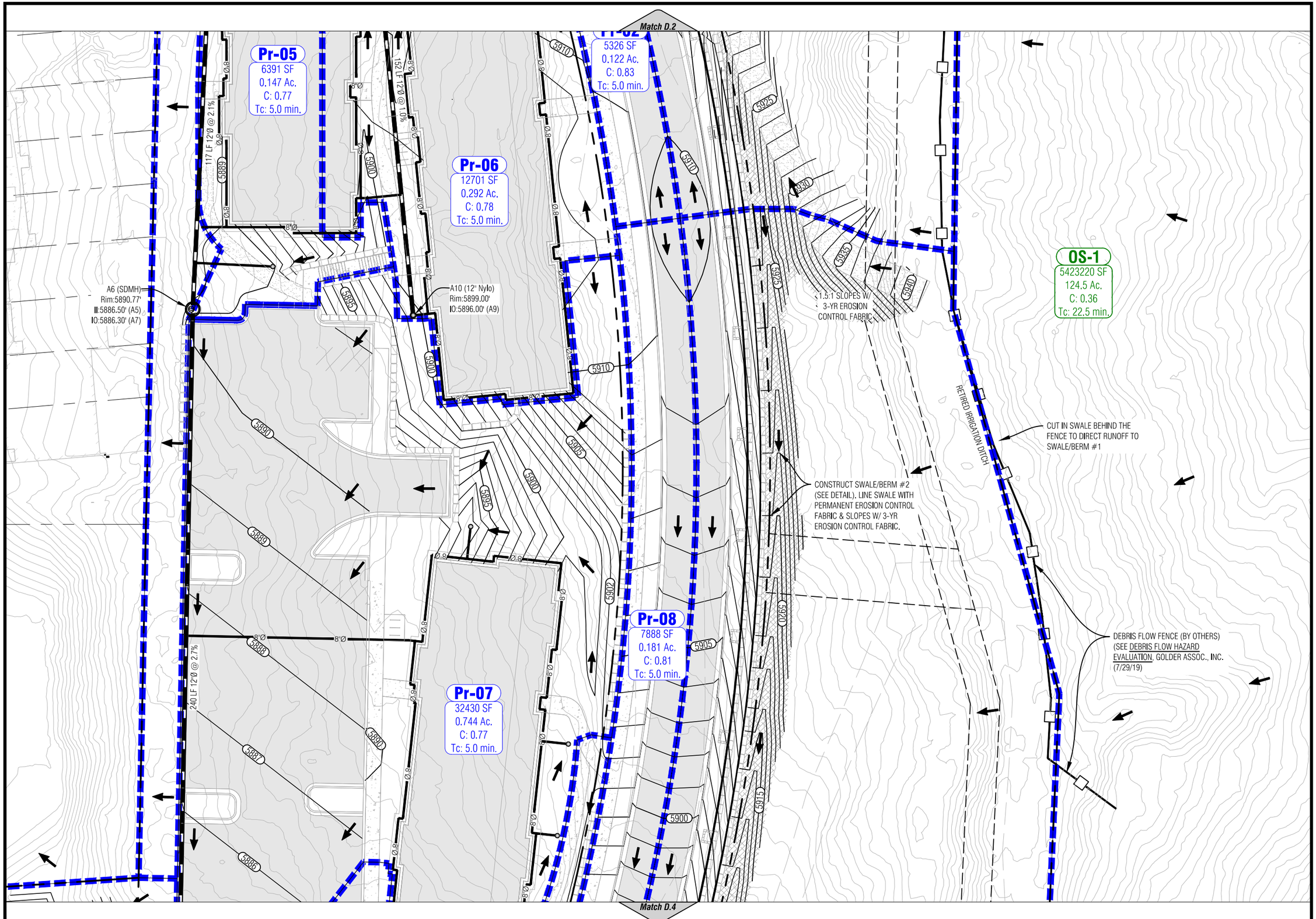
No.	Date	Revision	By
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PROJECT NO: *11104*
Designer: *DJW*
Drafter: *BUI*
Date: *2/5/13*

Sheet
D.2

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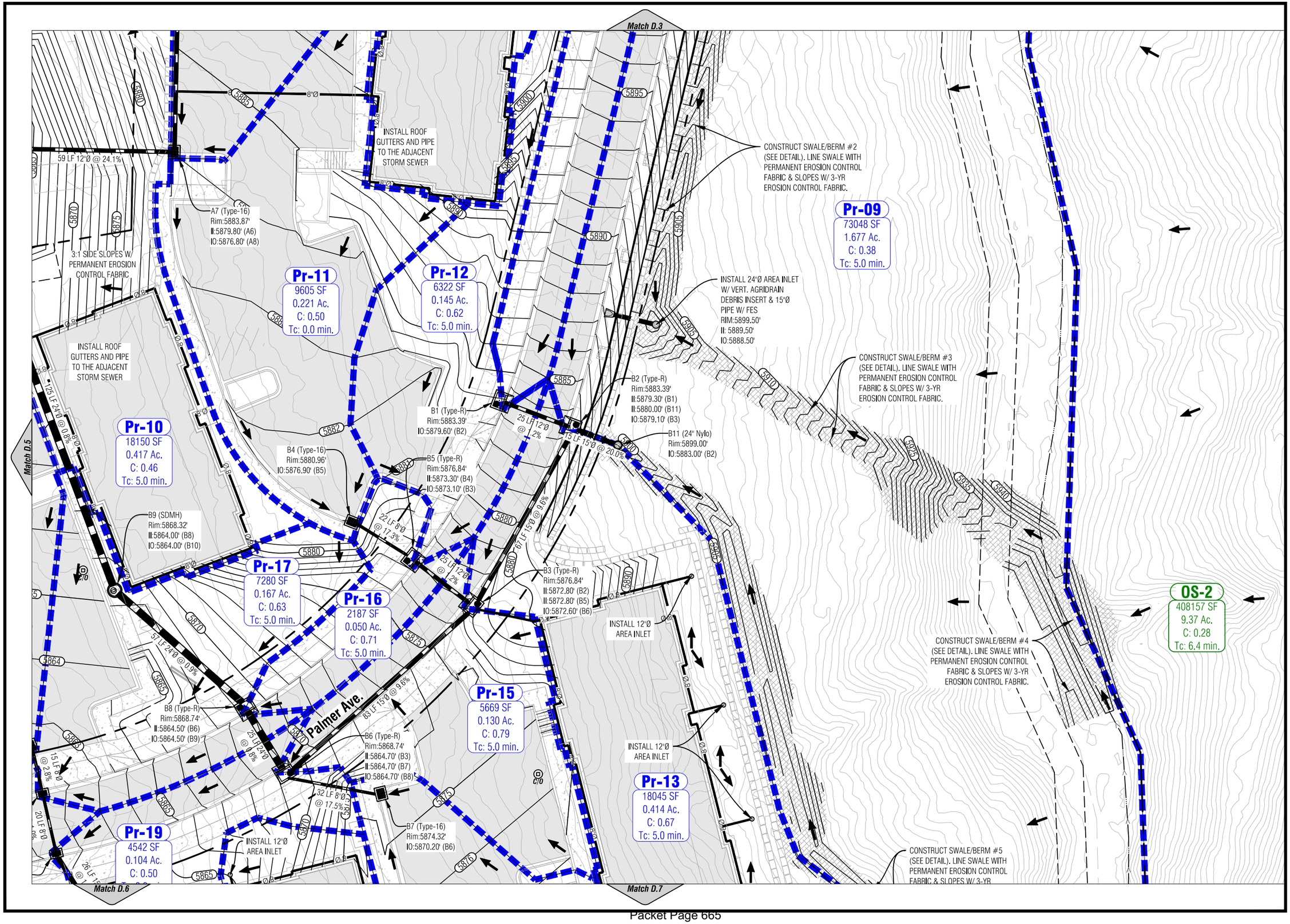
NORTH
0 15' 30'
Scale: 1" = 30'

Main Street Improvements Project
Sill, Colorado
Proposed Drainage
Construction Set

No.	Date	Revision	By
##	##		
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PROJECT NO. *11104*
Designer: *DJH*
Drafter: *BUI*
Date: *2/5/13*
Sheet *D.3*
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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.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%

25 LF 24"Ø @ 0.8%

83 LF 15"Ø @ 9.6%

22 LF 8"Ø @ 17.3%

32 LF 8"Ø

15 LF 8"Ø @ 2.8%

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 5885 5886

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NORTH
0 15' 30'
Scale: 1" = 30'

Main Street Improvements Project
Silt, Colorado
Proposed Drainage
Construction Set

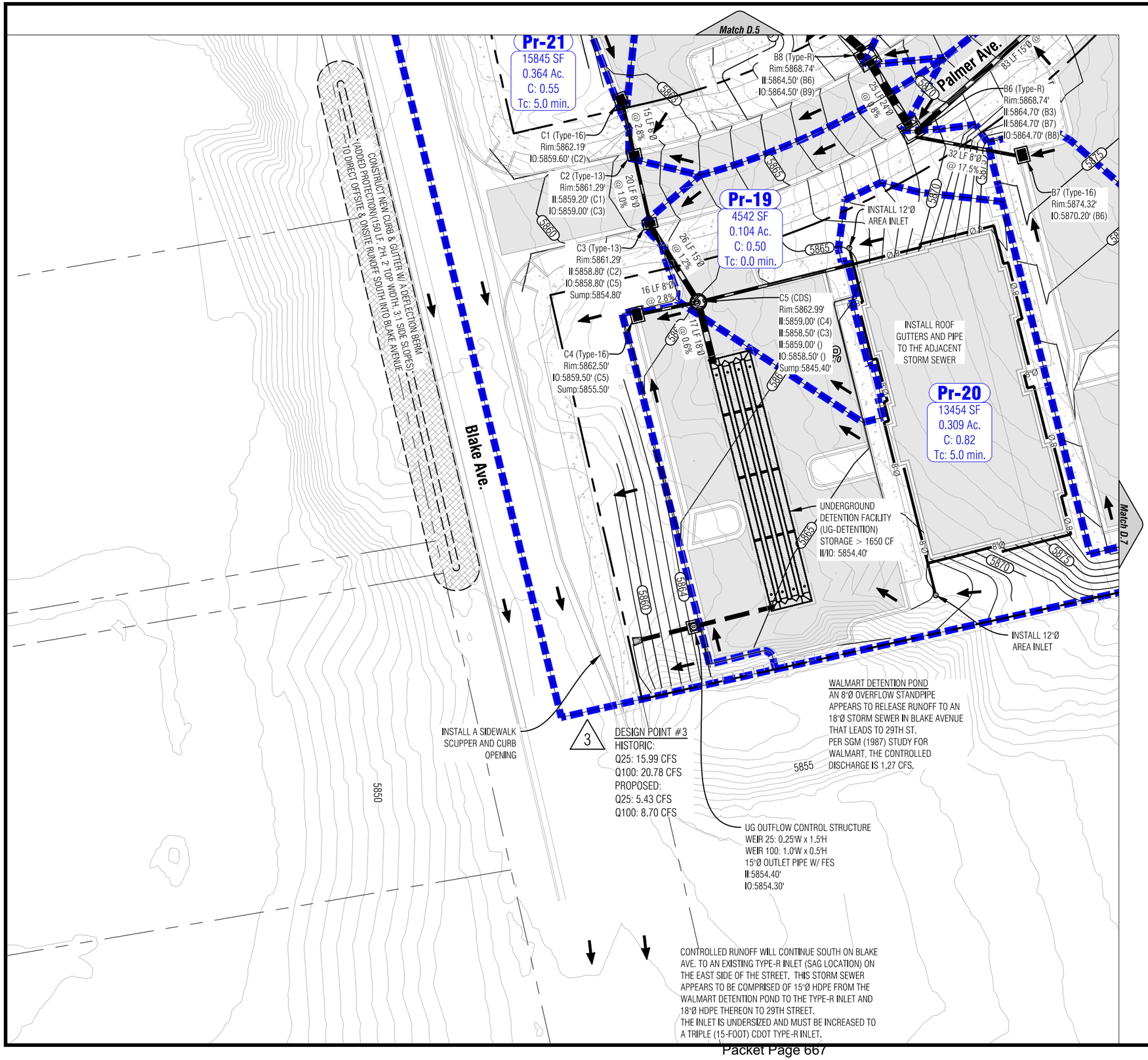
No.	Date	Revision	By
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PROJECT NO. 11104
Designer: DJW
Drafter: BUI
Date: 2/5/13

Sheet D.5

File Name: 20002-C-Drainage.dwg

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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: *BU*
Date: *2/5/13*

Sheet *D.6*

File Name: *20002-C-Drainage.dwg*

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Pr-16
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-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.

Match D.4

Match D.6

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)

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%
32 LF 8"Ø @ 17.5%
26 LF 15"Ø @ 2%
16 LF 8"Ø @ 2.8%
17 LF 18"Ø @ 0.6%

INSTALL 12"Ø AREA INLET

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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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

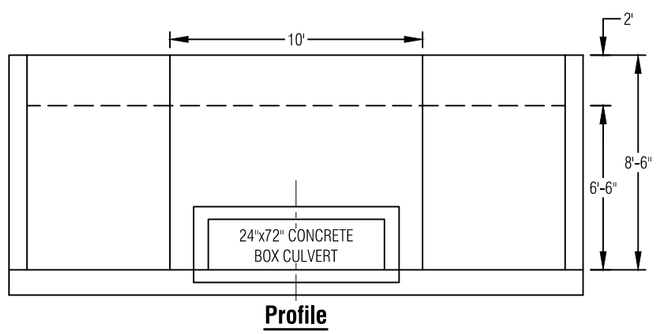
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File Name: *Z0002-C-Drainage.dwg*

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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

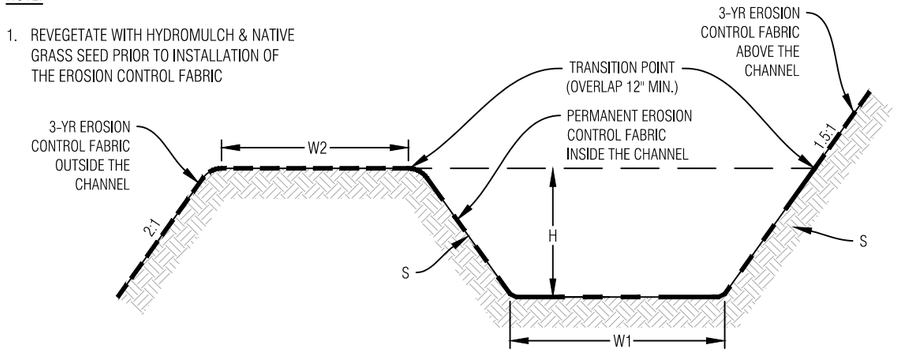
1. CONSTRUCTION SHALL CONFORM TO CDOT STANDARD PLAN NO(S). M-601-1 "SINGLE CONCRETE BOX CULVERT (CAST-IN-PLACE)", M-610-10 "HEADWALL FOR PIPES", M-610-20 "WINGWALLS FOR PIPE OR BOX CULVERTS", AND M-603-12 "TRAVERSABLE END SECTIONS AND SAFETY GRATES", LATEST EDITION.

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.

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'

No.	Date	Revision	By
##	##		

PROJECT NO. *11104*
Designer: *DJW*
Drafter: *BUI*
Date: *2/5/13*

Sheet *D.8*

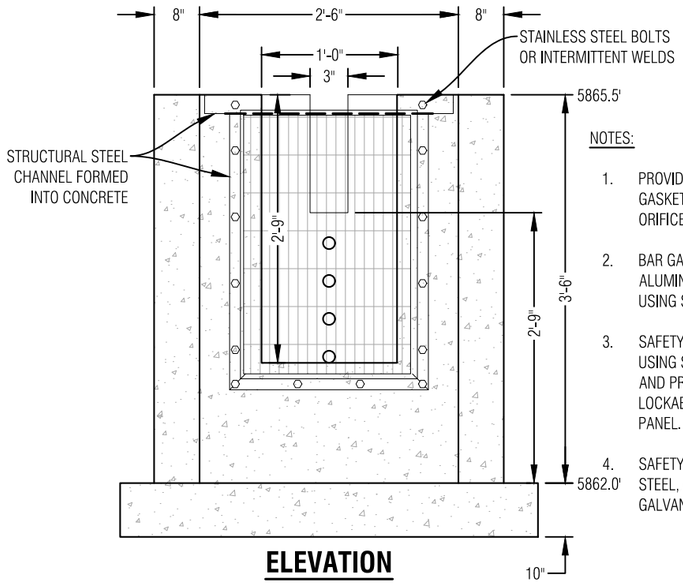
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Silt, Colorado

Main Street Improvements Project

Drainage Notes & Details
Construction Set

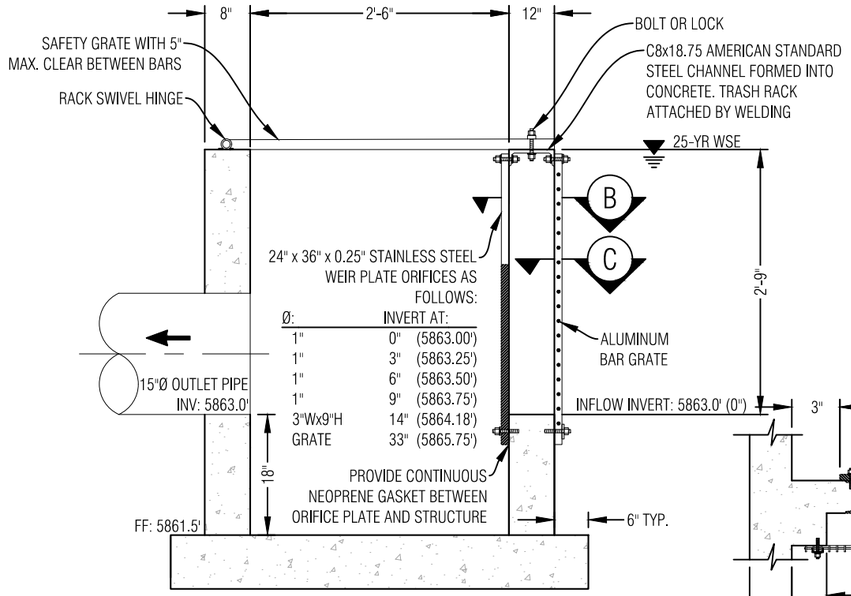
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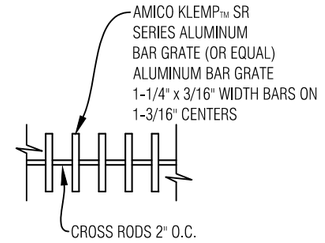
NOTES:

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.

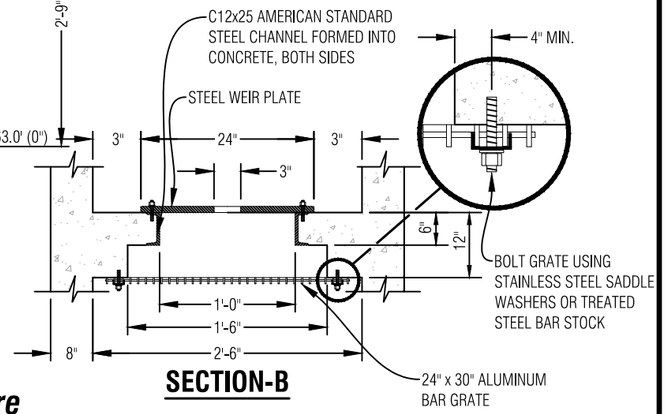
ELEVATION



SECTION VIEW



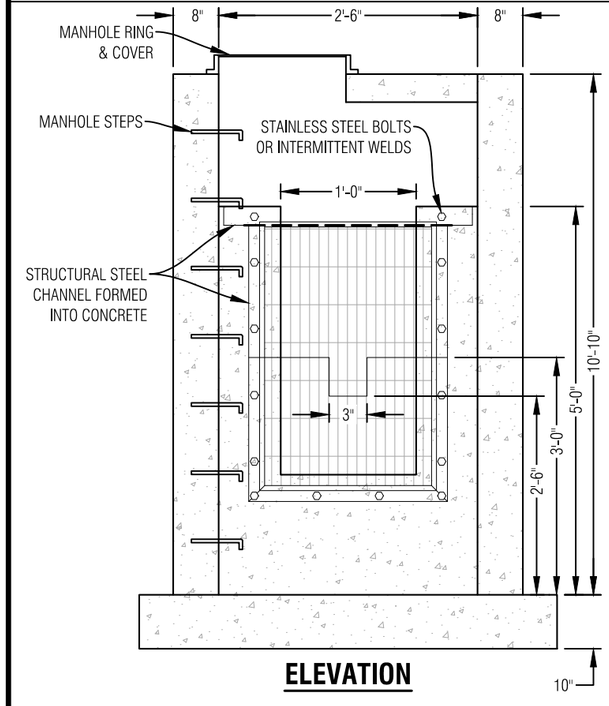
SECTION-C



SECTION-B

Extended Detention Basin (EDB) Outflow Control Structure

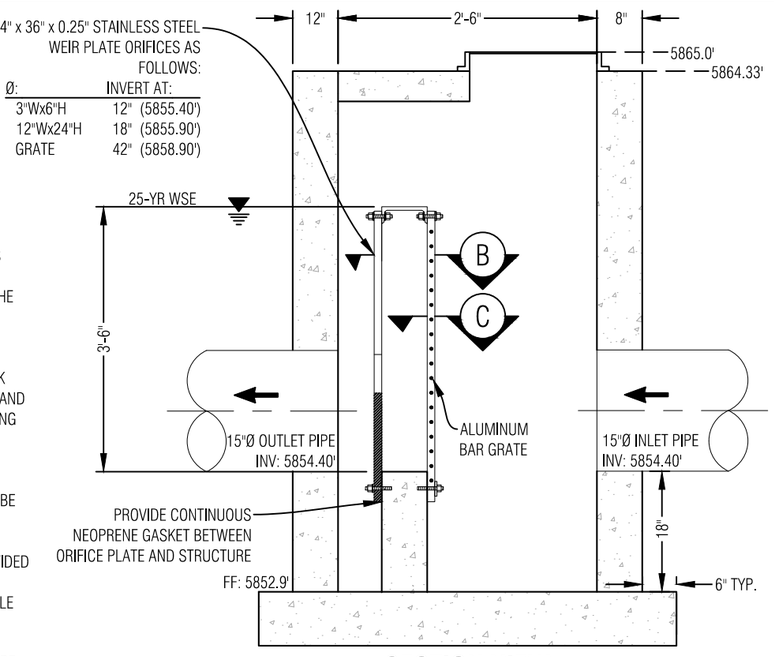
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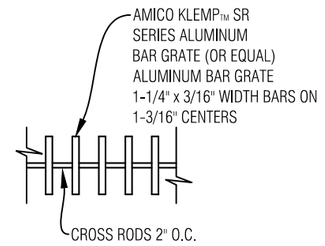
NOTES:

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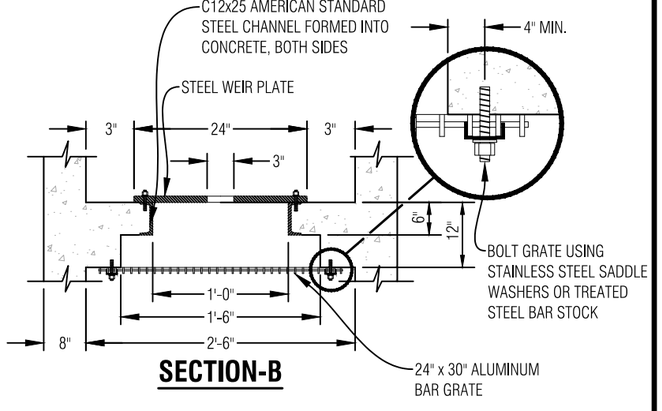
ELEVATION



SECTION VIEW



SECTION-C



SECTION-B

Underground (UG) Outflow Control Structure

Scale: N.T.S.

Boundaries Unlimited Inc.
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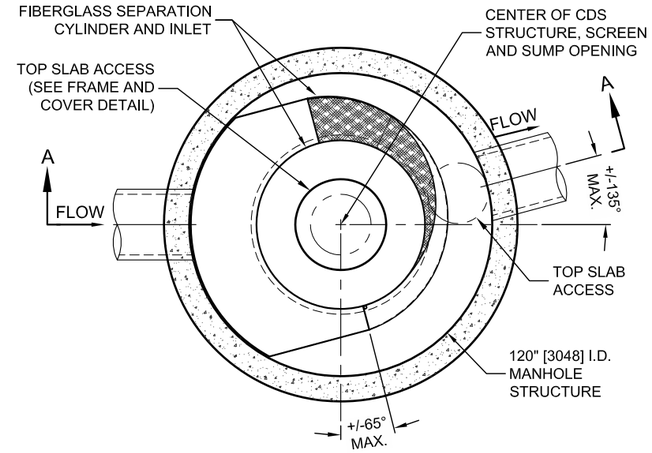
NORTH
0 0.5' 1'
Scale: 1" = 1'

Main Street Improvements Project
Silt, Colorado
Drainage Details
Construction Set

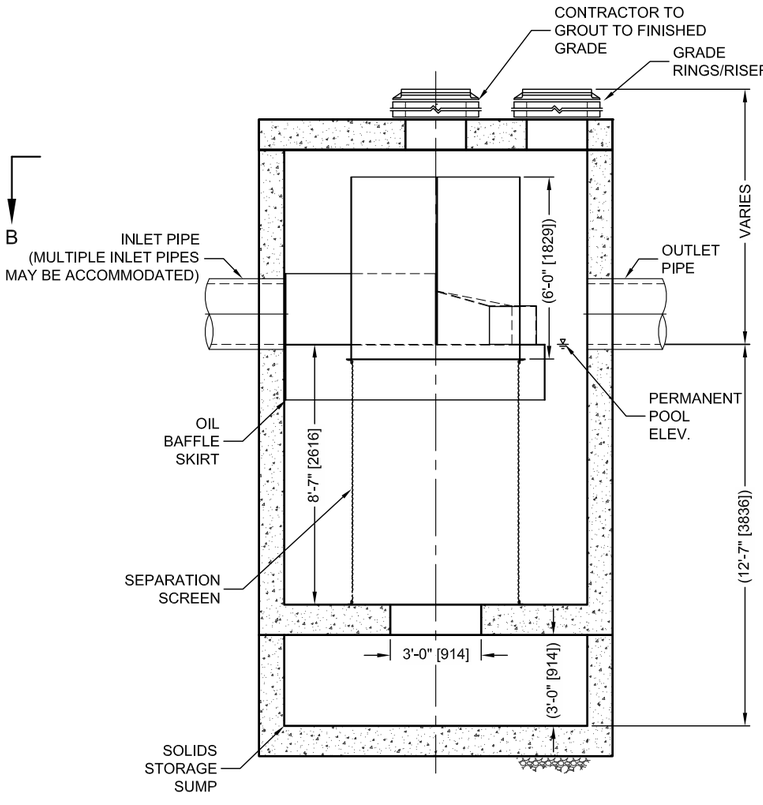
No.	Date	Revision	By
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PROJECT NO. 11104
Designer: DJW
Drafter: BUI
Date: 2/5/13
Sheet D.9
File Name: 20002-C-Drainage.dwg

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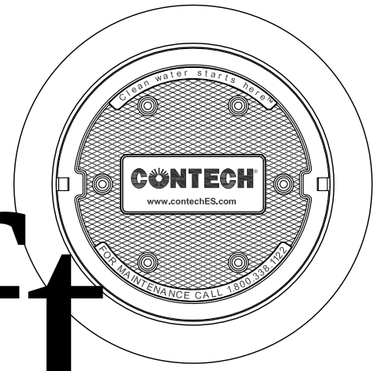
PLAN VIEW B-B
N.T.S.



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.

