AGENDA
CITY OF GLENWOOD SPRINGS
REGULAR CITY COUNCIL MEETING
NOVEMBER 18, 2021
101 W. 8TH STREET
6:15 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.*

ATTENTION: To ensure your written comments are included in the City Council packet, public comments must be received by 4 p.m. (closing time of City Hall) on the day before City Council meetings. Comments may be submitted to ryan.muse@cogs.us or delivered to the City Clerk's Office at 101 W. 8th Street.
Written comments may be submitted after this deadline and will be shared via email to City Council but are not guaranteed to make it into the meeting packet. Submit comments at any time directly to City Council via email at citycouncil@cogs.us.

ZOOM INSTRUCTIONS

1. You are invited to a Zoom webinar.

   When: Nov 18, 2021 06:15 PM Mountain Time (US and Canada)

   Topic: 2021/11/18 Regular Council Meeting

   Please click the link below to join the webinar:

   https://us02web.zoom.us/j/86235788650

   Or One tap mobile :

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   Webinar ID: 862 3578 8650

   International numbers available: https://us02web.zoom.us/u/keevnE0EcQ

WORK SESSION

2:45	2.	Agenda Review/Future Agenda	Information/Discussion
3:15	3.	Transportation Demand Management Program/Paid Public Parking Input	Information/Discussion
4:15	4.	Development Moratorium and Ad Hoc Affordable Housing Committee	Information/Discussion

REGULAR SESSION

5:30	5.	Roll Call

EXECUTIVE SESSION

Executive Session to Conduct a Conference with the City Manager and City Attorney for the Purpose of Discussing the City's Purchase, Acquisition, Lease, Transfer or Sale of Real Property; Determining Positions Relative to Matters That May be Subject to Negotiations, Developing Strategy for Negotiations, and Instructing Negotiators, Developing Strategy for Negotiations, and Instructing Negotiators; and to Conduct a Conference with the City Attorney to Receive Legal Advice in Accordance with C.R.S. 24-6-402(4)(a), (b) and (e), and 24-6-402(4)(f) (I), C.R.S., related to

6. The Advise of Legal Council — Information/Discussion
7. Personnel Related Matter — Information/Discussion

RECONVENE REGULAR SESSION

6:15
8. Pledge of Allegiance
9. Agenda Changes & Conflicts
10. Citizens Appearing Before Council (for items not on the Agenda-comments limited to 3 minutes)
11. Teacher of the Year Honor
12. Council Comments
13. Consent Agenda — Discussion and/or Action
    - A. November 4, 2021 City Council Minutes
    - B. Parks and Recreation Commission Appointment
    - C. Ordinance 13 - Series of 2021; 2nd Reading - An Ordinance of the City of Glenwood Springs, Colorado, Acting by and Through its Utility Enterprise, Approving a Loan, Evidenced by a Note, to Finance System Capital Improvements; Approving the Note Form and Loan Repayment From the Operation of the City's Water and Facilities; and Providing Other Details and Approving Documents Relating to the Loan.

ACTIONS AND/OR PRESENTATIONS

14. Planning File 60-20 - Consideration of a Major Site/Architectural Plan Review application for the construction of 300-unit multi-family development in 14 separate buildings in Glenwood Meadows. — Discussion and/or Action
15. Planning Item 68-21, Silver Sage Planned Unit Development Extension of Vested Rights — Discussion and/or Action
16. Ordinance 17 Series of 2021; An Emergency Ordinance of the City of Glenwood Springs, Colorado, Imposing a Temporary Moratorium on Residential Development within the Geographical Limits of the City for the Immediate Preservation of the Public Health, Safety and Welfare. (First Reading) — Discussion and/or Action
17. 2020 Comprehensive Annual Financial Report (Audit) Presentation from McMahan and Associates — Discussion and/or Action
18. Lease of Boat Ramp in West Glenwood — Discussion and/or Action
19. Replacement of Fuel Tanks at the Airport — Discussion and/or Action
20. Ordinance No. 14, Series of 2021; An Ordinance of the City Council of the City of Glenwood Springs, Colorado, Fixing and Certifying the Mill Levy on the 2021 Assessment for Collection in Fiscal Year 2022 and Providing for a Temporary Tax Credit (FIRST READING) — Discussion and/or Action

21. Ordinance No. 16, Series of 2021; An Ordinance of the City Council of the City of Glenwood Springs, Colorado, Fixing and Certifying the Mill Levy on the 2021 Assessment for Collection in Fiscal Year 2022 for the Glenwood Springs General Improvement District No. 1980 and Providing for a Temporary Tax Credit (FIRST READING) — Discussion and/or Action

22. Report from City Administration

    A. City Manager

        i. Hotel Colorado Lighting Ceremony

    B. City Attorney

    C. Correspondence Incoming/Outgoing

23. Adjournment

DRAFT

Work Session/Agenda Planning through April of 2023

City Council Meeting	Work Session Item	Agenda Item
November 4, 2021	Airport Commission BOCC Joint Meeting and Dinner (5-6)	BLD Planning Item Budget Approval Black Hills Energy Presentation Mountain Bike Trails Fare Free on RFTA
November 18, 2021	TDM/Parking Management – Public Input (3-4) Glenwood Springs Association of Realtors (Housing) Mitchel Cooper Water System	Code of Conduct Spring Cleanup Blake Avenue
December 2, 2021 (Chanukah)	Board and Commission Discussion Pedestrian connections, (MOVE STUDY) 2021 Building Codes	Youth Mental Health Paid Parking Decision
December 16, 2021	Parks and Recreation Commission (RFP for South Canyon) Sayre Park Future Phases Housing Commission	Direction on RFP for South Canyon Pedestrian connections, (MOVE STUDY) Approval Decision
January 6, 2022	CLEER/GCE Update (45 Minutes) Code Enforcement Philosophy (15 Minutes)	CLEER Contract on Consent Pricing package for Downtown Parking (if approved earlier)

DRAFT

January 20, 2022	Comp Plan Check In CORA Conversation with Post Independent (4 -5) BRT/local bus optimization (MOVE STUDY) (45 Minutes)	BRT/local bus optimization (MOVE STUDY) (45 Minutes) Vehicular traffic optimization decision
February 3, 2022	Charter Review/Elected Mayor Council Compensation MOVE Study Ped and Cycling Improvements	BRT/local bus optimization (MOVE STUDY) decision 2021 Building Codes
February 17, 2022	Arts and Culture Board Long Term Cemetery Planning	MOVE Study Ped and Cycling Improvements
March 3, 2022	River Commission Water Use Reduction Solutions/Incentives Lone Pine Property	
March 17, 2022 (Purim ends in the evening of March 17)	Financial Advisory Board Encampment Cleanup/Solutions Transient impacts to downtown/solutions	
April 7, 2022	Ad Hoc Committee for Affordable Housing Recommendation Planning Commission	
April 21, 2022 (Passover is 4/15-4/23 – Mayor Holiday)	Airport Commission Vale Board Dog Park	Ad Hoc Committee for Affordable Housing Recommendation

	Dog Leash Enforcement Vehicular traffic optimization	
May 5, 2022	Art Center/Preforming Arts Center Special Events	
May 19, 2022	Tourism Board North Landing	
June 2, 2022	Historic Preservation Commission Cardiff Schoolhouse Future	
June 16, 2022	RFTA Construction Fill opportunities- Drive-In Theater, Outdoor Amphitheater, Sledding Hill	
July 7, 2022	Downtown Development Authority	
July 21, 2022	RICD Project Confluence (Confluence Park)	
August 4, 2022	Budget Only	
August 18, 2022	Budget Only	
September 1, 2022	Budget Only	
September 15, 2022	Budget Only	
October 6, 2022	Transportation Commission	Budget Hearing
October 20, 2022		Budget Approval
November 3, 2022	River Commission	
November 17, 2022		
December 1, 2022	Housing Commission	
December 15, 2022		

January 5, 2023	Planning Commission	Comp Plan Adoption
January 19, 2023		
February 2, 2023	Arts and Culture Board	
February 16, 2023		
March 2, 2023	Financial Advisory Board	
March 16, 2023		
April 6, 2023	Airport Commission Vale Board	

Items to Schedule:

BRT- Adoption of Both Preferred Alternatives or a Single Alternative

Traffic Report and Recommendations * Includes recommendation to go to North - South couplet on 8th and 9th

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Transportation Demand Management Program/Paid Public Parking Input

Action Requested: Review of program goals and resources

Department: Engineering

Presented By: Terri Partch, City Engineer
linda duPriest

Background Info: The City has been working to develop a transportation demand management program as well as a paid parking program. Paid Parking is one of the important strategies in implementing a TDM program.

Issues: None at this time.

Staff Recommendation: Request to allow staff to apply for a grant to help with TDM implementation.

Staff will request approval to move ahead with a paid parking program at the Council's December 2nd meeting.

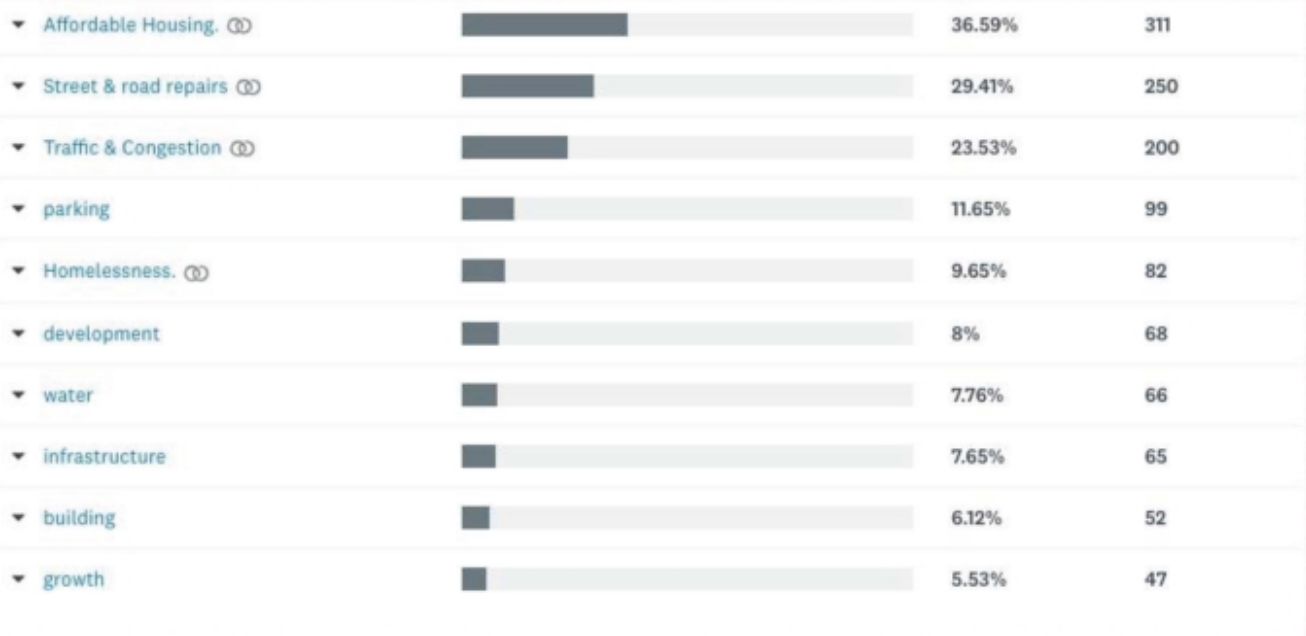
Reduction of Traffic and Congestion

Transportation Demand Management Program and Paid Parking

Resident Top Issues, Priorities & Problems

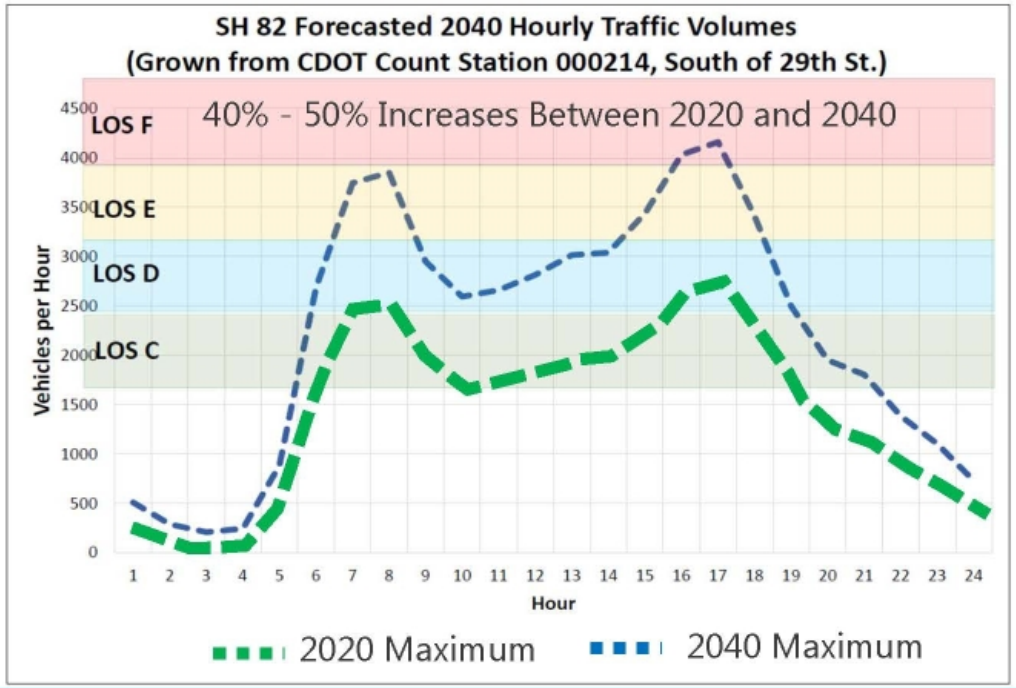
Please describe the top issues, priorities, or problems that you think the City of Glenwood Springs should address in the next three years.







2040 Congestion in Glenwood Springs



Traffic

Average Daily Traffic is projected to grow from 24,000 AADT to 46,000 ADT in 2040.

Transportation Demand Management Definitions

Federal Highway Administration TDM Desk Reference, 2012:

"A set of strategies aimed at maximizing traveler choices"

-As an alternative to building more lane-miles, TDM seeks to get improved efficiency out of existing transportation infrastructure.

CDOT Statewide Transportation Demand Plan, 2019:

"The application of strategies and policies to reduce motor vehicle travel demand, or to redistribute this demand in space or in time.



CITY OF GLENWOOD SPRINGS TRANSPORTATION

TDM Core Strategies

- Transit – Local, Regional, Intercity
- Vanpools
- Carpools
- Walking
- Bicycling
- First /Last Mile Walking & Bicycling – connect to transit
- Variable Work Hours
- Telecommuting



CITY OF GLENWOOD SPRINGS TRANSPORTATION

TDM Support Strategies

- Rideshare Matching
- Guaranteed Ride Home
- Parking Management
- Incentives – financial, time off, transit passes
- Marketing & Education
- Market-Based – toll roads, managed lanes, parking cost
- ITS – incl. Smart Cards for Transit
- App-based – MaaS (Mobility as a Service)
- All-modes infrastructure



CITY OF GLENWOOD SPRINGS TRANSPORTATION

Three Levels or Scales of a TDM Program

Downtown

Glenwood Springs

Regional – Aspen to Parachute

Downtown and Glenwood Traffic Types

- Business owners and employees
- Downtown residents
- Tourists
- Local through-commuters, shopping and eating out
- Big truck deliveries/freight
- Small personal deliveries – meals, parcels (UPS, Fed Ex, etc)
- Driving around searching for parking – 30%
- Through-traffic, regional travel
- Emergency

Create Downtown Transportation Management Association

- COGS initiates and provides start-up funding
- Identify partners
- Analyze business owner/employee survey
- Hire TDM consultant (small contract) to set up ETCs, tech platform, incentive programs
- Fast track needed infrastructure improvements & transit services
- Set up future funding plan and seek grants
- Establish data collection protocol
- Triggered by managed/paid parking initiative

CDOT Grant Available for TDM Program Start Up. Are we interested in pursuing it with some of these ideas?

Why would anyone choose to get out of their cars?

- Current and Projected Worsening of Traffic and Congestion
- Scarcity of Parking at Your Destination
- Having to Pay for Parking at your Destination

Benefits of Managed/Paid Parking Downtown

- Frees up parking for business patrons and tourists
- Eases congestion, auto emissions by reducing parking space hunt and reducing the number of cars overall
- Improves safety & quality of Downtown public spaces
- Generates revenue for expanding transportation options

Paid/Managed Parking Input –Sample of Comments

- Manage our current lots only instead of on street parking
- Should manage the parking to 85% occupancy without charging people.
- Add more garages first and manage the current time limitations
- Don’t charge employees or downtown residents to park
- City and County should provide transit passes for their employees
- Never let developers reduce the required amount of parking
- Paid parking will negatively affect business. Parking should be free.
- Paid parking will force more cars out to the residential areas
- No to paid parking!
- Paid parking is part of the evolution of a resort town.
- Don’t allow housing to be constructed without off street parking
- Paid parking will not stop people from circling the block

Paid/Managed Parking Input –Sample of Comments

- Need residential parking management. Residential cars should be moved every 48 hours.
- City and County lots should be used for public parking also
- Why restrict overnight parking?/ Overnight parking should be prohibited in City lots.
- Provide a lot for RVs
- Snow plowing limits parking spots through icing and snow piles.
- Provide a shuttle service between the hotels and dining.
- Park Mobile app is easy to use
- Allow garages to be used by residents after a certain time. Have them out by 8:00 am
- Paid parking should be one block east and west of grand, not two.
- Build parking structures on the west side of downtown and force long term parking users to these structures

Paid/Managed Parking Input-Sample of Comments

- Provide spaces for residents downtown, perhaps with payment.
- City and County should build multilevel parking lots on their property.
- Need parking to be managed on the weekends
- Agree that there should be no residential parking in the two hour spots
- Provide exceptions for downtown residents between the hours of 6pm and 6 am.
- Need to increase penalties
- Permits for residents will discourage rentals and ADUs/ Make it illegal to operate and ADU downtown
- Adequate public transportation is needed across the valley to accommodate workers
- Free employee permits in certain lots/ USFS would be interested in paying for employee passes.

Ideas in response to the public comments that we'd like to propose:

- Free downtown parking for each license plate for 30 minutes -1 hour for pick up and deliveries
- Free employee passes in the WWTP lot (Propose expanding this and adding new spaces)
- Low cost employee passes in the residential areas near downtown
- Up to three free residential passes for areas around the downtown. Low cost permits for additional cars.
- Free downtown residential permits available for the City garage between the hours of 5:00pm and 8:00 am. Cars must move after 8:00am
- Up to two long term downtown residential car storage permits available for the WWTP lot.
- Improved enforcement through license plate recognition technology, Smart Park or similar technology for parking management by space/block and payment kiosks for those who can't pay through a cell phone.
- Weekend parking management
- Progressive pricing for parking in the downtown area up to four hours.
- Increased fines for repeat offenders for parking tickets
- Work towards a delivery management plan for downtown businesses . It looks like early morning hours for deliveries might work?

Other TDM Ideas in Progress:

- In the 2022 Budget we plan to evaluate increased service to North and South Glenwood
- We are working with RFTA to identify a BRT route to connect West and South Glenwood
- We are working with RFTA on We Cycle implementation in town
- We are improving pedestrian/bike infrastructure in these areas:
  - Underpasses at 27th and SH 82
  - Evaluating improved connectivity between Midland and the underpasses along 27th Street
  - Proposing raised crosswalks on Mount Sopris, and at 12th and 14th on Blake

End of presentation

City of Portland ideas if we have time

The Way to Go Plan: Moving People in Portland

A Transportation Demand Management strategy to advance our mobility, climate, and equity goals





PBOT engages with large employers to increase transit usage to remedy Portland's violation of the **CLEAN AIR ACT.**

TRANSPORTATION OPTIONS DIVISION formed at PBOT.

TRAVELSMART piloted in Multnomah Village.

PBOT launches **SMARTTRIPS** program.

SMARTTRIPS DOWNTOWN launches, coinciding with the construction of the MAX Green line.

SMARTTRIPS BUSINES and **SMARTTRIPS RESIDENTIAL** program launched.

1990s | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009



SAFE ROUTES TO SCHOOL Program begins.

First **SUNDAY PARKWAYS** opens the city's largest public space—its streets—for people to walk, bike, and roll.





Transportation Options Division reorganizes as the **ACTIVE TRANSPORTATION DIVISION.**

SMARTTRIPS NEW MOVERS launches.

PBOT launches Portland's bike-share system, **BIKETOWN.**

PBOT launches the **TRANSPORTATION WALLET** program.

The PBOT Strategic Plan **MOVING TO OUR FUTURE** makes TDM and mobility-related policies, programs, and projects central to the work of the city.

PBOT launches the **PRICING OPTIONS FOR EQUITABLE MOBILITY (POEM)** project.

BIKETOWN transitions to e-assist bikes and expands service area.

2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020



City adopts **VISION ZERO POLICY.**

ACTIVE TRANSPORTATION AND SAFETY DIVISION brings TDM, Safe Routes to School, micromobility management, and Vision Zero into a single team.



PBOT initiates its **SHARED ELECTRIC SCOOTER** pilot.

PRICING OPTIONS FOR EQUITABLE MOBILITY

FINAL REPORT



CITY OF PORTLAND
PORTLAND BUREAU OF TRANSPORTATION
PORTLAND BUREAU OF PLANNING AND SUSTAINABILITY

Bureau of Planning and Sustainability

PBOT



DEVELOPED FOR

PBOT

PERFORMANCE BASED PARKING MANAGEMENT MANUAL

APRIL 2018



DEVELOPED BY

Kimley»Horn

FEHR PEERS

Memorandum

Date: April 30, 2021

To: Emily Kushto, Parsons
David Johnson, RFTA
Terri Partch, City of Glenwood Springs

From: Patrick Picard and Charlie Alexander, Fehr & Peers

Subject: MOVE Grand Avenue – Parking Analysis & Findings UPDATED

DN19-0647

Contents

Contents 1

Overview and Purpose 2

- Background 3
  - Previous Plans 3
  - Parking Enforcement 4
  - Residential Parking Permit Program 5
  - 27th Street Park & Ride 5

Methodology 7

- Study Area 7
- Curb Space and Parking Lot Inventory 8
  - Downtown Glenwood Springs 9
  - Park & Rides 9
  - 700 Block Cooper Avenue 10
- Parking Utilization Study Periods 11
- Parking Occupancy 13
- Bicycle Parking at Park & Rides 14
- Summer Data Methodology 14
  - StreetLight Data 14
  - Satellite Imagery 16

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www.fehrandpeers.com

Key Findings **17**
27th Street South Glenwood Station 17
West Glenwood Park & Ride 18
Downtown Glenwood Springs Winter 18
Downtown Glenwood Springs Summer 20
Bicycle Parking at Park & Rides 23
Estimating Parking Demand at 27th Street South Glenwood Station 25
Low End Estimation 25
High End Estimation 28
Existing and Future Parking Demand at 27th Street Park & Ride 29
Opportunities & Recommendations **31**
Downtown Parking & Curb Space Management 31
Short-Term 31
Long-term 41
RFTA Parking 44
Strategies to Increase Parking Capacity 45
Strategies to Reduce Parking Demand 46
BRT Considerations 47
BRT Impact to On-Street Parking 48
BRT Impact to Parking Demand Downtown 52

Overview and Purpose

The City of Glenwood Springs and the Roaring Fork Transportation Authority (RFTA) are jointly leading the Multimodal Options for a Vibrant Economy (MOVE) Grand Avenue project to explore alternatives for extending the existing VelociRFTA bus rapid transit (BRT) into downtown Glenwood Springs and to the West Glenwood Park & Ride. An important aspect of this project includes evaluation and recommendations for improving parking and curb space management both downtown and at the RFTA Park & Rides.

This memo provides a summary of existing on-street parking and off-street public parking conditions in downtown Glenwood Springs and at the two RFTA Park & Rides in Glenwood Springs. This memo also summarizes existing and future parking and curb space opportunities and recommendations. Future conditions recommendations consider alternatives explored for extending BRT downtown. Parking and curb space management strategies in downtown Glenwood

Springs focus on existing supply, demand, access, and management issues from the relatively dense mix of uses downtown, as well as potential new considerations as part of extending BRT downtown. Recommendations are also included to improve access to the BRT under existing and future conditions.

Determining existing on-street parking conditions occurred in two main stages: taking inventory of curb space and off-street parking supply and then collecting parking utilization data. Existing curb space restrictions and parking management strategies (time limits, etc.) were used to classify the curb space. Ownership and user restrictions were used to classify the off-street lots. Parking utilization was observed and documented during multiple study periods in the winter of 2020. Due to the COVID-19 pandemic, other data sources were used to estimate parking demand in the summer.

Background

Previous Plans

Below is a summary of previously completed parking and curb space plans relevant to the study area:

- **Downtown Parking Study (2013)** – The last detailed parking study in downtown Glenwood Springs was conducted in 2013. This study was completed prior to the construction of the City Parking Garage (at 9th Street/Cooper Avenue) and the Grand Avenue Bridge project. The study area included the downtown core north of 11th Street and south of 5th Street and utilization was measured on a single Thursday in August at 9 AM and 1 PM. The study concluded that while some blocks downtown have parking shortages at times, parking was always available within a block or two and with the construction of the City Parking Garage, no new parking would be needed in the short-term. The study also concluded that paid parking was not necessary in the short-term, but should be considered long-term as parking demand increased.
- **RFTA 27th Street Pedestrian Crossing (2019)** – This analysis evaluated pedestrian crossings options across SH 82 to connect the Rio Grande Trail with the 27th Street South Glenwood Station. This study also included an analysis of potential parcels and designs to expand the Park & Ride. The analysis assumed a need for between 65 and 95 additional parking spacing and provided opportunities, constraints, design considerations, and potential design concepts for several parcels.

Parking Enforcement

On February 28, 2020 a meeting was held with members of the project consultant team, City of Glenwood Springs staff, and parking enforcement officers in Glenwood Springs. The purpose of the meeting was to discuss current parking enforcement practices, as well as to identify existing parking and curb spaces issues, challenges, and potential solutions for downtown Glenwood Springs. Current enforcement practices and key challenges identified from that meeting are summarized here:

- Parking regulations downtown are enforced by a single enforcement officer on foot who patrols the area bound by 7th Street, 10th Street, Blake Avenue and Pitkin Avenue between 9 AM and 6 PM Monday through Friday, with occasional patrols on 6th Street.
- Chalk is used to track time parked and paper tickets are issued when needed.
- The City is currently exploring license plate readers and paid parking as a more effective and efficient management and enforcement tool.
- The most common violations are for time restrictions, vehicles illegally parked in the alley, and vehicles parked in safety zones (marked by yellow paint on the curb for driveways, sight lines, crosswalks, fire hydrants, etc.).
- Most parking violations result in a $20 ticket.
- Officers issue about 15-20 tickets per day in the winter and 30-40 tickets per day in the summer.
- Violations generate about $40,000 per year but cost the City about $50,000 per year to enforce.
- The maximum a car is allowed to park on street in unrestricted spaces is 72 hours, which is enforced in public off-street lots and in the unrestricted parking spaces.
- The 7th & Colorado lot is signed for 4-hour parking, but is not currently enforced as negotiations that allow some downtown residents and County employees to park longer are currently ongoing.

Some potential ideas for improving the parking management and enforcement downtown that were discussed include:

- Weekend enforcement
- Paid parking
- More frequent striping of curb/adopting standard practice for color designations
- Use of license plate readers for enforcement
- Development a truck delivery plan
- Increase fines

Residential Parking Permit Program

The City of Glenwood Springs has a residential parking permit program that allows residents downtown to park in 2-hour time restricted parking spaces for up to 72 hours. The exceptions include 7th Street and the 700 Block of Cooper Avenue. The program is managed by the police department. Residents that live between 7th Street, 10th Street, Blake Avenue, and Pitkin Avenue can apply for up to two permits per unit, good for the length of their lease or up to one year before needing renewal. Demand for the program sometimes exceeds the allowed number of permits per unit.

27th Street Park & Ride

The RFTA-owned 27th Street Park & Ride is known to be at capacity on most days and parking occupancy data was collected in the Park & Ride lot and some surrounding locations where transit users are suspected to be parking. Conversations with RFTA staff also revealed additional background information regarding regulations and other existing issues currently observed at the station that were considered as part of recommendations for parking management. Anecdotal background information provided by RFTA staff includes the following:

- The 27th Street Park & Ride is observed to fill up early and it is suspected that many people who would ride the bus from Glenwood Springs end up driving due to the lack of sufficient parking.
- While RFTA signs the Park & Ride for the exclusive use of RFTA transit riders and Rio Grande Trail users, and prohibits storing vehicles or using lots for ridesharing, RFTA has virtually no parking enforcement program and few funds are directed at parking enforcement.
- The residents of the surrounding neighborhood sometimes store extra vehicles in the 27th Street Park & Ride.
- Epic Mountain Express, which provides shuttle service to Denver and other mountain communities, will sometimes direct its customers to park in the 27th Street Park & Ride.
- Other businesses also use the parking lot as a ride share lot.
- Without adequate parking management, the planned residential development adjacent to the 27th Street Park & Ride could increase use of the lot by non-transit users.
- Based on anecdotal observations, most other Park & Ride lots along SH 82 generally fill to capacity during the summer and winter season with the exception of the back parking lot at the Basalt Park & Ride.

- The Carbondale Park & Ride acts as a trail head for the Rio Grande trail and is also anecdotally observed to fill to capacity almost every morning during the winter season and almost to capacity during the summer season.

Methodology

Study Area

Parking and curb space inventory and utilization were collected for two areas in Glenwood Springs as part of this analysis. These are mapped in the Parking Inventory maps attached to this memo and are described here:

- **Downtown Glenwood Springs.** The study area includes on-street parking in downtown Glenwood Springs bound by 6th Street, 14th Street, Pitkin Avenue, and Blake Avenue. It also includes on-street parking along 8th Street between Pitkin Avenue and Defiance Avenue as well as 7th Street between Blake Avenue and Bennett Avenue.

  Six off-street public parking facilities downtown were also included:
  - City Parking Garage (at 9th Street/Cooper Avenue)
  - Cooper Avenue lot (on Cooper Avenue between 8th Street and 9th Street)
  - 7th & Colorado lot (at the SE corner of 7th Street/Colorado Avenue)
  - 7th Street lot (on 7th Street at the Confluence)
  - Colorado Mountain College Garage (at 8th Street/Cooper Avenue) – public parking on evenings after 6 PM and weekends only
  - Garfield County lot (at the SW corner of 7th Street/Colorado Avenue) – public parking on evenings after 6 PM and weekends only

- **RFTA Park & Rides.** There are two Park & Rides in Glenwood Springs that are used to access bus service. These were both included in the analysis as described below:
  - *27th Street South Glenwood Station* – The RFTA-owned Park & Ride located at the southwest corner of 27th Street and Blake Avenue in south Glenwood Springs is the primary access point to the VelociRFTA BRT. In addition to the Park & Ride, parking supply and utilization data was collected at two off-street parking lots and two on-street street segments nearby that may experience spillover parking due to limited capacity at the Park & Ride:
    - On-street: Blake Avenue between 26th Street and 27th Street
    - On-street: 26th Street between Blake Avenue and Palmer Avenue
    - Off-street: Walmart north parking lot
    - Off-street: Walmart employee parking lot (which is also the designated RFTA overflow lot)

- *West Glenwood Park & Ride* – This Park & Ride is located near the intersection of Wulfsohn Road and Midland Avenue and provides access to RFTA Local Valley buses to/from Aspen, select BRT runs, the Hogback route (to/from Rifle/Silt/New Castle) and the Bustang West Line (operated by CDOT between Grand Junction and Denver).

Curb Space and Parking Lot Inventory

Curb space is defined as any place along the curb designated for parking or loading activity. Existing parking inventory maps of the study area and Google Maps Street View provided the basis for understanding curb space designations in the study area. Data collected from these methods was field verified to determine a classification for each segment of curb space and off-street parking facility in the study area. Field verification was completed on February 28, 2020 and the classification of each parking space, including the presence of ADA accessible parking spots, was cataloged according to the February 28, 2020 observations.

Each curb face was drawn by segment in GIS using aerial imagery as a guide. Segments were coded according to each curb space classification and separated when curb space designation changed, or is broken within a block by an alley or intersection. The number of available parking or loading spaces per segment was determined by dividing the segment length by 20 feet and rounding down. Twenty feet is a standard on-street parking space length in most urban contexts.

Off-street parking lots and garages were demarcated by a polygon on the maps and the number of parking spaces was inventoried based on the number of striped parking spaces.

Parking Classification

Curb space in the study area is classified into 12 different management types, which are further differentiated by three different physical parking arrangements: parallel, diagonal, and perpendicular.

The 12 curb space classifications observed in the study area and mapped in the Parking Inventory Maps include:

- 15-Minute Parking
- 30-Minute Parking 9AM – 6PM
- 2-Hour Parking 9 AM – 6 PM
- 2-Hour Parking 8 AM – 10 PM
- 2-Hour Parking
- Bus Stop

- Disability Reserved Parking
- 10-Minute Loading
- Loading Only
- Pick Up & Drop Off Only
- No Parking
- Unrestricted Parking

Off-street parking facilities included in the analysis were categorized into four different types:

- Public
- Private
- Transit
- Shared

The following are a few high-level observations regarding the classification maps:

Downtown Glenwood Springs

- Two-hour parking is generally limited to the area bound by 6th Street, 10th Street, Pitkin Avenue, and Blake Avenue.
- The only location where two-hour time restrictions are from 8 AM – 10 PM occur on the north side of 7th Street between Cooper Avenue and Grand Avenue; all other locations are signed for 9 AM – 6 PM or have no time designation.
- The 700 block of Cooper Avenue includes a center parking lane, a portion of which is signed for parking and a portion of which is signed for truck loading. No parking is allowed in the center lane from 12 AM to 7 AM for snow removal. Note: the center parking lane was removed in the summer of 2020.
- Of the 54 spaces at the 7th Street lot, 18 are reserved for County vehicles, leaving 36 spaces available for public use.
- The actual capacity of some of the off-street lots during winter observations was less than the capacity during the summer as several spaces were being used for snow storage (see **Table 1**)

Park & Rides

- About 17 of 94 spaces in the West Glenwood Park & Ride are signed as Bustang-Only parking.
- The designated overflow lot for the 27th Street Park & Ride is about 1,500 feet south of the station (over a quarter mile away) and to access the overflow lot from the Park & Ride

requires drivers to detour onto SH 82 because there is a gate blocking vehicle movement along Blake Avenue south of the 27th Street South Glenwood Station.

- The Walmart North parking lot is not a designated parking facility for transit users, but was included in the analysis as it is only about 400 feet from the 27th Street South Glenwood Station.

Table 1 includes a summary of observations and restrictions for the ten off-street parking lots included in the analysis.

Table 1. Off-Street Parking Lots Included in Analysis

Name	Type	Parking Spaces	Time Restrictions	Other Observations
City Parking Garage	Public	148 Total: • 5 Disability	72-hours	Time restrictions not signed
Cooper Avenue Lot	Public	42 Total: • 4 Disability	72-hours	Time restrictions not signed
7th & Colorado Lot	Public	62 Total: • 3 Disability • 3 Snow Storage	4-hours (some exceptions)	
7th Street Lot	Public	54 Total: • 2 Snow Storage • 18 County-Only	24-hours (exceptions for Amtrak patrons)	18 spaces signed for County-only parking
CMC Garage	Shared	65 Total: • 3 Disability	Evenings after 6 PM & Weekends Only	
County Lot	Shared	39 Total	Evenings after 6 PM & Weekends Only	
West Glenwood Park & Ride	Transit	94 Total: • 4 Disability • 2 Snow Storage • 17 Bustang-Only	Not specified	17 spaces signed for Bustang-only parking
27th Street Park & Ride - South Glenwood Station	Transit	50 Total: • 2 Disability	Not specified	
North Walmart Lot	Private	203 Total: • 4 Disability • 27 Snow Storage	No overnight parking	
Walmart Employee Lot/ RFTA Overflow Lot	Shared	113 Total: • 10 Snow Storage	Not specified	6-10 Spaces used for taxi parking

700 Block Cooper Avenue

The City recently restriped the parking arrangement on Cooper Avenue between 7th Street and 8th Street by converting diagonal parking that was previously on the east side to parallel parking and adding a center lane for parking and truck loading. The motivation for the change was to create a

designated space for truck loading in the heart of the restaurant area of downtown. Because of concern over the loss of on-street parking, part of the center lane allows for parking, but is a challenge to properly sign and enforce. The loading zone has helped mitigate trucks from blocking travel lanes, but there is often more trucks loading than designated space and trucks sometimes load when parking demand is highest (such as the late afternoon), resulting in additional challenges.



Center parking/loading lane in the 700 Block of Cooper Avenue

Parking Utilization Study Periods

Parking utilization data was collected by driving each roadway and parking lot in the study area with a dashboard video camera during the study hours. Data collected from the field observation video recordings was entered into the GIS inventory.

Parking utilization data was collected to capture typical peak demand at the RFTA Park & Rides and downtown Glenwood Springs at different times of day and time of year. The study periods were identified based on conversations with staff at RFTA and the City of Glenwood Springs as well as based on BRT ridership data, traffic counts, and Glenwood Springs' sales and lodging tax data to understand peak demand. Data shows that activity in Glenwood Springs is highest in the summer months, peaking in July, and BRT ridership is highest in the winter and summer, with slightly higher ridership in the winter months.

Conversations with the project team revealed that the 27th Street Park & Ride does not have enough parking capacity to meet weekday demand in the winter and typically fills up sometime between 6 AM and 8 AM. Additionally parking demand in downtown Glenwood Springs is driven by a

combination of residents, employees, and visitors. Resident demand is likely highest in the evening and overnight, employee parking demand is highest during weekday business hours, and visitor demand is likely highest during the day and evening, peaking on Friday night and weekends.

Conversations with the parking enforcement officers also revealed anecdotally that parking demand in downtown Glenwood Springs tends to be highest between 9 AM and 2 PM due to business activity and the lunch scene and between 4 PM and 7 PM due to the bar and restaurant scene. In addition, Tuesday and Friday are typically the highest demand days. Tuesday demand is from jury duty and Friday is likely from an influx of visitors and high restaurant activity.

Two rounds of parking utilization data will be collected as part of this study, one in the winter and one in the summer. The winter data collection period is intended to capture peak demand for RFTA bus service and the summer collection period is intended to capture peak demand for parking in downtown Glenwood Springs. The original plan was to collect data at all locations in the winter and summer. However, do due the significant change in travel patterns and parking demand caused by the COVID-19 pandemic, other data sources were used to estimate historic parking demand in the summer of 2019. These are explained in detail in the Summer Parking Data Findings section at the end of this memo.

Two days were selected to capture peak demand in the winter:

- A mid-week weekday (Tuesday, Wednesday, or Thursday) - to capture peak commuting patterns both downtown and at the Park & Rides.
- A Friday - to capture peak afternoon and evening demand for restaurants, hotels, and other visitor/recreational activity in downtown Glenwood Springs.

Winter parking utilization data was collected on Thursday, February 27, 2020 and Friday, February 28, 2020. On each of these days, four study periods were collected to measure parking demand at different times of the day, plus an additional study period just at the 27th Street Park & Ride (and surrounding areas):

- 5 AM – To isolate residential parking demand.
- 7 AM – Around the 27th Street South Glenwood Station only to measure parking demand during the morning commute.
- 9 AM – To capture demand after the morning commute.
- 4 PM – To capture overlap between employee and visitor/recreational demand downtown.
- 7 PM – To capture evening demand associated with restaurants and other recreational activities.

Parking Occupancy

Parking occupancy for each parking curb space segment or off-street lot was determined by comparing the number of observed parked vehicles to the number of available spaces. In the accompanying maps, parking occupancy is shown as a percentage range for each study period, symbolized by different colors. Parking occupancy are organized into the following percentage ranges, each with different implications for managing demand and planning future BRT alternatives:

- 0% - 20% - Parking is very underutilized compared to capacity
- 21% - 40% - Parking is underutilized compared to capacity
- 41% - 60% - Parking is moderately used, but with plenty of excess capacity
- 61% - 85% - Parking is well used, but with enough capacity that unoccupied spaces can still be found with relative ease
- 85% - 99% - Parking is near capacity and it may be difficult to find available parking
- 100%+ - Parking utilization is at (or may be) exceeding capacity

In some instances, a segment or lot may have more vehicles parked than the total capacity indicates is possible. This would be due to closely spaced cars parked on-street or cars parked illegally. The following methodologies should also be noted when reviewing the parking occupancy maps and data:

- Parking occupancy is measured per block face unless there is a change in the parking restrictions mid-block (for example, where part of the block includes unrestricted parking and part includes time-restricted parking).
- Disability parking occupancy was collected but was excluded from the denominator when calculating the percentages shown in the maps. For example, if a parking lot has 60 spaces and three are designated as disability parking, the occupancy rate was measured as the total occupied spaces excluding disability parking divided by 57 total spaces. This methodology better reflects general parking occupancy rates as disability parking demand is based on a different set of parameters and legal requirements.
- Parking spaces that were being used for snow storage during the winter collection period were excluded from the denominator when calculating the percentages shown in the maps.
- Parking occupancy data for the County lot and CMC Garage was only collected during the 7 PM time period as these lots were not available for public use during the other time periods.

Bicycle Parking at Park & Rides

An additional analysis conducted in the winter included taking an inventory of bicycle parking available at the two RFTA Park & Rides in Glenwood Springs and observing occupancy during the same study periods as the motor vehicle parking.

Summer Data Methodology

Parking occupancy data was originally to be collected on the same days of the week and during the same times in the summer as it was collected in the winter along with a Saturday count when visitor activity in Glenwood Springs is high. Due to the impact to normal travel patterns caused by the COVID-19 pandemic in the summer of 2020, summer parking demand was instead estimated using alternative data sources. These include Big Data provided by StreetLight as well as satellite imagery data from the summer of 2019. The methodology for collecting, analyzing, and applying summer data, as well as findings and implications to recommendations are summarized here.

Two data sources were used to estimate public parking demand in Downtown Glenwood Springs during the summer of 2019:

- Big Data provided by StreetLight
- Satellite imagery

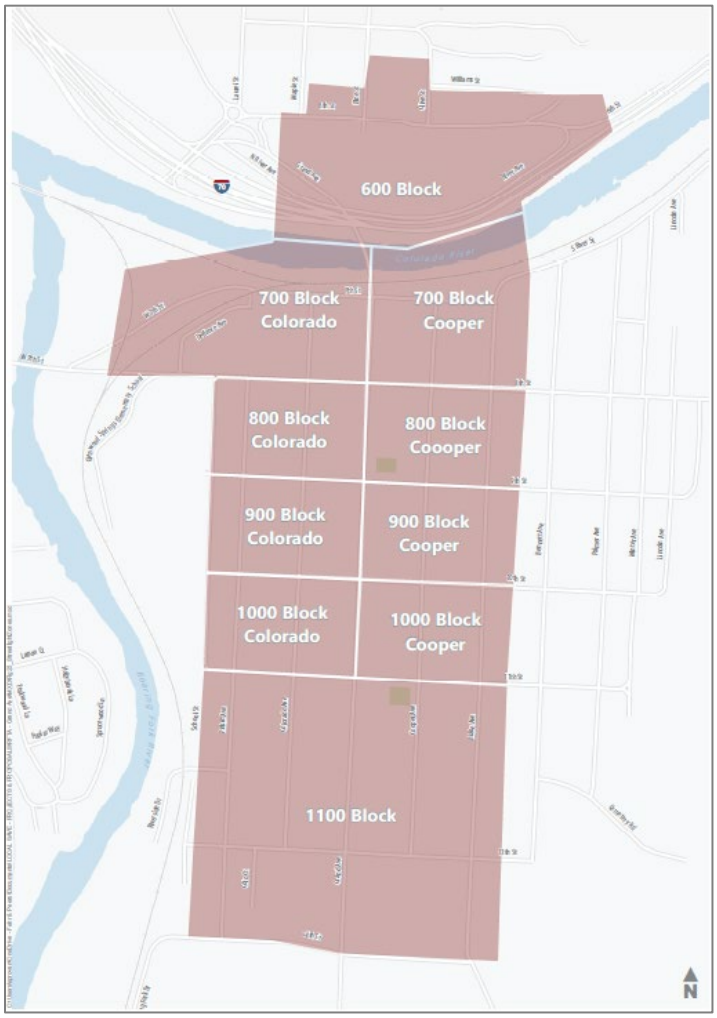
Summer parking data was only collected for the downtown area and not the two RFTA Park & Rides in Glenwood Springs. This is because more reliable data was collected at the two Park & Rides in the winter when transit parking demand is highest, while demand for parking in downtown is higher in the summer. Thus, summer data was prioritized in the downtown area. It should also be noted that while the methodology summarized here provided useful information to inform parking strategies downtown, the data is not as robust as the winter data when field observations could be accurately conducted on a block-by-block basis during multiple times of day.

StreetLight Data

StreetLight Data is a "Big Data" provider that uses anonymous cellphone data to compile person trip counts between predefined geographic zones. Trips are recorded by mobile device tracking technology in smartphones which is enabled when a user has a location-based services application turned on. A trip is considered to end when the cellphone is stationary for at least five consecutive minutes. Trips by all modes of transportation are recorded, including people driving, riding in a car, walking, bicycling, riding a bus, or traveling by other means.

In terms of sample size, StreetLight data resources includes about 33% of all mobile devices in the United States. Given the variability of when a device's location-based application is engaged, on a given day StreetLight captures between 1% and 5% of all trips. However, data is compiled by hour of day and day of the week and averaged over the course of at least a calendar month to ensure the sample size is large enough to have a high confidence level. Lastly, trip data provided by StreetLight represents an estimate of total trips, based on the sample size captured.

Figure 1. StreetLight Data Zones Downtown



To estimate parking demand in the summer of 2019, the downtown area of Glenwood Springs was divided into ten zones as mapped in **Figure 1**. Activity-based data was collected from StreetLight in July 2019 and February 2020. Activity-based data represents the number of trips that begin or end in a given location and is a good proxy for estimating parking demand. July data was used as a representative of peak parking demand in the summer as July consistently records the highest

lodging tax of any month of the year in Glenwood Springs. February 2020 was collected from StreetLight as that was when parking data was collected in the field and can be compared with July 2019 data to estimate the relative change in parking demand as compared to winter. The number of trip-ends in July 2019 was compared against the number of trip-ends in February 2020 on different days of the week and different times of day to estimate parking demand in different parts of downtown in July 2019 relative to February 2020.

Satellite Imagery

Satellite imagery of downtown Glenwood Springs from the summer of 2019 was provided by a RS Metrics, a data analytics firm. RS Metrics combed their historic satellite imagery database in the months of June, July, and August 2019 and found two images of Downtown Glenwood Springs on the following dates and times:

- Friday, August 8, 2019 at 12 PM
- Thursday, August 15, 2019 at 5:30 PM

Vehicle parking and curbspace occupancy was analyzed in these two images from the summer of 2019 on downtown streets. Not all on-street parking occupancy was visible from the satellite imagery due to street trees on some blocks. However, curbspace occupancy on the blocks that were visible were mapped and are included in the attached maps (**Figure 21** and **Figure 22**). Additionally, parking occupancy of the four public lots in downtown were visible in the satellite imagery and were also mapped, with the exception of the lower level of the City Parking Garage.

Key Findings

A number of key takeaways from the existing parking conditions analysis from the winter are outlined below and organized by each of the three study areas. Findings of the bicycle parking analysis and more in-depth analysis of parking demand at 27th Street South Glenwood Station from other data sources are also provided in this section.

27th Street South Glenwood Station

- The Park & Ride lot was about 40 percent occupied at 5 AM on both Thursday and Friday and it was clear that 8-12 cars had been parked overnight (this was evident by the fact that some cars were covered in frost at 5 AM or because the same cars were parked in the same location at 7 PM Thursday and 5 AM Friday).
- The Park & Ride lot was full by 7 AM on Thursday and nearly full by 7 AM Friday. In the brief time that parking utilization was observed at this lot at 7 AM Thursday and 9 AM Friday, several cars were observed entering and exiting the lot upon finding it full.
- Some transit riders appear to park along Blake Avenue north of 27th Street and along 26th Street between Blake Avenue and Palmer Avenue based on comparing 5 AM counts with 7 AM and 9 AM counts, likely about 8 - 12 cars in total.
- Some transit riders appear to park in the north Walmart parking lot based on the number of vehicles parked at the north end of the lot away from the store entrance and close to the Park & Ride - about 25 by 9 AM. On Thursday, 19 cars were counted parked in the same location at both 9 AM and 4 PM. It is possible not all of these cars are transit users as some people may be parking here to carpool or may be store employees. It should be noted that the lot was empty at 5 AM both days.
- The overflow lot (also Walmart employee parking) is well used during the day, but it is unclear how much use is by transit riders. The 113-space lot was about 25 percent full at 5 AM and 70 percent full by 9 AM on both days.
- The Park & Ride lot is used quite a bit for pick up and drop off, although there does not appear to be a designated spot (people are using the handicap spots and double parking briefly when the lot is full).
- In total, based on these observations there may be anywhere between 30 and 70 vehicles parking at other locations besides the designated Park & Ride (on-street, at the Walmart north lot, or the designated RFTA overflow lot) to access the bus. Where exactly that number falls in this range is dependent on the number of people parking in these locations for other uses – such as carpooling or store employees – which is impossible to

know based just on observing parked cars. To get a better understanding of existing and latent demand for parking a more detailed analysis was conducted using additional data sources (see *Parking Demand Estimation at 27th Street South Glenwood Station* below).

West Glenwood Park & Ride

- The West Glenwood Park & Ride is lightly used relative to capacity. With 94 parking spaces it was never more than 35 percent occupied during any of the time periods studied.
- The 17 Bustang-only spaces were also lightly used, with about 4-6 cars parked in those spaces during the study periods.

Downtown Glenwood Springs Winter

- General Findings:
    - On-street parking occupancy is generally highest between 7th Street and 9th Street (except at 5 AM), and to a lesser extent between 10th and 11th Street.
        - On-street occupancy north of 9th Street is higher west of Grand Avenue weekday mornings and higher east of Grand Avenue weekday afternoons.
        - On-street parking occupancy north of 9th Street downtown is highest on Friday evenings.
        - On-street parking occupancy between 10th and 11th Street downtown remains high at 5 AM indicating this demand is likely generated by residential/hostel parking demand.
    - Parking occupancy along Grand Avenue is relatively low, generally less than 30 percent during all time periods, with two exceptions:
        - Between 8th and 9th Streets - occupancy was highest in the evening, about 75 percent.
        - On the west side of Grand Avenue between 10th and 11th Streets where occupancy was between 80 percent and 100 percent at all times of day, which may be due to the Glenwood Springs Hostel.
    - The Garfield County and CMC lots were heavily used after 6 PM on Friday, 97 percent and 84 percent full respectively (and less used on Thursday evening).
    - The 7th & Colorado lot was full at all time periods except 5 AM when it was about 25 percent full. Many vehicles were observed looking for parking in this lot at nearly every time period. The high demand may be in part due to exceptions to the 4-hour time restriction granted to County employees and some downtown

residents and that time restrictions at this lot are temporarily not being enforced. It is expected this will change when a final decision on which users will be granted exceptions is determined and an enforcement plan for this lot is developed.

  - The Cooper Avenue lot (between 8th Street and 9th Street) was full or nearly full during the day and about 40 percent full at 5 AM.
  - The City Parking Garage was most full during the day (at 9 AM and 4 PM), but never exceeded 80 percent capacity. It was less than 20 percent full overnight.
  - The public spaces at the 7th Street lot near the confluence were never more than 50 percent occupied.

- 5 AM Weekday:
  - High occupancy was observed along the residential streets between 10th Street and 13th Street and along Blake Avenue between 8th and 11th Streets.
  - The occupancy along Grand Avenue was less than 25 percent except on the west side of the street between 10th and 11th Street, which may be associated with the Glenwood Springs Hostel.
- 9 AM Weekday:
  - High occupancy was observed along 8th Street, 10th Street, and several side streets north of 9th Street.
  - Occupancy was also high along Pitkin Avenue between 13th and 14th Street likely because of the proximity to Glenwood Springs High School.
  - The 7th & Colorado lot and Cooper Avenue lot were both full and the City Parking Garage was about 80 percent occupied.
- 4 PM Weekday:
  - Occupancy was high on most streets between 9th Street and 7th Street, with the exception of Grand Avenue.
  - Occupancy was generally higher on Friday on most streets than Thursday.
- 7 PM Thursday:
  - On-street occupancy was high around 8th Street and Cooper Avenue and 7th Street and Colorado Avenue.
  - Occupancy was low at all of the off-street lots except the 7th and Colorado lot.
  - Occupancy was high between 10th Street and 11th Street along Cooper Avenue, and two nearby block faces although there were many available spaces within a block.
- 7 PM Friday

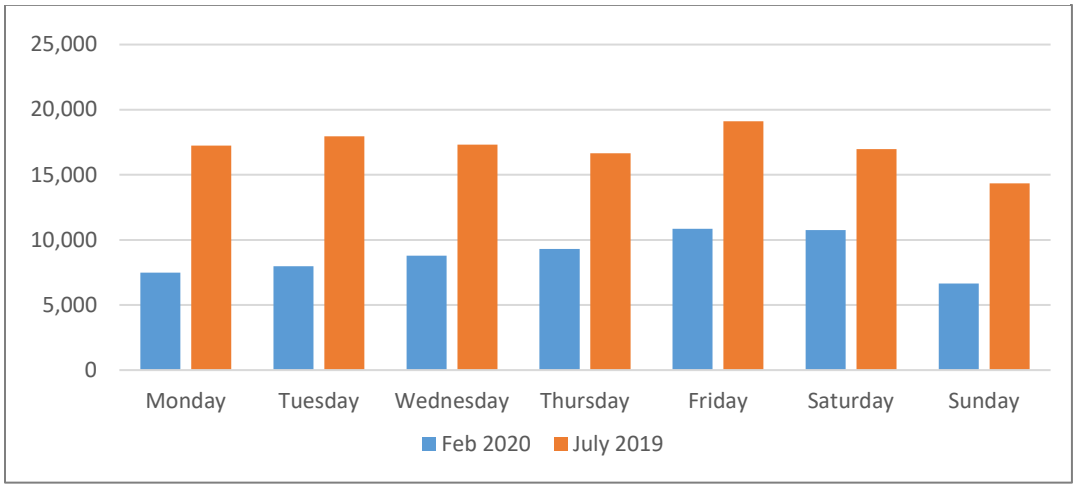
- Occupancy was high between 9th Street and 7th Street between Colorado Avenue and Blake Avenue.
- The County lot and 7th & Colorado lot were both full. The CMC garage and Cooper Avenue lot were well used, but still had available parking. The City Parking Garage was only 40 percent occupied.
- Occupancy was high between 10th Street and 11th Street along Cooper Avenue, and a couple of nearby block faces although there were plenty of available spaces on the opposing sides of the street.

Downtown Glenwood Springs Summer

Several key findings from the summer data analysis are useful in informing parking and curbspace demand and management in downtown Glenwood Springs, including the following.

- **Nearly two times as many trips begin or end in the downtown core in the summer as compared to the winter. Figure 2** shows the average daily trip ends between 7th Street and 9th Street in downtown Glenwood Springs in February of 2020 compared to July of 2019 on each day of the week. On average there is about 1.9 times as much trip activity in the summer as compared to the winter. Additionally, while the data confirms that trip activity is highest on Friday (and Saturday in winter), it also shows that there is less variability from day to day in the summer as compared to the winter.

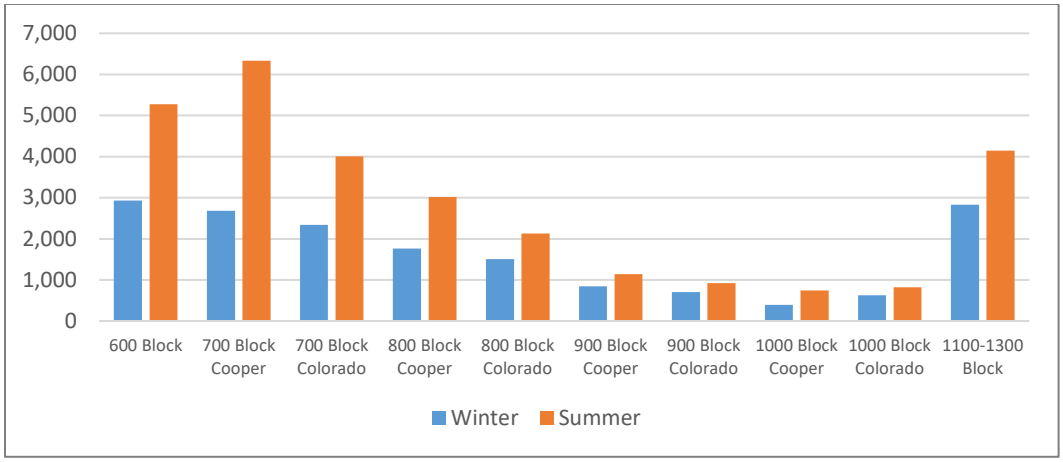
Figure 2. Average Daily Trip Ends Downtown (7th St to 9th Street)



Source: StreetLight Data, Fehr & Peers

- **Trip activity is highest north of 9th Street, particularly in the summer. Figure 3** shows the average daily trip ends by zone downtown on Fridays in February of 2020 and July of 2019 provided by StreetLight. This data shows that trip activity is highest in the 700 block of downtown and gets progressively lower in each block south. For example, trip activity in the 700 Block of Cooper Street is about 5.5 times higher than the 900 Block of Cooper Street in the summer and 3.1 times higher in the winter. Additionally, north of 10th Street, trip activity is on average a little higher east of Grand Avenue than west of Grand Avenue. Lastly, **Figure 3** also shows that the discrepancy between summer and winter trip activity is greater north of 9th Street compared to south. For example, there are about 1.9 times as many trip ends in the summer compared to the winter between 7th Street and 9th Street, while there are about 1.4 times as many trip ends in the summer compared to the winter between 9th Street and 14th Street.

Figure 3. Friday Trip Ends by Downtown Zone



Source: StreetLight Data, Fehr & Peers

It should be noted that the StreetLight activity data does not necessarily represent where people are parking their car, but instead where people are beginning or ending their trip. For example, someone who parks in the 900 block and walks to the 700 block would show up in the data as ending their trip in the 700 block. Thus, in locations where parking demand is high and spaces are full, drivers may be parking a block or more from their destination. This data reveals where people are trying to get downtown, but not necessarily where they park or how they get there.

- **Parking demand peaks around 1 PM and 6 PM and is highest on Friday and Saturday.** Hourly trip activity data from StreetLight shows that parking demand

downtown likely peaks around 1 PM and 6 PM each day, which is generally consistent with anecdotal data provide by the downtown parking enforcement officer. Additionally, the data shows that trip activity is highest on Friday in the summer and both Friday and Saturday in the winter.

- **Off-street public parking is at capacity in the summer.** Satellite imagery data from Friday, August 9, 2019 at 12 PM revealed that the all three public surface lots downtown were 100% full, including the 7th Street lot (at the confluence), the 7th & Colorado lot, and the Cooper Avenue lot (see **Figure 21** in attached map set). Additionally, while the lower level of the City Garage is not visible in the satellite imagery, the upper level of the garage was observed to be about 95% full (note: winter field observations showed the lower level of the garage to consistently have a higher occupancy than the upper level, thus the garage is presumed to be nearly full during peak times in the summer). By comparison, while the 7th & Colorado and Cooper Avenue lot were observed to be full at 9 AM in the winter counts, the 7th Street lot was never more than 53% full and the City Parking Garage was never more than 80% full in the winter. Thus, the satellite imagery provides evidence that parking demand at these lots is substantially higher in the summer and these lots are indeed effectively at capacity. Satellite imagery also revealed that the visible curbspace (not blocked by tress) was about 78% occupied at 12 PM on Friday in the summer.

While trip activity from StreetLight data is not necessarily directly correlated to parking demand, the data is a useful proxy for estimating demand. In other words, we cannot conclude with certainty that parking demand is 1.9 times higher in the downtown core in the summer as compared to the winter, but it is likely somewhere in that range. Other data sources also support the idea that parking demand may be 50% - 100% greater in the summer than the winter. For example, the Glenwood Springs Police Department issues about twice as many parking tickets in the summer compared to the winter. Additionally, hotel tax revenue is typically about 60% higher in July than March and over 200% higher in July than February. Lastly, the satellite imagery data, while limited in scope and timeframe, show that demand is at or exceeding capacity at all downtown public lots midday on Friday in the summer - and is quite high on-street as well.

This data strongly suggests that downtown Glenwood Springs is reaching parking capacity through most of the core area at peak times in the summer. Parking occupancy at this level can lead to several negative impacts, including increased congestion caused by people circling for parking, higher likelihood of illegal parking (as evident in the police data), and could negatively affect business activity as patrons find it difficult to park downtown. While there is no conclusive evidence of who is generating parking demand at different times of the day, both the winter and

summer data suggest that employees are likely occupying much of the off-street parking during the day, as are downtown residents. For example, the Cooper Avenue lot would typically fill up by 9 AM and start to empty out at around 4 PM in the winter, a trend typically indicative of employee parking. Overnight, this lot was observed to be about 40% occupied in the winter representing the residential demand. Based on both the summer and winter data, similar trends also occur at the City Parking Garage.

Bicycle Parking at Park & Rides

Both the West Glenwood Park & Ride and 27th Street South Glenwood Station provide bicycle parking in the form of inverted "U" bicycle racks adjacent to the bus loading areas. The 27th Street South Glenwood Station can accommodate up to 40 bikes in a sheltered location. The West Glenwood Park & Ride can accommodate up to 20 bikes unsheltered. **Table 2** summarizes bike occupancy at the two Park & Rides during each of the study periods in the winter. Bicycle parking occupancy was low at both locations during the winter, and several bikes were observed parked overnight. Given bicycle use is higher in the summer, more conclusions on bicycle use at the stations would have been made from the summer analysis, which did not occur due to the COVID-19 pandemic.

Table 2. Winter Bicycle Parking Occupancy at Glenwood Springs Park & Rides

Day & Time	27th Street S. Glenwood Station		West Glenwood Park & Ride	
	Total Bikes	Occupancy	Total Bikes	Occupancy
Thursday 5 AM	5	13%	1	5%
Thursday 7 AM	5	13%	-	-
Thursday 9 AM	5	13%	1	5%
Thursday 4 PM	5	13%	1	5%
Thursday 7 PM	4	10%	1	5%
Friday 5 AM	3	8%	1	5%
Friday 7 AM	4	10%	-	-
Friday 9 AM	5	13%	1	5%
Friday 4 PM	4	10%	0	0%
Friday 7 PM	4	10%	0	0%



Bike Parking at South Glenwood Station



Bike Parking at West Glenwood Park & Ride

Estimating Parking Demand at 27th Street South Glenwood Station

The existing designated Park & Ride at the 27th Street South Glenwood Station has 50 parking spaces. The winter parking observations revealed that this Park & Ride lot reaches capacity by about 7 AM on a mid-week weekday (and a little later in the morning on Friday) and is generally full throughout the day. RFTA is exploring opportunities to provide additional parking at this station, and a key question in doing this is, how much additional parking should be provided to meet existing and future demand?

The parking observations revealed that somewhere between 30 and 70 people are likely parking at other locations besides the designated Park & Ride to access the BRT at 27th Street South Glenwood Station. This includes on-street (along Blake Avenue and 26th Street), in the Walmart north parking lot, and in the designated RFTA overflow lot (which is about a 7-minute walk from the Park & Ride). While additional undesignated parking is available close to the 27th Street South Glenwood Station, and some people are using it, our survey research in other peer communities has shown that many people are uncomfortable parking in an undesignated space to use transit. Therefore, the estimation of people parking in other locations likely underrepresents the true parking demand as many people traveling between Glenwood Springs and Aspen/Snowmass Village are no doubt foregoing transit because there is not enough reliable parking in close proximity to the station. This latent demand for the BRT in Glenwood Springs was evidenced in comments provided in the MOVE Grand Avenue public survey, and anecdotally by RFTA staff.

Due to the inability to collect passenger survey data at the 27th Street South Glenwood Station due to the impacts of the COVID-19 pandemic, an alternative methodology was used to estimate parking demand at this station. A parking demand analysis was performed using a combination of the observed parking counts from February, 2020, bus boarding and alighting data on the same days parking data was collected, commuter data from the United States Census Bureau, and data from the most recent RFTA Onboard Transit Survey (from 2018). Because of the inability to collect survey data and so many variables are at play, parking demand was estimated as a range to account for unknowns.

Low End Estimation

To estimate the lower end of parking demand, the pace at which the 27th Street Park & Ride lot fills in the morning was compared to bus boardings during the same time. **Figure 4** shows that the number of vehicles parking the 27th Street Park & Ride at various times on the two days when parking occupancy was observed. (It should be noted that while the capacity of this lot is 50 spaces,

two of the spaces are reserved for handicap parking and on the times when the lot was observed to have 49 cars, the only space available was one of the handicap reserved spaces). The data shows that on Friday the demand was a little less than Thursday, and by 7 AM on Friday the parking lot had not yet reached capacity. Therefore, the rate of increase in observed parking between 5 AM and 7 AM on Friday, about 20 vehicles parked during this time, is generally reflective of true existing demand for parking (but not latent demand), as anyone arriving in this time frame would have found an available parking space.

Figure 4. 27th Street Park & Ride Parking Occupancy February 27-28, 2020

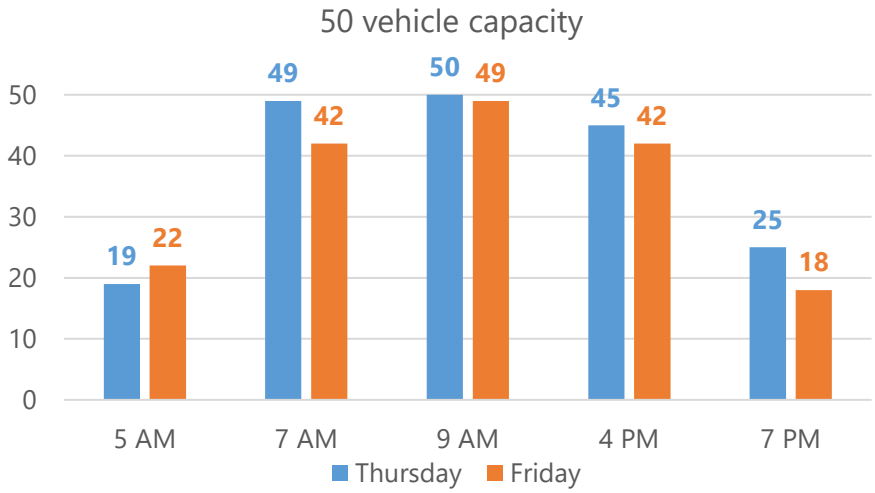


Figure 5 and **Figure 6** show the boardings by hour at the 27th Street South Glenwood Station for the three regional services (BRT, Snowmass Express, and Valley Local) in the upvalley direction on the two days when parking was observed. **Figure 6** shows that between 5 AM and 7 AM, when 20 vehicles parked in the 27th Street Park & Ride, about 67 people boarded buses in the upvalley direction. Therefore, it is assumed that if parking was not constrained, about 30% of people boarding the bus at the 27th Street South Glenwood Station would get to the station by driving and parking (20/67 = 30%).

Figure 5. Upvalley Boardings by Hour at the 27th Street S. Glenwood Station (Thursday, February 27th, 2020)

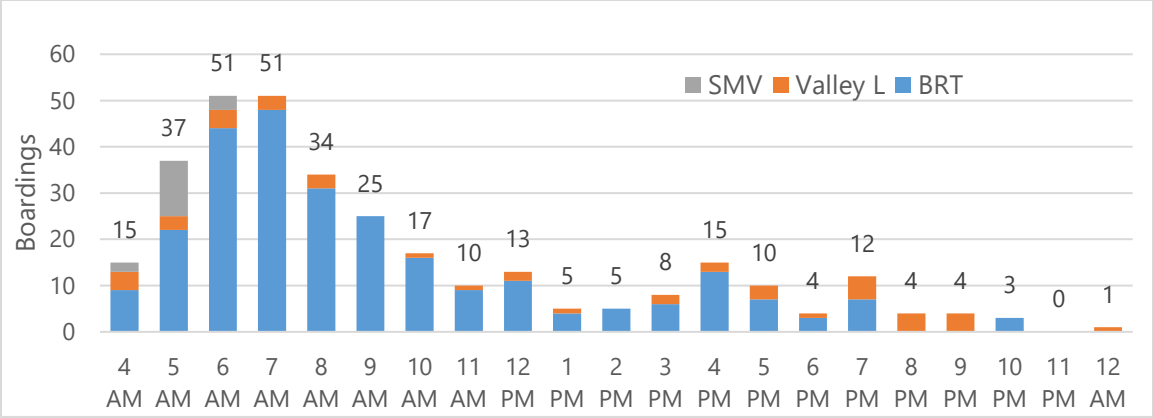
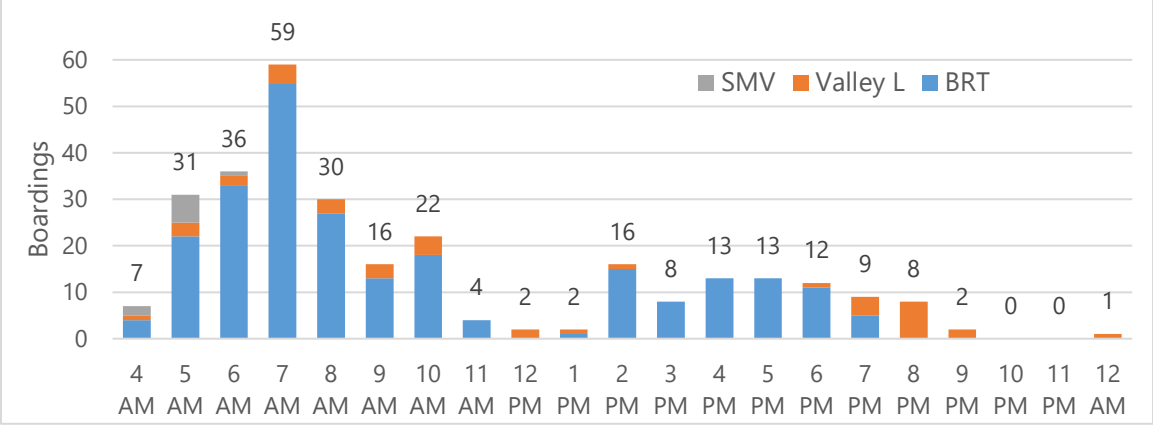


Figure 6. Upvalley Boardings by Hour at the 27th Street S. Glenwood Station (Friday, February 28th, 2020)



If this ratio is then applied to the 263 boardings on regional services in the upvalley direction at the 27th Street South Glenwood Station between 4 AM and 3 PM (by which time the parking lot will start emptying out), that equates to an existing parking demand of about 80 vehicles (263 * 0.3 = 80). This does not account for latent demand (i.e., the number of people that would park and catch the bus, if there was consistently reliable parking at the 27th Street South Glenwood Station). On the low end, a conservative estimate of latent demand compared to existing demand is estimated to be about 25%. Therefore, the low-end estimate for total parking demand under current conditions at the 27th Street South Glenwood Station is estimated to be about 100 parking spaces.

For comparison, the 2018 RFTA Onboard Transit Survey shows that the percent of riders who drive and park in order to take regional buses (excluding local service) is about 37%. Applying this percentage to the 263 boardings at 27th Street South Glenwood Station on a winter weekday before

3 PM would result in an estimated parking demand of about 97 vehicles (263 * 0.37 = 97), similar to the estimate of 100 vehicles derived using a slightly different methodology.

High End Estimation

The high-end parking demand estimate is based on the potential market share of total commuters traveling between Glenwood Springs and Aspen/Snowmass Village that would take transit if parking (among other factors) was more convenient. The U.S. Census Bureau provides an estimation of commuters between community pairs through their Longitudinal Employer-Household Dynamics (LEHD) data. This data shows that in 2018 about 920 people commute from the 81601 zip code (which covers the greater Glenwood Springs area) and the City of Aspen and Town of Snowmass Village. Data from the 2012-2016 5-Year American Community Survey through the Census Transportation Planning Products shows that (about five years ago) 16% of commuters from Glenwood Springs to Aspen took the bus. Thus, it is assumed that achieving a transit mode share of 33% for this market, while likely on the high-end, would be within reason. Assuming that transit could potentially capture 33% of this market share, would equate to about 300 potential transit commuters per day.

The RFTA Onboard Transit Survey data shows that about 32% of RFTA transit riders drive and park to get to the bus. Excluding local service, the percent of riders who drive and park in order to take regional buses is about 37%. Given this number is suppressed by lack of sufficient parking along the entire system, for purposes of this analysis, it will be assumed that if there were an unlimited supply of parking about 50% of commuters between Glenwood Springs and Aspen/Snowmass Village would drive and park to get to the bus. Therefore, demand for transit parking, assuming maximum reasonable use by the commuter population between Glenwood Springs and Aspen/Snowmass Village (about 33%), would be about 150 parking spaces. However, this estimate also needs to include several other parking users, including the following:

- Those commuting to other upvalley destinations (such as Carbondale or Basalt);
- Those commuting from down valley of Glenwood Springs (such as New Castle or Rifle); and
- Non-commuters.

The parking demand for these riders was estimated using the following assumptions:

- An additional 15% for non-commuters (based-on the 2018 RFTA Onboard survey which showed that about 86% of BRT users were using the service for work-related travel).
- An additional 15% for other commuters (5% for commuters destined to other upvalley stops besides Aspen and 10% for commuters from downvalley of Glenwood Springs). The

primary other upvalley destinations via transit are Basalt and Carbondale. Given the ease of parking in those locations its unlikely many commuters bound to those locations are driving to a Park & Ride. Most folks are likely driving door-to-door or using transit door-to-door. Secondly, while LEHD Census data shows that in 2018 around 500 people commuted from the Rifle, Silt, and New Castle areas to Aspen and Snowmass Village, our experience in other communities is that most people who use a Park & Ride don't drive very far (typically less than 3 miles). So, while the 27th Street Park & Ride is the first location where someone coming from downvalley of Glenwood Springs could reliably catch the BRT to Aspen, there's likely to be a smaller portion of the commuters from this market using that Park & Ride as compared to people originating in Glenwood Springs.

When these additional transit parking users are factored in, the upper end parking demand at the 27th Street South Glenwood Station under existing conditions is estimated to be about 200 parking spaces.

Formula:

*[Total commuters Glenwood Springs to Aspen/Snowmass] * [max % that would use transit] * [% drive & park] + [other commuters] + [non-commuters]*

*((920 * 0.33 * 0.5) * 1.15) * 1.15 = 200*

It should be noted that there are many unknowns with this estimation. For example, if RFTA were able to capture 50% of total market share, then the parking demand estimate would increase to about 325 spaces and if they were only able to capture 25% then the parking demand estimate would be closer to 150 parking spaces.

Existing and Future Parking Demand at 27th Street Park & Ride

Based on this analysis, the existing parking demand at the 27th Street Park & Ride, including latent demand, is likely somewhere between 100 and 200 parking spaces. Based on forecasts from the RFTA Destination 2040 project, over the next 20 years the population of Garfield County is forecast to grow by 65% and traffic in Glenwood Springs is forecast to grow by 34%. At this rate, assuming all else is equal, parking demand at the 27th Street Park & Ride would be expected to grow at a rate of somewhere in between these two, about 40-60%. This would result in an estimated parking demand of between 150 and 320 parking spaces at the 27th Street Park & Ride by 2040.

It should be noted that several future factors currently being considered would also impact parking demand if implemented. These include the following:

- **Extension of the BRT into downtown Glenwood Springs** – The extension of the BRT into downtown and the West Glenwood Park & Ride would reduce demand for parking at the 27th Street Park & Ride by about 10-20%. This is because some existing and potential riders close to downtown would be able to walk to the BRT and others originating in West Glenwood Springs or other points west would be able to park at the West Glenwood Park & Ride and more reliably catch the bus. Based on 2018 Census data about 10% of the population of the Glenwood Springs area lives in downtown and would be within walking distance to a centrally located station. However, many existing transit users downtown may already be walking to the bus today. Additionally, about 15% of the greater Glenwood Springs population lives north and west of the West Glenwood Park & Ride and would more conveniently be able to access the BRT at that station. In general, Park & Ride users are not likely to back-track. Therefore, the majority of users of the West Glenwood Park & Ride will be from locations north and west.
- **Addition of a New Park & Ride at South Bridge** – RFTA is considering adding a new BRT station between Glenwood Springs and Carbondale near where the planned South Bridge project would intersect SH 82. If implemented its estimated that this station would reduce demand for parking at the 27th Street South Glenwood Station by about 10-20% as it would be more convenient for those originating in South Glenwood Springs south of 27th Street and west of the Roaring Fork River (and along Four Mile Road). Based on 2018 U.S. Census data, about 20-25% of the population of the Glenwood Springs area live in these locations. It should be noted that if insufficient parking continues at the 27th Street Park & Ride (as exists today), demand for parking at South Bridge is likely to be much higher as many people wishing to park at the 27th Street South Glenwood Station, but finding it to be full, would instead park at a South Bridge station.
- **Addition of a Pedestrian Overpass at 27th Street South Glenwood Station** – RFTA is considering constructing a pedestrian overpass above SH 82 to better connect pedestrians and bicyclists between the 27th Street South Glenwood Station and the Rio Grande Multiuse Trail. While this may encourage some additional walking and biking to the station, it may also increase demand by recreational users of the Rio Grande Trail. As is the case with other RFTA Park & Rides adjacent to the Rio Grande Trail, such as Carbondale, some trail users are likely to park at the Park & Ride, particularly in the summer and on weekends, which may increase parking demand at the 27th Street Park & Ride.

Opportunities & Recommendations

Opportunities and recommendations to improve parking management in the study area are divided into three general categories: parking and curb space downtown, parking at the RFTA Park & Rides, and parking considerations/potential impacts as part of evaluating alternatives for extending the BRT into downtown.

The following recommendations were made based on parking/curb-curb space occupancy data collected in the winter of 2020, estimated historic 2019 summer parking demand in downtown Glenwood Springs from other data sources, conversations with City, RFTA staff, and the police department, public feedback from the MOVE Grand Avenue project, and other data sources.

Downtown Parking & Curb Space Management

Parking is a limited resource and valuable public asset, particularly in a downtown environment. The recommendations included here are intended to improve management of this asset to maximize the efficient use of limited curb space, better ensure convenient parking is available to serve uses downtown, and improve the efficiency and effectiveness of enforcement.

Recommendations are provided both short-term and long-term. Short-term recommendations are aimed at addressing existing challenges over the next 1-3 years. Long-term recommendations are aimed at addressing potential future challenges or more complex existing issues 4-10 years from now.

Short-Term

Several existing parking/curb-space issues downtown were identified as part of this study. These include:

- High parking demand during the day and evening in the north end of downtown.
- The impact of truck loading on traffic flow and parking availability.
- Cost, inefficiencies, and other challenges of effectively enforcing parking regulations downtown.

To address these and other challenges, the City of Glenwood Springs should consider the following recommendations near-term:

- **Establish a Truck Loading Plan** – The businesses and restaurants downtown require regular delivery of food, beverages, and other goods. However, given the limited street spaces active truck loading can come in conflict with vehicle traffic and parking availability. To mitigate the impacts of truck loading on traffic and parking the City should consider developing a truck delivery plan to regulate the location and times of when and where trucks deliver goods downtown. Both the Town of Vail and City of Aspen have ordinances dictating when and where trucks can deliver in the core parts of those communities to limit the impact of truck loading. Glenwood Springs may consider the following restrictions: restricting truck delivery north of 9th Street to before 4 PM, limiting truck loading to designated loading zones or alleys at certain times of the day, or restricting loading activities all together on certain streets (such as 7th Street). The City should also consider coordinating with the City of Aspen and Town of Vail to explore the feasibility of coordinating loading times for trucks that may be serving all three locations. It is recommended that the City closely involve downtown businesses and operators of the loading trucks when developing this plan.

- **Manage the 700 Block of Cooper Avenue** – As explained earlier in this memo, the 700 block of Cooper Avenue was redesigned to provide designated truck loading zones in the center lane along with five parking spaces. The redesign has been effective at providing a space for trucks to deliver goods to nearby businesses without blocking travel lanes (to the extent that drivers follow the regulations). The challenge with this redesign is that drivers do not always understand or comply with the regulations, i.e. when and where they can park and where delivery trucks can load. Parking and loading regulations are indicated through paint in the pavement (which can sometimes be covered in snow and will wear quickly in the center lanes) and moveable signs. The moveable signs are not always oriented correctly, may be difficult to determine the parking/loading space the sign is referencing, and can (and sometimes are) moved by people not wanting to comply with the parking regulations. Because the regulations are not always clear, parking and loading are not generally enforced along this center lane further leading to non-compliance.

  One solution to this challenge would be to install more permanent end caps in the median at the two ends of the corridor where more permanent signs can be placed. This could be something semi-permanent, such as bollards bolted into the pavement (but that can be temporarily removed to allow for snow removal or street sweeping). Currently the south end of the street is designated for parking and the north end for loading. To clearly sign

the change in use mid-block, end caps will likely be needed mid-block on either side of the alley.

Additionally, the City may also want to consider regulating the loading zone to better accommodate the change in demand at different times of the day. For example, the loading zone could be signed to allow parking in the evening when parking demand is highest and conversely the parking spaces could be signed for loading in the morning or midday if more space is needed to accommodate loading activities.

- **Weekend Enforcement –** The City does not currently enforce parking and curb space regulations on the weekend. However, collection of Big Data (detailed at the end of this memo) demonstrated that parking demand likely remains high in parts of the downtown on the weekend, particularly on Saturday. Additionally, local drivers are more likely to ignore parking restrictions on the weekend if they know those restrictions will not be enforced. It is recommended that the City enforce parking regulations downtown on the weekends (at least occasionally) to ensure better compliance. This will help ensure parking turnover and availability of parking as well as mitigate potential safety issues (such as blocking fire hydrants, crosswalks, sight lines, or handicap parking).

- **Leverage Parking Enforcement Technology –** The City is considering the use of new technologies to aide in parking enforcement, such as handheld license plate recognition (LPR) devices pared with automated ticket printing. While use of these technologies will require upfront and annual investment, they would increase efficiency and improve the accuracy of monitoring and ticket issuance. More effective enforcement will result in higher rates of compliance and reduce the negative impacts of illegal parking, including ensuring there is more parking and loading space available. The increased efficiency from using these technologies would result in increased revenue generation that may off-set the cost of investing in the technology. Paid parking could also be used to off-set upfront costs of this technology.

- **Increase Fines for Parking Violations –** Parking violations for most offenses currently result in a $20 ticket (the exception being $100 for illegally parking in a handicap reserved parking space) and The City of Glenwood Springs has not raised these amounts for many years. These fees are comparable or on the lower end of peer communities. For comparison parking violations result in a $30 - $50 fine in Aspen, $30 fine in Breckenridge, and $25 fine in Durango for most first-time offenses. However, most peer communities use a graduating scale where parking violation amounts double or triple for

repeat offenders or for those that wait too long to pay. To increase the rate of compliance in Glenwood Springs, keep pace with inflation, and generate additional revenue to better cover the cost of enforcement, it is recommended that the City consider increasing the fines for parking violations. In particular it is recommended that the City increase the fine for repeat offenders. Additionally, if paid parking is implemented downtown, parking fines should be set to be at least 50% higher than the cost of all-day parking in order to incentivize compliance.

- **Curb Space Signage and Striping –** Proper maintenance of curb space paint and signage is important to safely manage parking downtown and properly enforce regulations. It is also important to ensure signs are consistent and clear to encourage compliance. The City currently uses yellow paint on the curb to indicate no parking zones and blue paint to indicate disability reserved parking. The areas with yellow paint are called safety zones and are at locations where parking is not allowed in order to preserve safe sight lines at intersections, driveways, crosswalks, where there are fire hydrants, or to preserve adequate space in the travel lane for safe vehicle movement.

  However, the locations with yellow paint are not always clear or consistent. In some locations downtown yellow paint is in locations signed for parking or loading. In other locations the paint is worn and only partially visible. Most locations with yellow paint also do not have corresponding no parking signs. The inconsistency can lead to confusion among the public (particularly visitors) and can make enforcing curb space regulations in safety zones more challenging.



Example of yellow safety zone on Colorado Avenue.



Example of partially visible yellow paint on a curb on Colorado Avenue.

To improve compliance and enforcement of parking regulations downtown, the following curb space signage and stripping actions are recommended.

- *Regular Maintenance of Curb Paint* – It is recommended that the City regularly maintain the curb paint to ensure the paint is clearly visible. It is also recommended to remove yellow paint in locations where parking and loading activities are allowed. Regular maintenance could be funded through fees collected from paid parking, increasing fines for parking violations, and other changes to improve the efficiency of enforcement.
- *Corresponding Signage* – Section 3B.23 of the Manual of Uniform Traffic Control Devices (MUTCD) states that "*Since yellow and white curb markings are frequently used for curb delineation and visibility, it is advisable to establish parking regulations through the installation of standard signs.*" Given this, it is recommended that the City place "No Parking" signs in corresponding safety zones where feasible, prioritizing locations where non-compliance with parking regulations is most frequent.
- *Curb Paint Color Scheme* – While there is no state or national standard color scheme for curb paint to indicate parking regulations, it is most common to use red paint to indicate no parking or standing and yellow paint to indicate loading (see California Driver Handbook and SRTS Guide among others). Given the number of out of town tourists that visit Glenwood Springs the City may want to consider converting safety zones to red paint and loading zones to yellow paint to be more consistent with what drivers are familiar with in other locations.
- *Consistency of Signs* – The following three signs were observed downtown in loading zones: "Loading Only," "10-Minute Loading Only," and "Pick-Up and Drop-Off Only." Additionally, the following three signs were observed for 2-hour parking: "2 Hour Parking 9AM-6PM," "2 Hour Parking 8AM-10PM," and "2 Hour Parking." By far the most common was "2 Hour Parking 9AM-6PM." To alleviate confusion among drivers and simplify enforcement it is recommended to use one sign type for all loading zones and one sign for all 2-hour parking consistent with what will be enforced.

- **Implement Paid Parking** – The City of Glenwood Springs is currently considering converting some of the publicly available time-restricted parking downtown to paid parking as a more effective means to enforce and manage parking where demand is high. Time restricted parking (such as 2-hour parking), enforcement of parking regulations, and provision of additional parking (such as the City Parking Garage) are the primary tools the

City of Glenwood Springs has used to manage parking demand and encourage turnover downtown. Short of further increasing parking supply, which is expensive and may encourage additional traffic congestion downtown, the most effective remaining tool to managing parking downtown is to implement paid parking.

Note: Please see the supplemental Memo titled "Implementing Paid Parking in Downtown Glenwood Springs" for a more detailed summary of recommendations for how the City of Glenwood Springs could implement paid parking.

There are three primary reasons to consider implementing paid parking:

- To manage demand in high-occupancy locations to ensure parking is more readily available in those locations, which will reduce traffic congestion caused by drivers circling for parking.
- To incentivize use of non-driving modes of transportation to downtown.
- To generate revenue to cover the cost of parking operations, maintenance, capital improvements, and enforcement, as well as to potentially fund transit, bicycle, and pedestrian improvements downtown to further mitigate parking demand.

If the City implemented paid parking the revenue could be used to fund parking enforcement and management with less need (or potentially without need) for general funds. Currently there is a about a ten thousand dollar gap in cost of enforcing parking downtown from the revenue generated by tickets and this does not include capital, administrative, planning, and maintenance related costs to the parking program. City general funds currently cover the gap. Revenue could also be used to fund regular maintenance of curb paint, signs, and public parking lots as well as for pedestrian, bicycle, and transit improvements downtown. Investing in other modes would further mitigate parking demand as it would make using other modes more convenient.

Paid parking could also be used to ensure parking spaces are easier to find downtown and is an effective incentive for people to walk, bike, or use transit in place of driving. To achieve this, paid parking should be implemented downtown at the locations when and where occupancy is high and turnover is desirable. This strategy will ensure that people who want to park close to their destination are more likely to have that option if willing to pay. This strategy will also result in better utilization of available parking where demand is lower.

It is also recommended to extend paid parking and time restrictions later in the evening as demand was observed to be just as high or higher on many downtown streets at 7 PM. This will help reduce congestion caused by drivers circling for parking after 4 PM, and ensure parking is more readily available close to popular evening destinations downtown.

Based on occupancy rates observed in the winter, paid parking would be most effective near-term at the following on-street locations:

- Between 9th Street and 7th Street between Pitkin Avenue and Blake Avenue. Given this covers nearly all the time-restricted parking it may be most efficient from an enforcement standpoint to convert all 2 Hour parking downtown to paid parking.
- 7th Street between Blake Avenue and Bennet Avenue. This block had high parking demand at all times of the day except overnight.

Based on winter data paid parking is also recommended at two off-street lots with high demand in the core areas of downtown where on-street paid parking would also be implemented:

- *7th & Colorado Lot* – The current 4-hour time restriction could be maintained in order to provide a slightly longer-term parking option in this area of downtown.
- *Cooper Avenue Surface Lot* – The Cooper Avenue parking lot was full during the day on both Thursday and Friday. There are no time restrictions at this lot (other than the citywide requirement to move one's vehicle every 72 hours) and its likely many employees are parking here all day as well as residents (the lot was about 40% full overnight). To encourage more turnover, the City could consider converting this lot to a 4 hour time restriction. Alternatively, if all-day parking is desired to be retained at this location, paid parking could be implemented here on an hourly and daily rate used in order ensure parking is more readily available.

Analysis of summer data demonstrated that parking demand in downtown Glenwood Springs is higher in the summer than the winter, potentially 1.5 – 2 times greater. Thus, the parking management recommendations amplify the need for many of the recommendations already discussed, including paid parking and making improvements to enforcement. The summer data (particularly the satellite imagery) demonstrated that all four of the public off-street parking facilities fill to capacity in the summer. Given this, ***it is recommended to charge for parking at all four facilities, at least in the summer***, to ensure longer-term parking is also available downtown. It may not be necessary to charge

for parking all the time at all these facilities, but would be most important when demand is high, such as in the summer and during the day and early evening. The pricing in these lots would be different than most on-street spaces as these lots are intended to provide the option for longer term parking, while most on-street paid parking would serve short-term parking.

Some additional strategies related to implementing paid parking are provided below:

- *Variable Pricing* - Data demonstrates there is opportunity for implementing variable pricing schemes, such as charging more when and where demand is higher, to more effectively and efficiently manage demand. This strategy can also help demonstrate transparency to the public that the primary purpose of paid parking is not to generate revenue, but to manage demand. For example, the data shows that demand is highest in the summer, particularly midday and early evening, and is higher closer to the 700 block. The City of Glenwood Springs could use this data, as well as continue to monitor data after initial implementation, to implement variable pricing schemes to best meet demand.

- *Managing Spillover Parking* - Given the high demand for parking in the downtown core in the summer, and if the City were to implement paid parking, it may be necessary for the City to manage spillover parking along residential streets of downtown south of 10th Street. Winter data shows there is excess parking available during the day on most blocks south of 10th Street. However, there is likely less excess capacity in the summer and the current conditions are likely to change once paid parking is introduced and people begin to look for free parking options near downtown.

  The people most likely to be impacted by introducing paid parking downtown are downtown employees who drive to work and do not have access to a private off-street lot. Several strategies can be used to manage this demand and prevent the negative impacts of spillover parking:

  - Paid parking combined with improvements to the transit network and first/last mile connections will provide significant incentive to using transit to get downtown.
  - Additionally, employer-provided bus passes would add further incentive and mitigate parking demand.



    - It may also become necessary to extend on-street parking regulations further south, including extending the downtown resident parking permit program further south. Monitoring parking occupancy on the residential streets south of downtown will be an important aspect of effectively implementing paid parking.

- *Resident Permit Program* - Given the high demand for parking downtown demonstrated by the summer data, the City may also need to consider making modifications to the resident parking permit program, especially if paid parking is introduced. Currently, the residents in downtown that have a parking permit can park up to 72 hours in any of the 2 Hour time-restricted spaces and public lots, with the exception of 7th Street and the 700 Block of Cooper Avenue. To ensure residents are not occupying large portions of high demand parking, the City may need to consider additional exceptions to the resident permit program on blocks when and where demand is highest and at some of the off-street lots. Funneling residents to park on streets when and where demand is lower will help ensure parking for people trying to access businesses downtown is readily available.

- **Monitor & Adjust** – A key aspect of managing parking will be to collect data to see what is and what is not working and then use that information to make adjustments over time to pricing, restrictions, enforcement, communication, and other aspects of the parking program. This will be a particularly critical component of implementing paid parking as it will help staff determine whether the changes are meeting the program goals and provide information on what adjustments to make. Data monitoring will also be valuable in providing transparency to the public and demonstrating the benefits of paid parking, which can be a highly controversial topic among the public and other stakeholders.

- **Bike Corrals** - Curb space in a downtown environment is a valuable commodity and should be managed to maximize access to downtown businesses. One means that many communities have used to achieve this is to convert on-street parking in high-demand locations to bike parking. This type of design is called a bike-corral. On-street bike corrals can provide parking for up to ten bikes in the same space that can accommodate one parked motor vehicle, effectively serving more people in the same space. If there are locations with demand for bike parking that is not or cannot currently be provided along the sidewalk, the City may want to consider converting an on-street parking space to a bike corral. This strategy will also incentivize people to bike downtown, which will help mitigate the need to provide parking for motor vehicles.

Additional study is needed to quantify bike parking supply and demand downtown and determine whether this could be an effective short-term strategy.



Example of an on-street bike corral.

Long-term

Over time, new development and changing travel behaviors may shift demand for parking and curb space downtown. To respond to future changes that are more likely to occur gradually over time, the City should consider the following strategies long-term.

- **Evaluate Increasing Parking Capacity** – The City should continue to monitor parking demand downtown in the future. If data shows a growth in parking demand begins to reach capacity even with the short-term recommendations in place, the City may want to consider adding new supply. Due to the geographic constraints, urban design considerations, and the high land value downtown, this most likely would be in the form of a new parking garage. The decision to add capacity should not be based entirely on demand, but should also be a value-based decision among the community. Construction of a new parking structure

downtown is expensive and adding supply will also make it more convenient to drive and park downtown, which could contribute to additional traffic congestion. These factors should be considered against other potential options. Other strategies, such as increasing parking fees, should be considered prior to increasing supply. Instead of investing in additional parking supply (which is expensive) the City should consider applying that investment toward making it more convenient to access downtown via walking, biking, and transit.

- **Zoning regulations** – Properties within the City's General Improvement District are exempt from the City's off-street parking and loading zoning regulations. Given this area covers most of the core area of downtown (see map), no changes to the zoning code are recommended at this time. Management of parking downtown will instead be through the application of other strategies discussed in this memo.

- **Improve Transit Service Downtown** – A long-term strategy to address parking demand downtown should continue to be making investments in the transit network that make it more convenient to get to downtown via transit. This, combined with other parking management strategies (such as implementing paid parking) will incentivize more people to use transit instead of driving into downtown. One option to partially fund transit, could be through the use of parking revenue. Extending the BRT into downtown as part of this project, as well as making strategic improvements to the local transit network, will help mitigate long-term growth in parking demand downtown. Another option to be considered to incentivize transit and mitigate parking demand would be to provide downtown employees with free bus passes and/or make local bus trips free within Glenwood Springs.

- **Confluence Area Parking** – A new mixed used development is proposed for the confluence area (where the 7th Street Lot is currently located). Final plans for development were not available as of publication. However, this development will change parking demand and supply within this area of downtown and will likely amplify the need for other recommendations, including paid parking.

- **Planning for TNCs an AVs** – The rise in transportation network companies (TNCs), such as Uber and Lyft, over the last decade has dramatically changed

travel patterns and demand for curb space in many urban areas across the country. While TNCs currently operate in Glenwood Springs, their use is relatively limited at this time. However, this may change in the future, and if demand for these services increases, the City should be prepared to manage the curb space in response, particularly in high-activity areas downtown. TNCs are also considered a precursor for how autonomous vehicles (AVs) are likely to operate in the future, with the ability to drop people off in high demand areas and drive unoccupied to park in low demand locations. Planning for heavier TNC use will help the City prepare for the emergence of AVs as well.

Curb space in a downtown environment is a valuable commodity and should be managed to maximize access to downtown businesses. In studies for other communities Fehr & Peers has developed a curb productivity index, to measure how many people a curb can "serve" depending on its use. Just like time restricted parking encourages more turnover than unrestricted parking, these studies have found that allocating curb space to bus stops and passenger loading (to serve TNCs) where that demand exists serve many more people per hour than a two-hour parking space.

To maximize productivity of the curb space, as TNC use becomes more ubiquitous in Glenwood Springs in the future, the City should consider designating curb space in high demand areas specifically for passenger loading. These spaces can be managed flexibly over the course of the day. For example, if passenger loading demand is associated with the evening bar and restaurant scene, the curb can be signed for parking during the day and loading in the evening. The City already designates curb space for loading and short-term parking in high activity areas, including loading zones in front of hotels, the hot springs, and Amtrak station, and 15-minute parking on the 700 Block of Cooper Avenue and adjacent to the post office. These types of locations along with locations where parking demand is highest are likely the best candidates for designating loading zones.

Design of passenger loading zones should account for the curb space needed to fully pull in and out, to not block the travel-way. Our research has shown that when placed near a corner, driveway, or bus stop, the space needed for a loading area is about 40 feet (or the equivalent of two parking spaces). If placed mid-block the loading areas should be at least 60 feet (or the equivalent of three parking spaces).

RFTA Parking

The parking occupancy analysis shows that demand for parking at the 27th Street South Glenwood Station exceeds capacity of the adjacent 50-space Park & Ride lot. The parking occupancy analysis demonstrates that somewhere between 30 and 70 transit riders are likely parking on-street, in the Walmart north parking lot, and in the designated overflow due to the lack of available spaces at the Park & Ride. It is possible that additional transit riders from Glenwood Springs may also be driving to Carbondale or Brush Creek to park and board the bus, while other potential transit riders may be foregoing transit all together due to the challenge of finding parking at the 27th Street South Glenwood Station after 7 AM. Based on parking counts it's estimated that about 8-12 cars park in the 27th Street Park & Ride overnight. Additionally, RFTA staff have observed use of the lot for rideshare, Epic Mountain Express users, and adjacent residents. Based on this information, nearly 20% of the lot may be used by non-transit users (and non-Rio Grande Trail users) reducing the effective capacity to 40 parking spaces.

Additional analysis using boarding and alighting data at the 27th Street South Glenwood Station on the days parking counts were collected, as well as population and commuting data from the U.S Census Bureau, and mode share data from the 2018 RFTA Onboard Transit Survey, it was estimated that actual parking demand at the 27th Street Park & Ride, including latent demand, is likely between 100 and 200 parking spaces. Given use by non-transit users the Park & Ride is likely only serving about 20-40% of total parking demand for transit, and an additional 60-160 spaces are needed just to serve existing and latent demand for transit. Based on traffic and population forecast, parking demand at the 27th Street Park & Ride is likely to grow by an additional 40-60% by 2040.

In addition to considering existing demand, several future changes in the transit system are likely to impact parking demand at the 27th Street South Glenwood Station in the future. These changes should be considered as part of any parking management recommendation. RFTA is considering adding a new BRT station near the planned South Bridge connection along SH 82 just south of Glenwood Springs. Additionally, the extension of BRT service into downtown and to the West Glenwood Station and restructuring of the local and regional transit network through Glenwood Springs as part of the MOVE Grand Avenue project will impact parking demand at 27th Street South Glenwood Station. Independent of future population and employment growth in the region, both of these changes are likely to reduce the demand for parking at the 27th Street South Glenwood Station (by about 20-40% in total) as these changes will create new opportunities for people to access the BRT in Glenwood Springs. For this reason, options that provide flexibility long-term

should be considered, such as leasing parking, which can be canceled, or purchasing land, which can be resold, as oppose to constructing a parking structure.

Considering existing parking demand and potential future changes to the transit network, several potential options to address parking challenges at the 27th Street South Glenwood Station are recommended. These are organized into two general categories: strategies to increase parking capacity and strategies to reduce parking demand.

Strategies to Increase Parking Capacity

The following options are potential strategies RFTA could explore to address the parking challenges at 27th Street South Glenwood Station by increasing the parking capacity.

- *Better Connect Existing Overflow Lot* – The existing overflow lot on Blake Street is over a quarter mile from the 27th Street South Glenwood Station equating to about a seven-minute walk. Observations show that this lot has additional parking capacity. While the distance will continue to be a significant deterrent for many potential transit users, the poor connectivity between the overflow lot and transit station likely also deters users. Because of the gate on Blake Street, drivers that find the Park & Ride to be full must make two left turns navigating traffic on SH 82 to reach the overflow lot despite there being a direct connection on Blake Avenue. Additionally, the sidewalk is discontinuous between the two. Potential improvements include opening the gate on Blake Avenue to allow through vehicle movements on Blake Avenue, paving the portion of Blake Avenue that is dirt, completing the sidewalk network, improving the pedestrian environment to make it safer and more inviting (improvements could include providing street lighting, regular sidewalk maintenance, widening the walkway, etc.), and providing clear wayfinding for pedestrian and drivers.
- *Lease Additional Parking* – A potentially cost-effective option for RFTA to consider near-term is leasing parking spaces from existing nearby privately-owned parking lots for use by transit customers. The most obvious choice for this arrangement would be the north parking lot of Walmart, which is located about 500 feet south of the 27th Street South Glenwood Station along Blake Street. The parking occupancy analysis demonstrated that 204-space lot was never more than about a third full during the times observed, and about a 30 percent of parked cars in this lot were likely already transit users. An arrangement of this type would result in formally designating a portion of the parking lot that could be used by transit riders. If this were pursued it is recommended to also improve the connection between the transit station and entrance to the Walmart parking lot for pedestrians and vehicle circulation. A small section of Blake Street is unpaved in

this area, there are no sidewalks in this area, and there is a gate blocking vehicle circulation.

- *Purchase Land for Additional Parking* – RFTA is exploring the potential to purchase nearby parcels to expand the supply of parking (see *27th Street Pedestrian Crossing* analysis above). The planned pedestrian crossing across SH 82 will additionally open the possibility for purchasing land on either side of SH 82 near 27th Street. If this option is pursued, it is recommended to develop surface parking and not structured parking, as surface parking can more easily be sold and repurposed in the future if parking demand at the 27th Street South Glenwood Station decreases long term. Due to the high cost and permanence of structured parking it is not recommended to convert the existing Park & Ride or develop new parking facilities into structured parking. Parking lot designs that allow for more flexibility if demand changes long-term should be explored.

Strategies to Reduce Parking Demand

The following options are potential strategies to address the parking challenges at 27th Street South Glenwood Station by reducing parking demand at the station.

- *Establish a More Robust Parking Enforcement Program* – Under current conditions, the 27th Street Park & Ride is being used for parking by some non-transit and non-trail users, potentially consuming as much as 20% of available parking. Around 8-12 vehicles were observed to be parking overnight at the 27th Street Park & Ride. Better enforcement of the existing Park & Ride regulations could free up 10 or more parking spaces per day. One potential means to achieve this would be to restrict overnight parking at the 27th Street Park & Ride and conversely allow it at the West Glenwood Park & Ride where there is excess capacity. It's unclear whether the vehicles parking overnight were daily commuters working the graveyard shift or people using the Park & Ride for longer-term parking. However, if the former is occurring, RFTA may want to preserve the ability to park overnight. An alternative strategy would be to implement and enforce a 24-hour time limit to more effectively restrict the use of the Park & Ride for long-term parking.
- *Kiss & Ride* – Many drivers were observed using the existing Park & Ride to pick up and drop off people taking the bus (using both legal and illegal parking spaces). To better support and encourage pick-up and drop-off as a means to access transit and free up parking spaces for people parking, it is recommended that RFTA formalize a "kiss & ride" location near the 27th Street South Glenwood Station. A location on Blake Street may work for a formal kiss & ride location, but additional design analysis would be needed to determine the best location. The kiss & ride could serve as the designated space for TNC loading as well.

- *Additional BRT stations* – As mentioned earlier, another strategy to reduce parking demand at the 27th Street South Glenwood Station includes adding additional access points to board the BRT in Glenwood Springs. Extending the BRT into downtown Glenwood Springs would provide more options for people to access the BRT from the core of the city without driving. If the BRT were extended to the West Glenwood Park & Ride riders coming from west of Glenwood Springs would have an additional reliable option to park as well. This is estimated to reduce parking demand at the 27th Street South Glenwood Station by about 10-20%. Analysis showed the West Glenwood Park & Ride is currently underutilized and has capacity. Lastly, a new station with parking near the planned South Bridge would also shift some parking demand away from the 27th Street South Glenwood Station. This is also estimated to reduce parking demand at 27th Street South Glenwood Station by at least 10-20%, and possibly more if the 27th Street Park & Ride remains over capacity.
- *Improved Multimodal Connections* – Improvements to the pedestrian, bike, and local transit network in Glenwood Springs targeted toward making it easier for people to get to the BRT without driving would also reduce demand for parking. Near-term, the planned pedestrian crossing at SH 82 will improve access to the BRT for bicyclists and pedestrians from the Rio Grande Trail and neighborhoods west of the station. When the BRT is extended to downtown, pedestrian and bicycle connectivity to future stations will be critical to reducing demand for Park & Rides. Lastly, improving the connections to local transit at 27th Street South Glenwood Station (and future downtown stations), including improving the local transit network will enable more people to access the BRT without need for a car. For this to be effective local buses should be frequent (every 10-15 minutes) or timed to meet the BRT, and should provide direct, reliable service to high activity corridors and destinations in Glenwood Springs not directly accessible by the BRT.

Lastly, the addition of parking capacity should consider use of any designated transit parking by non-transit and non-trail users. If RFTA is unable to effectively enforce parking at their lots, the estimated demand for parking will need to be increased by about 10-20% in order to ensure sufficient parking is available to transit users.

BRT Considerations

This section provides discussion and recommendations related to potential parking impacts in downtown Glenwood Springs that would be caused by the extension of the VelociRFTA BRT into downtown Glenwood Springs.

Two primary impacts of the BRT on parking are addressed in this section. These include:

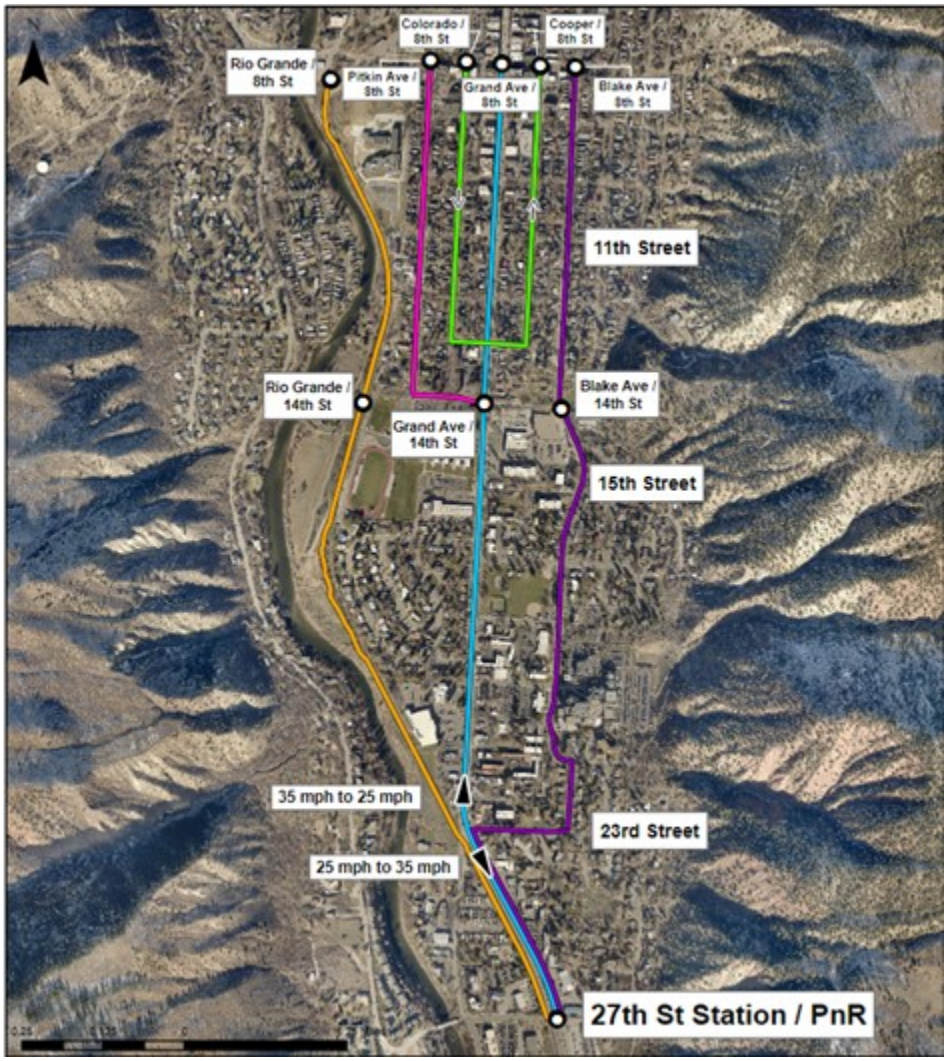
- The impact to on-street parking supply from the addition of bus-only lanes or other transit infrastructure downtown.
- The impact to parking demand by a new BRT station in downtown and parking management strategies to mitigate that demand.

BRT Impact to On-Street Parking

Several infrastructure alternatives were explored for extending the BRT into downtown Glenwood Springs. Infrastructure options considered include the addition of bus-only lanes, queue jump lanes, bus bulbs, and in-line on-street stations, all with the potential to repurpose curb space and on-street parking supply for use by transit. Five potential BRT alignments through downtown were evaluated as part of the MOVE Grand Avenue project as mapped in **Figure 7**:

- Grand Avenue alignment
- Rio Grande Corridor alignment
- Blake Avenue alignment
- Pitkin Avenue alignment
- Cooper/Colorado Avenues one-way couplet alignment

Figure 7. BRT Alignment Alternatives through Downtown



With the exception of the Rio Grande Trail corridor, the other four street alignments would impact on-street parking if curb space was repurposed for bus-only lanes, queue jump lanes or in-line stations. Table 3 summarizes the sum of parking supply and average occupancy along the four on-street corridors through downtown initially considered for BRT. Along all of the corridors, parking occupancy was higher on Friday than Thursday, thus Table 3 shows the parking occupancy data for Friday. Please note that this data is from winter 2020 counts. Parking occupancy is likely to be higher in the summer, particularly north of 9th Street.

Table 3. Winter On-Street Parking Supply and Average Occupancy along Downtown Corridors.

Corridor	On-Street Supply	Friday 5 AM	Friday 9 AM	Friday 4 PM	Friday 7 PM	Friday Avg.	Thurs Avg.
Grand Ave	140	14%	18%	33%	37%	25%	19%
Cooper/ Colorado Ave	140[1]	37%	48%	53%	63%	50%	49%
Pitkin Ave	161	42%	51%	37%	57%	47%	41%
Blake Street	200	35%	29%	39%	43%	36%	35%

1 Supply on Cooper/Colorado couplet represents one side of the street on each corridor.

Table 3 shows that of the four on-street alternatives, Grand Avenue has the lowest parking supply and lowest average parking occupancy at all times of the day (the average occupancy is about half the Pitkin Ave and Cooper/Colorado Ave corridors). While the specific designs and impacts to parking may vary by corridor and other considerations are important, purely from a parking supply and occupancy lens, a BRT alignment along Grand Avenue would have the least impact to on-street parking of the four on-street alternatives.

Grand Avenue Alignment Analysis and Implications

Of the four on-street BRT alignment options originally considered, only the Grand Avenue alignment was carried forward for further evaluation. One of the options being considered would repurpose the parking lane on Grand Avenue for a bus-only lane, potentially just during the peak period in the peak direction. This would be southbound in the morning peak and northbound in the afternoon peak. When accounting for the length of Grand Avenue from 8th Street to 13th Street on both sides of the street the average parking occupancy never exceeded 37% in the winter observations. Based on data described at the end of this memo, it is possible that summer parking could be 50% to 100% higher than the winter, particularly at the north end of the corridor during peak demand.

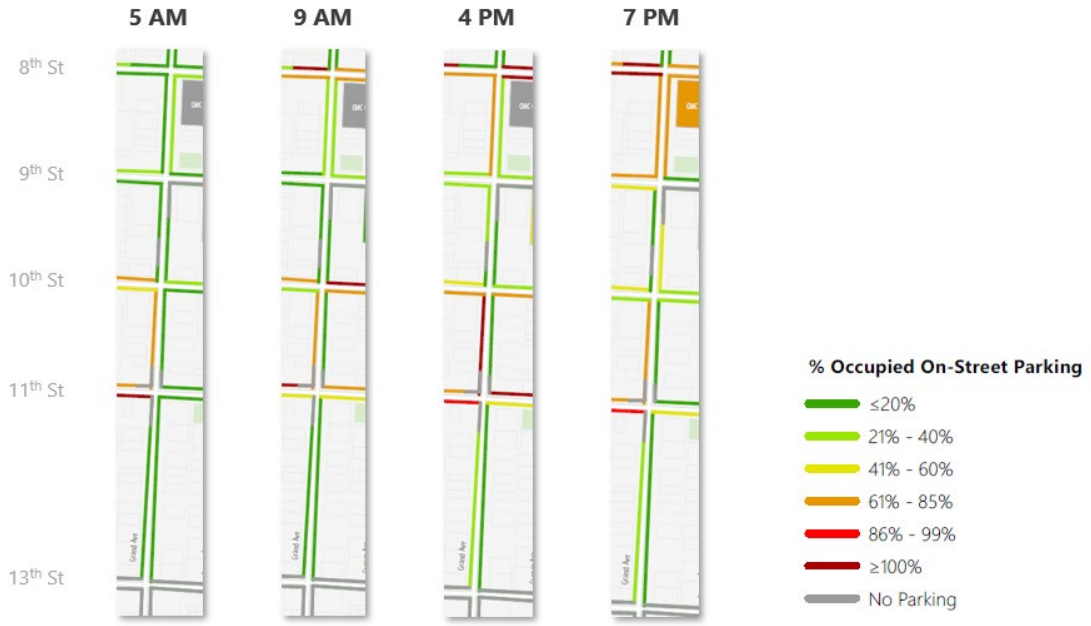
A more detailed analysis of parking occupancy at each block, during the morning and afternoon peaks in the winter is illustrated in **Figure 8**. This shows that parking occupancy is only high (>60%) on two blocks of Grand Avenue:

- Between 8th Street and 9th Street (west and east side) in the afternoon and evening
- In front of the Glenwood Springs Hostel (west side of 1000 Block of Grand Avenue) during all time periods

Parking occupancy at all other locations on Grand Avenue is generally low, typically below 20% in the winter. While summer parking demand is higher, and the impact of removing parking is

expected to be greater in the summer, removing on-street parking on these blocks is still expected to have minimal impact on these blocks. Between 8th Street and 9th Street, the on-street spaces were observed over 50% occupied at 4 PM and over 75% occupied at 7 PM on Friday in the winter, however occupancy was below 40% at 9 AM. Thus, removing parking just during the morning commute would likely have minimal impact on this block as well. Conversely, removing parking on this block during the afternoon peak period would have a greater impact on parking.

Figure 8. Grand Avenue Parking Occupancy on Friday in Winter



Recommendations for Managing a Parking/Bus Lane on Grand Avenue

If the City of Glenwood Springs and RFTA were to implement a peak period, peak direction, bus-only lane in the parking lane on Grand Avenue downtown, with on-street parking available at all other times, the following actions are recommended to ensure bus operations are not impacted:

- **Advance Communication Prior to Implementation.** Changes to parking operations on Grand Avenue should be clearly communicated to downtown businesses and residents prior to implementation. In addition, citywide public service announcements should be made.
- **Clear and Visible Signage.** Proper signage on every block should be in place, indicating the times when parking is not allowed as well as the penalty, such as: Violators Will be Towed.

- **Allow Time for Driver Adjustment.** During the first month or two following implementation, the City should show compassion to drivers who will be getting used to the change. Consider a grace period when only warnings will be issued to allow time for the public to adjust.
- **Have a Towing Plan.** Ultimately, the City will need to have a towing plan in place following the grace period. This will ensure the bus lane is not blocked (and thus ineffective) and the bus lane will need to be monitored on regular basis, likely twice daily at least at first. Based on experience with a similar situation in Aspen, towing is likely to be relatively common at first and then much less frequent as people adjust to the change. Allowing a grace period should help to minimize the need for towing as well.

BRT Impact to Parking Demand Downtown

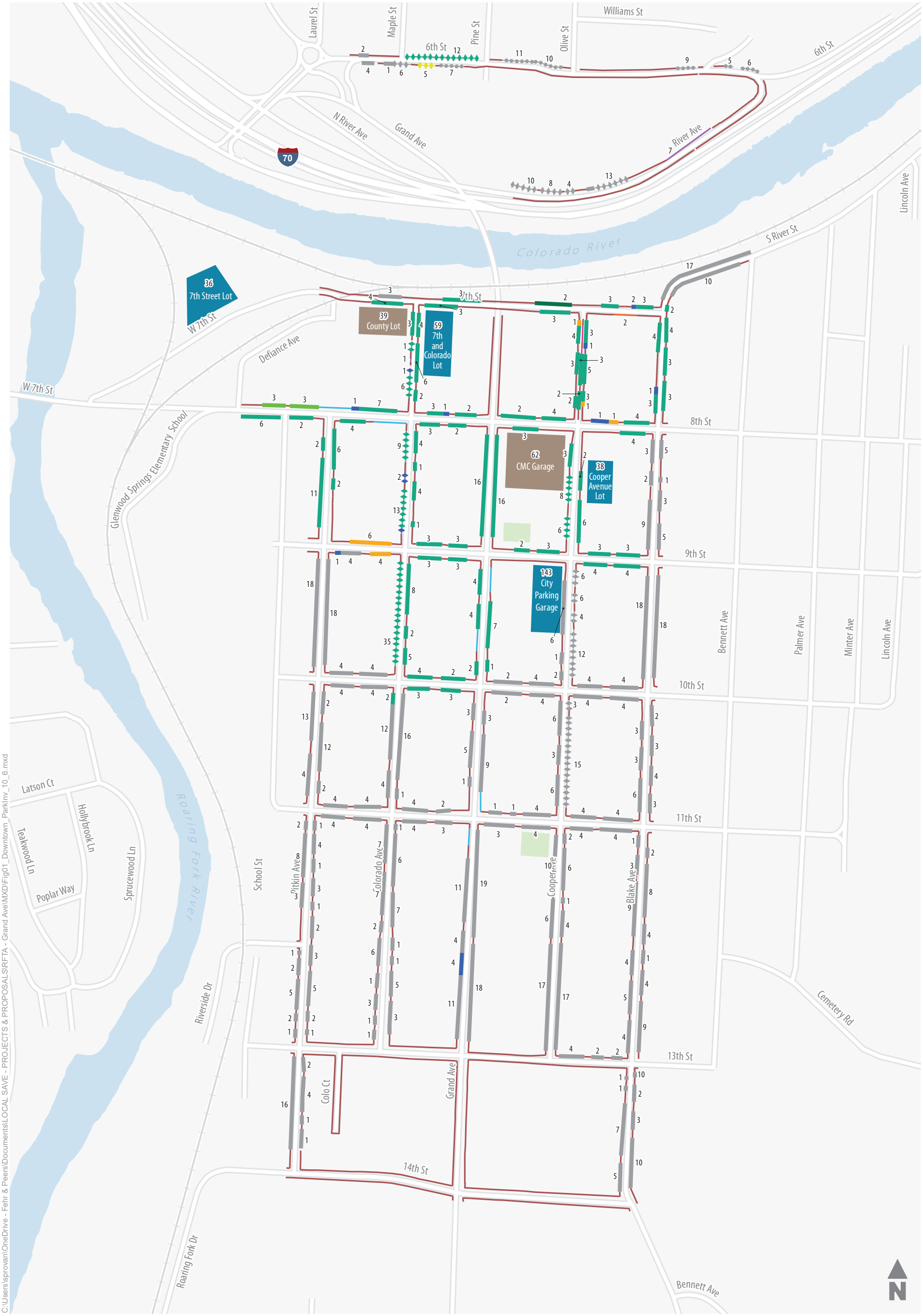
From an operational perspective, extending the BRT downtown may increase parking demand downtown from transit riders who access the BRT by driving and parking downtown. Downtown transit centers are not ideal locations for Park & Rides. In fact, one of the major benefits of a downtown transit center is its ability to increase non-driving access to downtown. Additionally, the land values downtown are typically the highest in the city and storing vehicles for people who are going to other destinations outside downtown is a highly inefficient use of that land.

Both the City of Glenwood Springs and RFTA are looking for ways to discourage transit riders from parking downtown as part of this project. At the same time, the City of Glenwood Springs is also hoping to mitigate the number of people driving through downtown Glenwood Springs to access the BRT via the 27th Street South Glenwood Station.

To achieve both outcomes with the BRT extension into downtown, the following strategies to manage parking and transit operations are recommended.

- **Eliminate Free All-Day Parking in the Downtown Core** - Transit riders that want to access the bus via driving and parking will look for free all-day parking close to a bus stop (typically within a five-minute walk). Time restricted parking (such as 2-hour Parking) will not be an option for transit riders. However, most downtown streets south of 9th Street currently have unrestricted on-street parking, and three public lots downtown offer free all-day parking. These include the 7th Street lot, the Cooper Avenue lot, and the City Parking Garage. It is recommended that in concert with the BRT extension into downtown, all publicly available parking within a five (and potentially ten) minute walk of the downtown transit center or station be converted to paid parking or time-restricted parking. Strategic exceptions can be made through a permit program for residents (similar to the existing program).

- **Connect the BRT to the West Glenwood Park & Ride** – Some BRT demand will be generated by people originating in West Glenwood and other communities to the west (such as New Castle, Silt, and Rifle). To provide those transit patrons a convenient option to park and take the BRT without driving through downtown Glenwood Springs or being tempted to park, the BRT should also be extended to the West Glenwood Park & Ride where it can intercept drivers from the west side of Glenwood Springs. There is currently excess capacity at this lot (and space to add parking in the future if needed), and parking demand will likely increase with more frequent BRT service than is offered today.
- **Provide Convenient Bicycle and Pedestrian Access to the BRT** – Investments to reduce barriers and increase convenience of pedestrian and bicycle access to BRT stations will provide better alternatives to driving and parking. Investments should target enhancing the pedestrian environment along key pedestrian corridors, improving pedestrian crossings of major streets, eliminating bike network gaps, providing low-stress bike connections between the BRT and multiuse trails (including the Rio Grande and LOVA Trails), and providing bike parking adjacent to BRT stations. A well-planned local bike share program would also increase access and modal choice to downtown.
- **Provide Convenient Connections to Local Transit** – The route structure and schedule of local transit in Glenwood Springs should be designed in part to act as a feeder service to regional transit, in particular the BRT. This will provide convenient options for more people to access the BRT without the need to drive and park. To be effective in this regard, local routes should be designed to provide direct service from high activity nodes and neighborhoods of Glenwood Springs to BRT stations. Service should also be frequent (every 15 minutes or less) or timed to connect to the BRT.



On-Street Parking Type

- Diagonal Parking
- Parallel Parking
- Perpendicular Parking
- Other Curb Space Type
- X Number of Parking Spaces

On-Street Parking Classification

- Unrestricted Parking
- 2-Hour Parking 8AM-10PM
- 2-Hour Parking 9AM-6PM
- 15-Minute Parking
- 1-Hour Parking
- 15-Minute Parking
- Disability Reserved Parking

Other Curb Space Type Classification

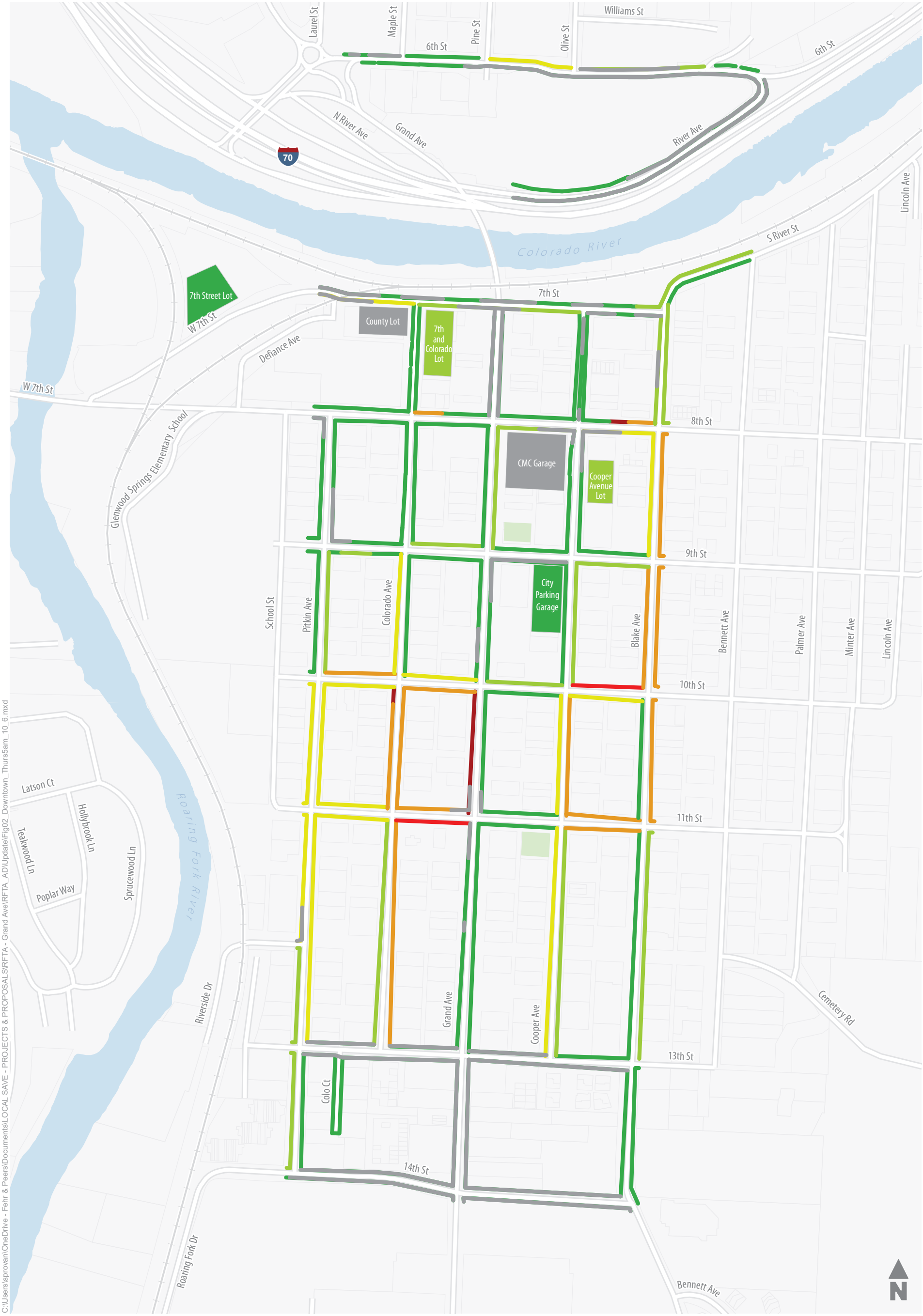
- Bus Loading
- Pick-up and Drop-off Only
- 10-Minute Loading
- Loading Only
- No Parking

Off-Street Parking Classification

- Public Parking
- Shared Parking

Figure 1

Downtown Glenwood Springs - Parking Inventory



% Occupied On-Street Parking

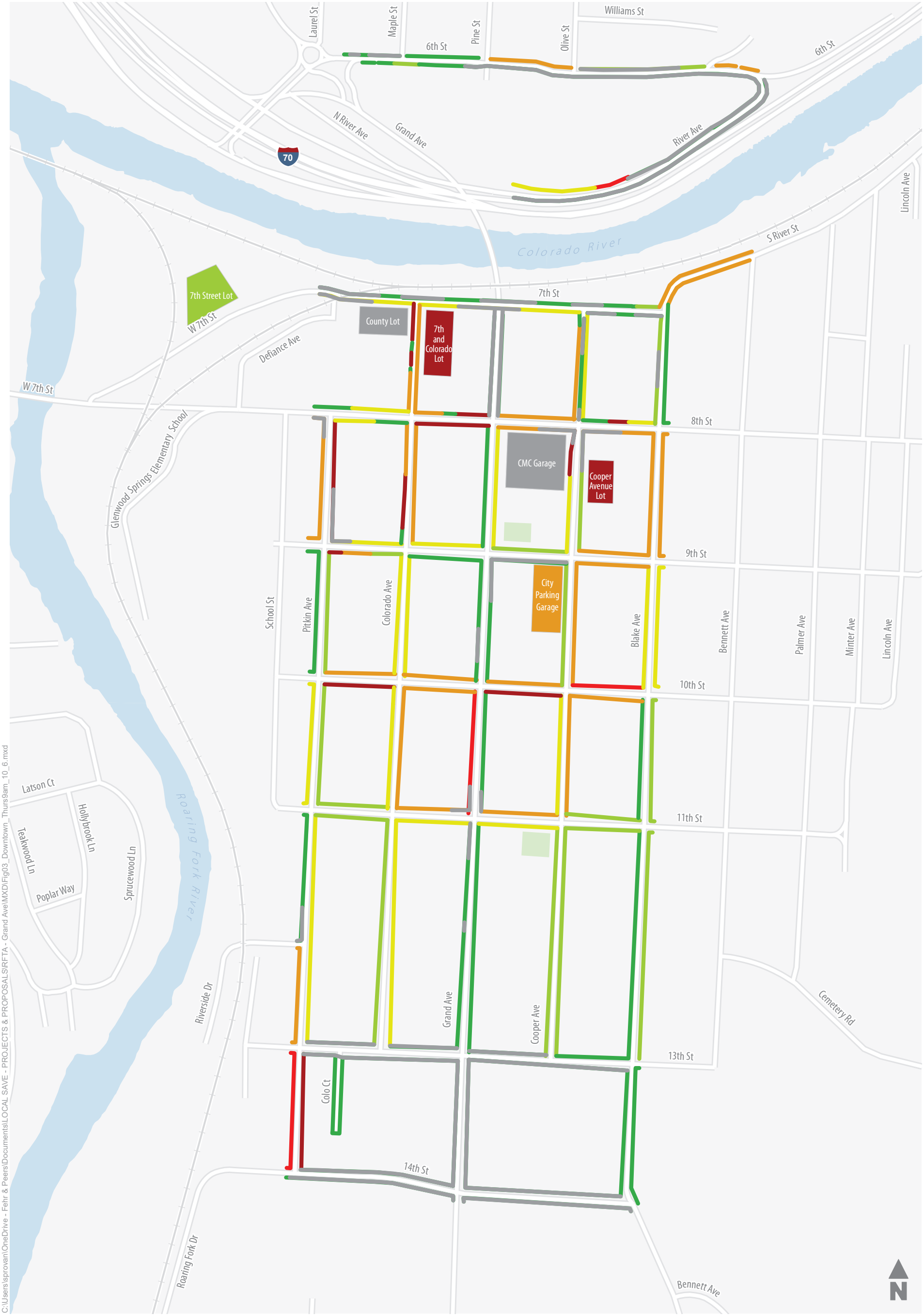
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

Figure 2

Downtown Glenwood Springs - Winter Parking Utilization, Thursday 5am



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% Occupied On-Street Parking

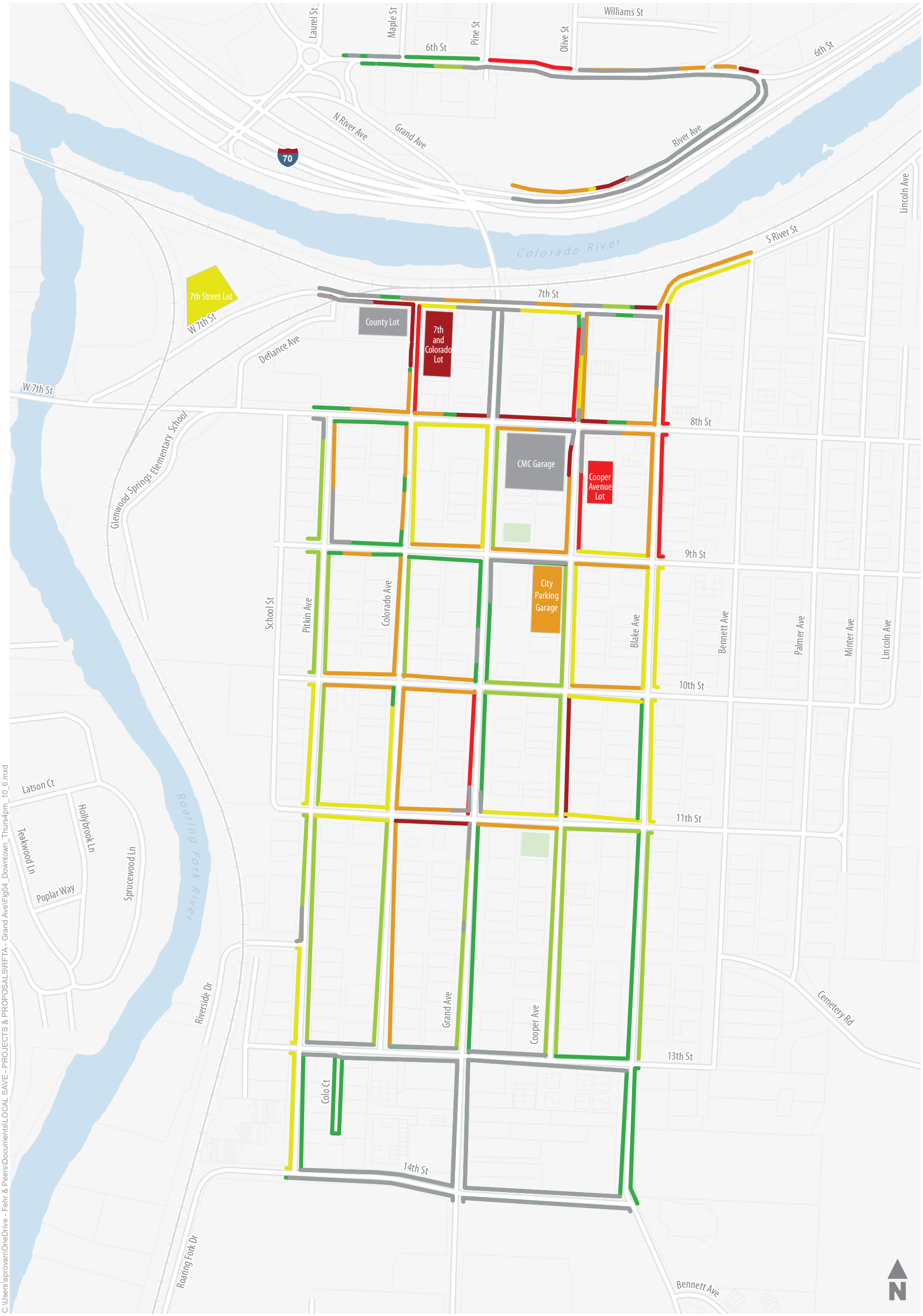
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

Figure 3

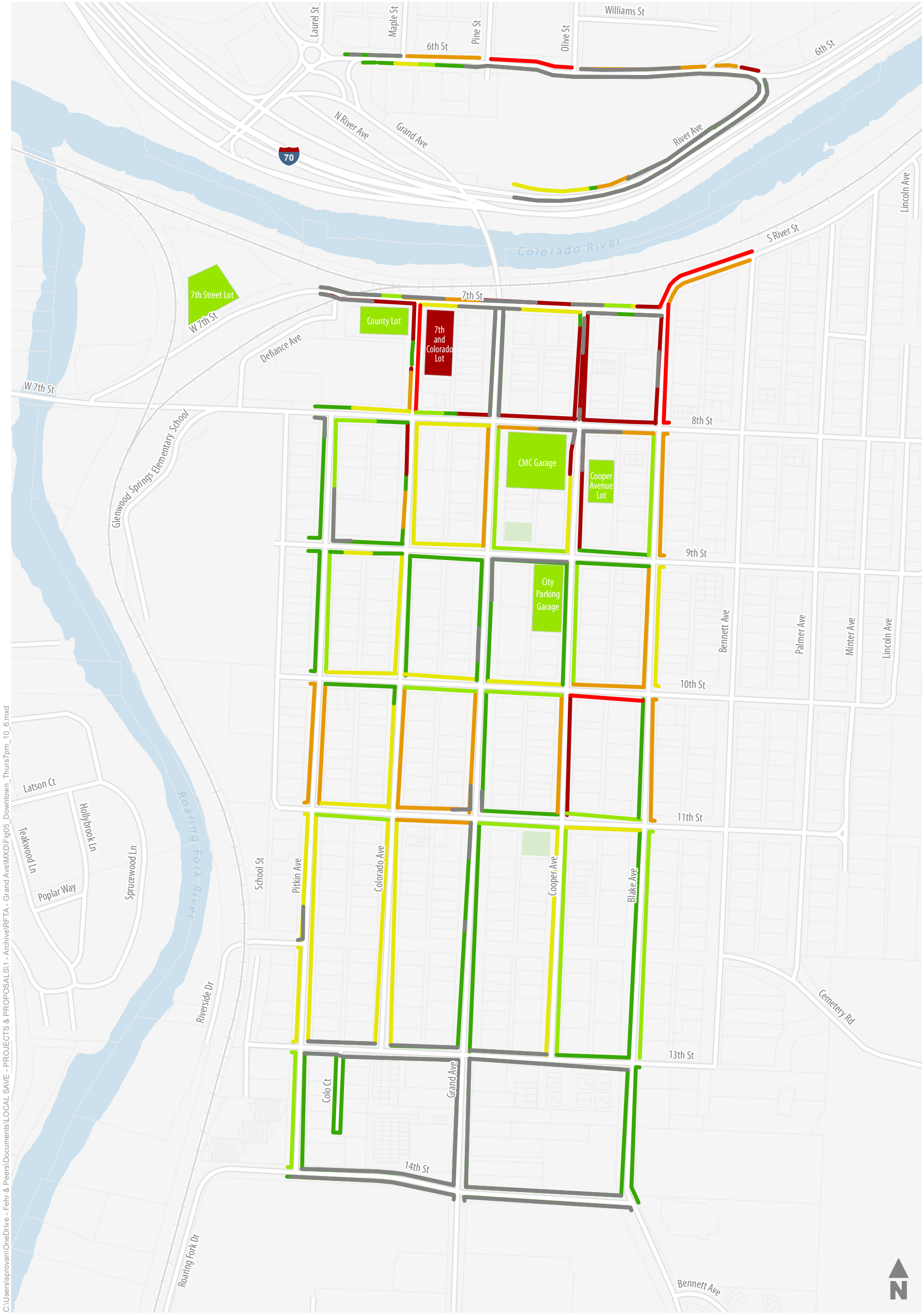
Downtown Glenwood Springs - Winter Parking Utilization, Thursday 9am



% Occupied On-Street Parking	% Occupied Off-Street Parking
≤20%	≤20%
21% - 40%	21% - 40%
41% - 60%	41% - 60%
61% - 85%	61% - 85%
86% - 99%	86% - 99%
≥100%	≥100%
No Parking	No Parking

Figure 4

Downtown Glenwood Springs -
Winter Parking Utilization, Thursday 4pm



% Occupied On-Street Parking

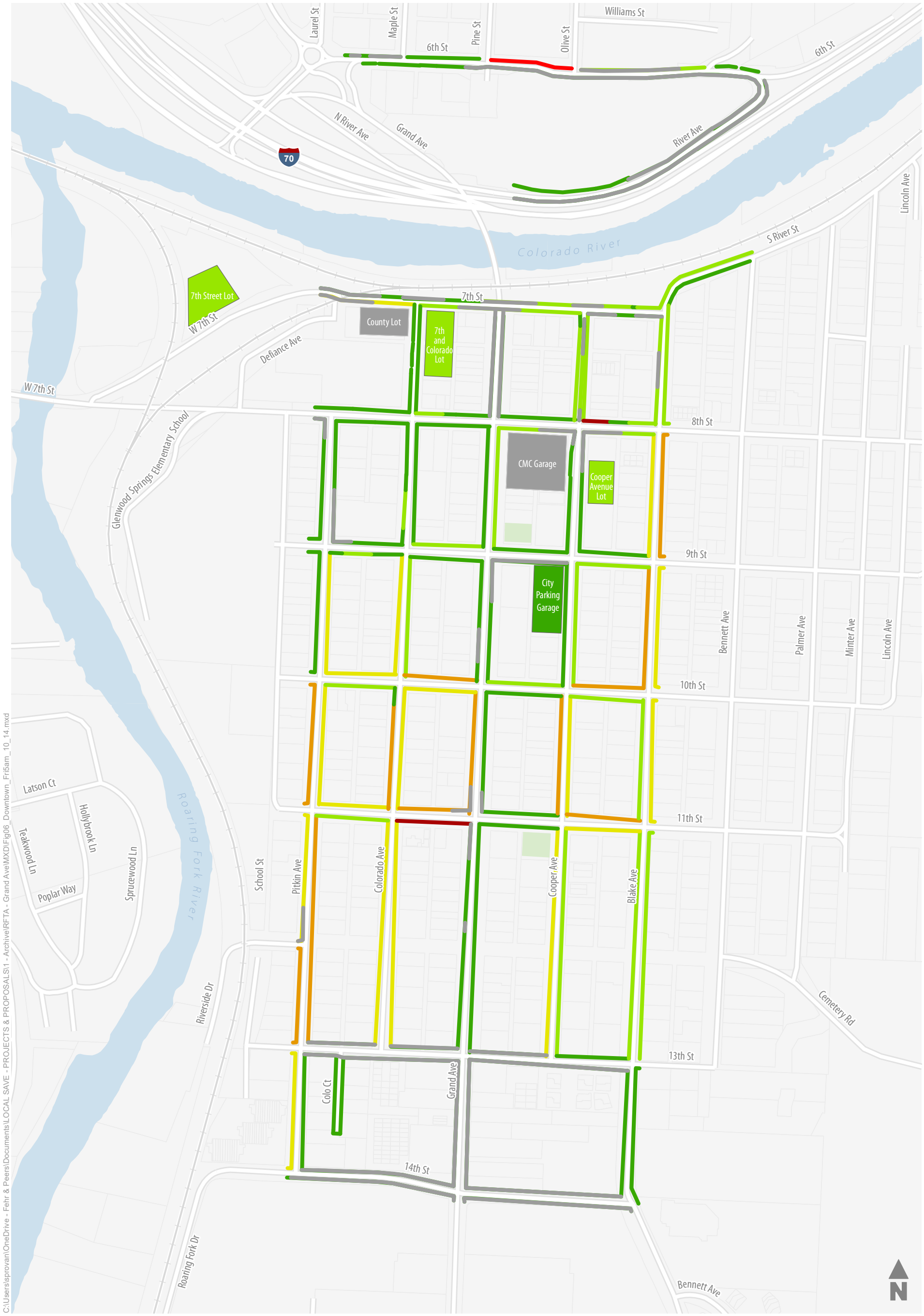
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

Figure 5

Downtown Glenwood Springs - Winter Parking Utilization, Thursday 7pm



% Occupied On-Street Parking

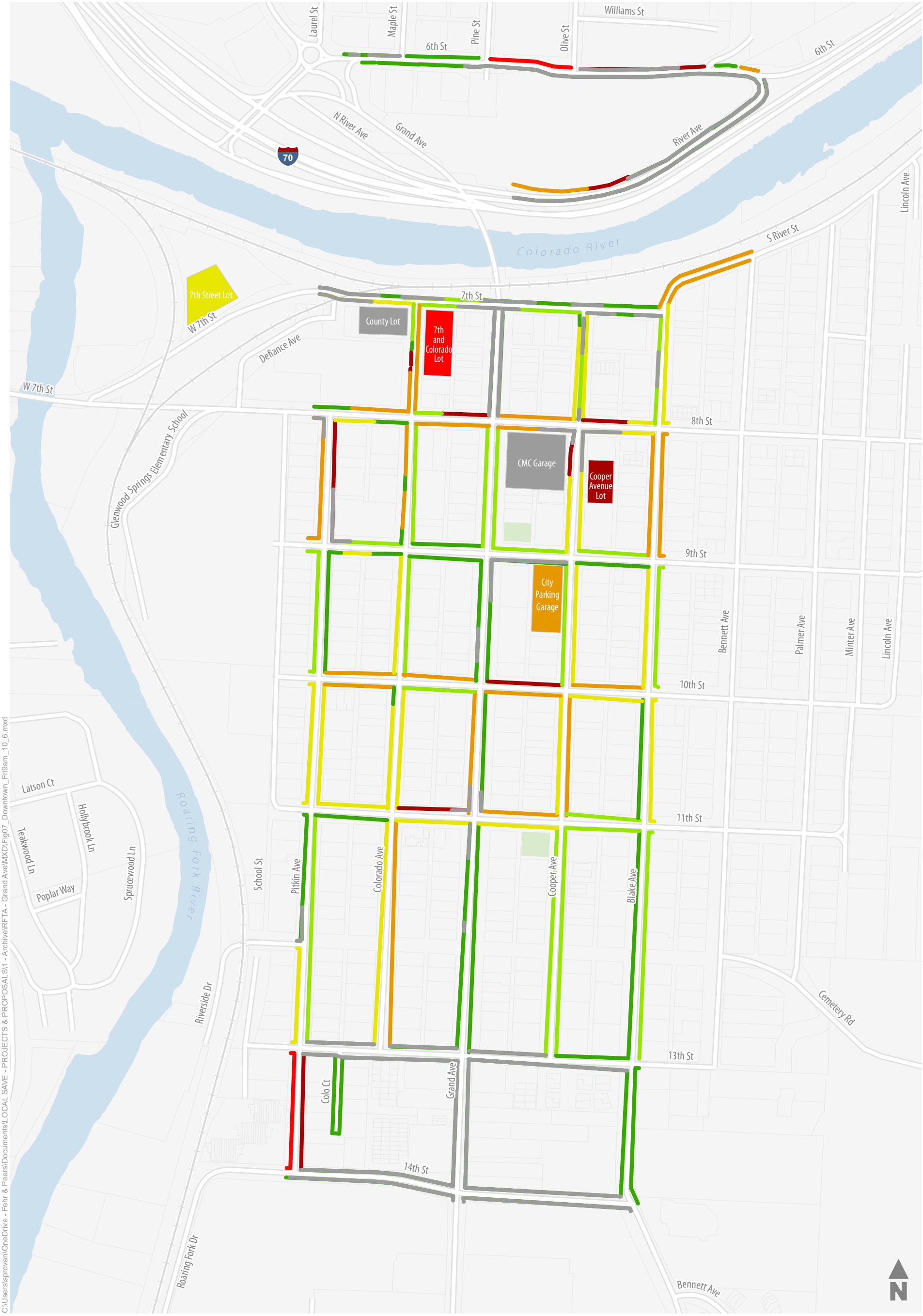
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

Figure 6

Downtown Glenwood Springs - Winter Parking Utilization, Friday 5am



% Occupied On-Street Parking

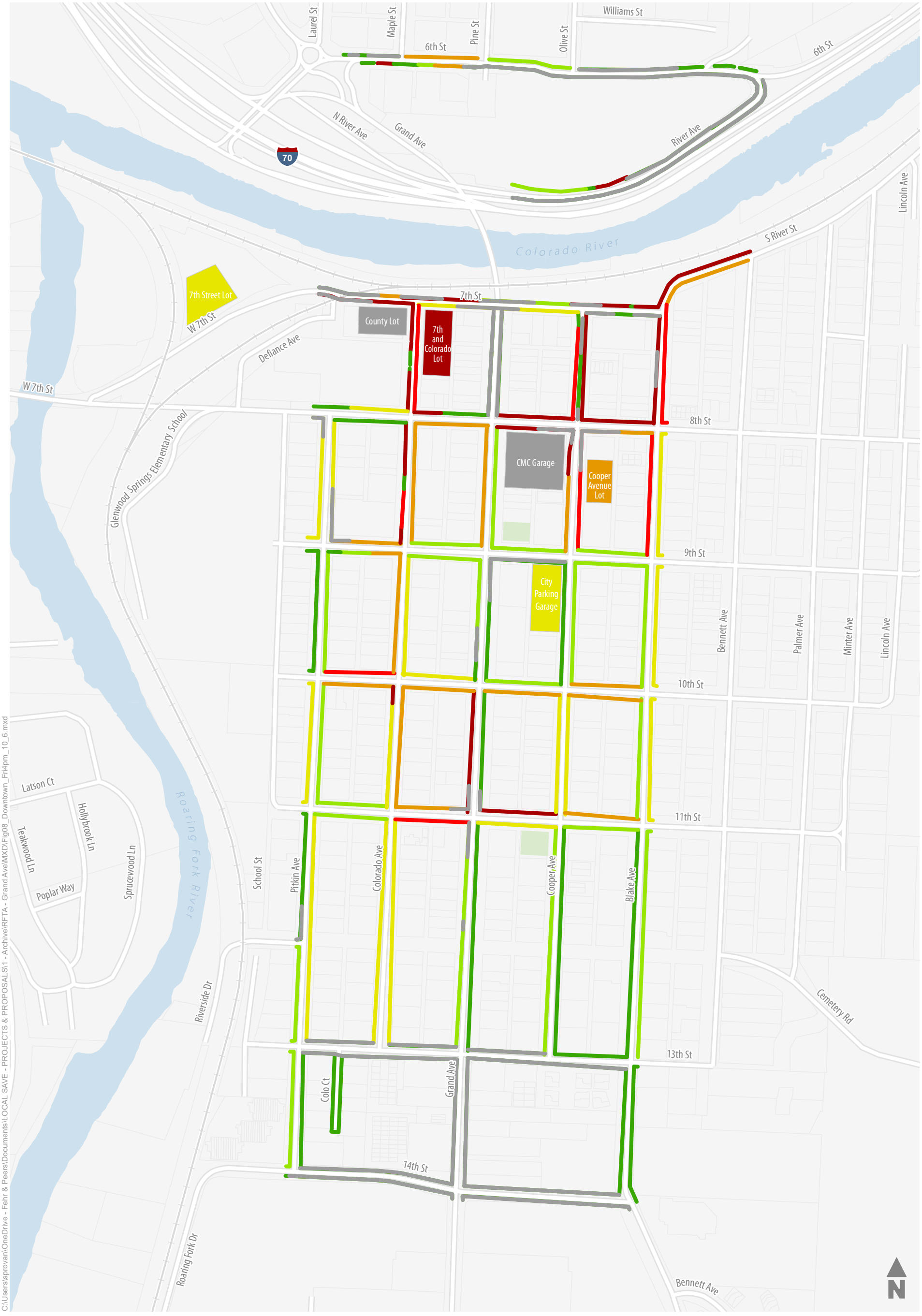
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

Figure 7

Downtown Glenwood Springs - Winter Parking Utilization, Friday 9am



% Occupied On-Street Parking

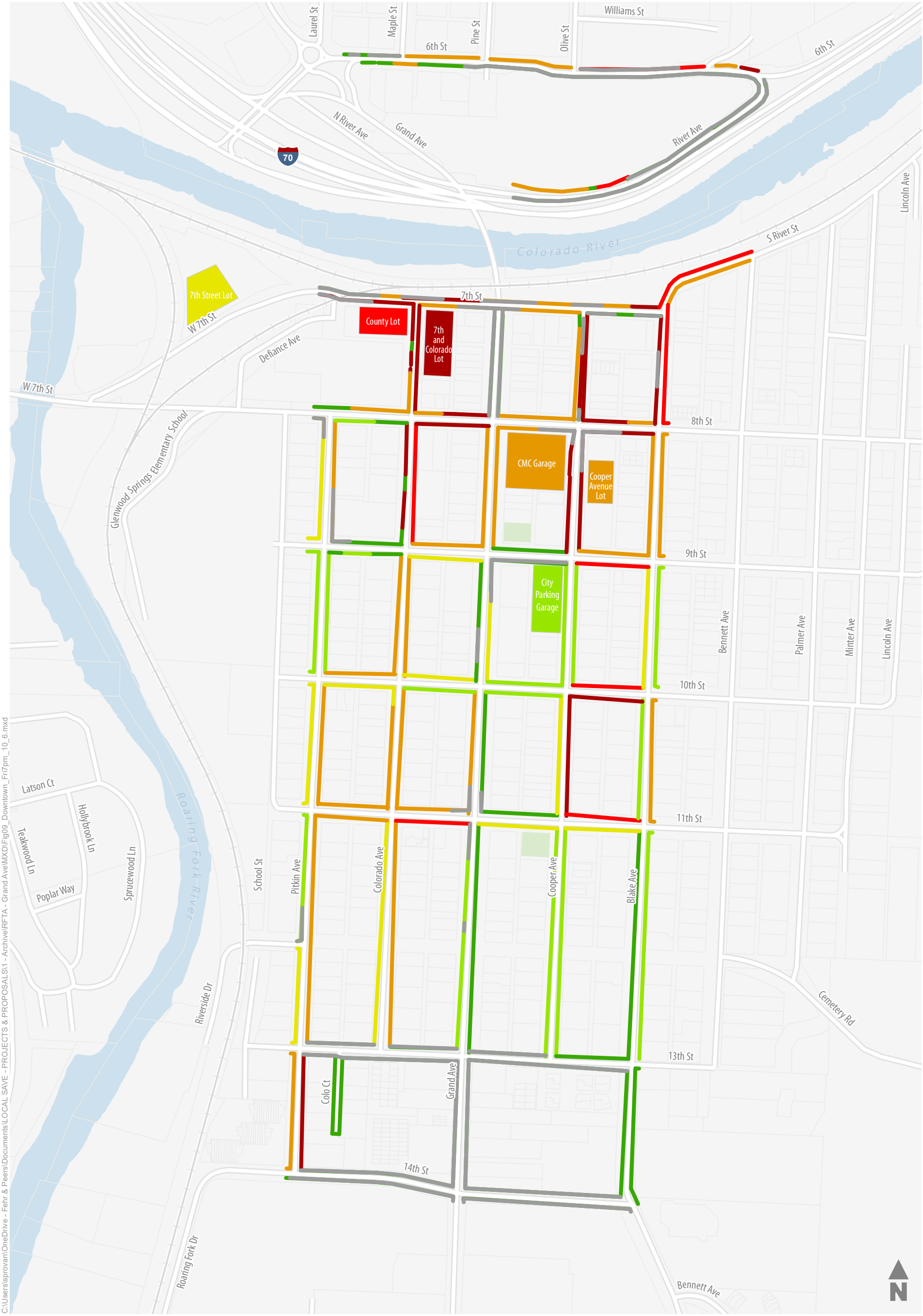
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Parking

Figure 8

Downtown Glenwood Springs - Winter Parking Utilization, Friday 4pm



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Figure 9

Downtown Glenwood Springs - Winter Parking Utilization, Friday 7pm



Figure 10

Glenwood Springs Park & Rides- Winter Parking Inventory



Figure 11

Glenwood Springs Park & Rides- Winter Parking Utilization, Thursday 5am



Figure 12

Glenwood Springs Park & Rides- Winter Parking Utilization, Thursday 7am



Figure 13

Glenwood Springs Park & Rides- Winter Parking Utilization, Thursday 9am



Figure 14

Glenwood Springs Park & Rides- Winter Parking Utilization, Thursday 4pm



Figure 15

Glenwood Springs Park & Rides- Winter Parking Utilization, Thursday 7pm



Figure 16

Glenwood Springs Park & Rides- Winter Parking Utilization, Friday 5am



Figure 17

Glenwood Springs Park & Rides- Winter Parking Utilization, Friday 7am



Figure 18

Glenwood Springs Park & Rides- Winter Parking Utilization, Friday 9am



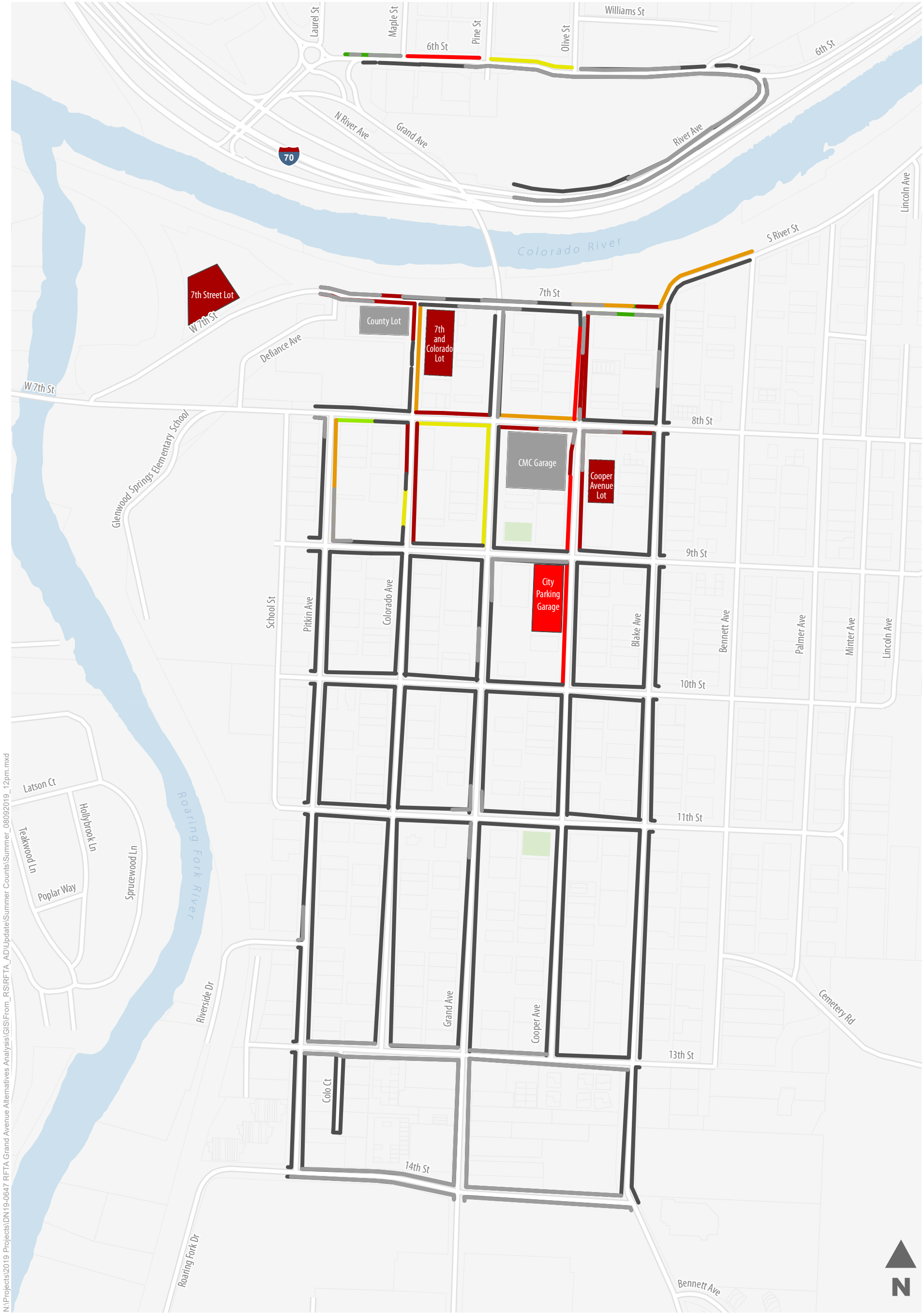
Figure 19

Glenwood Springs Park & Rides- Winter Parking Utilization, Friday 4pm



Figure 20

Glenwood Springs Park & Rides- Winter Parking Utilization, Friday 7pm



% Occupied On-Street Parking

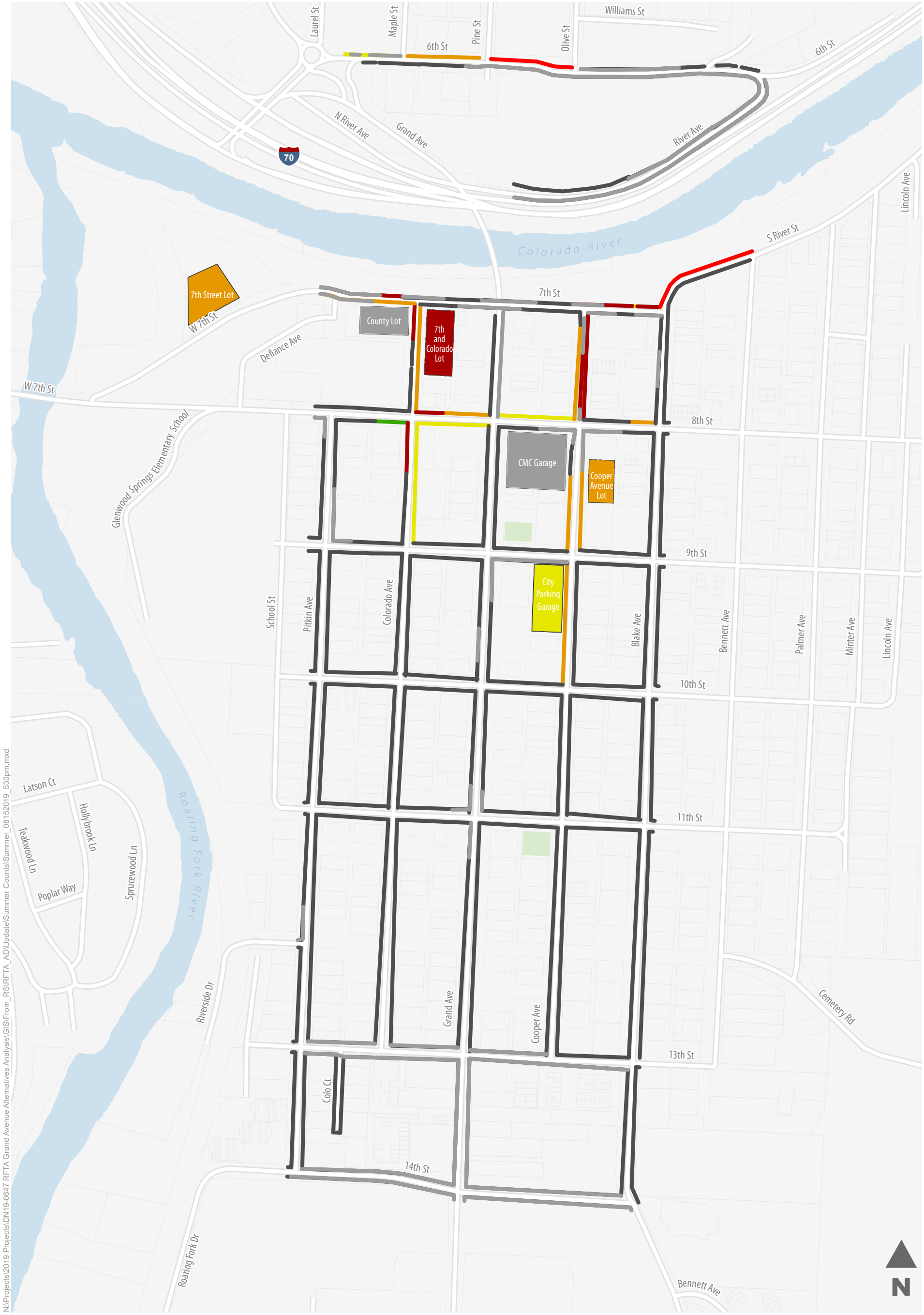
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Data
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21 - 40%
- 41 - 60%
- 61 - 85%
- 86 - 99%
- 100%
- No Parking

Figure 21

Downtown Glenwood Springs - Summer Parking Utilization, Friday 12 pm



% Occupied On-Street Parking

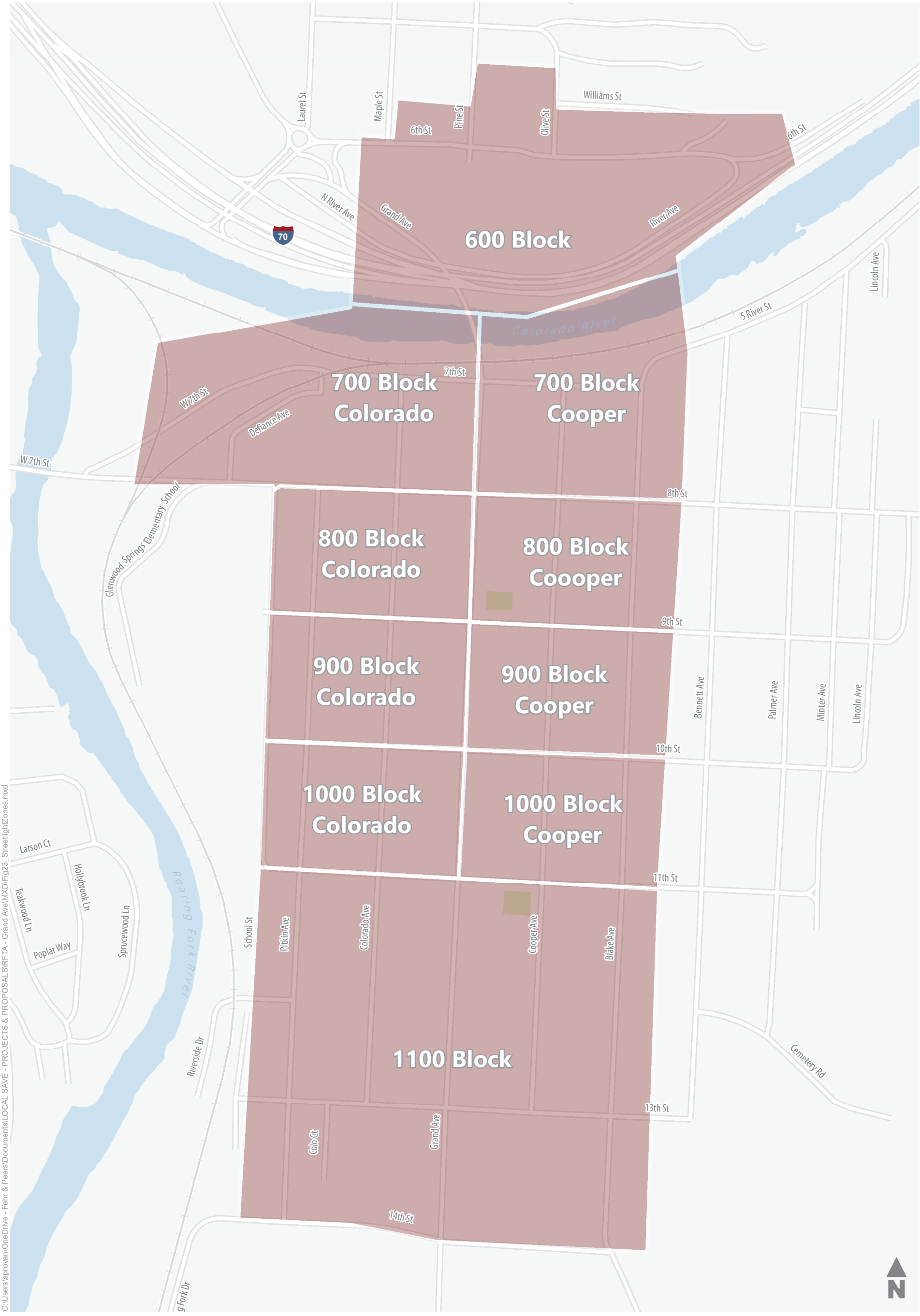
- ≤20%
- 21% - 40%
- 41% - 60%
- 61% - 85%
- 86% - 99%
- ≥100%
- No Data
- No Parking

% Occupied Off-Street Parking

- ≤20%
- 21 - 40%
- 41 - 60%
- 61 - 85%
- 86 - 99%
- 100%
- No Parking

Figure 22

Downtown Glenwood Springs - Summer Parking Utilization, Thursday 5:30 pm



StreetLight Zones

Figure 23

Downtown Glenwood Springs - StreetLight Zones

FEHR PEERS

Memorandum

Date: April 30, 2021

To: Emily Kushto, Parsons
David Johnson, RFTA
Terri Partch, City of Glenwood Springs

From: Patrick Picard, AICP and Charlie Alexander, PE, AICP

Subject: MOVE Grand Avenue: Aspen Parking Program Case Study

DN19-0647

Case Study for Glenwood Springs:

Aspen Parking Management Program

Staff from the City of Aspen's Transportation Department and Parking Department participated in a conversation with the members of the MOVE Grand Avenue project team on July 27, 2020. Staff from Aspen shared information about their parking program, including successes and challenges, some of which may be of value to the City of Glenwood Springs as they advance their parking management program. Key takeaways from that conversation as they relate to the City of Glenwood Springs parking management are highlighted below.

- **Parking Program Goals** – Understanding the goals of Aspen's parking program is important to understanding the strategies they have in place. There are two high-level goals of the parking program. One is to ensure there are always available on-street parking spaces downtown for people who want to park close to their destination. This is to ensure people can easily access businesses and to reduce congestion from people circling for parking. Aspen has set a goal of 85% occupancy of on-street parking spaces mostly by adjusting pricing and time restrictions. Second, the City has a larger transportation goal of keeping vehicle miles traveled into Aspen flat and uses the parking program as a means to incentivize other modes of transportation.

- **Parking is Integrated into the Transportation Program** – Parking management is a key tool in the toolbox for the larger transportation program in Aspen. The City recognizes the high value of parking in Aspen and leverages that value through pricing, permits, enforcement, and providing a variety of parking options to influence transportation in the City. Most parking downtown is paid. However, free parking is available at the Brush Creek Park & Ride, and all local bus service in Aspen (and from Brush Creek) is free, including Aspen's on-demand microtransit service, the Downtowner. Many employers also offer free bus passes (for regional service) in lieu of free parking. Bike share and car share programs are also available and free parking is available to those who carpool. Lastly, the parking program costs about $2 million annually to operate, but generates about $5 million per year in revenue. The surplus parking revenue is used to fund the bus system and other aspects of the transportation program. Therefore, the parking program is integrated into the larger transportation program using both the "carrot" (free bus, etc.) and the "stick" (paid parking) to incentivize people to use non-driving means to access downtown.

- **Progressive Pricing** – The pricing structure of the paid parking program is designed with a goal of 85% occupancy of on-street parking spaces. Therefore, parking is priced highest when and where demand is highest and gets more expensive the longer one parks. In the case of Aspen, this occurs between 11AM and 3PM on-street in the core of downtown during the summer and winter months. During this time, parking is most expensive. In addition, the public parking garage is less expensive and available for all day parking to direct people wishing to park for longer parts of the day, while on-street spaces are priced to cater to people who want convenient access over a shorter time frame. The pricing program also provides flexibility. For example, the first 30 minutes are free (once per 24 hours) to allow people who are making a quick stop downtown to do so without incurring a fee. This also incentivizes high turnover for businesses. In addition, the time restriction is capped at 4 hours (instead of 2) allowing people more time to shop and dine, but each additional hour gets more expensive. Therefore, most people still choose to park for a shorter period, but have the option to park longer if willing to pay for it. Lastly, the City manages spillover parking in the residential areas around downtown by providing residents with residential parking permits and allowing some commuter parking in residential areas through a permitting program.

- **Technology** – Much of Aspen's parking system is feasible because of the technology that is used for payment and enforcement. Aspen provides the option of kiosks as well as mobile payments through two mobile apps. The City is in the process of moving to entirely mobile payment and would like to expand to a total of five mobile apps replicating apps used in the most common home cities of Aspen tourists (such as Denver, Chicago, etc.) to make it as convenient as possible for visitors. Second, parking

enforcement officers have vehicles equipped with license plate readers (LPRs) that enable officers to cover a lot of ground in short period of time and conduct frequent checks.

- **Fines** – Aspen's fine structure for parking violations has some similarities to Glenwood Springs, but is generally higher. First time offenses for most parking violations result in a warning given the high number of tourists unfamiliar with the area. Second time offenses result in fines of $30 for failing to pay or exceeding a time limit, $50 for parking in an illegal space, and $100 for parking in a handicapped space or in front of a fire hydrant. For comparison, fines in Glenwood Springs are $20 for all parking violations except illegally parking in a handicap space which is $100. Many of those issued tickets in Aspen are repeat offenders and Aspen staff would like to move to a tiered system whereby the parking fines increase for each successive ticket.

- **Truck Loading** – Aspen has 17 loading zones in the downtown, some of which are only signed at certain parts of the day. The majority of loading activity occurs at five locations, and about 90% of loading activity is from trucks. Aspen explored regulating truck loading by certain times of the day, but this was infeasible given the distances many trucks travel to reach Aspen and the need for truckers to unload at different times of the day. Aspen is exploring using color coding in the future to delineate loading zones for different purposes or at different times of day.

- **Cost & Revenues** – As mentioned earlier, the parking program generates about $5 million annually. The majority of the revenue is from paid parking. Less than 15% of revenue is generated by fines. In addition to paid public parking, the City also charges for construction parking, $100 per day for spaces in the core and $40 per space per day in the residential areas, which generates about $700,000 annually. In comparison, Glenwood Springs generates about $40,000 per year from parking violations downtown.

- **Data Monitoring** – Aspen uses an external data analyst to monitor several metrics of their parking program. This information is used to continuously make targeted adjustments to pricing and other aspects of their parking program to ensure its meeting their goals.

- **Messaging –** Changing parking regulations and in particular paid parking can be highly controversial. Aspen has learned over time the most effective means to mitigate public backlash is to stay in front of messaging and clearly communicate what is being implemented and why. Another key strategy is to closely monitor data to show the benefits of parking management strategies. For example, many downtown businesses were initially unhappy with the City's shift to a progressive parking structure for fear of losing business with higher parking costs. The City agreed to a pilot program with

businesses and monitored sales tax revenue before and after implementation. After the pilot, data showed that sales tax revenue increased by over 10% after increasing pricing during high demand parts of the day as it increased the ability for people to find parking close to their destination. Similar to Glenwood Springs, many of the parking spaces in downtown Aspen prior to implementing the progressive pricing system were occupied by employees. By changing the pricing more on-street spaces became available for customers instead of employees.

It should be noted that Aspen and Glenwood Springs are different cities with different levels of parking demand, employment, tourism, travel patterns, and community goals. However, there are some parallels and both cities face many of the same issues related to parking. As Glenwood Springs makes improvements to parking management downtown, many of the key takeaways from Aspen's parking program listed above could also apply - albeit in a different context. Ultimately the parking strategies that Aspen uses are intended to achieve their larger economic, land use, and transportation goals. As Glenwood Springs makes adjustments to their parking management, strategies should be consistent and support the City's larger goals for their downtown and transportation system.

Applicability to Glenwood Springs

Some of the key parking management strategies Aspen currently uses that Glenwood Springs could adopt to improve parking and access downtown include:

- **Implementing Variable Pricing** – Implement variable pricing on-street so the cost of parking can shift over time depending on demand in order to ensure some parking is always available on all blocks (i.e. parking will be more expensive when and where demand is highest). This was a key strategy in reducing congestion and increasing business activity in Aspen.
- **Provide Flexible Parking Options** – This could include things like:
    - Offer free parking on-street for the first 30 minutes to make it easy and convenient for people to make quick stops at downtown businesses.
    - Extend parking time restrictions from 2 to 3 or 4 hours, but increase the price for each additional hour to allow more flexibility when dining and shopping downtown, but still incentivize high turnover.
    - Provide all-day parking in off-street public lots. Off-street lots may need to be converted to paid parking in order to ensure availability of parking but could be priced less expensively than parking on-street.
    - Implement flexible spaces. Designate some spaces as loading zones part of the day (when demand for loading is high) and on-street parking other times (when demand for loading is lower).

- **Leverage Technology** – This would include offering mobile payment options for paid parking and LPR technology to improve enforcement.
- **Invest in Transit and Other Modes** – Use excess parking revenues to invest in the transit network and other modes to increase the viability and attractiveness of non-driving modes as a means of getting downtown. This would help reduce growth in parking demand and traffic.
- **Address Employee Parking** – Many of the parking spaces in downtown Glenwood Springs, particularly in the off-street lots, are being used by downtown employees during weekdays. One of the most successful aspects of Aspen's parking program was to free up parking downtown by dis-incentivizing use of the highest demand locations by employees. This allowed more availability of parking for visitors and people doing business, which has helped boost downtown business and sales tax revenue and reduce congestion from people circling for parking. There are a few ways Glenwood Springs could encourage the same thing, including:
    - Use pricing and regulations to incentivize all-day parking in lower demand areas outside the downtown core. This could include some of the residential areas to the south or an intercept lot like the West Glenwood Park & Ride.
    - Incentivize free bus passes for employees. The MOVE Grand Avenue project will significantly improve regional bus service downtown. An additional incentive for employees to choose the bus instead of driving would be to increase the number of employers that provide free bus passes to employees.
    - Provide free bus service in Glenwood Springs – If the City converts to paid parking downtown, one potential use of excess revenue would be to make the Ride Glenwood and other RFTA service free within Glenwood Springs, which, when combined with paid parking downtown, would further incentivize people to use transit to get downtown, particularly among employees.
    - Extend the VelociRFTA BRT to downtown Glenwood Springs and the West Glenwood Park and Ride. More frequent and faster service associated with the BRT will greatly improve non-driving access to Downtown Glenwood Springs. Additionally, if combined with free bus service in Glenwood Springs employees would have the option and could be encouraged to park in the West Glenwood Park and Ride for free and use the BRT to get to/from downtown for free. Many employees in downtown Glenwood Springs live in neighborhoods and communities west of Glenwood Springs. This would be similar to the arrangement that Aspen has where people can park for free in at the Brush Creek Park and Ride and ride the BRT for free into Aspen.
- **Messaging & Communication** - Given the controversial nature of parking, it will be important to clearly message changes to parking, gather input, and articulate the benefits that address concerns, particularly to downtown businesses and residents of the City.

- **Monitor & Adjust** – A key aspect of managing parking will be to collect data to see what is and what is not working and then use that information to make adjustments over time to pricing, restrictions, enforcement, communication, and other aspects of the parking program.

FEHR PEERS

Memorandum

Date: April 30, 2021

To: Emily Kushto, Parsons
David Johnson, RFTA
Terri Partch, City of Glenwood Springs

From: Patrick Picard, AICP and Charlie Alexander, PE, AICP

Subject: Implementing Paid Parking in Downtown Glenwood Springs

DN19-0647

Contents

Implementing Paid Parking 2

Next Steps 2

Step 1: Develop a Comprehensive Parking Management Implementation Plan 2

Step 2: Actions Prior to Implementing Paid Parking 4

Step 3: Actions During First Year of Paid Parking 5

Step 4: Program Maturation (Year 2+) 6

Preliminary Recommendations 6

Where and When 6

Technology 13

Staffing 14

Costs 14

Resident Parking and Managing Spillover 15

Summary 16

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Implementing Paid Parking

This memo provides a high-level guidance and our recommended next steps to consider for the City of Glenwood Springs as part of its implementation of paid parking in downtown Glenwood Springs. We also provide some preliminary guidance on pricing, geography, management strategies, technology, staffing, cost considerations and other actions necessary to implement a comprehensive paid parking program downtown.

The MOVE Grand Avenue – Parking Analysis & Findings memo (prepared separately) provides an overview of parking occupancy findings as well as key issues to consider as part of implementing a paid parking program. Additionally, we prepared a separate technical memorandum on a Case Study of Aspen's Parking Program which summarizes lessons learned and describes examples that may be useful for Glenwood Springs staff in advancing the parking program in Glenwood Springs, particularly as it relates to paid parking.

Next Steps

Outlined below are our recommended next steps for the City of Glenwood Springs to implement paid parking in downtown.

Step 1: Develop a Comprehensive Parking Management Implementation Plan

The MOVE Grand Avenue project provided an overview of parking inventory and occupancy at select times in downtown, as well as a summary of observed challenges, opportunities and recommendations related to parking and curb space management. The next critical step in advancing many of the recommendations from the MOVE Grand Avenue project (and summarized in this document) are for the City to develop a comprehensive Parking Management Implementation Plan.