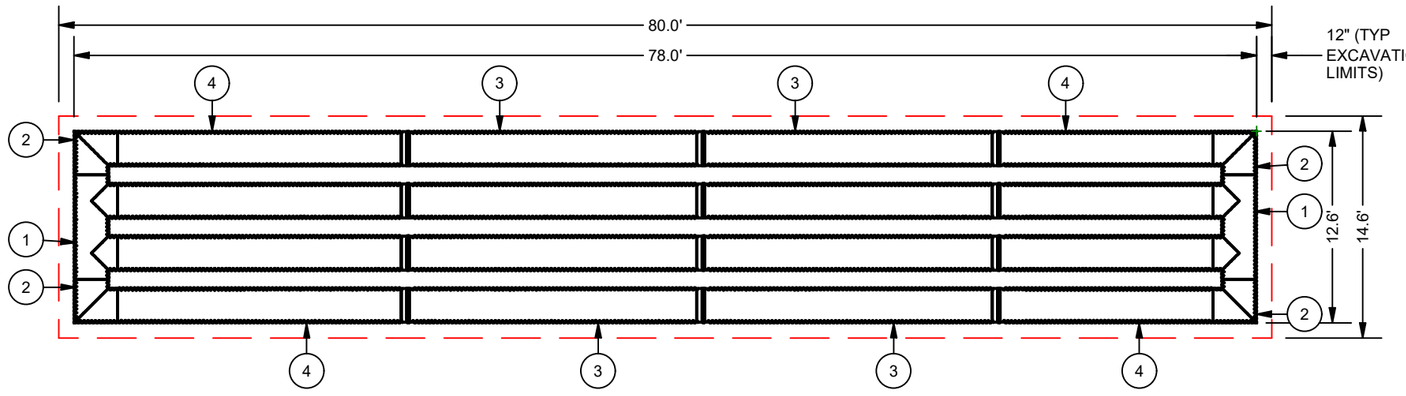
CUSTOMER DATE

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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

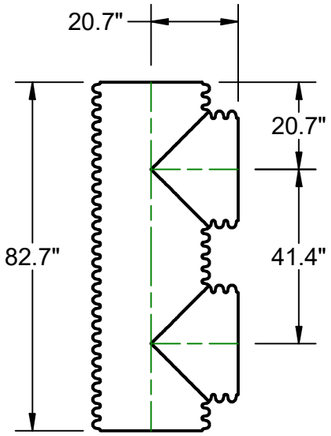
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

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

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1-800-733-7473

ADS
ADVANCED DRAINAGE SYSTEMS, INC.

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SHEET
3 OF 5

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

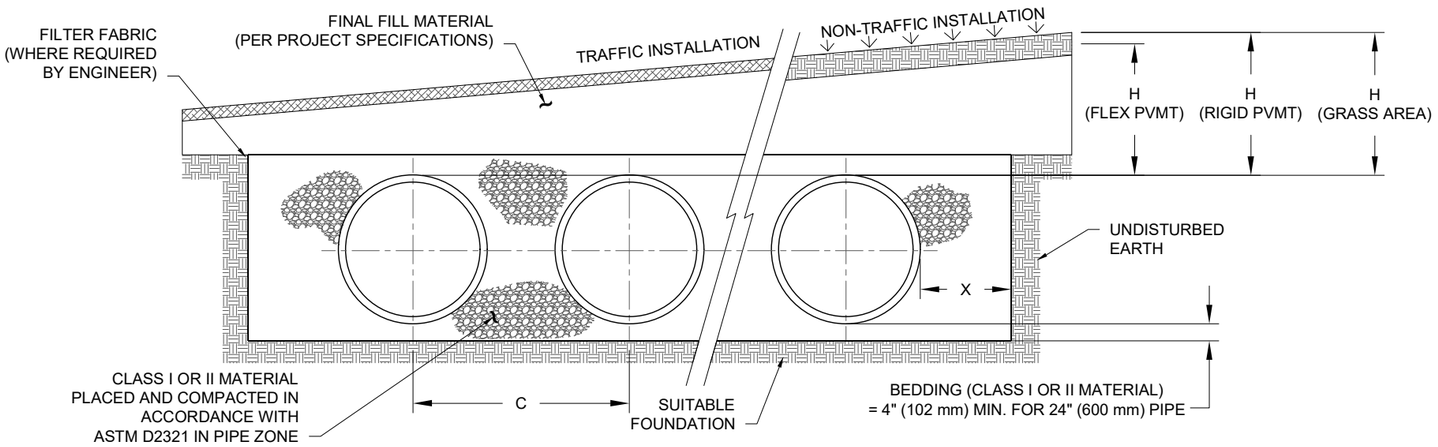
24" STIB PERF
DETENTION SYSTEM

HDPE N-12

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HILLIARD, OH 43026
1-800-733-7473

ADVANCED DRAINAGE SYSTEMS, INC.

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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
CHECKED: N/A
PROJECT #:

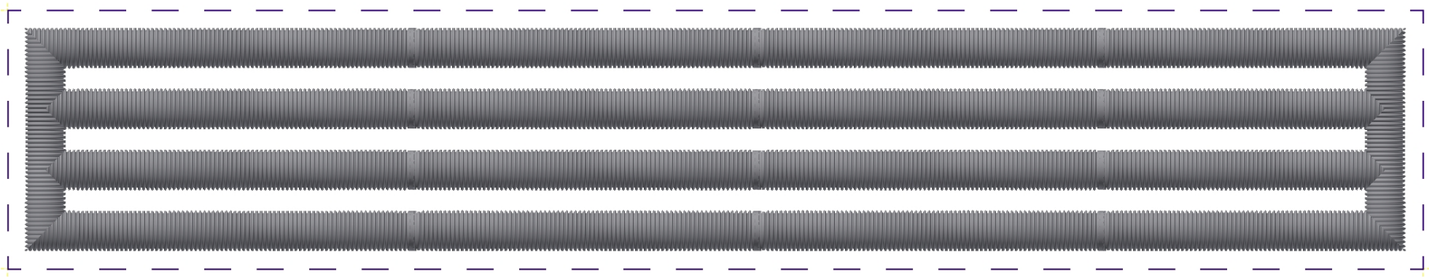
REV	DRW	CHK	DESCRIPTION

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 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.



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.
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1669256

July 29, 2019

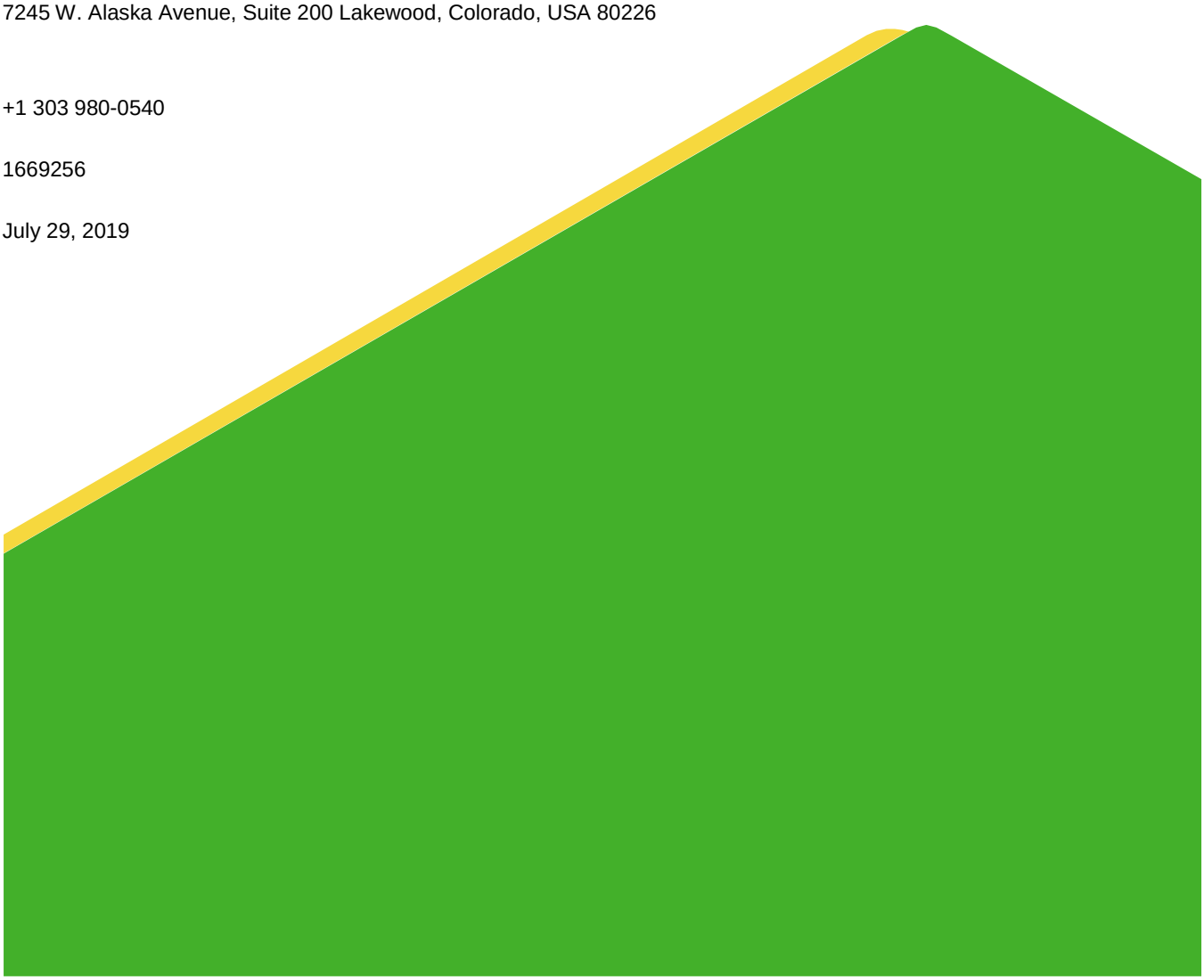


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Figure 1 Flexible Debris Flow Fence Example

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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)

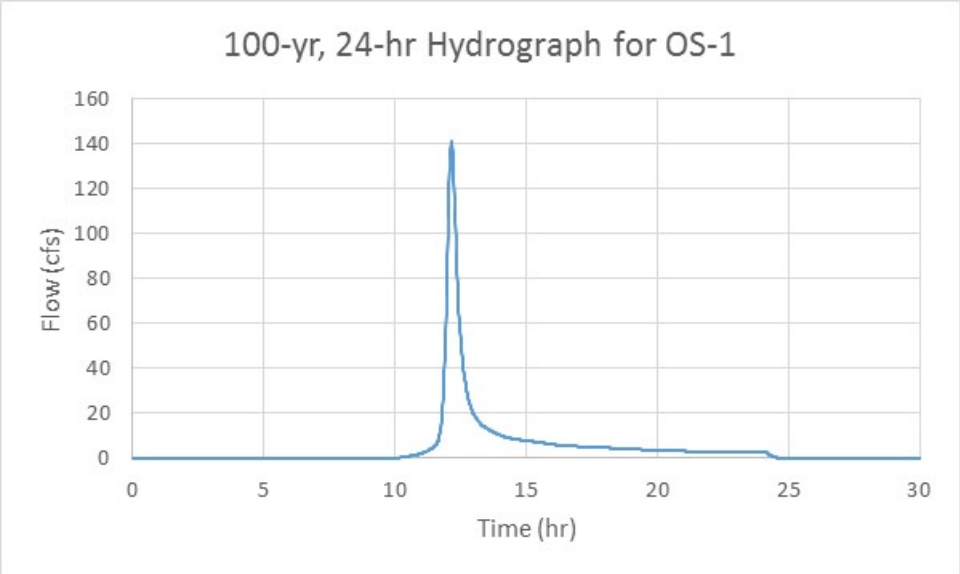
3.3 Analysis

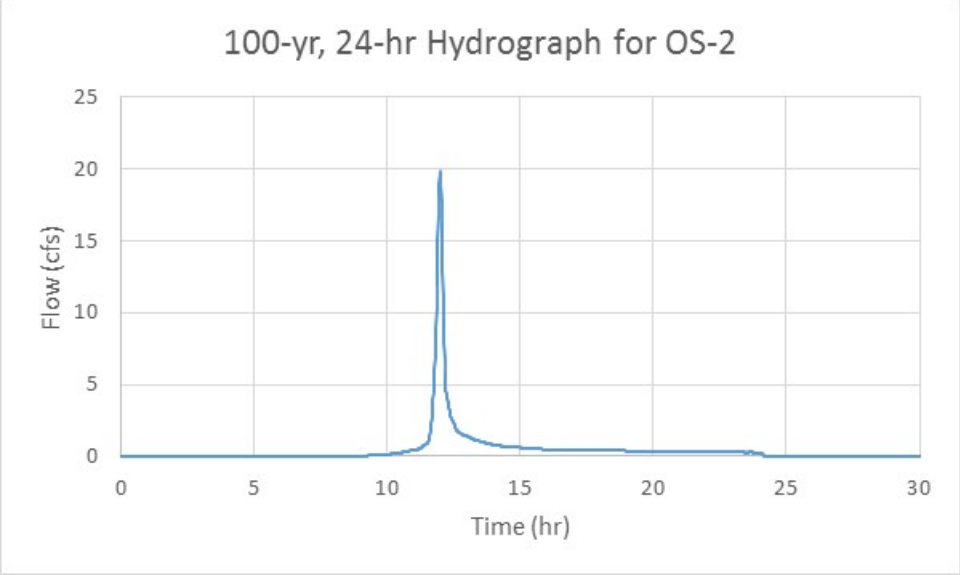
Calculations were performed by Yarnell for off-site basins OS-1 and OS-2 that correspond to the north and south contributing basins, respectively, subject to debris flows (Yarnell 2017). Precipitation that falls directly on the fan will not contribute significantly to the potential for debris flow at 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.

Elizabeth Kidner, PE
Senior Engineer

Roger Pihl, PG
Senior Geologist



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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

Path: M:\Glenwood\Multi Family\LLC\Mapping\11x17_GlenwoodMultiFamily_Fig02_SiteLocation.mxd



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

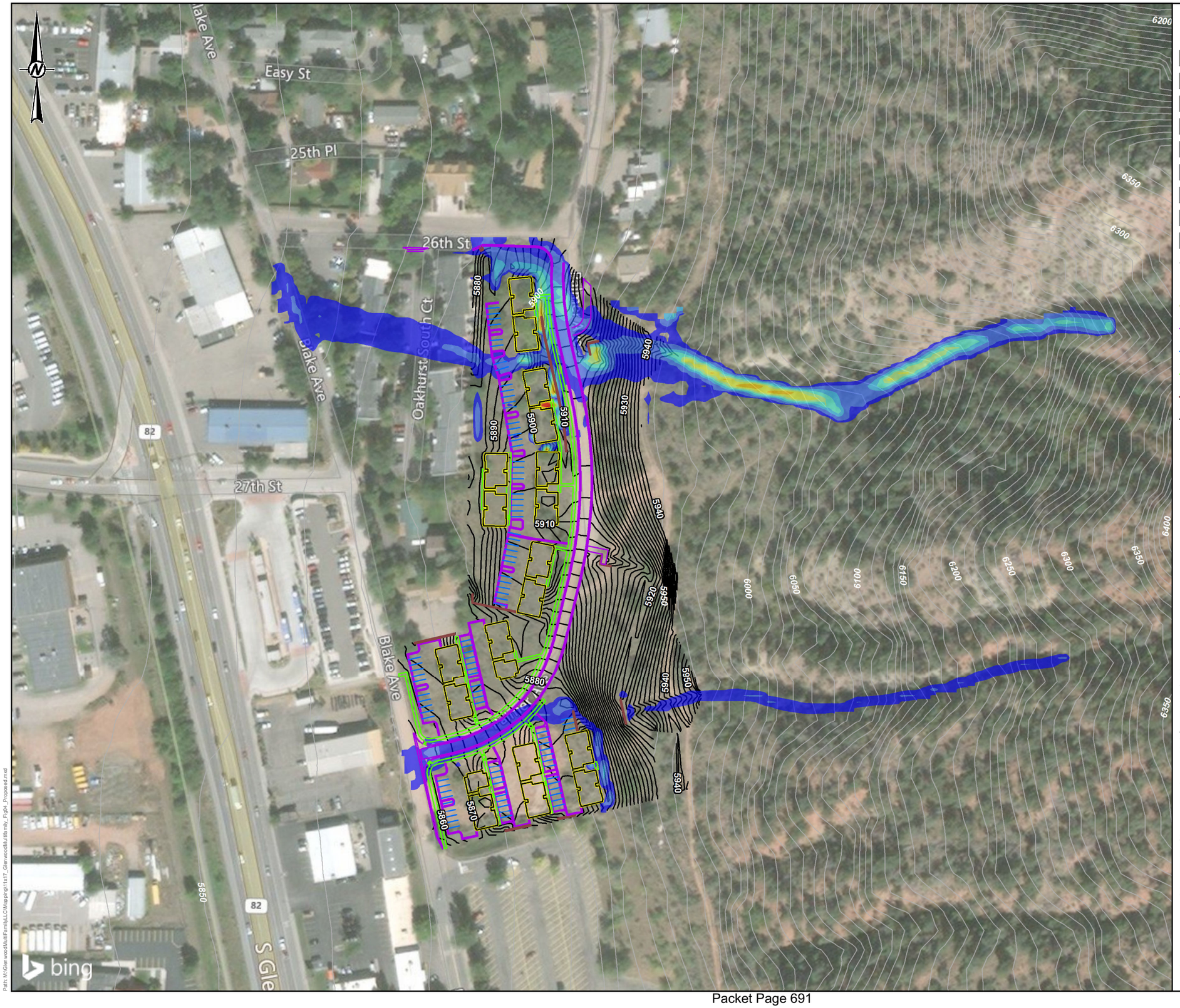
YYYY-MM-DD	2017-08-16
PREPARED	KJC
DESIGN	KJC
REVIEW	CPB
APPROVED	SWR

PROJECT No.
1669256

FIGURE
3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
1in
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)

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:
1in
0

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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

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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.

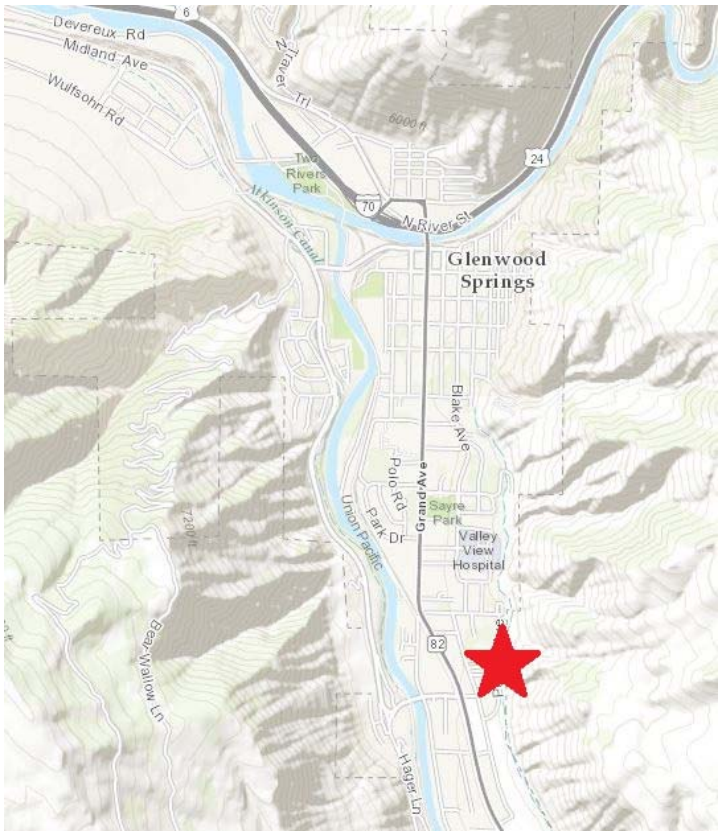
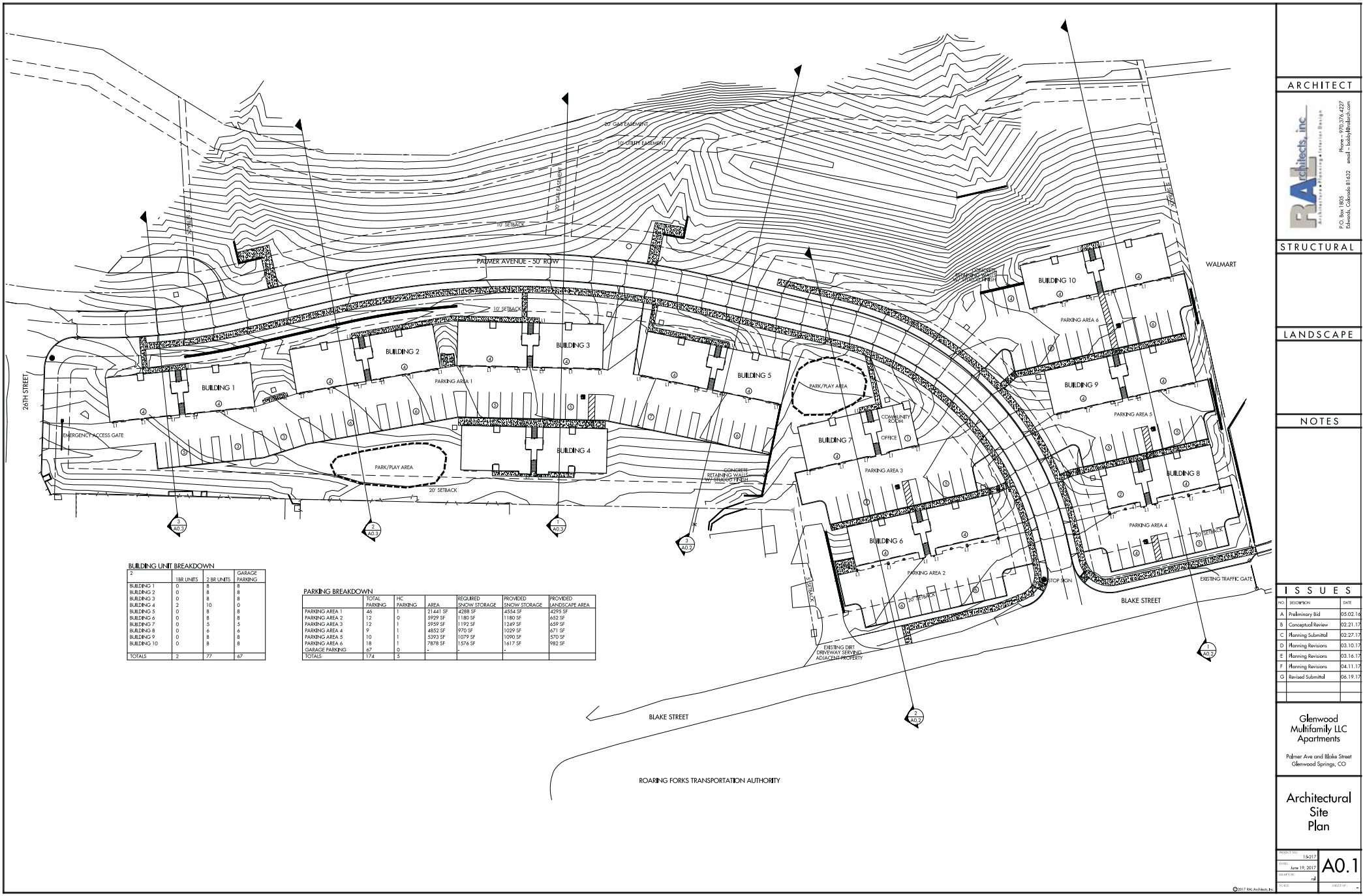


Figure 1: Area Map

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

RAL Architects, Inc
Architecture • Planning • Interior Design
P.O. Box 1805
Edwards, Colorado 81632
Phone – 970.376.4227
email – bobby@ralarch.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
CHKD:
SHEET NO. A0.1

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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.

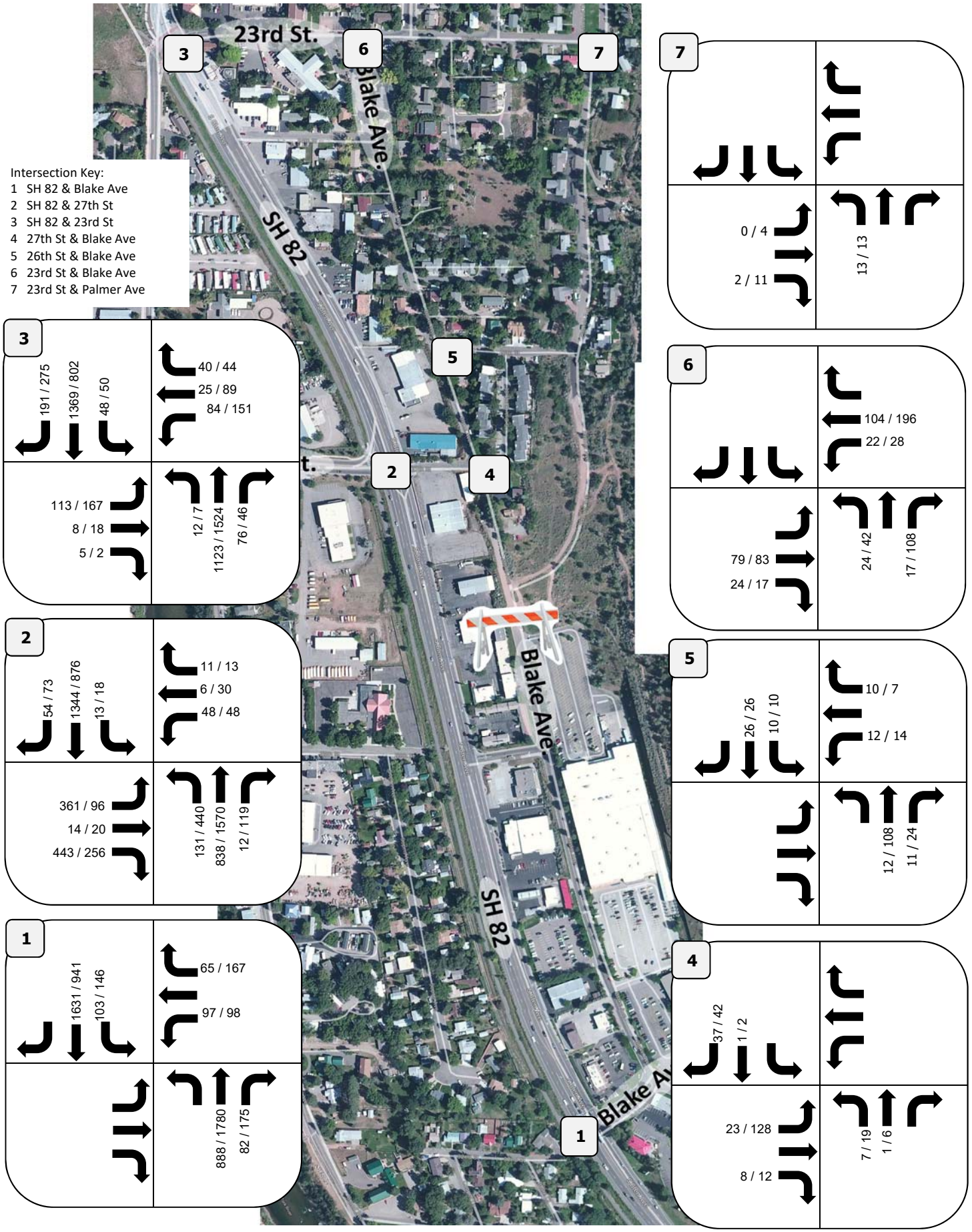
Existing Land Use:

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



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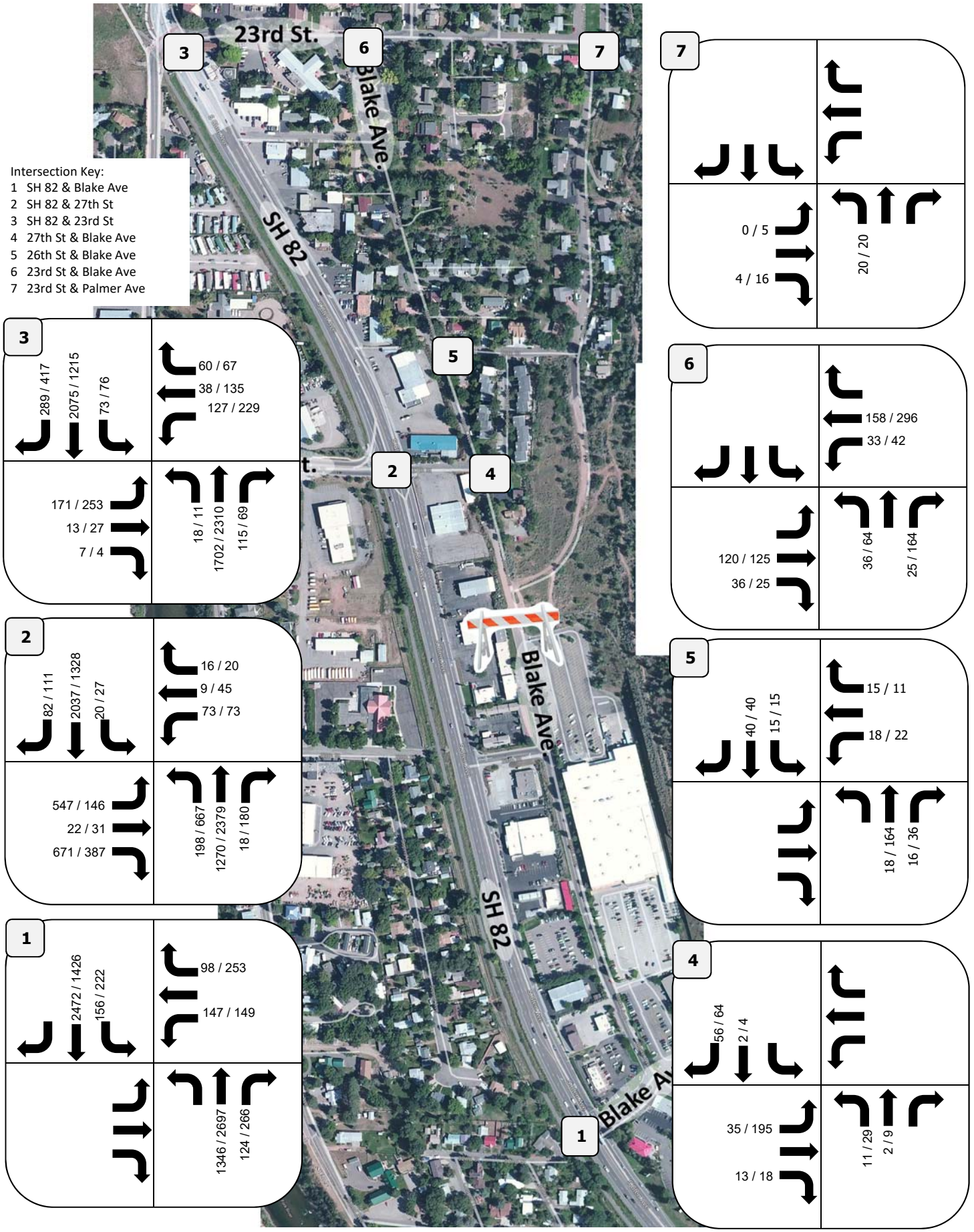
LEGEND :

AM/PM Volumes

LEGEND :

April 9, 2019

Figure 4: Year 2040 Background Traffic - Blake Ave. Gate Remains Closed



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LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

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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.

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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.

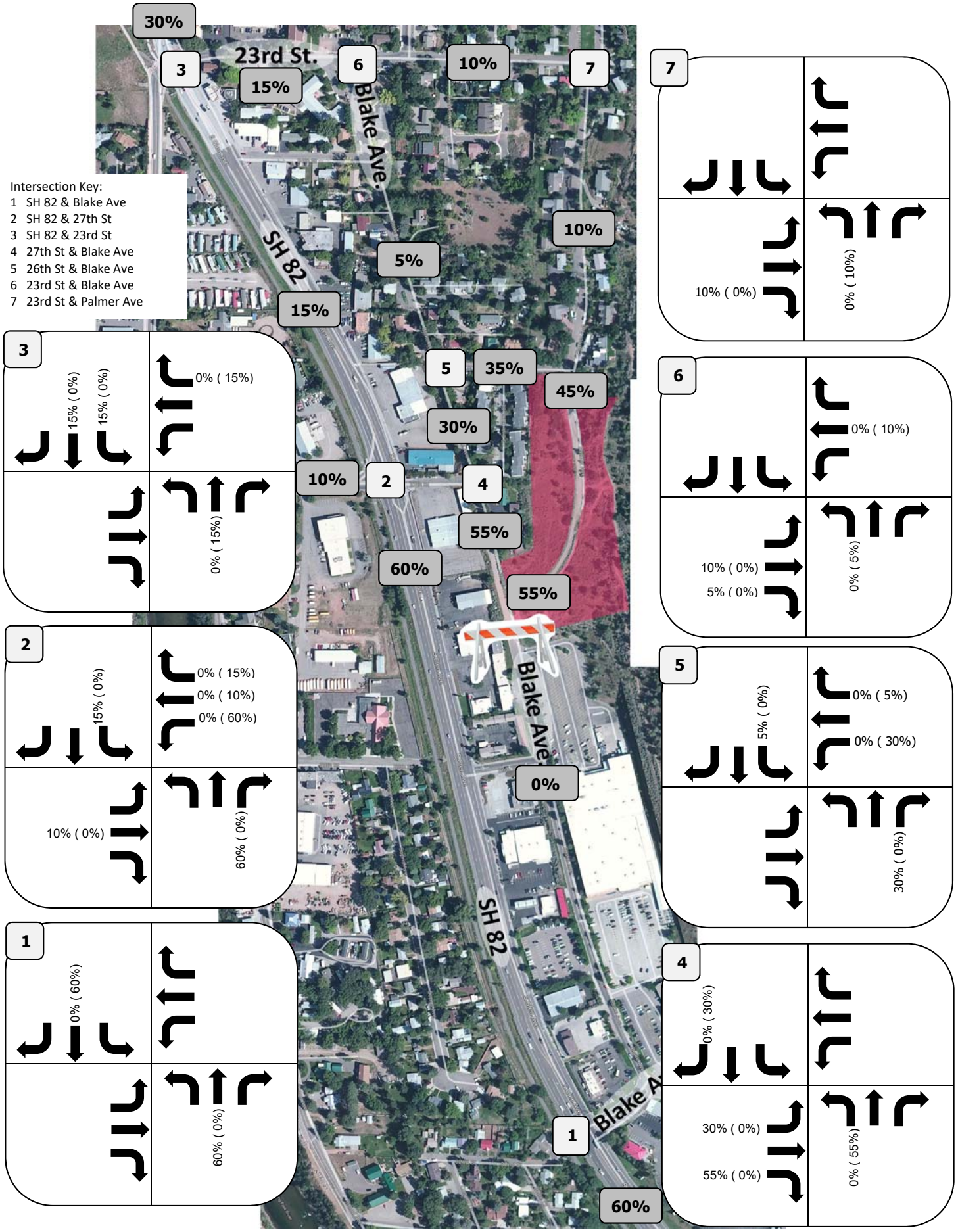
3.2 Traffic Assignment and Total Traffic

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

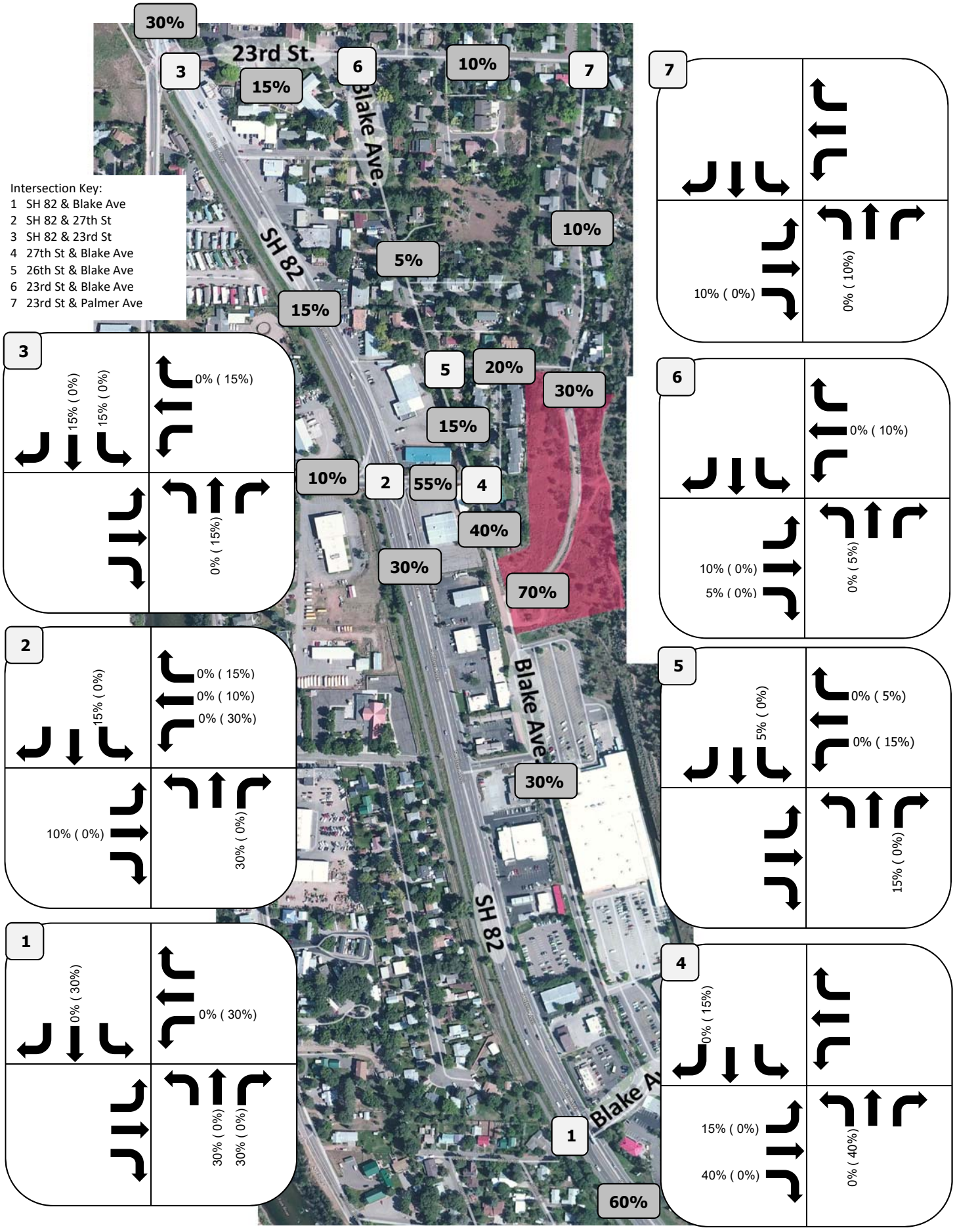


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LEGEND
INBOUND % (OUTBOUND %) = XX% (XX%)
DIRECTIONAL DISTRIBUTION

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Figure 6: Directional Distribution of Project Traffic - Blake Ave. Gate is Opened

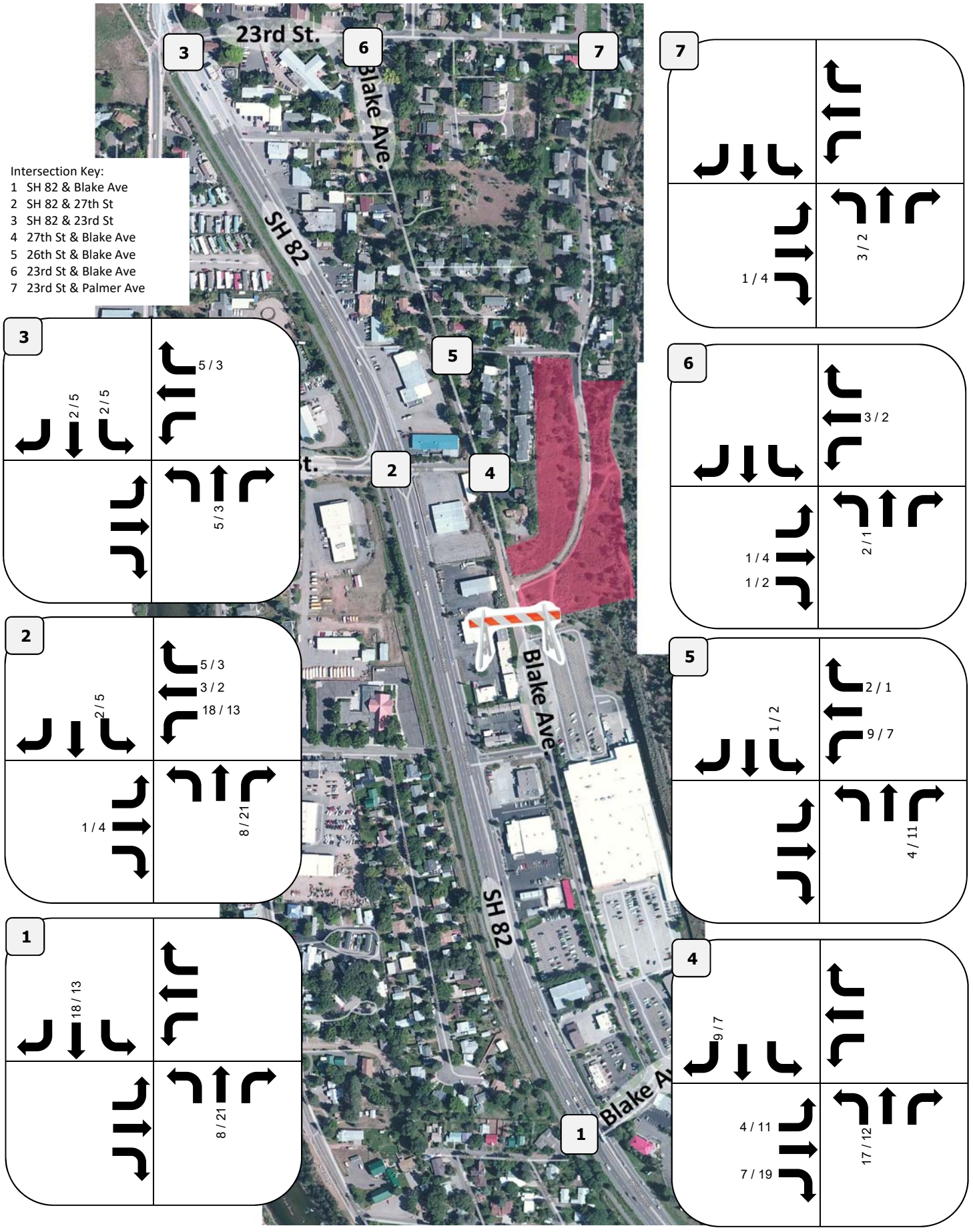


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LEGEND
INBOUND % (OUTBOUND %) = XX% (XX%)
DIRECTIONAL DISTRIBUTION

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



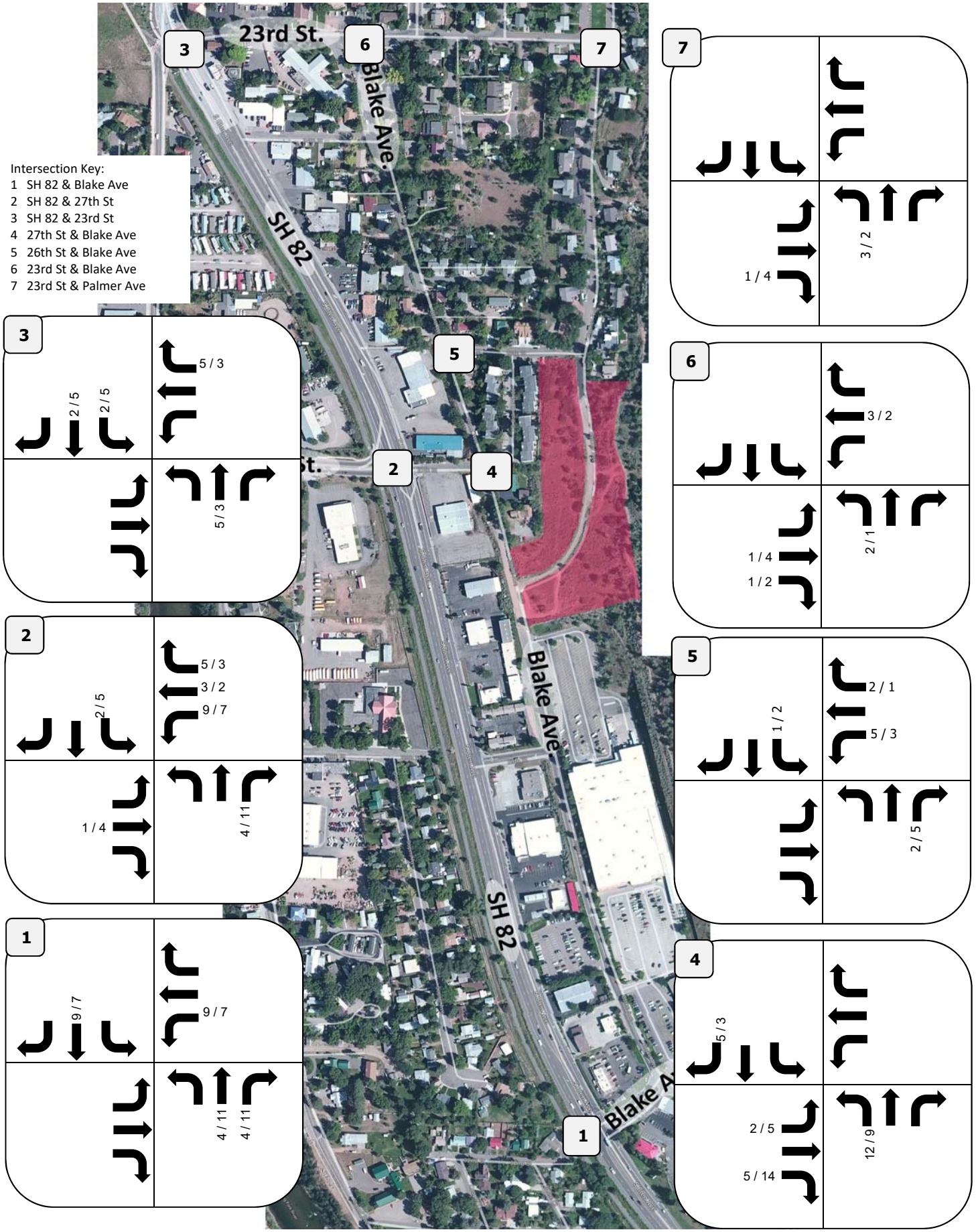
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LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

April 9, 2019

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



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LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

April 9, 2019

Figure 9: Year 2019 Total Traffic - Blake Ave. Gate Remains Closed

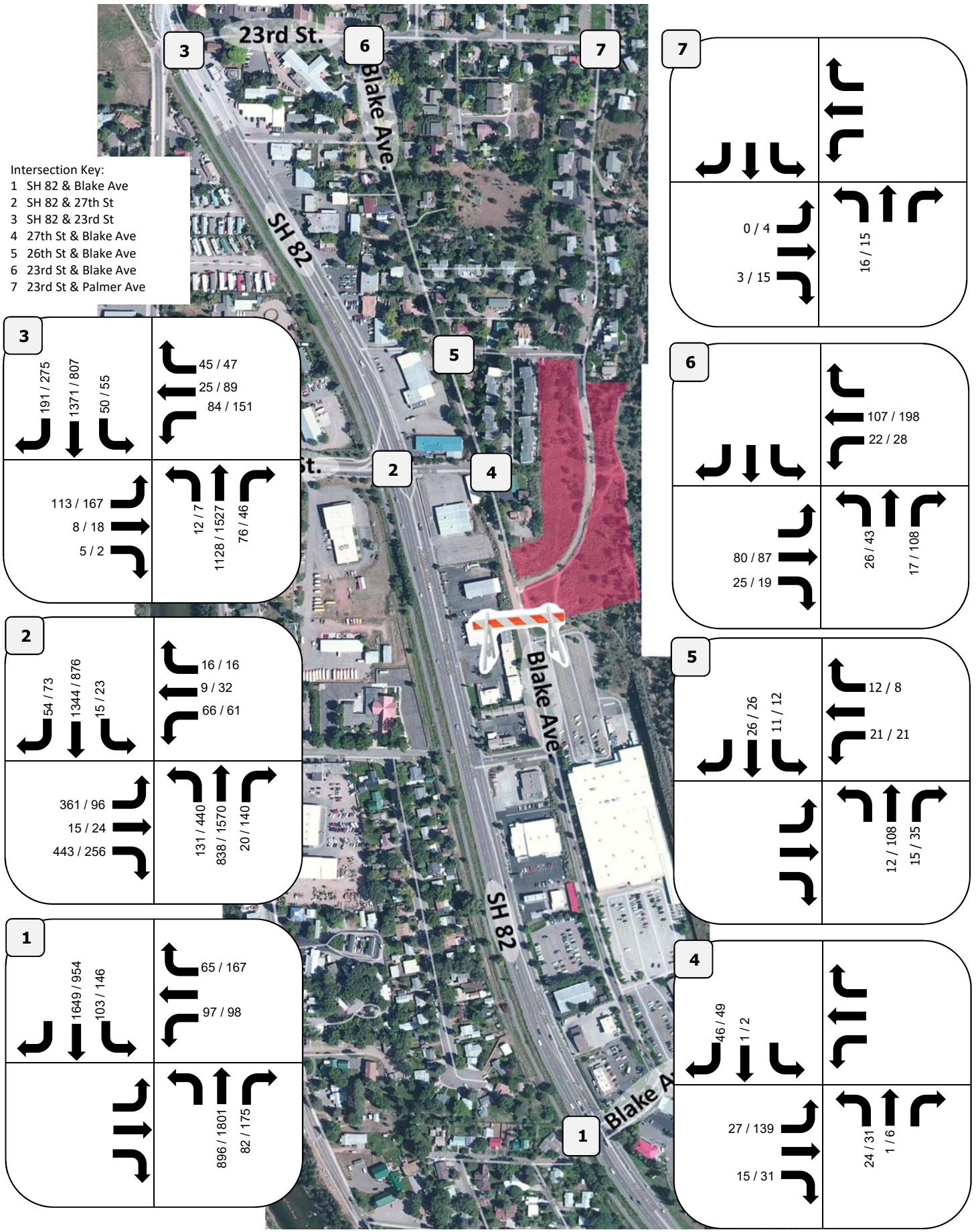
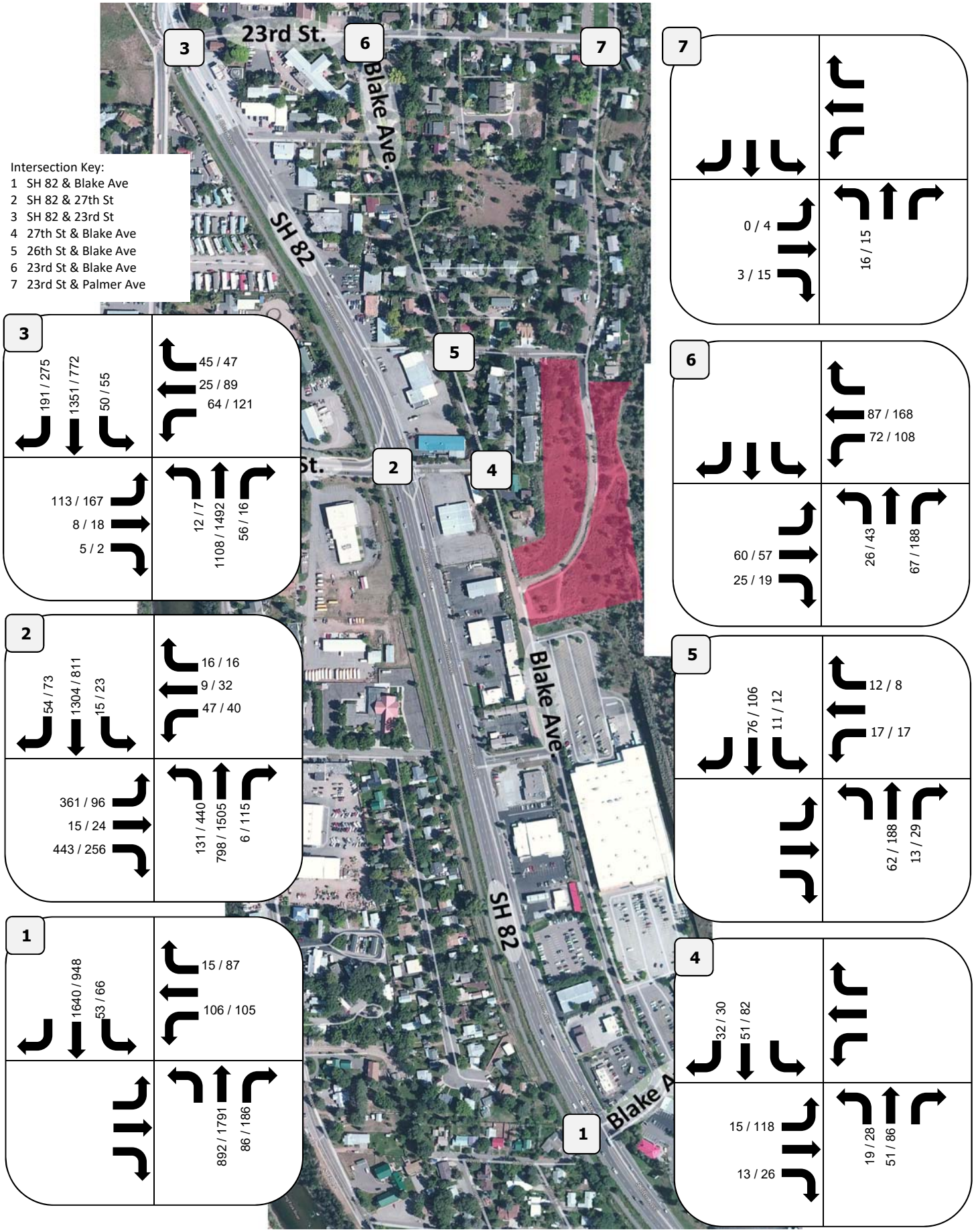


Figure 10: Year 2019 Total Traffic - Blake Ave. Gate is Opened



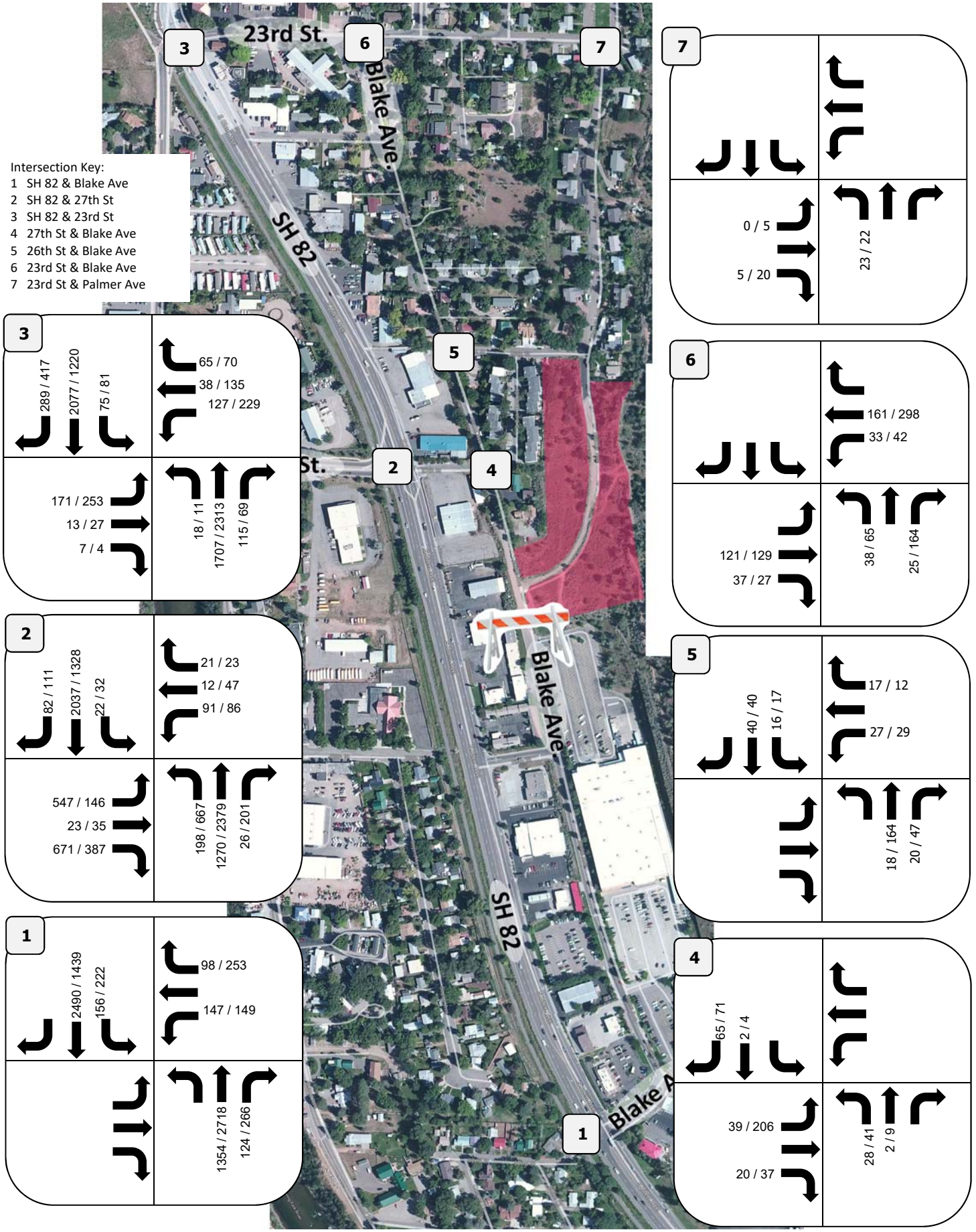
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Bell Rippy, Glenwood Springs, Colorado