Building off data collected during the MOVE Grand Avenue project, an Implementation Plan would clearly identify the problems associated with parking, which the community wants to address. Accordingly, the Plan would formulate objectives to directly move the needle in solving the problems while ensuring the strategies align with the City's stated goals. The plan should provide guidance on three major aspects of the parking program: policy, finance, and operations. The Plan will clearly define the timeline for implementation, associated costs (including revenue projections), and operational strategies, such as pricing, timing restrictions, enforcement, technology, etc. to achieve the program objectives. The Plan should be flexible to allow for modifications post implementation and should establish a clear set of performance metrics that define success.

Downtown businesses, employers, residents, the Glenwood Police Department, and other stakeholders should be closely involved in setting the goals and objectives and providing input at key milestones during Plan development. In order for paid parking to be successful, a majority of the downtown community (i.e. over 50% of stakeholders) should be in support before it is implemented. If sufficient support for paid parking is lacking, other strategies, such as enforcement, time restrictions, etc. can be pursued near-term and paid parking evaluated again in the future.

Key components of the Implementation Plan will include:

- **Identify the Problem(s)** - The community should identify the parking related problems to be addressed (for example, convenient parking is hard to find, excessive illegal parking, not enough loading areas or short-term parking, lack of employee parking, traffic congestion from circling for parking, etc.). The problems would be based on both objective data (such as parking occupancy data, parking citation data, etc.) as well as subjective input (such as the issues most important to the community).
- **Define Objectives** - Define the objectives of the parking program, and associated metrics of success, based on the identified problems (examples could include: achieve 85% occupancy on every block, increase downtown business activity, enhance availability of convenient parking, mitigate traffic growth downtown, grow transit ridership, reduce illegal parking, etc.).
- **Timeline of Actions** - Develop a clearly defined timeline for implementation with near-term, mid-term, and long-term actions with associated costs.
- **Allocate Expenses** - Define how revenue will be utilized towards a parking program that is solvent and achieves the stated objectives. For example, revenue should be used to cover the cost of enforcement, maintenance, and administration of the parking program and could also be used for strategic investments in technology, transit, bike share, a new parking garage, or other improvements to advance the goals of the parking program.
- **Get Input from Community** - Coordinate with downtown businesses, employers, and residents (listen to concerns and incorporate feedback into program elements). The Plan should be community driven.
- **Additional Data Collection** - Conduct a parking duration study to better set pricing and time restrictions by block and parking facility. This would include collecting data on parking turnover in 30 minutes increments on the most utilized blocks downtown as well as off-street public parking facilities. We recommend conducting a parking turnover analysis early in the process so that data can be presented to the community and stakeholders as part of identifying the issues and objectives within the Implementation Plan.

- **Preferred Technology** - Identify the preferred parking management technology (central parking management software, meters, kiosks, gates for parking facilities, merchant validation system, enforcement technology, etc.).
- **Operations Plan -** Define initial pricing scheme and restrictions for each block and the four public parking facilities.
- **Equity/Alternative Options** - Address equity concerns and expand mobility options especially for residents, visitors, and commuters that would be most impacted due to dependency on free parking. This should include alternative parking options, such as free or reduced-priced parking options, for short-term parking, in lower demand locations, or for carpoolers, and/or better access to transit (i.e., employer-provided bus passes, free local bus, more frequent service, etc.). It is recommended that the parking program be part of a holistic transportation program, including quality access to multiple modes for employees, residents, customers, and visitors travelling to or from downtown.

Step 2: Actions Prior to Implementing Paid Parking

Converting from free to paid parking will be a significant change to the City. It will impact how the City manages parking, including administration and enforcement, as well as user expectations. Addressing the public's concerns and providing an abundance of communication in terms of the rollout process, setting expectations, and relaying the anticipated benefits will be key to its success. Parking is always controversial, especially paid parking, and staying on top of the messaging will be essential to success. Additionally, it will take time to select a vendor and rollout the program and there several other small changes the City can make to wayfinding signage and curbspace regulations leading up to implementation.

Key steps for the City to take one year prior to rolling out the paid parking plan:

- Consider hiring an expert to solicit and evaluate vendor proposals and help with other aspects of program setup.
- Contract a parking vendor (to install and manage software and equipment).
- Establish a centralized parking management system (this is a software to manage permitting, dynamic pricing, data monitoring of both on-street and off-street parking).
- Budget for a permanent parking manager as well as other first year costs (salary and other costs of the parking program will eventually come out of revenue generated).
- Communicate changes to the public and inform on intended outcomes and benefits based on the Implementation Plan objectives.
- Educate the public and answer questions about how to use the system (when and where to park, how to use the technology interface, changes to permitting and enforcement, and alternative options for getting downtown). Focus should be given to downtown businesses, employers, and residents.

- Update parking wayfinding signage, and information to reflect planned changes and realign the community's expectations for parking in downtown.
- Consider starting with adjustments to residential parking permits and time restrictions prior to converting to paid parking. Examples could include reducing the area where residents with permits are exempt from time restrictions, eliminating overnight parking in some or all of the off-street parking facilities, converting the Cooper Street lot to 4 hour parking, and eliminating the exemptions to parking restrictions at the 7th & Colorado lot and strictly enforcing the 4 hour time restriction. More detail is provided in the Preliminary Recommendations section below.

Step 3: Actions During First Year of Paid Parking

The key theme for the first year of paid parking should be flexibility. An Implementation Plan based on data, with clearly defined community-supported objectives and performance metrics will have anticipated and mitigated many issues as part of the initial program design. However, following implementation there will inevitably be some tweaks needed. It is impossible to predict all the ways in which people will respond to the changes. Therefore, it will be important to closely monitor performance of the system and allow flexibility to adjust during and following the first year of rollout. The tweaks could include adjusting pricing, time restrictions, geography, permitting, enforcement, etc. It will also be important to allow time for people to adjust and keep lines of communication open. This may include offering a hotline where people can ask questions and provide comments, regularly meeting with the parking enforcement team, providing opportunity for feedback, and closely monitoring data.

Key actions during the first year of rollout include:

- Allow a 4-6 months of grace period before full enforcement:
    - Phase 1: Educate on new expectations (prior to and during the first year).
    - Phase 2: Issue warnings for paid parking violations (months 2-4).
    - Phase 3: Clearly identify when full enforcement will begin.
    - Phase 4: Begin full enforcement (4-6 months in).
- Keep communication lines open (hotline, host events, conduct surveys, document and analyze feedback, and communicate adjustments).
- Closely monitor performance measures.
- Make minor adjustments as needed.

Step 4: Program Maturation (Year 2+)

Following the first year of implementation, the City will know more about staffing needs, revenue, stakeholder comfort with changes, and generally what worked and did not work. Certain aspects of the parking program may need to be adjusted to improve operations to meet program objectives. This may include adjusting pricing, time restrictions, and location by hour, day, or season. Additional mid-term strategies can also be implemented to improve performance and operations. This may include expanding the geography, introducing additional technology, better addressing residential or commuter needs, improving transit service, or providing incentives (such as free bus passes, carpooling discounts, etc.). Strategies should generally follow the timeline identified in the Parking Management Implementation Plan. Long-term, the City may consider additional large-scale investments in the parking program such as a new parking garage, additional enhancements to transit service, or adjustments when the BRT is extended into downtown.

Recommended actions in years 2+ include:

- Second year refresher to the system: adjust pricing, geography, enforcement etc. based on data and feedback to better align outcomes with objectives.
- Communicate outcomes of the first year to stakeholders and collect feedback through a formal survey.
- Make adjustments to respond to changing travel behaviors post-COVID.
- Monitor evolution of technology and consider incorporating.
- Make additional improvements and investments as revenue grows.
- Make adjustments when BRT is extended into downtown.

Preliminary Recommendations

The Parking Management Implementation Plan will define exactly how Glenwood Springs will implement paid parking. However, we can offer several preliminary recommendations to get the City started. This includes high-level recommendations for the City to consider regarding when, where, and how much to price parking, what technology to consider, potential enforcement strategies, staffing, garage maintenance cost estimates, and resident parking management strategies particularly in regard to managing spillover parking that may result from paid parking in the commercial core.

Where and When

In general, we recommend paid parking to be implemented where and when parking demand is at, near, or exceeding capacity. This would include both on-street and off-street locations.

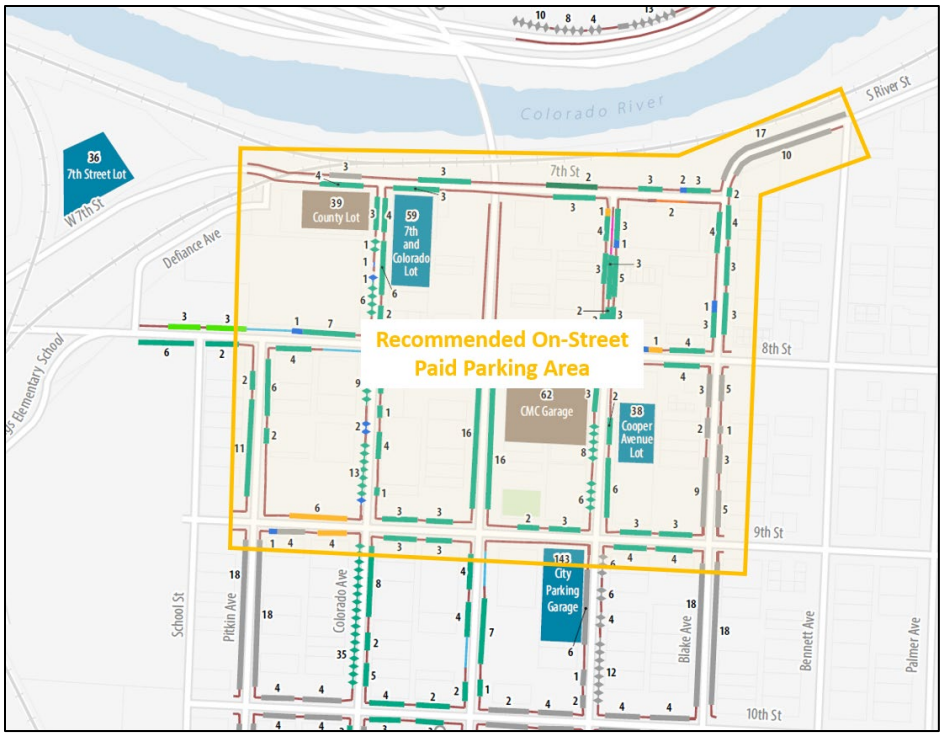
Dynamic pricing can be used to adjust pricing at different times of day and year to match demand and promote efficient use of the parking supply.

Where

On-Street

Data collected in this study demonstrated roughly an eight-block area where demand is high and paid parking appears most suitable. This includes the area from Pitkin Avenue to Blake Avenue and from 7th Street to 9th Street, see **Figure 1**. Demand was also high along 7th Street east of Blake Avenue during the day and evening (but not overnight). The City should consider extending the 2-hour time restrictions to this block and potentially converting to paid parking as well.

Figure 1. Recommended On-Street Paid Parking Area.



6th Street

6th Street was also included as part of the downtown inventory and parking occupancy analysis conducted as part of the MOVE Grand Avenue project and interest has been expressed for converting portions of this street to paid parking. However, given the influence of hotels on parking along this street combined with the relatively low occupancy rates observed in the winter in the 2-hour time restricted segments, we recommend collecting additional data before moving forward with paid parking.

The portion of 6th Street east of Pine Street is unrestricted and heavily influenced by demand for hotel parking. This segment was well occupied during the winter observation period and any changes to parking on this block should be closely coordinated with the hotels.

The two blocks west of Pine Street are signed for 2-hour parking on the north side. These blocks had low occupancy during the day, and moderate parking in the evening (most likely from spillover parking from the hotel after time restrictions expire). Given businesses along this street have expressed interest in paid parking to better manage demand, we would recommend that as part of the Parking Management Implementation Plan the City should collect summer occupancy data on weekdays and weekends and solicit input from the hotels and businesses on this block to see what issues they experience. If data shows this block is consistently full in the summer (and/or on weekends), and there is support from the adjacent businesses, then paid parking may be appropriate. Based on the winter weekday data alone, paid parking is not recommended along 6th Street west of Pine Street given the low rates of parking occupancy, but could always be added at a later date.

Off-Street

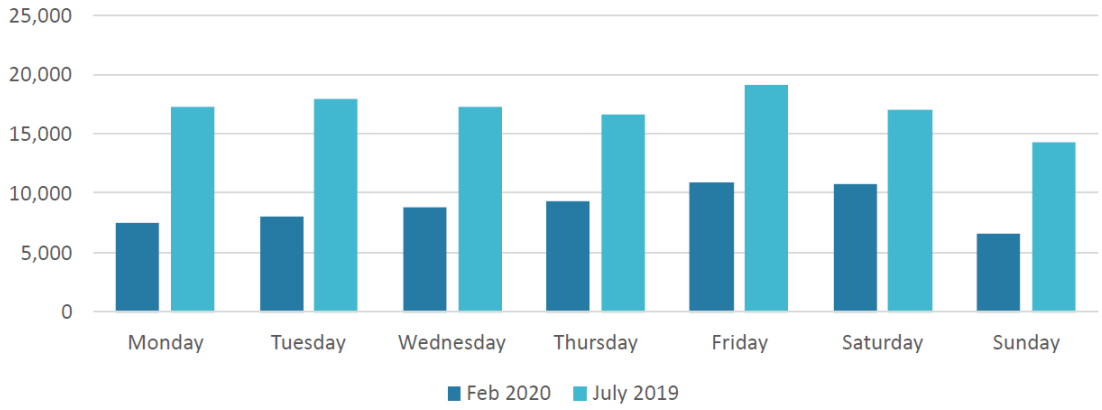
Parking occupancy data indicate parking demand is at or exceeding capacity in the summer at all four public off-street parking facilities (only two in the winter: the 7th & Colorado and Cooper Street parking lots). Therefore, paid parking is also recommended for all off-street parking facilities, although some may only be needed seasonally.

When

On-Street

Parking occupancy data shows that parking demand is moderate to high within the eight-block area identified above during the day on weekdays, and on most blocks in the evening as well. While field observations were not collected on the weekend due to COVID-19, StreetLight data, illustrated in **Figure 2**, suggests that demand may be just as high on Saturday. Based on this data it is recommended that paid parking be implemented on-street Monday through Saturday from 9 AM to 8 PM. StreetLIght data suggests parking demand may be lower on Sunday, but additional data is needed to determine whether paid parking should also be implemented on Sunday. Winter data shows parking demand drops in the evening west of Colorado Avenue, which may mean parking can continue to be free in the evening on these block faces.

Figure 2. Average Daily Trip Ends 7th Street to 9th Street in Glenwood Springs (collected from StreetLight)



Off-Street

Winter parking occupancy data indicates that the Cooper Street Lot and 7th and Colorado Lot are at 100% occupancy between 9 AM and 4 PM on weekdays and at or near capacity in the evening. Based on this, we suggest both parking lots be converted to paid parking to increase availability of parking. Additionally, the City Parking Garage and 7th Street parking lot were observed to be below 80% occupied in the winter, but the same facilities were 100% occupied midday in the summers. This data suggests the City should consider converting these parking facilities to paid parking during business hours (9 AM to 5 PM), at least in the summer.

Similar to the on-street recommendations, its likely that the Cooper Street and 7th and Colorado parking lots could also be priced on Saturday (and maybe Sunday). Additionally, the City Parking Garage and 7th Street parking lots may also warrant pricing on the weekend in the summer as well to manage demand. However, due to COVID-19, weekend occupancy data was not collected specific to the off-street parking facilities. Thus, as part of the Parking Management Implementation Plan, we recommended collecting parking occupancy data for the off-street parking facilities on Saturday and Sunday in the summer to determine which off-street facilities should also be priced on weekends.

It should be noted that overnight parking was observed to be 10%-40% occupied at all four off-street parking facilities in the winter, see **Table 1**.

Table 1. Off-Street Parking 5 AM Winter Occupancy Rates

Public Parking Lot	Non-Disability Public Spaces	5 AM Winter Occupancy
City Parking Garage	143	15% - 20%
Cooper Avenue Lot	38	35% - 40%
7th & Colorado Lot	59	20% - 25%
7th Street Lot	36	10% - 20%
Combined	**276**	**20% - 25%**

Parking occupancy at 5:00 AM is typically associated with residential demand. If residents are parking their vehicles overnight in these facilities, it is likely they are also storing their cars in the same parking facilities during the day. This consumes valuable parking that could otherwise be used by people trying to access businesses in downtown during the day. A more detailed parking duration and turnover study (as suggested earlier) would shed more light on how people are using these off-street parking facilities. If the same people are parking their vehicles overnight as well as during the day (essentially using these facilities as long-term storage), a first step prior to implementing paid parking would be to eliminate overnight parking in these off-street parking facilities. This strategy alone is likely to free up space for people to park in these facilities during the day and evening.

Dynamic Pricing

Dynamic pricing simply means that the cost of parking is more demand responsive and can be different for different times of the day, days of the week, times of the year and by location. Dynamic pricing is recommended to achieve efficient use of the parking supply, such as an 85% occupancy level. The City should use occupancy data from this study as well as additional data collected prior to implementing paid parking to set initial pricing. However, to achieve the optimal balance such that parking supply is not underutilized or overutilized, the City will need to monitor parking occupancy during the first year of implementation and make adjustments.

We recommend the following pricing strategies:

- Set the prices ahead of time so users know what to expect. When the City wants to change prices to better optimize occupancy rates, the changes should be communicated to the public in advance. We do not recommend that prices change in real-time.
- Set prices higher when and where demand is highest and minimal or free parking where demand is lower. As a management strategy, the City can use pricing to encourage greater use of less desirable spaces. As an example, off-street parking facilities further from the commercial core, such as the City Parking Garage and 7th Street Lot should be priced lower than the 7th & Colorado Lot, where demand is highest.

- Consider progressive pricing whereby the first hour is less expensive and successive hours get more expensive. This allows flexibility, providing an option for people to park longer, but also incentivizes higher turnover rate.
- Consider allowing free parking during the first 30 minutes (or maybe 60 minutes) once per day per vehicle. This would increase equity in the pricing structure, incentivize turnover, and increase business activity.

Time Restrictions

On-Street

Currently, most on-street spaces in the downtown core are time restricted, typically with a two-hour maximum during the day. Notable exceptions that were observed to have high parking occupancy include 7th Street, east of Blake Avenue and Blake Avenue south 8th Street, where parking is currently unrestricted. Additionally, there are a handful of single stalls restricted to 15 minutes as well as a few loading zones in the downtown core. Additional changes to the time restrictions should be informed by a more detailed parking turnover study which is recommended to be part of the Parking Management Implementation Plan. Time restrictions should be modified to best meet the demand and to achieve the City's larger parking objectives. If data from the turnover study shows demand is high for short-term parking, the City could consider converting additional spaces to 30-minute or 1-hour restrictions. Additionally, implementing paid parking provides more flexibility through the use of progressive pricing. For example, converting all the 2-hour time restricted spaces downtown to 4-hour, while using pricing to continue to incentivize short-term use could better achieve the same objectives as free time-restricted parking.

Off-Street

The existing time restrictions vary for each of the four off-street parking facilities. The 7th & Colorado parking lot is restricted to 4-hour parking. The 7th Street and Cooper Street parking lots are restricted to 24-hour parking and the City Parking Garage is restricted to 72-hour parking. Additionally, residents with permits can park in any of these facilities for up to 72 hours. Many of the spaces in these facilities are also used for all-day parking by downtown employees. In general, off-street parking facilities should provide longer-term parking than most commercial-fronting on-street spaces, which should generally be priced for higher turnover. However, the observed high use of these parking facilities suggests that the current time restrictions need additional adjustment so that some spaces are still available during the day. In particular, the 7th & Colorado and Cooper Street parking lots are in the heart of the downtown commercial area and are typically full during the day, even in the winter. Adjusting the time restrictions, eliminating exceptions to residents, and pricing these locations higher will provide more parking options to people trying to access downtown businesses and services. Additional turnover data collected as

part of the Parking Management Implementation Plan will reveal how long people are parking in these off-street facilities and better inform what additional adjustments to make.

Some preliminary recommendations on time restrictions to increase availability for public parking off-street, particularly for those trying to access downtown businesses and services, include:

- Implement no overnight parking (for example, No Parking 2 AM to 5 AM).
- Eliminate resident permit parking and employee parking exceptions at the 7th & Colorado parking lot, Cooper Street parking lot, and lower level of the City Parking Garage.
- Convert the Cooper Street parking lot from 24-hour to 4-hour maximum during the day
- Allow businesses to purchase monthly employee parking spaces in the 7th Street Lot and upper level of the City Parking Garage.

Table 2. Existing and Recommended Time Restrictions at Off-Street Parking Lots

Public Parking Lot	Existing Time Restrictions	Recommended Time Restrictions	Existing Exceptions	Recommended Exceptions
City Parking Garage	72 hour	All day (no overnight)	N/A	Could allow free resident with permits and employee reserved on upper level
Cooper Avenue Lot	24 hour	4 hour (no overnight)	Resident permits	None
7th & Colorado Lot	4 hour	4 hour (no overnight)	Resident permits and certain employees	None
7th Street Lot	24 hour	All day (no overnight)	Resident permits	Consider resident permits

Equity in Pricing

We also recommend that the issue of equity be considered as part of the Parking Management Implementation Plan and incorporated into the objectives that emerge from that plan. Without a well-crafted plan, simply charging for parking can have the negative effect of only serving people who can afford to pay for parking. Providing alternative options for those who need to access downtown but have fewer resources to pay for parking will be important. It will be critical to work with downtown employers to better understand their employees commuting needs when crafting the Implementation Plan.

There are several strategies for the City to consider such that implementing paid parking leads to a more equitable transportation system in downtown:

- Provide free short-term parking. For example, allow the first 30 or 60 minutes free once every 24 hours – similar to Aspen's progressive pricing scheme.
- Use part of the revenue to invest in non-automobile modes, particularly transit. Revenue generated from paid parking can be reinvested to make transit service more convenient. Transit tends to be disproportionally used by lower-income portions of the population, so investments in transit will provide direct benefits. Some examples include: provide more frequent transit service, convert local transit service to fare-free, provide free bus passes to downtown employees, offer free or discounted on-demand shuttle services.
- Invest in extending the VelociRFTA BRT to downtown Glenwood Springs and the West Glenwood Park & Ride and use the West Glenwood Park & Ride as an intercept lot. This would give employees a fast, frequent, and reliable non-driving option to get downtown. Parking revenue could also be used to make the service within Glenwood Springs free, which would allow the downtown employees (many of which come from the west) to park at the West Glenwood Park & Ride and take the bus for free into downtown.
- Dedicate free or reduced-fare parking to downtown employees in lower demand locations through a permit program.
- Offer free parking spaces to commuters who carpool.

Technology

The technology related to paid parking has advance significantly in the last decade and continues to evolve. Technology has made it more convenient and efficient for people to find and pay for parking, it has improved the efficiency of enforcement, and allows for better data management and flexible pricing, such as dynamic and progressive parking pricing.

There are many different types of technology for the City to consider when converting to paid parking. Based on the context of downtown Glenwood Springs and our experience in other communities, we recommend the City consider the following technologies when soliciting a parking vendor:

- **Invest in a centralized parking management system** - This is a software system that can be used to manage permitting, provide dynamic pricing, collect and analyze occupancy data, and provide wayfinding to customers for both on-street and off-street parking.
- **Use kiosks instead of individual meters** – Kiosks are generally more affordable to install and maintain than individual meters as only one or two are needed per block face instead

on one per parking space. They also take up less sidewalk space and have a better user interface. Kiosks can be used for both on-street and off-street parking.

- **Allow payment through mobile apps** – Most vendors today provide mobile apps that allow customers to pay for parking with their smartphone. This will improve convenience, especially for repeat users whose information will all be saved on the app. Some communities, including Aspen, have or are considering switching entirely to mobile payments.
- **Try to use the same mobile apps as nearby communities** – Using an app that many people in the region are already familiar with will make it more convenient for residents and visitors to find and pay for parking.
- **Use license plate recognition (LPR) technology for enforcement** – LPR technology will allow parking enforcement officers to more efficiently identify offenders and issue tickets. This technology will be necessary as part converting to payment through mobile devices. The improvement in efficiency from LPR technology will help augment its cost.

Staffing

As part of converting to paid parking downtown, we anticipate that Glenwood Springs will need 1.5 to 2 additional full-time positions to manage and enforce paid parking at least to start. Additional staff may be needed in the future if the program and geography expands. Both positions would be funded from revenue generated by the parking program. New positions include:

- A parking manager – To manage the parking program including contracting with the parking vendor, overseeing the permit program, analyzing parking data, planning, and managing other aspects of the parking program.
- Additional parking enforcement officer – Glenwood Springs currently employs one full time parking enforcement officer downtown. Use of LPR technology will increase the efficiency of parking enforcement, but expanding enforcement to evenings and Saturdays will require at least one additional part-time or full-time enforcement officer.

Costs

Detailed costs and revenue projections will be developed as part of the Parking Management Implementation Plan. The City should anticipate costs for developing that plan as well as startup costs during the first year of implementation to line up a vendor and make initial improvements. These initial costs will depend on the scope of the Plan and scale of changes the City is interested in pursuing. Once paid parking is in place, all the costs of managing the parking program, including enforcement, administration, and maintenance of parking facilities will be covered by revenue generated from paid parking, parking tickets, and parking permits.

Maintenance Cost

Maintenance of the City's off-street parking facilities as well as the curbspace should be considered as part of the cost of the overall parking program. One of the most significant annual maintenance costs will be for the City Parking Garage. The 143-space, two-level parking garage at 9th Street and Cooper Avenue represented both a significant investment by the City when constructed in 2013 and is a valuable long-term asset to downtown parking. Research shows that the typical cost for maintaining a parking structure ranges from about $325 per space/year to $425 per space/year (adjusted for 2021 dollars), and the cost will increase each year the structure ages.[1] These typical costs would equate to about $45,000 to $60,000 per year (in 2021 dollars) on average to maintain the City Parking Garage (Note: these are typical costs and a more detailed analysis is needed to understand maintenance costs specific to this garage). Implementing paid parking would provide a revenue source for the City to cover the cost of maintenance while improving access to downtown.

Resident Parking and Managing Spillover

As part of implementing paid parking downtown the City should also reevaluate its resident permit program and regulations on residential streets adjacent to the commercial core of downtown to align with the program's objectives. The two primary issues for the City to consider when implementing paid parking are:

- The structure of the residential permit program (which currently exempts residents with a permit from time restrictions downtown on most streets)
- Management of spillover parking on residential streets from people trying to avoid paying for parking downtown

Recommendations for addressing both these topics are addressed below.

Modifying the Resident Permit Program

We recommend the City consider the following changes to the resident permit program as part of converting to paid parking:

- Exemption that allows residents with a permit to park in 2-hour time restricted parking spaces for up to 72 hours north of 9th Street should be removed with the exception of Blake Avenue south of 8th Avenue. Winter parking data collected at 5:00 AM illustrates resident parking demand north of 9th Avenue is primarily concentrated on Blake Avenue.

[1]Chrest, Anthony P., et. al. *Parking Structures, Third Edition, Planning, Design, Construction, Maintenance & Repair*. Springer, 2001.
Gupta, Pawan R. and Shiu, K. Nam. *Effective Repair and Maintenance Strategies for Parking Structure*. Concrete Repair Bulletin, July/August 2014.

- Overnight parking should not be allowed in the off-street parking facilities. As mentioned earlier, all off-street parking facilities were observed to be utilized to some extent overnight. Many of these vehicles are likely residents using these facilities for long-term parking. By not permitting overnight parking more spaces will be available during the day for people who want to park and access businesses downtown.
- Residents should not be allowed to park for free with parking permits in the off-street parking facilities. If there is demand the City could issue monthly parking permits for a reasonable cost to park in the upper level of the City Parking Garage.

Managing Spillover Parking

As mentioned earlier in this document, implementing paid parking in the downtown core could result in more people parking in the residential areas south of 9th Street to avoid paying, which may make it more difficult for residents to find parking near their home. Residential parking intrusion is a common side-effect in communities with paid parking. A few strategies are recommended to mitigate this occurrence:

- Convert all the on-street spaces between 9th Street and 10th Street to 2-hour free parking, but allow exceptions for residents with permits.
- Alternatively, if this strategy does not work, the City could convert this one-block buffer around the paid parking area to resident parking-only using a permit program.
- Lastly, it will be important to monitor spillover impacts during the first year of paid parking and adjust regulations and the geography accordingly to mitigate issues.

Summary

Findings from the parking and curb space analysis conducted as part of the MOVE Grand Avenue projecty demonstrate that there is sufficient demand for parking downtown to justify implementing paid parking so long as there is sufficient community support. Paid parking is a tool the City could use to better manage parking downtown when and where demand is high.

Some of the benefits of implementing paid parking include:

- Increasing the availability of convenient parking;
- Reducing congestion caused by circling for parking;
- Increasing parking turnover to generate additional business activity;
- Generating a reliable revenue to source to fund the parking program (including maintenance, administration, and enforcement); and

- Generating funds that can be used to improve multimodal transportation access to downtown in alignment with the community's goals (such as improved transit, free transit, bike share, other TDM strategies, an additional parking garage, etc.).

To advance paid parking downtown, we recommend the City develop a Comprehensive Parking Management Implementation Plan, which would define the objectives and provide a detailed implementation strategy. The Plan would cover three main topics: policy, finance, and operations. We also provide several preliminary recommendations for how the paid parking program could be implemented based on data collected as part of the MOVE Grand Avenue study.

Glenwood Springs
DOWNTOWN
DEVELOPMENT AUTHORITY

RE: DDA Comments on Paid Parking Process and Next Steps

Over the course of the last several months, the DDA has had several opportunities to review the MOVE study and associated paid parking recommendations as a Board and with City staff. These conversations have occurred during our regularly scheduled board meetings. Several members of the DDA Board have also attended and participated in the various community meetings and open house. A summary of DDA thoughts with regard to Paid Parking follow:

1. Concerned that there is insufficient information to make a formal recommendation on whether or not to move forward with implementation of a paid parking program. The DDA recommends a specific study related to paid parking and its impacts, drilling down with more tangible information. At this point, there are too many moving parts and potential scenarios.
2. Cautious about moving forward with paid parking, without understanding the parameters; for instance: is the parking 10 cents an hour or 10 dollars an hour? What's the actual model that the City is proposing to implement?
3. Would like to see more engagement with restaurants and retailers to understand their positions on the topics and the recommended direction. There is a concern that there has not been enough turnout for public meetings and that this important topic justifies additional outreach. The DDA would also like to see outreach extended to adjacent downtown residents, landlords, and real estate owners as all will be impacted by a paid parking program.
4. Without a specific plan it may be too overwhelming for the public to know what they're weighing in on.
5. Implement intermediate steps before instituting paid parking program. Examples include:
    a. adjusting the hours for parking on the existing parking lots,
    b. adding access control at the parking lots,
    c. adopting a higher level of enforcement, before instituting paid parking; enforcement is key.
    d. focus on development of the water treatment plant as a parking lot for employees and communicate that to move employee vehicles out of the core.
6. There's an over-arching concern that paid parking will encourage people to go to other restaurants/retail areas where parking is free. Paid parking doesn't incentivize locals to come downtown.
7. Interest in how a circulator might improve parking, movement downtown for the tourists. How can WE-Cycle and other programs help to reduce parking needs in the downtown?

In summary, the DDA offers as a preliminary recommendation:

- enforcement first,
- maximize parking in the lots,
- leave paid parking on the streets until later
- improve wayfinding, visiting customers don't know where to find parking, facilitate that through an app.

The DDA would consider helping to provide financial support for implementation of interim steps like enforcement.

The DDA looks forward to the City staff presentation to Council and will then weigh-in with additional comment and a specific response. In the meantime, the DDA recommends a **GO SLOW** approach avoiding paid parking as long as possible until there's a better understanding of the context.

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feels like decision has been made. staff says "…when…"	
I don't believe we have any current managed parking. We never have.	
Look at turning our current lots into paid parking. It's easier to start up, manage and less expensive	
Did we mplement any of the findings from last parking studies? What were those findings?	
Hitting 85% should be our goal with increasing available spaces. Not detering (sic) people by charging them.	
look for pkg space options & pursue along w/actual pgk mngmt program instead of paying for limited pkg	
I work downtown and regularly park in the garage…..when it's not filled up with CMC employees. I think it's scandalous to even consider burdening our local workforce with paid parking. I think you should give parking permits to all the downtown employers and let them apportion them to their employees. As for charging residents to park in front of their own homes…..are you kidding me?	
I work downtown and regularly park in the garage…..when it's not filled up with CMC employees. I think it's scandalous to even consider burdening our local workforce with paid parking. I think you should give parking permits to all the downtown employers and let them apportion them to their employees. As for charging residents to park in front of their own homes…..are you kidding me?	
I am not so sure paid parking downtown would change the fact that people drive around the block looking for places to park. Have you ever been to downtown Denver? People circle and circle looking for a space. I do feel the city and county should provide transit passes for their employees and/or encourage them to use transit or carpool. (Understanding that Covid could be a concern, but that won't be around any longer than it will take you to implement any new parking plan.) Residents need to be able to park on their block for FREE! Downtown employees need to have someplace to park. The parking Garage??You should NEVER let developers reduce the number of parking space regardless of bike parking or anything else. 1.5 spaces per unit is absurd!	
I own Crystal Tuning in downtown Glenwood, and people come in here and can stay up to an hour. Having paid parking would rush our customers, and I'm sure that it would rush the customers in other stores as well. When people walk in and ask us if there's paid parking, they are always excited when we say it's free to park. Paid parking would limit us, and it's why a lot of us in the community never go to Aspen. I feel that Glenwood should be a nice peaceful little mountain town, where businesses and the people who come from all over are prioritized over the greed that comes along with asking people to pay for something as basic as parking when we already have a two hour parking limit. Myria D. Smallwood	

This seems like a good idea in theory, but you might want to consider the following:

1. Workers - will they have to pay these fees? Will you have enough parking spaces that offer unlimited time for them? Will they have to be managed by permits? Otherwise shoppers can unknowingly take these spots and workers are left having to use the paid spots & rotate every nth hour.

2. Locals - tourists might have less of a problem with this. But locals will become more conscious of parking costs & a percentage might be less likely to visit downtown to dine and shop.

3. Is the core problem not enough parking availability? Why not simply establish a parking time limit?

4. On the same note, if the problem is not enough parking spaces, could the solution involve creating more? This makes the most logical sense. If a business is growing & generating more revenue but is limited by its current capacity. You are faced with increasing prices or expanding. Generally speaking, expanding is the wiser option unless it's literally impossible to create more product.

How about a two or three story parking facility by the court? more people wanting to be downtown is NOT a problem. that means more business, taxes etc. Eventually you'll have to address the rising population in glenwood.

5. finally, this approach is essentially disincentivizing people to visit downtown, correct? This is why you predict an increase in spots available. Do you want less people to visit downtown?

6. One more, quality of the experience lowers when you have to pay parking on a timed meter. Overall the experience of visiting glenwood can suffer for tourists and visitors, which - this is more abstract & probably impossible to meadure - but could mean less likely hood of people coming back. (or not but you can't deny the experience can become slightly less positive & that is bound to have an effect, even if minimal) This kind of goes hand in hand with when you see big businesses advertising feel good ads and not any of their products directly just their brand. You have to think about glenwood springs brand.

Paid parking downtown is bad for the downtown businesses, which in turn will have negative consequences on our beautiful core. If you have to worry about feeding your meter while you are enjoying dining and shopping you will just decided not to patronize downtown Glenwood. How about exploring other options? Paid parking downtown will increase the issues downtown residences face in terms of more cars parking in neighborhoods.

where do I give my impute on this plan?

Please No Paid Parking in residential neighborhoods!
NO GOVERNMENT-MANAGED-PARKING IN RESIDENTIAL NEIGHBORHOODS!!!!!

I don't know if you've been reading the app Next Door, but there are MANY comments from your locals on it and NOT ONE thinks ANY FORM of PAID PARKING downtown is a good idea. I HOPE YOU'RE READING & LISTENING! I think it's a horrible idea. Take some of the monies the City is spending on future beautification projects (ie our parks were just fine as they were!) and build a huge parking structure on the city's lot on 7th street. I don't believe you'll be blocking anyone's views. And what useful thing is that lot doing anyway? While i understand that we are a resort town, i feel like the "powers-that-be" are trying to make us into a place such as Aspen where the locals are given NO CONSIDERATION. This is OUR TOWN...but it's feeling less and less like a community and more & more like a money making greedy monster! Is that where YOU want to live?

I am opposed to paid parking. Period!
I don't want to pay for parking when the coat of dining/drinks have risen. If I want to have drinks and then walk home, I want to know that I'm not owing a lot of money for parking to do the right thing by walking.
No to paid parking!!!

Learn how to manage your budget better.

Every town I have ever lived in before moving here 15 years ago has had paid parking. It's a mild inconvenience. If the benefit is substantial, then I do not mind it in certain high-volume locations. We live in a popular destination, and paid parking eventually goes with that at some point in the evolution of a resort town.

This is a terrible idea, you will spend close to what is collected enforcing it. Not to mention how ever many millions you spend on these stupid studies. Why do you need more money to mismanage?

In my opinion paid parking is not managed parking. It states, you are not welcomed here so please pay me to stay. It will not manage parking. If you want to manage parking then issue permit's to residents only in residential areas and ticket anyone else who parks in said area. Otherwise just admit it is a revenue tool. I believe it will hurt the businesses that generate tax money for our government. Have you forgotten how few people were in Glenwood Springs during the COVID scare or the fire? This is a tourist town first and foremost. Without tourist money we will fade our identity and become a town to supply labor for up valley. I say no to paid parking and yes to tourism.

I am very much against paid parking downtown. It will hurt business very much. Decades ago we had paid parking and the city got rid of it because it hurt downtown business Very much.

The city should monitor better the 2-hour free parking we have now because I know people park longer then 2 hours. They should help private parking lot owners keep people from illegally parking there because those lots are parking for their tenants which are downtown businesses.

Allowing housing to be constructed w/o off-street parking conflicts with the TDM management concepts such as paid parking

get city & county to park in lots provided by them

ice builds up on sidewalks

I firmly believe enforcement is a huge cmponent. More enforcement = less abuse of time limits, etc.

I have not heard any talk of increasing new infrastructure of parking spaces. Confluence project?

Council giving variences (sic) on developments regarding parking does not help out issue. 6 Canyons

Enforcement of current parking rules would be a great start.

Again, paid parking probably won't stop the circling the block, but I am not opposed to meters only in the downtown business area.

Still need someone marking tires in other areas (residential that has a 2 hour limit). Also need to set limits like cars have to be moved every 48 hours, even if they have a residential parking permit.

City & county should free up parking space also

plowing & snow storage adds difficulty in winter

Restricting overnight parking in inefficient. What is the point of an empty lot from 9pm - 8am?

Data acquired when GAC was downtown. Very different now.

Overnight should not be permitted in City lots.

Where are small business owner's employees supposed to park?

Increasing rates @ peak hours will push consumers to malls & internet--increasing rates @ peaks will punish consumters with str???? working hours

The parallel parking spots on Cooper often are used by RVs in the summer--build a lot for RFs for summer use. People often sleep in their RVs on the street

4th of July - mid Oct peak ???? season (pointing to 'we are reaching parking capacity.....'

Plowing, or lack thereof, in the areas of on-street parking greatly impacts the desire to park in the spots that may be ice/snowpacked.

Maybe provide convenient shuttle service between hotels and downtown dining and shopping to decrease vehicles needing a place to park. I use this a lot when I am in a city that provides clean, convenient transportation.

Can't even magnify these maps to get a better view, they just get out of focus.

Make paid parking Easy! with an app. for locals. ParkMobil app

Please don't reiterate the consultant recommendations as those off staff

Very unfair to Cooper residents (pointing to 'time restriction recommendations.....')

Day parking for employees and night parking for residents. Residents must be out of parking lot by 8:00 or get a ticket. (pointing to 'time restrictions....')

When we attended a council mtg to comment on the 9-plex at 10th & Cooper and the lack of any rqd. off-street pkg, we were told the pg garage was built for that purpose, to provide pkg for GID residents. (pointing to 'time restrictions.....')

Statistically, one variable change at a time is the only way t know how the change improves the issue--try zone mngmt before paid parking.

paid parking will push employees to res areas employees need a place to park

Paid parking should be 1 block east & west of grand not 2 blocks.

7th & Bennet lives on Cooper concern why thru 14th street

typically 2 factions--employees & owners looking for place to park large vehicles, or no parking downtown, take residential parking space & walk downtown

once ppl are ?????? can't turn to access 7th street turn from Bennett onto 7th tight corner

1) Safety 7th street one way from Blake to Lincold. Beond Palmer b/c parking occurs on north side--the street maint dec???ed for parking there, andnot wide enough for parking there & have functional street

Resident Parking: *need to incentivize and not be overly onerous to residents, if the city wants residents to live/work downtown. *making it too challenging will push residents out. *City has oportunity to walk the walk and provide a space for residents with payment if necessary.

2 hour parking in all residential (including between 8th and 9th on Pitkin need to be 2 hour with FREE permit exceptions. City and County both created the problem on this block by building there. They should have built multi-level parking on their own lots or underground.

You are doing nothing but pushing people away from downtown. Learn how to manage your budget better instead of raising taxes. How about a bike share program, larger parking garage over by the old unused railroad tracks, or how about making it illegal to operate a Air BNB within this same area???

What happened to GID funds? (pointing to 'No funding for parking maintenance and other new parking infrastructure investments')

When the parking structure is paid off, can that $ be used to pruchase new parking mgmnt software? (pointing to same as above)

Overnight parking in the garage was a purpose of the garage & relied on as the City permits development of multifamily housing w/in the GID. (pointing to 'Residential overnight parking in off-street lots')

How does paid parking decrease circling? Don't you still circle for parking spots.

We absolutely need parking managed on weekends. We have not had that & it's the busiest time of the week.

Overall planning is a major issue. Expect developers to provide ADEQUATE parking.
Easy, clean transit. (smaller busses running regularly from all areas of town) at convenient times so that employees and tourists will use it.
Not in favor of bus only lanes at all.

Parking is difficult enough to find downtown. I don't want to pay for it on top of it!

You are hurting those that live here, those that work here, and those who come and visit. Learn from the ski areas...they charge for parking, but they have large parking structures that are out of the way and can hold large amount of cars.

south of 10th not regulated

How can we get private lots topen after 6 pm? Ways to achieve public use as well?

There has never been any enforcement on weekends

Hard for some empllyees to get to business in wnter esp. when walks aren't clear

I agree that there should be no residential parking in 2-hour spots. This has been a problem for as long as I've been here.

I also believe that there could be exceptions to the resident parking between say the hours of 6pm - 6am

Sounds about right (pointing to 'Current Program Financials')

You cannot generate funds with low penalties like $20 & with no or little enforcement for 10 yrs. There's no determent. (pointing to 'Current Program Financials')

How do you generate any money with low fees for tickets & little or 0 enforcement

Limiting # of permits will discourage ADUs and multi-family units. If there is no parking for our tenants, we will be discouraged from renting apts.

Still don't agree with 72 hour residential parking in the permitted area, mostly because it is not enforced, but 48 hours should be adequate.
RAISE the fees for parking tickets!
It works OK for us, we have 2 off street spaces, however, during school pick up and drop off folks park at the end of our driveways so that we can not leave. Someone should ticket those folks.
No one is paying attention to pedestrians, even in the intersections where kids are crossing to school.

The bicycle lane on Pitkin is a joke. Side view mirrors jut out into is, so no one can ride ing.

I stay away from those areas.

Again learn how to manage your budget better.

[Should the City implement paid parking to reach goals listed below?] Doubtful paid parking will advance these goals

[Yes] Only between 7th - 8th

[No] worried that paid parking is going to push more employees into the residential neighborhoods. (piggybacked comment: Agree!)

[No] How does one manage the parking of residents cars, on-street, when they take mass transit and store their car for many days?

[No] I do not believe paid parking will increase turnover. People will just pay and stay.

[Unsure/It depends...] Not a magic bullet - will create additional issues as well as some solutions

[if not, what do yout suggest to meet these goals?] I believe that we could do some paid parking but I also believe that current resources could be better managed. I'm just not convinced paid parking is the answer.

[If not, what do you suggest to meet these goals?] I would love to put together something in writing

[If not, what do you suggest to meet these goals?] Enforcement on weekends is necessary for employees

Seems like the main reason for paid parking is to create a revenue stream and I would like to see goals, how much and to fund what specific projects. This idea of just future projects seems a bit vague. I am trying to figure out where you plan to build future parking structures. Need more info. If you don't have a specific plan, you plan to fail.

Still don't think it will end the circling-evidence I see from other locations don't support that theory.

I'm not sure.

Bike share program, use the open spaces on the west side of downtown to build larger parking structures. You can still limit the core area of downtown parking. But force everybody that wants long term parking to park in these lots. Also make it illegal to operate an AIR BNB within the downtown area. This would cut down parking AND open up these locations to people who actually need housing.

[I would support implementing paid parking in off-street lots downtown] With the right plan - but not what I saw in the room. Residents would need free off street parking lots

[I would support implementing paid parking in off-street lots downtown] I believe that if you do paid parking in the lots and structures you will see abuse of parking off-street unless it is strictly enforced.

[I would support implementing paid parking in off-street lots downtown] I would support paid parking in City Parking & 7th street

[I would support implementing paid parking in off-street lots downtown]Seasonally, and demand dependent TC

[I would not support paid parkingin off-street lots downtown] Residents need somewhere for free overnight making these lots paid is reducing their multiple time use

[I would not support paid parking in off-street lots downtown] We live next door to 1 VRBO, 2 apts with 2 owner occupant units. and we rent 2 apts in our house. Limiting parking to permits will discourage rentals

[I would not support paid parking in off-street lots downtown] I work downtown 4 days a week and count on the off street pakring. As a hairdresser I cannot move my car every 2 hours. I leave on street parking open for people shopping at local businesses.

[I would not support paid parking in off-street lots downtown] Paid parking will discourage locals from shopping at our store. We built our business to serve local residents 1st and of course tourist are very helpful for our success. But we are not willing or can we afford to lose our loyal local base.

[I would not support implementing paid parking in on-street spaces downtown] Paid parking will push downtown related pakring into already congested neighborhoods unfairly impacting residents.

[I would not support implementing paid parking in on-street spaces downtown] The city has recnfigured several areas downtown & eliminated pkg spots--STOP! (Piggy back: Yes, this is part of the problem!)

[I would support implementing paid parking in on-street spaces downtown] Seasonally, only if warranted by data and only if off street were paid first. TC

[I would support implementing paid parking in on-street spaces downtown] Agree w/ seasonal.

Add parking garage in lot between Smoke & City Hall Colorado Ave between 7th & 8th

Parking garage at the jail/county lot. Block off ????? for jail/entrance intake

Require Bldngs of a certain size to park underground. ANB

Reconfigure 7th St. parking lot as a garage lot for employees and jurors

Opportunity for motorcycle parking in a yellow section on the east side of CMC building between 8th and 9th

Undecided because I can't tell what you mean by "Downtown" from the fuzzy maps that just get worse if you try to enlarge them.

KISS method would work. Keep these maps simple and clear.

Make the 7th street lot a large multi level parking structure. Make the 7th and Colorado lot a multi level parking structure. Increase the size of the city parking garage.

[I would support a year round paid parking program] ….. With concessions.

[I would support a seasonal paid parking program during the summer.] Depending on data as processed by staff. TC

[I would not support a paid parking program.] Without bus service from South GWS, TDM does not work

[I would not support a paid parking program.] I may not completley understand how this would work - but it seems confusing if only seasonally.

[I am undecided/neutral.] I believe that the program should be year-roun w/ possibly grace periods durin down seasons - If it is implemented

Same as the previous page. These maps are useless.

Only if it was in the immediate downtown area. Nothing north of 9th and only from Pitkin to Cooper.

[There should be no daily limit for staying in the same paid parking space.] The rate charged should relate to the time the space is occupied. I am still not convinced paid parking is a solution.

[There should be no daily limit for staying in the same paid parking space.] 2 hr limit near stores and restaurants

[There should be a 4-hour time limit for staying in the same parking space.] 2 hr?

[There should be a 4-hour time limit for staying in the same parking space.] 2 hr limits w/o paid enforce!

[I am undecided/neutral.] Manage/Staff to decide TC

[What would you think about limiting paid parking times to the busiest parking hours, 8:00 am - 9:00pm?] Don't like at all

[What would you think about limiting paid parking times to the busiest parking hours, 8:00 am - 9:00pm?] 8:00 - 9:00 is all day

[What would you think about limiting paid parking times to the busiest parking hours, 8:00 am - 9:00pm?] 2 hours isn't long enough

[What would you think about limiting paid parking times to the busiest parking hours, 8:00 am - 9:00pm?] No paid parking. general fund parking garages

[What would you think about limiting paid parking times to the busiest parking hours, 8:00 am - 9:00pm?] 10am to 5 or 6pm should be the hours, not 8am - 9pm

Agree with above

[What would you think about limiting paid parking times to the busiest parking hours, 8:00 am - 9:00pm?] This concept conflicts with our tenants parking in front of our house (w/2 apts) and taking public transit to work 5 days per week.

Should be a blue P (pointing to Parking garage sign

enforcement -- what about incremental tickets, the longer you go over, the more the fine

IF there was paid parking is should only be for the busy times.

I don't like it.

public transportation across the city or valley to accommodate those workers.

4 hours is a long time if you are wanting to have turn over.

cooper

[What hours would be best for deliveries?] Businesses need to determine delivery schedule

[What hours would be best for deliveries?] Let businesses decide

[What hours would be best for deliveries?] As a business owner we should set early mng hours and allow deliveries M-F until 11am. We've suggested this many times.

[What hours would be best for deliveries?] Concerns on limiting delivery times due to uncertainty of I-70, mudslides, fires, etc.

[What hours would be the best for deliveries?] Set strict time tables per day with all delivery trucks. Early morning deliveries will not disrupt hotel customers anymore than the trains & I-70 traffic.

[What hours would be best for deliveries?] They should be able to deliver anywhere before 10 or 11am. If after then in allwy on Cooper by Hotel Denver or on Blake otherwise ticket them.

[Where should trucks stage for business delivery?] Staff should decide with biz input. TC

[Where should trucks stage for business delivery?] Let businesses decide.

[Where should trucks stage for business delivery?]Hard to say without further study of what's appropriate.

[Where should trucks stage for business delivery?] north side of 7th Street under the bridge where kiosk is.

This is so hard. Does anyone understand that all the various delivery trucks work for different companies and deliver to other towns, as well? What if the next/previous town expects deliveries during the same time? Truck driver shortages? Seriously don't think you can really make this work. I70 closes and the truck finally gets here and it can't unload??

I don't know.

Early in the morning

Depends on where the business is located. The location that makes it workable for the delivery driver, and least disruption of traffic.

I don't know - the middle of Cooper Ave seems to work.

closest they can to the business. Not each business is equal in their needs or location. You cannot make it one way for all.

Arguement for or against having residents in downtown core.

The USFS would be interested in paying for employee passes.

Free employee permit in certain lots. It's already to expensive to live here. If I had to pay to park where I live that means less money for me to spend at local businesses.

Permits need to be easier to get/track and provided to businesses based on # of employees to encourage freeing up core parking. TC

No resident parking between 7th & 8th on Cooper.

Free employee parking is a must!

May be places where paid parking is too much for employees.

incentivize residenst/renters to not have cars maybe in GID. Reduce resident parking.

citizens should not be restricted on how many vehicles they cn own & park in available spaces.

Paid parking will impact areas outside of those zones and will create a parking problem in outer neighborhoods.

employees need greter encouragement to park outside retail areas.

I think low or no cost permits for employees.Should be issued weekly so as not to be abused if the job is left - managed by employers.

I believe there needs to be a balance of access for both residents and employees. Both groups have abused the current status of parking in the downtown core.

Permits should not be restricted. Such restrictions penalize certain residents

Street cleaning days? Snow plowing -- LT parking in res.

Business/employees provide sales tax for the city. Don't tag them w/parking costs.

Allow overnight resident parking with strict times ie: move out by 8am

Big yes on contractor parking. I have not always found them to show consideration

Want 2 hr parking on Colorado at 10th because employees are taking up parking in front of my house

There should be better mgmt and enforcement of City AND County employees by rqmt of pkg in their off street lots. This would solve a large part of the perceived issue

CO between 10th & 1th. parking stops @ 10th St. employees park in res areas. extend 2 hrs parking farther south. people park & take the bus. parking in residential areas should be redential only--employees should be restricted from res areas. I always see one person per car paid parking would encourage carpool & incentivize other way!

Street spaces from 9th to 10th should be 2-hour free parking (enforced) with residential permit exceptions.

A lot of people get off before 6:00 p.m., so if there is employee free/paid permitting until 6 are residents supposed to circle until 6?

On Pitkin families dropping/picking up at GSES use the street parking, so I feel that needs to be 2 hour and not employees until 6.

Not sure what your issue is with residential parking N of 9th on Pitkin. I walk that way all the time and don't see it full of residents, or anyone else for that matter. Needs to remain 2 hour with residential permits to allow for turnover and not for City and County Employee parking.

I feel 2 residential permits/household work for residents. Not sure how to handle multi-family or mixed use, like apartments over businesses. I think the theory is they will park at night and be gone during the day while the business is operating, but some of those residents just park for days on end in the same place.

I don't live near or use off street over night parking, and don't want to comment because I am not sure what folks in those neighborhoods are dealing with. Would 8:00 be early enough if employees/shoppers are using them during the day?

Don't reduce any more spaces. For instance on Cooper between 8th and 9th, under the bridge. All new construction needs to include ADEQUATE parking.

NO RESIDENTIAL PARKING LIMITS!!!!!!!!

Should there be free parking for a limited time to allow for quick purchases or takeout food pick up?

[No] Most likely not enough--Depends on the block

[Yes] [Designated 15-minute spaces, one per block] Need more than 1 per block! Out store needs more than that to sustain our customers.

[Yes] [Designated 15-minute spaces, one per block]Yes place in center of street not on one side

[Yes] [Designated 15-minute spaces, one per block] This is the best idea yet!

[Yes] [Designated 15-minute spaces, one per block] Depends more on type of business not just 1 per block

[Yes] [Designated 15-minute spaces, one per block] Tax paying vouchers?

[Yes] [Designated 15-minute spaces, one per block] This is a must for delivery drivers

[Yes] [Some amount of free time per license plate in any spot] [What is the right amount of time?] Staff/manager to decide. I would suggest 20-30 min. TC

[Yes] [Some amount of free time per license plate in any spot] [What is the right amount of time?] 20 min

[Yes] [Some amount of free time per license plate in any spot] [What is the right amount of time?] 20 minutes

[Yes] [Some amount of free time per license plate in any spot] [What is the right amount of time?] 30 mins

People don't respect 15 min spots in Smoke lot.

30 minutes max

30 MINUTES

I'm ok with having a spot designated for pickup / delivery. But no spaces should be paid.

Which pricing structure would you prefer? Progressive pricing (cost per space increase with the amount of time) or flat rate pricing per hour?

Progressive TC

Progressive is best however you may have to hve a day rate in some lots or structures

Seems expensive! Most places pay to park the first hr is under $1.00. 60 cents usually

Progressive, 2nd hour should jump

Seasonal pricing summer vs winter

Excessive will kill D.T. business

Flat rate

Flat rate

less for 1st hour or free

Pre pay bulk purchase

Flat rate pricing per hour (cost per hour remains constant regardless of the amount of time the space is occupied)

Neither

hourly fee, but then a discounted rate for all day parking or anything over four hours.

Still limit to 4 hours.

NO RESIDENTIAL PARKING RESTRICTIONS!!! NO RESIDENTIAL PARKING PASSE!!!

Should the Glenwood Springs include private lots in a managed parking plan?

Yes

I believe if private owners are willing to share their resource it could be another option

Yes. encourage private lots to offer public parking after 6. Empty lots are inefficient.

No. But private property owners should choose, and get police help w/getting cars off of their property.

Yes, but costs should be regulated by city.

As needed should on-street/off-street managed plan fail to address issues adequately. TC

When you work all day you may not feel like walking far

how does jury duty fit in? how do they know where to park?

how much activity happens at courthouse? -license plates - 7th Street parking ramp abut RR should be parking garage. Need paid parking to make this better

No!

That is up to the owner of the lot, not you!!!! Government does not control a private business contrary to what out president is doing.

A managed parking program. A robust permit system. A circulator tourist tram & bike share programs. TC

Improve the transportation option. *Make downtwon safer and more walkable for bikes & peds

I believe we should have an additional parking structure

Green bike paths on streets

Provide bus service to Mtn Family and hosiptal, City Market. turn right at Taco Bell

Have more options, bike share, walking path ways, lights that accommodate the walking and biking community and not the traffic community.

Link to:
Downtown Parking Open House Dot Voting.docx

City of Glenwood Springs Transportation Commission

Transit Demand Management Model
Guiding Principles and Recommendations

revised November 2, 2021

The transportation commission offers the following analysis and recommendations for integrating transportation demand management into decisions, budgets, and designs affecting mobility in and near Glenwood Springs.

The Transportation Commission's Traffic Demand Management Model

A. Purpose and Theory

Context – preservation of community values

Glenwood Springs is a small community split by a Federal Interstate, a State Highway, two railway corridors, and two rivers, surrounded by mountains that hem it in on all sides. It also benefits from a great deal of seasonal tourist travel in no small part because of its small- town character and charm. Preserving this "charm," including its walkable downtown core areas and magnificent riparian corridors, is critical to all residents and to commerce.

Travel patterns

Traffic in Glenwood Springs is increasing, and the population of the surrounding areas is expected to grow. Commuter patterns for the past few decades consist of a predominately one-way flow of traffic from downvalley areas to, or through, Glenwood, heading south in the morning, with a similar commuting wave heading north in the afternoon; current assumptions (accurately or inaccurately) suggest those patterns will continue at increased volume and intensity absent effective TDM strategies being implemented.

Recent data suggest the commuting traffic coming to Glenwood each morning is split roughly equally between travelers ending their trips in Glenwood and those traveling beyond. Limited data and anecdotal observations suggest Glenwood residents primarily commute within town, with some heading south in the morning, returning north in the evening.

Unique geography, unique opportunities

The narrow corridor and other unique features and travel patterns of Glenwood Springs require unique solutions. Historically, the City has employed few or no

transportation demand management (TDM) measures, such as paid / permitted parking, managed lanes, transit- priority traffic signals, and tourist-targeted transit solutions (e.g., shuttle services).

Location and design of bus stops along Grand Avenue could be better optimized. Varying fare structures could improve transit appeal. Smart-card type payment systems could allow for origin-destination trip data collection.

Finally, the city's generally narrow profile lends itself to safe, convenient bicycle and pedestrian travel for many local trips—commuting, school, shopping, appointments and tourism. Enhancing opportunities and facilities for those trips is important to reducing growth in motor traffic volumes.

Recent over-emphasis on high impact structural responses

Recent proposals for addressing traffic congestion in Glenwood Springs have focused primarily on solutions that promote big "supply-based" infrastructure projects. Pursuit of costly infrastructure, without first attempting lower-impact "demand-based" measures, risks needlessly threatening the charm and character that makes Glenwood such a great place to live and tourist attraction.

B. Outline and Goals

In light of all the above, the City of Glenwood Springs Transportation Commission urges Council to adopt a graduated approach to managing mobility and reducing traffic congestion, first utilizing all available inexpensive, flexible, proven TDM techniques, and relegating expensive, high impact projects (like highway widening and/or river corridor bypass routes) to long term status.

It should be feasible for the City's Transit Planning and Development Lead ("Transit Coordinator"), with the support of the Transportation Commission, to pursue "low hanging fruit" options to help reduce traffic and improve quality for life for residents and tourists alike, before more expensive giant infrastructure projects are contemplated. The Transportation Commission therefore recommends the City empower the Transit Coordinator to pursue the following solutions, in the following step-by-step approach.

Stage 1, Research & Design

Empower Transit Coordinator, in collaboration with the Commission and City Council, to set TDM Target Traffic Levels, review available TDM techniques, and use historical data and consensus of local and regional partners to develop a roadmap for implementing TDM strategies. (The Commission initially recommends TDM levels to be volumes at 2019 levels (29,000 AADT at Exit 116 or 25,000 AADT S/O Blake)).

- Take advantage of expertise and enthusiasm from Transportation Commission.

• Empower the Transit Coordinator to work with City and regional agencies to refine and implement transportation demand management elements, with assistance from Transportation Commission members and other local expertise.

• Research and outline a higher enforcement / managed parking program downtown as recommended by the MOVE study consultants (potential source of revenue for TDM programs).

• Collect and synthesize immediately available data on traffic flow / transit use to inform Stage 2 planning (no new studies before beginning to take action), including review of existing data from the Grand Avenue bridge replacement experience.

• Maintain communication and coordination with Pitkin County / Aspen transportation managers on their entities' demonstrated TDM successes and difficulties vis a vis past and ongoing TDM programs.

• Evaluate comparative values of investment in bike share, on-demand scooters, ebikes, *etc.* and expanded support for user-owned bicycling, including partnerships with major employers.

• Implement best practices technology for trip data collection for tracking trips, both transit and vehicular, looking forward.

• Establish criteria to measure success, and criteria that establish when to trigger various TDM intervention levels and tools (as outlined below).

• Compile comprehensive inventory of needed bicycle-pedestrian-trails improvements.

Stage 2, Implementation

Implement measures to keep peak hour congestion and overall motor traffic within TDM Traffic Target levels.

Level 1 Tools (using existing infrastructure)

• Implement MOVE study parking recommendations.

• Implement MOVE study bike/ped connection service recommendations (complete repairs & accelerate maintenance of bicycle-pedestrian infrastructure; fill route gaps; adopt policies and design adjustments to prioritize safer bicycling).

• Implement seasonal tourist-focused human powered travel services, including by collaborating with lodges to provide guests with bicycles, shuttles, and other non- car options, and to explore electric circulator trams.

• Implement a refined / modified / expanded Hogback service to more effectively accommodate West Garfield commuters, whether seeking to (1) transfer to BRT at West Glenwood or (2) commute to work centers in GWS.

• Consider having RFTA take over the existing Ride GWS route on 6 &24 to replace with Local service and re-direct the Ride GWS service route(s) and/or create an on-demand service option.

• Explore congestion management and incentive strategies such as peak hour managed lanes on east-bound I-70 at key points approaching Glenwood's exits (e.g., HOV 2 + lanes on I-70 and exit 116).

• Collaborate with large local employers incentives and accommodations for commuting options (bicycling, walking, bus passes, car pooling, telecommuting, parking limitations, *etc*.).

• Implement an ongoing method for data collection, to inform changes to route- priorities/resources over time, to facilitate regular / ongoing monitoring of TDM goals.

Level 2 Tools (improving existing infrastructure)

• Revisit parking rates based on collected data.

• Revisit transit service levels / rates / offered incentives based on collected data.

• Explore and invest in synchronized/adaptive signal timing along Grand Ave. that accounts for different signal timing during commute hours, as well as bus prioritization interventions.

• Implement common sense rationalizations and improvements to bus stop locations along Grand Ave.

- Consider relocating stops adjacent to a signal that the bus can control.
- Activate Transit Signal Priority.

• Implement peak hour managed lanes on I-70 and consider adding peak hour managed lanes on Grand Ave / State Highway 82.

• Consider options for Midland Ave. use as an alternative busway route, for express buses, for certain times of day.

• Explore automated traffic calming measures to avoid cut through traffic in problem areas (automated speed bumps, e.g.).

• Expand and refine bicycle-pedestrian-trails infrastructure for improve safety, access, and convenience.

Level 3 Tools (modifying and improving existing infrastructure).

• Revisit parking rates based on collected data.

• Revisit transit service levels / rates / offered incentives based on collected data.

• Revisit conditions of peak hour managed lanes on I-70 and add peak hour managed lanes on Grand Ave / State Highway 82 southbound.

• Integrate enhanced bicycle-pedestrian-trails features into all new transportation construction projects.

• Build all Grand Ave. bus stations to be pull-off stations, adjacent to traffic signals with bus prioritization implemented.

• Implement developed options for Midland Ave.'s use as an express busway alternative route, for certain times of day.

• Implement automated traffic calming measures to avoid cut through traffic in problem areas (automated speed bumps, e.g.)

Stage 3, Major New Infrastructure (last resort)

Consider major infrastructure investments to accommodate motor traffic if other TDM tools prove ineffective.

• Consider reconfiguration of Grand Ave. to prioritize through-traffic at certain times of day.

• Consider constructing a BRT route on the Rio Grande corridor.

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item:	Development Moratorium and Affordable Housing Ad Hoc Committee
Action Requested:	Discussion
Presented By:	Debra Figueroa, City Manager Jenn Ooton, Economic and Community Development Director Hannah Klausman, Economic and Community Development Assistant Director Trent Hyatt, Long Range Senior Planner
Background Info:	The City of Glenwood Springs on December 13 will officially kick off the process to update the Comprehensive Plan with a meeting of the steering committee. At the Nov. 4, 2021, City Council meeting, Council voted to enact a six-month moratorium on new residential developments over 10 units and to have the Community Development Office investigate growth and how other communities are responding to growth in service to the Comprehensive Plan. See motion below: Councilor Wussow moved, seconded by Mayor Godes, *to immediately enact a six-month moratorium on new residential developments over ten units. This moratorium will apply to only new applications, therefore, previously applied for and or approved developments will not be privy to this action. The goal during this six-months is to charge the Community Development Office with investigating growth, how other communities are responding to growth, requirements, limitations, cohesiveness surrounding growth in and around our communities similar in size and economy to ours. Those on Council and some community members may remember we did a similar course of action including a moratorium on short term rentals, VRBO's and Airbnb's. During that window we received thorough, thoughtful, and engaging feedback from the community as well as other communities on what has worked and what has not. We came back as a community and a Council adopted a revised short-term rental amendment that has now been copied and complemented throughout both the State, and I think the region. The issue of growth is not new, nor will this action solve all issues that inherently bubble up between community, developers, and growth, however this pause will allow us as a community to feel heard, to be proactive and to optimistically grow better. Making its recommendations on daycare requirements, more robust affordable housing, green building requirements, know that the data compiled by Community Development will be shared with the community, Council, and the Comp*

Plan Steering Committee. We are about nine to twelve months out on the Comp Plan, and this will align with timing, and the ultimate goal of this exercise is feedback to give to the Comp Plan so that we can have the best outcome from that. I want to make it very clear this for the primary benefit of our community, however, it is also for the benefit of future developers who often invest thousands in preliminary development costs based on our current code, only to have those parameters changed mid-planning via multiple extensions, hearing with Planning and Zoning and Council. This is exhaustive for you guys, the developers, for us. This is an opportunity for everyone to pause, reflect and feel heard and hopefully move forward in a better form, focus and outcome.

Staff believes that the Comprehensive Plan consultant team led by Cushing Terrell is well poised to gather the information that Council is looking for regarding case studies, growth management and potential impacts on attainable housing. Some of the work would have already been part of the contract and staff believes that a path forward would be to add scope to the project and move items up in the timeline.

Cushing Terrell provided the following for next steps regarding this work:
Review document case studies (3-5 examples)

- When and why was the growth policy initiated?
- What caused the initiative to rise to a level of concern?
- Policy/regulations outcomes
- Lessons learned: Anticipated and unforeseen consequences
- Interim deliverable: Initial findings / recommendations

Growth Projections / Scenario modelling

- Confirm population growth projections
- Establish an acceptable broadly based strategy (carrying capacity, growth limits, infill, annexation, etc.)

This phase will take time and dialogue among community members

- Define appropriate (acceptable) growth areas (physical areas)
- Establish growth impact and trade-offs
- Establish a preliminary strategy as part of the Comp Plan
- Caps/limitations
- Impacts on attainable housing, increased market values, demographics
- Deliverable: Comp Plan Report / Recommendations

Additionally, staff would like direction on how to simultaneously achieve the objectives of an Ad Hoc Affordable Housing Committee. Staff is seeking direction on this item, as follows:

At the September 2, 2021 meeting, City Council approved the formation of an Ad-Hoc Committee to review and recommend policies for an Accommodations Tax Increase and Attraction Tax. The committee organization was tasked to the Housing

	Commission with Staff support. The original list and direction are included as Attachment A. Housing Commission reviewed the approved committee list and proposes revisions to the makeup and scope of work identified. The Commission, lead by proposed Ad Hoc Committee Chair Sumner Schachter, drafted a new Ad Hoc Committee proposal for review and approval by Council. This new list was approved by City Council on November October 21, 2021. This document is included as Attachment B. At the meeting, Councilor Stepp made a motion that was seconded by Councilor Kaup to approve this new committee selection including a restaurant industry representative and change the second sentence of the priorities to the main purpose of such taxes will be to provide a dedicated source of funding for increasing inventory and availability of affordable and working housing. Staff believes that it is important to let the work regarding growth management take place in advance of this committee meeting. Staff also believes that it may be possible for recommendations about potential ballot language options to be shared with this Ad Hoc Committee for consideration. No matter the process selected by City Council, Staff believes more time may be necessary than initially allotted by City Council. A more realistic time frame would be June of 2022 for a deliverable from this group.
Staff Recommendation:	Staff recommends adding scope to the Comprehensive Plan contract and to hold off on a first meeting of the Ad Hoc Committee until early spring 2022.

Proposed Ad Hoc Study Committee for tourist revenue to support affordable workforce housing

Goals

- Clarify the specific community gaps and barriers in housing the employees of Glenwood Springs businesses
- Determine best practices of a community workforce housing plan
- Make recommendations on priorities, opportunities and implementation strategies for the recently passed Accommodations/Attractions tax

Guidance Document

- Greater Roaring Fork Regional Housing Study

Makeup of Committee

- Organized and lead by our Housing Commission, supported by City Staff

One representative each from the following areas

<u>Organizations that have expertise in affordable workforce housing</u>

- School District superintend/board member
- Garfield County Housing Authority Director
- Habitat for Humanity
- APCHA

<u>Businesses, workers and community members that are impacted by the housing crisis</u>

- School District teacher/staff
- Valley View nurse/staff
- Mountain Family staff
- Retail staff
- Restaurant industry staff

<u>Organization/people that are subject matter experts</u>

- Debbie Wilde (homeless expert)
- Faith community (Catholic Charities?)
- Voces Unidas/Mountain Voices
- Kathryn Grosscup of CHFA

<u>Businesses that are impacted by the recently passed tax</u>

- Lodging
- Attractions

Schedule

- Start by November 5th
- Recommendation to Council by 2nd meeting in April
- Expected commitment of 1-2 meetings a month

Considerations for 'revised' Ad Hoc Study Committee scope and sequence

The Goal of the committee will be to make recommendations to council on:

- Priorities, opportunities and implementation of an attractions tax and increased accommodations tax for ballot consideration.The purpose of such taxes will be to provide a dedicated source of funding for increasing inventory and availability of affordable/workforce housing.

The committee will provide a 'toolbox' of applications and uses of funding for support of affordable/workforce housing. Examples include but are not limited to:

- Funding to preserve/protect current MHP and conversion to owner coop
- Contributions to infrastructure and/or acquisition costs for employer build employee/deed restricted housing
- Technical support for housing grants/proposals; acquisition of land or units
- Contributions to partnered affordable/workforce housing projects
- Grants for ADU additions with deed restrictions
- Down payment assistance for 'qualified' applicants and housing
- Provide matching funds for housing grants/projects when applicable

The committee will explore and provide the council with recommendations on:

- Tax levels/proposed revenue stream
- Proposed definitions as to 'attractions' and businesses targeted for tax collection.
- Types and parameters of housing including occupancy type and income-based affordability levels by Area Median Income.

Guidance Documents: Greater Roaring Fork Regional Housing Study completed in 2018
2010 Strategic Housing Plan

In order to be both representative and still efficient a committee of seven members is proposed.

Candidates:

1. Chairperson (and housing commission representative) — Sumner Schachter
2. Representative from the accommodations industry.
3. Representative from the attractions industry.
4. Technical/Funding/Housing expert (CHAFA/ GCHA)
5. Finance/Banker representative
6. Latinx Community Representative
7. Chamber/Community on the Move Representative

These members will be responsible for reaching out to their peers/interest groups/community for broader based input.

Tentative schedule:

October:	initial meeting and goals and ‘ground rules’
November - February:	Two meetings per month (schedule allowing for Holidays)
March	Prep for final recommendations for council presentation
April	Final recommendation to Council

Meetings will invite/use city staff and regional experts as needed and available for guidance and technical assistance.

A DECREE MAKING NOVEMBER 18TH AUTUMN RIVERA DAY

WHEREAS, Autumn Rivera is a sixth-grade science teacher at Glenwood Springs Middle School, the middle school science lead for her school district, as well as an adjunct professor in the education department at Colorado Mountain College and;

WHEREAS, Autumn and her students played an important role in preserving Sweetwater Lake by raising funds and awareness through The Save the Lake campaign and;

WHEREAS, Autumn volunteers with the American Association of Chemistry Teachers and is the Region 3 Elementary Board representative for the Colorado Association of Science Teachers and;

WHEREAS, Autumn volunteered as co-chair of the mill levy override campaign and;

WHEREAS, Autumn has presented a variety of professional development courses including at the Roaring Fork EdTech Summit and the Colorado Science Conference and;

WHEREAS, Autumn holds both a Bachelor of Arts in Biology and a Master of Arts in Teaching Secondary Science from Colorado College; and a Masters in Educational Leadership from the University of Colorado - Colorado Springs and;

WHEREAS, each year, the Colorado Teacher of the Year Program honors an exceptionally dedicated, knowledgeable and skilled K-12 classroom teacher to represent the entire profession in the state and;

WHEREAS, The Colorado Department of Education has named Autumn as the 2022 Colorado Teacher of the Year.

THEREFORE BE IT RESOLVED, I, Jonathan Godes, Mayor of Glenwood Springs in the State of Colorado, ask all our city residents to join me in proudly making November 18th Autumn Rivera Day.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the City of Glenwood Springs, Colorado to be affixed, this 18th day of November, in the year 2021.

_____

Jonathan Godes, Mayor

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: November 4, 2021 City Council Minutes

Action Requested: November 4, 2021 Council Minutes

Department: City Clerk

Presented By:

Background Info:

Issues:

Staff Recommendation:

MINUTES

CITY OF GLENWOOD SPRINGS

REGULAR CITY COUNCIL MEETING

NOVEMBER 4, 2021

101 W. 8TH STREET

6:15 PM

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

REGULAR SESSION

:07 Roll Call

Present: Mayor Godes, Mayor Pro-Tem Willman, Councilor Kaup, Councilor Wussow, Councilor Hershey, Councilor Davis and Councilor Stepp. Also present were Debra Figueroa, City Manager; Steve Boyd, Chief Operating Office, Jenn Ooton, Asst. City Manager, Matt Langhorst, Director of Public Works, Yvette Gustad, Finance Director and Karl Hanlon, City Attorney.

:08 Pledge of Allegiance

Mayor Godes led the Pledge.

:08 Agenda Changes and Conflicts

Comments were made by Mayor Godes, Councilor Hershey, Mayor Pro-Tem Willman, City Attorney Karl Hanlon, and Councilor Stepp.

:11 Councilor Hershey moved, seconded by Councilor Stepp, to open public comment on agenda items 13, 14 and 15.

Motion passed unanimously

Comments were made by Councilor Wussow, City Attorney Karl Hanlon, Councilor Hershey, and City Manager Debra Figueroa.

:12 Citizens Appearing Before Council

Citizen comments were made.

1:06 Council Comments

1:06 Councilor Wussow moved, seconded by Mayor Godes, to immediately enact a six-month moratorium on new residential developments over ten units. This moratorium will apply to only new applications, therefore, previously applied for and/or approved developments will not be privy to this action. The goal during this six-months is to charge the Community Development Office with investigating growth, how other communities are responding to growth; requirements, limitations, and cohesiveness surrounding growth in and around our communities similar in size and economy to ours. Those on Council and some community members may remember we did a similar course of action including a moratorium on short term rentals, VRBO's and Airbnb's. During that window we received thorough, thoughtful, and engaging feedback from the community as well as other communities on what has worked and what has not. We came back as a community and a Council adopted a revised short-term rental amendment that has now been copied and complemented throughout both the State, and I think the region. The issue of growth is not new, nor will this action solve all issues that inherently bubble up between community, developers, and growth, however this pause will allow us as a community to feel heard, to be proactive and to optimistically grow better. Making its recommendations on daycare requirements, more robust affordable housing, green building requirements, know that the data compiled by Community Development will be shared with the community, Council, and the Comp Plan Steering Committee. We are about nine to twelve months out on the Comp Plan, and this will align with timing, and the ultimate goal of this exercise is feedback to give to the Comp Plan so that we can have the best outcome from that. I want to make it very clear this for the primary benefit of our community, however, it is also for the benefit of future developers who often invest thousands in preliminary development costs based on our current code, only to have those parameters changed mid-planning via multiple extensions, hearing with Planning and Zoning and Council. This is exhaustive for you guys, the developers, for us. This is an opportunity for everyone to pause, reflect and feel heard and hopefully move forward in a better form, focus and outcome.

Comments were made by Councilor Stepp, City Attorney Karl Hanlon, City Manager Debra Figueroa, Councilor Kaup, Councilor Hershey, and Mayor Pro-Tem Willman.

Motion passed unanimously.

Comments were made by Councilor Wussow, Mayor Godes, City Manager Debra Figueroa, Councilor Kaup, Mayor Pro-Tem Willman, City Attorney Karl Hanlon, and Councilor Stepp.

1:26 Motion for Consent

1:26 Councilor Hershey moved, seconded by Councilor Kaup, to approve the consent agenda.

Motion passed unanimously.

1:27 Planning Item 09-20 - Annexation Agreement for 214 Center Drive (PIN: 2185-061-00-042), Ordinance 2021-08: Annexing Property to the City, Second Reading and Ordinance 2021-09: Zoning a Parcel of Land Annexed into the City, Second Reading.

Comments were made by City Attorney Karl Hanlon and Mayor Godes.

1:28 Mayor Godes opened public comment.

Public comments were made.

1:58 Mayor Godes closed public comment.

Comments were made by developer Barry Rosenberg, Mayor Godes, City Attorney Karl Hanlon, Councilor Hershey, Councilor Kaup, Councilor Wussow, and Councilor Stepp.

2:08 Councilor Davis moved, seconded by Councilor Kaup, to approve Ordinance 2021-08: Annexing Property to the City, Second Reading, as amended.

Comments were made by Councilor Hershey, Mayor Godes, Mayor Pro-Tem Willman, Councilor Wussow, Councilor Kaup, and Councilor Stepp.

Ayes: Davis, Willman, Godes, Kaup

Nays: Stepp, Hershey, Wussow

Motion passed 4-3.

2:28 Councilor Davis moved, seconded by Mayor Godes, to approve Ordinance 2021-09: Zoning a Parcel of Land Annexed into the City, Second Reading, as amended.

Ayes: Kaup, Davis, Willman, Godes

Nays: Hershey, Wussow, Stepp

Motion passed 4-3

2:29 Councilor Davis moved, seconded by Councilor Kaup, to approve Planning Item 09-20 - Annexation Agreement for 214 Center Drive and 480 Donegan, not listed, as amended.

Ayes: Godes, Davis, Kaup, Willman

Nays: Hershey, Wussow, Stepp

Motion passed 4-3

2:30 Recess

2:44 Planning File 60-20 - Consideration of a Major Site/Architectural Plan Review application for the construction of 300-unit multi-family development in 14 separate buildings in Glenwood Meadow

2:44 Councilor Kaup moved, seconded by Councilor Hershey, to continue Planning File 60-20 to the November 18 Council meeting.

Passed Unanimously.

2:45 Consideration of Going Fare Free on Ride Glenwood.

Presented by City Engineer Terri Partch.

2:48 Councilor Hershey moved, seconded by Councilor Kaup, to support Going Free on Ride Glenwood.

Comments were made by Citizen David Merritt, Mayor Pro-Tem Willman, City Manager Debra Figueroa, and Mayor Godes.

Motion passed unanimously.

2:50 Fuel Tank Upgrades

City Manager Debra Figueroa presented.

Comments were made by Mayor Godes, City Attorney Karl Hanlon, Councilor Hershey, Councilor Kaup, Glenwood Citizen and Chair of the Airport Commission David Merritt, Councilor Stepp, Mayor Pro-Tem Willman, Councilor Davis, and Councilor Wussow.

3:16 Councilor Davis moved, seconded by Mayor Pro-Tem Willman, to stop selling Jet-A fuel until we resolve this sometime in the future.

Public comment was made.

Comments were made by Councilor Kaup, Councilor Davis, Councilor Wussow, Mayor Godes, Mayor Pro-Tem Willman, City Attorney Karl Hanlon, and Councilor Stepp.

3:27 Councilor Davis made an amended motion, seconded by Mayor Pro-Tem Willman, to stop selling Jet-A fuel, with seven days discretion and time to prepare some resolution with partners, or the commission or staff, within ninety days.

Ayes: Wussow, Godes, Willman, Davis, Stepp

Nays: Kaup, Hershey

Motion passed 5-2.

3:29 2022 Budget Approval

3:29 Mayor Pro-Tem Willman moved, seconded by Councilor Hershey, to approve the 2022 Budget.

Ayes: Willman, Wussow, Godes, Stepp, Kaup, Davis

Nays: Hershey

Motion passed 6-1.

3:30 Ordinance 13 - Series of 2021; An Ordinance of the City of Glenwood Springs, Colorado, Acting by and Through its Utility Enterprise, Approving a Loan, Evidenced by a Note, to Finance System Capital Improvements; Approving the Note Form and Loan Repayment From the Operation of the City's Water and Facilities; and Providing Other Details and Approving Documents Relating to the Loan.

3:30 Mayor Godes moved

Chief Operating Officer Steve Boyd presented.

Comments were made by Councilor Kaup.

3:33 Mayor Godes opened public comment.
3:33 Mayor Godes closed public comment.

3:33 Mayor Godes moved, seconded by Councilor Kaup, to approve Ordinance 13 - Series of 2021.

Motion passed unanimously.

3:34 Ad Hoc Affordable Housing Committee.

Comments were made by Mayor Godes, Mayor Pro-Tem Willman.
Item moved to November 18 Council meeting.

3:35 Report from City Administration

City Manager

Comments were made by City Manager Debra Figueroa and Mayor Godes.

City Attorney

Comments were made by City Attorney Karl Hanlon and Councilor Hershey.

Correspondence Incoming/Outgoing

None

3:36 Adjournment

3:03 Mayor Pro Tem Willman moved, Seconded by Councilor Hershey, to adjourn.

Motion Passed unanimously.

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Parks and Recreation Commission Appointment

Action Requested: Parks and Recreation Commission Appointment

Department: City Administration

Presented By:

Background Info: Christina Pearson was interviewed on November 3rd and deemed eligible for appointment to the Parks and Recreation Commission for an alternate seat with a to fill term expiring March 2022.

Issues: None.

Staff Recommendation: Staff defers to City Council.

Respondent

6 | Anonymous

38:05
Time to complete

Parks and Recreation Commission Application

Thank you for your interest and time commitment in serving your community. Please complete all questions on this application.

Personal Information

1. Name *

Christina Pearson

2. Home Address *

101 Polo Road Glenwood Springs, CO 81601

3. Mailing Address *

101 Polo Road Glenwood Springs, CO 81601

4. Home Phone *

303-358-9913

5. Work Phone *

970-384-9073

6. Mobile Phone *

303-358-9913

7. Email Address *

christina.mcclard@gmail.com

8. Occupation *

Water Resources Engineer

Personal and Professional Interests

9. Why are you interested in serving on the Parks and Recreation Commission? *

I view physical activity - and outdoor activity - as extremely important to my well being and happiness. I also believe it is crucial that all residents have access to such amenities. Our outdoor amenities and surrounding area are why many residents move here and tourists visit. Also, I want to get more involved and would like to make a contribution to the City by serving on the Commission.

10. What do you view as your role if selected as a member of the Parks and Recreation Commission? *

My role would be as listed on the Parks and Recreation Commission page. I am an avid mountain biker and have been a heavy user of the City parks, so my particular focus would

be on bike infrastructure, parks (including free amenities like tennis, pickleball, basketball and baseball courts) and the Community Center. As a resident from 2008- 2013, I was a consistent Community Center user and plan to be again following the slow down in the spread of COVID.

11. What experience and/or interest do you have in programming, planning, and being a part of community meetings? *

My experience in Glenwood has been limited to attending meetings very specific to my concerns, however I was an active attendant of the Bicycle Advisory Committee in Fort Collins, CO and involved with Bike Fort Collins. I want to be an active and engaged member of the community here and want to join in.

12. Do you have any particular areas of interest or a particular perspective relating to parks and recreation in Glenwood Springs? *

My interests are mostly bike infrastructure, parks (including free amenities like tennis, pickleball, basketball and baseball courts) and the Community Center. However, my top area of interest is cycling. I'm a bike commuter, road cyclist and mountain biking.

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

Yes. That is the role of a commission member.

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

It's a regular part of my job as an engineer. I've had to deal with residents who were extremely unhappy with decisions being made by my client based upon my and my coworkers' work. Being thorough in everything I do helps to be assured of whatever decision or recommendation I have made. That being said, I find it extremely helpful to listen to people who are unhappy with a decision and try to understand the root of why they are unhappy with a decision. It also helps to have wide ranging stakeholder involvement and communication when possible. Though it has been awhile, I was the president of my sorority and I believe it will be hard to top that experience in dealing with unhappy people. No experience has come close to date.

15. Do you have any existing time commitments that will hamper your ability to serve? (The Commission generally meets monthly in the evening for approximately 90 minutes, with members encouraged to participate in ad hoc projects outside of the scheduled meetings.) *

I work from 8am to 5 pm Monday through Friday and would be available otherwise with notice.

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

My work experience has generally been supporting the board or committee with information to make informed decisions.

17. Please select today's date. *

10/21/2021

18. Have you served on the Parks and Recreation Commission before? *

- (•) No
- ( ) Yes

Powers and Duties of the Parks and Recreation Commission

(as defined in Title 020 of the Glenwood Springs Municipal Code)

Composition of the Parks and Recreation Commission:

(5) Parks and Recreation Commission:

a. Seven (7) citizens, at least six (6) who are residents of the City and one (1) who may reside

outside of the City but within the 81601 zip code area or own real property or a business within the City.

b. (R 20-05 §2)

c. (R 20-05 §2)

d. One (1) youth (under the age of eighteen [18] at appointment) who shall serve a one-year term from June 1 to May 31 of the following year.

Powers and Duties:

(e) Powers and duties of Parks and Recreation Commission. The powers and duties of the Parks and Recreation Commission shall be:

(1) To investigate, study and report to the City Council all matters concerning City parks and recreation within the City and other matters concerning the subject of parks and recreation which may be pertinent to the City and requested of such Commission by the City Council.

(2) To investigate, study and report to the City Council on such other matters concerning parks and recreation within the City as the Commission may deem in the best interests of the City.

(3) To provide technical assistance, advice and planning support to the Parks and Recreation Director and City Council regarding tree planting and maintenance needs in the City.

(4) To provide recommendations from time to time regarding the administration and implementation of Article 090.050 of this Code.

(5) To investigate, study and report to City Council all matters concerning the burial and internment facilities of the City and other such matters as may be requested by City Council from time to time.

(6) To investigate, study and report to City Council on such other matters concerning burial and internment facilities and such other similar matters as the Commission may deem in the best interests of the City.

(7) To investigate, study and report to City Council any and all matters concerning the use and operation of the City's Community Center.

(8) To coordinate with other City boards and commissions on any aspect of the Community Center that may relate to the powers and duties of such other boards and commissions.

(9) To investigate, study and report to City Council on grants, donations and other forms of funding to assist in the operation of the Community Center, and to otherwise advise City Council on budgetary needs related to the operation of the Community Center.

(A 61-02 §4)

Appointment, Removal, Term and Vacancies of Boards and Commissions

Glenwood Springs, CO Municipal Code 020.020.040

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

(2) March:
Parks and Recreation Commission;

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

(c) Limit to term of members. No board member shall serve more than two (2) successive terms on the same board or commission.

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

(e) Vacancies. The City Council shall fill all vacancies on boards and commissions by appointment for the unexpired term.
(Code 1971 §§ 2-63, 2-64, 2-67; 6-95 § 1; 10-07 § 2; Ord. No. 9-2018 , § 2, 4-20-2018)

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Ordinance 13 - Series of 2021; 2nd Reading - An Ordinance of the City of Glenwood Springs, Colorado, Acting by and Through its Utility Enterprise, Approving a Loan, Evidenced by a Note, to Finance System Capital Improvements; Approving the Note Form and Loan Repayment From the Operation of the City's Water and Facilities; and Providing Other Details and Approving Documents Relating to the Loan.

Action Requested: Approve Ordinance 13 - Series of 2021 allowing our Water/Wastewater Enterprise fund to take debt to finance projects and upgrades.

Department: Public Works

Presented By: Matthew Langhorst, Public Works Director
Steve Boyd, COO

Background Info: The Water/Wastewater system is in need of approximately $12,000,000 in upgrades, much of which is attributable to recent fire activity. The City closed on a line-of-credit with the Colorado Water Conservation Board (CWCB) in June that staff expects to draw up to $4,000,000 against. These funds can only be used for specific capital improvements that meet the qualification of the loan documents.

The additional $8,100,000 that we are closing in December will fund some or all of the following projects and bring available fund reserves to adequate levels:

- Water Treatment Plant upgrades: $3,500,000 – Scheduled for completion in 2021
- Wastewater Plant 10 Year Maintenance: $500,000 – To be completed in 2022
- Lift Station 16,000 Replacement: $530,000 – Scheduled for completion in 2021
- Lift Station 11,000 Replacement: $500,000 – To be designed in 2022, constructed in 2023
- Cardiff 500k Gallon Water Tank: $830,000 – Will be completed in 2021
- Red Mountain South Phase 2: $690,000 – To be completed in 2022
- Pump Station #1 Design and Construction: $450,000 - To be designed in 2022, constructed in 2023.
- Sunny Acres Area 500,000 Gallon Water Tank: $1,000,000 - To be designed in 2022, constructed in 2023.

Bank of Colorado is offering the most favorable terms. The loan is fixed for the first 10 years at 2.54% interest, then will reset to the then-current 10-year US Treasury rate plus 1.25%. There is no prepayment penalty and staff is budgeting to have the funds available to pay the loan off in 10 years. This debt is secured by a lien against the revenues of the water fund on parity with the two existing obligations in the fund, no sales or property tax dollars are obligated and the full faith and credit of the City is not pledged for payment. The only relevant covenant is that the Water Fund must have cash flow equal to at least 1.1 times the maximum annual debt service. The debt service is included in the pro forma developed with the help of Gov Rates during the recent rate study.

Tom Peltz from Kutak Rock is acting as bond counsel on the issue, and Nick Taylor from Northslope Advisors is our Municipal Advisor.

Issues: None.

Staff Recommendation: Approve Ordinance 13 - Series of 2021.

ORDINANCE NO. 2021 - 13

AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ACTING BY AND THROUGH ITS UTILITY ENTERPRISE, APPROVING A LOAN, EVIDENCED BY A NOTE, TO FINANCE SYSTEM CAPITAL IMPROVEMENTS; APPROVING THE NOTE FORM AND LOAN REPAYMENT FROM THE OPERATION OF THE CITY'S WATER FACILITIES AND WASTEWATER FACILITIES; AND PROVIDING OTHER DETAILS AND APPROVING DOCUMENTS RELATING TO THE LOAN.

WHEREAS, the City of Glenwood Springs, Colorado, is a municipal corporation duly organized and operating as a home-rule city under Article XX of the Constitution of the State of Colorado and the Charter of the City (unless otherwise indicated, capitalized terms used in this preamble shall have the meanings set forth in Section 1 of this Ordinance); and

WHEREAS, as codified in Article 080.070 of the Municipal Code, the City has established its Utility Enterprise which constitutes an enterprise within the meaning of Article X, Section 20 of the Colorado Constitution and undertakes utility activities including the diversion, storage, carriage, delivery, distribution, collection, treatment, use, reuse, augmentation, exchange or discharge of electricity, water, wastewater, fiber optics or storm drainage services, and the acquisition of electricity, water or water rights in accordance with applicable provisions of State law, the City Charter, and the Municipal Code; and

WHEREAS, as part of its Utility Enterprise, the City has heretofore determined and undertaken to operate and maintain "Water Facilities" and "Wastewater Facilities" as defined in Section 080.070.020 of the Municipal Code as a joint system (the Water Facilities and Wastewater Facilities are collectively defined herein as the "System") and the financial activities of the System are annually accounted for by the City in the City's "Water and Sewer Fund"; and

WHEREAS, during the 2021 fiscal year the Utility Enterprise received under ten percent of its annual revenue in State and local grants and, during the current fiscal year, it is reasonably anticipated that the Utility Enterprise will receive under ten percent of its revenue in State and local grants as provided in Section (10)(a) of Article 080.070.030 of the Municipal Code as the City's standard to issue bonds or other multiple fiscal year obligations without voter approval; and

WHEREAS, the City Council is acting hereunder as the governing body of the Utility Enterprise as provided in Section 080.070.050 of the Municipal Code; and

WHEREAS, in order to finance System Capital Improvements the City issued a proposal request seeking funding in the amount of $8,000,000 net of estimated closing fees and costs and, with the assistance of North Slope Capital Advisors as financial advisor to the City, the City staff has made recommendations to the City Council based upon the qualified responses received; and

WHEREAS, the City Council has determined that proceeding with the Loan proposal from the Bank of Colorado is in the best interests of the City and the residents thereof, and that a promissory note be issued to evidence the repayment obligation for the Loan; and

WHEREAS, the Note shall be a revenue obligation of the City payable solely from the Net Revenues derived from System accounted for in the Water and Sewer Fund; and

WHEREAS, none of the members of the City Council have any potential conflicting interests in connection with the authorization, issuance and delivery of the Note, or the use of the proceeds thereof; and

WHEREAS, there have been presented to the City, and made available to the members of the City Council, the Term Sheet for the Loan and forms of other documents relating to the Note; and

WHEREAS, the City Council desires to authorize the Loan to be evidenced by the Note.

THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ORDAINS:

Section 1. Definitions. The following terms shall have the following meanings as used in this Ordinance:

"*Authorized Denomination*" means the outstanding principal amount of the Note issued and delivered pursuant to this Ordinance.

"*Business Day*" means any day other than (a) a Saturday or Sunday or (b) a day on which banking institutions in the State are authorized or obligated by law or executive order to be closed for business.

"*Capital Improvements*" means the acquisition of land, easements, facilities, and equipment (other than ordinary repairs and replacements), and the construction or reconstruction of improvements, betterments, and extensions, for use by or in connection with the System which, under Generally Accepted Accounting Principles for governmental units as prescribed by the Governmental Accounting Standards Board, are properly chargeable as capital items.

"*Charter*" means the Glenwood Springs Home Rule Charter.

"*City*" means the City of Glenwood Springs, Colorado.

"*City Council*" means the City Council of the City.

"*Combined Maximum Annual Principal and Interest Requirements*" means, with regard to the Note and any Parity Obligations, the maximum annual payments of principal of and interest on all of said issues, excluding redemption premiums, to become due during any fiscal year while the Note is outstanding; provided that such computation shall assume the redemption and payment of principal subject to mandatory redemption for the Note and any Parity Obligations, but shall be made without regard to any right of optional redemption which has not been exercised. In the event that the calculation is made prior to January 1, 2032, the assumed Interest Rate for the Note as reset on and after January 1, 2032, shall be calculated as the greater of 2.54% or the published 10-year U.S. Treasury Rate plus 1.25% (one hundred twenty-five basis points) on the date on which such calculation is to be made.

"C.R.S." means the Colorado Revised Statutes, as amended and supplemented as of the date hereof.

"CWCB 2021 Loan" means the public loan from an agency of the State, identified by Intergovernmental Loan Contract Number CMS 164684 CT2021-3104, as the same may be amended from time to time, by and between the City and the State acting by and through the Department of Natural Resources, Colorado Water Conservation Board and evidenced by the Promissory Note issued in the aggregate principal amount of $8,080,000.

"CWRPDA 2010 Loan" means the Loan Agreement, dated as of May 1, 2010 by and between the City and the Colorado Water Resources and Power Development Authority, and related Governmental Agency Bond, dated May 13, 2010, issued in the aggregate principal amount of $29,820,000.

"*Dated Date*" means the date of the issuance and delivery of the Note as set forth in the Note, which date is currently expected to be December 1, 2021.

"*Enabling Law*" means collectively, the Charter, the Municipal Code, Part 4 of Article 35 of Title 31, Colorado Revised Statutes, the Supplemental Act, and all other State laws enabling the actions taken pursuant to this Ordinance.

"*Event of Default*" means any of the events specified in the section hereof entitled "Events of Default."

"*Federal Securities*" means bills, certificates of indebtedness, bonds, notes or similar securities which are direct non-callable obligations of the United States of America or which are fully and unconditionally guaranteed as to the timely payment of principal and interest by the United States of America.

"Generally Accepted Accounting Principles" shall mean accounting principles, methods and terminology followed and construed for enterprises which are employed in business comparable to the business of the Utility Enterprise, as amended from time to time.

"*Gross Revenue*" means (a) all rates, fees (including system improvement fees), charges and revenues directly or indirectly derived by the City for the services furnished by, or use of, the System, or any part thereof, including all income attributable to any future dispositions of property or rights or related contracts, settlements, or judgments held or obtained in connection with the System or its operations, (b) the proceeds of any insurance covering business interruption loss relating to the System, and (c) all income and revenue derived from the investment of any of the funds used to account for the financial activity of the System; provided however, that there shall be excluded from Gross Revenues (i) moneys borrowed and used for providing Capital Improvements, (ii) any money and securities, and investment income therefrom, in any refunding fund, escrow account, or similar account pledged to the payment of any bonds or other obligations for the purpose of defeasing the same, and (iii) any moneys received as grants or appropriations from the United States, the State of Colorado, or other sources, the use of which is limited or restricted by the grantor or donor to the provision of Capital Improvements or for other purposes resulting in the general unavailability thereof, except to the extent any such moneys shall be received as payments for the use of the System, services rendered thereby, the availability of any

such service, or the disposal of any commodities therein. Notwithstanding anything contained above, amounts deposited in a rate stabilization account shall not be deemed Gross Revenues in the calendar year deposited and amounts withdrawn from such rate stabilization account shall be deemed Gross Revenues in the year withdrawn.

"*Interest Payment Date*" means the first day of each month, commencing on the month following the Dated Date, or such other dates as set forth in the Note.

"*Interest Rate*" means the per annum rate of interest for the Note which shall be fixed at 2.54% until December 1, 2031 and reset on and after December 1, 2031, to the greater of 2.54% or the published 10-year U.S. Treasury Rate plus 1.25% (one hundred twenty-five basis points).

"*Interest Sub-Account*" means a sub-account of the Note Account established by the provisions hereof for the purpose of paying the interest on the Note.

"*Lender*" means Bank of Colorado, the initial registered owner of the Note.

"*Letter of Instructions*" means the Letter of Instructions, dated the Dated Date and delivered by Note Counsel to the City, as it may be superseded or amended in accordance with its terms.

"*Loan*" means the loan extended by the Lender pursuant to the terms established in the Term Sheet and this Ordinance and evidenced through the issuance and delivery of the Note by the City.

"*Loan Delegate*" means the Mayor or, in the absence of the Mayor, the Mayor Pro Tem of the City.

"*Maturity Date*" means December 1, 2041.

"*Municipal Code*" means the Glenwood Springs Municipal Code.

"*Net Revenues*" means Gross Revenue after deducting Operation and Maintenance Expenses.

"*Note*" means the Water and Wastewater Revenue Note, dated as of the Dated Date, which will be issued and delivered pursuant to this Ordinance.

"*Note Account*" means the "2021 Water and Wastewater Note Account" established in the Section hereof entitled "Reaffirmation of Water and Sewer Fund; Establishment of Accounts."

"*Note Counsel*" means (a) as of the date of issuance of the Note, Kutak Rock LLP, and (b) as of any other date, Kutak Rock LLP or such other attorneys selected by the City with nationally recognized expertise in the issuance of municipal obligations.

"*Operation and Maintenance Expenses*" means all reasonable and necessary current expenses of the City, paid or accrued, for operating, maintaining, and repairing the System, but only if such charges are applied on a consistent basis and made in conformity with Generally

Accepted Accounting Principles; provided however, that there shall be excluded from Operating Expenses any allowance or transfers for depreciation, payments in lieu of taxes or franchise fees, legal liabilities not based on contract, expenses incurred in connection with Capital Improvements, and payments due in connection with any bonds or other obligations issued to provide Capital Improvements.

"*Ordinance*" means this ordinance which authorizes the issuance of the Note, including any amendments or supplements properly made hereto.

"*Owner*" means the Lender as of the Dated Date, and thereafter, following a transfer and exchange of the Note, the Person in whose name such Note is registered on the registration books maintained by the Paying Agent pursuant hereto.

"*Parity Obligations*" means the CWRPDA 2010 Loan, the CWCB 2021 Loan, and any bond, note or other obligation (which may or may not be multiple-fiscal year financial obligations), permitted to be issued in the future pursuant to the Section hereof entitled "Conditions to the Issuance of Parity Obligations," with a lien that is equal and on a parity with the lien of the Note on the Net Revenues.

"*Paying Agent*" means the City Director of Finance and its successors in interest or assigns approved by the City with prior written notice to the Owner, which shall act as paying agent, registrar, and authenticating agent for the Note.

"*Permitted Investments*" means any lawful investment permitted for the investment of funds of the City by the Enabling Law.

"*Person*" means a corporation, firm, other body corporate, partnership, association or individual and also includes an executor, administrator, trustee, receiver or other representative appointed according to law.

"*Principal Redemption Date*" means the first day of each month, commencing on the first full month which is three years after the Dated Date, or such other dates as set forth in the Note.

"*Principal Sub-Account*" means a sub-account of the Note Account established by the provisions hereof for the purpose of paying the principal of and premium, if any, on the Note.

"*Pro Rata Portion*" means when used with respect to a required credit to the accounts or subaccounts established for the payment of the principal of and interest on the Note and any Parity Obligations, the dollar amount derived by dividing the amount of principal or interest to come due on the next principal or interest payment date by the number of monthly credits required to be made prior to such payment date.

"*Project*" means any Capital Improvements permitted under the Enabling Law which would comprise a portion of the System.

"*Project Account*" means the "2021 System Project Account" established in the Section hereof entitled "Reaffirmation of Water and Sewer Fund; Establishment of Accounts."

"*Project Costs*" means the City's costs properly attributable to the Project, or any parts thereof, including without limitation: all engineering, construction, inspection, fiscal and legal expenses; the costs of reimbursing funds advanced by the City in anticipation of reimbursement from Note proceeds, including any intrafund or interfund loan; the costs of contingencies or reserves; the costs of issuing the Note, including without limitation any Loan origination fee; all expenses as may be necessary or incident to the financing, acquisition, improvement, equipment, and completion of the Project; and all other lawful costs as determined by the City Manager.

"*State*" means the State of Colorado.

"*Subordinate Obligations*" means loans, bonds, notes or other multiple fiscal year financial obligations having a lien upon the Pledged Revenues or any part thereof junior and subordinate to the lien thereon of the Note.

"*System*" means the Wastewater Facilities and Water Facilities.

"*Supplemental Act*" means Part 2 of Article 57 of Title 11, of the Colorado Revised Statutes.

"*Tax Code*" means the Internal Revenue Code of 1986, as amended. Each reference to a section of the Tax Code herein shall be deemed to include the United States Treasury Regulations proposed or in effect thereunder and applicable to the Note or the use of proceeds thereof, unless the context clearly requires otherwise.

"*Term Sheet*" means collectively, the term sheet of the Lender, dated on October 13, 2021, as supplemented or revised, which sets forth the terms pursuant to which the Lender is making the Loan to the City.

"Utility Enterprise" means the Utility Enterprise which has been established by the City, as codified in Article 080.070 of the Municipal Code, and which includes, but is not limited to, the activities and operations of the System.

"Wastewater Facilities" means (as defined in Article 080.070.020 of the Municipal Code) any one or more of the various devices used in collection, treatment, or disposition of sewage or industrial, commercial, or domestic wastes of a liquid or water-carried nature, together with any ground water, surface water, or stormwater that may be contributed into or permitted to enter such devices.

"Water and Sewer Fund" means the City's Water and Sewer Fund, which is a proprietary enterprise funds of the City, or any successor fund or accounts within which the City records and accounts for the financial activity of the System.

"Water Facilities" means (as defined in Article 080.070.020 of the Municipal Code) any one or more works and improvements used in and as a part of the collection, treatment, or distribution of water for the beneficial uses and purposes for which the water has been or may be appropriated.

Section 2. Authorization and Purpose of the Note. Pursuant to and in accordance with the Enabling Law, the City hereby approves the Loan in the principal amount of $8,100,000 and, to evidence the Loan, authorizes and orders that there shall be issued the City of Glenwood Springs, acting by and through its Utility Enterprise, Water and Wastewater Revenue Note for the purpose of financing Project Costs. The caption on the Note shall include a series reference that identifies the Note by the year of its issuance.

Section 3. Note Details.

(a) ***Registered Form, Denomination, Dated Date and Numbering***. The Note shall be issued as a single, fully registered promissory note, which shall be dated as of the Dated Date and registered in the name of the Lender, or if later transferred pursuant to the Section hereof entitled "Registration, Transfer and Exchange of the Note," in the name of the Person identified in the registration books of the City maintained by the Paying Agent. The Note shall be issued in the Authorized Denomination and shall be in substantially the form set forth in Appendix A hereto, with such changes and additions requested by the Lender which the Loan Delegate determines to be consistent with the provisions of this Ordinance, and approved by the City officials executing the same (whose signatures thereon shall constitute conclusive evidence of such determinations and approval). The Note may be numbered in such manner as determined by the Paying Agent to facilitate registration. The Note shall recite that it is issued under the authority of the Supplemental Act. Such recital shall be conclusive evidence of the validity and the regularity of the issuance of the Note after its deliver for value.

(b) ***Maturity Date, Interest Rate and Accrual of Interest***. As set forth in Note executed by the Loan Delegate, the Note shall be dated as of the Dated Date, mature on the Maturity Date and bear per annum interest at the Interest Rate from the Dated Date (calculated based on a 360-day year of twelve 30-day months) payable on each Interest Payment Date.

(c) ***Manner and Form of Payment***. The interest on and principal of the Note is payable in lawful money of the United States of America to the Owner at its address as it appears on the registration books maintained by or on behalf of the City by the Paying Agent. Interest and principal payments shall be paid by check or draft of the Paying Agent mailed on or before each Interest Payment Date and Principal Redemption Date to the Owner. The Paying Agent shall make payments of interest and principal by alternative means, such as by wire transfer, if mutually agreed to between the Owner of the Note and the Paying Agent.

The Note certificate must be presented for the final payment of the principal of the Note on the Maturity Date or date on which the principal of the Note is to be paid in full and need not be presented for mandatory scheduled redemption of the Note. Presentation of the Note to the Paying Agent shall be made at the principal office of the Paying Agent, or at such other address or location as provided in writing by the Paying Agent to the Owner.

Section 4. Redemption of the Note Prior to Maturity.

(a) ***Optional Redemption***. The Note shall be subject to redemption at the option of the City, in whole but not in part, on any Interest Payment Date; upon payment of the outstanding and unpaid principal amount and accrued interest to the Interest Payment Date on which such optional redemption is made, without redemption premium.

(b) ***Mandatory Scheduled Redemption***. The principal amount of the Note shall be subject to mandatory scheduled redemption on each Principal Redemption Date and in the principal amounts specified in, or attached as an Exhibit to, the Note at a redemption price equal to the principal amount thereof (with no redemption premium), plus accrued interest to the scheduled Principal Redemption Date.

(c) ***Redemption Procedures***. No notice shall be required for mandatory scheduled redemption to occur on each Principal Redemption Date. Notice of optional redemption of the Note shall be given at the direction of the City by the Paying Agent, not less than fifteen days prior to the optional redemption date, by electronic means (provided that the Owner has consented to such means of notification at the address provided by the Owner to the Paying Agent), by first class mail or by such other means acknowledged by the Owner of the Note. Such notice shall specify the Interest Payment Date on which optional redemption is to occur.

Section 5. Execution, Authentication and Delivery of the Note.

(a) ***Execution***. The Note shall be executed in the name and on behalf of the City with the manual signature of the Mayor, shall bear a manual or facsimile of the seal of the City and shall be attested by the manual signature of the City Clerk, both of whom are hereby authorized and directed to prepare and execute the Note in accordance with the requirements hereof. Should any officer whose signature appears on the Note cease to be such officer before delivery of the Note, such signature shall nevertheless be valid and sufficient for all purposes.

(b) ***Authentication***. When the Note has been executed, the Note shall be delivered to the Paying Agent for authentication. No executed Note shall be secured by or entitled to the benefit of this Ordinance, or shall be valid or obligatory for any purpose, unless the certificate of authentication of the Paying Agent has been manually executed by an authorized signatory of the Paying Agent. The executed certificate of authentication of the Paying Agent upon an executed Note shall be conclusive evidence, and the only competent evidence, that the Note has been properly authenticated hereunder.

(c) ***Delivery***. Upon the authentication of an executed Note, receipt of the principal amount of the Note from the Lender and issuance of the approving opinion of Note Counsel, the Paying Agent shall release the Note and deliver the same to the Lender in accordance with the directions of the Lender.

Section 6. Registration, Transfer and Exchange of the Note.

(a) ***Registration***. The Paying Agent shall maintain the registration book or similar record retention system in which the ownership, transfer and exchange of the Note shall be

recorded. The Person in whose name the Note shall be registered in such registration book shall be deemed to be the absolute owner thereof for all purposes.

(b) ***Transfer and Exchange***. The Note may be transferred at the principal office of the Paying Agent or at such other location designated by the Paying Agent for such purpose, for a like aggregate outstanding principal amount of the same Maturity Date and Interest Rate. Upon surrender for transfer of the Note, duly endorsed for transfer or accompanied by an assignment duly executed by the Owner or his or her attorney duly authorized in writing, the City shall execute and the Paying Agent shall authenticate and deliver in the name of the transferee a new Note.

Section 7. Replacement of Lost, Destroyed or Stolen Note. If the Note shall become lost, apparently destroyed, stolen or wrongfully taken, it may be replaced in the form and tenor of the lost, destroyed, stolen or taken Note and the City shall execute and the Paying Agent shall authenticate and deliver a replacement Note upon the Owner furnishing, to the satisfaction of the Paying Agent: (a) proof of ownership (which shall be shown by the registration books of the Paying Agent), (b) proof of loss, destruction or theft, (c) an indemnity to the City and the Paying Agent with respect to the Note lost, destroyed or taken, and (d) payment of the cost of preparing and executing the new Note.

Section 8. Reaffirmation of Water and Sewer Fund; Establishment of Accounts. There is hereby reaffirmed the Water and Sewer Fund. Moneys credited to the Water and Sewer Fund shall be appropriated and distributed in accordance with the Municipal Code and this Ordinance. There also are hereby established within the Water and Sewer Fund the following accounts: (a) the Note Account, which shall include the Interest Sub-Account and the Principal Sub-Account; and (b) the Project Account.

Section 9. Application of Proceeds of the Note. Upon payment to the City of all or a portion of the Loan evidenced by the Note, the Loan proceeds received by the City shall be credited to the Project Account and applied as a supplemental appropriation of the City, provided however, the cost of issuance relating to the Note may be paid by or on the City's behalf from proceeds of the Loan prior to the credit of such Loan proceeds into the Project Account.

Section 10. Net Revenues. All Gross Revenues shall continue to be credited to the Water and Sewer Fund, a proprietary and enterprise fund of the City. The City shall apply the moneys credited to the Water and Sewer Fund to Operation and Maintenance Expenses as the same becomes due, and thereafter shall apply the Net Revenues in the following order of priority (for purposes of the following when credits to more than one account or purpose are required at any single priority level, such credits shall rank pari passu with each other and, in the event that Net Revenues are not sufficient to fully fund all amounts required at any single priority level, credits shall be made pro rata, in accordance with the relative amounts required to be credited to such accounts or purposes):

FIRST, to the credit of or deposit in the accounts or subaccounts established for the payment of interest on the Note and Parity Obligations, if any, the Pro Rata Portion equal to the interest coming due on the next succeeding interest payment date for the respective obligations;

SECOND, to the credit of or deposit in the accounts or subaccounts established for the payment of principal on the Note and Parity Obligations, if any, the Pro Rata Portion equal to the principal coming due on the next succeeding principal payment date for the respective obligations;

THIRD, to the credit of any reserve accounts established for the payment of the Note and the Parity Obligations, if any, the amounts required in the Ordinances or related documents authorizing and controlling the establishment of such reserve accounts; and

FOURTH, to the credit of any other fund or account as may be designated by the City, to be used for any lawful purpose, any moneys remaining in the Water and Sewer Fund after the payments and accumulations set forth in FIRST through THIRD hereof.

Section 11. Note Account.

(a) ***Use of Moneys in the Note Account***. Moneys credited to the Note Account shall be used solely for the purpose of paying the principal of, premium if any, and interest on the Note. The Interest Sub-Account shall be used to pay the interest on the Note and the Principal Sub-Account shall be used to pay the principal of, and premium if any on, the Note.

(b) ***Credits to the Interest Sub-Account***. Commencing on or before the last Business Day of each month following the Dated Date and taking into consideration moneys then credited to the Interest Sub-Account, Net Revenues shall be credited to the Interest Sub-Account in an amount equal to the interest to come due on the Note on the next succeeding Interest Payment Date and made available to the Paying Agent for the timely payment of interest on the Note on the next succeeding payment date.

(c) ***Credits to the Principal Sub-Account***. Commencing on or before the last Business Day of the month preceding each Principal Redemption Date and taking into consideration moneys then credited to the Principal Sub-Account, there shall be credited to the Principal Sub-Account Net Revenues in an amount equal to the principal to come due on the Note on the next succeeding Principal Redemption Date and on the Maturity Date (following the last Principal Redemption Date for the Note) and made available to the Paying Agent for the timely payment of the principal of the Note on the next succeeding payment date.

(d) ***Investments***. Moneys credited to the Note Account may be invested or credited to securities or obligations that are Permitted Investments. The investment of moneys credited to the Note Account shall, however, be subject to the covenants and provisions of the Section hereof entitled "Covenants Regarding Exclusion of Interest on the Note from Gross Income for Federal Income Tax Purposes."

Section 12. Project Account.

(a) ***Use of Moneys in Project Account***. All moneys credited to the Project Account shall be applied solely to the payment of Project Costs. Upon the determination of the City Manager that all Project Costs have been paid or are determinable, any balance remaining in the Project Account (less any amounts necessary to pay the Project Costs not then due and owing) shall be transferred to any sub-account of the Note Account.

(b) ***Investments***. Moneys credited to the Project Account may be invested or credited to securities or obligations that are Permitted Investments. The investment of moneys credited to the Project Account shall, however, be subject to the covenants and provisions of the Section hereof entitled "Covenants Regarding Exclusion of Interest on the Note from Gross Income for Federal Income Tax Purposes." Except to the extent otherwise required by such section, interest income from the investment or reinvestment of moneys shall remain in and become part of the Project Account.

Section 13. Pledge and Lien for Payment of the Note.

(a) ***Pledge of Revenues***. The City hereby pledges for the payment of the principal of and interest on the Note and grants a first lien (but not necessarily an exclusive first lien) for such purpose on the Net Revenues, including without limitation moneys credited to the Note Account, as well as moneys on deposit in the Project Account until they are applied to the payment of Project Costs. The creation, perfection, enforcement, and priority of the pledge of Net Revenues shall be governed by Section 208 of the Supplemental Act and this Ordinance. The Net Revenues shall immediately be subject to the lien of such pledge without any physical delivery, filing, or further act. The lien of such pledge shall have the priority described herein. The lien of such pledge shall be valid, binding, and enforceable as against all persons having claims of any kind in tort, contract, or otherwise against the City irrespective of whether such persons have notice of such liens.

(b) ***Superior Liens Prohibited***. The City shall not pledge or create any other lien on the Net Revenues that is superior to the pledge thereof or lien thereon pursuant to such paragraphs.

(c) ***Subordinate Liens Require Consent***. For such period of time that the Lender is the Owner of the Note, the City shall not issue subordinate lien obligations or pledge or create a lien on the Net Revenues that is subordinate to the pledge for payment of the Note and Parity Obligations, if any, without the prior written consent of the Lender. If the Lender is no longer the Owner of the Note, nothing herein shall prohibit the City from issuing subordinate lien obligations and pledging or creating a lien on the Net Revenues that is subordinate to the pledge thereof or lien thereon established pursuant to paragraph (a) of this Section, provided that no Event of Default shall have occurred and be continuing.

(d) ***No Prohibition on Additional Security***. Nothing herein shall prohibit the City from crediting any legally available revenues that are not Net Revenues or any other moneys into any account of the Water and Sewer Fund pledged to the payment of the Note (and thereby subjecting the moneys so credited to the pledge made and lien granted in paragraph (a) of this Section).

(e) ***The Note is Special, Limited Obligation of the City***. The Note is a special, limited obligation of the City payable solely from the Net Revenues. The Note shall not constitute a general obligation of the City. This Note shall not be payable in whole or in part from the proceeds of general property taxes, and the full faith and credit of the City is not pledged for payment thereof.

(f) ***Outstanding Parity Obligations.*** As of the date of this Ordinance, the CWRPDA 2010 Loan and the CWCB 2021 Loan are the City's only outstanding loan, bonds, notes or other multiple fiscal year obligations with a parity lien on the Pledges Revenues. .

Section 14. Conditions to the Issuance of Parity Obligations. The City may issue Parity Obligations without the prior written consent of the Owner if (i) the Net Revenues for the 12 consecutive months out of the immediately preceding 18 months in which the Parity Obligations are issued, have been equal to at least 110% of (1.1 times) the sum of the Combined Maximum Annual Principal and Interest Requirements on the Note, any outstanding Parity Obligations and the proposed Parity Obligations during each calendar year following the date of issuance of the Parity Obligations and (ii) no Event of Default has occurred and is continuing under this Ordinance. Compliance with such covenant shall be certified by the City Manager or the City Finance Director to the Owner and concurrence to the calculation shall be obtained from the Owner prior to the issuance of the Parity Obligations. Except as set forth above, the City shall not issue Parity Obligations without the prior written consent of the Owner.

Section 15. Additional General Covenants. In addition to the other covenants of the City contained herein, the City hereby further covenants for the benefit of Owner of the Note that:

(a) ***Maintenance of System Rates, Fees and Coverage.*** The City will establish, maintain, enforce, and collect rates, fees, and charges for services furnished by the System or the use of the System to create Net Revenues in an amount equal to not less than 110% of (1.1 times) the amount necessary to pay when due the principal of and interest on the Note and any Parity Obligations coming due during such calendar year. If the Net Revenues at any time are not sufficient to make such payments, the City shall promptly increase such rates, fees, and charges to an extent which will ensure the payments and accumulations required by this Ordinance.

(b) ***Efficient Operations.*** The City will continue to operate and manage the System in an efficient and economical manner in accordance with all applicable laws, rules, and regulations, and keep and maintain separate accounts of the receipts and expenses thereof in such manner that the Net Revenues may at all times be readily and accurately determined. The City will promptly charge for service furnished by, or the use of, the System and shall use all legal means to assure prompt payment thereof.

(c) ***No Free Service Upon and Event of Default.*** Upon the occurrence of an Event of Default and for so long as the Event of Default is continuing, the City will furnish no free service from the System and, other than for use related to the operation of the System, the City shall pay a fair and reasonable amount for the use of services which it receives from the System.

(d) ***Sale or Alienation of Property.*** The City will not sell or alienate any of the property constituting any part of the System in any manner or to any extent as might reduce the security provided for the payment of the Note, but the City may sell any portion of such property which shall have been replaced by other similar property of at least equal value, or which shall cease to be necessary for the efficient operations; provided however, that the proceeds of any such sale of a part of the System shall be included as part of the Gross Revenue.

(e) ***Audits.*** At least once a year in the time and manner provided by law, the City will cause an audit to be performed of the records relating to the revenues and

expenditures of the System. Such audit may be made part of and included within the general audit of the City and made at the same time as the general audit. In addition, at least once a year in the time and manner provided by law, the City will cause a budget to be prepared and adopted. Copies of the budget and the audit will be filed and recorded in the places, time, and manner provided by law. Additionally, the City shall provide the Lender with such financial statements and other related publicly available information at such frequencies and in such detail that the Lender may reasonably request.

(f) ***Insurance.*** The City will carry public liability and such other forms of insurance on insurable Water Facilities and Wastewater Facilities as would ordinarily be carried by utilities having similar properties of equal value, such insurance being in such amounts as will protect the System and its operations. In the event of any loss or damage to Water Facilities or Wastewater Facilities, or in the event part or all of Water Facilities or Wastewater Facilities are taken by the exercise of a power of eminent domain, the insurance proceeds or the condemnation award shall be used for restoring, replacing, or repairing the property lost, damaged, or taken, and the remainder thereof, if any, shall be considered as Gross Revenue; provided however, that if the City Council determines that the System and the security for the Note will not be adversely affected thereby, the City Council may determine not to restore, replace, or repair the property lost, damaged, or taken and all of the insurance proceeds or condemnation award shall be considered as Gross Revenue.

(g) ***Enterprise Status.*** The City has and will continue to maintain the System as an "enterprise" or as part of the Utility Enterprise within the meaning Article X, Section 20 of the Colorado Constitution; provided, however, after the current calendar year the City may disqualify the System as an "enterprise" or part of the Utility Enterprise in any year in which said disqualification does not materially, adversely affect the enforceability of the covenants made pursuant to this Ordinance. In the event that the System or the Utility Enterprise is disqualified as an enterprise and the enforceability of the covenants made pursuant to this Ordinance are materially, adversely affected, the City covenants to (i) immediately take all actions necessary to qualify the System as an enterprise within the meaning of Article X, Section 20 of the Colorado Constitution and (ii) permit the enforcement of the covenants made herein.

(h) ***Protection of Security.*** The City, its officers, agents and employees, shall not take any action in such manner or to such extent as might prejudice the security for the payment of the principal of and interest on the Note and any other securities payable from the Net Revenues according to the terms thereof No contract shall be entered into nor any other action taken by which the rights of the Owners might be prejudicially and materially impaired or diminished.

(i) ***Project Useful Life.*** The Note matures at such time not exceeding the estimated useful life of the Project.

Section 16. Covenants Regarding Exclusion of Interest on the Note from Gross Income for Federal Income Tax Purposes. For purposes of ensuring that the interest on the Note

is and remains excluded from gross income for federal income tax purposes, the City hereby covenants that:

(a) ***Prohibited Actions***. The City will not use or permit the use of any proceeds of the Note or any other funds of the City from whatever source derived, directly or indirectly, to acquire any securities or obligations and shall not take or permit to be taken any other action or actions, which would cause the Note to be an "arbitrage bond" within the meaning of Section 148 of the Tax Code, or would otherwise cause the interest on the Note to be includible in gross income for federal income tax purposes.

(b) ***Affirmative Actions***. The City will at all times do and perform all acts permitted by law that are necessary in order to assure that interest paid by the City on the Note shall not be includible in gross income for federal income tax purposes under the Tax Code or any other valid provision of law. In particular, but without limitation, the City represents, warrants and covenants to comply with the following rules unless it receives an opinion of Note Counsel stating that such compliance is not necessary: (i) gross proceeds of the Note will not be used in a manner that will cause the Note to be considered "private activity bond" within the meaning of the Tax Code; (ii) the Note is not and will not become directly or indirectly "federally guaranteed"; and (iii) the City will timely file Internal Revenue Form 8038-G which shall contain the information required to be filed pursuant to Section 149(e) of the Tax Code.

(c) ***Letter of Instructions***. The City will comply with the Letter of Instructions delivered to it on the date of issuance of the Note, including but not limited by the provisions of the Letter of Instructions regarding the application and investment of Note proceeds, the use of the Project, the calculations, the deposits, the disbursements, the investments and the retention of records described in the Letter of Instructions; provided that, in the event the original Letter of Instructions is superseded or amended by a new Letter of Instructions drafted by, and accompanied by an opinion of Note Counsel stating that the use of the new Letter of Instructions will not cause the interest on the Note to become includible in gross income for federal income tax purposes, the City will thereafter comply with the new Letter of Instructions.

(d) ***Qualified Tax-Exempt Obligation Designation***. The City hereby designates the Note as a qualified tax-exempt obligation within the meaning of Section 265(b)(3) of the Tax Code. The City covenants that the aggregate face amount of all tax-exempt obligations issued by the City, together with governmental entities which derive their issuing authority from the City or are subject to substantial control by the City, shall not be more than $10,000,000 during calendar year 2021. The City recognizes that such tax-exempt obligations include bonds, notes, leases, loans and warrants, as well as the Note to be issued and delivered pursuant to this Ordinance. The City further recognizes that any Owner will rely on the City's designation of the Note as a qualified tax-exempt obligation.

Section 17. Defeasance. The Note shall not be deemed to be outstanding hereunder if it shall have been paid and cancelled or if cash or Federal Securities shall have been credited to trust for the payment thereof (whether upon or prior to the maturity of the Note, but if the Note is to be paid prior to maturity, the City shall have given the Paying Agent irrevocable directions to give notice of redemption as required by this Ordinance, or such notice shall have been given in

accordance with this Ordinance). In computing the amount of the deposit described above, the City may include interest to be earned on the Federal Securities.

Section 18. Events of Default. Each of the following events constitutes an Event of Default:

(a) ***Nonpayment of Principal, Premium or Interest***. Failure to make any payment of principal of, premium, if any, or interest on the Note when due hereunder;

(b) ***Breach or Nonperformance of Duties***. Breach by the City of any covenant set forth herein or failure by the City to perform any duty imposed on it hereunder and continuation of such breach or failure for a period of thirty days after receipt by the City Clerk of written notice thereof from the Paying Agent or from the Owner; or

(c) ***Appointment of Receiver***. An order or decree is entered by a court of competent jurisdiction appointing a receiver for all or any portion of the revenues and moneys pledged for the payment of the Note pursuant hereto is entered with the consent or acquiescence of the City or is entered without the consent or acquiescence of the City but is not vacated, discharged or stayed within thirty days after it is entered.

Section 19. Remedies for Events of Default.

(a) ***Remedies***. Upon the occurrence and continuance of any Event of Default, the Owner, or a trustee therefor, may protect and enforce its rights hereunder by proper legal or equitable remedy deemed most effectual including mandamus, specific performance of any covenants, the appointment of a receiver (the consent of such appointment being hereby granted), injunctive relief, or requiring the City Council to act as if it were the trustee of an express trust, or any combination of such remedies. All proceedings shall be maintained for the benefit of the Owner of the Note. Additionally, upon the occurrence of any payment Event of Default as provided in Section 19(a) hereof, an additional 2.00% (two hundred basis point) shall be added to the annual Interest Rate then in effect as the default rate for each day in which such payment Event of Default is in effect.

(b) ***Failure to Pursue Remedies Not a Release; Rights Cumulative***. The failure of the Owner to proceed in any manner herein provided shall not relieve the City of any liability for failure to perform or carry out its duties hereunder. The foregoing rights are in addition to any other right available to the Owner of the Note and the exercise of any right by the Owner shall not be deemed a waiver of any other right.

Section 20. Amendment of Ordinance. The City may not amend this Ordinance without the prior written consent of the Owner of the Note.

Section 21. Findings and Determinations. Having been fully informed of and having considered all the pertinent facts and circumstances, the City Council does hereby find, determine, and declare:

(a) ***Compliance with Law.*** The issuance of the Note and all procedures undertaken incident thereto are in full compliance and conformity with all applicable requirements, provisions

and limitations prescribed by the State Constitution and the Enabling Law, and all conditions and limitations of the State Constitution and the Enabling Law have been satisfied.

(b) ***Best Interests.*** It is to the best advantage of the City and its residents that the Note be authorized, issued and delivered at the time, in the manner and for the purposes provided in this Ordinance.

(c) ***Supplemental Public Securities Act.*** The City hereby elects to apply the provisions of Section 11-57-209, C.R.S. Section 11-57-210, C.R.S. and Section 11-57-212, C.R.S. to the authorization of the Loan and the issuance and delivery of the Note.

(d) ***No Advisory of Fiduciary Role.*** The City acknowledges and agrees that (i) the transaction contemplated herein is an arm's length commercial transaction between the City and the Lender and its affiliates, (ii) in connection with such transaction, the Lender and its affiliates are acting solely as a principal and not as an advisor including, without limitation, a "Municipal Advisor" as such term is defined in Section 15B of the Securities and Exchange Act of 1934, as amended, and the related final rules (the "Municipal Advisor Rules"), agent or a fiduciary of the City, (iii) the Lender and its affiliates are relying on the bank exemption in the Municipal Advisor Rules, (iv) the Lender and its affiliates have not provided any advice or assumed any advisory or fiduciary responsibility in favor of the City with respect to the transaction contemplated hereby and the discussions, undertakings and procedures leading thereto (whether or not the Lender, or any affiliate of the Lender, has provided other services or advised, or is currently providing other services or advising the City on other matters), (v) the Lender and its affiliates have financial and other interests that differ from those of the City, and (vi) the City has consulted with its own financial, legal, accounting, tax and other advisors, as applicable, to the extent it deemed appropriate.

Section 22. Appointment and Duties of Paying Agent. The Paying Agent is hereby appointed as paying agent, registrar and authenticating agent for the Note unless and until the City removes it as such and appoints a successor Paying Agent, in which event such successor shall automatically succeed to the duties of the Paying Agent hereunder and its predecessor shall immediately turn over all its records regarding the Note to such successor. The Paying Agent, by accepting its duties as such, agrees to perform all duties and to take all actions assigned to it hereunder in accordance with the terms hereof. The appointment and acceptance of the duties of Paying Agent hereunder shall be affected through the execution of an agreement by the Paying Agent.

Section 23. Approval of Miscellaneous Documents. The City Council hereby authorizes and approves the execution of all documents and certificates necessary or desirable to effectuate the issuance of the Note and the transaction contemplated hereby, including without limitation the Term Sheet, and execution by the parties thereto shall constitute the City Council's approval of such documents and certificates in the form so executed. In the discretion of City officials, the use of electronic signatures as authorized pursuant to Resolution 2021-19 of the City shall be permitted except in relation to the manual signatures required for the execution of the Note.

Section 24. Ratification of Prior Actions. All actions heretofore taken (not inconsistent with the provisions of this Ordinance) by the City Council or by the officers and employees of the

City directed toward the issuance of the Note for the purposes herein set forth, including without limitation actions taken on the City's behalf in connection with the request for proposals are hereby ratified, approved and confirmed.

Section 25. Events Occurring on Days That Are Not Business Days. Except as otherwise specifically provided herein with respect to a particular payment, event or action, if any payment to be made hereunder or any event or action to occur hereunder which, but for this Section, is to be made or is to occur on a day that is not a Business Day shall instead be made or occur on the next succeeding day that is a Business Day.

Section 26. Headings. The headings to the various sections and paragraphs to this Ordinance have been inserted solely for the convenience of the reader, are not a part of this Ordinance, and shall not be used in any manner to interpret this Ordinance.

Section 27. Ordinance Irrepealable. After the Note has been issued, this Ordinance shall constitute a contract between the Owner and the City and shall be and remain irrepealable until the principal of the Note and all interest accruing thereon shall have been fully paid, satisfied, and discharged, as herein provided.

Section 28. Severability. It is hereby expressly declared that all provisions hereof and their application are intended to be and are severable. In order to implement such intent, if any provision hereof or the application thereof is determined by a court or administrative body to be invalid or unenforceable, in whole or in part, such determination shall not affect, impair or invalidate any other provision hereof or the application of the provision in question to any other situation; and if any provision hereof or the application thereof is determined by a court or administrative body to be valid or enforceable only if its application is limited, its application shall be limited as required to most fully implement its purpose.

Section 29. Repealer. All orders, bylaws, ordinances, and resolutions of the City, or parts thereof, inconsistent or in conflict with this Ordinance, are hereby repealed to the extent only of such inconsistency or conflict.

INTRODUCED, READ ON FIRST READING, PASSED AND ORDERED PUBLISHED BY TITLE ONLY THIS 4th DAY NOVEMBER 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____

Jonathan Godes, Mayor

ATTEST:

_____

Ryan Muse, City Clerk

INTRODUCED, READ ON SECOND READING, AND ORDERED PUBLISHED BY TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND PUBLICATION THIS 18th DAY OF NOVEMBER 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____

Jonathan Godes, Mayor

ATTEST:

_____

Ryan Muse, City Clerk

APPENDIX A

FORM OF NOTE

UNITED STATES OF AMERICA

CITY OF GLENWOOD SPRINGS, COLORADO
ACTING BY AND THROUGH ITS UTILITY ENTERPRISE
WATER AND WASTEWATER REVENUE NOTE
SERIES 2021

R-1 $8,100,000

Interest Rate	Maturity Date	Dated Date
2.54% until December 1, 2031	December 1, 2041	December 1, 2021

REGISTERED OWNER:

PRINCIPAL SUM: EIGHT MILLION ONE HUNDRED THOUSAND DOLLARS

CITY OF GLENWOOD SPRINGS, COLORADO, in the State of Colorado, a duly organized and validly existing home-rule City and political subdivision of the State of Colorado, acting by and through its Utility Enterprise (the "City"), for value received, hereby promises to pay, solely out of the special funds hereinafter designated but not otherwise, to the registered owner named above, or registered assigns, on Principal Redemption Dates or on the Maturity Date specified above or, the principal amount specified above (capitalized terms used herein shall have the meanings set forth in City Ordinance No. 2021-13 authorizing the issuance of this Note (the "Ordinance")). In like manner the City promises to pay interest on the unpaid principal amount (computed on the basis of a 360-day year of twelve 30-day months) on each monthly Interest Payment Date, computed initially from the Dated Date set forth above, at the Interest Rate per annum specified above (which rate resets on and after December 1, 2031, to the greater of 2.54% or the published 10-year U.S. Treasury Rate plus one hundred twenty-five basis points), until the outstanding principal amount is paid in full.

Attached as an Exhibit to this Note is a schedule of the monthly principal and interest due on this Note on each Interest Payment Date and Principal Redemption Date, as well as on the Maturity Date.

The principal of and interest on this Note shall be paid by check or draft of the Paying Agent mailed on or before each Interest Payment Date and Principal Redemption Date to the registered owner of this Note; provided however, the Paying Agent shall make such payments by wire transfer or such alternative means as may be mutually agreed to between the registered owner of this Note and the Paying Agent. The final installment of the principal of and interest on this Note shall only be payable upon presentation and surrender of this Note to the Paying Agent, provided however this Note need not be presented for the payment of principal when redeemed in the case of mandatory scheduled redemption. THE ORDINANCE CONSTITUTES THE

CONTRACT BETWEEN THE REGISTERED OWNER OF THIS NOTE AND THE CITY. THIS NOTE IS ONLY EVIDENCE OF SUCH CONTRACT AND, AS SUCH, IS SUBJECT IN ALL RESPECTS TO THE TERMS OF THE ORDINANCE, WHICH SUPERSEDES ANY INCONSISTENT STATEMENT IN THIS NOTE.

This Note is subject to redemption at the option of the City, in whole but not in part, on any Interest Payment Date; upon payment of the outstanding and unpaid principal amount and accrued interest to the Interest Payment Date on which such optional redemption is made, without redemption premium

The Note is special, limited obligation of the City payable solely from and secured solely from the Net Revenues generated from the System as provided in the Ordinance and shall not constitute a general obligation of the City. Pursuant to the Ordinance the City pledged for the payment of the principal of, premium if any, and interest on the Note at any time outstanding, and granted a lien for such purpose on the Net Revenues. This Note is issued under authority of the City Charter and, among other things, under the authority of the Part 2 of Article 57 of Title 11, of the Colorado Revised Statutes. Such recital shall be conclusive evidence of the validity and the regularity of the issuance of this Note after its deliver for value.

If any payment required by this Note is not made at the time it becomes due and remains unpaid for a period of 10 days or if any other Event of Default shall have occurred under the City's obligations under the Ordinance then the unpaid balance of this Note may be accelerated by the holder of this Note, and the unpaid principal balance of this Note plus all accrued interest and any reimbursable fees and costs shall be due and payable in full. Additionally, upon the occurrence of a payment Event of Default, an additional 2.00% per annum interest rate shall be added to the annual Interest Rate then in effect as the default rate for each day in which such payment Event of Default is in effect. The City waives presentment, notice of dishonor and protest and agrees that any extension of time with respect to any payment shall not affect the City's liability under this Note. No waiver by the holder of this Note of any payment or right under this Note shall operate as a waiver of any other payment or right under this Note. The City will pay all costs and expenses, including reasonable attorney fees, incurred by the holder of this Note on default regardless of whether an action shall be instituted to collect this Note and in collecting any judgment thereon.

The City agrees with the Owner of this Note that it will keep and perform all the covenants and agreements contained in the Ordinance.

It is hereby certified that all conditions, acts and things required by the City Charter, and the constitution and laws of the State of Colorado, and the ordinances of the City, to exist, to happen and to be performed, precedent to and in the issuance of this Note, exist, have happened and have been performed, and that the Note do not exceed any limitations prescribed by said City Charter, Constitution or laws of the State of Colorado, or the ordinances of the City.

This Note shall not be entitled to any benefit under the Ordinance, or become valid or obligatory for any purpose, until the Paying Agent shall have signed the certificate of authentication hereon.

IN WITNESS WHEREOF, City of Glenwood Springs, Colorado, has caused this Note to be signed in the name and on behalf of the City with the manual signature of the Mayor, to be sealed with the seal of the City or a facsimile thereof and to be attested by the manual signature of the City Clerk.

[MANUAL OR FACSIMILE SEAL] GLENWOOD SPRINGS, COLORADO

By (Manual Signature)
Mayor

ATTEST:

By (Manual Signature)
City Clerk

CERTIFICATE OF AUTHENTICATION

This is the Note described in the within-mentioned Ordinance.

City Director of Finance, as Paying Agent

By _____
Authorized Representative

Date of Authentication: _____

CERTIFICATE OF TRANSFER

FOR VALUE RECEIVED, _____, the undersigned, hereby sells, assigns and transfers unto _____ (Tax Identification or Social Security No. _____) the within Note and all rights thereunder, and hereby irrevocably constitutes and appoints _____ attorney to transfer the within Note on the books kept for registration thereof, with full power of substitution in the premises.

Dated: _____

_____
NOTICE: The signature to this assignment must correspond with the name as it appears upon the face of the within Note in every particular, without alteration or enlargement or any change whatever.

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Planning File 60-20 - Consideration of a Major Site/Architectural Plan Review application for the construction of 300-unit multi-family development in 14 separate buildings in Glenwood Meadows.

Action Requested: **Action 1 – Major Site/Architectural Plan Review** – for the construction of 300 multi-family residential apartment units.

Department: Economic and Community Development

Presented By: Trent Hyatt, Senior Planner

Background Info: The Planning and Zoning Commission (Commission) is the recommending body to City Council for all Major Site/Architectural Plan Review applications. The Commission considered the proposal at their August 24, 2021 regular meeting where public comment was taken. All information/materials provided to the Commission and the minutes from each meeting are attached for your review.

Issues: For a complete analysis of various issues related to the proposal, please refer to the attached staff reports, staff memos and public comments submitted to date. However, the list below is a summary of the topics addressed by the Commission during the review process.

Issues Addressed/Recommendations to Applicant

1. Request to add affordable/attainable/inclusionary housing to the project via City's voluntary system improvement fee waiver program;
2. Need to improve pedestrian connectivity, add more stairways to Wulfsohn;
3. Improve screening/buffering of proposed parking areas;
4. Similarity of building design and bedroom configurations;
5. Landscaping and related water use;
6. Need to provide details related to proposed shuttle operations;
7. Proposal limited to only one housing type (apartments);
8. Concerns regarding density and addition of traffic to and condition of Wulfsohn Road.

Planning and Zoning Commission Discussion/Recommendation

The Commission voted unanimously 6-0 to recommend approval of the application to City Council 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 appears to be consistent with all dimensional, design, development, and all other standards of the Glenwood Meadows Zoning and Development Plan and Glenwood Springs Municipal Code;
3. The site/architectural plan is consistent with the precedent setting land use approval, the Glenwood Meadows Annexation Zoning and Development Plan; 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 Glenwood Springs Municipal Code specific City staff comments prior to submittal of any future development permit (including but not limited to a Final Plans Review) application.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein.
3. Prior to approval of any future development review application, the applicant shall apply for and receive the approval of a CDOT access permit, where applicable.
4. The applicant shall receive approval of the related Minor Subdivision application to create the development parcel and residual lots.
5. 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.
6. The applicant shall comply fully with the Memorandum of Understanding between the City and Glenwood Meadows, LLC executed May 5, 2021.
7. The applicant shall deed restrict a minimum of 10 units as owner occupied at 100 percent of AMI for a period of five years.
8. Prior to submitting a building or grading permit application, the applicant shall
a. Submit a Final Plans Review 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.

Applicant Response
Regarding attainable housing, the applicant improved upon their initial offering of voluntarily restricting 10 units to 100% of AMI by increasing the number to 15. While they are not voluntarily offering to restrict 20% of the total units as resident of occupied, they do intend to meet the requirements via procedures outlines in the response letter attached to the staff report.

Related to the design, the applicant has increased variations in materials and colors in an attempt to diversify the similar aesthetic of the proposed buildings. Please see pages 72-83 of the revised plan set attached hereto.

Staff Recommendation: **Action 1 – Major Site/Architectural Plan Review** – for the construction of 300 multi-family residential apartment units.

Staff Recommendation
Staff recommends **approval (with conditions)** of the Site/Architectural Plan Review application with the findings and conditions outlined below. Please note, the recommended conditions include revisions related to the applicant's changes stemming from the Commission's recommendations.

Recommended Findings:
1. The site/architectural plan is consistent with the general purpose and intent of the Code;
2. The site/architectural plan appears to be consistent with all dimensional, design, development, and all other standards of the Glenwood Meadows Zoning and Development Plan and Glenwood Springs Municipal Code;
3. The site/architectural plan does is consistent with the precedent setting land use approval, the Glenwood Meadows Annexation Zoning and Development Plan; 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 Glenwood Springs Municipal Code specific City staff comments prior to submittal of any future development permit (including but not limited to a Final Plans Review) application.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein.
3. Prior to approval of any future development review application, the applicant shall apply for and receive the approval of a CDOT access permit, where applicable.
4. The applicant shall receive approval of the related Minor Subdivision application to create the development parcel and residual lots.
5. 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.
6. The applicant shall comply fully with the Memorandum of Understanding between the City and Glenwood Meadows, LLC executed May 5, 2021.
7. The applicant shall deed restrict a minimum of 15 units as owner occupied at an average of 100 percent of AMI per the City's voluntary system improvement fee waiver program.
8. Prior to submitting a building or grading permit application, the applicant shall

a. Submit a Final Plans Review 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.

BLD GROUP AFFORDABLE HOUSING PLAN

BLD Group filed its application for 300 rental apartment units in Glenwood Meadows in December 2020, prior to the City's February 2021 enactment of its current Community Housing Standards. This means BLD is not subject to these Community Housing Standards, which require 20% of residential units to be "resident occupied community housing" and one half of these units, 10%, to be deed restricted to an initial rental price based on an average of no more than 100% AMI.

Moreover, there is already Community Housing constructed within the Glenwood Meadows master plan. In fact, Glenwood Meadows, LLC, the current owner of the parcel, was responsible for creating 60 of the most affordable units in the City when it constructed the Glenwood Greens project in 2013. These 60 units are deed restricted to 40/60/80% of AMI and are adjacent to the BLD project. Both parcels are within the Residential High zone district of the Meadows. When considering the existing 60 affordable units within Glenwood Meadows' RH district out of the total 475 permitted units, a minimum of 12.6% of the entire Glenwood Meadows RH zone development will be deed restricted affordable units—at levels exceeding the current code requirement to average 100% AMI.

BLD's application was stalled for several months while City Staff and BLD negotiated contributions to various infrastructure improvements to serve the project. Pursuant to the Memorandum of Understanding between the City and BLD, BLD has committed to contributing up to $625,000 for City infrastructure upgrades contingent upon approval of this site plan. Nonetheless, BLD has heard the requests from Staff and the Planning Commission that community housing is desperately wanted and needed within the City. Therefore, BLD is offering the following:

(1) Voluntary Affordable and Workforce Housing Program.

BLD will place 15 of its units into the City's voluntary Affordable and Workforce Housing program as described in 070.045.120(b), which requires 100% AMI rents to local occupants and allows for the waiver of certain City fees. With the addition of these units, upon completion of the BLD project, 21% of completed units in the Glenwood Meadows RH zone district will be deed restricted units, more than double the City's recently enacted Community Housing Standard of 10%, at rents averaging below 100% of AMI.

(2) Local Preference.

The current Community Housing Guidelines require 20% of units to be "resident occupied." According to the Lofts at Red Mountain Management, the Lofts are currently at 65% resident occupied. We have every reason to believe BLD's project will far exceed 20% resident occupied. The City's current RO guidelines as enacted require waiting and lease periods, and other administrative burdens that would materially impact occupancy, available financing for the project, and ultimately its viability. Consequently, BLD cannot agree to the City's current RO guidelines. Nonetheless, BLD strongly believes in serving the community. Therefore, BLD is willing to offer a local preference for its units as follows:

Upon request from the City, BLD will annually report to the City the percentage of its units which qualify as "resident occupied" under the City's current Code. Additionally, in the event the percentage of "resident occupied" units is ever below 20%, BLD Group will implement a preference to prospective tenants who otherwise qualify and meet the City's current occupancy requirement for community housing:

(a) Employed to primarily work at a physical location within the 81601 zip code;
(b) Directly employed by a company that has its principal office located within the 81601 zip code;
(c) Enrolled as a full-time student at a local educational institution;
(d) Is sixty-five years of age or older; or
(e) Is receiving social security disability benefits.

GLENWOOD MEADOWS MULTI-FAMILY HOUSING

Glenwood Springs, Colorado

MAJOR SITE / ARCHITECTURE REVIEW

SUBMITTAL #4: October 07, 2021

INDEX OF SHEETS

ALTA Land Title Survey

SHEET 1 OF 4
SHEET 2 OF 4
SHEET 3 OF 4
SHEET 4 OF 4

Civil Sheet Set

GR1	PRELIMINARY GRADING PLAN - SHEET 1
GR2	PRELIMINARY GRADING PLAN - SHEET 2
UT1	PRELIMINARY UTILITY PLAN - SHEET 1
UT2	PRELIMINARY UTILITY PLAN - SHEET 2

Landscape Sheet Set

L1.0	OVERALL SITE PLAN
L1.1	DEVELOPMENT AREA SITE PLAN
L1.2	SITE PLAN ENLARGEMENT KEY PLAN
L1.3	ENLARGED SITE PLAN
L1.4	ENLARGED SITE PLAN
L1.5	ENLARGED SITE PLAN
L1.6	ENLARGED SITE PLAN
L1.7	ENLARGED SITE PLAN
L1.8	ENLARGED SITE PLAN
L1.9	ENLARGED SITE PLAN
L2.0	PLANT LIST AND GENERAL NOTES
L2.1	PLANTING DETAILS
LP.1	SITE LIGHTING ENLARGEMENT KEY PLAN
LP.2	SITE LIGHTING ENLARGEMENT PLAN
LP.3	SITE LIGHTING ENLARGEMENT PLAN
LD.1	DESIGN IMAGERY SHEET
LD.2	DESIGN IMAGERY SHEET
EXBT 1	SITE PLAN RENDERING
EXBT 2	PERSPECTIVE ILLUSTRATION
EXBT 3	PERSPECTIVE ILLUSTRATION
EXBT 4	PERSPECTIVE ILLUSTRATION
EXBT 5	PERSPECTIVE ILLUSTRATION
EXBT 6	PERSPECTIVE ILLUSTRATION
EXBT 7	PERSPECTIVE ILLUSTRATION
EXBT 8	PERSPECTIVE ILLUSTRATION
EXBT 9	PERSPECTIVE ILLUSTRATION
EXBT 10	PERSPECTIVE ILLUSTRATION
EXBT 11	PERSPECTIVE ILLUSTRATION
EXBT 12.1	SITE SECTION
EXBT 12.2	SITE SECTION
EXBT 12.3	SITE SECTION
EXBT 13	WEST ENTRY PLAN AND PROFILE
EXBT 14	POOL WALL GRADING

Architecture Sheet Set

A-1	BUILDING TYPE 1 FLOOR PLANS
A-2	BUILDING TYPE 1 FLOOR PLANS
A-3	BUILDING TYPE 1 FLOOR PLANS
A-4	BUILDING TYPE 1 FLOOR PLANS
A-5	BUILDING TYPE 1 FLOOR PLANS
A-6	BUILDING TYPE 1 ROOF PLAN
A-7	BUILDING TYPE 1 N/S ELEVATIONS
A-8	BUILDING TYPE 1 E/W ELEVATIONS
A-9	BUILDING TYPE 1 SECTION
A-10	BUILDING TYPE 2 FLOOR PLANS
A-11	BUILDING TYPE 2 FLOOR PLANS
A-12	BUILDING TYPE 2 FLOOR PLANS
A-13	BUILDING TYPE 2 FLOOR PLANS
A-14	BUILDING TYPE 2 FLOOR PLANS
A-15	BUILDING TYPE 2 ROOF PLAN
A-16	BUILDING TYPE 2 N/S ELEVATIONS
A-17	BUILDING TYPE 2 E/W ELEVATIONS
A-18	BUILDING TYPE 2 SECTION

Architecture Sheet Set (Cont.)

A-19	BUILDING TYPE 3 FLOOR PLANS
A-20	BUILDING TYPE 3 FLOOR PLANS
A-21	BUILDING TYPE 3 FLOOR PLANS
A-22	BUILDING TYPE 3 FLOOR PLANS
A-23	BUILDING TYPE 3 FLOOR PLANS
A-24	BUILDING TYPE 3 ROOF PLAN
A-25	BUILDING TYPE 3 N/S ELEVATIONS
A-26	BUILDING TYPE 3 E/W ELEVATIONS
A-27	BUILDING TYPE 3 SECTION
A-28	APARTMENT UNIT FLOOR PLANS
A-29	APARTMENT UNIT FLOOR PLANS
A-30	GARAGE BUILDING ELEVATION
A-31	CLUBHOUSE FLOOR PLANS
A-32	CLUBHOUSE ROOF PLANS
A-33	CLUBHOUSE N/S ELEVATIONS
A-34	CLUBHOUSE E/W ELEVATIONS
A-35	BUILDING MATERIALS
A-36	BLDG. TYPE 1 SOUTH ELEV. (RENDERED)
A-37	BLDG. TYPE 1 NORTH ELEV. (RENDERED)
A-38	BLDG. TYPE 1 EAST ELEV. (RENDERED)
A-39	BLDG. TYPE 1 WEST ELEV. (RENDERED)
A-40	BLDG. TYPE 2 SOUTH ELEV. (RENDERED)
A-41	BLDG. TYPE 2 NORTH ELEV. (RENDERED)
A-42	BLDG. TYPE 2 EAST ELEV. (RENDERED)
A-43	BLDG. TYPE 2 WEST ELEV. (RENDERED)
A-44	BLDG. TYPE 3 SOUTH ELEV. (RENDERED)
A-45	BLDG. TYPE 3 NORTH ELEV. (RENDERED)
A-46	BLDG. TYPE 3 EAST ELEV. (RENDERED)
A-47	BLDG. TYPE 3 WEST ELEV. (RENDERED)

PROJECT TEAM

LANDSCAPE ARCHITECT

DHM DESIGN CORPORATION
311 MAIN STREET, SUITE 102
CARBONDALE, CO 81623
PHONE: (970) 963-6520
CONTACT: JEN DICUOLLO

ARCHITECTURE

BLD GROUP
1500 CORDOVA RD
FORT LAUDERDALE, FL 33316
PHONE: (954) 578-6008
CONTACT: RICHARD COBA

CIVIL ENGINEER

HIGH COUNTRY ENGINEERING
1517 BLAKE AVE, #101
GLENWOOD SPRINGS, CO 81601
PHONE: (970) 945-8676
CONTACT: ROGER NEAL

BASIS OF BEARING / BENCHMARK

BEARINGS ARE BASED UPON A #5 REBAR WITH ALUMINUM CAP L.S. #5933 FOUND AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S.
25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.

LOCATION MAP



UNIT AND SITE AMENITY DATA

LOT SIZE INFORMATION	Acres	SF	LOT COVERAGE	Required (SF & %)	Proposed (SF & %)
Lot 2 - Phase 1	**27.9 Acres**	**1,215,160 sf**		**50% Max. Lot Coverage**	**591,051 sf** *49% Lot Size*
LIMITS OF DISTURBANCE		Proposed (SF & %)	**AVERAGE SLOPE WITHIN LIMITS OF DISTURBANCE**	Percentage (%)	
Lot 2 - Phase 1		**895.561 sf** **74%** *Lot Size*		**16%**	
OFF-STREET PARKING SPACES	Required # Vehicle Spaces	Proposed # Vehicle Spaces	**BICYCLE PARKING**	Required # Spaces	Proposed # Spaces
Residence Parking *1.7 spaces per unit*	**510 Spaces** *Phase 1 Count: 300 units*	**510 Spaces**	**Bike Racks** *150 parking spaces- 9 bike parking spaces plus 1 space for each 50 vehicle spaces provided after the first 150 spaces*	**17 Bike Parking Spaces** *Phase 1 Count: 538 Parking Spaces*	**160 Bike Parking Spaces**
Clubhouse *1 per 400 sf of building area plus 1 per 10,000 sf of outdoor space*	**29 Spaces** *Phase 1 Count: 10,900 sf Building and 11,000 sf of Outside area*	**29 Spaces**			
ADA	**20 Spaces**	**38 Spaces**			
TOTAL PARKING	**539 Spaces**	**539 Spaces**			

RESIDENTIAL UNITS	Buildings	Units	COMMON AMENITY SPACE	Required (SF)	Provided (SF)
Building Type 1	**7 Buildings**	**168 Units**	Community Center & Daycare		**20,960 sf**
Building Type 2	**3 Buildings**	**60 Units**	Community Gardens		**7,665 sf**
Building Type 3	**3 Buildings**	**72 Units**	Amenity Spaces between Buildings		**30,160 sf**
TOTAL	**13 Buildings**	**300 Units**	Trail Connections		**2,058 sf**
BUILDING HEIGHT	Required	Proposed	Dog Yard		**36,432 sf**
	40 ft. maximum	**37 ft.** *roof center line to grade*	**TOTAL**	**60,000 sf** *Required: 200 sf per unit Phase 1 Count: 300 units*	**97,275 sf**

LANDSCAPE DATA

OPEN SPACE	SQUARE FOOTAGE	TREES		SHRUBS	
		REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Upper tier - disturbed	87,483 SF	73	74	219	366
Lower tier - disturbed	79,351 SF	66	66	198	285

INTERNAL DRIVEWAY	LINEAR FEET	TREES	
		REQUIRED *(1/35 LF)*	PROVIDED
Flat Tops View Dr (Sunny Aspen)	2,071 LF	59	60
Wolf Liam Lane	1,735 LF	50	50
Adios Avenue	1,748 LF	50	50

PARKING AREAS	Total Parking Area (SF)	Landscaped Area (SF & %)	TREES		SHRUBS	
			REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Parking Lots	29,694 SF	10,485 SF *(35% of the parking area)*	25	40	74	240

TOTAL LANDSCAPED AREA	Proposed (SF & %)	OPEN SPACE	Required (SF & %)	Proposed (SF & %)
	304,510 sf *25% Lot Size*		**486,064 sf** *40% Lot Size*	**504,083 sf** *41.5% Lot Size*
TOTAL IMPERVIOUS AREA	Proposed (SF & %)			
	591,051 sf *49% Lot Size*			

SNOW STORAGE NOTE: ON-SITE SNOW STORAGE WILL BE PROVIDED IN LANDSCAPE AREAS AT THE EAST AND WEST ENDS OF THE BUILDING ROWS AND BEHIND THE CURB WHERE SIDEWALKS DO NOT EXIST. FINAL SNOW MANAGEMENT WILL BE REFINED BASED ON GEOTECHNICAL REVIEW, RECOMMENDATIONS, AND GRADING & DRAINAGE PLAN.

LEGAL DESCRIPTION

PARCEL A:
****
NOTE: THE FOLLOWING LEGAL DESCRIPTION IS PRELIMINARY AND IS SUBJECT TO CHANGE UPON COMPLIANCE WITH THE REQUIREMENTS UNDER SCHEDULE B-1, HEREIN.
****
LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
COUNTY OF GARFIELD, STATE OF COLORADO
PARCEL B:
EASEMENTS FOR UTILITIES, DRAINAGE AND ACCESS AS DESCRIBED AND DEPICTED IN RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 5, 17, 2012 UNDER RECEPTION NO. 818857 AND FIRST AMENDMENTS TO RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 18, 2017 UNDER RECEPTION NO. 892528.

FEMA FLOODPLAIN STATEMENT

PARCELS A & B ARE LOCATED WITHIN ZONE D ACCORDING TO FEMA MAP PANELS 0802051431B AND 0802051432B BOTH EFFECTIVE 01/03/1986. ACCORDING TO FEMA, NO ADDITIONAL DIGITAL DATA IS AVAILABLE IN THIS AREA.

PUBLIC IMPROVEMENTS STATEMENT

THE PUBLIC IMPROVEMENTS FOR THE ENTIRETY OF THE GLENWOOD MEADOWS SUBDIVISION HAVE BEEN SATISFIED AS MEMORIALIZED IN THE JULY 2013 MOU BETWEEN THE DEVELOPER (GLENWOOD MEADOWS, LLC) AND THE CITY OF GLENWOOD SPRINGS. THESE PUBLIC IMPROVEMENTS INCLUDED OFF-SITE TRAFFIC IMPROVEMENTS, ON- AND OFF-SITE PEDESTRIAN TRAIL IMPROVEMENTS, WATER RIGHTS CONVEYANCES, OFF-SITE RIVERTRAIL CONTRIBUTIONS, TRANSIT IMPROVEMENTS, AND PUBLIC OPEN SPACE DEDICATIONS. IN JUNE OF 2021 THE CITY OF GLENWOOD SPRINGS AND GLENWOOD MEADOWS, LLC ENTERED INTO A MOU THAT ADDED PUBLIC IMPROVEMENTS ABOVE AND BEYOND THE PREVIOUSLY SATISFIED REQUIREMENTS, INCLUDING INFRASTRUCTURE UPGRADES AND TRAFFIC IMPACT FEES. THE PROJECT PROPOSAL INCLUDES ON-SITE PUBLIC IMPROVEMENTS INCLUDING A SIDEWALK EXTENSION ALONG WULFSOHN ROAD, PUBLICLY-ACCESSIBLE TRAILHEADS TO OPEN SPACE, AND A PUBLICLY-AVAILABLE DAYCARE FACILITY.

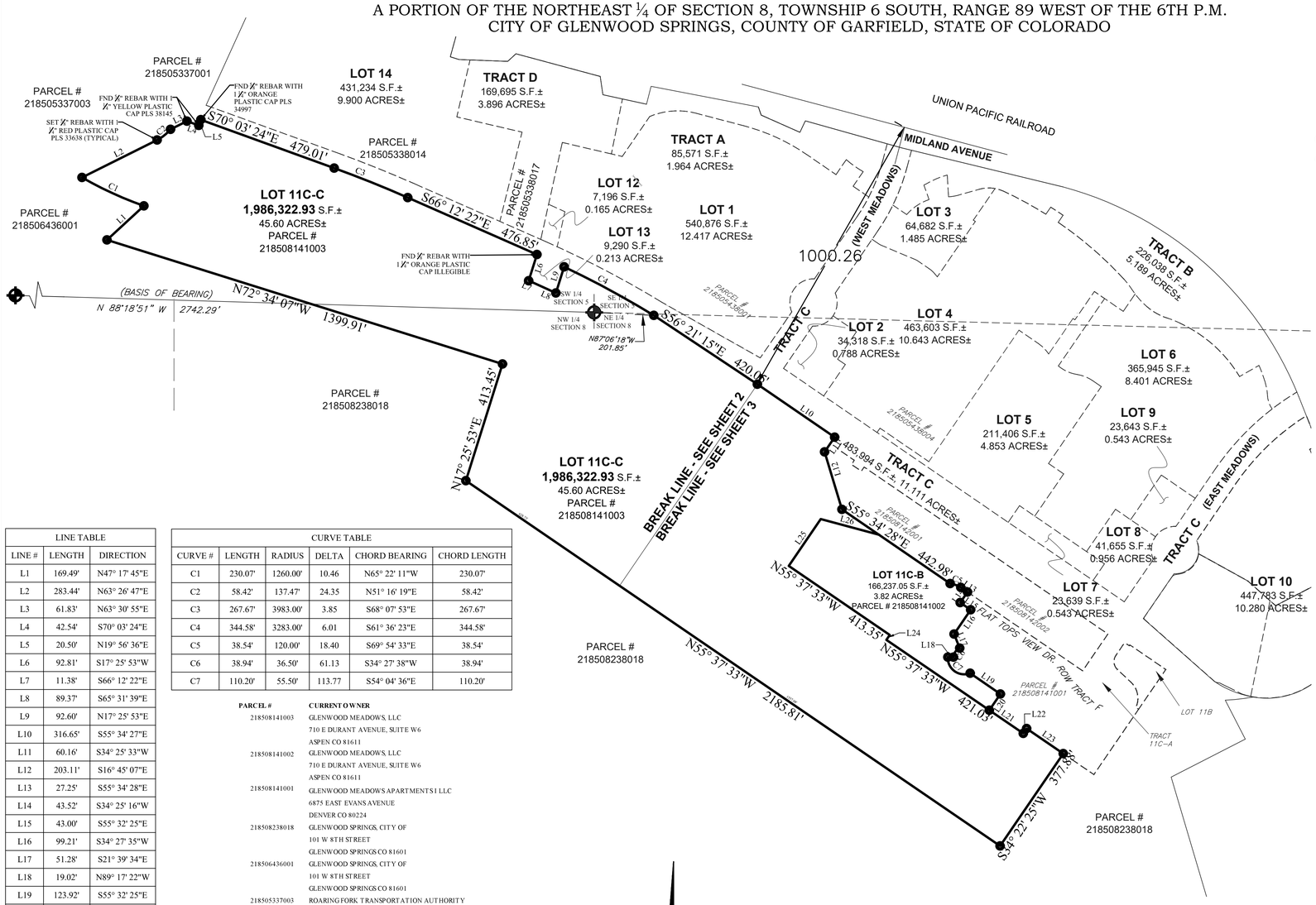
GEOLOGIC HAZARDS DISCLOSURE

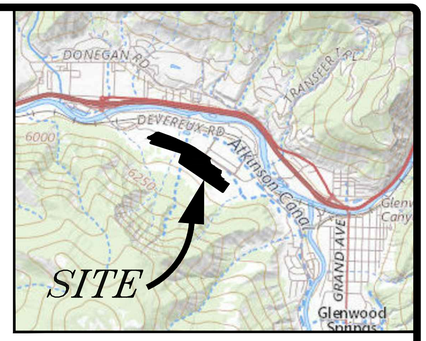
THE PROPERTY IS SUBJECT TO GEOLOGIC HAZARDS PER THE ADOPTED MAPPING BY THE CITY OF GLENWOOD SPRINGS. HAZARDS TO NOTE ARE SEVERE POTENTIAL FOR HYDROCOMPACTION, AND FOR OFF-SITE DEBRIS FLOW. A FINAL GEOLOGIC HAZARD REPORT WILL BE SUBMITTED UPON APPLICATION OF A BUILDING PERMIT.

ALTA/ACSM LAND TITLE SURVEY

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037

A PORTION OF THE NORTHEAST ¼ OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO





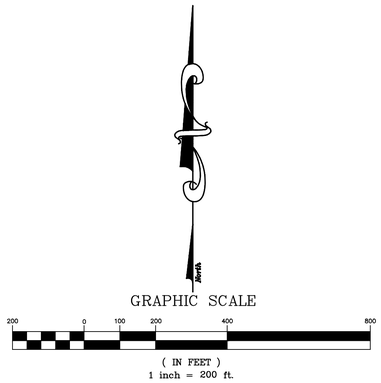
VICINITY MAP
SCALE: 1" = 3000'

LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	169.49'	N47° 17' 45"E
L2	283.44'	N63° 26' 47"E
L3	61.83'	N63° 30' 55"E
L4	42.54'	S70° 03' 24"E
L5	20.50'	N19° 56' 36"E
L6	92.81'	S17° 25' 53"W
L7	11.38'	S66° 12' 22"E
L8	89.37'	S65° 31' 39"E
L9	92.60'	N17° 25' 53"E
L10	316.65'	S55° 34' 27"E
L11	60.16'	S34° 25' 33"W
L12	203.11'	S16° 45' 07"E
L13	27.25'	S55° 34' 28"E
L14	43.52'	S34° 25' 16"W
L15	43.00'	S55° 32' 25"E
L16	99.21'	S34° 27' 35"W
L17	51.28'	S21° 39' 34"E
L18	19.02'	N89° 17' 22"W
L19	123.92'	S55° 32' 25"E
L20	66.33'	S34° 22' 27"W
L21	138.97'	S55° 37' 33"E
L22	20.00'	N34° 22' 25"E
L23	150.00'	S55° 37' 33"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L24	20.00'	N34° 22' 27"E
L25	191.73'	N34° 22' 04"E
L26	202.63'	S75° 00' 01"E

CURVE TABLE					
CURVE #	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD LENGTH
C1	230.07'	1260.00'	10.46	N65° 22' 11"W	230.07'
C2	58.42'	137.47'	24.35	N51° 16' 19"E	58.42'
C3	267.67'	3983.00'	3.85	S68° 07' 53"E	267.67'
C4	344.58'	3283.00'	6.01	S61° 36' 23"E	344.58'
C5	38.54'	120.00'	18.40	S69° 54' 33"E	38.54'
C6	38.94'	36.50'	61.13	S34° 27' 38"W	38.94'
C7	110.20'	55.50'	113.77	S54° 04' 36"E	110.20'

PARCEL #	CURRENT OWNER
218508141003	GLENWOOD MEADOWS, LLC 710 E DURANT AVENUE, SUITE W6 ASPEN CO 81611
218508141002	GLENWOOD MEADOWS, LLC 710 E DURANT AVENUE, SUITE W6 ASPEN CO 81611
218508141001	GLENWOOD MEADOWS APARTMENTS I LLC 6875 EAST EVANS AVENUE DENVER CO 80224
218508238018	GLENWOOD SPRINGS, CITY OF 101 W 8TH STREET GLENWOOD SPRINGS CO 81601
218506436001	GLENWOOD SPRINGS, CITY OF 101 W 8TH STREET GLENWOOD SPRINGS CO 81601
218505337003	ROARING FORK TRANSPORTATION AUTHORITY 0766 INDUSTRY WAY CARBONDALE CO 81623
218505337001	ROARING FORK TRANSPORTATION AUTHORITY 0051 SERVICE CENTER DRIVE ASPEN CO 81611
218505338014	CENTURA VENTURES LLC 9100 E MINERAL CIRCLE ENGLEWOOD CO 80112
218505338017	GLENWOOD SPRINGS, CITY OF 101 W 8TH STREET GLENWOOD SPRINGS CO 81601
218508142001	SC GLENWOOD I LLC 760 W MAIN STREET, STE 140 BARRINGTON IL 60010
218508142002	SC GLENWOOD II LLC 760 W MAIN STREET, STE 140 BARRINGTON IL 60010
218505438004	TARGET CORPORATION PO BOX 72028 PHOENIX AZ 85050
218505438001	WEINGARTEN MILLER GLENWOOD LLC 6900 EAST BELLEVIEW AVENUE SUITE 300 GREENWOOD VILLAGE CO 80111



LEGEND AND NOTES:

● - INDICATES FOUND MONUMENT AS DESCRIBED

◎ - INDICATES MONUMENT TO BE SET AS DESCRIBED

- DATE OF SURVEY: SEPTEMBER 5 - 8, 2020

- UNIT OF MEASUREMENT: US SURVEY FOOT

- ZONING DATA TO BE PROVIDED BY CLIENT

- PARCELS A & B ARE LOCATED WITHIN ZONE D ACCORDING TO FEMA MAP PANELS 0802051431B AND 0802051432B BOTH EFFECTIVE 01/03/1986. ACCORDING TO FEMA, NO ADDITIONAL DIGITAL DATA IS AVAILABLE IN THIS AREA.

- BEARINGS ARE BASED UPON A #5 REBAR WITH ALUMINUM CAP L.S. #5933 FOUND AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.

- THIS ALTA LAND TITLE SURVEY IS BASED UPON INFORMATION PROVIDED BY LAND TITLE GUARANTEE COMPANY IN ORDER NUMBER ABS63015235-4 DATED AUGUST 26, 2020. THIS PROPERTY IS SUBJECT TO THE FOLLOWING EXCEPTIONS PER SAID ORDER NUMBER ABS63015235-4:

8. EXISTING LEASES AND TENANCIES, IF ANY. **NOTHING TO PLOT.**

9. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 268. **NOTHING TO PLOT.**

10. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 269. **NOTHING TO PLOT.**

11. EASEMENTS AND RIGHTS OF WAY AS GRANTED TO THE MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY IN INSTRUMENT RECORDED JUNE 25, 1936 IN BOOK 183 AT PAGE 430. **NOTHING TO PLOT.**

12. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 270. **NOTHING TO PLOT.**

13. (THIS ITEM WAS INTENTIONALLY DELETED) **NOTHING TO PLOT.**

14. TERMS, CONDITIONS AND PROVISIONS OF ANNEXATION AND DEVELOPMENT AGREEMENT RECORDED DECEMBER 06, 2002 IN BOOK 1414 AT PAGE 526 AND THE AMENDMENT RECORDED MAY 6, 2004 IN BOOK 1585 AT PAGE 438 AND THE AMENDED AGREEMENT RECORDED JULY 26, 2004 IN BOOK 1607 AT PAGE 895 AND THIRD AMENDMENT RECORDED DECEMBER 2, 2010 UNDER RECEPTION 795138 AND AMENDED AND RESTATED THIRD AMENDMENT RECORDED AUGUST 16, 2011 UNDER RECEPTION NO. 806719 AND RERECORDED AUGUST 18, 2011 UNDER RECEPTION NO. 806794 AND FOURTH AMENDMENT RERECORDED AUGUST 8, 2013 UNDER RECEPTION NO. 839074 AND FOURTH AMENDMENT RERECORDED APRIL 10, 2015 UNDER RECEPTION NO. 861345. **NOTHING TO PLOT.**

NOTE: INCLUSIONARY HOUSING CREDITS ASSIGNMENT IN CONNECTION WITH THE ABOVE AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION NO. 818854. MEMORANDUM OF UNDERSTANDING RECORDED JULY 18, 2013 UNDER RECEPTION NO. 838187

15. (THIS ITEM WAS INTENTIONALLY DELETED) **NOTHING TO PLOT.**

16. EASEMENTS AND NOTES AS SHOWN ON THE PLAT FOR GLENWOOD MEADOWS NO. 2, RECORDED AUGUST 9, 2004 UNDER RECEPTION NO. 657439. **PLOTTED HEREON.**

17. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 4 RECORDED OCTOBER 28, 2009 UNDER RECEPTION NO. 776958. **UNCLEAR DOCUMENTS, UNABLE TO EVALUATE.**

18. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 5 RECORDED MAY 17, 2010 UNDER RECEPTION NO. 818851. **PLOTTED HEREON.**

19. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 4 - LOT LINE ADJUSTMENT RECORDED MARCH 13, 2012 UNDER RECEPTION NO. 815777. **PLOTTED HEREON.**

20. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN AGREEMENT RECORDED JUNE 29, 2012 UNDER RECEPTION NO. 820756. **NOTHING TO PLOT.**

21. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN AGREEMENT RECORDED JUNE 29, 2012 UNDER RECEPTION NO. 820755. **NOTHING TO PLOT.**

22. TERMS, CONDITIONS, PROVISIONS, BURDENS, OBLIGATIONS AND EASEMENTS AS SET FORTH AND GRANTED IN RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION 818857. **NOTHING TO PLOT.**

EASEMENT MODIFICATION RECORDED MAY 18, 2017 UNDER RECEPTION NO. 892528.

23. TERMS, CONDITIONS, PROVISIONS, BURDENS, OBLIGATIONS AND EASEMENTS AS SET FORTH AND GRANTED IN ACCESS AND MAINTENANCE AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION 818859. **PLOTTED HEREON.**

24. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN DEVELOPMENT AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION NO. 818856 AND AMENDMENT RECORDED MAY 18, 2017 AT RECEPTION NO. 892527. **NOTHING TO PLOT.**

25. (THIS ITEM WAS INTENTIONALLY DELETED). **NOTHING TO PLOT.**

26. (THIS ITEM WAS INTENTIONALLY DELETED). **NOTHING TO PLOT.**

27. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 6 RECORDED SEPTEMBER 7, 2017 UNDER RECEPTION NO. 897037. **PLOTTED HEREON.**

28. (THIS ITEM WAS INTENTIONALLY DELETED). **NOTHING TO PLOT.**

LEGAL DESCRIPTION:

PARCEL A:

****
NOTE: THE FOLLOWING LEGAL DESCRIPTION IS PRELIMINARY AND IS SUBJECT TO CHANGE UPON COMPLIANCE WITH THE REQUIREMENTS UNDER SCHEDULE B-1, HEREIN.
****

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
COUNTY OF GARFIELD, STATE OF COLORADO

PARCEL B:

EASEMENTS FOR UTILITIES, DRAINAGE AND ACCESS AS DESCRIBED AND DEPICTED IN RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 5, 17, 2012 UNDER RECEPTION NO. 818857 AND FIRST AMENDMENTS TO RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 18, 2017 UNDER RECEPTION NO. 892528.

SURVEYOR'S CERTIFICATE:

TO:
BLD GROUP, LLC,
ALPINE BANK,
AND LAND TITLE GUARANTEE COMPANY
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

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, 6(B), 8, 11, 13, 14, 16, 17, 18, AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 28, 2020 DATE OF PLAT OR MAP: SEPTEMBER 2-8, 2020.

COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

09/16/2020
JEFFREY ALLEN TUTTLE L.S. 33638 — DATE

NOTICE: ACCORDING TO COLORADO LAW, YOU **MUST** COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER 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.

TUTTLE SURVEYING SERVICES
923 COOPER AVENUE
GLENWOOD SPRINGS, COLORADO 81601
(970) 928-9708 (FAX 947-9007)
Email- jeff@tss-us.com

TUTTLE SURVEYING SERVICES

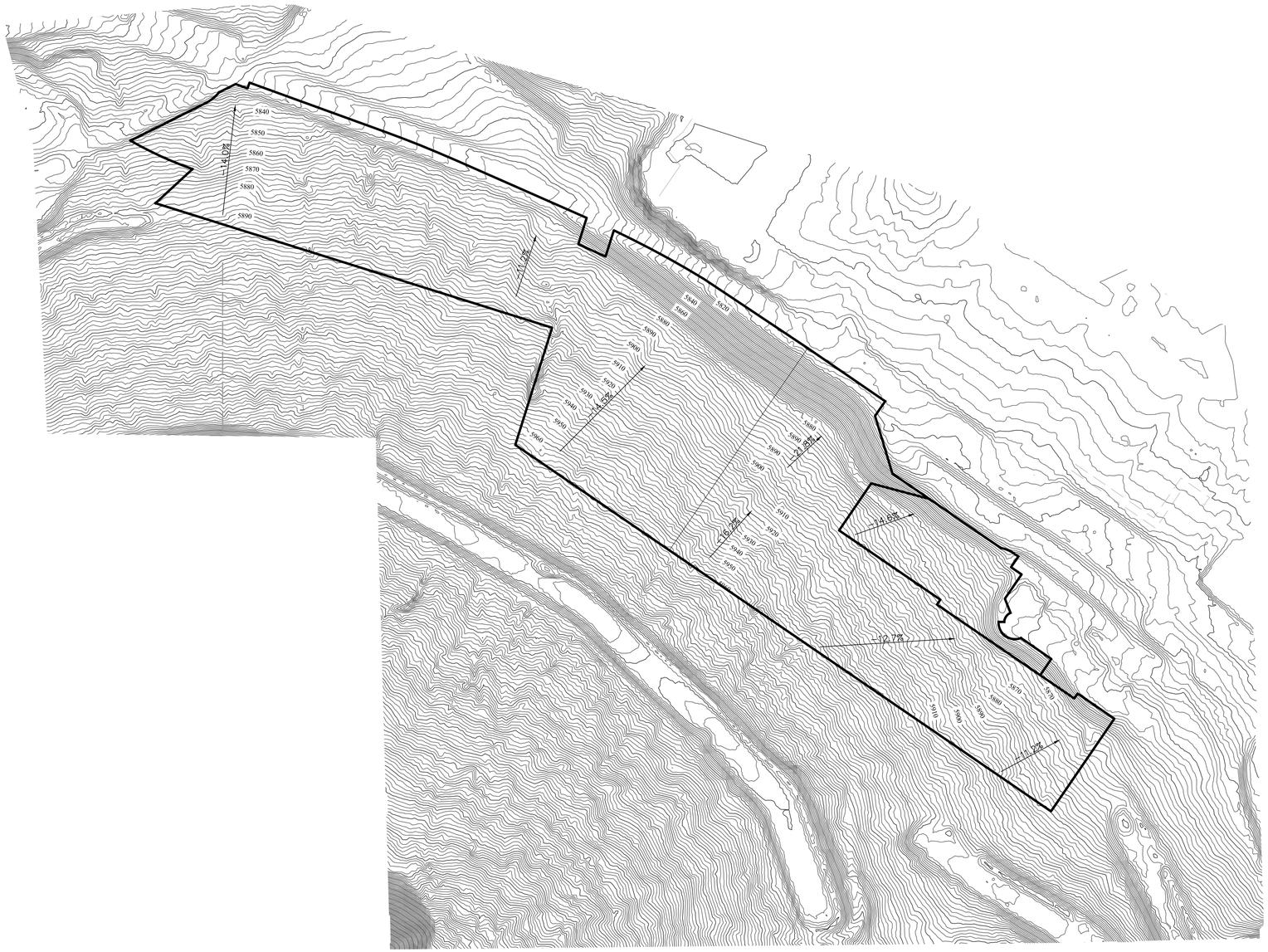
ALTA/ACSM LAND TITLE SURVEY

TBD GLENWOOD MEADOWS
GLENWOOD SPRINGS, CO 81647

DRAWN BY: JG
DATE: 09/16/2020

ALTA/ACSM LAND TITLE SURVEY

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
A PORTION OF THE NORTHEAST ¼ OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO



GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

NOTES:

CONTOUR DATA OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA,
STATE PLAIN NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY
IN AREAS CRITICAL TO DESIGN.

SURVEYOR'S CERTIFICATE:

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ALPINE BANK,
AND LAND TITLE GUARANTEE COMPANY
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DATE OF PLAT OR MAP: SEPTEMBER 2-8, 2020.

COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

JEFFREY ALLEN TUTTLE L.S. 33638 — 09/16/2020 DATE

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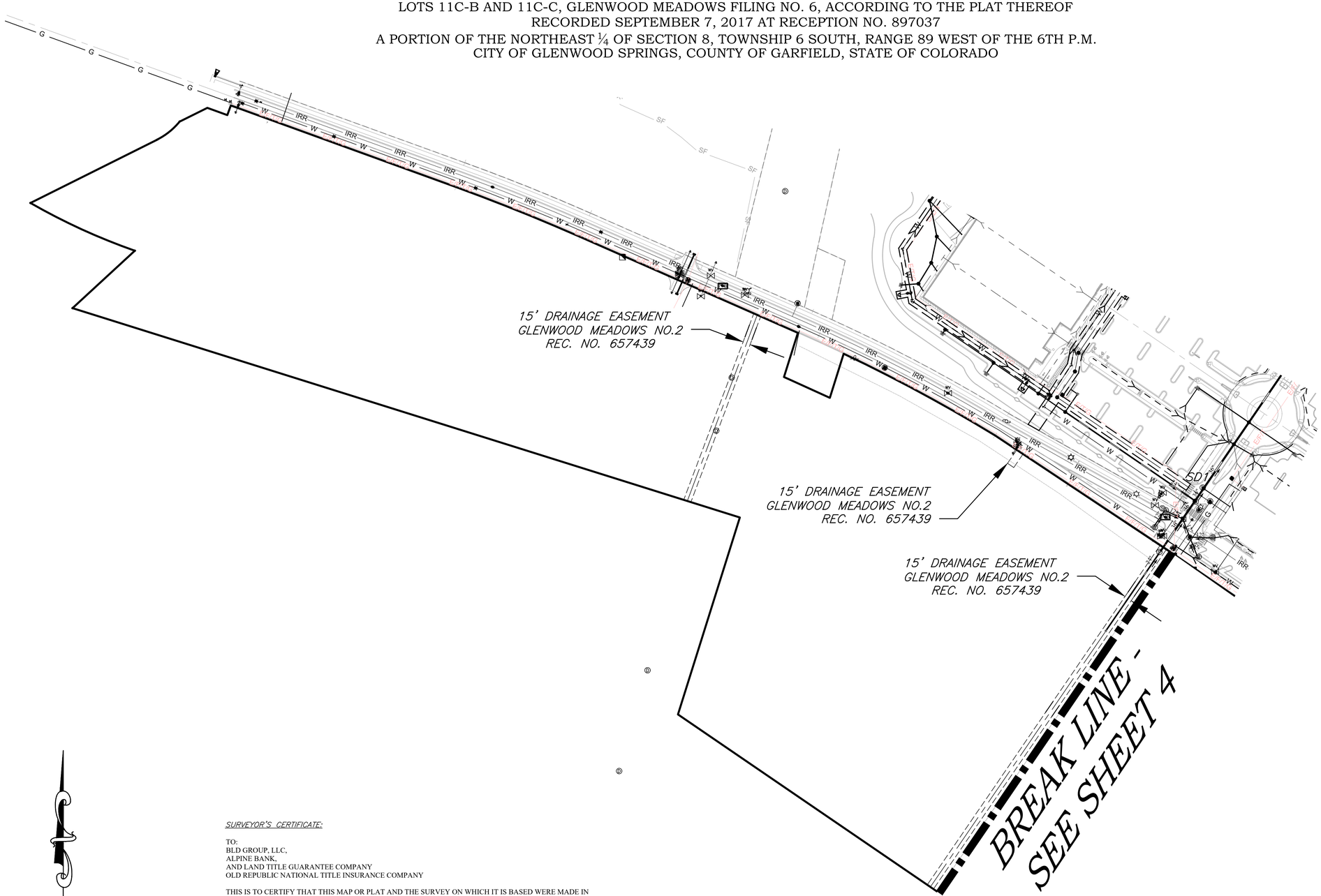
ALTA/ACSM LAND TITLE SURVEY

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GLENWOOD SPRINGS, CO 81647

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CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO



LEGEND

- TV PEDESTAL
- ELECTRICAL TRANS
- CLEAN–OUT
- WATER VALVE
- TELE. PEDESTAL
- ELEC. PEDESTAL
- SET #5 REBAR & CAP L.S. NO. 33638
- FOUND PROPERTY CORNER AS DESCRIBED
- UTILITY POLE/ POWER POLE
- ANCHOR
- TELE. VAULT
- ELECT. VAULT
- LIGHT POLE
- MARKER/ SIGN
- HANDICAP
- FIRE HYDRANT
- WATER SHUTOFF
- GAS VALVE
- SAN. SEWER MH
- ST. SEWER MH
- ELECT. MH
- TELEPHONE MH
- WATER MH
- WATER METER
- GAS METER
- ELECTRICAL METER
- STORM GRATE
- ELECTRIC MARKER
- GAS MARKER
- IRRIGATION VALVE BOX

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SURVEYOR'S CERTIFICATE:

TO:
BLD GROUP, LLC,
ALPINE BANK,
AND LAND TITLE GUARANTEE COMPANY
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

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COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

09/16/2020
JEFFREY ALLEN TUTTLE L.S. 33638 — DATE

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TUTTLE SURVEYING SERVICES

ALTA/ACSM LAND TITLE SURVEY

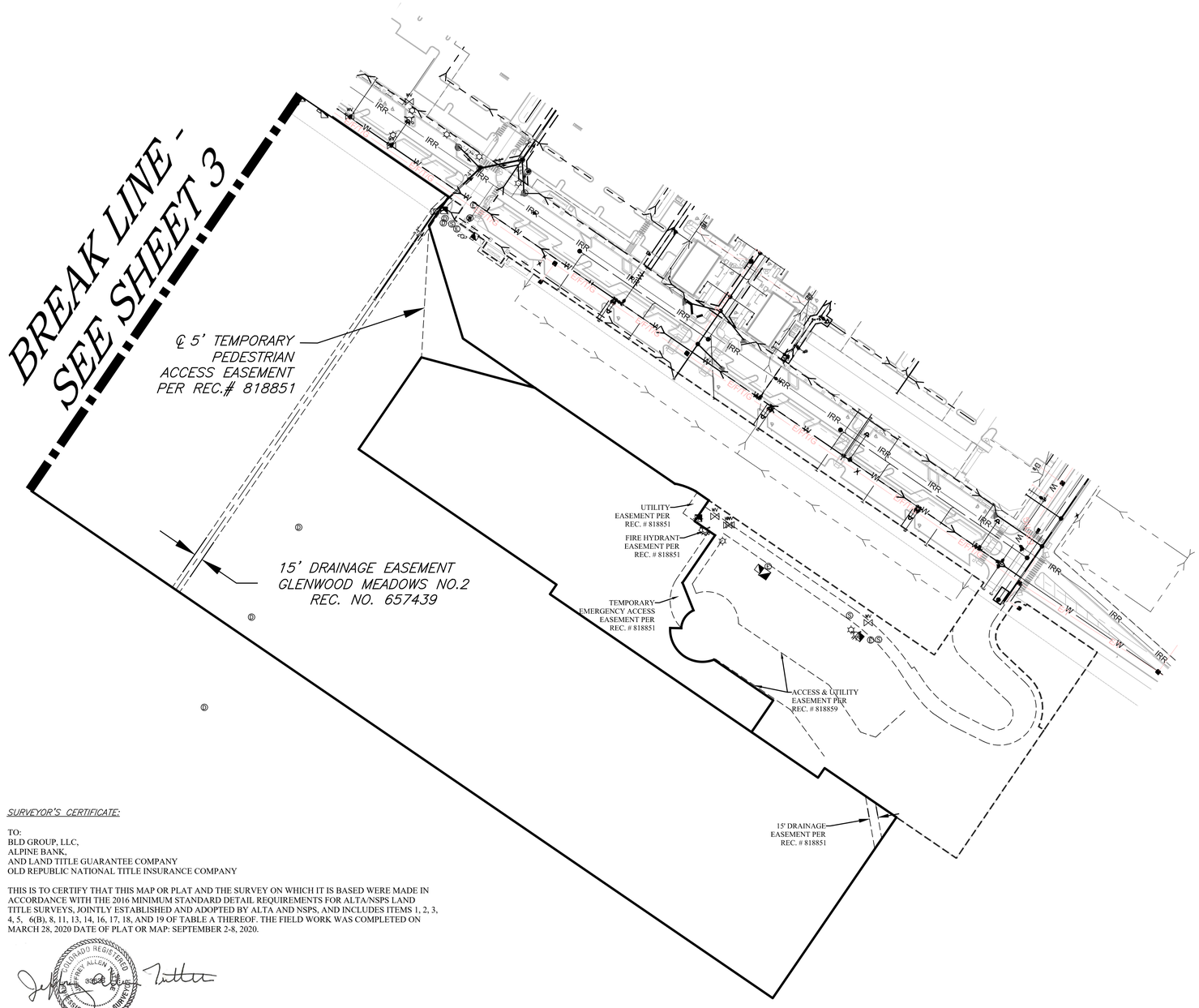
TBD GLENWOOD MEADOWS
GLENWOOD SPRINGS, CO 81647

DRAWN BY: JG
DATE: 09/16/2020

3 OF 4

ALTA/ACSM LAND TITLE SURVEY

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
A PORTION OF THE NORTHEAST ¼ OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO



LEGEND

- TV PEDESTAL
- ELECTRICAL TRANS
- CLEAN–OUT
- WATER VALVE
- TELE. PEDESTAL
- ELEC. PEDESTAL
- SET #5 REBAR & CAP L.S. NO. 33638
- FOUND PROPERTY CORNER AS DESCRIBED
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- WATER METER
- GAS METER
- ELECTRICAL METER
- STORM GRATE
- ELECTRIC MARKER
- GAS MARKER
- IRRIGATION VALVE BOX

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SURVEYOR'S CERTIFICATE:

TO:
BLD GROUP, LLC,
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COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

JEFFREY ALLEN TUTTLE L.S. 33638 — 09/16/2020 DATE

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TUTTLE SURVEYING SERVICES

ALTA/ACSM LAND TITLE SURVEY

TBD GLENWOOD MEADOWS
GLENWOOD SPRINGS, CO 81647

DRAWN BY: JC
DATE: 09/16/2020

4 OF 4

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

WULFSOHN RD.

INSTALL NEW LOT 14 CURB CUT ACROSS FORM PROPOSED ACCESS

EXISTING CURB CUT TO BE REMOVED. INSTALL 74–LF, 24–IN STANDARD CURB & GUTTER. EXISTING UTILITY STUBS TO REMAIN

TW: 5887.68
BW: 5882.68

TW: 5893.15
BW: 5888.03

TW: 5882.68
BW: 5876.68

TW: 5886.47
BW: 5880.58

TW: 5883.94
BW: 5878.01

TW: 5881.44
BW: 5877.32

TW: 5912.01
BW: 5906.23

TW: 5917.85
BW: 5915.77

TW: 5923.68
BW: 5919.24

TW: 5938.20
BW: 5934.75

TW: 5938.72
BW: 5923.16

TW: 5919.18
BW: 5917.85

TW: 5940.21
BW: 5938.75

TW: 5922.03
BW: 5919.99

TW: 5928.46
BW: 5928.72

TW: 5945.11
BW: 5941.65

TW: 5944.85
BW: 5938.85

TW: 5938.34
BW: 5932.34

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN–OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
	FIRE HYDRANT	BEND W/THRUST BLOCK
	WATER VALVE	FIRE HYDRANT
	WATER MANHOLE	INLET
	GAS METER	CURB INLET
	TELEPHONE PEDESTAL	STORM MANHOLE
	LIGHT POLE	SANITARY MANHOLE
	UTILITY POLE	SANITARY CLEANOUT
	SIGN	CABLE MANHOLE
		ELECTRIC MANHOLE
		ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT–OF–WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS SS	SS SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
STORM SEWER		
CONTOUR	6158	6158

NOTES

1. SURVEY COMPLETED BY TUTTLE SURVEYING SERVICES. REFER TO ALTA/ASCM LAND TITLE SURVEY DATED 10/08/20 FOR EXISTING CONDITIONS INFORMATION. DATE OF SURVEY SEPTEMBER 5–8, 2020.
2. BASIS OF BEARINGS: #5 REBAR WITH ALUMINUM CAP LS #5933 AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.
3. CONTOUR INFORMATION OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA, STATE PLANE NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY IN AREAS CRITICAL TO DESIGN.

COLORADO 811
CALL BEFORE YOU DIG
Utility Notification Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG
4	8/13/21	MAJOR SITE / ARCH. REVIEW #4	MGG

DRAWN BY: MGG
CHECKED BY: MGG
DATE: 8/13/2021
FILE:
SCALE 1" = 40'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101,
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 · FAX (970) 945-2555
WWW.HCENG.COM

BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY GRADING PLAN
SHEET 1

PROJECT NO.
2201044.00

GR1

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PRELIMINARY
NOT FOR
CONSTRUCTION

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN-OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
	FIRE HYDRANT	BEND W/THRUST BLOCK
	WATER VALVE	FIRE HYDRANT
	WATER MANHOLE	INLET
	GAS METER	CURB INLET
	TELEPHONE PEDESTAL	STORM MANHOLE
	LIGHT POLE	SANITARY MANHOLE
	UTILITY POLE	SANITARY CLEANOUT
	SIGN	CABLE MANHOLE
		ELECTRIC MANHOLE
		ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT-OF-WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS	SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
STORM SEWER		
CONTOUR	6158	6158

NOTES:

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DRAWN BY: MGG
CHECKED BY: MGG
DATE:
FILE: SCALE 1" = 40'

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BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY GRADING PLAN
SHEET 2

PROJECT NO.
2201044.00

GR2

PRELIMINARY
NOT FOR
CONSTRUCTION

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

WULFSOHN RD.

CONNECT TO EXISTING IRRIGATION MAIN PER CITY OF GLENWOOD SPRINGS STANDARDS

CONNECT TO EXISTING WATERMAIN PER CITY OF GLENWOOD SPRINGS STANDARDS

EXISTING WATERMAIN STUBS TO BE ABANDONED PER CITY OF GLENWOOD SPRINGS STANDARDS

EXISTING IRRIGATION STUBS TO BE ABANDONED PER CITY OF GLENWOOD SPRINGS STANDARDS

INSTALL NEW MANHOLE ON EXISTING STORM SEWER

249.99'–12" HDPE @ 2.31%

EXISTING CURB CUT TO BE REMOVED

24.06'–12" HDPE @ 1.00%

12.19'–15" HDPE @ 19.23%

CONNECT TO EXISTING STORM SEWER STRUCTURE

116.60'–15" HDPE @ 17.79%

14.00'–12" HDPE @ 2.00%

229.99'–12" HDPE @ 0.75%

229.98'–12" HDPE @ 0.75%

14.00'–12" HDPE @ 2.00%

14.00'–12" HDPE @ 5.70%

EXISTING 24" STORM PIPE "1B"

INSTALL MANHOLE ON EXISTING STORM SEWER

144.48'

134.80'–12" HDPE @ 4.00%

333.20'–12" HDPE @ 1.09%

333.20'–12" HDPE @ 1.09%

400.00'–8" PVC @ 1.10%

227.44'–8" PVC @ 1.10%

8" D.I.P. WATER MAIN

SAN–MH8

SAN–MH7

63.43'–12" HDPE @ 2.24%

24.00'–12" HDPE @ 1.00%

141.58'–12" HDPE @ 6.97%

62.32'–12" HDPE @ 3.62%

24.00'–12" HDPE

95.95'–12" HDPE @ 9.05%

116.56'–12" HDPE @ 10.77%

11.0' TYP.
10. MIN.

6" PVC SANITARY SERVICE, TYP.

6" D.I.P. WATER SERVICE, TYP.

51.17'–12" HDPE @ 4.12%

260.75'–8" PVC @ 1.13%

8" D.I.P. WATER MAIN

SAN–MH14

SEE SHEET 2

358.86'–12" HDPE @ 6.00%

56.04'–12" HDPE @ 6.00%

24.00'–12" HDPE @ 6.00%

138.99'–12" HDPE @ 6.00%

COMBINED FIRE/DOMESTIC WATER SERVICE CONNECTIONS TO BE NFPA24 COMPLIANT, TYP.

EXISTING STORM SEWER TO BE ABANDONED/REMOVED

8" D.I.P. WATER MAIN

INSTALL MANHOLE ON EXISTING STORM SEWER

LEGEND

EXISTING	PROPOSED
STORM MANHOLE	WATER SHUTOFF VALVE
SANITARY CLEAN–OUT	WATER VALVE
SANITARY MANHOLE	TEE W/THRUST BLOCK
FIRE HYDRANT	BEND W/THRUST BLOCK
WATER VALVE	FIRE HYDRANT
WATER MANHOLE	INLET
GAS METER	CURB INLET
TELEPHONE PEDESTAL	STORM MANHOLE
LIGHT POLE	SANITARY MANHOLE
UTILITY POLE	CABLE MANHOLE
SIGN	ELECTRIC VAULT
	ELECTRIC TRANSFORMER

BOUNDARY
RIGHT–OF–WAY
EASEMENT
STRUCTURE
ASPHALT
GRAVEL
CONCRETE
RETAINING WALL
CENTERLINE ROAD
CURB AND GUTTER
FLOWLINE
PAVEMENT STRIPING
WATER MAIN
WATER SERVICE
SEWER MAIN
SEWER SERVICE
OVERHEAD ELECTRIC
ELECTRIC
CATV
TELEPHONE
GAS
IRRIGATION
STORM SEWER

NOTES

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4. ALL COMBINED FIRE/DOMESTIC WATER SERVICES SHALL BE NFPA24 COMPLIANT.
5. PUBLICLY DEDICATED UTILITIES SHALL HAVE UTILITY EASEMENT FOR ACCESS AND MAINTENANCE.
6. ALL FIRE HYDRANTS TO HAVE 15' EASEMENT FOR ACCESS AND MAINTENANCE.
7. ALL UTILITY EASEMENTS TO BE SHOW AN FINALIZED ON PERMIT PLANS.
8. ALL WET UTILITIES WILL REQUIRE JOINTS/BELLS WITHIN ENTIRE PROJECT AREA.
9. ALL UNUSED UTILITY STUBS SHALL BE ABANDONED PER COGS STANDARDS.

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SCALE 1" = 40'

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BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY PLAN
SHEET 1

PROJECT NO.
2201044.00

UT1

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

CONNECT TO IRRIGATION STUB PER CITY OF GLENWOOD SPRINGS STANDARDS

CONNECT TO WATERMAIN STUB PER CITY OF GLENWOOD SPRINGS STANDARDS

EXISTING SANITARY MANHOLE TO BE REMOVED

EXISTING 24" STORM PIPE "1C"

INSTALL MANHOLE ON EXISTING STORM SEWER

8.45'–12" HDPE @ 2.00%

162.17'–12" HDPE @ 1.00%

EXISTING STORM STRUCTURES TO BE REMOVED BETWEEN NEW STORM SEWER, TYP.

FLAT TOPS VIEW DR.

57.66'–8" PVC @ 13.94%

SAN–MH1

INSTALL NEW SANITARY MANHOLE PER CITY OF GLENWOOD SPRINGS STANDARDS

SAN–MH3

144.71'–8" PVC @ 4.74%

194.90'–8" PVC @ 5.62%

24.04'–12" HDPE @ –1.00%

5" D.I.P. WATER MAIN

SAN–MH4

SAN–MH2

148.42'–12" HDPE @ –1.00%

172.26'–8" PVC @ 0.40%

246.66'–8" PVC @ 0.40%

SAN–MH6

SAN–MH5

62.59'–12" HDPE @ 1.00%

60.25'–12" HDPE @ –8.63%

CONNECT TO EXISTING STORM INLET PER CITY OF GLENWOOD SPRINGS STANDARDS

58.94'–8" PVC @ 4.80%

SAN–MH9

11.0' TYP. 10' MIN.

27.38'–12" HDPE @ 1.00%

192.09'–8" PVC @ 7.95%

172.71'–12" HDPE @ 8.85%

24.00'–12" HDPE @ –1.00%

33.20'–8" PVC @ 5.83%

SAN–MH10

42.16'–12" HDPE @ 8.53%

SAN–MH12

216.91'–12" HDPE @ 5.65%

70.74'–12" HDPE @ 0.98%

247.80'–8" PVC @ 1.10%

SAN–MH13

8" D.I.P. WATER MAIN

222.33'–8" PVC @ 5.83%

SAN–MH11

6" PVC SANITARY SERVICE, TYP.

EXISTING STORM PIPE TO BE ABANDONED/REMOVED, TYP.

184.67'–12" HDPE @ 3.14%

24.00'–12" HDPE @ 1.00%

16" D.I.P. WATER SERVICE, TYP.

8" D.I.P. WATER MAIN

234.00'–12" HDPE @ –5.00%

45.18'–12" HDPE @ 1.00%

200.51'–12" HDPE @ 10.53%

48.69'–12" HDPE @ 2.00%

28.24'–12" HDPE @ 8.33%

COMBINED FIRE/DOMESTIC WATER SERVICE CONNECTIONS TO BE NFPA24 COMPLIANT, TYP.

60.33'–12" HDPE @ 12.31%

93.82'–12" HDPE @ 2.14%

INSTALL MANHOLE ON EXISTING STORM SEWER

EXISTING 12" STORM PIPE

EXISTING 12" STORM PIPE "1C"

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN–OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
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	WATER VALVE	FIRE HYDRANT
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	TELEPHONE PEDESTAL	STORM MANHOLE
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		ELECTRIC VAULT
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BOUNDARY		
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GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS SS	SS SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
IRRIGATION		IRR
STORM SEWER		

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GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY PLAN
SHEET 2

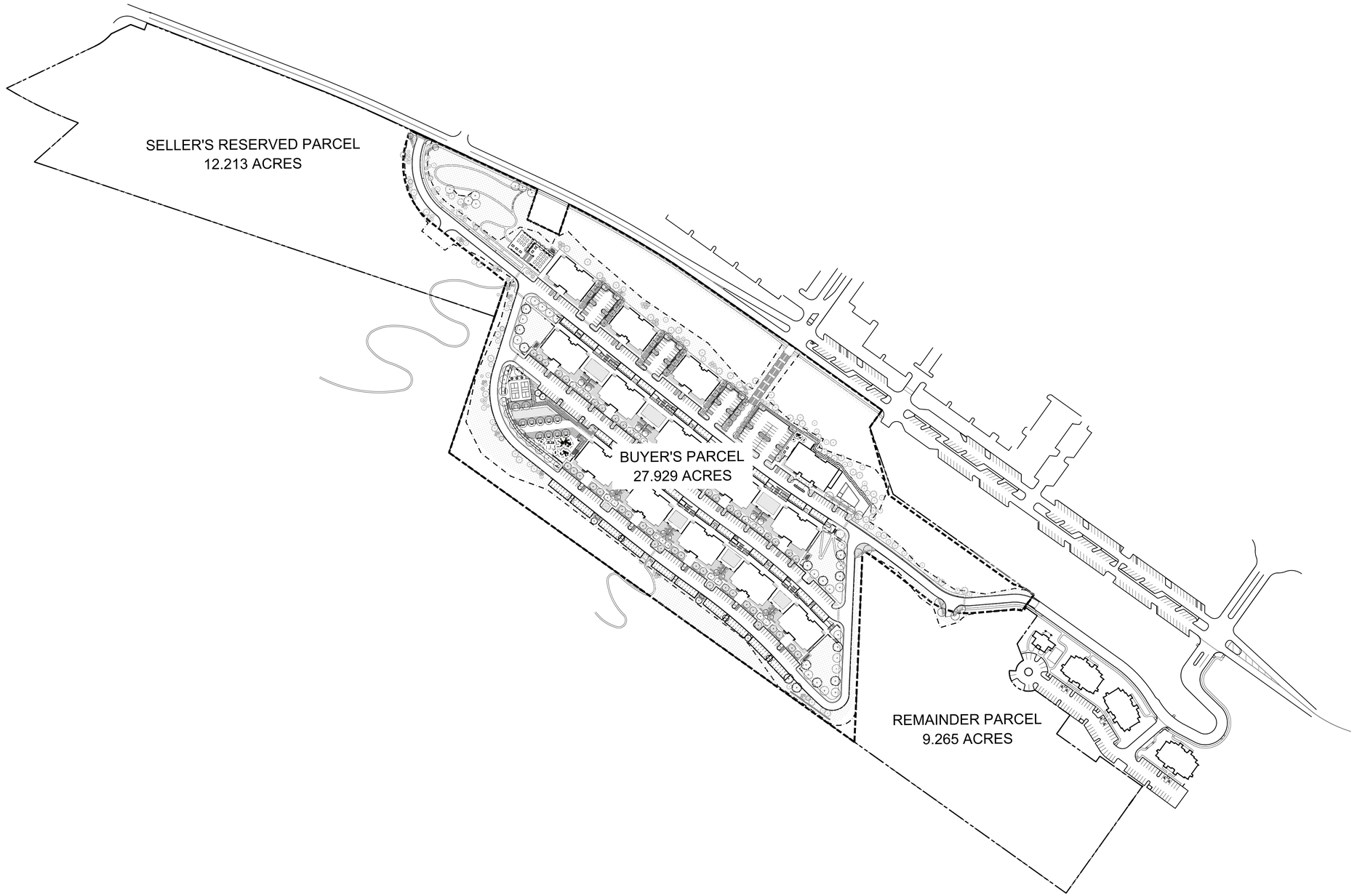
PROJECT NO.
2201044.00

UT2

IMAGES
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2019\10_3D Modeling\3_Renderings\2021\0923 - Updated Renderings\11.jpg
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2019\10_3D Modeling\3_Renderings\2021\0923 - Updated Renderings\12.jpg
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2019\10_3D Modeling\3_Renderings\2021\0923 - Updated Renderings\13.jpg
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P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2019\10_3D Modeling\3_Renderings\2021\0811 Progress Set\GM_GraphicSet_16 - Photo.jpg
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XREFS
X-SITE IMPROVEMENTS [\\Vrets\V-SITE IMPROVEMENTS PHASE 1.dwg]
X-CIVIL PHASE 1 GRADING [\\Vrets\V-CIVIL PHASE 1 GRADING.dwg]
X-CIVIL PHASE 1 UTILITIES [\\Vrets\V-CIVIL PHASE 1 UTILITIES.dwg]
X-PROPOSED ROAD [\\Vrets\V-PROPOSED ROAD.dwg]
X-BUILDING PAD [\\Vrets\V-BUILDING PAD.dwg]
X-CS-ST [\\Vrets\V-CS-ST.dwg]
X-LANDSCAPE [\\Vrets\V-LANDSCAPE.dwg]
X-CIVIL ROAD [\\Vrets\V-CIVIL ROAD.dwg]
X-CIVIL PHASE 2 [\\Vrets\V-CIVIL PHASE 2.dwg]
X-CIVIL PHASE 2 GRADING [\\Vrets\V-CIVIL PHASE 2 GRADING.dwg]
X-CIVIL PHASE 2 UTILITIES [\\Vrets\V-CIVIL PHASE 2 UTILITIES.dwg]
X-PARCEL LINE [\\Vrets\V-PARCEL LINE.dwg]
X-SITE TRUCK [\\Vrets\V-SITE TRUCK.dwg]

NAME
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2019\9_Land Use Permit Revision\CAD\Sheets\SITE PLAN SUBMITTAL.dwg
LAYOUT: 36 x 24 - 1:30PM



DHM DESIGN
311 Main Street
#102
Carbondale, Co. 81623
970.963.6520
www.dhmdesign.com

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NOT FOR CONSTRUCTION

GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

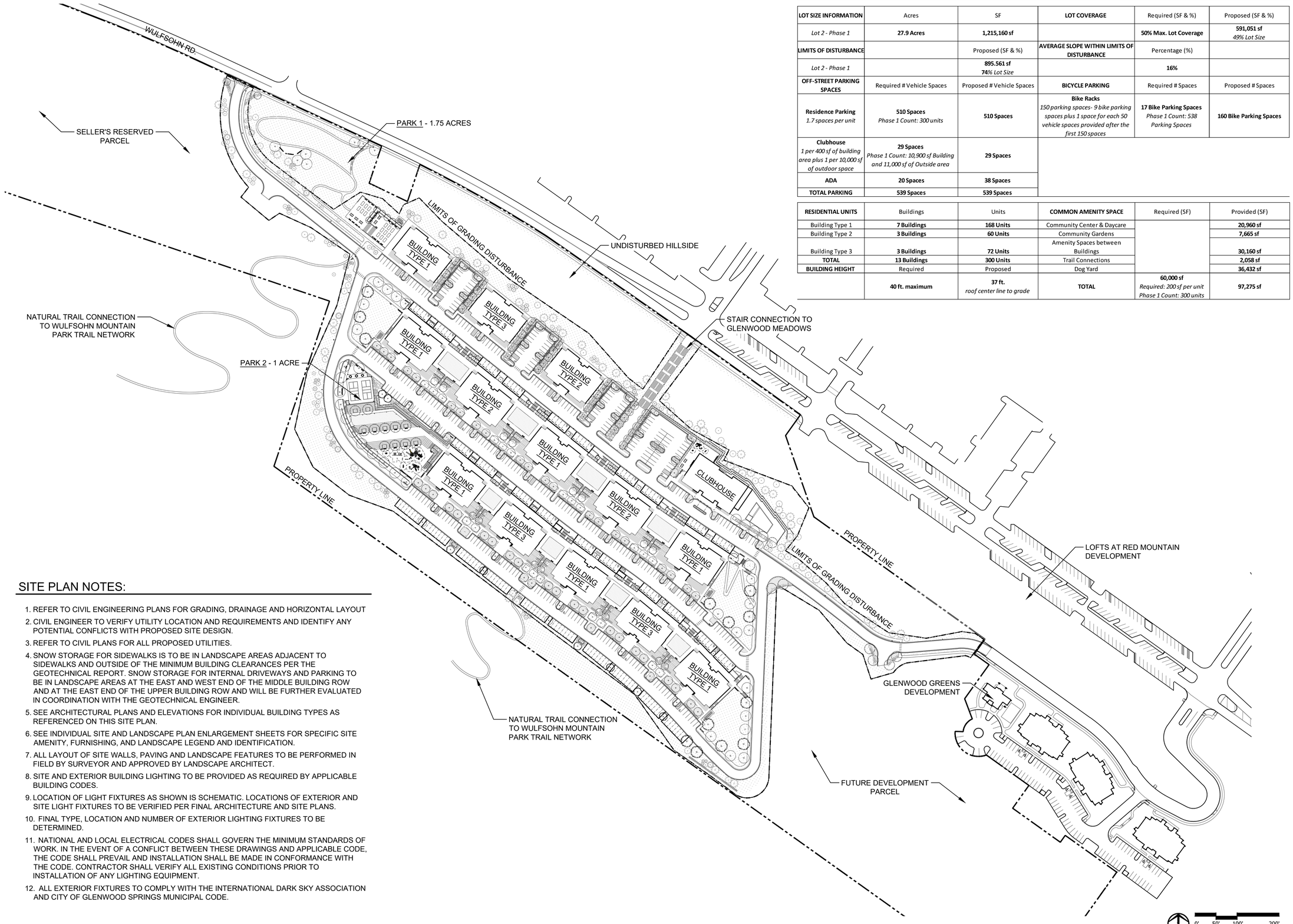
JOB DESCRIPTION:
MAJOR SITE /
ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN

SCALE:

SHEET NUMBER:
L1.0

SHEET_____OF_____



UNIT AND SITE AMENITY DATA:

LOT SIZE INFORMATION	Acres	SF	LOT COVERAGE	Required (SF & %)	Proposed (SF & %)
Lot 2 - Phase 1	**27.9 Acres**	**1,215,160 sf**		**50% Max. Lot Coverage**	**591,051 sf** *49% Lot Size*
LIMITS OF DISTURBANCE		Proposed (SF & %)	**AVERAGE SLOPE WITHIN LIMITS OF DISTURBANCE**	Percentage (%)	
Lot 2 - Phase 1		**895.561 sf** **74**% *Lot Size*		**16%**	
OFF-STREET PARKING SPACES	Required # Vehicle Spaces	Proposed # Vehicle Spaces	**BICYCLE PARKING**	Required # Spaces	Proposed # Spaces
Residence Parking *1.7 spaces per unit*	**510 Spaces** *Phase 1 Count: 300 units*	**510 Spaces**	**Bike Racks** *150 parking spaces- 9 bike parking spaces plus 1 space for each 50 vehicle spaces provided after the first 150 spaces*	**17 Bike Parking Spaces** *Phase 1 Count: 538 Parking Spaces*	**160 Bike Parking Spaces**
Clubhouse *1 per 400 sf of building area plus 1 per 10,000 sf of outdoor space*	**29 Spaces** *Phase 1 Count: 10,900 sf Building and 11,000 sf of Outside area*	**29 Spaces**			
ADA	**20 Spaces**	**38 Spaces**			
TOTAL PARKING	**539 Spaces**	**539 Spaces**			

RESIDENTIAL UNITS	Buildings	Units	COMMON AMENITY SPACE	Required (SF)	Provided (SF)
Building Type 1	**7 Buildings**	**168 Units**	Community Center & Daycare		**20,960 sf**
Building Type 2	**3 Buildings**	**60 Units**	Community Gardens		**7,665 sf**
Building Type 3	**3 Buildings**	**72 Units**	Amenity Spaces between Buildings		**30,160 sf**
TOTAL	**13 Buildings**	**300 Units**	Trail Connections		**2,058 sf**
BUILDING HEIGHT	Required	Proposed	Dog Yard		**36,432 sf**
	40 ft. maximum	**37 ft.** *roof center line to grade*	**TOTAL**	**60,000 sf** *Required: 200 sf per unit* *Phase 1 Count: 300 units*	**97,275 sf**

SITE PLAN NOTES:

1. REFER TO CIVIL ENGINEERING PLANS FOR GRADING, DRAINAGE AND HORIZONTAL LAYOUT
2. CIVIL ENGINEER TO VERIFY UTILITY LOCATION AND REQUIREMENTS AND IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED SITE DESIGN.
3. REFER TO CIVIL PLANS FOR ALL PROPOSED UTILITIES.
4. SNOW STORAGE FOR SIDEWALKS IS TO BE IN LANDSCAPE AREAS ADJACENT TO SIDEWALKS AND OUTSIDE OF THE MINIMUM BUILDING CLEARANCES PER THE GEOTECHNICAL REPORT. SNOW STORAGE FOR INTERNAL DRIVEWAYS AND PARKING TO BE IN LANDSCAPE AREAS AT THE EAST AND WEST END OF THE MIDDLE BUILDING ROW AND AT THE EAST END OF THE UPPER BUILDING ROW AND WILL BE FURTHER EVALUATED IN COORDINATION WITH THE GEOTECHNICAL ENGINEER.
5. SEE ARCHITECTURAL PLANS AND ELEVATIONS FOR INDIVIDUAL BUILDING TYPES AS REFERENCED ON THIS SITE PLAN.
6. SEE INDIVIDUAL SITE AND LANDSCAPE PLAN ENLARGEMENT SHEETS FOR SPECIFIC SITE AMENITY, FURNISHING, AND LANDSCAPE LEGEND AND IDENTIFICATION.
7. ALL LAYOUT OF SITE WALLS, PAVING AND LANDSCAPE FEATURES TO BE PERFORMED IN FIELD BY SURVEYOR AND APPROVED BY LANDSCAPE ARCHITECT.
8. SITE AND EXTERIOR BUILDING LIGHTING TO BE PROVIDED AS REQUIRED BY APPLICABLE BUILDING CODES.
9. LOCATION OF LIGHT FIXTURES AS SHOWN IS SCHEMATIC. LOCATIONS OF EXTERIOR AND SITE LIGHT FIXTURES TO BE VERIFIED PER FINAL ARCHITECTURE AND SITE PLANS.
10. FINAL TYPE, LOCATION AND NUMBER OF EXTERIOR LIGHTING FIXTURES TO BE DETERMINED.
11. NATIONAL AND LOCAL ELECTRICAL CODES SHALL GOVERN THE MINIMUM STANDARDS OF WORK. IN THE EVENT OF A CONFLICT BETWEEN THESE DRAWINGS AND APPLICABLE CODE, THE CODE SHALL PREVAIL AND INSTALLATION SHALL BE MADE IN CONFORMANCE WITH THE CODE. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO INSTALLATION OF ANY LIGHTING EQUIPMENT.
12. ALL EXTERIOR FIXTURES TO COMPLY WITH THE INTERNATIONAL DARK SKY ASSOCIATION AND CITY OF GLENWOOD SPRINGS MUNICIPAL CODE.

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LANDSCAPE AREA:

OPEN SPACE	SQUARE FOOTAGE	TREES		SHRUBS	
		REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Upper tier - disturbed	87,483 SF	73	74	219	366
Lower tier - disturbed	79,351 SF	66	66	198	285

INTERNAL DRIVEWAY	LINEAR FEET	TREES	
		REQUIRED *(1/35 LF)*	PROVIDED
Flat Tops View Dr (Sunny Aspen)	2,071 LF	59	60
Wolf Liam Lane	1,735 LF	50	50
Adios Avenue	1,748 LF	50	50

PARKING AREAS	Total Parking Area (SF)	Landscaped Area (SF & %)	TREES		SHRUBS	
			REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Parking Lots	29,694 SF	10,485 SF *(35% of the parking area)*	25	40	74	240

TOTAL LANDSCAPED AREA	Proposed (SF & %)	OPEN SPACE	Required (SF & %)	Proposed (SF & %)
	304,510 sf *25% Lot Size*		**486,064 sf** *40% Lot Size*	**504,083 sf** *41.5% Lot Size*

TOTAL IMPERVIOUS AREA	Proposed (SF & %)
	591,051 sf *49% Lot Size*

L1.3

L1.4

L1.5

L1.6

L1.7

L1.8

L1.9

0' 50' 100' 200'
Scale: 1" = 100'

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER: DATE 2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT KEY PLAN

SCALE:

SHEET NUMBER:
L1.2

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XERIC PERENNIALS / ORNAMENTAL GRASSES ENTRY GARDEN BED

CONNECTION TO EXISTING WULFSOHN CURB CUT

WULFSOHN RD.

PROPERTY LINE

TRASH RECEPTACLE

LOCAL ACCESS TRAILHEAD

STAIR CONNECTION

SOFT SURFACE TRAIL

NATIVE SEED

AC CONDENSING UNTIS

FENCE (6' MAX. HEIGHT)

TERRACED PLANTER

TRASH RECEPTACLES

PARK 1

XERIC PERENNIALS / ORNAMENTAL GRASSES ENTRY GARDEN BED

CRUSHER FINES SEATING AREA

COMMUNITY GARDEN WITH RAISED PLANTER BOXES

RETAINING WALL (6' MAX. HEIGHT)

PROPOSED ROAD; RE: CIVIL

CRUSHER FINES

PICNIC TABLE

PARK BENCH

ADA ACCESSIBLE COMMUNITY GARDEN

SELLER RESERVED PARCEL

STREET LIGHT TYP.

SIGHT TRIANGLES; PER: CIVIL

CROSSWALK

TRASH RECEPTACLE

LOCAL ACCESS TRAILHEAD

NATIVE SHRUBS / SMALL TREES

NATIVE SHRUBS / SMALL TREES

DOG WASTE STATION

TRAILHEAD KIOSK

LIMITS OF GRADING DISTURBANCE

NATURAL TRAIL CONNECTION TO WULFSOHN MOUNTAIN PARK TRAIL NETWORK

MATCHLINE: REFERENCE SHEET L1.4

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
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L1.3

SHEET_____OF_____

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WULFSOHN RD.

PROPERTY LINE

WULFSOHN SIDEWALK

NATIVE SEED

EXISTING LANDSCAPE TO REMAIN

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
- EVERGREEN TREES
- DECIDUOUS TREES
- ORNAMENTAL TREES
- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

LIMITS OF GRADING DISTURBANCE

NATIVE TREES AND SHRUBS TO SCREEN RETAINING WALLS AT PARKING

NATIVE TREES AND SHRUBS TYP.

NATIVE REVEGETATION AREA

NATIVE TREES AND SHRUBS TYP.

MATCHLINE: REFERENCE SHEET L1.3

MATCHLINE: REFERENCE SHEET L1.5

SIDEWALK

RETAINING WALL (6' MAX. HEIGHT)

AC CONDENSING UNITS

BUILDING TYPE 1

DOUBLE ROW OF SHRUBS, TRIANGULAR SPACING TYP.

ROCK MULCH TYP.

BIKE RACK

RESIDENT PARKING LOT

19'-0" TYP.

9'-0" TYP.

ROCK MULCH TYP.

BUILDING TYPE 3

SIDEWALK

RETAINING WALL (6' MAX. HEIGHT)

AC CONDENSING UNITS

DOUBLE ROW OF SHRUBS, TRIANGULAR SPACING TYP.

SIDEWALK

ROCK MULCH TYP.

BUILDING TYPE 2

BIKE RACK

RESIDENT PARKING LOT

SIDEWALK

STREET LIGHT TYP.

SIGHT TRIANGLES; PER: CIVIL

MAILBOXES

STREET PARKING

MOUNTED STREETLIGHT TYP.

ENCLOSED BICYCLE PARKING AREA

SHRUBS TO SCREEN DUMPSTERS TYP.

STREETLIGHT TYP.

WALL MOUNTED STREET LIGHT TYP.

ENCLOSED BICYCLE PARKING AREA

DUMPSTER ENCLOSURE

TERRACED PLANTERS

DOG WASTE STATION

SIDEWALK

BOLLARD LIGHT TYP.

PARK BENCH

COVERED GARAGE / PARKING BELOW; RE: ARCH

RETAINING WALL (6' MAX. HEIGHT)

STAIRCASE

COVERED GARAGE / PARKING BELOW; RE: ARCH

DOG YARD

RETAINING WALL (6' MAX. HEIGHT)

STAIRCASE

BUILDING TYPE 1

ARTIFICIAL TURF

ROCK MULCH TYP.

BUILDING TYPE 2

ARTIFICIAL TURF

BUILDING TYPE 1

MATCHLINE: REFERENCE SHEET L1.7

MATCHLINE: REFERENCE SHEET L1.8

0' 10' 20' 40'

Scale: 1" = 20'

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L1.4

SHEET_____OF_____

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WULFSOHN RD.

WULFSOHN SIDEWALK

PROPERTY LINE

LIMITS OF GRADING DISTURBANCE

ENTRY PLANTING WITH XERIC PERENNIALS AND ORNAMENTAL GRASSES

NATIVE SEED

PLANTER TYP.

BOLLARD LIGHT TYP.

STAIRCASE

XERIC PERENNIALS AND ORNAMENTAL GRASSES

EXISTING LANDSCAPE TO REMAIN

RETAINING WALL (6' MAX. HEIGHT)

CLUBHOUSE / DAYCARE PARKING LOT

RESIDENT PARKING LOT

19'-0" TYP.

9'-0" TYP.

38'-0"

39'-0"

11'-0" TYP.

13'-6"

DOUBLE ROW OF SHRUBS, TRIANGULAR SPACING TYP.

GARAGE / PARKING BELOW; RE: ARCH

ENCLOSED BICYCLE PARKING AREA

DAYCARE PLAYGROUND (AGES 2-5)

FENCE (6' MAX. HEIGHT)

AC CONDENSING UNITS

CLUBHOUSE

GATE

MAILBOXES

BIKE RACK

30'-4"

9'-0" TYP.

33'-6"

CLUBHOUSE AND DAYCARE COVERED DROP OFF AREA

COVERED GARAGE / PARKING BELOW; RE: ARCH

TERRACED PLANTERS

RETAINING WALL (6' MAX. HEIGHT)

ROCK MULCH TYP.

ARTIFICIAL TURF

BUILDING TYPE 1

BUILDING TYPE 2

RETAINING WALL (6' MAX. HEIGHT)

NATIVE TREES AND SHRUBS TYP.

POOL DECK

FENCE (6' MAX. HEIGHT)

POOL

SPA

SIGHT TRIANGLES; PER: CIVIL

SIDEWALK

MAILBOXES

ENTRY PLANTING WITH ORNAMENTAL SHRUBS, XERIC PERENNIALS, AND ORNAMENTAL GRASSES

BOLLARD LIGHT TYP.

DOG WASTE STATION

MATCHLINE: REFERENCE SHEET L1.4

MATCHLINE: REFERENCE SHEET L1.6

MATCHLINE: REFERENCE SHEET L1.8

MATCHLINE: REFERENCE SHEET L1.9

0' 10' 20' 40'

Scale: 1" = 20'

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
- EVERGREEN TREES
- DECIDUOUS TREES
- ORNAMENTAL TREES
- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.5

SHEET____OF____

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
- EVERGREEN TREES
- DECIDUOUS TREES
- ORNAMENTAL TREES
- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

MATCHLINE: REFERENCE SHEET L1.5

PROPERTY LINE

EXISTING RED MOUNTAIN LOFTS DEVELOPMENT

UNDISTURBED HILLSIDE

GLENWOOD GREENS DEVELOPMENT

NATIVE TREES AND SHRUBS TYP.

SIDEWALK

STREET LIGHT TYP.

ENTRY ROAD; RE: CIVIL

FUTURE DEVELOPMENT PARCEL

SIGHT TRIANGLES; PER: CIVIL

SIGHT TRIANGLES; PER: CIVIL

ENTRY PLANTING WITH ORNAMENTAL SHRUBS, XERIC PERENNIALS, AND ORNAMENTAL GRASSES

NATIVE SEED

SIGHT TRIANGLES; PER: CIVIL

LIMITS OF GRADING DISTURBANCE

ENTRY PLANTING WITH ORNAMENTAL SHRUBS, XERIC PERENNIALS, AND ORNAMENTAL GRASSES

CONNECTION POINT FOR FUTURE DEVELOPMENT ROAD

MATCHLINE: REFERENCE SHEET L1.9

0' 10' 20' 40'
Scale: 1" = 20'

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER: DATE 2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

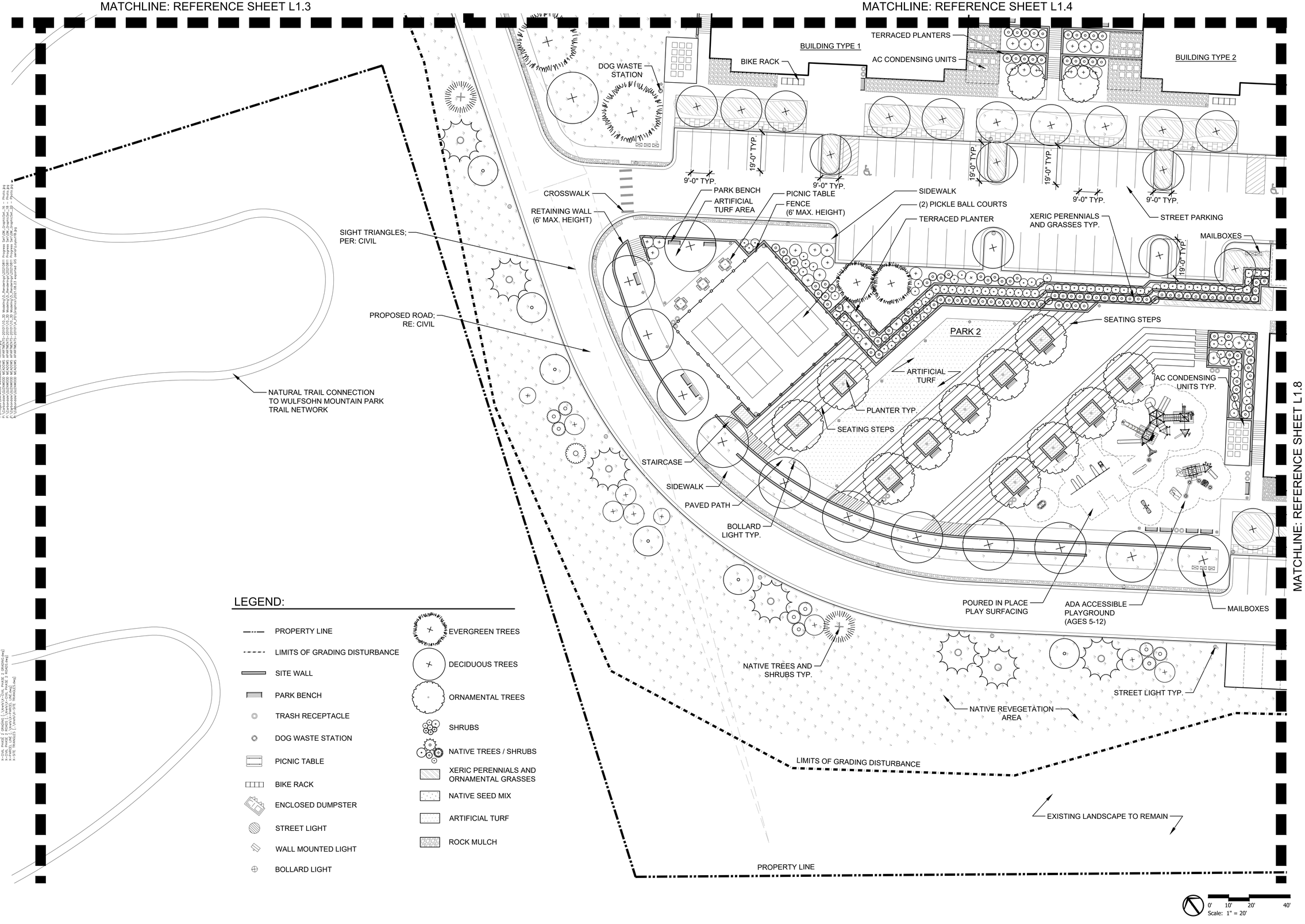
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SHEET_____OF_____

MATCHLINE: REFERENCE SHEET L1.3

MATCHLINE: REFERENCE SHEET L1.4

MATCHLINE: REFERENCE SHEET L1.8



LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
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- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.7

SHEET____OF____

MATCHLINE: REFERENCE SHEET L1.4

MATCHLINE: REFERENCE SHEET L1.5

MATCHLINE: REFERENCE SHEET L1.7

MATCHLINE: REFERENCE SHEET L1.9

BUILDING TYPE 2

AC CONDENSING UNITS

STAIRCASE

TERRACED PLANTERS

RETAINING WALL (6' MAX. HEIGHT)

BUILDING TYPE 1

BIKE RACK

19'-0" TYP.

9'-0" TYP.

STREETLIGHT TYP.

DECORATIVE PAVERS TYP.

MOUNTED STREETLIGHT TYP.

DUMPSTER ENCLOSURE

BICYCLE PARKING AREA

FENCE (6' MAX. HEIGHT)

TRANSFORMER LOCATION; RE: CIVIL

COVERED GARAGE / PARKING BELOW; RE: ARCH

STAIRCASE

TERRACED PLANTERS

WALL MOUNTED STREET LIGHT TYP.

RETAINING WALL (6' MAX. HEIGHT)

ROCK MULCH TYP.

ARTIFICIAL TURF

BUILDING TYPE 3

STAIRCASE

PARK BENCH

BUILDING TYPE 1

XERIC PERENNIALS AND GRASSES TYP.

STREET LIGHT TYP.

DECORATIVE PAVERS TYP.

COVERED CARPORT PARKING SPACES

TRASH RECEPTACLE

DOG WASTE STATION

LOCAL ACCESS TRAILHEAD

SHRUBS TO SCREEN DUMPSTERS TYP.

LIMITS OF GRADING DISTURBANCE

TRAILHEAD KIOSK

NATIVE TREES AND SHRUBS TYP.

NATIVE SEED

NATURAL TRAIL CONNECTION TO WULFSOHN MOUNTAIN PARK TRAIL NETWORK

PROPERTY LINE

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
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- ORNAMENTAL TREES
- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

0' 10' 20' 40'
Scale: 1" = 20'

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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

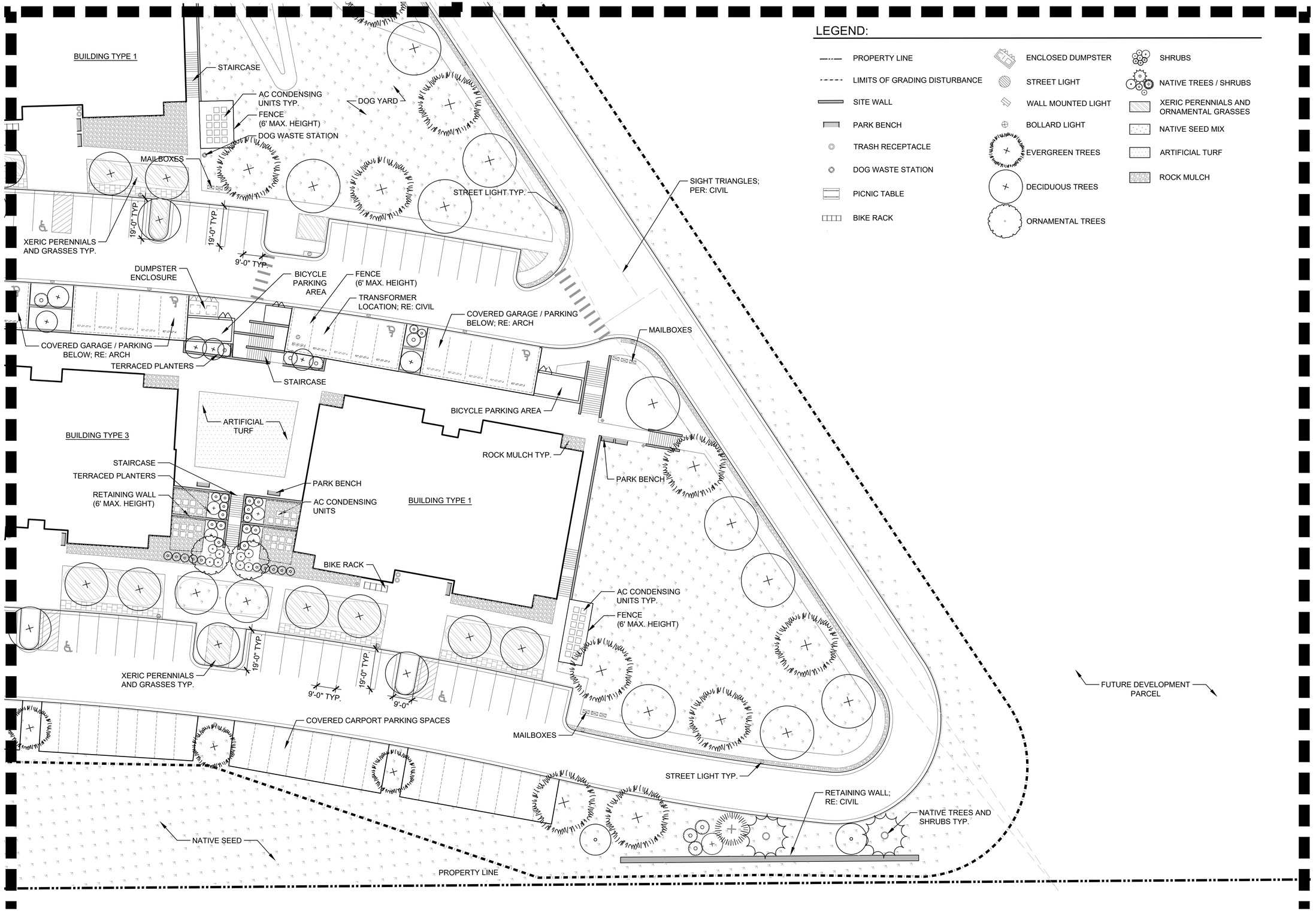
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L1.8

SHEET_____OF_____

MATCHLINE: REFERENCE SHEET L1.5

MATCHLINE: REFERENCE SHEET L1.6

MATCHLINE: REFERENCE SHEET L1.8



LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
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- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

0' 10' 20' 40'
Scale: 1" = 20'

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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

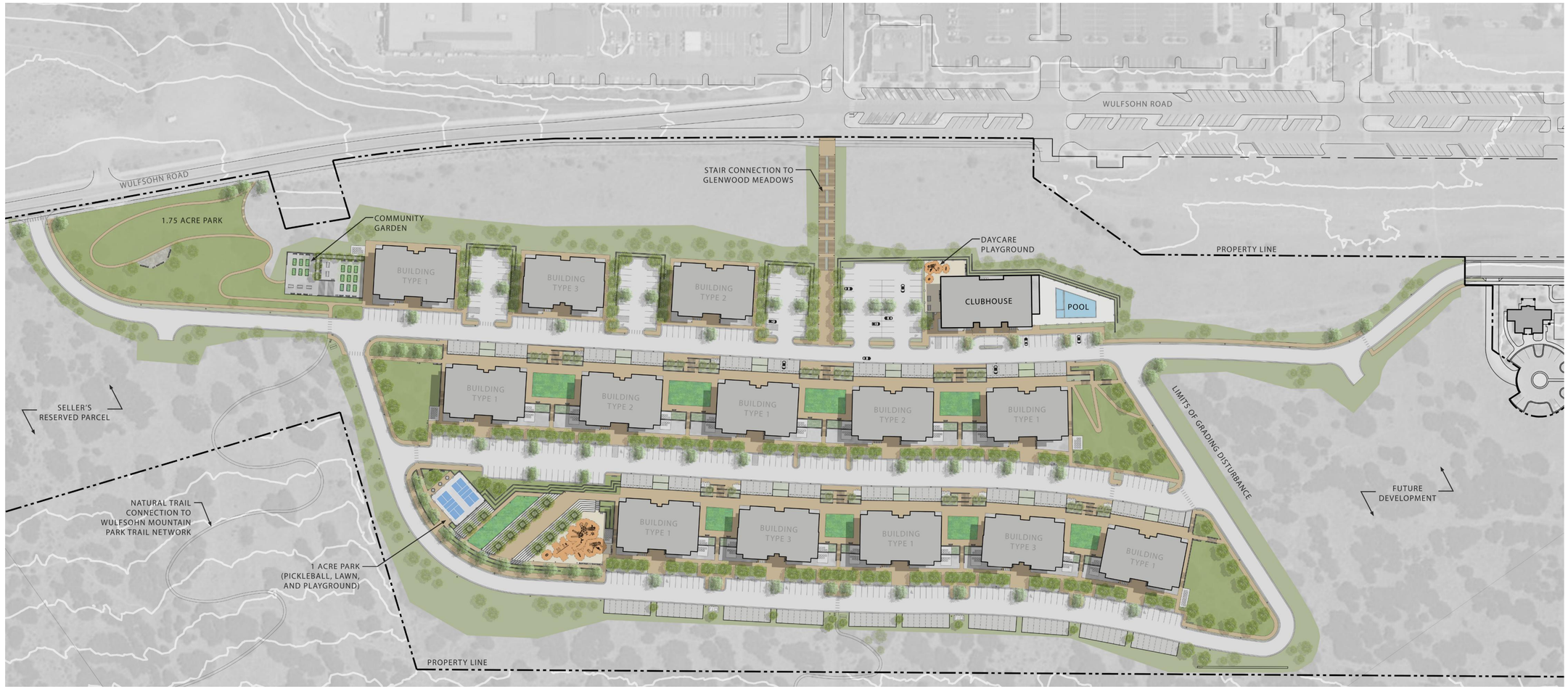
JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.9

SHEET_____OF_____



0' 40' 80' 160'
Scale: 1" = 80'-0"

IMAGES
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P:\Colorado\GLENWOOD MEADOWS APARTMENTS-2019\10_Design\VS_Renderings\20210923 - Updated Renderings\13.jpg
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[Layout: 11 x 17]
[Date: 10-07-2021]
[By: Jeff Shaw]

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN RENDERING

SCALE:

SHEET NUMBER:
EXBT 1

SHEET_____OF_____



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XREFS
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NAME
Insert GLENWOOD MEADOWS APARTMENTS-2020\10_Land Use Permit Revision\CAD Sheets\SITE PLAN SUBMITTAL.dwg
[DATE: 10/7/2021]

Packet Page 227

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 2

SHEET_____OF_____



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LAYOUT: ARCH E1 - 30" x 42"
DATE: 10/6/2021 - 2:37pm

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 3

SHEET_____OF_____



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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER: DATE
2021.10.07

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SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 4

SHEET_____OF_____



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Layout: EXBT 5

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GLENWOOD SPRINGS, COLORADO

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2021.10.07

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MAJOR SITE / ARCHITECTURE REVIEW

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PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 5

SHEET_____OF_____



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[11x17] - 1/64" = 1'-0"

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SUBMITTAL #5: 2021.10.07
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MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 6

SHEET_____OF_____



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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
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2021.10.07

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SUBMITTAL #4: 2021.08.13
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JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 7

SHEET_____OF_____



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Model:GLENWOOD MEADOWS APARTMENTS-2019\1_AR Drawings\2021.09.13 Exported DR sheet layouts\SITE PLAN SUBMITTAL.dwg
Layout: 18 - 24 x 36 - ARCH D - Offset

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SUBMITTAL #4: 2021.08.13
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REVISIONS:

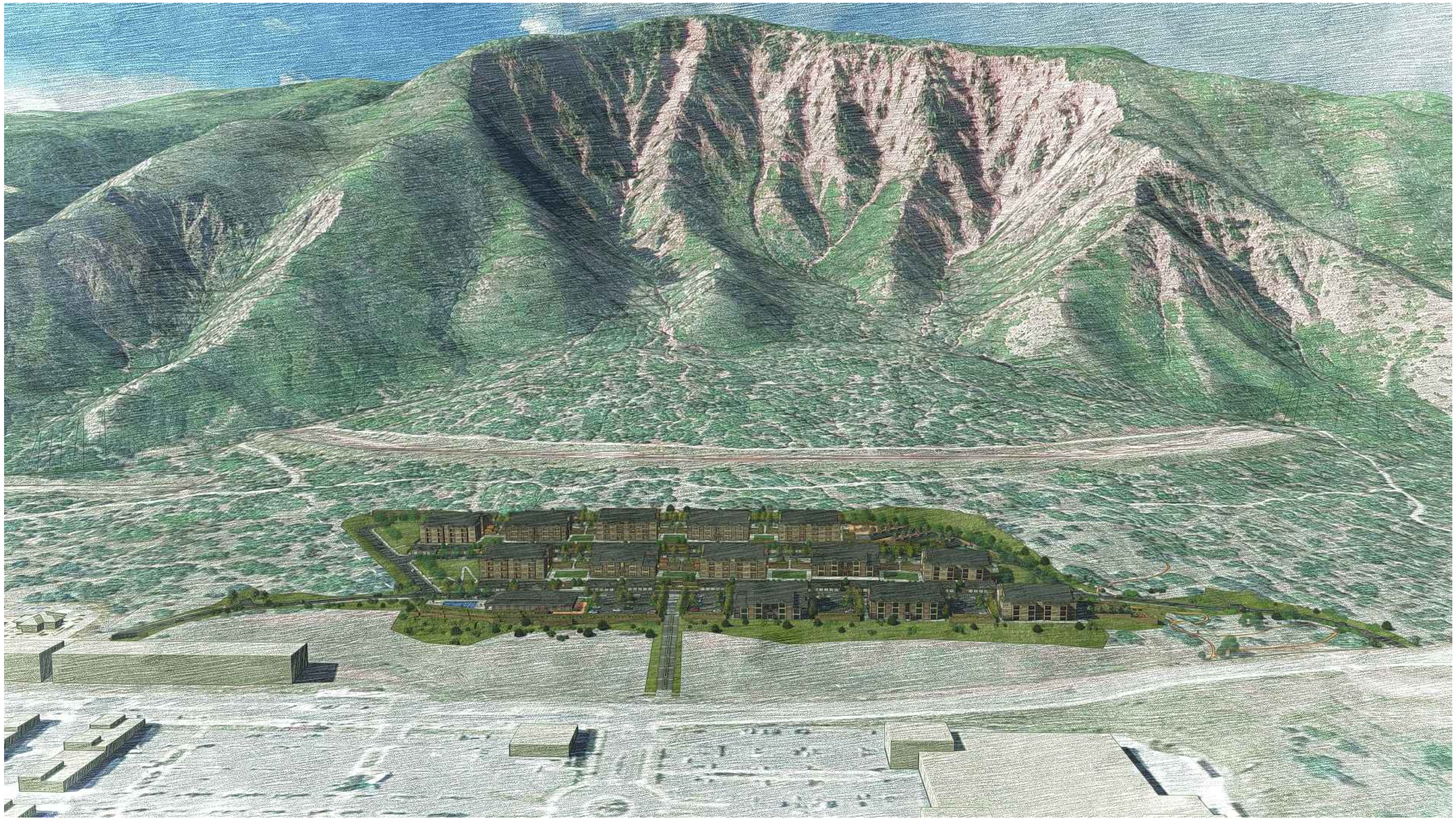
JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 8

SHEET_____OF_____



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NAME
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[ ] STYLE: Arial LAYOUT: Model

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SCALE:

SHEET NUMBER:
EXBT 9

SHEET_____OF_____

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Sheet(s):SUMMIT MEADOWS APARTMENTS-2019.DWG
LAYOUT: ARCH_24 x 36in

Packet Page 235

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970.963.6520
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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 10

SHEET_____OF_____



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DATE
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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.10.07

REVISIONS:
SUBMITTAL #4: 2021.08.13
SUBMITTAL #5: 2021.10.07
REVISIONS:

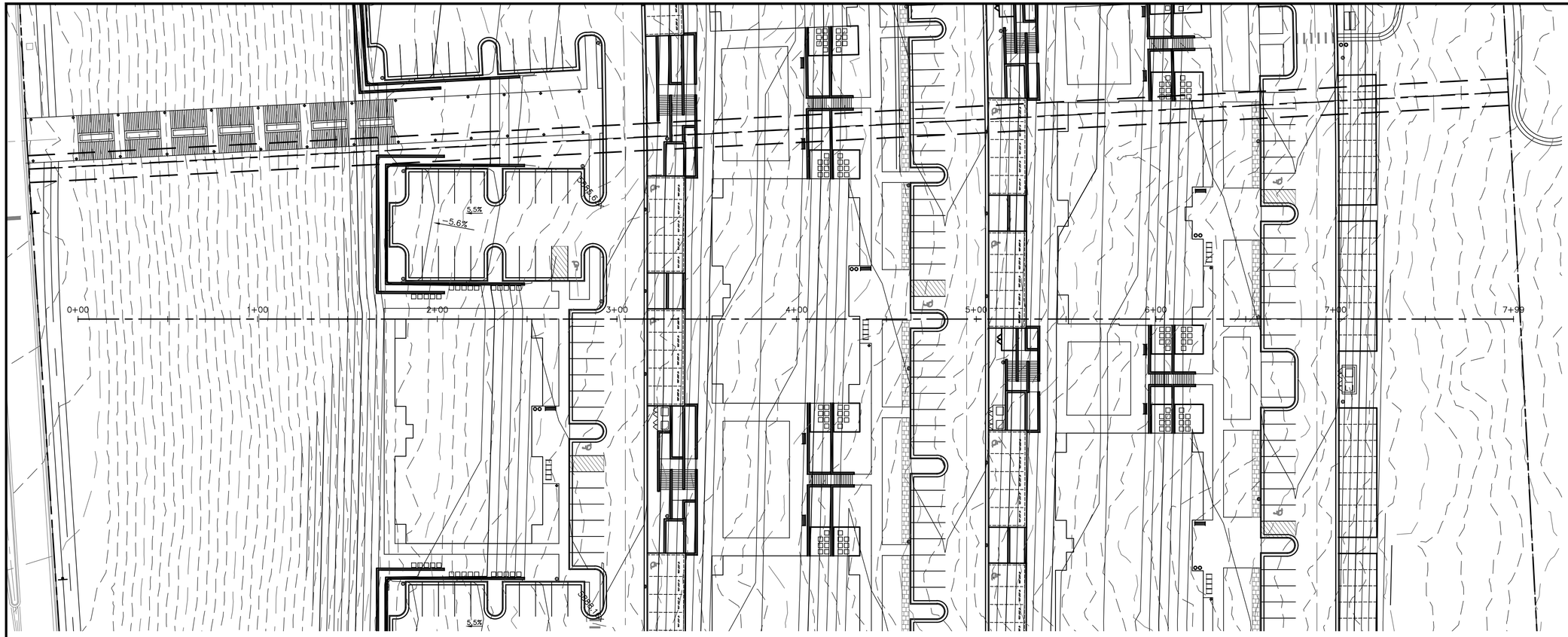
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SHEET TITLE:
PERSPECTIVE ILLUSTRATION

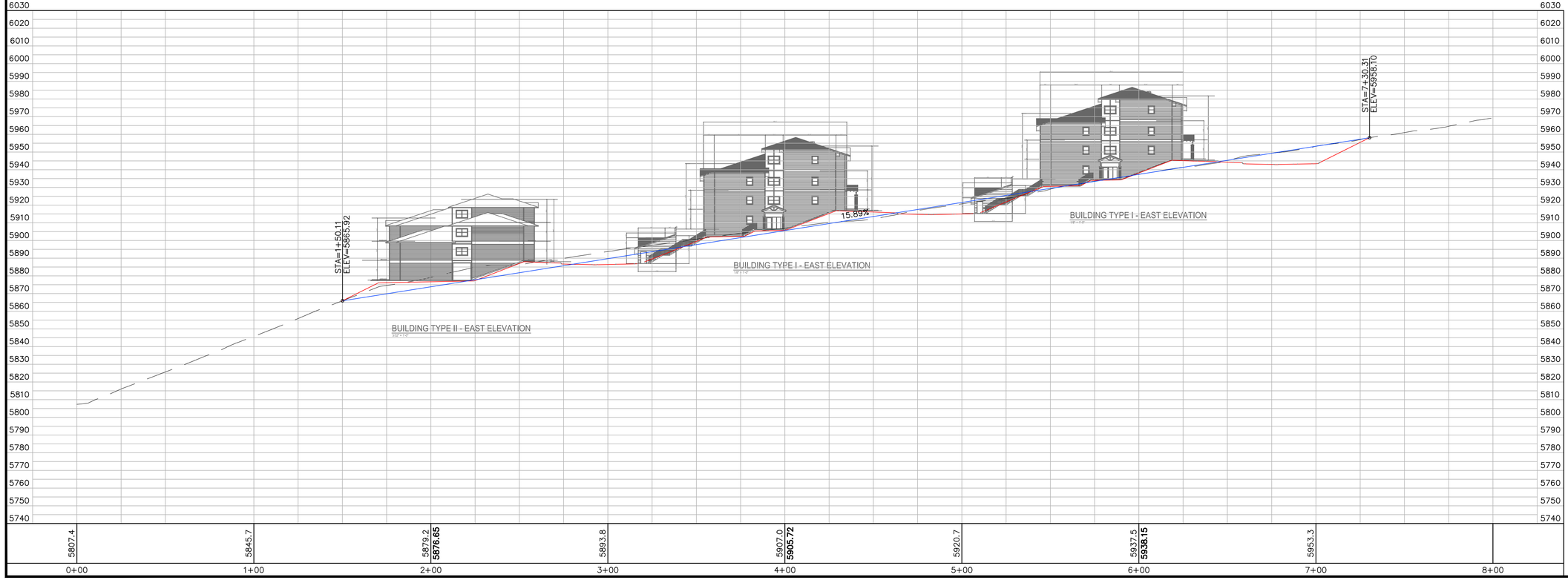
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SHEET NUMBER:
EXBT 11

SHEET____OF____



SECTION PROFILE



PRELIMINARY
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0 30' 60'

COLORADO 811
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Utility Notification
Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

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WWW.HCENG.COM

BLD GROUP, LLC;
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

SITE SECTIONS
EXHIBIT

PROJECT NO.
2201044.00

EXBT 12,1

SECTION2 PROFILE

PRELIMINARY
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CONSTRUCTION

0 30' 60'

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1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
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SITE SECTIONS
EXHIBIT

PROJECT NO.
2201044.00

EXBT 12.2

PRELIMINARY
NOT FOR
CONSTRUCTION

SECTION3 PROFILE

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2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

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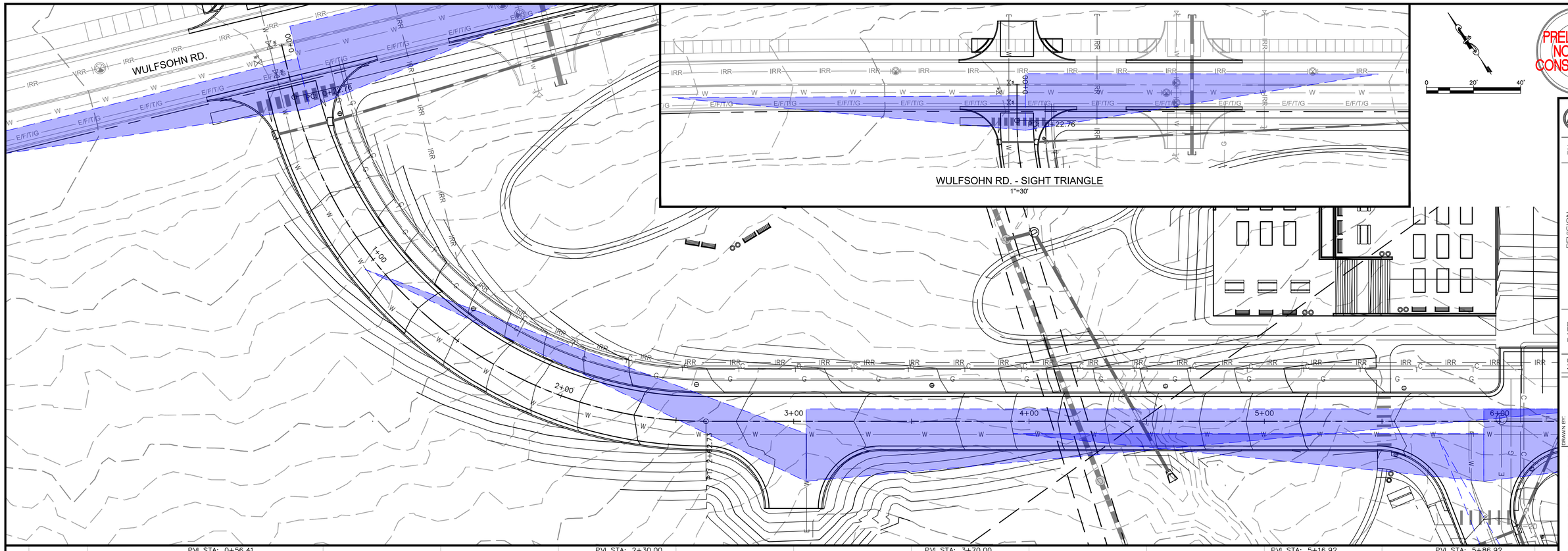
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SITE SECTIONS
EXHIBIT

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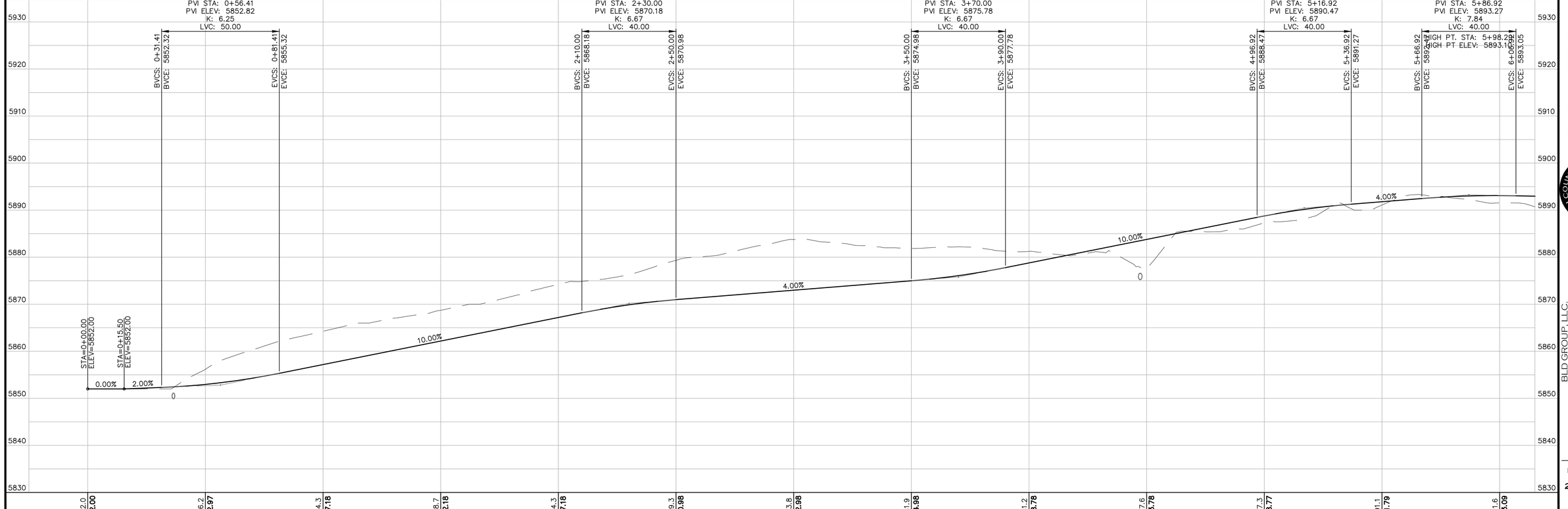
EXBT 12.3



WULFSOHN RD. - SIGHT TRIANGLE
1"=30'

0 20' 40'

PRELIMINARY NOT FOR CONSTRUCTION



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1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
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DATE:
FILE:
SCALE 1" = 20'

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WEST ENTRY PLAN & PROFILE
EXHIBIT

PROJECT NO.
2201044.00

EXBT 13

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

FOR PRELIMINARY REVIEW

TW: 5865.00
BW: 5859.00
TW: 5872.00
BW: 5866.00
TW: 5879.00
BW: 5873.00

5866 5864 5862 5864 5862 5860 5864 5818 5820 5822 5824 5826 5828 5830 5832 5834 5836 5838 5840 5842 5844 5846 5848 5850 5852 5854 5856 5858 5860 5862 5864 5866 5868

5824 5826 5828 5830 5832 5834 5836 5838 5840 5842 5844 5846 5848 5850 5852 5854 5856 5858

2.0

COLORADO 811
CALL BEFORE YOU DIG
Utility Notification Center of Colorado

NO.	DATE	REVISION	BY

DRAWN BY: HCE
CHECKED BY: HCE
DATE: MO/DA/YEAR
FILE: FILE

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GLENWOOD MEADOWS MULTI-FAMILY

POOL WALL GRADING EXHIBIT

PROJECT NO.
2201044.00
TASK

EXHBT 14

GLENWOOD SPRINGS

COLORADO

DESCRIPTION OF DRAWINGS

A 01	Index		**UNIT TYPES**
	BUILDING TYPE I	A 28	Apartment Floor Plans
A 1	Bldg Type-I - Garage Level	A 29	Apartment Floor Plans
A 2	Bldg Type-I - Lower Level	A 30	Garage Elevation for Building Type I, II & III
A 3	Bldg Type-I - First Floor		**CLUBHOUSE**
A 4	Bldg Type-I - Second Floor	A 31	Clubhouse & Daycare Center Floor plan
A 5	Bldg Type-I - Third Floor	A 32	Clubhouse & Daycare Center Roof plan
A 6	Bldg Type-I - Roof	A 33	Clubhouse & Daycare Center North & South Elevation
A 7	Bldg Type-I - North & South Elevation	A 34	Clubhouse & Daycare Center West & East Elevation
A 8	Bldg Type-I - West & East Elevation		
A 9	Bldg Type-I - Section		
	BUILDING TYPE II		
A 10	Bldg Type-II - Garage Level		
A 11	Bldg Type-II - Lower Level		
A 12	Bldg Type-II - First Floor		
A 13	Bldg Type-II - Second Floor		
A 14	Bldg Type-II - Third Floor		
A 15	Bldg Type-II - Roof		
A 16	Bldg Type-II - North & South Elevation		
A 17	Bldg Type-II - West & East Elevation		
A 18	Bldg Type-II - Section		
	BUILDING TYPE III		
A 19	Bldg Type-III - Garage Level		
A 20	Bldg Type-III - Lower Level		
A 21	Bldg Type-III - First Floor		
A 22	Bldg Type-III - Second Floor		
A 23	Bldg Type-III - Third Floor		
A 24	Bldg Type-III - Roof		
A 25	Bldg Type-III - North & South Elevation		
A 26	Bldg Type-III - West & East Elevation		
A 27	Bldg Type-III - Section		

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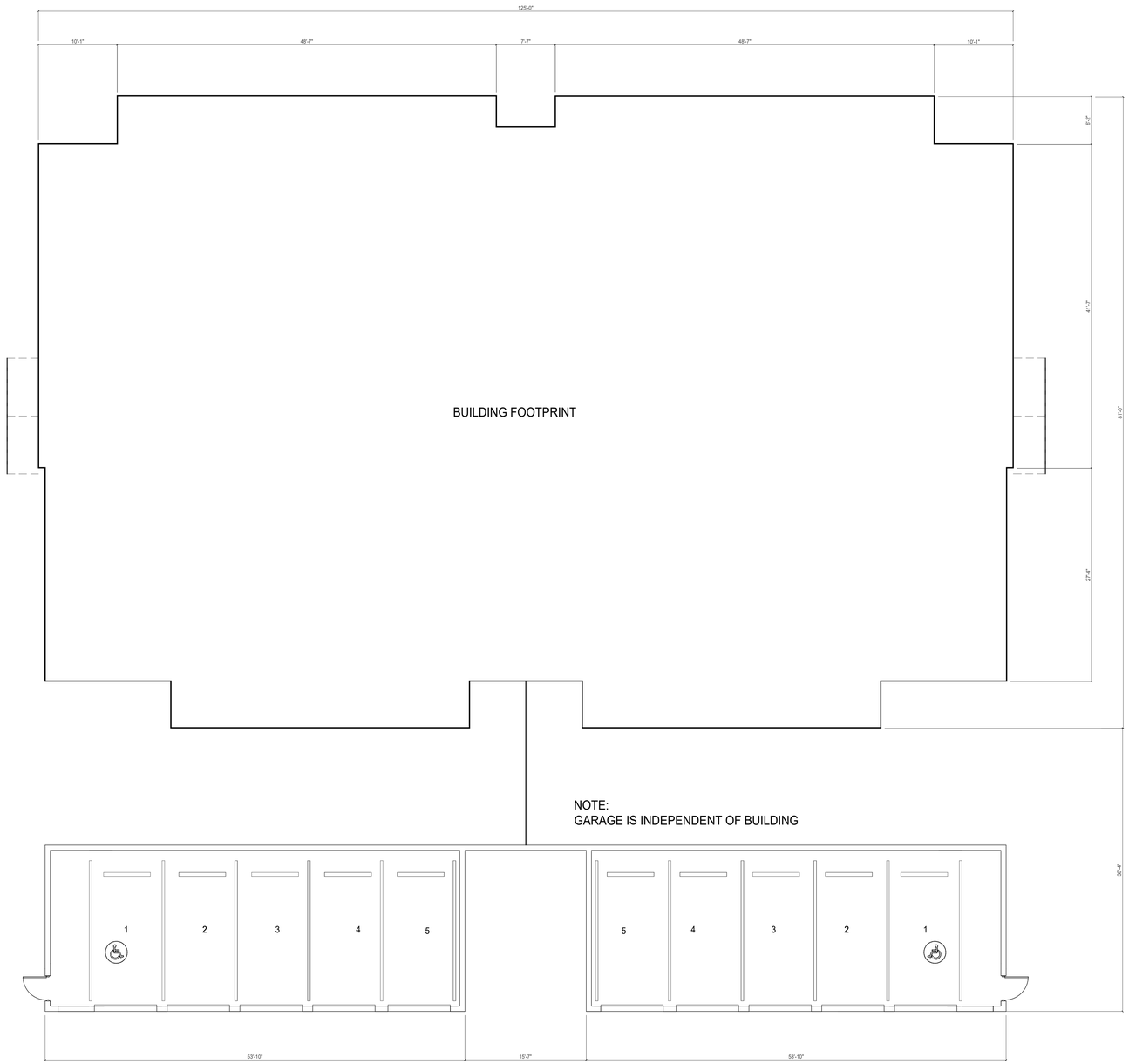
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
1	06/29/2021	
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: NTS

INDEX

A–01



BUILDING TYPE I - GARAGE LEVEL

1/8" = 1'-0"

BUILDING TYPE I				
LEVEL	GROSS AREA	OPEN FLOOR CORRIORS	CORRIDOR, ELEVATOR AND STORAGE	NET AREA
GARAGE (10 CARS)	2,630	0	0	2630
LOWER LEVEL	5,855	0	1824	4031
1ST LEVEL	9,623	0	1653	7970
2ND LEVEL	9,623	243	1648	7732
3RD LEVEL	5,675	243	1732	3700
TOTAL BUILDING	33,406			23,433
NO. OF BUILDINGS	7			7
TOTAL FOR BUILDING TYPE I	233,842			164,031

PHASE I - 300 APARTMENTS TOTAL					
BUILDING TYPE	I	II	III	TOTAL BUILDINGS	
NO. OF BUILDINGS	7	3	3	13	
Unit Types					%
3 BEDROOM	42	-	-	42	14.00%
2 BEDROOM - UNIT C1	0	36	36	72	24.00%
2 BEDROOM - UNIT C2	42	-	-	42	14.00%
1 BEDROOM - UNIT B1	0	24	36	60	20.00%
1 BEDROOM - UNIT B2	42	-	-	42	14.00%
STUDIO	42	-	-	42	14.00%
TOTAL UNITS	168	60	72	300	100.00%

PHASE I - 300 APARTMENTS TOTAL					
APARTMENT TYPE	NUMBER OF APARTMENTS	APARTMENT AREAS (SF)			TOTAL AREA (SF)
		INTERIOR	BALCONY	INTERIOR & BALCONY	
3 BEDROOM	42	1,269	80	1,349	56,658
2 BEDROOM - UNIT C1	72	1,126	80	1,206	86,832
2 BEDROOM - UNIT C2	42	1,109	80	1,189	49,938
1 BEDROOM - UNIT B1	60	704	80	784	47,040
1 BEDROOM - UNIT B2	42	711	71	782	32,844
STUDIO	42	593	80	673	28,266
					301,578

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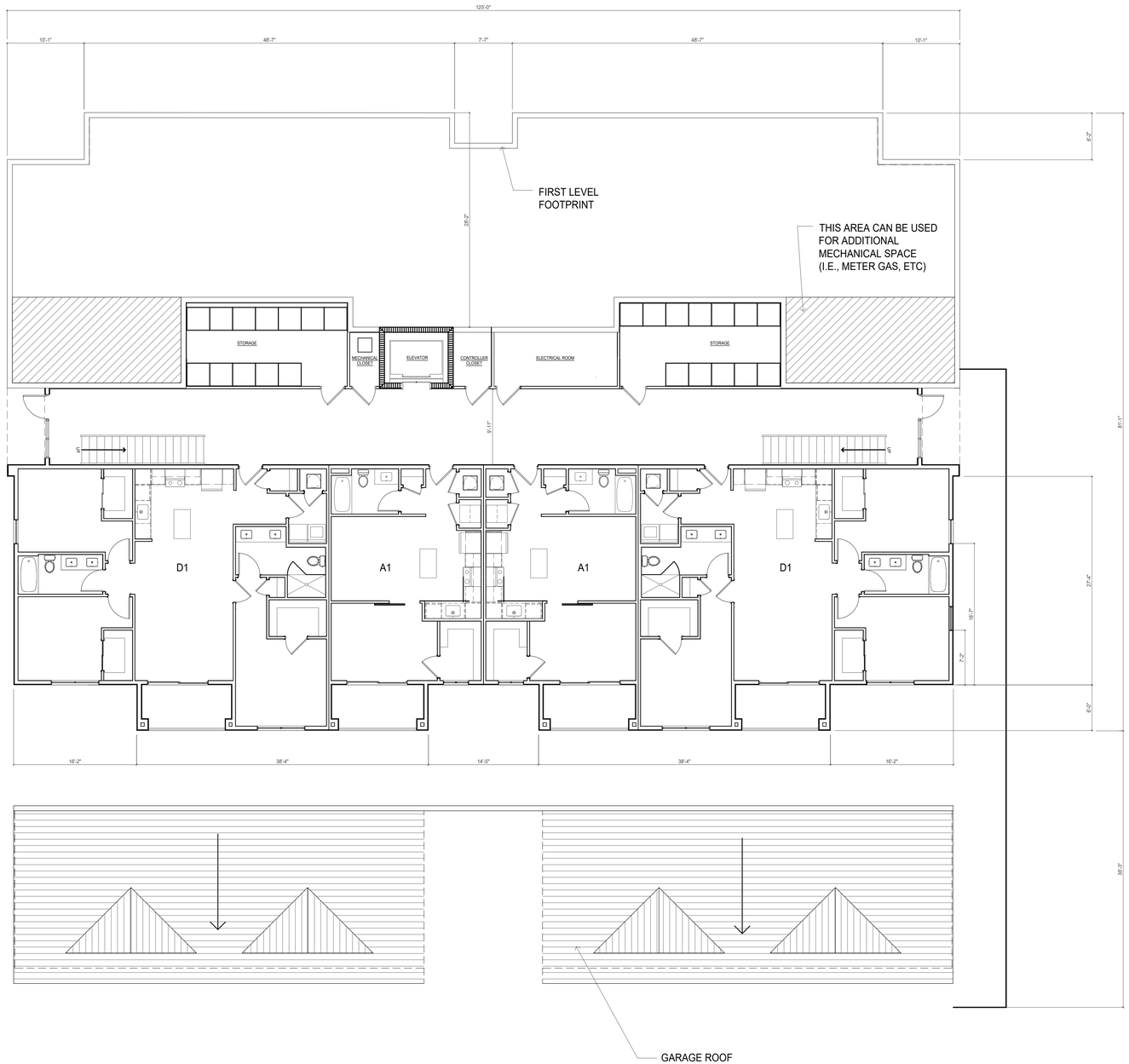
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	COMMENT
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-1



BUILDING TYPE I - LOWER LEVEL

1/8" = 1'-0"

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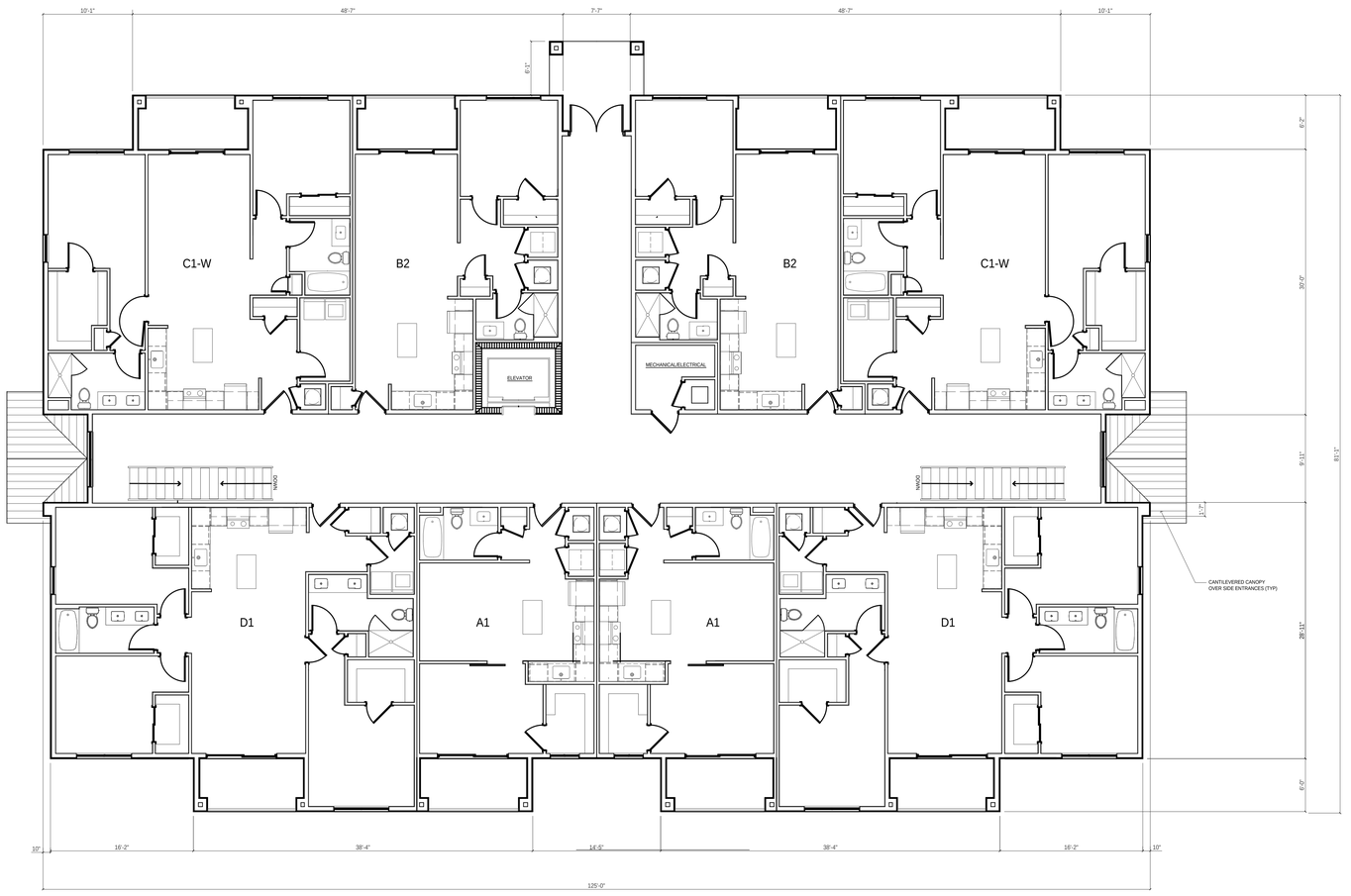
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GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-2



BUILDING TYPE I - FIRST FLOOR

1/8" = 1'-0"

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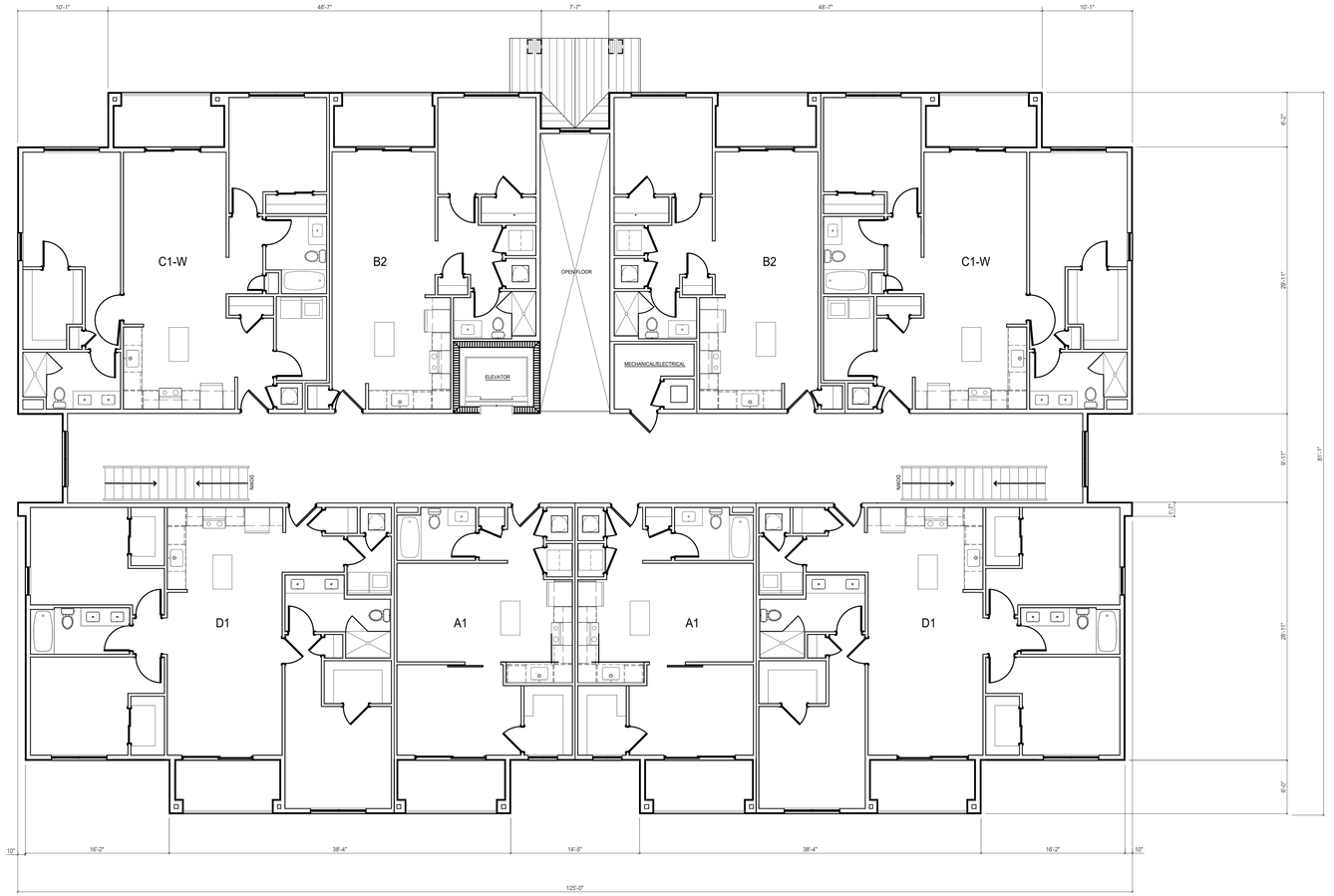
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-3



BUILDING TYPE I - SECOND FLOOR

1/8" = 1'-0"

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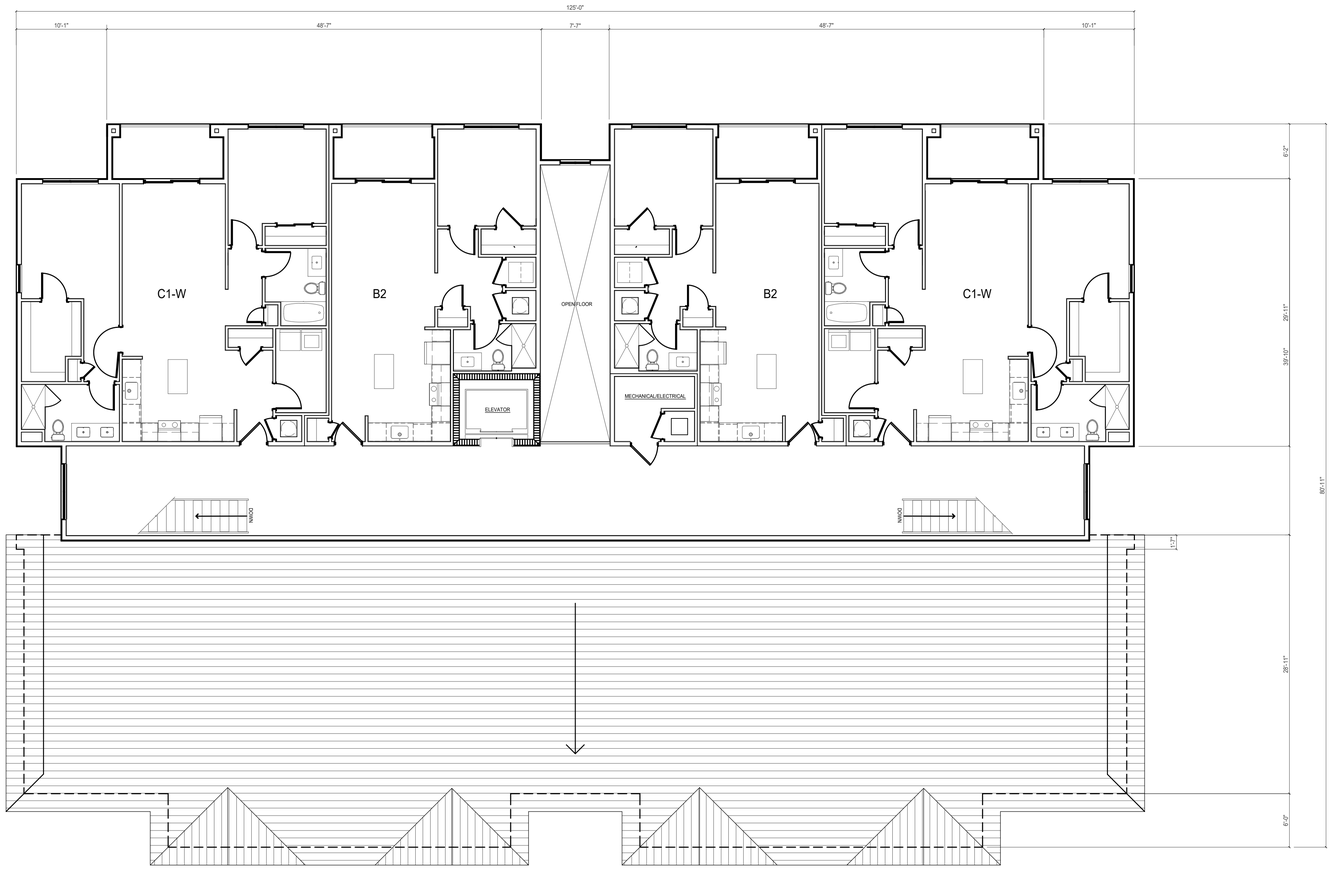
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-4



BUILDING TYPE I - THIRD FLOOR

1/8" = 1'-0"

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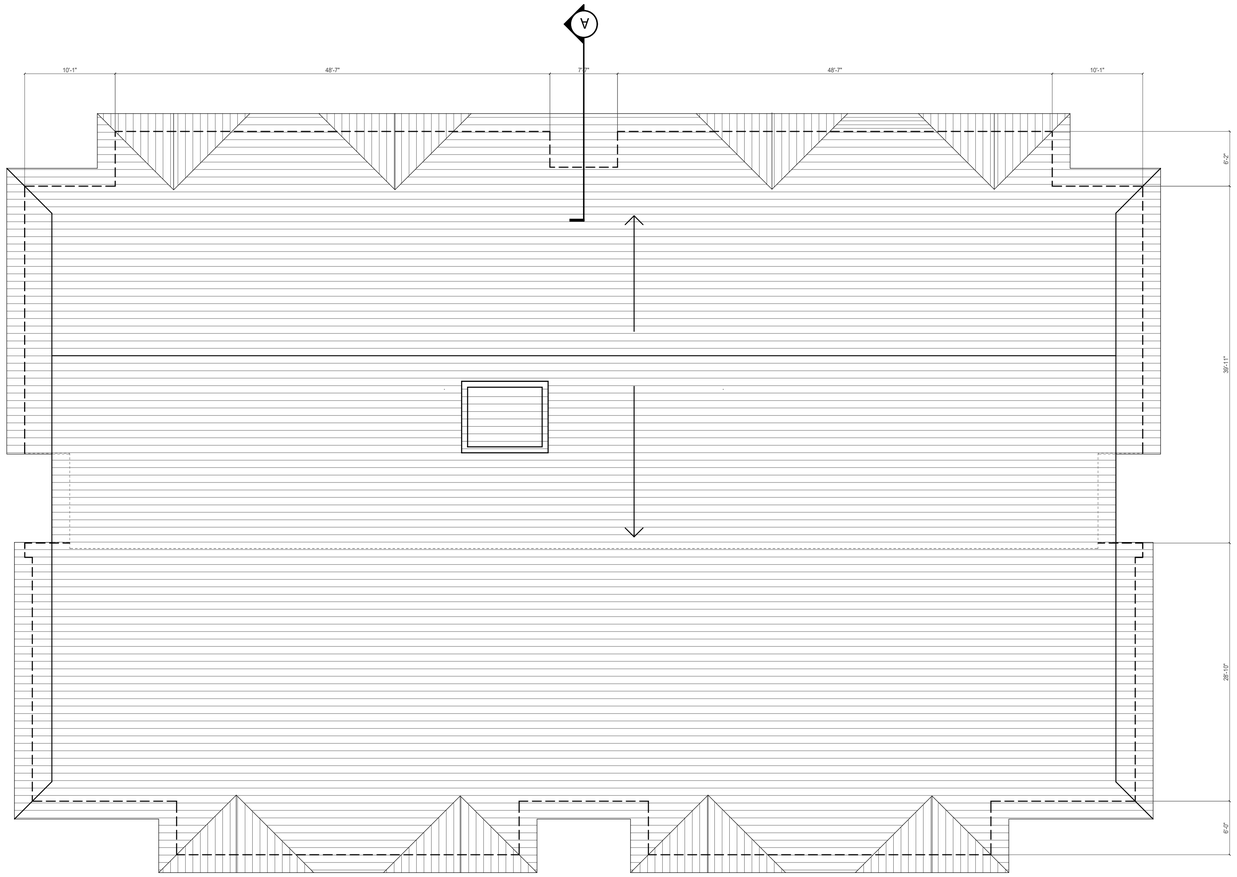
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GLENWOOD SPRINGS
COLORADO

BY	DATE	COMMENT
RC	12/26/2020	
2	07/26/2021	

DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-5



BUILDING TYPE I - ROOF

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	Comment	DATE
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

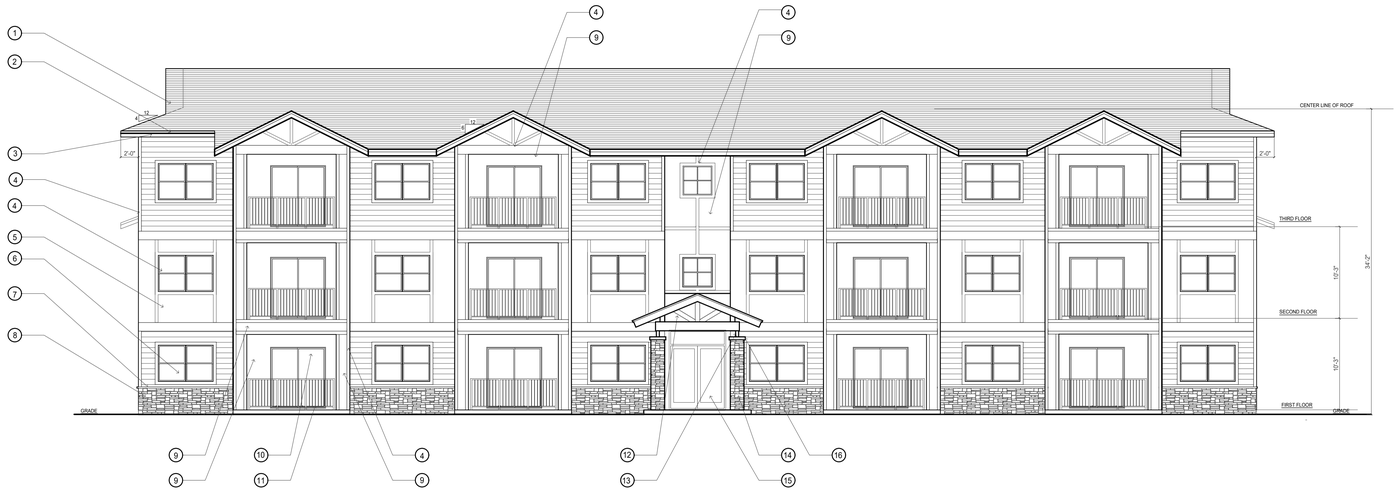
BUILDING TYPE I

A-6



BUILDING TYPE I - NORTH ELEVATION

1/8" = 1'-0"



BUILDING TYPE I - SOUTH ELEVATION

1/8" = 1'-0"

EXTERIOR FINISH SCHEDULE - BUILDING TYPE III			
LABEL	**ITEM**	**PRODUCT**	**COLOR**
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 4" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	NAVAJO BEIGE
6	WINDOW	ALUMINUM - SINGLE HUNG	BRONZE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	MONTEREY TAUPE
10	BALCONY DOOR	ALUMINUM SLIDING GLASS DOOR	WHITE
11	RAILING - BALCONY	ALUMINUM PICKET RAILING	WHITE
12	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
13	BUILDING ENTRY COLUMNS	STRUCTURAL STEEL	BLACK
14	STONE CLADDED COLUMN	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
15	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
16	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
17	RAILING - ROOF DECK COMMON AMENITY SPACE	ALUMINUM PICKET RAILING	WHITE
18	STUCCO - RESIDENTIAL GARAGES	3 - COAT SMOOTH CEMENT STUCCO FINISH	MONTEREY TAUPE
19	GARAGE DOOR	INSULATED METAL	WHITE
20	DOOR	METAL CLAD DOOR	MONTEREY TAUPE

BUILDING TYPE I					
NORTH ELEVATION			**SOUTH ELEVATION**		
	SURFACE AREA	**PERCENTAGE OF NET**		**SURFACE AREA**	**PERCENTAGE OF NET**
GROSS WALL	4089	NA	**GROSS WALL**	3866.00	NA
NET STONE CLADDING	169.91	4.2%	**NET STONE CLADDING**	187.48	4.8%
NET SIDING	1460.59	35.7%	**NET SIDING**	1371.74	35.5%
NET STUCCO FINISH	1584	38.7%	**NET STUCCO FINISH**	1269.10	32.8%
NET GLAZING	874.5	21.4%	**NET GLAZING**	1037.68	26.8%
EAST ELEVATION			**WEST ELEVATION**		
	SURFACE AREA	**PERCENTAGE OF NET**		**SURFACE AREA**	**PERCENTAGE OF NET**
GROSS WALL	3294	NA	**GROSS WALL**	3294	NA
NET STONE CLADDING	-	-	**NET STONE CLADDING**	-	-
NET SIDING	2672.23	81.1%	**NET SIDING**	2672.23	81.1%
NET STUCCO FINISH	451.37	13.7%	**NET STUCCO FINISH**	451.37	13.7%
NET GLAZING	170.4	5.2%	**NET GLAZING**	170.4	5.2%

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	COMMENT
2	07/28/2021	

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

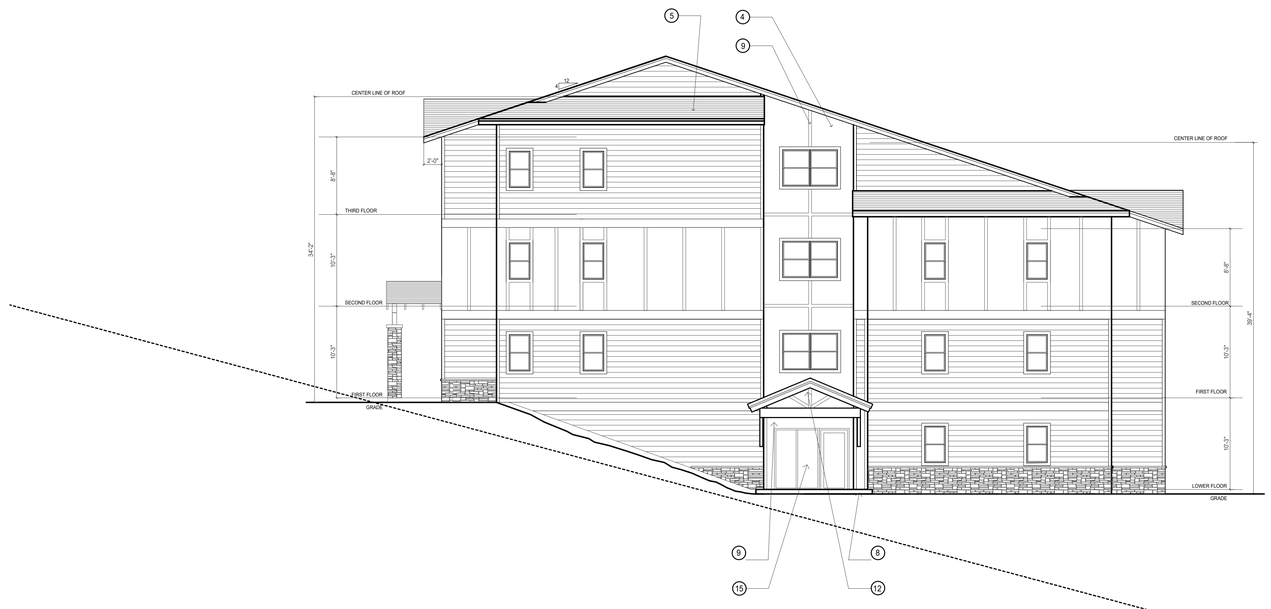
BUILDING TYPE I

A-7



BUILDING TYPE I - EAST ELEVATION

1/8" = 1'-0"



BUILDING TYPE I - WEST ELEVATION

1/8" = 1'-0"

BUILDING TYPE I - EAST ELEVATION

1/8" = 1'-0"

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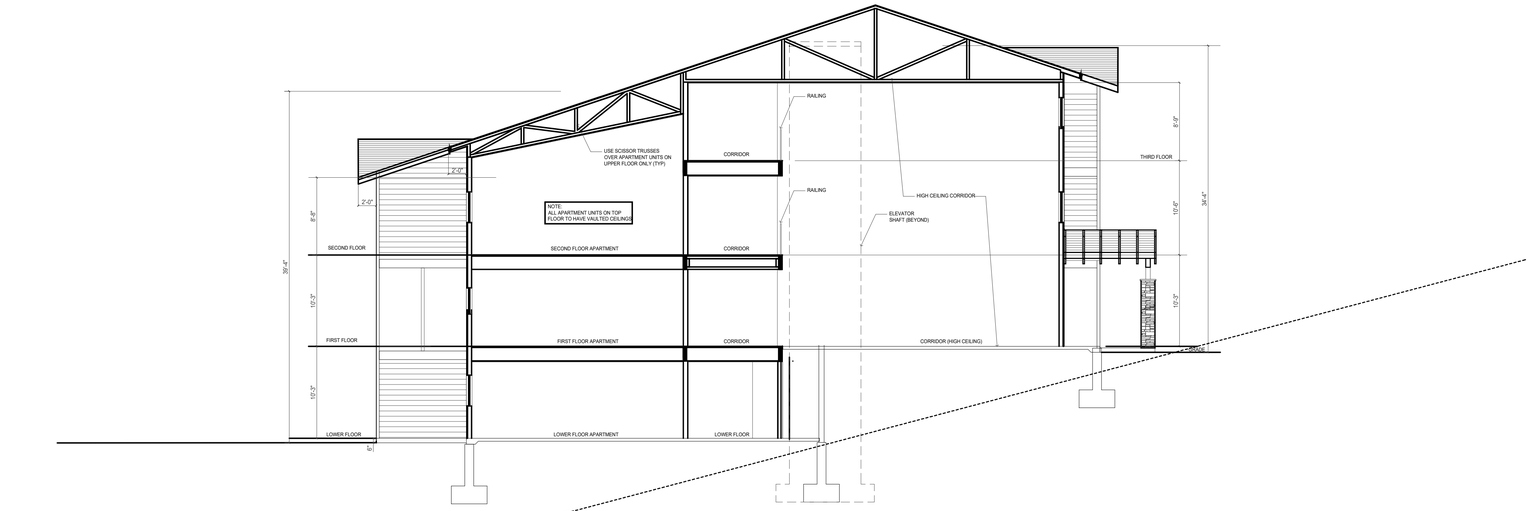
PROJECT:
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REV	COMMENT	DATE
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SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-8



BUILDING TYPE I - SECTION A

1/8" = 1'-0"

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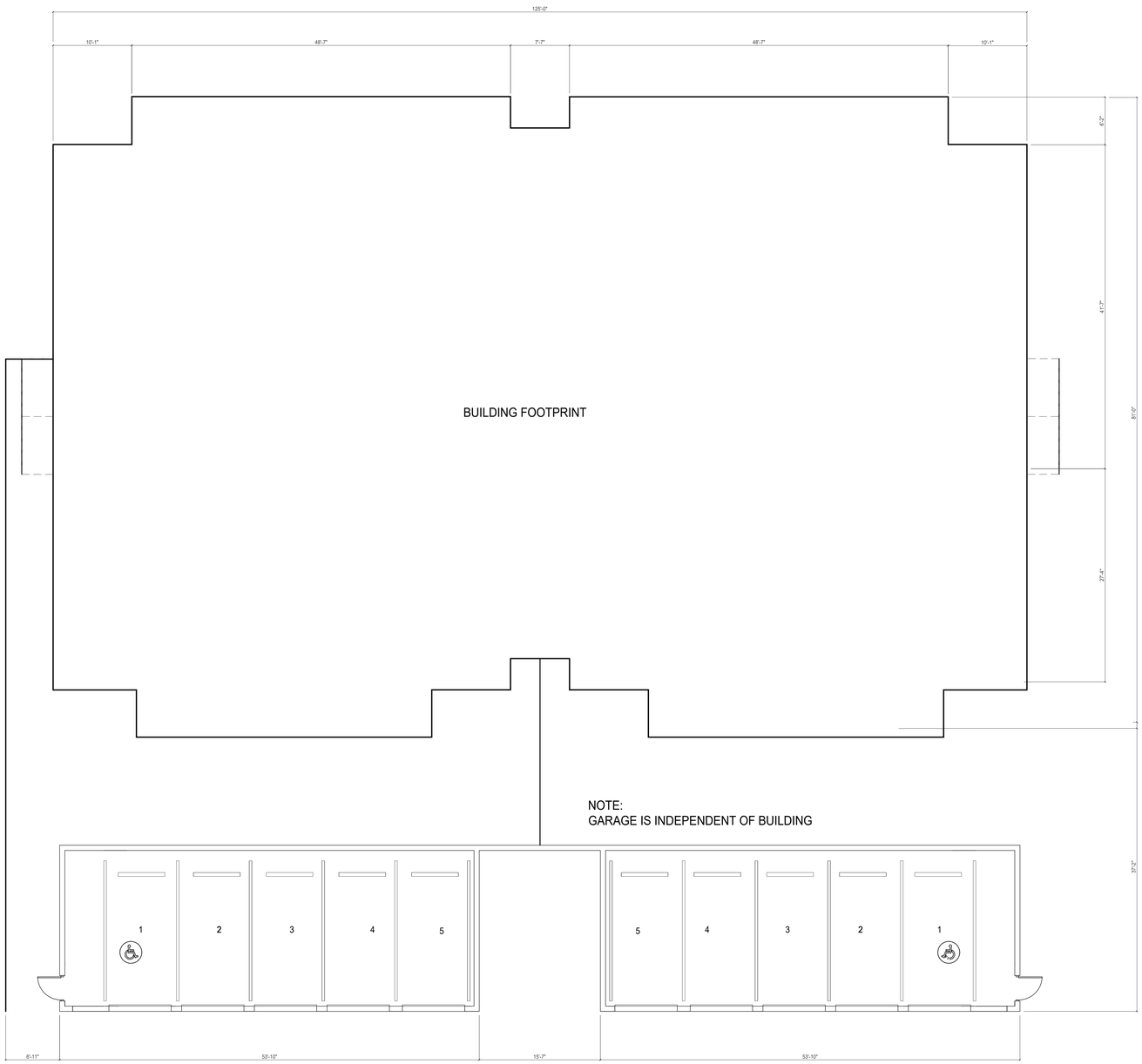
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	Comment	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1' - 0"

BUILDING TYPE I

A-9



BUILDING TYPE II - GARAGE LEVEL

1/8" = 1'-0"

BUILDING TYPE II				
LEVEL	GROSS AREA	OPEN FLOOR CORRIORS	CORRIDOR, ELEVATOR AND STORAGE	NET AREA
GARAGE (10 CARS)	2,630	0	0	2630
LOWER LEVEL	6,038	0	1830	4208
1ST LEVEL	9,778	0	1653	8125
2ND LEVEL	8,245	486	1147	6612
3RD LEVEL	5,697	243	1508	3946
TOTAL BUILDING	32,388			22,891
NO. OF BUILDINGS	3			3
TOTAL FOR BUILDING TYPE II	97,164			68,673

PHASE I - 300 APARTMENTS TOTAL					
BUILDING TYPE	I	II	III	TOTAL BUILDINGS	
NO. OF BUILDINGS	7	3	3	13	
Unit Types					%
3 BEDROOM	42	-	-	42	14.00%
2 BEDROOM - UNIT C1	0	36	36	72	24.00%
2 BEDROOM - UNIT C2	42	-	-	42	14.00%
1 BEDROOM - UNIT B1	0	24	36	60	20.00%
1 BEDROOM - UNIT B2	42	-	-	42	14.00%
STUDIO	42	-	-	42	14.00%
TOTAL UNITS	168	60	72	300	100.00%

PHASE I - 300 APARTMENTS TOTAL					
APARTMENT TYPE	NUMBER OF APARTMENTS	APARTMENT AREAS (SF)			TOTAL AREA (SF)
		INTERIOR	BALCONY	INTERIOR & BALCONY	
3 BEDROOM	42	1,269	80	1,349	56,658
2 BEDROOM - UNIT C1	72	1,126	80	1,206	86,832
2 BEDROOM - UNIT C2	42	1,109	80	1,189	49,938
1 BEDROOM - UNIT B1	60	704	80	784	47,040
1 BEDROOM - UNIT B2	42	711	71	782	32,844
STUDIO	42	593	80	673	28,266
					301,578

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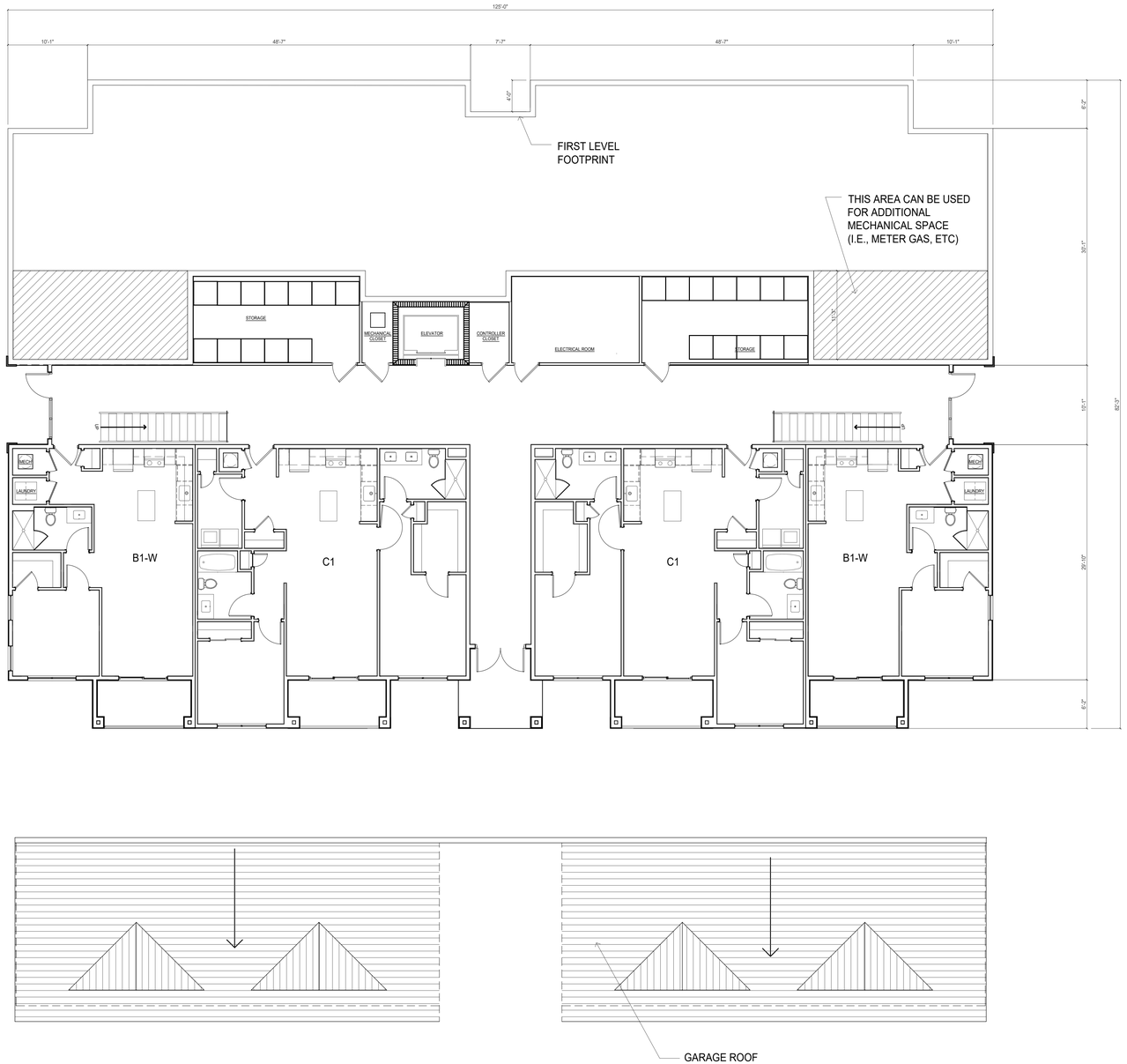
PROJECT:
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REV	DATE	COMMENT
2	07/28/2021	

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

BUILDING TYPE II

A-10



BUILDING TYPE II - LOWER LEVEL

1/8" = 1'-0"

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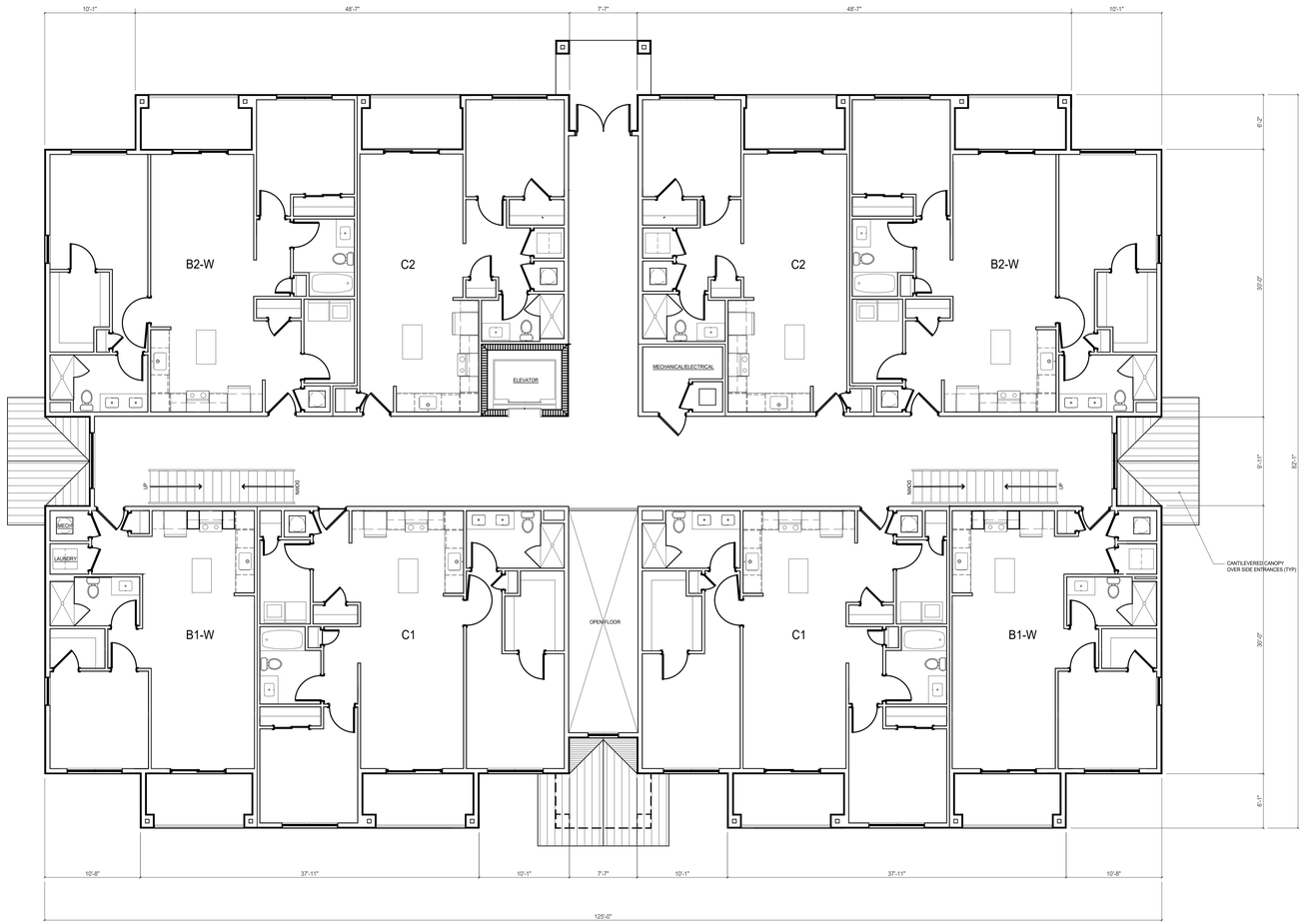
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1' - 0"

BUILDING TYPE II

A–11



BUILDING TYPE II - FIRST FLOOR

1/8" = 1'-0"

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DATE	COMMENT	REV

BY: RC
DATE: 12/24/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE II

A–12



BUILDING TYPE II - SECOND FLOOR

1/8" = 1'-0"

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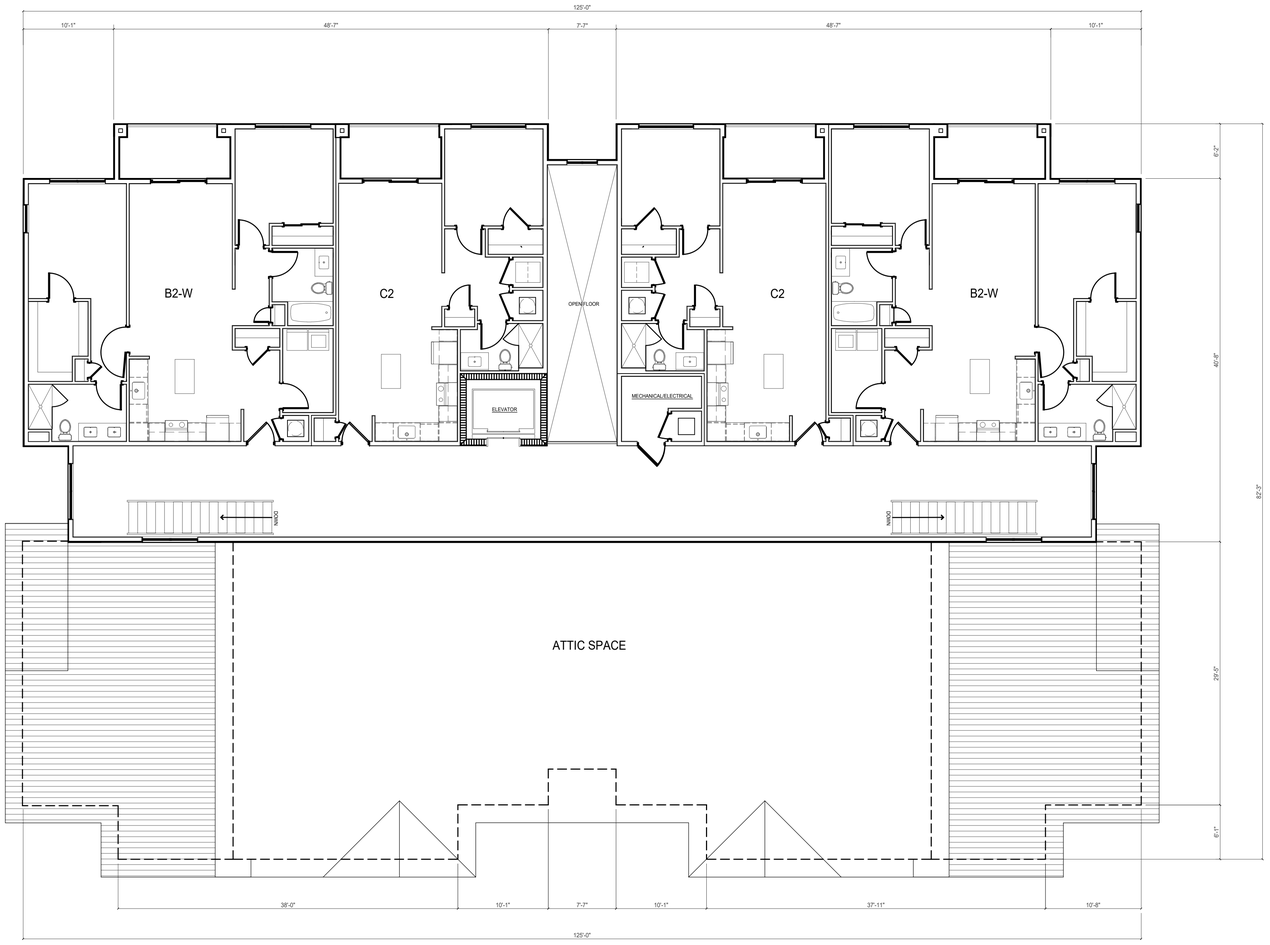
PROJECT:
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2	07/26/2021	

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

BUILDING TYPE II

A-13



BUILDING TYPE II - THIRD FLOOR

1/8" = 1'-0"

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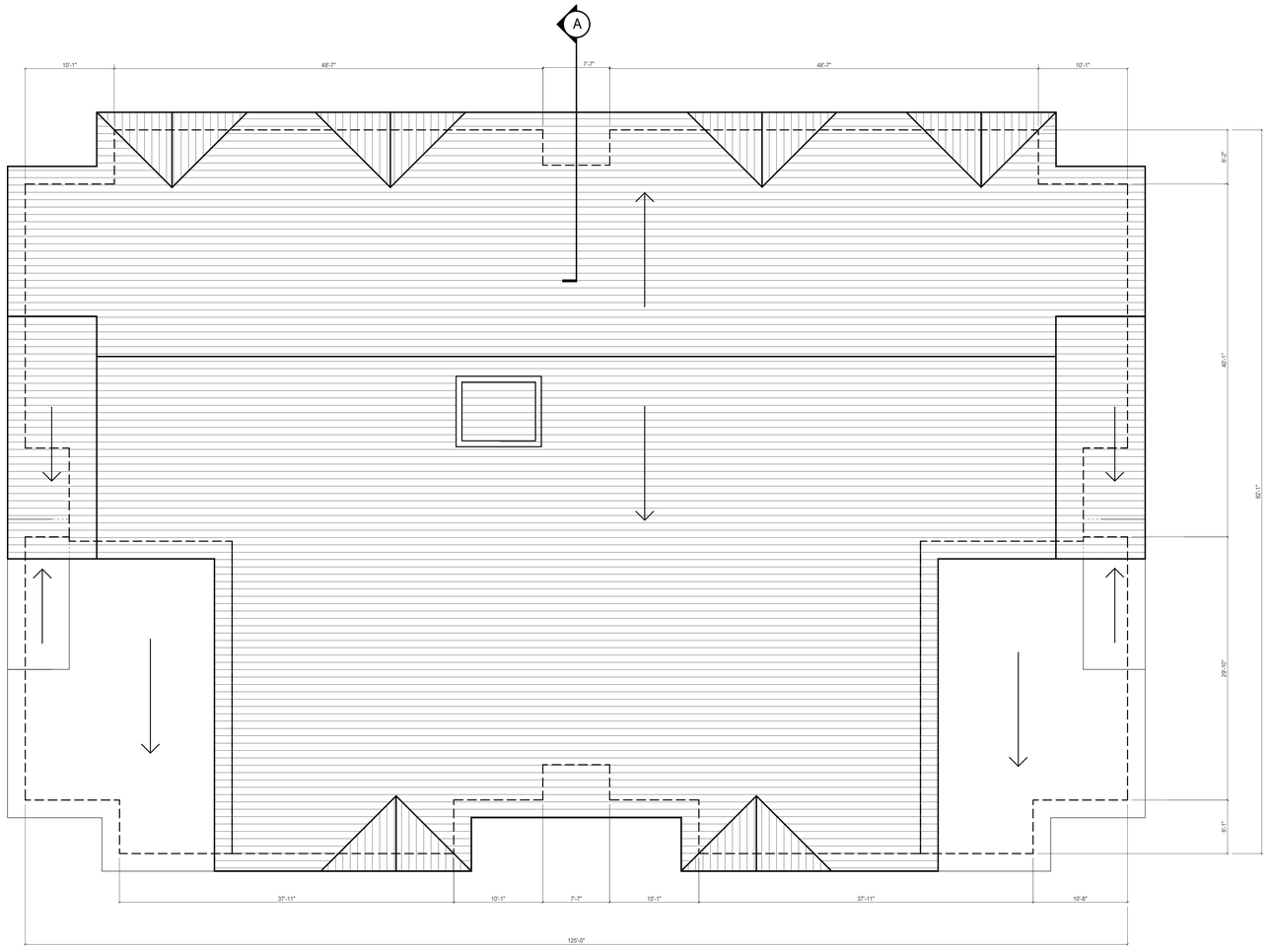
PROJECT:
GLENWOOD SPRINGS
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REV	Comment	DATE
2	07/26/2021	

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

BUILDING TYPE II

A-14



BUILDING TYPE II - ROOF

1/8" = 1'-0"

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GLENWOOD SPRINGS
COLORADO

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

BUILDING TYPE II

A-15



BUILDING TYPE II - NORTH ELEVATION

1/8" = 1'-0"



BUILDING TYPE II - SOUTH ELEVATION

1/8" = 1'-0"

EXTERIOR FINISH SCHEDULE - BUILDING TYPE III			
LABEL	**ITEM**	**PRODUCT**	**COLOR**
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 4" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	NAVAJO BEIGE
6	WINDOW	ALUMINUM - SINGLE HUNG	BRONZE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	MONTEREY TAUPE
10	BALCONY DOOR	ALUMINUM SLIDING GLASS DOOR	WHITE
11	RAILING - BALCONY	ALUMINUM PICKET RAILING	WHITE
12	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
13	BUILDING ENTRY COLUMNS	STRUCTURAL STEEL	BLACK
14	STONE CLADDED COLUMN	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
15	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
16	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
17	RAILING - ROOF DECK COMMON AMENITY SPACE	ALUMINUM PICKET RAILING	WHITE
18	STUCCO - RESIDENTIAL GARAGES	3 - COAT SMOOTH CEMENT STUCCO FINISH	MONTEREY TAUPE
19	GARAGE DOOR	INSULATED METAL	WHITE
20	DOOR	METAL CLAD DOOR	MONTEREY TAUPE

BUILDING TYPE II		
NORTH ELEVATION		
	SURFACE AREA	**PERCENTAGE OF NET**
GROSS WALL	4071	NA
NET STONE CLADDING	212.56	-
NET SIDING	1720.9	42.3%
NET STUCCO FINISH	1126.73	27.7%
NET GLAZING	1010.81	24.8%

SOUTH ELEVATION		
	SURFACE AREA	**PERCENTAGE OF NET**
GROSS WALL	3866.00	NA
NET STONE CLADDING	#REF!	#REF!
NET SIDING	#REF!	#REF!
NET STUCCO FINISH	1269.10	32.8%
NET GLAZING	1037.68	26.8%

EAST ELEVATION		
	SURFACE AREA	**PERCENTAGE OF NET**
GROSS WALL	3270.19	NA
NET STONE CLADDING	-	-
NET SIDING	2759.89	84.4%
NET STUCCO FINISH	377.67	11.5%
NET GLAZING	132.63	4.1%

WEST ELEVATION		
	SURFACE AREA	**PERCENTAGE OF NET**
GROSS WALL	3270.19	NA
NET STONE CLADDING	-	-
NET SIDING	2759.89	84.4%
NET STUCCO FINISH	377.67	11.5%
NET GLAZING	132.63	4.1%

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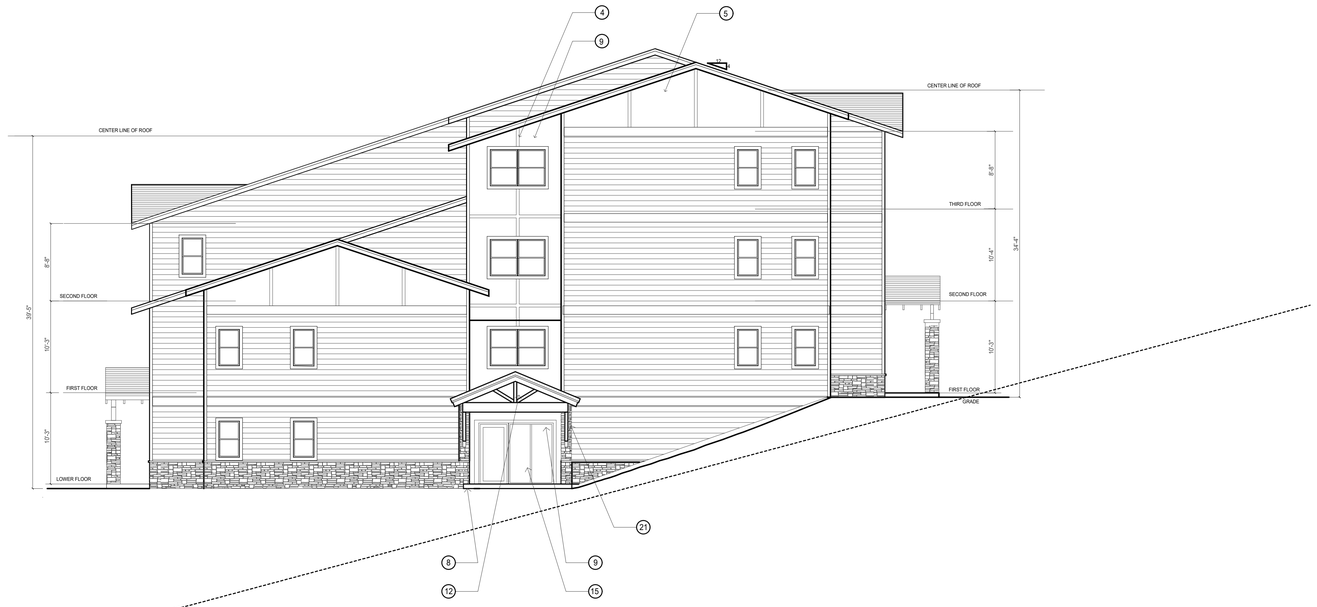
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
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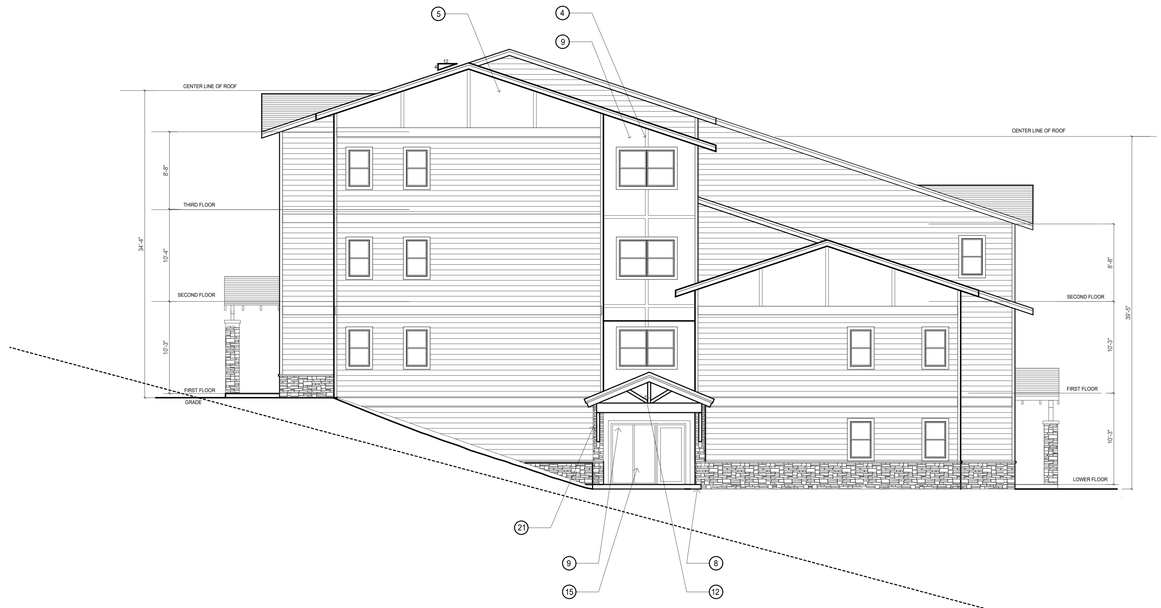
BUILDING TYPE II

A-16



BUILDING TYPE II - EAST ELEVATION

1/8" = 1'-0"



BUILDING TYPE II - EAST ELEVATION

1/8" = 1'-0"

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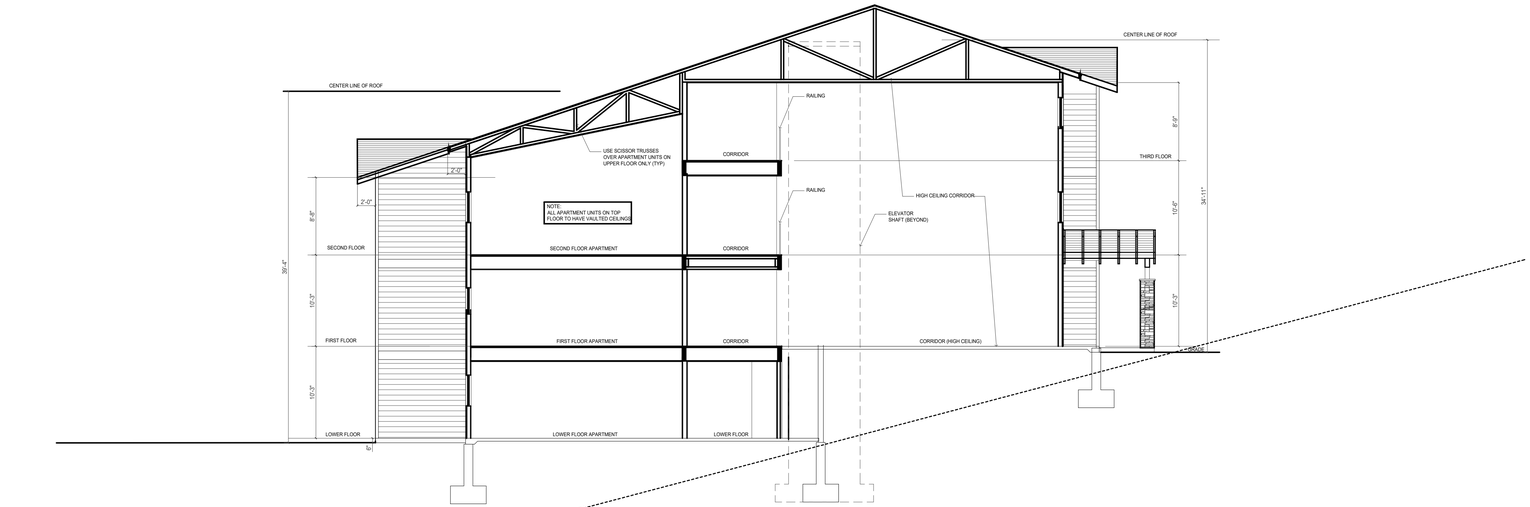
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BUILDING TYPE II

A–17



BUILDING TYPE II - SECTION A

1/8" = 1'-0"

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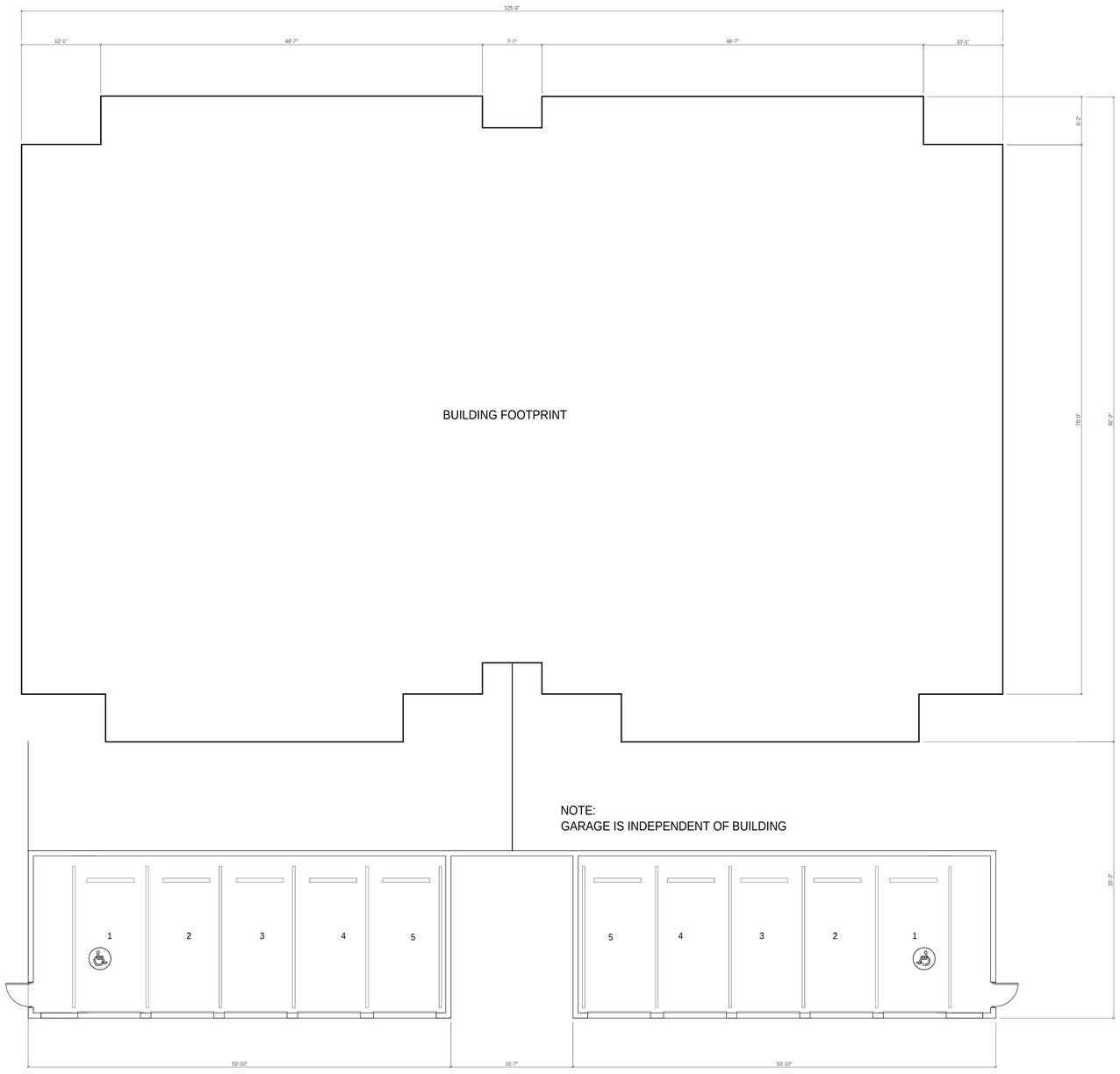
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BUILDING TYPE II

A-18



BUILDING TYPE III - GARAGE LEVEL

1/8" = 1'-0"

BUILDING TYPE III				
LEVEL	GROSS AREA	OPEN FLOOR CORRIORS	CORRIDOR, ELEVATOR AND STORAGE	NET AREA
GARAGE (10 CARS)	2,630	0	0	2630
LOWER LEVEL	6,038	0	1830	4208
1ST LEVEL	9,778	0	1653	8125
2ND LEVEL	9,778	486	1147	8145
3RD LEVEL	5,675	243	1508	3924
TOTAL BUILDING	33,899			24,402
NO. OF BUILDINGS	3			3
TOTAL FOR BUILDING TYPE III	101,697			73,206

PHASE I - 300 APARTMENTS TOTAL					
BUILDING TYPE	I	II	III	TOTAL BUILDINGS	
NO. OF BUILDINGS	7	3	3	13	
Unit Types					%
3 BEDROOM	42	-	-	42	14.00%
2 BEDROOM - UNIT C1	0	36	36	72	24.00%
2 BEDROOM - UNIT C2	42	-	-	42	14.00%
1 BEDROOM - UNIT B1	0	24	36	60	20.00%
1 BEDROOM - UNIT B2	42	-	-	42	14.00%
STUDIO	42	-	-	42	14.00%
TOTAL UNITS	168	60	72	300	100.00%

PHASE I - 300 APARTMENTS TOTAL					
APARTMENT TYPE	NUMBER OF APARTMENTS	APARTMENT AREAS (SF)			TOTAL AREA (SF)
		INTERIOR	BALCONY	INTERIOR & BALCONY	
3 BEDROOM	42	1,269	80	1,349	56,658
2 BEDROOM - UNIT C1	72	1,126	80	1,206	86,832
2 BEDROOM - UNIT C2	42	1,109	80	1,189	49,938
1 BEDROOM - UNIT B1	60	704	80	784	47,040
1 BEDROOM - UNIT B2	42	711	71	782	32,844
STUDIO	42	593	80	673	28,266
					301,578

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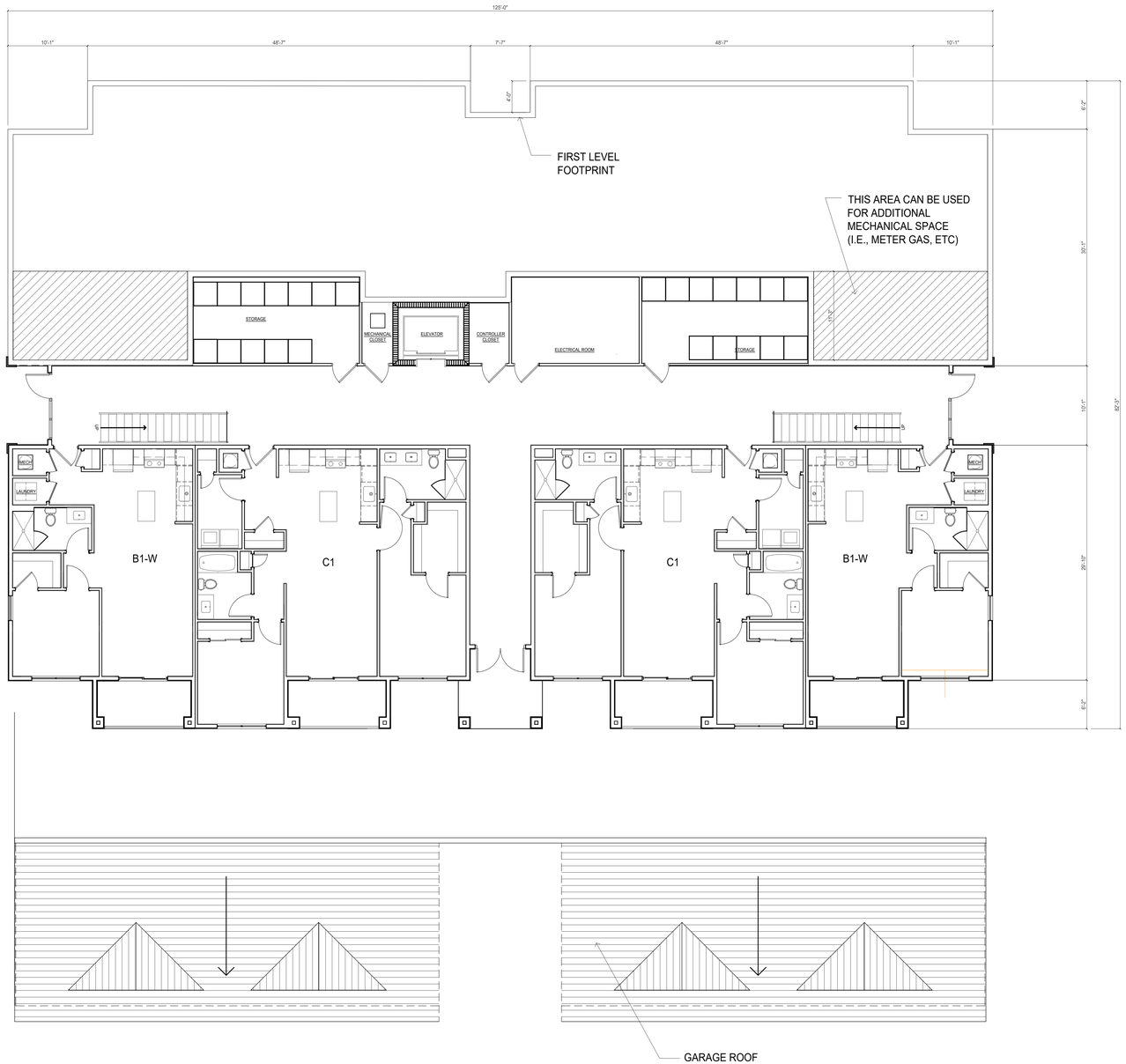
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2	07/26/2021	

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BUILDING TYPE III

A-19



BUILDING TYPE III - LOWER LEVEL

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	Comment

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DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING
TYPE III

A-20



BUILDING TYPE III - FIRST FLOOR

1/8" = 1'-0"

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BY:	RC	
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SCALE:	1/8" = 1'-0"	

BUILDING TYPE III

A-21



BUILDING TYPE III - SECOND FLOOR

1/8" = 1'-0"

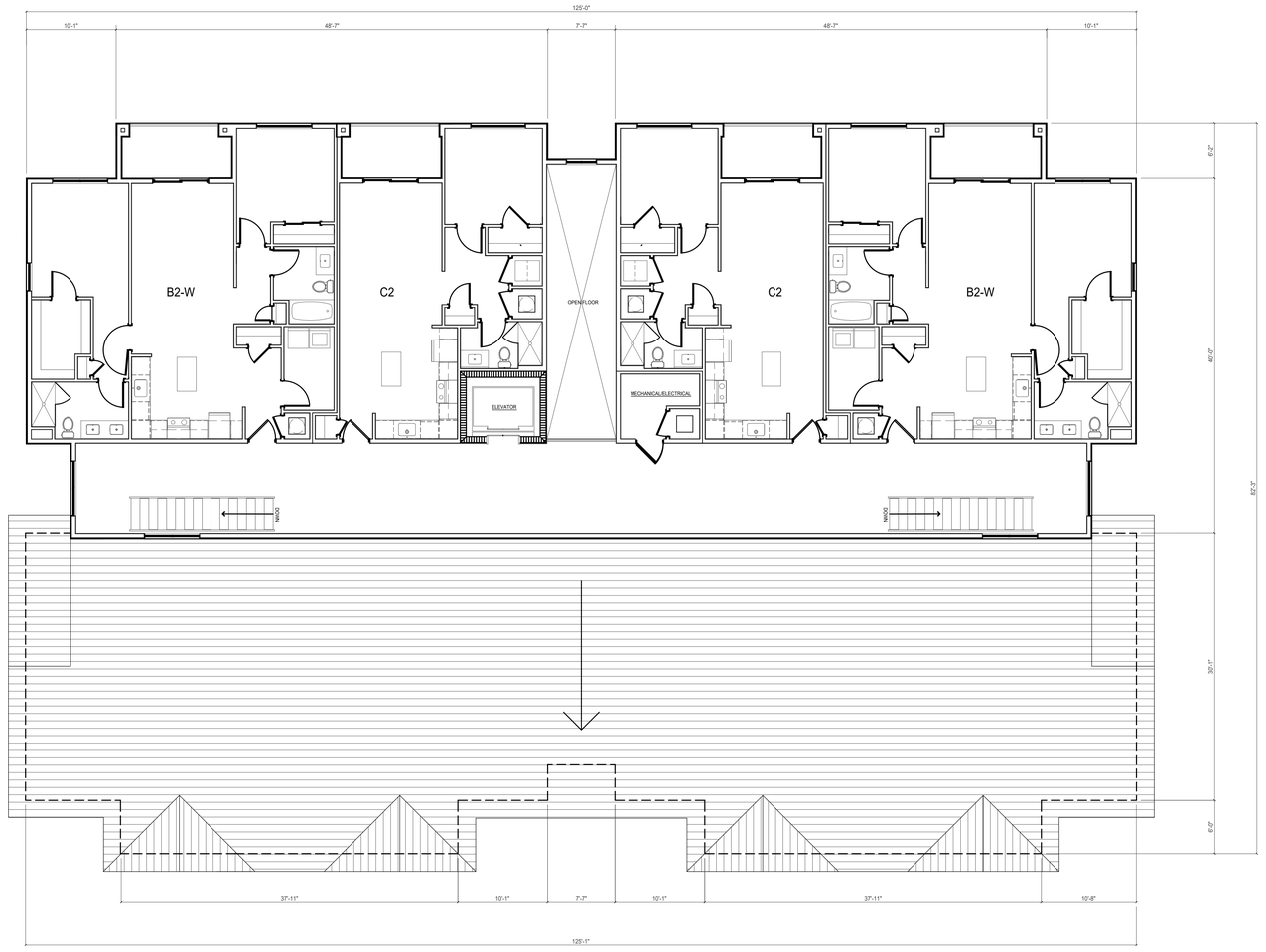
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COLORADO

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BUILDING TYPE III - THIRD FLOOR

1/8" = 1'-0"

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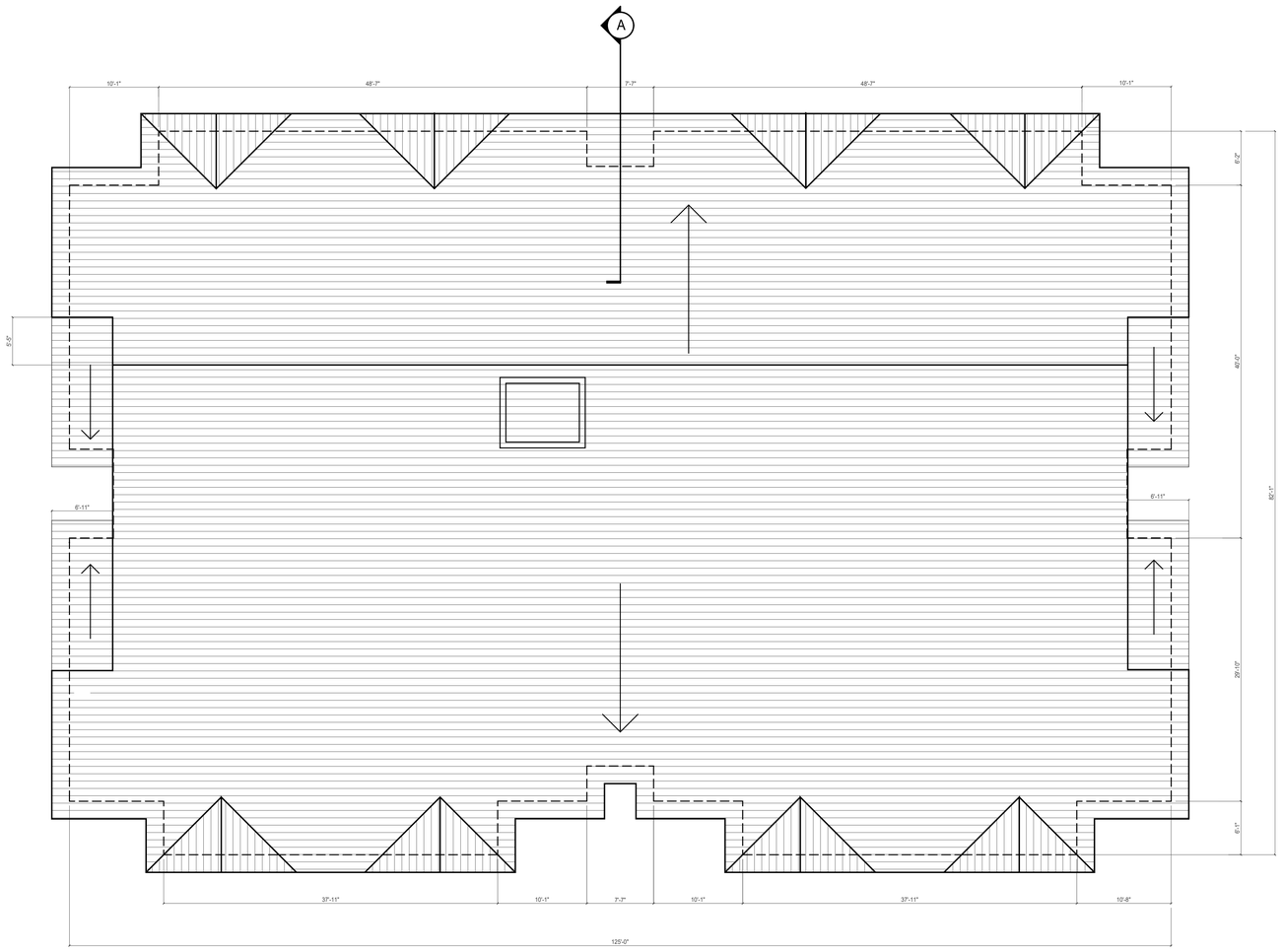
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BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE III

A-23



BUILDING TYPE III - ROOF

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	Comment	DATE
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

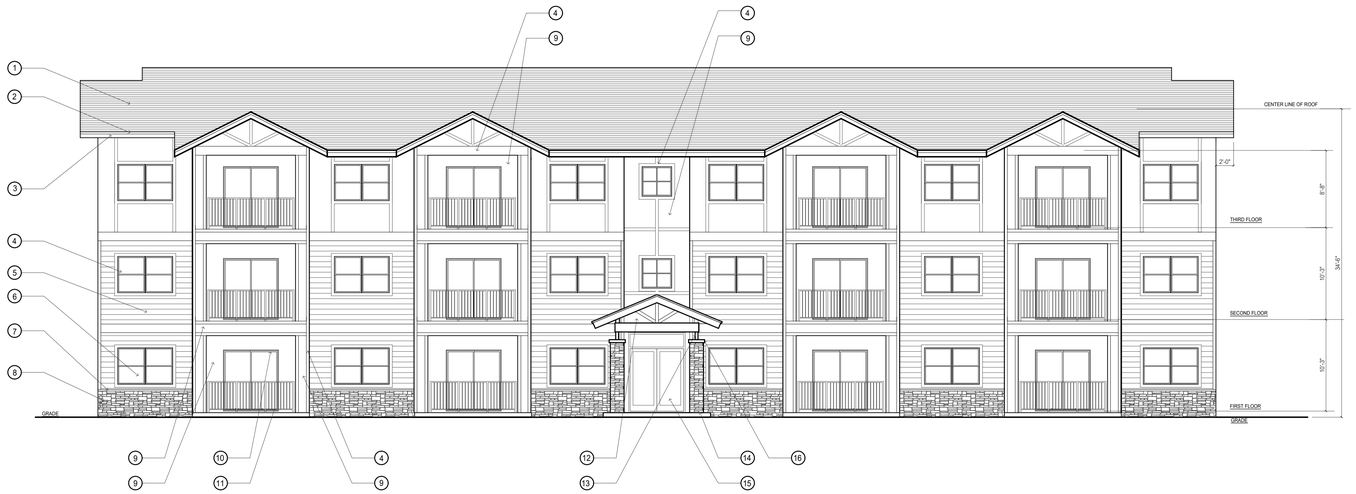
BUILDING TYPE III

A-24



BUILDING TYPE III - NORTH ELEVATION

1/8" = 1'-0"



BUILDING TYPE III - SOUTH ELEVATION

1/8" = 1'-0"

EXTERIOR FINISH SCHEDULE - BUILDING TYPE III			
LABEL	**ITEM**	**PRODUCT**	**COLOR**
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 4" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	NAVAJO BEIGE
6	WINDOW	ALUMINUM - SINGLE HUNG	BRONZE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	MONTEREY TAUPE
10	BALCONY DOOR	ALUMINUM SLIDING GLASS DOOR	WHITE
11	RAILING - BALCONY	ALUMINUM PICKET RAILING	WHITE
12	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
13	BUILDING ENTRY COLUMNS	STRUCTURAL STEEL	BLACK
14	STONE CLADDED COLUMN	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
15	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
16	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
17	RAILING - ROOF DECK COMMON AMENITY SPACE	ALUMINUM PICKET RAILING	WHITE
18	STUCCO - RESIDENTIAL GARAGES	3 - COAT SMOOTH CEMENT STUCCO FINISH	MONTEREY TAUPE
19	GARAGE DOOR	INSULATED METAL	WHITE
20	DOOR	METAL CLAD DOOR	MONTEREY TAUPE

BUILDING TYPE III					
NORTH ELEVATION			**SOUTH ELEVATION**		
	SURFACE AREA	**PERCENTAGE OF NET**		**SURFACE AREA**	**PERCENTAGE OF NET**
GROSS WALL	4112.73	NA	**GROSS WALL**	3866.00	NA
NET STONE CLADDING	205.64	5.0%	**NET STONE CLADDING**	#REF!	#REF!
NET SIDING	1590.56	38.7%	**NET SIDING**	#REF!	#REF!
NET STUCCO FINISH	1278.8	31.1%	**NET STUCCO FINISH**	1269.10	32.8%
NET GLAZING	1037.73	25.2%	**NET GLAZING**	1037.68	26.8%
EAST ELEVATION			**WEST ELEVATION**		
	SURFACE AREA	**PERCENTAGE OF NET**		**SURFACE AREA**	**PERCENTAGE OF NET**
GROSS WALL	3270.19	NA	**GROSS WALL**	3270.19	NA
NET STONE CLADDING	-	-	**NET STONE CLADDING**	-	-
NET SIDING	2759.89	84.4%	**NET SIDING**	2759.89	84.4%
NET STUCCO FINISH	377.67	11.5%	**NET STUCCO FINISH**	377.67	11.5%
NET GLAZING	132.63	4.1%	**NET GLAZING**	132.63	4.1%

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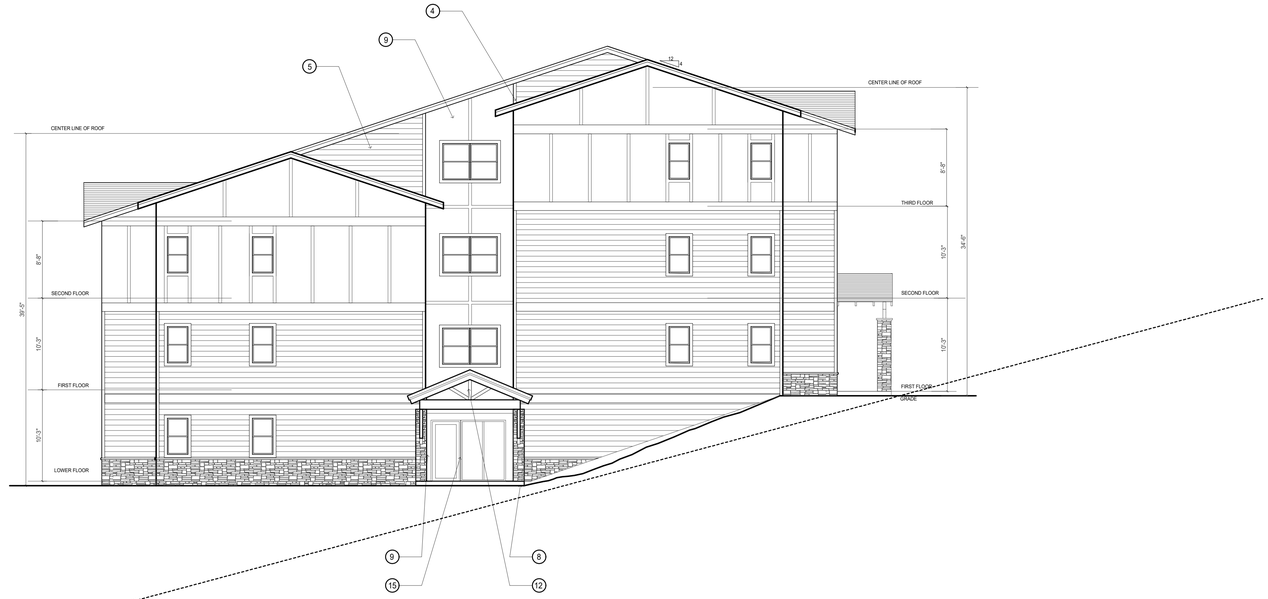
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	COMMENT
2	07/26/2021	

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DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

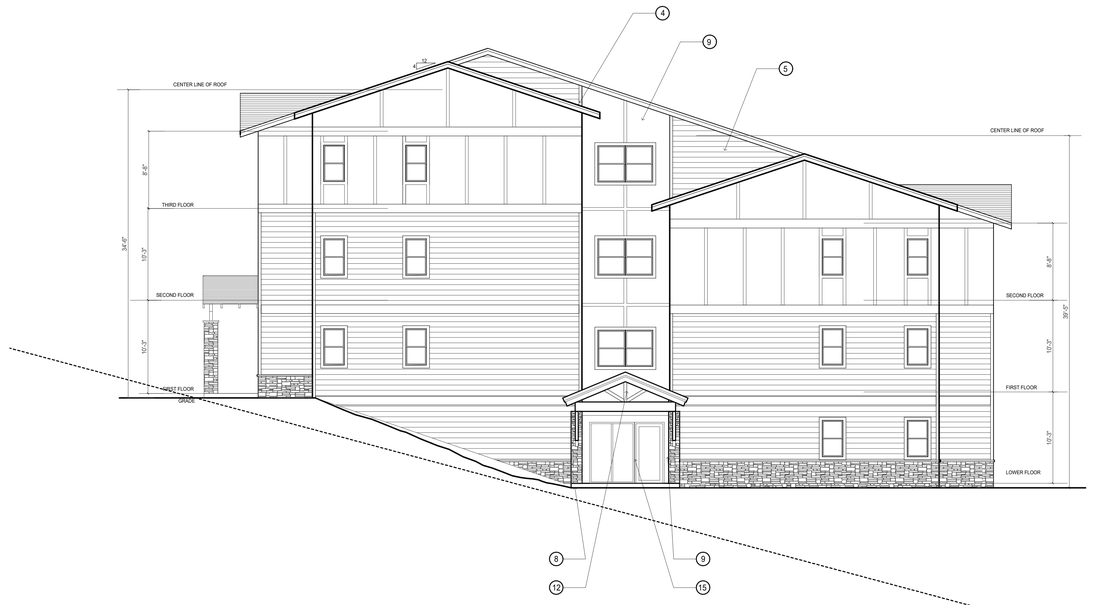
BUILDING TYPE III

A-25



BUILDING TYPE III - EAST ELEVATION

1/8" = 1'-0"



BUILDING TYPE III - WEST ELEVATION

1/8" = 1'-0"

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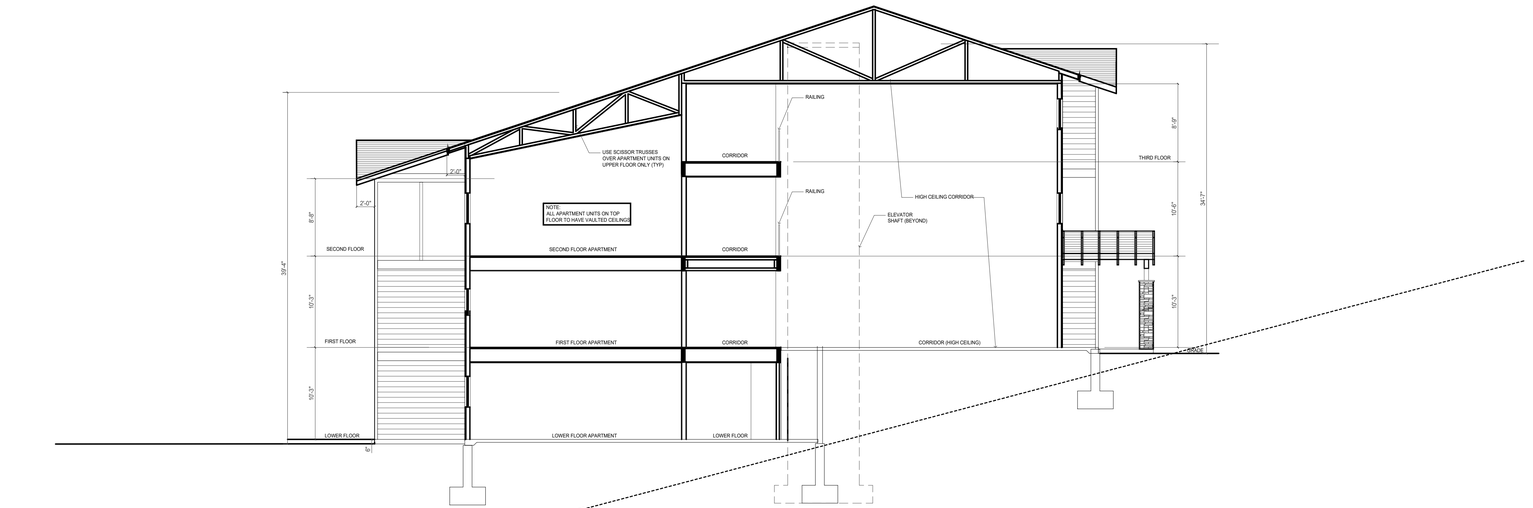
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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
2	07/26/2021	
		BY: RC
		DATE: 12/26/2020
		SCALE: 1/8" = 1'-0"

BUILDING TYPE III

A-26



BUILDING TYPE III - SECTION A

1/8" = 1'-0"

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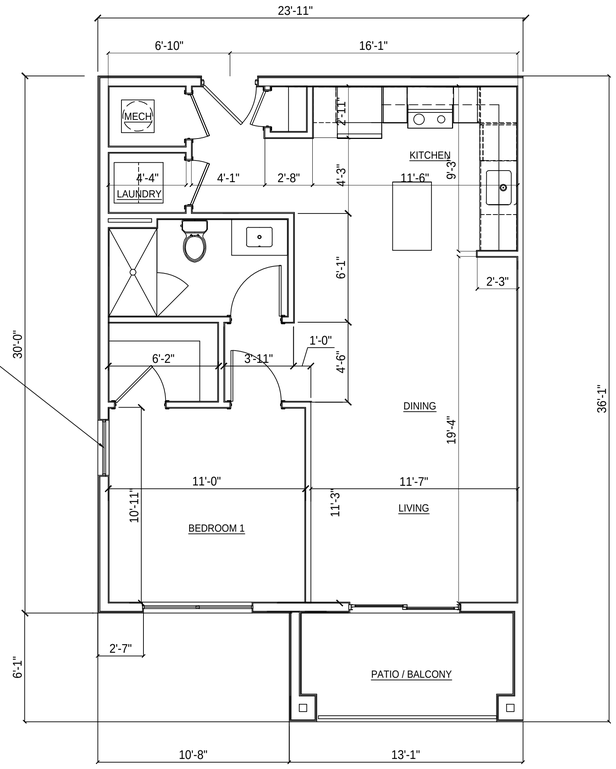
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

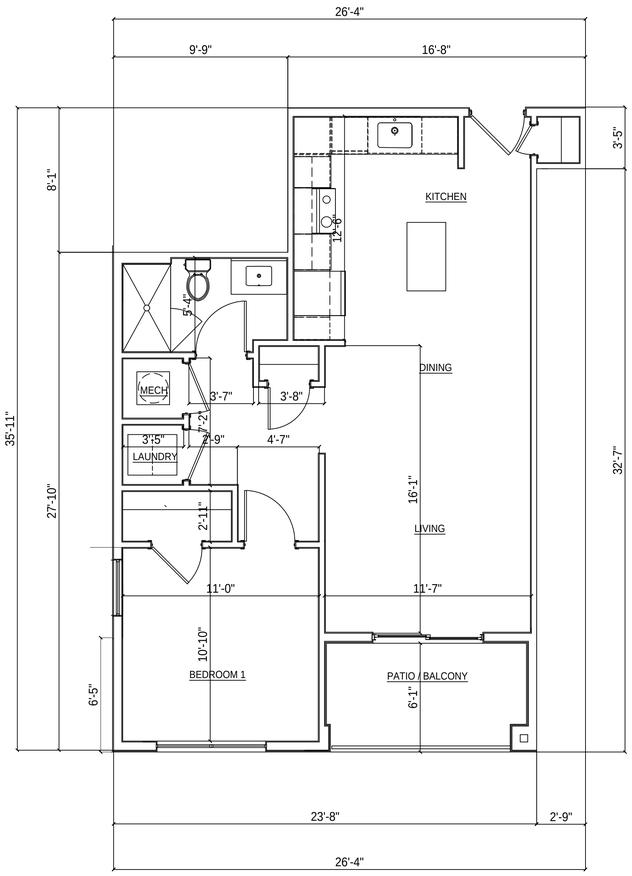
BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE III

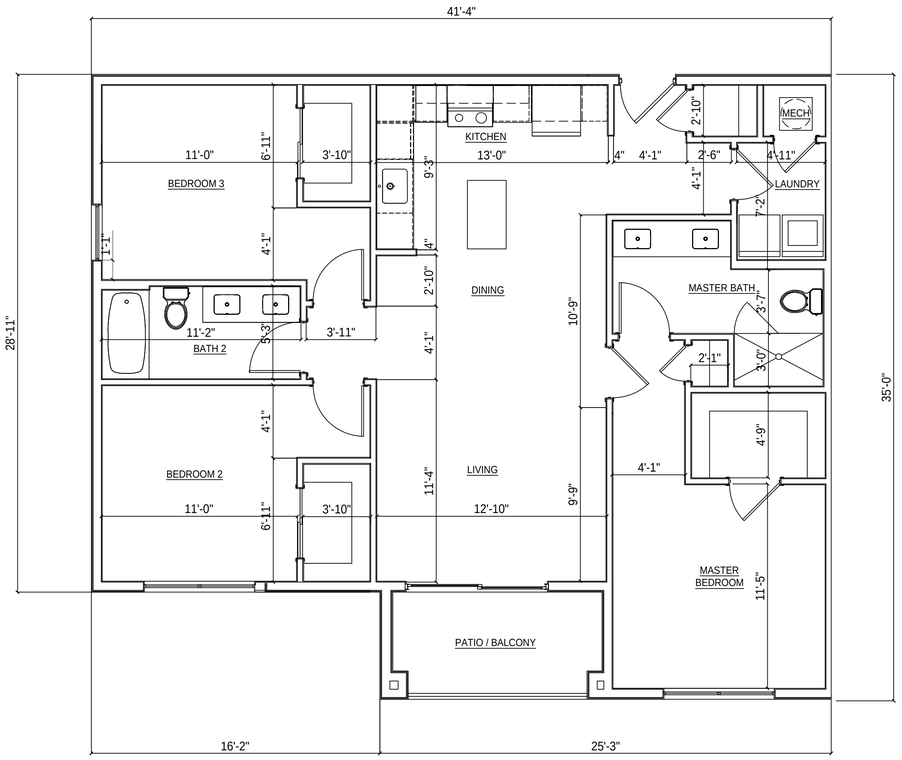
A-27



1 BEDROOM (UNIT B1)
1 BEDROOM (UNIT B1-W)
1/4" = 1'-0"



1 BEDROOM (UNIT B2)
1 BEDROOM (UNIT B2-W)
1/4" = 1'-0"



3 BEDROOM APARTMENT (UNIT D1)
1/4" = 1'-0"

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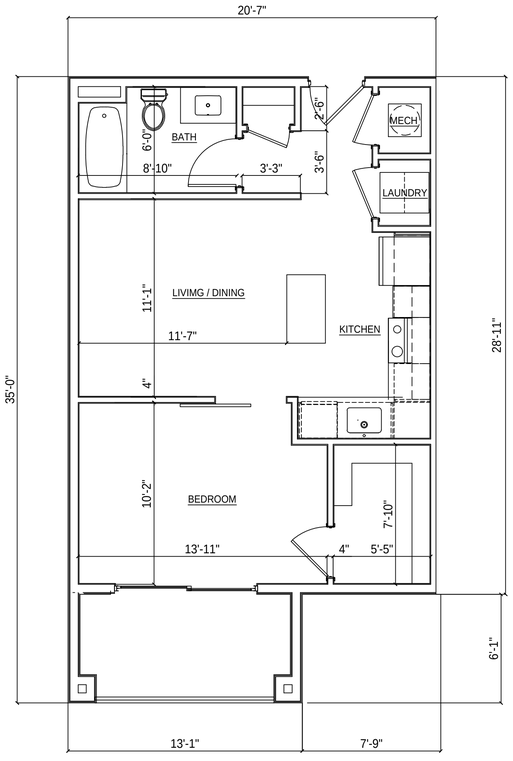
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/4" = 1' - 0"

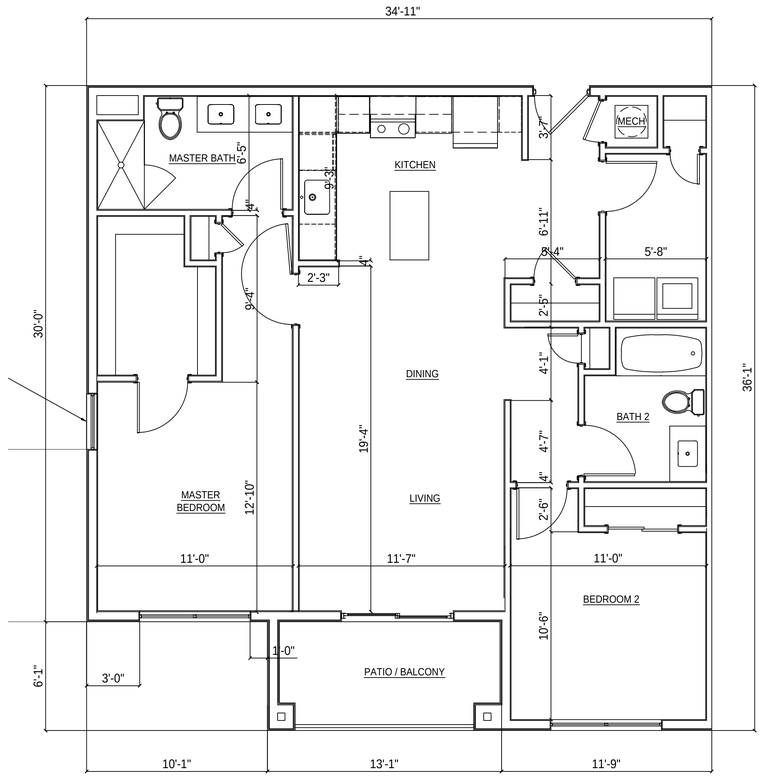
APARTMENT FLOOR PLANS

A-28



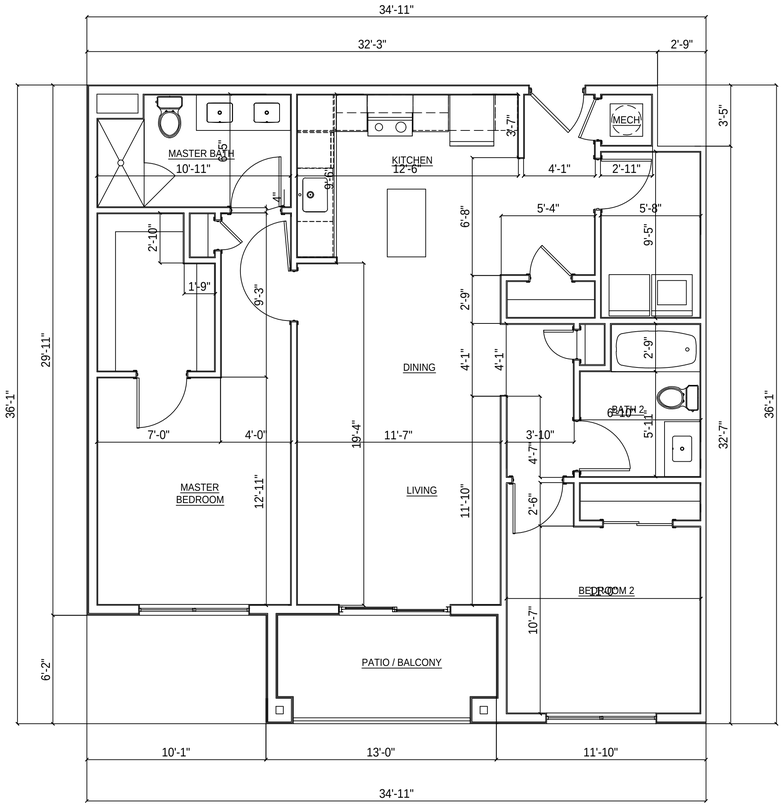
STUDIO (UNIT A1)

1/4" = 1'-0"



2 BEDROOM APARTMENT (UNIT C1)
2 BEDROOM APARTMENT (UNIT C1-W)

1/4" = 1'-0"



2 BEDROOM APARTMENT (UNIT C2)

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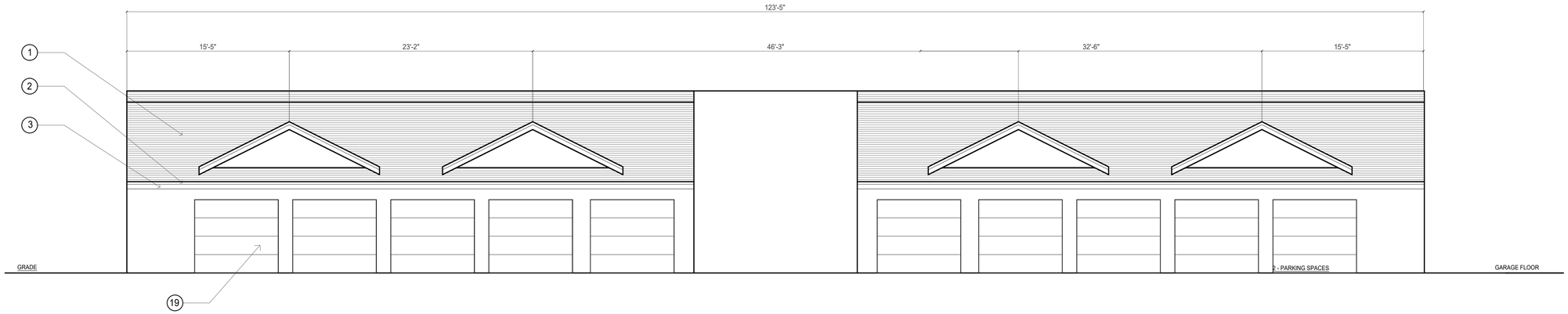
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

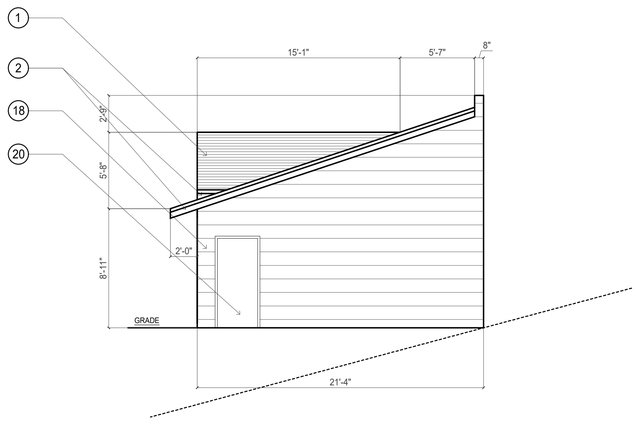
BY: RC
DATE: 12/26/2020
SCALE: 1/4" = 1' - 0"

APARTMENT FLOOR PLANS

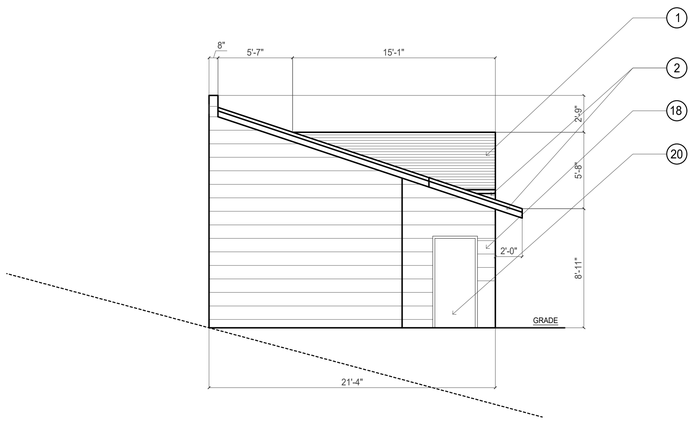
A-29



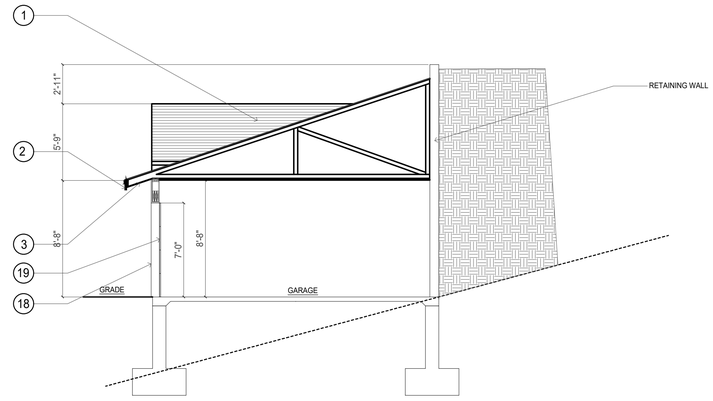
GARAGE - NORTH ELEVATION
3/16" = 1'-0"



GARAGE - EAST ELEVATION
3/16" = 1'-0"



GARAGE - WEST ELEVATION
3/16" = 1'-0"



GARAGE - SECTION
3/16" = 1'-0"

GARAGE ELEVATION FOR BUILDING TYPE I, II, III

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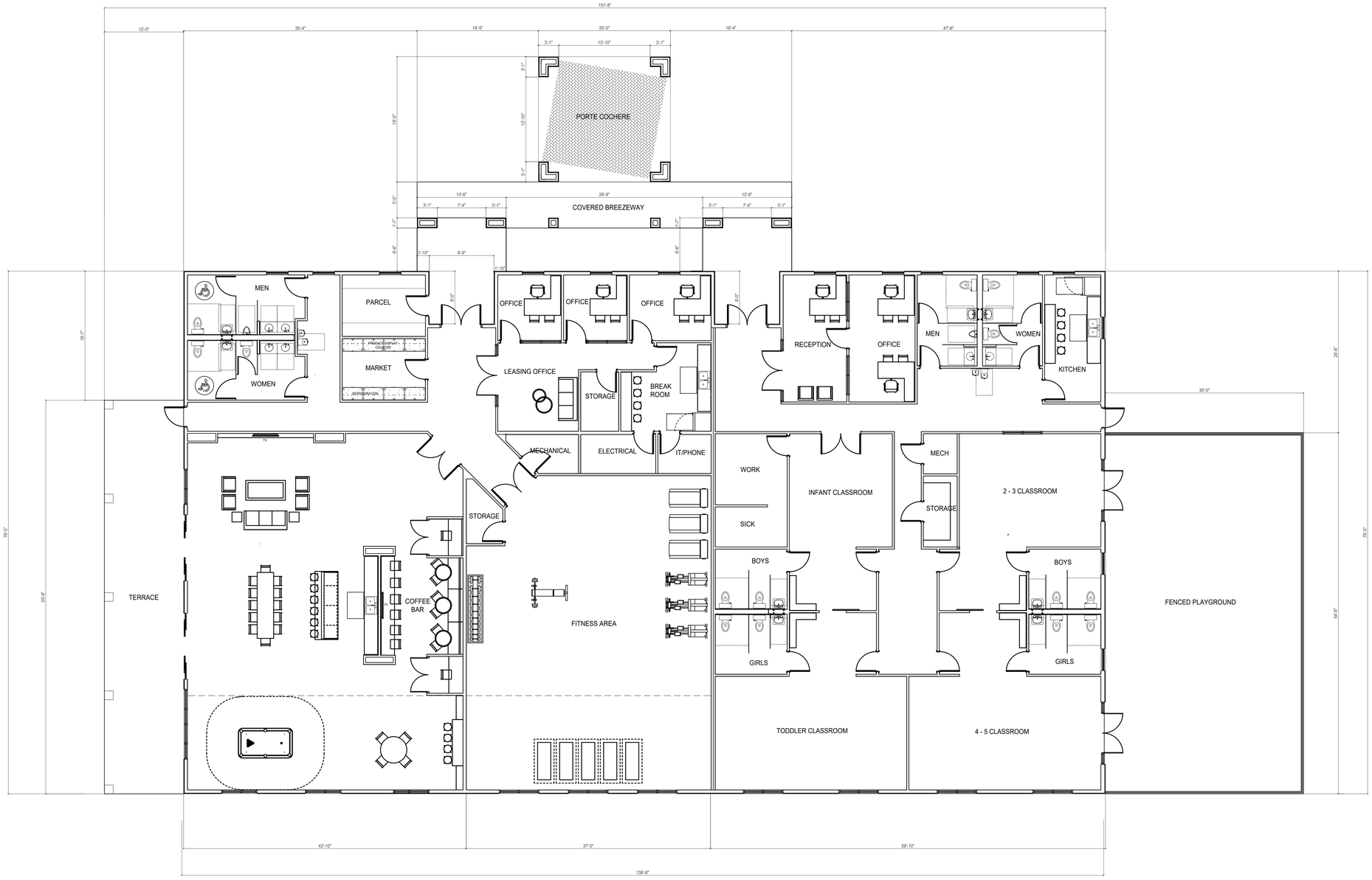
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
2	07/26/2021	

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GARAGE ELEVATIONS

A-30



CLUBHOUSE **DAYCARE CENTER**

CLUBHOUSE & DAYCARE CENTER

1/8" = 1'-0"

CLUBHOUSE & DAYCARE				
LEVEL	AREA	COVERED ENTRANCE	TERRACE	TOTAL AREA
CLUBHOUSE	6,284	187	716	7187
DAYCARE	4,629	187	-	4816
BREEZEWAY	364	-	-	364
PORTE COCHERE	380	-	-	380
TOTAL FOR CLUBHOUSE	**11,657**	**374**	**716**	**12,747**

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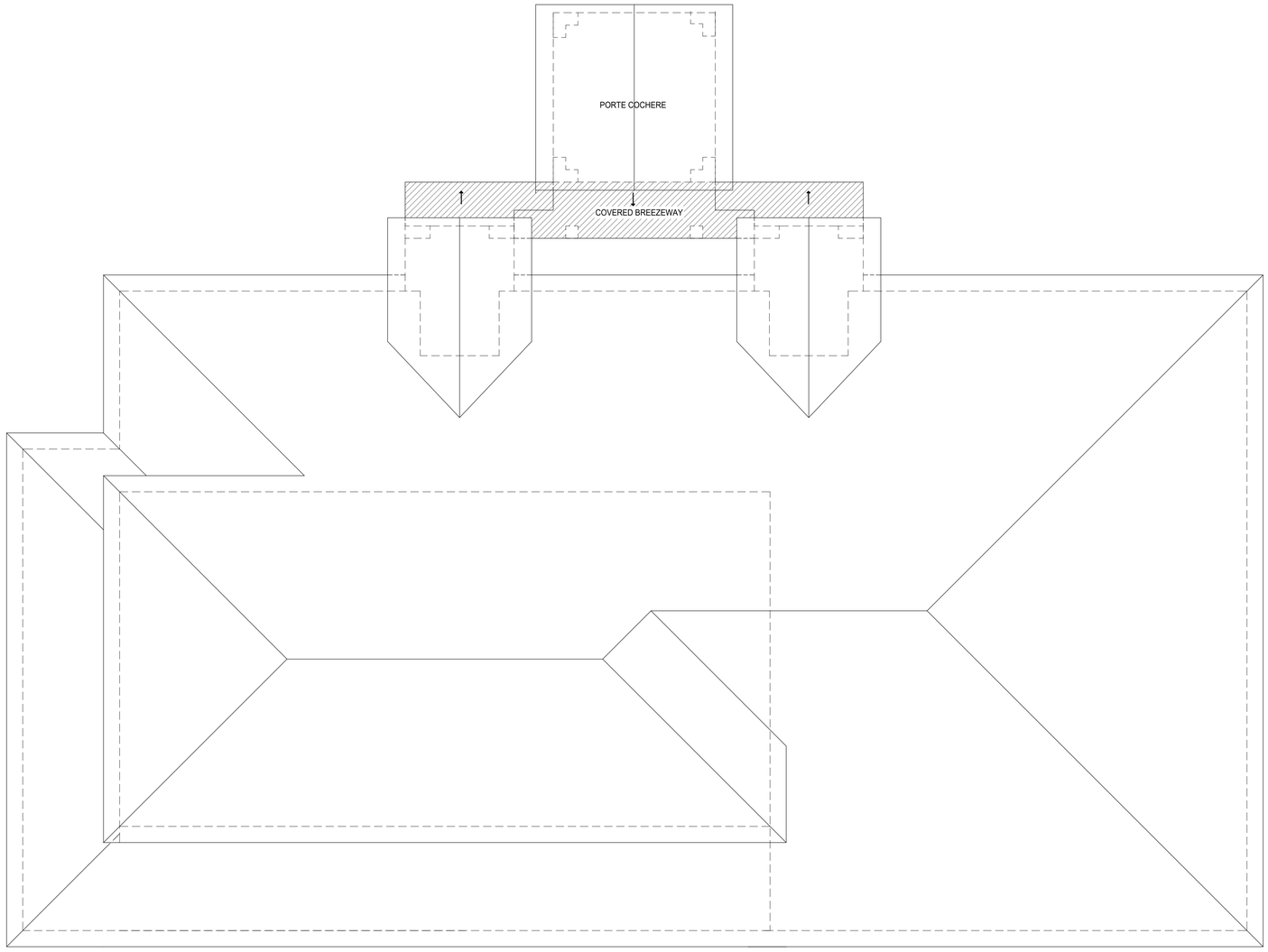
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PROJECT: GLENWOOD SPRINGS COLORADO

REV	Comment	DATE
BY: RC		
DATE: 12/26/2020		
SCALE: 1/8" = 1' - 0"		

CLUBHOUSE FLOOR PLAN

A – 31



CLUBHOUSE & DAYCARE CENTER - ROOF PLAN

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

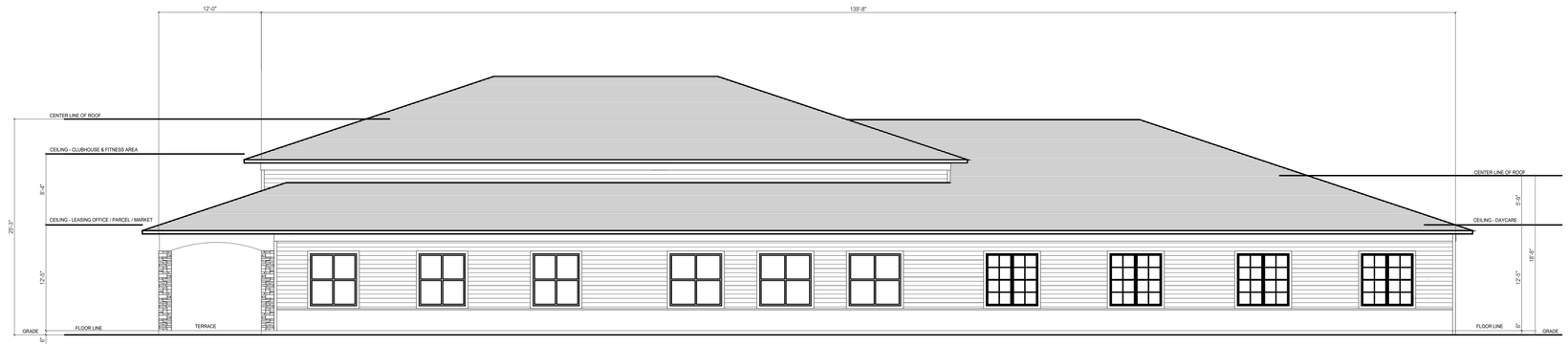
REV	COMMENT	DATE

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CLUBHOUSE ROOF PLAN

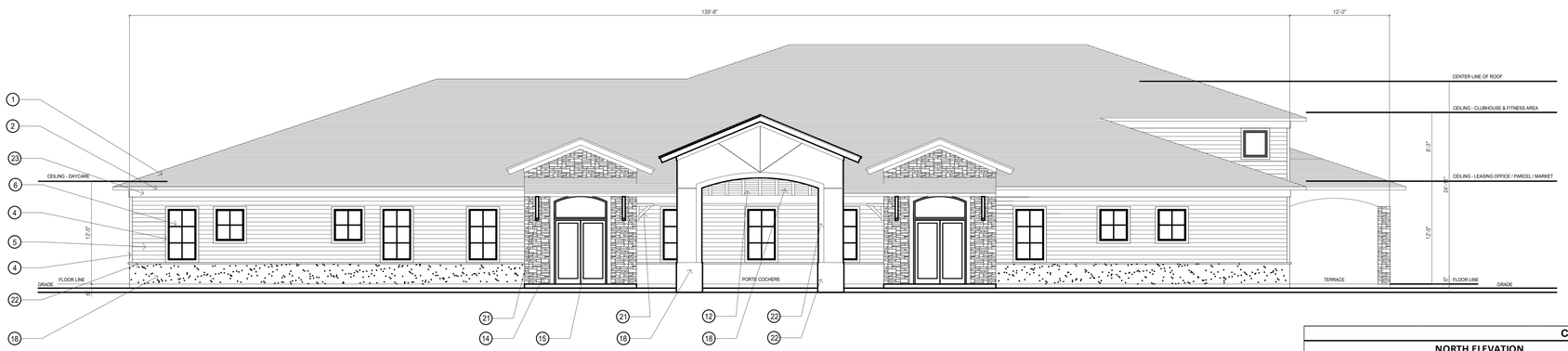
A-32

EXTERIOR FINISH SCHEDULE - CLUBHOUSE			
LABEL	ITEM	PRODUCT	COLOR
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 6" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	BOOTHBAY BLUE
6	WINDOW	ALUMINUM - SINGLE HUNG	WHITE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	APALACHIAN TWILIGHT
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	APALACHIAN TWILIGHT
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	COBBLE STONE
10	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
11	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
12	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	APALACHIAN TWILIGHT
13	STUCCO	3 - COAT SMOOTH CEMENT STUCCO FINISH	COBBLE STONE
14	WALL BRACKET SUPPORT	HEABY TIMBER	MINWAX JACOBEEAN #2750
15	STUCCO MOLDING - CLUBHOUSE	STYROTRIM MOLDING 3.5" X 3.5"	COBBLE STONE
16	TRIM - CLUBHOUSE	HARDIE BOARD - 5/4 BOARD 9.25" WIDE	ARTIC WHITE
17	CARPORT AND BREZEWAY CEILING	T&G WOOD	BROWN TINT



CLUBHOUSE & DAYCARE - NORTH ELEVATION

1/8" = 1'-0"



CLUBHOUSE & DAYCARE - SOUTH ELEVATION

1/8" = 1'-0"

CLUBHOUSE & DAYCARE CENTER		
NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	2337.84	NA
NET STONE CLADDING	14	0.6%
NET SIDING	1113.7	47.6%
NET STUCCO FINISH	651.48	27.9%
NET GLAZING	558.66	23.9%

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	1683.19	NA
NET STONE CLADDING	263.22	15.6%
NET SIDING	751.57	44.7%
NET STUCCO FINISH	345.06	20.5%
NET GLAZING	323.34	19.2%

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	2143.88	NA
NET STONE CLADDING	70	3.3%
NET SIDING	1,416.30	66.1%
NET STUCCO FINISH	321.65	15.0%
NET GLAZING	335.93	15.7%

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	1014.67	NA
NET STONE CLADDING	32.95	3.2%
NET SIDING	600.13	59.1%
NET STUCCO FINISH	169.7	16.7%
NET GLAZING	211.89	20.9%

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	BY
	COMMENT	DATE
		RC
		12/28/2020
		SCALE: 1/8" = 1'-0"

CLUBHOUSE ELEVATIONS

A – 33



CLUBHOUSE & DAYCARE - WEST ELEVATION

1/8" = 1'-0"



CLUBHOUSE & DAYCARE - EAST ELEVATION

1/8" = 1'-0"

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PROJECT:
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COLORADO

REV:	DATE	COMMENT

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DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

CLUBHOUSE ELEVATIONS

A-34

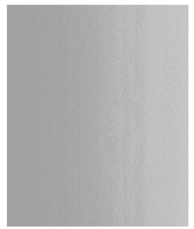
JAMES HARDIE FIBER CEMENT SIDING



AVAILABLE SIZES

THICKNESS:	0.312"	
LENGTH:	144" boards	
WIDTHS:	6.25"	8.25"
EXPOSURES:	5"	7"
	9.25"	12"
	8"	10.75"
	5.25"	7.25"
	4"	6"

Horizontal Siding



AVAILABLE SIZES

THICKNESS:	0.312"	
LENGTH:	108"	120"
WIDTHS:	48"	48"
	96"	
	48"	

Vertical Siding



AVAILABLE SIZES

THICKNESS:	1"	
LENGTH:	144" boards	
WIDTHS:	3.5"	5.5"
EXPOSURES:	3.5"	5.5"
	7.25"	9.25"
	7.25"	9.25"
	11.25"	
	11.25"	

Battens & Trims

CERTAINTEED STONE facade



Appalachian Twilight



Pocono Autumn



Highland Slate / Black Granite

CERTAINTEED SHINGLE ROOFING

SHERWIN WILLIAMS EXTERIOR BUILDING COLORS

TYPE-I VERTICAL/HORIZONTAL SIDING SW 6053	TYPE-I BALCONY PANELS SW 6115	TYPE-I BALCONY INTERIOR SW 6055	TYPE-I BATTEN AND TRIM SW 6113

Building Type I

TYPE-II VERTICAL/HORIZONTAL SIDING SW 6115	TYPE-II BALCONY PANELS SW 6054	TYPE-II BALCONY INTERIOR SW 6055	TYPE-II BATTEN AND TRIM SW 6113

Building Type II

TYPE-III VERTICAL/HORIZONTAL SIDING SW 6067	TYPE-III BALCONY PANELS SW 6054	TYPE-III BALCONY INTERIOR SW 6055	TYPE-III BATTEN AND TRIM SW 6114

Building Type III

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
BY:	RC	
DATE:	12/24/2020	
SCALE:	1/8" = 1' - 0"	

EXTERIOR MATERIALS

A-35



BUILDING TYPE I - SOUTH FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
Architects–Planners–Construction–Consultants
11041 S. Dixie Highway – Suite 214
Miami, Florida 33156
O (305)321-4172

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CONSULTANTS:

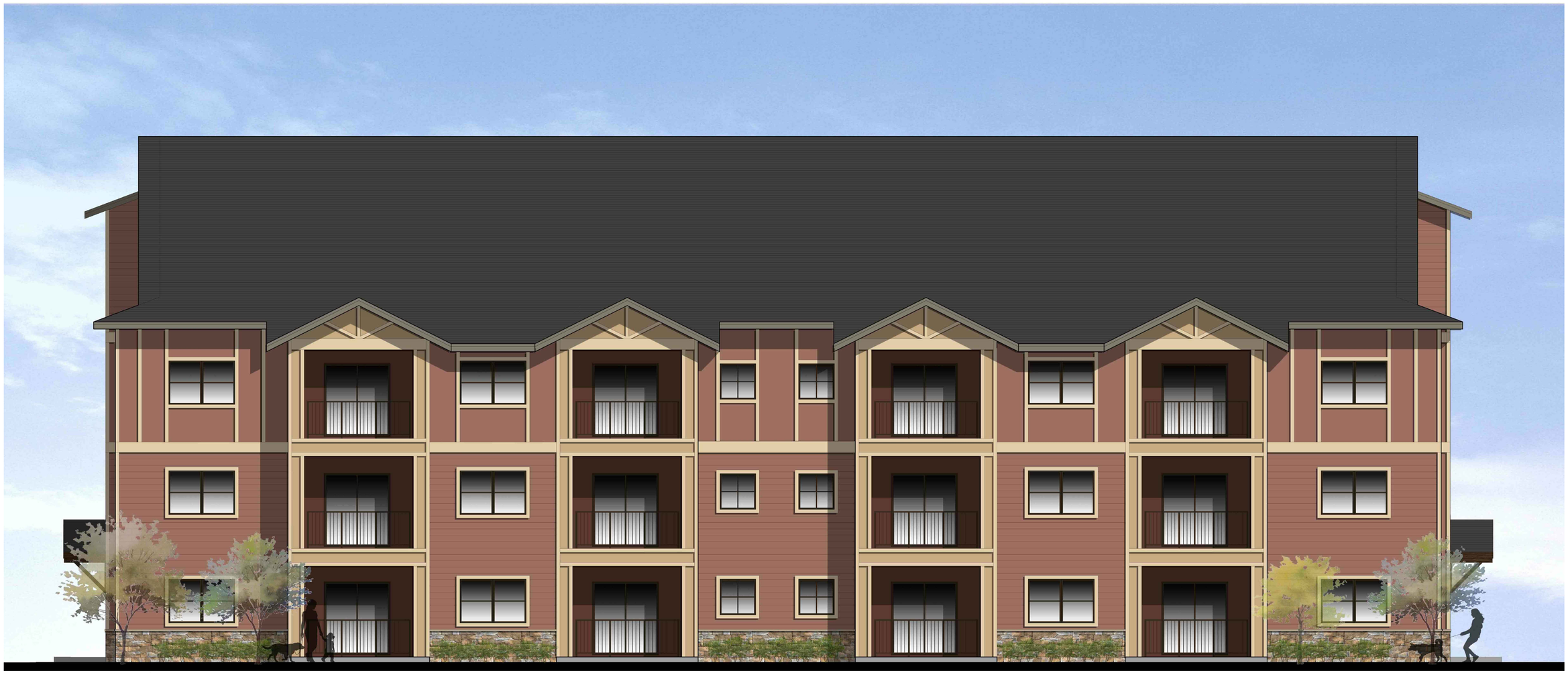
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1300 Cordova Road - Suite 300
Ft. Lauderdale, FL 33316

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

BY:	Comment	DATE
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE I
ELEVATION

DRAWING NUMBER:
A-36



BUILDING TYPE I - NORTH FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
Architects–Planners–Construction–Consultants
11041 S. Dixie Highway – Suite 214
Miami, Florida 33156
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RICHARD COBA
Architect

AR No. 10,173

CONSULTANTS:

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BLDGROUP
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Ft. Lauderdale, FL 33316

PROJECT NUMBER:

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

NO.	Content	DATE
3	Exterior Color Revision	09/17/2021

DRAWING NAME:
BLDG TYPE I
ELEVATION

DRAWING NUMBER:
A-37



BLDG TYPE I - EAST FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
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PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

PROJECT NUMBER:

BY	Issued	DATE
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE I
ELEVATION

DRAWING NUMBER:
A-38



BLDG TYPE I - WEST FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
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PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

PROJECT NUMBER:

BY	Comment	DATE
3	Exterior Color Revision	09/17/2020

DRAWING name:
BLDG TYPE I
ELEVATION

DRAWING NUMBER:
A-39



BUILDING TYPE II - SOUTH FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
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Ft. Lauderdale, FL 33314

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

#	Issued	Date
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE II
ELEVATION

DRAWING NUMBER:
A-40



BUILDING TYPE II - NORTH FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
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CONSULTANTS:

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1300 Corporate Broad - Suite 300
Ft. Lauderdale, FL 33316

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

PROJECT NUMBER:

BY	Comment	DATE
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE II
ELEVATION

DRAWING NUMBER:
A-41



BLDG TYPE II - EAST FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
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15041 S. Dixie Highway – Suite 214
Miami, Florida 33176
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RICHARD COBA
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CONSULTANTS:

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1500 Cordova Road - Suite 300
Ft. Lauderdale, FL 33316

PROJECT NUMBER:

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

No.	Comment	DATE
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE II
ELEVATION

DRAWING NUMBER:
A-42



BLDG TYPE II - WEST FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
Architects-Planners-Construction-Consultants
1501 S. Dixie Highway - Suite 214
Pompano Beach, FL 33316
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RICHARD COBA
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CONSULTANTS:

BLDGROUP
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Ft. Lauderdale, FL 33316

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

PROJECT NUMBER:

BY	Description	DATE
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE II
ELEVATION

DRAWING NUMBER:
A-43



BUILDING TYPE III - SOUTH FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
Architects–Planners–Construction–Consultants
1161 S. Dixie Highway – Suite 214
Pompano Beach, FL 33316
O (305)321-4172

RICHARD COBA
Architect
AR No. 10,173

CONSULTANTS:

BLDGROUP
1300 Cordova Road - Suite 300
Ft. Lauderdale, FL 33316

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

PROJECT NUMBER:

BY:	Comment	DATE
3	Exterior Color Revision	05/17/2021

DRAWING NAME:
BLDG TYPE III
ELEVATION

DRAWING NUMBER:
A-44



BUILDING TYPE III - NORTH FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
Architects–Planners–Construction–Consultants
11621 S. Bike Highway – Suite 214
Parker, Co. 80138
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CONSULTANTS:

CONSULTANTS:

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Ft. Lauderdale, FL 33316

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

PROJECT NUMBER:

Rev	Comment	Date
3	Exterior Color Revision	09/17/2021

DRAWING NAME:
BLDG TYPE III
ELEVATION

DRAWING NUMBER:
A-45



BLDG TYPE III - EAST FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
Architects–Planners–Construction–Consultants
1595 S. Dixie Highway – Suite 214
Boca Raton, FL 33432
O (305)321-4172

RICHARD COBA
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AR No. 10,173

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BLDGROUP
1200 Cordova Road - Suite 300
Ft. Lauderdale, FL 33316

PROJECT NUMBER:

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

No.	Issued	Date
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE III
ELEVATION

DRAWING NUMBER:
A-46



BLDG TYPE III - WEST FACADE ELEVATION

INTERNATIONAL CONSTRUCTION & DEVELOPMENT ADVISORS, INC.
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Miami, Florida 33176
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RICHARD COBA
Architect
AR No. 10,173

CONSULTANTS:

BLDGROUP
1300 Cordova Road - Suite 300
Ft. Lauderdale, FL 33316

PROJECT NUMBER:

PROJECT NAME:
GLENWOOD SPRINGS
COLORADO

No.	Content	DATE
3	Exterior Color Revision	09/17/2020

DRAWING NAME:
BLDG TYPE III
ELEVATION

DRAWING NUMBER:
A-47

Planning and Zoning Commission Report

Date: August 24, 2021
To: Planning and Zoning Commission
From: Trent L. Hyatt, Senior Planner
Subject: #60-20– BLD Group Major Site/Architectural Plan Review

REQUEST	Major Site/Architectural Plan Review for the construction of 300 multi-family residential apartment units.
APPLICANT	BLD Group
OWNER	Glenwood Meadows, LLC
LOCATION	Lots 11 C-B and 11 C-C of Glenwood Meadows Subdivision No. 6, adjacent to Flat Tops View Drive and Wulfsohn Road (PIN: 2185-081-41-002 and 2185-081-41-003)
ZONE	Residential High Density (RH) District (R/3 per Glenwood Meadows Zoning and Development Plan)
SURROUNDING LAND USES	North: Mixed residential/commercial South: Vacant East: Multi-family residential West: Vacant
LOT SIZE	Approximately 27.929 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 Major Site/Architectural Plan Review applications including 25 or more new dwelling units and/or more than 30,000 gross square feet of nonresidential space. Following any approval (with or without conditions) of an application, the applicant must still submit and receive approval of a Final Plans Review application from City staff prior to submitting a building or grading permit application.

Action 1 – Major Site/Architectural Plan Review – construction of 300 multi-family residential apartment units.

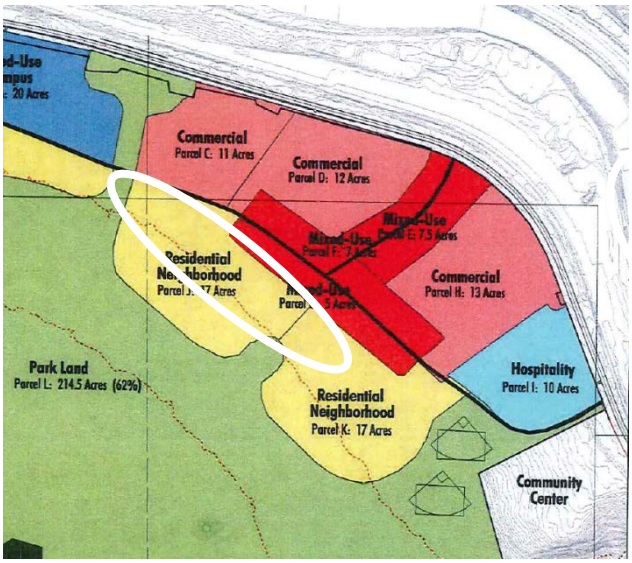
Staff recommendation: *Staff recommends **approval with conditions** of the Major Site/Architectural Plan Review with the findings and conditions on Page 10.*

BACKGROUND/ANALYSIS

History

In 2002, City Council approved the Glenwood Meadows annexation, rezoning, and development plan, which is memorialized in the attached Glenwood Meadows Annexation and Development Agreement which includes the Zoning and Development Plan (GMZDP) as an exhibit. The

document separated the 345-acre Glenwood Meadows property into 12 parcels and five zoning districts. The GMZDP includes general and zone-specific development standards, which at the time, intended to provide an elevated quality of site and building design beyond that of the *Glenwood Springs Municipal Code* (GSMC).



Glenwood Meadows Zoning Map

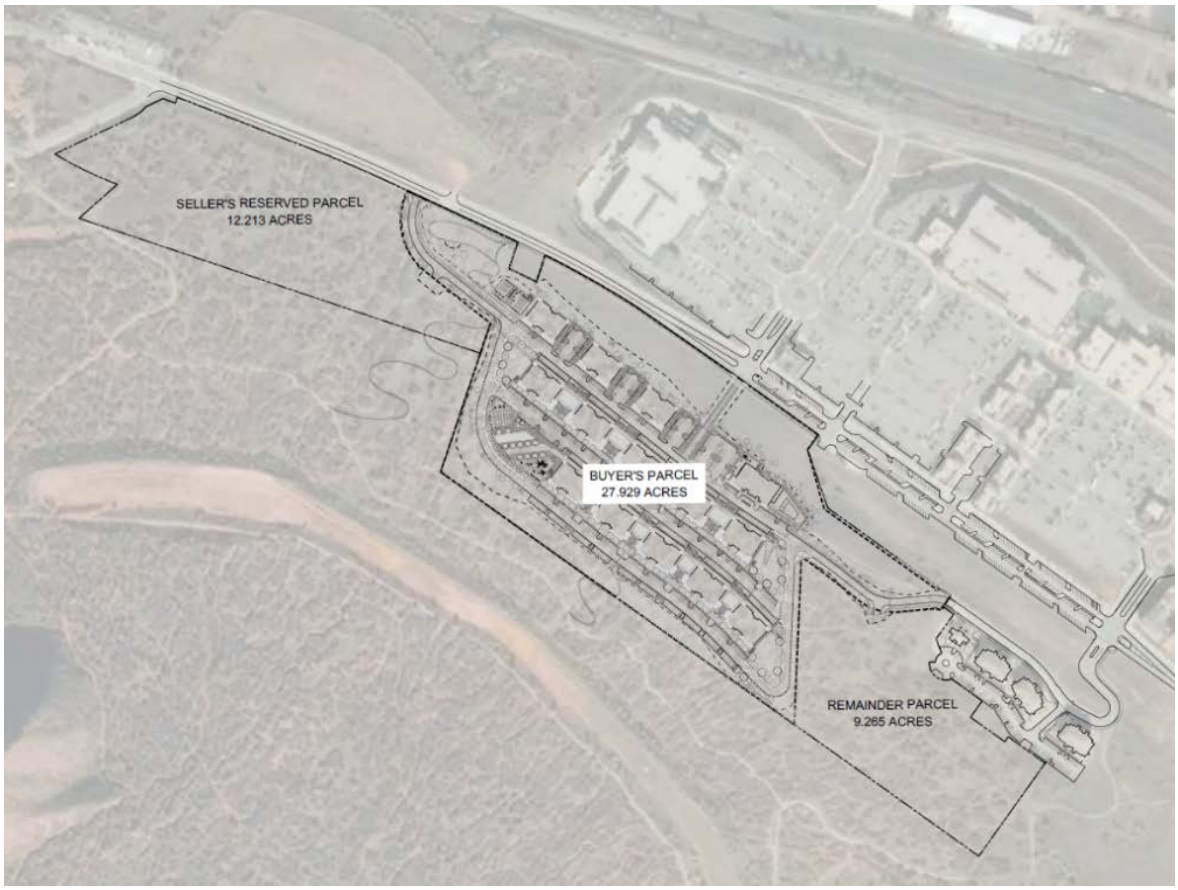


City Zoning Map

As depicted above left, the current application involves portion of Parcels J and K (circled in white) which are designated Residential Neighborhood (RN) in yellow. The RN area was previously zoned R/3 but is Residential High Density (RH) today as depicted in brown above right. The GMZDP allows a total maximum of 300 apartments units in the parcels designated RN, excluding 60 units to the southeast further discussed below. Approval of the proposal, if applicable, will eliminate the possibility of further multi-family apartment development on RN areas of Glenwood Meadows.

As mentioned above, BLD Group proposes the construction of 300 multi-family apartment units in 13 separate buildings on the approximately 27.929 acre (10.74 dwellings units per acre) subject property depicted below. The project also includes the construction of an approximately 20,960 square foot clubhouse and daycare building, and 20 detached garage buildings.

The site lies to the west of Flat Tops View Drive and south of Wulfsohn Road. A Minor Subdivision, which is administrative and not part of this review, is required to create the development parcel depicted below. Application materials include a site plan, floor plans, perspective views, section views, elevations, landscaping plan, grading plan, and related reports which are attached for your review.



Site plan-development site and remaining parcels



Aerial view look east (photo credit: Google Maps)



Similar perspective view to above aerial

Annexation and Development Agreement/Memorandum of Understanding

Upon receipt of the original application submittal in December 2020, staff questioned whether the GMZDP allowed additional multi-family apartment development beyond the 300 unit maximum outlined therein. We were concerned the current proposal would exceed the maximum number of units allowed when combined with the previous development phases of the Lofts at Red Mountain (LARM) to the north. The applicant submitted an appeal of the Community Development Director's interpretation/decision which was never heard by the Commission as it was determined that the 300 multi-family only applies to R-3 designated parcels within Glenwood Meadows, not C-2. Regardless, the owner of the property and the City have entered into the attached memorandum of understanding (MOU) to address certain issues associated with development of the proposal moving forward such as lift station upgrades and traffic impacts.

Development Standards

Site layout, building design, parking, landscaping, and other specifics related to development within Glenwood Meadows are subject to the GMZDP. Sections therein provide General Development Standards (Chapter V. beginning on page 11) as well as standards specific to each area (Chapter X, beginning on page 39) within the development. Where not addressed by the GMZDP, Section 070.040 of the Code applies. Staff provides an overview of the various applicable standards below.

Landscaping and Open Space

Chapter V.H of the GMZDP requires R-3 parcels provide a minimum of 40 percent open space and landscaping based on that amount. Required park land space for the Glenwood Meadows development has been previously satisfied by various improvements or land transfers to the City including the creation of hiking/biking trails, pedestrian infrastructure such as the Midland Trail, transfer of Community Center/garden property, etc. Common open space for future residents of the current proposal is provided via a clubhouse, pickleball courts, community gardens, a dog park, and various trail connections. Native and new landscaping is used to screen interior and exterior

open space, parking, and streetscape areas.

Off Street Parking and Loading

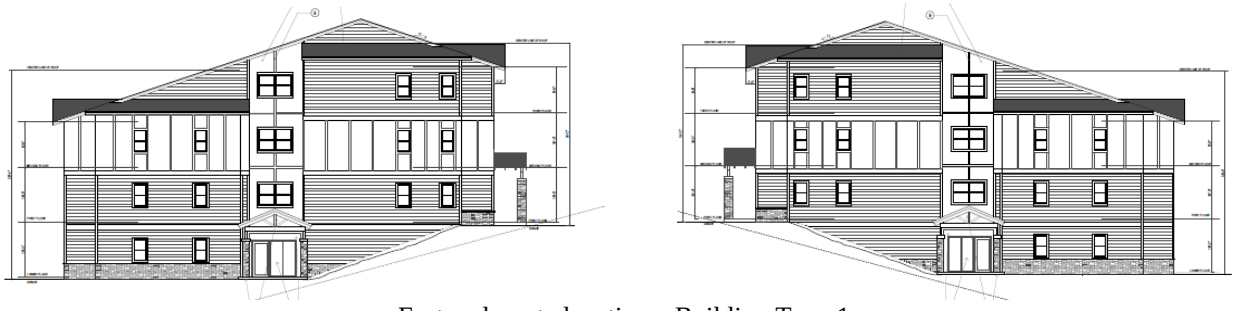
Section 070.030.020(e)/Table 030.1 Table of Allowed Uses outlines 1.5 spaces per multi-family dwelling unit (regardless of size) and one guest space per five dwelling units requiring 510 total spaces for the apartment unit. An additional 27 spaces are provided for the clubhouse. The Code also allows for compact spaces to account for 20 percent of the required number of spaces.

Residential Neighborhoods (R-3) Site Layout and Building Design

Section X of the GMZDP outlines design specifics for the R-3 parcels related to building orientation, architectural elements, heights, and façade articulation. All sides of residential buildings shall display similar architectural interest. The applicant has revised the elevations multiple times to address staff concerns/questions related to design in order to improve building aesthetic. All elevations of each proposed building type display similar interest to the more prominent front and rear (north/south) sides. Multi-family buildings proposed also do not exceed 125 feet in length as outlined in the GMZDP. At least every 50 linear feet, wall planes shall contain offsets or setbacks with a differential in horizontal plane of at least five feet. Roof line/heights along the east and west elevations were revised to be within the maximum height of 40 feet as outlined by Section 070.020.070(b)/Table 020.9 of the Code. Additionally, garage structures were broken up to comply with maximum size standards.



South color elevation-Building Type II



East and west elevations -Building Type 1



North elevation-Building Type 1

Traffic Impacts

Per the attached GMZDP, individual applicants are only required to submit information related to the expected traffic generation associated with each development proposal. This is in lieu of a detailed traffic impact analysis (TIA) per the City's Engineering Standards. Based on the letter submitted with the application, the proposal is expected to generate approximately 1,632 weekday daily trips (108 AM peak hour, 138 PM peak hour). The daycare use is not addressed in the information provided but is not expected to exceed previously estimated trip generation for the development. The property owner has agreed to a $500 per unit traffic impact fee payment toward future Midland Avenue intersection improvements, where needed. While a TIA is not required in this instance, an access permit and related improvements determined necessary may be required by the Colorado Department of Transportation if a 20 percent increase at any state highway intersection (i.e. Interstate 70 exit 114 8th Street at Highway 82/Grand Avenue) is associated with the project. However, the costs of any required improvements will not be borne by the applicant.

Inclusionary Housing

It is important to note that 60 affordable multi-family units, known as the Glenwood Green Apartments, offered at various average medium income (AMI) rates, were previously approved and currently exist within the Glenwood Meadows development. This represents approximately 12.6 of the total residential units approved (475) in the R-3 zoned portion (which excludes LARM approved and proposed units in C-2). However, the applicant has agreed to deed restrict 10 units as owner occupied at 100 precent of AMI for a period of five years.

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 as outlined in ***bold italics*** below. Other language is provided by staff.

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

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

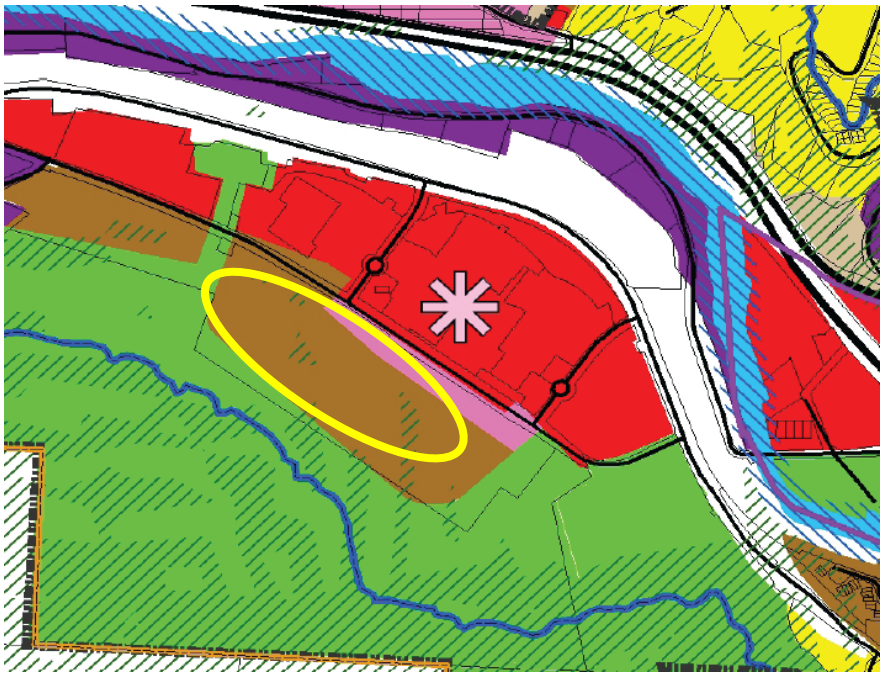
b. The site/architectural plan is consistent with the dimensional, design, development, and all other standards of this Code;

As outlined above, the applicant has worked with staff to address certain aspect of the project that were previously not in compliance with numerous applicable dimensional, design, development, or other standards outlined in the GMZDP and/or GSMC.

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

As outlined above, the applicant has worked with staff to address certain aspect of the project that were previously not in compliance with numerous applicable dimensional, design, development, or other standards outlined in the GMZDP and/or GSMC.

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



As shown at right, *Map 2.1 Future Land Use – North 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.

The Code requires identification of the Limits of Disturbance (LOD) and an exact measurement of the average slope within the LOD. The project summary on sheet L1.1 outlines that slopes average below the maximum 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 the GMZDP 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) -Increase the supply of housing that is affordable to the workforce (community

	housing) by implementing the Strategic Housing Plan. (Chapter 6, Page 75) -Encourage housing variety and affordability throughout the community (Chapter 6, Page 76) -Require good design for mixed-use and higher density project (Chapter 6, Page 78)
Staff Comment: Attainable housing supports the City's workforce. 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) -Increase the supply of housing that is affordable to the workforce (community housing) by implementing the Strategic Housing Plan. (Chapter 6, Page 75) -Require good design for mixed-use and higher density projects (Chapter 6, Page 78) -Direct growth inward (Chapter 9, Page 102)
Staff Comment: Attainable housing supports the City's workforce and infill/development allows for easier access to goods/services for the entire community.	

Reviewing Agency Comments
An overview of the attached comments received from referral agencies regarding various application submittals (December 2020, July 2021, and August 2021) is provided below. Please note, many of the comments have been addressed by the applicant throughout the review process.

Engineering - Comments received outline issues related to grading, asphalt depths, soil inconsistencies, and traffic.

Parks and Recreation – Comments received outline the need for suitable plant species, increased recreational opportunities, and trail connections.

Public Works - Comments received outline that all utilities remain private, the need for irrigation details, fire design requirements, necessary water and sewer details, electric system requirements, concerns related to site soils and slopes.

Transportation - Comments received outline the need for better access to transit and sidewalk connectivity.

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 – Major Site/Architectural Plan Review – construction of 300 multi-family residential apartment units.

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

Recommended Findings:
1. The site/architectural plan is consistent with the general purpose and intent of the Code;
2. The site/architectural plan appears to be consistent with all dimensional, design, development, and all other standards of the *Glenwood Meadows Zoning and Development Plan* and *Glenwood Springs Municipal Code*;
3. The site/architectural plan does is consistent with the precedent setting land use approval, the *Glenwood Meadows Annexation Zoning and Development Plan*; 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 *Glenwood Springs Municipal Code* specific City staff comments prior to submittal of any future development permit (including but not limited to a Final Plans Review) application.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein.
3. Prior to approval of any future development review application, the applicant shall apply for and receive the approval of a CDOT access permit, where applicable.
4. The applicant shall receive approval of the related Minor Subdivision application to create the development parcel and residual lots.
5. 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.
6. The applicant shall comply fully with the Memorandum of Understanding between the City and Glenwood Meadows, LLC executed May 5, 2021.
7. The applicant shall deed restrict a minimum of 10 units as owner occupied at 100 precent of AMI for a period of five years.
8. Prior to submitting a building or grading permit application, the applicant shall
    a. Submit a Final Plans Review 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.

GLENWOOD MEADOWS MULTI-FAMILY HOUSING

Glenwood Springs, Colorado

MAJOR SITE / ARCHITECTURE REVIEW

SUBMITTAL #4: August 13, 2021

INDEX OF SHEETS

ALTA Land Title Survey

SHEET 1 OF 4
SHEET 2 OF 4
SHEET 3 OF 4
SHEET 4 OF 4

Civil Sheet Set

GR1	PRELIMINARY GRADING PLAN - SHEET 1
GR2	PRELIMINARY GRADING PLAN - SHEET 2
UT1	PRELIMINARY UTILITY PLAN - SHEET 1
UT2	PRELIMINARY UTILITY PLAN - SHEET 2

Landscape Sheet Set

L1.0	OVERALL SITE PLAN
L1.1	DEVELOPMENT AREA SITE PLAN
L1.2	SITE PLAN ENLARGEMENT KEY PLAN
L1.3	ENLARGED SITE PLAN
L1.4	ENLARGED SITE PLAN
L1.5	ENLARGED SITE PLAN
L1.6	ENLARGED SITE PLAN
L1.7	ENLARGED SITE PLAN
L1.8	ENLARGED SITE PLAN
L1.9	ENLARGED SITE PLAN
L2.0	PLANT LIST AND GENERAL NOTES
L2.1	PLANTING DETAILS
LP.1	SITE LIGHTING ENLARGEMENT KEY PLAN
LP.2	SITE LIGHTING ENLARGEMENT PLAN
LP.3	SITE LIGHTING ENLARGEMENT PLAN
LD.1	DESIGN IMAGERY SHEET
LD.2	DESIGN IMAGERY SHEET
EXBT 1	SITE PLAN RENDERING
EXBT 2	PERSPECTIVE ILLUSTRATION
EXBT 3	PERSPECTIVE ILLUSTRATION
EXBT 4	PERSPECTIVE ILLUSTRATION
EXBT 5	PERSPECTIVE ILLUSTRATION
EXBT 6	PERSPECTIVE ILLUSTRATION
EXBT 7	PERSPECTIVE ILLUSTRATION
EXBT 8	PERSPECTIVE ILLUSTRATION
EXBT 9	PERSPECTIVE ILLUSTRATION
EXBT 10	PERSPECTIVE ILLUSTRATION
EXBT 11	PERSPECTIVE ILLUSTRATION
EXBT 12.1	SITE SECTION
EXBT 12.2	SITE SECTION
EXBT 12.3	SITE SECTION
EXBT 13	WEST ENTRY PLAN AND PROFILE
EXBT 14	POOL WALL GRADING

Architecture Sheet Set

A-1	BUILDING TYPE 1 FLOOR PLANS
A-2	BUILDING TYPE 1 FLOOR PLANS
A-3	BUILDING TYPE 1 FLOOR PLANS
A-4	BUILDING TYPE 1 FLOOR PLANS
A-5	BUILDING TYPE 1 FLOOR PLANS
A-6	BUILDING TYPE 1 ROOF PLAN
A-7	BUILDING TYPE 1 N/S ELEVATIONS
A-8	BUILDING TYPE 1 E/W ELEVATIONS
A-9	BUILDING TYPE 1 SECTION
A-10	BUILDING TYPE 2 FLOOR PLANS
A-11	BUILDING TYPE 2 FLOOR PLANS
A-12	BUILDING TYPE 2 FLOOR PLANS
A-13	BUILDING TYPE 2 FLOOR PLANS
A-14	BUILDING TYPE 2 FLOOR PLANS
A-15	BUILDING TYPE 2 ROOF PLAN
A-16	BUILDING TYPE 2 N/S ELEVATIONS
A-17	BUILDING TYPE 2 E/W ELEVATIONS
A-18	BUILDING TYPE 2 SECTION

Architecture Sheet Set (Cont.)

A-19	BUILDING TYPE 3 FLOOR PLANS
A-20	BUILDING TYPE 3 FLOOR PLANS
A-21	BUILDING TYPE 3 FLOOR PLANS
A-22	BUILDING TYPE 3 FLOOR PLANS
A-23	BUILDING TYPE 3 FLOOR PLANS
A-24	BUILDING TYPE 3 ROOF PLAN
A-25	BUILDING TYPE 3 N/S ELEVATIONS
A-26	BUILDING TYPE 3 E/W ELEVATIONS
A-27	BUILDING TYPE 3 SECTION
A-28	APARTMENT UNIT FLOOR PLANS
A-29	APARTMENT UNIT FLOOR PLANS
A-30	GARAGE BUILDING ELEVATION
A-31	CLUBHOUSE FLOOR PLANS
A-32	CLUBHOUSE ROOF PLANS
A-33	CLUBHOUSE N/S ELEVATIONS
A-34	CLUBHOUSE E/W ELEVATIONS
A-35	BUILDING TYPE 1 NORTH ELEVATION
A-36	BUILDING TYPE 1 SOUTH ELEVATION
A-37	BUILDING TYPE 1 SIDE ELEVATION
A-38	BUILDING TYPE 2 NORTH ELEVATION
A-39	BUILDING TYPE 2 SOUTH ELEVATION
A-40	BUILDING TYPE 2 SIDE ELEVATION
A-41	BUILDING TYPE 3 NORTH ELEVATION
A-42	BUILDING TYPE 3 SOUTH ELEVATION
A-43	BUILDING TYPE 3 SIDE ELEVATION

PROJECT TEAM

LANDSCAPE ARCHITECT

DHM DESIGN CORPORATION
311 MAIN STREET, SUITE 102
CARBONDALE, CO 81623
PHONE: (970) 963-6520
CONTACT: JEN DICUOLLO

ARCHITECTURE

BLD GROUP
1500 CORDOVA RD
FORT LAUDERDALE, FL 33316
PHONE: (954) 578-6008
CONTACT: RICHARD COBA

CIVIL ENGINEER

HIGH COUNTRY ENGINEERING
1517 BLAKE AVE, #101
GLENWOOD SPRINGS, CO 81601
PHONE: (970) 945-8676
CONTACT: ROGER NEAL

LOCATION MAP



UNIT AND SITE AMENITY DATA

LOT SIZE INFORMATION	Acres	SF	LOT COVERAGE	Required (SF & %)	Proposed (SF & %)
Lot 2 - Phase 1	**27.9 Acres**	**1,215,160 sf**		**50% Max. Lot Coverage**	**591,051 sf** *49% Lot Size*
LIMITS OF DISTURBANCE		Proposed (SF & %)	**AVERAGE SLOPE WITHIN LIMITS OF DISTURBANCE**	Percentage (%)	
Lot 2 - Phase 1		**895.561 sf** **74%** *Lot Size*		**16%**	
OFF-STREET PARKING SPACES	Required # Vehicle Spaces	Proposed # Vehicle Spaces	**BICYCLE PARKING**	Required # Spaces	Proposed # Spaces
Residence Parking *1.7 spaces per unit*	**510 Spaces** *Phase 1 Count: 300 units*	**510 Spaces**	**Bike Racks** *150 parking spaces- 9 bike parking spaces plus 1 space for each 50 vehicle spaces provided after the first 150 spaces*	**17 Bike Parking Spaces** *Phase 1 Count: 538 Parking Spaces*	**160 Bike Parking Spaces**
Clubhouse *1 per 400 sf of building area plus 1 per 10,000 sf of outdoor space*	**29 Spaces** *Phase 1 Count: 10,900 sf Building and 11,000 sf of Outside area*	**29 Spaces**			
ADA	**20 Spaces**	**38 Spaces**			
TOTAL PARKING	**539 Spaces**	**539 Spaces**			

RESIDENTIAL UNITS	Buildings	Units	COMMON AMENITY SPACE	Required (SF)	Provided (SF)
Building Type 1	**7 Buildings**	**168 Units**	Community Center & Daycare		**20,960 sf**
Building Type 2	**3 Buildings**	**60 Units**	Community Gardens		**7,665 sf**
Building Type 3	**3 Buildings**	**72 Units**	Amenity Spaces between Buildings		**30,160 sf**
TOTAL	**13 Buildings**	**300 Units**	Trail Connections		**2,058 sf**
BUILDING HEIGHT	Required	Proposed	Dog Yard		**36,432 sf**
	40 ft. maximum	**37 ft.** *roof center line to grade*	**TOTAL**	**60,000 sf** *Required: 200 sf per unit Phase 1 Count: 300 units*	**97,275 sf**

LANDSCAPE DATA

OPEN SPACE	SQUARE FOOTAGE	TREES		SHRUBS	
		REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Upper tier - disturbed	87,483 SF	73	74	219	366
Lower tier - disturbed	79,351 SF	66	66	198	285

INTERNAL DRIVEWAY	LINEAR FEET	TREES	
		REQUIRED *(1/35 LF)*	PROVIDED
Flat Tops View Dr (Sunny Aspen)	2,071 LF	59	60
Wolf Liam Lane	1,735 LF	50	50
Adios Avenue	1,748 LF	50	50

PARKING AREAS	Total Parking Area (SF)	Landscaped Area (SF & %)	TREES		SHRUBS	
			REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Parking Lots	29,694 SF	10,485 SF *(35% of the parking area)*	25	40	74	240

TOTAL LANDSCAPED AREA	Proposed (SF & %)	OPEN SPACE	Required (SF & %)	Proposed (SF & %)
	304,510 sf *25% Lot Size*		**486,064 sf** *40% Lot Size*	**504,083 sf** *41.5% Lot Size*
TOTAL IMPERVIOUS AREA	Proposed (SF & %)			
	591,051 sf *49% Lot Size*			

SNOW STORAGE NOTE: ON-SITE SNOW STORAGE WILL BE PROVIDED IN LANDSCAPE AREAS AT THE EAST AND WEST ENDS OF THE BUILDING ROWS AND BEHIND THE CURB WHERE SIDEWALKS DO NOT EXIST. FINAL SNOW MANAGEMENT WILL BE REFINED BASED ON GEOTECHNICAL REVIEW, RECOMMENDATIONS, AND GRADING & DRAINAGE PLAN.

BASIS OF BEARING / BENCHMARK

BEARINGS ARE BASED UPON A #5 REBAR WITH ALUMINUM CAP L.S. #5933 FOUND AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S.
25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.

LEGAL DESCRIPTION

PARCEL A:
****
NOTE: THE FOLLOWING LEGAL DESCRIPTION IS PRELIMINARY AND IS SUBJECT TO CHANGE UPON COMPLIANCE WITH THE REQUIREMENTS UNDER SCHEDULE B-1, HEREIN.
****
LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
COUNTY OF GARFIELD, STATE OF COLORADO
PARCEL B:
EASEMENTS FOR UTILITIES, DRAINAGE AND ACCESS AS DESCRIBED AND DEPICTED IN RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 5, 17, 2012 UNDER RECEPTION NO. 818857 AND FIRST AMENDMENTS TO RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 18, 2017 UNDER RECEPTION NO. 892528.

FEMA FLOODPLAIN STATEMENT

PARCELS A & B ARE LOCATED WITHIN ZONE D ACCORDING TO FEMA MAP PANELS 0802051431B AND 0802051432B BOTH EFFECTIVE 01/03/1986. ACCORDING TO FEMA, NO ADDITIONAL DIGITAL DATA IS AVAILABLE IN THIS AREA.

PUBLIC IMPROVEMENTS STATEMENT

THE PUBLIC IMPROVEMENTS FOR THE ENTIRETY OF THE GLENWOOD MEADOWS SUBDIVISION HAVE BEEN SATISFIED AS MEMORIALIZED IN THE JULY 2013 MOU BETWEEN THE DEVELOPER (GLENWOOD MEADOWS, LLC) AND THE CITY OF GLENWOOD SPRINGS. THESE PUBLIC IMPROVEMENTS INCLUDED OFF-SITE TRAFFIC IMPROVEMENTS, ON- AND OFF-SITE PEDESTRIAN TRAIL IMPROVEMENTS, WATER RIGHTS CONVEYANCES, OFF-SITE RIVERTRAIL CONTRIBUTIONS, TRANSIT IMPROVEMENTS, AND PUBLIC OPEN SPACE DEDICATIONS. IN JUNE OF 2021 THE CITY OF GLENWOOD SPRINGS AND GLENWOOD MEADOWS, LLC ENTERED INTO A MOU THAT ADDED PUBLIC IMPROVEMENTS ABOVE AND BEYOND THE PREVIOUSLY SATISFIED REQUIREMENTS, INCLUDING INFRASTRUCTURE UPGRADES AND TRAFFIC IMPACT FEES. THE PROJECT PROPOSAL INCLUDES ON-SITE PUBLIC IMPROVEMENTS INCLUDING A SIDEWALK EXTENSION ALONG WULFSOHN ROAD, PUBLICLY-ACCESSIBLE TRAILHEADS TO OPEN SPACE, AND A PUBLICLY-AVAILABLE DAYCARE FACILITY.

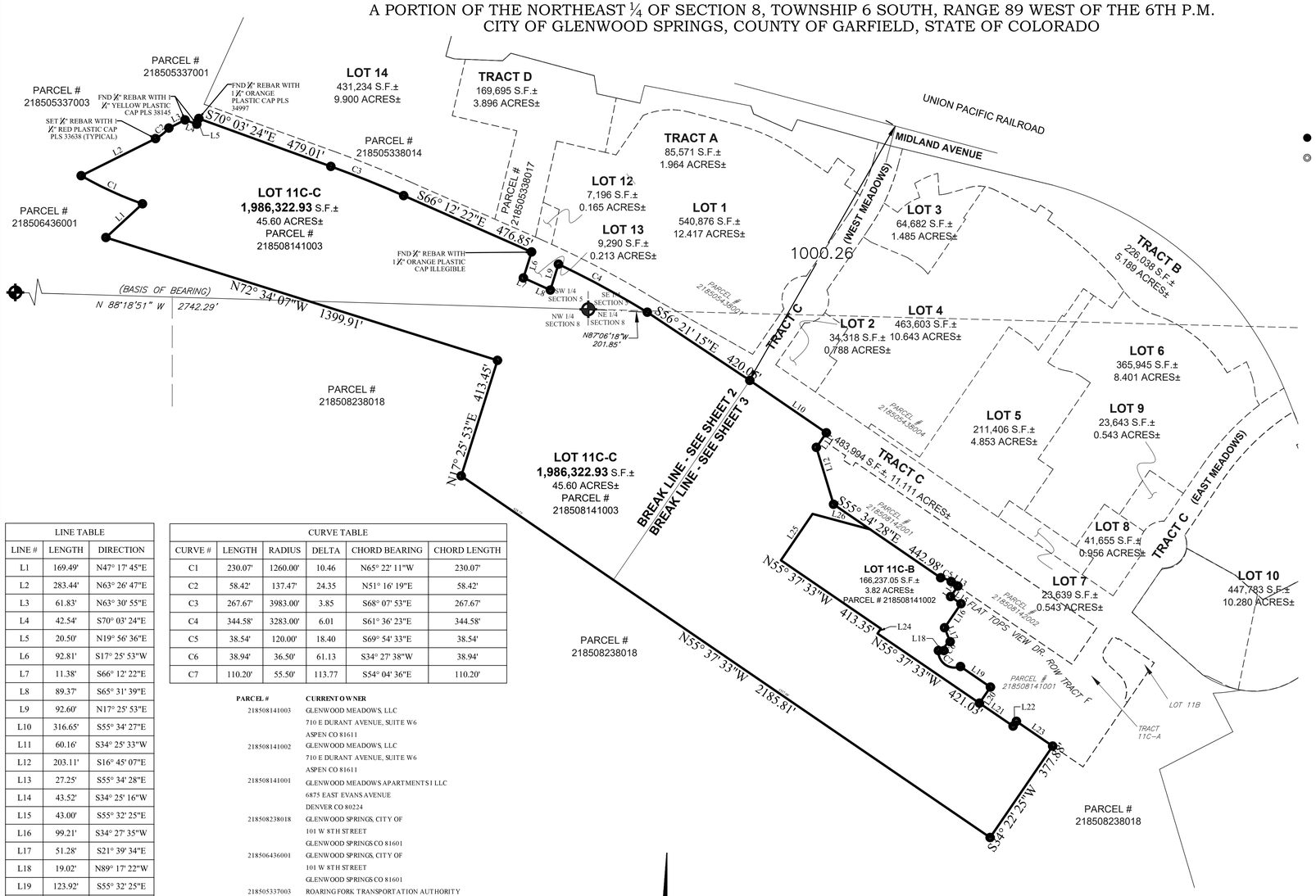
GEOLOGIC HAZARDS DISCLOSURE

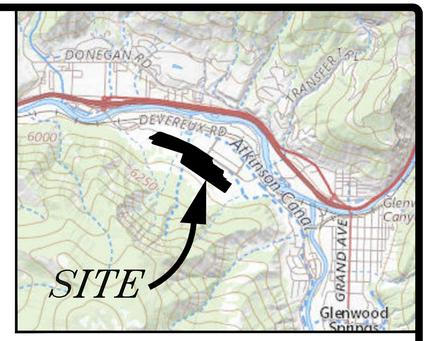
THE PROPERTY IS SUBJECT TO GEOLOGIC HAZARDS PER THE ADOPTED MAPPING BY THE CITY OF GLENWOOD SPRINGS. HAZARDS TO NOTE ARE SEVERE POTENTIAL FOR HYDROCOMPACTION, AND FOR OFF-SITE DEBRIS FLOW. A FINAL GEOLOGIC HAZARD REPORT WILL BE SUBMITTED UPON APPLICATION OF A BUILDING PERMIT.

ALTA/ACSM LAND TITLE SURVEY

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037

A PORTION OF THE NORTHEAST ¼ OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO





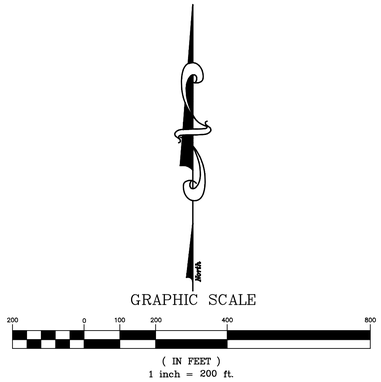
VICINITY MAP
SCALE: 1" = 3000'

LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	169.49'	N47° 17' 45"E
L2	283.44'	N63° 26' 47"E
L3	61.83'	N63° 30' 55"E
L4	42.54'	S70° 03' 24"E
L5	20.50'	N19° 56' 36"E
L6	92.81'	S17° 25' 53"W
L7	11.38'	S66° 12' 22"E
L8	89.37'	S65° 31' 39"E
L9	92.60'	N17° 25' 53"E
L10	316.65'	S55° 34' 27"E
L11	60.16'	S34° 25' 33"W
L12	203.11'	S16° 45' 07"E
L13	27.25'	S55° 34' 28"E
L14	43.52'	S34° 25' 16"W
L15	43.00'	S55° 32' 25"E
L16	99.21'	S34° 27' 35"W
L17	51.28'	S21° 39' 34"E
L18	19.02'	N89° 17' 22"W
L19	123.92'	S55° 32' 25"E
L20	66.33'	S34° 22' 27"W
L21	138.97'	S55° 37' 33"E
L22	20.00'	N34° 22' 25"E
L23	150.00'	S55° 37' 33"E

CURVE TABLE					
CURVE #	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD LENGTH
C1	230.07'	1260.00'	10.46	N65° 22' 11"W	230.07'
C2	58.42'	137.47'	24.35	N51° 16' 19"E	58.42'
C3	267.67'	3983.00'	3.85	S68° 07' 53"E	267.67'
C4	344.58'	3283.00'	6.01	S61° 36' 23"E	344.58'
C5	38.54'	120.00'	18.40	S69° 54' 33"E	38.54'
C6	38.94'	36.50'	61.13	S34° 27' 38"W	38.94'
C7	110.20'	55.50'	113.77	S54° 04' 36"E	110.20'

LINE TABLE		
LINE #	LENGTH	DIRECTION
L24	20.00'	N34° 22' 27"E
L25	191.73'	N34° 22' 04"E
L26	202.63'	S75° 00' 01"E

PARCEL #	CURRENT OWNER
218508141003	GLENWOOD MEADOWS, LLC 710 E DURANT AVENUE, SUITE W6 ASPEN CO 81611
218508141002	GLENWOOD MEADOWS, LLC 710 E DURANT AVENUE, SUITE W6 ASPEN CO 81611
218508141001	GLENWOOD MEADOWS APARTMENTS I LLC 6875 EAST EVANS AVENUE DENVER CO 80224
218508238018	GLENWOOD SPRINGS, CITY OF 101 W 8TH STREET GLENWOOD SPRINGS CO 81601
218506436001	GLENWOOD SPRINGS, CITY OF 101 W 8TH STREET GLENWOOD SPRINGS CO 81601
218505337003	ROARING FORK TRANSPORTATION AUTHORITY 0766 INDUSTRY WAY CARBONDALE CO 81623
218505337001	ROARING FORK TRANSPORTATION AUTHORITY 0051 SERVICE CENTER DRIVE ASPEN CO 81611
218505338014	CENTURA VENTURES LLC 9100 E MINERAL CIRCLE ENGLEWOOD CO 80112
218505338017	GLENWOOD SPRINGS, CITY OF 101 W 8TH STREET GLENWOOD SPRINGS CO 81601
218508142001	SC GLENWOOD I LLC 760 W MAIN STREET, STE 140 BARRINGTON IL 60010
218508142002	SC GLENWOOD II LLC 760 W MAIN STREET, STE 140 BARRINGTON IL 60010
218505438004	TARGET CORPORATION PO BOX 72028 PHOENIX AZ 85050
218505438001	WEINGARTEN MILLER GLENWOOD LLC 6900 EAST BELLEVIEW AVENUE SUITE 300 GREENWOOD VILLAGE CO 80111



LEGEND AND NOTES:

● - INDICATES FOUND MONUMENT AS DESCRIBED

◎ - INDICATES MONUMENT TO BE SET AS DESCRIBED

- DATE OF SURVEY: SEPTEMBER 5 - 8, 2020

- UNIT OF MEASUREMENT: US SURVEY FOOT

- ZONING DATA TO BE PROVIDED BY CLIENT

- PARCELS A & B ARE LOCATED WITHIN ZONE D ACCORDING TO FEMA MAP PANELS 0802051431B AND 0802051432B BOTH EFFECTIVE 01/03/1986. ACCORDING TO FEMA, NO ADDITIONAL DIGITAL DATA IS AVAILABLE IN THIS AREA.

- BEARINGS ARE BASED UPON A #5 REBAR WITH ALUMINUM CAP L.S. #5933 FOUND AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.

- THIS ALTA LAND TITLE SURVEY IS BASED UPON INFORMATION PROVIDED BY LAND TITLE GUARANTEE COMPANY IN ORDER NUMBER ABS63015235-4 DATED AUGUST 26, 2020. THIS PROPERTY IS SUBJECT TO THE FOLLOWING EXCEPTIONS PER SAID ORDER NUMBER ABS63015235-4:

8. EXISTING LEASES AND TENANCIES, IF ANY. **NOTHING TO PLOT.**

9. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 268. **NOTHING TO PLOT.**

10. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 269. **NOTHING TO PLOT.**

11. EASEMENTS AND RIGHTS OF WAY AS GRANTED TO THE MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY IN INSTRUMENT RECORDED JUNE 25, 1936 IN BOOK 183 AT PAGE 430. **NOTHING TO PLOT.**

12. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 270. **NOTHING TO PLOT.**

13. (THIS ITEM WAS INTENTIONALLY DELETED) **NOTHING TO PLOT.**

14. TERMS, CONDITIONS AND PROVISIONS OF ANNEXATION AND DEVELOPMENT AGREEMENT RECORDED DECEMBER 06, 2002 IN BOOK 1414 AT PAGE 526 AND THE AMENDMENT RECORDED MAY 6, 2004 IN BOOK 1585 AT PAGE 438 AND THE AMENDED AGREEMENT RECORDED JULY 26, 2004 IN BOOK 1607 AT PAGE 895 AND THIRD AMENDMENT RECORDED DECEMBER 2, 2010 UNDER RECEPTION 795138 AND AMENDED AND RESTATED THIRD AMENDMENT RECORDED AUGUST 16, 2011 UNDER RECEPTION NO. 806719 AND RERECORDED AUGUST 18, 2011 UNDER RECEPTION NO. 806794 AND FOURTH AMENDMENT RERECORDED AUGUST 8, 2013 UNDER RECEPTION NO. 839074 AND FOURTH AMENDMENT RERECORDED APRIL 10, 2015 UNDER RECEPTION NO. 861345. **NOTHING TO PLOT.**

NOTE: INCLUSIONARY HOUSING CREDITS ASSIGNMENT IN CONNECTION WITH THE ABOVE AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION NO. 818854. MEMORANDUM OF UNDERSTANDING RECORDED JULY 18, 2013 UNDER RECEPTION NO. 838187

15. (THIS ITEM WAS INTENTIONALLY DELETED) **NOTHING TO PLOT.**

16. EASEMENTS AND NOTES AS SHOWN ON THE PLAT FOR GLENWOOD MEADOWS NO. 2, RECORDED AUGUST 9, 2004 UNDER RECEPTION NO. 657439. **PLOTTED HEREON.**

17. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 4 RECORDED OCTOBER 28, 2009 UNDER RECEPTION NO. 776958. **UNCLEAR DOCUMENTS, UNABLE TO EVALUATE.**

18. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 5 RECORDED MAY 17, 2010 UNDER RECEPTION NO. 818851. **PLOTTED HEREON.**

19. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 4 - LOT LINE ADJUSTMENT RECORDED MARCH 13, 2012 UNDER RECEPTION NO. 815777. **PLOTTED HEREON.**

20. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN AGREEMENT RECORDED JUNE 29, 2012 UNDER RECEPTION NO. 820756. **NOTHING TO PLOT.**

21. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN AGREEMENT RECORDED JUNE 29, 2012 UNDER RECEPTION NO. 820755. **NOTHING TO PLOT.**

22. TERMS, CONDITIONS, PROVISIONS, BURDENS, OBLIGATIONS AND EASEMENTS AS SET FORTH AND GRANTED IN RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION 818857. **NOTHING TO PLOT.**

EASEMENT MODIFICATION RECORDED MAY 18, 2017 UNDER RECEPTION NO. 892528.

23. TERMS, CONDITIONS, PROVISIONS, BURDENS, OBLIGATIONS AND EASEMENTS AS SET FORTH AND GRANTED IN ACCESS AND MAINTENANCE AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION 818859. **PLOTTED HEREON.**

24. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN DEVELOPMENT AGREEMENT RECORDED MAY 17, 2012 UNDER RECEPTION NO. 818856 AND AMENDMENT RECORDED MAY 18, 2017 AT RECEPTION NO. 892527. **NOTHING TO PLOT.**

25. (THIS ITEM WAS INTENTIONALLY DELETED). **NOTHING TO PLOT.**

26. (THIS ITEM WAS INTENTIONALLY DELETED). **NOTHING TO PLOT.**

27. EASEMENTS AND NOTES ON THE PLAT OF GLENWOOD MEADOWS NO. 6 RECORDED SEPTEMBER 7, 2017 UNDER RECEPTION NO. 897037. **PLOTTED HEREON.**

28. (THIS ITEM WAS INTENTIONALLY DELETED). **NOTHING TO PLOT.**

LEGAL DESCRIPTION:

PARCEL A:

****
NOTE: THE FOLLOWING LEGAL DESCRIPTION IS PRELIMINARY AND IS SUBJECT TO CHANGE UPON COMPLIANCE WITH THE REQUIREMENTS UNDER SCHEDULE B-1, HEREIN.
****

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
COUNTY OF GARFIELD, STATE OF COLORADO

PARCEL B:

EASEMENTS FOR UTILITIES, DRAINAGE AND ACCESS AS DESCRIBED AND DEPICTED IN RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 5, 17, 2012 UNDER RECEPTION NO. 818857 AND FIRST AMENDMENTS TO RECIPROCAL EASEMENT AGREEMENT RECORDED MAY 18, 2017 UNDER RECEPTION NO. 892528.

SURVEYOR'S CERTIFICATE:

TO:
BLD GROUP, LLC,
ALPINE BANK,
AND LAND TITLE GUARANTEE COMPANY
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

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, 6(B), 8, 11, 13, 14, 16, 17, 18, AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 28, 2020 DATE OF PLAT OR MAP: SEPTEMBER 2-8, 2020.

COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

09/16/2020
JEFFREY ALLEN TUTTLE L.S. 33638 — DATE

NOTICE: ACCORDING TO COLORADO LAW, YOU **MUST** COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER 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.

TUTTLE SURVEYING SERVICES
923 COOPER AVENUE
GLENWOOD SPRINGS, COLORADO 81601
(970) 928-9708 (FAX 947-9007)
Email- jeff@tss-us.com

TUTTLE SURVEYING SERVICES

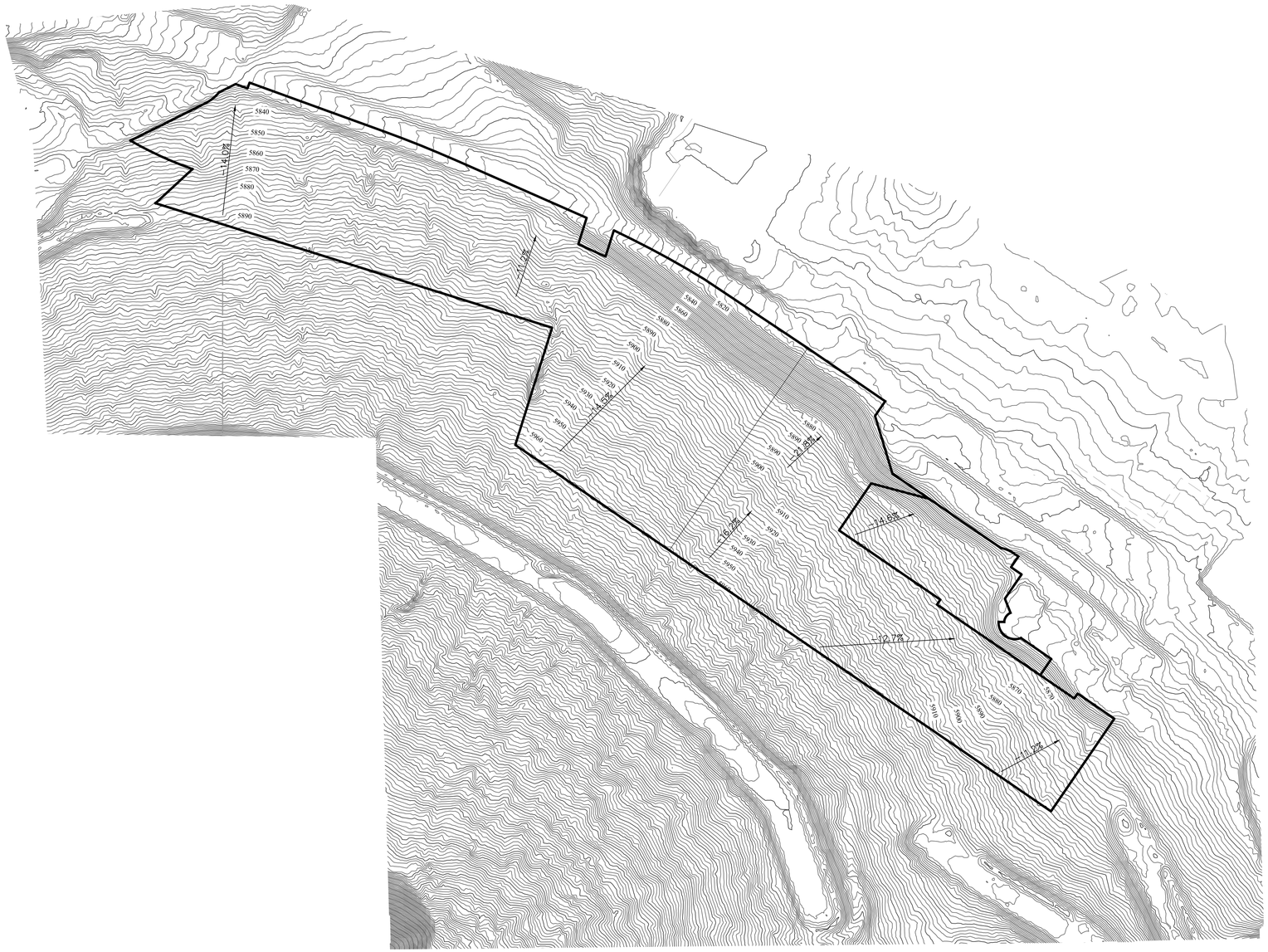
ALTA/ACSM LAND TITLE SURVEY

TBD GLENWOOD MEADOWS
GLENWOOD SPRINGS, CO 81647

DRAWN BY: JG
DATE: 09/16/2020

ALTA/ACSM LAND TITLE SURVEY

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
A PORTION OF THE NORTHEAST ¼ OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO



GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

NOTES:

CONTOUR DATA OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA,
STATE PLAIN NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY
IN AREAS CRITICAL TO DESIGN.

SURVEYOR'S CERTIFICATE:

TO:
BLD GROUP, LLC,
ALPINE BANK,
AND LAND TITLE GUARANTEE COMPANY
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

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, 6(B), 8, 11, 13, 14, 16, 17, 18, AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 28, 2020
DATE OF PLAT OR MAP: SEPTEMBER 2-8, 2020.

COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

JEFFREY ALLEN TUTTLE L.S. 33638 — 09/16/2020 DATE

NOTICE: ACCORDING TO COLORADO LAW, YOU **MUST** COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER 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.

TUTTLE SURVEYING SERVICES
923 COOPER AVENUE
GLENWOOD SPRINGS, COLORADO 81601
(970) 928-9708 (FAX 947-9007)
Email- jeff@tss-us.com
TUTTLE SURVEYING SERVICES

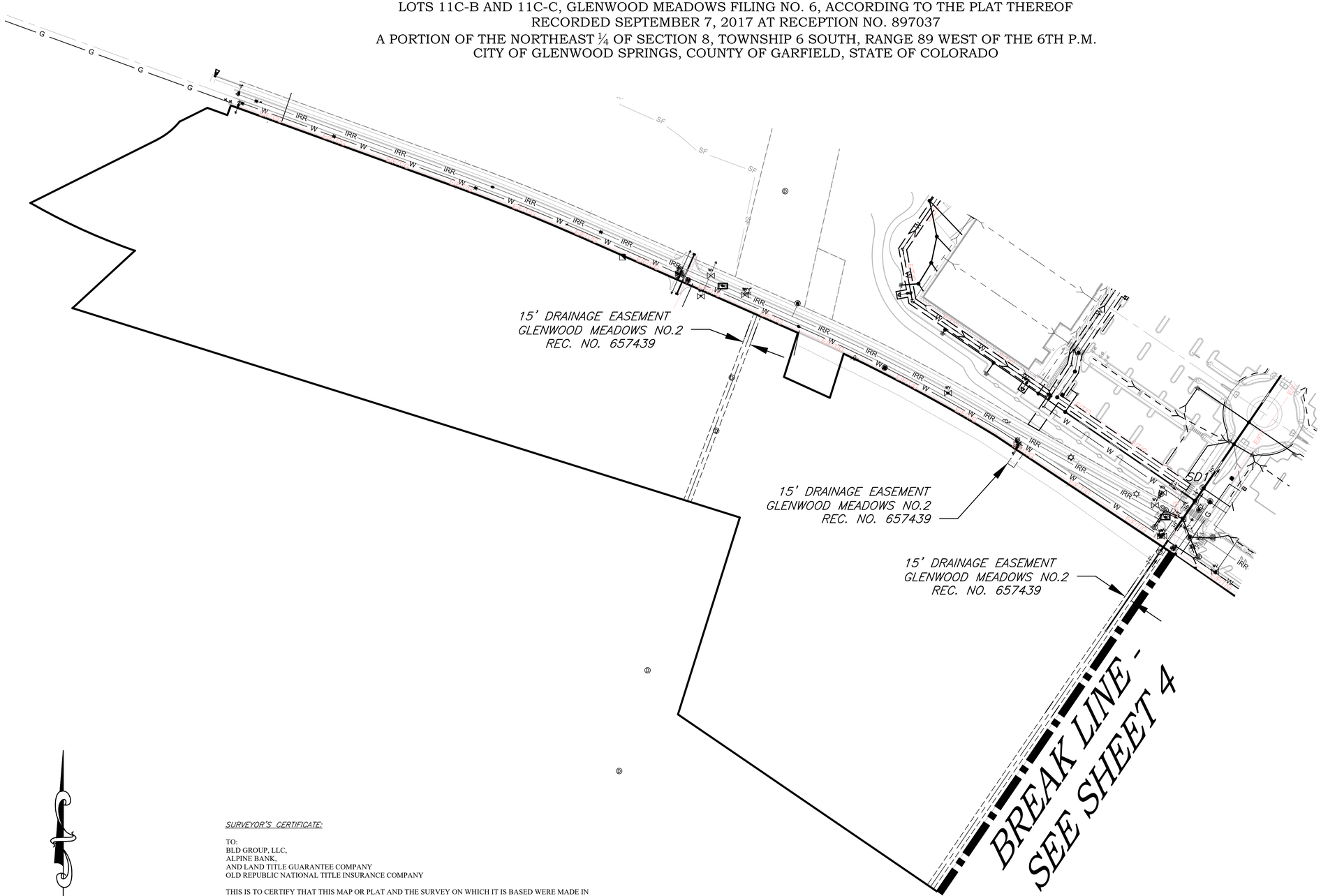
ALTA/ACSM LAND TITLE SURVEY

TBD GLENWOOD MEADOWS
GLENWOOD SPRINGS, CO 81647

DRAWN BY: JG
DATE: 09/16/2020

ALTA/ACSM LAND TITLE SURVEY

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
A PORTION OF THE NORTHEAST ¼ OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO



LEGEND

- TV PEDESTAL
- ELECTRICAL TRANS
- CLEAN–OUT
- WATER VALVE
- TELE. PEDESTAL
- ELEC. PEDESTAL
- SET #5 REBAR & CAP L.S. NO. 33638
- FOUND PROPERTY CORNER AS DESCRIBED
- UTILITY POLE/ POWER POLE
- ANCHOR
- TELE. VAULT
- ELECT. VAULT
- LIGHT POLE
- MARKER/ SIGN
- HANDICAP
- FIRE HYDRANT
- WATER SHUTOFF
- GAS VALVE
- SAN. SEWER MH
- ST. SEWER MH
- ELECT. MH
- TELEPHONE MH
- WATER MH
- WATER METER
- GAS METER
- ELECTRICAL METER
- STORM GRATE
- ELECTRIC MARKER
- GAS MARKER
- IRRIGATION VALVE BOX

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SURVEYOR'S CERTIFICATE:

TO:
BLD GROUP, LLC,
ALPINE BANK,
AND LAND TITLE GUARANTEE COMPANY
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

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, 6(B), 8, 11, 13, 14, 16, 17, 18, AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 28, 2020 DATE OF PLAT OR MAP: SEPTEMBER 2-8, 2020.

COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

09/16/2020
JEFFREY ALLEN TUTTLE L.S. 33638 — DATE

NOTICE: ACCORDING TO COLORADO LAW, YOU **MUST** COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER 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.

TUTTLE SURVEYING SERVICES
923 COOPER AVENUE
GLENWOOD SPRINGS, COLORADO 81601
(970) 928–9708 (FAX 947–9007)
Email– jeff@tss–us.com

TUTTLE SURVEYING SERVICES

ALTA/ACSM LAND TITLE SURVEY

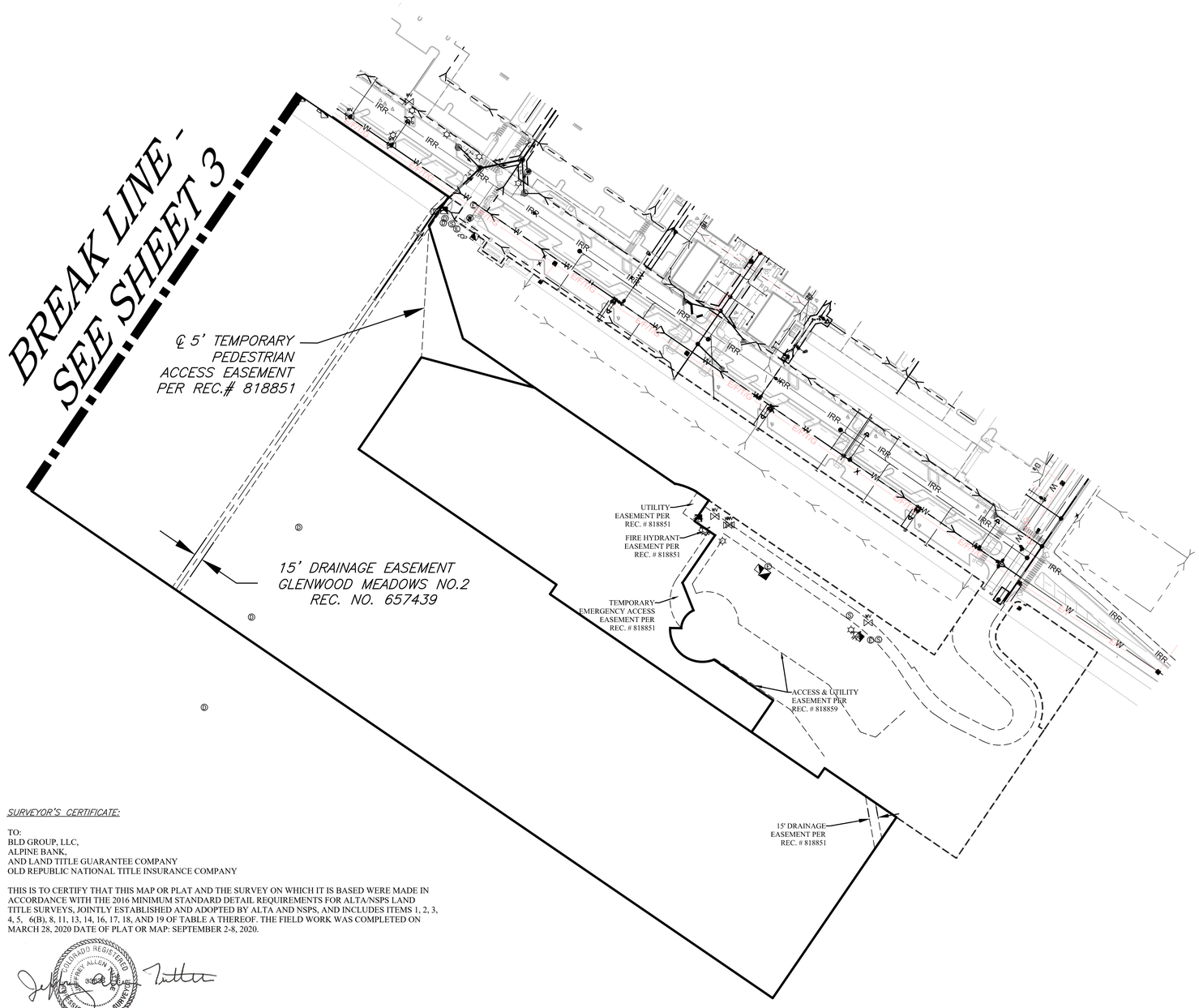
TBD GLENWOOD MEADOWS
GLENWOOD SPRINGS, CO 81647

DRAWN BY: JG
DATE: 09/16/2020

3 OF 4

ALTA/ACSM LAND TITLE SURVEY

LOTS 11C-B AND 11C-C, GLENWOOD MEADOWS FILING NO. 6, ACCORDING TO THE PLAT THEREOF
RECORDED SEPTEMBER 7, 2017 AT RECEPTION NO. 897037
A PORTION OF THE NORTHEAST ¼ OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO



LEGEND

- TV PEDESTAL
- ELECTRICAL TRANS
- CLEAN–OUT
- WATER VALVE
- TELE. PEDESTAL
- ELEC. PEDESTAL
- SET #5 REBAR & CAP L.S. NO. 33638
- FOUND PROPERTY CORNER AS DESCRIBED
- UTILITY POLE/ POWER POLE
- ANCHOR
- TELE. VAULT
- ELECT. VAULT
- LIGHT POLE
- MARKER/ SIGN
- HANDICAP
- FIRE HYDRANT
- WATER SHUTOFF
- GAS VALVE
- SAN. SEWER MH
- ST. SEWER MH
- ELECT. MH
- TELEPHONE MH
- WATER MH
- WATER METER
- GAS METER
- ELECTRICAL METER
- STORM GRATE
- ELECTRIC MARKER
- GAS MARKER
- IRRIGATION VALVE BOX

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SURVEYOR'S CERTIFICATE:

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COLORADO REGISTERED JEFFREY ALLEN TUTTLE 33638 PROFESSIONAL LAND SURVEYOR

JEFFREY ALLEN TUTTLE L.S. 33638 — 09/16/2020 DATE

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TUTTLE SURVEYING SERVICES

ALTA/ACSM LAND TITLE SURVEY

TBD GLENWOOD MEADOWS
GLENWOOD SPRINGS, CO 81647

DRAWN BY: JG
DATE: 09/16/2020

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

WULFSOHN RD.

INSTALL NEW LOT 14 CURB CUT ACROSS FORM PROPOSED ACCESS

EXISTING CURB CUT TO BE REMOVED. INSTALL 74–LF, 24–IN STANDARD CURB & GUTTER. EXISTING UTILITY STUBS TO REMAIN

TW: 5887.68
BW: 5882.68

TW: 5893.15
BW: 5888.03

TW: 5882.68
BW: 5876.68

TW: 5886.47
BW: 5880.58

TW: 5883.94
BW: 5878.01

TW: 5881.44
BW: 5877.32

TW: 5912.01
BW: 5906.23

TW: 5917.85
BW: 5915.77

TW: 5923.68
BW: 5919.24

TW: 5938.20
BW: 5934.75

TW: 5938.72
BW: 5923.16

TW: 5919.18
BW: 5917.85

TW: 5922.03
BW: 5919.99

TW: 5940.21
BW: 5938.75

TW: 5928.46
BW: 5928.72

TW: 5945.11
BW: 5941.65

TW: 5944.65
BW: 5938.85

TW: 5938.34
BW: 5932.34

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN–OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
	FIRE HYDRANT	BEND W/THRUST BLOCK
	WATER VALVE	FIRE HYDRANT
	WATER MANHOLE	INLET
	GAS METER	CURB INLET
	TELEPHONE PEDESTAL	STORM MANHOLE
	LIGHT POLE	SANITARY MANHOLE
	UTILITY POLE	SANITARY CLEANOUT
	SIGN	CABLE MANHOLE
		ELECTRIC MANHOLE
		ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT–OF–WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS SS	SS SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
STORM SEWER		
CONTOUR	6158	6158

NOTES

1. SURVEY COMPLETED BY TUTTLE SURVEYING SERVICES. REFER TO ALTA/ASCM LAND TITLE SURVEY DATED 10/08/20 FOR EXISTING CONDITIONS INFORMATION. DATE OF SURVEY SEPTEMBER 5–8, 2020.
2. BASIS OF BEARINGS: #5 REBAR WITH ALUMINUM CAP LS #5933 AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.
3. CONTOUR INFORMATION OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA, STATE PLANE NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY IN AREAS CRITICAL TO DESIGN.

COLORADO 811
CALL BEFORE YOU DIG
Utility Notification Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG
4	8/13/21	MAJOR SITE / ARCH. REVIEW #4	MGG

DRAWN BY: MGG
CHECKED BY: MGG
DATE: 8/13/2021
FILE:
SCALE 1" = 40'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101,
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 · FAX (970) 945-2555
WWW.HCENG.COM

GLENWOOD MEADOWS MULTI-FAMILY

BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

PRELIMINARY GRADING PLAN
SHEET 1

PROJECT NO.
2201044.00

GR1

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PRELIMINARY
NOT FOR
CONSTRUCTION

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN-OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
	FIRE HYDRANT	BEND W/THRUST BLOCK
	WATER VALVE	FIRE HYDRANT
	WATER MANHOLE	INLET
	GAS METER	CURB INLET
	TELEPHONE PEDESTAL	STORM MANHOLE
	LIGHT POLE	SANITARY MANHOLE
	UTILITY POLE	SANITARY CLEANOUT
	SIGN	CABLE MANHOLE
		ELECTRIC MANHOLE
		ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT-OF-WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS	SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
STORM SEWER		
CONTOUR	6158	6158

NOTES:

1. SURVEY COMPLETED BY TUTTLE SURVEYING SERVICES. REFER TO ALTA/ASCM LAND TITLE SURVEY DATED 10/08/20 FOR EXISTING CONDITIONS INFORMATION. DATE OF SURVEY SEPTEMBER 5-8, 2020.
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3. CONTOUR INFORMATION OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA, STATE PLANE NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY IN AREAS CRITICAL TO DESIGN.

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DRAWN BY: MGG
CHECKED BY: MGG
DATE:
FILE: SCALE 1" = 40'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101,
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 · FAX (970) 945-2555
WWW.HCENG.COM

BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY GRADING PLAN
SHEET 2

PROJECT NO.
2201044.00

GR2

PRELIMINARY
NOT FOR
CONSTRUCTION

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

WULFSOHN RD.

CONNECT TO EXISTING IRRIGATION MAIN PER CITY OF GLENWOOD SPRINGS STANDARDS

CONNECT TO EXISTING WATERMAIN PER CITY OF GLENWOOD SPRINGS STANDARDS

EXISTING WATERMAIN STUBS TO BE ABANDONED PER CITY OF GLENWOOD SPRINGS STANDARDS

EXISTING IRRIGATION STUBS TO BE ABANDONED PER CITY OF GLENWOOD SPRINGS STANDARDS

INSTALL NEW MANHOLE ON EXISTING STORM SEWER

249.99'–12" HDPE @ 2.31%

EXISTING CURB CUT TO BE REMOVED

24.06'–12" HDPE @ 1.00%

12.19'–15" HDPE @ 19.23%

CONNECT TO EXISTING STORM SEWER STRUCTURE

116.60'–15" HDPE @ 17.79%

14.00'–12" HDPE @ 2.00%

229.99'–12" HDPE @ 0.75%

229.98'–12" HDPE @ 0.75%

14.00'–12" HDPE @ 2.00%

14.00'–12" HDPE @ 5.70%

EXISTING 24" STORM PIPE "1B"

INSTALL MANHOLE ON EXISTING STORM SEWER

144.48'

134.80'–12" HDPE @ 4.00%

333.20'–12" HDPE @ 1.09%

333.20'–12" HDPE @ 1.09%

400.00'–8" PVC @ 1.10%

227.44'–8" PVC @ 1.10%

8" D.I.P. WATER MAIN

SAN–MH8

SAN–MH7

63.43'–12" HDPE @ 2.24%

24.00'–12" HDPE @ 1.00%

141.58'–12" HDPE @ 6.97%

62.32'–12" HDPE @ 3.62%

24.00'–12" HDPE

95.95'–12" HDPE @ 9.05%

116.56'–12" HDPE @ 10.77%

11.0' TYP.
10. MIN.

6" PVC SANITARY SERVICE, TYP.

6" D.I.P. WATER SERVICE, TYP.

51.17'–12" HDPE @ 4.12%

260.75'–8" PVC @ 1.13%

8" D.I.P. WATER MAIN

SAN–MH14

SEE SHEET 2

358.6'

56.01'–12" HDPE @ 6.00%

COMBINED FIRE/DOMESTIC WATER SERVICE CONNECTIONS TO BE NFPA24 COMPLIANT, TYP.

EXISTING STORM SEWER TO BE ABANDONED/REMOVED

348.99'–12" HDPE @ 6.00%

8" D.I.P. WATER MAIN

INSTALL MANHOLE ON EXISTING STORM SEWER

LEGEND

EXISTING	PROPOSED
STORM MANHOLE	WATER SHUTOFF VALVE
SANITARY CLEAN–OUT	WATER VALVE
SANITARY MANHOLE	TEE W/THRUST BLOCK
FIRE HYDRANT	BEND W/THRUST BLOCK
WATER VALVE	FIRE HYDRANT
WATER MANHOLE	INLET
GAS METER	CURB INLET
TELEPHONE PEDESTAL	STORM MANHOLE
LIGHT POLE	SANITARY MANHOLE
UTILITY POLE	SANITARY CLEANOUT
SIGN	CABLE MANHOLE
	ELECTRIC VAULT
	ELECTRIC TRANSFORMER

BOUNDARY
RIGHT–OF–WAY
EASEMENT
STRUCTURE
ASPHALT
GRAVEL
CONCRETE
RETAINING WALL
CENTERLINE ROAD
CURB AND GUTTER
FLOWLINE
PAVEMENT STRIPING
WATER MAIN
WATER SERVICE
SEWER MAIN
SEWER SERVICE
OVERHEAD ELECTRIC
ELECTRIC
CATV
TELEPHONE
GAS
IRRIGATION
STORM SEWER

NOTES

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4. ALL COMBINED FIRE/DOMESTIC WATER SERVICES SHALL BE NFPA24 COMPLIANT.
5. PUBLICLY DEDICATED UTILITIES SHALL HAVE UTILITY EASEMENT FOR ACCESS AND MAINTENANCE.
6. ALL FIRE HYDRANTS TO HAVE 15' EASEMENT FOR ACCESS AND MAINTENANCE.
7. ALL UTILITY EASEMENTS TO BE SHOW AN FINALIZED ON PERMIT PLANS.
8. ALL WET UTILITIES WILL REQUIRE JOINTS/BELLS WITHIN ENTIRE PROJECT AREA.
9. ALL UNUSED UTILITY STUBS SHALL BE ABANDONED PER COGS STANDARDS.

COLORADO 811
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DRAWN BY: MGG
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FILE:
SCALE 1" = 40'

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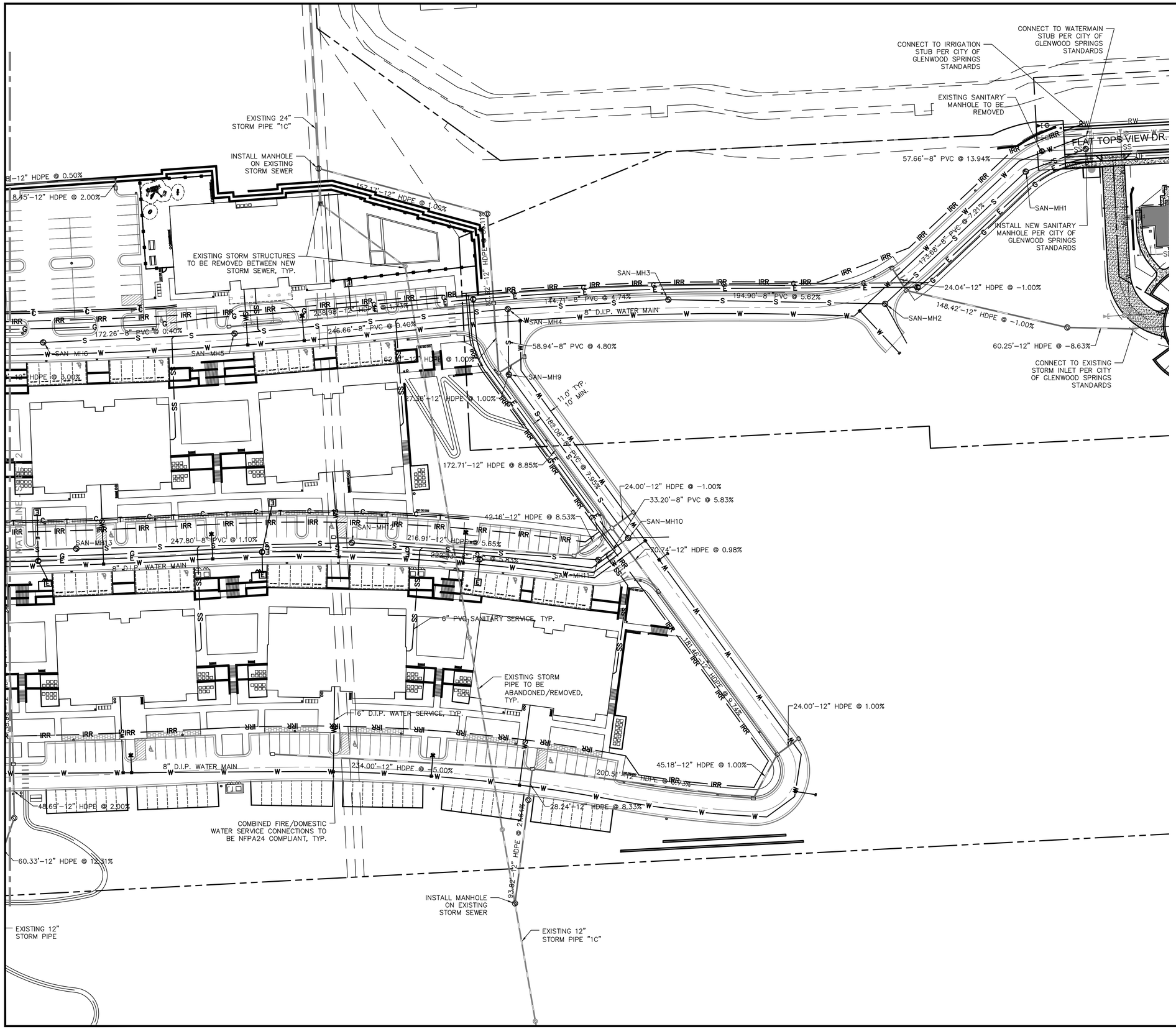
BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY PLAN
SHEET 1

PROJECT NO.
2201044.00

UT1



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN–OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
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	UTILITY POLE	SANITARY CLEANOUT
	SIGN	CABLE MANHOLE
		ELECTRIC VAULT
		ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT–OF–WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS SS	SS SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
IRRIGATION		IRR
STORM SEWER		

NOTES

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4	8/13/21	MAJOR SITE / ARCH. REVIEW #4	MGG

DRAWN BY: MGG
CHECKED BY: MGG
DATE:
FILE: SCALE 1" = 40'

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BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY PLAN

SHEET 2

PROJECT NO.
2201044.00

UT2

SELLER'S RESERVED PARCEL
12.213 ACRES

BUYER'S PARCEL
27.929 ACRES

REMAINDER PARCEL
9.265 ACRES

0' 75' 150' 300'
Scale: 1" = 150'

IMAGES
P:\Work\Omega\Glenwood Land_Big\
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2020\10_3D Modeling\5_Renderings\20210811 Progress Set\GM_GraphicSet_L1 - Photo.jpg
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2020\10_3D Modeling\5_Renderings\20210811 Updated Revised Aerial Renders\GM_GraphicSet_L2.jpg
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2020\10_3D Modeling\5_Renderings\20210811 Updated Revised Aerial Renders\GM_GraphicSet_L3.jpg
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2020\10_3D Modeling\5_Renderings\20210811 Updated Revised Aerial Renders\GM_GraphicSet_L4.jpg
P:\Corporate\GLENWOOD MEADOWS APARTMENTS-2020\10_3D Modeling\5_Renderings\20210811 Updated Revised Aerial Renders\GM_GraphicSet_L5.jpg
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XREFS
X-SITE IMPROVEMENTS [\Work\V-SITE IMPROVEMENTS_PHASE 1.dwg]
X-CIVIL PHASE 1 GRADING [\Work\V-CIVIL PHASE 1 GRADING.dwg]
X-CIVIL PHASE 1 UTILITY [\Work\V-CIVIL PHASE 1 UTILITY.dwg]
X-PROPOSED ROAD [\Work\V-PROPOSED ROAD.dwg]
X-EXISTING ROAD [\Work\V-EXISTING ROAD.dwg]
X-CS-ST [\Work\V-CS-ST.dwg]
X-CIVIL ROADS [\Work\V-CIVIL ROADS.dwg]
X-CIVIL ROADS [\Work\V-CIVIL ROADS.dwg]
X-CIVIL UTILITY [\Work\V-CIVIL UTILITY.dwg]
X-CIVIL PHASE 2 GRADING [\Work\V-CIVIL PHASE 2 GRADING.dwg]
X-CIVIL PHASE 2 UTILITY [\Work\V-CIVIL PHASE 2 UTILITY.dwg]
X-PARCEL LINE [\Work\V-PARCEL LINE.dwg]
X-SITE [\Work\V-SITE.dwg]
X-Job Boundary [\Work\V-Job Boundary.dwg]

NAME
\\HARTSRANGER-MOORE RWNKRT_2019\E_Land Use Permit Revision\CAD\Sheets\SITE PLAN SUBMITTAL.dwg
Jun 14, 2021 - 8:58am

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

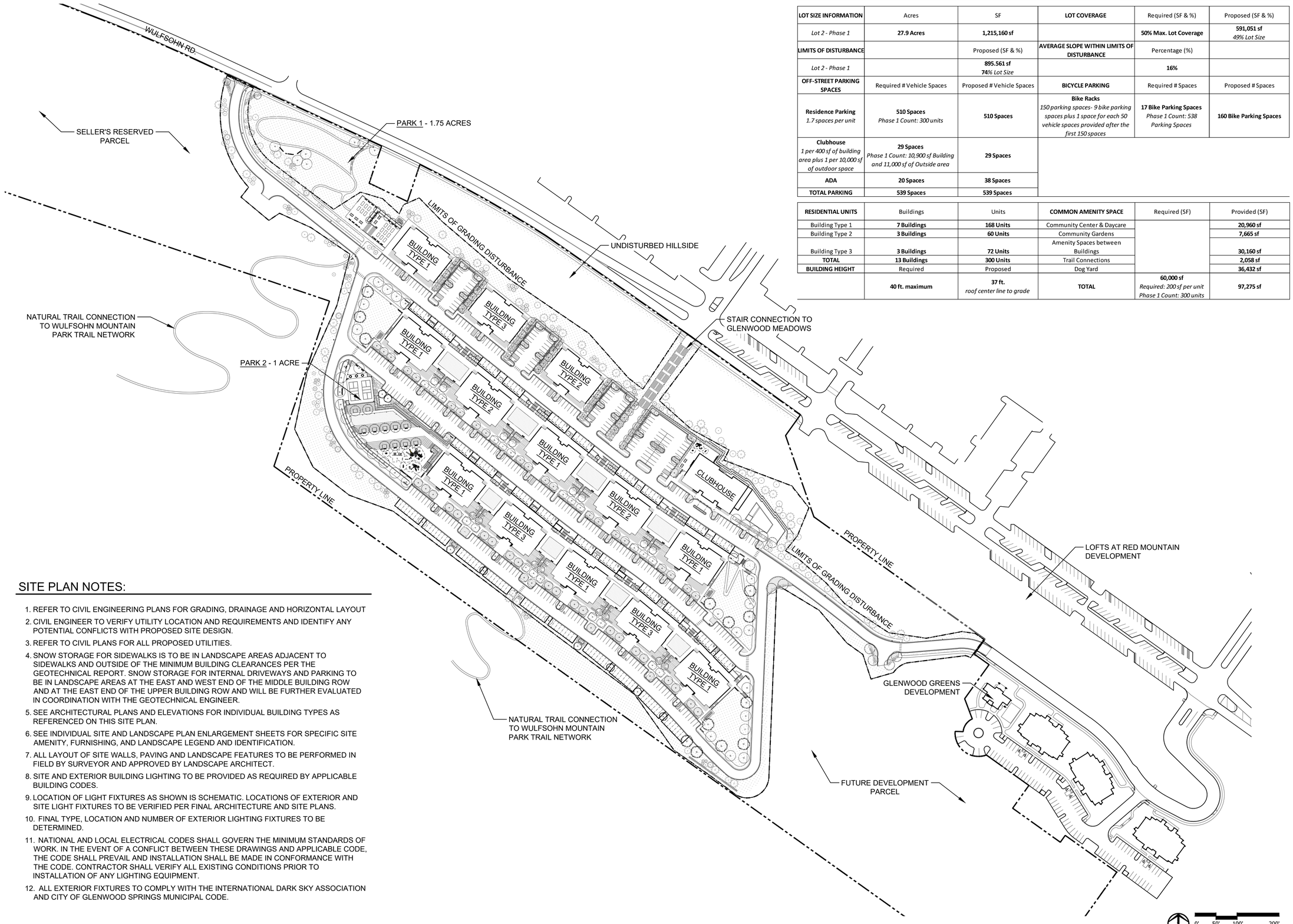
JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN

SCALE:

SHEET NUMBER:
L1.0

SHEET_____OF_____



UNIT AND SITE AMENITY DATA:

LOT SIZE INFORMATION	Acres	SF	LOT COVERAGE	Required (SF & %)	Proposed (SF & %)
Lot 2 - Phase 1	**27.9 Acres**	**1,215,160 sf**		**50% Max. Lot Coverage**	**591,051 sf** *49% Lot Size*
LIMITS OF DISTURBANCE		Proposed (SF & %)	**AVERAGE SLOPE WITHIN LIMITS OF DISTURBANCE**	Percentage (%)	
Lot 2 - Phase 1		**895.561 sf** **74**% *Lot Size*		**16%**	
OFF-STREET PARKING SPACES	Required # Vehicle Spaces	Proposed # Vehicle Spaces	**BICYCLE PARKING**	Required # Spaces	Proposed # Spaces
Residence Parking *1.7 spaces per unit*	**510 Spaces** *Phase 1 Count: 300 units*	**510 Spaces**	**Bike Racks** *150 parking spaces- 9 bike parking spaces plus 1 space for each 50 vehicle spaces provided after the first 150 spaces*	**17 Bike Parking Spaces** *Phase 1 Count: 538 Parking Spaces*	**160 Bike Parking Spaces**
Clubhouse *1 per 400 sf of building area plus 1 per 10,000 sf of outdoor space*	**29 Spaces** *Phase 1 Count: 10,900 sf Building and 11,000 sf of Outside area*	**29 Spaces**			
ADA	**20 Spaces**	**38 Spaces**			
TOTAL PARKING	**539 Spaces**	**539 Spaces**			

RESIDENTIAL UNITS	Buildings	Units	COMMON AMENITY SPACE	Required (SF)	Provided (SF)
Building Type 1	**7 Buildings**	**168 Units**	Community Center & Daycare		**20,960 sf**
Building Type 2	**3 Buildings**	**60 Units**	Community Gardens		**7,665 sf**
Building Type 3	**3 Buildings**	**72 Units**	Amenity Spaces between Buildings		**30,160 sf**
TOTAL	**13 Buildings**	**300 Units**	Trail Connections		**2,058 sf**
BUILDING HEIGHT	Required	Proposed	Dog Yard		**36,432 sf**
	40 ft. maximum	**37 ft.** *roof center line to grade*	**TOTAL**	**60,000 sf** *Required: 200 sf per unit* *Phase 1 Count: 300 units*	**97,275 sf**

SITE PLAN NOTES:

1. REFER TO CIVIL ENGINEERING PLANS FOR GRADING, DRAINAGE AND HORIZONTAL LAYOUT
2. CIVIL ENGINEER TO VERIFY UTILITY LOCATION AND REQUIREMENTS AND IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED SITE DESIGN.
3. REFER TO CIVIL PLANS FOR ALL PROPOSED UTILITIES.
4. SNOW STORAGE FOR SIDEWALKS IS TO BE IN LANDSCAPE AREAS ADJACENT TO SIDEWALKS AND OUTSIDE OF THE MINIMUM BUILDING CLEARANCES PER THE GEOTECHNICAL REPORT. SNOW STORAGE FOR INTERNAL DRIVEWAYS AND PARKING TO BE IN LANDSCAPE AREAS AT THE EAST AND WEST END OF THE MIDDLE BUILDING ROW AND AT THE EAST END OF THE UPPER BUILDING ROW AND WILL BE FURTHER EVALUATED IN COORDINATION WITH THE GEOTECHNICAL ENGINEER.
5. SEE ARCHITECTURAL PLANS AND ELEVATIONS FOR INDIVIDUAL BUILDING TYPES AS REFERENCED ON THIS SITE PLAN.
6. SEE INDIVIDUAL SITE AND LANDSCAPE PLAN ENLARGEMENT SHEETS FOR SPECIFIC SITE AMENITY, FURNISHING, AND LANDSCAPE LEGEND AND IDENTIFICATION.
7. ALL LAYOUT OF SITE WALLS, PAVING AND LANDSCAPE FEATURES TO BE PERFORMED IN FIELD BY SURVEYOR AND APPROVED BY LANDSCAPE ARCHITECT.
8. SITE AND EXTERIOR BUILDING LIGHTING TO BE PROVIDED AS REQUIRED BY APPLICABLE BUILDING CODES.
9. LOCATION OF LIGHT FIXTURES AS SHOWN IS SCHEMATIC. LOCATIONS OF EXTERIOR AND SITE LIGHT FIXTURES TO BE VERIFIED PER FINAL ARCHITECTURE AND SITE PLANS.
10. FINAL TYPE, LOCATION AND NUMBER OF EXTERIOR LIGHTING FIXTURES TO BE DETERMINED.
11. NATIONAL AND LOCAL ELECTRICAL CODES SHALL GOVERN THE MINIMUM STANDARDS OF WORK. IN THE EVENT OF A CONFLICT BETWEEN THESE DRAWINGS AND APPLICABLE CODE, THE CODE SHALL PREVAIL AND INSTALLATION SHALL BE MADE IN CONFORMANCE WITH THE CODE. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO INSTALLATION OF ANY LIGHTING EQUIPMENT.
12. ALL EXTERIOR FIXTURES TO COMPLY WITH THE INTERNATIONAL DARK SKY ASSOCIATION AND CITY OF GLENWOOD SPRINGS MUNICIPAL CODE.

IMAGES
P:\Glenwood\GLENWOOD MEADOWS #PARENTS-2201\SLD_Land Use Permit Revision\CAD\Sheets\SITE PLAN SUBMITAL.dwg Aug 13, 2021 - 4:39pm
XREFS
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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE 2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
DEVELOPMENT AREA SITE PLAN

SCALE:

SHEET NUMBER:
L1.1

SHEET ____ OF ____

LANDSCAPE AREA:

OPEN SPACE	SQUARE FOOTAGE	TREES		SHRUBS	
		REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Upper tier - disturbed	87,483 SF	73	74	219	366
Lower tier - disturbed	79,351 SF	66	66	198	285

INTERNAL DRIVEWAY	LINEAR FEET	TREES	
		REQUIRED *(1/35 LF)*	PROVIDED
Flat Tops View Dr (Sunny Aspen)	2,071 LF	59	60
Wolf Liam Lane	1,735 LF	50	50
Adios Avenue	1,748 LF	50	50

PARKING AREAS	Total Parking Area (SF)	Landscaped Area (SF & %)	TREES		SHRUBS	
			REQUIRED *(1/1200 SF)*	PROVIDED	REQUIRED (1/400 SF)	PROVIDED
Parking Lots	29,694 SF	10,485 SF *(35% of the parking area)*	25	40	74	240

TOTAL LANDSCAPED AREA	Proposed (SF & %)	OPEN SPACE	Required (SF & %)	Proposed (SF & %)
	304,510 sf *25% Lot Size*		**486,064 sf** *40% Lot Size*	**504,083 sf** *41.5% Lot Size*

TOTAL IMPERVIOUS AREA	Proposed (SF & %)
	591,051 sf *49% Lot Size*

L1.3

L1.4

L1.5

L1.6

L1.7

L1.8

L1.9

0' 50' 100' 200'
Scale: 1" = 100'

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REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT KEY PLAN

SCALE:

SHEET NUMBER:
L1.2

SHEET_____OF_____

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X-CIVIL PHASE 1 GRADING [..\Work\X-CIVIL PHASE 1 GRADING.dwg]
X-PROPOSED ROAD [..\Work\X-PROPOSED ROAD.dwg]
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XERIC PERENNIALS / ORNAMENTAL GRASSES ENTRY GARDEN BED

CONNECTION TO EXISTING WULFSOHN CURB CUT

WULFSOHN RD.

PROPERTY LINE

TRASH RECEPTACLE

LOCAL ACCESS TRAILHEAD

STAIR CONNECTION

SOFT SURFACE TRAIL

NATIVE SEED

AC CONDENSING UNTIS

FENCE (6' MAX. HEIGHT)

TERRACED PLANTER

TRASH RECEPTACLES

PARK 1

CRUSHER FINES SEATING AREA

COMMUNITY GARDEN WITH RAISED PLANTER BOXES

RETAINING WALL (6' MAX. HEIGHT)

XERIC PERENNIALS / ORNAMENTAL GRASSES ENTRY GARDEN BED

PROPOSED ROAD; RE: CIVIL

CRUSHER FINES

PICNIC TABLE

PARK BENCH

ADA ACCESSIBLE COMMUNITY GARDEN

SELLER RESERVED PARCEL

STREET LIGHT TYP.

SIGHT TRIANGLES; PER: CIVIL

CROSSWALK

TRASH RECEPTACLE

LOCAL ACCESS TRAILHEAD

NATIVE SHRUBS / SMALL TREES

DOG WASTE STATION

TRAILHEAD KIOSK

NATIVE SHRUBS / SMALL TREES

LIMITS OF GRADING DISTURBANCE

NATURAL TRAIL CONNECTION TO WULFSOHN MOUNTAIN PARK TRAIL NETWORK

MATCHLINE: REFERENCE SHEET L1.4

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
- EVERGREEN TREES
- DECIDUOUS TREES
- ORNAMENTAL TREES
- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

0' 10' 20' 40'
Scale: 1" = 20'

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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

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SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.3

SHEET_____OF_____

WULFSOHN RD.

PROPERTY LINE

WULFSOHN SIDEWALK

NATIVE SEED

EXISTING LANDSCAPE TO REMAIN

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
- EVERGREEN TREES
- DECIDUOUS TREES
- ORNAMENTAL TREES
- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

LIMITS OF GRADING DISTURBANCE

NATIVE TREES AND SHRUBS TO SCREEN RETAINING WALLS AT PARKING

NATIVE TREES AND SHRUBS TYP.

NATIVE REVEGETATION AREA

NATIVE TREES AND SHRUBS TYP.

SIDEWALK

RETAINING WALL (6' MAX. HEIGHT)

AC CONDENSING UNITS

BUILDING TYPE 1

19'-0" TYP.

9'-0" TYP.

ROCK MULCH TYP.

DOUBLE ROW OF SHRUBS, TRIANGULAR SPACING TYP.

BIKE RACK

RESIDENT PARKING LOT

SIDEWALK

STREET LIGHT TYP.

SIGHT TRIANGLES; PER: CIVIL

MAILBOXES

STREET PARKING

MOUNTED STREETLIGHT TYP.

ENCLOSED BICYCLE PARKING AREA

SHRUBS TO SCREEN DUMPSTERS TYP.

COVERED GARAGE / PARKING BELOW; RE: ARCH

RETAINING WALL (6' MAX. HEIGHT)

STAIRCASE

DOG WASTE STATION

SIDEWALK

BOLLARD LIGHT TYP.

PARK BENCH

DOG YARD

RETAINING WALL (6' MAX. HEIGHT)

STAIRCASE

BUILDING TYPE 1

ARTIFICIAL TURF

BUILDING TYPE 3

SIDEWALK

RETAINING WALL (6' MAX. HEIGHT)

AC CONDENSING UNITS

19'-0" TYP.

9'-0" TYP.

RESIDENT PARKING LOT

BIKE RACK

11'-0" TYP.

STREETLIGHT TYP.

ROCK MULCH TYP.

BUILDING TYPE 2

ARTIFICIAL TURF

BUILDING TYPE 2

DOUBLE ROW OF SHRUBS, TRIANGULAR SPACING TYP.

SIDEWALK

ROCK MULCH TYP.

BIKE RACK

WALL MOUNTED STREET LIGHT TYP.

ENCLOSED BICYCLE PARKING AREA

DUMPSTER ENCLOSURE

TERRACED PLANTERS

COVERED GARAGE / PARKING BELOW; RE: ARCH

BUILDING TYPE 1

MATCHLINE: REFERENCE SHEET L1.3

MATCHLINE: REFERENCE SHEET L1.5

MATCHLINE: REFERENCE SHEET L1.7

MATCHLINE: REFERENCE SHEET L1.8

0' 10' 20' 40'
Scale: 1" = 20'

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SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.4

SHEET_____OF_____

WULFSOHN RD.

WULFSOHN SIDEWALK

PROPERTY LINE

LIMITS OF GRADING DISTURBANCE

ENTRY PLANTING WITH XERIC PERENNIALS AND ORNAMENTAL GRASSES

NATIVE SEED

PLANTER TYP.

BOLLARD LIGHT TYP.

STAIRCASE

XERIC PERENNIALS AND ORNAMENTAL GRASSES

EXISTING LANDSCAPE TO REMAIN

RETAINING WALL (6' MAX. HEIGHT)

CLUBHOUSE / DAYCARE PARKING LOT

RESIDENT PARKING LOT

19'-0" TYP.

9'-0" TYP.

38'-0"

39'-0"

38'-0"

11'-0" TYP.

13'-6"

DOUBLE ROW OF SHRUBS, TRIANGULAR SPACING TYP.

GARAGE / PARKING BELOW; RE: ARCH

ENCLOSED BICYCLE PARKING AREA

DAYCARE PLAYGROUND (AGES 2-5)

FENCE (6' MAX. HEIGHT)

AC CONDENSING UNITS

CLUBHOUSE

GATE

MAILBOXES

BIKE RACK

30'-4"

9'-0" TYP.

33'-6"

CLUBHOUSE AND DAYCARE COVERED DROP OFF AREA

SIGHT TRIANGLES; PER: CIVIL

COVERED GARAGE / PARKING BELOW; RE: ARCH

TERRACED PLANTERS

RETAINING WALL (6' MAX. HEIGHT)

BUILDING TYPE 1

ARTIFICIAL TURF

ROCK MULCH TYP.

BUILDING TYPE 2

RETAINING WALL (6' MAX. HEIGHT)

NATIVE TREES AND SHRUBS TYP.

POOL DECK

POOL

SPA

FENCE (6' MAX. HEIGHT)

SIDEWALK

ENTRY PLANTING WITH ORNAMENTAL SHRUBS, XERIC PERENNIALS, AND ORNAMENTAL GRASSES

BOLLARD LIGHT TYP.

DOG WASTE STATION

MATCHLINE: REFERENCE SHEET L1.4

MATCHLINE: REFERENCE SHEET L1.6

MATCHLINE: REFERENCE SHEET L1.8

MATCHLINE: REFERENCE SHEET L1.9

0' 10' 20' 40'

Scale: 1" = 20'

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
- EVERGREEN TREES
- DECIDUOUS TREES
- ORNAMENTAL TREES
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- NATIVE TREES / SHRUBS
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- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

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REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.5

SHEET_____OF_____

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
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- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

MATCHLINE: REFERENCE SHEET L1.5

PROPERTY LINE

EXISTING RED MOUNTAIN LOFTS DEVELOPMENT

UNDISTURBED HILLSIDE

GLENWOOD GREENS DEVELOPMENT

NATIVE TREES AND SHRUBS TYP.

SIDEWALK

STREET LIGHT TYP.

ENTRY ROAD; RE: CIVIL

SIGHT TRIANGLES; PER: CIVIL

FUTURE DEVELOPMENT PARCEL

SIGHT TRIANGLES; PER: CIVIL

ENTRY PLANTING WITH ORNAMENTAL SHRUBS, XERIC PERENNIALS, AND ORNAMENTAL GRASSES

NATIVE SEED

SIGHT TRIANGLES; PER: CIVIL

LIMITS OF GRADING DISTURBANCE

ENTRY PLANTING WITH ORNAMENTAL SHRUBS, XERIC PERENNIALS, AND ORNAMENTAL GRASSES

CONNECTION POINT FOR FUTURE DEVELOPMENT ROAD

MATCHLINE: REFERENCE SHEET L1.9

0' 10' 20' 40'
Scale: 1" = 20'

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JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

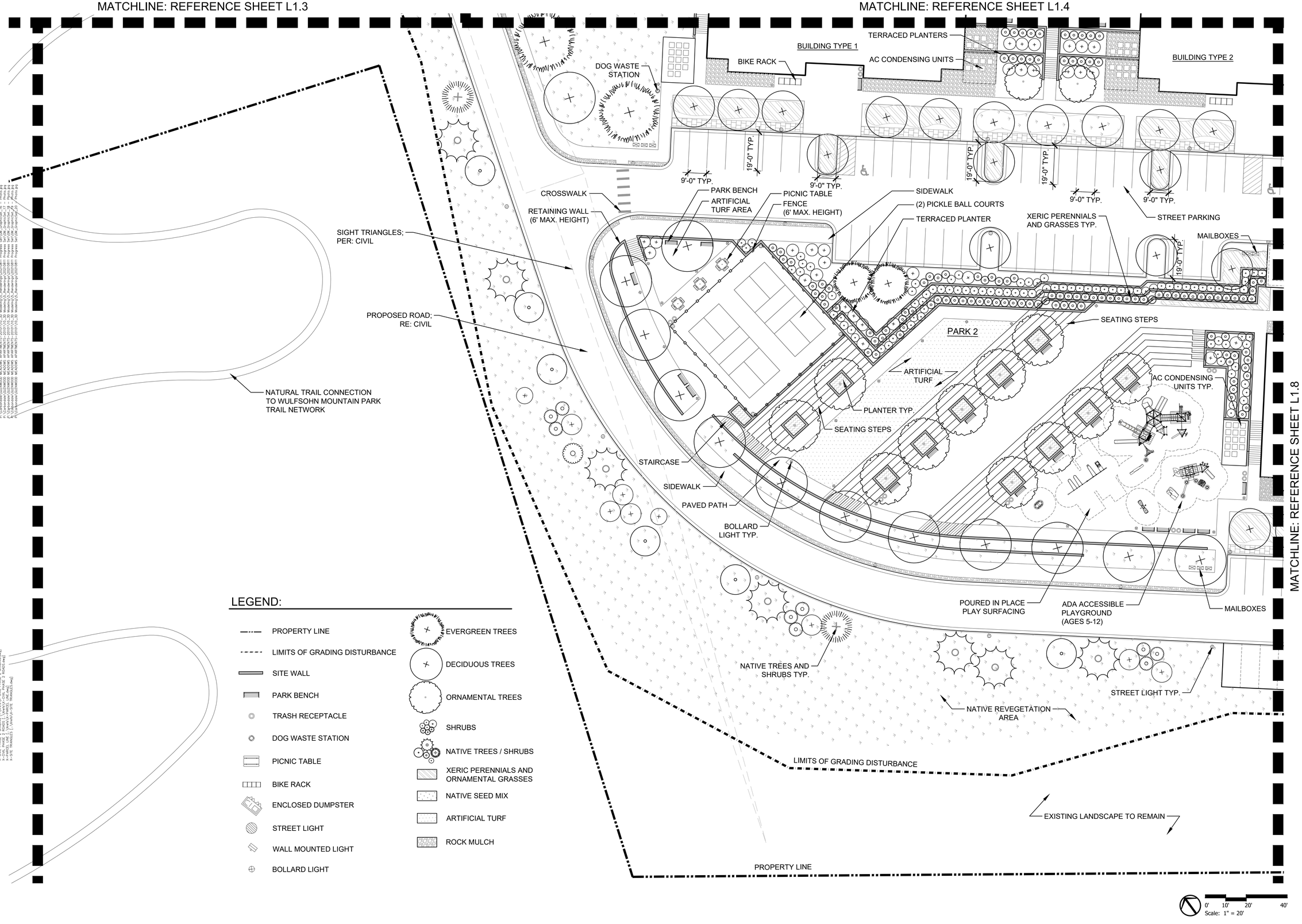
SHEET NUMBER:
L1.6

SHEET_____OF_____

MATCHLINE: REFERENCE SHEET L1.3

MATCHLINE: REFERENCE SHEET L1.4

MATCHLINE: REFERENCE SHEET L1.8



LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
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- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.7

SHEET____OF____

MATCHLINE: REFERENCE SHEET L1.4

MATCHLINE: REFERENCE SHEET L1.5

MATCHLINE: REFERENCE SHEET L1.7

MATCHLINE: REFERENCE SHEET L1.9

BUILDING TYPE 2

AC CONDENSING UNITS

STAIRCASE

TERRACED PLANTERS

RETAINING WALL (6' MAX. HEIGHT)

BUILDING TYPE 1

BIKE RACK

19'-0" TYP.

9'-0" TYP.

STREETLIGHT TYP.

DECORATIVE PAVERS TYP.

MOUNTED STREETLIGHT TYP.

DUMPSTER ENCLOSURE

BICYCLE PARKING AREA

FENCE (6' MAX. HEIGHT)

TRANSFORMER LOCATION; RE: CIVIL

COVERED GARAGE / PARKING BELOW; RE: ARCH

STAIRCASE

TERRACED PLANTERS

WALL MOUNTED STREET LIGHT TYP.

RETAINING WALL (6' MAX. HEIGHT)

ROCK MULCH TYP.

ARTIFICIAL TURF

BUILDING TYPE 3

PARK BENCH

TRASH RECEPTACLE

DOG WASTE STATION

LOCAL ACCESS TRAILHEAD

STREET LIGHT TYP.

COVERED CARPORT PARKING SPACES

LIMITS OF GRADING DISTURBANCE

TRAILHEAD KIOSK

XERIC PERENNIALS AND GRASSES TYP.

SHRUBS TO SCREEN DUMPSTERS TYP.

NATIVE TREES AND SHRUBS TYP.

NATIVE SEED

NATURAL TRAIL CONNECTION TO WULFSOHN MOUNTAIN PARK TRAIL NETWORK

PROPERTY LINE

LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
- DOG WASTE STATION
- PICNIC TABLE
- BIKE RACK
- ENCLOSED DUMPSTER
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT
- EVERGREEN TREES
- DECIDUOUS TREES
- ORNAMENTAL TREES
- SHRUBS
- NATIVE TREES / SHRUBS
- XERIC PERENNIALS AND ORNAMENTAL GRASSES
- NATIVE SEED MIX
- ARTIFICIAL TURF
- ROCK MULCH

0' 10' 20' 40'
Scale: 1" = 20'

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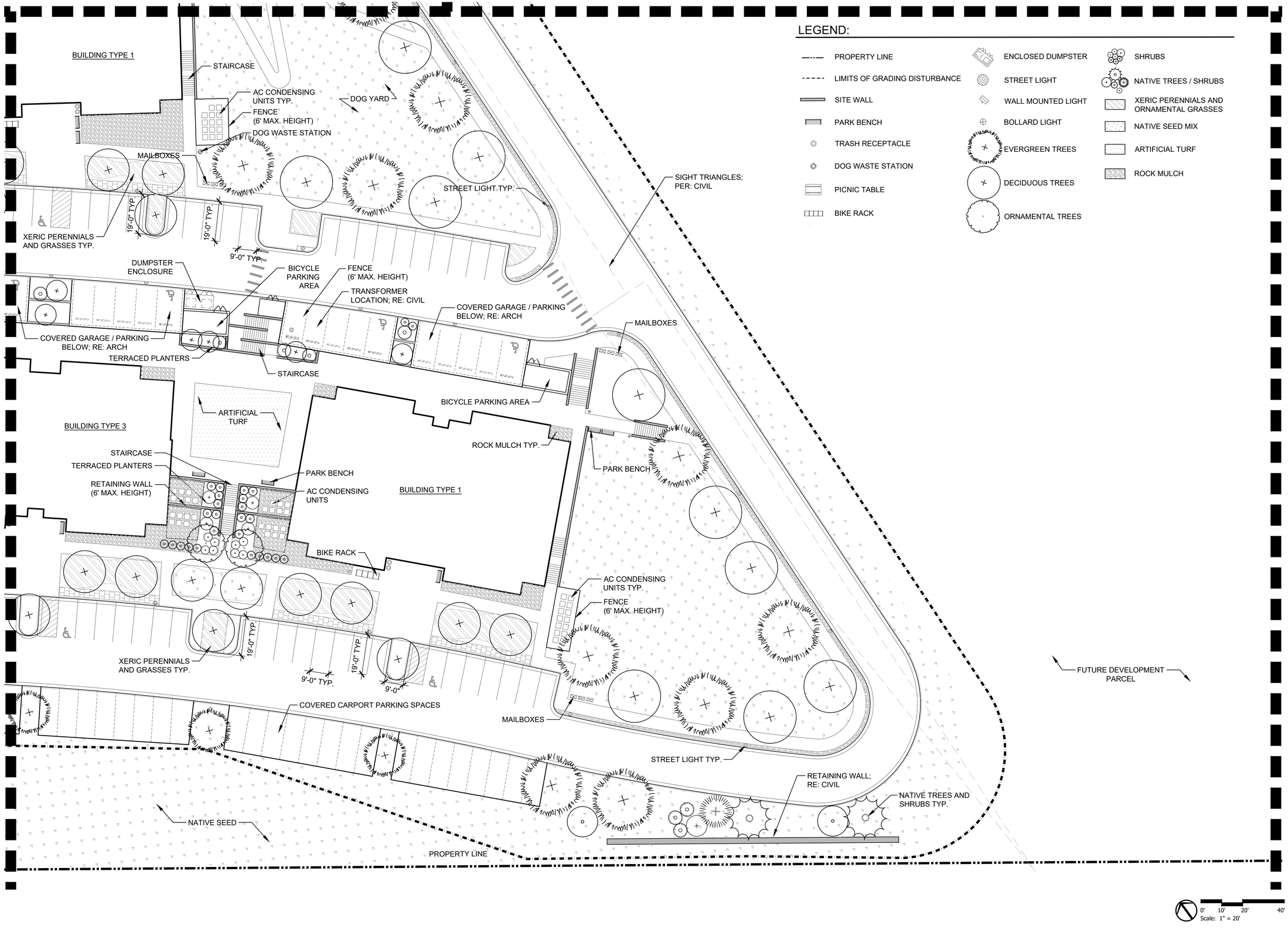
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L1.8

SHEET_____OF_____

MATCHLINE: REFERENCE SHEET L1.5

MATCHLINE: REFERENCE SHEET L1.6

MATCHLINE: REFERENCE SHEET L1.8



LEGEND:

- PROPERTY LINE
- LIMITS OF GRADING DISTURBANCE
- SITE WALL
- PARK BENCH
- TRASH RECEPTACLE
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SHEET TITLE:
SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER:
L1.9

SHEET_____OF_____

LANDSCAPE NOTES:

1. ALL PLANTING WILL MEET THE MINIMUM SIZES AS REQUIRED BY THE CITY OF GLENWOOD SPRINGS DEVELOPMENT CODE.
2. TREE AND SHRUB QUANTITIES COMPLY WITH THE REQUIRED MINIMUM QUANTITIES IN THE GLENWOOD MEADOWS DESIGN GUIDELINES FOR RESIDENTIAL NEIGHBORHOODS.
3. PARKING LOTS EDGES HAVE BEEN SCREENED FROM PUBLIC VIEW WITH PLANT MATERIAL AS REQUIRED IN THE GLENWOOD MEADOWS DESIGN GUIDELINES.
4. ALL LANDSCAPE PLANTING TO RECEIVE IRRIGATION. IRRIGATION SYSTEM TO BE PROFESSIONALLY DESIGNED TO LIMIT WATER CONSUMPTION. DRIP IRRIGATION TO BE USED WHEREVER POSSIBLE TO MINIMIZE RUN-OFF FROM SPRINKLERS.
5. IRRIGATION SYSTEM DESIGN, OPERATION AND MAINTENANCE TO COMPLY WITH THE GLENWOOD MEADOWS GEOTECHNICAL MITIGATION REQUIREMENTS AND GEOTECHNICAL REPORT FOR THE PROPERTY.
6. ALL LANDSCAPE PLANTINGS TO BE LOCATED AT LEAST 6' FROM THE BUILDINGS TO AVOID ADDING IRRIGATION WATER TO THE SOILS BENEATH THE STRUCTURES PER THE RECOMMENDATION OF THE GEOTECHNICAL REPORT.
7. FINAL LANDSCAPE AND IRRIGATION PLANS TO BE CERTIFIED BY GEOTECHNICAL ENGINEER FOR CONFORMANCE WITH GEOTECHNICAL RECOMMENDATIONS AS DEVELOPED FOR THIS SITE.
8. PROPOSED PLANTING AND IRRIGATION SYSTEM TO BE MAINTAINED BY THE APARTMENT COMPLEX MANAGEMENT.
9. ALL LANDSCAPE PLANTINGS ARE LOCATED TO ALLOW FOR SNOW STORAGE AREAS EQUALING 20% OF THE ADJACENT PAVING AREAS.
10. ALL DISTURBED AREAS ON THE PROJECT SITE TO BE REVEGETATED. SEE LANDSCAPE PLANS FOR PROPOSED PLANTING.
11. PLANT MATERIAL IS TO BE HEALTHY SPECIMENS FREE FROM DISEASE OR DAMAGE.
12. ALL MATERIALS USED SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARDS FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
13. ALL PLANT MATERIAL TO BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
14. CONTRACTOR TO STAKE ALL TREE LOCATIONS PER PLAN. OBTAIN LANDSCAPE ARCHITECT'S APPROVAL OF STAKED LOCATIONS PRIOR TO PLANTING.
15. STOCKPILED PLANT MATERIAL TO BE PLACED IN THE SHADE AND HAND-WATERED UNTIL PLANTED.
16. MAINTAIN POSITIVE DRAINAGE AWAY FROM WALLS, WALKS, BUILDINGS, AND OTHER STRUCTURES AT ALL TIMES. FINE GRADING SHALL BE APPROVED PRIOR TO SEEDING.
17. DO NOT PLACE MULCH WITHIN 6" OF TREE TRUNKS
18. INSTALL LANDSCAPE EDGER AT ALL BED/ GRASS BORDERS.
19. SEE CIVIL PLANS FOR PROPOSED GRADING AND DRAINAGE.
20. THE CONTRACTOR SHALL FINE GRADE ALL AREAS TO BE PLANTED.
21. THE CONTRACTOR SHALL REMOVE REQUIRED DEPTH OF SOIL ALONG WALKWAYS TO ACCOMMODATE SEED, TOPSOIL OR MULCH DEPTH.
22. SEE GEOTECHNICAL REPORT FOR RECOMMENDATIONS WITHIN 10' OF STRUCTURES. CONTACT OWNER'S REPRESENTATIVE IMMEDIATELY SHOULD A CONFLICT ARISE BETWEEN THESE PLANS AND THE GEOTECHNICAL REPORT.

PROPOSED PLANT LIST FROM GLENWOOD MEADOWS DESIGN GUIDELINES:

DECIDIOUS TREES

Botanic Name	Common Name
Acer campestre	Hedge Maple
Acer freemanii 'Autumn Blaze'	Autumn Blaze Maple
Acer tataricum subsp. *ginnala* 'Flame'	Flame Amur Maple
Amelanchier canadenis	Serviceberry
Catalpa speciosa	Catalpa
Celtis occidentalis	Hackberry
Crataegus ambigua	Russian Hawthorn
Crataegus crus-galli	Cockspur Hawthorn
Crataegus crus-galli var. *inermis*	Thornless Cockspur Hawthorn
Crataegus viridis 'Winter King'	Winter King Hawthorne
Gleditsia triacanthos f. inermis	Thornless Honeylocust 'Shademaster'
Gleditsia triacanthos f. inermis 'Imperial'	Honey Locust, Imperial
Gleditsia triacanthos f. inermis 'Skyline'	Honey Locust, Skyline
Gleditsia triacanthos f. inermis 'Sunburst'	Honey Locust, Sunburst
Prunus virginiana 'Shubert'	Canada Red Chokecherry
Pyrus calleryana 'Chanticleer'	Callery Pear
Quercus macrocarpa	Bur Oak
Robinia pseudoacacia 'Purple Robe'	Black Locust / Purple Robe Locust
Sorbus hybrida	Oakleaf Mountain Ash
Syringa reticulata	Japanese Tree Lilac
Tilia americana	American Linden
Tilia americana 'Redmond'	Redmond Linden
Tilia cordata 'Greenspire'	Littleleaf Linden
Ulmus Americana	American Elm

EVERGREEN TREES

Botanic Name	Common Name
Abies lasiocarpa	Subalpine or Rocky Mountain Fir
Juniperus scopulorum 'Wichita Blue'	Rocky Mountain Juniper
Picea engelmannii	Engelmann Spruce
Picea glauca 'Densata'	Black Hills Spruce
Picea pungens	Colorado Spruce
Picea pungens 'Glauca'	Colorado Blue Spruce
Pinus cembroides var. edulis	Pinyon Pine
Pinus flexilis	Limber Pine
Pinus nigra	Austrian Pine
Pinus ponderosa	Ponderosa Pine
Pinus strobiformis	Southwestern White Pine
Pinus sylvestris	Scotch Pine

SHRUBS

Botanic Name	Common Name
Arctostaphylos uva-ursi	Kinnikinnick
Artemisia cana	Silver Sagebrush
Artemisia filifolia	Sand Sagebrush
Berberis thunbergil 'Burgundy Carousel'	Burgundy Carousel Japanese Barberry
Caryopteris x clandonensis 'Blue Mist'	Blue Mist Spirea
Chrysothamnus nauseosus var. *nauseosus*	Dwarf Blue Rabbitbrush
Forestiera neomexicana	New Mexico Privet
Juniperus chinensis 'Armstrong'	Armstrong Juniper
Juniperus horizontalis 'Wiltonii'	Blue Rug Juniper
Juniperus sabina 'Buffalo'	Buffalo Juniper
Juniperus scopulorum 'Cologreen'	Cologreen Juniper
Juniperus scopulorum 'Moonglow'	Moonglow Juniper
Juniperus scopulorum 'Skyrocket'	Skyrocket Juniper
Junperus squamata 'Blue Star'	Blue Star Juniper
Ligustrum vulgare 'Cheyenne'	Cheyenne Privet
Perovskia atriplicifolia	Russian Sage
Philadelphus lewsii 'Blizzard'	Blizzard Mockorange
Physocarpus opulifolius 'Diabolo'	Diabolo Ninebark
Prunus virginiana melanocarpa	Rocky Mountain/Native Chokecherry
Quercus gambelii	Gambel Oak
Rhus aromatica 'Gro-Low'	Dwarf Fragrant Sumac
Rhus glabra	Smooth Sumac
Shepherdia argentea	Silver Buffaloberry
Speraea japonica 'Little Princess'	Little Princess Spirea
Syringa vulgaris 'Charles Joly'	Double Red French Lilac
Yucca glauca	Soapweed Yucca

PERENNIALS

Botanic Name	Common Name
Achillea millefolium 'Terra Cotta'	Terra Cotta Yarrow
Achillea 'Moonshine'	Moonshine Yarrow
Artemisia 'Powis Castle'	Powis Castle Sage
Campanula glomerata 'Superba'	Clustered Bellflower
Cerastium tomentosum	Snow in Summer
Dianthus graniticus	Granite Pinks
Echinacea purpurea	Purple Coneflower
Gazania linearis 'Colorado Gold'	Hardy Gazania
Iris x germanica cultivars	Bearded Iris
Lavandula angustifolia 'Munstead'	English Lavender
Penstemon digitalis 'Huskers Red'	Huskers Red Penstemon
Penstemon pinifolius	Pineleaf Penstemon
Penstemon strictus	Rocky Mt. Penstemon
Salvia superba	Perennial Salvia
Salvia n. 'May Night'	May Night Salvia
Salvia sylvestris 'Caradonna'	Caradonna Salvia
Sedum 'Autumn Joy'	Autumn Joy Sedum
Sedum 'Matrona'	Matrona Sedum

ORNAMENTAL GRASS

Calamagrostis acutiflora 'Karl Foerster'	Feather Reed Grass
Helictotrichon sempervirens	Blue Avena Grass
Miscanthus sinensis 'Yaku Jima'	Yaku Jima Maiden Grass
Pennisetum orientale 'Karly Rose'	Pink Oriental Fountian Grass
Pennisetum alopecuroides 'Hameln'	Dwarf Fountain Grass

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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
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2021.08.13

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SUBMITTAL #3: 2021.07.02
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REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PLANT LIST AND GENERAL NOTES

SCALE:

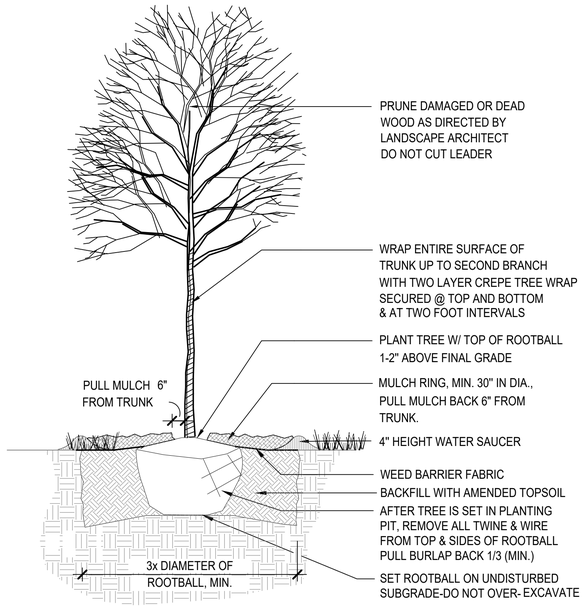
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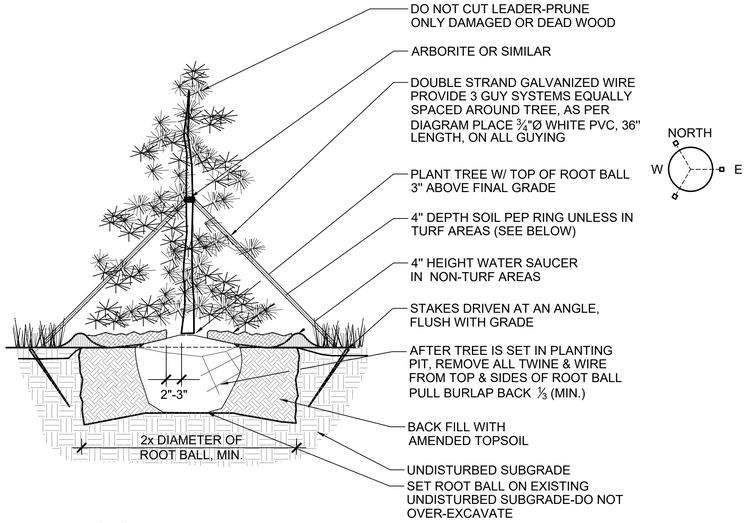
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NOTES:
1. MULCH TO BE 4" DEEP. MULCH TO BE SOIL PEP. CONTRACTOR TO PROVIDE SAMPLE FOR APPROVAL BY LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
2. ALL TREES 3" DIAMETER OR LARGER MAY BE STAKED FOR ONE YEAR IF PROPOSED BY LANDSCAPE CONTRACTOR AND APPROVED BY OWNER'S REPRESENTATIVE.

1 L2.1 DECIDUOUS TREE PLANTING

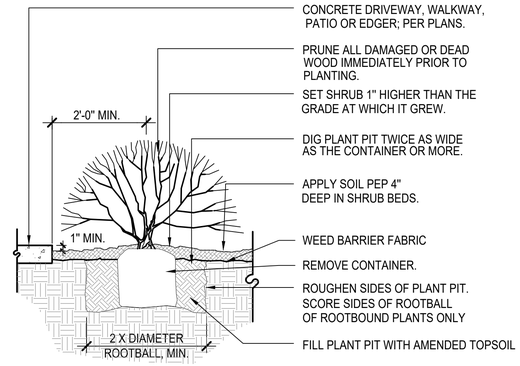
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NOTES:
1. PULL MULCH BACK 2" TO 3" FROM TRUNK OF TREE

2 L2.1 EVERGREEN TREE PLANTING

NOT TO SCALE

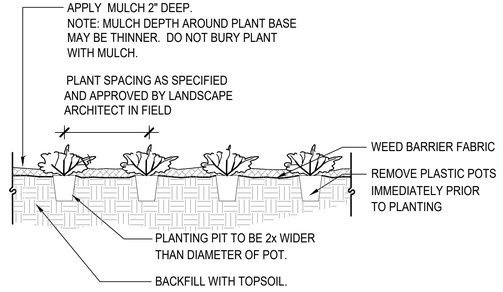


NOTES:

1. ANY BROKEN OR CRUMBLING ROOTBALL WILL BE REJECTED. REMOVING THE CONTAINERS WILL NOT BE AN EXCUSE FOR DAMAGED ROOTBALLS.
2. HOLD GRADE 1" BELOW EDGE OF WALK OR CURB
3. ALL MULCH TO BE SOIL PEP. CONTRACTOR TO PROVIDE SAMPLE FOR APPROVAL BY LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.

3 L2.1 SHRUB PLANTING

NOT TO SCALE

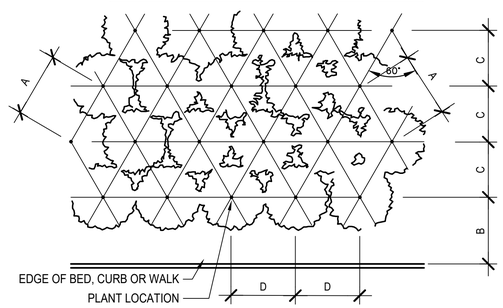


NOTE: MULCH TO BE SOIL PEP. CONTRACTOR TO PROVIDE SAMPLE FOR APPROVAL BY LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLATION.

4 L2.1 ORNAMENTAL GRASS AND PERENNIAL

NOT TO SCALE

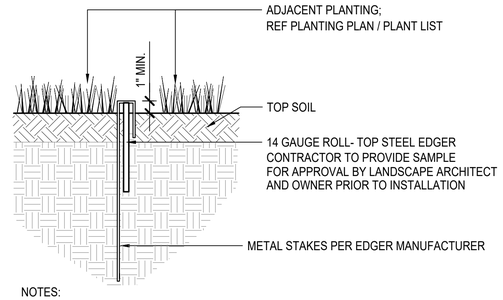
PLANT SPACING	A	B	C	D
6"	6"	6"	5"	6"
8"	8"	6"	7"	8"
12"	12"	8"	10"	12"
18"	18"	9"	15½"	18"
24"	24"	18"	21"	24"
30"	30"	15"	26"	30"
36"	36"	30"	31"	36"
48"	48"	30"	42"	48"
60"	60"	36"	52"	60"



NOTE:
ALIGN FRONT ROW PARALLEL TO BED LINE

5 L2.1 SHRUB/ ORNAMENTAL GRASS / GROUNDCOVER PLANTING LAYOUT - TRIANGULAR SPACED

NOT TO SCALE



NOTES:

1. SET ALL EDGING 1" ABOVE FINISH GRADE AS SHOWN.
2. EDGING SHALL ABUT ALL CONCRETE CURBS AND WALKS PERPENDICULAR OR AS SHOWN ON PLANS, AND FLUSH W/ GRADES OF CONCRETE.
3. ALL JOINTS TO BE SECURELY STAKED.
4. EDGING TO BE PARALLEL WITH GRADE.
5. INSTALL EDGER PER MANUFACTURERS SPECIFICATIONS USING SPLICES AND CORNERS AS DIRECTED.

6 L2.1 LANDSCAPE EDGER

NOT TO SCALE

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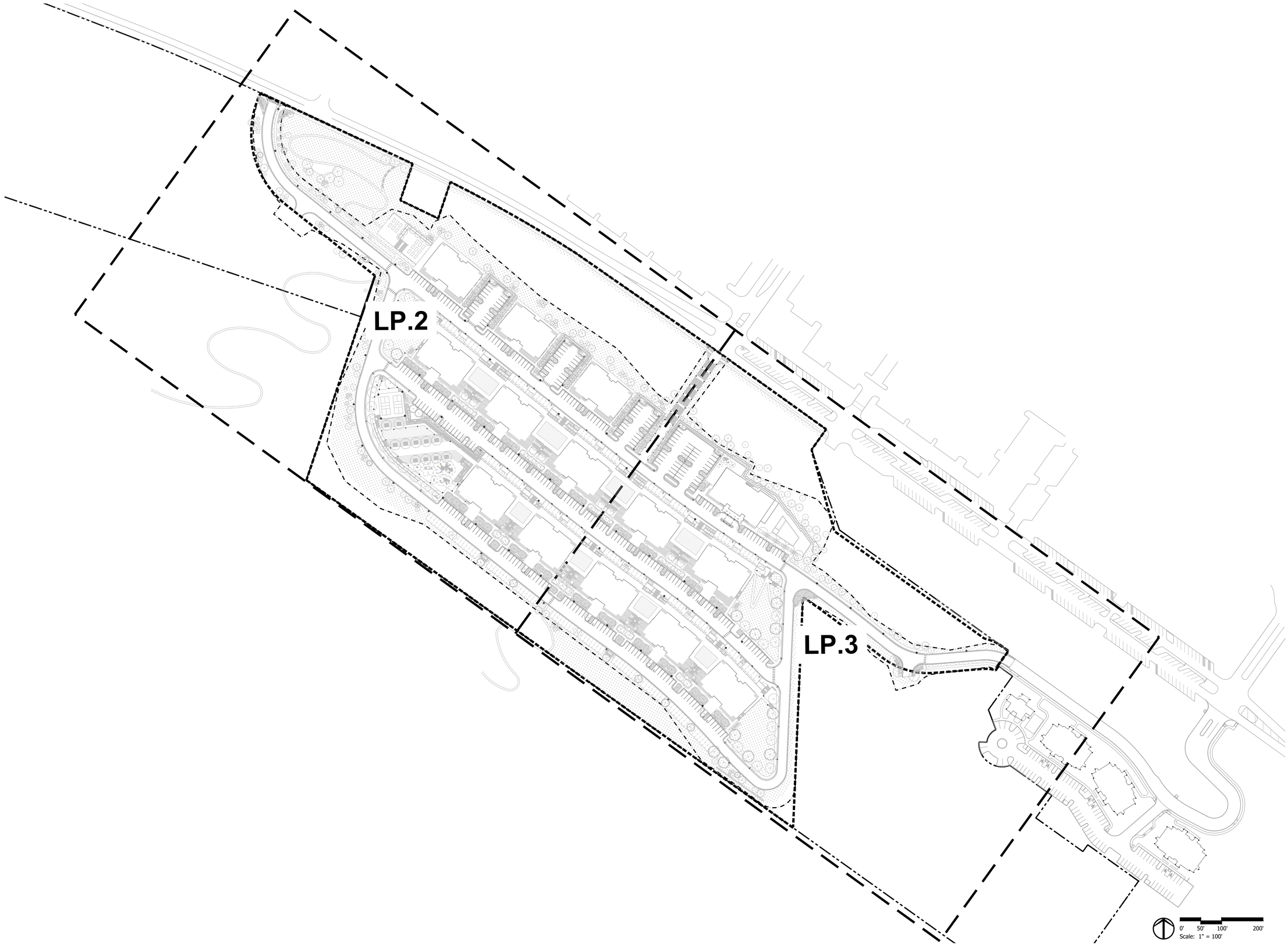
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L2.1

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

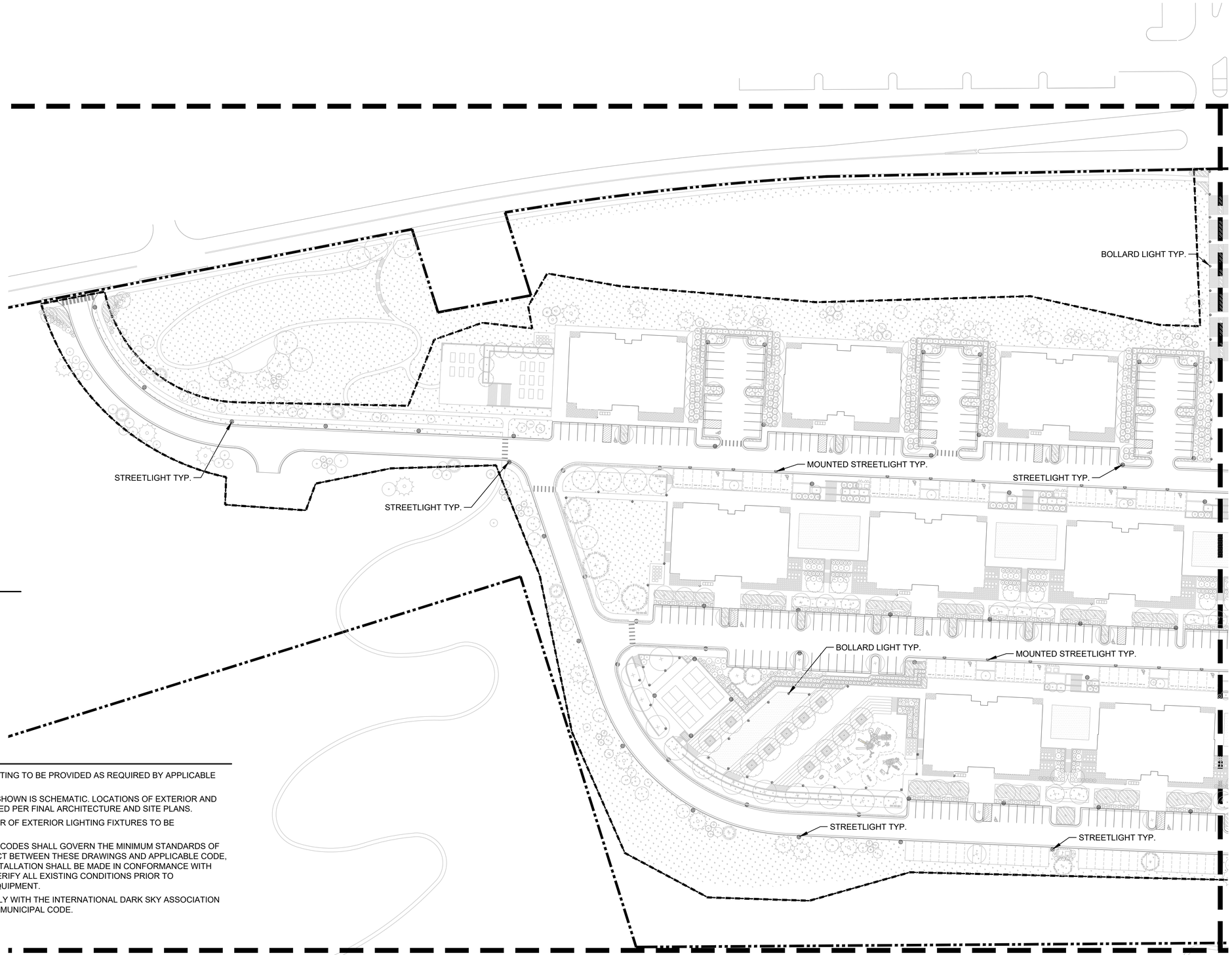
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MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE LIGHTING ENLARGEMENT KEY PLAN

SCALE:

SHEET NUMBER:
LP.1

SHEET_____OF_____



LEGEND:

- PROPERTY LINE
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT

SITE LIGHTING NOTES:

1. SITE AND EXTERIOR BUILDING LIGHTING TO BE PROVIDED AS REQUIRED BY APPLICABLE BUILDING CODES.
2. LOCATION OF LIGHT FIXTURES AS SHOWN IS SCHEMATIC. LOCATIONS OF EXTERIOR AND SITE LIGHT FIXTURES TO BE VERIFIED PER FINAL ARCHITECTURE AND SITE PLANS.
3. FINAL TYPE, LOCATION AND NUMBER OF EXTERIOR LIGHTING FIXTURES TO BE DETERMINED.
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5. ALL EXTERIOR FIXTURES TO COMPLY WITH THE INTERNATIONAL DARK SKY ASSOCIATION AND CITY OF GLENWOOD SPRINGS MUNICIPAL CODE.

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE 2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

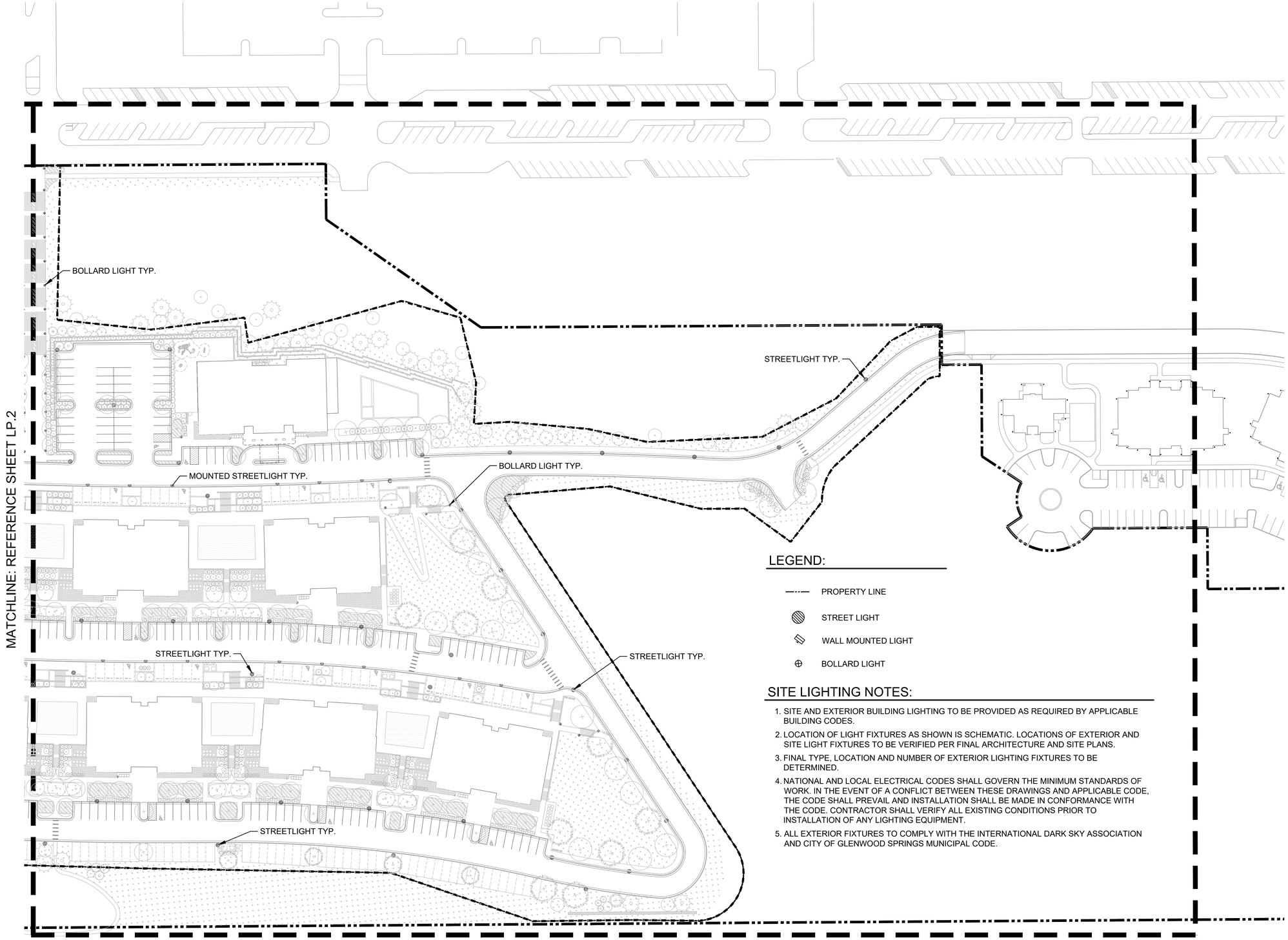
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DATE
Aug 04, 2021 - 10:11am



LEGEND:

- PROPERTY LINE
- STREET LIGHT
- WALL MOUNTED LIGHT
- BOLLARD LIGHT

SITE LIGHTING NOTES:

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5. ALL EXTERIOR FIXTURES TO COMPLY WITH THE INTERNATIONAL DARK SKY ASSOCIATION AND CITY OF GLENWOOD SPRINGS MUNICIPAL CODE.

0' 25' 50' 100'
Scale: 1" = 50'

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE 2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
SITE LIGHTING ENLARGEMENT

SCALE:

SHEET NUMBER:
LP.3

SHEET_____OF_____

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DOG YARD





Dog yards, as labeled on revised sheet set, to be located within the open space areas throughout the property. Dog waste stations will be located near open space areas and at each local access trailhead.

COMMUNITY AREA



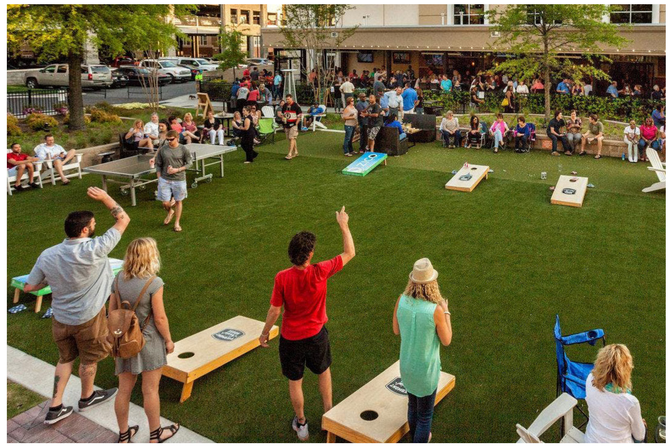




Community amenity spaces to be located between apartment buildings. ADA access shall be provided to all community/amenity spaces. Further design studies will continue to develop and finalize amenity features and materials.

AMENITIES







Potential site amenities options offered throughout the site. Currently, two pickleball courts are designed as a part of Park 2. Additionally, bench seating is located near each amenity space.

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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

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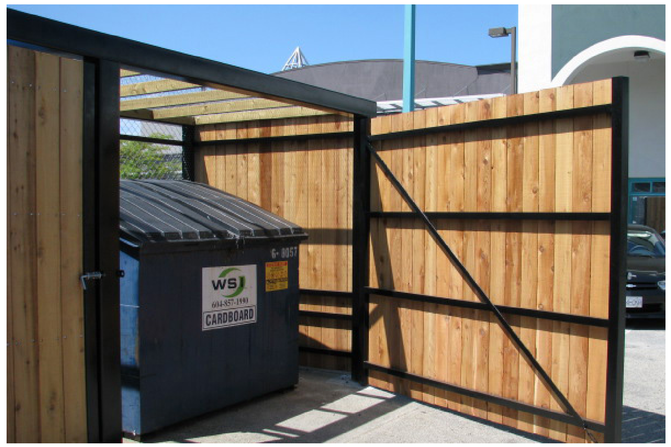
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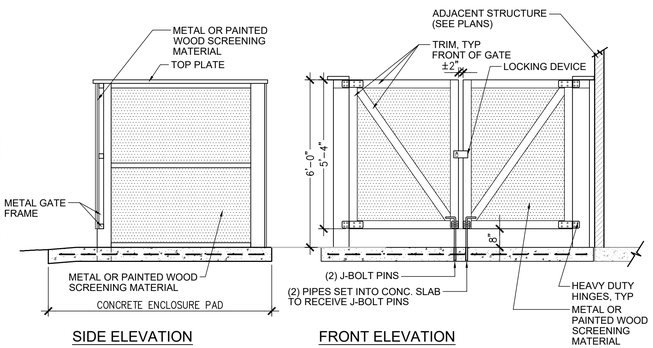
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DUMPSTER ENCLOSURE/UTILITY SCREEN

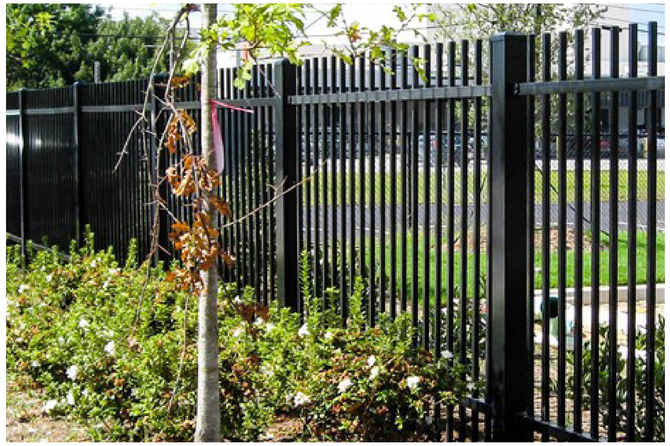






Character images and conceptual detail of proposed dumper enclosures and utility screening. Enclosures are designed to be integrated within retaining wall layouts. The dumpster enclosure screening shall be visually compatible with building materials and have planted material terraced along the hillside to soften the enclosure appearance. Dumpster enclosures will comply with the code and bear proofing requirements.

FENCE







Design recommendation for internal fencing design. Consistent style of fencing to be implemented throughout the overall site design for material cohesiveness. Fencing material shall be compatible with the overall site design and landscaping. Durable black aluminum fencing, similar to that used by DHM at Glenwood Hot Springs (as seen in the bottom image) is a recommended style.

RETAINING WALLS







Retaining walls shall be compatible with the overall site design and designed to conform to the existing natural terrain. Retaining wall heights limited to 6' max. with 3' min. planting zone between terraced walls. Anticipated materials and wall types are gravity block, precast block/MSE, or concrete. Final layout and materials to be determined after review of final geotechnical report.