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

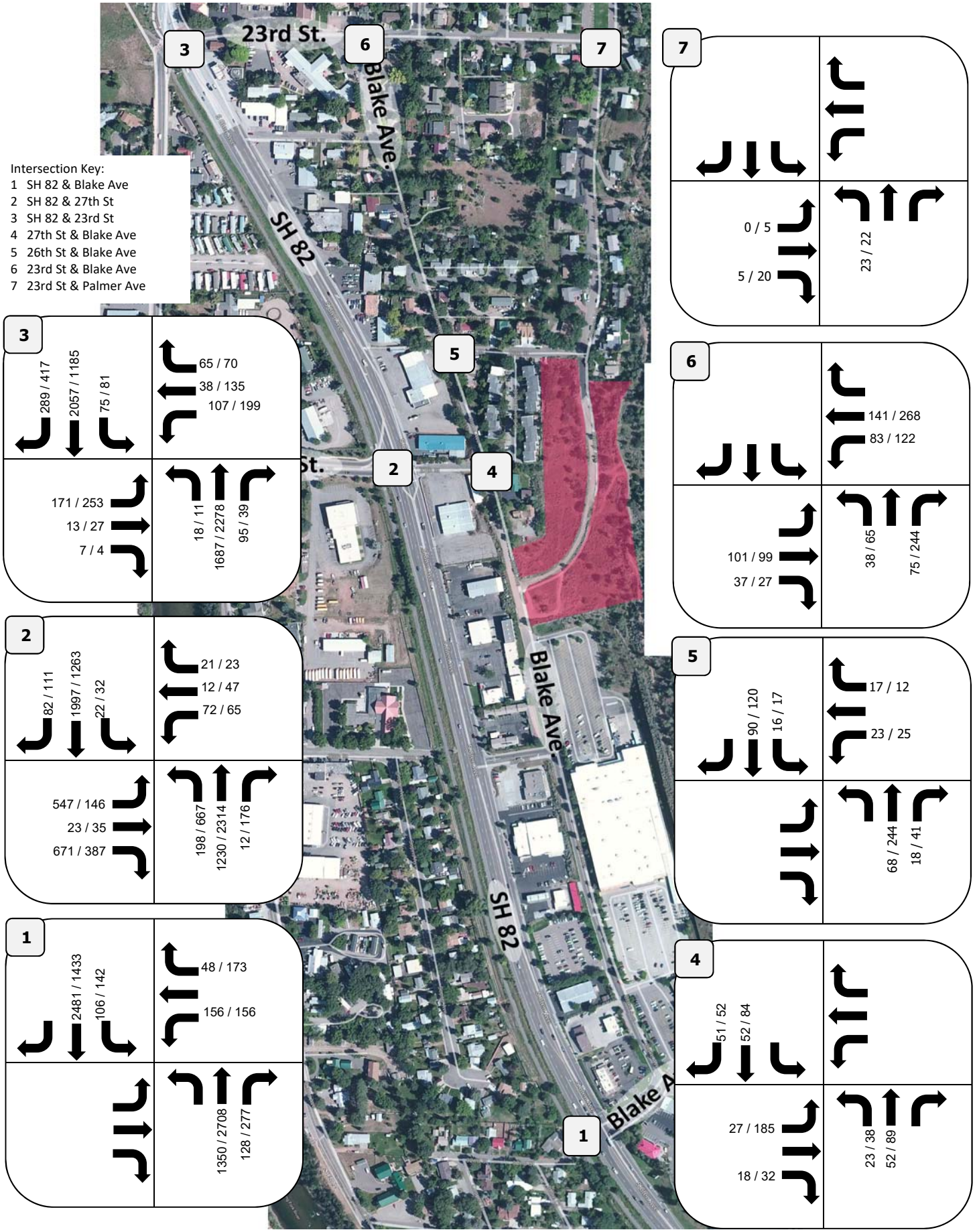
LEGEND :

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 veh

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

222 South 6th Street, Room 100, Grand Junction, CO 81501-3794
Phone: 970.683.6279 Cell: 970.812.6768 Fax: 970.683.6290
kent.harbert@state.co.us | www.codot.gov | www.cotrip.org



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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

McDOWELL ENGINEERING LLC

Eagle • Broomfield • Grand Junction

Phone: 970.366.9502
email: ben@mcdowelleng.com
www,mcdowelleng.com

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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

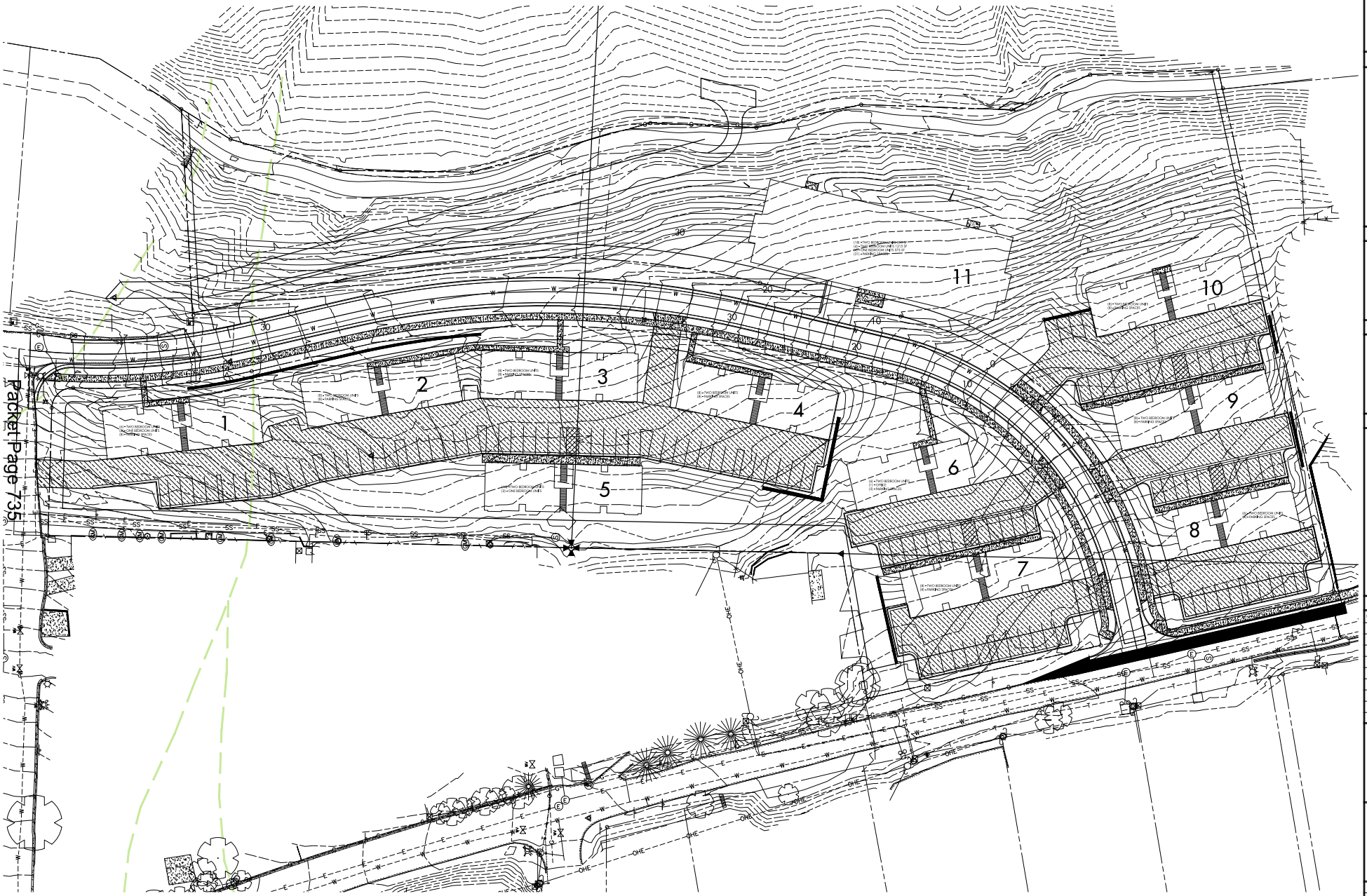
REVIEW AGENCY:

DEPARTMENT:

SIGNED:

PRINT NAME:

DATE:



ARCHITECT

RA architects, inc
Architecture • Planning • Interior Design
P.O. Box 1805
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

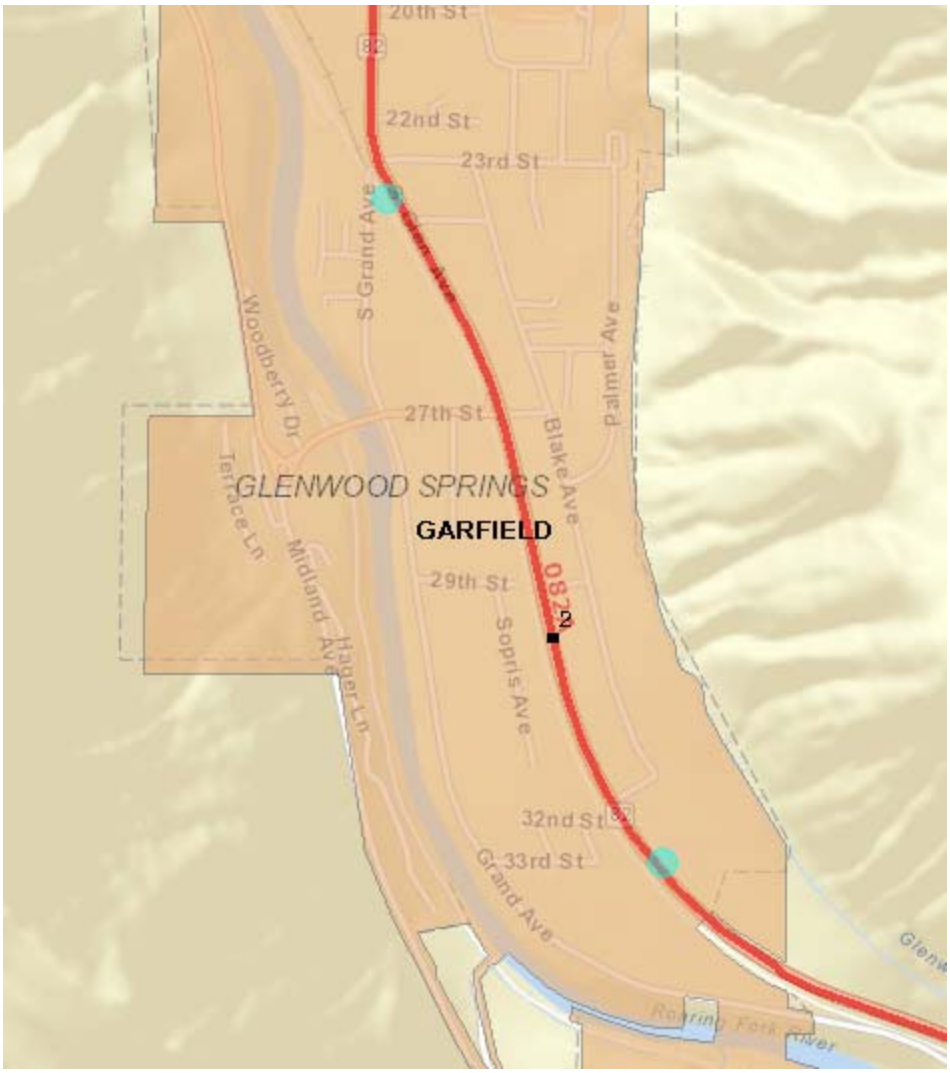
©2016 RAL Architects, Inc

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

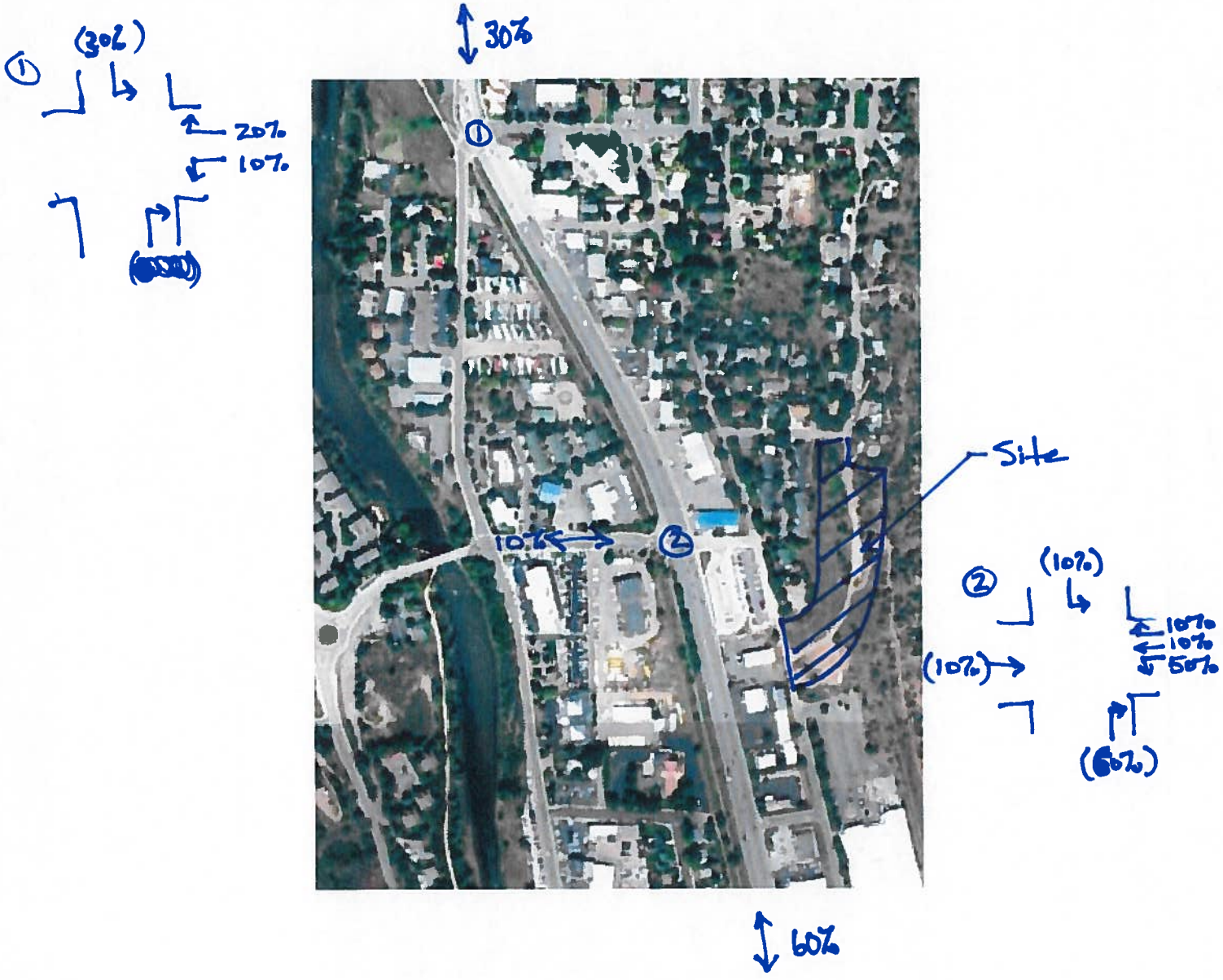
	Route	Start	End	Description	AADT	Year	Single Unit	Comb Trucks	% Trucks	20 Year Factor	DHV	DVMT	DD
	082A	1.405	2.194	ON SH 82, GLEN AVE SE/O SOUTH GR...	26,000	2015	650	360	3.9	1.06	10	20,384	63

CDOT OTIS Station ID 000214 = 1.16% annual growth rate

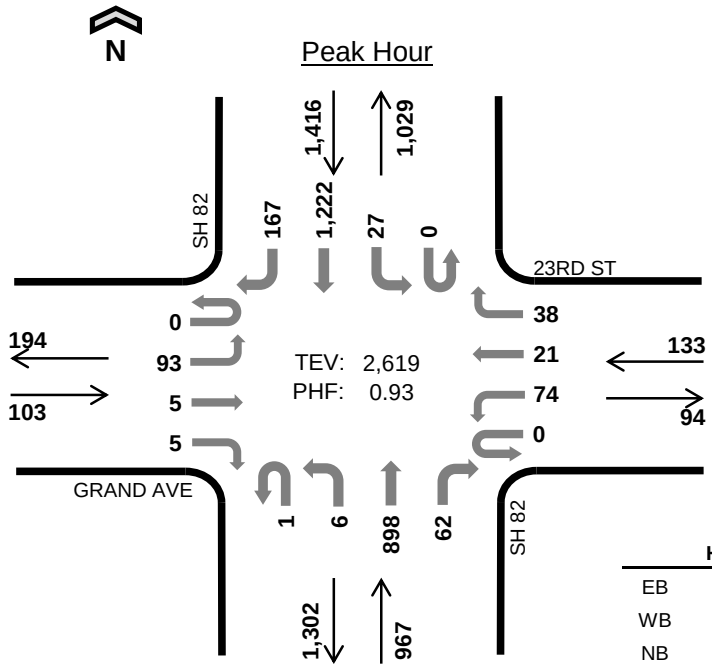
	Route	Start	End	Description	AADT	Year	Single Unit	Comb Trucks	% Trucks	20 Year Factor	DHV	DVMT	DD
	082A	2.194	7.824	ON SH 82, GLEN AVE S/O BLAKE AVE, ...	25,000	2015	580	350	3.7	1.26	11	138,725	57

Seasonal Adjustment = October to July = 1.07

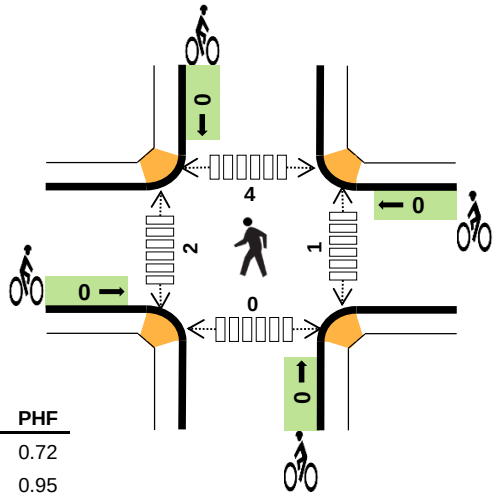
82 A	South end of Glenwood Springs	18,506	19,241	20,046	20,345	20,736	22,446	22,919	22,855	22,317	21,269	19,371	19,235
MM 2.3	Entire record: 1991 - 2016	1.24	1.19	1.14	1.13	1.11	1.02	1.00	1.00	1.03	1.08	1.18	1.19
	South end of Glenwood Springs	20,879	21,311	22,160	22,447	22,930	24,534	25,133	24,949	24,689	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

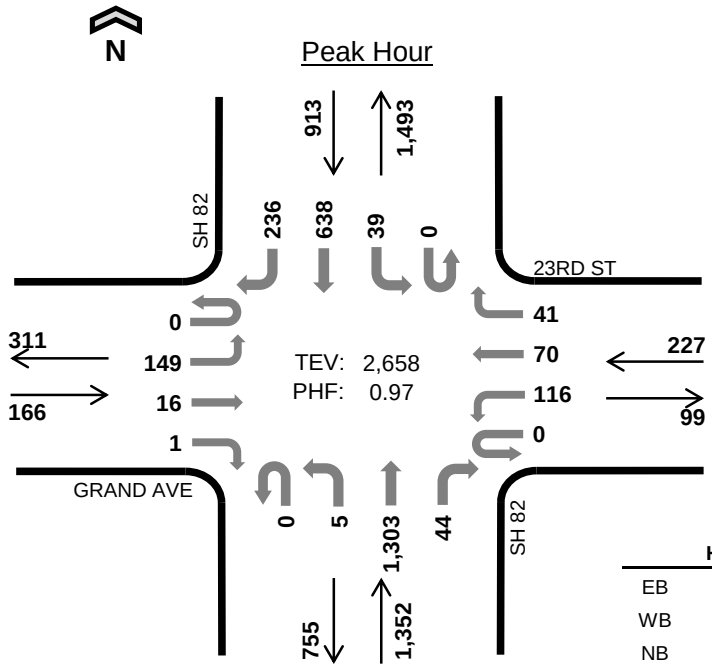
Interval Start	GRAND AVE Eastbound				23RD ST Westbound				SH 82 Northbound				SH 82 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	8	0	2	0	8	1	1	0	2	97	7	0	2	259	21	408	0
7:15 AM	**0**	**15**	**1**	**1**	**0**	**20**	**3**	**12**	**0**	**0**	**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.

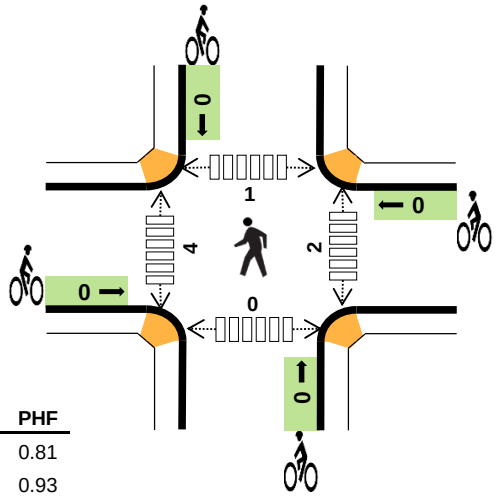
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	8	11	*21*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	**1**	**0**	**11**	**16**	***28***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 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

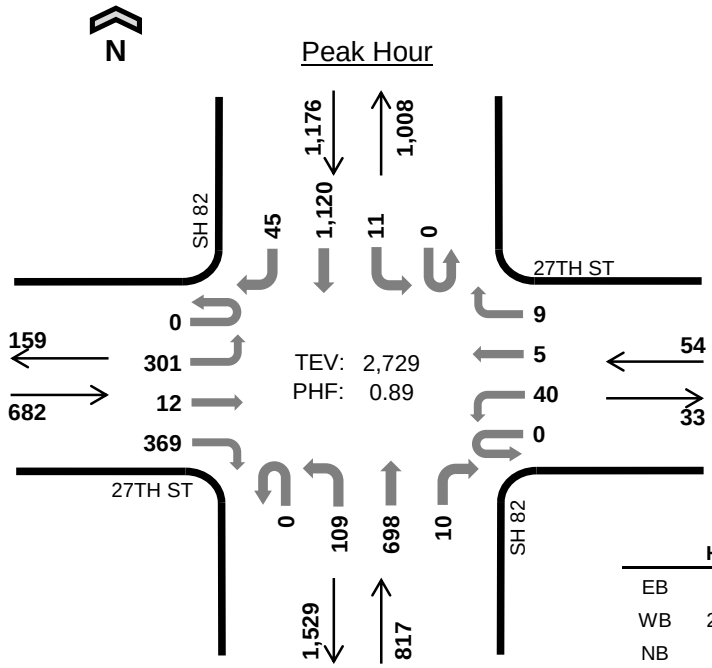
Two-Hour Count Summaries

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**

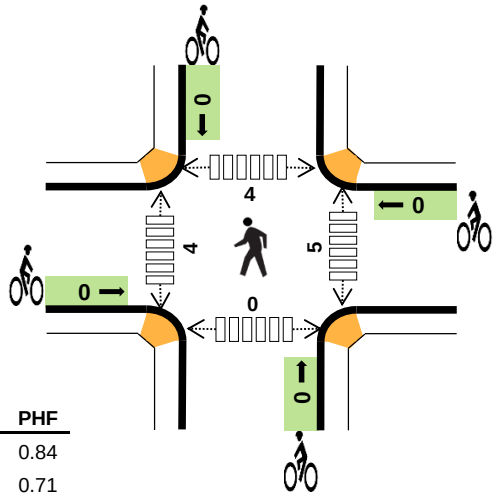
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

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***

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**

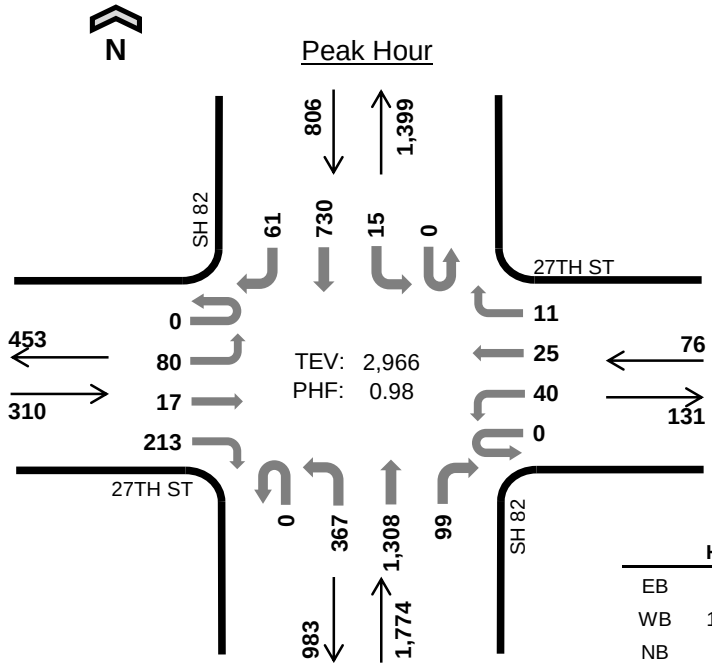
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

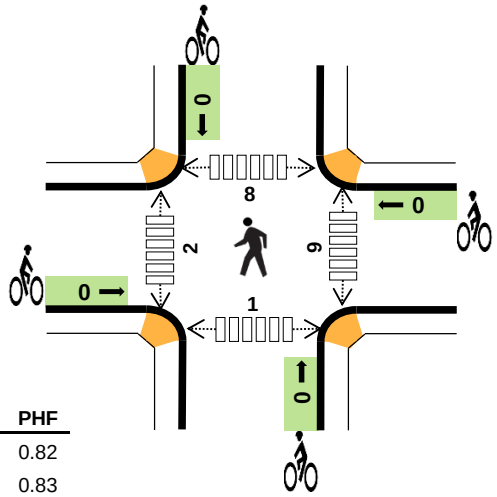
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	5	3	9	9	*26*	0	0	0	0	*0*	1	1	3	0	*5*
7:15 AM	7	3	6	17	*33*	0	0	0	0	*0*	2	0	2	0	*4*
7:30 AM	**6**	**3**	**6**	**14**	***29***	**0**	**0**	**0**	**0**	***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***

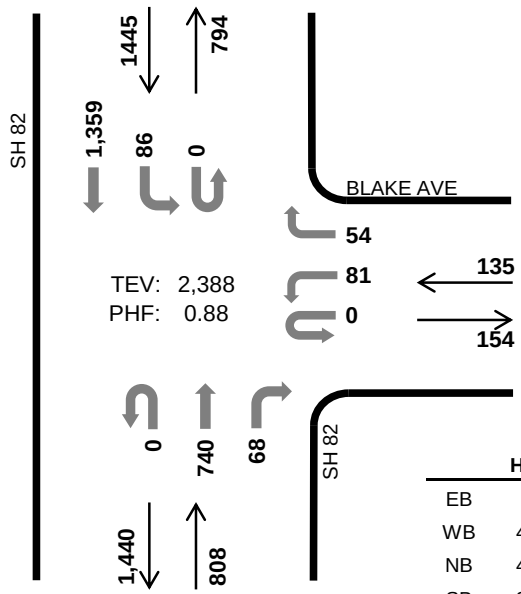
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SH 82
BLAKE AVE

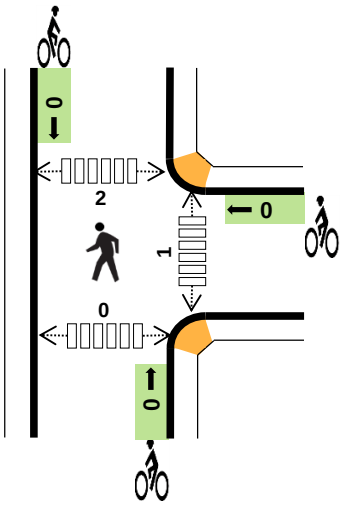
Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

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***

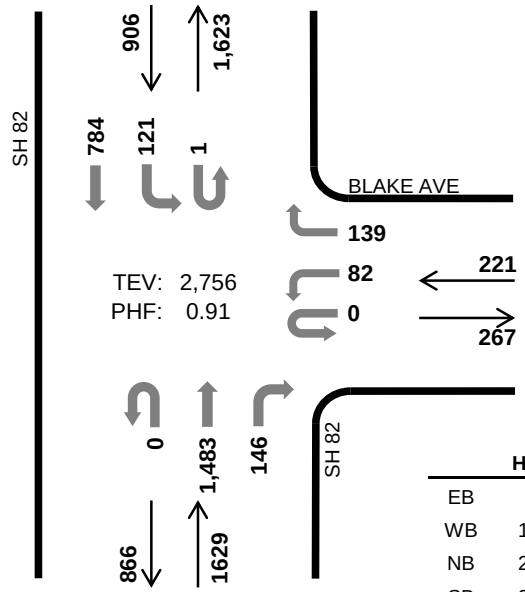
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SH 82
BLAKE AVE

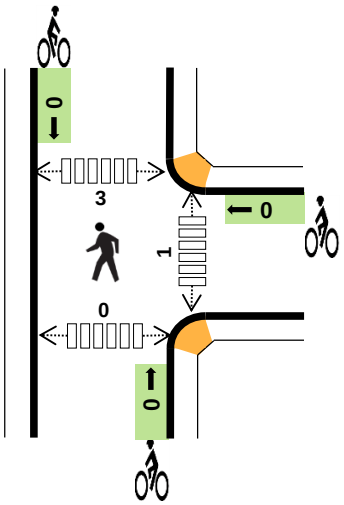
Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

N

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**

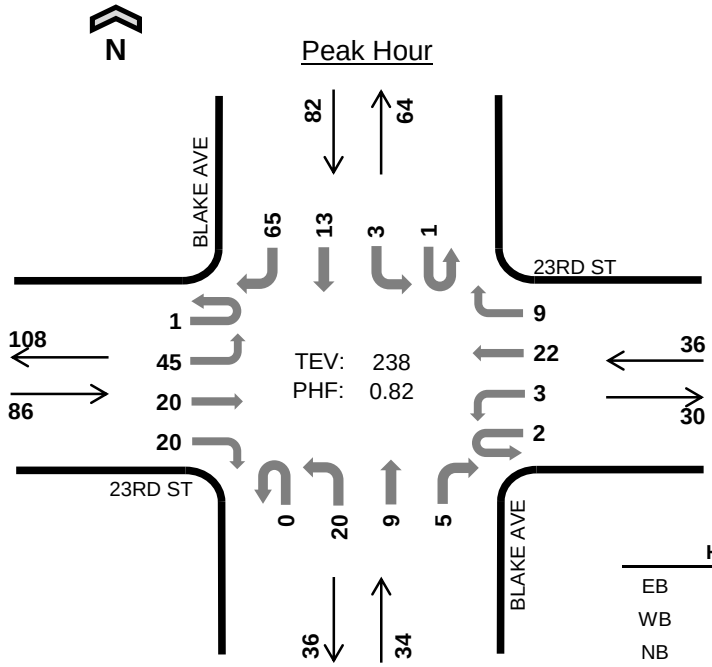
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

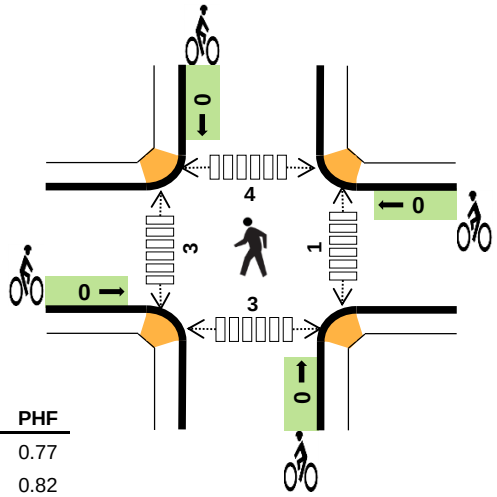
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	10	10	*22*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	1	6	10	*17*	0	0	0	0	*0*	1	3	1	0	*5*
4:30 PM	**0**	**0**	**6**	**7**	***13***	**0**	**0**	**0**	**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

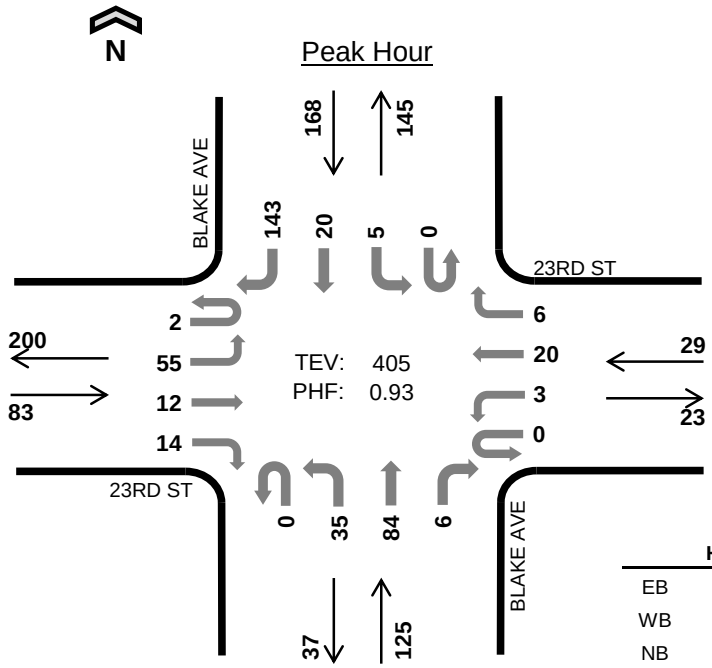
Interval Start	23RD ST Eastbound				23RD ST Westbound				BLAKE AVE Northbound				BLAKE AVE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	5	2	0	0	1	3	0	0	0	0	0	0	1	3	7	22	0
7:15 AM	0	13	0	0	0	0	9	2	0	3	2	0	0	0	1	19	49	0
7:30 AM	**1**	**5**	**4**	**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.

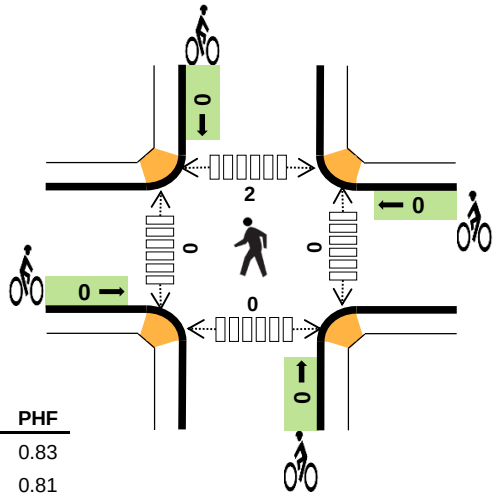
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	1	0	*1*
7:30 AM	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***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.

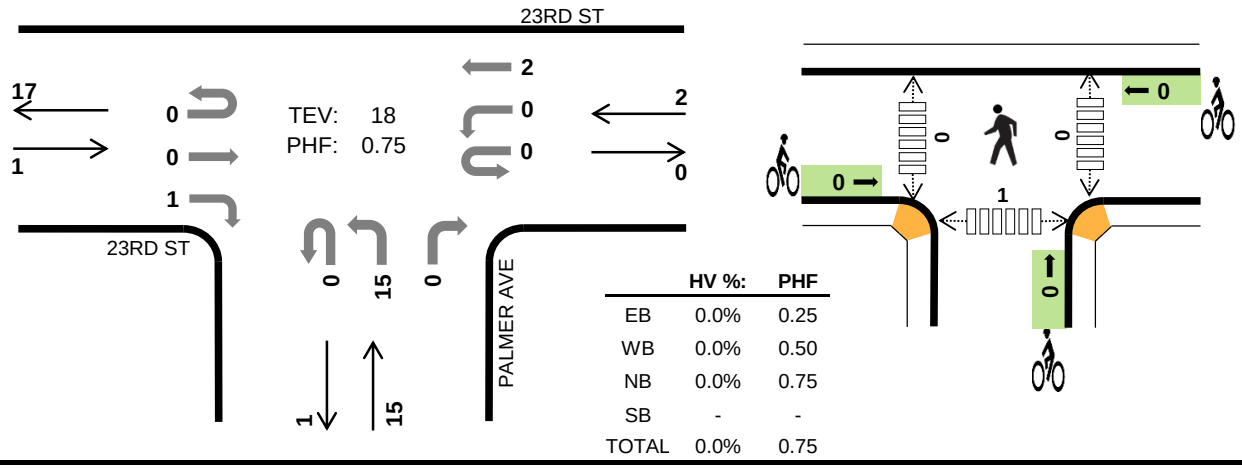
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	1	*2*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	0	*1*
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***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***

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***

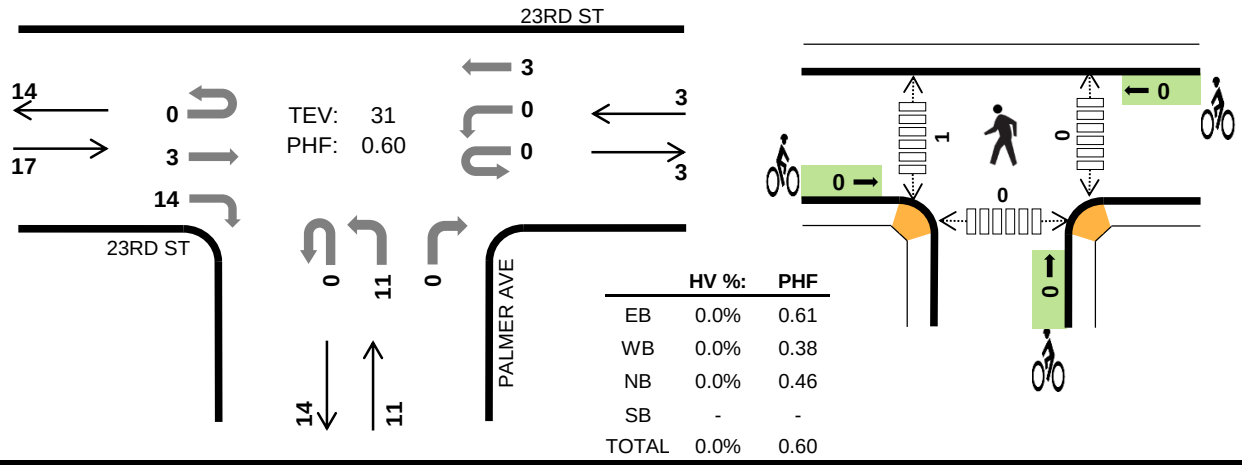
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

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.

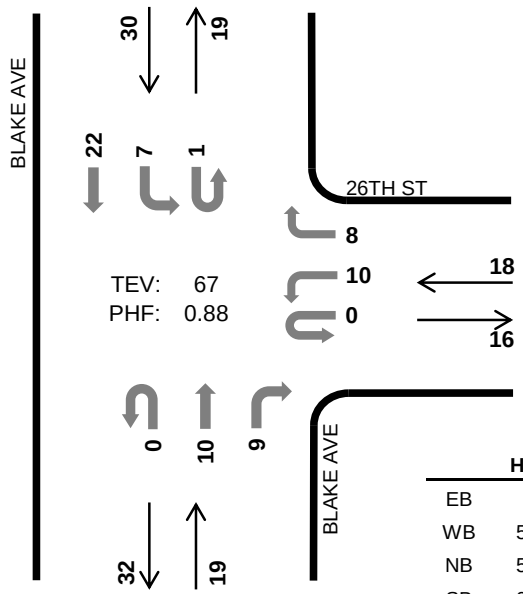
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
4:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
4:45 PM	0	0	0	0	*0*	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***

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BLAKE AVE
26TH ST

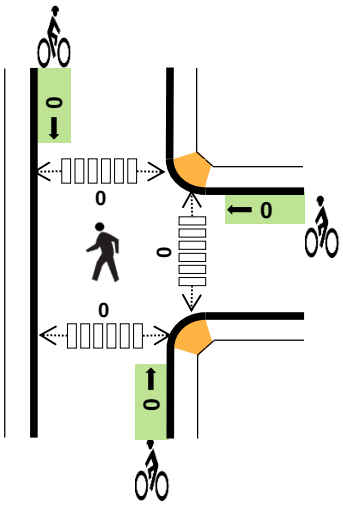
N

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

Date: Thu, Jan 17, 2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM



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***

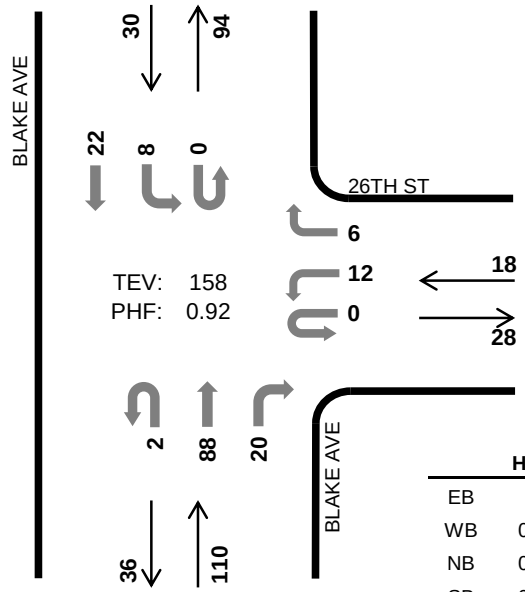
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

BLAKE AVE
26TH ST

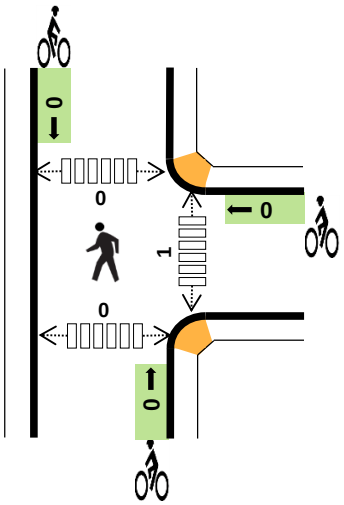
Date: Wed, Jan 16, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

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**

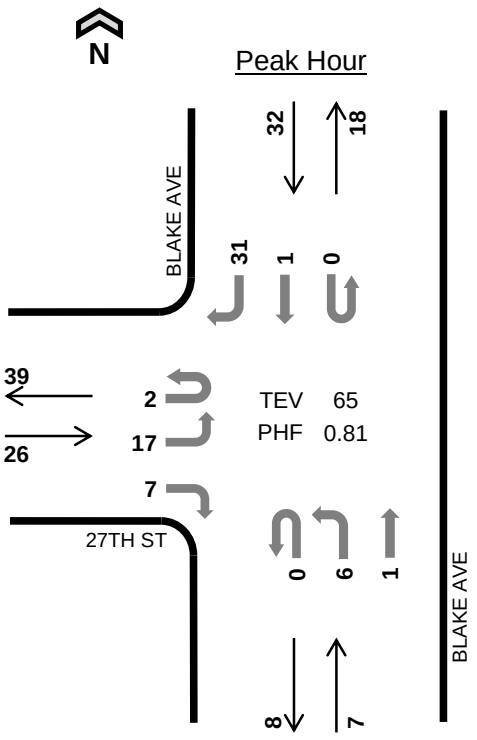
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

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***

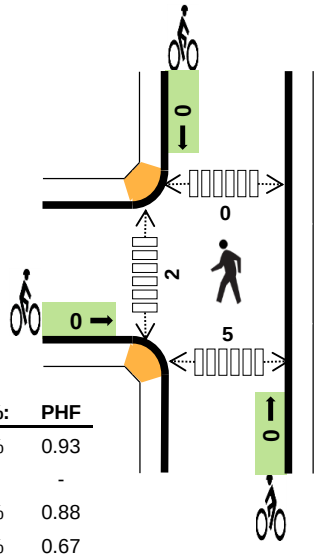
Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

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**

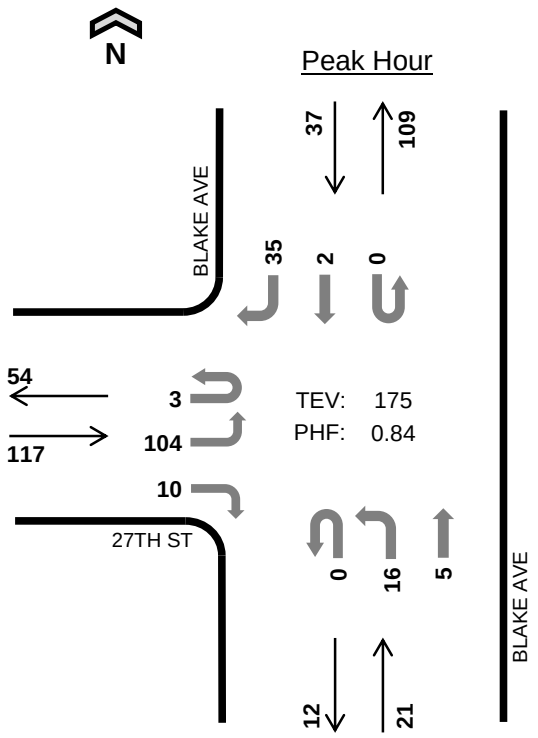
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

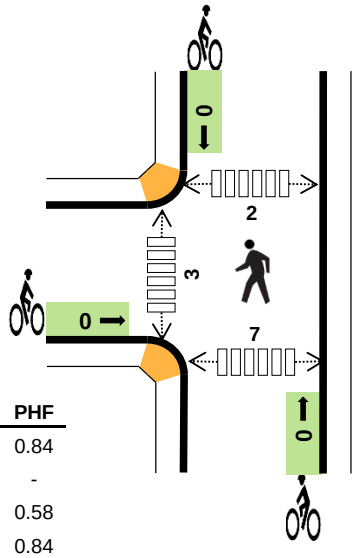
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	2	*3*
7:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	4	4	0	*8*
7:30 AM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***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***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

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***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

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

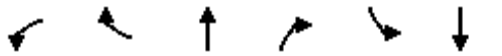
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

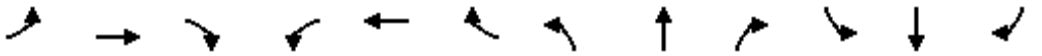
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
50th %ile Green (s)	13.0	13.0	45.3	45.3	7.7	55.5
50th %ile Term Code	Gap	Gap	Coord	Coord	Gap	Coord
30th %ile Green (s)	10.9	10.9	48.1	48.1	7.0	57.6
30th %ile Term Code	Gap	Gap	Coord	Coord	Min	Coord
10th %ile Green (s)	8.0	8.0	51.0	51.0	7.0	60.5
10th %ile Term Code	Gap	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	

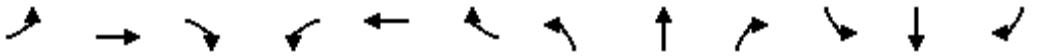
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

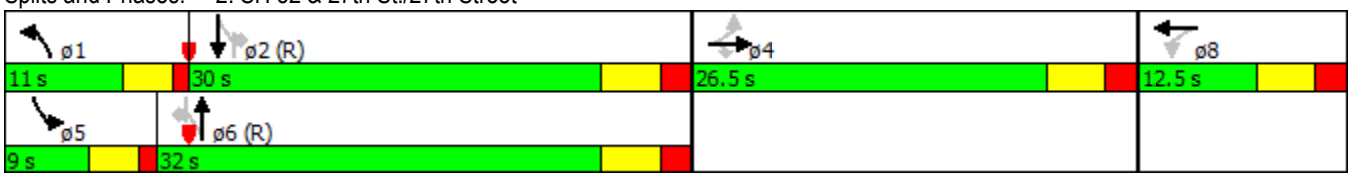
Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.33	
Intersection Signal Delay: 60.7	Intersection 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	

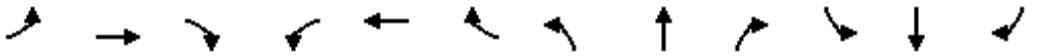
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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





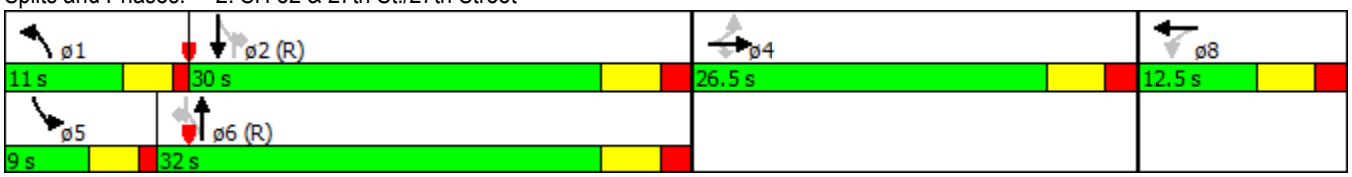
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	20	256	33	30	13	440	1505	104	18	811	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	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

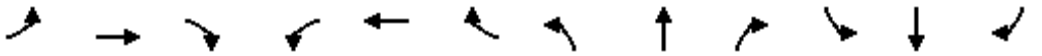
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	F	A	D	C		F	D	A	B	C	A
Approach Delay		32.2			35.7			72.0			30.7	
Approach LOS		C			D			E			C	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
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	

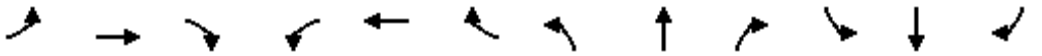
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

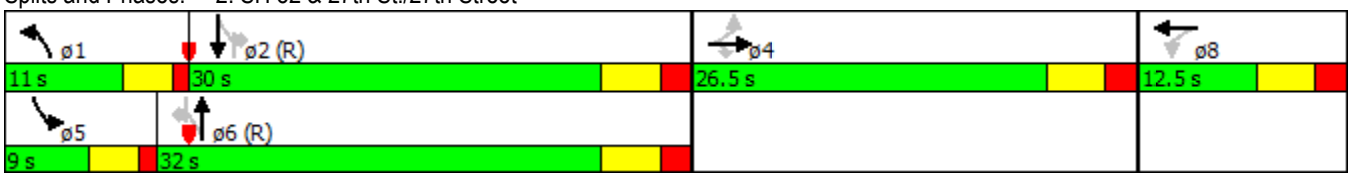
Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.36	
Intersection Signal Delay: 63.8	Intersection 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	

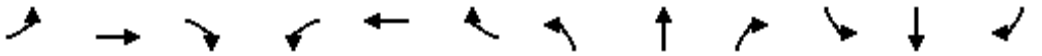
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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





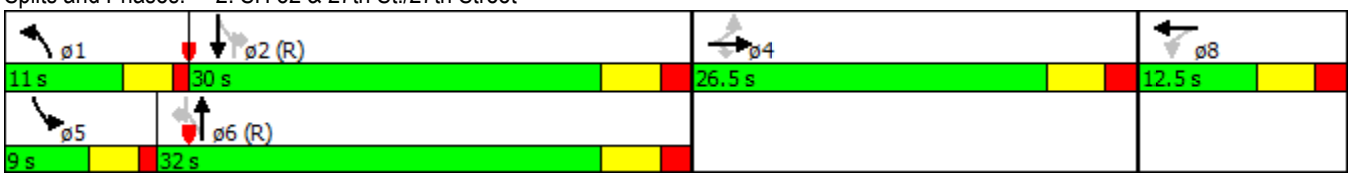
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	24	256	40	32	16	440	1505	115	23	811	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		0	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

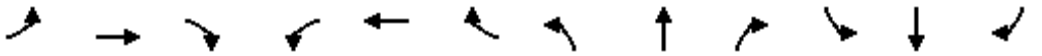
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	F	A	D	C		F	D	A	B	C	A
Approach Delay		36.1			36.7			74.6			30.7	
Approach LOS		D			D			E			C	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
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	

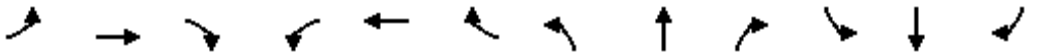
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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





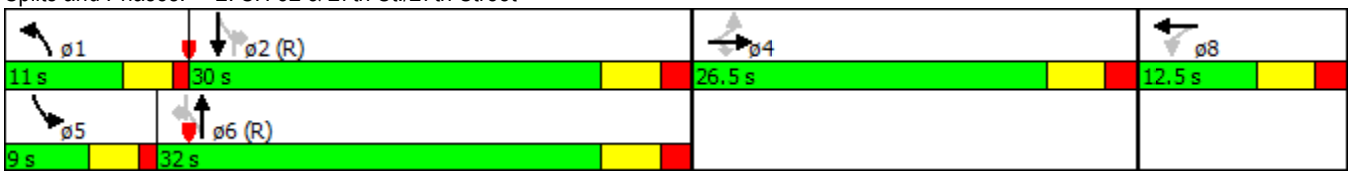
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	31	387	73	45	20	667	2379	180	27	1328	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		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	

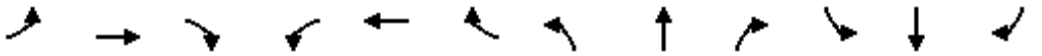
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			F			F	
90th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
90th %ile Term Code	Max	Max	Max	Max	Max		Max	Coord	Coord	Max	Coord	Coord
70th %ile Green (s)	21.0	21.0	21.0	7.0	7.0		7.0	26.5	24.5	5.0	24.5	26.5
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

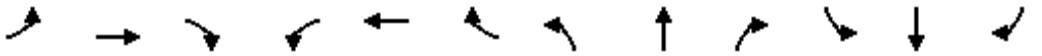
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

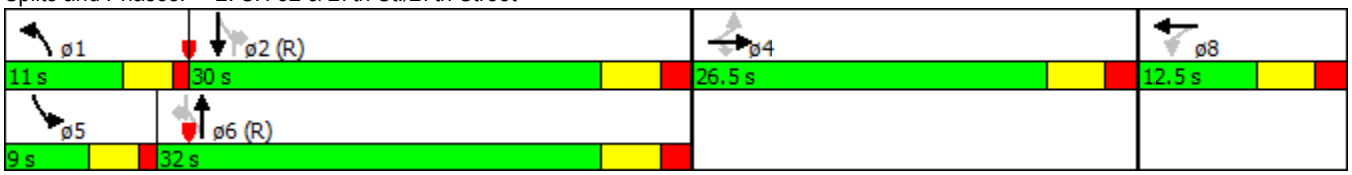
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.35
Intersection Signal Delay: 265.5 Intersection LOS: F
Intersection Capacity 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

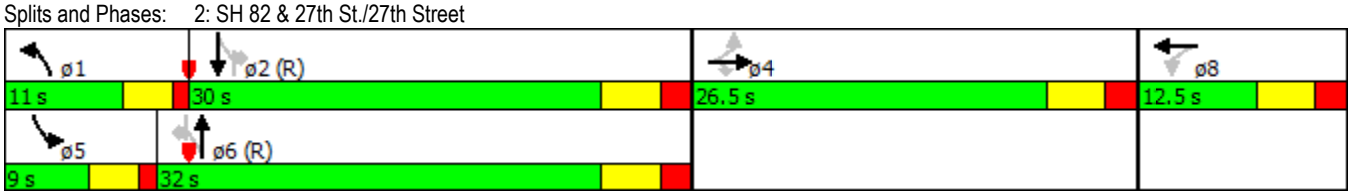
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.92
Intersection Signal Delay: 357.4 Intersection LOS: F
Intersection Capacity 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



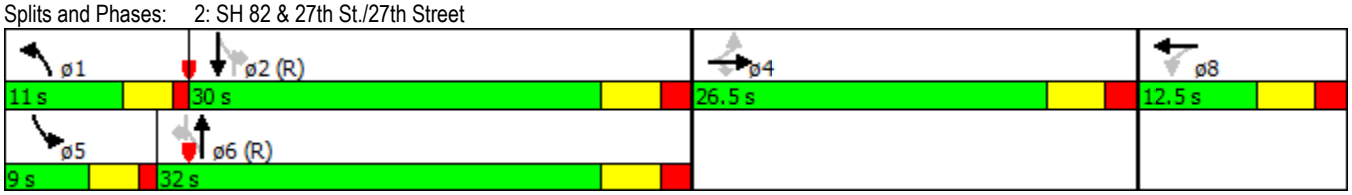
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	35	387	65	47	23	667	2314	176	32	1263	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	300		264	416		280
Storage Lanes	1		1	1		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

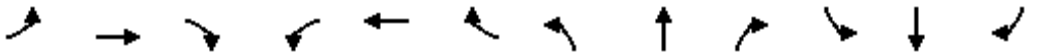
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		C	E		A	B		A	A	A
Approach Delay		48.5			45.2			18.4			6.5	
Approach LOS		D			D			B			A	
90th %ile Green (s)	5.0	7.0		5.0	7.0		5.0	46.5		5.0	46.5	46.5
90th %ile Term Code	Max	Ped		Max	Ped		Max	Coord		Max	Coord	Coord
70th %ile Green (s)	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	

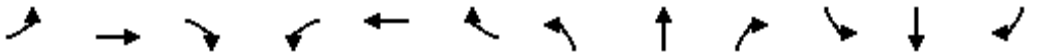
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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	

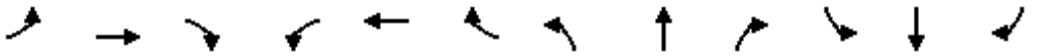
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			C			C	
90th %ile Green (s)	15.0	17.7		15.0	17.7		6.7	98.1		12.7	104.1	98.1
90th %ile Term Code	Max	Hold		Max	Gap		Gap	Coord		Gap	Coord	Coord
70th %ile Green (s)	15.0	14.1		15.0	14.1		6.2	104.7		9.7	108.2	104.7
70th %ile 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	

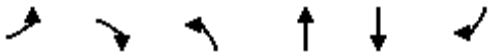
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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.