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LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
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SUBMITTAL #4: 2021.08.13
REVISIONS:

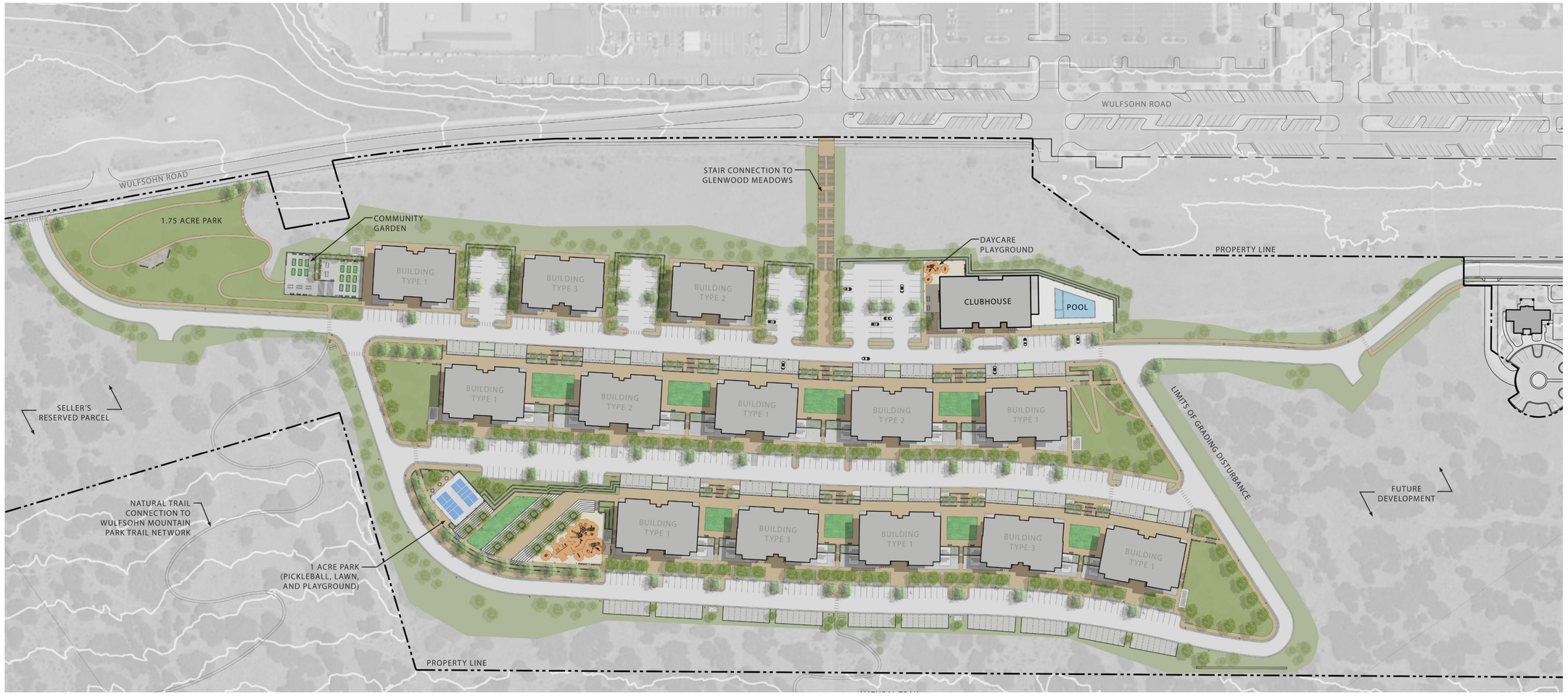
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MAJOR SITE / ARCHITECTURE REVIEW

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GLENWOOD SPRINGS, COLORADO

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SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
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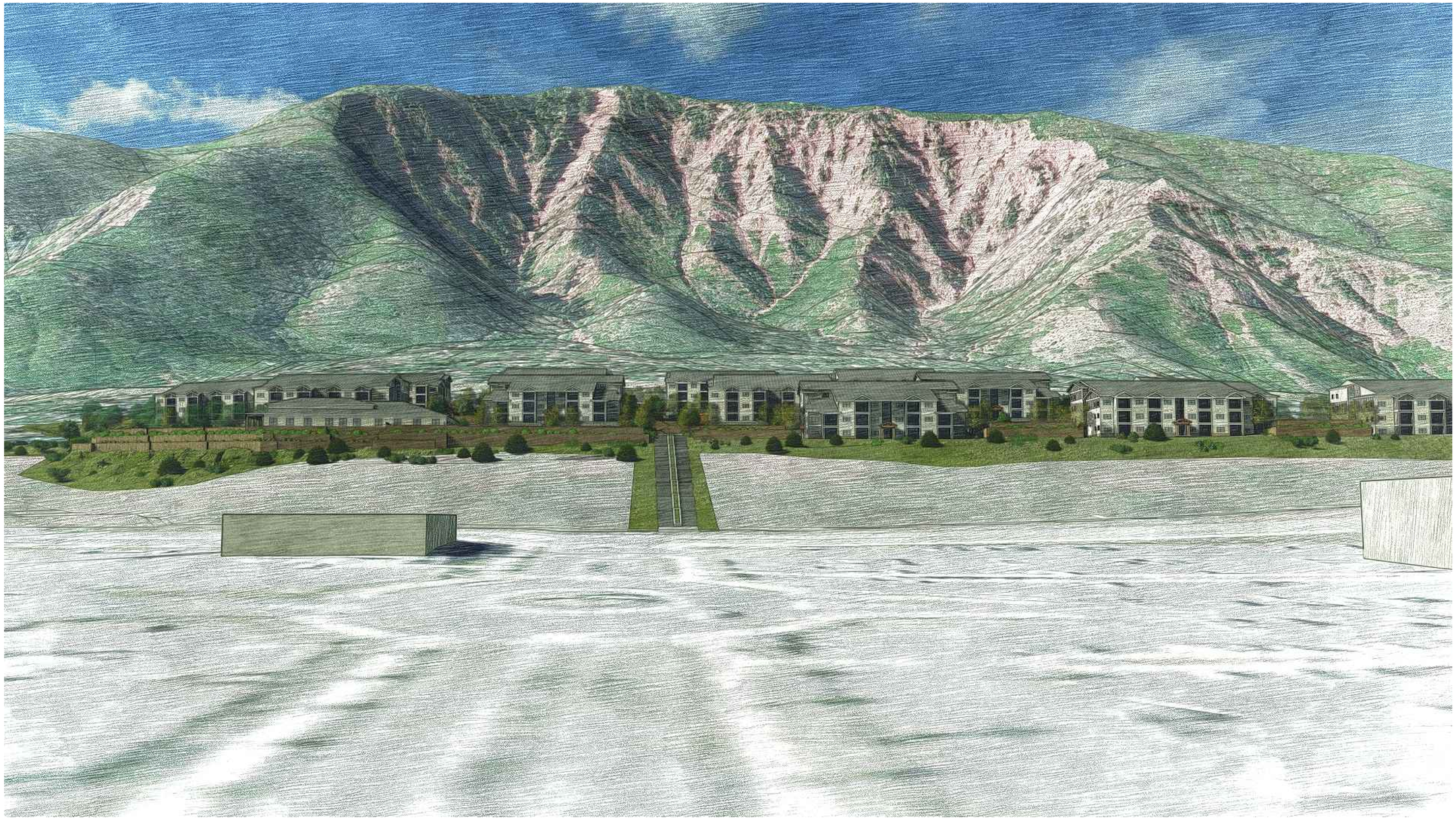
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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 2

SHEET_____OF_____



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Layout EXBT 3 - Aug 4, 2021 - 4:57pm

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 3

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Plotted: Aug 13, 2021 - 4:18pm

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 4

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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 5

SHEET_____OF_____



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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE
2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 6

SHEET_____OF_____



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GLENWOOD MEADOWS MULTI FAMILY HOUSING

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER:
DATE: 2021.08.13

REVISIONS:
SUBMITTAL #3: 2021.07.02
SUBMITTAL #4: 2021.08.13
REVISIONS:

JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

SCALE:

SHEET NUMBER:
EXBT 7

SHEET_____OF_____

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SCALE:

SHEET NUMBER:
EXBT 8

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JOB DESCRIPTION:
MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

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EXBT 10

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REVISIONS:

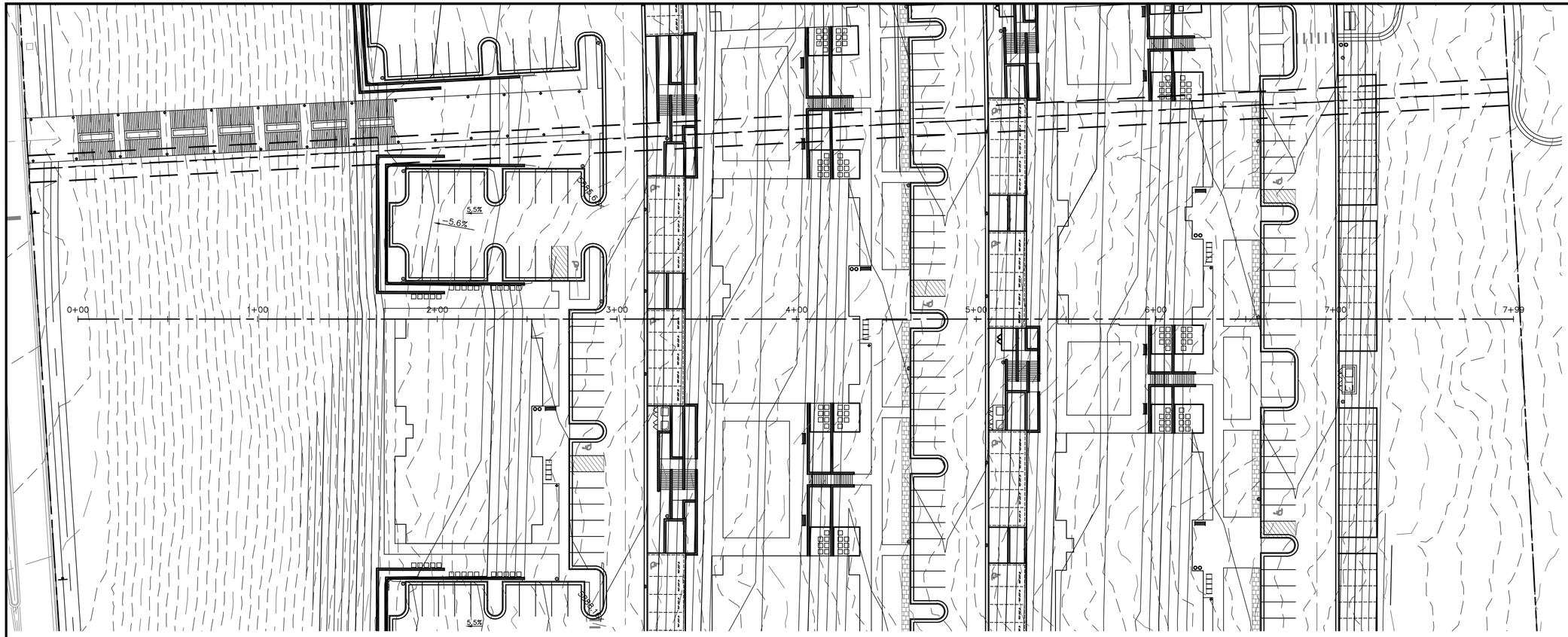
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MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE:
PERSPECTIVE ILLUSTRATION

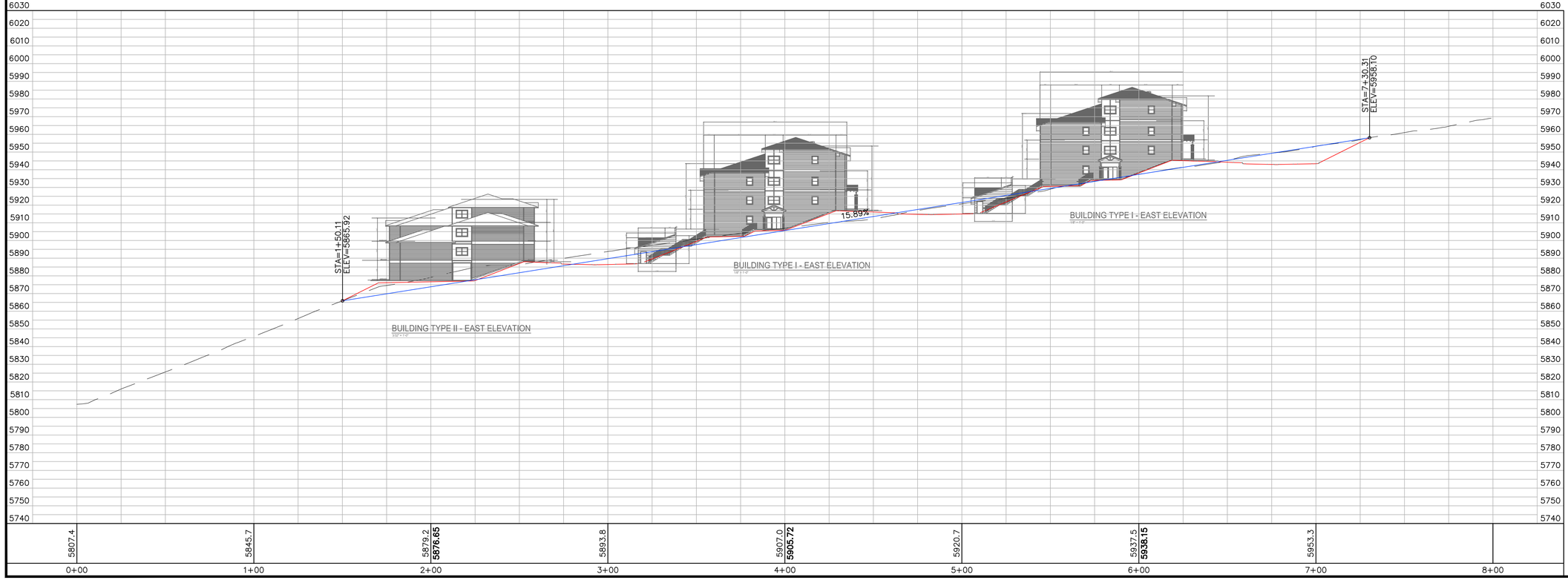
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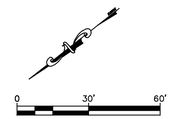
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SHEET_____OF_____



SECTION PROFILE





PRELIMINARY
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NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

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CHECKED BY: MGG
DATE:
FILE:

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GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 · FAX (970) 945-2555
WWW.HCENG.COM

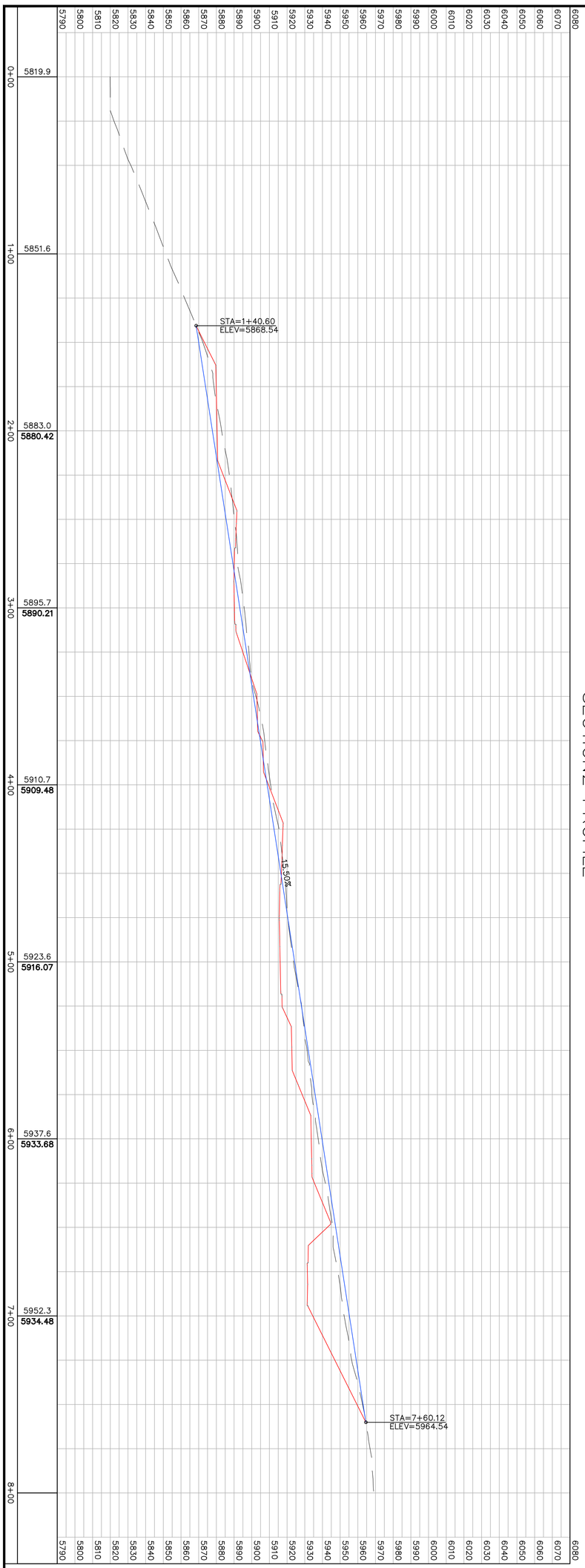
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GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

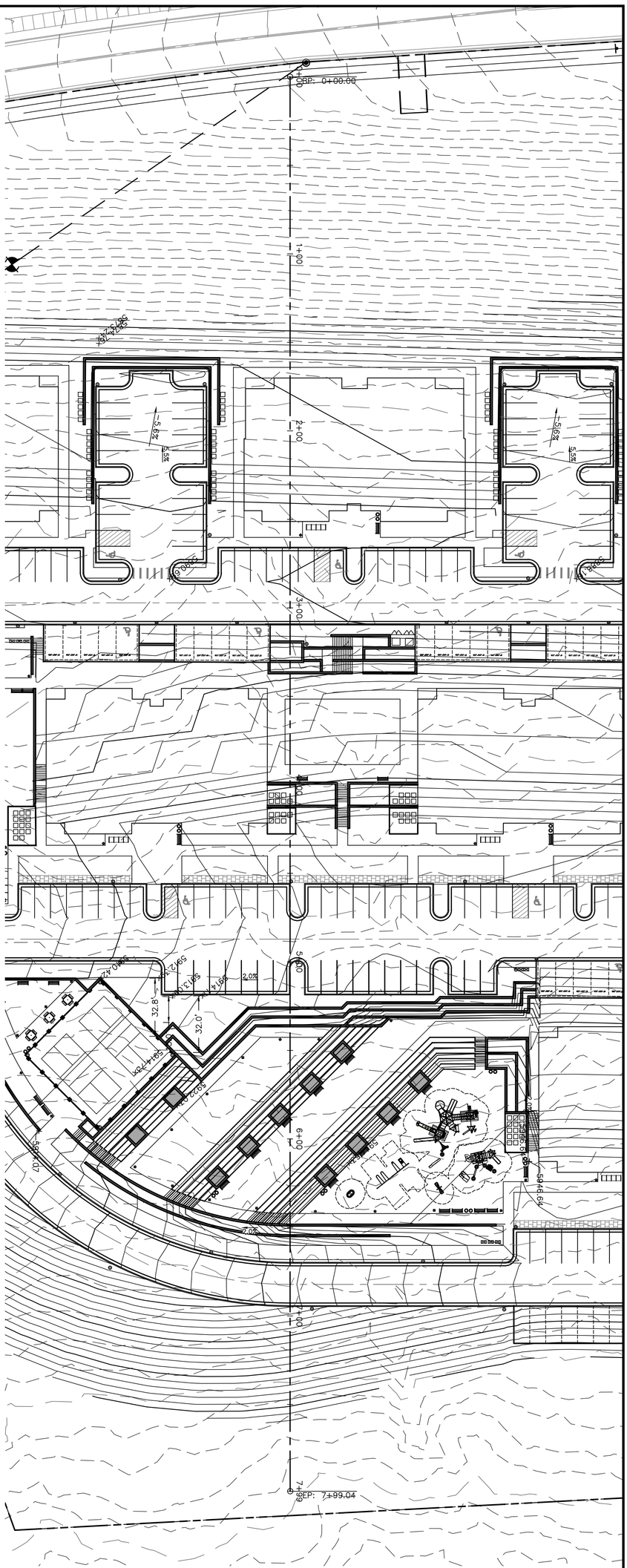
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EXHIBIT

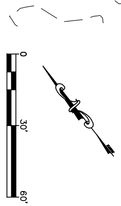
PROJECT NO.
2201044.00

EXBT 12,1



SECTION2 PROFILE





Packet Page 338

EXBT 12.2

PROJECT NO.
2201044.00

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GLENWOOD MEADOWS MULTI-FAMILY

SITE SECTIONS
EXHIBIT

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3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

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Locate Request Center

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SECTION3 PROFILE

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NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

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CHECKED BY: MGG
DATE:
FILE:

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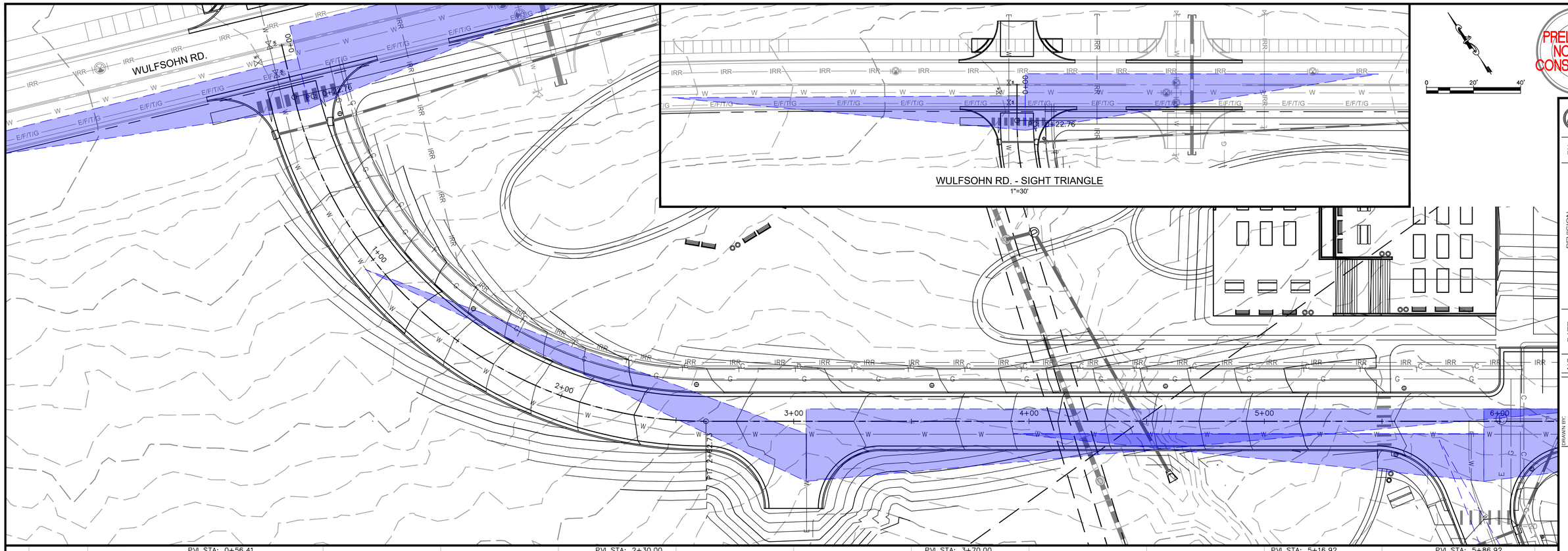
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GLENWOOD SPRINGS, CO

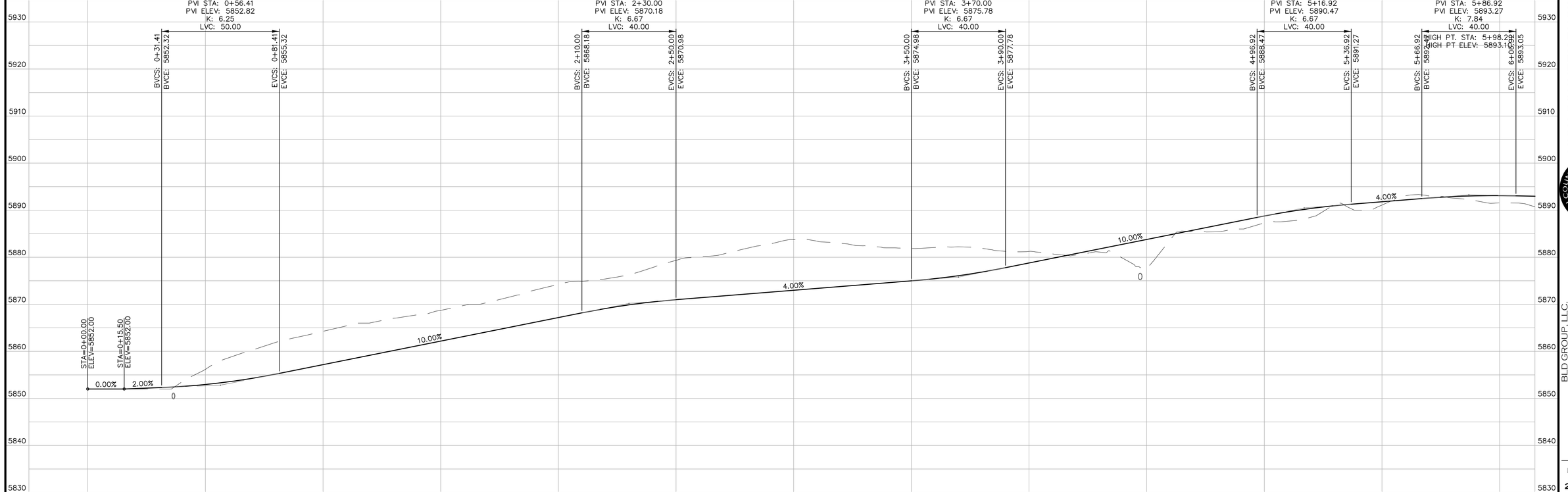
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EXHIBIT

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EXBT 12.3





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3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

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SCALE 1" = 20'

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GLENWOOD MEADOWS MULTI-FAMILY

WEST ENTRY PLAN & PROFILE
EXHIBIT

PROJECT NO.
2201044.00

EXBT 13

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

FOR PRELIMINARY REVIEW

TW: 5865.00
BW: 5859.00
TW: 5872.00
BW: 5866.00
TW: 5879.00
BW: 5873.00

5866 5864 5862 5860 5858 5856 5854 5852 5850 5848 5846 5844 5842 5840 5838 5836 5834 5832 5830 5828 5826 5824 5822 5820 5818

COLORADO 811
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Center of Colorado

NO.	DATE	REVISION	BY

DRAWN BY: HCE
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DATE: MO/DA/YEAR
FILE: FILE

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GLENWOOD MEADOWS MULTI-FAMILY

POOL WALL GRADING EXHIBIT

PROJECT NO.
2201044.00
TASK

EXHBT 14

GLENWOOD SPRINGS

COLORADO

DESCRIPTION OF DRAWINGS

A 01	Index		**UNIT TYPES**
	BUILDING TYPE I	A 28	Apartment Floor Plans
A 1	Bldg Type-I - Garage Level	A 29	Apartment Floor Plans
A 2	Bldg Type-I - Lower Level	A 30	Garage Elevation for Building Type I, II & III
A 3	Bldg Type-I - First Floor		**CLUBHOUSE**
A 4	Bldg Type-I - Second Floor	A 31	Clubhouse & Daycare Center Floor plan
A 5	Bldg Type-I - Third Floor	A 32	Clubhouse & Daycare Center Roof plan
A 6	Bldg Type-I - Roof	A 33	Clubhouse & Daycare Center North & South Elevation
A 7	Bldg Type-I - North & South Elevation	A 34	Clubhouse & Daycare Center West & East Elevation
A 8	Bldg Type-I - West & East Elevation		
A 9	Bldg Type-I - Section		
	BUILDING TYPE II		
A 10	Bldg Type-II - Garage Level		
A 11	Bldg Type-II - Lower Level		
A 12	Bldg Type-II - First Floor		
A 13	Bldg Type-II - Second Floor		
A 14	Bldg Type-II - Third Floor		
A 15	Bldg Type-II - Roof		
A 16	Bldg Type-II - North & South Elevation		
A 17	Bldg Type-II - West & East Elevation		
A 18	Bldg Type-II - Section		
	BUILDING TYPE III		
A 19	Bldg Type-III - Garage Level		
A 20	Bldg Type-III - Lower Level		
A 21	Bldg Type-III - First Floor		
A 22	Bldg Type-III - Second Floor		
A 23	Bldg Type-III - Third Floor		
A 24	Bldg Type-III - Roof		
A 25	Bldg Type-III - North & South Elevation		
A 26	Bldg Type-III - West & East Elevation		
A 27	Bldg Type-III - Section		

RICHARD COBA
Architect
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(305) 596-1244 F

RICHARD COBA
Architect
AR No. 10,173

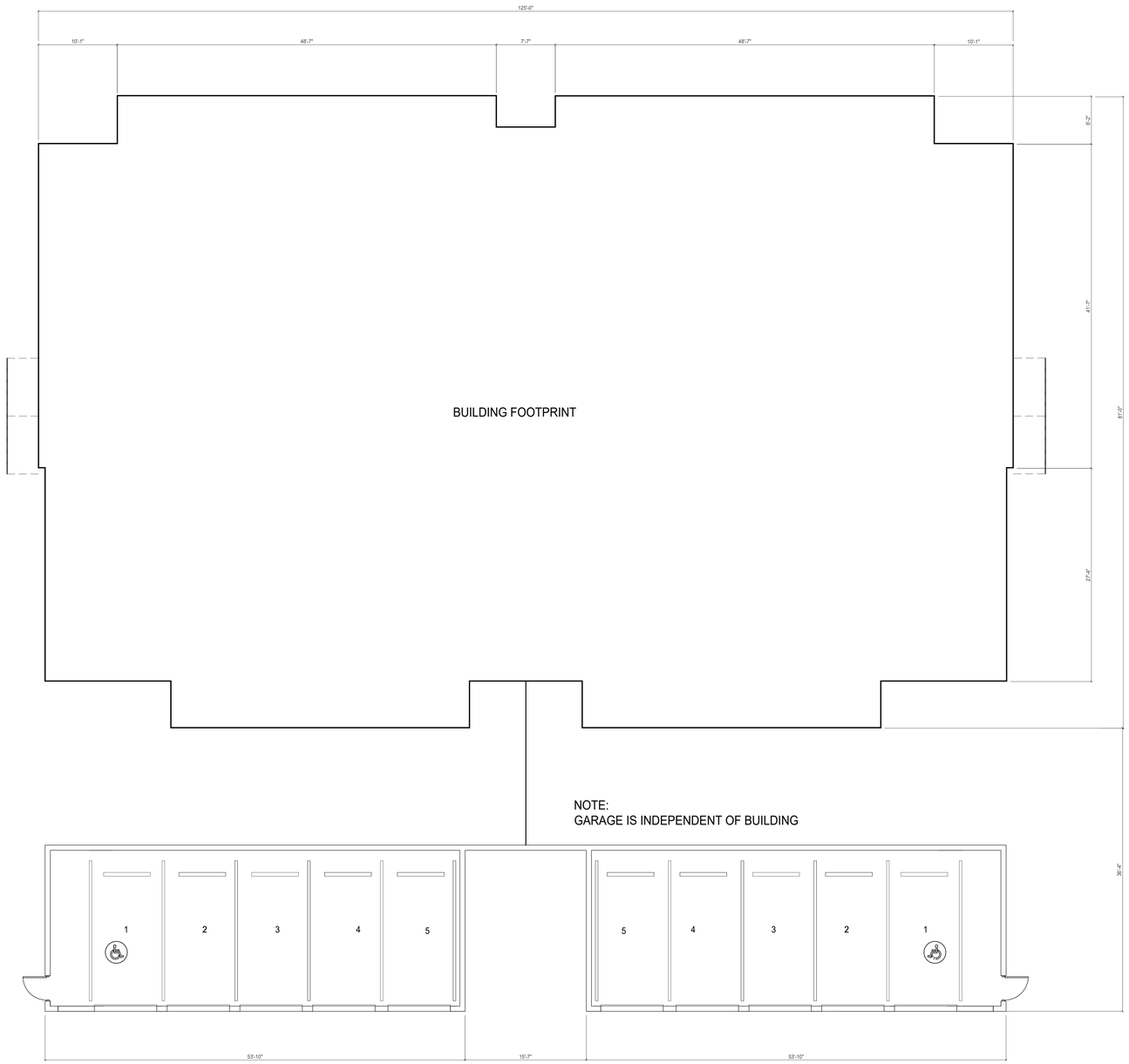
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1500 Cordova Road - Suite 300
Ft Lauderdale, FL 33316

PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
1	06/29/2021	
2	07/26/2021	
BY:	RC	
DATE:	12/26/2020	
SCALE:	NTS	

INDEX

A–01



BUILDING TYPE I - GARAGE LEVEL

1/8" = 1'-0"

BUILDING TYPE I				
LEVEL	GROSS AREA	OPEN FLOOR CORRIORS	CORRIDOR, ELEVATOR AND STORAGE	NET AREA
GARAGE (10 CARS)	2,630	0	0	2630
LOWER LEVEL	5,855	0	1824	4031
1ST LEVEL	9,623	0	1653	7970
2ND LEVEL	9,623	243	1648	7732
3RD LEVEL	5,675	243	1732	3700
TOTAL BUILDING	33,406			23,433
NO. OF BUILDINGS	7			7
TOTAL FOR BUILDING TYPE I	233,842			164,031

PHASE I - 300 APARTMENTS TOTAL					
BUILDING TYPE	I	II	III	TOTAL BUILDINGS	
NO. OF BUILDINGS	7	3	3	13	
Unit Types					%
3 BEDROOM	42	-	-	42	14.00%
2 BEDROOM - UNIT C1	0	36	36	72	24.00%
2 BEDROOM - UNIT C2	42	-	-	42	14.00%
1 BEDROOM - UNIT B1	0	24	36	60	20.00%
1 BEDROOM - UNIT B2	42	-	-	42	14.00%
STUDIO	42	-	-	42	14.00%
TOTAL UNITS	168	60	72	300	100.00%

PHASE I - 300 APARTMENTS TOTAL					
APARTMENT TYPE	NUMBER OF APARTMENTS	APARTMENT AREAS (SF)			TOTAL AREA (SF)
		INTERIOR	BALCONY	INTERIOR & BALCONY	
3 BEDROOM	42	1,269	80	1,349	56,658
2 BEDROOM - UNIT C1	72	1,126	80	1,206	86,832
2 BEDROOM - UNIT C2	42	1,109	80	1,189	49,938
1 BEDROOM - UNIT B1	60	704	80	784	47,040
1 BEDROOM - UNIT B2	42	711	71	782	32,844
STUDIO	42	593	80	673	28,266
					301,578

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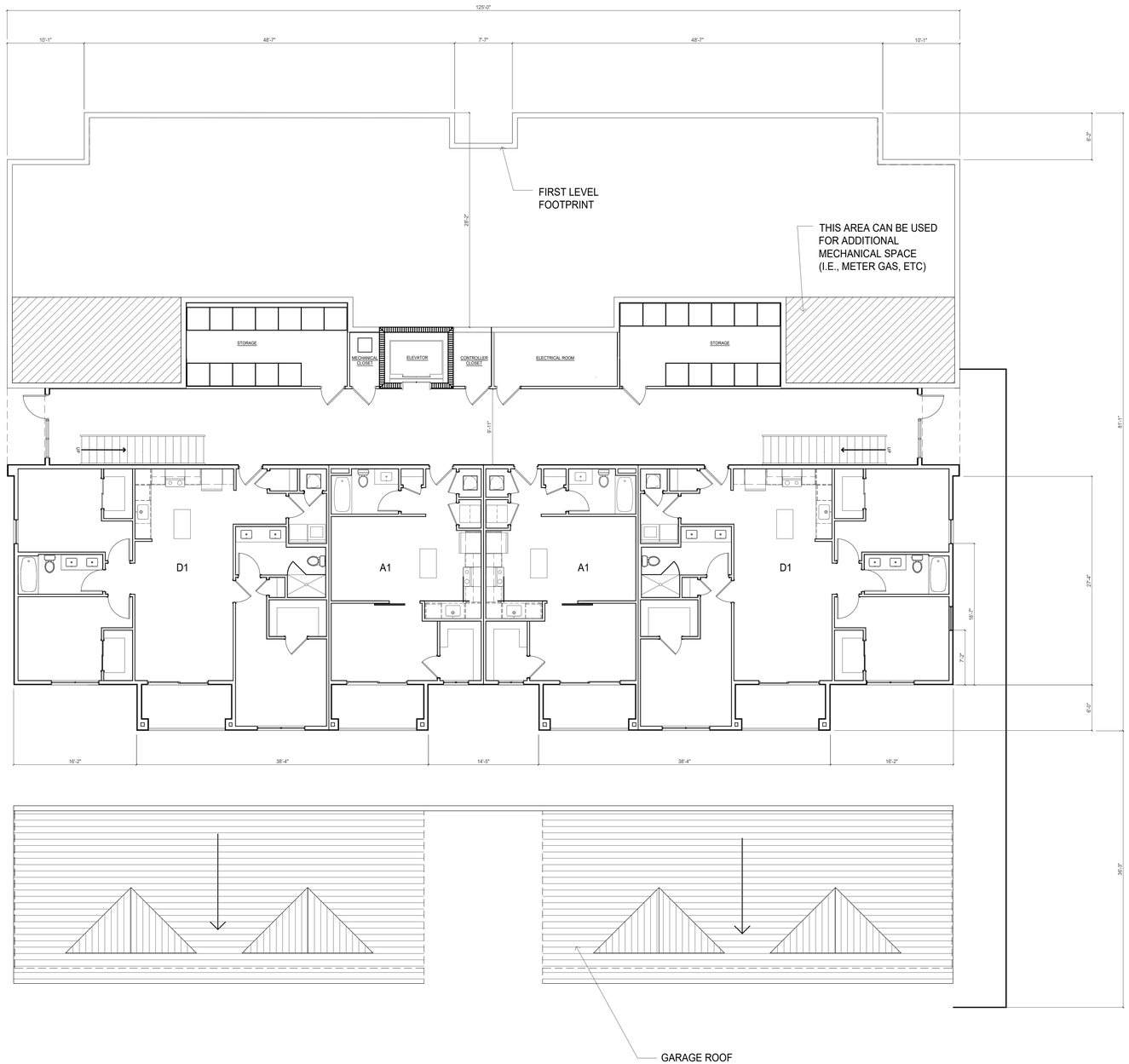
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	COMMENT
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-1



BUILDING TYPE I - LOWER LEVEL

1/8" = 1'-0"

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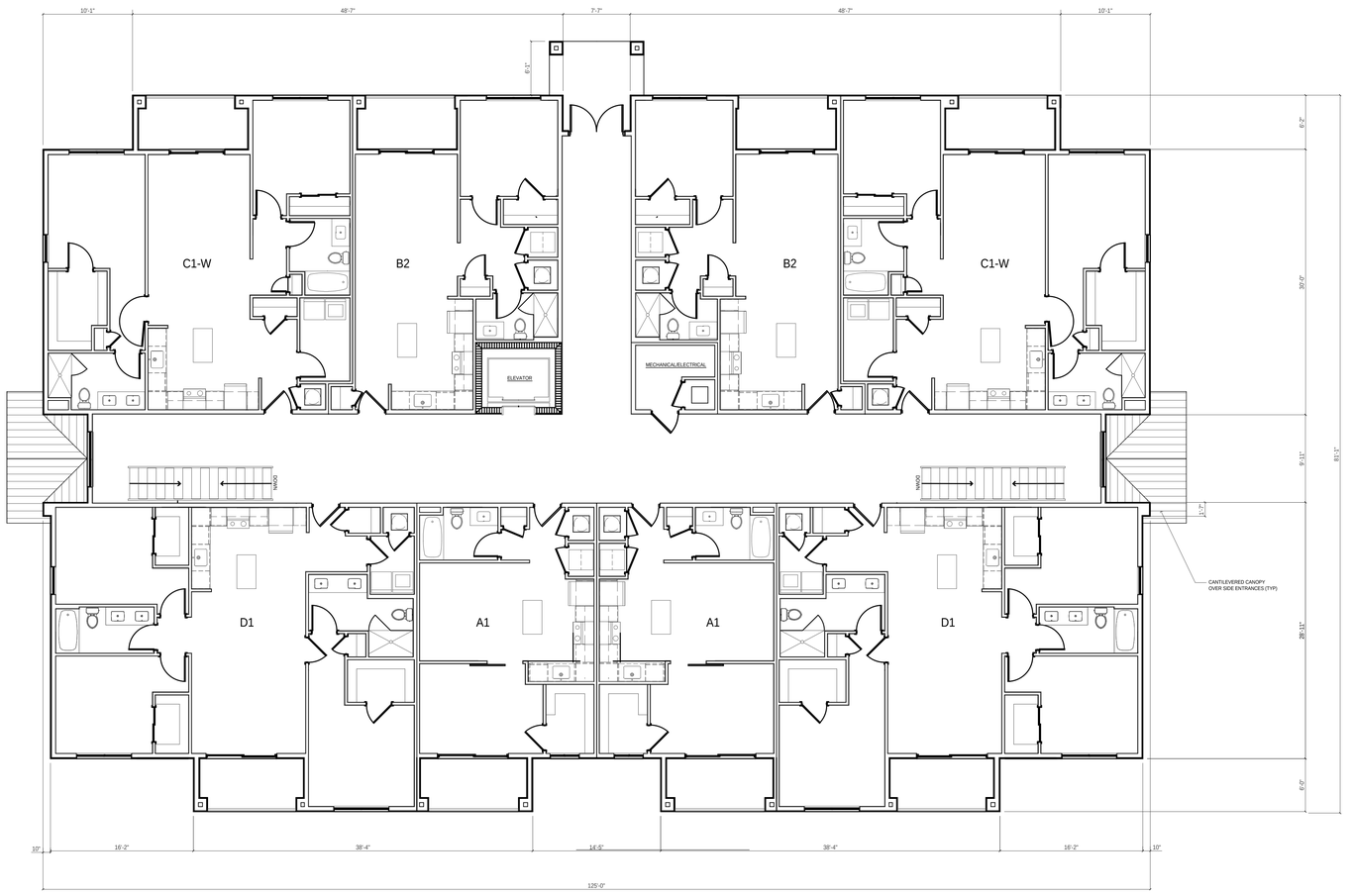
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-2



BUILDING TYPE I - FIRST FLOOR

1/8" = 1'-0"

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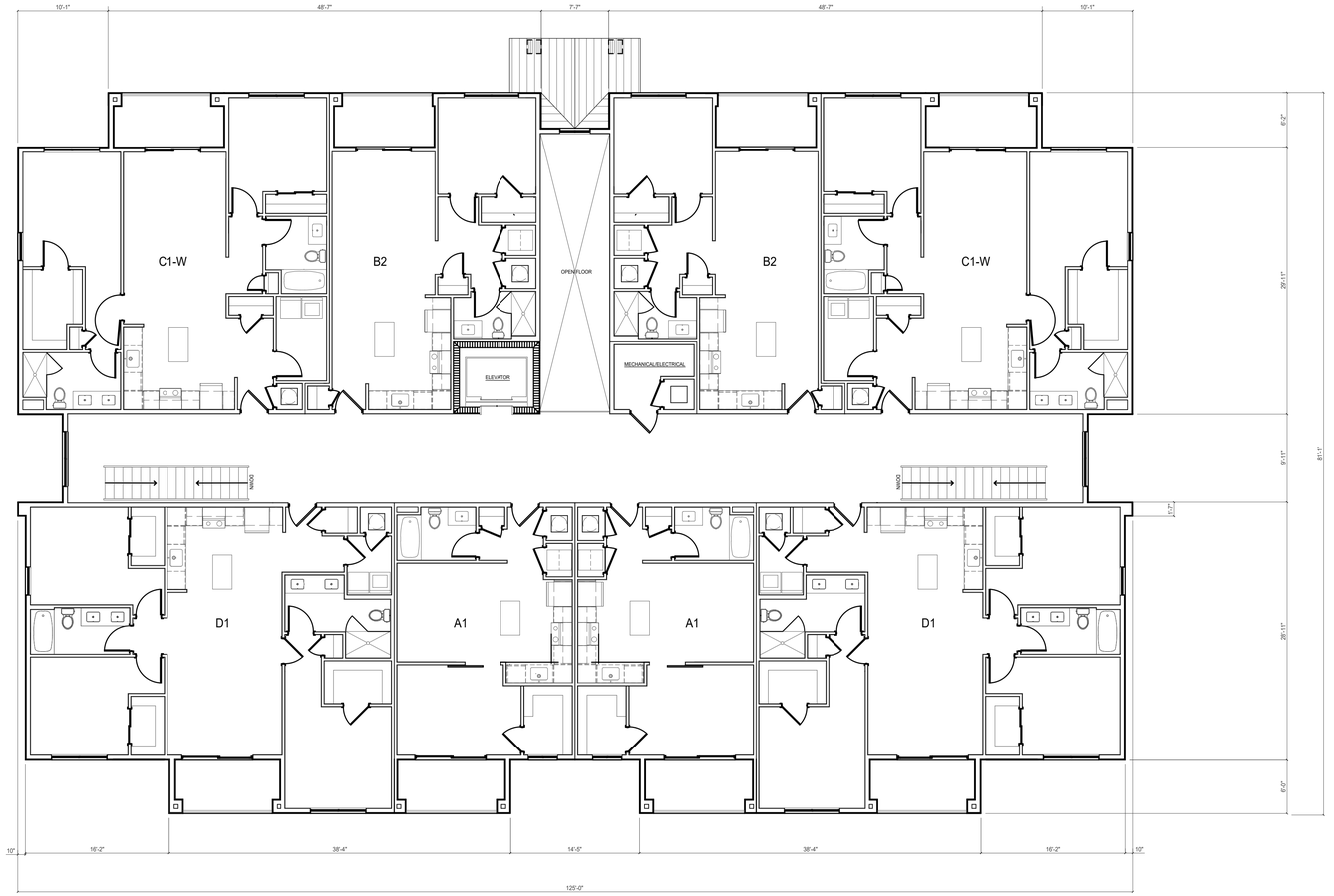
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-3



BUILDING TYPE I - SECOND FLOOR

1/8" = 1'-0"

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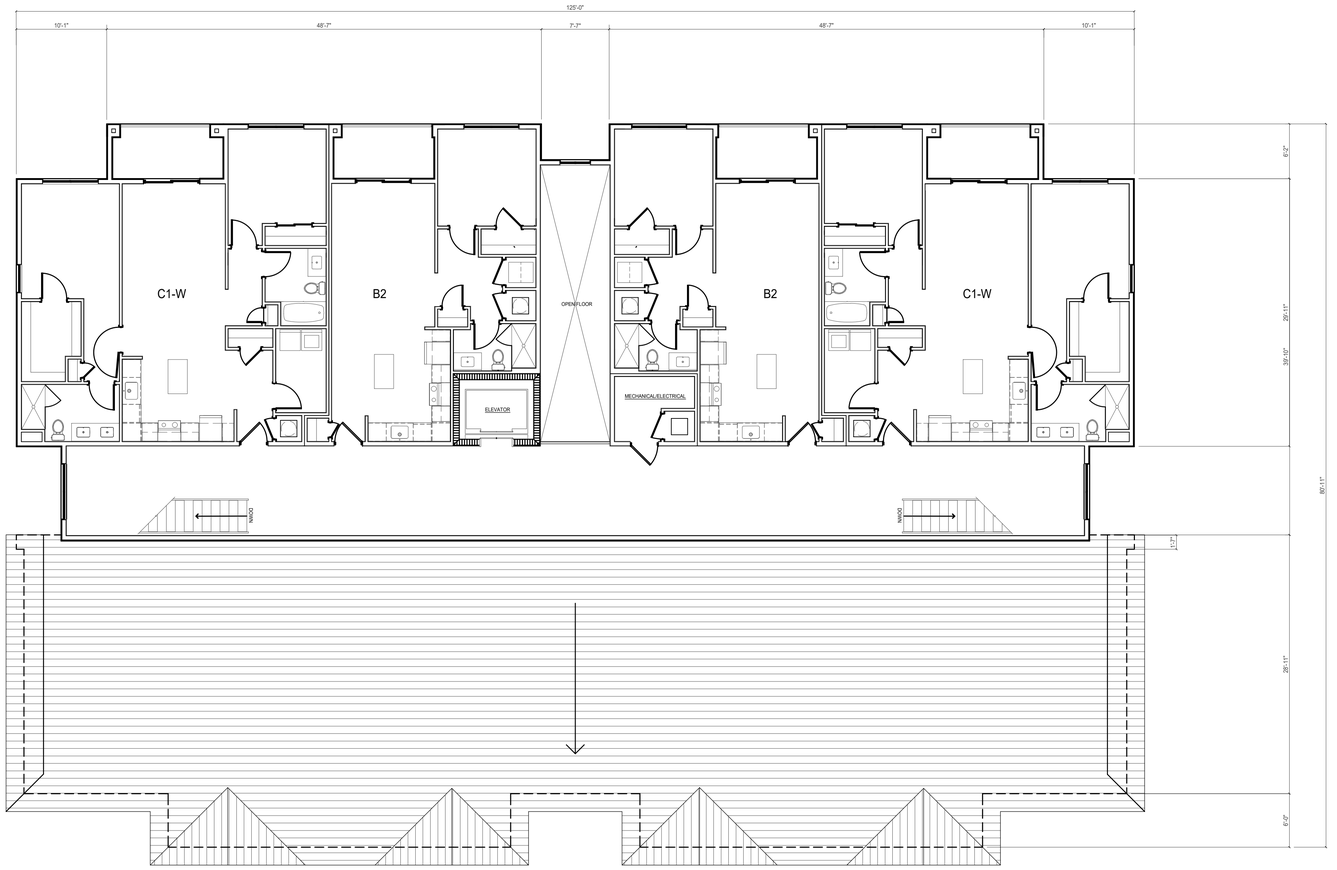
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-4



BUILDING TYPE I - THIRD FLOOR

1/8" = 1'-0"

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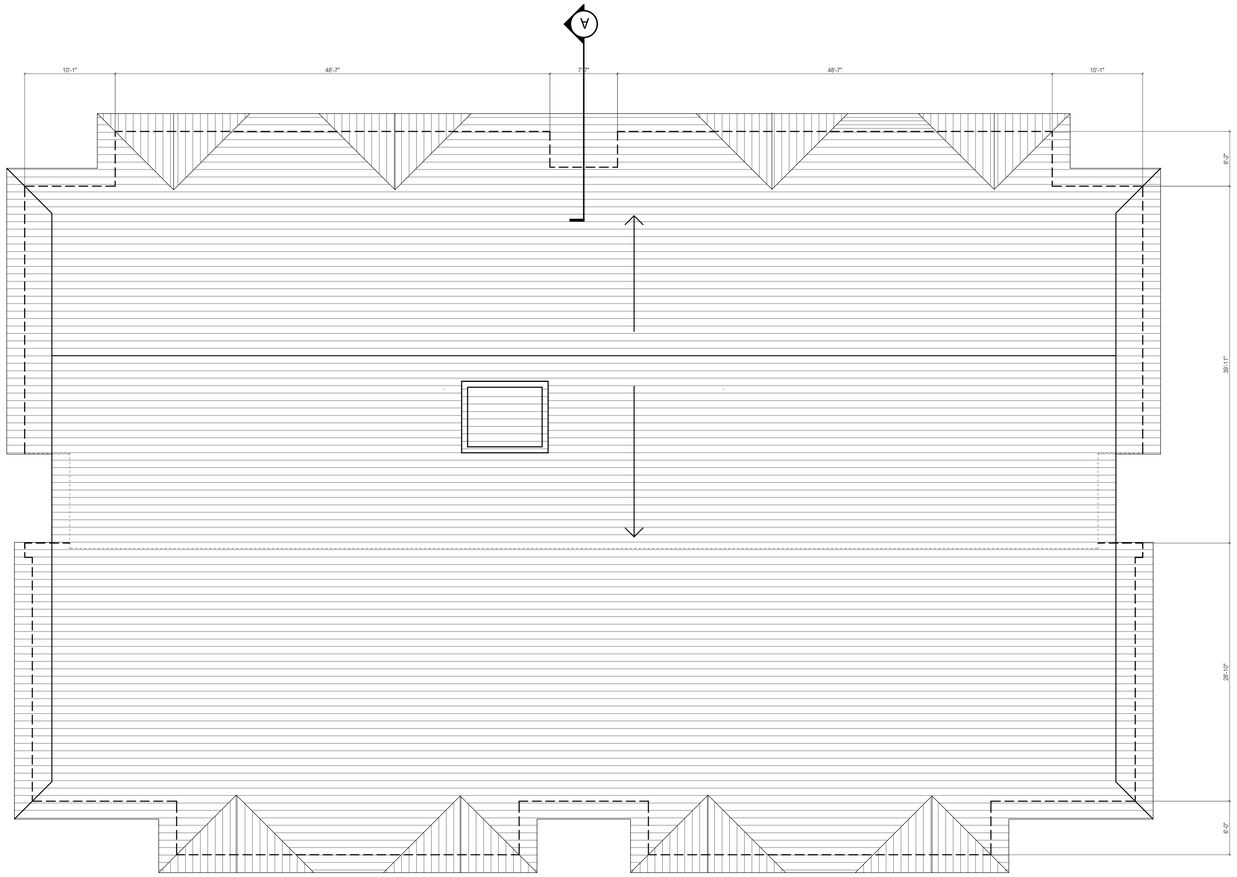
PROJECT:
GLENWOOD SPRINGS
COLORADO

BY	DATE	COMMENT
RC	12/26/2020	
2	07/26/2021	

DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-5



BUILDING TYPE I - ROOF

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	Comment	DATE
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

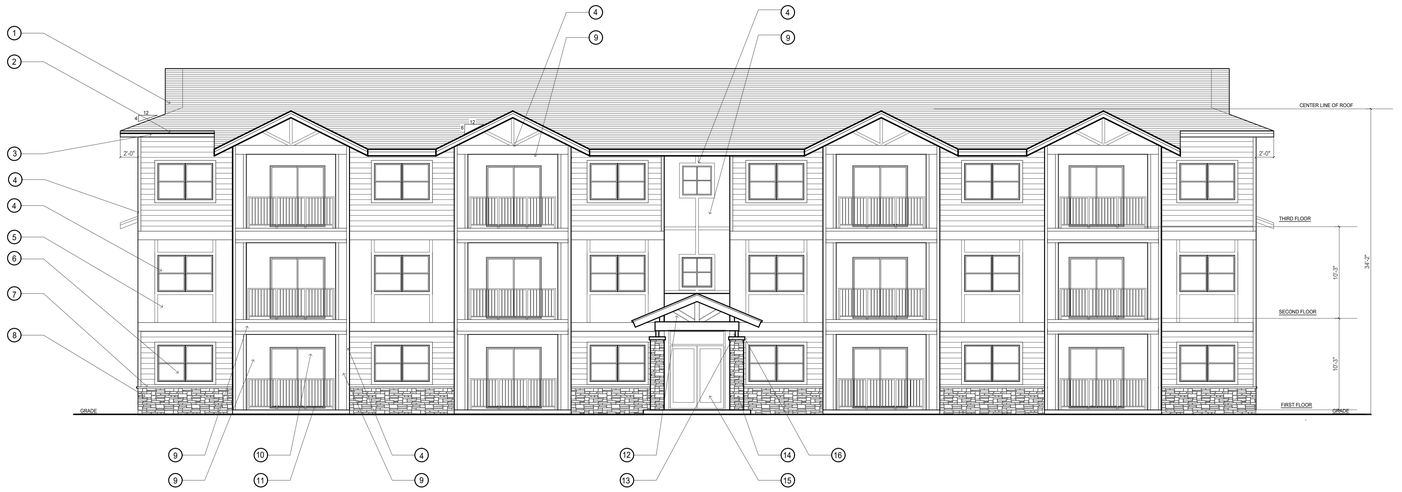
BUILDING TYPE I

A-6



BUILDING TYPE I - NORTH ELEVATION

1/8" = 1'-0"



BUILDING TYPE I - SOUTH ELEVATION

1/8" = 1'-0"

EXTERIOR FINISH SCHEDULE - BUILDING TYPE III			
LABEL	ITEM	PRODUCT	COLOR
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 4" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	NAVAJO BEIGE
6	WINDOW	ALUMINUM - SINGLE HUNG	BRONZE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	MONTEREY TAUPE
10	BALCONY DOOR	ALUMINUM SLIDING GLASS DOOR	WHITE
11	RAILING - BALCONY	ALUMINUM PICKET RAILING	WHITE
12	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
13	BUILDING ENTRY COLUMNS	STRUCTURAL STEEL	BLACK
14	STONE CLADDED COLUMN	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
15	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
16	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
17	RAILING - ROOF DECK COMMON AMENITY SPACE	ALUMINUM PICKET RAILING	WHITE
18	STUCCO - RESIDENTIAL GARAGES	3 - COAT SMOOTH CEMENT STUCCO FINISH	MONTEREY TAUPE
19	GARAGE DOOR	INSULATED METAL	WHITE
20	DOOR	METAL CLAD DOOR	MONTEREY TAUPE

BUILDING TYPE I					
NORTH ELEVATION			SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET		SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	4089	NA	GROSS WALL	3866.00	NA
NET STONE CLADDING	169.91	4.2%	NET STONE CLADDING	187.48	4.8%
NET SIDING	1460.59	35.7%	NET SIDING	1371.74	35.5%
NET STUCCO FINISH	1584	38.7%	NET STUCCO FINISH	1269.10	32.8%
NET GLAZING	874.5	21.4%	NET GLAZING	1037.68	26.8%
EAST ELEVATION			WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET		SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	3294	NA	GROSS WALL	3294	NA
NET STONE CLADDING	-	-	NET STONE CLADDING	-	-
NET SIDING	2672.23	81.1%	NET SIDING	2672.23	81.1%
NET STUCCO FINISH	451.37	13.7%	NET STUCCO FINISH	451.37	13.7%
NET GLAZING	170.4	5.2%	NET GLAZING	170.4	5.2%

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
2	07/28/2021	12/28/2020
BY:	RC	SCALE: 1/8" = 1'-0"

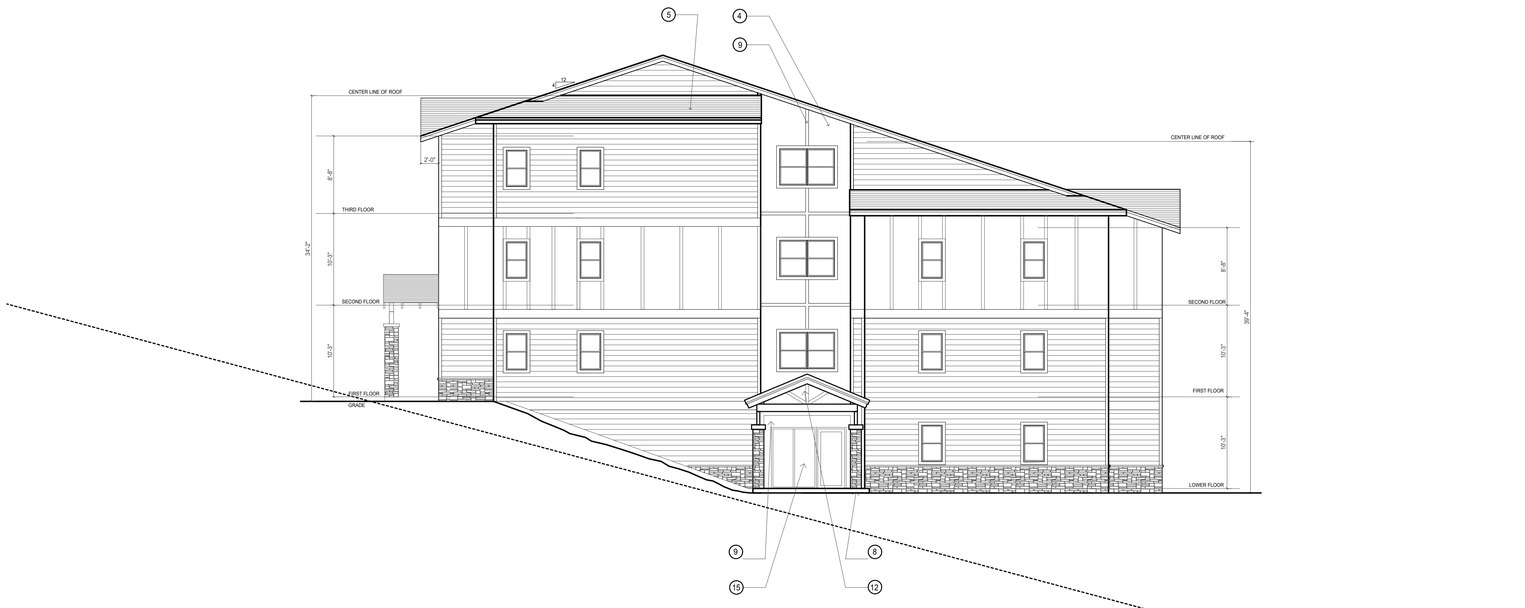
BUILDING TYPE I

A-7



BUILDING TYPE I - EAST ELEVATION

1/8" = 1'-0"



BUILDING TYPE I - WEST ELEVATION

1/8" = 1'-0"

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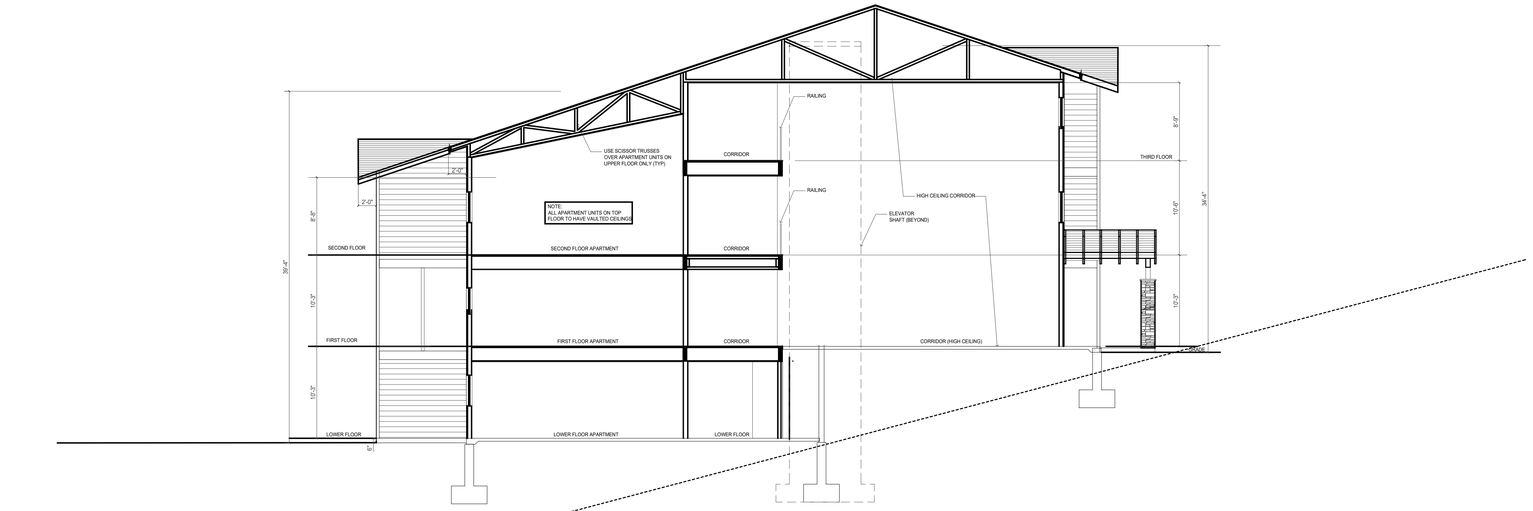
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE I

A-8



BUILDING TYPE I - SECTION A

1/8" = 1'-0"

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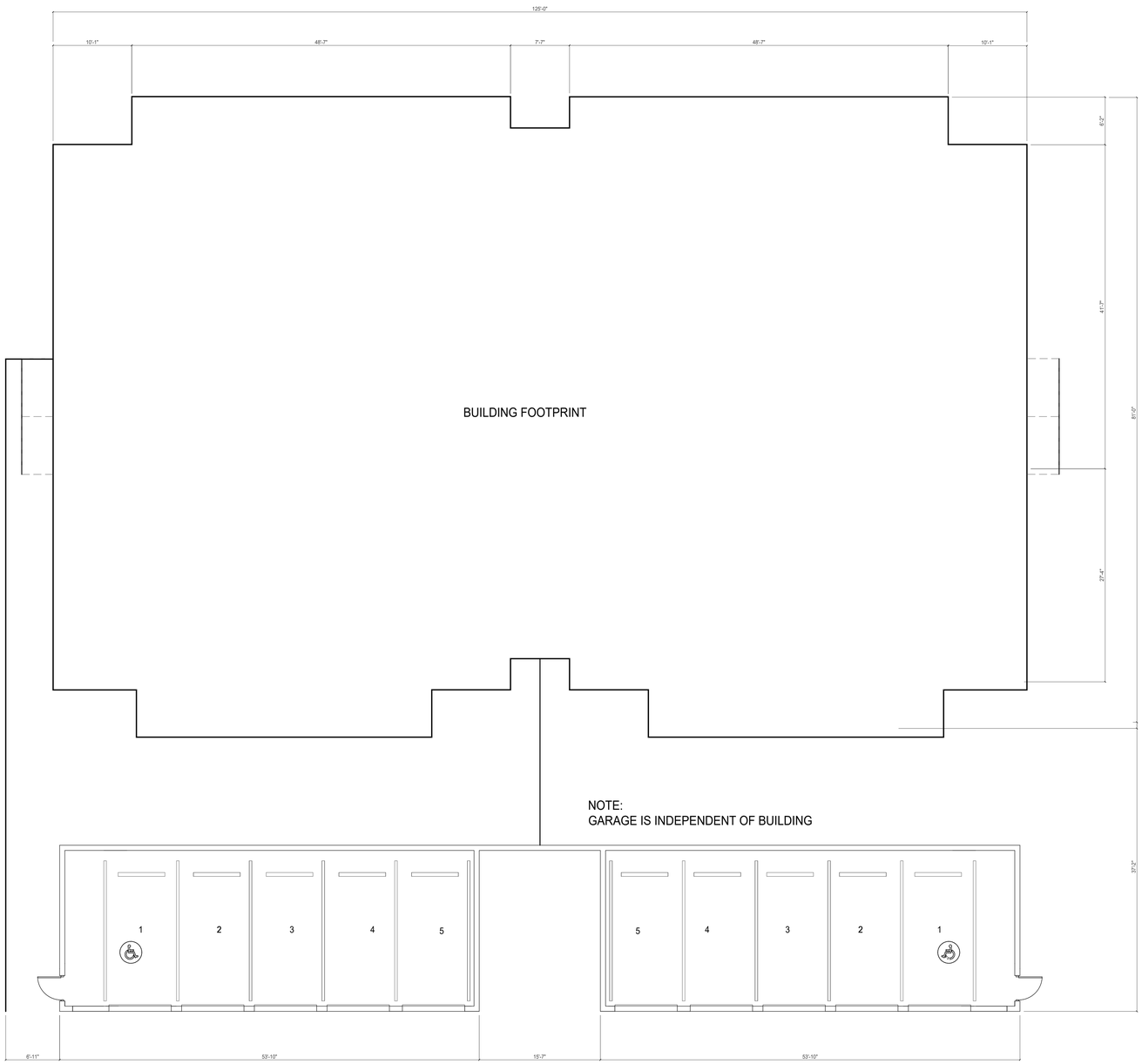
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	Comment	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1' - 0"

BUILDING TYPE I

A–9



BUILDING TYPE II - GARAGE LEVEL

1/8" = 1'-0"

BUILDING TYPE II				
LEVEL	GROSS AREA	OPEN FLOOR CORRIORS	CORRIDOR, ELEVATOR AND STORAGE	NET AREA
GARAGE (10 CARS)	2,630	0	0	2630
LOWER LEVEL	6,038	0	1830	4208
1ST LEVEL	9,778	0	1653	8125
2ND LEVEL	8,245	486	1147	6612
3RD LEVEL	5,697	243	1508	3946
TOTAL BUILDING	32,388			22,891
NO. OF BUILDINGS	3			3
TOTAL FOR BUILDING TYPE II	97,164			68,673

PHASE I - 300 APARTMENTS TOTAL					
BUILDING TYPE	I	II	III	TOTAL BUILDINGS	
NO. OF BUILDINGS	7	3	3	13	
Unit Types					%
3 BEDROOM	42	-	-	42	14.00%
2 BEDROOM - UNIT C1	0	36	36	72	24.00%
2 BEDROOM - UNIT C2	42	-	-	42	14.00%
1 BEDROOM - UNIT B1	0	24	36	60	20.00%
1 BEDROOM - UNIT B2	42	-	-	42	14.00%
STUDIO	42	-	-	42	14.00%
TOTAL UNITS	168	60	72	300	100.00%

PHASE I - 300 APARTMENTS TOTAL					
APARTMENT TYPE	NUMBER OF APARTMENTS	APARTMENT AREAS (SF)			TOTAL AREA (SF)
		INTERIOR	BALCONY	INTERIOR & BALCONY	
3 BEDROOM	42	1,269	80	1,349	56,658
2 BEDROOM - UNIT C1	72	1,126	80	1,206	86,832
2 BEDROOM - UNIT C2	42	1,109	80	1,189	49,938
1 BEDROOM - UNIT B1	60	704	80	784	47,040
1 BEDROOM - UNIT B2	42	711	71	782	32,844
STUDIO	42	593	80	673	28,266
					301,578

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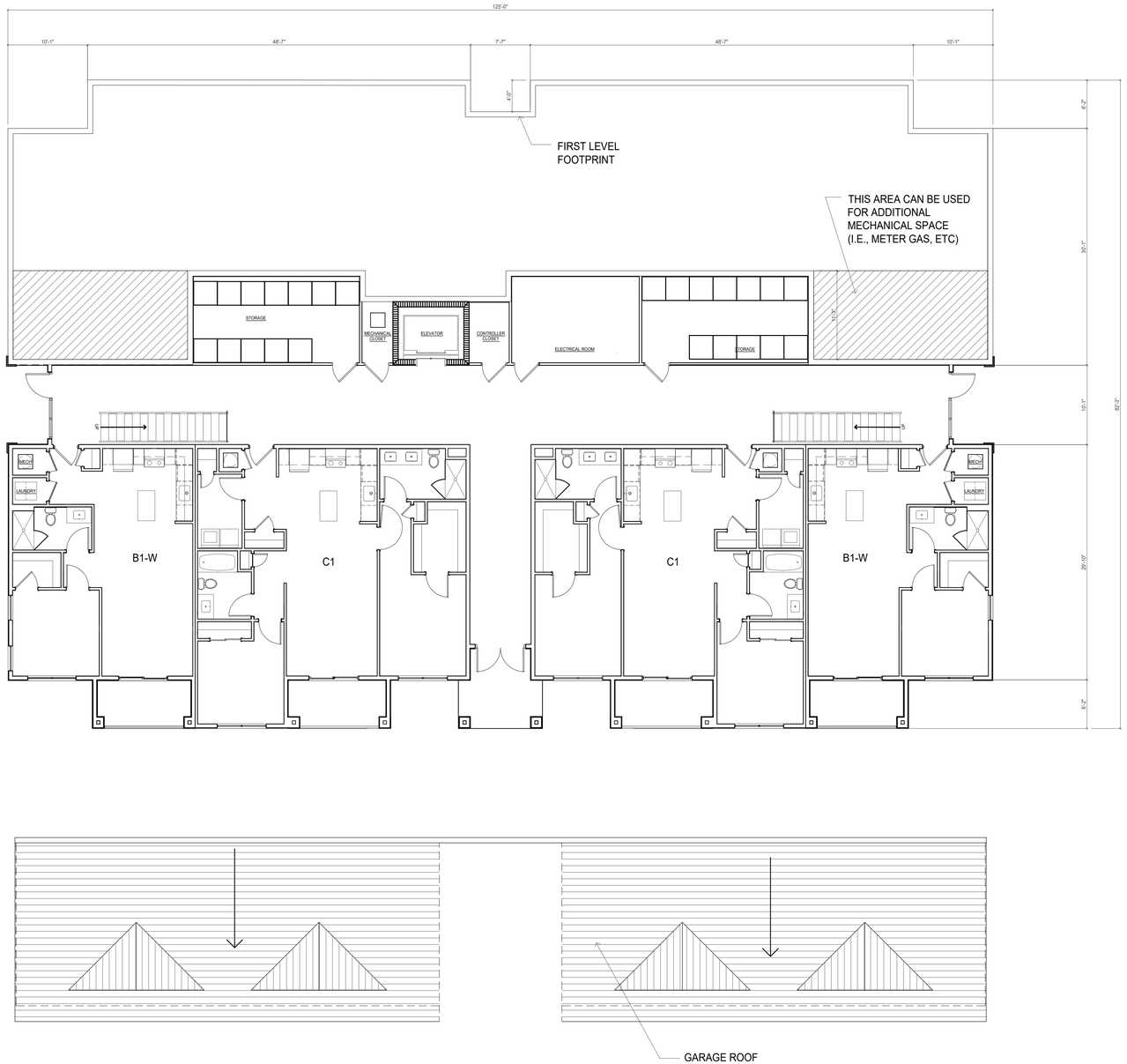
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	COMMENT
2	07/28/2021	

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE II

A-10



BUILDING TYPE II - LOWER LEVEL

1/8" = 1'-0"

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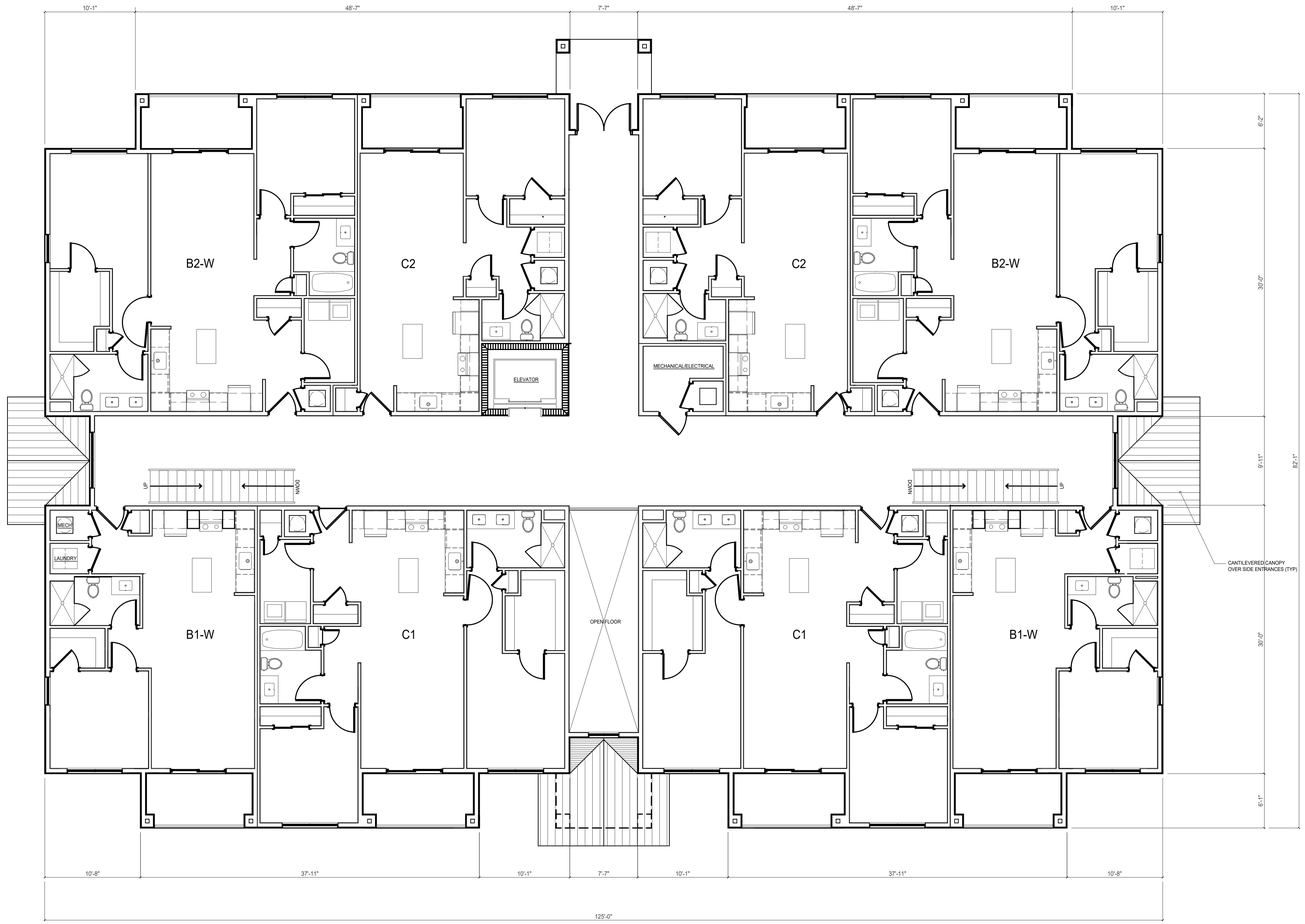
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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
BY:	R/C	
DATE:	12/26/2020	
SCALE:	1/8" = 1' - 0"	

BUILDING TYPE II

A–11



BUILDING TYPE II - FIRST FLOOR

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

DATE	COMMENT	REV

BY: RC
DATE: 12/24/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE II

A-12



BUILDING TYPE II - SECOND FLOOR

1/8" = 1'-0"

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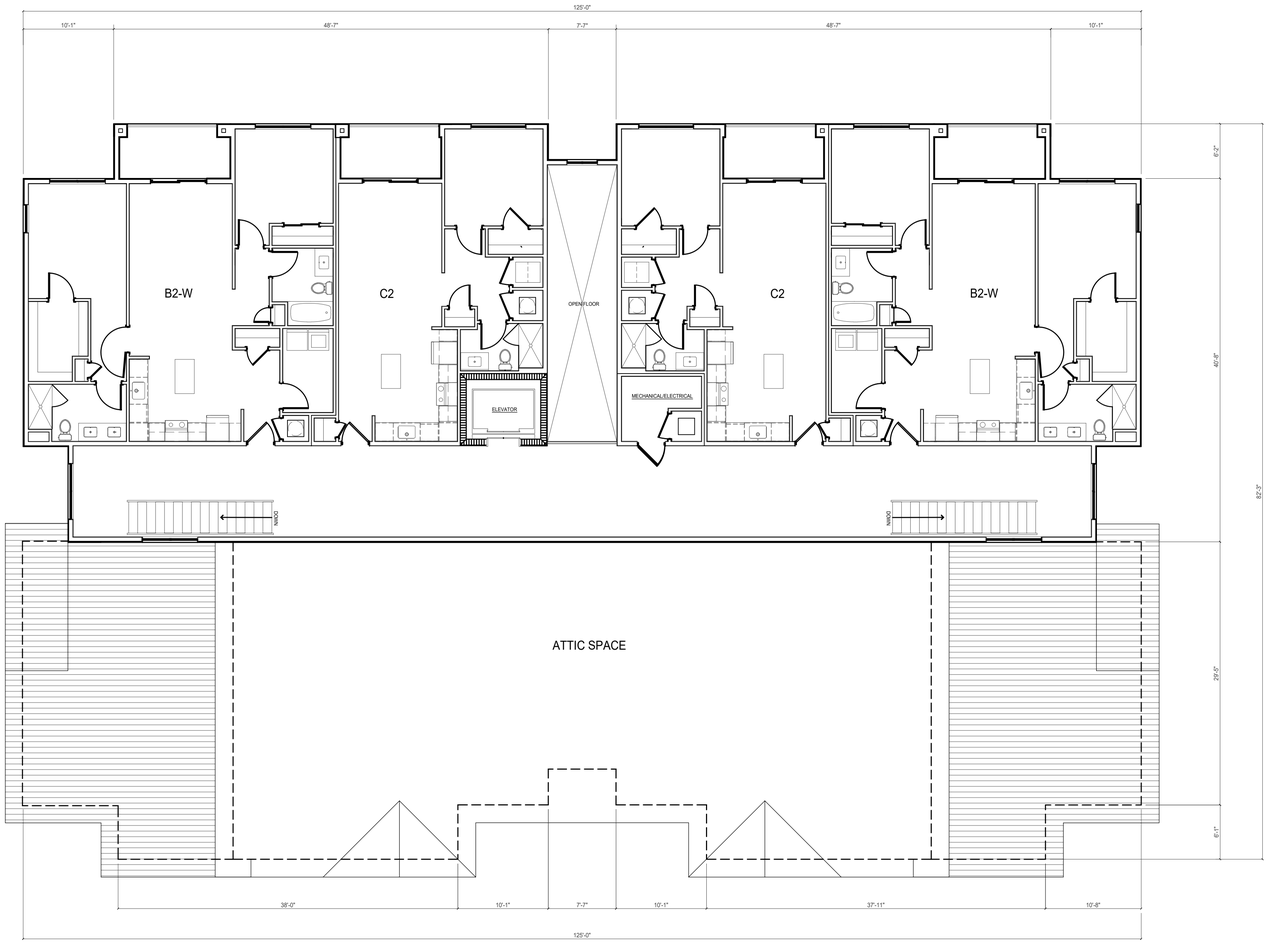
PROJECT:
GLENWOOD SPRINGS
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REV	COMMENT	DATE
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE II

A–13



BUILDING TYPE II - THIRD FLOOR

1/8" = 1'-0"

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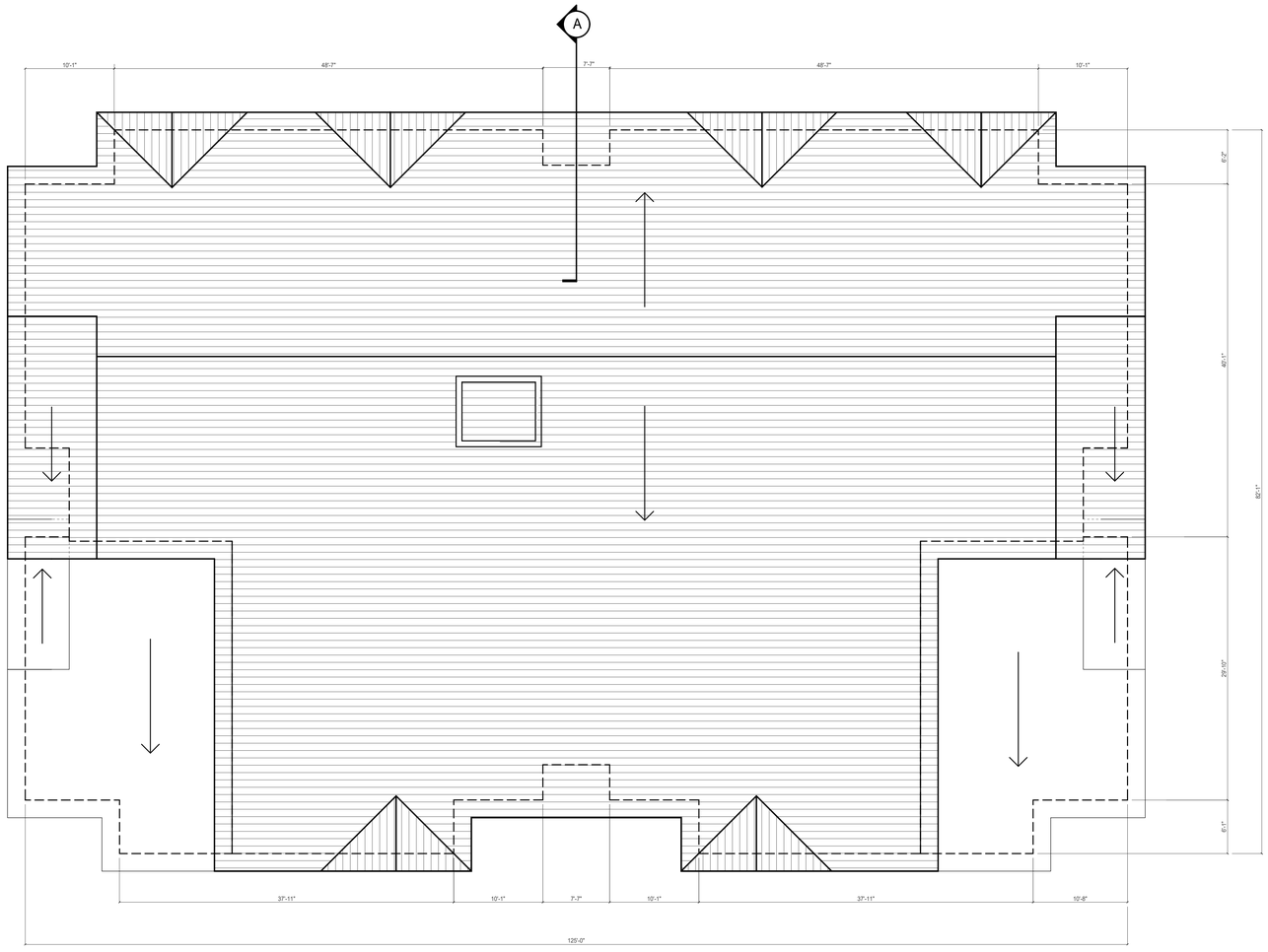
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	Comment	DATE
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1' - 0"

BUILDING TYPE II

A-14



BUILDING TYPE II - ROOF

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	Comment	DATE
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1' - 0"

BUILDING TYPE II

A-15



BUILDING TYPE II - NORTH ELEVATION

1/8" = 1'-0"



BUILDING TYPE II - SOUTH ELEVATION

1/8" = 1'-0"

EXTERIOR FINISH SCHEDULE - BUILDING TYPE III			
LABEL	ITEM	PRODUCT	COLOR
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 4" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	NAVAJO BEIGE
6	WINDOW	ALUMINUM - SINGLE HUNG	BRONZE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	MONTEREY TAUPE
10	BALCONY DOOR	ALUMINUM SLIDING GLASS DOOR	WHITE
11	RAILING - BALCONY	ALUMINUM PICKET RAILING	WHITE
12	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
13	BUILDING ENTRY COLUMNS	STRUCTURAL STEEL	BLACK
14	STONE CLADDED COLUMN	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
15	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
16	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
17	RAILING - ROOF DECK COMMON AMENITY SPACE	ALUMINUM PICKET RAILING	WHITE
18	STUCCO - RESIDENTIAL GARAGES	3 - COAT SMOOTH CEMENT STUCCO FINISH	MONTEREY TAUPE
19	GARAGE DOOR	INSULATED METAL	WHITE
20	DOOR	METAL CLAD DOOR	MONTEREY TAUPE

BUILDING TYPE II

NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	4071	NA
NET STONE CLADDING	212.56	-
NET SIDING	1720.9	42.3%
NET STUCCO FINISH	1126.73	27.7%
NET GLAZING	1010.81	24.8%

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	3866.00	NA
NET STONE CLADDING	#REF!	#REF!
NET SIDING	#REF!	#REF!
NET STUCCO FINISH	1269.10	32.8%
NET GLAZING	1037.68	26.8%

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	3270.19	NA
NET STONE CLADDING	-	-
NET SIDING	2759.89	84.4%
NET STUCCO FINISH	377.67	11.5%
NET GLAZING	132.63	4.1%

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	3270.19	NA
NET STONE CLADDING	-	-
NET SIDING	2759.89	84.4%
NET STUCCO FINISH	377.67	11.5%
NET GLAZING	132.63	4.1%

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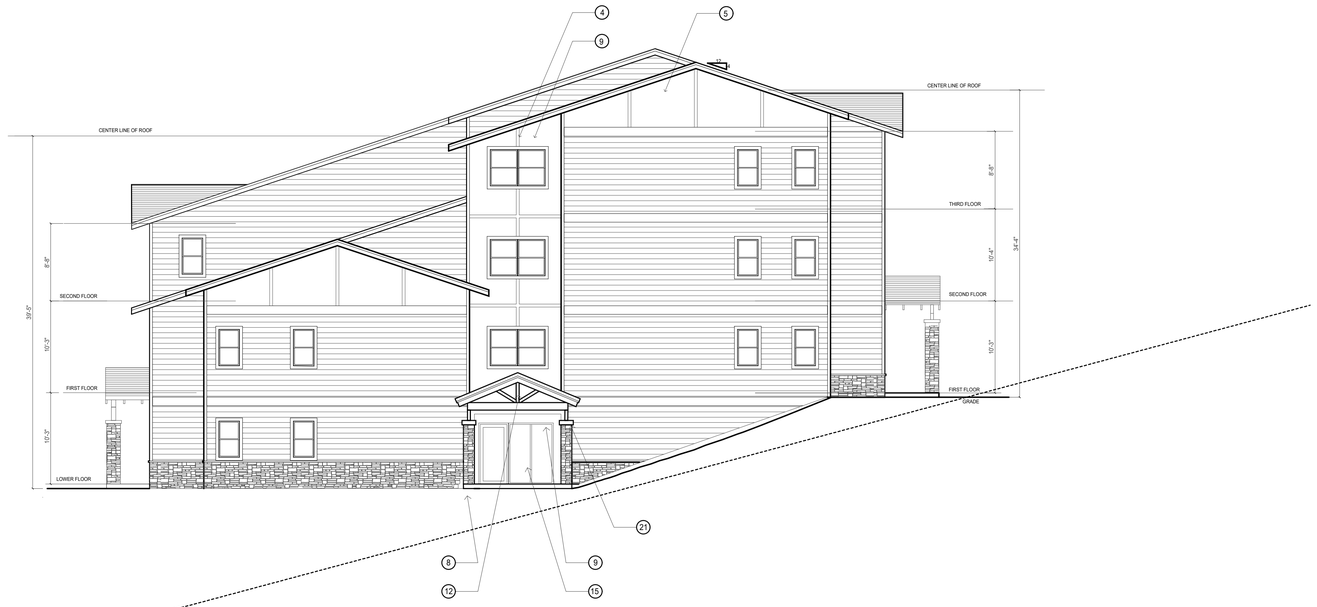
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	COMMENT
2	07/26/2021	

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

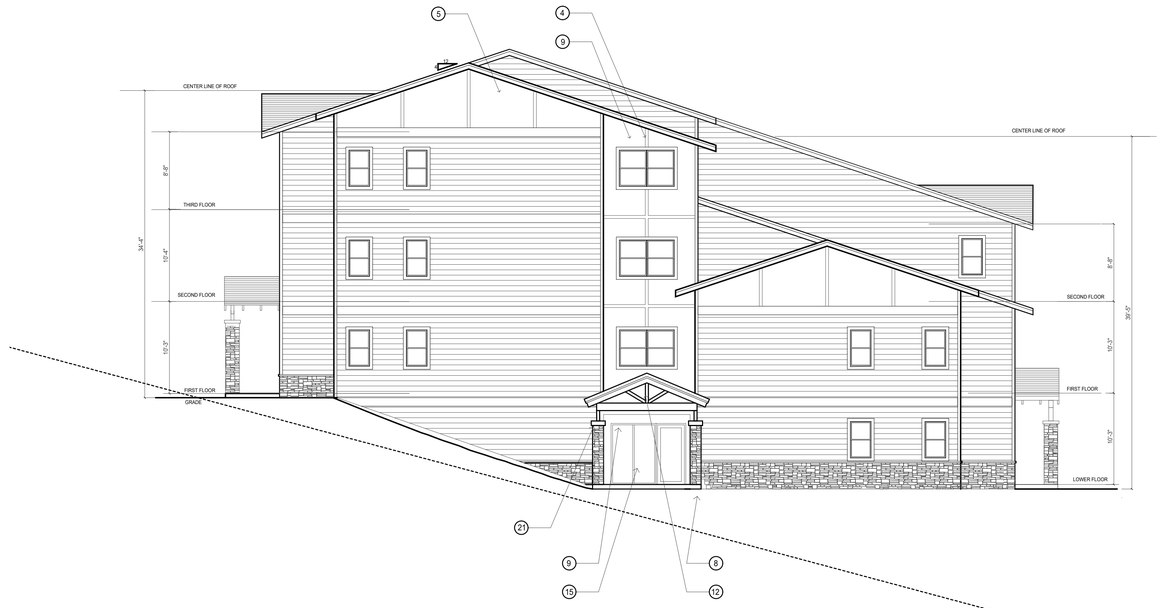
BUILDING TYPE II

A-16



BUILDING TYPE II - EAST ELEVATION

1/8" = 1'-0"



BUILDING TYPE II - EAST ELEVATION

1/8" = 1'-0"

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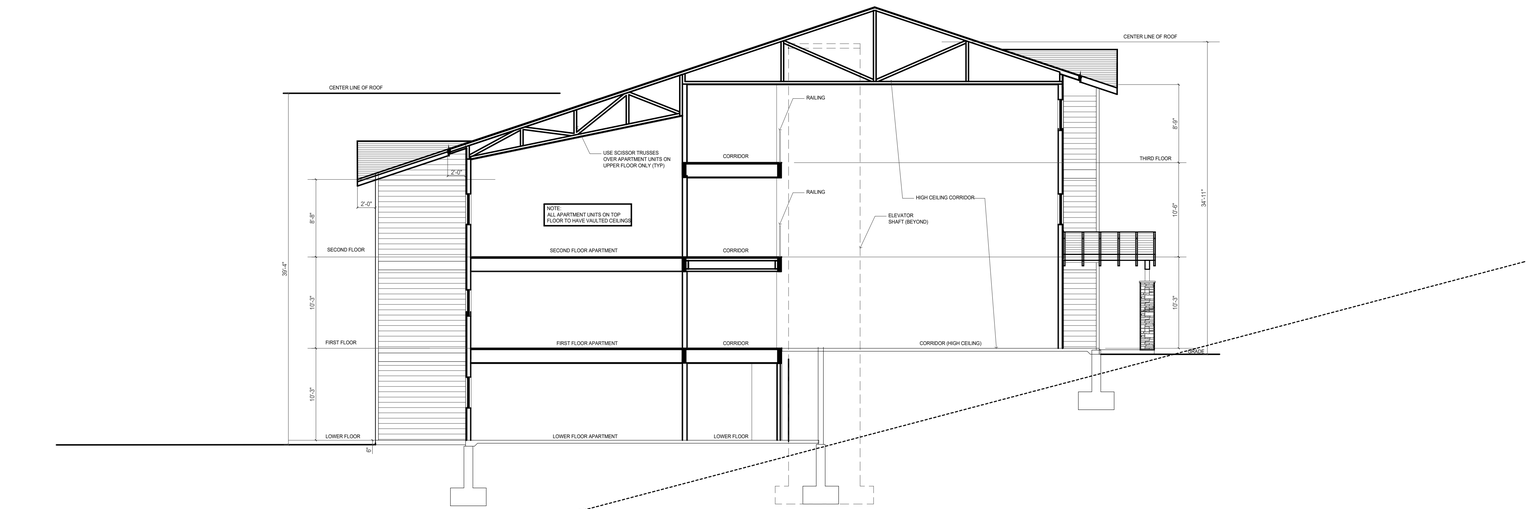
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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV:	COMMENT	DATE
		BY: RC
		DATE: 12/28/2020
		SCALE: 1/8" = 1'-0"

BUILDING TYPE II

A–17



BUILDING TYPE II - SECTION A

1/8" = 1'-0"

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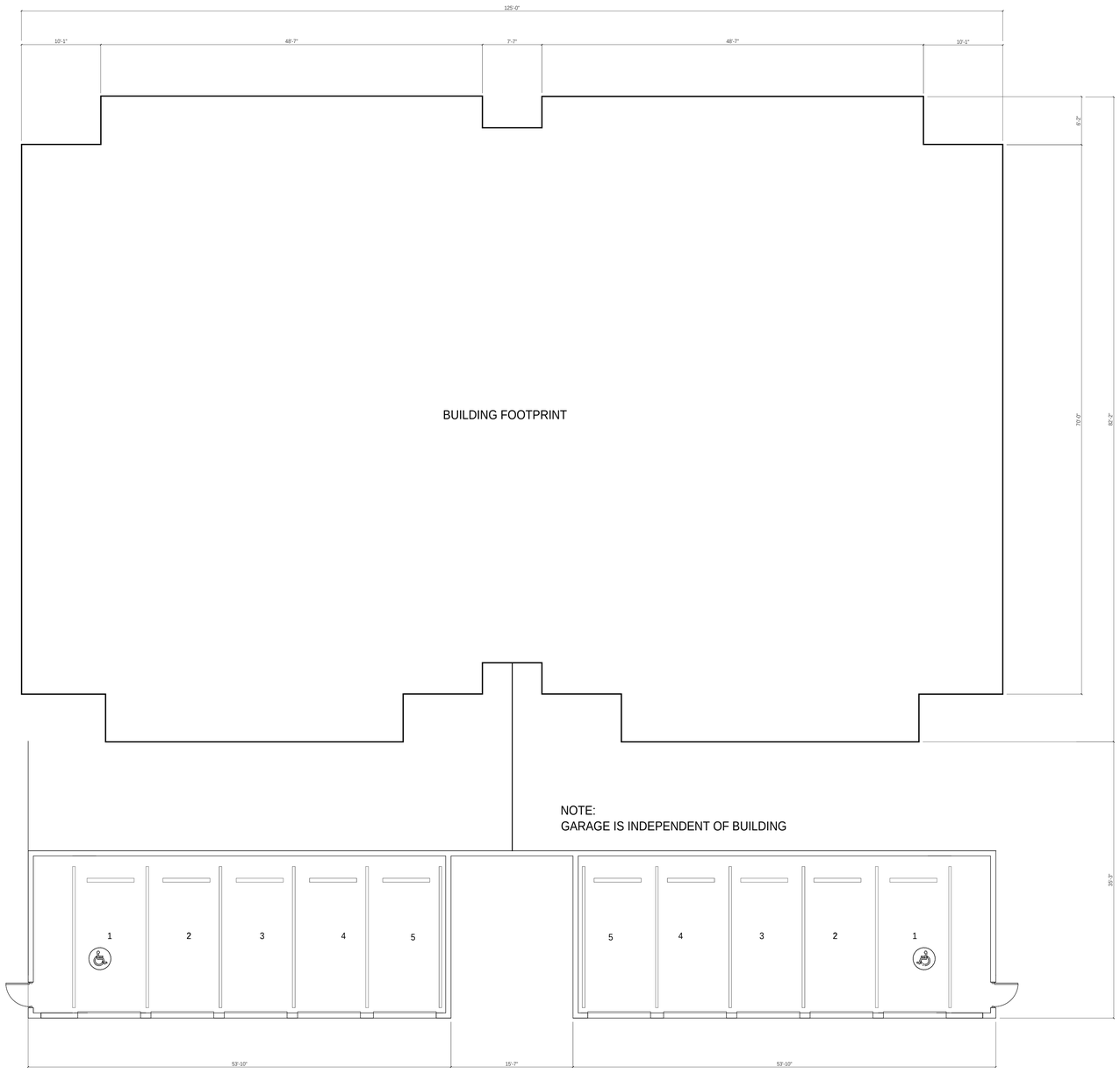
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE II

A-18



BUILDING TYPE III - GARAGE LEVEL

1/8" = 1'-0"

BUILDING TYPE III				
LEVEL	GROSS AREA	OPEN FLOOR CORRIORS	CORRIDOR, ELEVATOR AND STORAGE	NET AREA
GARAGE (10 CARS)	2,630	0	0	2630
LOWER LEVEL	6,038	0	1830	4208
1ST LEVEL	9,778	0	1653	8125
2ND LEVEL	9,778	486	1147	8145
3RD LEVEL	5,675	243	1508	3924
TOTAL BUILDING	33,899			24,402
NO. OF BUILDINGS	3			3
TOTAL FOR BUILDING TYPE III	101,697			73,206

PHASE I - 300 APARTMENTS TOTAL					
BUILDING TYPE	I	II	III	TOTAL BUILDINGS	
NO. OF BUILDINGS	7	3	3	13	
Unit Types					%
3 BEDROOM	42	-	-	42	14.00%
2 BEDROOM - UNIT C1	0	36	36	72	24.00%
2 BEDROOM - UNIT C2	42	-	-	42	14.00%
1 BEDROOM - UNIT B1	0	24	36	60	20.00%
1 BEDROOM - UNIT B2	42	-	-	42	14.00%
STUDIO	42	-	-	42	14.00%
TOTAL UNITS	168	60	72	300	100.00%

PHASE I - 300 APARTMENTS TOTAL					
APARTMENT TYPE	NUMBER OF APARTMENTS	APARTMENT AREAS (SF)			TOTAL AREA (SF)
		INTERIOR	BALCONY	INTERIOR & BALCONY	
3 BEDROOM	42	1,269	80	1,349	56,658
2 BEDROOM - UNIT C1	72	1,126	80	1,206	86,832
2 BEDROOM - UNIT C2	42	1,109	80	1,189	49,938
1 BEDROOM - UNIT B1	60	704	80	784	47,040
1 BEDROOM - UNIT B2	42	711	71	782	32,844
STUDIO	42	593	80	673	28,266
					301,578

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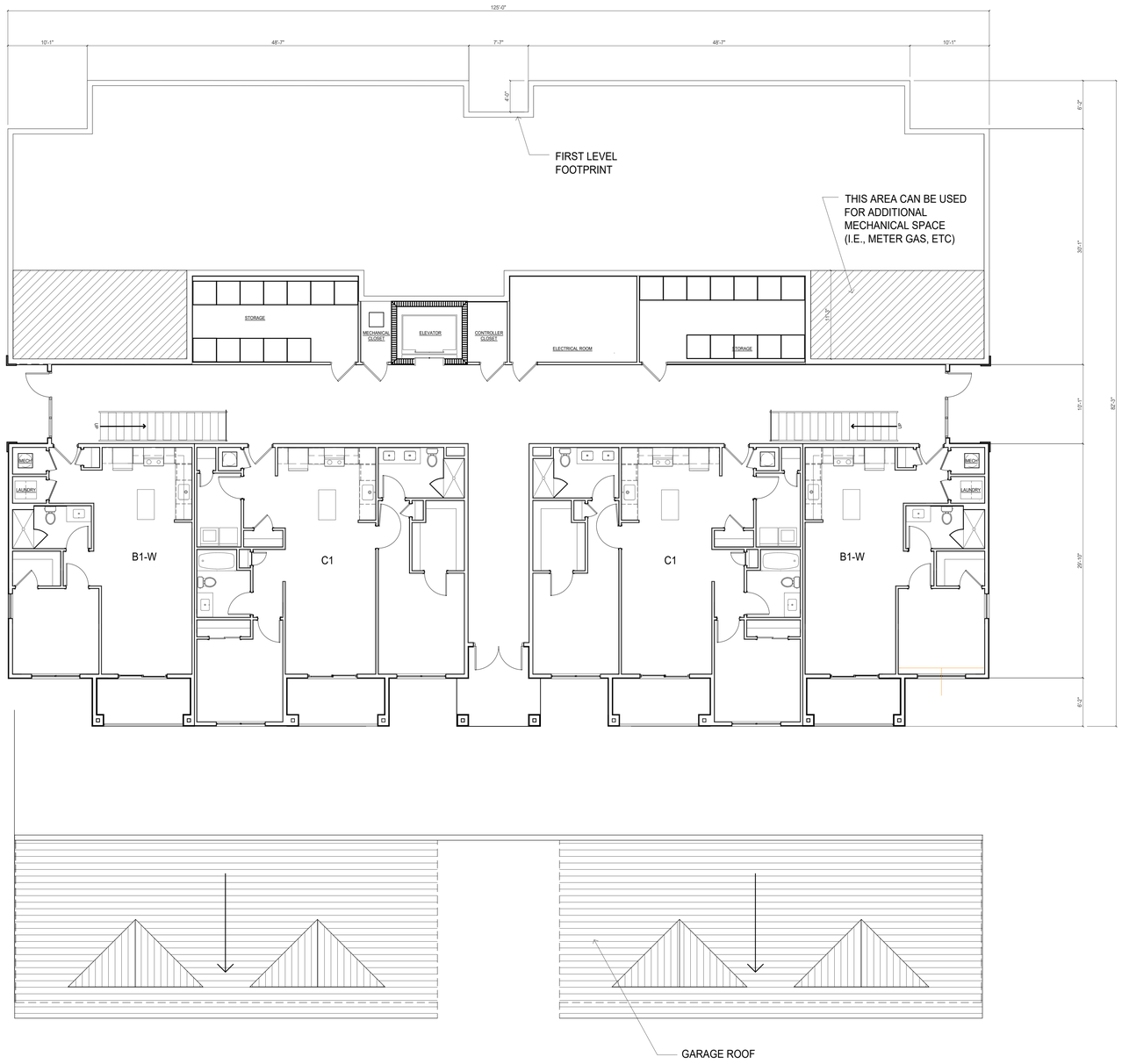
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	COMMENT
2	07/26/2021	

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BUILDING TYPE III

A-19



BUILDING TYPE III - LOWER LEVEL

1/8" = 1'-0"

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COLORADO

REV	COMMENT	DATE

RJC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING
TYPE III

A-20



BUILDING TYPE III - FIRST FLOOR

1/8" = 1'-0"

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COLORADO

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BY:	RC	
DATE:	12/28/2020	
SCALE:	1/8" = 1'-0"	

BUILDING TYPE III

A-21



BUILDING TYPE III - SECOND FLOOR

1/8" = 1'-0"

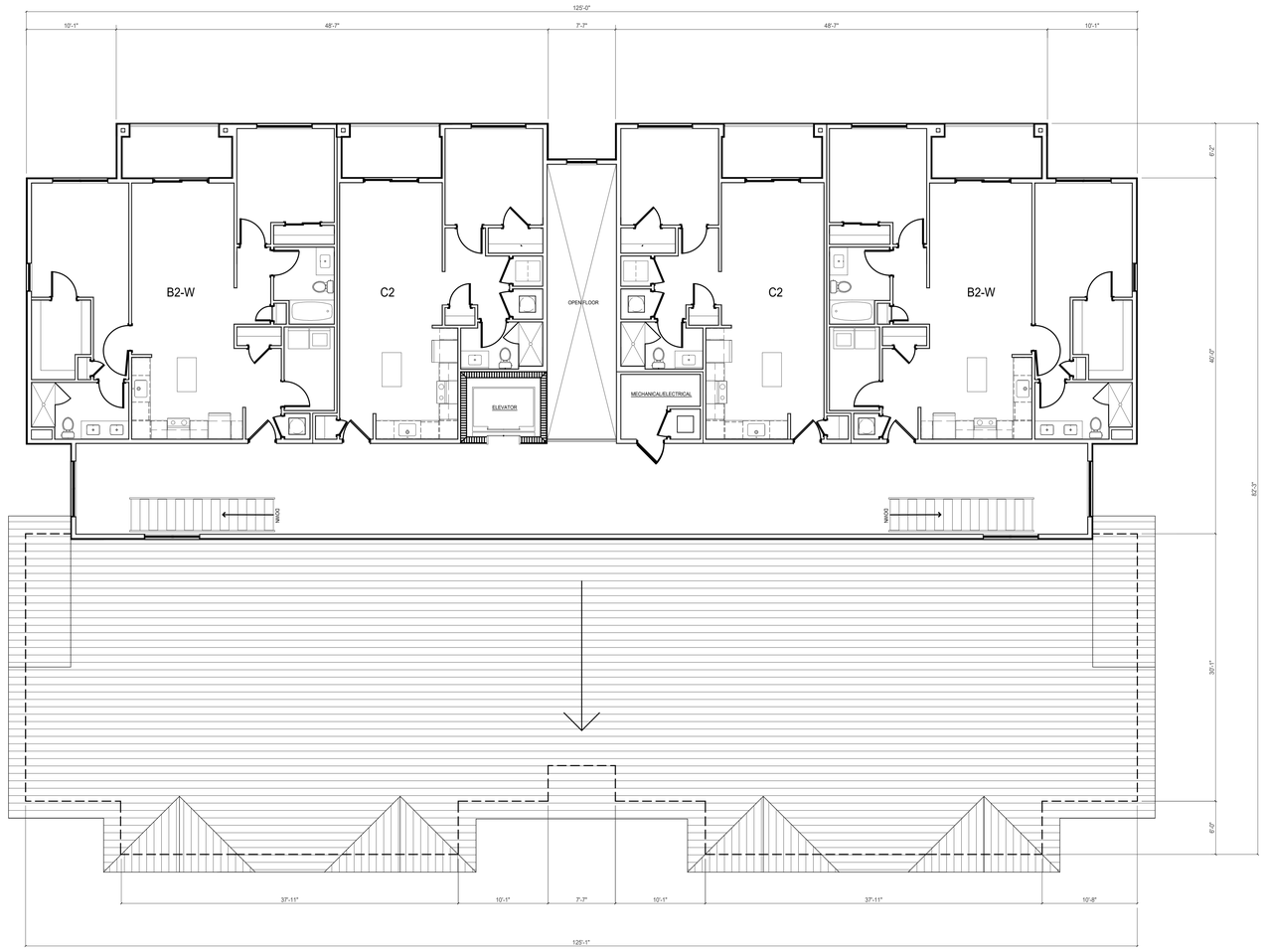
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REV	Comment	DATE



BUILDING TYPE III - THIRD FLOOR

1/8" = 1'-0"

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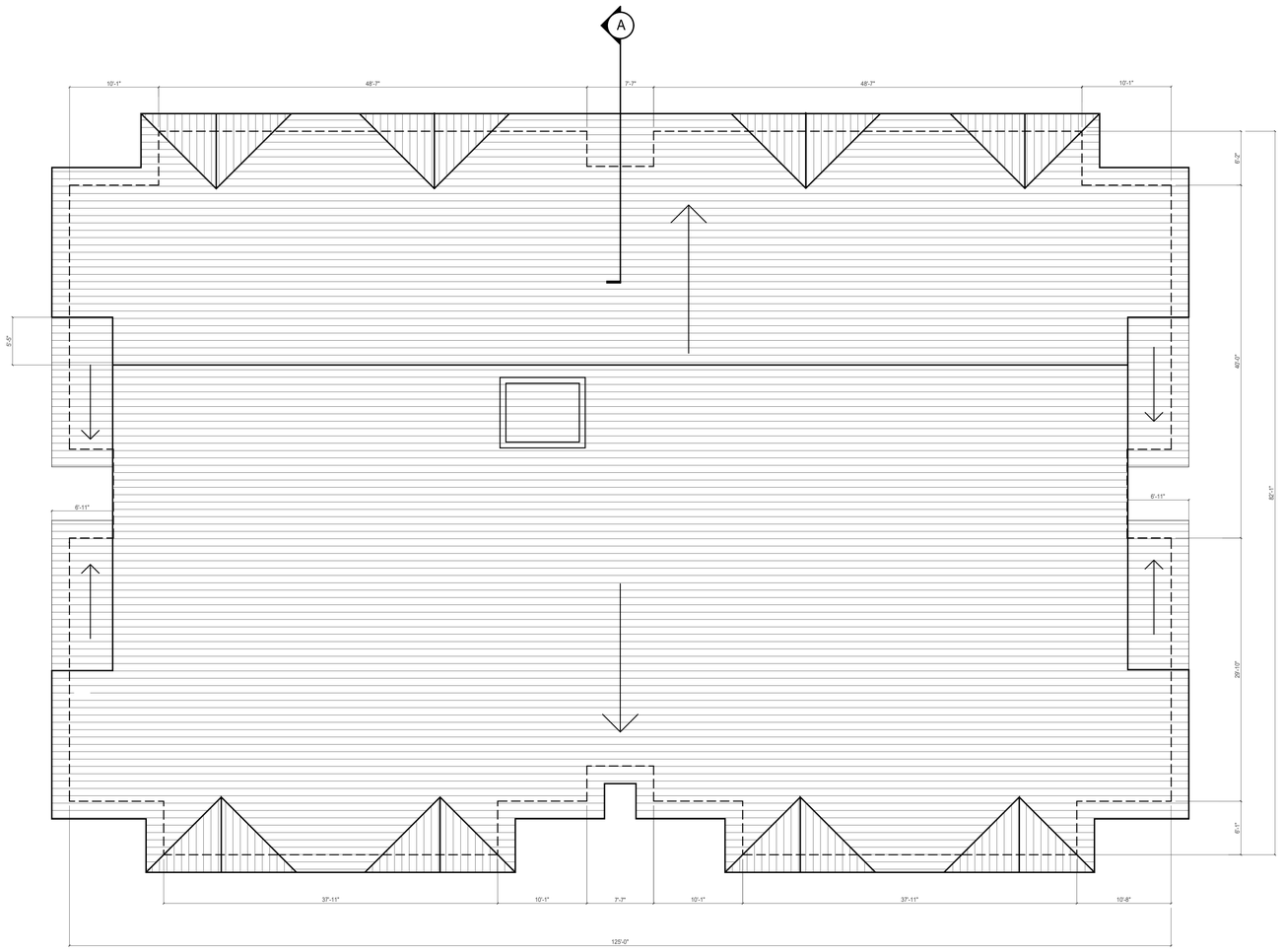
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
2	07/26/2021	

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BUILDING TYPE III

A-23



BUILDING TYPE III - ROOF

1/8" = 1'-0"

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PROJECT:
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BY: RC
DATE: 12/26/2020
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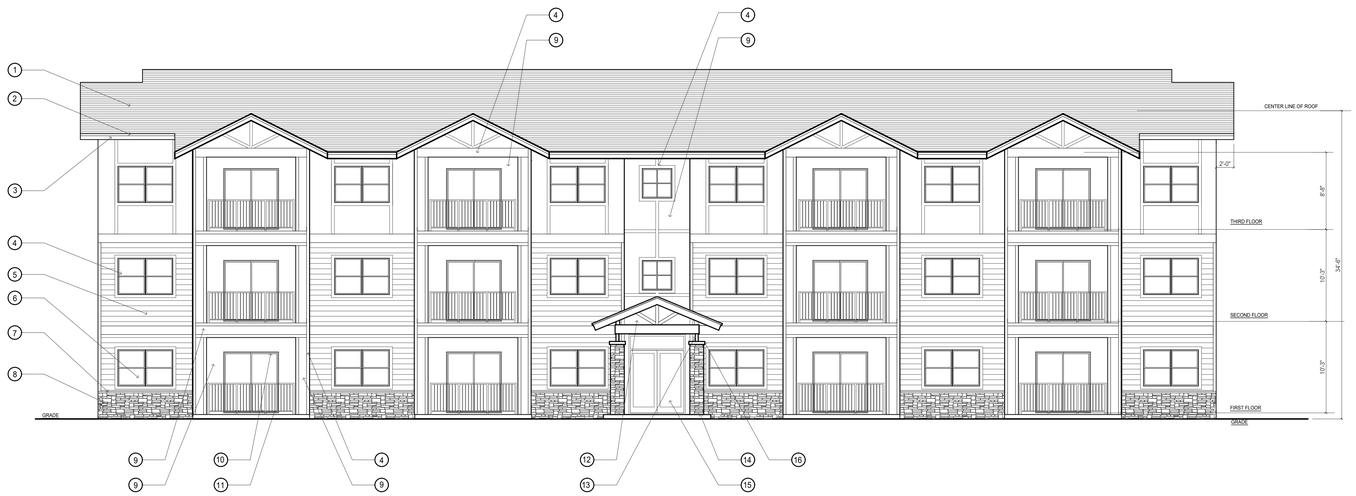
BUILDING TYPE III

A-24



BUILDING TYPE III - NORTH ELEVATION

1/8" = 1'-0"



BUILDING TYPE III - SOUTH ELEVATION

1/8" = 1'-0"

EXTERIOR FINISH SCHEDULE - BUILDING TYPE III			
LABEL	**ITEM**	**PRODUCT**	**COLOR**
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 4" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	NAVAJO BEIGE
6	WINDOW	ALUMINUM - SINGLE HUNG	BRONZE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	MONTEREY TAUPE
10	BALCONY DOOR	ALUMINUM SLIDING GLASS DOOR	WHITE
11	RAILING - BALCONY	ALUMINUM PICKET RAILING	WHITE
12	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
13	BUILDING ENTRY COLUMNS	STRUCTURAL STEEL	BLACK
14	STONE CLADDED COLUMN	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
15	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
16	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	POCONO AUTUMN
17	RAILING - ROOF DECK COMMON AMENITY SPACE	ALUMINUM PICKET RAILING	WHITE
18	STUCCO - RESIDENTIAL GARAGES	3 - COAT SMOOTH CEMENT STUCCO FINISH	MONTEREY TAUPE
19	GARAGE DOOR	INSULATED METAL	WHITE
20	DOOR	METAL CLAD DOOR	MONTEREY TAUPE

BUILDING TYPE III					
NORTH ELEVATION			**SOUTH ELEVATION**		
	SURFACE AREA	**PERCENTAGE OF NET**		**SURFACE AREA**	**PERCENTAGE OF NET**
GROSS WALL	4112.73	NA	**GROSS WALL**	3866.00	NA
NET STONE CLADDING	205.64	5.0%	**NET STONE CLADDING**	#REF!	#REF!
NET SIDING	1590.56	38.7%	**NET SIDING**	#REF!	#REF!
NET STUCCO FINISH	1278.8	31.1%	**NET STUCCO FINISH**	1269.10	32.8%
NET GLAZING	1037.73	25.2%	**NET GLAZING**	1037.68	26.8%
EAST ELEVATION			**WEST ELEVATION**		
	SURFACE AREA	**PERCENTAGE OF NET**		**SURFACE AREA**	**PERCENTAGE OF NET**
GROSS WALL	3270.19	NA	**GROSS WALL**	3270.19	NA
NET STONE CLADDING	-	-	**NET STONE CLADDING**	-	-
NET SIDING	2759.89	84.4%	**NET SIDING**	2759.89	84.4%
NET STUCCO FINISH	377.67	11.5%	**NET STUCCO FINISH**	377.67	11.5%
NET GLAZING	132.63	4.1%	**NET GLAZING**	132.63	4.1%

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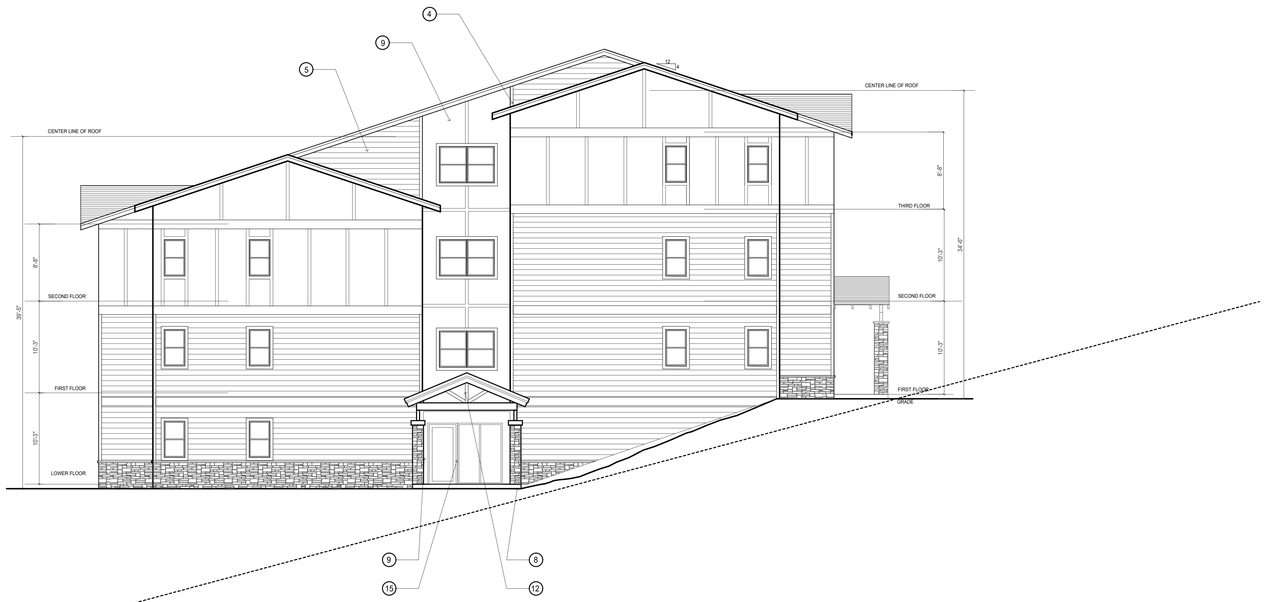
PROJECT:
GLENWOOD SPRINGS
COLORADO

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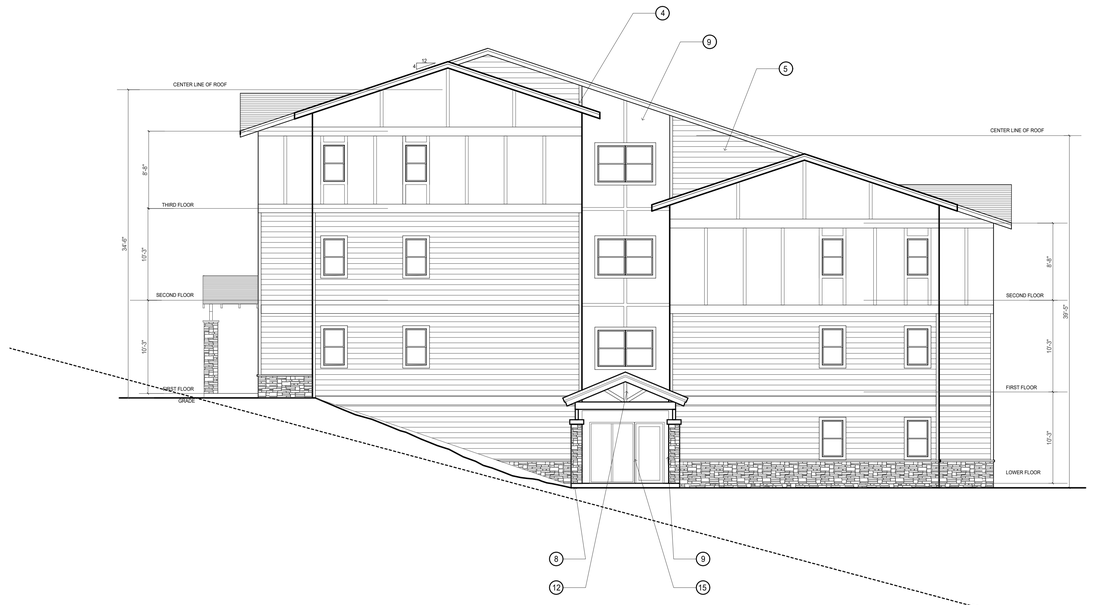
BUILDING TYPE III

A-25



BUILDING TYPE III - EAST ELEVATION

1/8" = 1'-0"



BUILDING TYPE III - WEST ELEVATION

1/8" = 1'-0"

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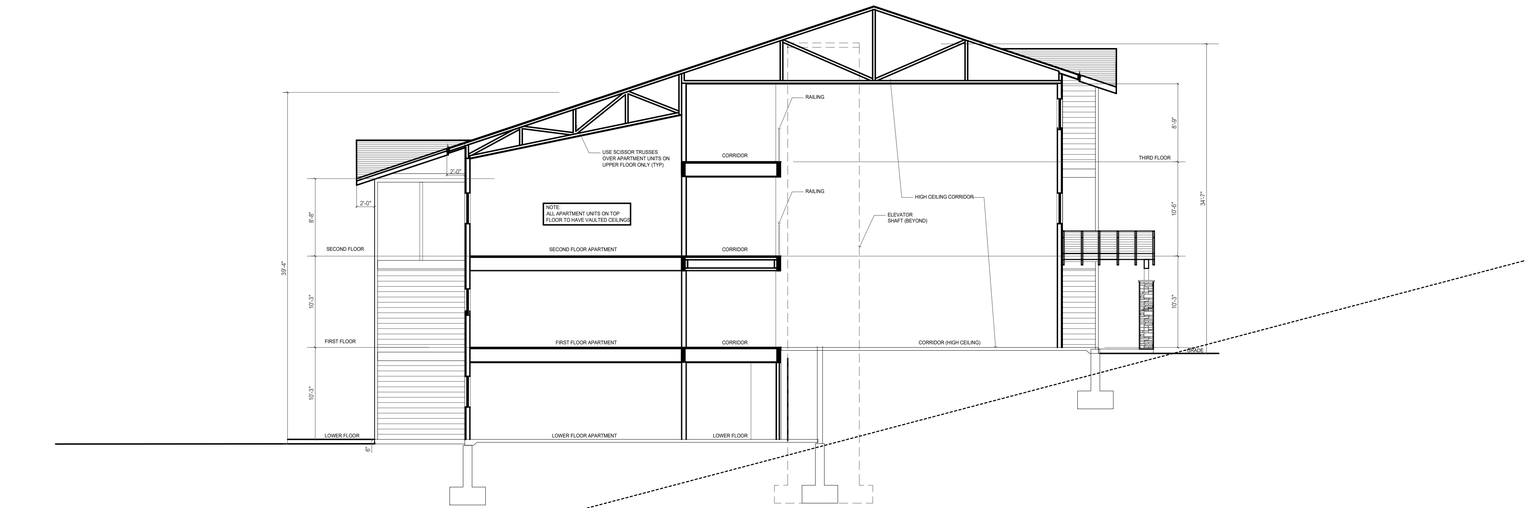
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BUILDING TYPE III

A-26



BUILDING TYPE III - SECTION A

1/8" = 1'-0"

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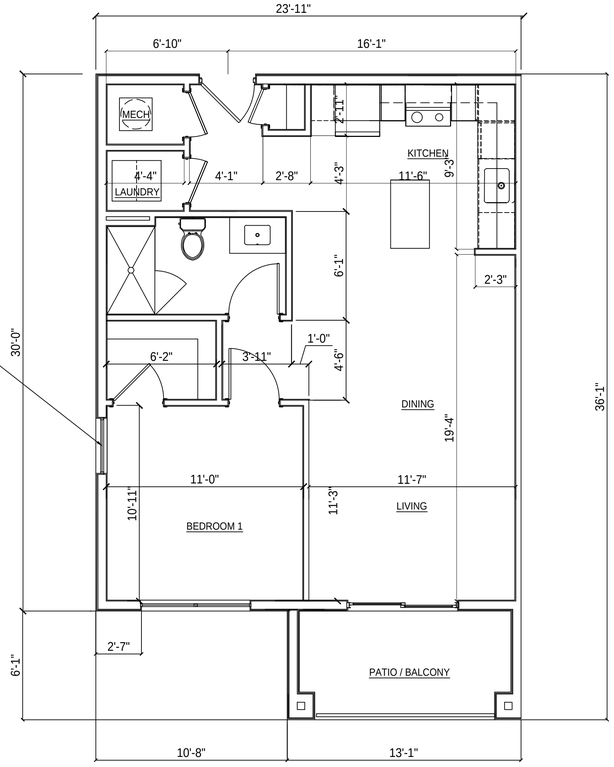
PROJECT:
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REV	COMMENT	DATE

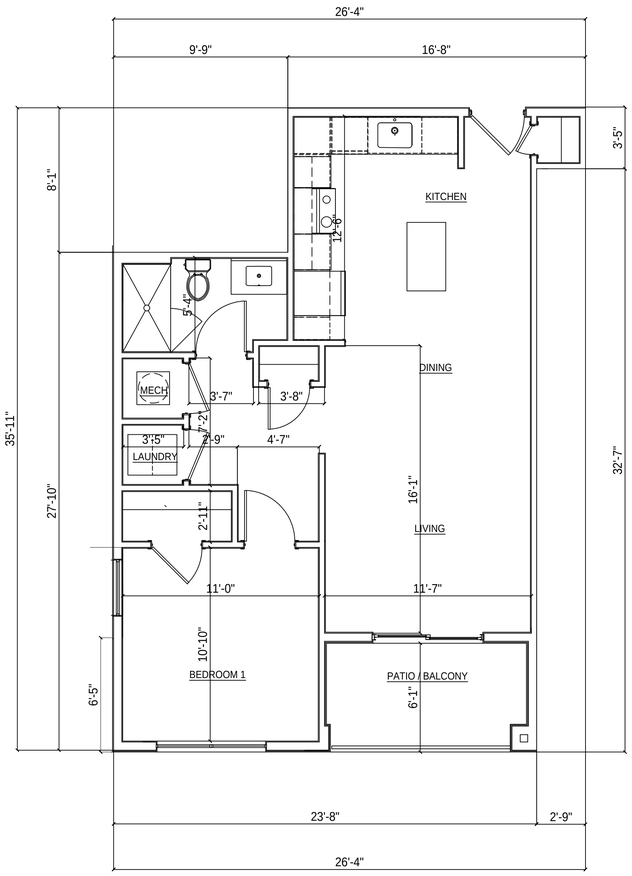
BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1'-0"

BUILDING TYPE III

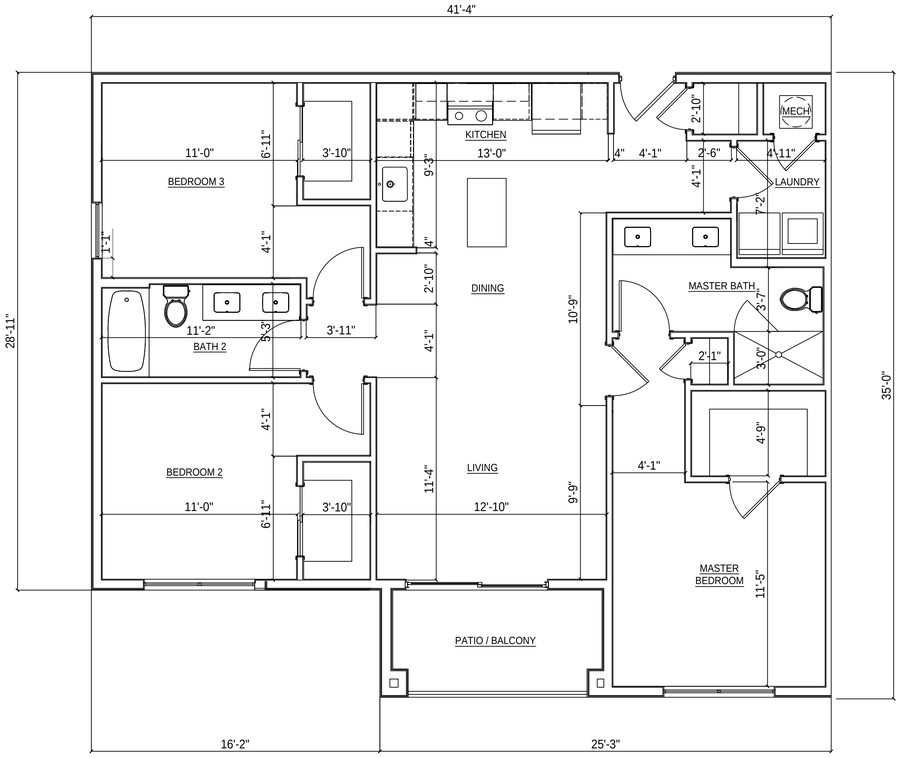
A-27



1 BEDROOM (UNIT B1)
1 BEDROOM (UNIT B1-W)
1/4" = 1'-0"



1 BEDROOM (UNIT B2)
1 BEDROOM (UNIT B2-W)
1/4" = 1'-0"



3 BEDROOM APARTMENT (UNIT D1)
1/4" = 1'-0"

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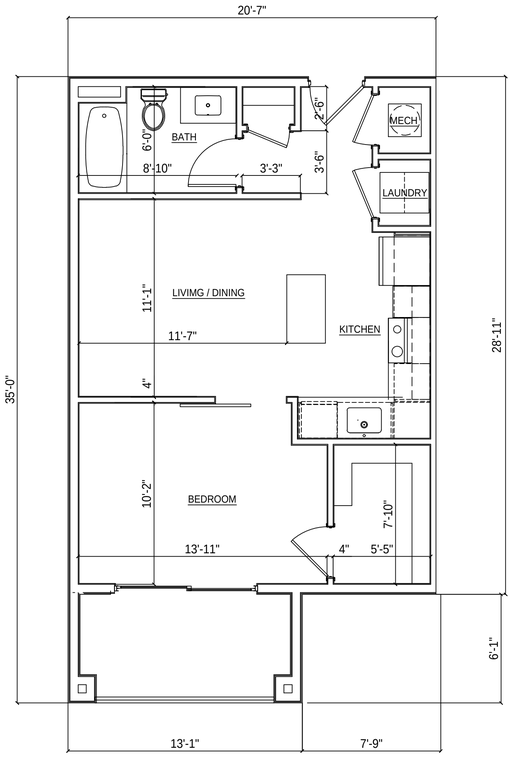
PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/4" = 1' - 0"

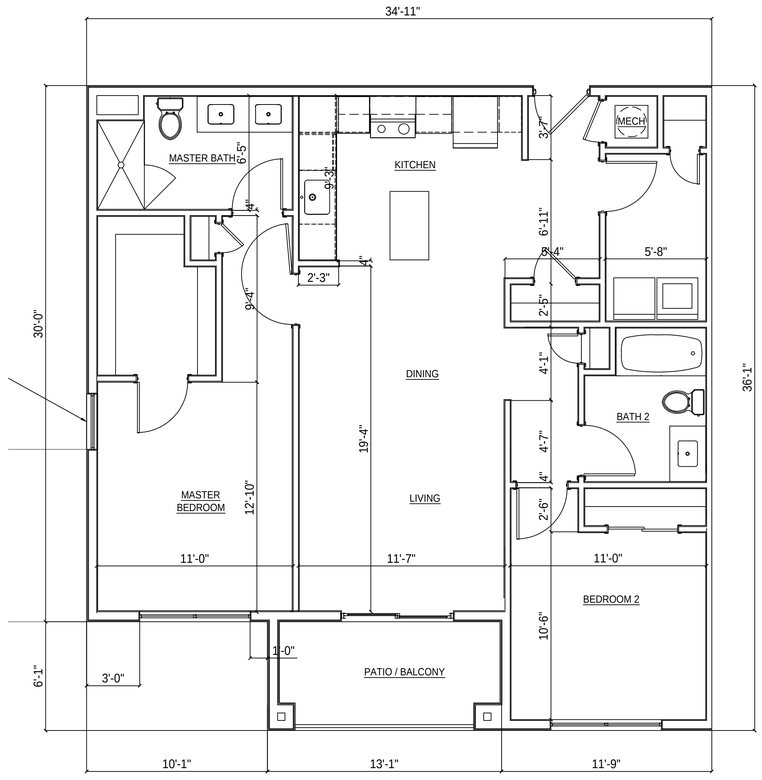
APARTMENT FLOOR PLANS

A-28



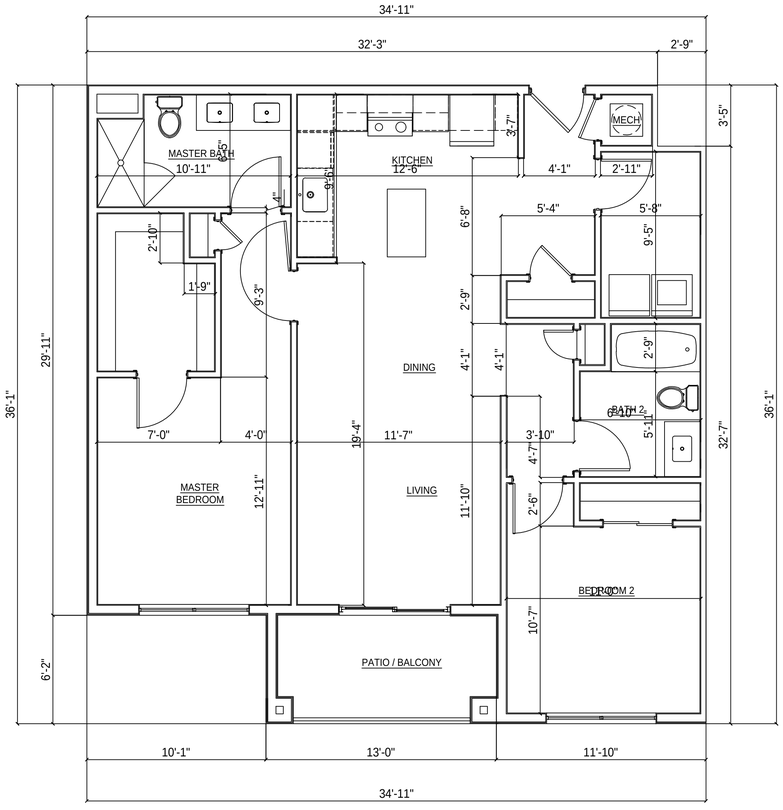
STUDIO (UNIT A1)

1/4" = 1'-0"



2 BEDROOM APARTMENT (UNIT C1)
2 BEDROOM APARTMENT (UNIT C1-W)

1/4" = 1'-0"



2 BEDROOM APARTMENT (UNIT C2)

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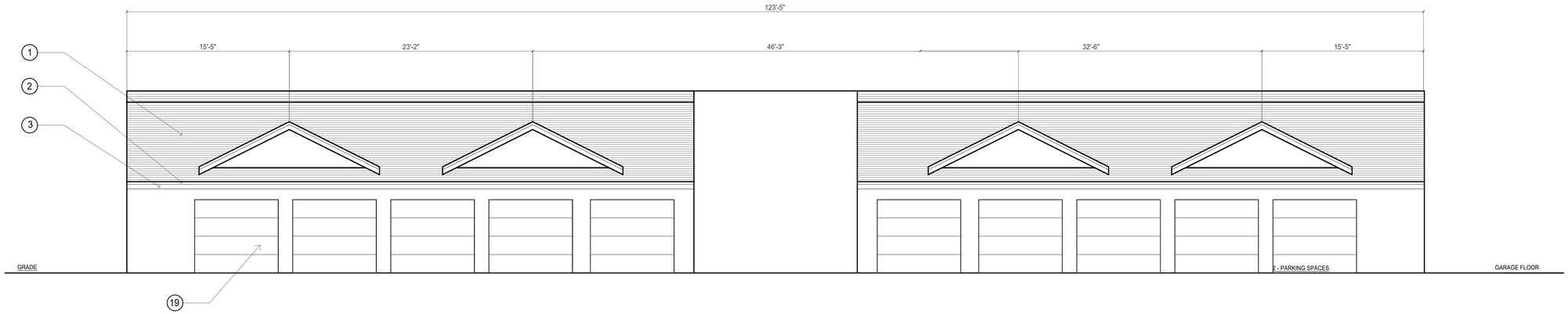
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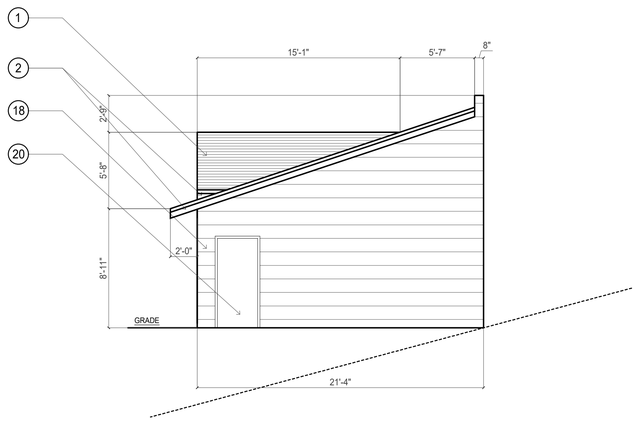
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APARTMENT
FLOOR PLANS

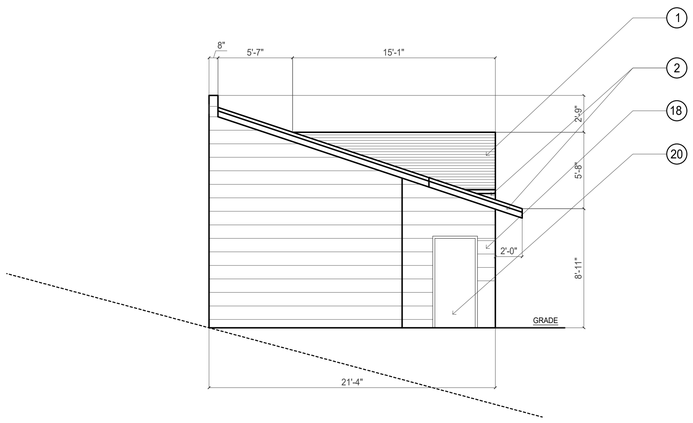
A-29



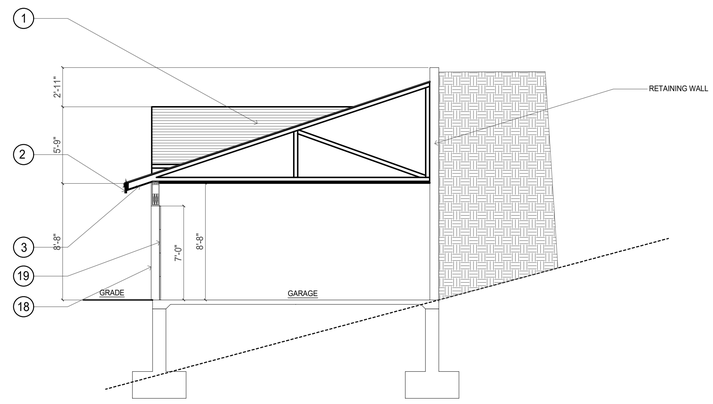
GARAGE - NORTH ELEVATION
3/16" = 1'-0"



GARAGE - EAST ELEVATION
3/16" = 1'-0"



GARAGE - WEST ELEVATION
3/16" = 1'-0"



GARAGE - SECTION
3/16" = 1'-0"

GARAGE ELEVATION FOR BUILDING TYPE I, II, III

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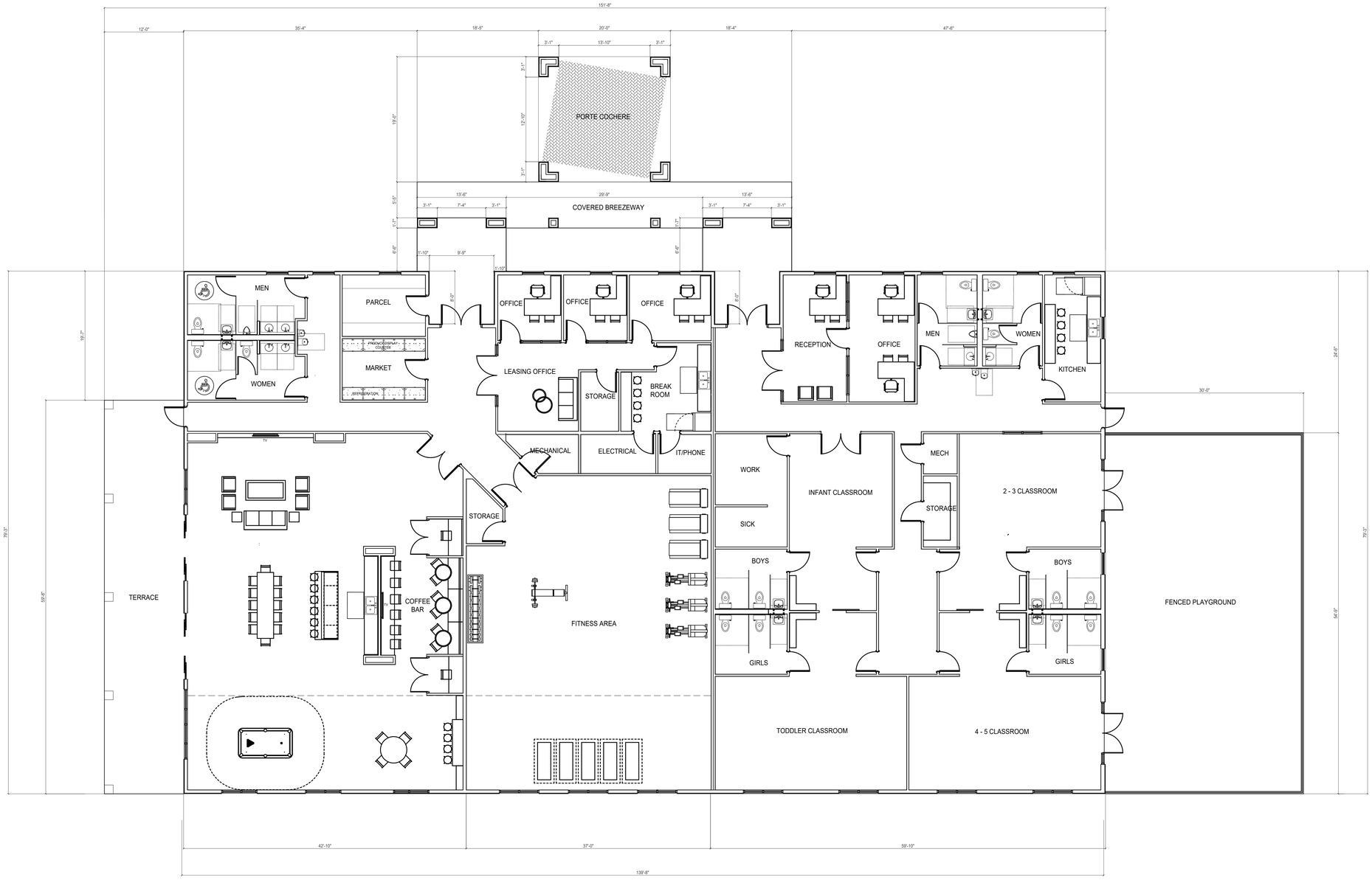
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GARAGE ELEVATIONS

A-30



CLUBHOUSE **DAYCARE CENTER**

CLUBHOUSE & DAYCARE CENTER

1/8" = 1'-0"

CLUBHOUSE & DAYCARE				
LEVEL	AREA	COVERED ENTRANCE	TERRACE	TOTAL AREA
CLUBHOUSE	6,284	187	716	7187
DAYCARE	4,629	187	-	4816
BREEZEWAY	364	-	-	364
PORTE COCHERE	380	-	-	380
TOTAL FOR CLUBHOUSE	**11,657**	**374**	**716**	**12,747**

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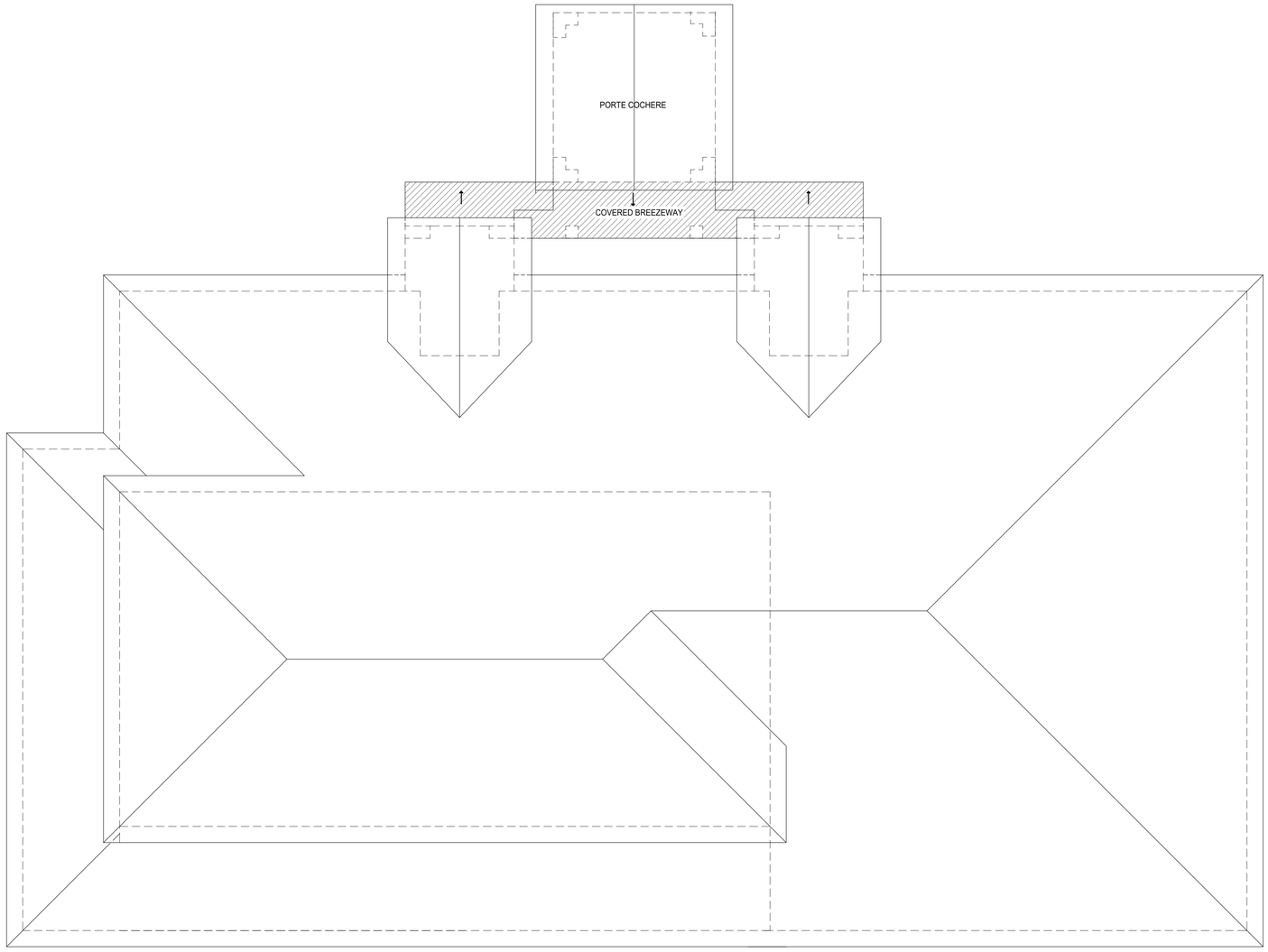
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PROJECT: GLENWOOD SPRINGS COLORADO

REV	Comment	DATE
BY: RC	DATE: 12/26/2020	SCALE: 1/8" = 1' - 0"

CLUBHOUSE FLOOR PLAN

A – 31



CLUBHOUSE & DAYCARE CENTER - ROOF PLAN

1/8" = 1'-0"

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PROJECT:
GLENWOOD SPRINGS
COLORADO

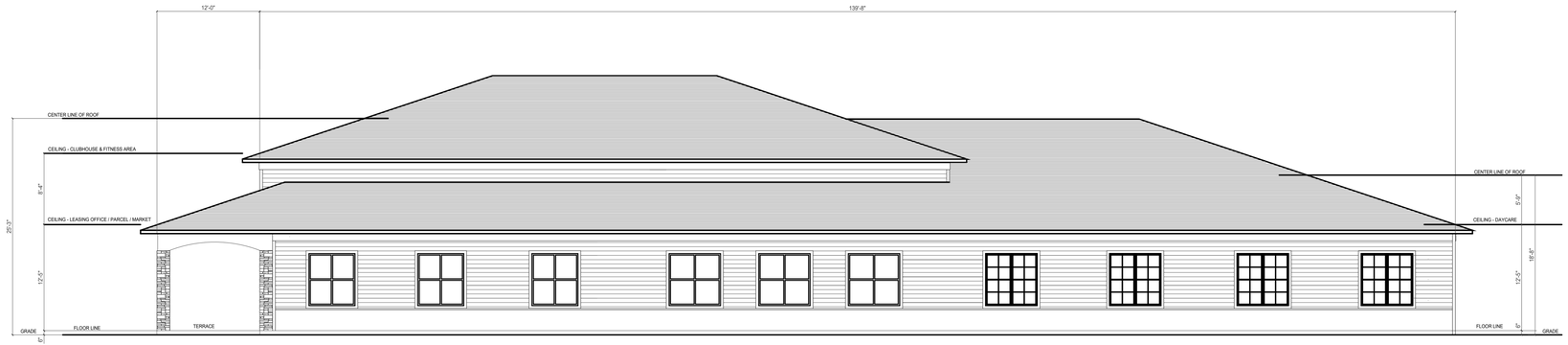
REV	COMMENT	DATE

BY: RC
DATE: 12/26/2020
SCALE: 1/8" = 1' - 0"

CLUBHOUSE ROOF PLAN

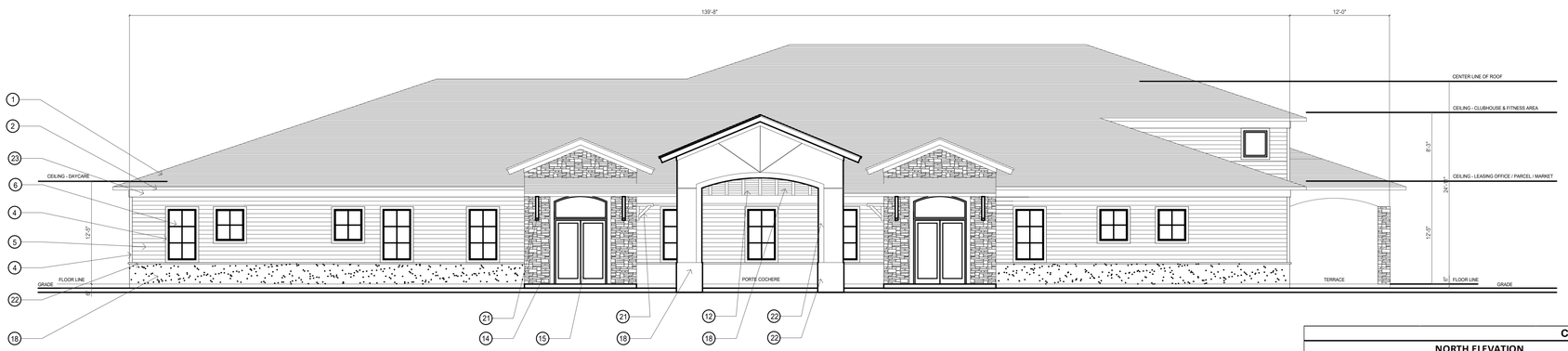
A-32

EXTERIOR FINISH SCHEDULE - CLUBHOUSE			
LABEL	ITEM	PRODUCT	COLOR
1	ROOFING	CERTAINTEED ASPHALT SHINGLES- LANDMARK PRO SOLARIS	CINDER BLACK
2	FASCIA	HARDIE BOARD - 5/4 BOARD 7.25" WIDE	ARTIC WHITE
3	SOFFIT	HARDIETRIM BOARD - 24" WIDE	ARTIC WHITE
4	TRIM	HARDIE TRIM BOARD - 6" WIDE	ARTIC WHITE
5	SIDING	HARDIE PLANK LAP SIDING - CEDAR MILL- 7" HIGH	BOOTHBAY BLUE
6	WINDOW	ALUMINUM - SINGLE HUNG	WHITE
7	STONE SILL	CERTAINTEED - STONE FAÇADE	APALACHIAN TWILIGHT
8	STONE CLADDING	CERTAINTEED - STONE FAÇADE	APALACHIAN TWILIGHT
9	STUCCO - BUILDINGS	HARDIE PANEL VERTICAL SIDING STUCCO	COBBLE STONE
10	BUIDING ENTRANCE CANOPY	HEAVY TIMER FRAMING	MINWAX JACOBEEAN #2750
11	ENTRANCE DOOR	ALUMINUM GLASS DOOR	WHITE
12	STONE COLUMN CAP	CERTAINTEED - STONE FAÇADE	APALACHIAN TWILIGHT
13	STUCCO	3 - COAT SMOOTH CEMENT STUCCO FINISH	COBBLE STONE
14	WALL BRACKET SUPPORT	HEABY TIMBER	MINWAX JACOBEEAN #2750
15	STUCCO MOLDING - CLUBHOUSE	STYROTRIM MOLDING 3.5" X 3.5"	COBBLE STONE
16	TRIM - CLUBHOUSE	HARDIE BOARD - 5/4 BOARD 9.25" WIDE	ARTIC WHITE
17	CARPORT AND BREZEWAY CEILING	T&G WOOD	BROWN TINT



CLUBHOUSE & DAYCARE - NORTH ELEVATION

1/8" = 1'-0"



CLUBHOUSE & DAYCARE - SOUTH ELEVATION

1/8" = 1'-0"

CLUBHOUSE & DAYCARE CENTER		
NORTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	2337.84	NA
NET STONE CLADDING	14	0.6%
NET SIDING	1113.7	47.6%
NET STUCCO FINISH	651.48	27.9%
NET GLAZING	558.66	23.9%

SOUTH ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	1683.19	NA
NET STONE CLADDING	263.22	15.6%
NET SIDING	751.57	44.7%
NET STUCCO FINISH	345.06	20.5%
NET GLAZING	323.34	19.2%

EAST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	2143.88	NA
NET STONE CLADDING	70	3.3%
NET SIDING	1,416.30	66.1%
NET STUCCO FINISH	321.65	15.0%
NET GLAZING	335.93	15.7%

WEST ELEVATION		
	SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	1014.67	NA
NET STONE CLADDING	32.95	3.2%
NET SIDING	600.13	59.1%
NET STUCCO FINISH	169.7	16.7%
NET GLAZING	211.89	20.9%

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	DATE	BY
	12/26/2020	RC

DATE:
COMMENT
SCALE: 1/8" = 1'-0"

CLUBHOUSE ELEVATIONS

A – 33



CLUBHOUSE & DAYCARE - WEST ELEVATION

1/8" = 1'-0"



CLUBHOUSE & DAYCARE - EAST ELEVATION

1/8" = 1'-0"

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PROJECT:
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COLORADO

REV:	COMMENT	DATE

BY: RC
DATE: 12/28/2020
SCALE: 1/8" = 1'-0"

CLUBHOUSE ELEVATIONS

A-34



BUILDING TYPE I - SOUTH FACADE ELEVATION

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
BY:		RC
DATE:		08/14/2021
SCALE:		NTS

BLDG TYPE I
ELEVATION

A-36



BUILDING TYPE II - SOUTH FACADE ELEVATION

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE
BY:	RC	
DATE:	08/14/2021	
SCALE:	NTS	

BLDG TYPE II
ELEVATION

A-39



BUILDING TYPE III - SOUTH FACADE ELEVATION

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PROJECT:
GLENWOOD SPRINGS
COLORADO

REV	COMMENT	DATE

BY: RC
DATE: 08/14/2021
SCALE: NTS

BLDG TYPE III
ELEVATION

A-42

CITY OF GLENWOOD SPRINGS

Engineering Department

Engineering Department **Jessica Bowser** **Asst. City Engineer**	**Date:** February 19, 2021 **To:** Community Development **Re:** Lot 11C-C

Please see the following engineering comments for the Lot 11C-C. Responses to these comments should be provided with the next submittal.

General comments:

1. These plans are insufficient and do not comply with CDPHS or the City of Glenwood springs Engineering Standards in many instances. See plan markup for more information.

Geotechnical Report Comments:

2. On page 20 of 30, under surface drainage the report states under bullet point 2 that landscaping of gravel adjacent to buildings should have a minimum slope of 6 inches in 5 feet (or 10%), but in bullet point 5, it states that landscaped areas within 10 feet of the foundation should be sloped at a minimum of 8%. This is inconsistent.
3. In general full-depth asphalt is not recommended in this area. As you can see from the meadows Development, it has not performed well over time and meeting subgrade requirements with the native soil is challenging. As these roadways are private and will remain private, the city does not have a requirement for the asphalt within the development, but will require any patches in City ROW to meet the requirements of the City's Engineering Standards.
    a. The report provides a recommendation for a full-depth asphalt section, but Figure 17 does not provide an exhibit of that section.

Drainage Report:

4. Include the original report referenced in the Appendix.
5. The original study was completed analyzing the development with Type C and D soils, while this analysis uses Type A soils. Please address this within the report.
6. The access road to the west is not fully considered in the analysis.

Traffic Report Comments:

7. A memo is not acceptable. A TIS will be required for this development. The original study was completed over 20 years ago and only provided a 10-year projection. Additionally, it was not stamped by a Colorado Licensed Engineer.

General Requirements:

At the time of Construction Document Submittal:

8. All final/stamped reports shall be submitted.

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

a. Landscaping plans should include utilities and proposed contours on a background layer for verification of clearances. Often these items are completed after the civil work is completed and they fill in drainage areas or plan directly on top of utilizes.

b. Landscape plans should also include sight triangles to verify sight distances.

9. Any proposed retaining walls greater than 4' from the bottom of footer to top of wall will require engineered design and structural calculations. The City may refer these documents out for review as necessary.
10. Stormwater facilities will require a maintenance agreement and plan.
11. Plan and Profiles should be supplied for the private utility mains.
12. Provide S.U.E. plan per Colorado Law CRS 9-1.5-102 requirements or provide a stamped letter determining why this is not a Subsurface Utility Engineering-Required Project.

Before Construction:

13. Any work within the Right of Way shall require appropriate ROW permitting though the City. With the ROW permit, the following documents should be submitted:
    a. Any SUE documents necessary.
    b. A plan of work to take place in the ROW, with patching shown that meets the requirements of the jurisdiction.
    c. Traffic Control Plans, as appropriate.
14. The site will require a Grading Permit. With the grading permit, the following documents should be submitted:
    d. Any SUE documents necessary.
    e. Final Stamped Drainage Report.
    f. Final Stamped Civil Documents.
    g. Final Geotechnical Report.
    h. Disturbance over one (1) acre will require a CDPHE Construction Stormwater Discharges Permit. As this development is over one acre, this permit is required, and any State approval should be submitted prior to the issuance of a Grading Permit.

Permit Closeout and Issuance of Certificate of Occupancy Requirements:

15. Before engineering completes a walk-though of the subject property
    a. Draft As-Built plans should be submitted.
    a. Applicable Stamped Certification Letters:
        i. Any engineered retaining walls. Letter certifying that the walls were constructed per plan or that address any changes to the design during construction, stamped by a Colorado Licensed Professional Engineer.
        i. Drainage improvements. Letter certifying that the drainage was constructed per plan or that addresses any site changed, stamped by a Colorado Licensed Professional Engineer.
    b. Test results for all improvements in the ROW shall be submitted. These should include all testing/backfill associated with any walls that support public facilities.
16. Engineering Approval to release the CO will not be provided until the final documents/files are supplied.
    b. Final As-builts with and Improvement Survey Plat (ISP) should be provided in an AutoCAD, PDF, and Mylar form.

c. Certification Letters can be supplied electronically (PDF).

d. All easement dedications shall be completed.

e. Maintenance Agreement for any water quality and detention facilities.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

WULFSOHN RD.

EXISTING CURB CUT TO BE REMOVED.
INSTALL 74–LF, 24–IN STANDARD
CURB & GUTTER.
EXISTING UTILITY STUBS TO REMAIN

Where will this drainage go?

Appears that the legend doesn't match the plans (typ all sheets)

Technically no grading through bldg (typ)

Is this curve practical w/ allowable pipe material deflection?

LEGEND

EXISTING	PROPOSED
STORM MANHOLE	WATER SHUTOFF VALVE
SANITARY CLEAN–OUT	WATER VALVE
SANITARY MANHOLE	TEE W/THRUST BLOCK
FIRE HYDRANT	BEND W/THRUST BLOCK
WATER VALVE	FIRE HYDRANT
WATER MANHOLE	INLET
GAS METER	CURB INLET
TELEPHONE PEDESTAL	STORM MANHOLE
LIGHT POLE	SANITARY MANHOLE
UTILITY POLE	SANITARY CLEANOUT
SIGN	CABLE MANHOLE
	ELECTRIC MANHOLE
	ELECTRIC TRANSFORMER

BOUNDARY
RIGHT–OF–WAY
EASEMENT
STRUCTURE
ASPHALT
GRAVEL
CONCRETE
RETAINING WALL
CENTERLINE ROAD
CURB AND GUTTER
FLOWLINE
PAVEMENT STRIPING
WATER MAIN
WATER SERVICE
SEWER MAIN
SEWER SERVICE
OVERHEAD ELECTRIC
ELECTRIC
CATV
TELEPHONE
GAS
STORM SEWER
CONTOUR 6158

NOTES

1. SURVEY COMPLETED BY TUTTLE SURVEYING SERVICES. REFER TO ALTA/ASCM LAND TITLE SURVEY DATED 10/08/20 FOR EXISTING CONDITIONS INFORMATION. DATE OF SURVEY SEPTEMBER 5–8, 2020.
2. BASIS OF BEARINGS: #5 REBAR WITH ALUMINUM CAP LS #5933 AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.
3. CONTOUR INFORMATION OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA, STATE PLANE NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY IN AREAS CRITICAL TO DESIGN.

PRELIMINARY
NOT FOR
CONSTRUCTION

COLORADO 811
CALL BEFORE
YOU DIG
Utility Notification
Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG

DRAWN BY: MGG
CHECKED BY: MGG
DATE: 1/21/2021
FILE:
SCALE 1" = 40'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 · FAX (970) 945-2555
WWW.HCENG.COM

BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY GRADING PLAN
SHEET 1

PROJECT NO.
2201044.00

GR1

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

Curve is fairly sharp.

Grading not practical through parking

Intersections should be T, how will they be controlled

FLAT TOPS VIEW DR.

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN–OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
	FIRE HYDRANT	BEND W/THRUST BLOCK
	WATER VALVE	FIRE HYDRANT
	WATER MANHOLE	INLET
	GAS METER	CURB INLET
	TELEPHONE PEDESTAL	STORM MANHOLE
	LIGHT POLE	SANITARY MANHOLE
	UTILITY POLE	SANITARY CLEANOUT
	SIGN	CABLE MANHOLE
		ELECTRIC MANHOLE
		ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT–OF–WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS SS	SS SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
STORM SEWER		
CONTOUR	6158	6158

NOTES

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FILE:
SCALE 1" = 40'

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GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY GRADING PLAN

SHEET 2

PROJECT NO.
2201044.00

GR2

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PRELIMINARY
NOT FOR
CONSTRUCTION

Gas + electric should have appropriate separation.

Storm/irrigation/sanitary considered the same + should maintain appropriate separation from potable water

WULFSOHN RD.

EXISTING CURB CUT TO BE REMOVED

CONNECT TO EXISTING WATERMAIN STUB PER CITY OF GLENWOOD SPRINGS STANDARDS

EXISTING 24" STORM PIPE "1B"

INSTALL MANHOLE ON EXISTING STORM SEWER

144.48

14.00'–12" HDPE @ 2.00%

229.99'–12" HDPE @ 0.75%

14.00'–12" HDPE @ 2.00%

229.98'–12" HDPE @ 0.75%

14.00'–12" HDPE @ 5.70%

134.80'–12" HDPE @ 11.27%

333.20'–12" HDPE @ 1.00%

8" D.I.P. WATER MAIN

399.94'–8" PVC @ 1.09%

227.80'–8" PVC @ 1.09%

SAN–MH7

SAN–MH6

63.43'–12" HDPE @ 2.24%

57.58

6" PVC SANITARY SERVICE, TYP.

24.00'–12" HDPE @ 1.00%

141.55'–12" HDPE @ 5.37%

6" D.I.P. WATER SERVICE, TYP.

8" D.I.P. WATER MAIN

52.92'–12" HDPE @ 4.13%

316.86'–8" PVC @ 1.63%

SAN–MH13

62.32'–12" HDPE @ 3.62%

135.95'–12" HDPE @ 9.03%

24.00'–12" HDPE

118.56'–12" HDPE @ 10.77%

EXISTING STORM SEWER TO BE ABANDONED/REMOVED

8" D.I.P. WATER MAIN

INSTALL MANHOLE ON EXISTING STORM SEWER

LEGEND

EXISTING	PROPOSED
STORM MANHOLE	WATER SHUTOFF VALVE
SANITARY CLEAN–OUT	WATER VALVE
SANITARY MANHOLE	TEE W/THRUST BLOCK
FIRE HYDRANT	BEND W/THRUST BLOCK
WATER VALVE	FIRE HYDRANT
WATER MANHOLE	INLET
GAS METER	CURB INLET
TELEPHONE PEDESTAL	STORM MANHOLE
LIGHT POLE	SANITARY MANHOLE
UTILITY POLE	SANITARY CLEANOUT
SIGN	CABLE MANHOLE
	ELECTRIC MANHOLE
	ELECTRIC TRANSFORMER

BOUNDARY
RIGHT–OF–WAY
EASEMENT
STRUCTURE
ASPHALT
GRAVEL
CONCRETE
RETAINING WALL
CENTERLINE ROAD
CURB AND GUTTER
FLOWLINE
PAVEMENT STRIPING
WATER MAIN
WATER SERVICE
SEWER MAIN
SEWER SERVICE
OVERHEAD ELECTRIC
ELECTRIC
CATV
TELEPHONE
GAS
STORM SEWER

NOTES

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GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY PLAN
SHEET 1

PROJECT NO.
2201044.00

UT1

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

CONNECT TO WATERMAIN STUB PER CITY OF GLENWOOD SPRINGS STANDARDS

EXISTING 24" STORM PIPE "1C"

INSTALL MANHOLE ON EXISTING STORM SEWER

8.45'–12" HDPE @ 2.00%

157.17'–12" HDPE @ 1.00%

38.12'–12" HDPE @ 1.00%

8" D.I.P. WATER MAIN

258.95'–12" HDPE @ 1.73%

172.95'–8" PVC @ 1.09%

258.22'–8" PVC @ 1.09%

52.91'–12" HDPE @ 1.00%

SAN–MH5

SAN–MH4

Does this connection work?

67.50'–8" PVC @ 1.00%

194.55'–8" PVC @ 9.45%

CONNECT TO EXISTING SANITARY MANHOLE PER CITY OF GLENWOOD SPRINGS STANDARDS

SAN–MH1

SAN–MH2

266.85'–8" PVC @ 6.50%

24.00'–12" HDPE @ –1.00%

60.25'–12" HDPE @ –8.63%

CONNECT TO EXISTING STORM INLET PER CITY OF GLENWOOD SPRINGS STANDARDS

SAN–MH3

42.51'–8" PVC @ 6.65%

SAN–MH8

Do these X's work in the inlet?

38.38'–12" HDPE @ 1.00%

187.37'–8" PVC @ 7.70%

24.00'–12" HDPE @ –1.00%

60.44'–8" PVC @ 4.50%

SAN–MH9

216.16'–12" HDPE @ 8.53%

70.74'–12" HDPE @ 0.98%

Cleanout?

8" D.I.P. WATER MAIN

216.91'–12" HDPE @ 5.65%

258.60'–8" PVC @ 1.63%

214.10'–8" PVC @ 6.10%

SAN–MH12

SAN–MH11

SAN–MH10

6" PVC SANITARY SERVICE, TYP.

181.46'–12" HDPE @ 9.74%

EXISTING STORM PIPE TO BE ABANDONED/REMOVED

6" D.I.P. WATER SERVICE, TYP.

24.00'–12" HDPE @ 1.00%

45.18'–12" HDPE @ 1.00%

8" D.I.P. WATER MAIN

224.00'–12" HDPE @ –4.25%

200.51'–12" HDPE @ 9.10%

48.69'–12" HDPE @ 2.00%

28.24'–12" HDPE @ 2.00%

60.33'–12" HDPE @ 12.31%

Storm should maintain same separation requirements as sanitary

Easements around hydrants & transformers

recommend Conc pan

will this slope be prone to sediment separation?

93.82'–12" HDPE @ 14.88%

INSTALL MANHOLE ON EXISTING STORM SEWER

EXISTING 12" STORM PIPE

EXISTING 12" STORM PIPE "1C"

LEGEND

	EXISTING	PROPOSED
	(D) STORM MANHOLE	WATER SHUTOFF VALVE
	(C) SANITARY CLEAN–OUT	WATER VALVE
	(S) SANITARY MANHOLE	TEE W/THRUST BLOCK
	FIRE HYDRANT	BEND W/THRUST BLOCK
	WATER VALVE	FIRE HYDRANT
	(W) WATER MANHOLE	INLET
	GAS METER	CURB INLET
	TELEPHONE PEDESTAL	(D) STORM MANHOLE
	LIGHT POLE	(S) SANITARY MANHOLE
	UTILITY POLE	(C) CABLE MANHOLE
	SIGN	(E) ELECTRIC MANHOLE
		E ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT–OF–WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS SS	SS SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
STORM SEWER		

NOTES

1. SURVEY COMPLETED BY TUTTLE SURVEYING SERVICES. REFER TO ALTA/ASCM LAND TITLE SURVEY DATED 10/08/20 FOR EXISTING CONDITIONS INFORMATION. DATE OF SURVEY SEPTEMBER 5–8, 2020.
2. BASIS OF BEARINGS: #5 REBAR WITH ALUMINUM CAP LS #5933 AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.
3. CONTOUR INFORMATION OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA, STATE PLANE NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY IN AREAS CRITICAL TO DESIGN.

COLORADO 811 CALL BEFORE YOU DIG Utility Notification Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG

DRAWN BY: MGG
CHECKED BY: MGG
DATE:
FILE: SCALE 1" = 40'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 • FAX (970) 945-2555
WWW.HCENG.COM

BLD GROUP, LLC
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY PLAN
SHEET 2

PROJECT NO.
2201044.00

UT2

From:	Dan Roper
To:	Trent Hyatt; Brian Smith
Cc:	Nathan Mohrmann; Lisa DiNardo; Adrian J. Brown
Subject:	Glenwood Meadows Development Review Comments
Date:	Friday, February 19, 2021 1:33:53 PM
Attachments:	L1.3 sheet.JPG L1.8 sheet.JPG image001.png

Trent,
Our comments for the Glenwood Meadows Development are below and the attached documents supports those. If you have any questions please let me know. Thanks.
Dan

Landscaping and Irrigation

~ Please provide an updated plant list with species, locations and quantities.
~ Please provide a detailed permanent irrigation plan.

Plant species not suited to our semi-arid climate or unsuitable selection.
~ Red Maple *Acer rubrum* - Colorado soils are alkaline (7.0 to 8.3) and the Red Maple prefers soils with a soil Ph of 7.4 and less. It also does not grow well in hot/dry locations.

~ Thinleaf Alder *Alnus tenuifolia* - prefers moist and wet sies. Ideal for wetland and riparian areas however, not suitable to upland landscapes.

~ Water Birch *Betula occidentalis* - Requires acidic and moist soils, not suitable for upland landscapes.

~ Many communities are not planting Ash trees (Fraxinus spp.) due to an exotic pest, the Emerald Ash Borer. This invasive insect has killed hundreds of millions of ash trees in North America and cost municipalities, property owners, nursery operators and forest products industries hundreds of millions of dollars. Let's substitute with a Linden, Expresso Kentucky Coffeetree, or an Elm variety or other suitable species.
~ Narrowleaf Cottonwood *Populus angustifolia* - Not appropriate for residential or commercial landscapes. This suckering Colorado native is found along streambanks and wet areas. It's profuse suckering (to hold riverbanks) causes havoc to water and sewer lines and building foundations.
~ Pagoda Dogwood *Cornus alternifolia* - prefers an acidic and organically rich with consistent soil moisture whose best performance occurs in cool summer climates. Substitute with Eastern Redbud *Cercis canadensis*, Wasatch maple *Acer grandidentatum,* 'Autumn Brilliance' Serviceberry *Amelanchier x grandiflora.*

Playground and Recreation Facilities:
With the close proximity of the Community Center we would recommend not building tennis courts.
We strongly recommend inclusion of appropriate outdoor spaces to support the residential needs of the proposed density level. Evaluation of formal complaints to the City demonstrates a necessity for a smaller park with a dog run area, playground, small turf and picnic area.
For any playground installations we would recommend separate playgrounds that are suited to specific age ranges. (Ages 2-5, 5-12)
Fenced dog runs with appropriate bear proof trash cans and dog waste bags.

Stairway Connection to Glenwood Meadows:
Due to the north facing aspect of the stairs they should be heated for safe winter maintenance.

Trails & Open Space:

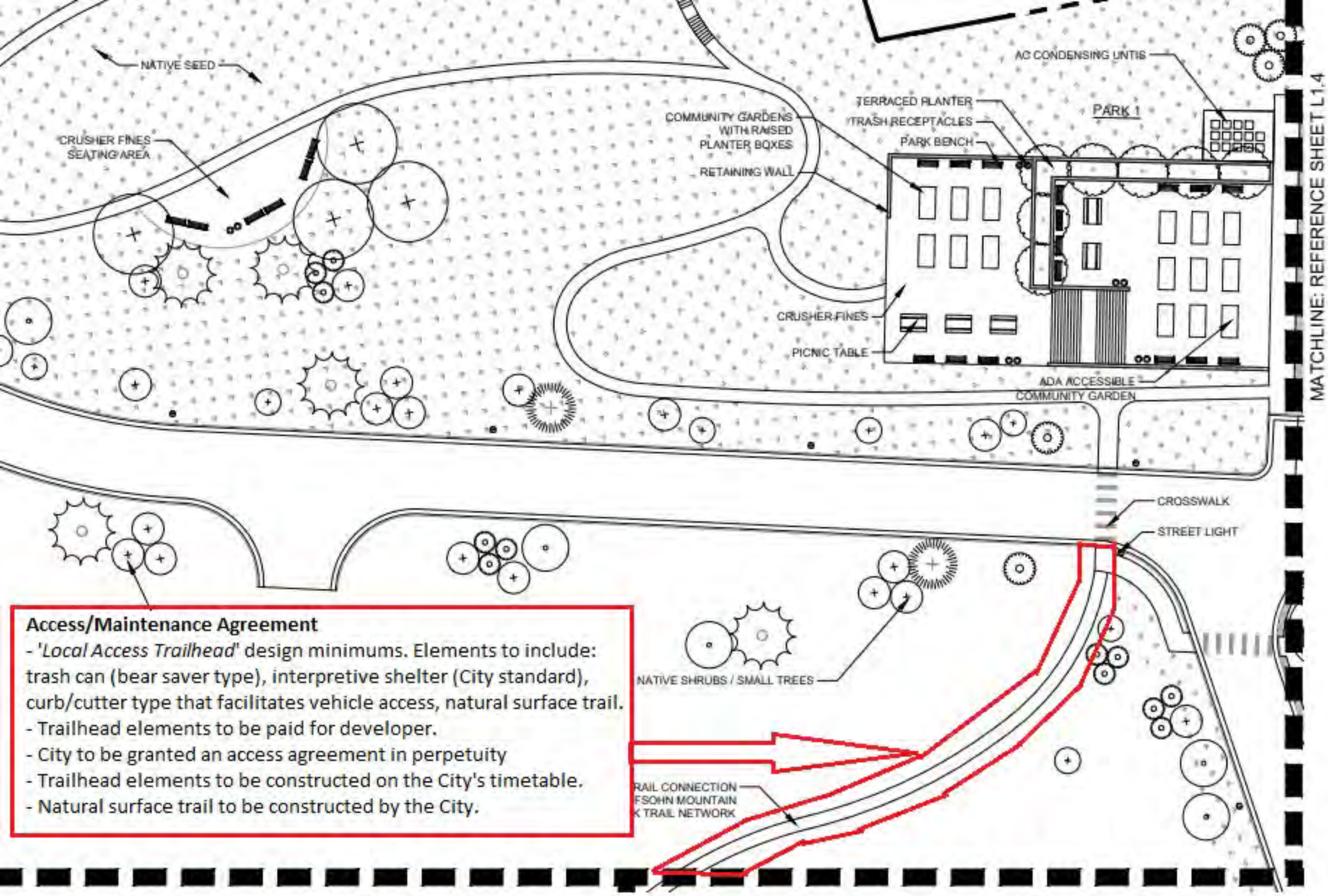
The attached documents reference the Trials & Open Space aspect of the plans.

Access/Maintenance Agreement.

"Local Access Trailhead" design minimums. Elements to include" trash can (bear saver type), interpretive shelter (City standard), cur/gutters that facilitates vehicle access, natural surface trail.
Trailhead elements to be paid for by the developer
City to be granted an access agreement in perpetuity
Trailhead elements to be constructed on the City's timetable.
Natural surface trail to be constructed by the City.