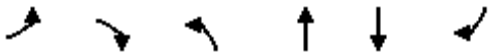




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	8	7	51	51	27
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	9	8	55	55	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
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

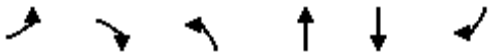
Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



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

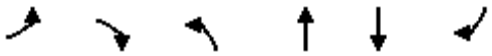
Intersection Summary			
Average Delay	10.1		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		



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

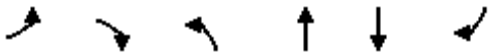
Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		



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

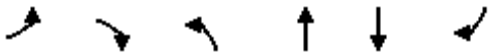
Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		



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

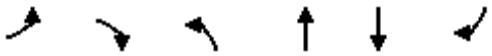
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		



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

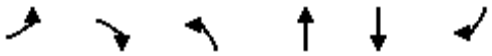
Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		



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

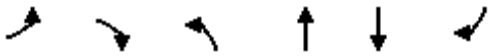
Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		



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

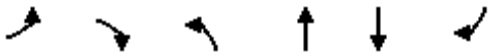
Intersection Summary			
Average Delay	10.0		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		



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

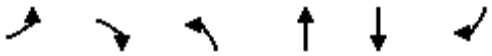
Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

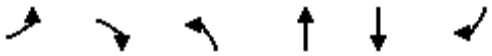
Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		



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

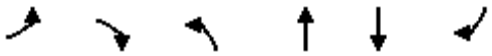
Intersection Summary			
Average Delay	11.3		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		



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

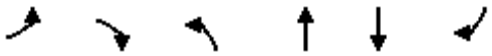
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		



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

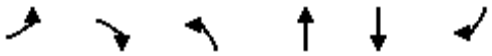
Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		



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

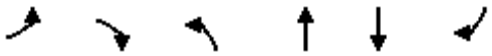
Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		



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

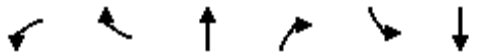
Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		



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

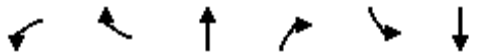
Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		



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		

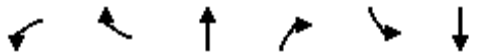
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		



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		

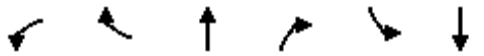
Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		23.9%	ICU Level of Service A
Analysis Period (min)		15	



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		

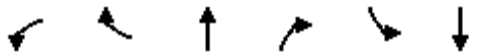
Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



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		

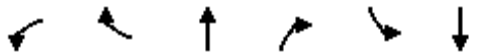
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		



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		

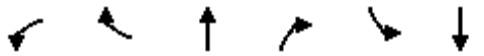
Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



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		

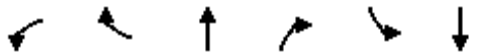
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		



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		

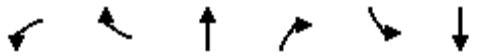
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		



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		

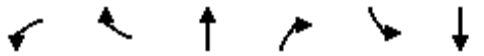
Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		



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		

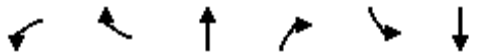
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		



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

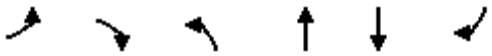
Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

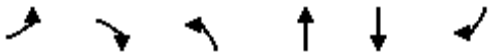
Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		



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

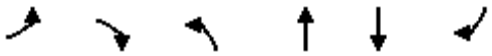
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

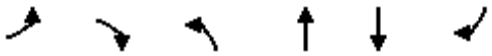
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

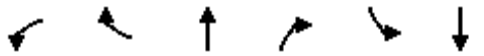
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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		

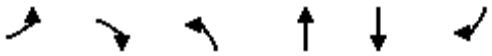
Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



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

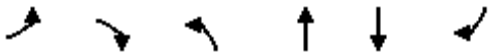
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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		

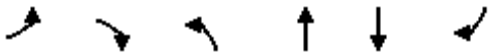
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



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

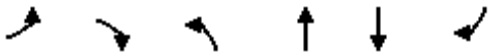
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

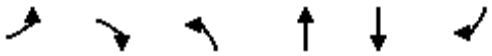
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

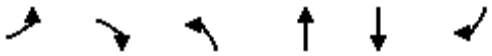
Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

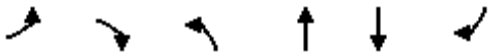
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

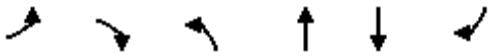
Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

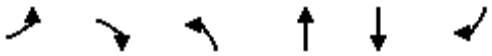
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

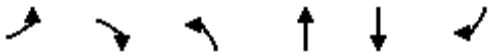
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

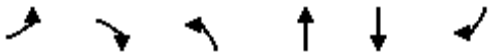
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

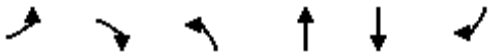
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

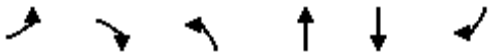
Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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

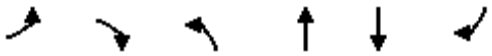
Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



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.

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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

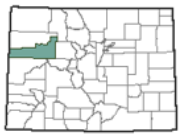


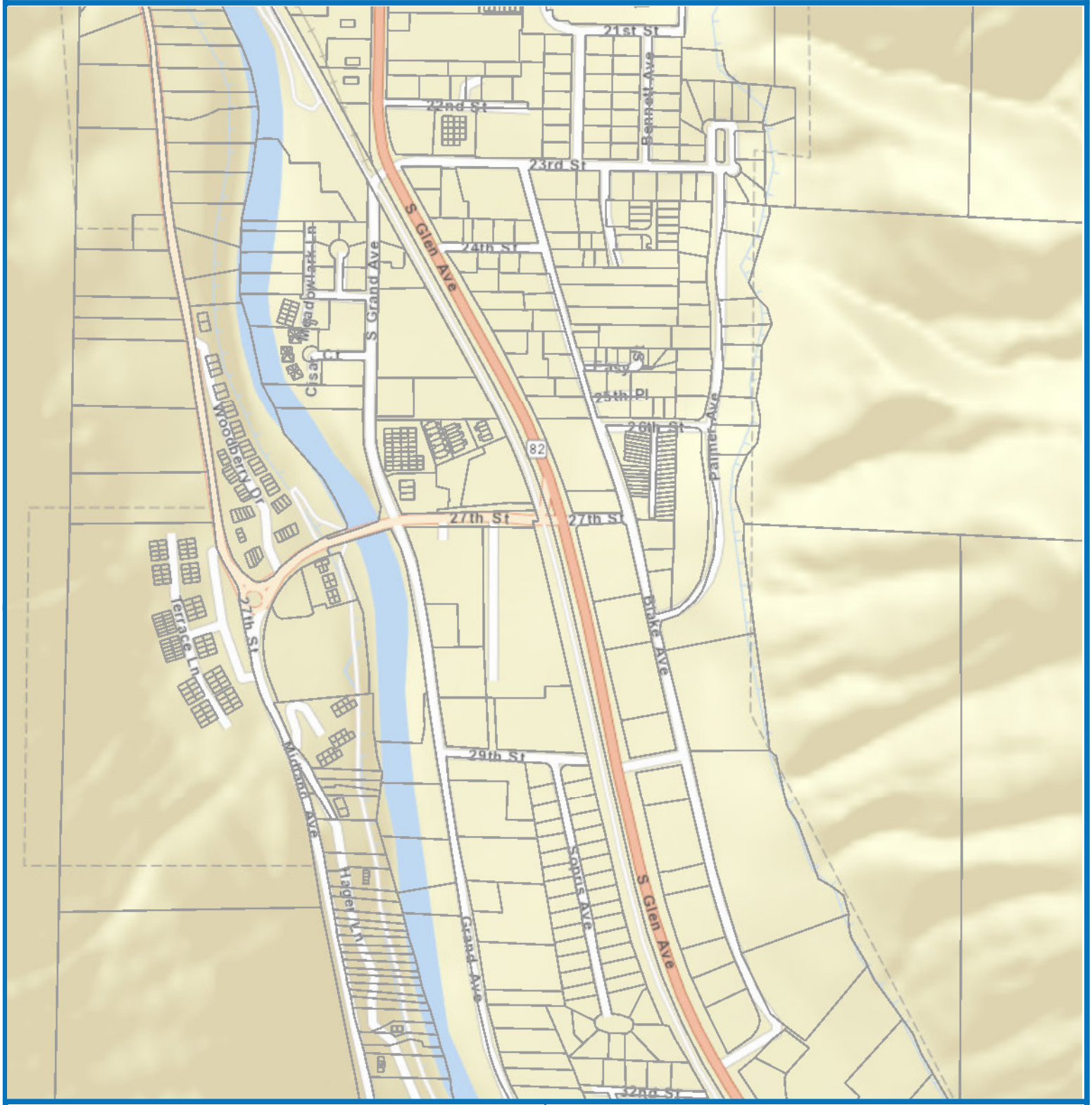
Michael A. Berry, P.E.
Vice President of Engineering

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

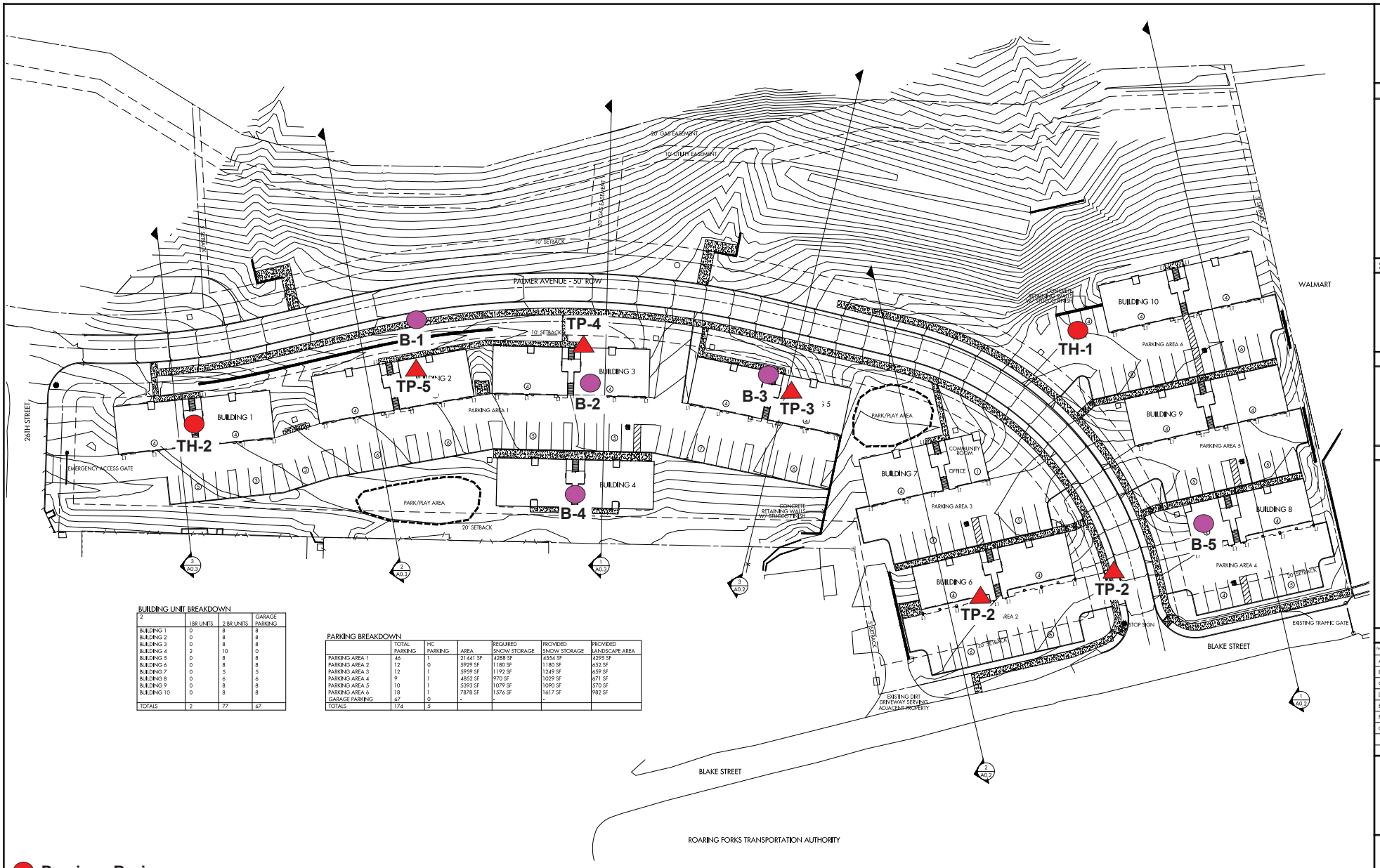


Disclaimer

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

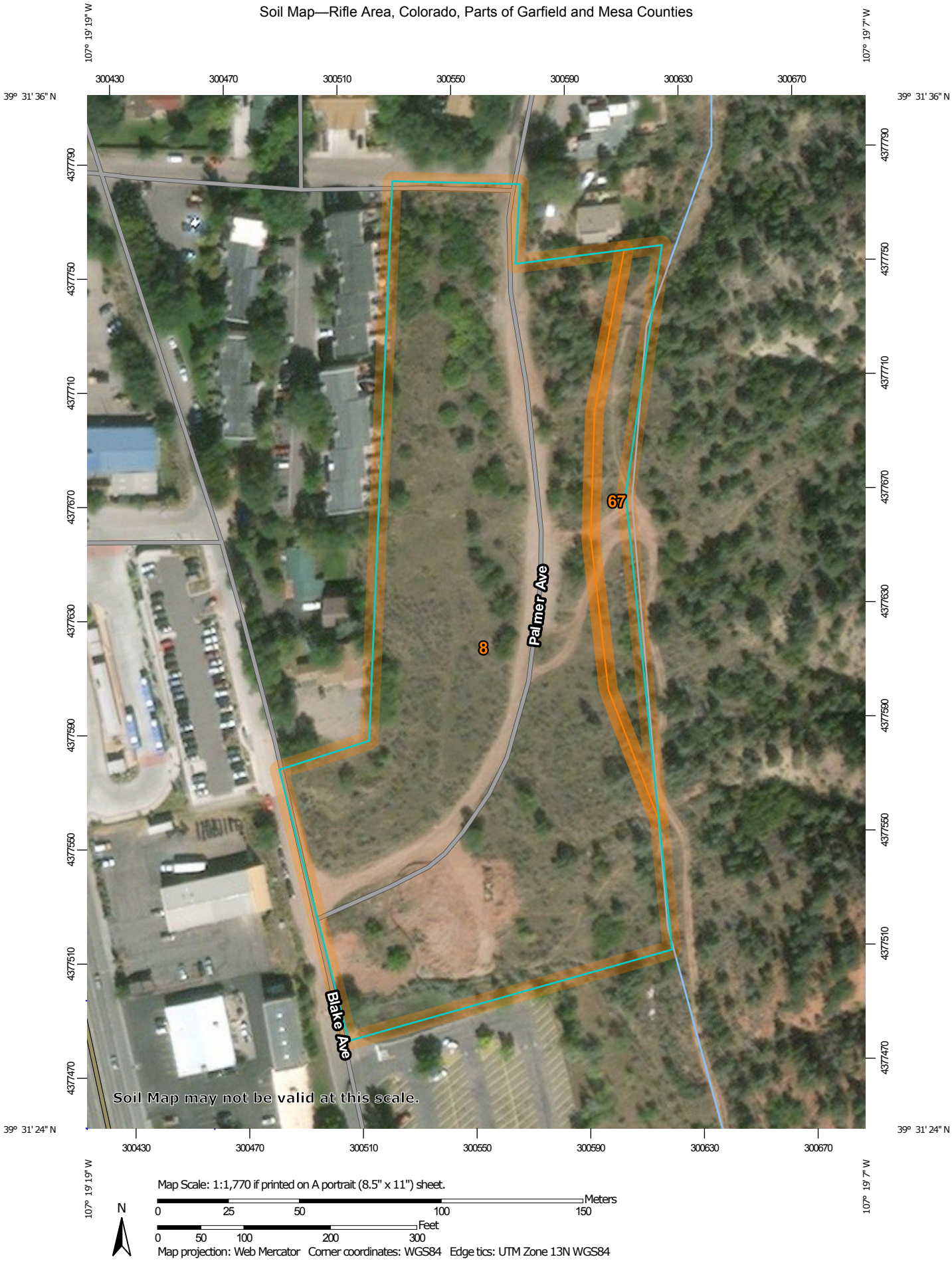
Glenwood Multifamily LLC Apartments

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.

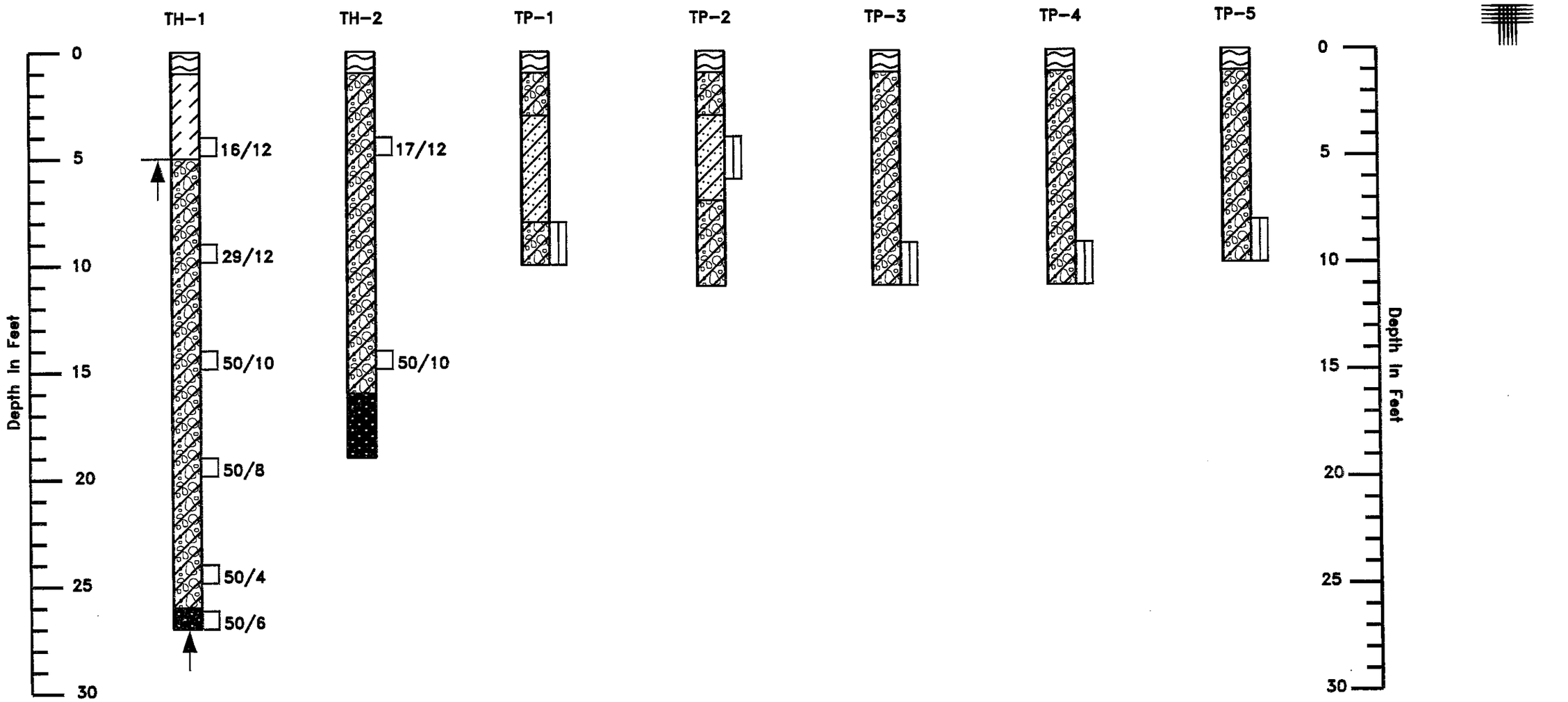
Report—Soil Features

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

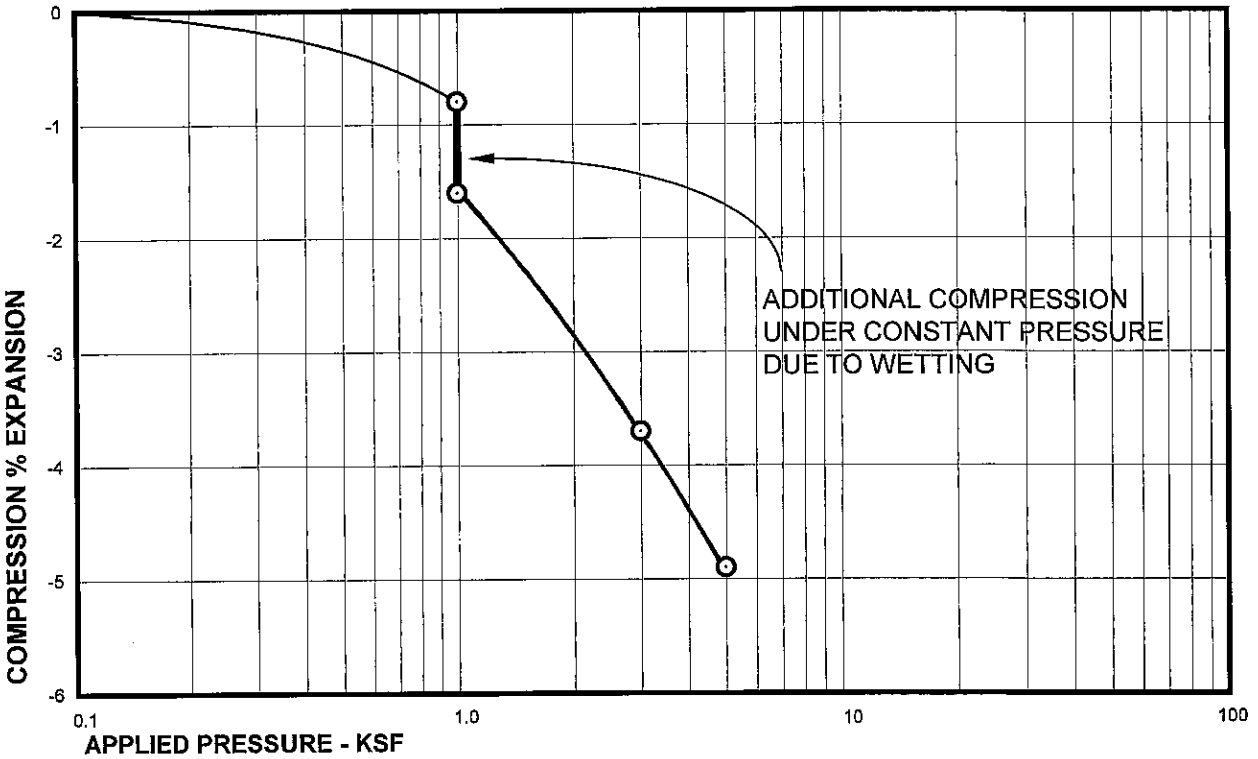
BORING NUMBER B-5

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.										

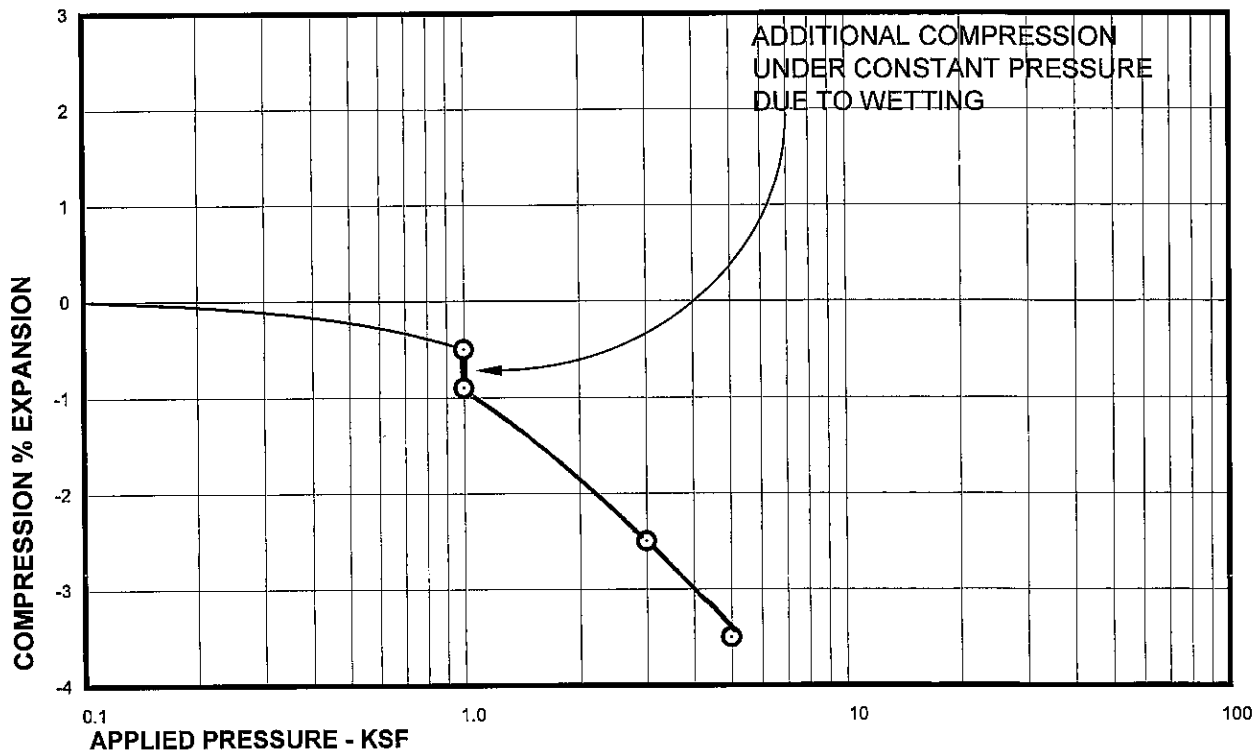
GEOTECH BH COLUMNS 01402-0002 GLENWOOD MULTIFAMILY.GPJ GINT US LAB.GDT 12/2/17

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 %



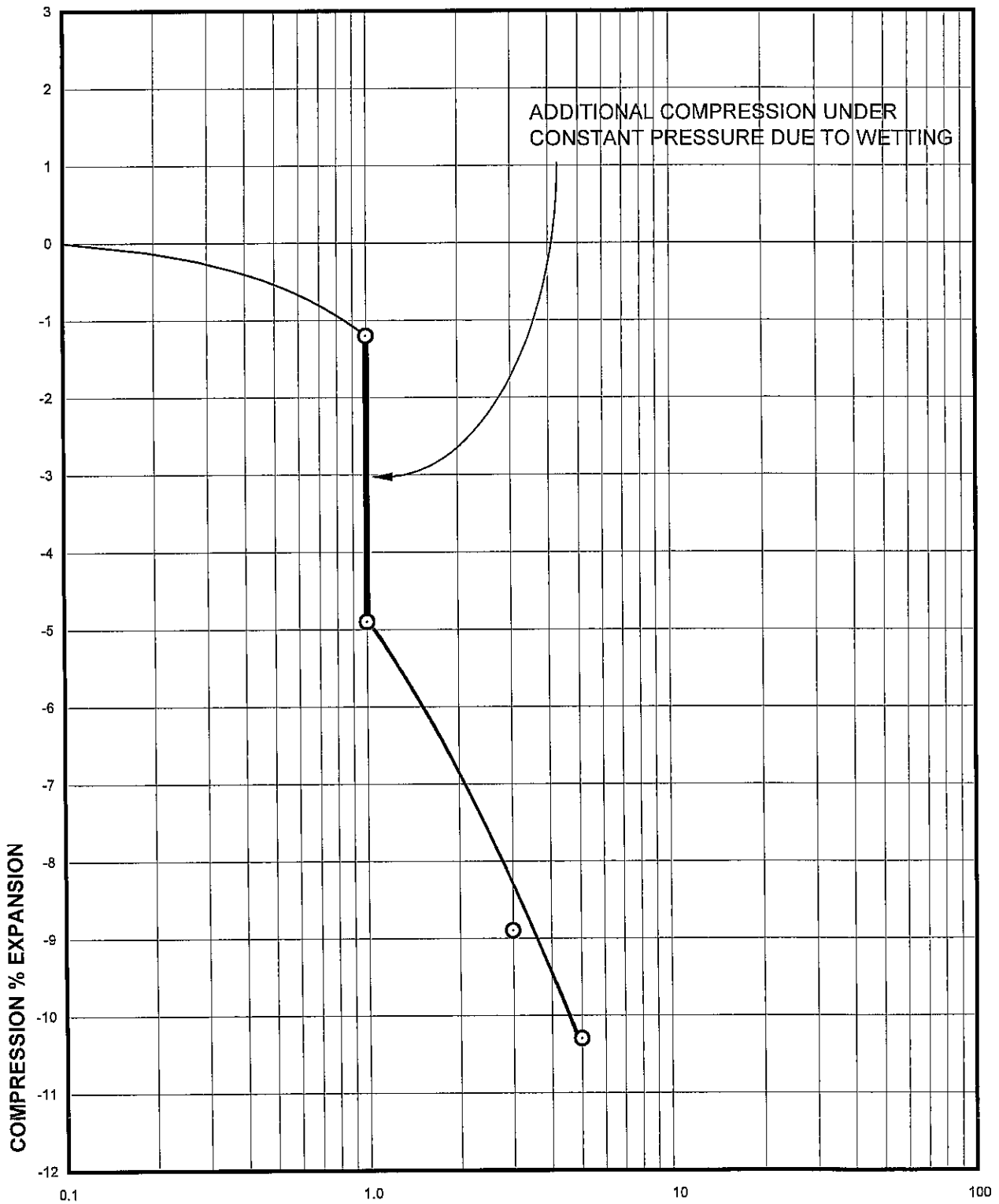
Sample of SAND, CLAYEY (SC)
From TH-1 AT 19 FEET

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



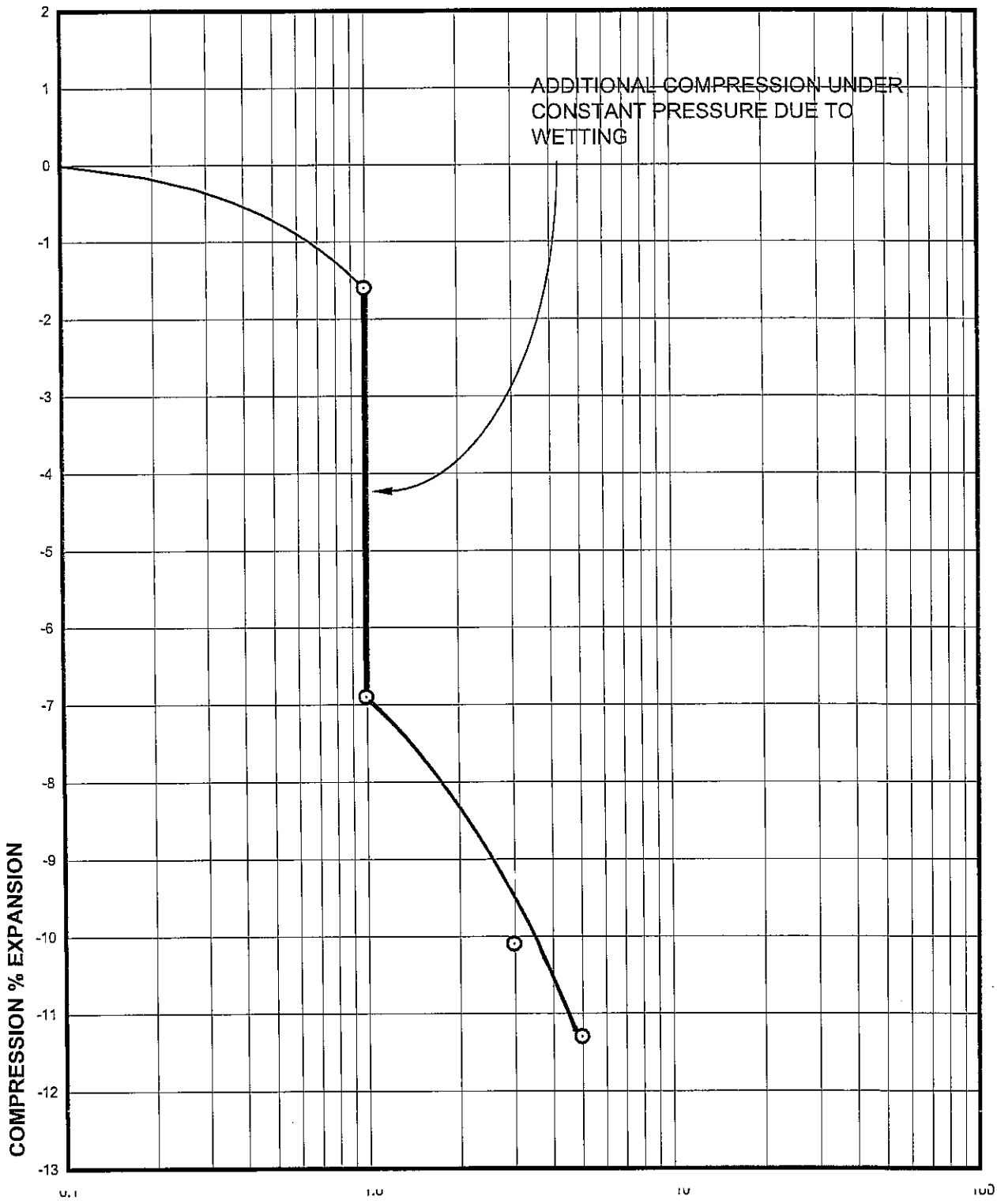
Sample of SAND, SILTY (SM)
From TH-1 AT 24 FEET

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



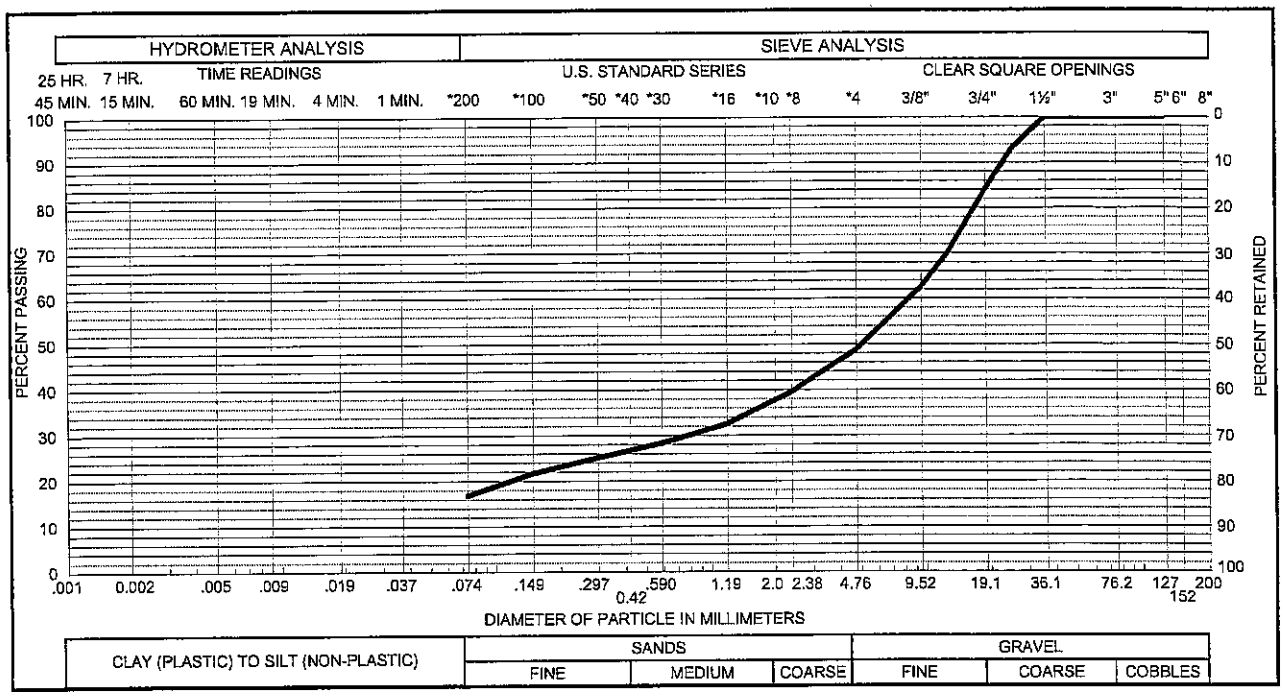
Sample of SAND, SILTY (SM)
From TH-1 AT 26 FEET

DRY UNIT WEIGHT= 109 PCF
MOISTURE CONTENT= 0.9 %

Swell Consolidation Test Results

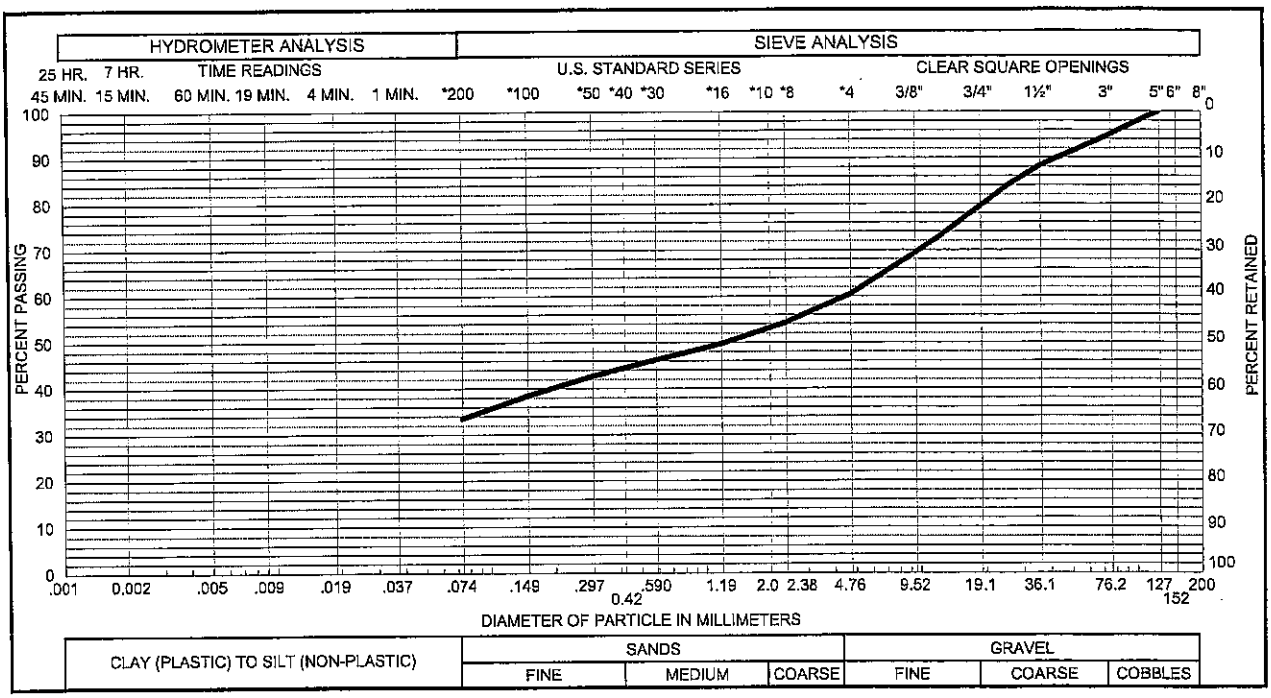
FIG. A-3

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 %



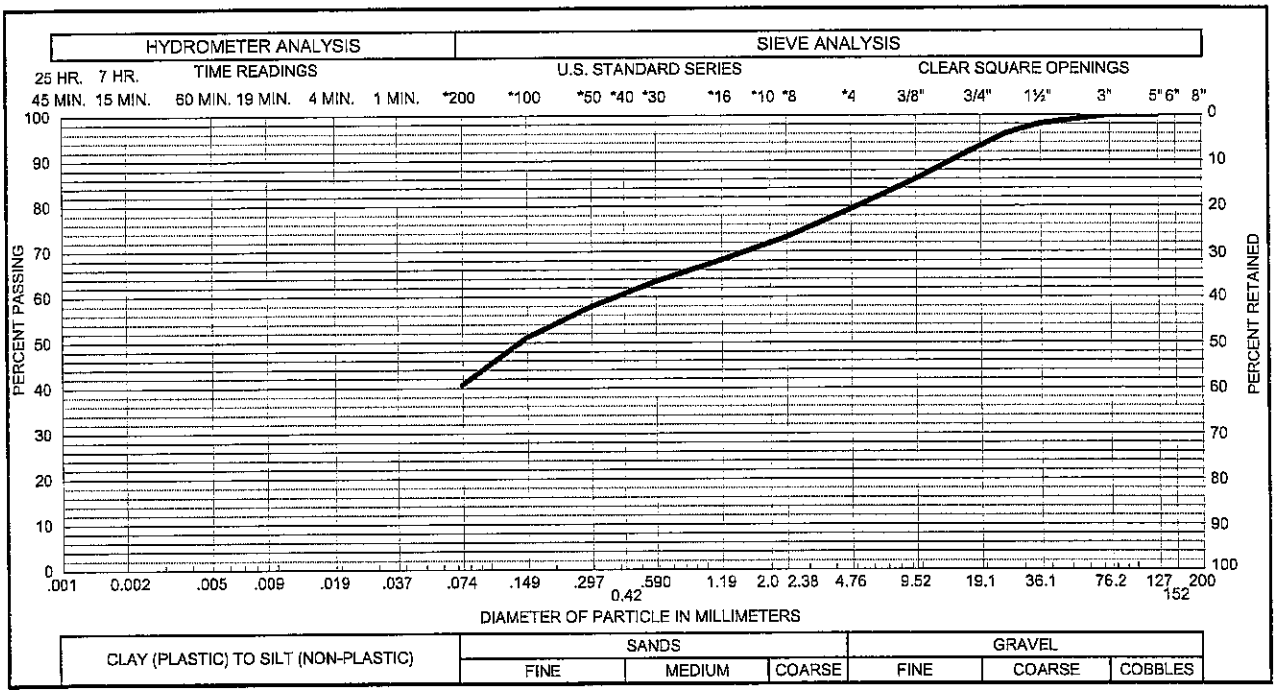
Sample of SILT, GRAVELLY (ML)
From TP - 1 AT 8-10 FEET

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

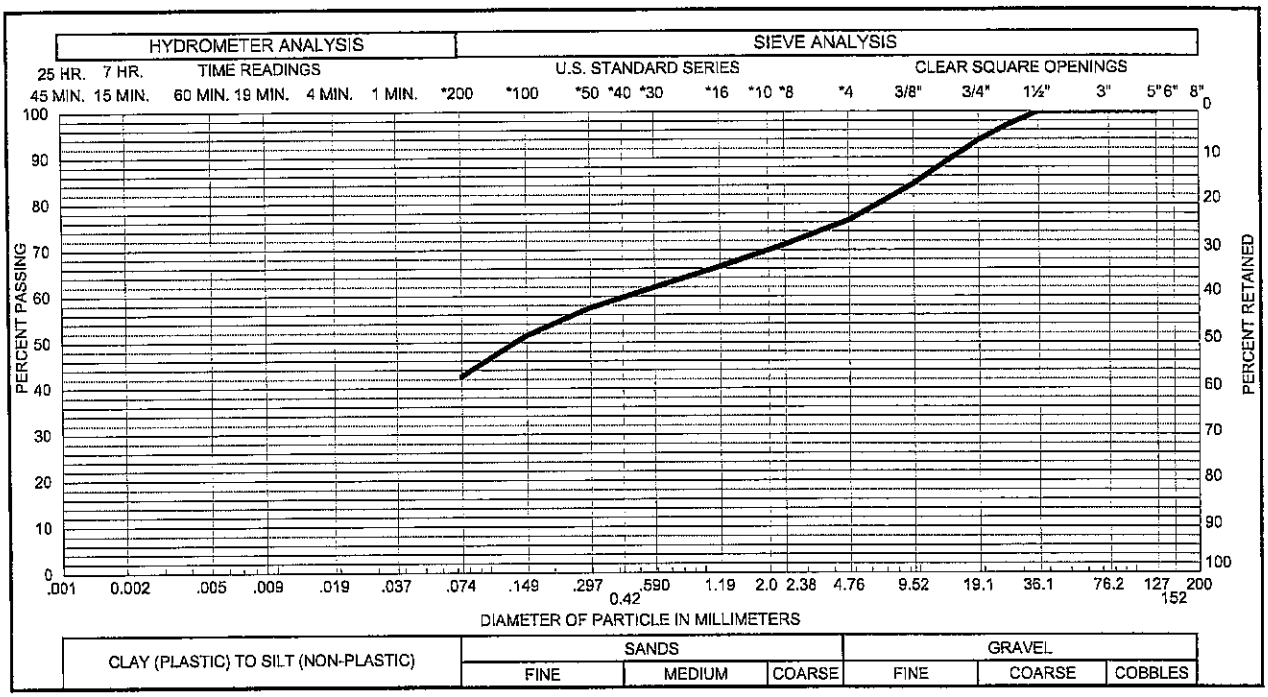
Gradation Test Results

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 %



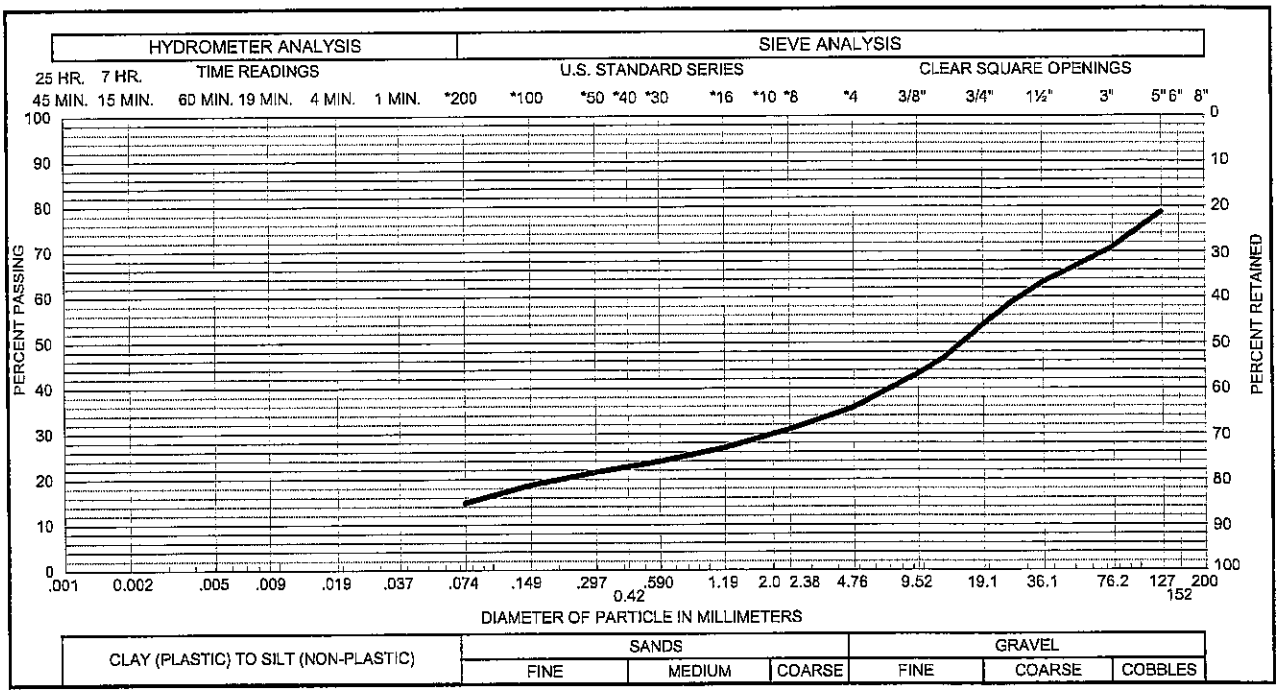
Sample of SILT, GRAVELLY (ML)
From TP - 3 AT 9-11 FEET

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

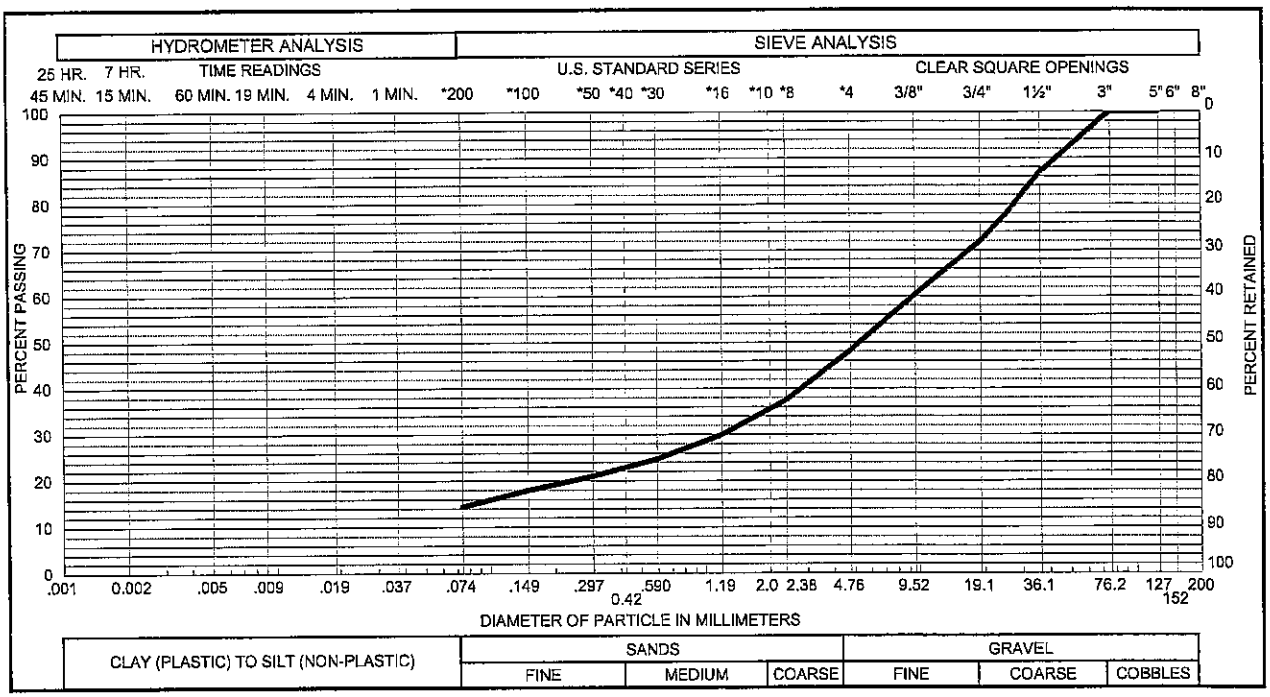
Gradation Test Results

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.

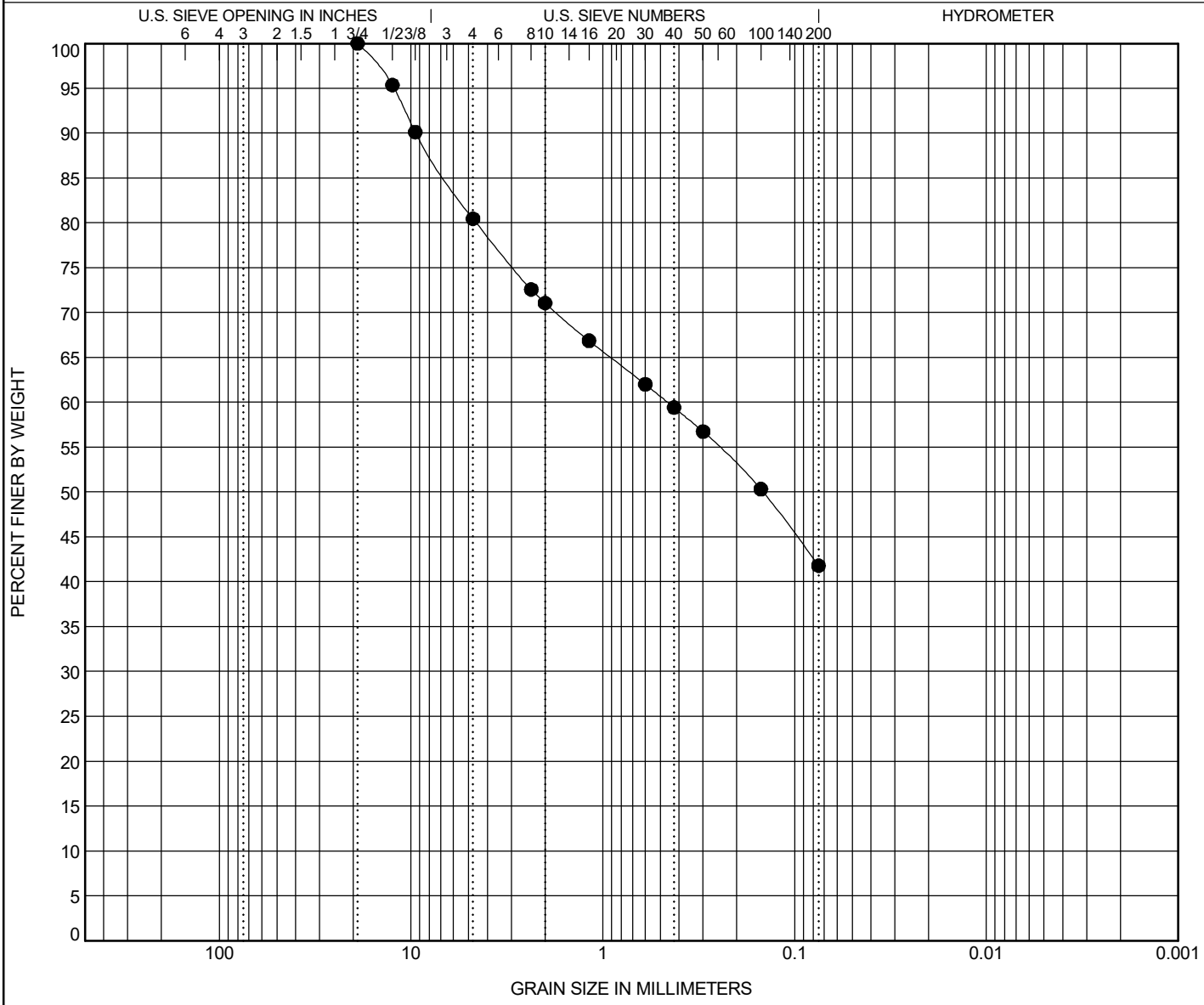
APPENDIX E
Laboratory Testing Results from Current Investigation