Daniel Roper
Parks Superintendent
Office: 970-384-6366
Cell: 970-471-6394

CITY OF GLENWOOD SPRINGS
PARKS AND RECREATION



GLENWOOD MEADOWS MULTI FAMILY HO

LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER: DATE: 2020.12.28

REVISIONS: SUBMITTAL #2: 2021.01.22

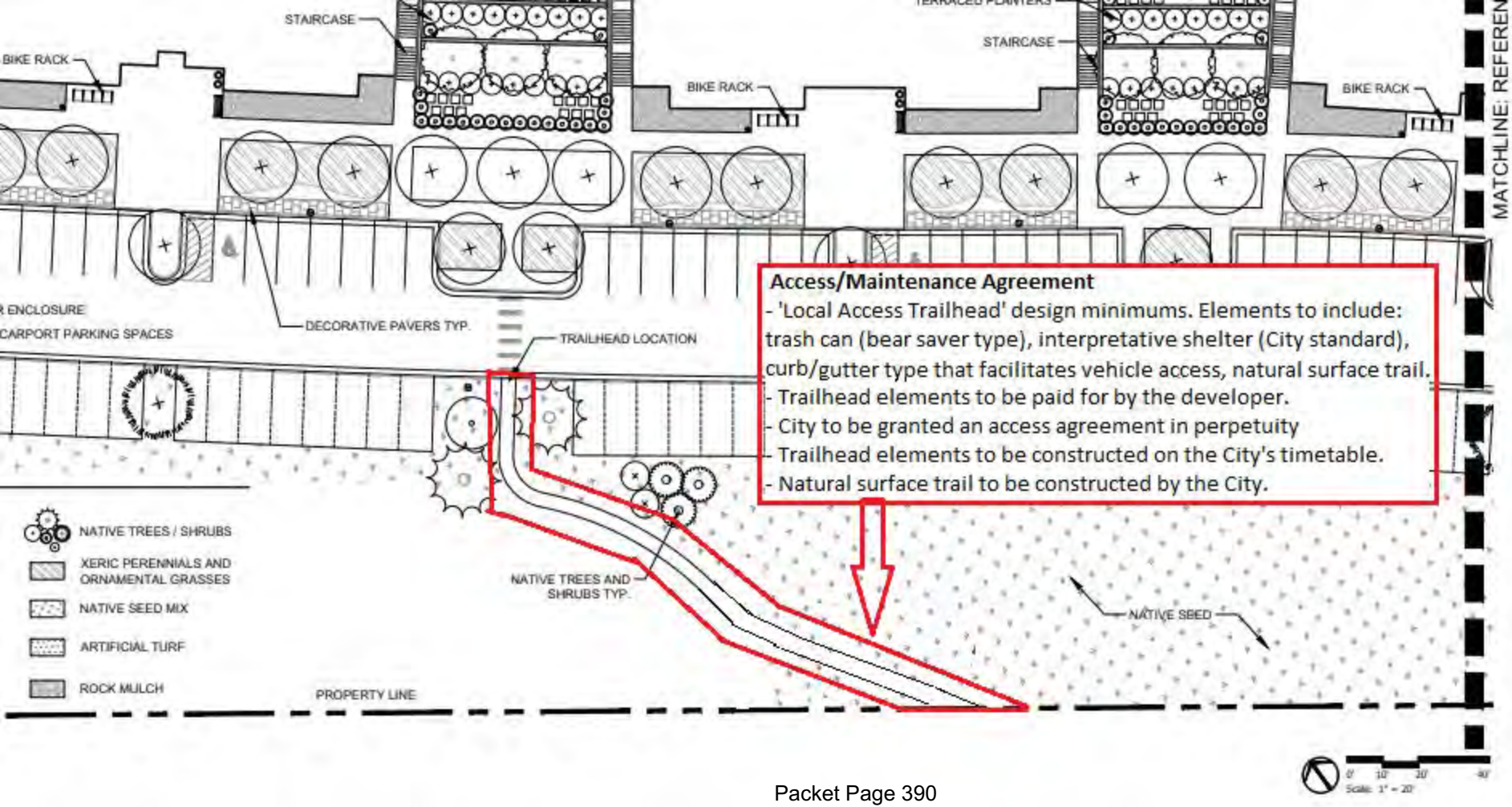
JOB DESCRIPTION: MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE: SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER: L1.3

SHEET OF



GLENWOOD MEADOWS
LOT 11C-B & LOT 11C-C
GLENWOOD SPRINGS, COLORADO

PROJECT NUMBER: DATE: 2020.12.28

REVISIONS: SUBMITTAL #2: 2021.01.22

JOB DESCRIPTION: MAJOR SITE / ARCHITECTURE REVIEW

SHEET TITLE: SITE PLAN ENLARGEMENT

SCALE:

SHEET NUMBER: L1.8

SHEET OF

Matthew Langhorst DPW
(970) 384-6438 (o)

CITY OF GLENWOOD SPRINGS PUBLIC WORKS

101 West 8th Street
Glenwood Springs, CO 81601

Planning Item:	**60-20 BLD Major Site/Architectural Plan Review and Minor Subdivision**
Applicant:	**BLD Group**
Owner:	**Glenwood Meadows, LLC**
Location:	**Lot 11C-B and 11 C-C, Glenwood Meadows Sub. No. 6**
Parcel:	**2185-081-41-002 and 2185-081-41-003**
Date of Comments:	**02/19/2021**

The following are W/WW Department comments based on the application package dated 1-21-2021.

W/WW Department Comments

- All water and wastewater utilities proposed for this project outside of public ROWs will be considered private and not maintained by the City. Water valves, manhole connections and sewer wyes will be considered private/public delineation points.
- All sanitary sewer, sewer laterals, water mains and water services shall have a tracer wire installed.
- The water, sewer and electric details need to follow city standards details at the City of Glenwood Springs Engineering Department website, Engineering Standards.
- There is no irrigation detail. The Glenwood Meadows area is irrigated by a raw water system. Please show how this development proposes to incorporate that system for its use. There is a raw water main stub out located next to the proposed water and sewer main connection points on flat tops drive. There is also smaller service location on Wulfsohn Rd.
- All Fire hydrants must have a 15' easement centered on the hydrant. Leads, valves and access to the hydrant will also need to have an easement for access and maintenance. The City will own and maintain all fire hydrants, leads and valves. The City will require access easements to each 15' hydrant easement if they are not adjacent to a public ROW.
- All services that are to be used for combined Fire/Domestic water must be designed and constructed to NFPA24 requirements and will be considered private. Needs to be shown in detail…thrust block calculations, restrains.
- Provide riser room details for the fire/domestic water services and how the proposed buildings are intended to be metered.
- All wet utilities will require restrained joints/bells within the entire project area.
- Water and Sanitary/Storm Sewer Crossings will need to be shown in future plans in a profile plan. All water and sewer crossings must have 10' horizontal separation or 18" vertical. If these distances can't be maintained encasement or sleeving will be required.

- Water and storm crossings may require insulation if proper bury depth can't be maintained.

W/WW Department Contact Information:

- Mike Hoffman – 384-6343 (W/WW Information)
- Utility Billing – 384-6400 (Account setup; Water Meter Purchase)
- Community Development Department – 384-6411 (Improvements Fees)

The following are Electric Department comments based on the application package dated 1-21-2021.

Electric Department Comments

- Owner will be responsible for cost associated with the line extension and or relocation through the ROW/property and all infrastructure for the new development.
- Owner will be responsible for all work involving new construction, final service layout and site planning will need to be coordinated with the City of Glenwood Springs Electric Department.
- A new switch gear will need to be set at the new intersection with Wulfsohn Road to supply electric back to the development. A connection from the switch gear vault at the lofts will need to be made back to the electric vault on Flat Top Roads, this line could be run with the 24" storm sewer that is being proposed to tie into Lofts system. Internal transformer locations and line looping to be coordinate with GWSE.
- Owners GC/excavation company will be responsible for all trenching, including the line extension trenches to new transformer locations, electric primary and secondary conduit installation, electric pull vaults and transformer vaults.
- The Costing Proposal will be paid in full prior to any work commencing. Any additions to the proposal will be due at time of completion of work or any saving will be refunded at time of completion of work.
- Contractor to install a 2" electrical conduit adjacent to the main electrical run to be slept up at pedestal locations for Broadband installation. Fiber to be brought to builds at service locations shown on plans.
- Developer to supply a Load Calculation form to the City of Glenwood Springs Electric Department for review and planning.
- Any work done outside of the owners needs for this property will be the responsibility of the City of Glenwood Springs Electric Department. City will coordinate with the GC with any city needs.
- Any street lightings outside of a Public ROW will need to be a part of the HOA electric system and power paid for be the HOA.
- Xcel is not the power or gas supplier in this location per the Utility Report, City of Glenwood Springs Electric and Black Hills Energy are the correct contacts.

- The Electric design, details and clearances need to follow City Engineering Standards details located at the City of Glenwood Springs Engineering Department website, Engineering Standards.
- If the developer has any information on the additional 175 units noted on within the reports, it would be advisable to plan for electric layouts/conduits for the possible expansion at this time.

Electric Department Contact Information:

- Doug Hazzard – 384-6353 (Electric Information)
- Utility Billing – 384-6400 (Account setup; Water Meter Purchase)

The following are Public Works Department comments based on the application package dated 1-25-2021.

PW Department Comments

- The storm sewer system within the Glenwood Meadows development is owned and operated by the Metro District. The district should be a review agency for these plan sets.
- The City's broadband department can add another communications option to the residents of this development if the developer would like to work with CBN to plan for high-speed fiber connections to the buildings.
- The City would like to have a discussion with the developer on Public ROWs and what the developer's intentions are for dedications. The City can see a small benefit to taking ROW along the main Flat Top View Drive roadway alignment from the connection with existing Flat Top View Drive all the way back to its new connection at Wulfsohn Road. The City would not maintain the parking areas along this roadway nor shovel sidewalks along this segment of road. The City would be looking at ROW that encompasses the area from Top back of roadway curb to top back of roadway curb, not parking area curb. It would be desirable to have snow storage locations at either end of the building areas and possibly down the center of the roadway for easy of plowing and snow removal.
- The City would suggest some form of velocity reducing manhole at the debris pond storm sewer connection.
- After review of the soils report it seems that there are risks associated with the site that the report did not review in detail due to those risks not being part of the consultant's scope of services. See comments in the inherent risks section that are labelled "outside scope of services" and owner is completely responsible for taking all risks associated with any future potential for instability at the site or in the site vicinity area type comments.
- No topographic slopes were labeled thus these comments are generic. Geotech report calls for no structures within 25' of a crest of a slope that is 2.5:1. The lower row of structures appears to be within 25' of a crest of a slope, but the slopes below are not labeled for verification of the report note.
- The slopes to the south of the development that lead to the proposed roadway appear to be quite steep and will be an erosion and revegeation issue for the development. These

roadways lead directly to storm water intake structures and piping that could be clogged with excess material flowing them, thus causing downstream issues.

- The Geotech report notes that the soils are highly susceptible to water erosion and moderately susceptible to wind erosion. During construction dust mitigation will be a significant issue with the site as the City has learned with other projects in this area. Excessive dust from the working face will not be acceptable and must be properly mitigated.
- The Geotech report notes that plantings around the structures should eb either Xeriscaping, landscaping gravel or plants with low moisture requirements.
- The Geotech report notes that slopes away from the buildings should be a minimum of 6' in 5' for landscaping areas or 2% for hardscape areas. This cannot be verified on the current drawing set, engineer of record to confirm slopes away from structures.
- Contractor should confirm the trenching backfill material that is acceptable in this area, previous potions of the development have utilized gravel materials, which has caused underground water to use the trenches as river passages and flood manhole locations during certain times of the year.
- Full depth pavement will not be accepted in any areas that are deemed public ROW and possibly maintained by the City. Full depth asphalt is not recommended, it has shown not to be successful in other areas of the Glenwood Meadows Development.
- 4.5 " of asphalt over 6" of ABC for heavy traffic areas is not recommended, it has sown not to be successful in other areas of the Glenwood Meadows Development. Thicker asphalt and base course sections have shown promise in stability and longevity.
- The Geotech report notes that asphalt overlays should be completed every 5-6 years on asphalt sections of pavement. What does the Geotech considered an appropriate overlay material and thickness being that overlay is a generic term.

Public Works Contact Information:

- Matthew Langhorst – 384-6438 (PW Director)

Development Review Comments

Linda DuPriest, AICP

02/21/2021

60-20 BLD; Glenwood Meadows

My review of this application concerns access to transit, accessible pedestrian routes and sidewalk requirements, and bicycling.

Access to transit – With the project proposing hundreds of multifamily units situated along a primary transit route for not just Glenwood Springs but for our entire Colorado and Roaring Fork valleys, this development has an opportunity to do it right by making it easy for residents to get to bus stops, not just for able bodied folks but for mobility impaired, too. Plus, with the potential housing located close to shopping at the Meadows plus Downtown, this development needs a roadway or a street, with direct sidewalks from one end to the other (not the proposed meandering walkways among the buildings) and ultimately some bike route signage and markings.

RFTA and Ride Glenwood stops at west end of Lofts development – This stop serves the RFTA Valley Local, VelociRFTA BRT and Ride Glenwood, yet there is no reasonably direct ADA compliant pedestrian route from the majority of the proposed housing development. There are no sidewalks along Wulfsohn included, no sidewalk along the access road at the far west end of the site and no hard-surface sidewalk or path from either of the two levels of buildings. The switchback soft surface path through the small park at the west end is the only pedestrian facility from this entire development that does not include multiple levels of stairs, and as is it soft surface does not comply with ADA.

The middle and east section are similarly cut off from access to the Bus Stop, unless people walked all the way past the Glenwood Greens housing development to East Meadows Drive, then doubled back in front of the Lofts to the bus stop.

While this is a very hilly site, it seems that the designers could come up with better access to the key transit stops already provided by the Meadows, to help Glenwood's goals toward reducing traffic and maintaining quality of life.

Comments:

- Require sidewalk along Wulfsohn from the west end of the property to existing sidewalk at Meadows/Lofts (access to transit stop)
- Require sidewalk along access road at west end of the site
- Provide direct sidewalk along the entire length of both sections if roadways are not to be built; in other words, make it possible to walk the length of this property without having to meander behind all the head-in parking bays
- Provide ADA compliant elevators within this property to get mobility impaired residents from up the hills down to Wulfsohn Rd and the transit stops.

July 2, 2021

Trent L. Hyatt
Senior Planner
City of Glenwood Springs
101 W. Eighth Street
Glenwood Springs, CO 81601
trent.hyatt@cogs.us

RE: Glenwood Meadows Multifamily Housing, Response to City Comments

Trent,

The following letter is submitted on behalf of the applicant, BLD Group, in response comments received from City staff and referral departments related to the current Major Architectural Review application as submitted to the City of Glenwood Springs Community Development Department. Comments and the applicant's responses are compiled by department, presented in the order received, and each comment received is addressed herein. We believe that these items have been adequately addressed with this additional information.

We have also refined an important component of the programming related to the clubhouse operations and access to and from the child care operation (on-site) and the RFTA transit station on Wulfsohn Road, west of the project. The child care operation will be available for the general public to access and reserve available classroom spaces. A shuttle, operated by the owner, will circulate from the clubhouse to the Wulfsohn Road RFTA park and ride, providing convenient access between the project to the public transit system.

Community Development, General

1. Additional information regarding anticipated traffic impacts and necessary mitigation is needed as outlined in various comments from other departments.

   Response: *Please review the letter from Balcomb & Green to Trent Hyatt dated January 8, 2021, which discussed that the ADA and associated documents accounted for all traffic-related impacts at the time of annexation, and that only a traffic impact statement is necessary. Nonetheless, recently Applicant voluntarily agreed to contribute a traffic impact fee to further offset any impacts of Applicant's development. This fee was memorialized in the May 2021 Memorandum of Understanding with the City.*

2. The City may wish to accept the Flat Tops View Drive extension into our road system. Further conversations with Public Works are necessary to determine feasibility. Doing so may encourage compliance with the "hierarchy of streets" intended by Section V.F of the *Glenwood Meadows Zoning and Development Plan* (GMZDP). Currently, it seems that only one access type is provided which serves mainly as a parking lot for the specific development. Please provide a typical cross section for proposed roads/driveways.

***Response**: At this time the applicant's intent, as coordinated with City staff, is to maintain the internal driveway network in private ownership and provide easements as necessary for access to publicly-owner infrastructure. Should the Applicant and City agree to a dedication of public right-of-way, a variance for specific dimensional standards may be necessary given the current roadway configuration within the property.*

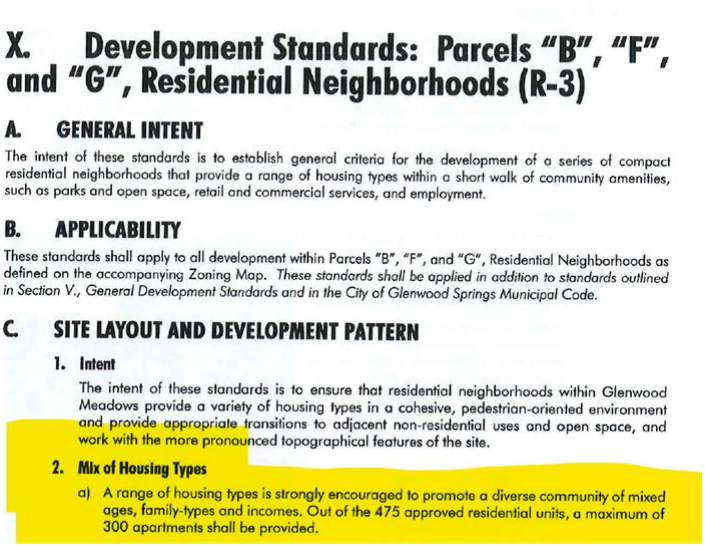
3. Sidewalks are required along internal and external project streets (i.e. Flat Tops View Drive extension and Wulfsohn Road.) Please clarify.

   ***Response:** Sidewalks have been added along Flat Tops View Drive extension and Wulfsohn Road. See revised sheet set.*

4. Please clarify if the project is to be completed in multiple phases and provide related information, if applicable.

   ***Response**: The applicant's intent is to complete construction of the proposed improvements in a single phase, with individual buildings or groups of buildings occupied as they are completed.*

5. The GMZDP outlines the following regarding multiple housing types.



X. Development Standards: Parcels "B", "F", and "G", Residential Neighborhoods (R-3)

A. GENERAL INTENT

The intent of these standards is to establish general criteria for the development of a series of compact residential neighborhoods that provide a range of housing types within a short walk of community amenities, such as parks and open space, retail and commercial services, and employment.

B. APPLICABILITY

These standards shall apply to all development within Parcels "B", "F", and "G", Residential Neighborhoods as defined on the accompanying Zoning Map. *These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.*

C. SITE LAYOUT AND DEVELOPMENT PATTERN

1. Intent

The intent of these standards is to ensure that residential neighborhoods within Glenwood Meadows provide a variety of housing types in a cohesive, pedestrian-oriented environment and provide appropriate transitions to adjacent non-residential uses and open space, and work with the more pronounced topographical features of the site.

2. Mix of Housing Types

a) A range of housing types is strongly encouraged to promote a diverse community of mixed ages, family-types and incomes. Out of the 475 approved residential units, a maximum of 300 apartments shall be provided.

***Response:** Applicant understands the ADA encourages a diversity of housing types within the Meadows Development. The ADA also expressly allows up to 300 commercial apartment units. Diversity in housing types proposed for this specific application includes a range of unit types from studio to 3 bedrooms. In addition, three different building types are proposed in this application. Diversity in income levels is provided in aggregate between the Red Mountain Lofts (market rate) and the Glenwood Green Apartments (40/60/80% AMI units). The approvals provide for another 115 units to be developed on the fathering parcel(s); these units are envisioned as free market units of a zero-lot line or townhome format, further increasing the diversity of housing in the Meadows.*

Community Development, Cover Sheet

6. Please call out the project basis of bearings & benchmarks.

   Response: *ALTA/ACSM Land Title Survey contains this information and has been added to the submittal. See revised sheet set.*

7. Please add a FEMA floodplain statement outlining the applicable community map number and date and the designated flood zone.

   Response: *ALTA/ACSM Land Title Survey contains this information and has been added to the submittal. The applicable FEMA FIRM maps are: 0802051432B, effective on 01/03/1986 (Zone D); and 0802051431B, effective on 01/03/1986 (Zone D). See revised sheet set.*

8. Please add a geologic hazards disclosure similar to the following: "This property is subject to geologic hazards per the adopted mapping by the City of Glenwood Springs. Hazards to note are _____. A final Geologic Hazard Report will be submitted upon application of a building permit.

   Response: *Off-site geological hazards have been mitigated in accordance with the Glenwood Meadows Debris Flow Mitigation Plan. As an entitled property within the Glenwood Meadows Metropolitan District(s), the subject parcel will participate in the maintenance of the debris flow and drainage structures designed and built to mitigate the off-site geologic hazards. The debris mitigation structure was built by the Glenwood Meadows Metropolitan Districts on land donated to the City and Glenwood Meadows Metropolitan District No. 1. The metro district is responsible for maintenance. Expenses are paid by all properties protected by the structure. This assessment also applies to certain City of Glenwood Springs and Roaring Fork Transportation District sites. The subject parcel is in Glenwood Meadows Metropolitan District No. 2 and subject to this assessment. On site geological conditions are identified, with preliminary recommendations, in the current preliminary geotechnical report. These recommendations will be finalized for permit submittal.*

9. Please add a note outlining proposed public facilities or contributions related to the development.

   Response: Please review Applicant's prior letters to staff detailing the extensive public contributions related to the Glenwood Meadows development at the time of annexation, including off site traffic improvements, and extensive public dedications of open space. The ADA was clear that no further exactions were allowed as a result of future development applications. Nonetheless, Applicant collaborated with the City to voluntarily enter into the May 2021 MOU, which contributes additional funds toward water and sewer infrastructure, in addition to traffic impact fees.

10. Please project a project summary table similar to that depicted below. Please call out required (as opposed to existing)/provided numbers, where applicable. It does not appear that 40% of the site is proposed as open space. Please clarify. Please call out the area/percentage (which is a portion of the overall open

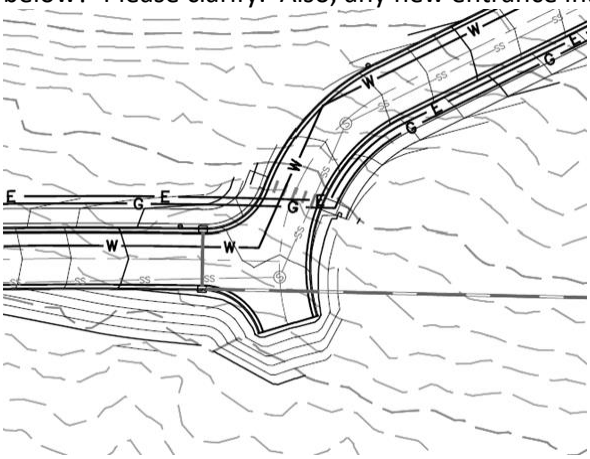
space) proposed as common open space per Section V.J.4.a of the *Glenwood Meadows Zoning and Development Plan*. Sheet L1.1 provides details relative to site amenities. Please expand this information to include a list of amenities and the areas associated with each.

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

Response: *Please see project summary table provided in the revised planset.*

Community Development, Site Plan (Sheet L1.0)

11. Can a smaller, gentler curve be provided along the extension of Flat Tops View Drive depicted below? Please clarify. Also, any new entrance into the adjacent property shall occur at a 90 degree angle.



Response: The layout of the extension of Flat Tops View has been modified to eliminate the three-way intersection and to accommodate the future access to Lot 3 via a perpendicular intersection. See plan set for modified alignment and grading.

12. Sidewalks are required along internal and external project streets (i.e. Flat Tops View Drive extension and Wulfsohn Road.) Please clarify.

Response: *Sidewalks have been added along Flat Tops View Drive extension and Wulfsohn Road. See revised sheet set.*

13. Section X.C.3 of the GMZDP outlines the need for blocks within the residential parcels having a maximum length of 500 feet or 800 feet with midblock pedestrian crossings. Please clarify.

    Response: *The arrangement of the site plan is responsive to the intent of section X.C, with the neighborhood arranged "in a pattern of blocks and interconnecting streets…defined by buildings, streetscape, sidewalks and trails." The site plan provides for clear pedestrian circulation along streets, between buildings, and to trails and adjacent pedestrian network. The site plan is also directly responsive to the challenges presented by the existing topography of the site.*

14. Section X.C.7.a of the GMZDP states that each residential parcel shall be considered its own neighborhood that includes a mix of housing types. Please clarify.

    Response: *This project is located on a portion of what was originally Parcel K, which was 17 acres, and also includes the Glenwood Green Apartments. The ADA also expressly permits up to 300 commercial apartment units on this parcel. The project encompasses a portion of one development parcel. Diversity in housing types proposed for this application includes a range of unit types from studio to 3 bedrooms. In addition, three different building types are proposed in this application. Diversity in income levels is provided in aggregate between the Red Mountain Lofts (market rate) and the Glenwood Green Apartments (40/60/80% AMI units). The approvals provide for another 115 units to be developed on the fathering parcel(s); these units are envisioned as free market units of a zero-lot line or townhome format, further increasing the diversity of housing in the Meadows.*

15. Section X.D.2.b of the GMZDP requires that a maximum of 50 percent of the street frontage is occupied by parking. Please clarify.

    Response: *The internal vehicle network will not be dedicated road right-of-way, but will be private driveways. Because of the topographic constraints of the site, there are limited areas where parking can be located. In order for the plans to comply with the minimum parking requirements, parking must occupy the driveway frontage in the level areas between the buildings. The site plan locates parking away from Wulfsohn Road, the nearest public right-of-way, and the topography of the site further conceals parking from view from adjacent public streets.*

Community Development, Architectural Elevations

16. It is difficult to gain an understanding of the mass, bulk, and scale of the total project via the drawings submitted. Please provide colored 3D perspective drawings of the proposal from all cardinal directions. Additionally, please provide typical cross sections for the entirety of the project.

    Response: *3D perspective drawings are not required for a major architectural site plan review and are not included in the formal submittal package. The project team is developing perspective drawings to be included*

in the Planning Commission packet; these will be available for review during Planning Commission and Council hearings.

17. Please provide and call out both the existing and proposed grade on each elevation.

    ***Response**: This information has been added to the elevations. See revised sheet set.*

18. Please call out the maximum height of each side of the proposed buildings from the lowest proposed grade to the midpoint of the highest roof midpoint at the proposed adjacent grade. Please see examples below and call out the greatest heights in the example with multiple lines.

    ***Response**: This information has been added to the elevations. See revised sheet set.*



19. Please provide an elevation that explains typical materials and colors proposed for the various building types.

Response: *This information has been added to the elevations. See revised sheet set.*

20. In addition to the dimensions provided, please call out the dimensions of various wall and roof sections along each elevation per the example below.



Response: *This information has been added to the elevations. See revised sheet set.*

21. Wall material coverage details are provided for all building elevations on one sheet as shown below. Please provide the applicable information on each sheet accordingly. Similarly, please provide a materials schedule on each sheet.

BUILDING TYPE II					
	NORTH ELEVATION			SOUTH ELEVATION	
	SURFACE AREA	PERCENTAGE OF NET		SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	4071	NA	GROSS WALL	3856.00	NA
NET STONE CLADDING	212.56	-	NET STONE CLADDING	#REF!	#REF!
NET SIDING	1720.9	42.3%	NET SIDING	#REF!	#REF!
NET STUCCO FINISH	1126.73	27.7%	NET STUCCO FINISH	1259.10	32.8%
NET GLAZING	1010.81	24.8%	NET GLAZING	1037.68	26.8%
	EAST ELEVATION			WEST ELEVATION	
	SURFACE AREA	PERCENTAGE OF NET		SURFACE AREA	PERCENTAGE OF NET
GROSS WALL	3270.19	NA	GROSS WALL	3270.19	NA
NET STONE CLADDING	-	-	NET STONE CLADDING	-	-
NET SIDING	2759.89	84.4%	NET SIDING	2759.89	84.4%
NET STUCCO FINISH	377.67	11.5%	NET STUCCO FINISH	377.67	11.5%
NET GLAZING	132.63	4.1%	NET GLAZING	132.63	4.1%

Response: *This information has been added to the drawing package. See revised sheet set.*

22. Please provide the following note on each elevation sheet: “These elevations are conceptual in nature. Individual building elevations may vary but will be evaluated for compliance with design standards contained within the Glenwood Meadows Zoning and Development Plan or Title 070 of the Glenwood Springs Municipal Code, where applicable, at the time of submitting a building permit application.”

Response: *This information has been added to the elevations. See revised sheet set.*

23. Each multi-family building shall provide a minimum wall offset of five feet every 50 linear feet per Section V.D.3.b of the GMZDP. It does not appear the east nor west elevations of any of the proposed buildings meet this requirement. Please clarify. Additionally, said sides severely lack glazing. Please provide additional windows.

Response: *The east and west elevations have been modified to comply with this requirement. See revised sheet set.*

24. As per Section V.D.3.c of the GMZDP, no multi-family building shall exceed 125 feet in length. It appears the clubhouse building exceeds the maximum length permitted. Please clarify.

    Response: *This code section applies to multifamily residential buildings. The clubhouse is not a multifamily residential building; it is a non-residential building.*

25. Section V.E.3.a of the GMZDP requires inclusion of one of the materials outlined below. Please clarify.

    3. Residential

    a) One or more of the following building materials shall be incorporated into a structure's design:

    (1) Split shakes;
    (2) Rough-sawn wood; or
    (3) Board and batten wood.

    Response: *This information has been added to the drawing package. See revised sheet set.*

26. Are the proposed shingles for each building high profile? Please clarify.

    Response: *Asphalt roofing shingles are identified in the materials schedules as "Certainteed Landmark Pro Solaris", a 30-year rated architectural shingle and are defined as a "dimensional" shingle..*

27. Please provide details for the dumpster enclosures.

    Response: *Representative imagery has been added to illustrate the intent for the dumpster enclosures. See revised sheet set.*

28. Please clarify the surface materials and/or amenities proposed atop the parking garages for building type 1.

    Response: *The garage designs have been modified to include a sloping roof and no longer have amenity spaces on the roof. Amenity spaces are provided between the buildings, at the clubhouse, and within the park areas.*

29. Assuming that the adjacent residual residential parcels will include lower density residential, you will likely need to consider of the transitional development standards outlined in Section X.C.8 of the GMZDP.

    Response: *Plans for the remaining development have not been developed and the density for this remainder of the parcel has not been studied in detail. This request cannot be addressed with specificity based on a theoretical future development. However, the Applicant has created conceptual layout and program studies for Lot 3 which does comply with the intent of X.C.8. Regardless of the future arrangement and format of the future development, the open space areas, pedestrian walkways, and vehicular circulation will provide buffering between housing types to meet the intent of section X.C.8.*

30. Section X.E.3.b of the GMZDP outlines the need to emphasize building entrances by extending the front façade and with materials and detailing. Please clarify.

    Response: *Additional articulation and detailing of materials is included to emphasize building entrances. See revised sheet set.*

31. Section X.E.3.c of the GMZDP states that garages shall not be a prominent streetscape element. Please clarify.

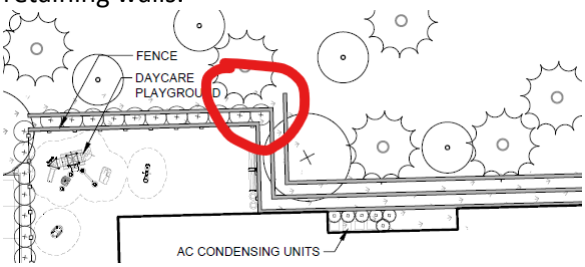
    Response: *The Garages are located at the back of the buildings and do not face any public street or right-of-way. They are built into the slope of the site and serve to retain grade between building levels.*

Community Development, Landscaping

32. I recommend providing a colorized landscaping sheet (or one of the existing representative sheets in color) to the plan set. Also, it may be helpful to see some landscaping typical sections for various areas within the project.

    Response: *Our understanding is that we have provided all of the required plans for a major architectural site plan review. The project team is developing additional illustrative drawings to be included in the Planning Commission packet; these will be available for review during Planning Commission and Council hearings.*

33. Please call out the lines features circled below as shown on sheet L1.5 (and other applicable grading sheets). If these are retaining walls, please call out the maximum height at various locations. Please note, Section V.H.6 of the GMZDP limits wall heights to a maximum of six feet, 50 feet in length without a 12 inch offset, and to three in any given area. Please clarify. Please provide design typical/details for proposed retaining walls.



    Response: *This information has been added to the site grading plans, and images depicting the materials envisioned for these walls. Final material selection and assembly details will be provided at permit submittal. See revised sheet set.*

34. Please call out proposed maximum fence heights and provide a design typical/details.

    Response: *Representative imagery has been added to illustrate the intent for internal fences. See revised sheet set.*

35. Please call out the width of parking spaces and islands or provide a typical call outs in various locations.

    Response: *This information has been added to the site plans. See revised sheet set.*

36. Is any existing landscaping proposed for preservation. Please clarify.

    Response: *Notes regarding existing landscape have been added to the sheet set.*

37. Please depict the limits of disturbance on all applicable landscaping plan sheets.

    Response: *This information has been added to the sheet set.*

38. Please depict and call out sight distance triangles for each and every intersection on various sheets.

    Response: *This information has been added to the sheet set.*

39. Please provide a chart (Sheet L1.2 may be the best location) which details/calls out the total amount of landscape and hardscape areas expressed in square feet and as a percentage of the total lot area. For parking areas, please note square footage of landscaped area and as a percentage of the parking area; include total number of required and provided trees, shrubs, and perennials. Landscaping shall be provided at the minimum rates required for the residential neighborhood district by Section V.H.9 of the GMZDP outlined below.

Use	Residential Neighborhood	A
Required Open Space	40%	
Open Space Planting	▪ 1 tree/1200 s.f. ▪ 4-shrubs/1200 s.f.	▪ ▪
Setbacks Buffers Screens	▪ 1 tree/25 l.f. ▪ 1/3 deciduous 2/3 evergreen ▪ 10 shrubs/25 l.f	▪ ▪ ▪
Midland Avenue ROW	N/A	▪ ▪
Wulfson Road ROW	▪ 1tree/35 l.f. ▪ Irregular spacing	▪ ▪
Internal Neighborhood Streets	1 deciduous tree/35 l.f. Evenly spaced	▪

    Response: *This information has been added to the sheet set.*

<u>Public Works, Water/Wastewater</u>

40. All water and wastewater utilities proposed for this project outside of public ROWs will be considered private and not maintained by the City. Water valves, manhole connections and sewer wyes will be

considered private/public delineation points.

Response: *Noted.*

41. The water, sewer and electric details need to follow city standards details at the City of Glenwood Springs Engineering Department website, Engineering Standards.

    Response: *Noted; details will comply and will be reflected in permit submittal.*

42. There is no irrigation detail. The Glenwood Meadows area is irrigated by a raw water system. Please show how this development proposes to incorporate that system for its use. There is a raw water main stub out located next to the proposed water and sewer main connection points on flat tops drive. There is also smaller service location on Wulfsohn Rd.

    Response: *Noted; connection to raw water system has been identified in the sheet set. The point of connection will be at the west end of Flat Tops View right-of-way.*

43. All Fire hydrants must have a 15' easement centered on the hydrant. Leads, valves and access to the hydrant will also need to have an easement for access and maintenance. The City will own and maintain all fire hydrants, leads and valves. The City will require access easements to each 15' hydrant easement if they are not adjacent to a public ROW.

    Response: *Noted.*

44. All services that are to be used for combined Fire/Domestic water must be designed and constructed to NFPA24 requirements and will be considered private. Needs to be shown in detail…thrust block calculations, restrains.

    Response: *Noted. Details complying with NFPA24 will be provided as required for permit submittal. The project team has developed preliminary riser room allocations within each building with the flexibility to adjust the square footage of these rooms without affecting overall building design.*

45. Provide riser room details for the fire/domestic water services and how the proposed buildings are intended to be metered.

    Response: *Noted. Details for fire/domestic service and metering will be provided as required for permit submittal. The riser room location in the lower level of the building provides flexibility to adjust non-bearing wall layout to accommodate changes in riser room dimensional requirements*

46. All wet utilities will require restrained joints/bells within the entire project area.

    Response: *Noted. This will be reflected in the permit submittal.*

47. Water and Sanitary/Storm Sewer Crossings will need to be shown in future plans in a profile plan. All water and sewer crossings must have 10' horizontal separation or 18" vertical. If these distances can't be maintained encasement or sleeving will be required.

    Response: *Noted. This will be reflected in the permit submittal.*

48. Water and storm crossings may require insulation if proper bury depth can't be maintained.

    Response: *Noted. This will be reflected in the permit submittal.*

Public Works, Electric

49. Owner will be responsible for cost associated with the line extension and or relocation through the ROW/property and all infrastructure for the new development.

    Response: *Noted; applicant assumes the division of responsibility will be memorialized in the ordinance/development agreement following project approval.*

50. Owner will be responsible for all work involving new construction, final service layout and site planning will need to be coordinated with the City of Glenwood Springs Electric Department.

    Response: *Noted; applicant assumes the division of responsibility will be memorialized in the ordinance/development agreement following project approval.*

51. A new switch gear will need to be set at the new intersection with Wulfsohn Road to supply electric back to the development. A connection from the switch gear vault at the lofts will need to be made back to the electric vault on Flat Top Roads, this line could be run with the 24" storm sewer that is being proposed to tie into Lofts system. Internal transformer locations and line looping to be coordinate with GWSE.

    Response: *This has been added to the utility plan; see revised sheet set.*

52. Owners GC/excavation company will be responsible for all trenching, including the line extension trenches to new transformer locations, electric primary and secondary conduit installation, electric pull vaults and transformer vaults.

    Response: *Noted; applicant assumes the division of responsibility will be memorialized in the ordinance/development agreement following project approval.*

53. The Costing Proposal will be paid in full prior to any work commencing. Any additions to the proposal will be due at time of completion of work or any saving will be refunded at time of completion of work

    Response: *Noted; applicant assumes the timing of financial instruments due for utility improvements will be memorialized in the ordinance/development agreement following project approval.*

54. Contractor to install a 2" electrical conduit adjacent to the main electrical run to be swept up at pedestal locations for Broadband installation. Fiber to be brought to builds at service locations shown on plans.

    Response: *Noted; applicant assumes the division of responsibility will be memorialized in the ordinance/development agreement following project approval.*

55. Developer to supply a Load Calculation form to the City of Glenwood Springs Electric Department for review and planning.

    Response: *The applicant has provided preliminary load calculations and coordinated preliminary transformer locations with City staff for planning purposes. Final load calculations will be developed by the project's MEP Engineer for permit submittal.*

56. Any work done outside of the owners needs for this property will be the responsibility of the City of Glenwood Springs Electric Department. City will coordinate with the GC with any city needs.

    Response: *Noted.*

57. Any street lightings outside of a Public ROW will need to be a part of the HOA electric system and power paid for be the HOA.

    Response: *Noted.*

58. Xcel is not the power or gas supplier in this location per the Utility Report, City of Glenwood Springs Electric and Black Hills Energy are the correct contacts.

    Response: *Noted.*

59. The Electric design, details and clearances need to follow City Engineering Standards details located at the City of Glenwood Springs Engineering Department website, Engineering Standards.

    Response: *Noted. Standards will be reflected in the permit submittal.*

60. If the developer has any information on the additional 175 units noted on within the reports, it would be advisable to plan for electric layouts/conduits for the possible expansion at this time.

    Response: *Noted.*

Public Works, General

61. The storm sewer system within the Glenwood Meadows development is owned and operated by the Metro District. The district should be a review agency for these plan sets.

Response: *Noted.*

62. The City's broadband department can add another communications option to the residents of this development if the developer would like to work with CBN to plan for high-speed fiber connections to the buildings.

    Response: *Noted. The applicant will review options as the project advances.*

63. The City would like to have a discussion with the developer on Public ROWs and what the developer's intentions are for dedications. The City can see a small benefit to taking ROW along the main Flat Top View Drive roadway alignment from the connection with existing Flat Top View Drive all the way back to its new connection at Wulfsohn Road. The City would not maintain the parking areas along this roadway nor shovel sidewalks along this segment of road. The City would be looking at ROW that encompasses the area from Top back of roadway curb to top back of roadway curb, not parking area curb. It would be desirable to have snow storage locations at either end of the building areas and possibly down the center of the roadway for easy of plowing and snow removal.

    Response: *See item #2 of this document.*

64. The City would suggest some form of velocity reducing manhole at the debris pond storm sewer connection.

    Response: *The drainage plans have been modified in response to this suggestion. See revised sheet set.*

65. After review of the soils report it seems that there are risks associated with the site that the report did not review in detail due to those risks not being part of the consultant's scope of services. See comments in the inherent risks section that are labelled "outside scope of services" and owner is completely responsible for taking all risks associated with any future potential for instability at the site or in the site vicinity area type comments.

    Response: *This item will be addressed fully in a revised geotechnical report. The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments. This memo will be provided to staff by July 9, 2021.*

66. No topographic slopes were labeled thus these comments are generic. Geotech report calls for no structures within 25' of a crest of a slope that is 2.5:1. The lower row of structures appears to be within 25' of a crest of a slope, but the slopes below are not labeled for verification of the report note.

    Response: *The project geotechnical engineer has confirmed that the current plans comply with this recommendation. The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments. This memo will be provided to staff by July 9, 2021.*

67. The slopes to the south of the development that lead to the proposed roadway appear to be quite steep and will be an erosion and revegetation issue for the development. These roadways lead directly to storm water intake structures and piping that could be clogged with excess material flowing them, thus causing

downstream issues.

Response: *Noted. Project team will evaluate the temporary erosion control needs and provide specific plans as required for permit submittal.*

68. The Geotech report notes that the soils are highly susceptible to water erosion and moderately susceptible to wind erosion. During construction dust mitigation will be a significant issue with the site as the City has learned with other projects in this area. Excessive dust from the working face will not be acceptable and must be properly mitigated.

    Response: *Noted. Project team will evaluate the construction management planning related to dust mitigation needs, as well as geotechnical recommendations related to wetting of soils, and provide specific plans as required for permit submittal.*

69. The Geotech report notes that plantings around the structures should be either Xeriscaping, landscaping gravel or plants with low moisture requirements.

    Response: *Noted. The landscape plans include notes requiring compliance with geotechnical recommendations.*

70. The Geotech report notes that slopes away from the buildings should be a minimum of 6' in 5' for landscaping areas or 2% for hardscape areas. This cannot be verified on the current drawing set, engineer of record to confirm slopes away from structures.

    Response: *The design team will follow the recommendations of the geotech report; detailed grading (including slopes away from buildings) will be developed for permit submittal and construction drawings.*

71. Contractor should confirm the trenching backfill material that is acceptable in this area, previous portions of the development have utilized gravel materials, which has caused underground water to use the trenches as river passages and flood manhole locations during certain times of the year.

    Response: *The applicant is willing to coordinate with City staff to evaluate specifications that are acceptable to the City and meet the recommendations of the project's geotechnical engineer. The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments, including backfill and bedding recommendations. This memo will be provided to staff by July 9, 2021. Revised trenching backfill recommendations will be included in an updated geotechnical report.*

72. Full depth pavement will not be accepted in any areas that are deemed public ROW and possibly maintained by the City. Full depth asphalt is not recommended, it has shown not to be successful in other areas of the Glenwood Meadows Development.

    Response: *The geotechnical engineer is in agreement that full depth asphalt is not recommended, and is developing updating paving recommendations. The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments. This memo will be provided to staff by July 9,*

2021, and will include updated paving section recommendations.

73. 4.5 " of asphalt over 6" of ABC for heavy traffic areas is not recommended, it has sown not to be successful in other areas of the Glenwood Meadows Development. Thicker asphalt and base course sections have shown promise in stability and longevity.

    Response: *The project team's geotechnical engineer is reviewing this recommendation. The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments. This memo will be provided to staff by July 9, 2021, and will include full response to paving section comments and refined paving section recommendations.*

74. The Geotech report notes that asphalt overlays should be completed every 5-6 years on asphalt sections of pavement. What does the Geotech considered an appropriate overlay material and thickness being that overlay is a generic term.

    Response: *The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments. This memo will be provided to staff by July 9, 2021, and will include full response to paving comments.*

Transportation

75. Require sidewalk along Wulfsohn from the west end of the property to existing sidewalk at Meadows/Lofts (access to transit stop)

    Response: *Sidewalks have been added along Flat Tops View Drive extension and Wulfsohn Road. See revised sheet set.*

76. Require sidewalk along access road at west end of the site

    Response: *Sidewalks have been added along Flat Tops View Drive extension and Wulfsohn Road. See revised sheet set.*

77. Provide direct sidewalk along the entire length of both sections if roadways are not to be built; in other words, make it possible to walk the length of this property without having to meander behind all the head-in parking bays

    Response: *Sidewalks are provided along streets and internal driveways to allow pedestrian circulation to and throughout the site. The project will be built in on phase, with complete infrastructure (including sidewalks) sequenced with the implementation of the buildings.*

78. Provide ADA compliant elevators within this property to get mobility impaired residents from up the hills down to Wulfsohn Rd and the transit stops.

    Response: *(*Note: In this case ADA relates to the Americans with Disabilities Act, not the Amended*

Development Agreement.) The plans as originally submitted comply with the requirements of the ADA related to accessible routes. The original elements supporting accessibility included accessible routes from designated accessible parking into all buildings and elevators within buildings. Additional modifications have been made to the site plans to enhance accessibility beyond the requirements of the ADA, including an accessible route from the development to Wulfsohn Road and a publicly-available shuttle that will circulate from the development to transit. The shuttle will also be available to non-resident users of the child care facility (and other guests) who may use transit and require a last-mile connection from RFTA to the child care facility.

Parks, Trails & Open Space

79. "Local Access Trailhead" design minimums. Elements to include: trash can (bear saver type, interpretive shelter (City standard), curb/gutter type that facilitates vehicle access, natural surface trail.

Response*: Trash can, dog waste station, and interpretive shelter have been added in two locations of public access to the Wulfsohn Trail network. Vehicle access has not been provided beyond the trail access point as the trail system is singletrack/natural soil surface.*

80. Trailhead elements to be paid for by the developer

Response: *Though not legally required, Applicant is will to work with this City in this regard.*

81. City to be granted an access agreement in perpetuity

Response: *Noted. The applicant will work with Parks and Community Development staff to provide the appropriate public pedestrian access easement to the adjacent open space.*

82. Trailhead elements to be construction on the City's timetable

Response: *Noted. The applicant will work with Parks staff to identify the appropriate time to implement trailhead elements related to overall construction schedule, project closeout, and overall public safety related to active construction operations.*

83. Natural surface trail to be constructed by the City

Response: *Noted.*

Parks, Landscaping and Irrigation

84. Please provide an updated plant list with species, locations and quantities

Response: *A fully annotated planting plan will be provided at permit. The applicant has updated the suggested plant list based on information provided by the Parks Department related to species known to be successful in this development. See revised sheet set.*

85. Please provide a detailed permanent irrigation plan.

    Response: *A detailed irrigation plan will be provided at permit submittal.*

86. Plant species not suited to our semi-arid climate or unsuitable selection

    Response: *The suggested species list included in the original submittal is as provided in the GMZDP. The applicant will work with Parks staff to refine the species list based on staff's experience with streetscape and landscape in the overall Meadows development.*

87. With the close proximity of the Community Center we would recommend not building tennis courts

    Response: *The two pickleball courts are included as an amenity for the residents of this complex, and complement the publicly-available facilities at the Community Center.*

88. We strongly recommend inclusion of appropriate outdoor spaces to support the residential needs of the proposed density level. Evaluation of formal complaints to the City demonstrates a necessity for a smaller park with a dog run area, playground, small turf and picnic area.

    Response: *As required by the GMZDP two one acre 1 acre parks have been provided. The parks have been designed to the required standards. The project is also adjacent to a large amount of open space, and is in close proximity to recreation center amenities. The applicant's project team is evaluating opportunities to include a dedicated dog run zone, and additional amenity areas between the buildings will provide a variety of picnic, small turf, and other gathering spaces for the residents of the complex.*

89. For any playground installations we would recommend separate playgrounds that are suited to specific age ranges. (Ages 2-5, 5-12)

    Response: *Noted; the applicant will consider the division of age-appropriate playgrounds as the amenity spaces are designed in greater detail moving forward.*

Parks, Stairway Connections to Glenwood Meadows

90. Due to the north facing aspect of the stairs they should be heated for safe winter maintenance

    Response: *The applicant wishes to avoid the energy input and long-term maintenance of heated stairs, and is studying other methods to accomplish the intent of safe and maintainable stairway (e.g. steel stairs with treads that do not allow for accumulation of snow and ice).*

Engineering, Civil Sheet Set

91. Appears that the legend doesn't match the plans

Response: *Noted and corrected in the updated sheet set.*

92. Question of where drainage will be located (Note: relates to existing swale along the west edge of the project)

    Response: *Drainage plan has been modified to capture the swale. See revised sheet set.*

93. Question if curve is practical with allowable pipe material deflection.

    Response: *Pipe deflection as designed is within specified tolerances from manufacturer; information has been added to utility sheets to illustrate compliance.*

94. Grading not practical through parking

    Response: *Grading as shown is conceptual in nature, with critical slopes along driveways, at the edges of the site, and between building levels identified and evaluated, but with contour information developed at an 'overlot grading' level. Detailed grading will be developed as the project advances.*

95. Curve is sharp (Note: relates to tie-in at Flat Tops View Drive).

    Response: *This intersection has been reconfigured to increase the centerline radius. The tie-in point to Flat Tops View is constrained by the existing storm inlet (on Glenwood Greens), the existing soil nail wall (on Lofts at Red Mountain), and the subject property topography. See revised sheet set. Related: see note 11, this memo.*

96. Question on how intersections should be controlled

    Response: *This intersection has been reconfigured. See note 11, this memo, and revised sheet set.*

97. Gas and electric should have appropriate separation

    Response: *Utility layout has been reconfigured to provide the appropriate separations.*

98. Storm/irrigation/sanitary considered the same and should maintain appropriate separation from potable water

    Response: *Utility layout has been reconfigured to provide the appropriate separations.*

99. Storm should maintain same separation requirements as sanitary. Easements around hydrants and transformers

    Response: *Utility layout has been reconfigured to provide the appropriate separations.*

100. These plans are insufficient and do not comply with CDPHS or the City of Glenwood springs Engineering Standards in many instances. See plan markup for more information

Response: *Plans have been modified to respond to markups; additional detail as required to illustrate compliance with standards will be provided at permit.*

Engineering, Geotechnical Report

101. On page 20 of 30, under surface drainage the report states under bullet point 2 that landscaping of gravel adjacent to buildings should have a minimum slope of 6 inches in 5 feet (or 10%), but in bullet point 5, it states that landscaped areas within 10 feet of the foundation should be sloped at a minimum of 8%. This is inconsistent.

Response: *The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments. This memo will be provided to staff by July 9, 2021, and will include a clarification of the slope recommendations.*

102. In general full-depth asphalt is not recommended in this area. As you can see from the meadows Development, it has not performed well over time and meeting subgrade requirements with the native soil is challenging. As these roadways are private and will remain private, the city does not have a requirement for the asphalt within the development, but will require any patches in City ROW to meet the requirements of the City's Engineering Standards. a. The report provides a recommendation for a full-depth asphalt section, but Figure 17 does not provide an exhibit of that section.

Response: *The geotechnical engineer is in agreement that full depth asphalt is not recommended, and is developing updating paving recommendations. The project team's geotechnical engineer is preparing a summary memorandum addressing all geotechnical comments. This memo will be provided to staff by July 9, 2021, and will include updated paving section recommendations.*

Engineering, Drainage

103. Include the original report referenced in the Appendix.

Response: *The original drainage report has been appended to the application materials.*

104. The original study was completed analyzing the development with Type C and D soils, while this analysis uses Type A soils. Please address this within the report.

Response: *This has been addressed in the updated drainage report.*

105. The access road to the west is not fully considered in the analysis.

Response: *The analysis has been updated to include the access road to the west.*

Engineering, Traffic

106. A memo is not acceptable. A TIS will be required for this development. The original study was completed over 20 years ago and only provided a 10-year projection. Additionally, it was not stamped by a Colorado Licensed Engineer.

Response: *The ADA expressly states that a TIS is all that is required of this development application. Please also see our response to comment 1.*

107. **(5/17 Departmental meeting)** CDOT access control plan 8th Street/SH82 and/or Midland/I-70 at exit 114. May exceed capacity of access control permit.

Response: *The City is the holder of the CDOT access control permit. All obligations of the developer were satisfied at the time of annexation.*

December 28, 2020

RE: Glenwood Meadows Multi Family Housing Development

Response to ADA Site Related Design Standards:

1. **Site Layout and development pattern works creatively within the site's natural constraints such as slope, geologic hazards and significant vegetation.**
    - *The primary approach to site layout and grading was to work with the existing natural slope and grading conditions to the greatest extent possible. Several adjustments were made during the design process to ensure that the site grading (cut and fill) was as balanced as possible.*
    - *The existing steep slope from Wulfsohn Rd. up to the project site will be undisturbed.*
    - *Grades around the perimeter of the property, adjacent to the Wulfsohn Mountain Park open space meet existing grade at or before the property line and areas of disturbance will be re-vegetated with native plant material to blend with the open space.*

2. **Parking- counts to be no less than the city of Glenwood Springs standard.**
    - *The development includes a total of 538 parking spaces. 537 spaces are required based on City of Glenwood Springs standards.*
    - *See table on sheet L 1.1 for a more detailed breakdown of the parking requirements and counts.*

3. **Landscaping and Screening: ADA standards meet or exceed City standards. Use ADA standards.**
    - **Required open space 40%**
        - *The total phase 1 area is 27 acres. The total area of the site that will be developed (buildings, roads, parking) is 8.43 Acres. This leaves 18.57 acres of open space on the site equating to 69% open space.*
    - **Open Space Planting**
        - **1 Tree/1200 SF**
        - **4 Shrubs/ 1200 SF**
            - *These calculations have been applied to all disturbed areas of open space in the development and are reflected in the landscape plans.*
    - **Setbacks, Buffers, Screens**
        - **1 tree/ 25LF**
        - **1/3 deciduous**
        - **2/3 evergreen**
        - **10 shrubs/ 25 LF**

            - *These calculations have been applied to relevant areas in the development and are reflected in the landscape plans.*

- **Internal Neighborhood Streets**
    - **1 deciduous tree/ 35 LF evenly spaced.**
    - *The minimum planting standards have been applied to all internal neighborhood streets as you enter the neighborhood. The areas adjacent to open space are designed to meet the natural character and blend with the native vegetation. A formal row of street trees would look out of character and create a contrast with the natural landscape, therefore rows of street trees have not been added in these areas.*
    - *Street trees have also been omitted from areas that are adjacent to the phase 2 property. It is anticipated that this area will be disturbed and developed in the future and that landscaping will be added as a part of the phase 2 development.*
    - *The character of the planting in the native areas for the hillside above Wulfsohn Rd. will be similar to planting found in other parts of the Glenwood Meadows development, in particular the native hillside zone in between Midland Ave and the Glenwood Meadows Shopping center.*

- **Building foundations shall be planted with ornamental plant materials such as ornamental trees, flowering shrubs and perennials, a ground covers and provide variety and year round interest.**
    - *The geotechnical report advises against irrigated plant material within 10' of the building foundations. The landscape plans reflect a "dry zone" at the foundation of the buildings to comply with this recommendation. Flowering shrubs, perennials and ground covers have been located in areas adjacent to the buildings outside of the 10' zone and will be drip irrigated to comply with the geotechnical recommendations.*
- **Development entryways shall be planted with ornamental plant material such as ornamental trees, flowering shrub and perennials and ground covers.**
    - *Planting beds with ornamental plant material have been included at both of the main entries to the development.*
- **Turf areas shall be established by sodding. Un-manicured natural areas may be seeded when adjacent to open space.**
    - *The geotechnical report advises against turf grass due to the higher watering needs. Artificial turf grass is being proposed as an alternative in select areas in the development along with a native seed mix for other areas which has a lower water requirement.*
- **Use xeriscape principles.**
    - *The intent of the planting design is to use xeriscape principles and to use low water plant material to reduce the amount of irrigation needed for the site. The proposed plant list was taken from the Glenwood Meadows ADA design guidelines and will be refined during the design development and construction document phases. The Irrigation plan will be designed by a professional irrigation designer with the intent of creating the most efficient system possible to reduce the amount of watering across the site. The geotechnical engineers will also be asked to review, make recommendations and sign off*

on each iteration of the proposed landscape design to ensure that the planting and irrigation complies with the geotechnical requirements.

4. **No areas for outdoor storage, trash collection or compaction, loading, or other such uses shall be located within 20' of any public street, public sidewalk, or internal walkway.**
    - *A total of 7 trash storage/ collection areas have been provided in the plans. The dumpsters will be enclosed and screened with planting and will not be visible from view. They will be located between parking areas within a reasonable walking distance from the residential buildings. Locations for trash storage and collection areas are limited due to the natural topography and slope of the site.*

5. **Mechanical/ Utility Screening required. – shall be an integral part of the building, not tacked on.**
    - *Condensing units for the buildings will be located within landscape areas and screened from view with shrubs and /or fencing to match the architecture, depending on location.*
6. **Open Space- desire to create an interconnected network of open spaces and parks within residential areas of Glenwood Meadows and provide visual interest and access to a variety of recreational and leisure opportunities.**
    - *An interconnected network of parks and open spaces has been provided throughout the neighborhood.*
    - *There is an internal network of sidewalks connecting the streets and buildings that provides circulation throughout the residential areas.*
    - *Park 1 creates a direct soft surface trail connection to the Wulfsohn Mountain park trails and a second connection to this public trail network is located at the south end of the property.*
    - *A pedestrian/ stair connection has been provided adjacent to W. Meadows drive leading up to the development.*
    - *Walking access from the residential units to the two parks and the open space areas is a primary component of the design.*
7. **Each 1 acre park shall contain at least 1 or more of the following features:**
    - **Multi- use areas**
    - **Community gardens**
    - **Walking paths**
    - **Plazas**
    - **Picnic tables**
    - **Benches**
        - *The plans include (2) one acre parks as required by the Glenwood Meadows ADA*
        - *Park 1 includes walking paths, benches, picnic tables, a community garden and multi-use areas*
        - *Park 2 includes two pickle ball courts, picnic tables, benches, a multi-use area and a children's play area with play equipment.*
8. **Site layout – Residential Specific**
    - *20' setback from front property line*

- *The buildings are set back more than 20' from the property lines.*

- ***Layout shall respect and follow the natural topography of the site to the extent possible.***
  - *The neighborhood has been designed to work with the existing topography of the site to the greatest extent possible.*
  - *The design intent was to meet existing grade at the south end of the site to avoid the need for large areas of cut and associated site retaining walls and to connect the development to the Wulfsohn Mountain Park Open Space.*

- **To the maximum extent practicable, multi- family buildings shall be oriented or arranged in a manner to enclose common open space.**
  - *Common open space is located throughout the neighborhood with common amenity and gathering space area adjacent to the buildings.*
- **Common open space should include**
  - **Gardens**
  - **Courtyards**
  - **Recreation or play areas and at least 3 of the following**
    - **Seasonal planting areas**
    - **Large flowering trees**
    - **Seating**
    - **Pedestrian scaled lighting**
    - **Gazebos or other decorative shelters**
    - **Play structures for children or**
    - **Natural features or areas**
  - *The common open space in the proposed development includes gardens, courtyard areas between buildings, recreation and play areas, seasonal planting areas, seating, pedestrian scaled bollard lighting, play structures for children and natural areas.*

- **Residential neighborhoods adjacent to open space shall incorporate one of more of the following techniques to create a visual transition between development and surrounding open space:**
  - **Staggering building setbacks to create a softer development edge**
  - **Establishing a landscape buffer along the rear or visible edge(s) of the property to create a soft visual edge of the development**
  - **Utilizing a variety of native plant species and planting forms similar to those found on the adjoining open space to create the appearance of a natural transition in the landscape.**
  - *The development includes a native buffer around the perimeter with native plant species to soften the visual edge of the development and transition to the existing native landscape beyond the property line.*

- **The area between the curb an adjacent property line shall be landscaped**

- *The area between the curb and the adjacent property line has been landscaped to match the character of the adjacent property to create a natural transition.*

9. Community Amenities:

- **Minimum ratio of 200 sf/ dwelling unit of internal open space/ outdoor leisure space.**
- **These open spaces/ outdoor leisure spaces shall be improved with a variety of community amenities including, but not limited to the following:**
  - **Community garden**
  - **Grove of trees**
  - **Village green**
  - **Pocket park**
  - **Swimming pool**
  - **Resident clubhouse**
  - **Tots lots**
  - **Basketball, volleyball or sports courts**
  - **Picnic areas**
  - *60,000 sf of common amenity space is required for this 300 unit development. A total of 119,400 sf common amenity space has been provided.*
  - *Common amenities for this development include a community garden, swimming pool, resident club house with fitness center and daycare, a play ground and two pickleball courts.*

10. Parking (location and layout – page 40 of ADA)

- **Parking areas and freestanding parking structures (detached garages and carports) shall not occupy more than 50% of each perimeter street.**
  - *Due to the natural sloping topography of the site, level areas for parking are limited. The proposed parking for this development are located in the available level areas in between buildings and along the perimeter of the streets and exceeds the 50% threshold due to the limitations of the site.*
- **Carports shall be limited to 72' in length, with a maximum of 8 spaces per car port structure.**
  - *A total of 20 garage structures are proposed for this development.*
  - *The 10 garage structures located along the upper road at the south of the development are 72' in length with a maximum of 8 parking spaces.*
  - *The 10 garage structures at the middle and lower roads relate directly to the architecture and are 125' in length with 10 parking space and two bicycle storage areas each. These structures are built into the slope of the hillside with the roof functioning as an outdoor patio and common amenity space for the adjacent residential buildings.*
- **No more than 2 detached garage structures or carport structures shall be located adjacent to each other end to end.**

- *Due to the natural sloping topography of the site, level areas for garages are limited. The proposed garage structures align with the layout of the residential buildings and streets and are located adjacent to each other with a minimum of 10' spacing between structures.*

- **The minimum separation between these structures shall be 10' and the separation area shall be landscaped with at least 1 deciduous tree and ground cover or sod**
  - *The garage structures are separated at least 10' from each other and the separation area is landscaped with at least one tree and ground cover.*

City Site Related Code Standards:

Parking requirements:

- **Clubhouse Building – 1/ 400 square feet for the clubhouse/building area, plus 1 /10,000 square feet site/pool/outdoor area.**
  - *27 spaces are required for the Clubhouse and 28 have been provided.*
- **Residential Units- 1.5 spaces for multi-family, plus 1 guest space per each 5 dwelling units (essentially 1.7 total but confirm count)**
  - *510 spaces are required for the residences and 510 have been provided.*
- **Required number of ADA spaces (National Standards)**
  - *The total number of proposed ADA spaces meets the national standards.*

Bike parking requirements:

- **For developments with more than 150 parking spaces- 9 bike parking spaces plus 1 space for each 50 vehicle spaces provided after the first 150 spaces.**
  - *17 bike parking space are required based on these calculations. 160 bike parking spaces have been provided in the plans for the development.*
- **Distribute evenly among buildings**
  - *Bike parking has been distributed evenly among the buildings.*
- **Must have adequate lighting**
  - *Bike parking is located adjacent to the main entry to the buildings and will be adequately lit.*
- **Bicycle parking spaces shall maintain an access aisle of at least 5 feet and clear of all obstructions.**
  - *Bike parking spaces maintain an access aisle of at least 5' and are clear of obstructions.*

Residential Architecture:

1. **A buildings special architectural features and treatments shall not be restricted to a single façade. All sides of a multi-family building open to view by the public, whether viewed from public or private property, shall display a similar level of quality and architectural interest.**

- *All sides of the multi-family residential buildings include special architectural features and treatment. The buildings are visible from all four sides and each façade displays a similar level of quality and interest.*
- *Three building types have been provided to create variety and interest.*

2. **All multi-family buildings shall be designed to provide complex massing configurations with a variety of different wall planes and roof planes. Plain, monolithic structures with long, monotonous, unbroken wall and roof plane surfaces are prohibited. At least every 50 linear feet, wall planes shall contain offsets or setbacks with a differential in horizontal plane of at least 5 feet.**
    - *A variety of different wall and roof planes have been provided in the design of the buildings.*
    - *Bike parking is located adjacent to the main entry to the buildings and will be adequately lit.*
    - *Wall planes have a setback or offset of at least 5' for every 50 linear feet.*

3. **The maximum length of a multi-family building is 125'**
    - *The building design meets this criteria*

4. **All elevations on multi-family buildings shall contain windows. An eave or an overhang of at least 12" shall be provided on the perimeter of all residential buildings, except gable roof ends, where an 8" overhang shall be required.**

    - *The roof design meets this criteria*

Architectural Detail:

1. **The incorporation of porches, balconies and patio's shall be strongly encouraged for all residential types.**
    - *Balconies and patios have been incorporated into the design of the residential buildings.*
2. **Building entries shall be called out as a prominent streetscape feature for all residential types by extending the front of the main façade and emphasizing with materials and detailing**
    - *The building entries are prominent features in the building design, they extend from the front of the main facades and are emphasized with materials and detailing.*

3. **Garages shall not be a prominent streetscape element. They shall be recessed and/ or oriented towards the rear of the lot.**
    - *The garage structures are located at the rear of the buildings and are not a prominent streetscape element.*

4. **Fronts of buildings shall be articulated through the use of bays, insets, balconies, porches or stoops related to entrances and windows.**
    - *The front of the proposed buildings are articulated though the use of insets, bays, balconies and front stoops related to the entrances.*

MEMORANDUM

To: City of Glenwood Springs Planning Staff

From: Michael Grzesiak, PE

CC: Mike Fellner – BLD Group

Date: 12/2/20

Subject: Glenwood Meadows Multi-Family – Phase 1 – Traffic Impact Statement

This memo shall address the estimated daily traffic trips for the proposed Glenwood Meadows Multi-Family Phase 1 project located in Glenwood Meadows development.

The proposed Glenwood Meadows Multi-Family project is located within Lot 11C-C of the Glenwood Meadows development on the south side of Wulfsohn Road. Proposed construction for phase 1 includes 300 apartment dwelling units and a club house. Access to the development is provided by a proposed extension of Flat Tops View Drive, and an existing curb cut provided on the south side of Wulfsohn Road approximately 1,120 feet northwest of the West Meadows Drive intersection.

Earlier traffic studies for both the Glenwood Meadows PUD project and the Glenwood Meadows Transportation Improvements Plan were completed by The Mobility Group, dated July 27, 2000 and September 14, 2001 respectively. The Glenwood Meadows PUD project traffic study included detailed analysis of existing traffic conditions along with proposed traffic conditions with for the overall PUD development.

The September 2001 Transportation Improvements Plan traffic study focused on a revised, smaller development scope than was originally proposed in the PUD traffic study. The reduced size and number of land uses for the Glenwood Meadows project was analyzed for trip generation and both on-site and off-site transportation improvements. The revised project scope from the original traffic study reduced daily trips by approximately 25% and would have less traffic impacts on the roadway system.

The September 2001 Transportation Improvements Plan traffic study included an apartment land use that accounted for 300 dwelling units and produced a trip generation of 1,546 net external daily trips. The dwelling unit count assumed under that traffic study is concurrent with the proposed 300 dwelling units for the Glenwood Meadows Multi-Family development.

A trip generation analysis was performed using standard rates from Trip Generation, 10th Edition, Institute of Transportation Engineers, 2017 (ITE) and produced approximately 1,306 daily trips. The trip generation analysis can be referenced in the attached Exhibit A.

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The discrepancy of 240 daily trips between the 2001 traffic study and this analysis is due to the average rate used. The 2001 traffic study used an average rate of 6.44 versus 5.44 for this study. The difference in average rates reflects the difference from the older Trip Generation edition and the 2017 10th Edition used for this analysis, specifically updates to the land use data.

Additionally as a check, the other Glenwood Meadows land uses from the 2001 traffic study were analyzed under the 2017 10th Edition. The total weekday daily trips generated by the development total 14,848. This is a net reduction of 769 daily trips. This discrepancy is also attributed to the updated data in the ITE Trip Generation 10th Edition.

An Annexation and Development Agreement (ADA) was drafted and recorded in 2002 which outlined the terms and conditions of the annexation, zoning and development of the Glenwood Meadows development to the City.

Section 3.a. of the ADA: "Non-Specific Assessments/Credits/Fees-in-Lieu of School Land Dedication; Non-Specific Assessments/Credit" states that "Glenwood Meadows, its successor and assigns, shall not be required to pay any future Traffic/Transportation Impact Fee established by the City subsequent to the execution and recordation of this Agreement."

Section 12 of the ADA: "Off-Site Traffic Improvements Obligations" details the required on-site and off-site traffic/transportation improvements and financial contribution obligations of Glenwood Meadows which are listed in subsections 12.(a)-(f).

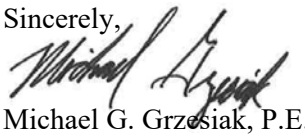
A Memorandum of Understanding (MOU) for the Glenwood Meadows project was recorded in 2013 that outlined and memorialized the acknowledgements, understandings and agreements between the Glenwood Meadows Owner and City to address the status of provisions of the original ADA.

Section 2 of the MOU identifies that: "At the time of re-subdivision and/or development application with respect to future developments, Owner, or its assignee, shall, as the sole remaining and ongoing obligation under said Section 12 of the ADA, remain responsible for providing to City site-specific development proposal calculations of estimated daily traffic trips for such development, as set forth by sub-section (a) of Section 12. Of the ADA."

This traffic impact statement addresses the site-specific estimated daily traffic trips for the Glenwood Meadows Multi-Family development as detailed above and in the attached Exhibit A. The proposed 300 apartment dwelling units for this project pairs with the approved 300 units under the original 2001 Transportation Improvements Plan traffic study and ADA.

Please feel free to contact us with any questions or comments you may have.

Sincerely,



Michael G. Grzesiak, P.E.

Enc.
Exhibit A –Trip Generation Analysis

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Land Use	ITE Code	Proposed Size	Average Vehicle Trip Ends vs:	Weekday Avg Rate	Weekday Daily	Trip Rate	AM Peak In	AM Peak Out	AM Peak Total	Trip Rate	PM Peak In	PM Peak Out	PM Peak Total
Multifamily Housing (Mid-Rise) (Apartments)	221	300	Dwelling Units	5.44	1632	0.36	28	80	108	0.44	81	51	132
Multifamily Housing (Mid-Rise) (Townhomes)	221	175	Dwelling Units	5.44	952	0.36	16	47	63	0.44	47	30	77
Office	710	90	1000 SF/GLA	9.74	877	1.16	90	15	104	1.14	16	86	103
Shopping Center	820	400	1000 SF/GLA	37.75	15100	0.94	233	143	376	0.44	84	92	176
Total Trips					18561		367	284	651		228	259	132
Minus Linked Trips		20%			-3712		-73	-57	-130		-46	-52	-26
Total Driveway Trips					14848		294	227	521		183	207	106
Minus Pass-by Trips		0%			0		0	0	0		0	0	0
Total New Trips					**14848**		**294**	**227**	**521**		**183**	**207**	**106**

Notes
Data from ITE Trip Generation Manual 10th Edition

AMERICAN GEOSERVICES

Initial Geotechnical Evaluation Report

Glenwood Meadows No.6 Housing, Wulfsohn Rd and West Meadows, Glenwood Springs, CO

Date: July 22, 2020; Project No: 0280-WS2020



AMERICAN GEOSERVICES

GEOTECHNICAL & MATERIALS
ENVIRONMENTAL
STRUCTURAL
CIVIL
ENGINEERING AND SCIENCE

888-276-4027

July 22, 2020

PROJECT NO: 0280-WS20

Client: Mr. Gregg Baumann
BLDGROUP
1500 Cordova Road Suite 300
Ft. Lauderdale, FL 33316

Ref: Initial Geotechnical Evaluation Report, Glenwood Meadows No.6 Housing, Wulfsohn Rd and West Meadows, Glenwood Springs, CO

Dear Mr. Baumann,

At your request, we have completed the initial geotechnical evaluation for the referenced project. Results of our evaluation and design recommendations are summarized below.

PROJECT INFORMATION

The subject property consists of parcels as shown in attached figures. The property is gently to moderately sloping downwards to the north-northeast (NNE) with elevations in the range of approximately 5840-5980 feet above mean sea level (MSL). General vicinity area has a gentle northerly downward slope. Access to the site is via Wulfsohn Rd and the property is located south of it. See attached Figure 1 and Figure 2, aerial photographs, and site photographs for illustrations and visual information on existing site conditions.

The site is currently vacant, undeveloped, and without any residential, commercial, or industrial structures. The adjacent and surrounding area consists of a low density commercial/residential structures. We understand, the proposed development may consist of building multistory residential structures, most likely less than ten stories high. Considering the site topography, we anticipate significant site grading for this project. As discussed below in this report, the site is located in the moderate soil hazard zone and landslide hazard zone or in proximity of geologic

hazards. Therefore, it is imperative that the project team works closely with AGS to assure site stability especially during construction as well as after construction. We anticipate proposed structures will be constructed with moderate foundation loads. High foundation loads (>5000 psf bearing pressures) are not anticipated. If these proposed conditions change, we should be contacted to modify our report.

SCOPE OF WORK

During May through July 2020, several site visits were made, as well as, a total of eleven (11) Standard Penetration Test (SPT) equivalent borings (B1 through B11) were drilled at locations shown in Figure 2. Borehole locations and depths were chosen based on soil conditions, the presence or absence of boulders, accessibility, proposed construction, and the results of our desk study.

Using Standard Penetration Test (SPT) drill rigs, SPT borings were extended to the maximum exploration depth of approximately 50 feet below the existing ground surface where refusal to drilling was noted. The drill rig was equipped with solid-stem and/or hollow-stem continuous-flight augers. The augers were used to advance the boreholes and samples were obtained using standard split-spoon sampler and a California ring sampler. The sampler was driven using an automatic hammer weighing 140 pounds falling a distance of 30 inches. The sampler was first seated into the bottom of the borehole, and then driven 12 inches. The number of blows required driving the sampler 12 inches, or a fraction thereof, constitutes a penetration test and is similar to the SPT testing standards as per American Society for Testing and Materials ASTM D1586. The penetration tests, when evaluated, provide an index to the soil strength and density of the material tested. The penetration test results are shown on the individual borehole log included in an appendix. The Legend and Notes necessary to interpret our borehole logs are also included in an appendix.

After the completion of drilling, boreholes were backfilled with soil cuttings. Samples of subsurface soil materials were collected at regular intervals during drilling. The samples were visually inspected, logged, placed in a sealed container, and transported to testing laboratory for further visual evaluation. Groundwater level measurements were taken during drilling and after the completion of drilling. Data obtained from site observations, subsurface exploration, laboratory evaluation, and previous experience in the area was used to perform engineering analyses. Results of engineering analyses were then used to reach conclusions and recommendations presented in this report.

In addition, Williamson Drive Probe (WDP) apparatus along with soil augers were used to perform soil explorations in some areas based on accessibility issues. The WDP is a “relative density”

exploration device which is used to determine the distribution and to estimate strength of the subsurface soil and decomposed rock units. The resistance to penetration is measured in blows-per-1/2 foot of an 11-pound hammer which free falls roughly 3.5 feet driving the ½ inch diameter pipe into the ground. This measure of resistance to penetration can be used to estimate relative density of soils. For a more detailed description of this geotechnical exploration method, please refer to the Slope Stability Reference Guide for National Forests in the United States, Volume I, EM-7170-13, August 1994, p. 317-321. A representative schematic of WDP is included in appendix along with the published data on correlation between WDP and SPT. The penetration test results are shown on the individual Borehole Log included in the appendix. The Legend and Notes necessary to interpret our Borehole Logs are also included in the appendix.

SUBSURFACE SOIL/BEDROCK CONDITIONS

Subsurface conditions encountered in our boreholes are described in detail in the Borehole Logs provided in an Appendix. Soil classification and identification is based on commonly accepted methods employed in the practice of geotechnical engineering. In some cases, the stratigraphic boundaries shown on Borehole Logs represent transitions between soil types rather than distinct lithological boundaries. It should be recognized that subsurface conditions often vary both with depth and laterally between individual borehole locations. The following is a summary of the subsurface conditions encountered at the site:

Topsoil: Site is underlain by roughly up to 6 inches of topsoil.

Native Debris Fan Deposit: Below topsoil, the site is primarily underlain by generally medium dense to dense mixtures of sands, silt, gravel, cobble, and occasional boulders (ML/GM, GM-ML GM), extending to the maximum depth of exploration. Based on the results of our explorations, our review of available geologic literature, water well logs, and available geotechnical data from past projects in the site vicinity, and our local experience, in our opinion, the debris fan deposit extends to depths of 100-125 feet. These soils exhibit extremely low plasticity or considered non-plastic with minimal expansive/heave potential.

Based on the results of our lab testing and our local experience, these soils have a low to moderate potential for collapse and may results in excessive differential foundation settlements, if proper mitigation and foundation design are not performed as per the geotechnical engineer's recommendations.

Completely to Partially Weathered Eagle Valley Formation: Below the upper debris fan deposit, the site is underlain by completely weathered evaporite sequences interbedded with mudstone, sandstone, and shale extending to several tens of feet. This bedrock material is not

known to cause any sinkholes in the site vicinity area. At the time of our site visits, there was no visual evidence of sinkholes. The site and the immediate vicinity area is not known or mapped as having evaporite-related sinkhole hazards.

GROUNDWATER

Groundwater was not encountered below the ground surface during or after exploration. Based on our experience in the project vicinity area, the stable groundwater table is not expected to be encountered within the anticipated project excavation depths. Groundwater table is not a concern for the proposed development.

These observations may not be indicative of other times or at locations other than the site. Some variations in the groundwater level may be experienced in the future. The magnitude of the variation will largely depend upon the duration and intensity of precipitation, temperature, and the surface and subsurface drainage characteristics of the surrounding area.

LABORATORY EVALUATION

During drilling, SPT soil samples and California Ring samples were collected at strategic depths, sealed in air-tight containers, and transported to the laboratory for visual evaluation and testing. Laboratory tests included the following.

Soil Index Properties: Soil index properties including in-situ moisture content and natural dry density, Atterberg Limits, and the percent of soil passing the U.S. No. 200 sieve or gradations were performed. These results were used for classifying soils into categories of similar engineering properties in general accordance with the Unified Soil Classification System (USCS).

Moisture content tests were performed in general accordance with ASTM D 2216. Test procedure included weighing before and after over-drying, and calculation of water content. Dry density was determined from the select California Ring samples in general accordance with ASTM D2937 procedure. Sample dimensions were determined to calculate volume, the sample was weighed, and moist unit weight was calculated. Dry density was then estimated based on moist unit weight and moisture content. Atterberg Limits were determined in general accordance with ASTM D4318. Tests included the determination of Liquid Limit, Plastic Limit, and the estimation of Plasticity Index.

Swell-Consolidation Tests: One-dimensional swell-consolidation tests were performed in general accordance with ASTM D 4546 Method B. California Ring samples were extruded and loaded in a fixed ring consolidometer which measures vertical change in volume for different

loading conditions. Pore water was allowed to drain from the top and bottom of the sample. Samples were inundated with water at a particular loading condition and then allowed to swell. The swelled sample was loaded down to reach the original volume. Each sample was prepared and placed in a confining ring between porous discs, then subjected to a surcharge pressure of up to 1,000 psf and allowed to consolidate before being submerged. The sample height was monitored until sample deformation was minimal under the given load increment. Results of the swell-consolidation tests are plotted as a curve of the final strain at each increment of pressure against the log of the pressure. The results of all the laboratory tests are mentioned on the borehole logs.

LANDSLIDE HAZARDS CONSIDERATIONS

Based on the results of our site reconnaissance, geologic literature review, and limited subsurface exploration, we have performed a preliminary geologic hazards evaluation for the site. The site should be developed considering the geologic hazards discussed below, and a final detailed geologic hazards evaluation should be performed after the project design is made available for review.

Landslides: Our review of available geologic maps and landslide hazard maps did not indicate that landslides had occurred at the site or in the site vicinity area, and the site is not located within the existing known landslide area. During our site reconnaissance and in the available geologic and geologic hazards maps, landslide features were not mapped within the site boundary area. Our site reconnaissance did not reveal any significant potential for slope failures at the site. At present, there are no visual signs of slope failures such as tension cracks, several bent trees, unusual drainage patterns and vegetation, deep ground cracks, headscarp areas, leaning retaining walls, or significant settlements or movements in any existing structures, etc.

However, in general, the site vicinity area to the south of the subject site is close to or within the zone designated as having landslide potential. The site itself has not been subjected to the deep-seated landslides or slope failures. However, the closest landslide hazard area of concern is located just a few hundred feet to the south and uphill of the site boundaries as shown in Figure 6.

Evaluation of ancient landslide analysis was beyond our scope of services. In general, any ancient landslide mass (If present) or landslide deposit (if present) or mapped geologic hazard areas are more likely to become unstable, relatively, compared to the areas that are not mapped as geologically hazardous. It is possible that there have been historic landslides, deep-seated landslides, or recently developed landslides (however inactive) present within or in the immediate vicinity of the site boundaries, or in the site vicinity area. Historically, for sites located within such

critical slope areas next to lakes on steep slopes, there is an inherent higher risk associated with future ground movement and associated structural distress. The owner/client should be aware of this inherent risk and should assume the entire risk.

Inherent Risk: Considering the site topography, site geologic conditions, and current surface and subsurface conditions, it is our opinion that the immediate site and the vicinity area have some 'inherent' risk associated with slope instability and structural impact from local slope movements. Moreover, historically, with construction in such areas, there is always an inherent risk associated with ground movement and/or settlements and related structural damage. The owner should understand these inherent risks. If the owner wants to better understand the risks and to eliminate the site-specific landslide hazard risks, then a detailed and comprehensive geotechnical evaluation including deep drilling, inclinometer installations, detailed slope stability modeling, and a detailed geologic hazards assessment (including global landslide hazards evaluation) should be performed to quantify the abovementioned risks and to provide detailed geotechnical design recommendations for comprehensive mitigation measures. Unless these recommended studies are performed, the owner is completely responsible for taking all risks associated with any future potential for instability at the site or in the site vicinity.

Life Safety Risk: We evaluated available historic aerial photographs and published maps including geologic maps, USGS quadrangles and topographic maps, and City/County GIS data. The landslide terrain and the vicinity area are such that, under normal conditions, there exists some potential for a future shallow slope failure, based on the slopes, distance to the fault zones, local geology, and especially if excessive cuts or grading or roads or extensively modifications of the terrain by anthropogenic activity, and forest loss occurs. However, in our opinion, the life safety risk to the occupants from such a shallow slide is extremely low provided all our recommendations given in this report are strictly followed.

There is a likelihood of the occurrence of an event of a size and in a location that would cause casualties, damage, or disruption to an existing standard of safety at the site, especially during a seismic event; although a detailed slope stability analyses under seismic conditions was beyond our scope of services. The project site vicinity conditions are landslide-prone area during seismic event, and thus the expected location and extent of the effects of the activation of any slides within site vicinity area exists under poor construction practices and especially under the absence of geotechnical oversight. The anticipated severity of the landslide activation effects on the on-site structures and future structures can be determined only by performing extensive subsurface explorations and detailed slope stability analyses under static and seismic conditions for the site vicinity area including the site area.

Historically, with construction in such areas, there is always an inherent high risk associated with ground movement and/or settlements and related structural damage. Again, it is important that the owner understands these inherent high risks. The owner is completely responsible for taking all risks associated with any future potential for instability at the site or in the site vicinity.

Limitation of Liability: There has been a certain amount of variability in legal interpretations of liability of geotechnical engineers and geologists in regard to landslide-related losses; but the conclusions reached are general in nature and not necessarily valid in any specific court. Liability of geotechnical engineers and engineering geologists for landslide damages to home sites is based most often on the theory of negligence and occasionally on negligent misrepresentation. Although allegations seeking to recover damages from geotechnical engineers and geologists on the basis of strict liability, breach of warranty, or intentional misrepresentation are often included in a complaint, they are not usually applicable or valid under normal circumstances. All private property owners should make a note of this.

The conclusions and recommendations given in this report are valid only if AGS services are retained to provide a detailed landslide and rockfall hazard evaluation and detailed geotechnical design report, and only if AGS performs construction observations and testing services during construction. It is our assumption that the current client will retain this project for at least 10 years. If the project and/or property ownership changes, AGS must be contacted to evaluate the limitations of liability and project consulting limitations. It should also be noted that a detailed rockfall hazard evaluation or 'global' landslide hazard evaluation was not part of the current scope of work. Moreover, **AGS has not reviewed or approved any landslide hazard or rockfall hazard mitigation or drainage improvements completed for the uphill properties to the south. We understand these improvements were completed in the recent past (<50 years) after rockfall and/or landslides had occurred in steep slope area present to the south of the site as shown in Figure 6. The stability of the subject property depends upon the stability of the uphill properties. At your request, AGS can perform an extensive review, evaluation, and approval of all the improvements made uphill of this subject property and confirm whether additional mitigation is required or not to protect the subject property from landslide hazards and rockfall hazards.**

ROCKFALL HAZARD CONSIDERATIONS

Site is not located within high rockfall hazard zone, however, the area immediately adjacent to the southern site boundaries, there is a high rockfall hazard potential. **At the time of our site visit, we noted several erratic boulders, up to 5 feet in diameter in areas adjacent to the southern site boundary but not within the subject property. Some of these boulders might have crossed the earthen berm that was constructed in the recent past (<50 years) to**

mitigate the landslide and rockfall hazards present in the steep to extremely steep slopes present adjacent to the south of the property boundary. Therefore, unless a detailed rockfall hazard evaluation is performed for the subject property in consideration of the presence of extremely steep slopes and erratic bounders, in our opinion, a low to moderate potential for rockfall hazard exists. For planning purposes, a rockfall hazard mitigation fence/barrier wall may be considered along the southern property boundary.

A detailed rockfall hazard assessment was not performed; therefore, in order to completely eliminate the rockfall hazards, we should be contacted to perform a detailed rockfall hazard study of the site and the adjacent steep to extremely steep slope areas. Following procedures will be used by AGS to assess rockfall hazards at the site.

- Climbing techniques will be utilized to scale the rock faces and to evaluate problem areas through field observations which will include:

    a. Identifying source areas for rock falls,

    b. Recording the degree of weathering, jointing, faulting, dipping, folding, and deformations of rockmass in source areas,

    c. Noting the freshness of talus deposits, and

    d. Identifying visual indications of recent rockfalls (tree scars, roadway damage, etc).

- Digital pictures of potential problem areas will be taken and evaluated by AGS for potential rockfall hazards.
- Available geologic literature and rockfall hazard literature will be reviewed.
- Relative rock-fall susceptibility will be evaluated using an engineering rock-classification scheme known as Rock-Mass Quality. This scheme is based on the characteristics of rock discontinuities such as joints, fractures, and bedding planes.
- Preliminary digital simulations will be conducted using the Colorado Rockfall Simulation Program (CSRP-3D) to understand the mechanics of potential rockfalls.

Preliminary Slope Stability: Using the results of limited subsurface exploration, laboratory evaluation, and site reconnaissance data, we analyzed on-site slopes by performing preliminary slope stability analyses. We used the software SLOPE/W to model on-site slopes, subsurface soil conditions, and the impact of proposed construction on the stability of the site. Based on the results of our preliminary evaluation, we make following recommendations.

- There is a low potential for shallow slumps or slope failures provided proper geotechnical design and well-monitored construction activities are used to develop the site. Provided proper geotechnical design is done, and all our recommendations are strictly followed, the site will remain stable after proposed construction. Although the potential is low, minor localized and shallow slumps may occur in areas steeper than 2.5H(Horizontal):1V(Vertical); however, their occurrence will not impact the stability of the proposed structures provided they are properly located and designed in accordance with our recommendations given in the following paragraphs.
- All proposed structures should be located **at least 25 feet** from the crest of any slope areas steeper than 2.5H:1V. At the time of construction, AGS should inspect the foundation location and confirm the presence of adequate slope setback.
- Storm water disposal regulations of the local county and the city, and general drainage recommendations given in following sections should be strictly followed.
- In general, areas with moderate to steep slopes present greater construction difficulties. These areas can easily become unstable as the result of poorly planned or non-engineered construction activities such as cuts and fill. Therefore, these areas should not be considered for development or disturbed without a detailed review of site grading plans and house plans by the project geotechnical engineer, and slope stability analysis and foundation design as required once the site grading plans and house plans are completed.

Results of our preliminary slope stability analyses are included in the appendix. However, these results must be confirmed by performing a detailed geotechnical evaluation, extensive laboratory testing program, soil strength parameter determination and confirmation, and risk analysis. The given slope stability results are meant to be used only for planning purposes and not for the project design purposes.

Earthquakes: Based on site geology, topography, and our preliminary evaluation, in our opinion, the site is generally not considered to be located within highly active seismic area. Therefore, anticipated ground motions in the region due to seismic activity are relatively low and do not pose a significant hazard. Ground accelerations more than 0.1g to -0.2g are not anticipated to occur at the site.

Based on the results of our subsurface explorations and review of available literature (Current international Building Code), in our opinion, a site classification “D” may be used for this project. However, this site classification may be revised by performing a site-specific shear wave velocity study.

Subsurface soil conditions at the site are not susceptible to liquefaction. Seismically induced slope instability may occur on a localized scale in the steep slope areas; however, such an evaluation was beyond our scope of services. A detailed seismic hazards evaluation of the site was beyond our scope of services

Expansive Soils and Bedrock: The site is not underlain by expansive clayey soils or clayey sedimentary bedrock materials. In any case, if expansive soil pockets are encountered, mitigation of expansive soils will require over-excavation and replacement with non-expansive soils placed and compacted at a minimum of 95% of its maximum Standard Proctor Dry Density, ASTM D-698. As an option, the use of drilled pier foundation may be considered. Floor slabs on expansive soils should be expected to experience movement. Over-excavation and replacement has been successful in minimizing slab movements. The use of structural floors should be considered for basement construction on highly expansive clays. Final recommendations should be determined after an open-hole inspection is performed by AGS during construction.

Collapsible Soils: The site is most likely underlain by collapsible soils at random locations. In any case, if collapsible soil pockets are encountered, they will require surficial densification or over-excavation and replacement with non-collapsible soils placed and compacted a minimum of 95% of its maximum Standard Proctor Dry Density, ASTM D-698. Refer to geotechnical discussion given in this report regarding collapsible soil potential and recommended mitigation options.

Man-made soils or Artificial Fill: These consist of man-made fill deposits associated with erosion berms and earthen dams. These areas were not present at the time of site reconnaissance. Any earthen dam should be avoided during development unless significant grading is required in the drainage areas. Mitigation of drainage areas is discussed in the following paragraphs.

Seasonal & Potentially Seasonal Shallow Groundwater Areas: These areas have periodically high subsurface moisture conditions and frost-heave potential. In general, these areas lie within the drainages and low-lying areas. These areas are not present at the site. The site is not located within any mapped floodplain zones according to the FEMA Maps. A detailed flood hazard evaluation, or the determination of exact locations of floodplain and specific drainage studies were beyond our scope of services. In any case, as a minimum, finished floor elevations must be at least one foot above the 100-year floodplain elevations. If seasonal shallow groundwater areas are noted during construction, following mitigation measures should be implemented.

Foundations should be placed at least 36 inches below the finished exterior grade for frost protection. In areas where high subsurface moisture conditions are anticipated periodically,

subsurface perimeter drains should be installed to mitigate water intrusion into areas below grade. Proper grading (minimum 2%) should be done to direct surface water run-off around construction to avoid soil saturation or ponding.

Any organic material (including topsoil) should be completely removed from the construction area prior to the placement of fill.

Any potentially seasonal shallow groundwater areas may experience high subsurface moisture conditions and frost-heave potential. These lie within the drainages and low-lying areas and should be avoided using proper development methods or properly mitigated as discussed above. At the site, the potential does not exist for high groundwater during high moisture periods.

Flooding: Our review of available flood hazards map and literature did not indicate that the site is susceptible to flooding due to river, or due to any perennial and intermittent tributaries across the project area. Notwithstanding, a detailed flood hazard evaluation was beyond our scope of services.

Erosion & Gullying: The areas that are undergoing severe erosion by water and sheetwash producing gullies and rill erosion were noted during reconnaissance. Only minor areas of erosion were observed on site at random isolated locations such as the debris flow or drainage fans or gullies. Notwithstanding, due to the nature of on-site soils, majority of the site is subject to erosion by wind and water, unless proper geotechnical measures are implemented during construction. The presence of vegetation generally reduces the potential for erosion. Prior to or during construction, if eroding areas are identified, they should be mitigated using check dams, regrading, and revegetation using channel lining mats and erosion mats to anchor vegetation and promote vegetation. Specific recommendations pertaining to revegetation should be provided by a qualified landscape architect and/or the Natural Resource Conservation Service (previously Soil Conservation Service) officials.

Erosion Control: On-site soils are mildly to moderately susceptible to wind erosion, and moderately to highly susceptible to water erosion. During and immediately after construction, minor wind erosion and dust may occur. This minor hazard may be mitigated by watering exposed and cut areas or the use of a chemical palliative may be considered to control dust. In our opinion, after the completion of construction and re-vegetation at the site, the wind erosion hazard will be significantly reduced.

Any exposed or loosely compacted soils will be the most susceptible to water erosion. In general, residually weathered soils and weathered bedrock materials are significantly less susceptible to water erosion than alluvial soils. For on-site alluvial soils, water erosion hazard can be minimized

by limiting velocities for unvegetated and unlined earth channels to 3 to 4 feet/second, depending upon the sediment load carried by water. Allowable velocities can be increased to 4 to 7 feet/second provided adequate vegetation is used; final numbers depending upon the type of vegetation established. If anticipated velocities exceed these values, channel lining material or conventional riprap may be used to reduce erosion potential. In areas where ditch-lining materials are inadequate to control erosion, small check dams or sediment traps may be used. Check dams generally reduce flow velocities as well as provide small traps for containing sediment. A drainage engineer or civil engineer should determine the amount and location for the placement of ditch linings, check dams, and any special erosion control features.

We anticipate sheetwash and rill erosion in the proposed cut and fill slope areas unless these areas are properly re-vegetated. It should be noted that the unchecked rill erosion eventually leads to concentrated flows of water, which result in gully erosion. Therefore, adequate re-vegetation of cut and fill slope area is important. Cut and fill slope areas steeper than 3H:1V are increasingly more difficult to revegetate. Such areas should be revegetated based on the specific recommendations given by a qualified landscape architect and/or the Soil Conservation Service official.

SEISMIC CONSIDERATIONS

Based on the results of our subsurface explorations and review of available literature (current International Building Code), in our opinion, a site classification “D” may be used for this project. However, this site classification may be revised by performing a site-specific shear wave velocity study. We do not anticipate seismically induced significant liquefaction potential at the site. However, seismically induced slope stability and rockfall hazards may be present and can be fully evaluated only by performing a detailed site-specific seismic hazards evaluation.

GEOTECHNICAL CONSIDERATIONS

Following site conditions pose geotechnical concerns for the proposed construction.

- The presence of potentially collapsible soils in the upper 10-15 feet which are not suitable for foundation support without soil modifications.
- The need for soil modifications, the presence of moderate slopes, and the presence of debris fan deposit, requiring extensive geotechnical oversight during project civil and structural design and during earthwork/construction.
- The presence of erratic boulders north of the existing and recently built rockfall barrier/berm, suggesting that there is a possibility of some boulders to reach the southern site boundary.

These site conditions can lead to significant differential movements (geotechnical risk) or structural distress unless proper geotechnical design and construction methods are implemented. In order to address the geotechnical risk, following geotechnical considerations must be considered.

Basement or Below-Grade Construction: Due to the presence of unsuitable potentially collapsible soils in upper 10-15 feet, basement or below-grade construction will facilitate the automatic removal of unsuitable soils and optimize the foundation costs. If below-grade construction is not proposed, then following ground improvements should be considered for site development. Without value engineering and significant involvement of a geotechnical engineer during the design and construction process, below-grade construction is not recommended.

Ground Improvements: If basement or below-grade construction is not proposed, then ground improvement would be necessary for soils present in the upper 10-15 feet. We suggest following options for ground improvement.

a. No over-excavation option: Use rammed aggregate piers, stone columns, geopiers, or similar methods which compact the soils during installation. We do not anticipate or recommend the depth of these special foundation systems to exceed 50 feet without a detailed value engineering analysis.

b. Shallow over-excavation and backfilling option: Over-excavation of unsuitable soils in upper 5-10 feet (depending upon the building location) and backfilling with geogrid-reinforced structural fill prism. The use of geogrid reinforced structural fill prism is recommended to minimize differential settlements and to significantly improve bearing capacity, while reducing the depth of over-excavation.

c. Deep over-excavation and backfilling option (no geogrid): Over-excavation of unsuitable soils in upper 15 feet and backfilling with compacted structural fill is another viable option, however it may prove to be costly, due to required shoring and excavation related costs. The depth of over-excavation can be reduced after the completion of additional analyses and the review of project plans, including grading plans.

d. Geopolymer (such as **URETEK** or equivalent) injection option: This option may be used in conjunction with shallow over-excavation to further improve bearing capacity and reduce differential settlement potential.

Once a particular ground improvement method or a combination of methods is chosen, and the project plans are made available for review, at your request, we can provide detail design and construction recommendations for ground improvements. A specialty contractor must evaluate the applicability of their ground improvement technology for subsurface soil conditions described earlier.

Conventional Shallow Footings or Post-tensioned Mat Foundation Considerations: After ground improvement, proposed building can be supported on conventional shallow footings or post-tensioned mat foundation. Provided ground improvements are made as stated above, a post-tensioned mat foundation (instead of a conventional mat foundation) is a preferred option. Designer should pay attention to possible settlements in areas adjacent to the site due to mat foundation. It should be noted that the bearing capacity value and all other design values for the mat foundation design will depend upon the location of the mat foundation and the type of ground improvement chosen.

Deep Foundation Considerations: We do not recommend the use of deep foundations such as drilled piers or driven piles or augercast piles for the following reasons:

- Due to the presence of collapsible soils, there will be significant negative skin friction, as well as the use of casing may become necessary, thus increasing the costs significantly.
- Due to the possibility of the presence of boulders at random depths, drilling or driving the piles will be difficult and very costly.
- The end bearing strata for conventional deep foundation systems is expected to be at least 100 feet below the ground surface, thus making the use of conventional deep foundations not only the costliest but also the least effective foundation choice.

Geotechnical Design Parameters: AGS will provide various geotechnical design parameters after the review of proposed civil drawings during the design phase of the project.

CONVENTIONAL SHALLOW SPREAD FOOTINGS

This option can be used provided the owner is willing to take low risk of future differential movement related structural damage due to the presence of potential collapsible soils. In order to manage the risk to some level, following recommendations may be used for construction:

- Foundation subgrades should be prepared as follows assuming favorable weather conditions:
    a. Over-excavate the foundation areas to a depth determined by AGS for each building during the design phase of the project. AGS will provide detailed recommendations on slopes of over-excavation, depth of over-excavation, and backfilling with structural fill using on-site soils to reduce earthwork costs. As a minimum, all the structural fill should be compacted to at least 95% and up to 100 of ASTM D698 maximum dry density as discussed in the fill compaction section of this report. Any non-soil materials encountered in the foundation subgrade level should be removed and backfilled with structural fill.
    b. AGS will perform detailed geogrid-reinforced soil prism analysis and make specific recommendations on the type and number of geogrid layers to be placed within the

structural backfill to minimize the collapsible soils hazards and to improve soil bearing capacity at the same time.

c. Over-excavation recommendation may be modified based on the results of an open-hole inspection to be performed by AGS during construction to evaluate subgrade soil moisture conditions, soil consistency, and soil uniformity.

d. If specific soil conditions are encountered at the foundation level throughout the site during an open hole inspection, AGS may be able to eliminate the above over-excavation requirement and recommend other procedures such as uniformly wetting the subgrade to obtain certain soil moisture content range and surficial compaction/kneading with a kneading compactor. In any case, if recommended, subject to open hole inspection, all subgrade wetting work should be done in the presence of AGS in order to avoid over-saturation of soils and foundation subgrades.

- Foundations bearing upon properly prepared and approved subgrade may be designed for a maximum allowable bearing pressure of **3,000 - 5,000 pounds per square foot (psf)** based on the geotechnical design during the design phase of the project.
- Estimated final structural loads will dictate the final form and size of foundations to be constructed. However, as a minimum, we recommend bearing walls be supported by continuous footings of at least 16 inches in width. Isolated columns should be supported on pads with minimum dimensions of 24 inches square.
- Continuous foundation walls should be reinforced in the top and bottom to span an unsupported length of at least 8 feet to further aid in resisting differential movement. As a minimum, additional reinforcement as shown in Figure 13 should be placed.
- Exterior footings and footings in unheated areas should extend below design frost depth of 36 inches.
- Foundation/basement walls (if used) should be adequately designed as retaining walls and adequate drainage measures as illustrated in Figure 14.

We estimate total movement/heave for foundations designed and constructed as discussed in this section will be 1.0 inch – 1.5 inch, with differential settlements on the order of one-half to three-fourths of the total settlement.

POST-TENSIONED MAT FOUNDATION

Provided ground improvements are made as stated above, a post-tensioned mat foundation may be used to further reduce to potential for differential movement.

Allowable Bearing Capacity and Settlements: It should be noted that the allowable bearing capacity value for the mat foundation design will depend upon the location of the mat foundation and ground improvement techniques. Following bearing capacity values may be considered for preliminary design:

Case 1(Preferred): Post-tensioned mat underlain by 5-foot thick geogrid reinforced fill prism (base layer), which in turn, is underlain by recompacted on-site structural fill…… …..**Up to 5,000 psf***

Case 2: After ground improvement is completed using rammed aggregate piers, stone columns, or geopiers; no over-excavation……..…..**Up to 3,250 psf***

Case 3: Basement or below grade construction; no ground improvements, allowable bearing capacity at 10-15 feet below existing grade……..……**4,000-5,000 psf**

*Ground improvement design to be done by AGS or reviewed and approved by AGS.

The above recommended allowable bearing pressures may be increased by 1/3rd for transient loads. Provided these recommendations are followed, we have estimated total settlements may be in the range of 0.75-1.25 inches for an assumed rigid mat of 150 FT X 250 FT plan dimensions for the given maximum bearing pressures resulting from symmetrically distributed column loads. Differential settlements between the center of the mat and edges and corner of the mat are estimated to be approximately 1/2 to 3/4th of the maximum total settlements. Given estimates must be confirmed after the review of foundation plans including project loading data.

The above settlements are based on elastic theory and the assumption that the mat will be rigid for all practical purposes. The rigidity of mat foundation is a function of soil-structure interaction. It depends upon the modulus of subgrade reaction of soil, mat dimensions, column spacing, and the rigidity of the superstructure. Therefore, AGS should perform settlement analyses after the review of foundation plan and structural design data, to confirm given settlement estimates. If the mat cannot be considered rigid, AGS will compute the soil pressure distribution using soil-structure interaction model such as 'the beam on an elastic foundation' and evaluate the settlement pattern of the proposed foundation using an iterative process.

For preliminary settlement analyses by others, a modulus of vertical subgrade reaction value (K) of 300 pci may be used for structural fill to be placed underneath the mat. This modulus value is based on a 1-Foot square plate, therefore, it must be corrected for the mat shape and size as per the project plans. In addition, the K value may be modified by AGS depending upon the chosen soil modification technique.

The bottom of mat foundation should be placed at least 3 feet below the finished exterior grade. Prepared mat foundation subgrades should be inspected and approved by AGS prior to the placement of concrete.

At your request, AGS will provide detailed design parameters and recommendations for a post-tensioned mat foundation.

SLAB-ON-GRADE

As per the CAGE (Colorado Association of Geotechnical Engineers) guidelines, the "Slab Performance Risk" associated with heaving of native soils is "Low" due to the absence of expansive soils near the surface. Slab-on-grade is a viable option; however, the owner should be aware that there is always some potential risk associated with slab movement, especially if the site is underlain by fill and/or if site modifications as described earlier are not completed. In order to minimize the risk of slab movement, we recommend over-excavation of existing potentially collapsible soils to a depth of at least 5 feet and backfilling with structural fill reinforced with geogrid. Depth of over excavation will depend upon site grading and slab loading. The use of geogrid reinforcement may also become necessary due to the possibility of the presence of variable fill depths. AGS should review the final project plans including slab loading and confirm that excessive settlements will not occur.

A slab-on-grade supported on subgrades after the completion of ground improvements as described earlier, a structural slab, or a post-tensioned slab (PTS) slab is always a more reliable option, especially if the owner is not willing to assume any risk associated with excessive differential slab movement.

For design of floor slabs, a modulus of subgrade reaction of 300 pounds per cubic inch (pci) may be used provided slab-on-grade is placed on properly prepared subgrades. This value can be modified after the project plans are finalized.

We recommend that the construction measures outlined in the following paragraphs be followed to reduce potential damage to floor slabs, should wetting of the subsurface soils occur:

- Prior to the placement of any structural fill, scarify the slab subgrade to a depth of 8 inches, surficially compact it to 95% of the Standard Proctor (ASTM D698) maximum dry density at moisture content within 2% of the optimum, and then proof-roll the subgrade in the presence of AGS representative. Place the structural fill as per the fill placement recommendations given in this report, after the subgrade is approved by AGS representative. Proof-rolling may be performed using a full water truck or a front-end loader with a loaded large bucket.

- Separate floor slab from all bearing walls and columns with expansion joints to allow unrestrained vertical movement. Under any circumstances, floor slab should not extend beneath exterior doors or over foundation grade beams without saw cutting the slab at the beam after construction.

- Frequent control joints should be provided at appropriate spacing to reduce problems with shrinkage and cracking according to ACI specifications. Control joint spacing is a function of slab thickness, aggregate size, slump and curing conditions. The requirements for concrete slab thickness, joint spacing, and reinforcement should be established by the project designer, based on experience, recognized design guidelines and the intended slab use. Placement and curing conditions will have a strong impact on the final concrete slab integrity.

- Floor slabs should be adequately reinforced for given loading and to control cracking.

- The need for a vapor barrier will depend on the sensitivity of floor coverings to moisture. If moisture sensitive floor coverings are proposed for portions of the proposed structure, a capillary break material, typically consisting of a "clean" gravel, should be considered. We can provide additional recommendations if this is the case.

- Provided gravel is desired below the slab, a layer of 4 to 6 inches can be used. Plumbing passing through slabs should be isolated from the slabs and provided with flexible connections to allow for movement. A positive bond break should be provided where plumbing lines enter through the slab. Under slab, plumbing should be avoided if possible and should be brought above the slab as soon as possible. Any drain lines and plumbing lines should be tested before operations.

- Where mechanical equipment and HVAC equipment are supported on slabs, we recommend provision of a flexible connection between the furnace and ductwork with a minimum of 1.5 inches of vertical movement.

- Sidewalks and other exterior flatwork should be separated from the slab and the slab should be designed as an independent unit.

RETAINING WALLS

Foundation walls and basement walls (if used) should be designed to be rigid (unyielding), and not free to rotate. Retaining walls such as elevator pit walls or other similar structures extending below ground floor level that are not supposed to have deflection should be designed for at-rest conditions in accordance with soil design parameters to be provided by AGS during the design phase of the project. If needed, only imported granular backfill meeting CDOT Class 1 structural backfill may be used. Attached Figure 15 and Figure 16 may be used to assist in estimating for

lateral pressure calculations. We should be contacted to provide additional recommendations for any specific site retaining conditions. In addition, we highly recommend AGS reviews retaining structure designs performed by others to facilitate design optimization and value engineering.

Retaining wall backfill should be placed in strict accordance with our earthwork recommendations given below. Backfill should not be over-compacted in order to minimize excessive lateral pressures on the walls. As a precautionary measure, a drainage collection system (drains or geosynthetic drains) should be included in the wall design in order to minimize hydrostatic pressures. A prefabricated drainage composite or drain board such as the MiraDrain 2000 or an engineer-approved equivalent may be installed along the backfilled side of the basement foundation wall.

For preliminary design, foundation walls and basement walls, if used, should be designed to be rigid (unyielding), and not free to rotate. Retaining walls for at-rest conditions can be designed to resist an equivalent fluid density of 55 pcf for on-site materials. Retaining walls for unrestrained conditions (free lateral movement) can be designed to resist an equivalent fluid density of 45 pcf for on-site fill materials and 35 pcf for imported granular backfill or CDOT Class 1 structural backfill. For passive resistance of unrestrained walls, we recommend passive resistance of 300 psf per foot of wall height. A coefficient of friction value of 0.35 may be used for contact between the prepared soil surface and concrete base.

The above recommended values do not include a factor of safety or allowances for surcharge loads such as adjacent foundations, sloping backfill, vehicle traffic, or hydrostatic pressure. The above recommended values do not include hydrostatic pressures as they are based on drained conditions. We should be contacted to provide additional recommendations for any specific site retaining conditions.

SUBSURFACE DRAINAGE

High groundwater table was not encountered during or after the completion of drilling. Nonetheless, proper subsurface drainage is important for long-term performance of the proposed structures.

- A perimeter drain/dewatering system should be installed to reduce the potential for groundwater entering into foundation and slab areas. The lot-specific perimeter dewatering systems should be meticulously designed and connected to the suitable discharge from the lot.

- The subgrade beneath a structural floor system (if any) should be graded so that water does not pond. In addition, drain laterals that span the crawl space are recommended to prevent ponding of water within the crawlspace.
- As a minimum, the subsurface drainage system should consist typically of 4-inch minimum diameter perforated rigid PVC pipe surrounded by at least one pipe diameter of free draining gravel. The pipe should be wrapped in a geosynthetic to prevent fine soils from clogging the system in the future. The pipe should drain by gravity to a suitable all-weather outlet or to a meticulously designed area underdrain system. If an outlet or area underdrain is not available, the subsurface drainage system should be sloped to sump pits with sump pumps having standby capacity in the event of pump failure.
- Surface cleanouts of the perimeter drain should be installed at minimum serviceability distances around the addition. A properly constructed drain system can result in a reduction of moisture infiltration of the subsurface soils. Drains which are improperly installed can introduce settlement or heave of the subsurface soils and could result in improper surface grading only compounding the potential issues.
- The entire design and construction team should evaluate, within their respective field of expertise, the current and potential sources of water throughout the life of the structure and provide any design/construction criteria to alleviate the potential for moisture changes. If recommended drain systems are used, the actual design/layout, outlets, and location should be designed by AGS. The construction means and methods should be observed by a representative of AGS.

SURFACE DRAINAGE

Proper surface drainage should be maintained at the site during and after completion of construction operations. Based on the intended use of the proposed facility, all drainage recommendations provided local, state, and federal regulatory agencies should be strictly followed.

- It is important to follow these recommendations to minimize wetting or drying of the foundation elements throughout the life of the facility. Construction means and methods should also be utilized which minimize improper increases/decreases in the moisture contents of the soils during construction.
- The ground surface adjacent to buildings should be sloped to promote rapid run-off of surface water. We recommend a minimum slope of six inches in the first five horizontal feet for landscaped or graveled areas. These slopes should be maintained during the service life of buildings.

- Landscaping should be limited around building areas to either xeri-scaping, landscaping gravel, or plants with low moisture requirements. Irrigation should be minimal and limited to maintain plants. Roof downspouts should discharge on splash-blocks or other impervious surfaces and directed away from the building. Ponding of water should not be allowed immediately adjacent to the building.
- Upper 2 feet of exterior grading or landscaping fill placed immediately adjacent to the building (within 10ft) should be relatively impervious to minimize water infiltration adjacent to the building. Do not use plastic membrane in lieu of impervious fill to cover the ground surface.
- Again, positive drainage away from the new structures is essential to the successful performance of foundations and flatwork and should be provided during the life of the structure. Paved areas within 10 feet of structures should slope at a minimum of 2 percent away from foundations, and landscape areas within 10 feet of structures should slope away at a minimum of 8 percent.
- Downspouts from all roof drains, if any, should cross all backfilled areas such that they discharge all water away from the backfill zones and structures. Drainage should be created such that water is diverted away from building sites and away from backfill areas of adjacent buildings.

See Figure 14 for typical drainage details for shallow footings, which may be used wherever applicable. At your request, we can provide specific drainage recommendations after the review of detailed project plans, including civil engineering drawings. For any underground retention/detention structures, we should be contacted to review and approve the civil drawings and to evaluate leakage criteria, if any.

GENERAL EARTHWORK

At the time of report preparation, grading plans were not available. If cuts and fills will exceed 4 feet of depth, we must be contacted for specific earthwork recommendations, especially stability of adjacent structures, shoring requirements, cut slopes, oversite site slope stability, and construction dewatering. In any case, site grading should be carefully planned so that positive drainage away from all structures is achieved. Following earthwork recommendations should be followed for all aspects of the project.

Shoring and/or slope stability may become an important element of project planning for this site, if below-grade construction is planned. In general, proper shoring design and slope/cut stabilization should be performed and a shoring system or retaining walls installed in order to maintain on-site and off-site stability during construction.

EXCAVATIONS

Materials encountered at this site may be excavated with conventional mechanical excavating equipment including some specialized equipment for boulder removal. Although our borings did not encounter "buried" foundation elements or other structures or debris, these materials will most likely be encountered during excavation activities. In older urban areas, it is highly likely to have miscellaneous underground structures, facilities, and debris materials such as brick, wood, concrete, abandoned utility lines, cisterns, buried fuel tanks. If encountered, these non-soil materials should be removed from the site and all cavities and voids should be backfilled with compacted structural fill.

Temporary excavations should comply with OSHA and other applicable federal, state, and local safety regulations. In our opinion, OSHA Type B/C soils will be encountered at this site during excavations. We recommend maximum allowable unbraced temporary excavation slopes of 1.25:1(H:V) for Type B/C soils for excavations up to 15 feet deep, only after cut stability analyses are performed. The cut stability analyses are recommended due to the presence of upslopes and debris fan deposit which may become unstable if they are not properly excavated or supported. Permanent cut slopes are anticipated to be stable at slope ratios as steep as 2H:1V (horizontal to vertical) under dry conditions. New slopes should be revegetated as soon as possible after completion to minimize erosion.

We recommend a minimum of 10 feet of clearance between the top of excavation slopes and soil stockpiles or heavy equipment or adjacent structures (subject to approval of AGS). If braced excavations are to be used, they should be reviewed and designed by AGS. It should be noted that near-surface soils encountered at the site will be susceptible to some sloughing and excavations should be periodically monitored by AGS.

If excavation is performed under water table, or excavation is made steeper than OSHA recommendations, proper shoring should be provided. It is contractor's responsibility to assure safety during excavation and earthwork operations.

CONSTRUCTION DEWATERING

Due to the absence of high-water table, construction dewatering may not be critical for this project, as long as excavations do not exceed 15 feet below existing site grades. As a minimum, an

interceptor drain outside the entire uphill perimeter of proposed buildings may be considered with proper discharge and proper maintenance during construction.

During construction in wet or cold weather, grade the site such that surface water can drain readily away from the building areas. Promptly pump out or otherwise remove any water that may accumulate in excavations or on subgrade surfaces and allow these areas to dry before resuming construction. Berms, ditches, and similar means may be used to prevent storm water from entering the work area and to convey any water off-site efficiently.

FILL MATERIAL SPECIFICATIONS AND PLACEMENT

Following fill material specifications may be used, however, AGS should evaluate the suitability of all proposed fill materials prior to placement. In general, fill material should be a non- expansive soil free of vegetation, brush, sod, trash and debris, and other deleterious substances, and should not contain rocks or lumps having a diameter of more than 5 inches. A fill material should be considered non-expansive if the swell potential under a 200 psf surcharge pressure does not exceed 0.5%. Swell potential should be confirmed by performing a swell test on a remolded sample (95% ASTM D698 maximum dry density at optimum moisture content). We anticipate on-site soils, including existing fill will generally meet the requirements for non-expansive fill.

On-site fill materials: Excavated on-site fill materials may be reused in the non-foundation areas such as slabs, pavements, and landscape areas, provided they are free from organics and any non-soil materials. Highly plastic clays or weathered sandstone/claystone bedrock should not be re-used on-site except in landscaped areas.

Structural fill materials: Structural fill under the foundations should be non-expansive and free from organics and non-soil materials. Imported structural fill should consist of sand or gravel material with a maximum particle size of 2 inches or less. In addition, this material shall have a liquid limit less than 35 and a plasticity index of 10 or less. Structural fill should also have a percent fine less than 20 percent passing the No. 200 sieve. Colorado Department of Transportation (CDOT) Class 1 structure backfill meets these requirements.

Subslab Fill materials: Structural fill placed beneath floor slabs, pavements, and exterior flatwork areas may consist of moisture-conditioned on-site granular soils or non-expansive imported soil materials. Imported non-expansive fill materials should have a maximum of 30% passing the No. 200 sieve, a maximum Liquid Limit of 35, and a maximum Plasticity Index of 15.

Utility Trench Backfill: Materials excavated from the utility trenches may be used for trench backfill above the pipe zone fill provided they do not contain unsuitable material or particles larger than 4 inches and are outside of areas requiring structural fill or subslab fill.

Pipe Bedding Material: Pipe bedding material should be a free-draining, coarse-grained sand and/or fine gravel. Some of the on-site sand and gravel mixtures may be suitable as pipe bedding fill materials.

Fill Compaction Criteria: In general, we recommend the following fill compaction criteria, which may be modified as deemed necessary after the review of project plans and project team discussions.

Fill Location	Minimum % of ASTM D698 Standard Proctor Maximum Dry Density	Moisture Content
All areas sensitive to differential settlement	100	Within 2% of OMC
Underneath mat foundation	98	Within 2% of OMC
Area within 10ft of the edges of mat foundation	98	Within 2% of OMC
Floor slabs, garage slabs, and pavements	95	Within 2% of OMC
Retaining wall foundations	95	Within 2% of OMC
Retaining wall backfill	90	Within 2% of OMC
Landscape and other non-structural areas	85	Within 2% of OMC

Fill Placement: All fill subgrades should be prepared uniformly and scarified to a depth of at least 8 inches and recompacted to at least 95% of the standard Proctor (ASTM D698) maximum dry density at moisture contents recommended above. Fill material should then be placed under proper moisture control, in uniform horizontal layers (lifts) not exceeding 8 inches, before compacting to the required density and before successive layers are placed. If the contractor's equipment is not capable of properly moisture conditioning and compacting 8-inch lifts, then the lift thickness shall be reduced until satisfactory results are achieved.

Permanent fill slopes are anticipated to be stable at slope ratios as steep as 2H:1V (horizontal to vertical) under dry conditions. New slopes should be revegetated as soon as possible after completion to minimize erosion.

AGA representative should observe prepared fill subgrades and fill placement on a full-time basis.

PAVEMENT DESIGN & CONSTRUCTION

Pavement design assumes pavement structure as a layered system that is used to adequately distribute concentrated vehicular traffic loading to subgrade soils. Therefore, the performance of the pavement structure is related to proper characterization of the physical properties of subgrade soils as well as traffic loading.

Subgrade Soil Improvement: Unless the owner is willing to assume a low to moderate risk for differential movement associated with collapsible soils, subgrade soils may be over-excavated and backfilled with structural fill as per the recommendations given for the proposed foundations. The use of geogrids may also be considered to minimize the over-excavation depths. Once the project is finalized and traffic data is made available to us, we can provide specific subgrade improvement recommendations including geogrid specifications and depth of over-excavation for different areas.

Subgrade Soil Characterization: Based on the results of our subsurface exploration, we anticipate sandy-silty soil subgrades for pavements, which is equivalent to soil classification A-2, in accordance with American Association of State Highway and Transportation Officials (AASHTO). All pavement subgrades should be proof-rolled and approved by a registered geotechnical engineer from our office prior to the placement of base rock or pavement materials.

Based on the results of our laboratory testing and the engineering evaluation, we have estimated a Hveem Stabilometer “R’ value of 10 for the subgrade soils.

Pavement Section: We used the modified AASHTO pavement design method for the preliminary design of pavements and assumed standard Equivalent Daily Load Application (EDLA) or Equivalent Single Axle Load (ESAL) values for automobile parking, access driveways, and fire lanes for a typical 6-7 multistory residential project with 15-20 buildings and a design life of 20 years. Results of our design are summarized below and illustrated in Figure 17.

Pavement Area	Full-depth AC (Inches)	AC + ABC (Inches)	PCC (Inches)
Parking	5.0	3.5 AC + 6.0 ABC	5.5
Driveways, Fire Lanes, and Heavy Traffic / Loading Areas	6.5	4.5 AC + 6.0 ABC	6.0
AC: Asphaltic Concrete; ABC: Aggregate Base Course; PCC: Portland Cement Concrete			

If specific pavement loading is planned or if some of our recommendations given here cannot be followed, we should be contacted immediately. We recommend the use of PCC (instead of AC) in areas of loading/unloading, concentrated loading, and turning movements by heavy vehicles. These areas typically include delivery zones, entrances, and trash collection/dumpster locations.

Pavement Construction: Pavement areas should be over-excavated as per the recommendations given for the soil modifications. A minimum of 4 feet of over-excavation and the placement of geogrid is anticipated for the pavement area; however, final over-excavation depths will be determined during the geotechnical design phase of the project. Over-excavated and re-compacted subgrade should be inspected and approved by AGS, prior to the placement of structural fill. This recommendation can be modified based on the chosen ground modification method and final grading plans.

All pavement subgrades should be proof-rolled with a full water truck or a heavily loaded pneumatic-tired vehicle. All pumping areas and heavily deformed subgrades should be removed and replaced with structural fill. AGS representative should inspect and approve the final pavement subgrades prior to the placement of base layer.

All PCC pavement should have adequate construction joints, including longitudinal and transverse joints. All joints should be formed during construction or sawed into freshly setting concrete prior to uncontrolled cracking. All formed joints should be properly sealed. Proper curing procedures should be used to protect PCC pavements from moisture loss, freezing, rapid temperature change, and mechanical injury. Traffic should not be allowed during the first week after pavement construction.

Pavement areas should be properly graded, and adequate drainage provided to assure quick removal of water or surface run-off from pavement areas. Ponding of water should not be allowed. All joints and curb areas should be properly sealed to minimize water infiltration. Proper and routine maintenance including annual crack repair and 5-6 year overlays should be performed to assure long-term performance of AC pavements. Similarly, regular maintenance and sealing of concrete joints should be done for PCC pavements. Deicing salts should not be used during the first year after pavement construction.

All pavement materials and placement methods should conform to the requirements given in the most current Colorado Department of Transportation's (CDOT) "Standard Specifications for Road and Bridge Construction." In addition, all applicable specifications and requirements of the local City should be followed. Pavement materials should be submitted for our review and tested for conformance with CDOT and local City specifications.

COLD WEATHER CONSTRUCTION

If earthwork is performed during the winter months when freezing is a factor, no grading fill, structural fill, or other fill should be placed on frosted or frozen ground, nor should frozen material be placed as fill. Frozen ground should be allowed to thaw or be completely removed prior to placement of fill. A good practice is to cover the compacted fill with a "blanket" of loose fill to help prevent the compacted fill from freezing overnight. The "blanket" of loose fill should be removed the next morning prior to resuming fill placement.

During cold weather, foundations, concrete slabs-on-grade, or other concrete elements should not be constructed on frozen soil. Frozen soil should be completely removed from beneath the concrete elements, or thawed, scarified and re-compacted. The amount of time passing between excavation or subgrade preparation and placing concrete should be minimized during freezing conditions to prevent the prepared soils from freezing. Blankets, soil cover or heating as required may be utilized to prevent the subgrade from freezing.

CONCRETE & STEEL CONSTRUCTION

Concrete sidewalks and any other exterior concrete flatwork around the proposed structure may experience some differential movement and cracking. While it is not likely that the exterior flatworks can be economically protected from distress, we recommend following techniques to reduce the potential long-term movement:

- Scarify and re-compact at least 8 inches of subgrade material located immediately beneath structures.
- Avoid landscape irrigation and moisture holding plants adjacent to structures.
- Thicken or structurally reinforce the structures.

Based on our experience, for this site, we anticipate Class 0 severity exposure to sulphate attach on concrete as per ACI 201 standards for all concrete in contact with the soil on this site. Calcium chloride should not be added. Concrete should not be placed on frost or frozen soil. Concrete must be protected from low temperatures and properly cured.

We anticipate corrosive potential for on-site soils. A qualified corrosion professional should evaluate site conditions and provide proper recommendations for buried metal structures.

ADDITIONAL SERVICES

We recommend retaining AGS services to provide value engineering for ground modifications, retaining structures and foundation structural design review due to soil-structure interaction complexities and ground modification requirements involved due to the presence of collapsible soils.

We recommend that AGS services are retained to provide a detailed geotechnical design report after the project design data is available, and construction observation/testing services to document and confirm that our recommendations are properly followed. This will facilitate easy modifications of recommendations provided in this report, in case variations and unknown soil/geotechnical conditions are encountered during construction. AGS will not be responsible for the implementation of all the recommendations provided in this report if these services are not performed by AGS.

It should also be noted that a detailed rockfall hazard evaluation and/or 'global' landslide hazard evaluation was not part of the current scope of work. Moreover, AGS has not reviewed or approved any rockfall hazard or drainage improvements completed in the recent past for the uphill properties located to the south of the subject site. The stability of the subject site depends upon the stability of the adjacent uphill properties. At your request, AGS can perform a detailed rockfall hazards evaluation of the uphill properties and the subject property, as well as an extensive review, evaluation, and approval of all the improvements made on the uphill properties located to the south of the subject site. This evaluation is critical to confirm whether additional mitigation is required or not to protect the subject site from future rockfall or global landslide events occurring on the adjacent southern properties located in proximity of the site.

PROJECT ASSUMPTIONS and LIMITATIONS

The recommendations given in this report are valid only if AGS services are retained to provide a detailed geotechnical design report and if AGS performs construction observations and testing services during construction. It is our assumption that the current client will retain this project for at least 10 years. If the project and/or property ownership changes, AGS must be contacted to evaluate the limitations of liability and project consulting limitations. It should also be noted that a detailed rockfall hazard evaluation or 'global' landslide hazard evaluation was not part of the current scope of work. Moreover, AGS has not reviewed or approved any rockfall hazard or drainage improvements completed for the uphill properties to the south. The stability of the subject property depends upon the stability of the uphill properties. At your request, AGS can perform an extensive review, evaluation, and approval of all the improvement made uphill of the subject site and confirm whether additional mitigation is required or not.

Evaluation of any kind of existing structures was beyond our scope of services. Recommendations contained in this report are based on our field observations and subsurface explorations, limited laboratory evaluation, and our present knowledge of the proposed construction. It is possible that soil conditions could vary between or beyond the points explored. If soil conditions are encountered during construction that differ from those described herein, we should be notified so that we can review and make any supplemental recommendations necessary. If the scope of the proposed construction, including the proposed loads or structural locations, changes from that described in this report, our recommendations should also be reviewed and revised by AGS.

Our Scope of Work for this project did not include research, testing, or assessment relative to past or present contamination of the site by any source. If such contamination were present, it is highly likely that the exploration and testing conducted for this report would not reveal its existence. If the Owner is concerned about the potential for such contamination, additional studies should be undertaken. We are available to discuss the scope of such studies with you. No tests were performed to detect the existence of mold or other environmental hazards as it was beyond Scope of Work.

Local regulations regarding land or facility use, on and off-site conditions, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of the report within one year from the date of report preparation, AGS may recommend additional work and report updates. Non-compliance with any of these requirements by the client or anyone else will release AGS from any liability resulting from the use of this report by any unauthorized party. Client agrees to defend, indemnify, and hold harmless AGS from any claim or liability associated with such unauthorized use or non-compliance.

In this report, we have presented judgments based partly on our understanding of the proposed construction and partly on the data we have obtained. This report meets professional standards expected for reports of this type in this area. Our company is not responsible for the conclusions, opinions or recommendations made by others based on the data we have presented. Refer to American Society of Foundation Engineers (ASFE) general conditions included in an appendix. This report has been prepared exclusively for the client, its' engineers, and subcontractors for the purpose of design and construction of the proposed structure. No other engineer, consultant, or contractor shall be entitled to rely on information, conclusions or recommendations presented in this document without the prior written approval of AGS.

We appreciate the opportunity to be of service to you on this project. If we can provide additional assistance or observation and testing services during design and construction phases, please call us at 1 888 276 4027.

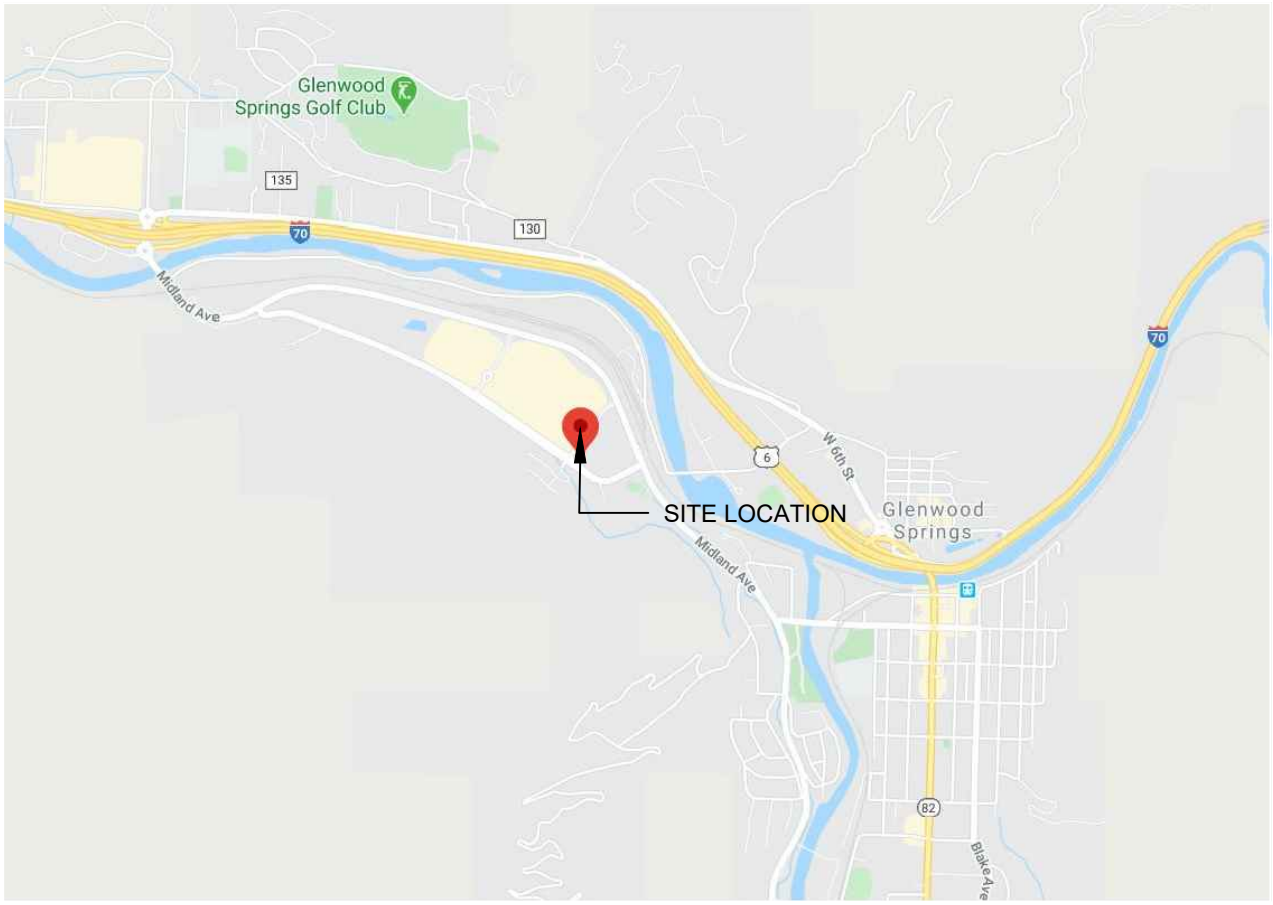
Sincerely,

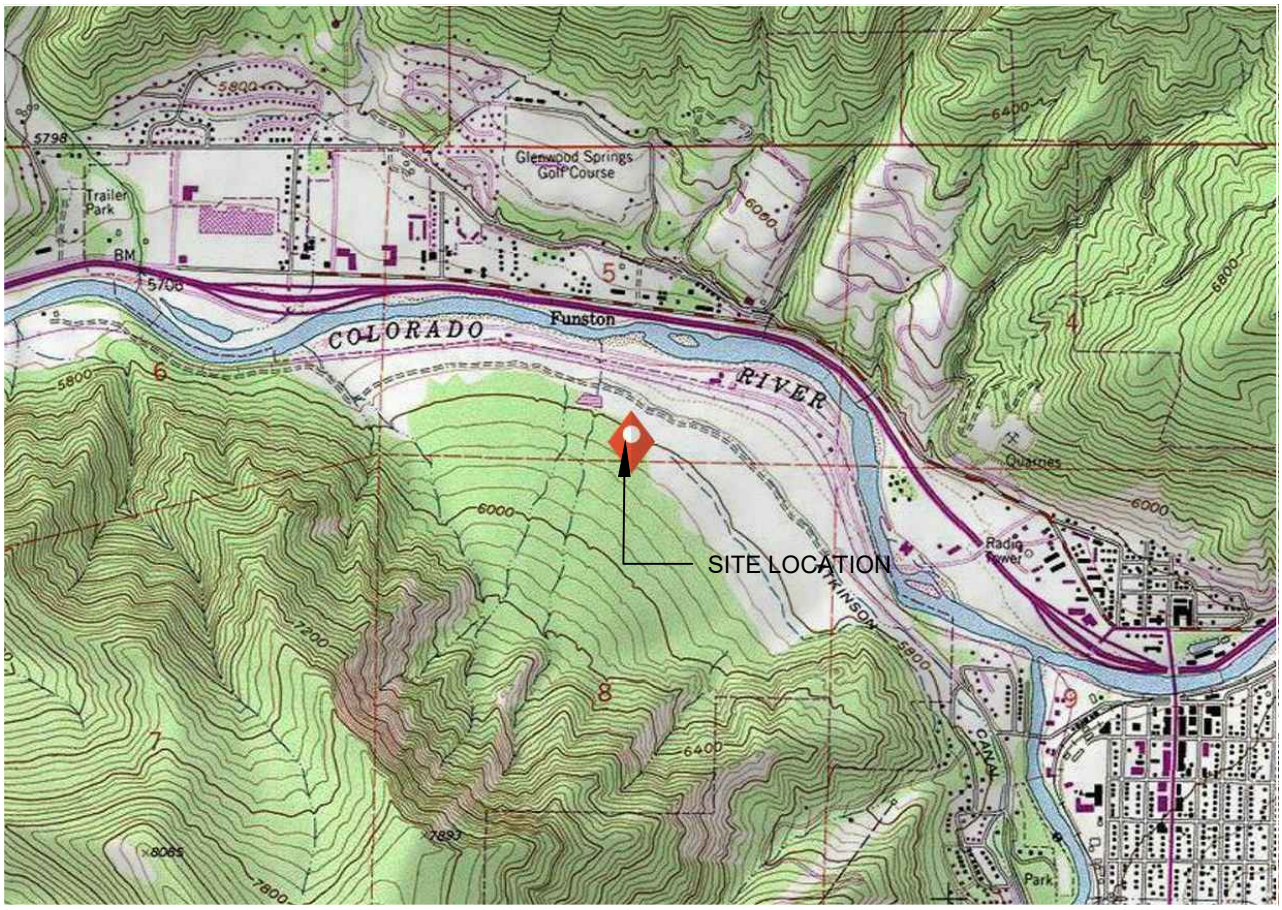


Sam Adettiwar, MS, PE, GE, P.Eng, M.ASCE
Senior Engineer

Attachments

FIGURES



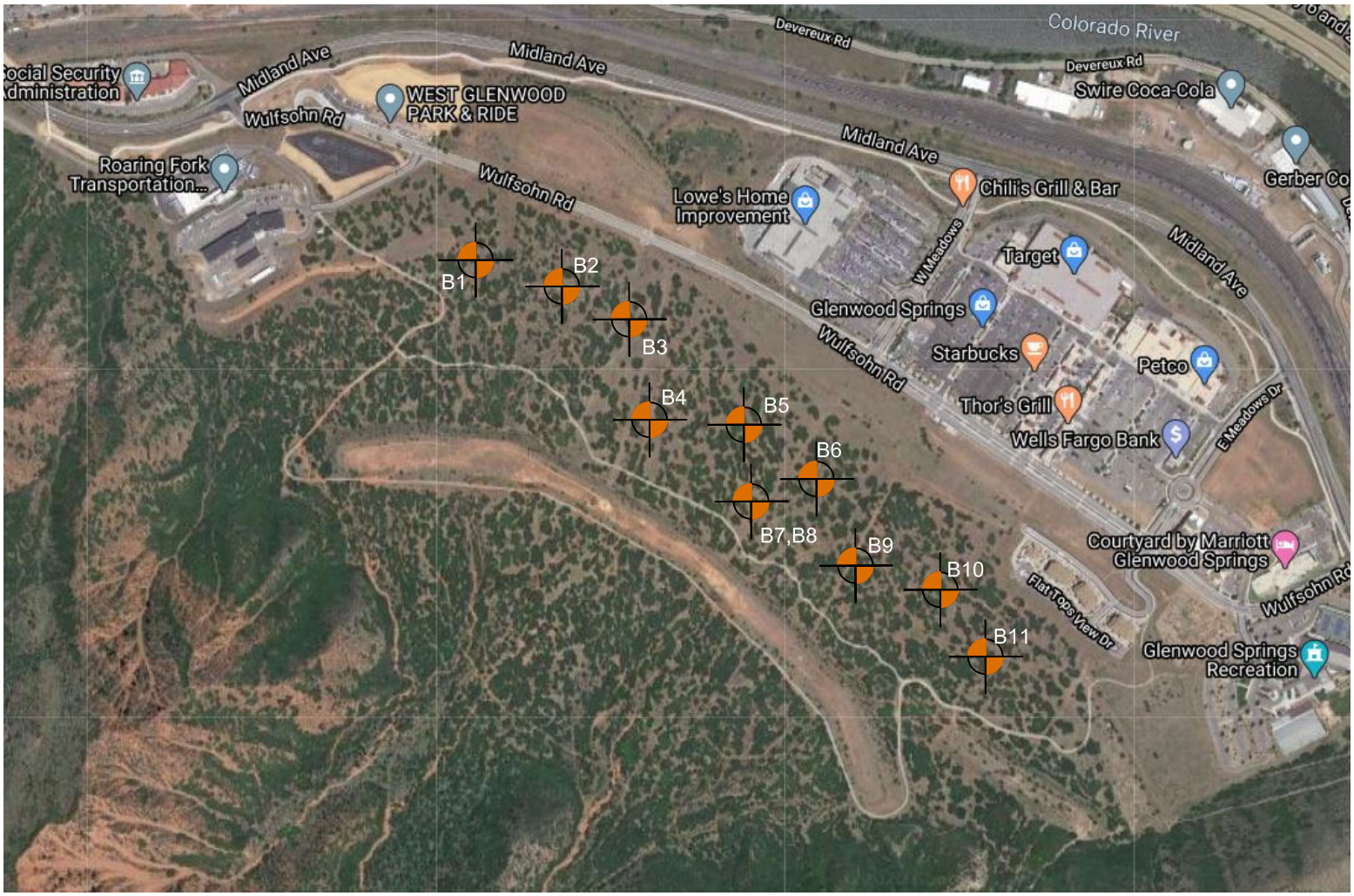


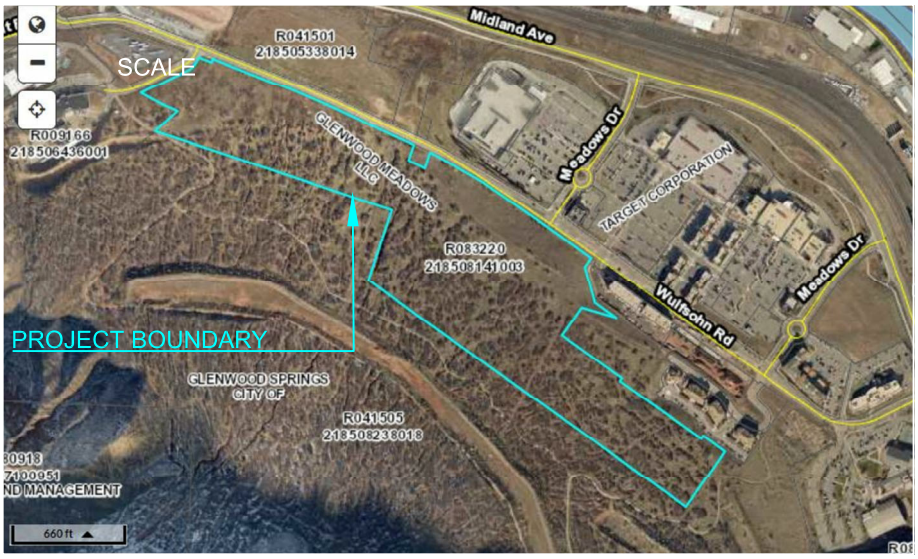
REFERENCE:
GOOGLE MAPS
USGS TOPOGRAPHIC MAPS

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FIGURE 1: SITE LOCATION MAP





NOTE:
SCHEMATIC PLAN TO SHOW APPROXIMATE SUBSURFACE EXPLORATION LOCATION ONLY; NOT SURVEYED.

N

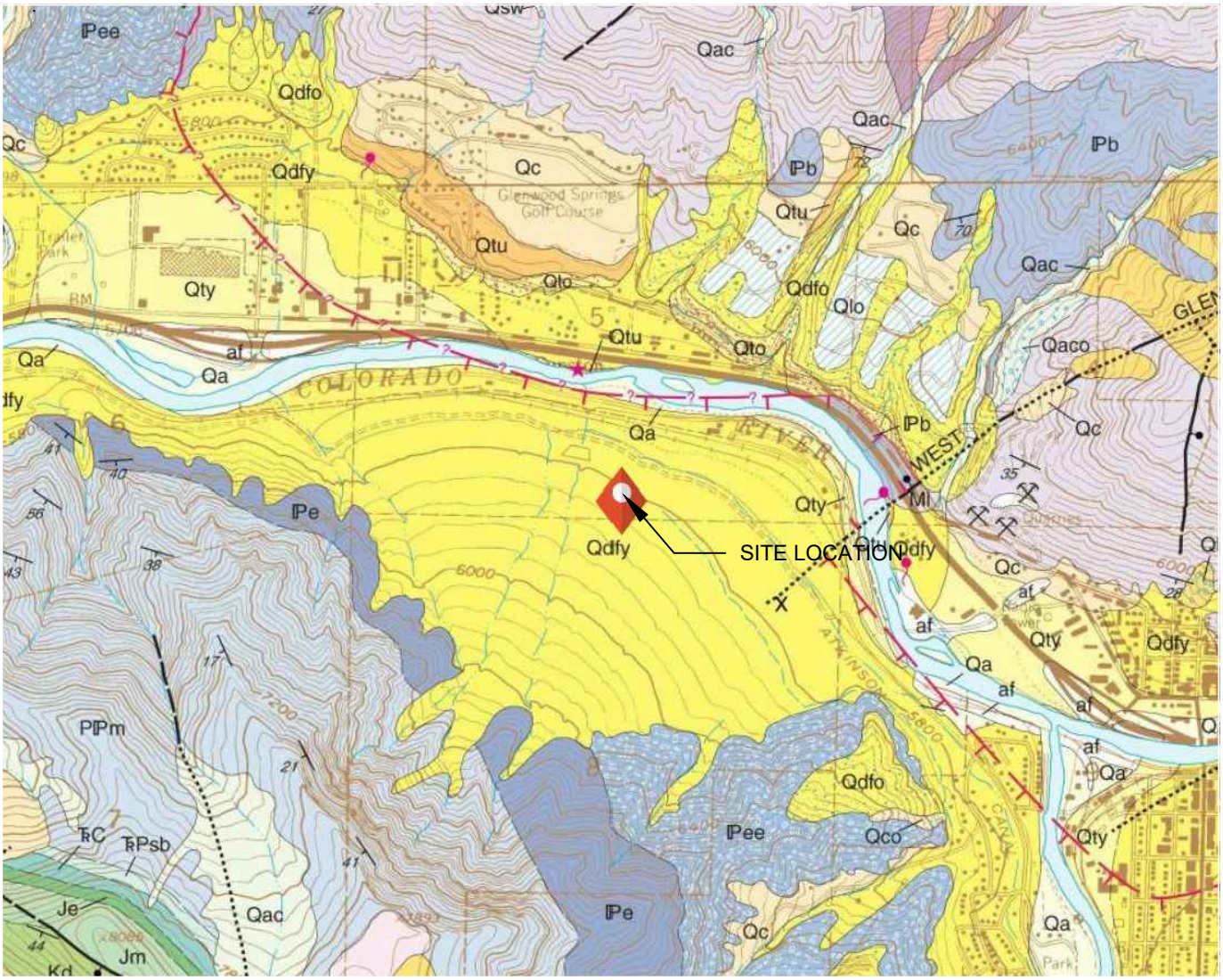
LEGEND:

DESIGNATES SUBSURFACE EXPLORATION LOCATION, BY AMERICAN GEOSERVICES, LLC. ,JUNE 2020 SEE EXPLORATION LOG IN APPENDIX FOR FURTHER DETAILS.

REFERENCE:
GARFIELD COUNTY
COLORADO GIS

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FIGURE 2: SCHEMATIC SITE PLAN



LEGEND

ALLUVIAL AND MASS-WASTING DEPOSITS

Qdfy — **Younger debris-flow deposits (Holocene)**—Poorly sorted to moderately well-sorted matrix- and clast-supported, pebble, boulder, and cobble gravel in a sandy silt or silty sand matrix. Distal fan areas are finer grained. Deposited on active fans

PIPm — **Maroon Formation (Permian and Pennsylvanian)**—Mainly reddish-brown sandstone, conglomerate, mudstone, siltstone, and claystone with minor, thin beds of gray limestone. Includes Schoolhouse Member at top of formation

IPe — **Eagle Valley Formation (Middle Pennsylvanian)**—Intertonguing sequence of Maroon Formation and Eagle Valley Evaporite

IPee — **Eagle Valley Evaporite (Middle Pennsylvanian)**—Evaporitic sequence of gypsum, halite, and anhydrite interbedded with mudstone, fine-grained sandstone, thin carbonate beds, and black shale. Commonly intensely folded, faulted, and plastically deformed

N

REFERENCE:
U.S. GEOLOGICAL MAPS

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FIGURE 3: GEOLOGIC MAP



LEGEND

Rifle Area, Colorado, Parts of Garfield and Mesa Counties (CO683)

Rifle Area, Colorado, Parts of Garfield and Mesa Counties (CO683)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Arle-Ansari-Rock outcrop complex, 12 to 65 percent slopes	200.0	15.5%
7	Ascalon-Pena complex, 6 to 25 percent slopes	40.9	3.2%
8	Atencio-Azeltine complex, 1 to 3 percent slopes	202.7	15.7%
9	Badland	60.1	4.7%
11	Begay sandy loam, 6 to 12 percent slopes	204.8	15.9%
15	Chilton channery loam, 12 to 25 percent slopes	220.4	17.1%
26	Farlow-Rock outcrop association, steep	0.8	0.1%
34	Ildefonso stony loam, 25 to 45 percent slopes	68.4	5.3%
39	Jerry loam, 12 to 50 percent slopes	10.7	0.8%
42	Lamphier loam, 15 to 50 percent slopes	15.7	1.2%
58	Potts-Ildefonso complex, 12 to 25 percent slopes	71.9	5.6%
59	Potts-Ildefonso complex, 25 to 45 percent slopes	19.3	1.5%
66	Torriorthents-Camborthids-Rock outcrop complex, steep	62.0	4.8%
67	Torriorthents-Rock outcrop complex, steep	61.3	4.7%
73	Water	52.5	4.1%
Totals for Area of Interest		**1,291.5**	**100.0%**

N

REFERENCE:

WEB SOIL SURVEY

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FIGURE 4: SOIL SURVEY MAP



Legend

Collapsable_Soils_withMeeker

EG-14 Eolian (wind-blown) deposits

EG-14 Dune and sheet sand deposits

EG-14 Cretaceous and Tertiary Formations

EG-14 Evaporite Formations

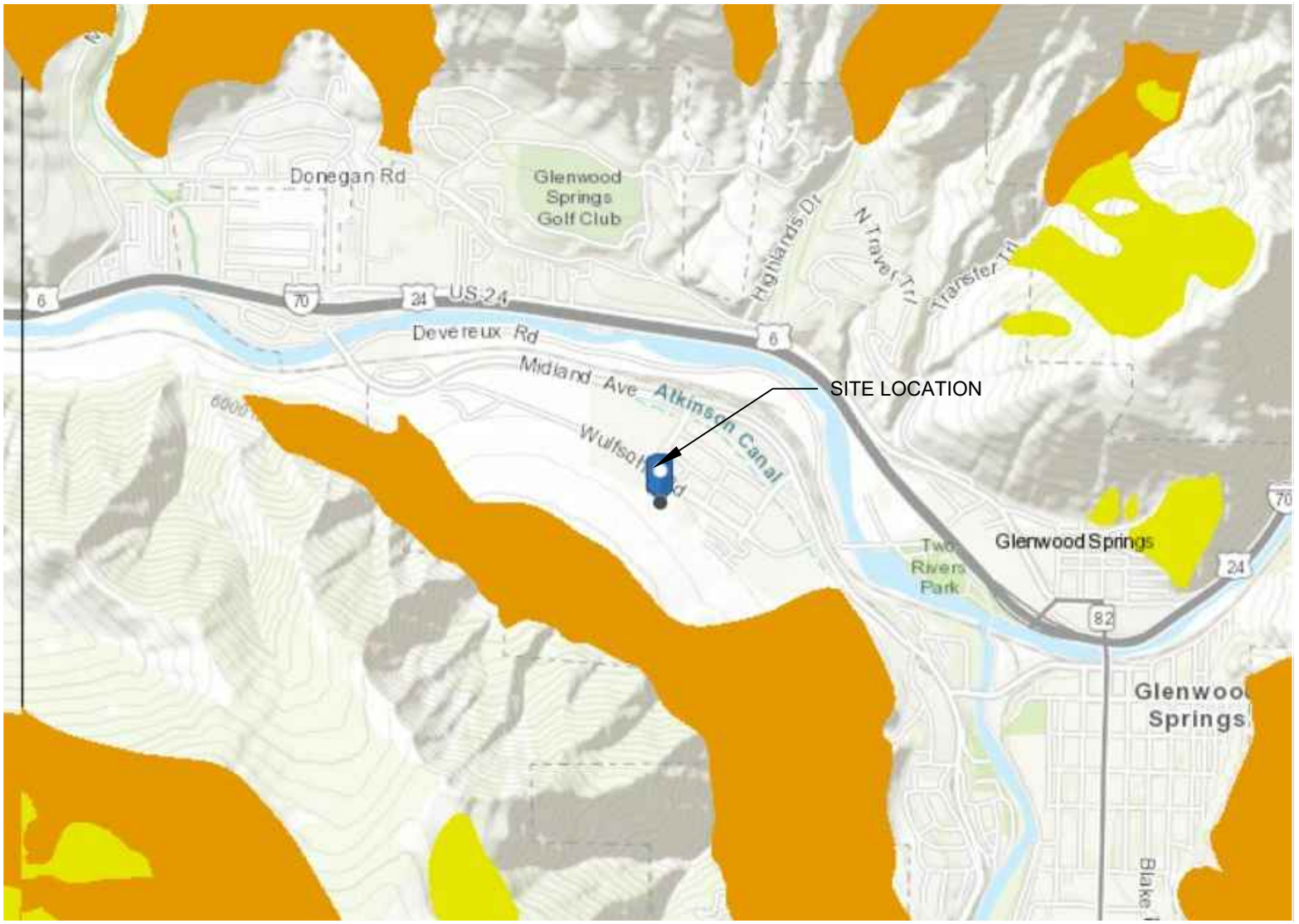
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REFERENCE:

COLORADO GEOLOGICAL SURVEY

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FIGURE 5: COLLAPSIBLE SOILS MAP



Colorado_landslide_inventory_new

compiled_landslides_from_24K_maps

compiled_landslides_from_48-100K_maps

compiled_landslides_from_HB1041_maps

GeologicQuadsIndex

N

REFERENCE:

COLORADO LANDSLIDES INVENTORY

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FIGURE 6: LANDSLIDES HAZARD



Slope Hazard

Major

Moderate

N

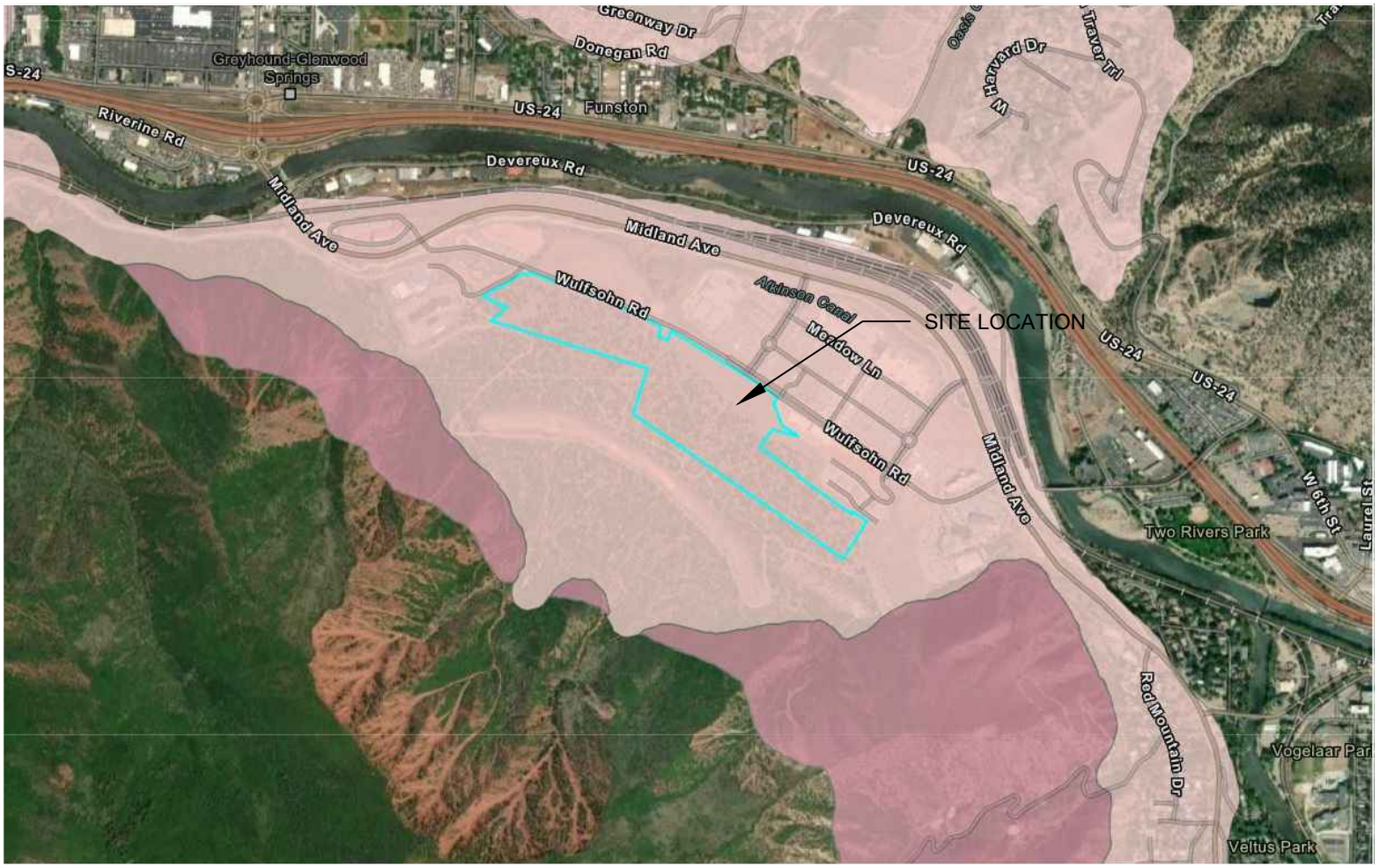
REFERENCE:

GLENWOOD GIS

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FIGURE 7: SLOPES HAZARD



Soil Hazard

- Coal Mine
- Moderate
- Major

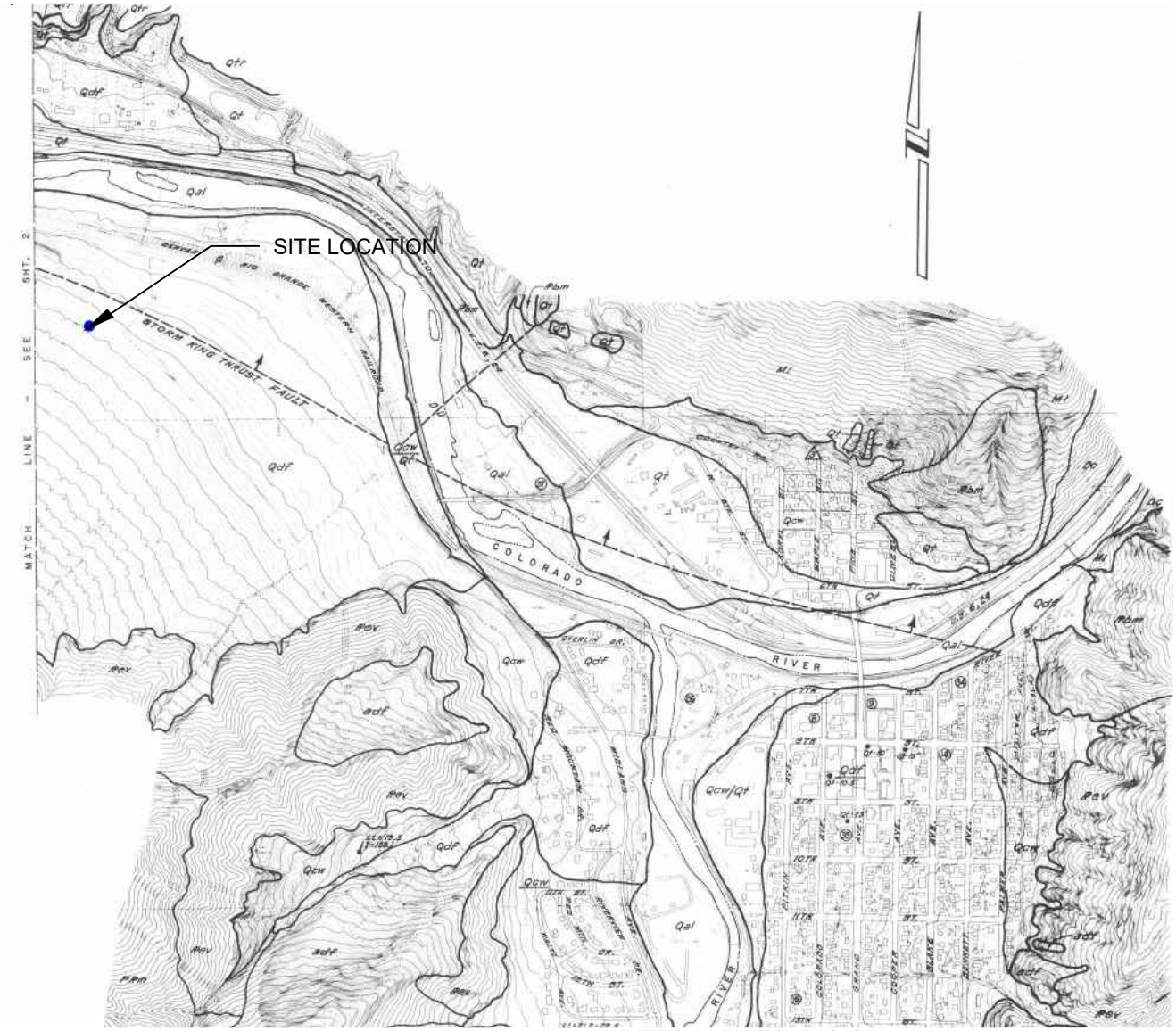
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REFERENCE:

GLENWOOD GIS

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FIGURE 8: SOILS HAZARD

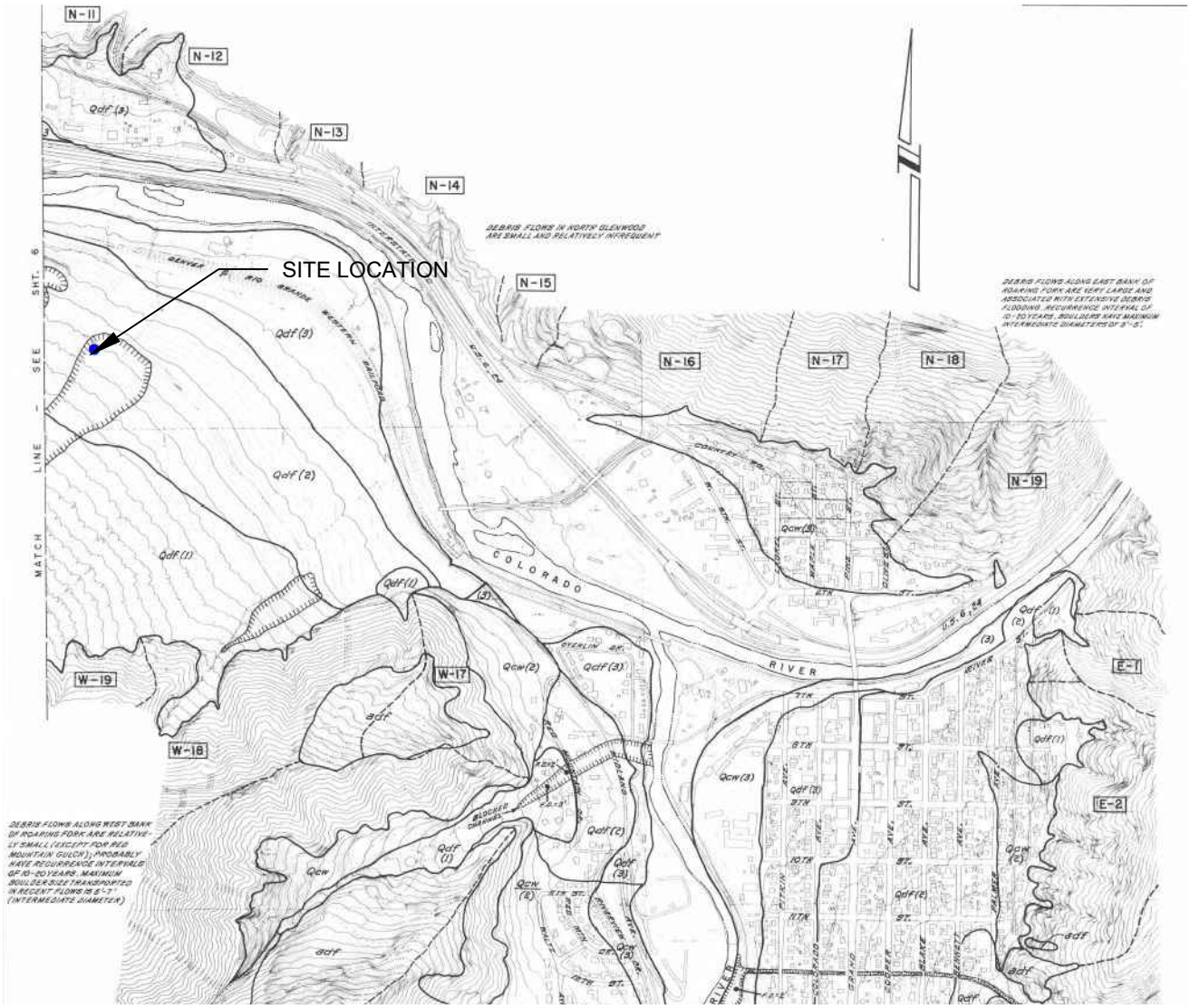


REFERENCE:

COLORADO GEOLOGICAL SURVEY

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FIGURE 9: SURFICIAL GEOLOGY AND DATA INDEX MAP



EXPLANATION:

Qdf ... MAPPED DEBRIS FANS
Qcw ... MAPPED COLLUVIAL WEDGE AND COLLUVIAL DEPOSITS
adf ... MAPPED ANCIENT DEBRIS FLOW, MUD FLOW AND LANDSLIDE DEPOSITS
(1) ... SEVERE HAZARD ZONE: POSSIBLE SERIOUS DAMAGE TO STRUCTURES AND RISK TO LIFE. MITIGATION NECESSARY.
(2) ... MODERATE HAZARD ZONE: POSSIBLE MINOR DAMAGE TO STRUCTURES AND RISK TO LIFE. MITIGATION RECOMMENDED. MAJOR CLEANUP PROBABLE.
(3) ... SLIGHT HAZARD ZONE: CLEANUP REQUIRED; LIMITED RISK TO STRUCTURES AND LIFE
AREA COVERED BY RECENT DEBRIS FLOWS (7-24-77, UNLESS OTHERWISE INDICATE)
F.D. FLOW DEPTH DATA POINT
DRAINAGE BASIN BOUNDARY (SEE PROJECT BOUNDARY AND BASIN INDEX MAP)
DRAINAGE BASIN INDEX NUMBER

NOTE: THESE MAPS ARE INTENDED FOR USE IN CONJUNCTION WITH THE REPORT, "DEBRIS FLOWS, HYDROCOMPACTION, AND GEOLOGIC HAZARDS IN GLENWOOD SPRINGS, COLORADO."

SEE SHEET NO. 6 FOR EXPLANATION OF SYMBOLS AND NOTE.

PREPARED FOR
THE COLORADO GEOLOGICAL SURVEY
JOHN W. ROLD, DIRECTOR
DEPARTMENT OF NATURAL RESOURCES
STATE OF COLORADO

IN CO-OPERATION WITH
THE CITY OF GLENWOOD SPRINGS, COLORADO AND THE COUNTY OF GARFIELD, COLORADO

LINCOLN DeVORE TESTING LABORATORY
COLORADO: Colorado Springs, Pueblo, Glenwood Springs, Montrose, Gunnison, Grand Junction – WYO. Rock Springs

400 0 400 800
SCALE IN FEET
CONTOUR INTERVAL = 5 FEET

MAP OF DEBRIS FAN DEPOSITS AND HAZARDS

GEOLOGIC HAZARDS OF THE GLENWOOD SPRINGS METROPOLITAN AREA

GARFIELD COUNTY, COLORADO

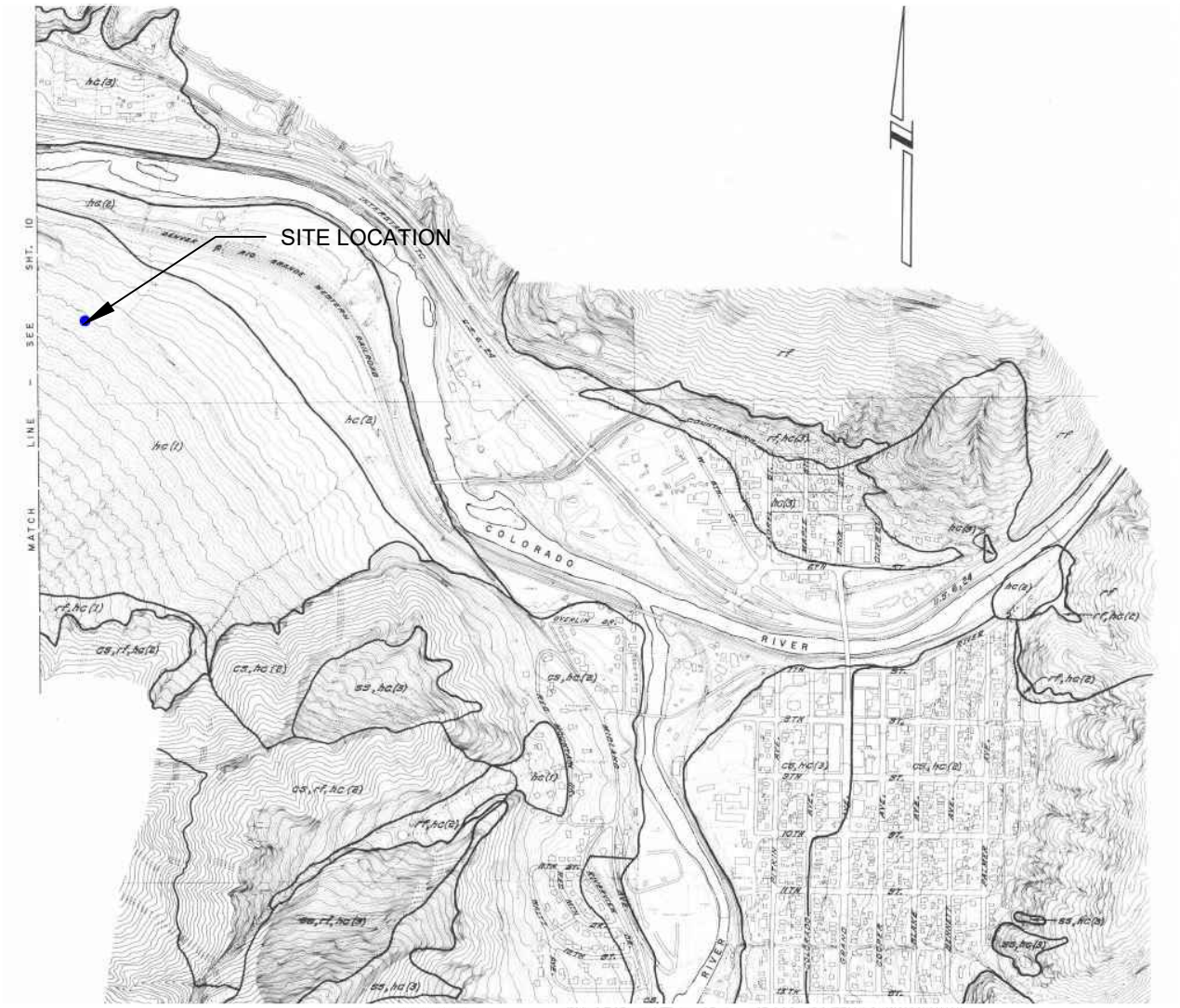
DECEMBER 1977

REFERENCE:

COLORADO GEOLOGICAL SURVEY

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FIGURE 10: DEBRIS FAN DEPOSIT AND HAZARDS



EXPLANATION

BOUNDARY BETWEEN MAPPED UNITS
INDEFINITE BOUNDARY BETWEEN MAPPED UNITS

- hc ____ ZONE OF POTENTIAL HYDROCOMPACTION AND RELATED SETTLEMENT HAZARDS
- (1) ____ SEVERE HAZARD ZONE. HIGH PROBABILITY OF MAJOR AND/OR RAPID SETTLEMENT, ACCOMPANIED BY LOCAL PIPING AND SLOPE INSTABILITY DUE TO SOIL STRUCTURE DISRUPTION.
- (2) ____ MODERATE HAZARD ZONE. LOW PROBABILITY OF RAPID MAJOR SETTLEMENT; HIGH PROBABILITY OF SIGNIFICANT LONG-TERM SETTLEMENT.
- (3) ____ SLIGHT HAZARD ZONE. VERY LOW PROBABILITY OF RAPID SETTLEMENT; MODERATE PROBABILITY OF SIGNIFICANT LONG-TERM SETTLEMENT.
- rf ____ ZONE OF SIGNIFICANT ROCKFALL HAZARDS. CRITERIA INCLUDE (A) AN IDENTIFIABLE SOURCE AREA FOR ROCKS AND (B) THE PRESENCE OF FALLEN ROCKS WITH INTERMEDIATE DIAMETERS OF 2 FEET OR MORE.
- ls ____ ZONE OF IDENTIFIED LAND SLIDE FEATURES. SLIDES ARE MOSTLY OLDER FEATURES, BUT HAVE POTENTIAL FOR REACTIVATION.
- ss ____ ZONE OF IDENTIFIED SLOPE STABILITY FEATURES OTHER THAN LANDSLIDES. DENOTES AREAS OF PAST AND CURRENT MASS WASTING PROCESSES.
- cs ____ ZONE OF SOILS POTENTIALLY CORROSIVE TO CONCRETE AND STEEL.

NOTE: THESE MAPS ARE INTENDED FOR USE IN CONJUNCTION WITH THE REPORT, "DEBRIS FLOWS, HYDROCOMPACTION, AND GEOLOGIC HAZARDS IN GLENWOOD SPRINGS, COLORADO."

SEE SHEET NO. 10 FOR EXPLANATION OF SYMBOLS AND NOTE.

PREPARED FOR
THE COLORADO GEOLOGICAL SURVEY
JOHN W. ROLD, DIRECTOR
DEPARTMENT OF NATURAL RESOURCES
STATE OF COLORADO

IN CO-OPERATION WITH
THE CITY OF GLENWOOD SPRINGS, COLORADO AND THE COUNTY OF GARFIELD COLORADO

LINCOLN DeVORE TESTING LABORATORY
COLORADO: Colorado Springs, Pueblo, Glenwood Springs, Montrose, Gunnison, Grand Junction – WYO. Rock Springs

400 0 400 800
SCALE IN FEET
CONTOUR INTERVAL = 5 FEET

GENERAL GEOLOGIC HAZARDS MAP

GEOLOGIC HAZARDS
OF THE
GLENWOOD SPRINGS METROPOLITAN AREA
GARFIELD COUNTY, COLORADO

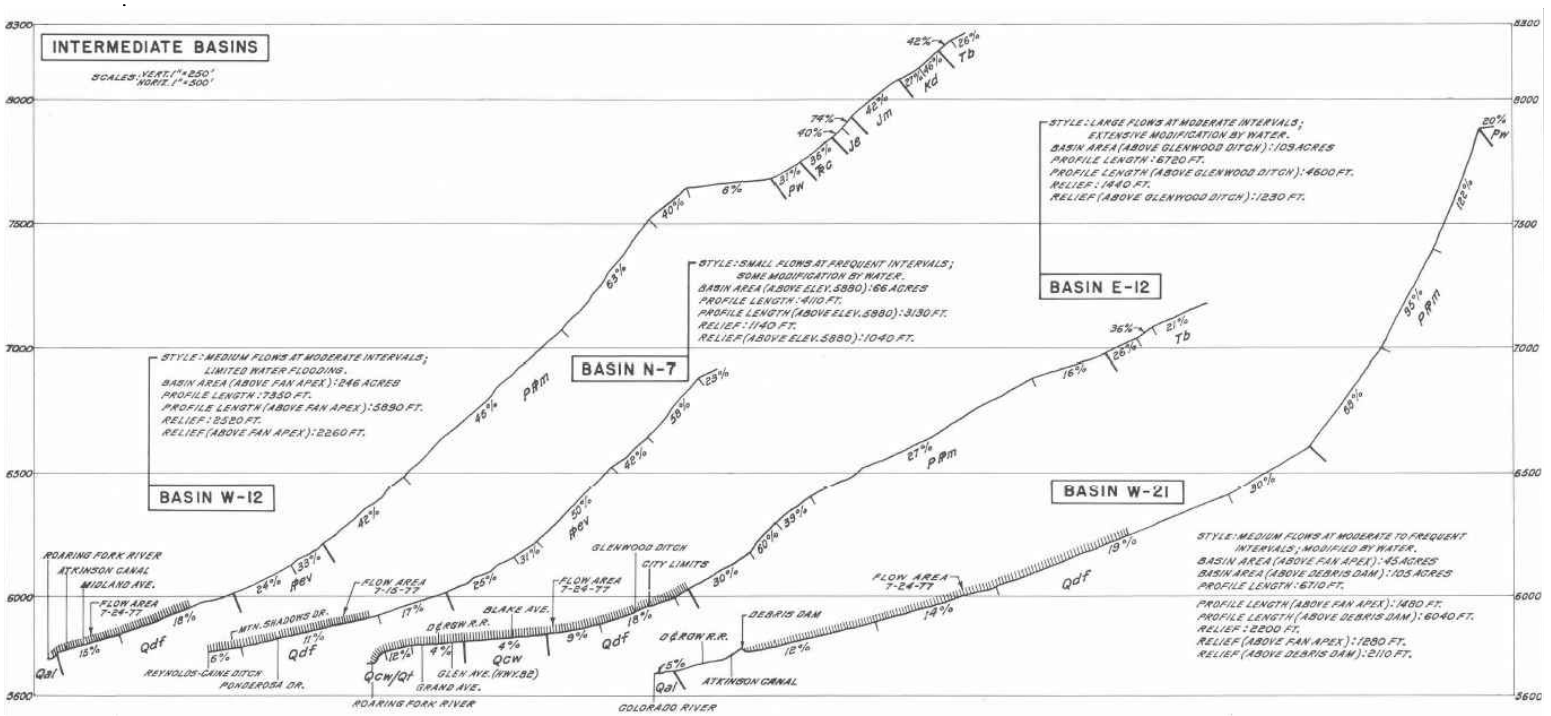
DECEMBER 1977

REFERENCE:

COLORADO GEOLOGICAL SURVEY

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FIGURE 11: GENERAL GEOLOGIC HAZARD MAP



PREPARED FOR
THE COLORADO GEOLOGICAL SURVEY
JOHN W. ROLD, DIRECTOR
DEPARTMENT OF NATURAL RESOURCES
STATE OF COLORADO

IN CO-OPERATION WITH
THE CITY OF GLENWOOD SPRINGS, COLORADO AND THE COUNTY OF GARFIELD COLORADO

LINCOLN DeVORE TESTING LABORATORY
COLORADO: Colorado Springs, Pueblo, Glenwood Springs, Montrose, Gunnison, Grand Junction – WYO. Rock Springs

EXPLANATION:

VERTICAL EXAGGERATION = 2X
BREAK IN SLOPE
GEOLOGIC CONTACT
FAULT
DEBRIS FLOW AREA

SURFICIAL DEPOSIT SYMBOLS:

Qal.....ALLUVIUM
Qt.....STREAM TERRACE
Qcw....COLLUVIUM & COLLUVIAL WEDGE
Qdf.....DEBRIS FAN
Qls.....ANCIENT LANDSLIDE

FOR EXPLANATION OF BEDROCK SYMBOLS, SEE SHEET NO. 1

COMPARATIVE STREAM PROFILES SHEET

GEOLOGIC HAZARDS
OF THE
GLENWOOD SPRINGS METROPOLITAN AREA
GARFIELD COUNTY, COLORADO

REFERENCE:

COLORADO GEOLOGICAL SURVEY

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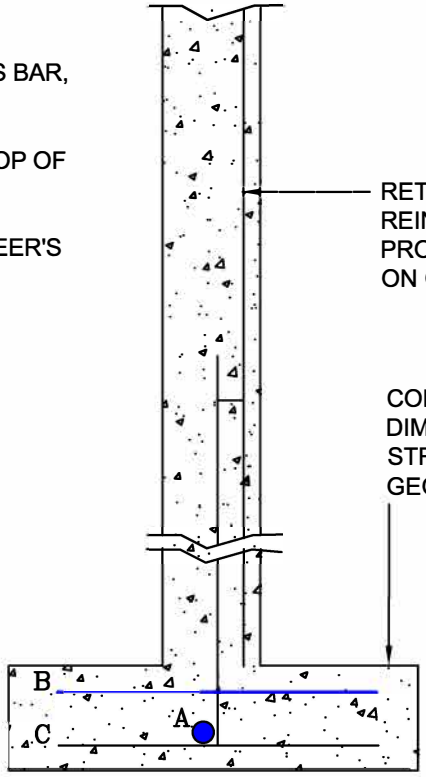
FIGURE 12: COMPARATIVE STREAM PROFILE SHEET

NOTES:

A. ADDITIONAL REINFORCEMENT, #4 CONTINUOUS BAR, BOTTOM OF FOOTING.

B. ADDITIONAL REINFORCEMENT, #4 AT 48" C/C, TOP OF FOOTING.

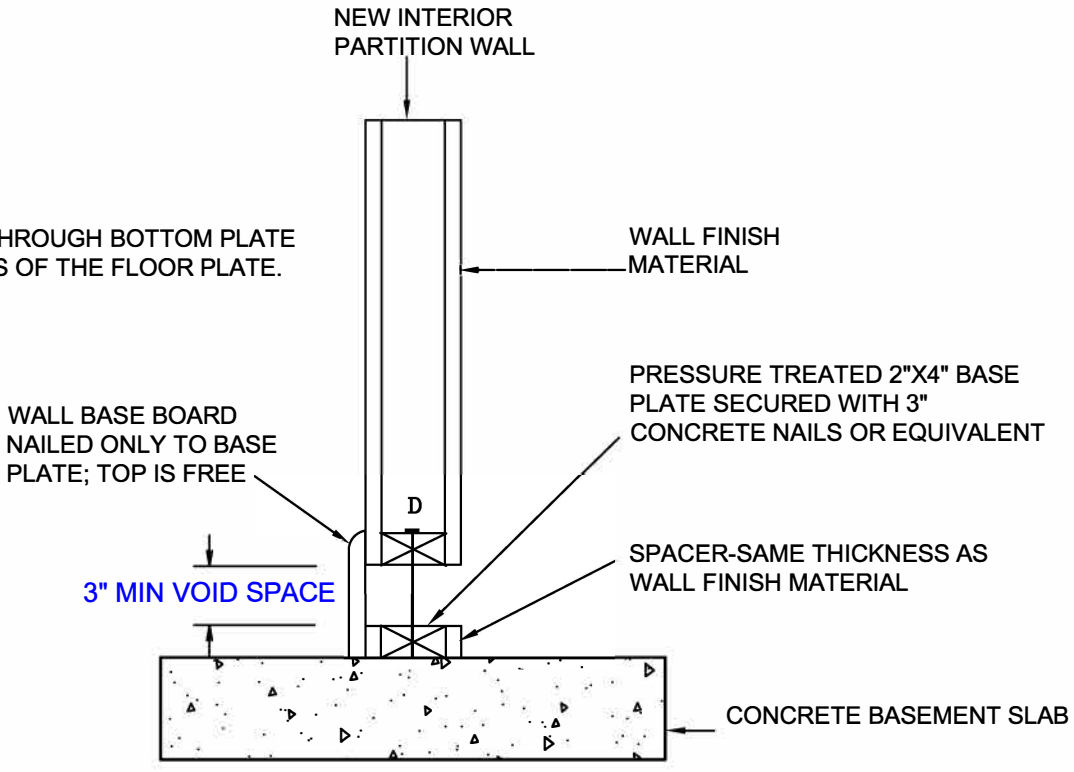
C. REINFORCEMENT AS PER STRUCTURAL ENGINEER'S DESIGN. AS A MINIMUM, USE #4 AT 48" C/C.