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

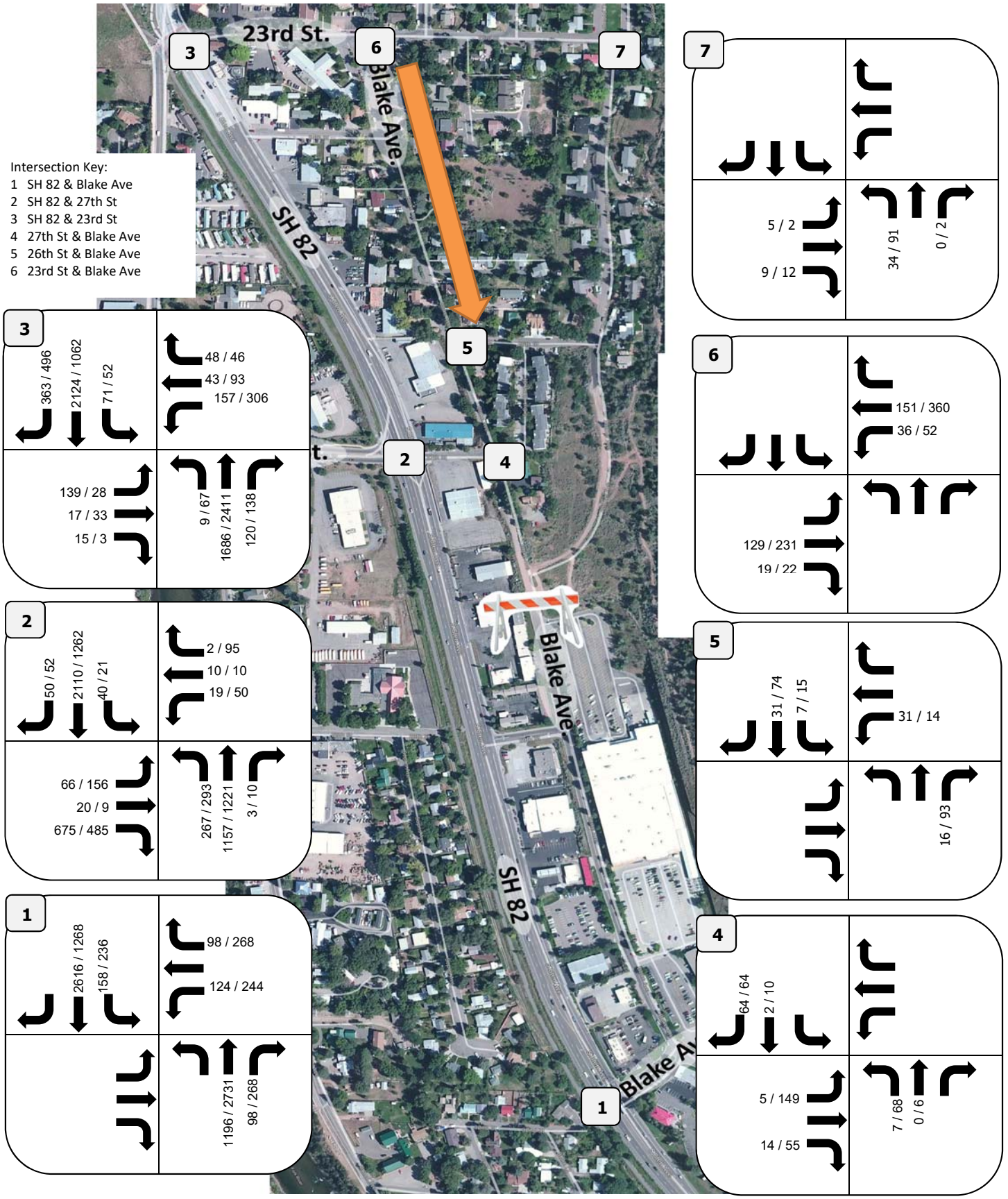
The proposed traffic volumes from the Glenwood Multifamily are not substantial compared to the background traffic volumes that presently exist. The creation of the one-way Blake Avenue configuration is not significantly impacted by the site traffic. Opening the Blake Avenue gate will provide another 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



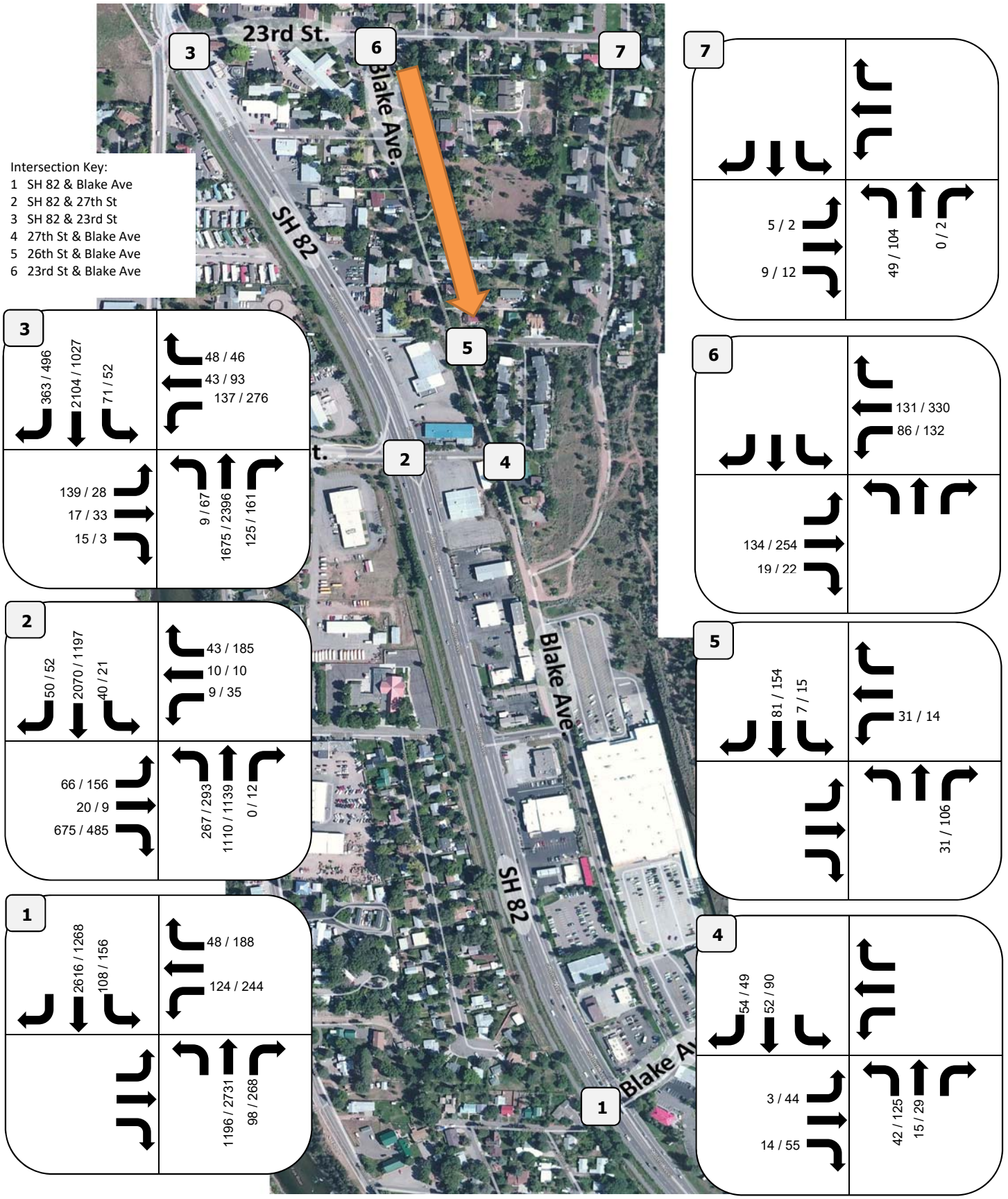
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

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



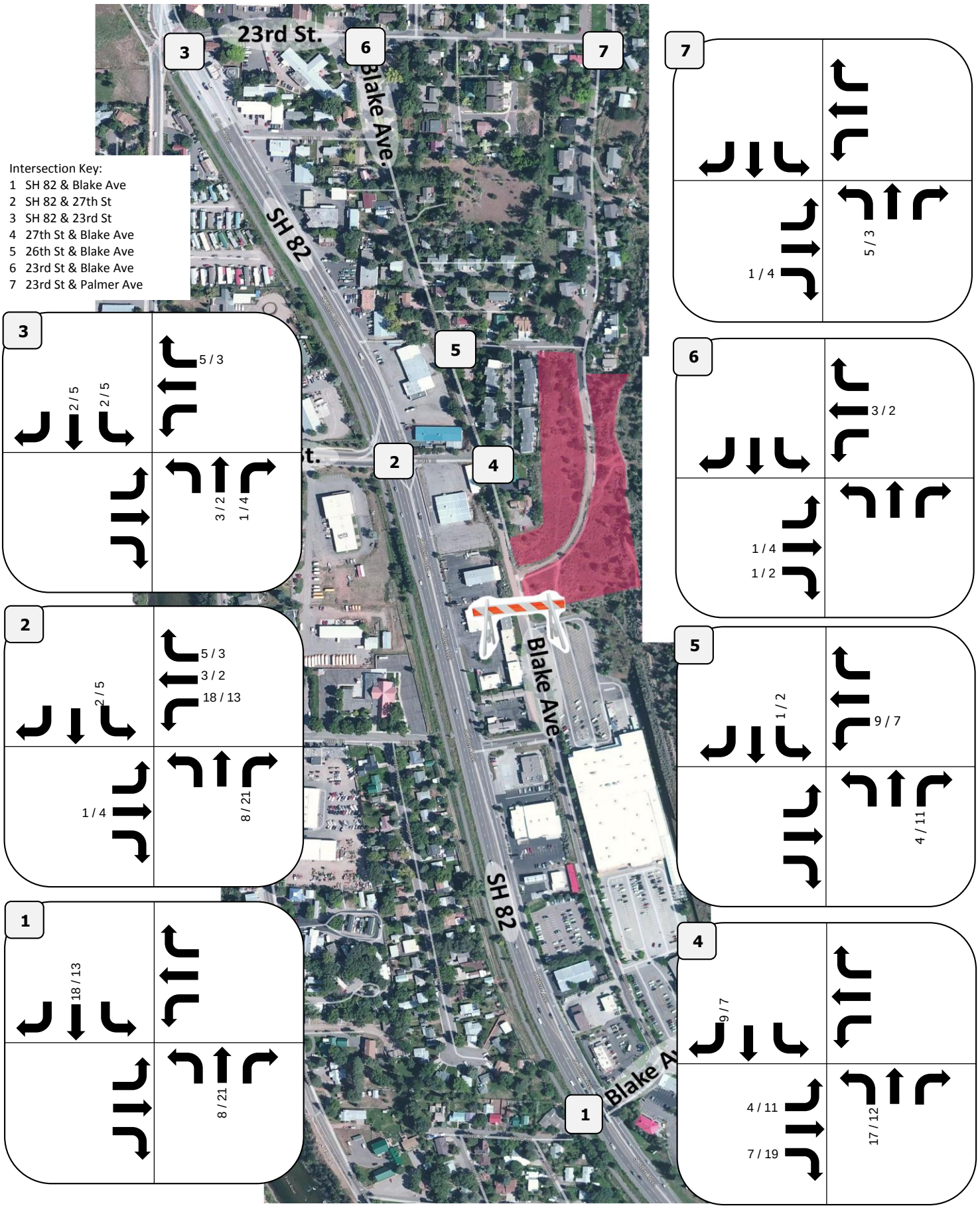
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

October 30, 2017

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



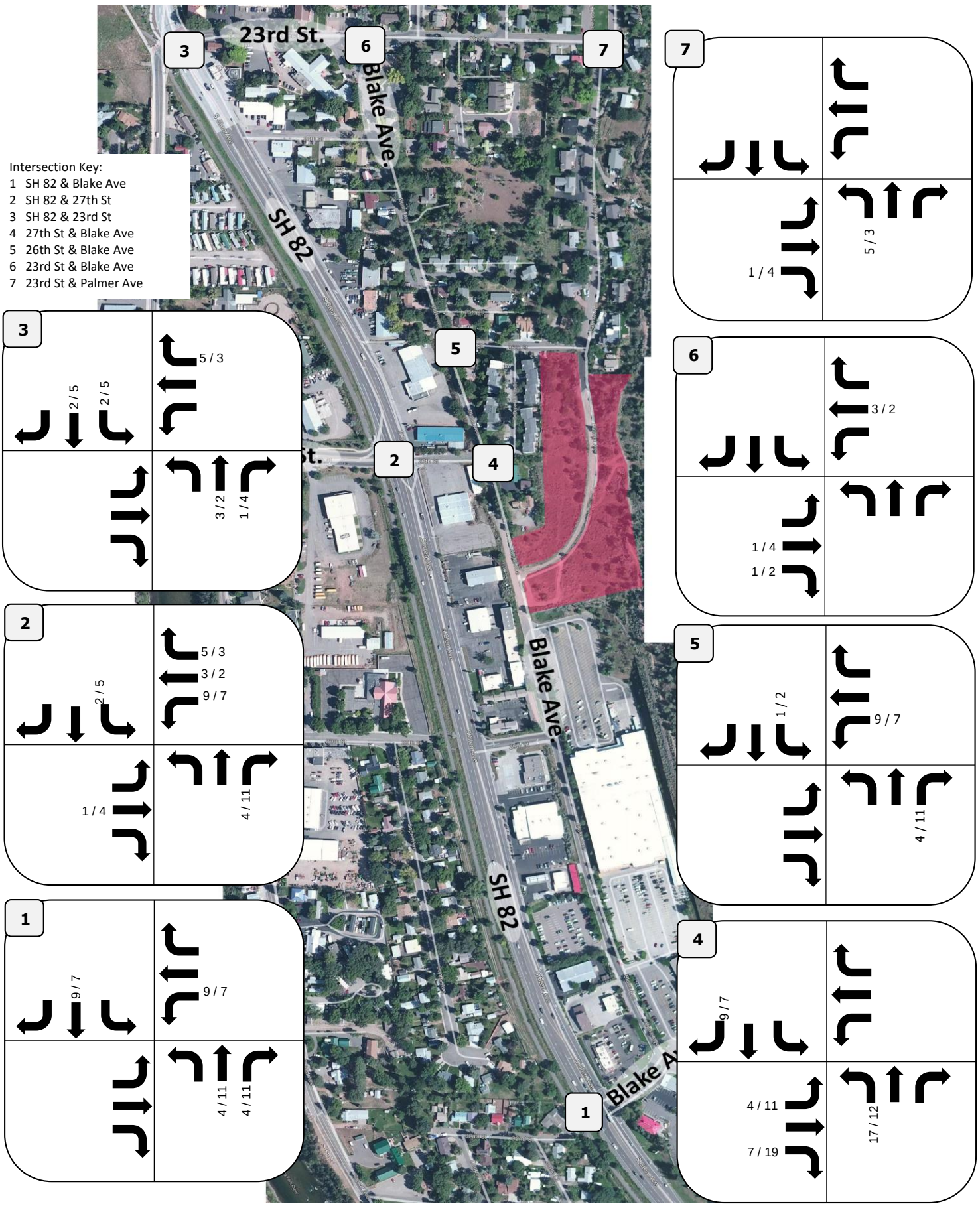
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

LEGEND :

LEGEND :
AM/PM Volumes = XX / XX vph

March 9, 2017

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



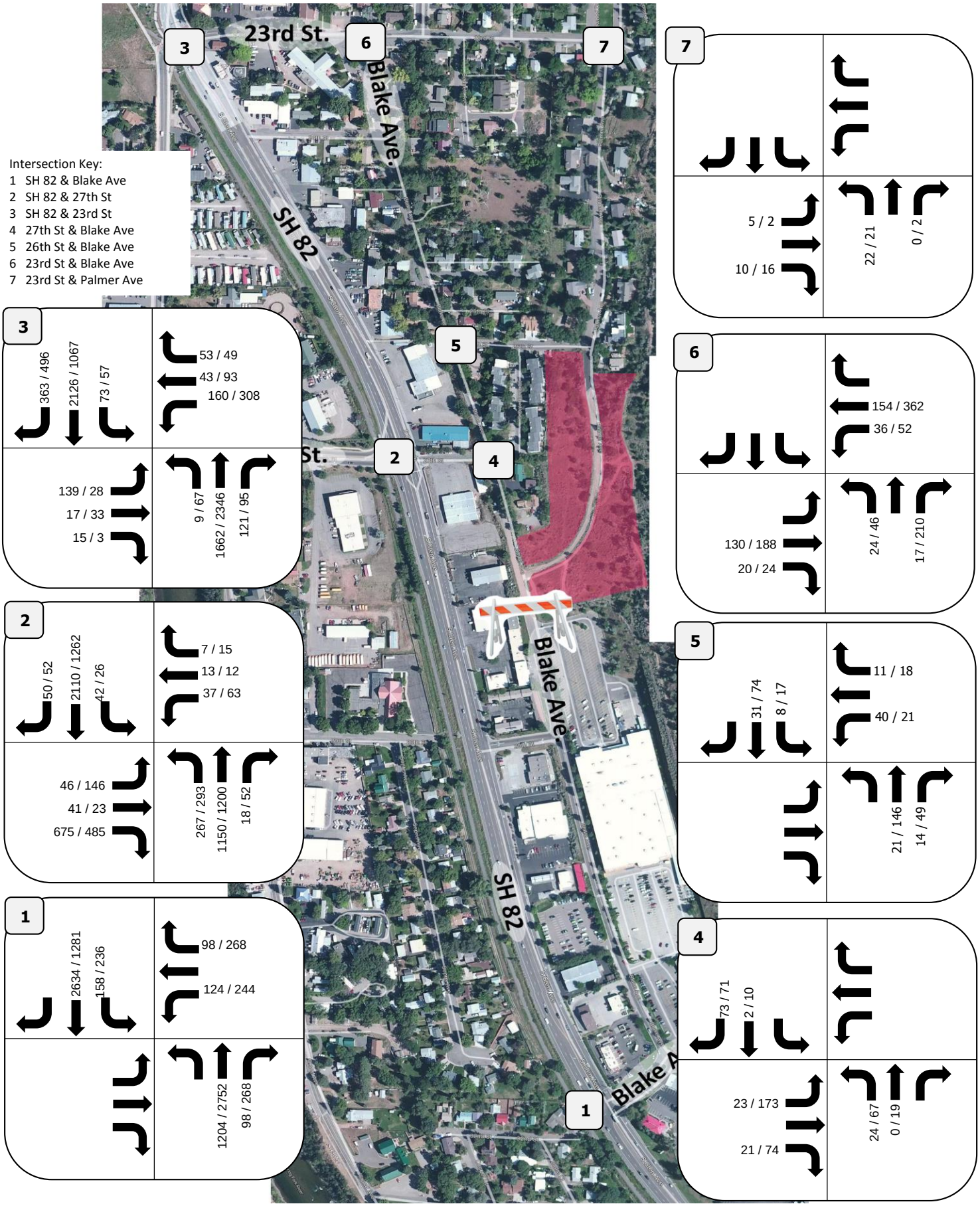
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

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



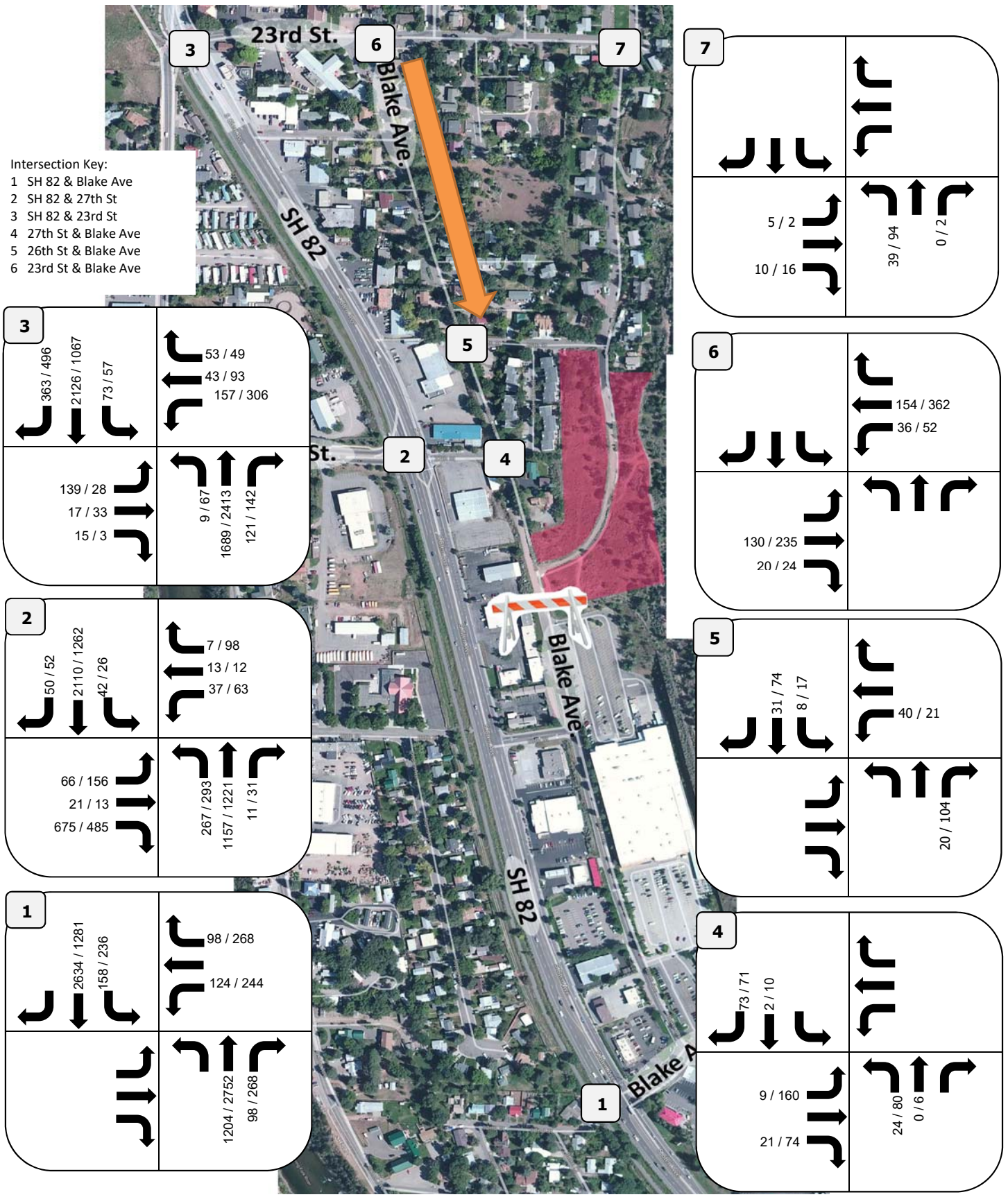
Project Number: 1247
Prepared By: BBG
Bell Rippy, Glenwood Springs, Colorado

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



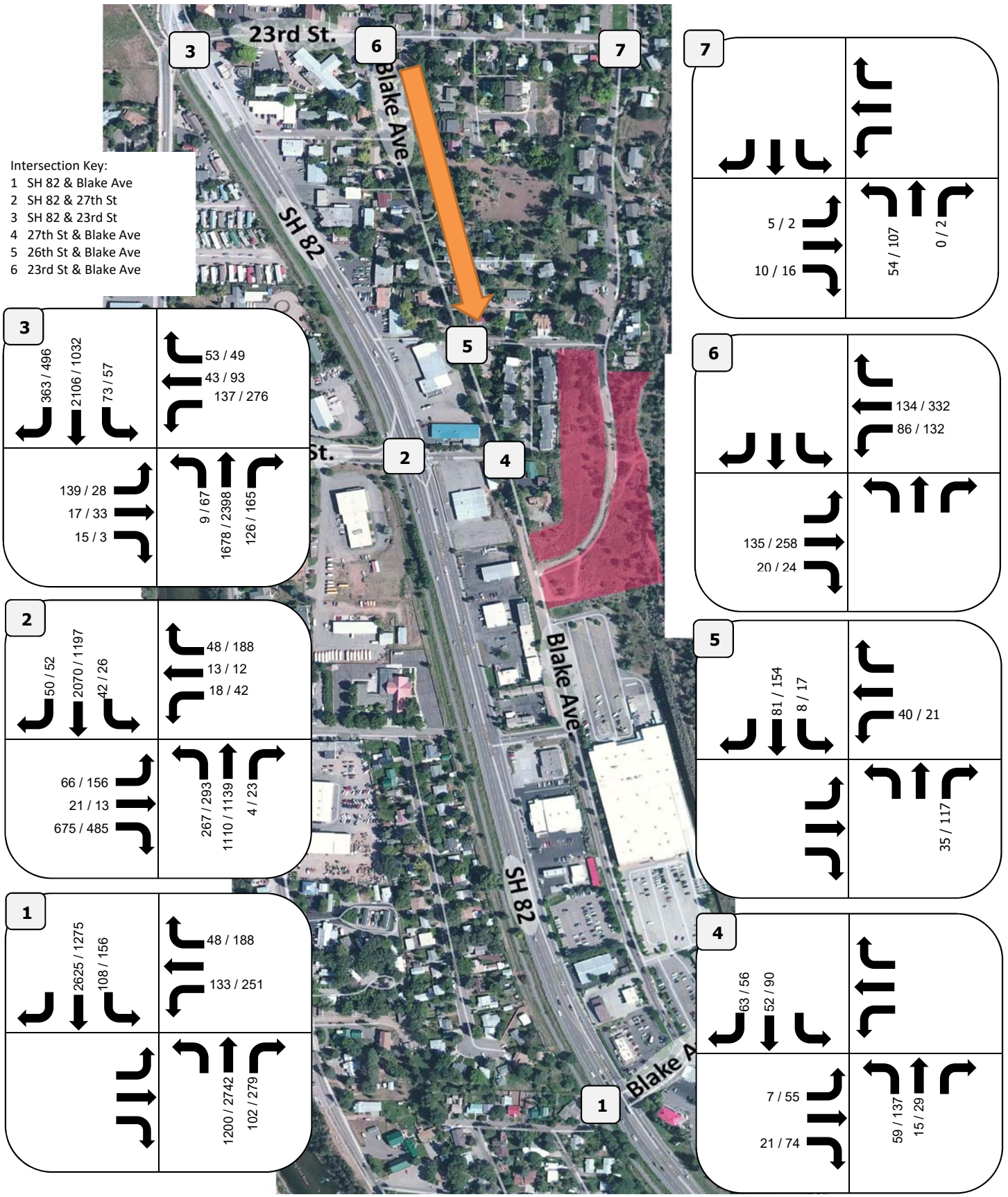
Project Number: 1247
Prepared By: KJS
Bell Rippy, Glenwood Springs, Colorado

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

City Council
STAFF REPORT
City of Glenwood Springs
July 23, 2020

Agenda Item: *CONTINUED FROM JULY 16 REGULAR CITY COUNCIL MEETING*
Ordinance No. 20, Series of 2020; An Ordinance of the City Council of the City of Glenwood Springs, Colorado, Rezoning Property Owned by Bell Rippy Glenwood, LLC Known as 2710 Blake Avenue, Glenwood Springs Colorado, from Residential High-Density(RH) to Residential Transitional (RT) Zoning (FIRST READING)

Action Requested: See attached staff report for Planning Item 04-20

Department: Economic and Community Development

Presented By: Trent Hyatt, Senior Planner

Background Info:

Issues:

Staff Recommendation:

ORDINANCE NO. 20

Series of 2020

AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, REZONING PROPERTY OWNED BY BELL RIPPY GLENWOOD, LLC KNOWN AS 2710 BLAKE AVENUE, GLENWOOD SPRINGS, COLORADO, FROM RESIDENTIAL HIGH DENSITY (RH) TO RESIDENTIAL TRANSITIONAL (RT) ZONING.

WHEREAS, Triumph Development West, LLC (the "Applicant") filed with the City of Glenwood Springs ("Glenwood Springs" or the "City") on behalf of Bell Rippy Glenwood, LLC (the "Owner"), a request to rezone from RH-Residential High Density to RT-Residential Transitional real property known as 2710 Blake Avenue, Glenwood Springs, CO 81601, also known as parcel 218521100002 in the real property records of Garfield County, Colorado (the "Property"); and

WHEREAS, the Planning and Zoning Commission considered the requested rezoning at a public hearing on May 26, 2020 and recommended approval of the rezoning based on its consideration of the rezoning approval criteria set forth in Section 070.060.040(a)(3)f.3 of the Municipal Code and its findings that the rezoning is consistent with the Comprehensive Plan and the purpose of the Municipal Code; the rezoning is consistent with the Residential Transitional zone district's purpose statement; substantial changes in the area warrant a zoning change; and the intensity in the new zoning district is not expected to create significantly adverse impacts to surrounding properties or the neighborhood; and

WHEREAS, City Council, following notice required by law, held a public hearing at a regular meeting on July 16, 2020 to consider the rezoning request for the property in light of the approval criteria set forth in Section 070.060.040(a)(3)f.3 of the Municipal Code and found that rezoning the property to Residential Transitional (RT) is an appropriate designation for the Property pursuant to Section 070.060.040(a)(3)f.3; and

WHEREAS, City Council wishes to rezone the property from Residential High Density (RH) to Residential Transitional (RT).

NOW, THEREFORE, IT IS ORDAINED BY THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS THAT:

Section 1: The recitals above are hereby adopted as findings.

Section 2: The Property is hereby zoned Residential Transitional (RT).

Section 3: Pursuant to Section 070.060.040(a)(3)g. of the Municipal Code, the Community Development Director shall prepare a revision to the Official Zoning Map of the City of Glenwood Springs to reflect the rezoning approval herein and shall record the amended map and this Ordinance with the Garfield County Clerk and Recorder.

Section 4: Any ordinances or resolutions or parts thereof, which are in conflict with this ordinance, are hereby repealed to the extent of such conflict only.

INTRODUCED READ ON FIRST READING, PASSED, AND ORDERED PUBLISHED BY TITLE ONLY THIS 16TH DAY OF JULY 2020.

CITY OF GLENWOOD SPRINGS, COLORADO

_____
Jonathan Godes, Mayor

ATTEST:

_____
Catherine Fletcher, City Clerk

INTRODUCED, READ ON SECOND READING, PASSED AND ORDERED PUBLISHED BY TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND PUBLICATION THIS _____ DAY OF _____, 2020.

CITY OF GLENWOOD SPRINGS, COLORADO

_____
Jonathan Godes, Mayor

ATTEST:

_____
Catherine Fletcher, City Clerk