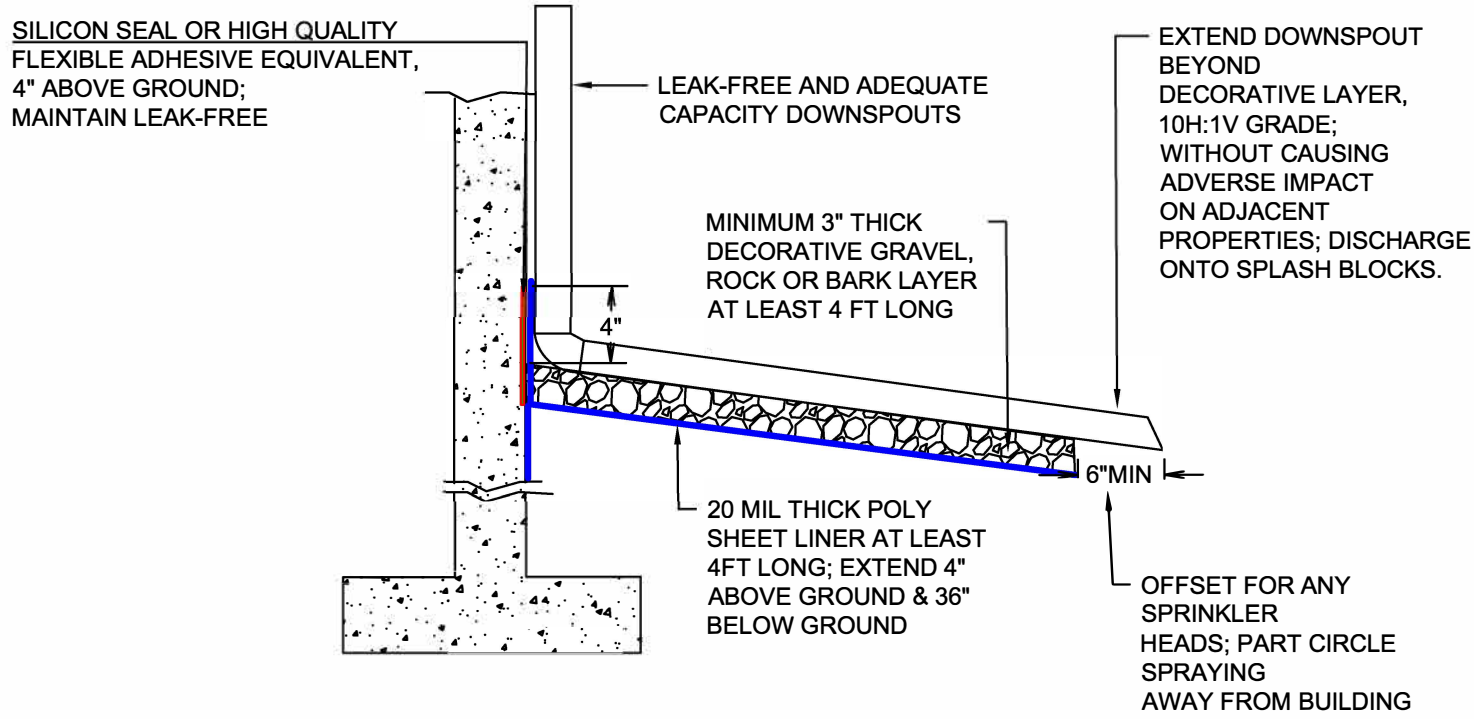
ADDITIONAL FOOTING REINFORCEMENT DETAIL

NOTES:

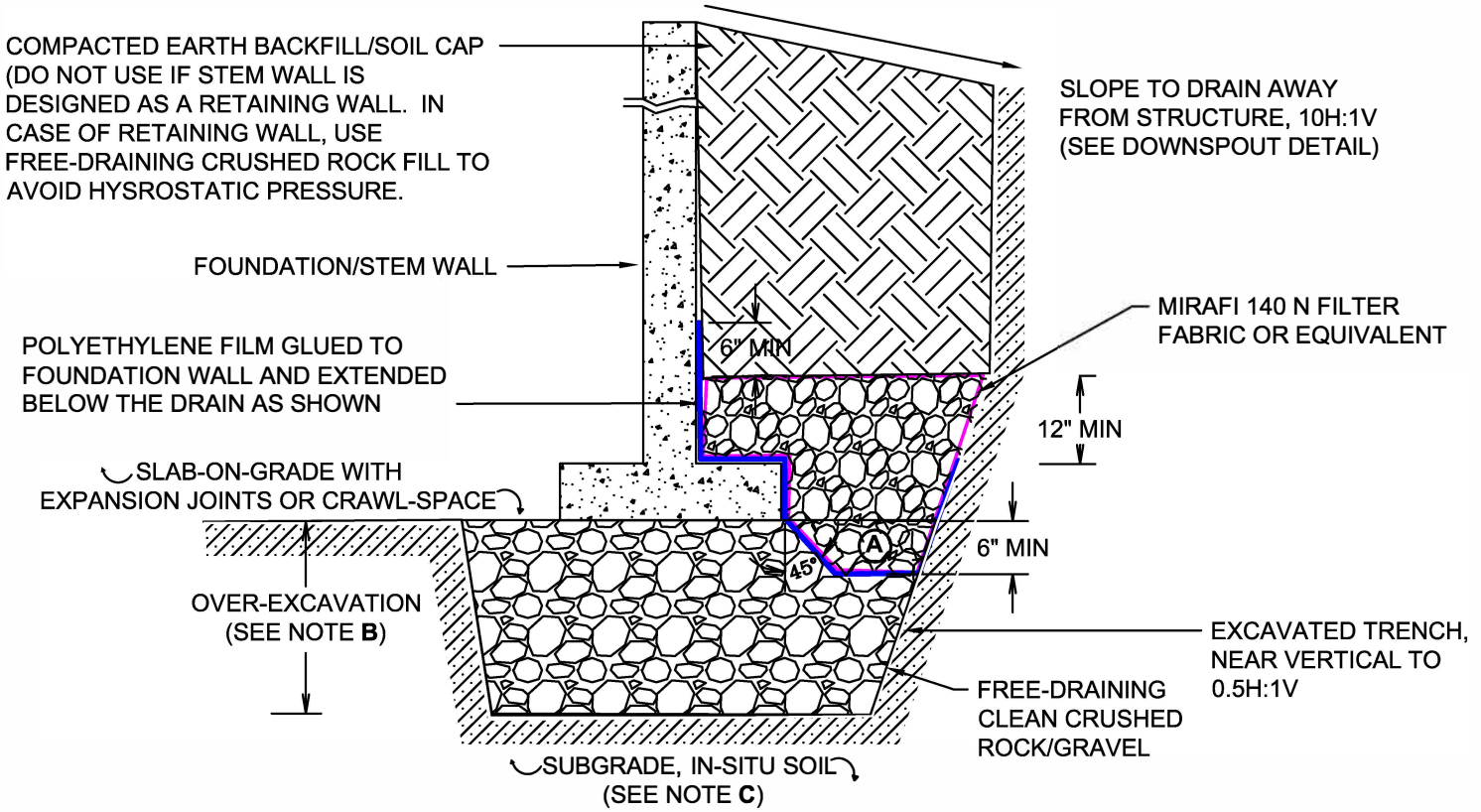
D. 40d NAILS EVERY 24" THROUGH BOTTOM PLATE INTO PRE-DRILLED HOLES OF THE FLOOR PLATE.



"FLOAT" (FLOATING WALL DETAIL)

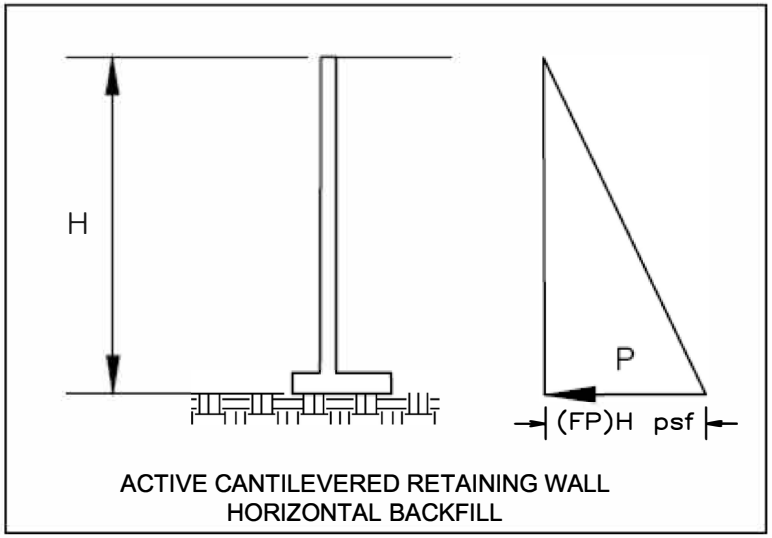


DOWNSPOUT & MOISTURE BARRIER DETAIL

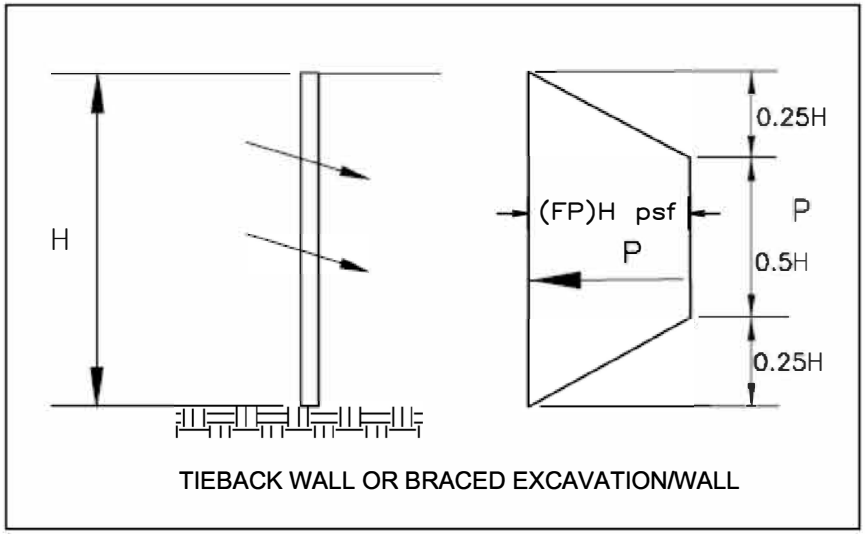


PERIMETER OR FOUNDATION DRAIN DETAIL

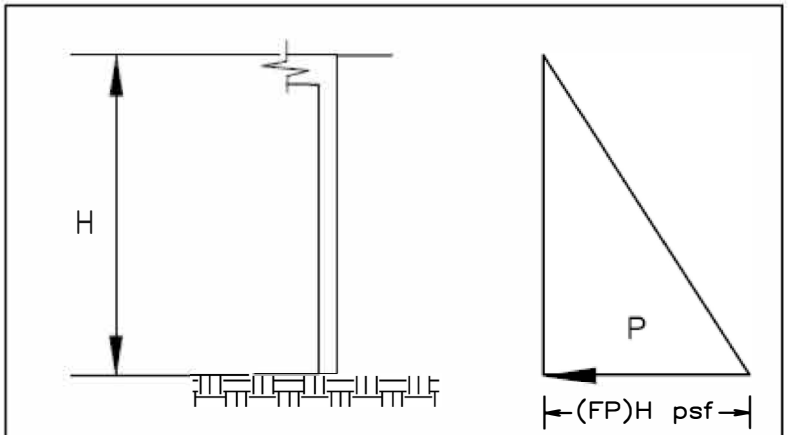
NOTES: **A**. 4-INCH DIAMETER PERFORATED PIPE PLACED 2" ABOVE DRAIN SUBGRADE EMBEDDED IN FREE-DRAINING GRAVEL OR CRUSHED ROCK ENVELOPE WITH 2% GRADE TO SUMP PIT OR DISCHARGED TO A SUITABLE RECEPTACLE SUCH THAT ON-SITE AS WELL AS OFF-SITE STABILITY IS NOT ADVERSELY IMPACTED. **B**. DEPTH BASED ON OPEN HOLE INSPECTION, FOR SHALLOW FOUNDATION OPTION. **C**. ALL FOUNDATION OR OVER-EXCAVATED SUBGRADES MUST BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER.



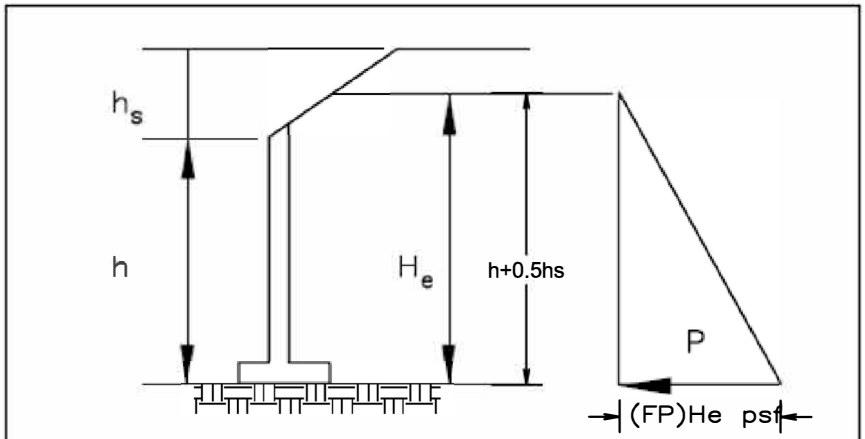
ACTIVE CANTILEVERED RETAINING WALL
HORIZONTAL BACKFILL



TIEBACK WALL OR BRACED EXCAVATION/WALL



AT-REST (BASEMENT) RETAINING WALL
(HIGHER P VALUES THAN ACTIVE)



ACTIVE CANTILEVERED RETAINING WALL
SLOPING BACKFILL

LEGEND:

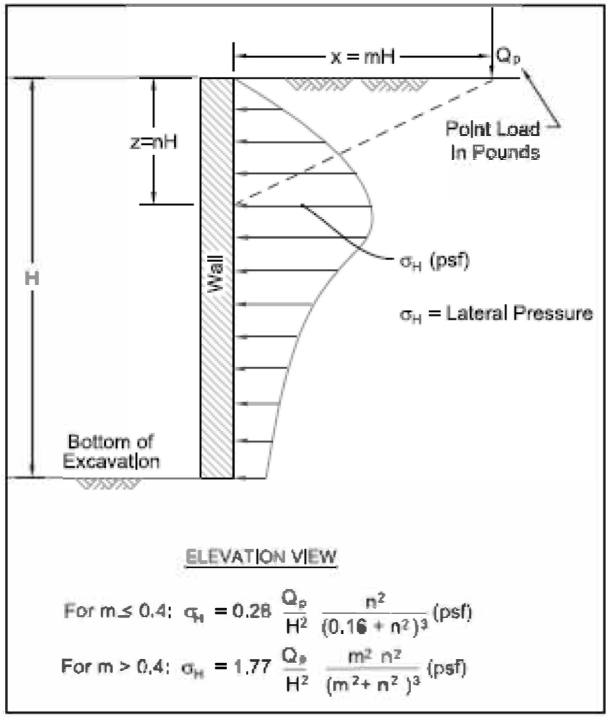
H: DESIGN WALL HEIGHT
HE: EQUIVALENT DESIGN WALL HEIGHT
H: WALL HEIGHT
HS: BROKEN BACKSLOPE HEIGHT
FP: EQUIVALENT FLUID PRESSURE
P: LATERAL EARTH PRESSURE BASED ON SOIL CONDITIONS AT THE SITE. SEE TABLE 1.0 FOR COEFF. OF LATERAL EARTH PRESSURES (K) OR FP VALUES

REFERENCES:

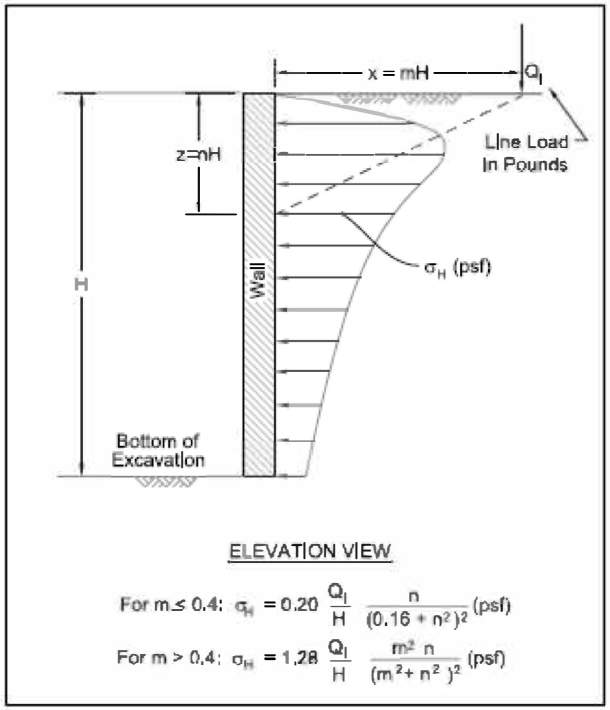
NAVFAC DM 7.2, 1974, 1986
POULOUS & DAVIS, 1974
TERZAGHI & PECK, 1967
BOWELS, 2001

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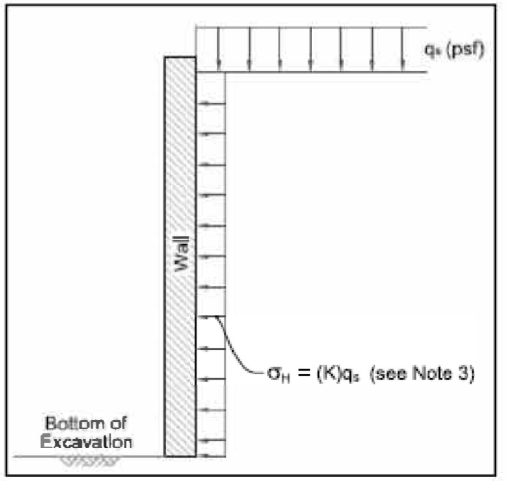
FIGURE 15: EARTH PRESSURES



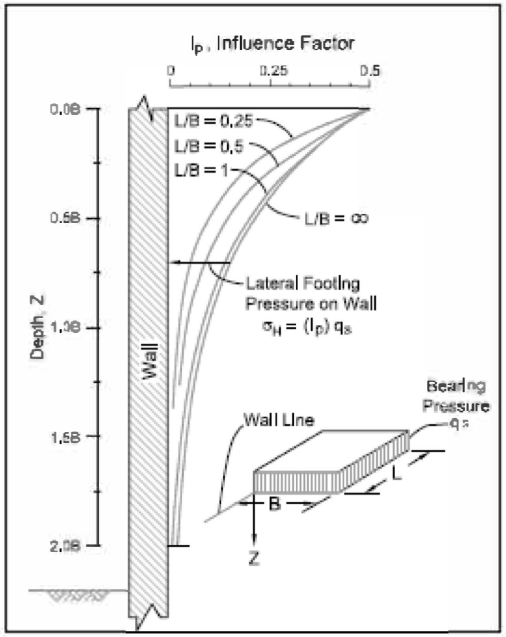
POINT SURCHARGE LOAD
(WHEEL OR ISOLATED FOOTING/COLUMN)



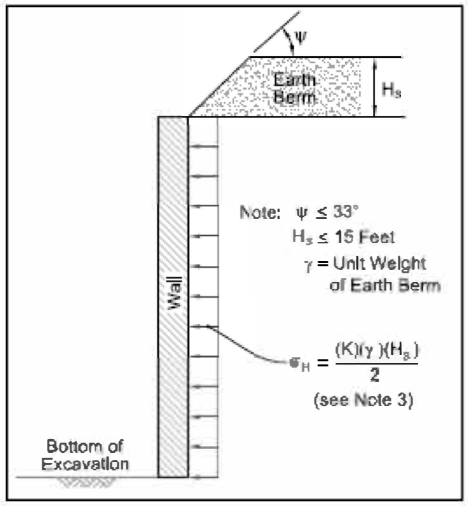
LINE SURCHARGE LOAD
(NARROW FOOTING)



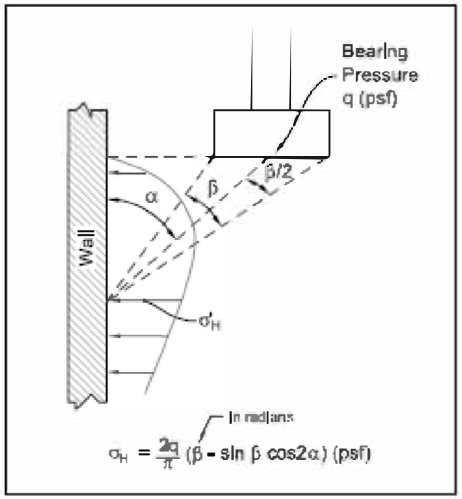
UNIFORM SURCHARGE LOAD



CORNER FOOTING SURCHARGE LOAD



BACKSLOPE/BERM SURCHARGE LOAD



STRIP FOOTING SURCHARGE LOAD

NOTES:

1.NOT TO SCALE.
SCHEMATICS ONLY.

2.ADD APPROPRIATE SURCHARGE LOADING TO LATERAL EARTH PRESSURE & HYSROSTATIC PRESSURE ON THE WALL.

3.DESIGN VALUES ARE GIVEN IN THE REPORT.

4.WALL DESIGNS SHOULD BE REVIEWED AND APPROVED BY US TO CONFIRM PROPER USE OF SOIL DESIGN PARAMETERS.

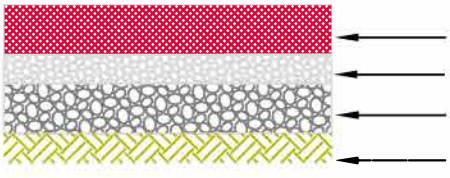
REFERENCES:
NAVFAC DM 7.2, 1974, 1986
FANG, 1991
POULOUS & DAVIS, 1974
TERZAGHI & PECK, 1967

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FIGURE 16: LATERAL PRESSURES

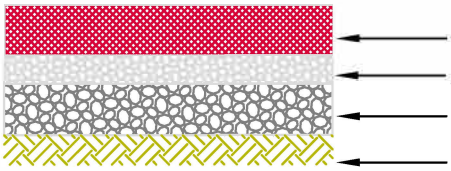
BITUMINOUS PAVEMENT SECTIONS

PARKING AREA
(LIGHTLY LOADED)



3.5" AC
2" 3/4"-0" BASE ROCK W/95% COMPACTION
4" 1 1/2"-0" BASE ROCK W/95% COMPACTION
SUBGRADE TO BE AT 95% COMPACTION (ASTM D698)

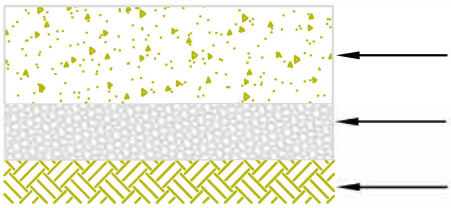
DRIVEWAYS, ETC
(HEAVILY LOADED)



4.5" AC CLASS 'C'
2" 3/4"-0" BASE ROCK W/95% COMPACTION
4" 1 1/2"-0" BASE ROCK W/95% COMPACTION
SUBGRADE TO BE AT 95% COMPACTION (ASTM D698)

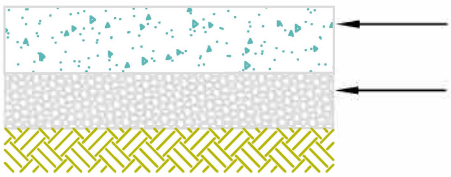
CONCRETE PAVEMENT SECTIONS

PARKING AREA
(LIGHTLY LOADED)



5.5" REINFORCED CONCRETE. 3500 PSI @ 28 DAYS
6X6W1.4X1.4WWM
4" OF 3/4"-0" BASE ROCK W/95% COMPACTION
SUBGRADE TO BE AT 95% COMPACTION (ASTM D698)

DRIVEWAYS, ETC
(HEAVILY LOADED)



6" REINFORCED CONCRETE. 3500 PSI @ 28 DAYS
6X6W1.4X1.4WWM
4" OF 3/4"-0" BASE ROCK W/95% COMPACTION
SUBGRADE TO BE AT 95% COMPACTION (ASTM D698)

SUBSURFACE EXPLORATION DATA

B1

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	25 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log	Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
OL	TOPSOIL: 3.0" thick, sand and organics									
ML/ GM	SANDY SILT with GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		7-5-8	20	4.5	107	NP		
GM/ ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	10		7-12-11	30	5.5	115	NP		
GM-ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	15		15-12-14	35	8	104	NP		
		20		10-22-14	29					
	End of Borehole. Refusal to augering. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	25		50+	30	2.5	125	NP		

B2

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	15 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 6.0" thick, sand and organics									
		SANDY SILT with GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder			15-10-14		2.0			-2.0 @ 1000 psf	
	ML GM		5		8-10-10	35	5.0				
			10		10-10-34	25					
		End of Borehole at 15 feet. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	15								
			20								
			25								

B3

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	15 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 6.0" thick, sand and organics									
	GM/ ML	SANDY SILT AND GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		5-8-12						
			10		50+						
			15		15-12-14						
		End of Borehole at 15 feet. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	20								
			25								

B4

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	50 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 3.0" thick, sand and organics									
	ML/ GM	SANDY SILT with GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		11-10-9	40	3.5	105	NP	-1.5 @ 1000 psf	
	GM/ ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	10		9-10-13	30	6.5	110	NP		
			15		12-15-15	29	5.0	115	NP		
	GM-ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	20		17-20-19	32	6.0	120	NP		
			25		17-21-23	35					

B4

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	50 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 3.0" thick, sand and organics									
	ML/ GM	SANDY SILT with GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	30		15-20-19						
	GM/ ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	35		50+						
	GM-ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	40		22-50+	35					
			45		50+	30	6.5	125	NP		
		End of Borehole. Refusal to augering. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	50		50+						

B5

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	7-07-2020	Total Depth of Borehole	15 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 6.0" thick, sand and organics									
	GM/ ML	SANDY SILT AND GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		11-12-11						
			10		50+						
		End of Borehole at 15 feet. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	15								
			20								
			25								

B6

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	7-07-2020	Total Depth of Borehole	10 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 6.0" thick, sand and organics									
	GM/ ML	SANDY SILT AND GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		50+						
		End of Borehole at 10 feet. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	10 15 20 25								

B7-B8

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	25 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log	Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
OL	TOPSOIL: 5.0" thick, sand and organics									
ML/ GM	SANDY SILT with GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		10-15-10	25	4.0	105	NP		
		10		9-10-11						
		15		12-12-24	30	6	105	NP		
		20		24-50+	20					
	End of Borehole. Refusal to augering. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	25		50+	35	5.5	120	NP		

B9

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	7-07-2020	Total Depth of Borehole	10 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 6.0" thick, sand and organics									
	GM/ SM/ ML	SANDY SILT to SITY SAND and GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		10-10-12						
			10		12-14-15					-2.2 @ 1000 psf	
		End of Borehole at 10 feet. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	15								
			20								
			25								

B10

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	40 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log	Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
OL	TOPSOIL: 3.0" thick, sand and organics									
ML/ GM	SANDY SILT with GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		5-8-10	23					
GM/ ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	10		10-10-10	35					
GM-ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	15		12-25-20	20	5.5	117	NP		
		20		15-50+						
		25		50+	25					

B10

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	6-26-2020	Total Depth of Borehole	40 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log	Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
GM	SANDY SILTY GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	30		5-8-10	23					
		35		10-10-10	35					
GM/ ML	SANDY GRAVEL AND SILT, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	40		12-25-50+	40	5.5	118	NP		
	End of Borehole. Refusal to augering. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	45								
		50								

B11

Glennwood Medows #6, Glennwood Springs, CO

Project Number	0280-WS20	Drill Rig: SPT Drill Rig / WDP / Soil Auger	
Geologist/Engineer	SMA	Ground Elevation	See Figures
Date Drilled	7-07-2020	Total Depth of Borehole	15 Feet
Borehole Diameter	4 OD Inches	Depth to Water	Not Encountered

Graphic Log		Description / Lithology	Depth (feet)	Sample	SPT Blow Count	%Passing #200	Moisture (%)	DD (pcf)	LL (%), PL (%)	Swell (%)	Completion
	OL	TOPSOIL: 6.0" thick, sand and organics									
	GM/ ML	SANDY SILT AND GRAVEL, red-brown to brown, trace to some cobbles, medium dense to dense, damp to moist, possible occasional boulder	5		7-8-12						
			10		10-10-21						
			15		50+						
		End of Borehole at 15 feet. Groundwater was not encountered during or at the completion of drilling. At completion, borehole was backfilled with soil cuttings. Soil descriptions/log are based on field explorations, soils/geologic research, lab testing, and local experience.	20								
			25								

AMERICAN GEOSERVICES

DESCRIPTIVE TERMINOLOGY & SOIL CLASSIFICATION
UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

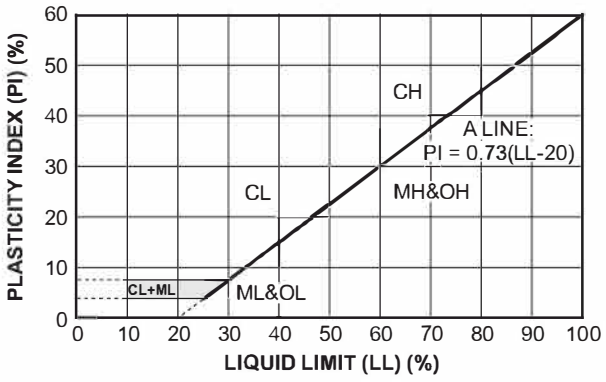
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



DESCRIPTIVE TERMINOLOGY & SOIL CLASSIFICATION

LABORATORY/FIELD TESTING DEFINITIONS FOR EXPLORATION LOGS

DD = DRY DENSITY (PCF)

WD = WET DENSITY (PCF)

MC = MOISTURE CONTENT (%)

PL = PLASTIC LIMIT (%)

LL = LIQUID LIMIT (%)

PI = PLASTICITY INDEX

OC = ORGANIC CONTENT (%)

S = SATURATION PERCENT (%)

SG = SPECIFIC GRAVITY

C = COHESION

Φ = ANGLE OF INTERNAL FRICTION

QU = UNCONFINED COMPRESSION STRENGTH

#200 = PERCENT PASSING THE #200 SIEVE

CBR = CALIFORNIA BEARING RATIO

VS = VANE SHEAR

PP = POCKET PENETROMETER

DP = DRIVE PROBE

SPT = STANDARD PENETRATION TEST

BPF = BLOWS PER FOOT (N VALUE)

SH = SHELBY TUBE SAMPLE

GW = GROUND WATER

RQD = ROCK QUALITY DESIDNATION

TP = TEST PIT

B = BORING

HA = HAND AUGER



GROUNDWATER LEVEL/SEEPAGE ENCOUNTERED DURING EXPLORATION



STATIC GROUNDWATER LEVEL WITH DATE MEASURED

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	STP (BPF)	PP (TSF)
VERY SOFT	0-1	LESS THAN 0.25
SOFT	2 - 4	0.25 - 0.5
MEDIUM STIFF	5 - 8	0.5 - 1.0
STIFF	9 - 15	1.0 - 2.0
VERY STIFF	16 - 30	2.0 - 4.0
HARD	30+	OVER 4.0

RELATIVE DENSITY OF COHESIONLESS SOILS

DENSITY	SPT (BPF)
VERY LOOSE	0 – 4
LOOSE	5 – 10
MEDIUM DENSE	11 – 30
DENSE	31 – 50
VERY DENSE	50+

PARTICLE SIZE IDENTIFICATION

NAME	DIAMETER (INCHES)	SIEVE NO.
ROCK BLOCK	>120	
BOULDER	12-120	
COBBLE	3-12	
GRAVEL		
COURSE	3/4 - 3	
FINE	1/4 – 3/4	NO. 4
SAND		
COARSE	4.75 MM	NO. 10
MEDIUM	2.0MM	NO. 40
FINE	.425 MM	NO. 200
SILT	.075 MM	
CLAY	<0.005 MM	

GRAIN SIZE

FINE GRAINED	<0.04 INCH	FEW GRAINS ARE DISTINGUISHABLE IN THE FIELD OR WITH HAND LENS.
MEDIUM GRAINED	0.04-0.2 INCH	GRAINS ARE DISTINGUISHABLE WITH THE AID OF A HAND LENS.
COARSE GRAINED	0.04-0.2 INCH	MOST GRAINS ARE DISTINGUISHABLE WITH THE NAKED EYE.

DESCRIPTIVE TERMINOLOGY & SOIL CLASSIFICATION

SPT EXPLORATIONS:

STANDARD PENETRATION TESTING IS PERFORMED BY DRIVING A 2 – INCH O.D. SPLIT-SPOON INTO THE UNDISTURBED FORMATION AT THE BOTTOM OF THE BORING WITH REPEATED BLOWS OF A 140 – POUND PIN GUIDED HAMMER FALLING 30 INCHES. NUMBER OF BLOWS (N VALUE) REQUIRED TO DRIVE THE SAMPLER A GIVEN DISTANCE WAS CONSIDERED A MEASURE OF SOIL CONSISTENCY.

SH SAMPLING:

SHELBY TUBE SAMPLING IS PERFORMED WITH A THIN WALLED SAMPLER PUSHED INTO THE UNDISTURBED SOIL TO SAMPLE 2.0 FEET OF SOIL.

AIR TRACK EXPLORATION:

TESTING IS PERFORMED BY MEASURING RATE OF ADVANCEMENT AND SAMPLES ARE RETRIEVED FROM CUTTINGS.

HAND AUGUR EXPLORATION:

TESTING IS PREFORMED USING A 3.25" DIAMETER AUGUR TO ADVANCE INTO THE EARTH AND RETRIEVE SAMPLES.

DRIVE PROBE EXPLORATIONS:

THIS "RELATIVE DENSITY" EXPLORATION DEVICE IS USED TO DETERMINE THE DISTRIBUTION AND ESTIMATE STRENGTH OF THE SUBSURFACE SOIL AND DECOMPRESSED ROCK UNITS. THE RESISTANCE TO PENETRATION IS MEASURED IN BLOWS-PER-1/2 FOOT OF AN 11-POUND HAMMER WHICH FREE FALLS ROUGHLY 3.5 FEET DRIVING THE 0.5 INCH DIAMETER PIPE INTO THE GROUND. FOR A MORE DETAILED DESCRIPTION OF THIS GEOTECHNICAL EXPLORATION METHOD, THE SLOPE STABILITY REFERENCE GUIDE FOR NATIONAL FORESTS IN THE UNITED STATES, VOLUME I, UNITED STATES DEPARTMENT OF AGRICULTURE, EM-7170-13, AUGUST 1994, P. 317-321.

CPT EXPLORATION:

CONE PENETROMETER EXPLORATIONS CONSIST OF PUSHING A PROBE CONE INTO THE EARTH USING THE REACTION OF A 20-TON TRUCK. THE CONE RESISTANCE (QC) AND SLEEVE FRICTION (FS) ARE MEASURED AS THE PROBE WAS PUSHED INTO THE EARTH. THE VALUES OF QC AND FS (IN TSF) ARE NOTED AS THE LOCALIZED INDEX OF SOIL STRENGTH.

ANGULARITY OF GRAVEL & COBBLES

ANGULAR	COARSE PARTICLES HAVE SHARP EDGES AND RELATIVELY PLANE SIDES WITH UNPOLISHED SURFACES.
SUBANGULAR	COARSE GRAINED PARTICLES ARE SIMILAR TO ANGULAR BUT HAVE ROUNDED EDGES.
SUBROUNDED	COARSE GRAINED PARTICLES HAVE NEARLY PLANE SIDES BUT HAVE WELL ROUNDED CORNERS AND EDGES.
ROUNDED	COARSE GRAINED PARTICLES HAVE SMOOTHLY CURVED SIDES AND NO EDGES.

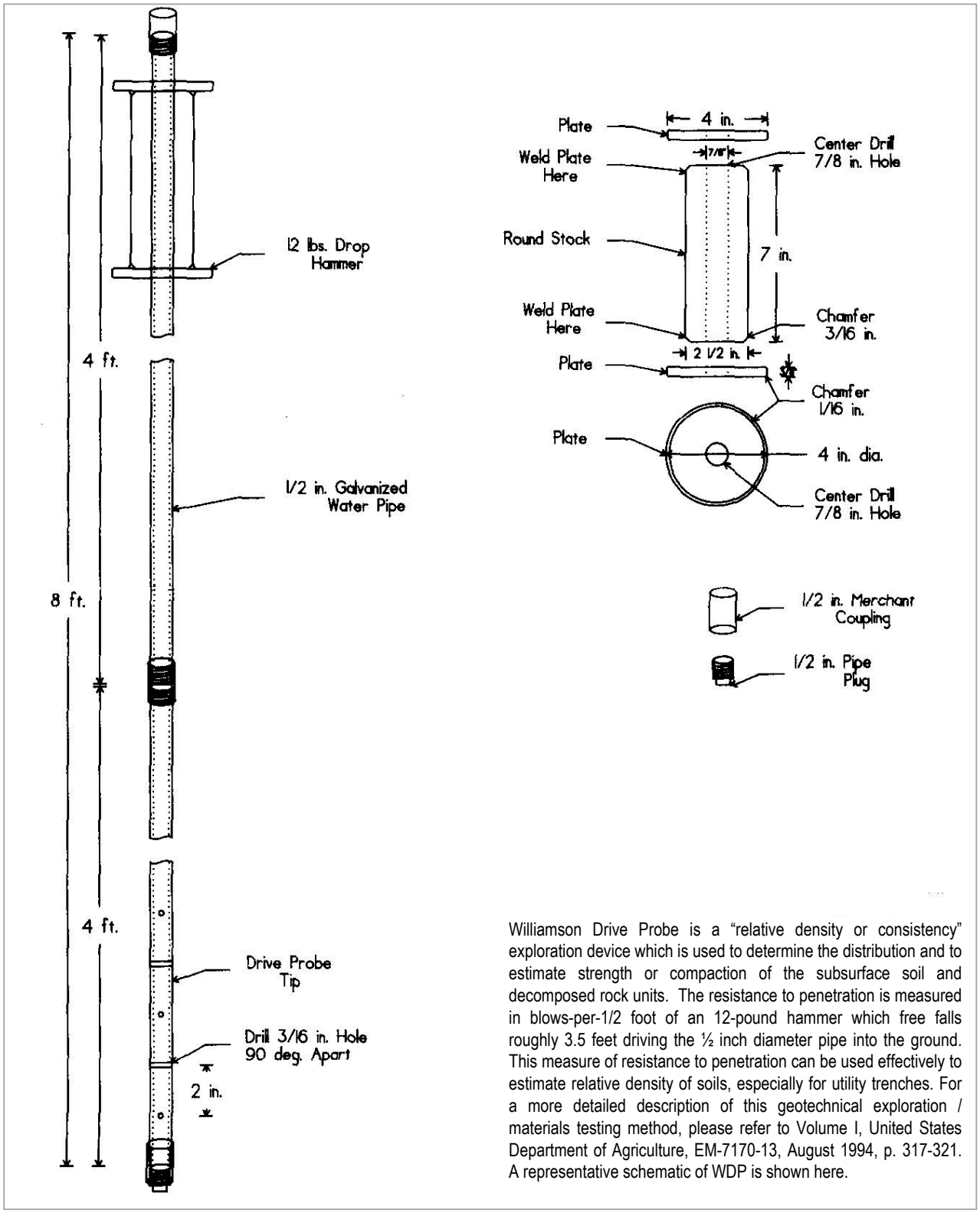
SOIL MOISTURE MODIFIER

DRY	ABSENCE OF MOISTURE; DUSTY, DRY TO TOUCH
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER

WEATHERED STATE

FRESH	NO VISIBLE SIGN OF ROCK MATERIAL WEATHERING; PERHAPS SLIGHT DISCOLORATION IN MAJOR DISCONTINUITY SURFACES.
SLIGHTLY WEATHERED	DISCOLORATION INDICATES WEATHERING OF ROCK MATERIAL AND DISCONTINUITY SURFACES. ALL THE ROCK MATERIAL MAY BE DISCOLORED BY WEATHERING AND MAY BE SOMEWHAT WEAKER EXTERNALLY THAN ITS FRESH CONDITION.
MODERATELY WEATHERED	LESS THAN HALF OF THE ROCK MATERIAL IS DECOMPOSED AND/OR DISINTEGRATED TO SOIL. FRESH OR DISCOLORED ROCK IS PRESENT EITHER AS A CONTINUOUS FRAMEWORK OR AS CORE STONES.
HIGHLY WEATHERED	MORE THAN HALF OF THE ROCK MATERIAL IS DECOMPOSED AND/OR DISINTEGRATED TO SOIL. FRESH OR DISCOLORED ROCK IS PRESENT EITHER AS DISCONTINUOUS FRAMEWORK OR AS CORE STONE.
COMPLETELY WEATHERED	ALL ROCK MATERIAL IS DECOMPOSED AND/OR DISINTEGRATED TO SOIL. THE ORIGINAL MASS STRUCTURE IS STILL LARGELY INTACT.
RESIDUAL SOIL	ALL ROCK MATERIAL IS CONVERTED TO SOIL. THE MASS STRUCTURE AND MATERIAL FABRIC IS DESTROYED. THERE IS A LARGE CHANGE IN VOLUME, BUT THE SOIL HAS NOT BEEN SIGNIFICANTLY TRANSPORTED.

Drive Prove Schematic

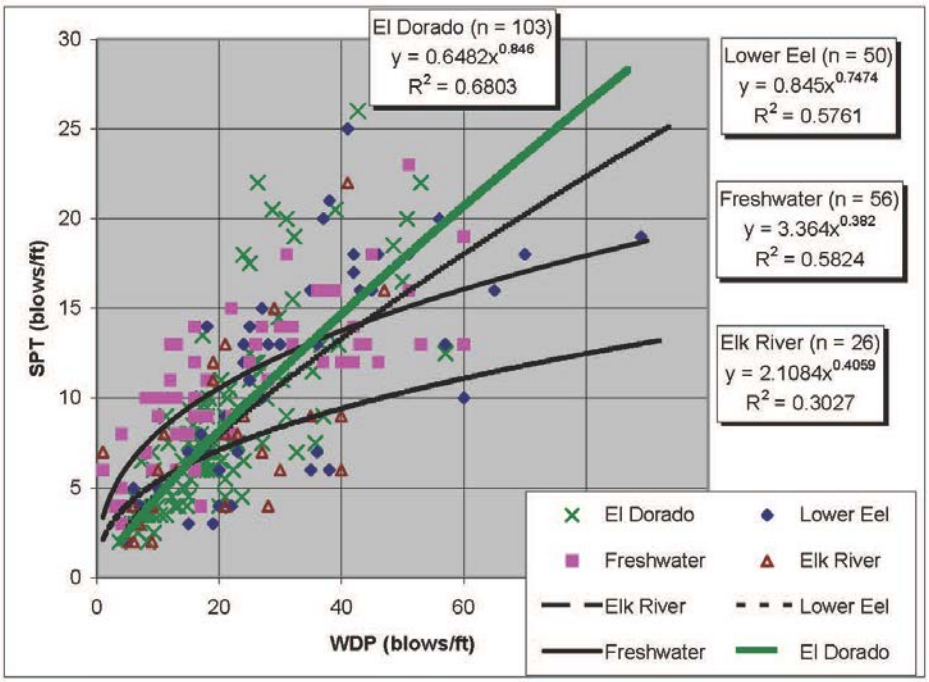


Williamson Drive Probe is a "relative density or consistency" exploration device which is used to determine the distribution and to estimate strength or compaction of the subsurface soil and decomposed rock units. The resistance to penetration is measured in blows-per-1/2 foot of an 12-pound hammer which free falls roughly 3.5 feet driving the ½ inch diameter pipe into the ground. This measure of resistance to penetration can be used effectively to estimate relative density of soils, especially for utility trenches. For a more detailed description of this geotechnical exploration / materials testing method, please refer to Volume I, United States Department of Agriculture, EM-7170-13, August 1994, p. 317-321. A representative schematic of WDP is shown here.

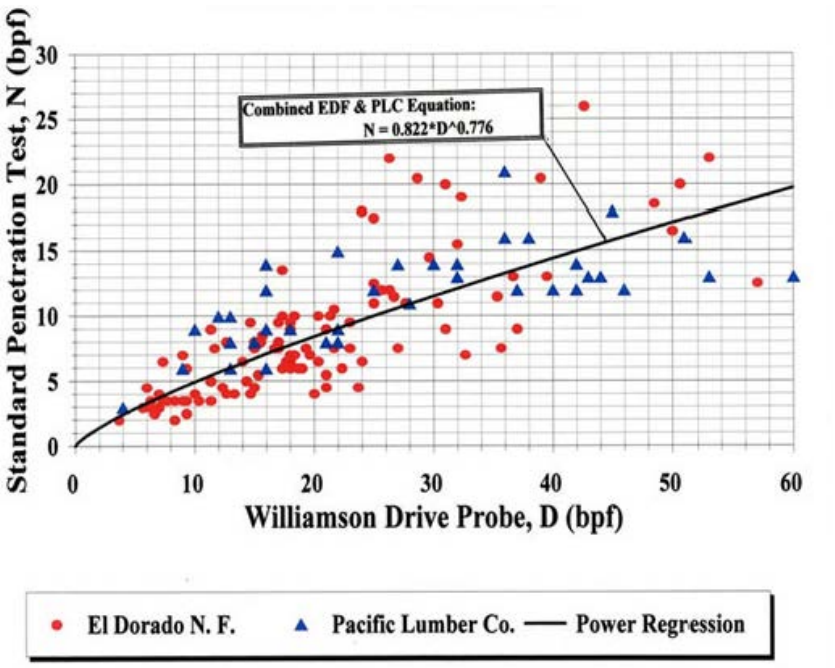
Reference: Figure 3.6.1, Appendix 3.6, Page No. 321, USDA EM-7170-13, August 1994, Volume I

CORRELATION

WILLIAMSON DRIVE PROBE (WDP)
STANDARD PENETRATION TEST (SPT)



SOURCE: Published literature by W.C. Adams (Hart Crowser, Inc.), R.W. Prellwitz (Bitterroot Geotechnical) & T.E. Koler (El Dorado National Forest).



SOURCE: United States Forest Service, Technology Development Program Website (http://www.fs.fed.us/t-d/programs/im/williamson_drive/correlation.shtml)

GEOPHYSICAL SETTING

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

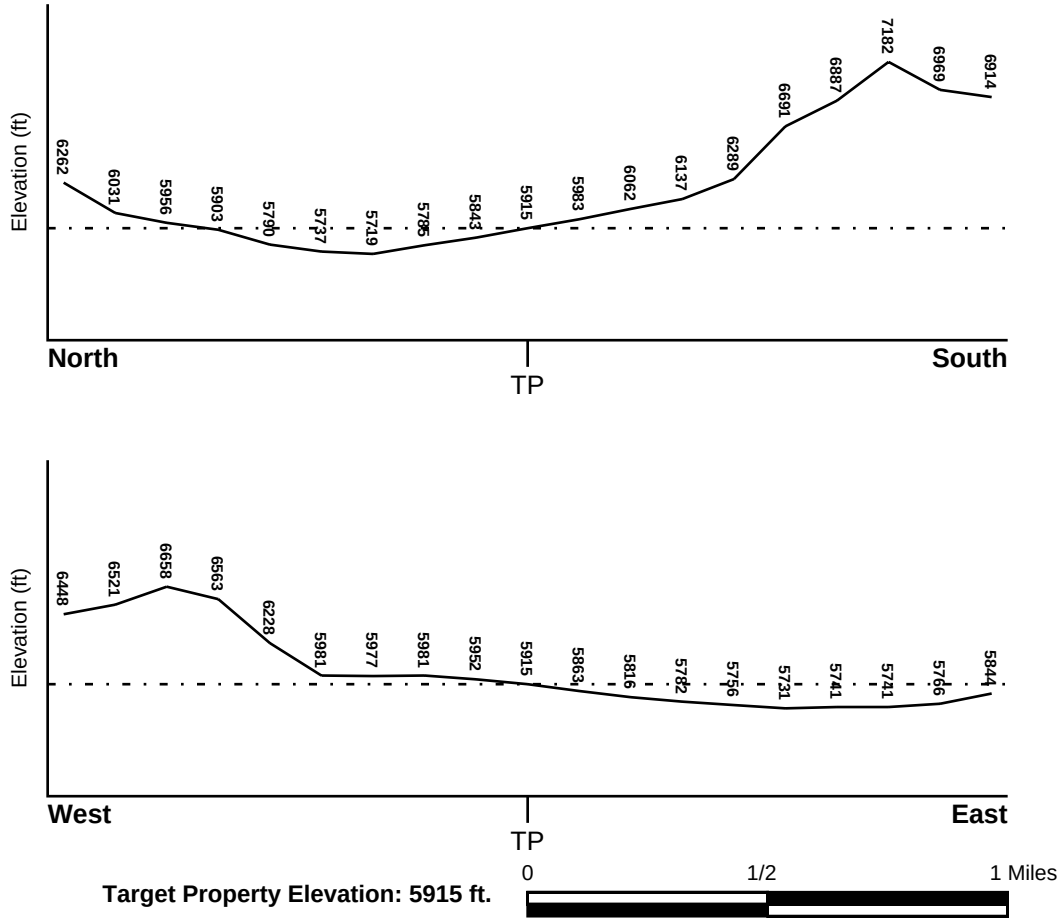
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

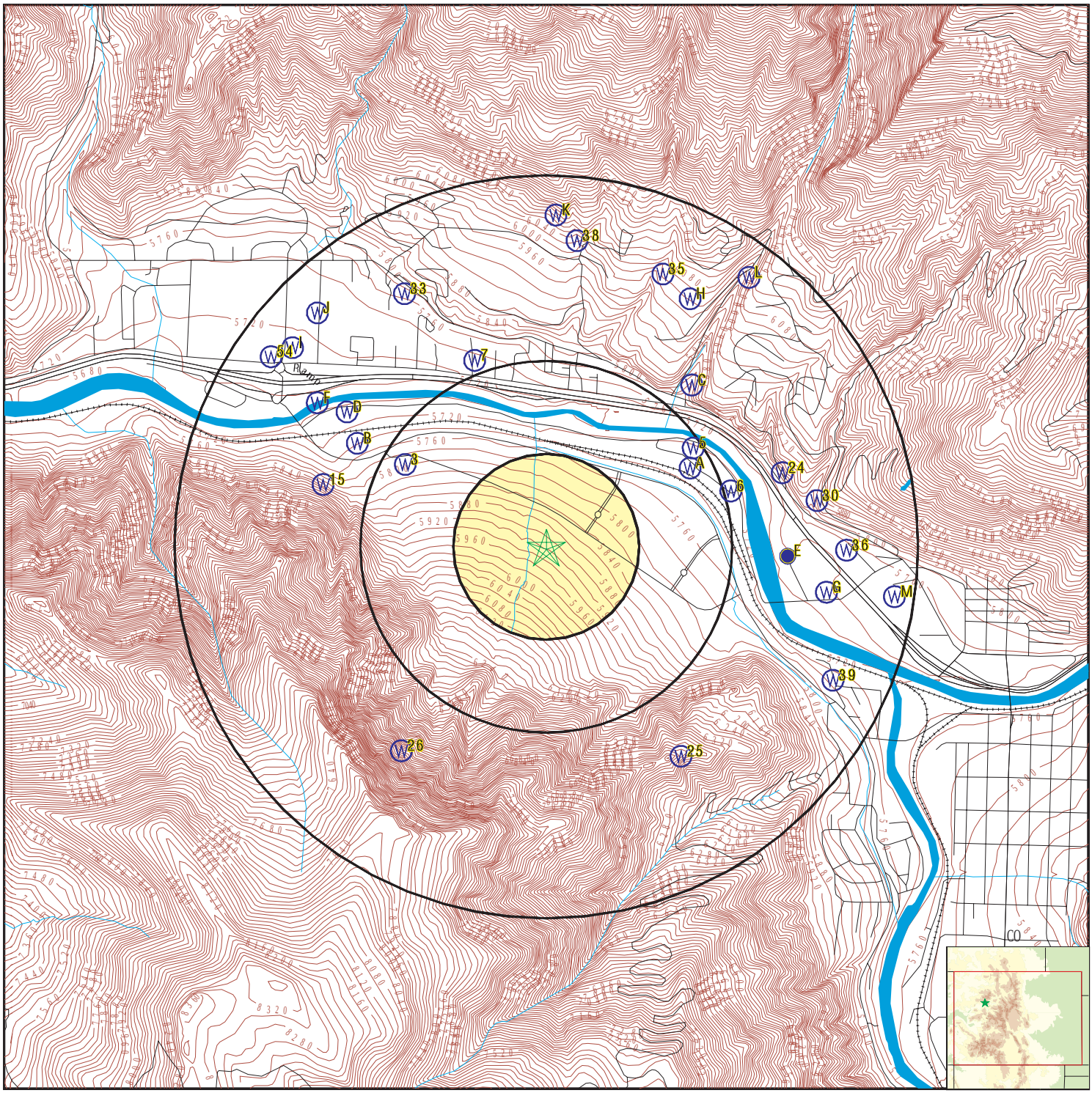
General Topographic Gradient: General NNE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

PHYSICAL SETTING SOURCE MAP - 6118520.2s

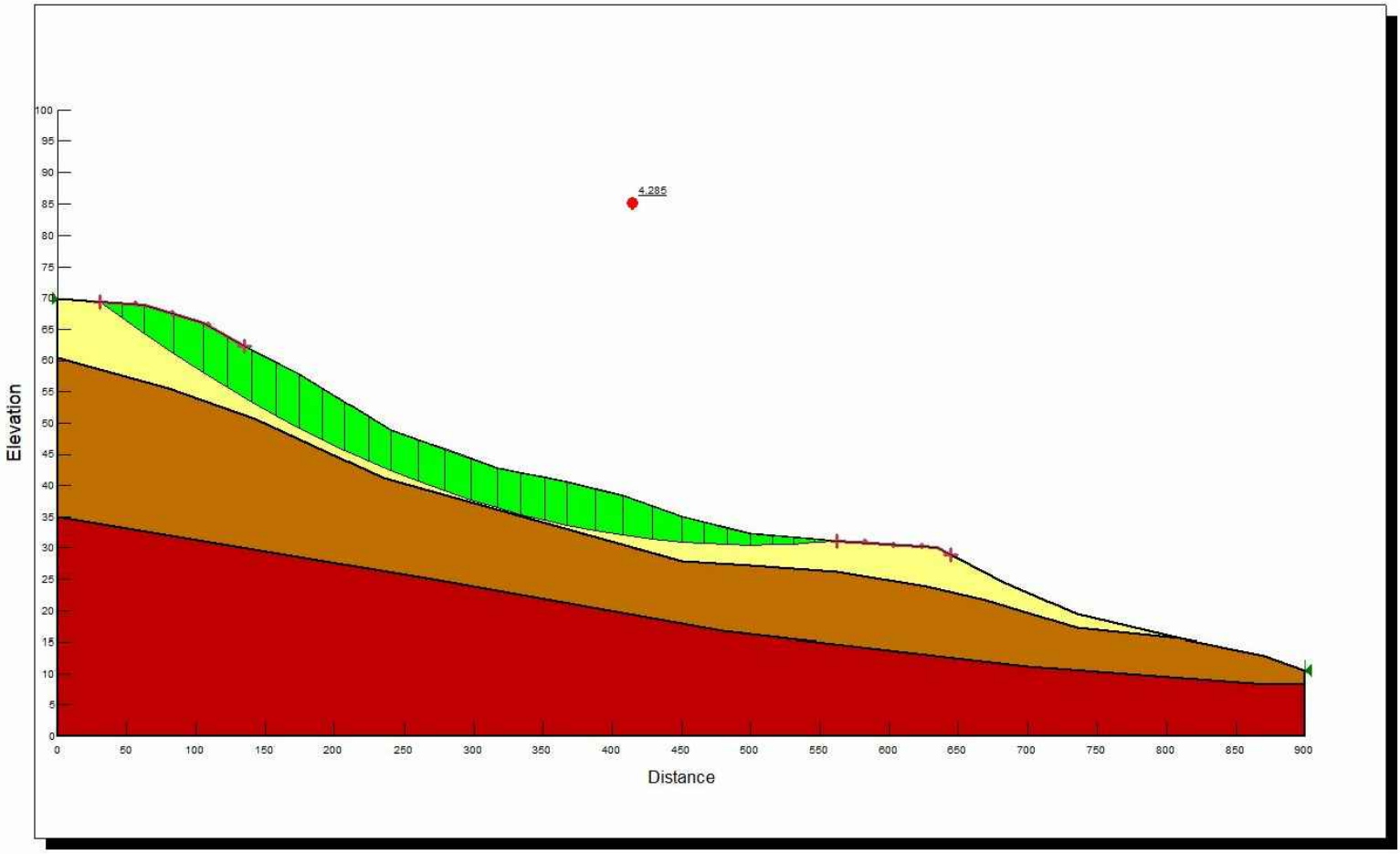


- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- Oil, gas or related wells

SITE NAME:	Glenwood Meadows Housing	CLIENT:	American Geoservices, LLC
ADDRESS:	Wulfsohn Road Glenwood Springs CO 81601	CONTACT:	SAM ADETTIWAR
LAT/LONG:	39.554395 / 107.348062	INQUIRY #:	6118520.2s
		DATE:	July 13, 2020 2:19 pm

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SLOPE STABILITY ANALYSIS RESULTS

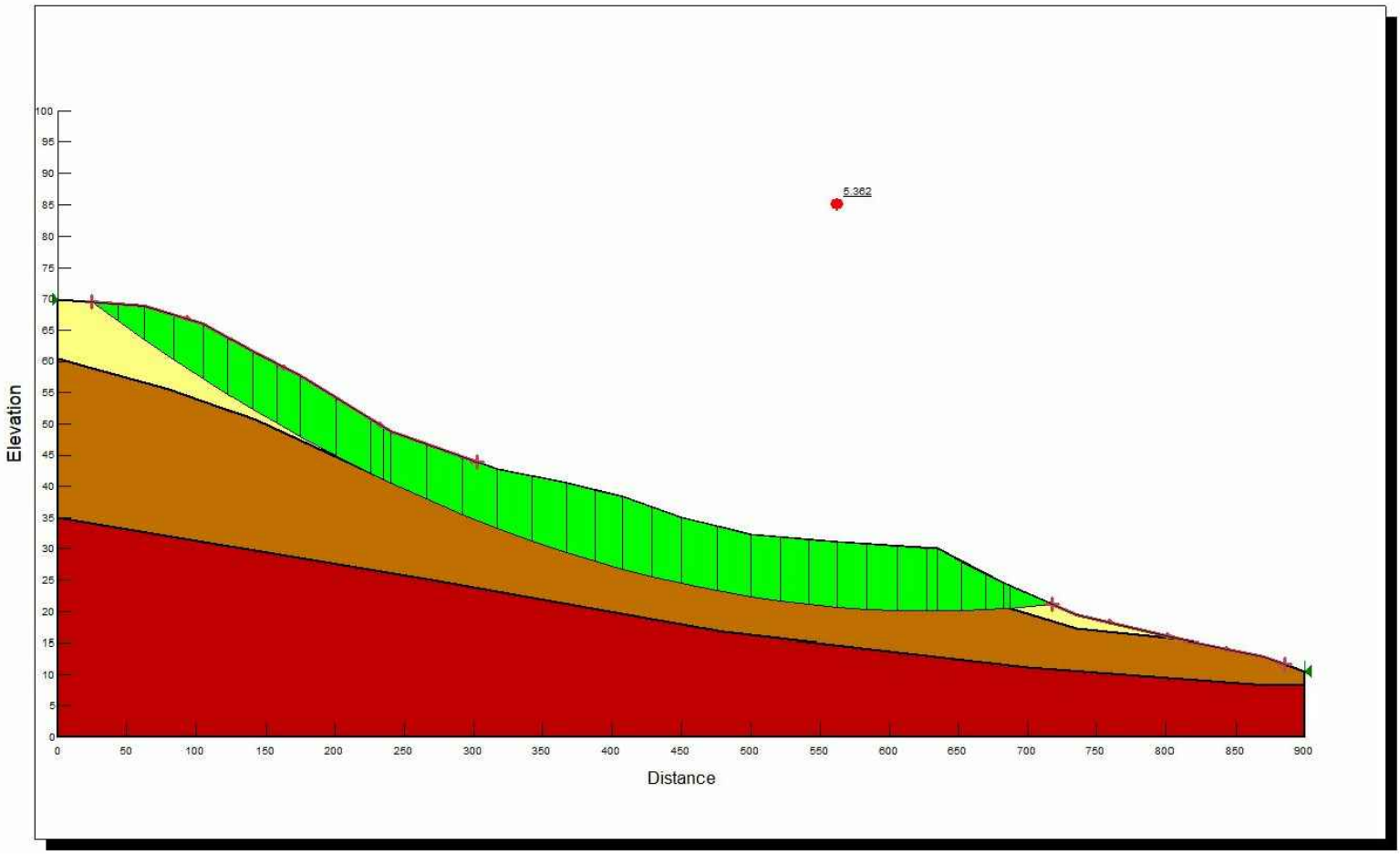


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (STATIC)

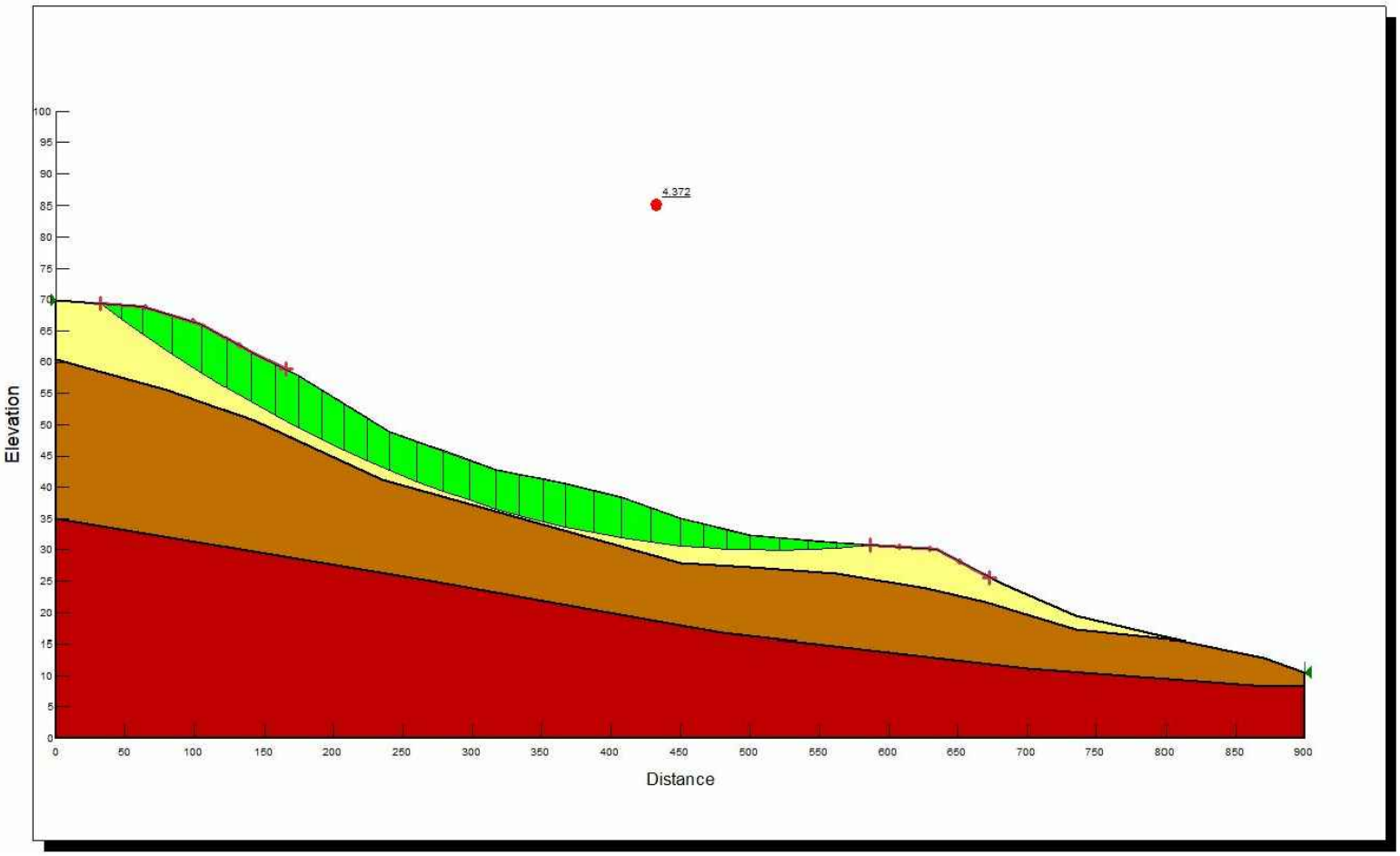


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REFERENCE:
SLOPE/W SOFTWARE

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SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (STATIC)

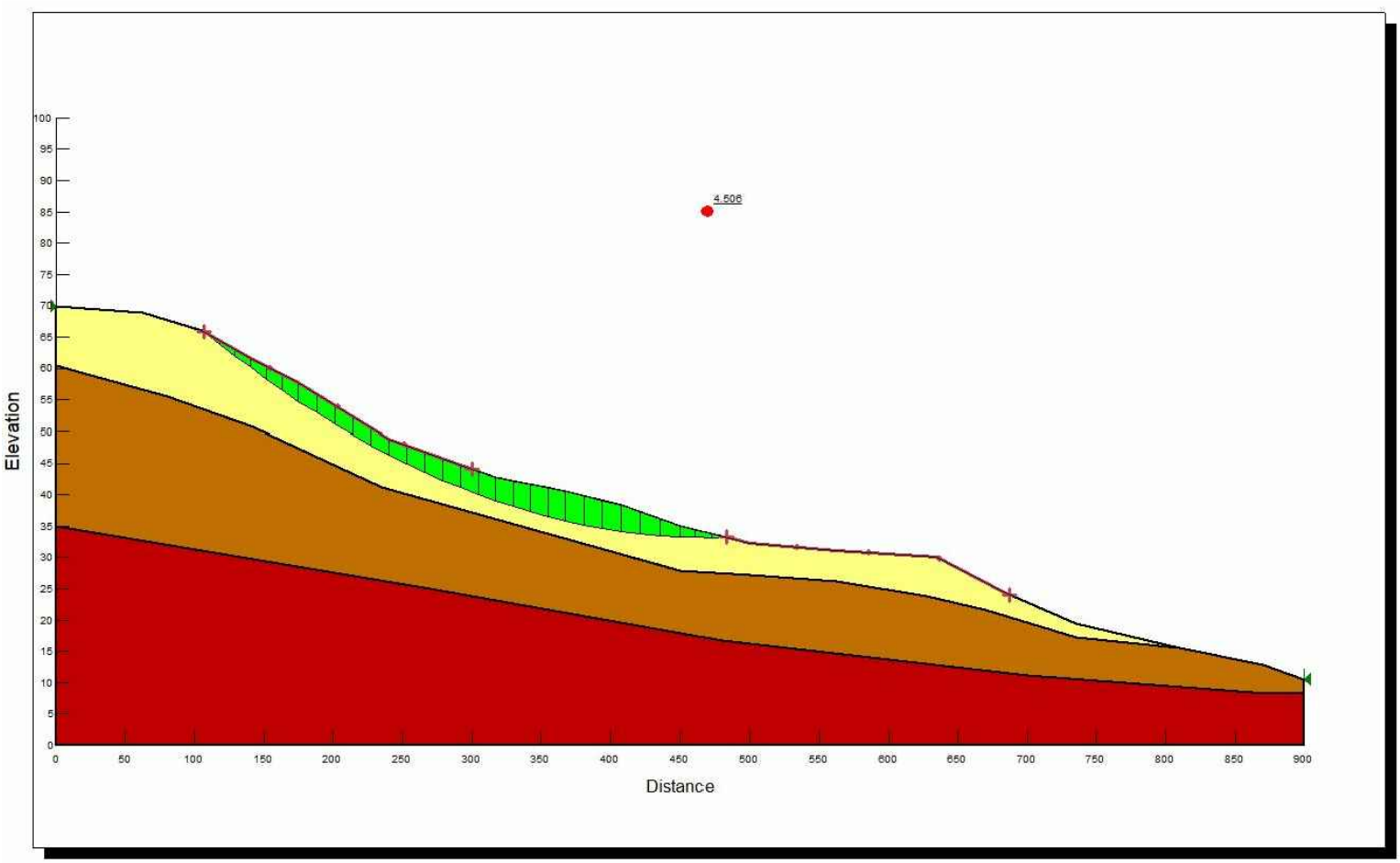


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REFERENCE:
SLOPE/W SOFTWARE

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SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (STATIC)

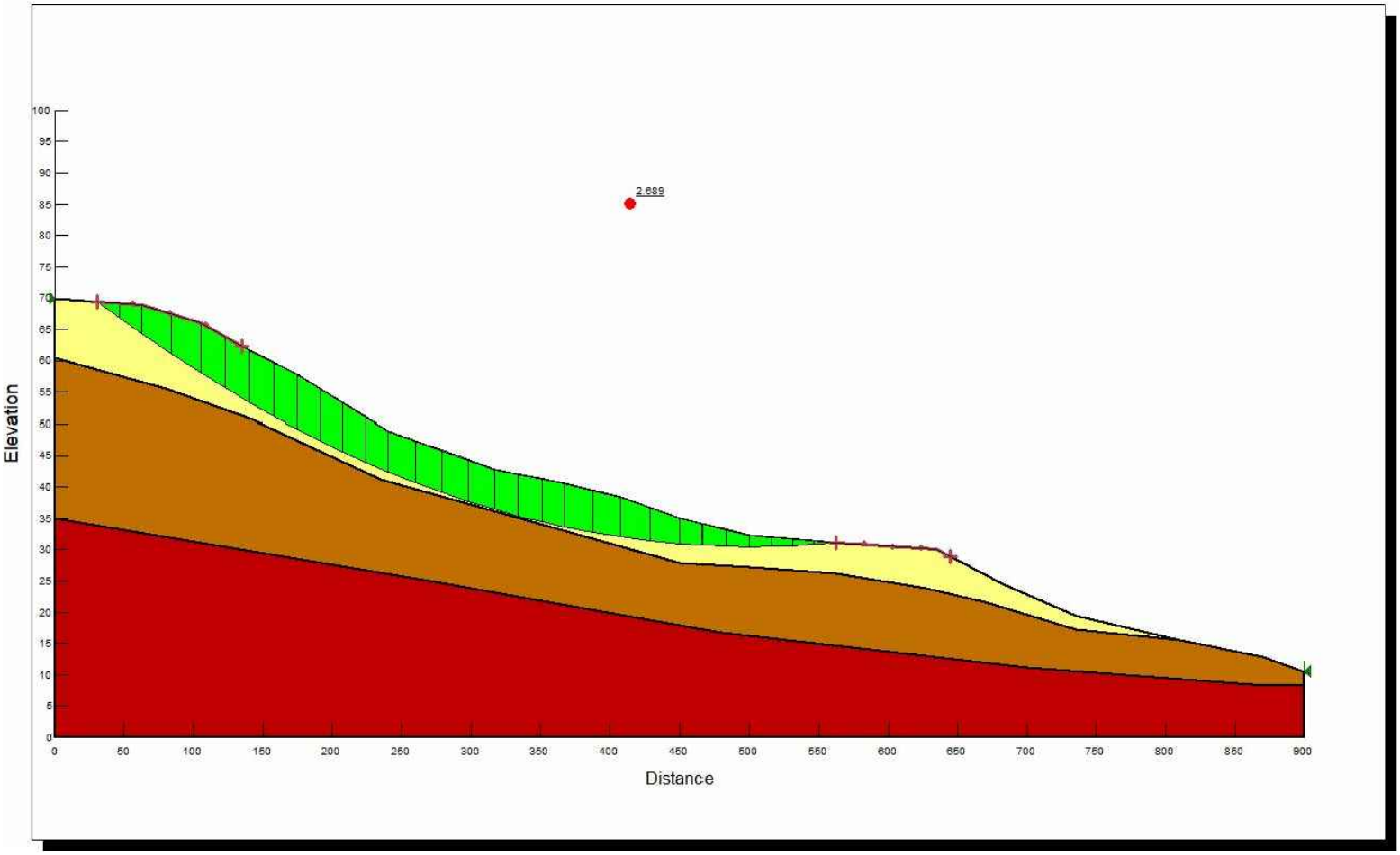


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REFERENCE:
SLOPE/W SOFTWARE

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SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (STATIC)

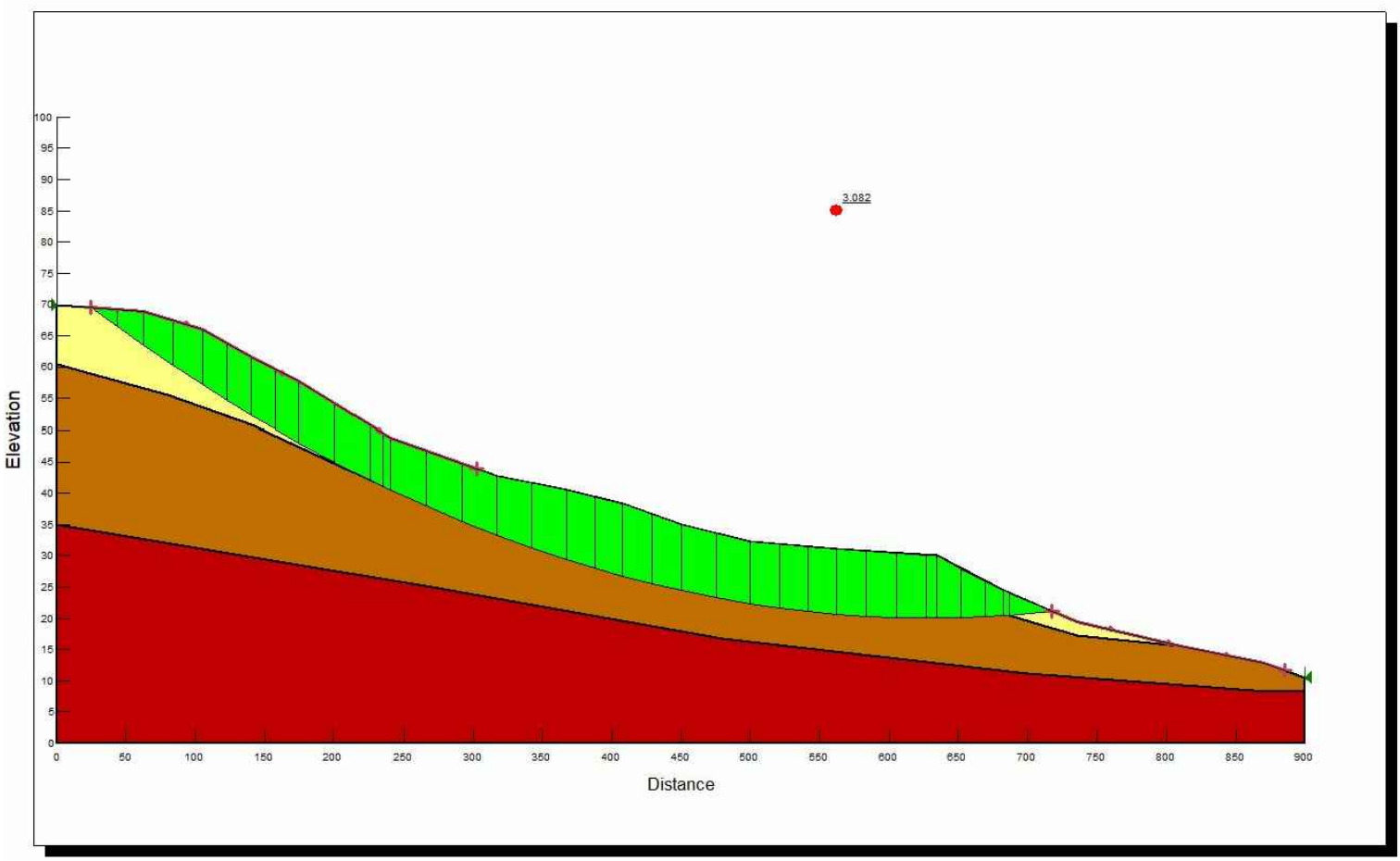


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REFERENCE:
SLOPE/W SOFTWARE

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SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (SEISMIC Kh=0.05g)

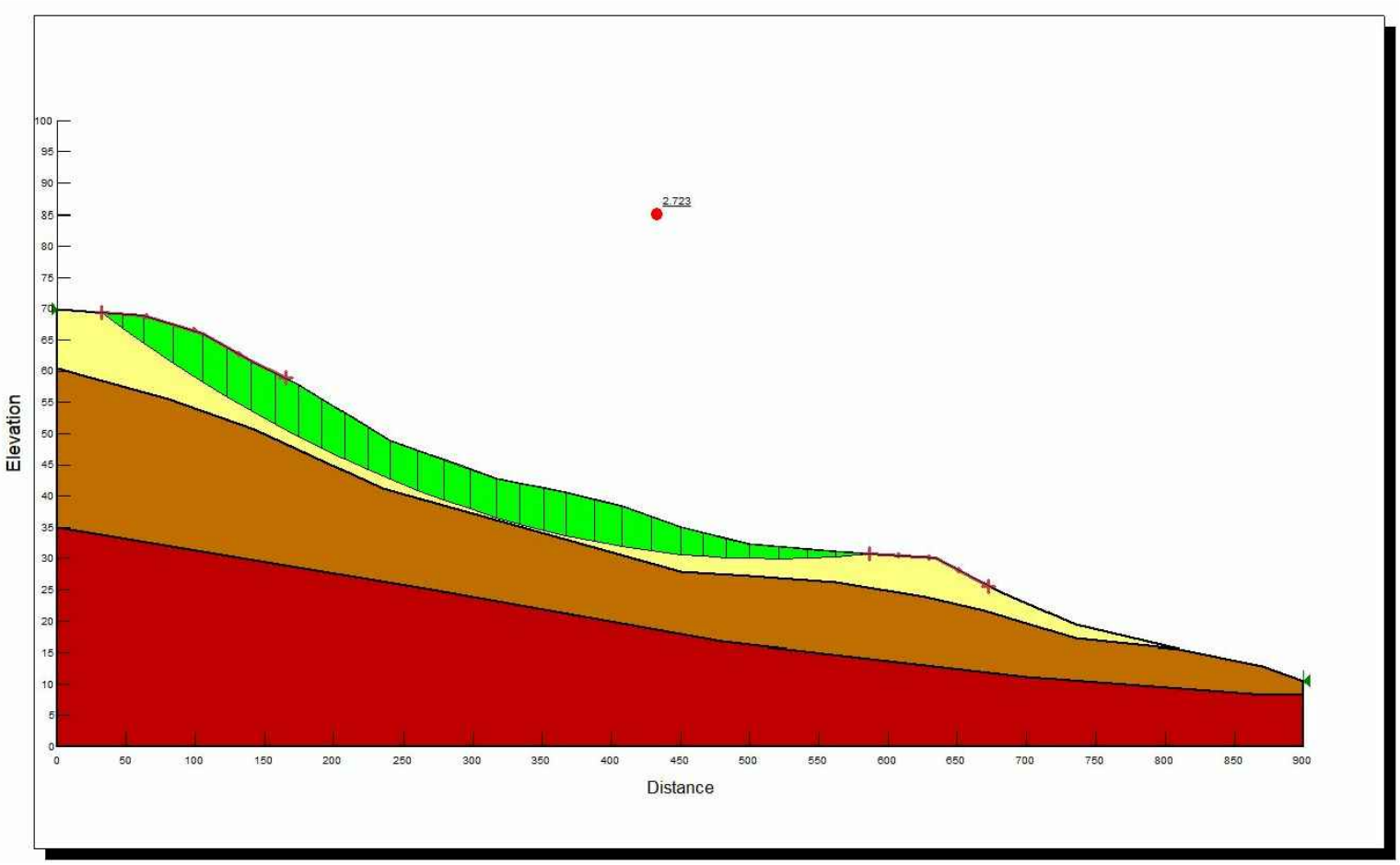


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
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SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (SEISMIC Kh=0.05g)

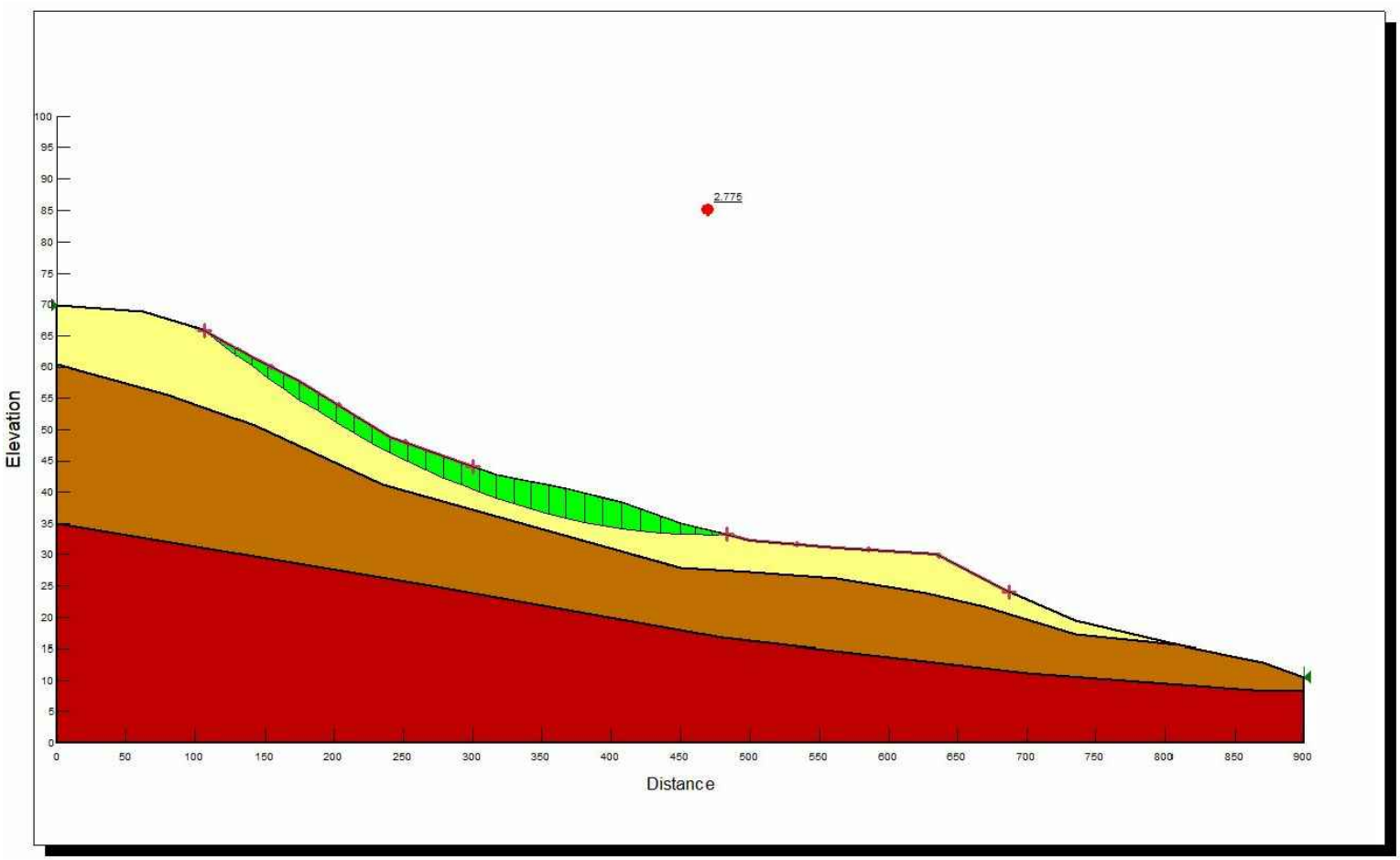


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REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (SEISMIC Kh=0.05g)

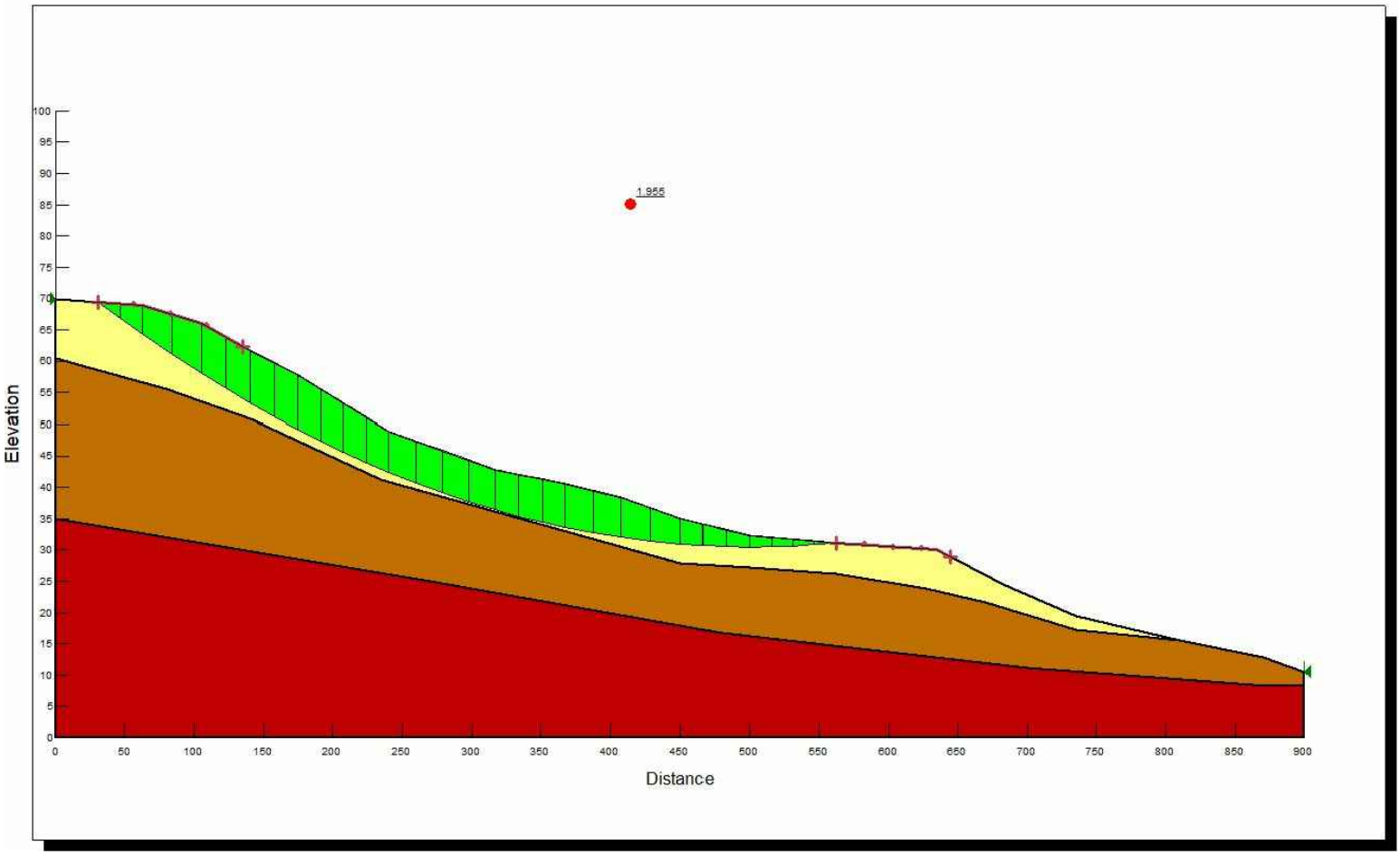


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REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
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SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (SEISMIC Kh=0.05g)

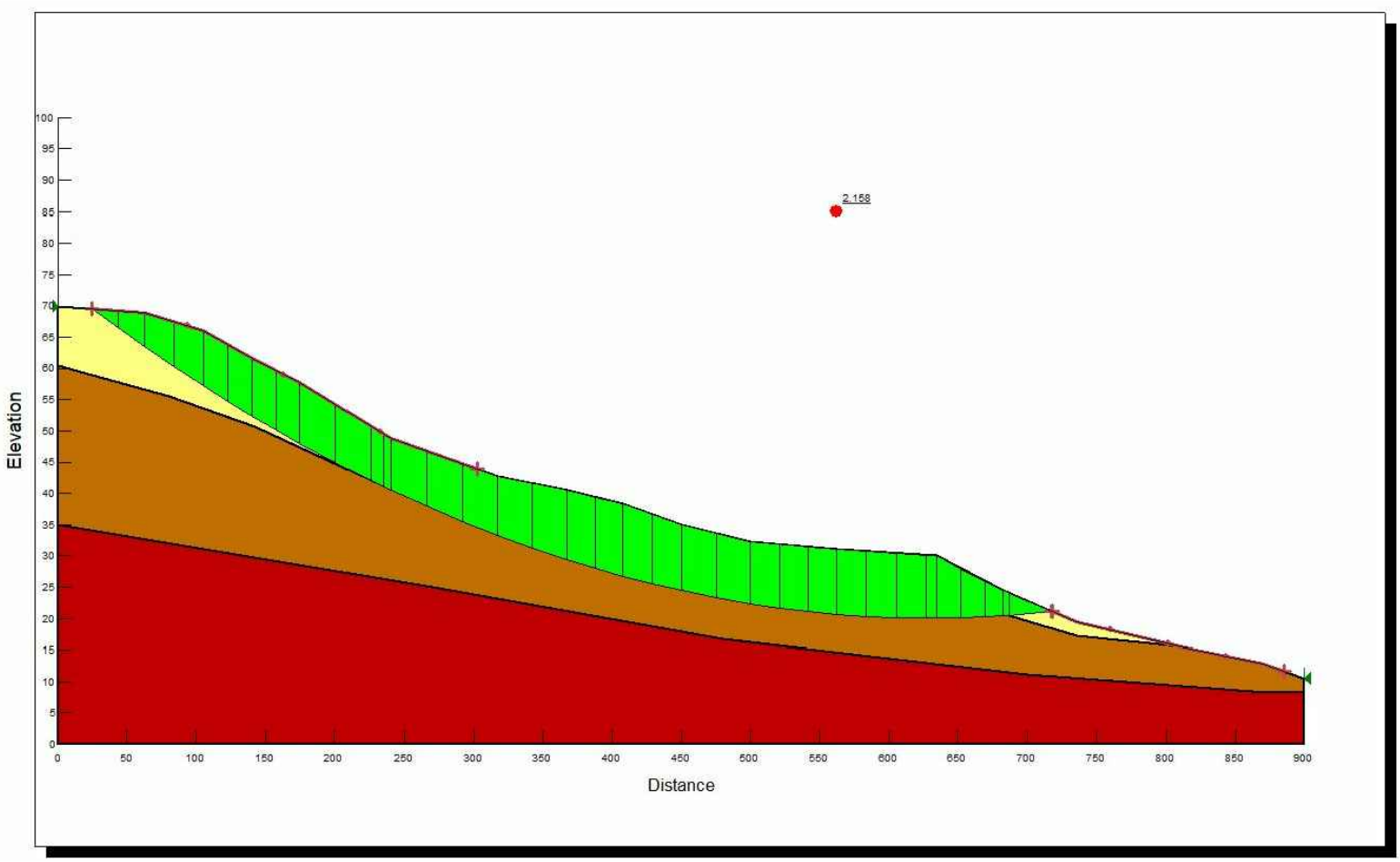


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REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITHOUT WATER TABLE (SEISMIC Kh=0.1g)

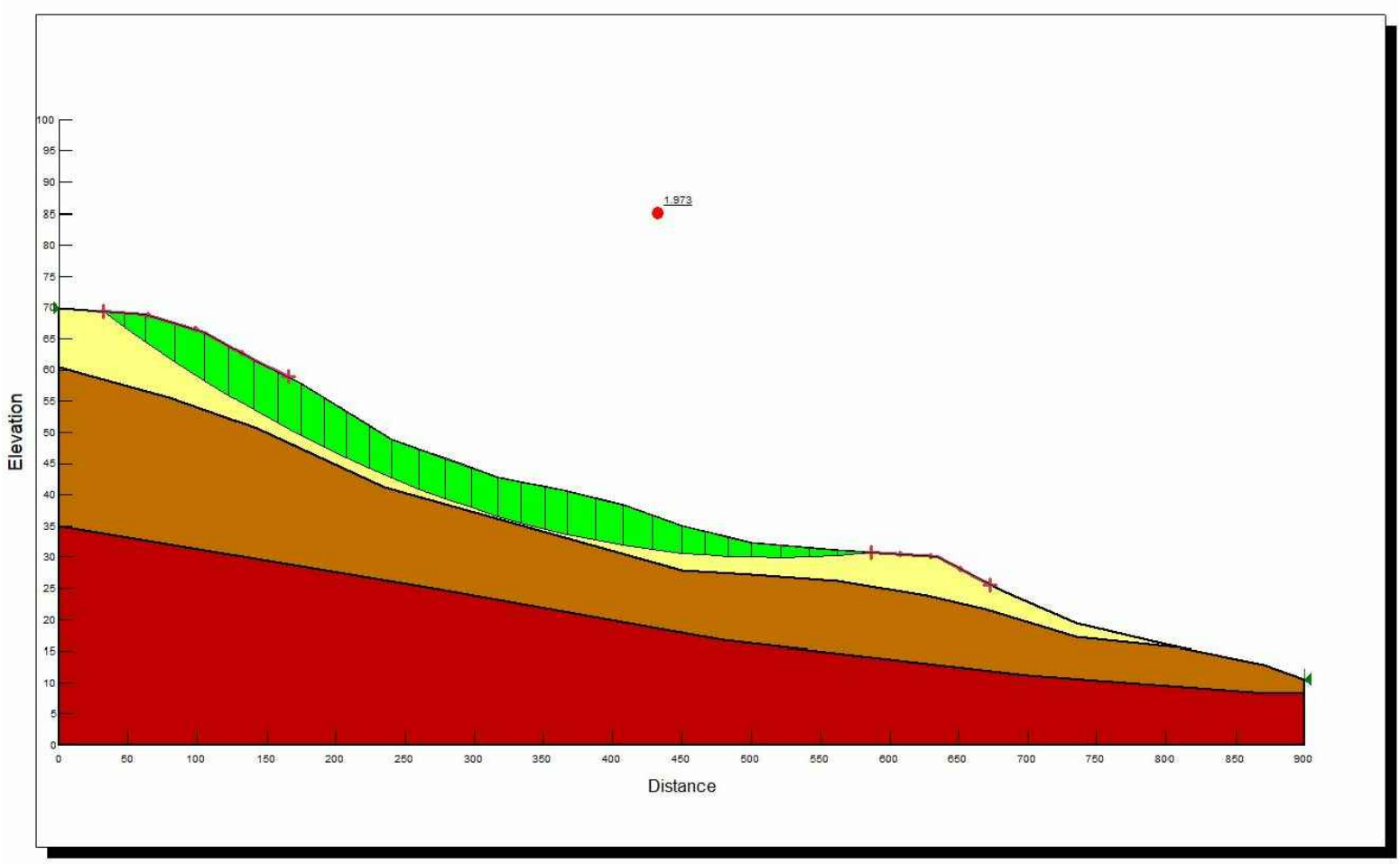


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REFERENCE:
SLOPE/W SOFTWARE

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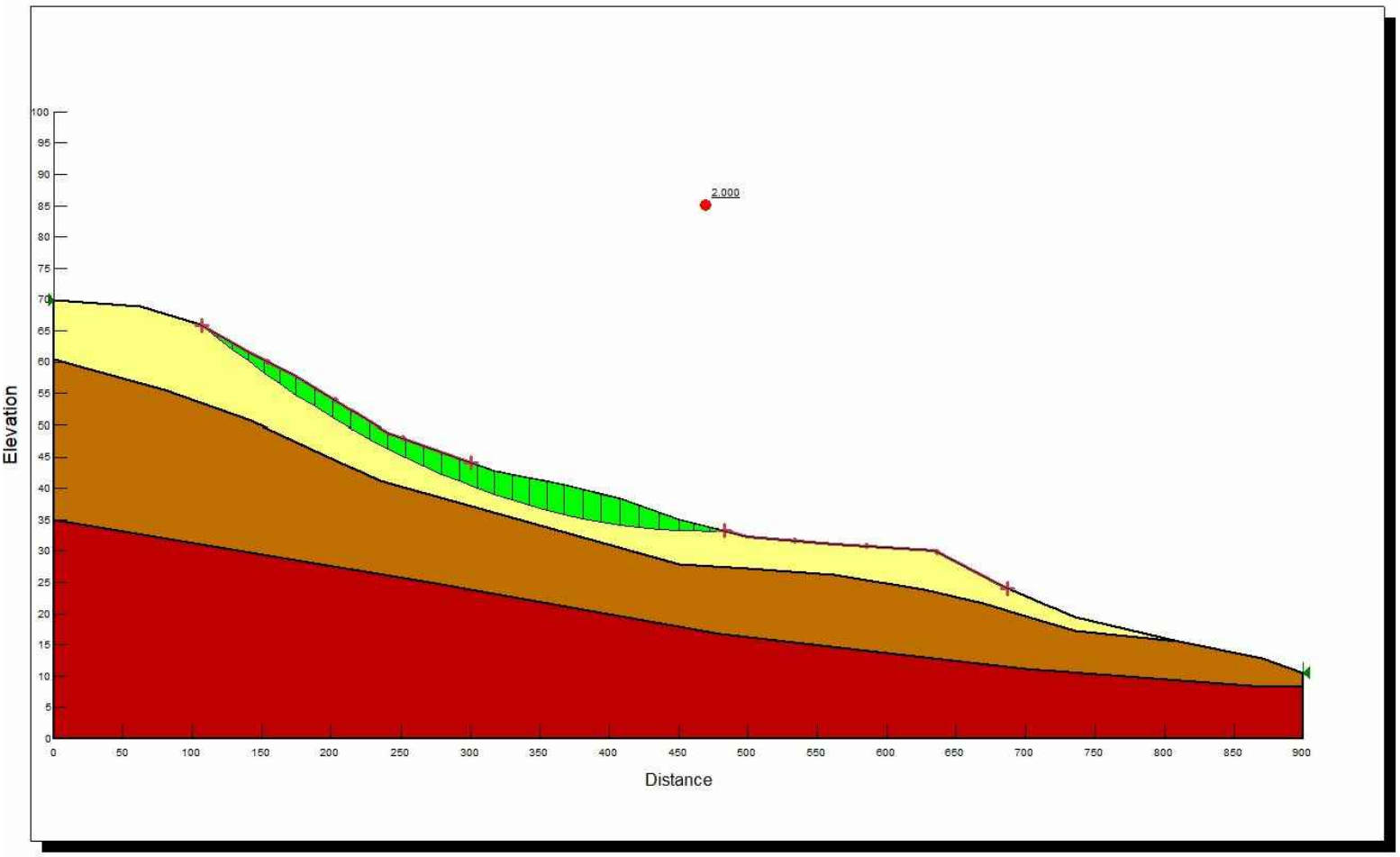


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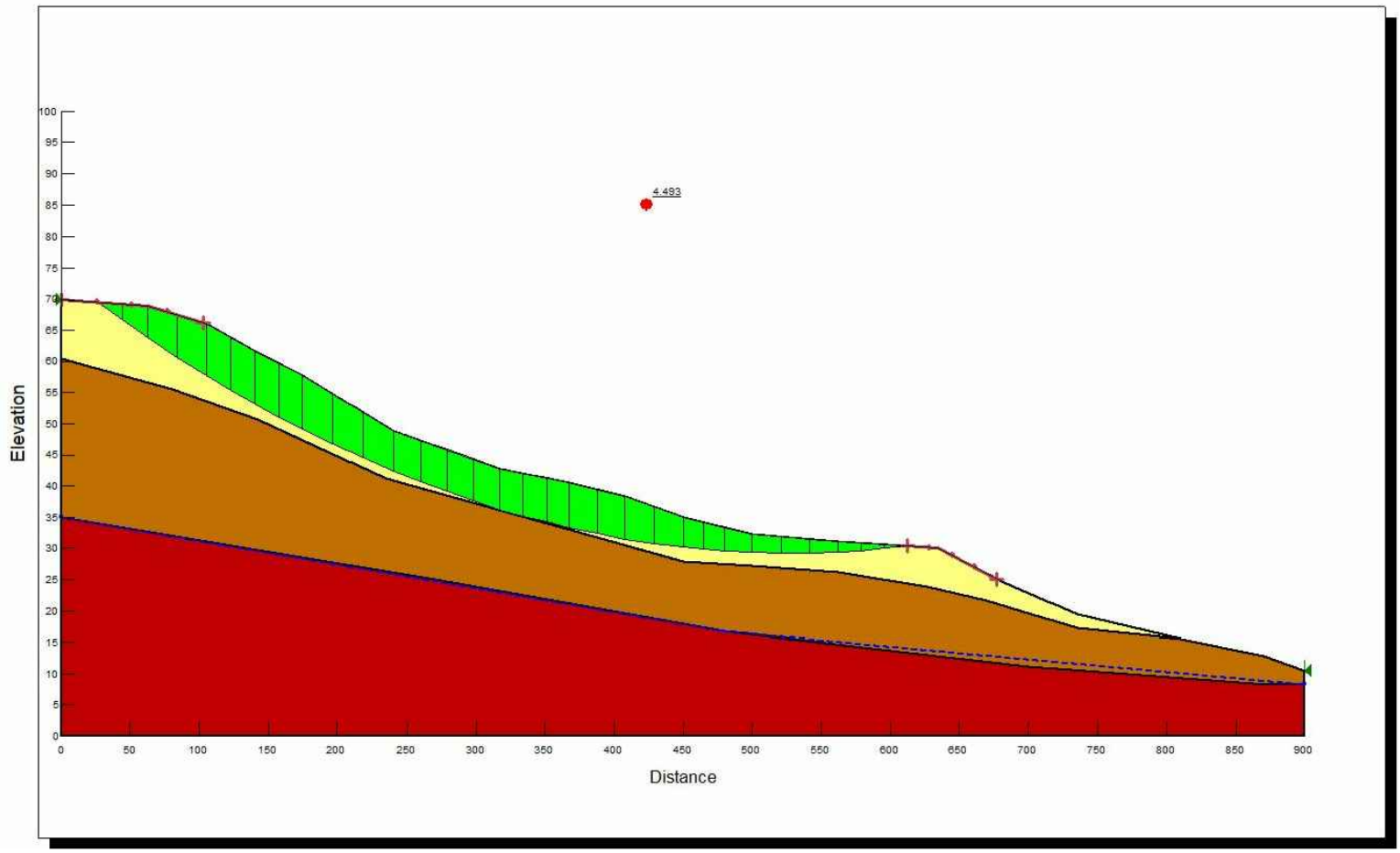


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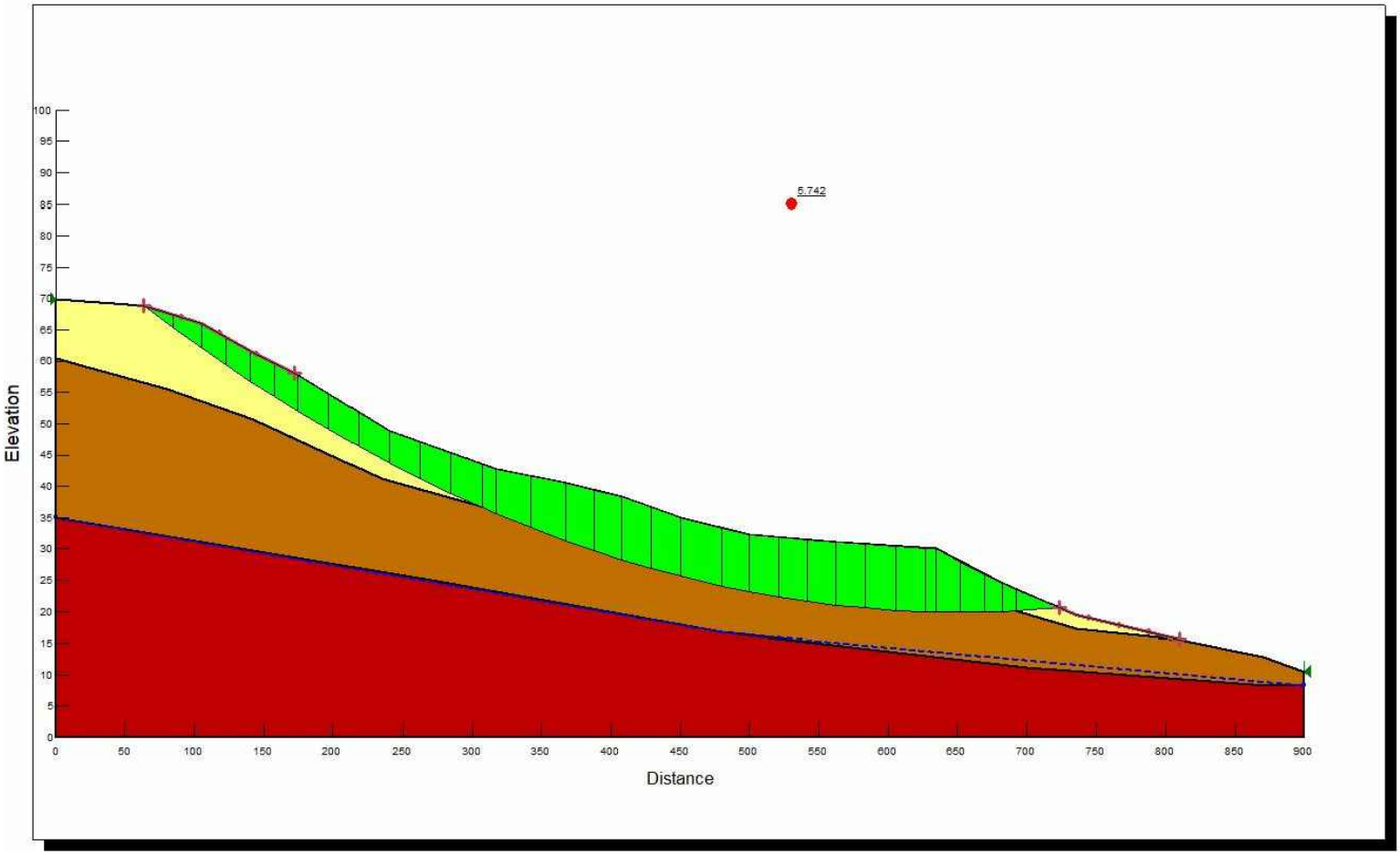


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REFERENCE:
SLOPE/W SOFTWARE

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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

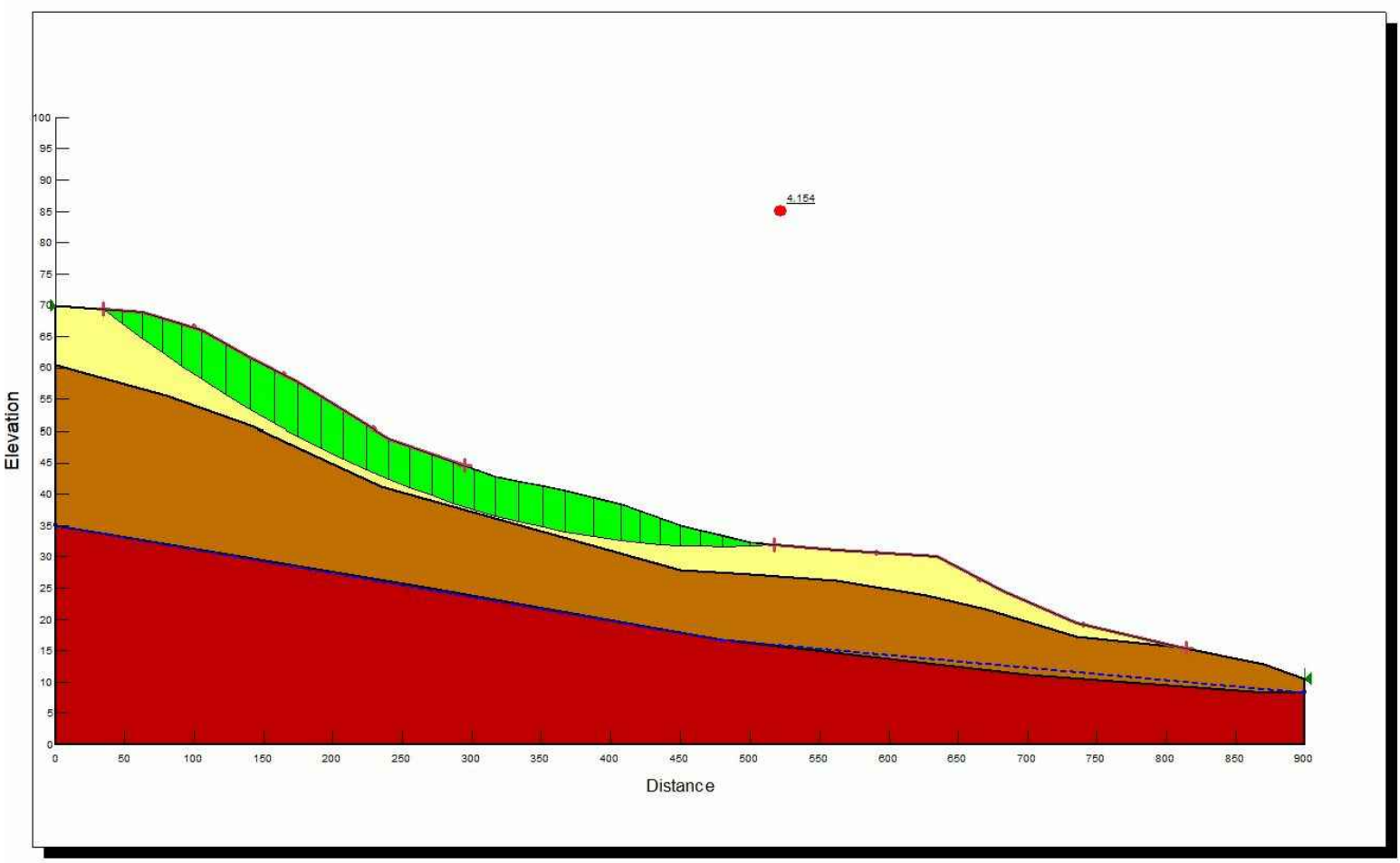


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

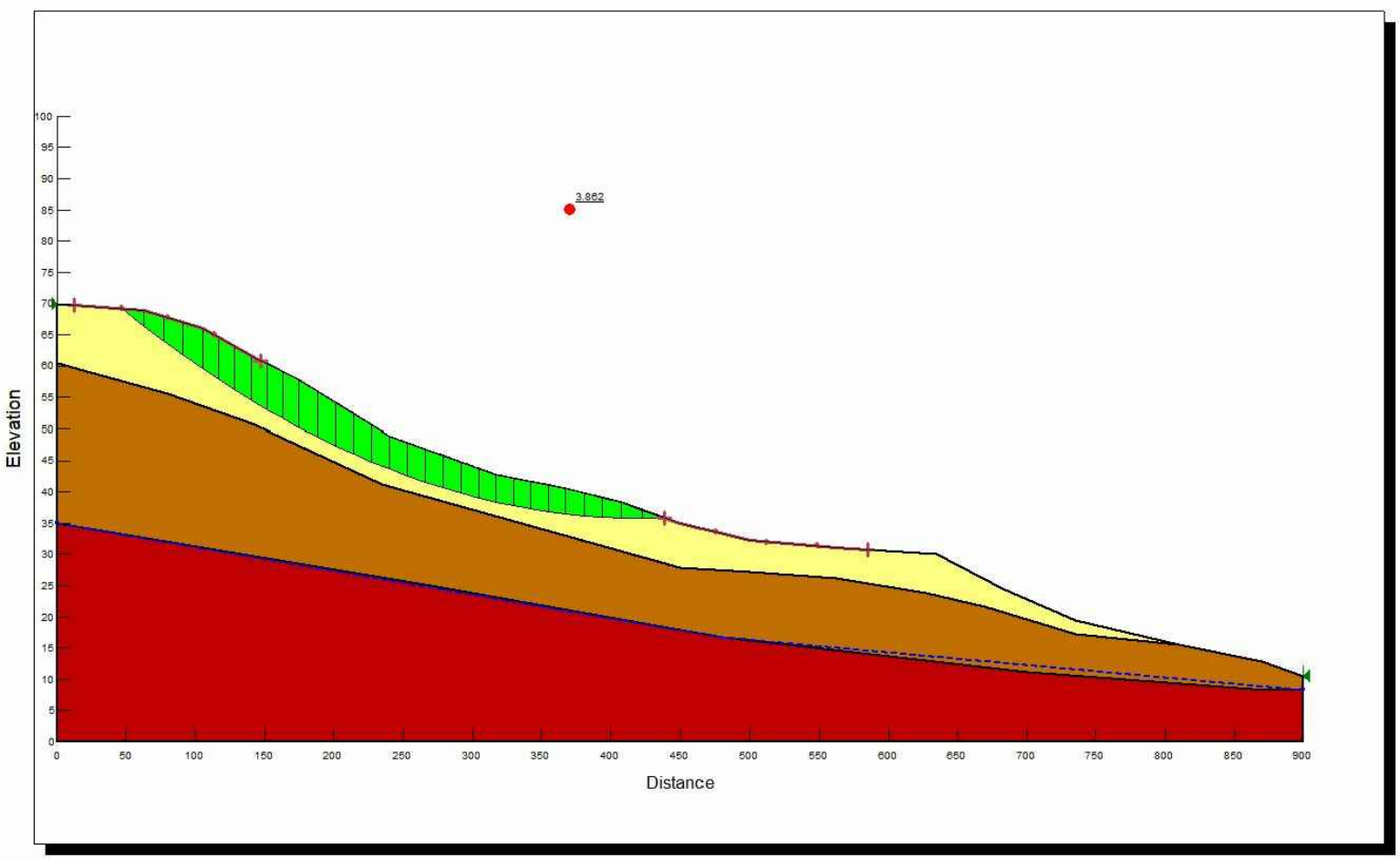


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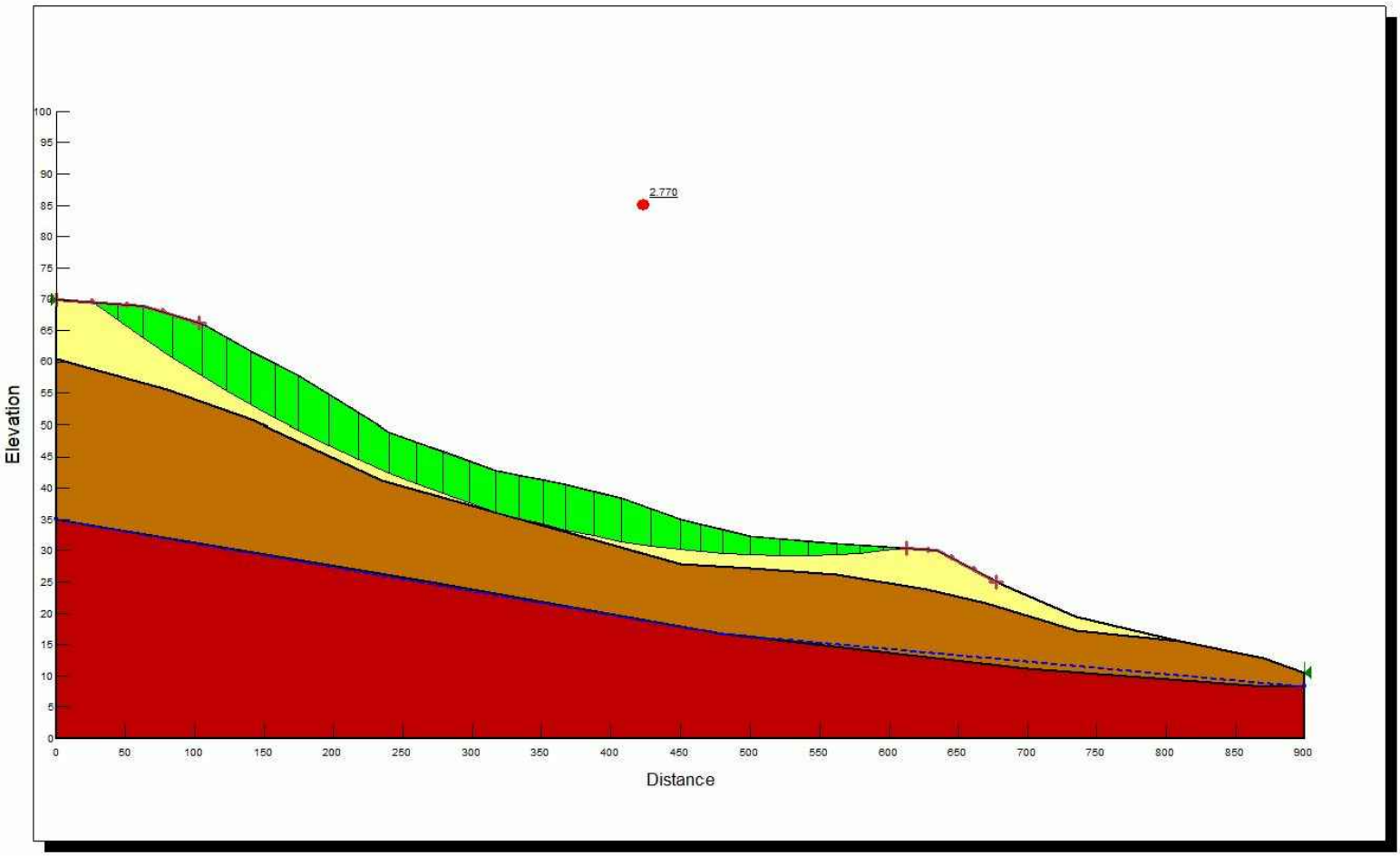


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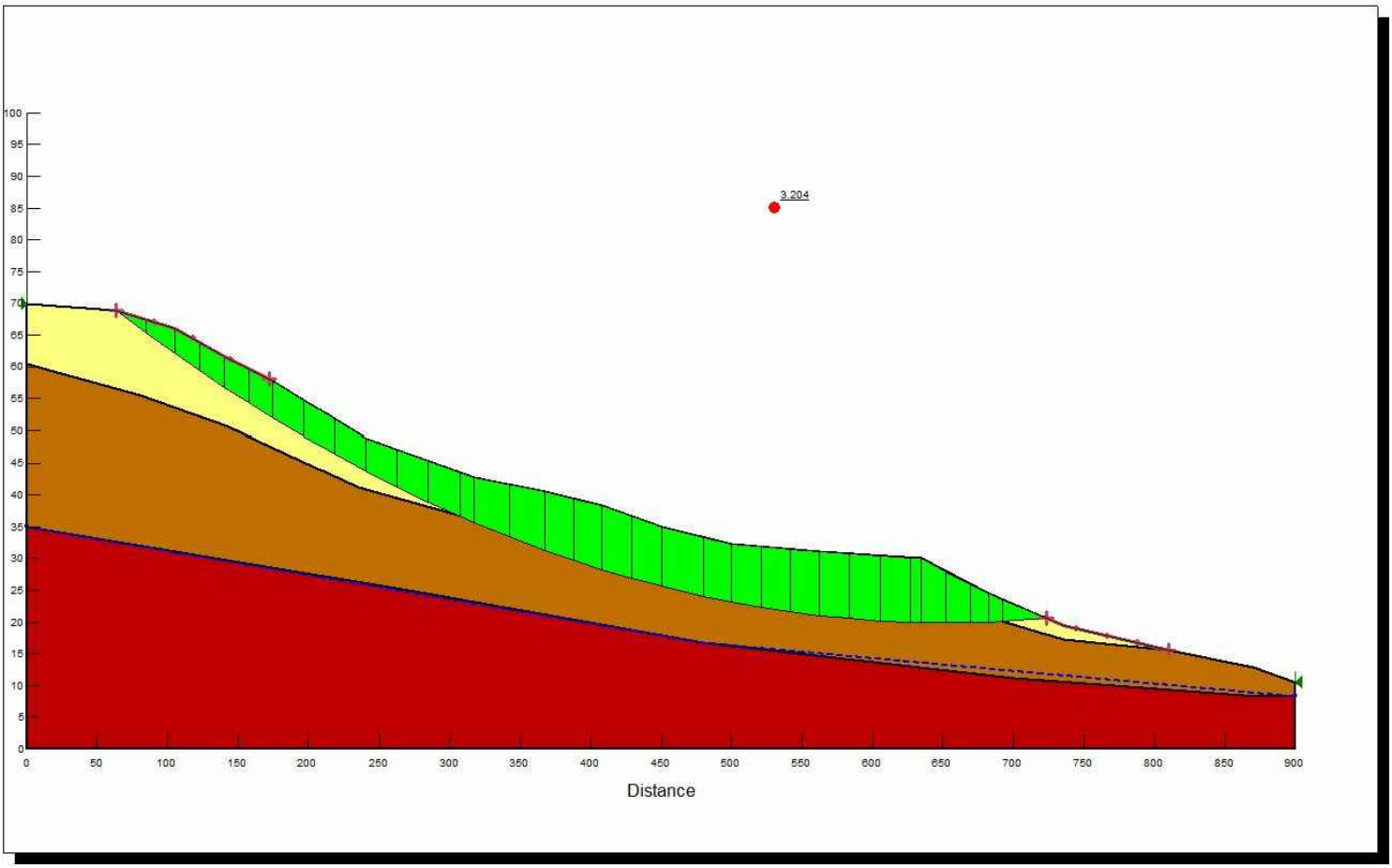


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.05g)

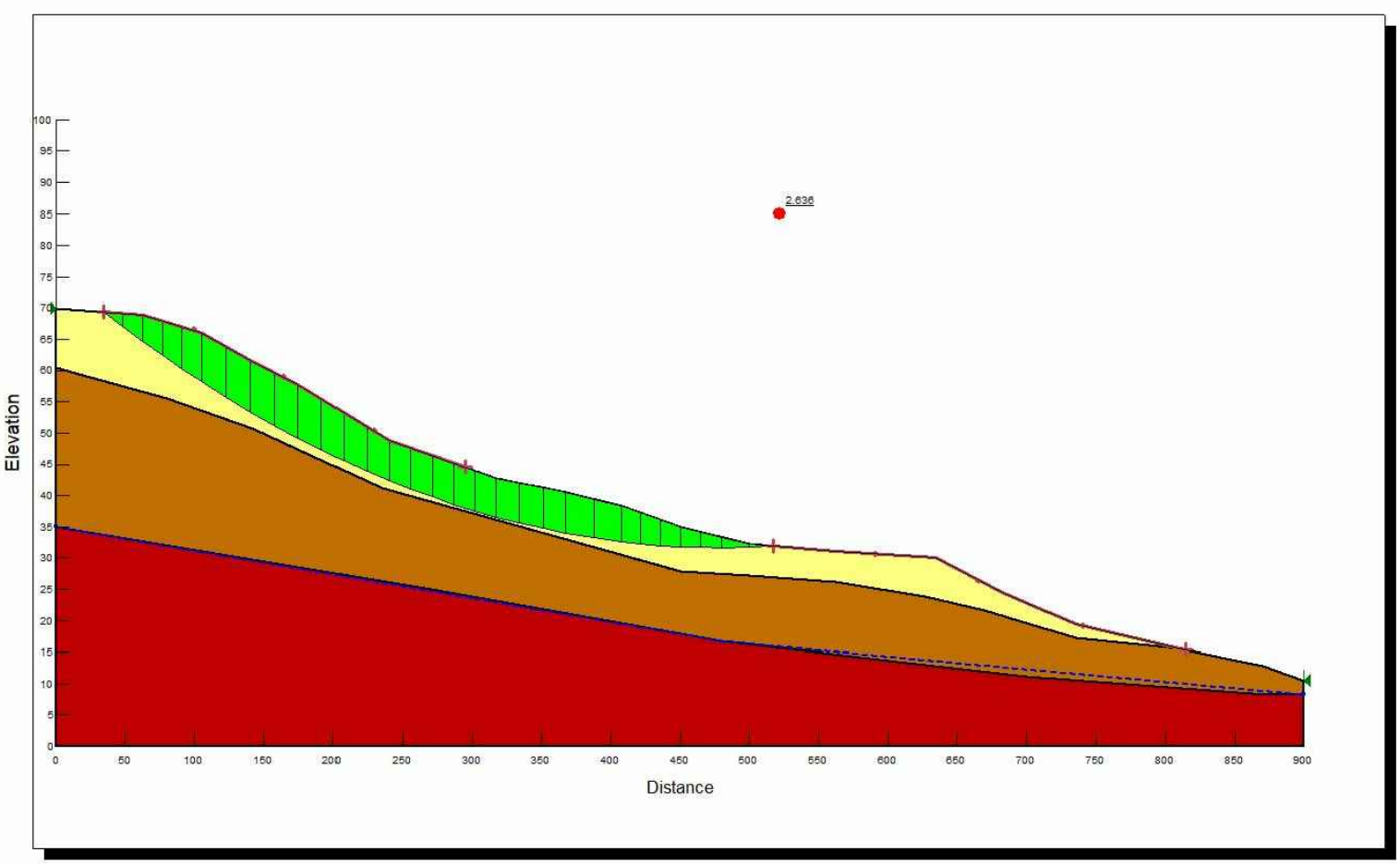


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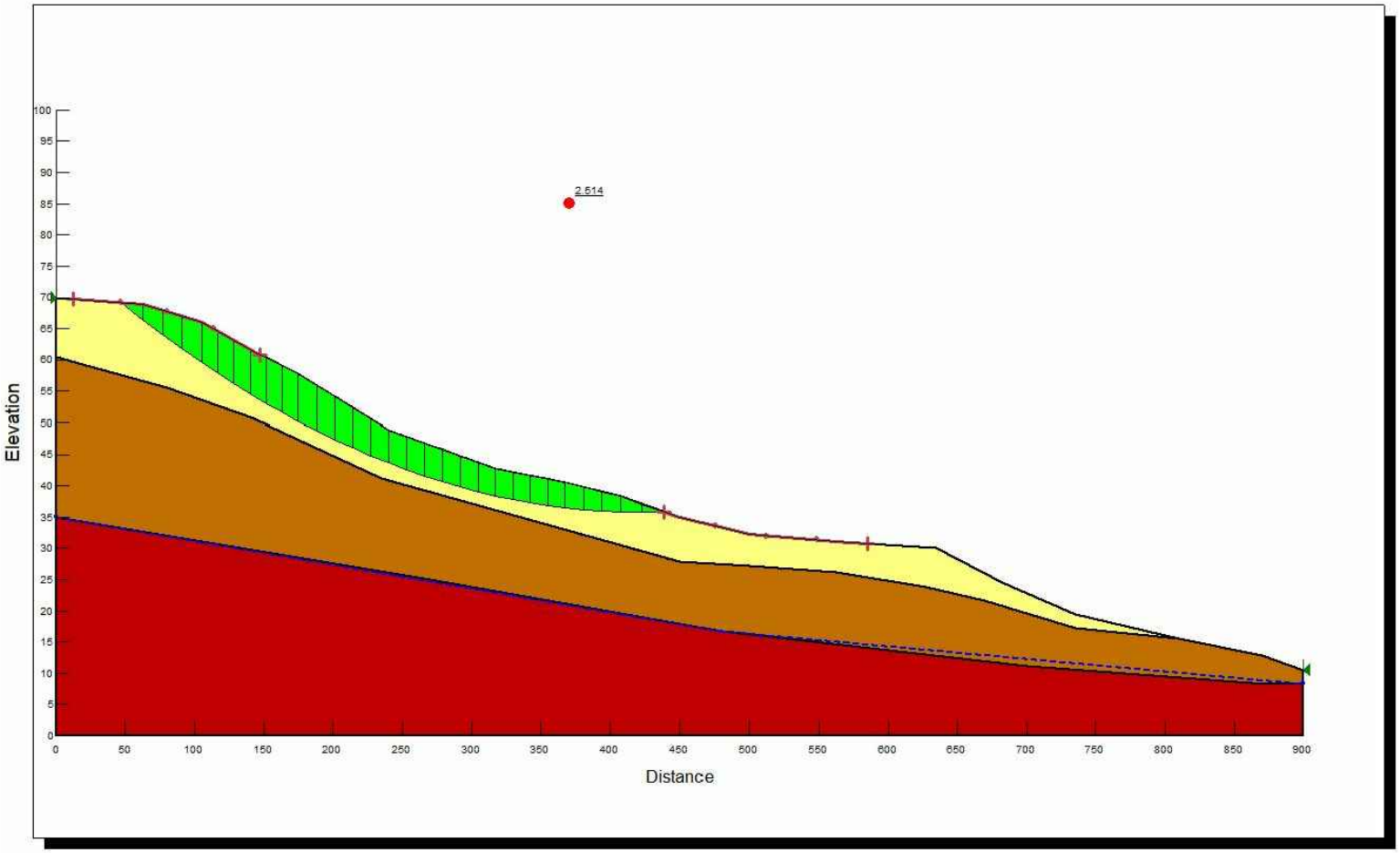


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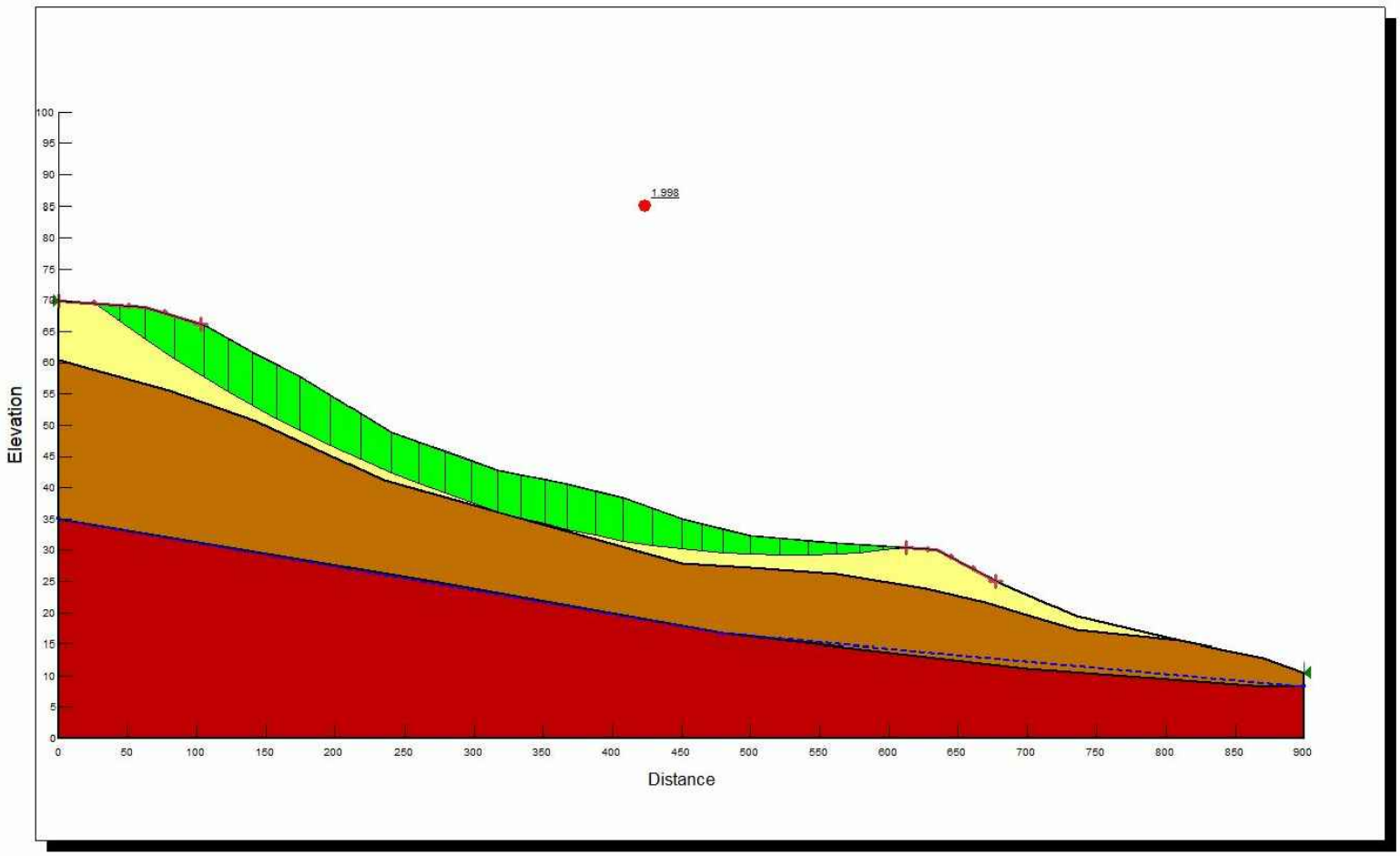


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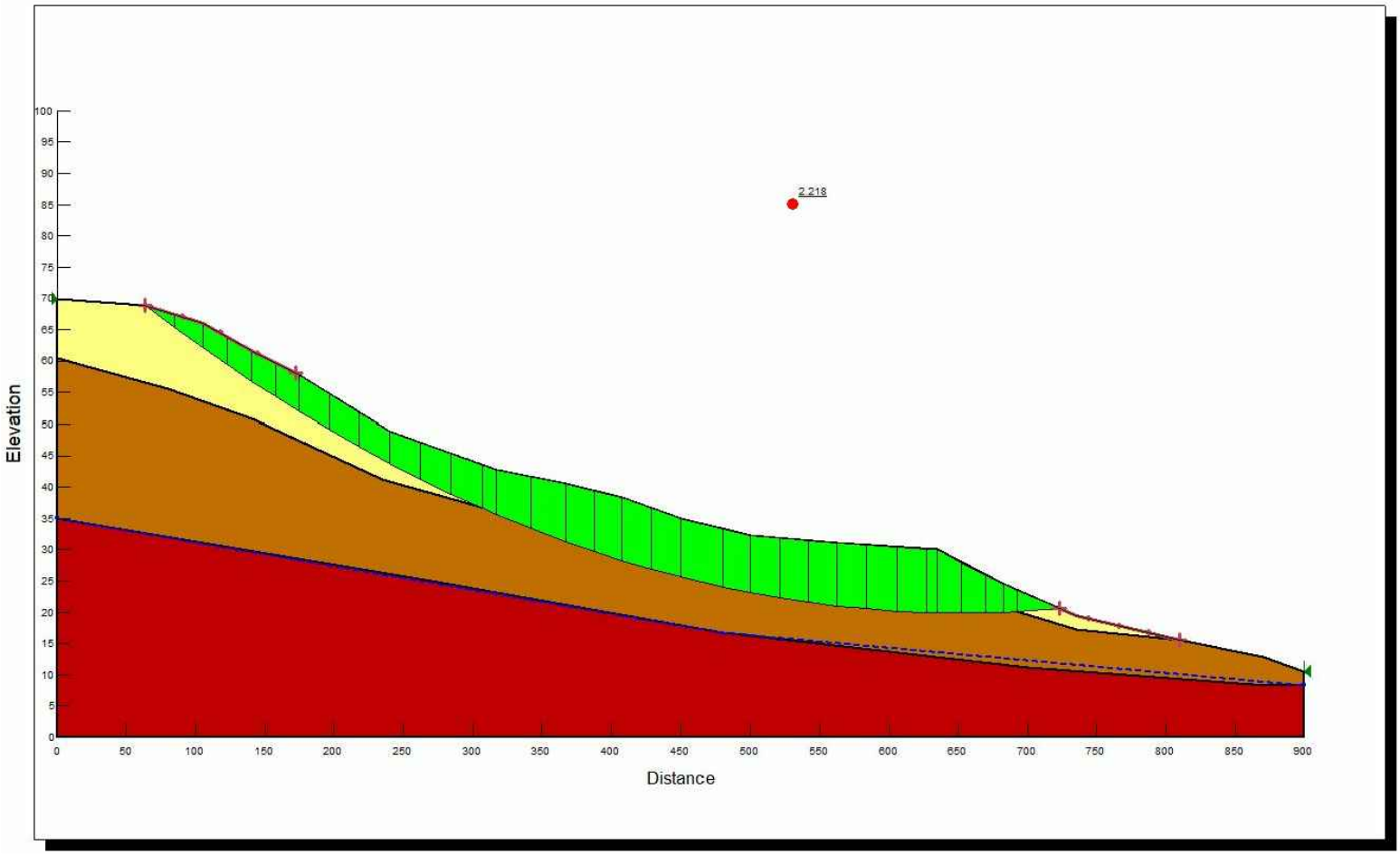


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.1g)

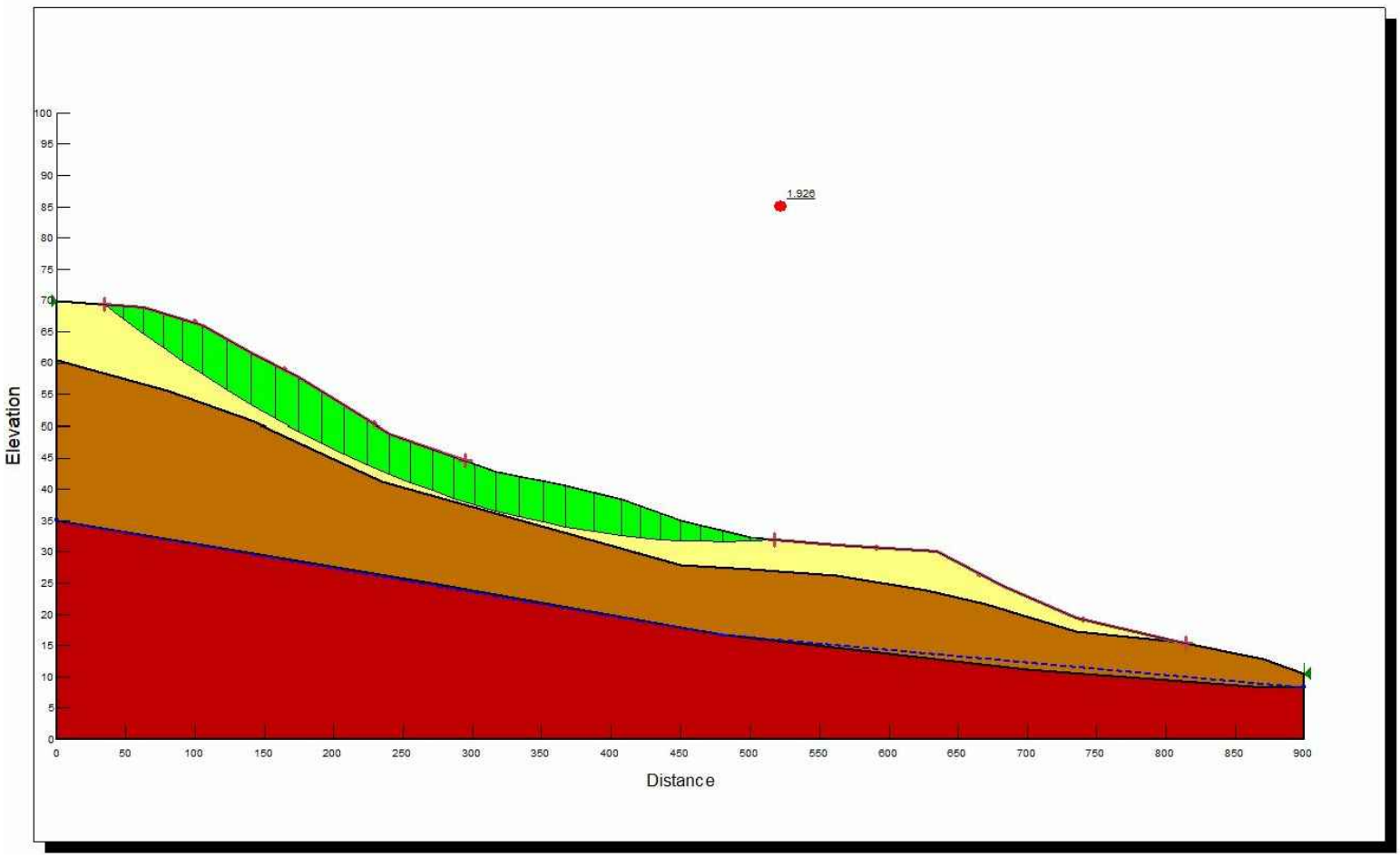


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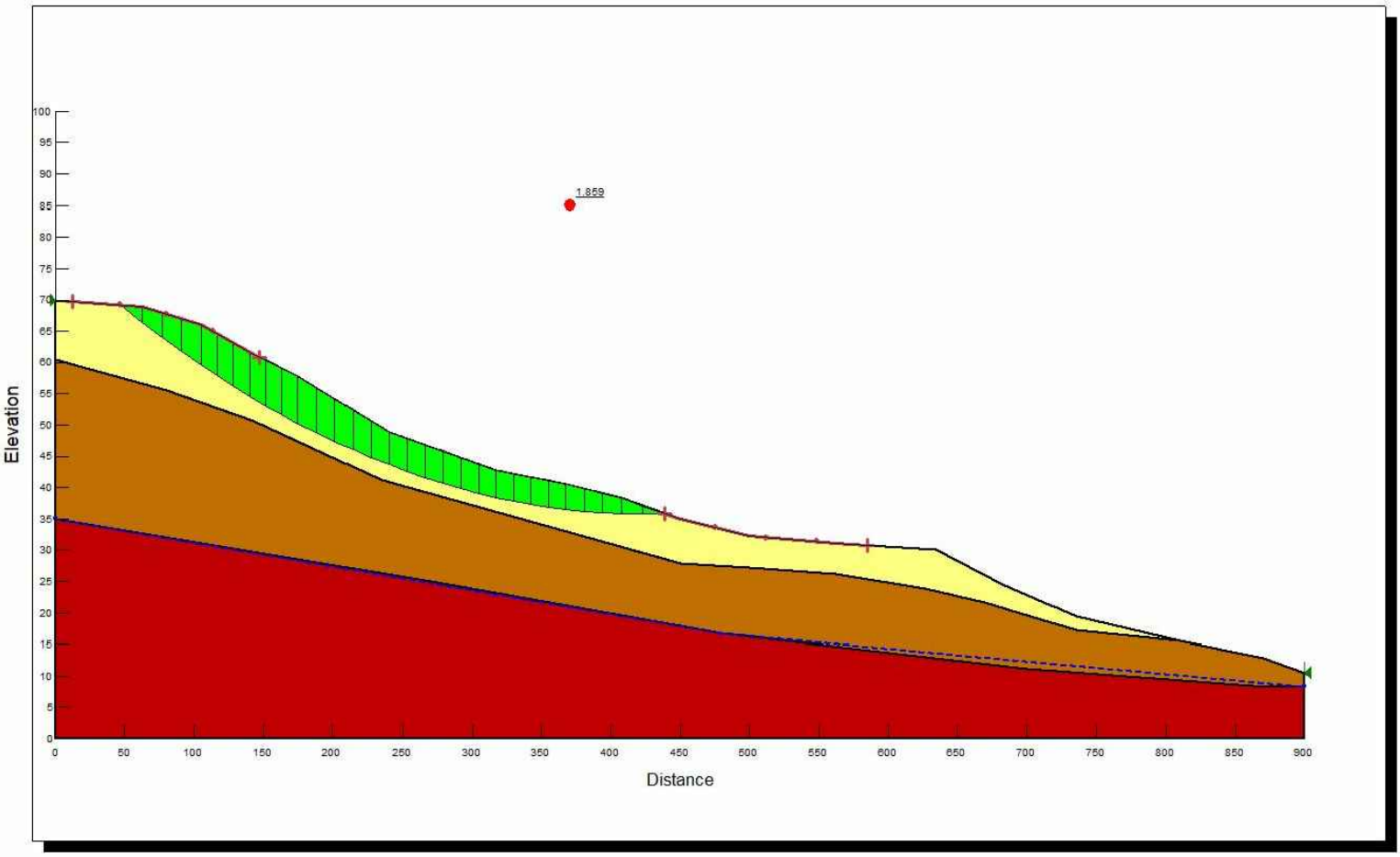


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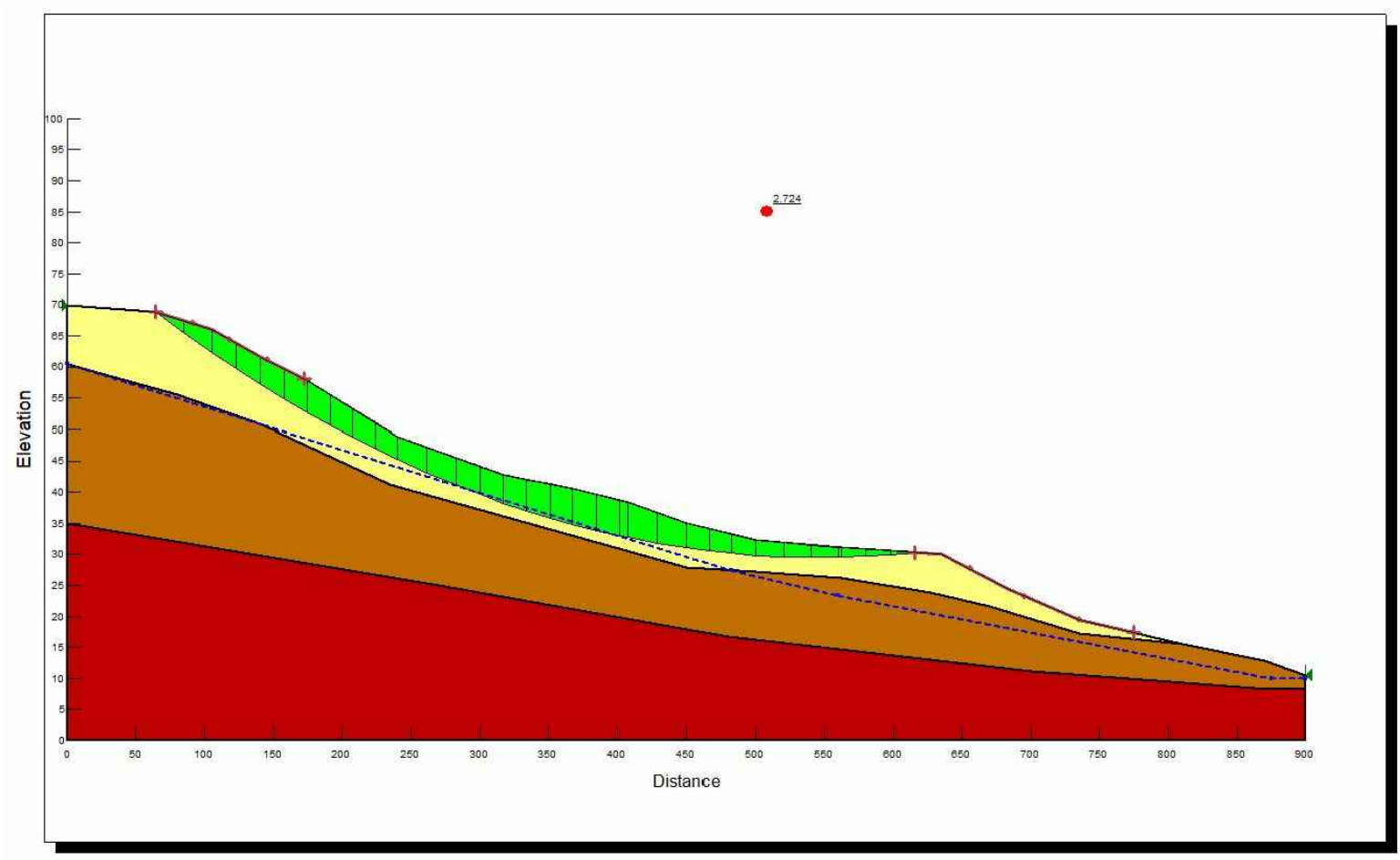


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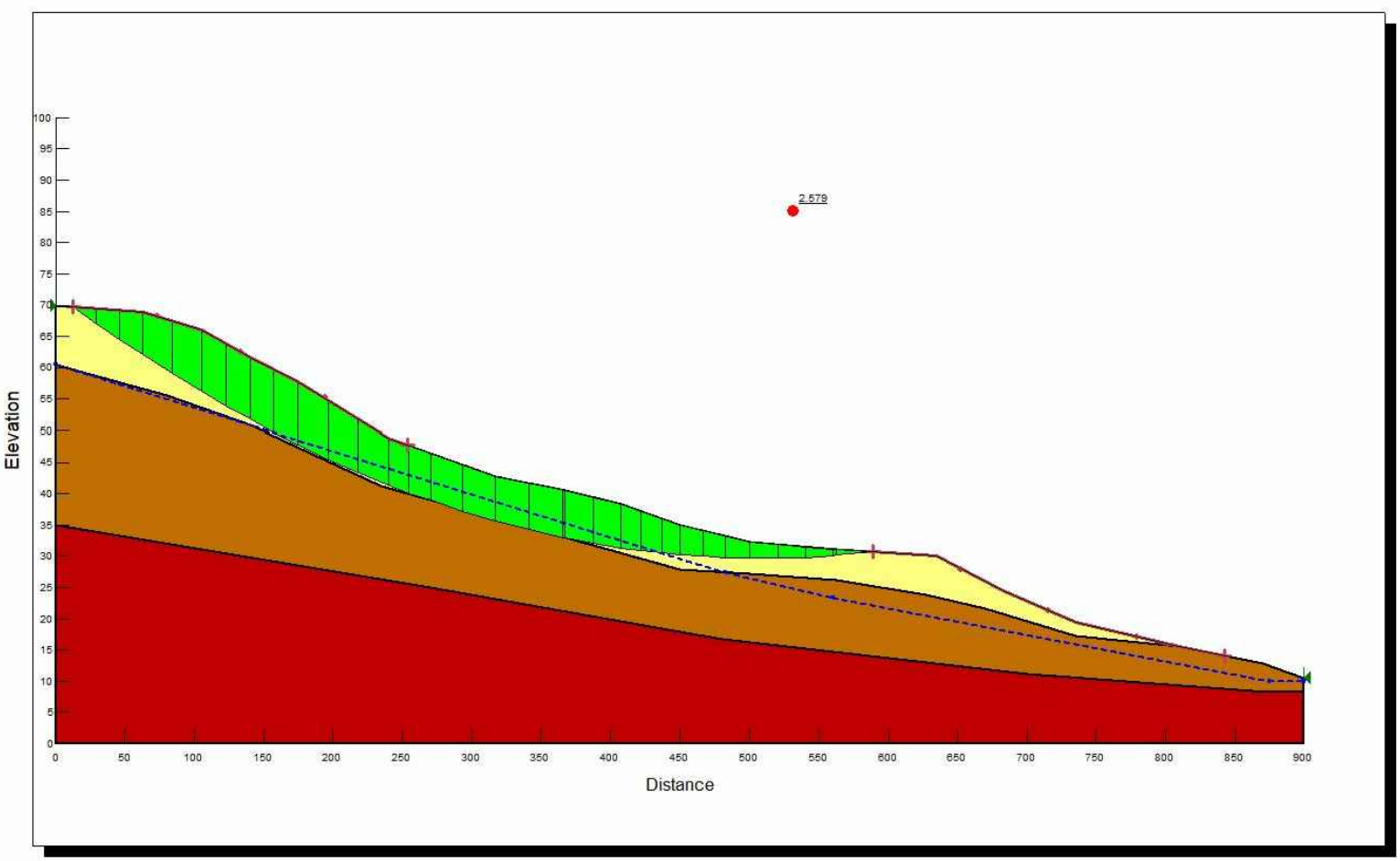


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

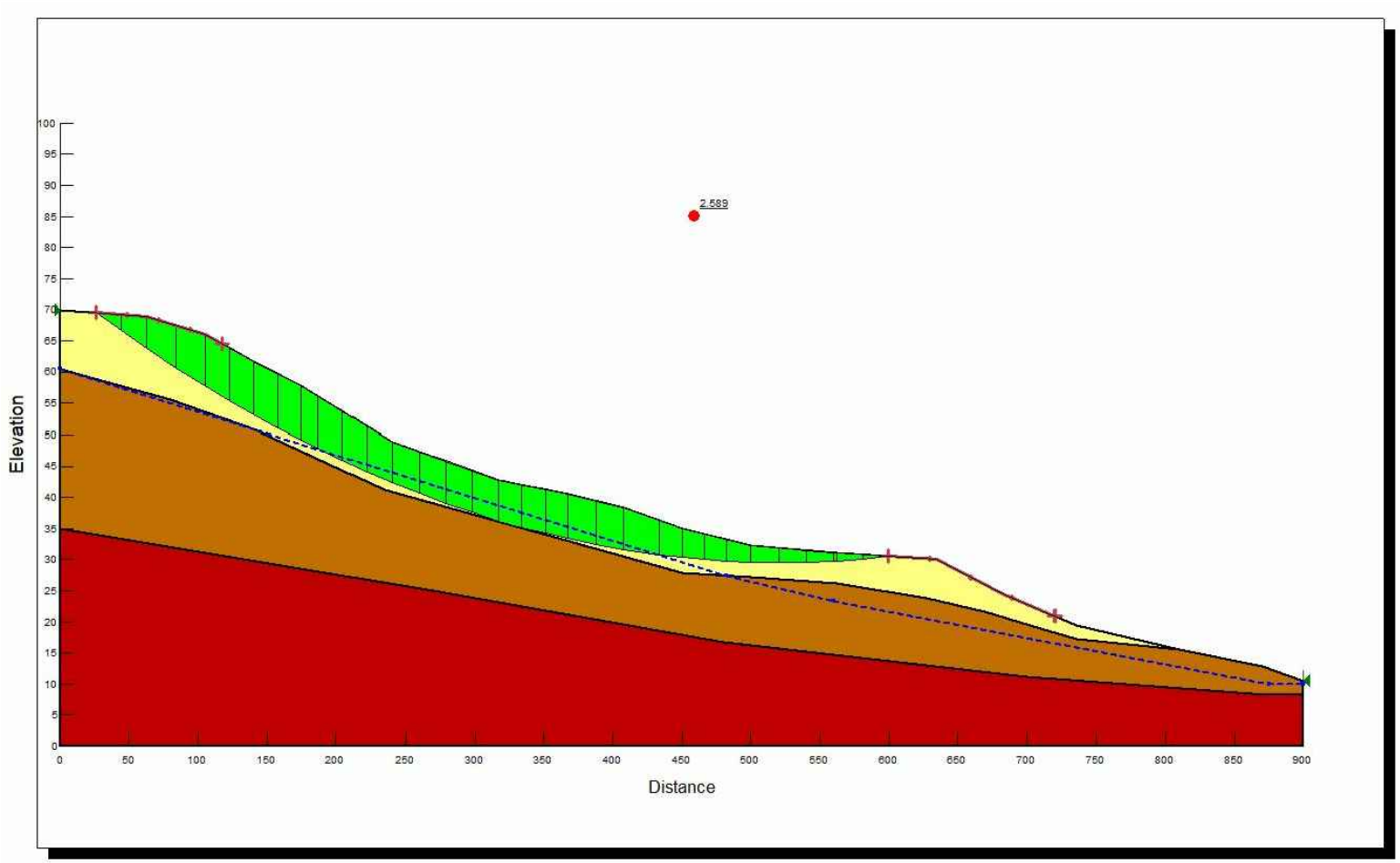


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

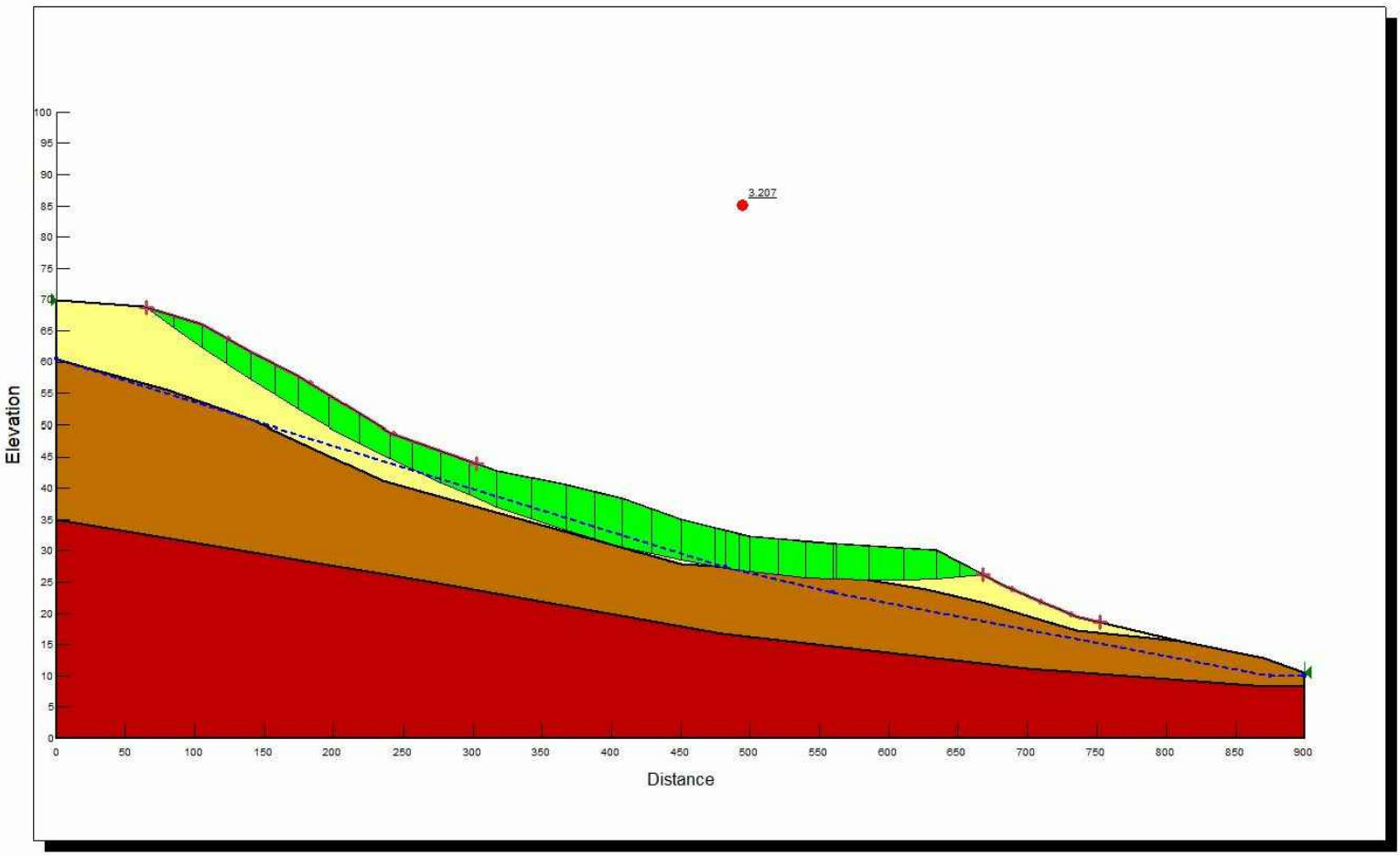


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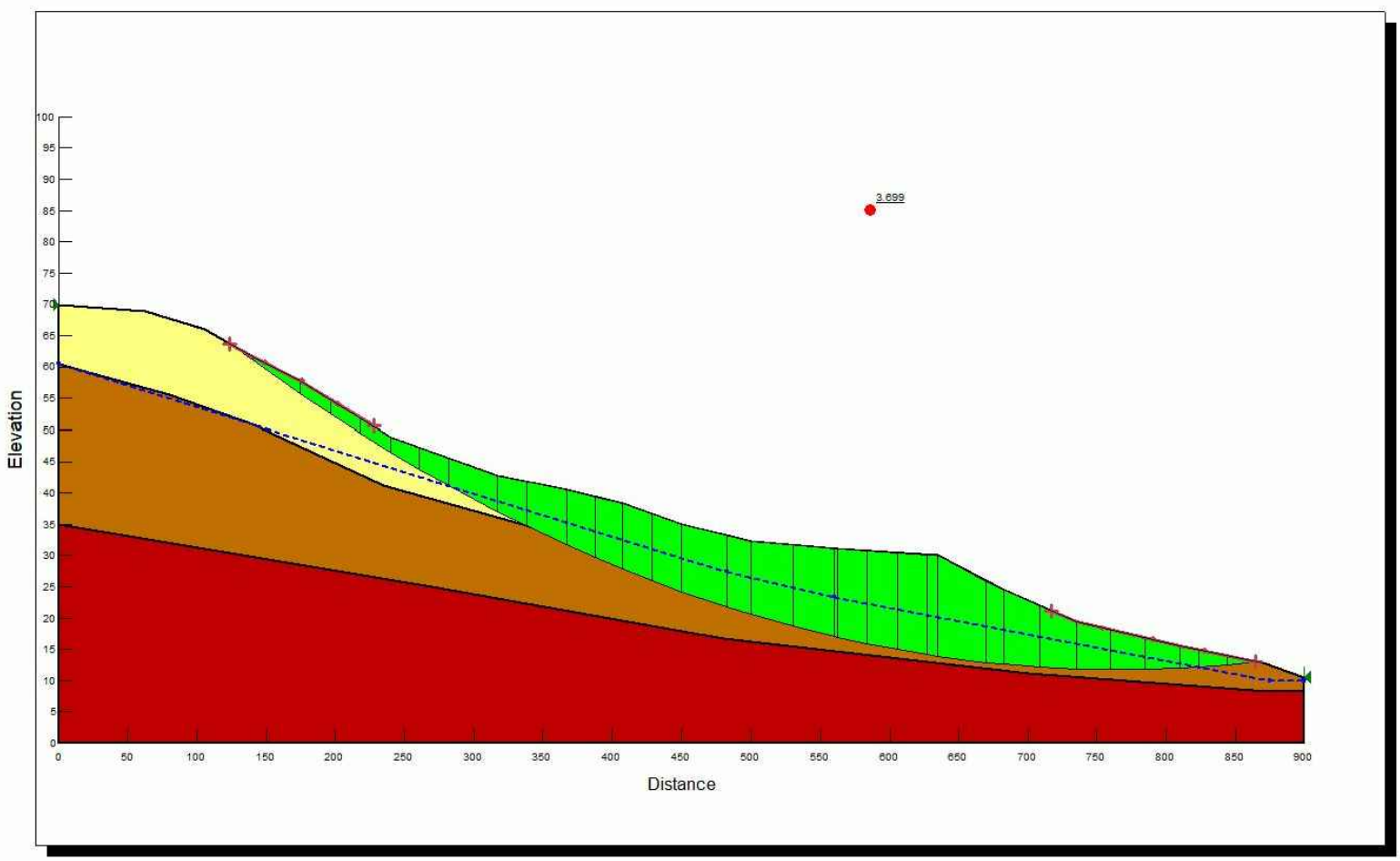


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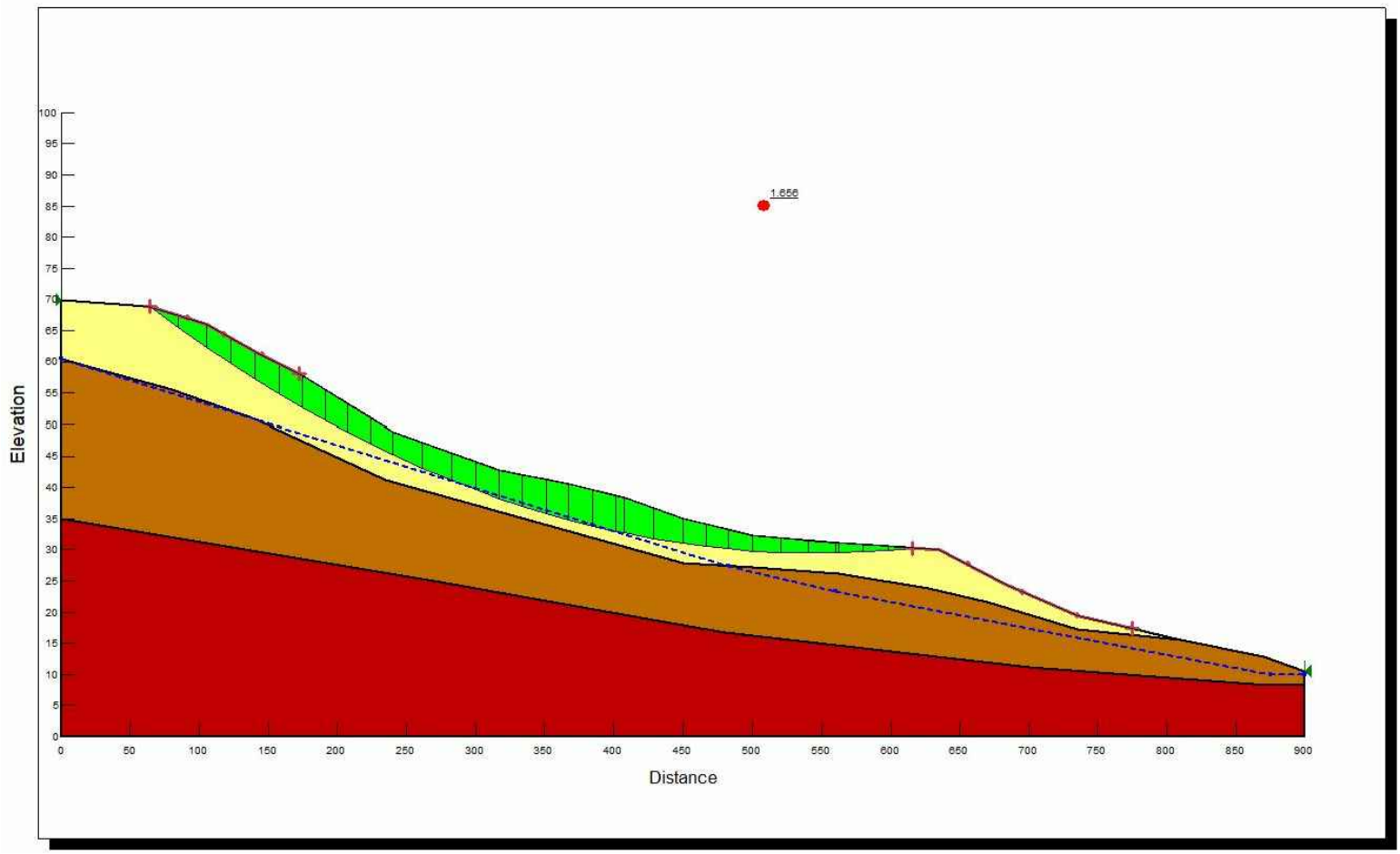


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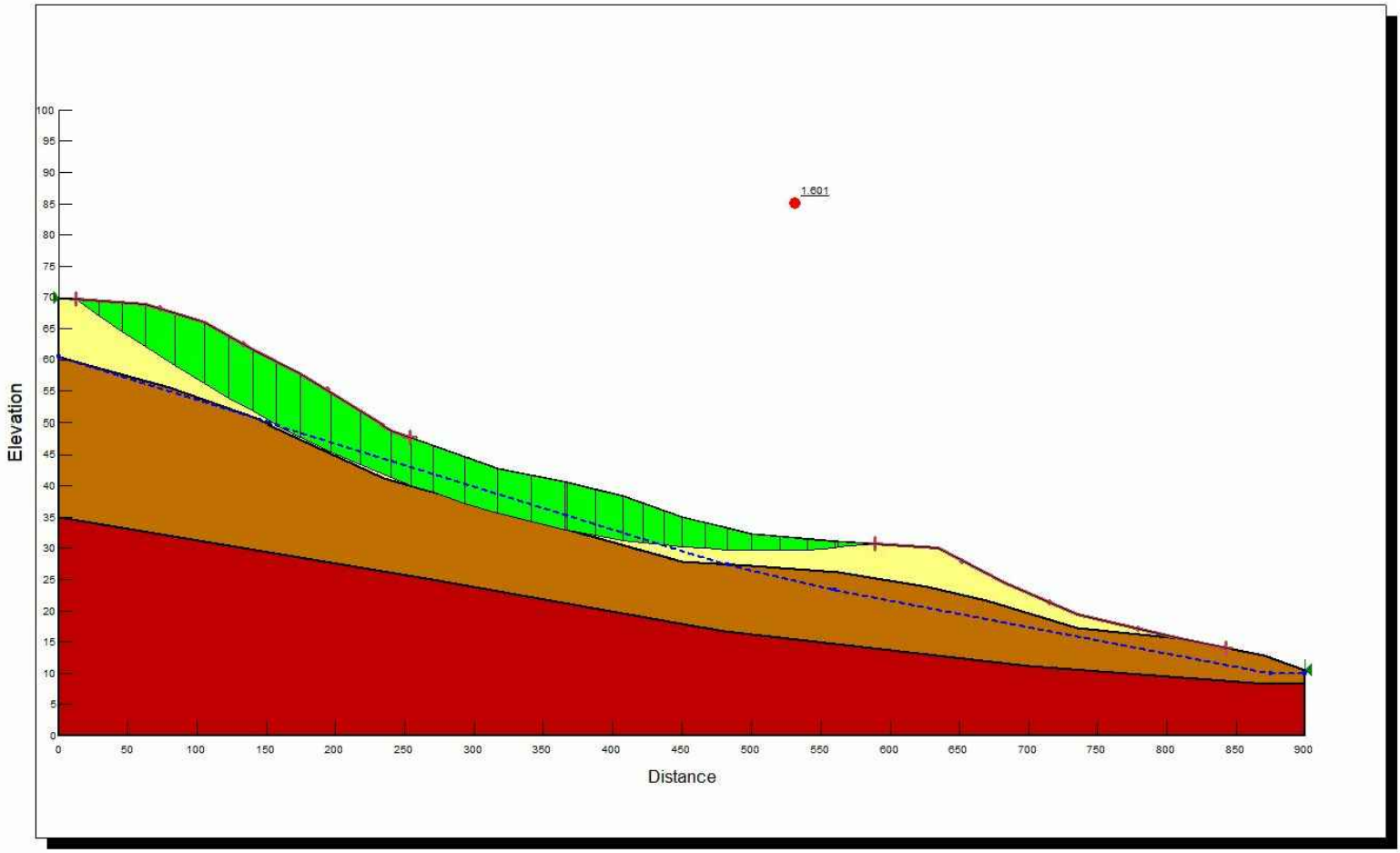


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.05g)

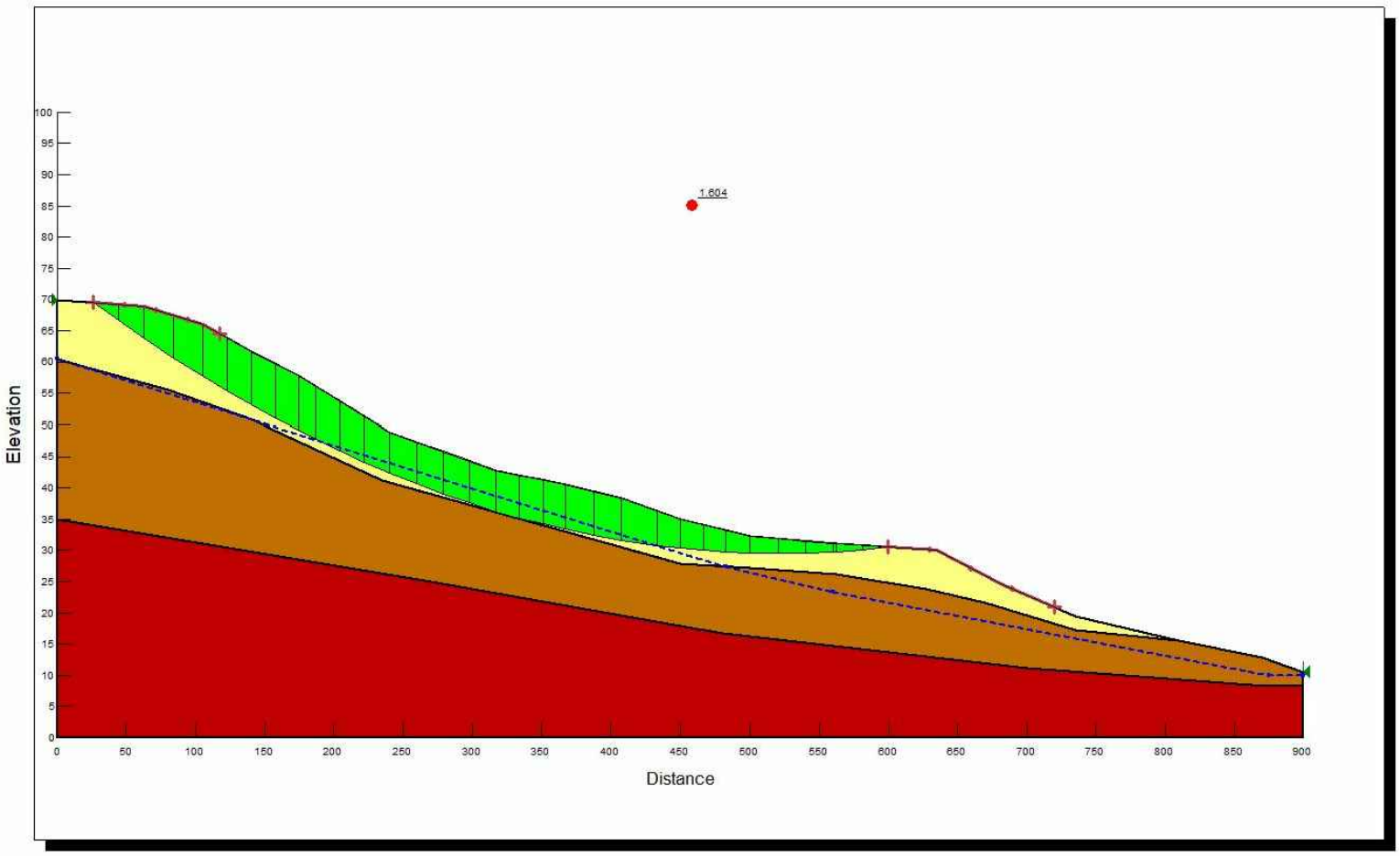


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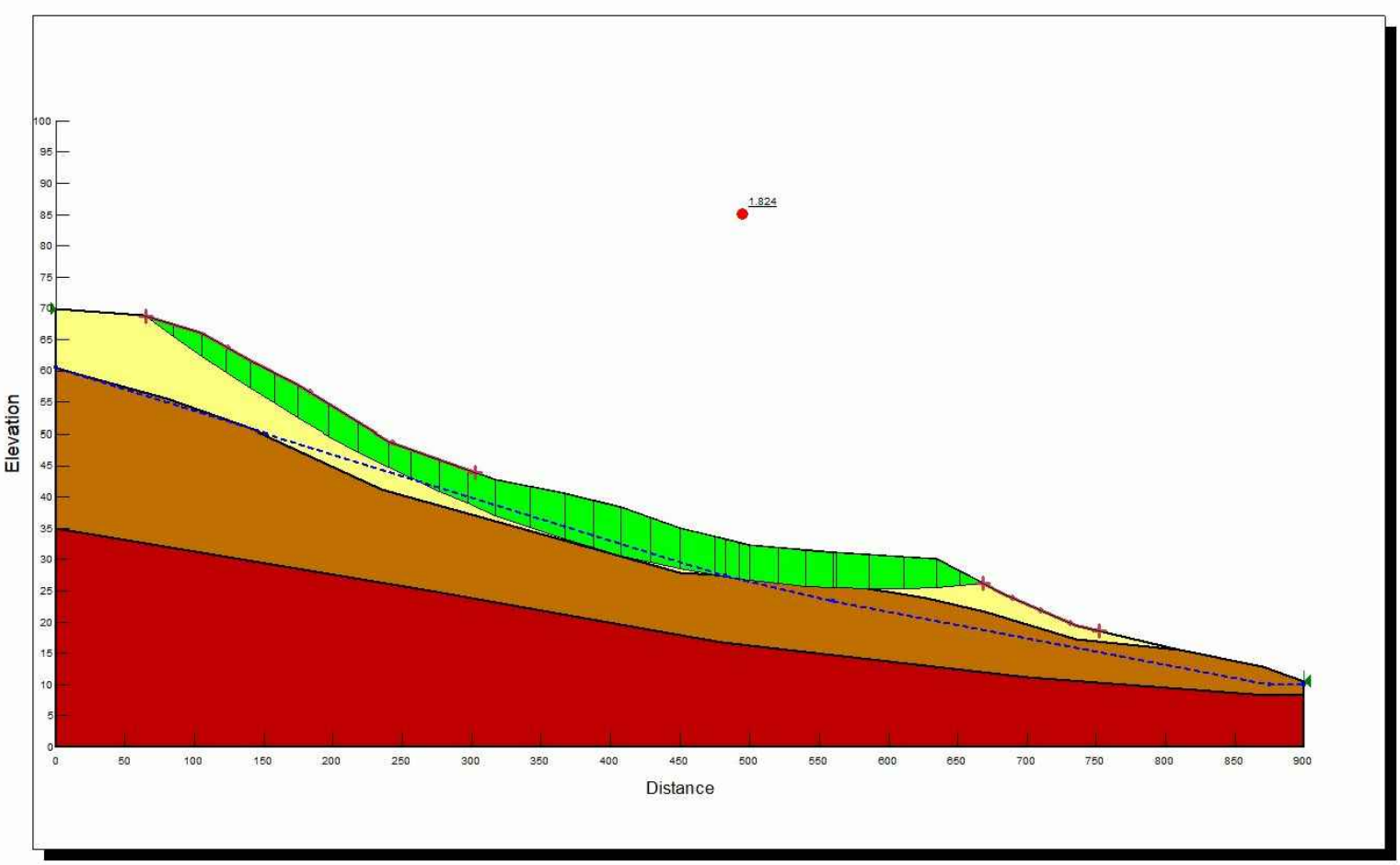


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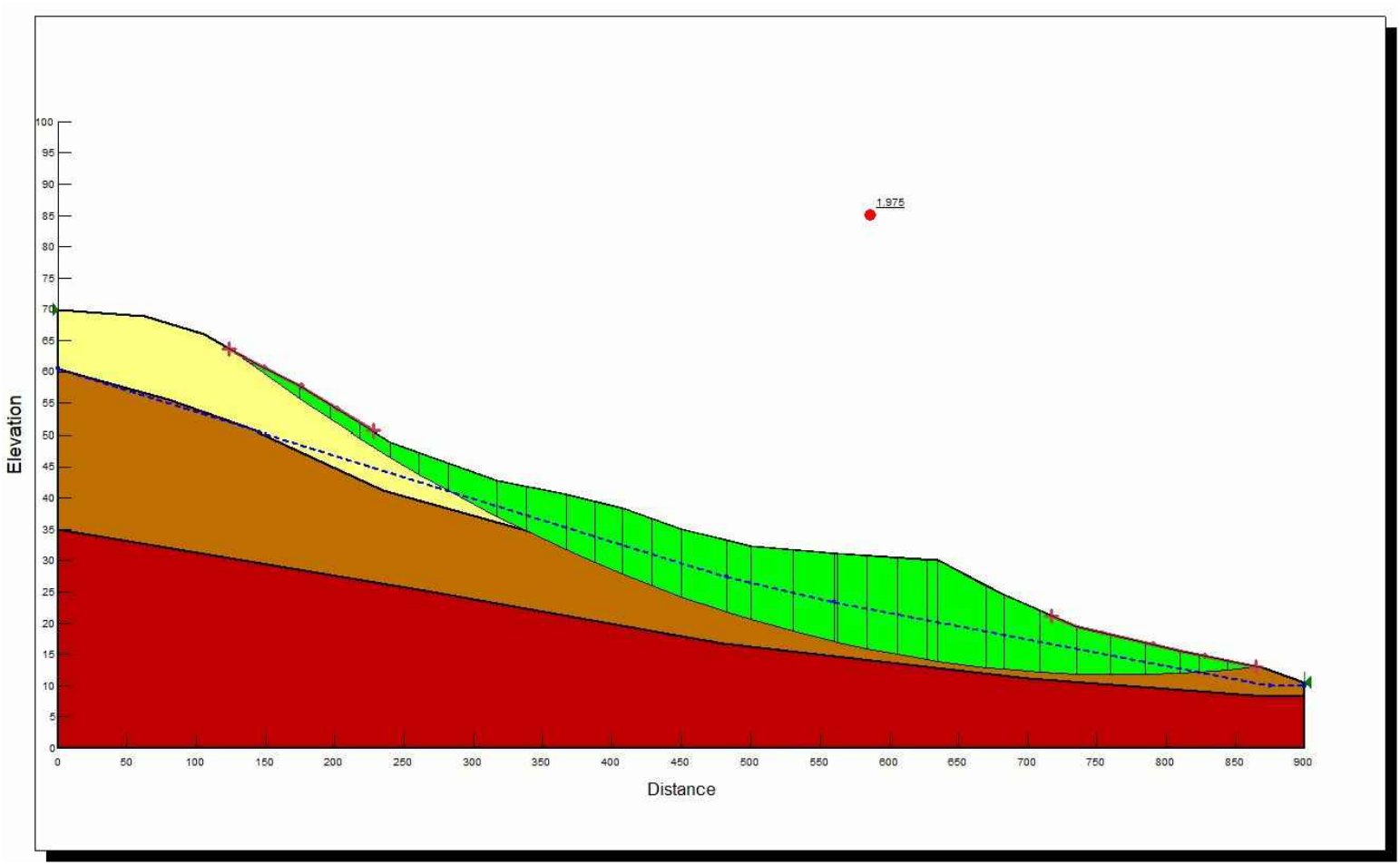


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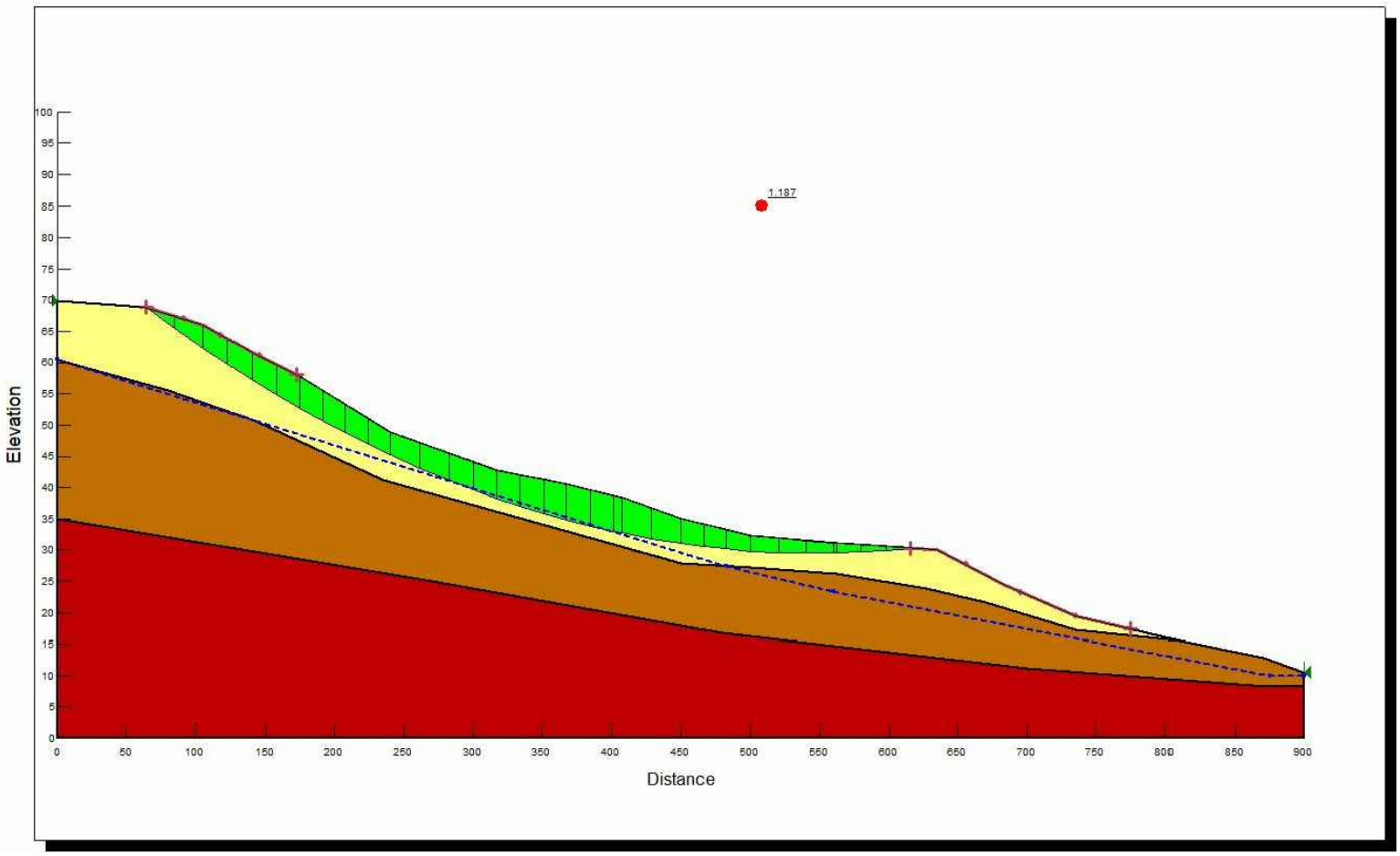


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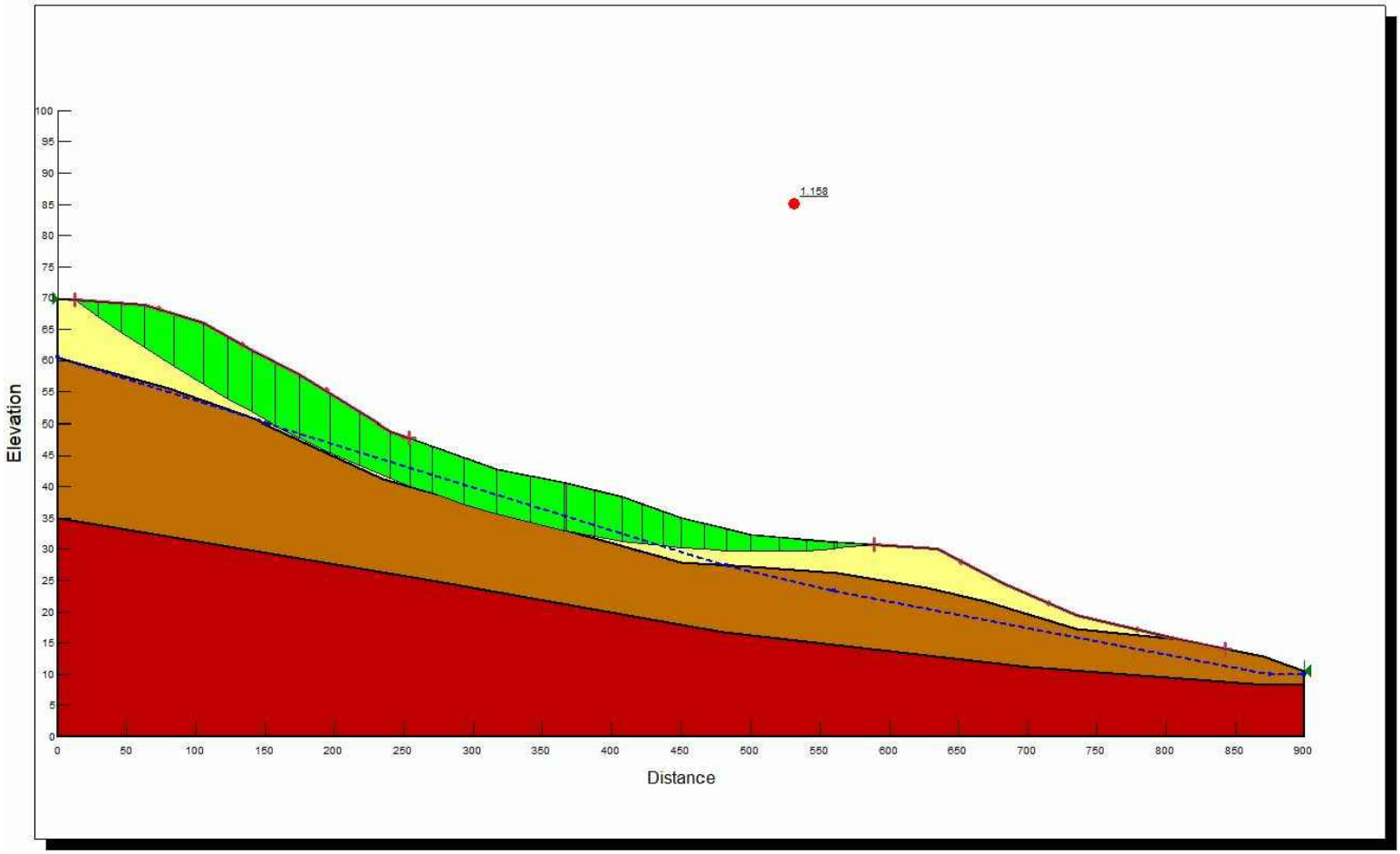


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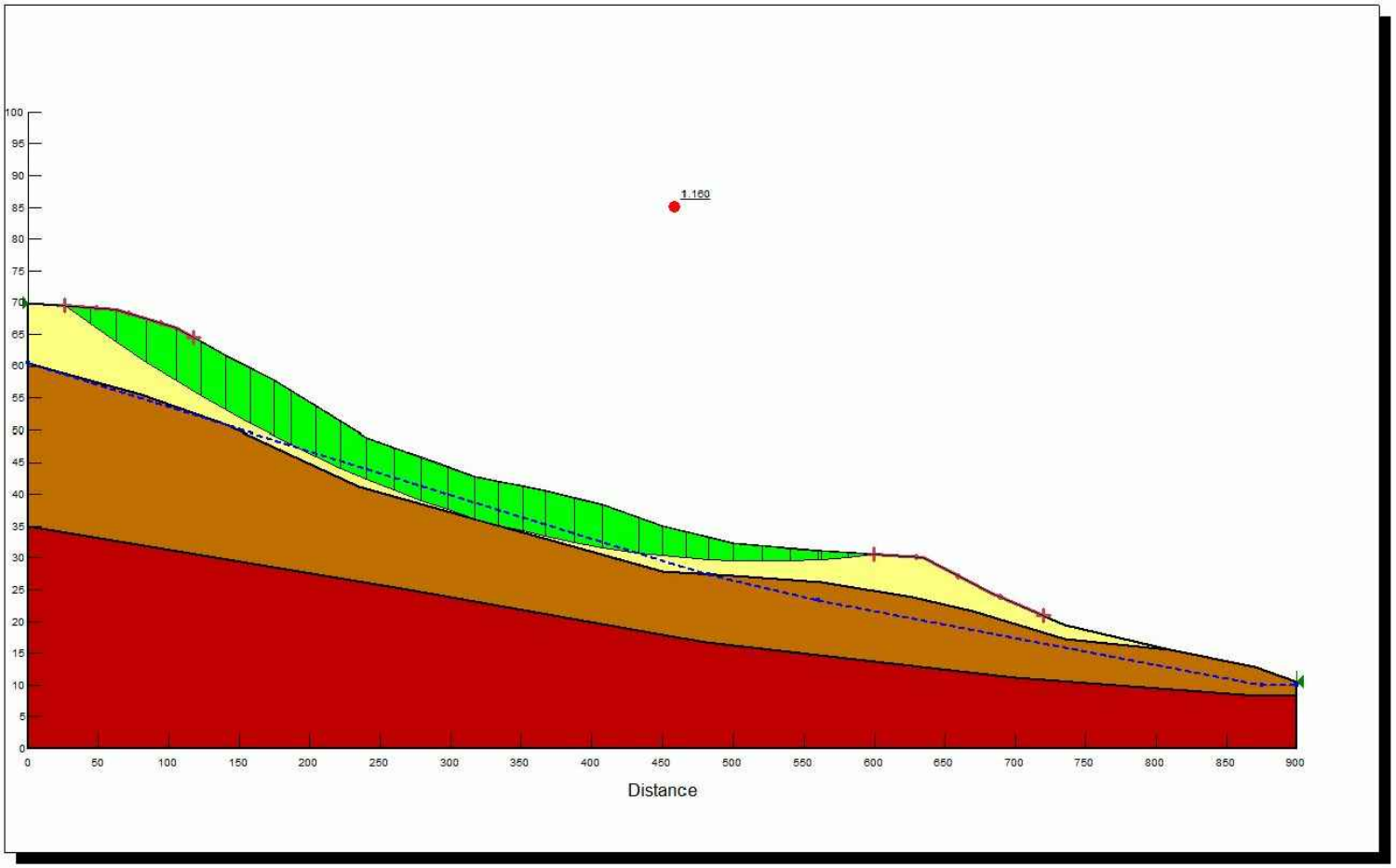


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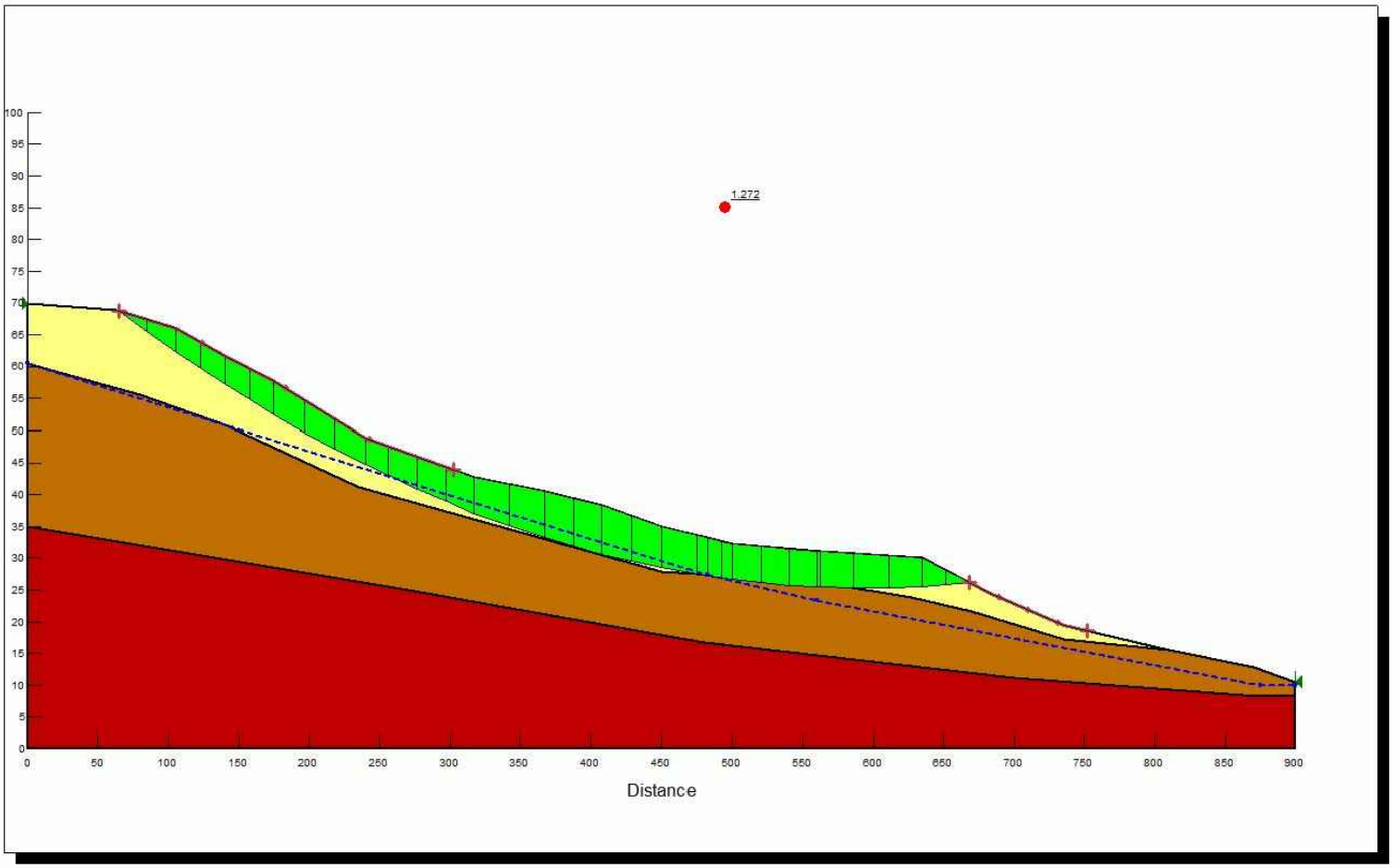


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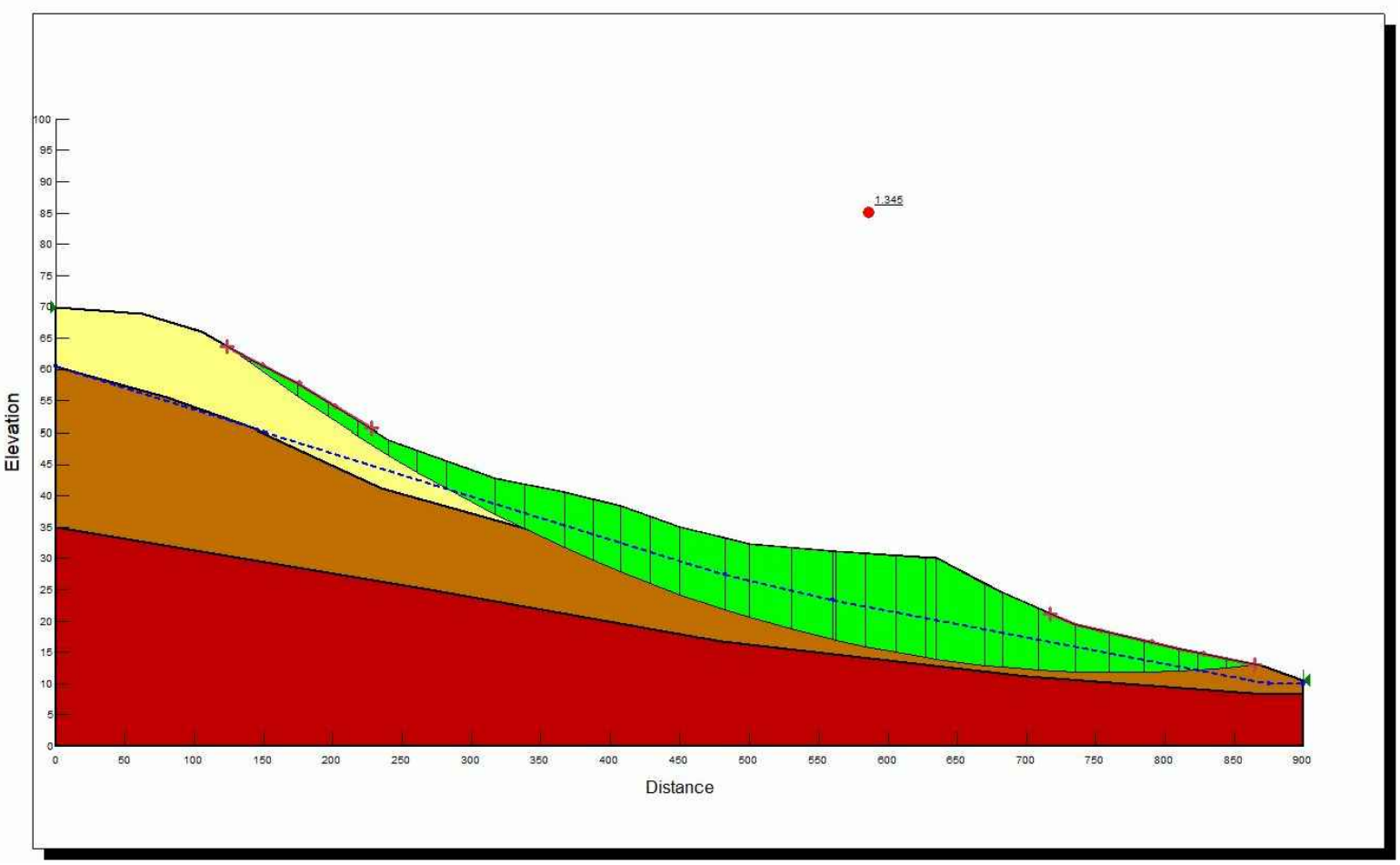


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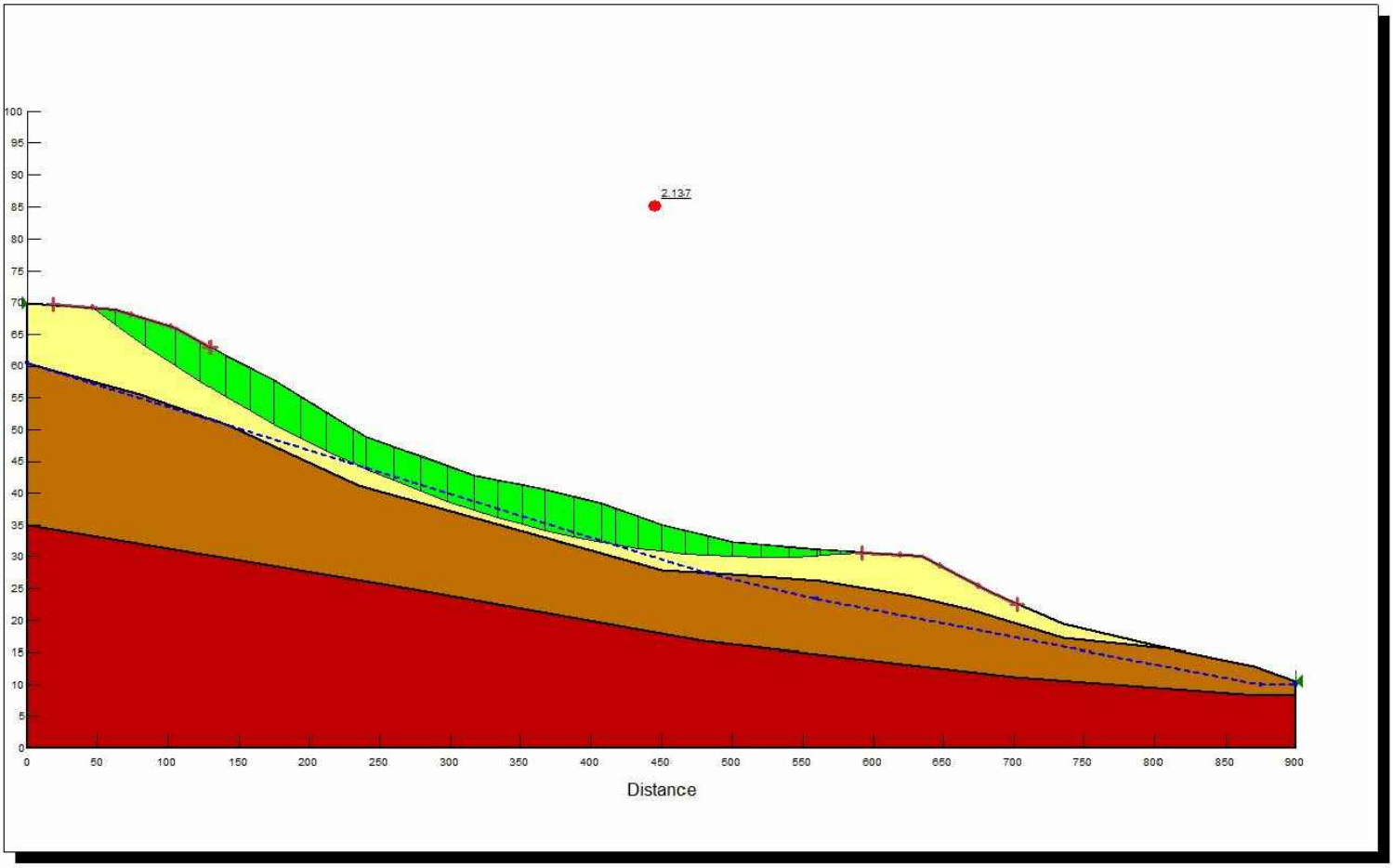


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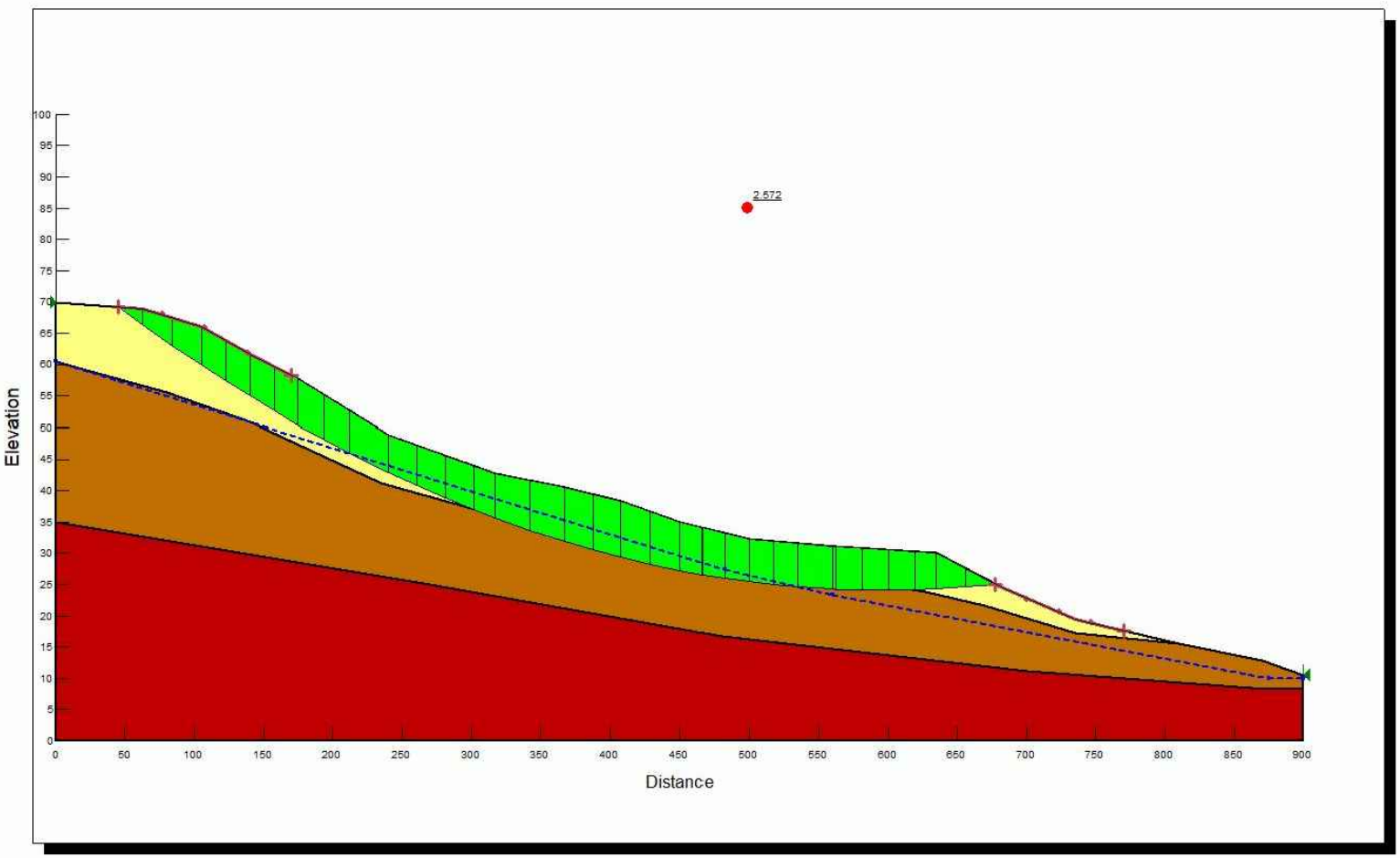


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SLOPE/W SOFTWARE

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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

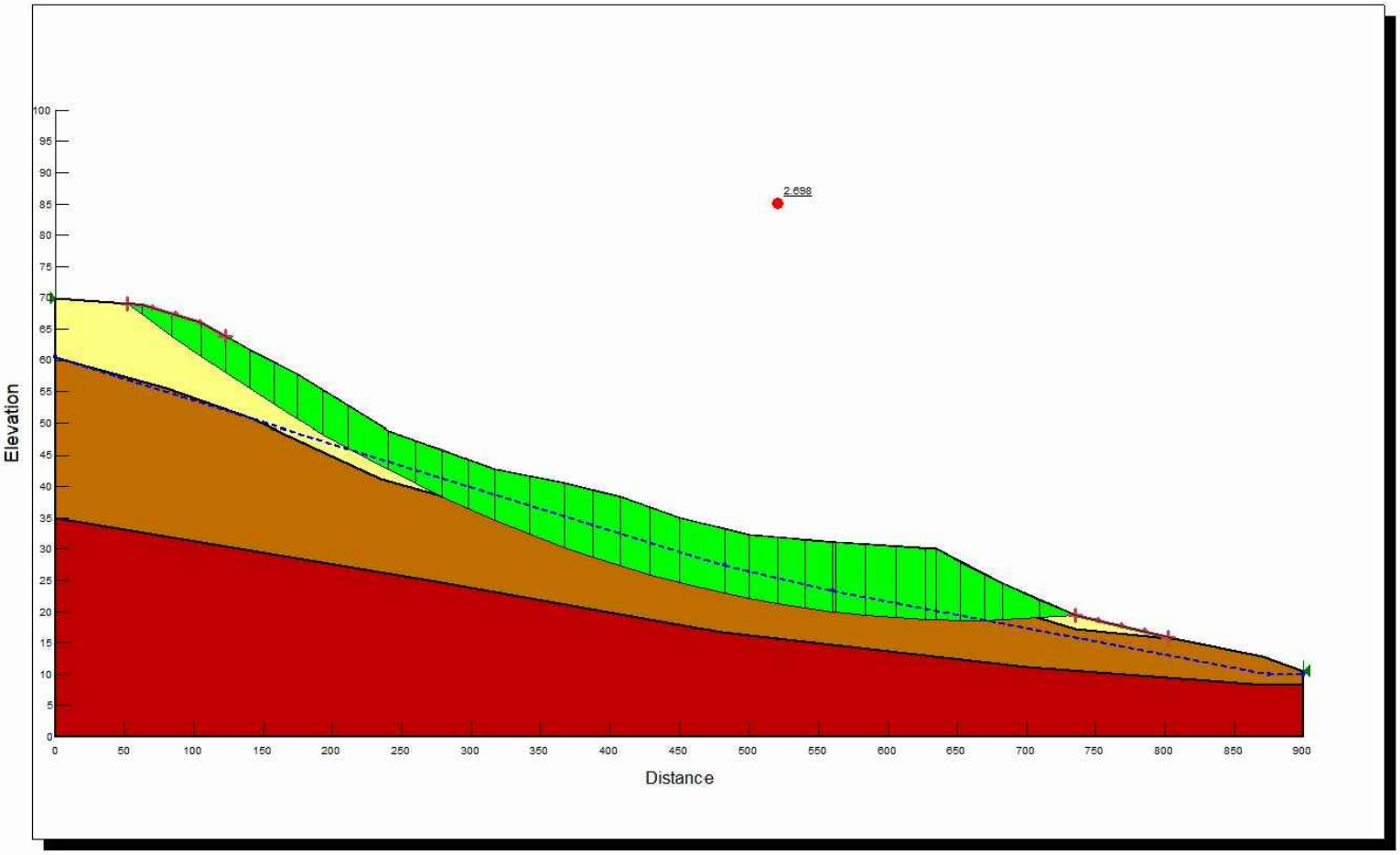


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

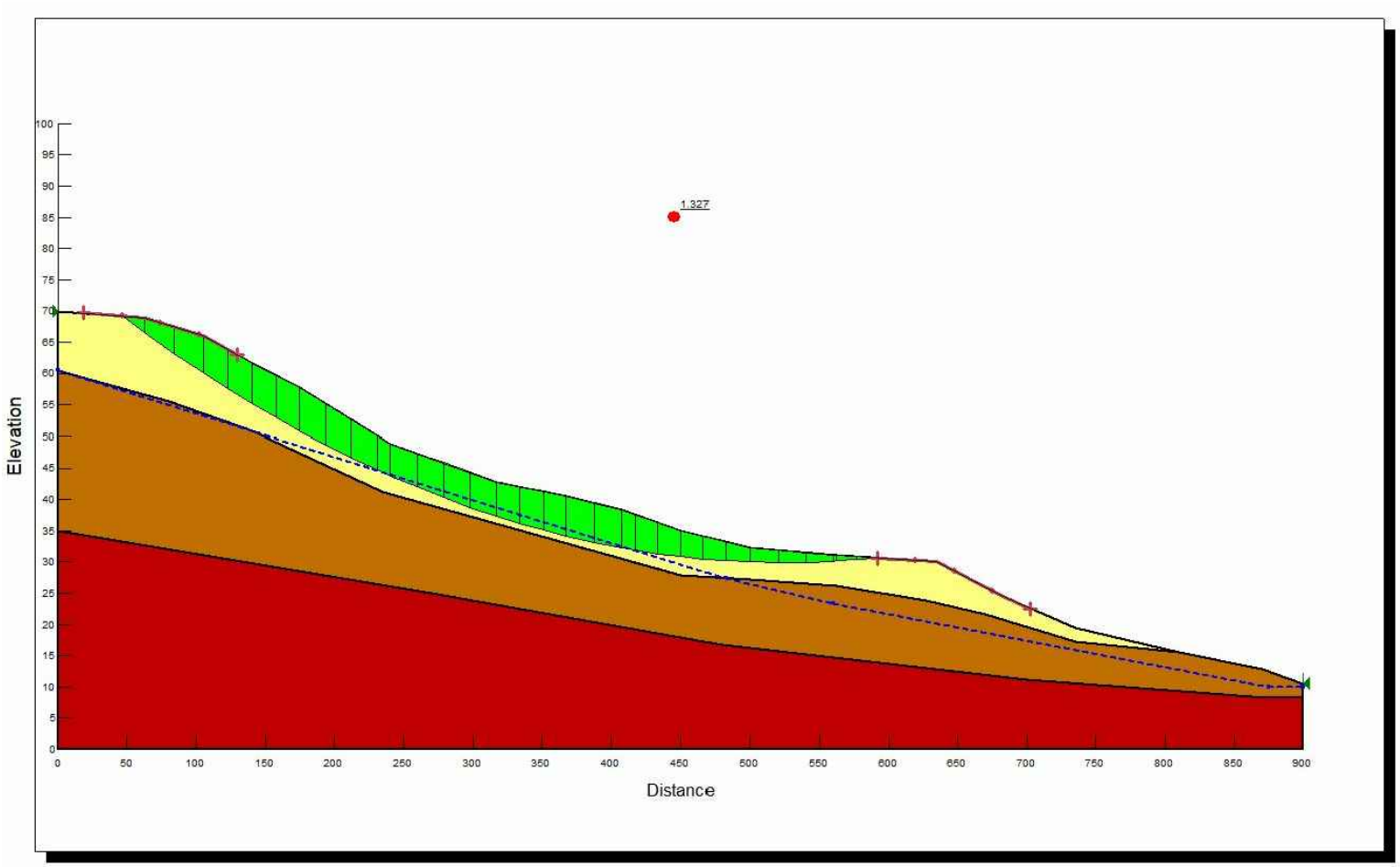


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

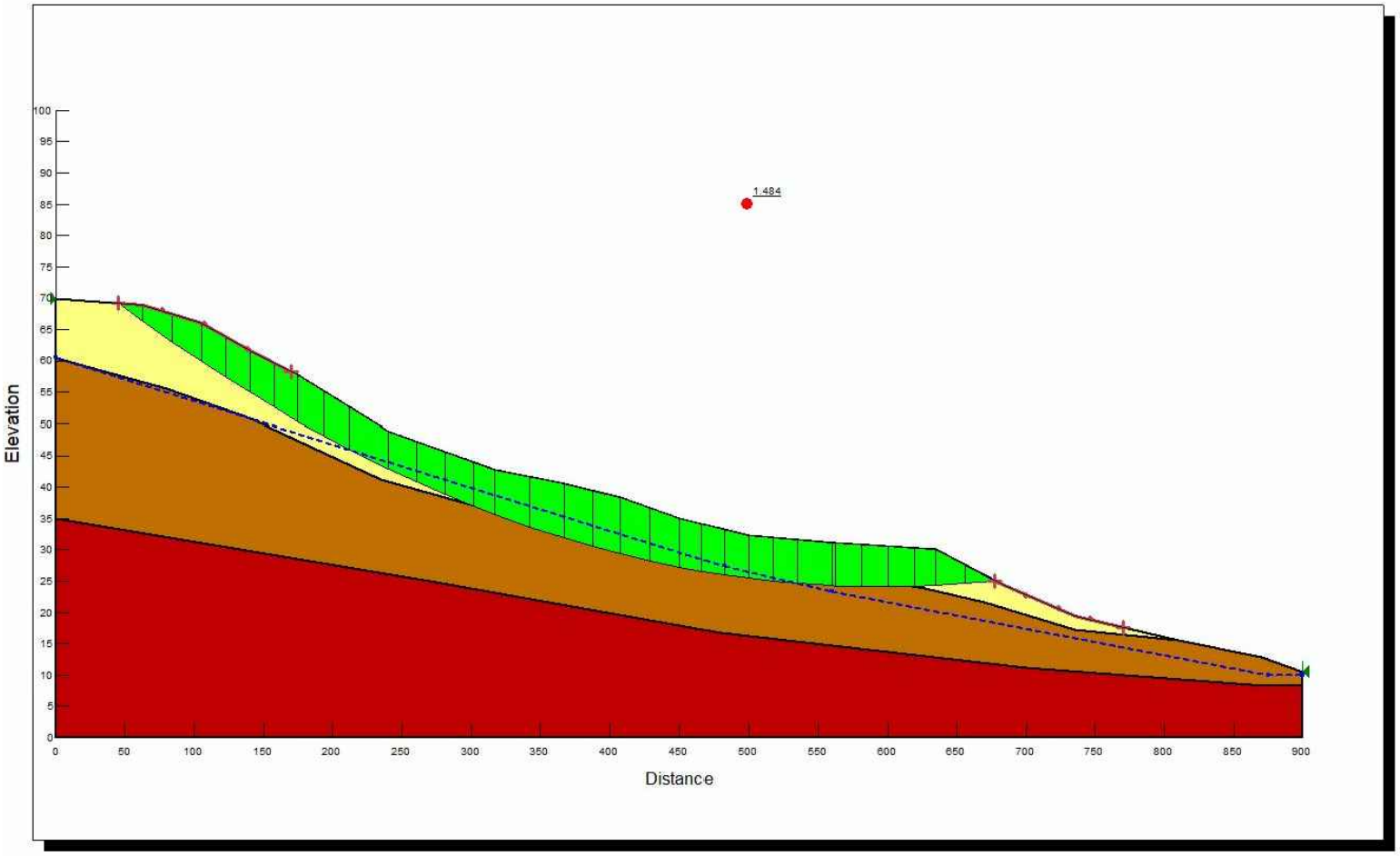


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.05g)

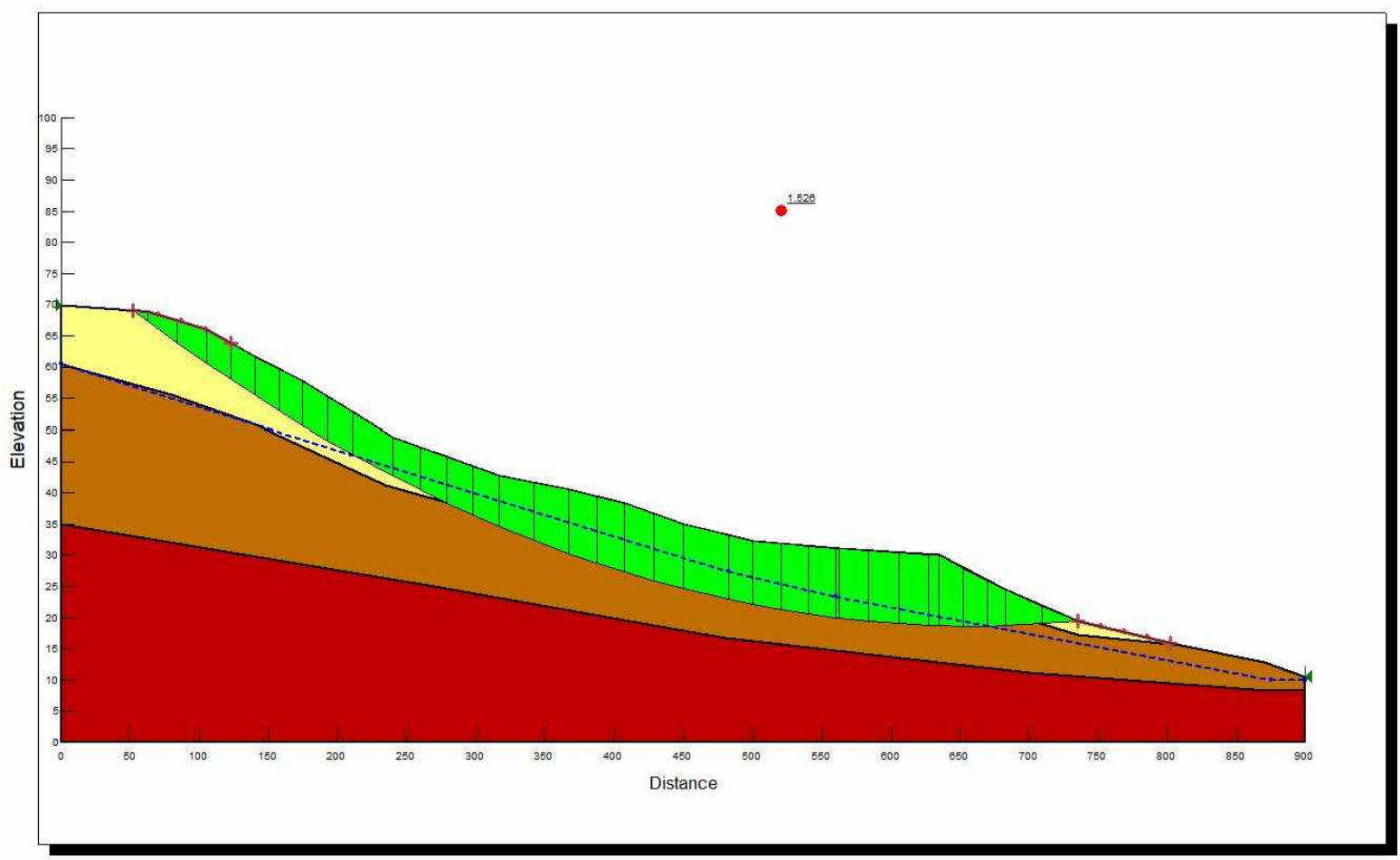


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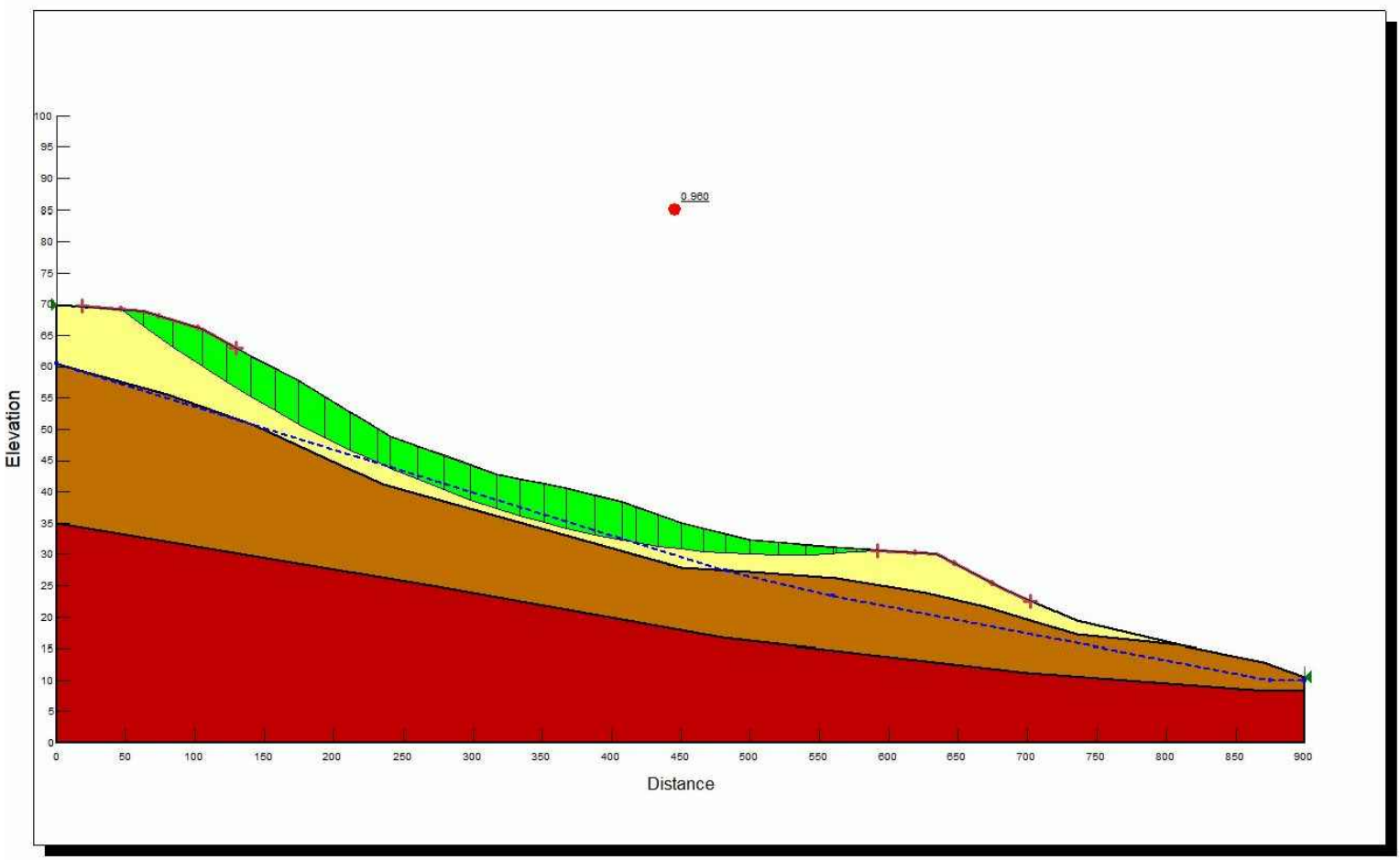


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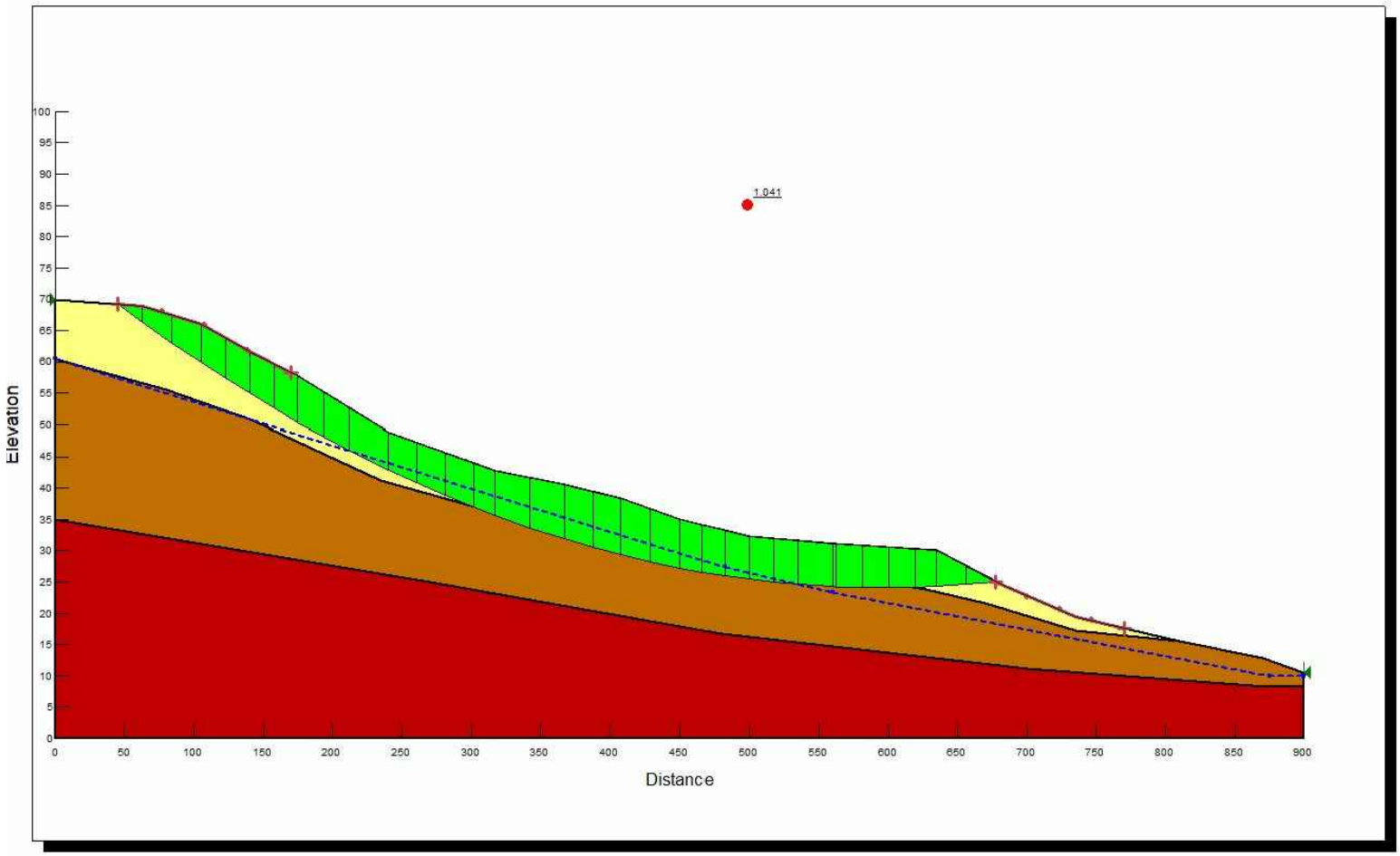


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.1g)

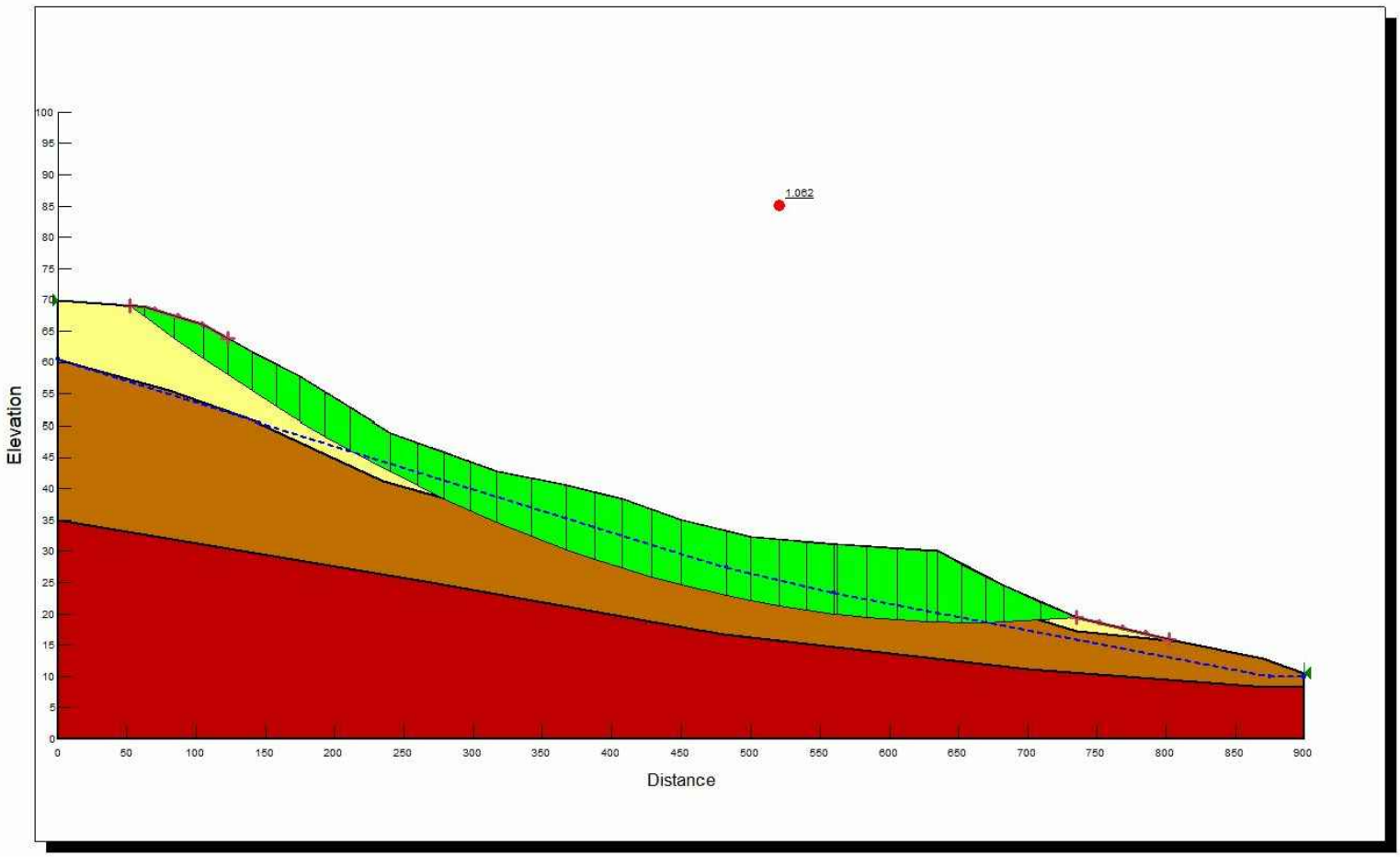


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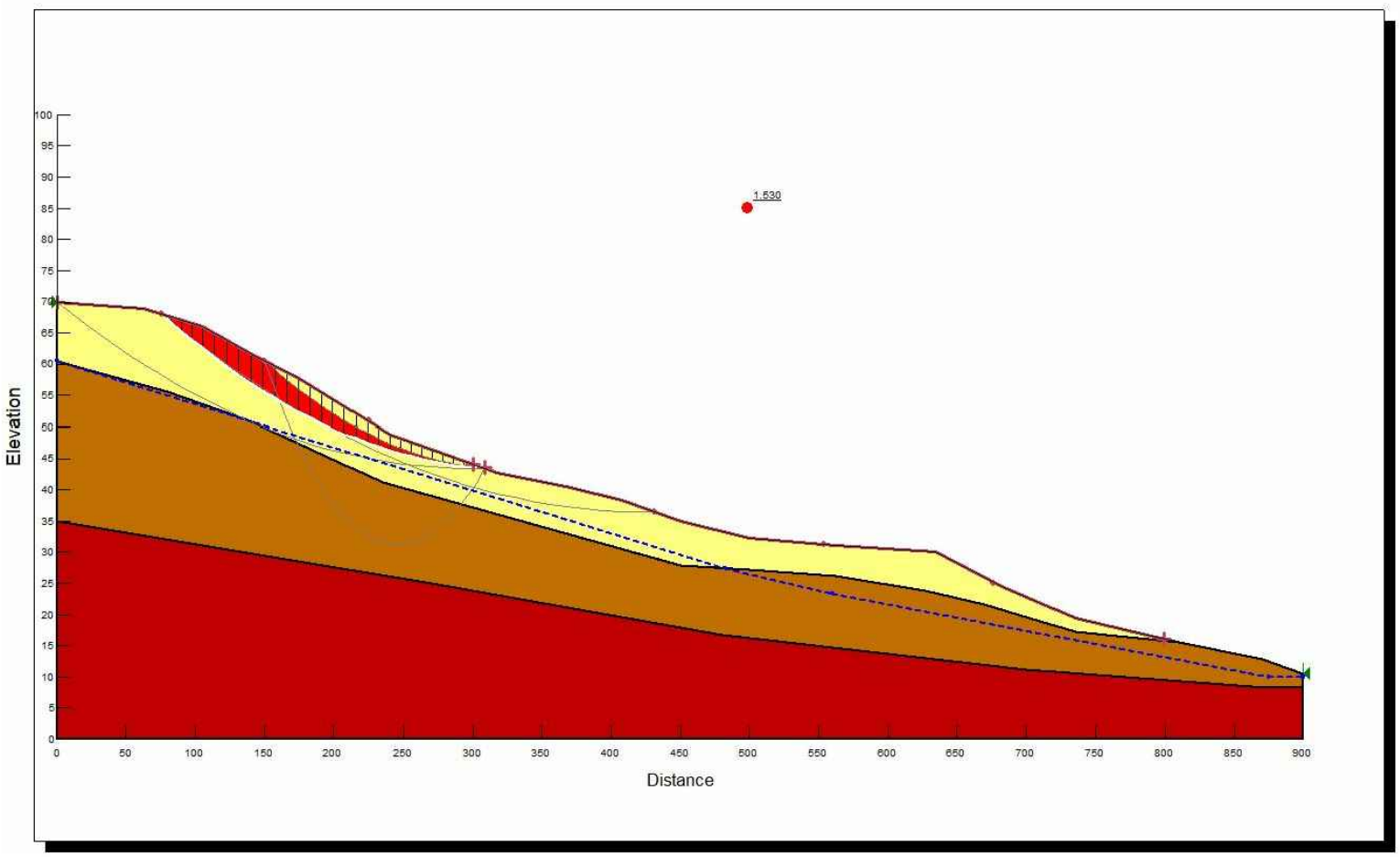


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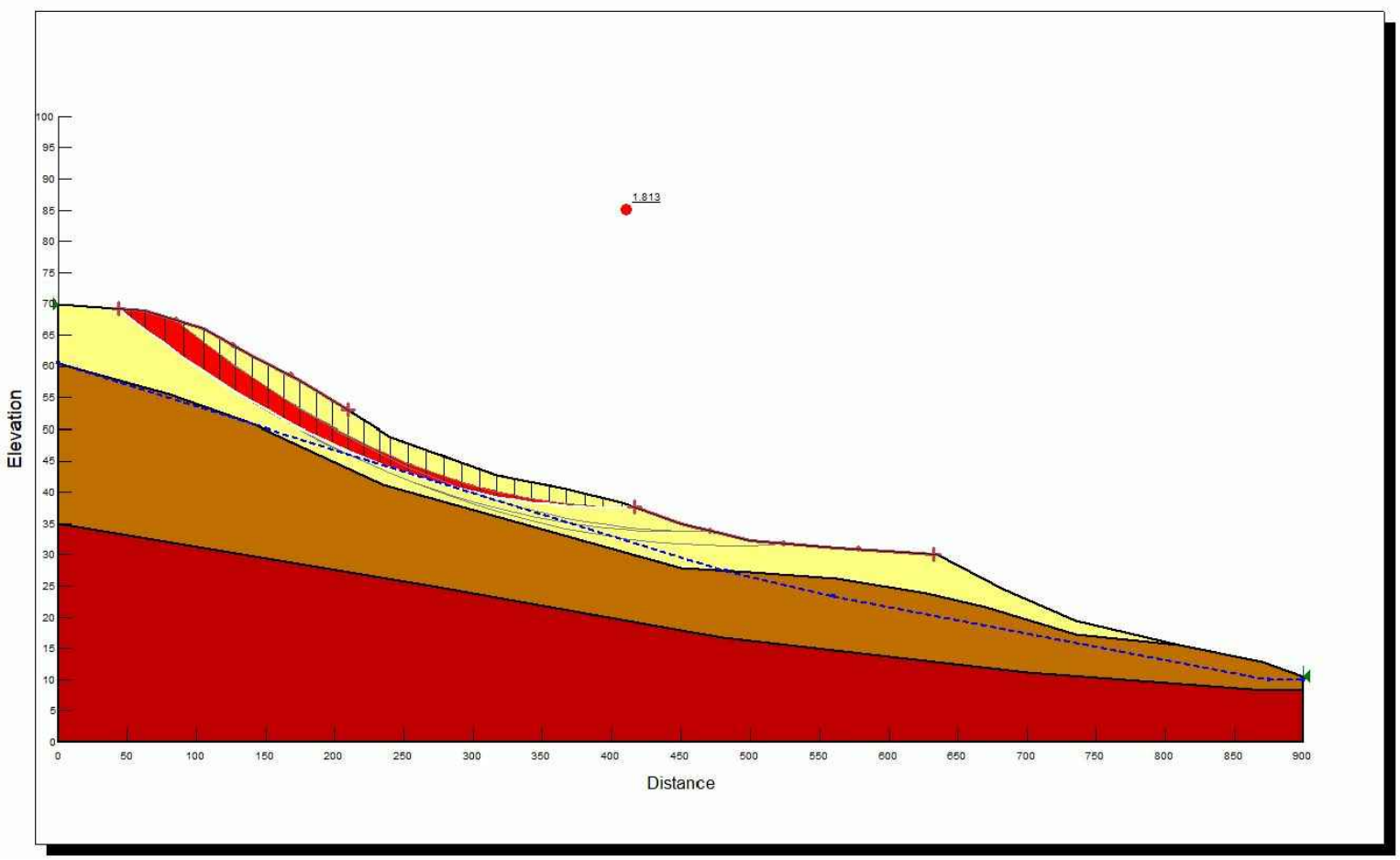


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SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

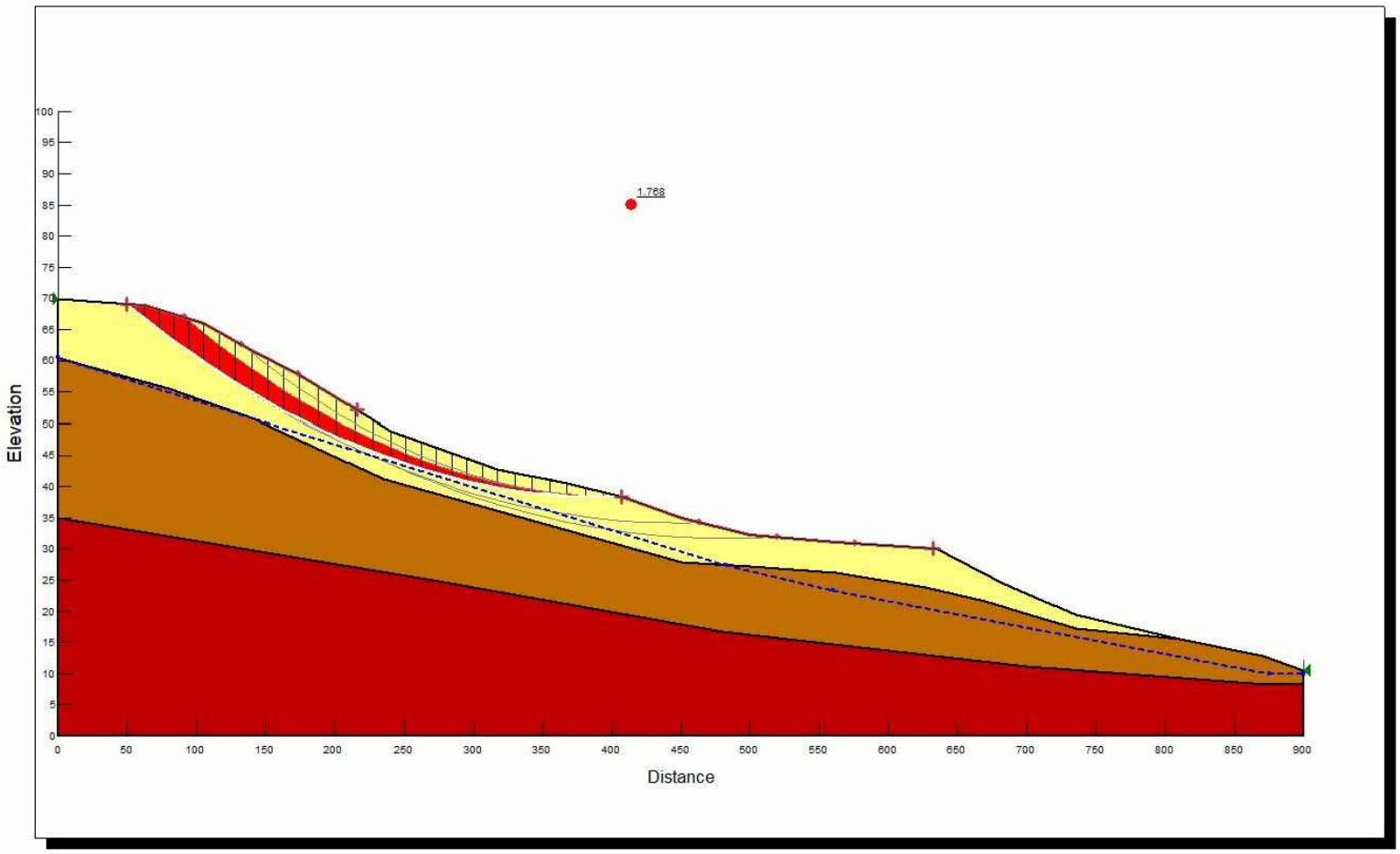


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

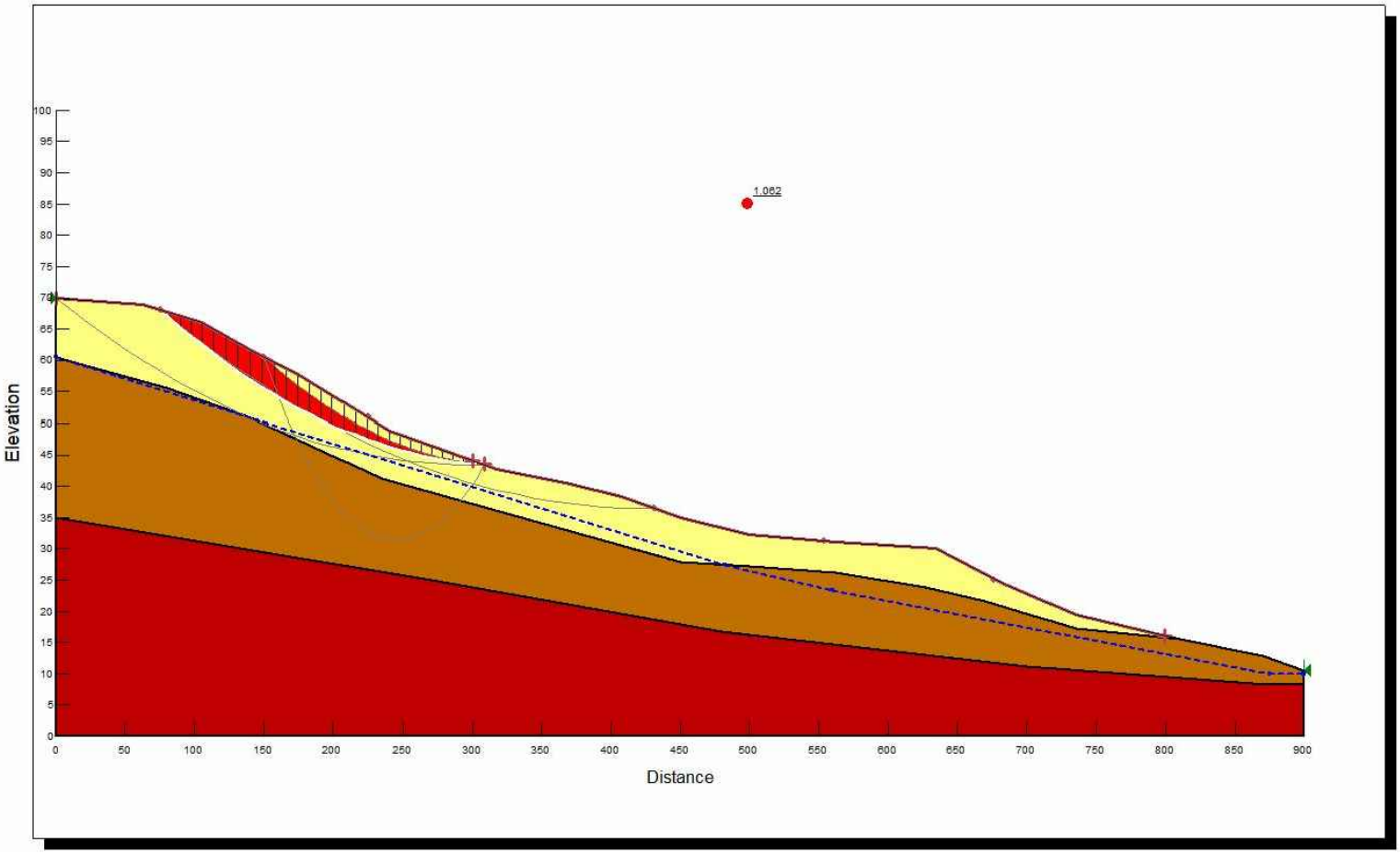


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REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (STATIC)

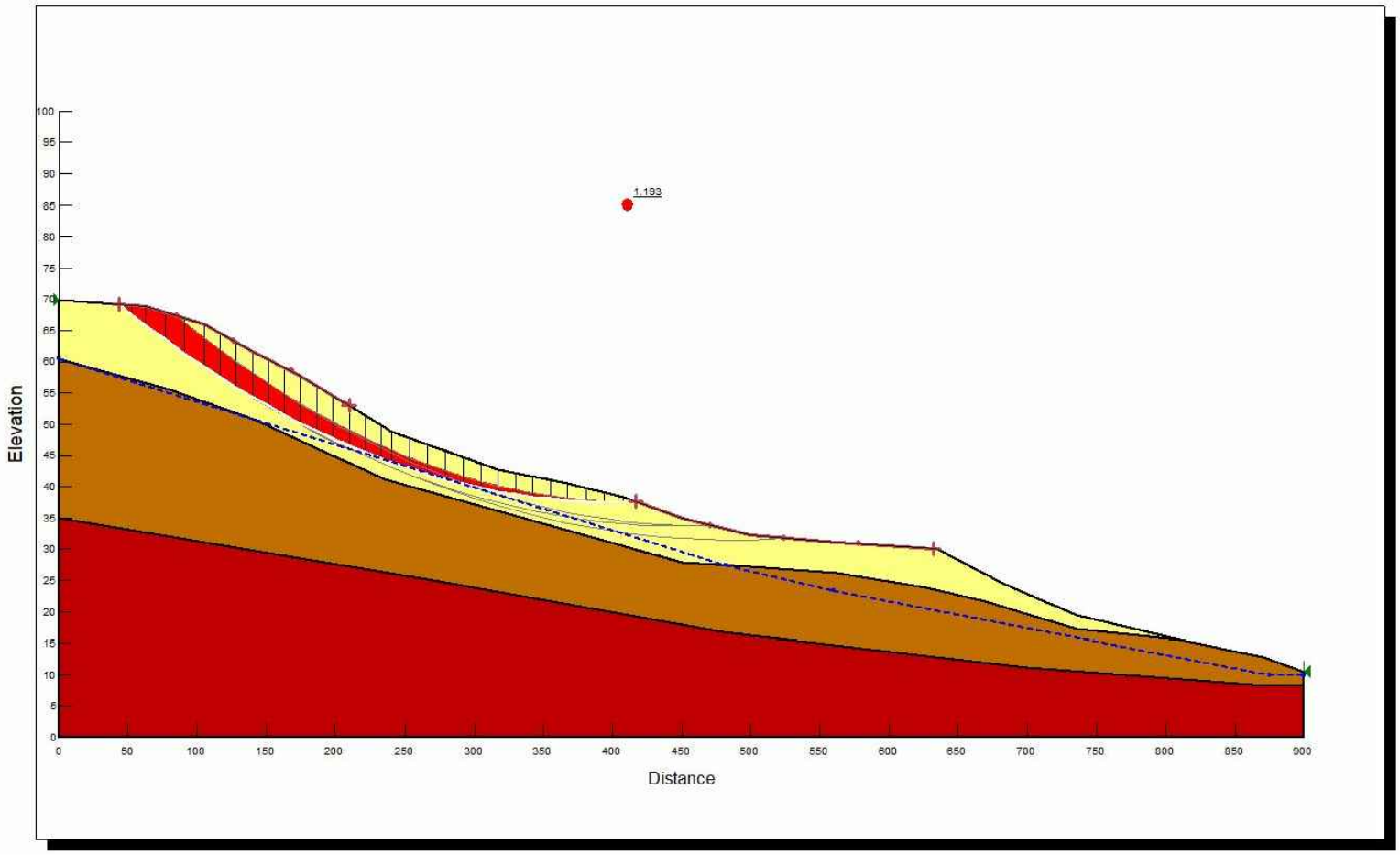


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.05g)

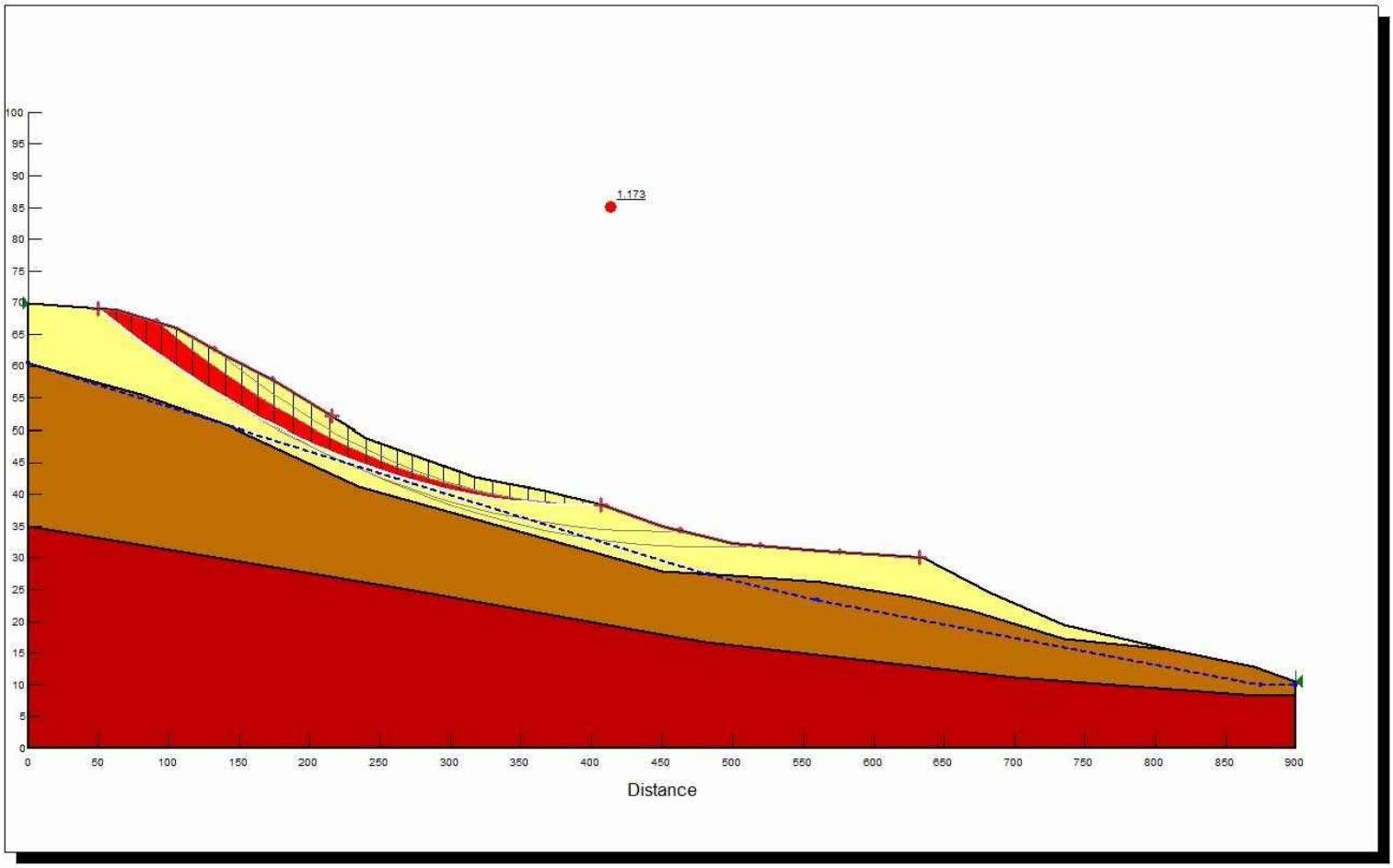


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.05g)

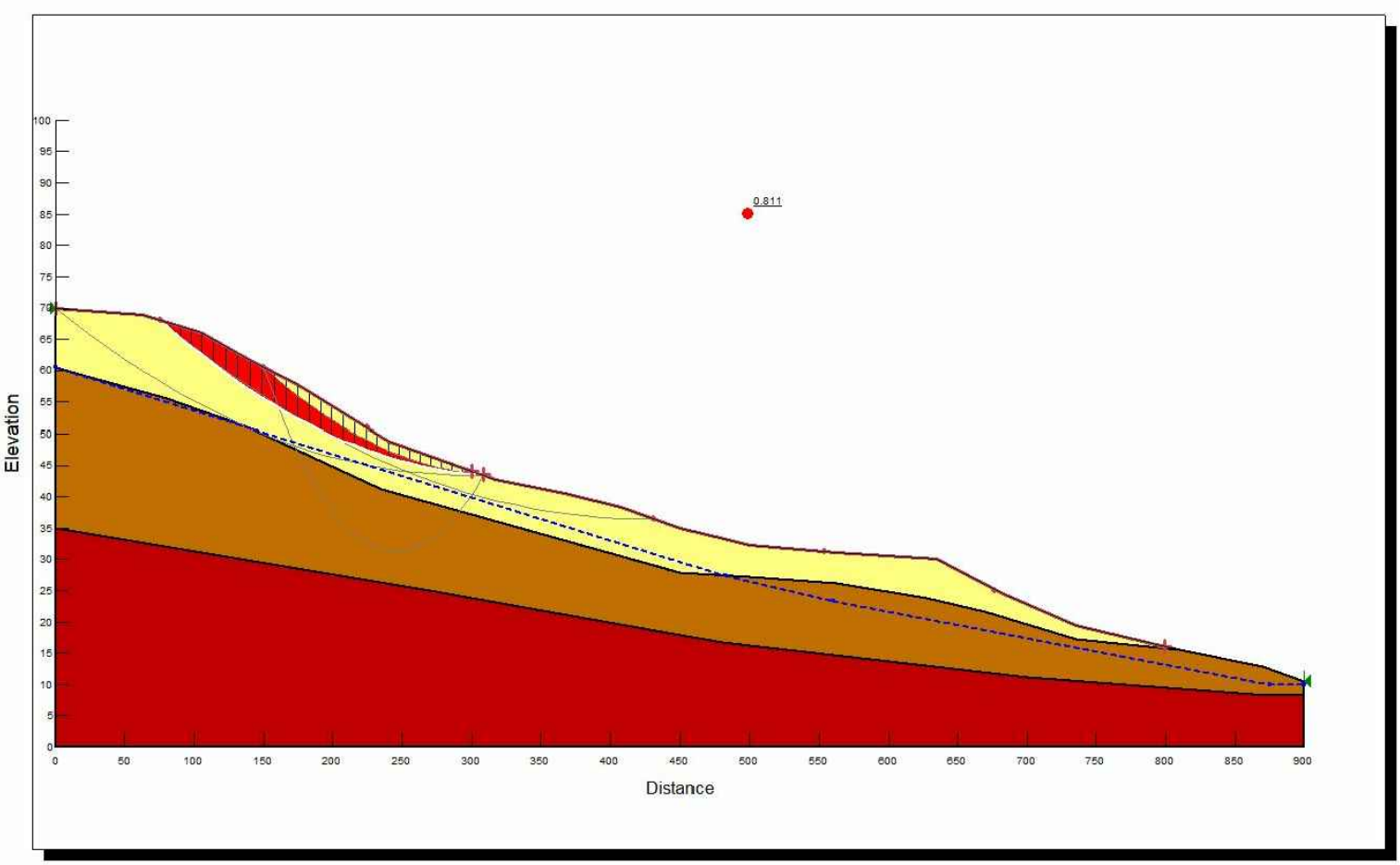


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.05g)

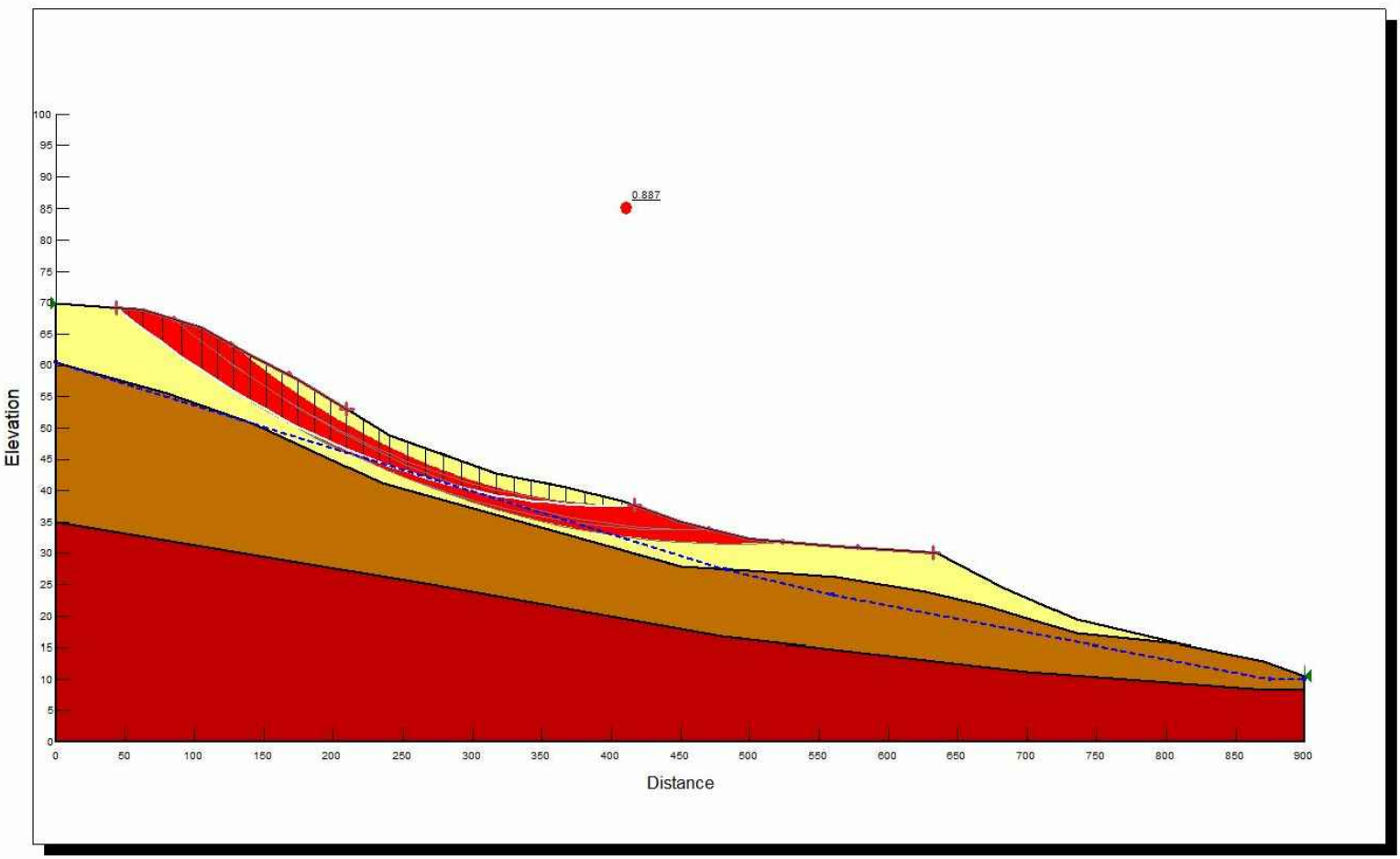


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.1g)

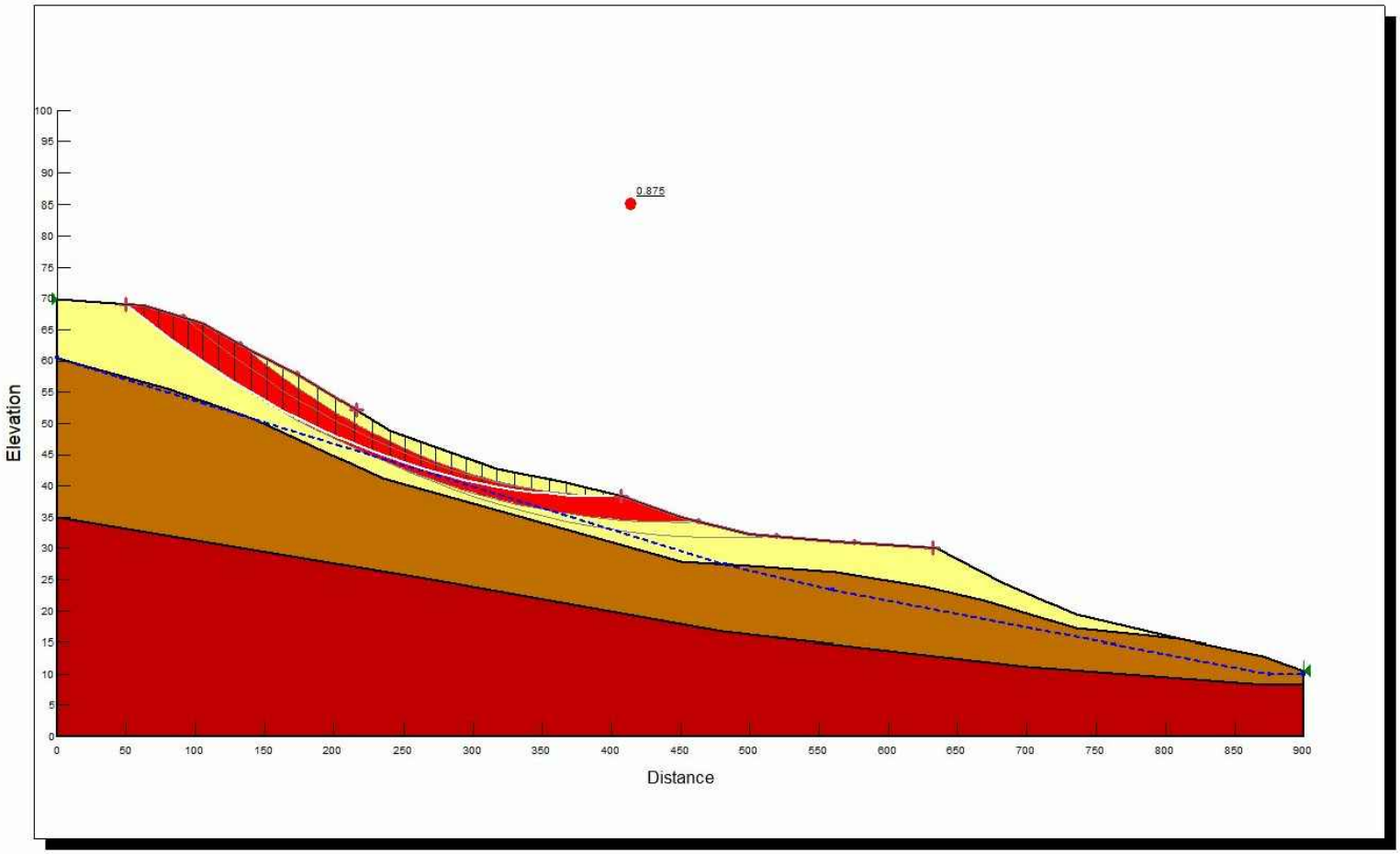


N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.1g)



N

REFERENCE:
SLOPE/W SOFTWARE

AMERICAN GEOSERVICES
888.276.4027 - americangeoservices.com

SLOPE STABILITY ANALYSIS WITH WATER TABLE (SEISMIC Kh=0.1g)

AERIAL PHOTOS

EDR Aerial Photo Decade Package

07/13/20

Site Name:

Glenwood Meadows Housing
Wulfsohn Road
Glenwood Springs, CO 81601
EDR Inquiry # 6118520.5

Client Name:

American Geoservices, LLC
2663 Cinnabar Rd
Colorado Springs, CO 80921
Contact: SAM ADETTIWAR

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2017	1"=500'	Flight Year: 2017	USDA/NAIP
2013	1"=500'	Flight Year: 2013	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1999	1"=500'	Flight Date: September 07, 1999	USGS
1993	1"=500'	Acquisition Date: September 03, 1993	USGS/DOQQ
1989	1"=500'	Flight Date: July 19, 1989	USGS
1983	1"=500'	Flight Date: September 10, 1983	USDA
1979	1"=500'	Flight Date: September 07, 1979	USGS
1960	1"=500'	Flight Date: August 18, 1960	USGS
1955	1"=500'	Flight Date: October 16, 1955	USGS

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INQUIRY #: 6118520.5

YEAR: 2017

= 500'

N

EDR


INQUIRY #: 6118520.5
YEAR: 2013
= 500'
N
EDR


INQUIRY #: 6118520.5
YEAR: 2009
= 500'
N
EDR



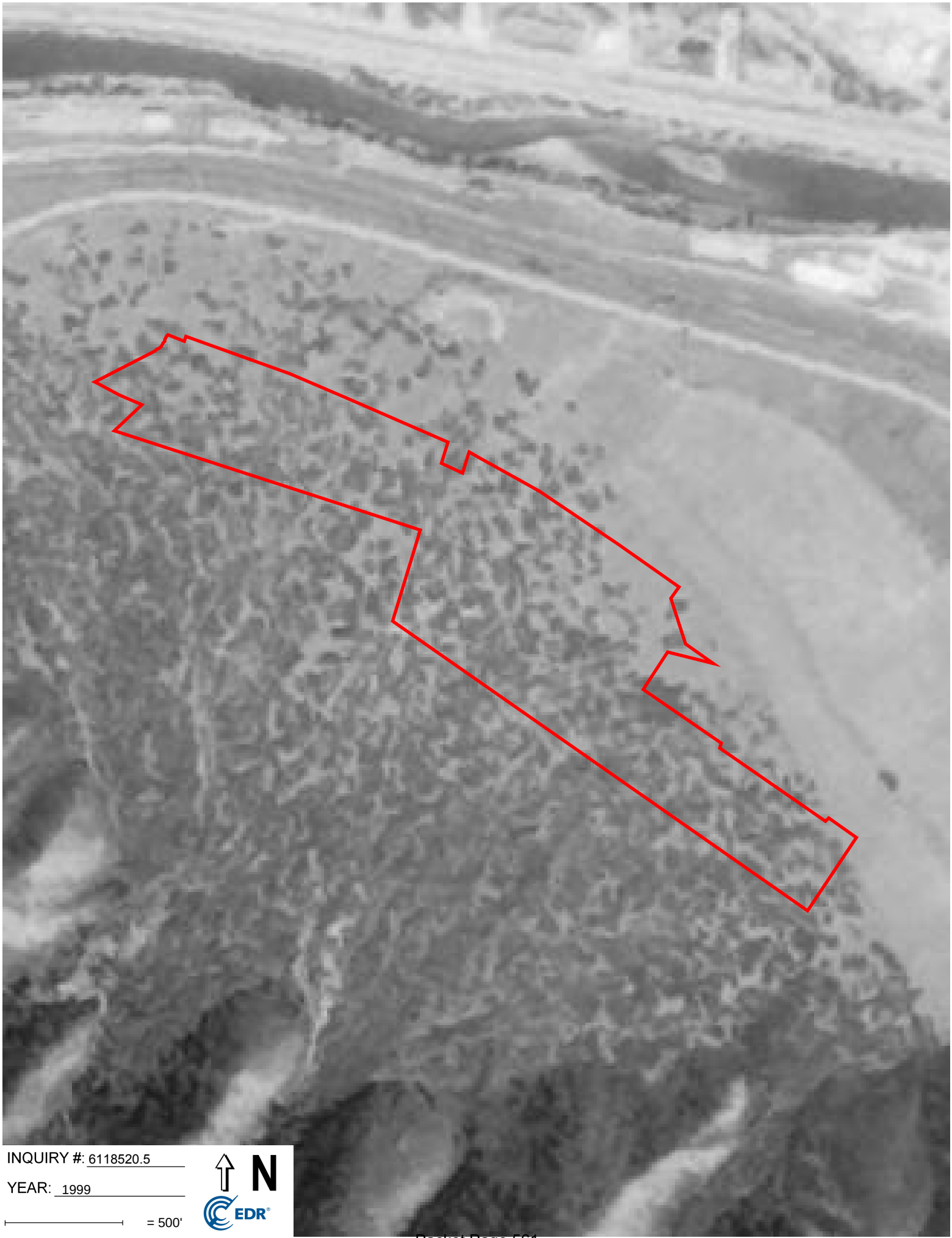
INQUIRY #: 6118520.5

YEAR: 2006

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EDR



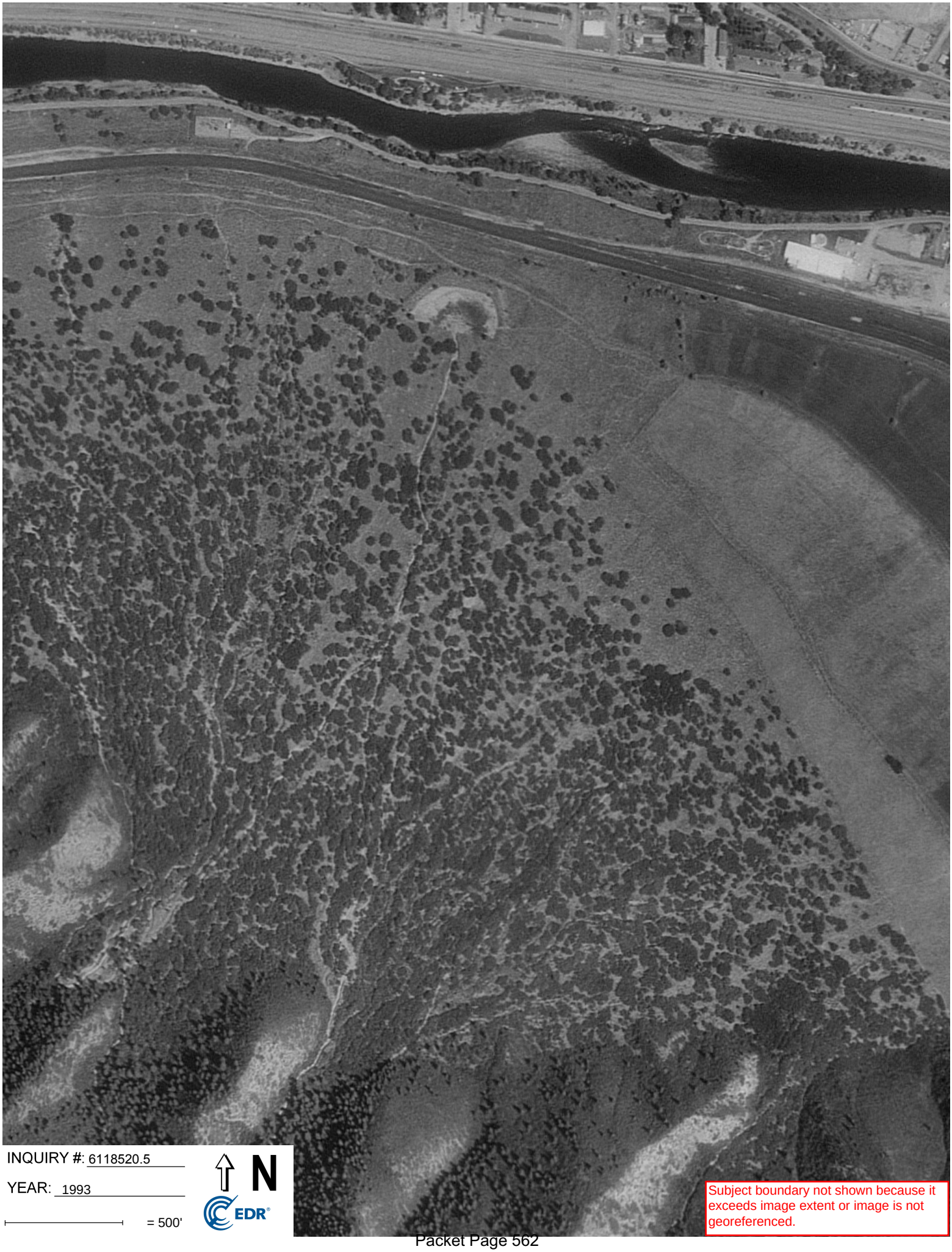
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YEAR: 1999

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EDR



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YEAR: 1993

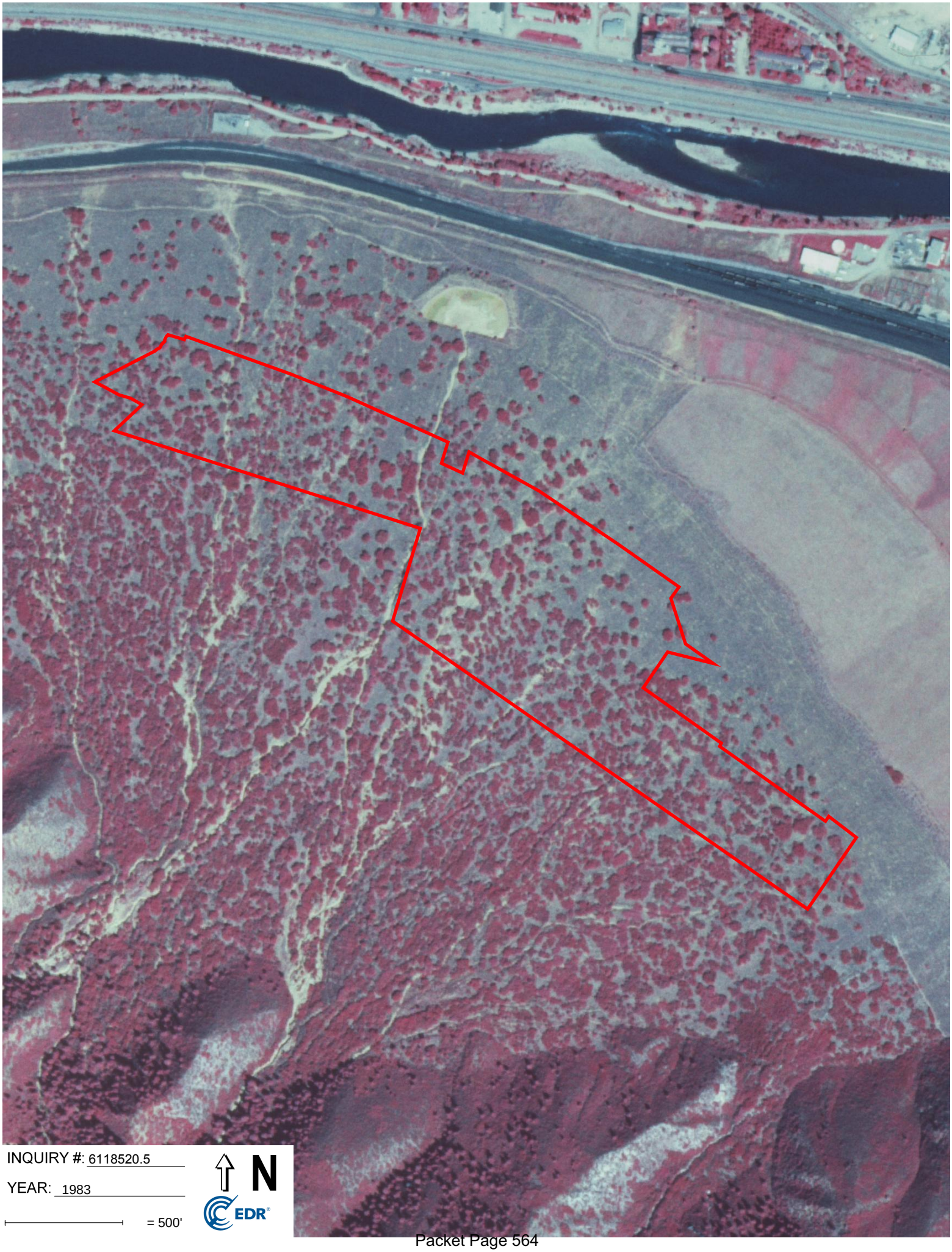
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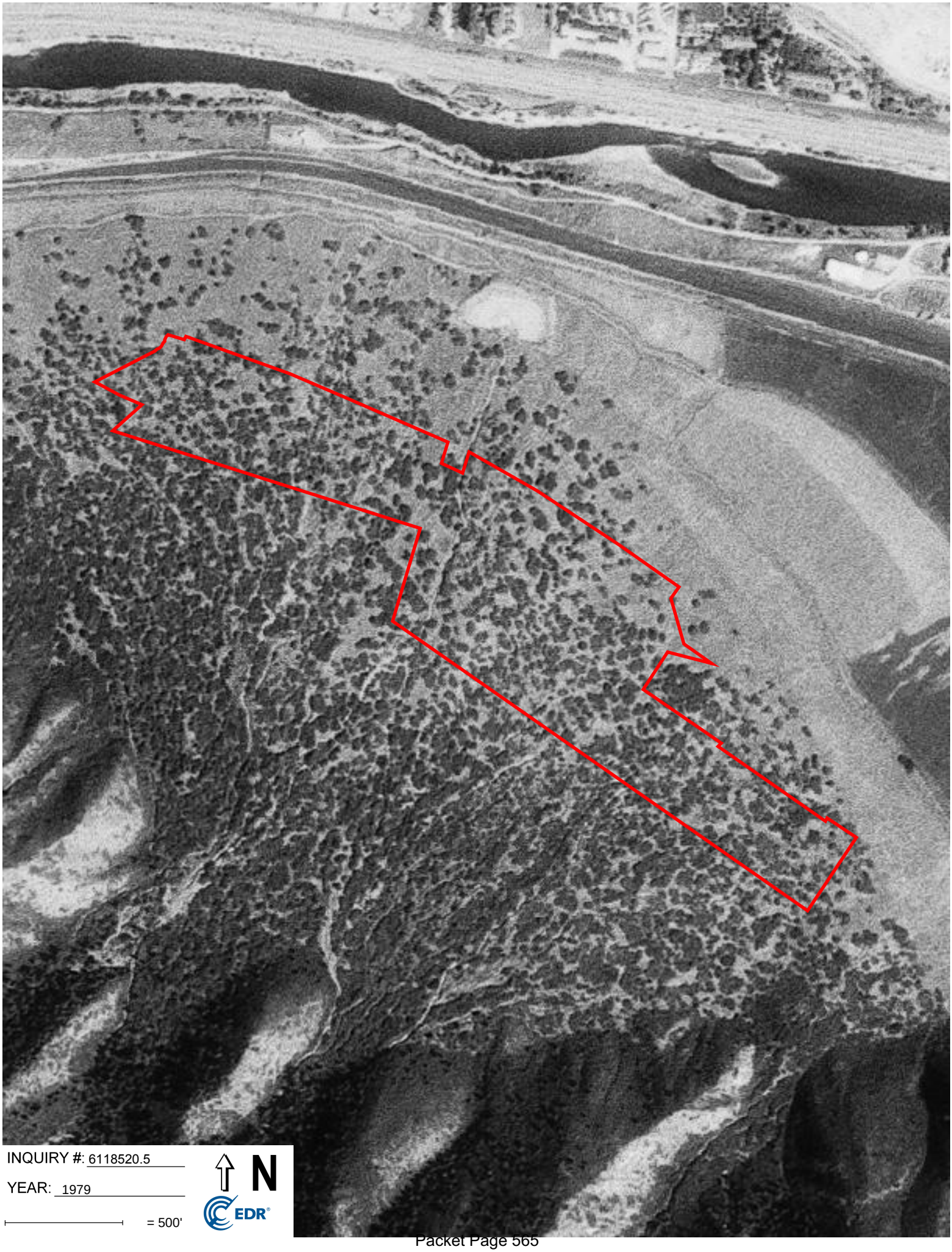
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EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.


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YEAR: 1989
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N
EDR


INQUIRY #: 6118520.5
YEAR: 1983
= 500'
N
EDR



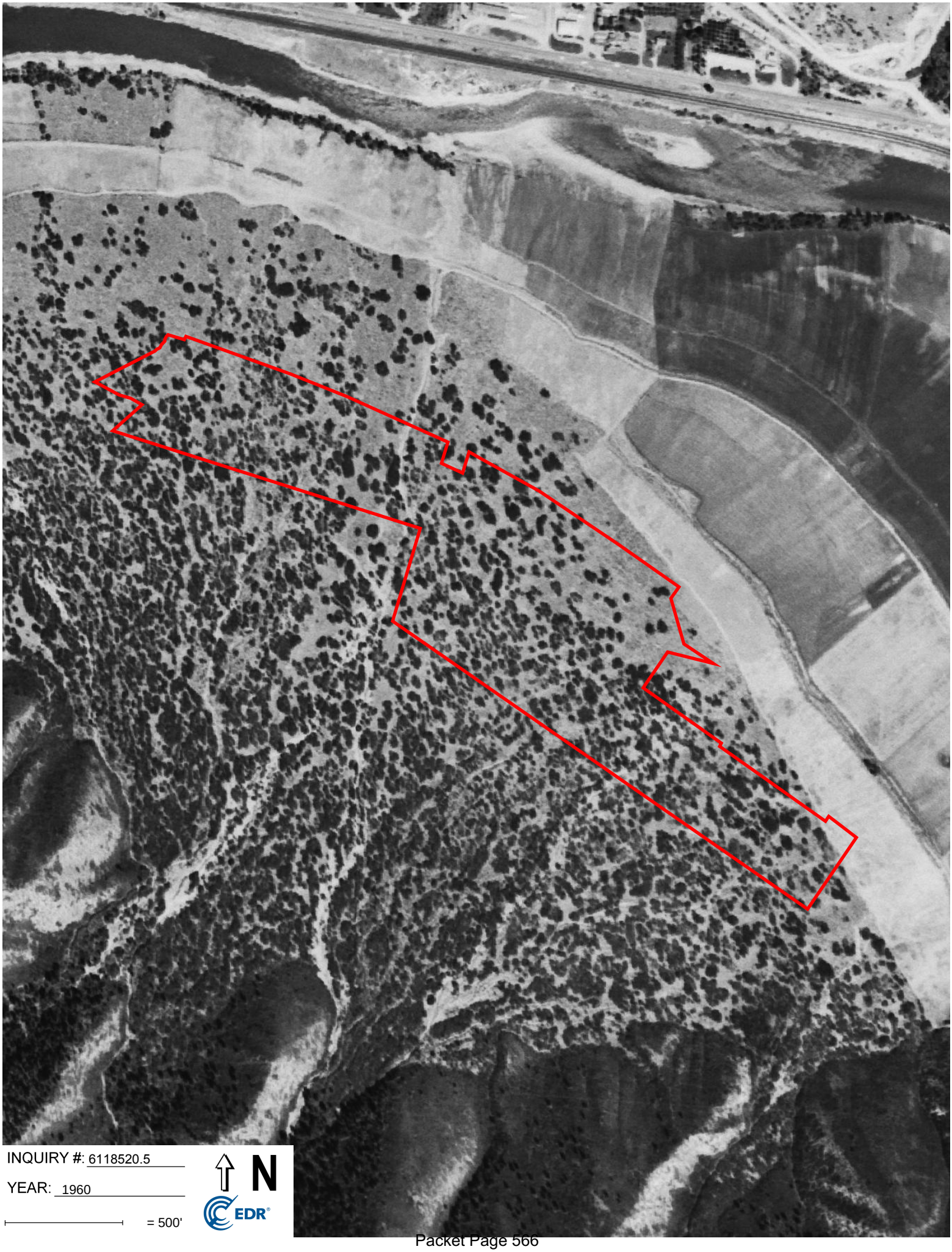
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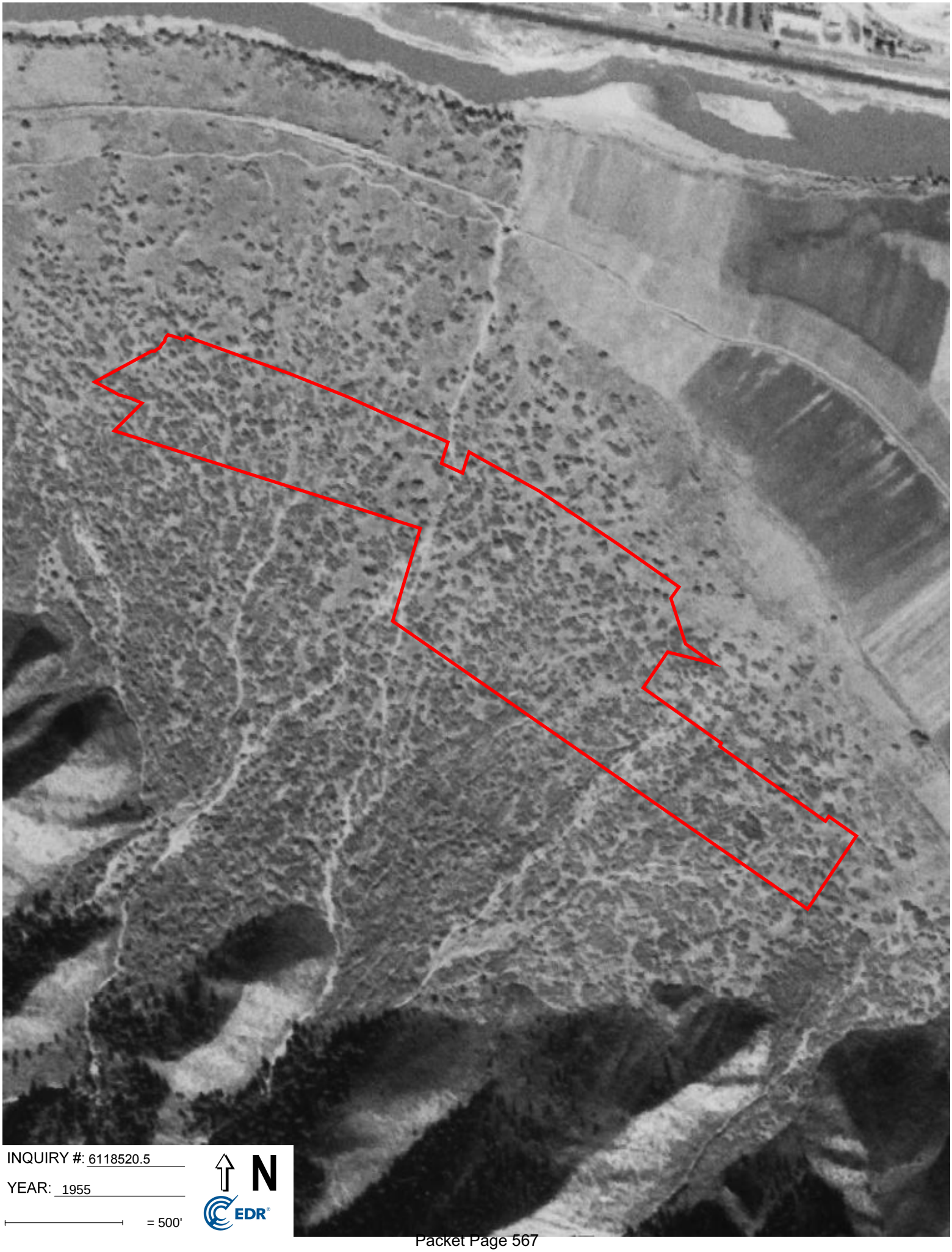
YEAR: 1979

= 500'

N

EDR


INQUIRY #: 6118520.5
YEAR: 1960
= 500'
N
EDR


INQUIRY #: 6118520.5
YEAR: 1955
= 500'
N
EDR

SITE PHOTOS

















































































































































SLOPE STABILITY ANALYSIS WITHOUT WATERTABLE (STATIC)

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 79
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 11:44:59
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 11:45:00

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (30.79374, 69.45256) ft
Left-Zone Right Coordinate: (135, 62.30159) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (562.27681, 31.11508) ft
Right-Zone Right Coordinate: (644.49999, 28.88889) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 4.285
Volume: 2,954.1635 ft³
Weight: 3,10,187.17 lbs
Resisting Moment: 3.2312006e+008 lbs-ft
Activating Moment: 7,54,12,295 lbs-ft
Resisting Force: 1,12,090.06 lbs
Activating Force: 26,160.608 lbs
F of S Rank: 1
Exit: (562.27681, 31.115078) ft
Entry: (30.79374, 69.452556) ft
Radius: 2,869.6254 ft
Center: (502.10181, 2,900.1095) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	38.720305	68.155564	0	119.63948	43.545209	0
Slice 2	54.573435	65.607077	0	354.08517	128.87646	0
Slice 3	73.125	62.749203	0	563.0916	204.94858	0
Slice 4	94.375	59.617701	0	743.14432	270.48241	0
Slice 5	113.75	56.897424	0	837.72803	304.90807	0
Slice 6	131.25	54.561908	0	849.56314	309.2157	0
Slice 7	148.74016	52.337036	0	864.54412	314.66833	0
Slice 8	166.22047	50.222431	0	882.71298	321.28125	0
Slice 9	183.09055	48.282906	0	868.48111	316.10127	0
Slice 10	199.35039	46.510935	0	822.5252	299.37469	0
Slice 11	215.61024	44.832658	0	766.87937	279.12126	0
Slice 12	231.87008	43.247909	0	701.49906	255.32478	0
Slice 13	249.6875	41.623456	0	676.46651	246.21368	0
Slice 14	269.0625	39.978692	0	689.86235	251.08936	0
Slice 15	288.4375	38.466053	0	689.51356	250.96241	0
Slice 16	307.8125	37.085328	0	675.35098	245.80766	0
Slice 17	325.83333	35.915068	0	680.18446	247.5669	0

Slice 18	342.5	34.938017	0	705.86504	256.91387	0
Slice 19	359.16667	34.058217	0	721.29716	262.5307	0
Slice 20	377.5	33.207997	0	714.15477	259.93108	0
Slice 21	397.5	32.408617	0	682.0831	248.25794	0
Slice 22	418.125	31.732793	0	607.56014	221.13381	0
Slice 23	439.375	31.189419	0	489.58318	178.1937	0
Slice 24	458.33333	30.829994	0	390.97215	142.30222	0
Slice 25	475	30.624169	0	315.0633	114.67366	0
Slice 26	491.66667	30.515158	0	228.90485	83.314551	0
Slice 27	507.7846	30.50027	0	167.0069	60.785539	0
Slice 28	523.3538	30.57334	0	130.03691	47.329565	0
Slice 29	538.92301	30.730889	0	84.198809	30.64586	0
Slice 30	554.49221	30.972931	0	29.529675	10.747923	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 82
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 11:53:34
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 11:53:37

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (24.40773, 69.56609) ft
Left-Zone Right Coordinate: (302.5, 43.96058) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (717.92524, 21.07061) ft
Right-Zone Right Coordinate: (885, 11.66667) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 5.362
Volume: 6,122.6541 ft³
Weight: 6,50,658.16 lbs
Resisting Moment: 8.8365152e+008 lbs-ft
Activating Moment: 1.6479033e+008 lbs-ft
Resisting Force: 2,35,734.13 lbs
Activating Force: 43,961.841 lbs
F of S Rank: 1
Exit: (717.92524, 21.070608) ft
Entry: (24.40773, 69.566085) ft
Radius: 3,735.7164 ft
Center: (630.62637, 3,755.7668) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	33.930797	68.025204	0	142.35368	51.812503	0
Slice 2	52.976932	64.99385	0	421.62645	153.45948	0
Slice 3	73.125	61.899787	0	652.64841	237.54459	0
Slice 4	94.375	58.75504	0	834.32978	303.67121	0
Slice 5	113.75	55.991468	0	933.32016	339.70076	0
Slice 6	131.25	53.588788	0	951.78232	346.42043	0
Slice 7	148.74016	51.271593	0	975.92237	355.20669	0
Slice 8	166.22047	49.039629	0	1,005.7755	366.07234	0
Slice 9	187.65476	46.428656	0	996.0067	362.51679	0
Slice 10	213.04303	43.48479	0	941.8843	342.81785	0
Slice 11	230.36858	41.557766	0	896.67663	326.3636	0
Slice 12	237.5	40.794111	0	875.64269	318.70787	0
Slice 13	252.91667	39.216846	0	901.86148	328.25074	0
Slice 14	278.75	36.682043	0	959.42008	349.20035	0
Slice 15	304.58333	34.328293	0	997.49744	363.05938	0
Slice 16	330	32.187438	0	1,060.9222	386.14409	0
Slice 17	355	30.253447	0	1,150.3828	418.70508	0

Slice 18	377.5	28.649506	0	1,204.5149	438.40757	0
Slice 19	397.5	27.34509	0	1,226.5035	446.41075	0
Slice 20	418.125	26.11445	0	1,211.1688	440.82939	0
Slice 21	439.375	24.96441	0	1,157.6321	421.34361	0
Slice 22	462.5	23.856605	0	1,116.5256	406.3821	0
Slice 23	487.5	22.814201	0	1,085.2652	395.00422	0
Slice 24	510.41667	21.999567	0	1,081.8518	393.76187	0
Slice 25	531.25	21.386999	0	1,109.1931	403.71327	0
Slice 26	552.08333	20.890741	0	1,123.5463	408.93741	0
Slice 27	573.33333	20.505516	0	1,126.5491	410.03033	0
Slice 28	595	20.23603	0	1,117.6518	406.792	0
Slice 29	616.66667	20.092228	0	1,094.6577	398.42282	0
Slice 30	631.25	20.052372	0	1,072.4402	390.33631	0
Slice 31	643.75	20.083737	0	951.6792	346.3829	0
Slice 32	661.25	20.186207	0	719.98407	262.05277	0
Slice 33	676.25	20.334274	0	514.28485	187.18438	0
Slice 34	684.9204	20.445791	0	397.68931	144.74707	0
Slice 35	702.63302	20.77579	0	184.30993	67.083329	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 87
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:00:58
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 12:01:00

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (32.06557, 69.42995) ft
Left-Zone Right Coordinate: (164.9719, 58.88889) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (586.522, 30.74296) ft
Right-Zone Right Coordinate: (672.99997, 25.55556) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 4.372
Volume: 2,968.2288 ft³
Weight: 3,11,664.02 lbs
Resisting Moment: 3.3789285e+008 lbs-ft
Activating Moment: 7,72,79,986 lbs-ft
Resisting Force: 1,12,655.76 lbs
Activating Force: 25,765.824 lbs
F of S Rank: 1
Exit: (586.522, 30.742957) ft
Entry: (32.06557, 69.429946) ft
Radius: 2,986.1639 ft
Center: (516.24486, 3,016.0798) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	39.674177	68.199896	0	113.35419	41.257552	0
Slice 2	54.891392	65.780049	0	335.78672	122.21637	0
Slice 3	73.125	62.995937	0	537.8709	195.769	0
Slice 4	94.375	59.885358	0	715.84683	260.54694	0
Slice 5	113.75	57.178846	0	809.01819	294.45854	0
Slice 6	131.25	54.850993	0	820.00916	298.45893	0
Slice 7	148.74016	52.629501	0	834.5627	303.75598	0
Slice 8	166.22047	50.514016	0	852.72018	310.36476	0
Slice 9	183.09055	48.569695	0	838.8614	305.32058	0
Slice 10	199.35039	46.789313	0	793.64681	288.86382	0
Slice 11	215.61024	45.098986	0	739.12182	269.01834	0
Slice 12	231.87008	43.49856	0	675.24923	245.77062	0
Slice 13	249.6875	41.852587	0	652.32826	237.42807	0
Slice 14	269.0625	40.179713	0	668.51657	243.32013	0
Slice 15	288.4375	38.633855	0	671.5186	244.41278	0
Slice 16	307.8125	37.214817	0	661.27612	240.68482	0
Slice 17	325.83333	36.004521	0	670.24163	243.948	0

Slice 18	342.5	34.986379	0	700.19152	254.84887	0
Slice 19	359.16667	34.061734	0	720.32675	262.1775	0
Slice 20	377.5	33.157644	0	718.8899	261.65452	0
Slice 21	397.5	32.294546	0	693.62186	252.45771	0
Slice 22	418.125	31.54727	0	626.77682	228.1281	0
Slice 23	439.375	30.92436	0	517.36236	188.3045	0
Slice 24	458.33333	30.489117	0	426.88674	155.37407	0
Slice 25	475	30.212364	0	358.55402	130.50299	0
Slice 26	491.66667	30.028661	0	280.3344	102.03338	0
Slice 27	510.41667	29.939738	0	221.3179	80.553129	0
Slice 28	531.25	29.971751	0	178.76554	65.065334	0
Slice 29	552.08333	30.14912	0	120.90717	44.006611	0
Slice 30	574.511	30.508551	0	44.070687	16.040418	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 90
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:06:20
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 12:06:22

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (106.92331, 65.86688) ft
Left-Zone Right Coordinate: (300, 44.15771) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (483.19428, 33.15587) ft
Right-Zone Right Coordinate: (687.5, 23.96825) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 4.506
Volume: 1,117.1407 ft³
Weight: 1,17,299.78 lbs
Resisting Moment: 8,79,19,662 lbs-ft
Activating Moment: 1,95,11,912 lbs-ft
Resisting Force: 42,416.87 lbs
Activating Force: 9,413.5477 lbs
F of S Rank: 1
Exit: (483.19428, 33.155872) ft
Entry: (106.92331, 65.86688) ft
Radius: 2,064.0739 ft
Center: (473.07445, 2,097.205) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	112.43609	64.888627	0	28.77401	10.472883	0
Slice 2	123.46165	62.962925	0	83.081131	30.239059	0
Slice 3	134.48722	61.098748	0	130.96402	47.667003	0
Slice 4	145.82677	59.246378	0	182.95568	66.590422	0
Slice 5	157.48031	57.409228	0	238.7304	86.89076	0
Slice 6	169.13386	55.64025	0	287.48772	104.63697	0
Slice 7	181.46457	53.844599	0	314.1759	114.35068	0
Slice 8	194.47244	52.030423	0	317.97793	115.7345	0
Slice 9	207.48031	50.300519	0	313.16095	113.98126	0
Slice 10	220.48819	48.654671	0	299.72731	109.09182	0
Slice 11	233.49606	47.092678	0	277.66658	101.06237	0
Slice 12	246.45833	45.61924	0	285.84482	104.03901	0
Slice 13	259.375	44.233593	0	324.41207	118.07634	0
Slice 14	272.29167	42.930096	0	354.5648	129.05103	0
Slice 15	285.20833	41.708593	0	376.28448	136.95635	0
Slice 16	298.125	40.568938	0	389.5436	141.78228	0
Slice 17	311.04167	39.510994	0	394.30866	143.51661	0

Slice 18	323.75	38.54909	0	413.20713	150.3951	0
Slice 19	336.25	37.680528	0	446.54645	162.52962	0
Slice 20	348.75	36.88817	0	471.91805	171.76412	0
Slice 21	361.25	36.171927	0	489.28252	178.08427	0
Slice 22	374.16667	35.512996	0	490.87043	178.66223	0
Slice 23	387.5	34.916536	0	476.07836	173.27835	0
Slice 24	400.83333	34.406431	0	452.06728	164.53903	0
Slice 25	414.58333	33.972151	0	400.48469	145.76451	0
Slice 26	428.75	33.619198	0	320.74927	116.74319	0
Slice 27	442.91667	33.363548	0	230.69263	83.965251	0
Slice 28	455.53238	33.213023	0	155.66893	56.658857	0
Slice 29	466.59714	33.148641	0	97.721936	35.567876	0
Slice 30	477.6619	33.143576	0	33.595989	12.22794	0

SLOPE STABILITY ANALYSIS WITHOUT WATERTABLE (SEISMIC Kh=0.05g)

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 80
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 11:49:56
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 11:50:01

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (30.79374, 69.45256) ft
Left-Zone Right Coordinate: (135, 62.30159) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (562.27681, 31.11508) ft
Right-Zone Right Coordinate: (644.49999, 28.88889) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.689
Volume: 2,954.1635 ft³
Weight: 3,10,187.17 lbs
Resisting Moment: 3.2175468e+008 lbs-ft
Activating Moment: 1.196644e+008 lbs-ft
Resisting Force: 1,11,617.77 lbs
Activating Force: 41,512.295 lbs
F of S Rank: 1
Exit: (562.27681, 31.115078) ft
Entry: (30.79374, 69.452556) ft
Radius: 2,869.6254 ft
Center: (502.10181, 2,900.1095) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	38.720305	68.155564	0	118.64264	43.182391	0
Slice 2	54.573435	65.607077	0	351.12311	127.79836	0
Slice 3	73.125	62.749203	0	558.35994	203.2264	0
Slice 4	94.375	59.617701	0	736.93543	268.22256	0
Slice 5	113.75	56.897424	0	830.82555	302.39577	0
Slice 6	131.25	54.561908	0	842.69166	306.71468	0
Slice 7	148.74016	52.337036	0	857.76545	312.20109	0
Slice 8	166.22047	50.222431	0	876.0918	318.87134	0
Slice 9	183.09055	48.282906	0	862.29638	313.85022	0
Slice 10	199.35039	46.510935	0	817.00354	297.36497	0
Slice 11	215.61024	44.832658	0	762.08753	277.37718	0
Slice 12	231.87008	43.247909	0	697.47799	253.86123	0
Slice 13	249.6875	41.623456	0	673.0428	244.96755	0
Slice 14	269.0625	39.978692	0	686.92224	250.01925	0
Slice 15	288.4375	38.466053	0	687.13036	250.095	0
Slice 16	307.8125	37.085328	0	673.55796	245.15505	0
Slice	325.83333	35.915068	0	678.86742	247.08753	0

17						
Slice 18	342.5	34.938017	0	704.92806	256.57283	0
Slice 19	359.16667	34.058217	0	720.74046	262.32807	0
Slice 20	377.5	33.207997	0	713.99702	259.87366	0
Slice 21	397.5	32.408617	0	682.28891	248.33285	0
Slice 22	418.125	31.732793	0	608.02496	221.30299	0
Slice 23	439.375	31.189419	0	490.15948	178.40346	0
Slice 24	458.33333	30.829994	0	391.538	142.50818	0
Slice 25	475	30.624169	0	315.56546	114.85644	0
Slice 26	491.66667	30.515158	0	229.29645	83.457084	0
Slice 27	507.7846	30.50027	0	167.2955	60.890583	0
Slice 28	523.3538	30.57334	0	130.24569	47.405553	0
Slice 29	538.92301	30.730889	0	84.319939	30.689948	0
Slice 30	554.49221	30.972931	0	29.567353	10.761636	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 84
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 11:56:02
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 11:56:06

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (24.40773, 69.56609) ft
Left-Zone Right Coordinate: (302.5, 43.96058) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (717.92524, 21.07061) ft
Right-Zone Right Coordinate: (885, 11.66667) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 3.082
Volume: 6,122.6541 ft³
Weight: 6,50,658.16 lbs
Resisting Moment: 8.8067076e+008 lbs-ft
Activating Moment: 2.8575098e+008 lbs-ft
Resisting Force: 2,34,941.84 lbs
Activating Force: 76,232.157 lbs
F of S Rank: 1
Exit: (717.92524, 21.070608) ft
Entry: (24.40773, 69.566085) ft
Radius: 3,735.7164 ft
Center: (630.62637, 3,755.7668) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	33.930797	68.025204	0	141.17953	51.385146	0
Slice 2	52.976932	64.99385	0	418.11538	152.18155	0
Slice 3	73.125	61.899787	0	647.15117	235.54376	0
Slice 4	94.375	58.75504	0	827.25485	301.09614	0
Slice 5	113.75	55.991468	0	925.38878	336.81397	0
Slice 6	131.25	53.588788	0	943.69201	343.4758	0
Slice 7	148.74016	51.271593	0	967.68716	352.20932	0
Slice 8	166.22047	49.039629	0	997.41495	363.02935	0
Slice 9	187.65476	46.428656	0	987.92064	359.57371	0
Slice 10	213.04303	43.48479	0	934.5149	340.13561	0
Slice 11	230.36858	41.557766	0	889.8886	323.89296	0
Slice 12	237.5	40.794111	0	869.1178	316.33301	0
Slice 13	252.91667	39.216846	0	895.48117	325.92849	0
Slice 14	278.75	36.682043	0	953.30371	346.97417	0
Slice 15	304.58333	34.328293	0	991.8807	361.01505	0
Slice 16	330	32.187438	0	1,055.7828	384.27353	0
Slice	355	30.253447	0	1,145.7185	417.00744	0

17						
Slice 18	377.5	28.649506	0	1,200.4734	436.93658	0
Slice 19	397.5	27.34509	0	1,223.1395	445.18638	0
Slice 20	418.125	26.11445	0	1,208.6042	439.89597	0
Slice 21	439.375	24.96441	0	1,155.9227	420.72145	0
Slice 22	462.5	23.856605	0	1,115.6145	406.05047	0
Slice 23	487.5	22.814201	0	1,085.0854	394.9388	0
Slice 24	510.41667	21.999567	0	1,082.2199	393.89584	0
Slice 25	531.25	21.386999	0	1,109.968	403.99532	0
Slice 26	552.08333	20.890741	0	1,124.6596	409.34261	0
Slice 27	573.33333	20.505516	0	1,127.9179	410.52852	0
Slice 28	595	20.23603	0	1,119.1762	407.34683	0
Slice 29	616.66667	20.092228	0	1,096.2241	398.99294	0
Slice 30	631.25	20.052372	0	1,073.9744	390.89471	0
Slice 31	643.75	20.083737	0	953.05455	346.88349	0
Slice 32	661.25	20.186207	0	721.02914	262.43315	0
Slice 33	676.25	20.334274	0	515.01757	187.45107	0
Slice 34	684.9204	20.445791	0	398.24345	144.94876	0
Slice 35	702.63302	20.77579	0	184.5673	67.177004	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 88
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:02:43
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 12:02:49

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (32.06557, 69.42995) ft
Left-Zone Right Coordinate: (164.9719, 58.88889) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (586.522, 30.74296) ft
Right-Zone Right Coordinate: (672.99997, 25.55556) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.723
Volume: 2,968.2288 ft³
Weight: 3,11,664.02 lbs
Resisting Moment: 3.3649354e+008 lbs-ft
Activating Moment: 1.2355877e+008 lbs-ft
Resisting Force: 1,12,190.52 lbs
Activating Force: 41,196.137 lbs
F of S Rank: 1
Exit: (586.522, 30.742957) ft
Entry: (32.06557, 69.429946) ft
Radius: 2,986.1639 ft
Center: (516.24486, 3,016.0798) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	39.674177	68.199896	0	112.42494	40.919333	0
Slice 2	54.891392	65.780049	0	333.03044	121.21317	0
Slice 3	73.125	62.995937	0	533.44654	194.15866	0
Slice 4	94.375	59.885358	0	709.99963	258.41873	0
Slice 5	113.75	57.178846	0	802.49952	292.08594	0
Slice 6	131.25	54.850993	0	813.51383	296.09482	0
Slice 7	148.74016	52.629501	0	828.13513	301.41654	0
Slice 8	166.22047	50.514016	0	846.40836	308.06745	0
Slice 9	183.09055	48.569695	0	832.93069	303.16198	0
Slice 10	199.35039	46.789313	0	788.31694	286.9239	0
Slice 11	215.61024	45.098986	0	734.45596	267.32011	0
Slice 12	231.87008	43.49856	0	671.28896	244.3292	0
Slice 13	249.6875	41.852587	0	648.89083	236.17695	0
Slice 14	269.0625	40.179713	0	665.47773	242.21409	0
Slice 15	288.4375	38.633855	0	668.95961	243.48139	0
Slice 16	307.8125	37.214817	0	659.24455	239.94539	0
Slice	325.83333	36.004521	0	668.63582	243.36354	0

17						
Slice 18	342.5	34.986379	0	698.92601	254.38826	0
Slice 19	359.16667	34.061734	0	719.42003	261.84748	0
Slice 20	377.5	33.157644	0	718.38639	261.47126	0
Slice 21	397.5	32.294546	0	693.51811	252.41995	0
Slice 22	418.125	31.54727	0	627.00476	228.21107	0
Slice 23	439.375	30.92436	0	517.80138	188.46429	0
Slice 24	458.33333	30.489117	0	427.40203	155.56162	0
Slice 25	475	30.212364	0	359.07293	130.69186	0
Slice 26	491.66667	30.028661	0	280.80081	102.20314	0
Slice 27	510.41667	29.939738	0	221.71208	80.696597	0
Slice 28	531.25	29.971751	0	179.07518	65.178036	0
Slice 29	552.08333	30.14912	0	121.10156	44.077362	0
Slice 30	574.511	30.508551	0	44.135367	16.06396	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 91
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:07:43
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 12:07:46

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (106.92331, 65.86688) ft
Left-Zone Right Coordinate: (300, 44.15771) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (483.19428, 33.15587) ft
Right-Zone Right Coordinate: (687.5, 23.96825) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.775
Volume: 1,117.1407 ft³
Weight: 1,17,299.78 lbs
Resisting Moment: 8,75,66,106 lbs-ft
Activating Moment: 3,15,56,524 lbs-ft
Resisting Force: 42,246.793 lbs
Activating Force: 15,224.718 lbs
F of S Rank: 1
Exit: (483.19428, 33.155872) ft
Entry: (106.92331, 65.86688) ft
Radius: 2,064.0739 ft
Center: (473.07445, 2,097.205) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	112.43609	64.888627	0	28.516029	10.378986	0
Slice 2	123.46165	62.962925	0	82.335348	29.967616	0
Slice 3	134.48722	61.098748	0	129.78715	47.23866	0
Slice 4	145.82677	59.246378	0	181.31862	65.994582	0
Slice 5	157.48031	57.409228	0	236.61595	86.121163	0
Slice 6	169.13386	55.64025	0	284.97884	103.72381	0
Slice 7	181.46457	53.844599	0	311.48516	113.37133	0
Slice 8	194.47244	52.030423	0	315.32084	114.7674	0
Slice 9	207.48031	50.300519	0	310.62974	113.05998	0
Slice 10	220.48819	48.654671	0	297.40508	108.2466	0
Slice 11	233.49606	47.092678	0	275.62418	100.319	0
Slice 12	246.45833	45.61924	0	283.89488	103.32929	0
Slice 13	259.375	44.233593	0	322.40088	117.34432	0
Slice 14	272.29167	42.930096	0	352.58563	128.33067	0
Slice 15	285.20833	41.708593	0	374.41735	136.27677	0
Slice 16	298.125	40.568938	0	387.85296	141.16693	0
Slice	311.04167	39.510994	0	392.84193	142.98277	0

17						
Slice 18	323.75	38.54909	0	411.91275	149.92398	0
Slice 19	336.25	37.680528	0	445.38559	162.1071	0
Slice 20	348.75	36.88817	0	470.92519	171.40275	0
Slice 21	361.25	36.171927	0	488.47498	177.79035	0
Slice 22	374.16667	35.512996	0	490.26925	178.44342	0
Slice 23	387.5	34.916536	0	475.68037	173.13349	0
Slice 24	400.83333	34.406431	0	451.83586	164.45481	0
Slice 25	414.58333	33.972151	0	400.39224	145.73086	0
Slice 26	428.75	33.619198	0	320.75112	116.74386	0
Slice 27	442.91667	33.363548	0	230.73446	83.980477	0
Slice 28	455.53238	33.213023	0	155.71128	56.674273	0
Slice 29	466.59714	33.148641	0	97.751169	35.578516	0
Slice 30	477.6619	33.143576	0	33.606708	12.231842	0

SLOPE STABILITY ANALYSIS WITHOUT WATERTABLE (SEISMIC Kh=0.1g)

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 81
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 11:51:35
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 11:51:37

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (30.79374, 69.45256) ft
Left-Zone Right Coordinate: (135, 62.30159) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (562.27681, 31.11508) ft
Right-Zone Right Coordinate: (644.49999, 28.88889) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.955
Volume: 2,954.1635 ft³
Weight: 3,10,187.17 lbs
Resisting Moment: 3.203944e+008 lbs-ft
Activating Moment: 1.639165e+008 lbs-ft
Resisting Force: 1,11,147.29 lbs
Activating Force: 56,864.207 lbs
F of S Rank: 1
Exit: (562.27681, 31.115078) ft
Entry: (30.79374, 69.452556) ft
Radius: 2,869.6254 ft
Center: (502.10181, 2,900.1095) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	38.720305	68.155564	0	117.65384	42.822495	0
Slice 2	54.573435	65.607077	0	348.18351	126.72843	0
Slice 3	73.125	62.749203	0	553.65967	201.51564	0
Slice 4	94.375	59.617701	0	730.75815	265.97421	0
Slice 5	113.75	56.897424	0	823.94613	299.89187	0
Slice 6	131.25	54.561908	0	835.8305	304.21742	0
Slice 7	148.74016	52.337036	0	850.98411	309.73289	0
Slice 8	166.22047	50.222431	0	869.45589	316.45606	0
Slice 9	183.09055	48.282906	0	856.08721	311.59026	0
Slice 10	199.35039	46.510935	0	811.45129	295.34411	0
Slice 11	215.61024	44.832658	0	757.26268	275.62107	0
Slice 12	231.87008	43.247909	0	693.42518	252.38612	0
Slice 13	249.6875	41.623456	0	669.59174	243.71146	0
Slice 14	269.0625	39.978692	0	683.96246	248.94198	0
Slice 15	288.4375	38.466053	0	684.73817	249.22431	0
Slice 16	307.8125	37.085328	0	671.7683	244.50367	0
Slice	325.83333	35.915068	0	677.56549	246.61367	0

17						
Slice 18	342.5	34.938017	0	704.01654	256.24106	0
Slice 19	359.16667	34.058217	0	720.21814	262.13796	0
Slice 20	377.5	33.207997	0	713.8804	259.83122	0
Slice 21	397.5	32.408617	0	682.53879	248.4238	0
Slice 22	418.125	31.732793	0	608.53135	221.4873	0
Slice 23	439.375	31.189419	0	490.76995	178.62565	0
Slice 24	458.33333	30.829994	0	392.12991	142.72362	0
Slice 25	475	30.624169	0	316.08664	115.04613	0
Slice 26	491.66667	30.515158	0	229.70044	83.604121	0
Slice 27	507.7846	30.50027	0	167.59162	60.998361	0
Slice 28	523.3538	30.57334	0	130.45873	47.483095	0
Slice 29	538.92301	30.730889	0	84.442972	30.734728	0
Slice 30	554.49221	30.972931	0	29.605497	10.77552	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 85
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 11:57:36
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 11:57:39

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (24.40773, 69.56609) ft
Left-Zone Right Coordinate: (302.5, 43.96058) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (717.92524, 21.07061) ft
Right-Zone Right Coordinate: (885, 11.66667) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.158
Volume: 6,122.6541 ft³
Weight: 6,50,658.16 lbs
Resisting Moment: 8.7770586e+008 lbs-ft
Activating Moment: 4.0671162e+008 lbs-ft
Resisting Force: 2,34,153.81 lbs
Activating Force: 1,08,503.11 lbs
F of S Rank: 1
Exit: (717.92524, 21.070608) ft
Entry: (24.40773, 69.566085) ft
Radius: 3,735.7164 ft
Center: (630.62637, 3,755.7668) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	33.930797	68.025204	0	140.01664	50.961888	0
Slice 2	52.976932	64.99385	0	414.63689	150.91548	0
Slice 3	73.125	61.899787	0	641.70151	233.56025	0
Slice 4	94.375	58.75504	0	820.23424	298.54085	0
Slice 5	113.75	55.991468	0	917.5092	333.94604	0
Slice 6	131.25	53.588788	0	935.64445	340.54673	0
Slice 7	148.74016	51.271593	0	959.48426	349.22371	0
Slice 8	166.22047	49.039629	0	989.07535	359.99399	0
Slice 9	187.65476	46.428656	0	979.8398	356.63252	0
Slice 10	213.04303	43.48479	0	927.13342	337.44897	0
Slice 11	230.36858	41.557766	0	883.07897	321.41446	0
Slice 12	237.5	40.794111	0	862.56812	313.94912	0
Slice 13	252.91667	39.216846	0	889.0707	323.59527	0
Slice 14	278.75	36.682043	0	947.15128	344.73487	0
Slice 15	304.58333	34.328293	0	986.22708	358.9573	0
Slice 16	330	32.187438	0	1,050.6106	382.39098	0
Slice	355	30.253447	0	1,141.0295	415.30079	0

17						
Slice 18	377.5	28.649506	0	1,196.4184	435.46068	0
Slice 19	397.5	27.34509	0	1,219.7744	443.96159	0
Slice 20	418.125	26.11445	0	1,206.0525	438.96721	0
Slice 21	439.375	24.96441	0	1,154.2403	420.10913	0
Slice 22	462.5	23.856605	0	1,114.7437	405.73354	0
Slice 23	487.5	22.814201	0	1,084.9571	394.8921	0
Slice 24	510.41667	21.999567	0	1,082.6459	394.05089	0
Slice 25	531.25	21.386999	0	1,110.8033	404.29934	0
Slice 26	552.08333	20.890741	0	1,125.832	409.76934	0
Slice 27	573.33333	20.505516	0	1,129.3411	411.04655	0
Slice 28	595	20.23603	0	1,120.7474	407.91869	0
Slice 29	616.66667	20.092228	0	1,097.8276	399.57655	0
Slice 30	631.25	20.052372	0	1,075.5387	391.46407	0
Slice 31	643.75	20.083737	0	954.45324	347.39257	0
Slice 32	661.25	20.186207	0	722.08877	262.81882	0
Slice 33	676.25	20.334274	0	515.75892	187.7209	0
Slice 34	684.9204	20.445791	0	398.80356	145.15263	0
Slice 35	702.63302	20.77579	0	184.82721	67.271603	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 89
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:04:25
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 12:04:28

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (32.06557, 69.42995) ft
Left-Zone Right Coordinate: (164.9719, 58.88889) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (586.522, 30.74296) ft
Right-Zone Right Coordinate: (672.99997, 25.55556) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.973
Volume: 2,968.2288 ft³
Weight: 3,11,664.02 lbs
Resisting Moment: 3.3509943e+008 lbs-ft
Activating Moment: 1.6983756e+008 lbs-ft
Resisting Force: 1,11,727.04 lbs
Activating Force: 56,626.691 lbs
F of S Rank: 1
Exit: (586.522, 30.742957) ft
Entry: (32.06557, 69.429946) ft
Radius: 2,986.1639 ft
Center: (516.24486, 3,016.0798) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	39.674177	68.199896	0	111.50311	40.583814	0
Slice 2	54.891392	65.780049	0	330.295	120.21755	0
Slice 3	73.125	62.995937	0	529.05197	192.55917	0
Slice 4	94.375	59.885358	0	704.18385	256.30196	0
Slice 5	113.75	57.178846	0	796.00576	289.7224	0
Slice 6	131.25	54.850993	0	807.03261	293.73585	0
Slice 7	148.74016	52.629501	0	821.7105	299.07816	0
Slice 8	166.22047	50.514016	0	840.08873	305.76729	0
Slice 9	183.09055	48.569695	0	826.98295	300.99718	0
Slice 10	199.35039	46.789313	0	782.96348	284.9754	0
Slice 11	215.61024	45.098986	0	729.76291	265.61198	0
Slice 12	231.87008	43.49856	0	667.30093	242.87767	0
Slice 13	249.6875	41.852587	0	645.42763	234.91644	0
Slice 14	269.0625	40.179713	0	662.41779	241.10036	0
Slice 15	288.4375	38.633855	0	666.38702	242.54504	0
Slice 16	307.8125	37.214817	0	657.20889	239.20448	0
Slice	325.83333	36.004521	0	667.03557	242.78109	0

17						
Slice 18	342.5	34.986379	0	697.67514	253.93298	0
Slice 19	359.16667	34.061734	0	718.53653	261.52591	0
Slice 20	377.5	33.157644	0	717.91382	261.29926	0
Slice 21	397.5	32.294546	0	693.45067	252.3954	0
Slice 22	418.125	31.54727	0	627.27008	228.30764	0
Slice 23	439.375	30.92436	0	518.27433	188.63643	0
Slice 24	458.33333	30.489117	0	427.94605	155.75962	0
Slice 25	475	30.212364	0	359.61526	130.88925	0
Slice 26	491.66667	30.028661	0	281.28484	102.37931	0
Slice 27	510.41667	29.939738	0	222.11841	80.84449	0
Slice 28	531.25	29.971751	0	179.39212	65.293392	0
Slice 29	552.08333	30.14912	0	121.29936	44.149355	0
Slice 30	574.511	30.508551	0	44.200899	16.087812	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 92
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:09:13
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\
Last Solved Date: 29-06-2020
Last Solved Time: 12:09:15

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: (none)

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit

Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (106.92331, 65.86688) ft
Left-Zone Right Coordinate: (300, 44.15771) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (483.19428, 33.15587) ft
Right-Zone Right Coordinate: (687.5, 23.96825) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8

1			
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.000
Volume: 1,117.1407 ft³
Weight: 1,17,299.78 lbs
Resisting Moment: 8,72,13,787 lbs-ft
Activating Moment: 4,36,01,136 lbs-ft
Resisting Force: 42,077.317 lbs
Activating Force: 21,036 lbs
F of S Rank: 1
Exit: (483.19428, 33.155872) ft
Entry: (106.92331, 65.86688) ft
Radius: 2,064.0739 ft
Center: (473.07445, 2,097.205) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	112.43609	64.888627	0	28.260513	10.285985	0
Slice 2	123.46165	62.962925	0	81.596205	29.69859	0
Slice 3	134.48722	61.098748	0	128.61974	46.813757	0
Slice 4	145.82677	59.246378	0	179.69294	65.402881	0
Slice 5	157.48031	57.409228	0	234.51352	85.355942	0
Slice 6	169.13386	55.64025	0	282.48076	102.81459	0
Slice 7	181.46457	53.844599	0	308.8017	112.39463	0
Slice 8	194.47244	52.030423	0	312.66616	113.80117	0
Slice 9	207.48031	50.300519	0	308.09635	112.1379	0
Slice 10	220.48819	48.654671	0	295.07695	107.39923	0
Slice 11	233.49606	47.092678	0	273.57352	99.572616	0
Slice 12	246.45833	45.61924	0	281.93561	102.61617	0
Slice 13	259.375	44.233593	0	320.38015	116.60884	0
Slice 14	272.29167	42.930096	0	350.59786	127.60719	0
Slice 15	285.20833	41.708593	0	372.54379	135.59485	0
Slice 16	298.125	40.568938	0	386.15918	140.55045	0
Slice	311.04167	39.510994	0	391.37612	142.44926	0

17						
Slice 18	323.75	38.54909	0	410.62346	149.45472	0
Slice 19	336.25	37.680528	0	444.23387	161.68791	0
Slice 20	348.75	36.88817	0	469.94511	171.04603	0
Slice 21	361.25	36.171927	0	487.68302	177.5021	0
Slice 22	374.16667	35.512996	0	489.68521	178.23084	0
Slice 23	387.5	34.916536	0	475.29945	172.99485	0
Slice 24	400.83333	34.406431	0	451.61988	164.37619	0
Slice 25	414.58333	33.972151	0	400.3121	145.70169	0
Slice 26	428.75	33.619198	0	320.76133	116.74758	0
Slice 27	442.91667	33.363548	0	230.78099	83.99741	0
Slice 28	455.53238	33.213023	0	155.75587	56.690501	0
Slice 29	466.59714	33.148641	0	97.781284	35.589477	0
Slice 30	477.6619	33.143576	0	33.617599	12.235806	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (STATIC)

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 96
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:21:12
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:21:13

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (0.17917, 69.99681) ft
Left-Zone Right Coordinate: (102.5, 66.27451) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (612.4616, 30.34542) ft
Right-Zone Right Coordinate: (677.5, 25.02924) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35

Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 4.493
Volume: 3,255.2947 ft^3
Weight: 3,41,805.94 lbs
Resisting Moment: 3.9095275e+008 lbs-ft
Activating Moment: 8,70,21,874 lbs-ft
Resisting Force: 1,23,595.95 lbs
Activating Force: 27,511.307 lbs
F of S Rank: 1
Exit: (612.4616, 30.345416) ft
Entry: (25.779131, 69.541705) ft
Radius: 3,149.7994 ft
Center: (528.17393, 3,179.0169) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	34.959348	68.086251	0	133.8733	48.725897	0
Slice 2	53.319783	65.230808	0	395.74588	144.03972	0
Slice 3	73.125	62.279552	0	612.36757	222.88357	0
Slice 4	94.375	59.250893	0	782.00326	284.62591	0
Slice 5	113.75	56.612151	0	868.24564	316.01557	0
Slice 6	131.25	54.339297	0	873.56134	317.95033	0
Slice 7	148.74016	52.167204	0	883.00414	321.38722	0
Slice 8	166.22047	50.095551	0	896.60968	326.33924	0
Slice 9	185.80052	47.899197	0	870.52656	316.84576	0
Slice 10	207.48031	45.60448	0	801.95577	291.88803	0

Slice 11	229.1601	43.461338	0	717.65952	261.2067	0
Slice 12	249.6875	41.567738	0	682.02333	248.23619	0
Slice 13	269.0625	39.90822	0	696.75739	253.59895	0
Slice 14	288.4375	38.369105	0	698.99535	254.4135	0
Slice 15	307.8125	36.950214	0	688.6883	250.66204	0
Slice 16	325.83333	35.734368	0	698.20077	254.1243	0
Slice 17	342.5	34.705842	0	729.21643	265.41308	0
Slice 18	359.16667	33.765968	0	750.94583	273.32193	0
Slice 19	377.5	32.839273	0	751.91119	273.67329	0
Slice 20	397.5	31.945138	0	729.97685	265.68984	0
Slice 21	418.125	31.158464	0	667.39693	242.91262	0
Slice 22	439.375	30.487355	0	563.21406	204.99315	0
Slice 23	457.5	30.01937	0	481.19088	175.13916	0
Slice 24	472.5	29.718459	0	425.25923	154.7817	0
Slice 25	490	29.464668	0	349.6528	127.26321	0
Slice 26	510.41667	29.284737	0	290.53856	105.74739	0
Slice 27	531.25	29.236184	0	256.50996	93.36199	0
Slice 28	552.08333	29.32543	0	207.91263	75.674008	0
Slice 29	570.82693	29.517273	0	154.5854	56.264485	0
Slice 30	587.4808	29.786858	0	99.189597	36.102061	0
Slice 31	604.13467	30.144544	0	34.588516	12.58919	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 99
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:25:52
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:25:55

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (63.53878, 68.821) ft
Left-Zone Right Coordinate: (172.5, 58.05149) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (723.00849, 20.58649) ft
Right-Zone Right Coordinate: (810, 15.55556) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35

Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 5.742
Volume: 4,730.2192 ft^3
Weight: 5,02,241.83 lbs
Resisting Moment: 6.5095824e+008 lbs-ft
Activating Moment: 1.1337376e+008 lbs-ft
Resisting Force: 1,82,069.45 lbs
Activating Force: 31,710.138 lbs
F of S Rank: 1
Exit: (723.00849, 20.586489) ft
Entry: (63.53878, 68.820996) ft
Radius: 3,564.4879 ft
Center: (652.16965, 3,584.3704) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	73.904085	67.116854	0	106.59779	38.798421	0
Slice 2	94.634695	63.771225	0	313.08505	113.95364	0
Slice 3	113.75	60.792695	0	436.27236	158.79015	0
Slice 4	131.25	58.163033	0	478.23616	174.06373	0
Slice 5	148.74016	55.623496	0	525.30219	191.19436	0
Slice 6	166.22047	53.173794	0	577.51804	210.19938	0
Slice 7	185.80052	50.540438	0	596.01688	216.9324	0
Slice 8	207.48031	47.746877	0	578.41415	210.52553	0
Slice 9	229.1601	45.088318	0	546.94129	199.07035	0
Slice 10	251.11123	42.534575	0	567.59581	206.58798	0

Slice 11	273.33369	40.088758	0	640.11846	232.98406	0
Slice 12	295.55615	37.78387	0	698.19979	254.12394	0
Slice 13	312.08369	36.147486	0	734.33581	267.27638	0
Slice 14	330	34.493911	0	807.61243	293.94688	0
Slice 15	355	32.313705	0	923.35907	336.07522	0
Slice 16	377.5	30.495065	0	1,000.5289	364.16273	0
Slice 17	397.5	29.005895	0	1,042.4576	379.42353	0
Slice 18	418.125	27.590447	0	1,047.2058	381.15172	0
Slice 19	439.375	26.255864	0	1,013.8608	369.01516	0
Slice 20	465	24.831693	0	992.92533	361.39527	0
Slice 21	490	23.587522	0	983.87931	358.10278	0
Slice 22	510.41667	22.717508	0	1,001.2319	364.4186	0
Slice 23	531.25	21.949353	0	1,045.7857	380.63486	0
Slice 24	552.08333	21.303176	0	1,076.787	391.91843	0
Slice 25	573.33333	20.77091	0	1,096.1652	398.97152	0
Slice 26	595	20.357472	0	1,103.3305	401.57945	0
Slice 27	616.66667	20.075789	0	1,095.7361	398.81531	0
Slice 28	631.25	19.945872	0	1,083.5766	394.38961	0
Slice 29	643.75	19.903195	0	971.12196	353.45949	0
Slice 30	661.25	19.904817	0	750.73112	273.24378	0
Slice 31	676.25	19.969331	0	554.36026	201.77063	0
Slice 32	687.60994	20.062363	0	411.95082	149.93784	0
Slice 33	707.86418	20.34983	0	176.6404	64.291846	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 102
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:32:27
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:32:28

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (34.18753, 69.39222) ft
Left-Zone Right Coordinate: (295, 44.55197) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (517.22354, 31.91602) ft
Right-Zone Right Coordinate: (815, 15.32408) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35

Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 4.154
Volume: 2,773.5066 ft^3
Weight: 2,91,218.2 lbs
Resisting Moment: 2.77261e+008 lbs-ft
Activating Moment: 6,67,48,992 lbs-ft
Resisting Force: 1,05,187.13 lbs
Activating Force: 25,323.334 lbs
F of S Rank: 1
Exit: (517.22354, 31.916024) ft
Entry: (34.18753, 69.392222) ft
Radius: 2,623.2665 ft
Center: (477.75402, 2,654.8856) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	41.265648	68.197832	0	110.4818	40.212088	0
Slice 2	55.421883	65.848835	0	327.2023	119.0919	0
Slice 3	69.583333	63.578496	0	500.79981	182.27623	0
Slice 4	83.75	61.386663	0	631.41385	229.81585	0
Slice 5	97.916667	59.274001	0	753.92447	274.40606	0
Slice 6	113.75	57.011422	0	825.05548	300.29564	0
Slice 7	131.25	54.619406	0	842.76929	306.74294	0
Slice 8	148.74016	52.348471	0	862.60485	313.96249	0
Slice 9	166.22047	50.198171	0	884.61003	321.97172	0
Slice 10	183.09055	48.233775	0	873.15226	317.80143	0

Slice 11	199.35039	46.447023	0	828.95494	301.71492	0
Slice 12	215.61024	44.762784	0	774.15781	281.7704	0
Slice 13	231.87008	43.180861	0	708.7005	257.94589	0
Slice 14	247.75	41.733316	0	681.23044	247.9476	0
Slice 15	263.25	40.415329	0	692.34198	251.99187	0
Slice 16	278.75	39.189855	0	693.81788	252.52905	0
Slice 17	294.25	38.056764	0	685.61067	249.54188	0
Slice 18	309.75	37.015936	0	667.67401	243.01346	0
Slice 19	325.83333	36.035153	0	668.58117	243.34364	0
Slice 20	342.5	35.121496	0	687.60992	250.26954	0
Slice 21	359.16667	34.314156	0	695.359	253.08998	0
Slice 22	377.5	33.554598	0	678.51224	246.95826	0
Slice 23	397.5	32.866066	0	634.49946	230.93892	0
Slice 24	414.58333	32.389365	0	567.89307	206.69617	0
Slice 25	428.75	32.086398	0	482.82191	175.7328	0
Slice 26	442.91667	31.859978	0	389.5884	141.79858	0
Slice 27	457.5	31.707992	0	303.07376	110.30983	0
Slice 28	472.5	31.635062	0	222.83562	81.105531	0
Slice 29	490	31.666724	0	116.99931	42.584267	0
Slice 30	508.61177	31.814715	0	26.770323	9.7436006	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 105
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:40:36
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:40:37

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (12.5127, 69.77755) ft
Left-Zone Right Coordinate: (147.5, 60.8324) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (438.98291, 35.86408) ft
Right-Zone Right Coordinate: (585, 30.76628) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35

Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 3.862
Volume: 1,912.0951 ft^3
Weight: 2,00,769.99 lbs
Resisting Moment: 1.5649502e+008 lbs-ft
Activating Moment: 4,05,21,197 lbs-ft
Resisting Force: 72,430.986 lbs
Activating Force: 18,754.626 lbs
F of S Rank: 1
Exit: (438.98291, 35.864085) ft
Entry: (46.36065, 69.175811) ft
Radius: 2,148.9251 ft
Center: (423.5778, 2,184.734) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	54.430325	67.768656	0	130.40052	47.461909	0
Slice 2	69.583333	65.178487	0	334.93838	121.9076	0
Slice 3	83.75	62.861046	0	478.27018	174.07611	0
Slice 4	97.916667	60.640617	0	611.66443	222.62765	0
Slice 5	110.83333	58.696521	0	688.03228	250.42327	0
Slice 6	122.5	57.012994	0	708.98346	258.04888	0
Slice 7	134.16667	55.39472	0	723.36201	263.28224	0
Slice 8	145.82677	53.842387	0	740.6662	269.58045	0
Slice 9	157.48031	52.355779	0	760.92117	276.95266	0
Slice 10	169.13386	50.933851	0	774.64441	281.94751	0

Slice 11	181.46457	49.501562	0	764.68091	278.32109	0
Slice 12	194.47244	48.066694	0	730.14825	265.75223	0
Slice 13	207.48031	46.71193	0	687.31187	250.16106	0
Slice 14	220.48819	45.437116	0	636.11863	231.52825	0
Slice 15	233.49606	44.242111	0	576.51589	209.83462	0
Slice 16	246.45833	43.130412	0	547.67429	199.33714	0
Slice 17	259.375	42.10134	0	549.75154	200.0932	0
Slice 18	272.29167	41.150594	0	543.59112	197.85099	0
Slice 19	285.20833	40.27807	0	529.15283	192.59588	0
Slice 20	298.125	39.483671	0	506.40263	184.31548	0
Slice 21	311.04167	38.767312	0	475.31539	173.00065	0
Slice 22	323.75	38.137975	0	459.21499	167.14059	0
Slice 23	336.25	37.59312	0	458.40295	166.84503	0
Slice 24	348.75	37.121158	0	449.8011	163.71421	0
Slice 25	361.25	36.72204	0	433.40521	157.7466	0
Slice 26	374.16667	36.387356	0	400.36259	145.72006	0
Slice 27	387.5	36.122084	0	350.15992	127.44779	0
Slice 28	400.83333	35.939577	0	291.17673	105.97966	0
Slice 29	415.37073	35.838952	0	197.58718	71.915852	0
Slice 30	431.11218	35.836489	0	67.827144	24.687061	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.05g)

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 97
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:22:51
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:22:53

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (0.17917, 69.99681) ft
Left-Zone Right Coordinate: (102.5, 66.27451) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (612.4616, 30.34542) ft
Right-Zone Right Coordinate: (677.5, 25.02924) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 2.770
Volume: 3,255.2947 ft³
Weight: 3,41,805.94 lbs
Resisting Moment: 3.8937718e+008 lbs-ft
Activating Moment: 1.405678e+008 lbs-ft
Resisting Force: 1,23,099.22 lbs
Activating Force: 44,440.03 lbs
F of S Rank: 1
Exit: (612.4616, 30.345416) ft
Entry: (25.779131, 69.541705) ft
Radius: 3,149.7994 ft
Center: (528.17393, 3,179.0169) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	34.959348	68.086251	0	132.79311	48.332739	0
Slice 2	53.319783	65.230808	0	392.55425	142.87806	0
Slice 3	73.125	62.279552	0	607.43466	221.08813	0
Slice 4	94.375	59.250893	0	775.76108	282.35394	0
Slice 5	113.75	56.612151	0	861.41693	313.53012	0
Slice 6	131.25	54.339297	0	866.80988	315.49299	0
Slice 7	148.74016	52.167204	0	876.3641	318.97045	0
Slice 8	166.22047	50.095551	0	890.1181	323.9765	0
Slice 9	185.80052	47.899197	0	864.53602	314.66538	0
Slice	207.48031	45.60448	0	796.79875	290.01103	0

10						
Slice 11	229.1601	43.461338	0	713.42008	259.66367	0
Slice 12	249.6875	41.567738	0	678.41222	246.92186	0
Slice 13	269.0625	39.90822	0	693.53299	252.42537	0
Slice 14	288.4375	38.369105	0	696.2366	253.4094	0
Slice 15	307.8125	36.950214	0	686.44482	249.84548	0
Slice 16	325.83333	35.734368	0	696.37342	253.4592	0
Slice 17	342.5	34.705842	0	727.72191	264.86911	0
Slice 18	359.16667	33.765968	0	749.80992	272.90849	0
Slice 19	377.5	32.839273	0	751.19163	273.41139	0
Slice 20	397.5	31.945138	0	729.68839	265.58485	0
Slice 21	418.125	31.158464	0	667.49331	242.9477	0
Slice 22	439.375	30.487355	0	563.59273	205.13098	0
Slice 23	457.5	30.01937	0	481.70592	175.32662	0
Slice 24	472.5	29.718459	0	425.83061	154.98967	0
Slice 25	490	29.464668	0	350.22701	127.47221	0
Slice 26	510.41667	29.284737	0	291.07976	105.94437	0
Slice 27	531.25	29.236184	0	257.00032	93.540467	0
Slice 28	552.08333	29.32543	0	208.30431	75.81657	0
Slice 29	570.82693	29.517273	0	154.86174	56.365064	0
Slice 30	587.4808	29.786858	0	99.354152	36.161954	0
Slice 31	604.13467	30.144544	0	34.641607	12.608514	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 100
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:27:47
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:27:49

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (63.53878, 68.821) ft
Left-Zone Right Coordinate: (172.5, 58.05149) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (723.00849, 20.58649) ft
Right-Zone Right Coordinate: (810, 15.55556) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 3.204
Volume: 4,730.2192 ft³
Weight: 5,02,241.83 lbs
Resisting Moment: 6.4890622e+008 lbs-ft
Activating Moment: 2.0250949e+008 lbs-ft
Resisting Force: 1,81,497.56 lbs
Activating Force: 56,641.814 lbs
F of S Rank: 1
Exit: (723.00849, 20.586489) ft
Entry: (63.53878, 68.820996) ft
Radius: 3,564.4879 ft
Center: (652.16965, 3,584.3704) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	73.904085	67.116854	0	105.69922	38.471371	0
Slice 2	94.634695	63.771225	0	310.41268	112.98098	0
Slice 3	113.75	60.792695	0	432.49592	157.41564	0
Slice 4	131.25	58.163033	0	474.042	172.53718	0
Slice 5	148.74016	55.623496	0	520.67412	189.50988	0
Slice 6	166.22047	53.173794	0	572.44809	208.35407	0
Slice 7	185.80052	50.540438	0	590.81855	215.04037	0
Slice 8	207.48031	47.746877	0	573.42617	208.71006	0
Slice 9	229.1601	45.088318	0	542.3183	197.38772	0
Slice	251.11123	42.534575	0	563.01629	204.92117	0

10						
Slice 11	273.33369	40.088758	0	635.31151	231.23448	0
Slice 12	295.55615	37.78387	0	693.36399	252.36385	0
Slice 13	312.08369	36.147486	0	729.58452	265.54705	0
Slice 14	330	34.493911	0	802.82938	292.206	0
Slice 15	355	32.313705	0	918.6066	334.34546	0
Slice 16	377.5	30.495065	0	996.07231	362.54067	0
Slice 17	397.5	29.005895	0	1,038.457	377.96743	0
Slice 18	418.125	27.590447	0	1,043.8554	379.93229	0
Slice 19	439.375	26.255864	0	1,011.2899	368.07941	0
Slice 20	465	24.831693	0	991.17689	360.75888	0
Slice 21	490	23.587522	0	982.84279	357.72552	0
Slice 22	510.41667	22.717508	0	1,000.6835	364.21901	0
Slice 23	531.25	21.949353	0	1,045.6646	380.59078	0
Slice 24	552.08333	21.303176	0	1,077.0608	392.01807	0
Slice 25	573.33333	20.77091	0	1,096.7802	399.19536	0
Slice 26	595	20.357472	0	1,104.2086	401.89908	0
Slice 27	616.66667	20.075789	0	1,096.7761	399.19385	0
Slice 28	631.25	19.945872	0	1,084.6677	394.78676	0
Slice 29	643.75	19.903195	0	972.15723	353.8363	0
Slice 30	661.25	19.904817	0	751.5807	273.553	0
Slice 31	676.25	19.969331	0	554.99991	202.00345	0
Slice 32	687.60994	20.062363	0	412.42428	150.11016	0
Slice 33	707.86418	20.34983	0	176.8482	64.367481	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 103
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:33:49
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:33:50

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (34.18753, 69.39222) ft
Left-Zone Right Coordinate: (295, 44.55197) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (517.22354, 31.91602) ft
Right-Zone Right Coordinate: (815, 15.32408) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.636
Volume: 2,773.5066 ft³
Weight: 2,91,218.2 lbs
Resisting Moment: 2.7605273e+008 lbs-ft
Activating Moment: 1.0471379e+008 lbs-ft
Resisting Force: 1,04,730.15 lbs
Activating Force: 39,727.077 lbs
F of S Rank: 1
Exit: (517.22354, 31.916024) ft
Entry: (34.18753, 69.392222) ft
Radius: 2,623.2665 ft
Center: (477.75402, 2,654.8856) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	41.265648	68.197832	0	109.53161	39.866248	0
Slice 2	55.421883	65.848835	0	324.36605	118.05959	0
Slice 3	69.583333	63.578496	0	496.42513	180.68397	0
Slice 4	83.75	61.386663	0	625.88287	227.80274	0
Slice 5	97.916667	59.274001	0	747.35516	272.01503	0
Slice 6	113.75	57.011422	0	817.94555	297.70783	0
Slice 7	131.25	54.619406	0	835.65258	304.15267	0
Slice 8	148.74016	52.348471	0	855.57664	311.40443	0
Slice 9	166.22047	50.198171	0	877.76815	319.48148	0
Slice	183.09055	48.233775	0	866.80792	315.49228	0

10						
Slice 11	199.35039	46.447023	0	823.35424	299.67644	0
Slice 12	215.61024	44.762784	0	769.37689	280.03029	0
Slice 13	231.87008	43.180861	0	704.78117	256.51937	0
Slice 14	247.75	41.733316	0	677.95199	246.75434	0
Slice 15	263.25	40.415329	0	689.5273	250.96741	0
Slice 16	278.75	39.189855	0	691.51355	251.69035	0
Slice 17	294.25	38.056764	0	683.83616	248.89601	0
Slice 18	309.75	37.015936	0	666.42225	242.55786	0
Slice 19	325.83333	36.035153	0	667.78345	243.0533	0
Slice 20	342.5	35.121496	0	687.21123	250.12443	0
Slice 21	359.16667	34.314156	0	695.32413	253.07729	0
Slice 22	377.5	33.554598	0	678.80993	247.06661	0
Slice 23	397.5	32.866066	0	635.03933	231.13541	0
Slice 24	414.58333	32.389365	0	568.52268	206.92533	0
Slice 25	428.75	32.086398	0	483.43621	175.95639	0
Slice 26	442.91667	31.859978	0	390.12547	141.99406	0
Slice 27	457.5	31.707992	0	303.49899	110.4646	0
Slice 28	472.5	31.635062	0	223.13262	81.213634	0
Slice 29	490	31.666724	0	117.14194	42.636178	0
Slice 30	508.61177	31.814715	0	26.798082	9.7537042	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 106
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:42:48
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:42:55

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (12.5127, 69.77755) ft
Left-Zone Right Coordinate: (147.5, 60.8324) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (438.98291, 35.86408) ft
Right-Zone Right Coordinate: (585, 30.76628) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 2.514
Volume: 1,912.0951 ft³
Weight: 2,00,769.99 lbs
Resisting Moment: 1.5576157e+008 lbs-ft
Activating Moment: 6,19,47,934 lbs-ft
Resisting Force: 72,092.574 lbs
Activating Force: 28,672.126 lbs
F of S Rank: 1
Exit: (438.98291, 35.864085) ft
Entry: (46.36065, 69.175811) ft
Radius: 2,148.9251 ft
Center: (423.5778, 2,184.734) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	54.430325	67.768656	0	129.22892	47.035481	0
Slice 2	69.583333	65.178487	0	331.90425	120.80327	0
Slice 3	83.75	62.861046	0	473.91379	172.49051	0
Slice 4	97.916667	60.640617	0	606.12343	220.61089	0
Slice 5	110.83333	58.696521	0	681.86994	248.18036	0
Slice 6	122.5	57.012994	0	702.72788	255.77203	0
Slice 7	134.16667	55.39472	0	717.13069	261.01423	0
Slice 8	145.82677	53.842387	0	734.50183	267.3368	0
Slice 9	157.48031	52.355779	0	754.86882	274.74978	0
Slice	169.13386	50.933851	0	768.81548	279.82595	0

10						
Slice 11	181.46457	49.501562	0	759.30856	276.36572	0
Slice 12	194.47244	48.066694	0	725.43842	264.03799	0
Slice 13	207.48031	46.71193	0	683.31433	248.70608	0
Slice 14	220.48819	45.437116	0	632.85537	230.34052	0
Slice 15	233.49606	44.242111	0	573.98116	208.91206	0
Slice 16	246.45833	43.130412	0	545.68993	198.61489	0
Slice 17	259.375	42.10134	0	548.17867	199.52072	0
Slice 18	272.29167	41.150594	0	542.43479	197.43012	0
Slice 19	285.20833	40.27807	0	528.3961	192.32045	0
Slice 20	298.125	39.483671	0	506.00926	184.17231	0
Slice 21	311.04167	38.767312	0	475.23353	172.97086	0
Slice 22	323.75	38.137975	0	459.35872	167.1929	0
Slice 23	336.25	37.59312	0	458.70318	166.9543	0
Slice 24	348.75	37.121158	0	450.20966	163.86292	0
Slice 25	361.25	36.72204	0	433.86867	157.91528	0
Slice 26	374.16667	36.387356	0	400.82513	145.88842	0
Slice 27	387.5	36.122084	0	350.56524	127.59531	0
Slice 28	400.83333	35.939577	0	291.48403	106.09151	0
Slice 29	415.37073	35.838952	0	197.76079	71.979042	0
Slice 30	431.11218	35.836489	0	67.872502	24.70357	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.1g)

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 98
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:24:27
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:24:29

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (0.17917, 69.99681) ft
Left-Zone Right Coordinate: (102.5, 66.27451) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (612.4616, 30.34542) ft
Right-Zone Right Coordinate: (677.5, 25.02924) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 1.998
Volume: 3,255.2947 ft³
Weight: 3,41,805.94 lbs
Resisting Moment: 3.878076e+008 lbs-ft
Activating Moment: 1.9411373e+008 lbs-ft
Resisting Force: 1,22,604.41 lbs
Activating Force: 61,369.021 lbs
F of S Rank: 1
Exit: (612.4616, 30.345416) ft
Entry: (25.779131, 69.541705) ft
Radius: 3,149.7994 ft
Center: (528.17393, 3,179.0169) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	34.959348	68.086251	0	131.72149	47.9427	0
Slice 2	53.319783	65.230808	0	389.38633	141.72504	0
Slice 3	73.125	62.279552	0	602.53408	219.30447	0
Slice 4	94.375	59.250893	0	769.55173	280.09392	0
Slice 5	113.75	56.612151	0	854.61424	311.05415	0
Slice 6	131.25	54.339297	0	860.07384	313.04128	0
Slice 7	148.74016	52.167204	0	869.72865	316.55534	0
Slice 8	166.22047	50.095551	0	883.62074	321.61165	0
Slice 9	185.80052	47.899197	0	858.5294	312.47915	0
Slice	207.48031	45.60448	0	791.61786	288.12534	0

10						
Slice 11	229.1601	43.461338	0	709.15376	258.11086	0
Slice 12	249.6875	41.567738	0	674.77505	245.59803	0
Slice 13	269.0625	39.90822	0	690.28582	251.24349	0
Slice 14	288.4375	38.369105	0	693.46106	252.39918	0
Slice 15	307.8125	36.950214	0	684.19265	249.02576	0
Slice 16	325.83333	35.734368	0	694.54592	252.79404	0
Slice 17	342.5	34.705842	0	726.23563	264.32815	0
Slice 18	359.16667	33.765968	0	748.69067	272.50112	0
Slice 19	377.5	32.839273	0	750.49702	273.15858	0
Slice 20	397.5	31.945138	0	729.43178	265.49146	0
Slice 21	418.125	31.158464	0	667.62511	242.99567	0
Slice 22	439.375	30.487355	0	564.00632	205.28151	0
Slice 23	457.5	30.01937	0	482.25326	175.52583	0
Slice 24	472.5	29.718459	0	426.43114	155.20824	0
Slice 25	490	29.464668	0	350.8255	127.69004	0
Slice 26	510.41667	29.284737	0	291.6397	106.14817	0
Slice 27	531.25	29.236184	0	257.50423	93.723876	0
Slice 28	552.08333	29.32543	0	208.70451	75.962231	0
Slice 29	570.82693	29.517273	0	155.14281	56.467366	0
Slice 30	587.4808	29.786858	0	99.520991	36.222678	0
Slice 31	604.13467	30.144544	0	34.695323	12.628065	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 101
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:29:09
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:29:10

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (63.53878, 68.821) ft
Left-Zone Right Coordinate: (172.5, 58.05149) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (723.00849, 20.58649) ft
Right-Zone Right Coordinate: (810, 15.55556) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.218
Volume: 4,730.2192 ft³
Weight: 5,02,241.83 lbs
Resisting Moment: 6.4686483e+008 lbs-ft
Activating Moment: 2.9164521e+008 lbs-ft
Resisting Force: 1,80,928.66 lbs
Activating Force: 81,573.964 lbs
F of S Rank: 1
Exit: (723.00849, 20.586489) ft
Entry: (63.53878, 68.820996) ft
Radius: 3,564.4879 ft
Center: (652.16965, 3,584.3704) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	73.904085	67.116854	0	104.80992	38.14769	0
Slice 2	94.634695	63.771225	0	307.76672	112.01792	0
Slice 3	113.75	60.792695	0	428.75425	156.05379	0
Slice 4	131.25	58.163033	0	469.88268	171.02331	0
Slice 5	148.74016	55.623496	0	516.07933	187.83752	0
Slice 6	166.22047	53.173794	0	567.4082	206.5197	0
Slice 7	185.80052	50.540438	0	585.64268	213.15651	0
Slice 8	207.48031	47.746877	0	568.44987	206.89883	0
Slice 9	229.1601	45.088318	0	537.6965	195.70552	0
Slice	251.11123	42.534575	0	558.42976	203.25181	0

10						
Slice 11	273.33369	40.088758	0	630.49071	229.47985	0
Slice 12	295.55615	37.78387	0	688.50858	250.59663	0
Slice 13	312.08369	36.147486	0	724.81067	263.80951	0
Slice 14	330	34.493911	0	798.02202	290.45626	0
Slice 15	355	32.313705	0	913.82999	332.60692	0
Slice 16	377.5	30.495065	0	991.59543	360.91122	0
Slice 17	397.5	29.005895	0	1,034.4426	376.5063	0
Slice 18	418.125	27.590447	0	1,040.5005	378.7112	0
Slice 19	439.375	26.255864	0	1,008.7255	367.14606	0
Slice 20	465	24.831693	0	989.44808	360.12965	0
Slice 21	490	23.587522	0	981.83719	357.35951	0
Slice 22	510.41667	22.717508	0	1,000.1731	364.03323	0
Slice 23	531.25	21.949353	0	1,045.5862	380.56227	0
Slice 24	552.08333	21.303176	0	1,077.3793	392.13399	0
Slice 25	573.33333	20.77091	0	1,097.4386	399.43499	0
Slice 26	595	20.357472	0	1,105.1258	402.2329	0
Slice 27	616.66667	20.075789	0	1,097.8483	399.58409	0
Slice 28	631.25	19.945872	0	1,085.7856	395.19364	0
Slice 29	643.75	19.903195	0	973.21359	354.22078	0
Slice 30	661.25	19.904817	0	752.44382	273.86715	0
Slice 31	676.25	19.969331	0	555.64782	202.23927	0
Slice 32	687.60994	20.062363	0	412.90299	150.2844	0
Slice 33	707.86418	20.34983	0	177.05797	64.443831	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 104
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:35:14
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:35:16

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (34.18753, 69.39222) ft
Left-Zone Right Coordinate: (295, 44.55197) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (517.22354, 31.91602) ft
Right-Zone Right Coordinate: (815, 15.32408) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.926
Volume: 2,773.5066 ft³
Weight: 2,91,218.2 lbs
Resisting Moment: 2.748491e+008 lbs-ft
Activating Moment: 1.4267858e+008 lbs-ft
Resisting Force: 1,04,274.96 lbs
Activating Force: 54,131.027 lbs
F of S Rank: 1
Exit: (517.22354, 31.916024) ft
Entry: (34.18753, 69.392222) ft
Radius: 2,623.2665 ft
Center: (477.75402, 2,654.8856) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	41.265648	68.197832	0	108.58931	39.523278	0
Slice 2	55.421883	65.848835	0	321.55206	117.03538	0
Slice 3	69.583333	63.578496	0	492.08137	179.10297	0
Slice 4	83.75	61.386663	0	620.38498	225.80167	0
Slice 5	97.916667	59.274001	0	740.81642	269.63512	0
Slice 6	113.75	57.011422	0	810.85624	295.12754	0
Slice 7	131.25	54.619406	0	828.54109	301.56429	0
Slice 8	148.74016	52.348471	0	848.53822	308.84265	0
Slice 9	166.22047	50.198171	0	870.90234	316.98253	0
Slice	183.09055	48.233775	0	860.42972	313.17081	0

10						
Slice 11	199.35039	46.447023	0	817.71491	297.62389	0
Slice 12	215.61024	44.762784	0	764.55765	278.27623	0
Slice 13	231.87008	43.180861	0	700.82856	255.08074	0
Slice 14	247.75	41.733316	0	674.64823	245.55188	0
Slice 15	263.25	40.415329	0	686.69727	249.93737	0
Slice 16	278.75	39.189855	0	689.20583	250.85041	0
Slice 17	294.25	38.056764	0	682.07112	248.25358	0
Slice 18	309.75	37.015936	0	665.19252	242.11028	0
Slice 19	325.83333	36.035153	0	667.01943	242.77522	0
Slice 20	342.5	35.121496	0	686.85611	249.99518	0
Slice 21	359.16667	34.314156	0	695.33915	253.08275	0
Slice 22	377.5	33.554598	0	679.15913	247.19371	0
Slice 23	397.5	32.866066	0	635.62637	231.34908	0
Slice 24	414.58333	32.389365	0	569.19144	207.16874	0
Slice 25	428.75	32.086398	0	484.08096	176.19106	0
Slice 26	442.91667	31.859978	0	390.68422	142.19743	0
Slice 27	457.5	31.707992	0	303.9381	110.62442	0
Slice 28	472.5	31.635062	0	223.43727	81.324514	0
Slice 29	490	31.666724	0	117.28734	42.689099	0
Slice 30	508.61177	31.814715	0	26.826236	9.7639514	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 107
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 29-06-2020
Time: 12:44:55
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\With Water Table\
Last Solved Date: 29-06-2020
Last Solved Time: 12:44:57

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 20 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (12.5127, 69.77755) ft
Left-Zone Right Coordinate: (147.5, 60.8324) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (438.98291, 35.86408) ft
Right-Zone Right Coordinate: (585, 30.76628) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	35
Coordinate 2	480	16.66667
Coordinate 3	900	8.33333

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556
Point 30	25	58.88889

Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 1.859
Volume: 1,912.0951 ft³
Weight: 2,00,769.99 lbs
Resisting Moment: 1.5503083e+008 lbs-ft
Activating Moment: 8,33,74,671 lbs-ft
Resisting Force: 71,755.441 lbs
Activating Force: 38,589.77 lbs
F of S Rank: 1
Exit: (438.98291, 35.864085) ft
Entry: (46.36065, 69.175811) ft
Radius: 2,148.9251 ft
Center: (423.5778, 2,184.734) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	54.430325	67.768656	0	128.06694	46.612554	0
Slice 2	69.583333	65.178487	0	328.89253	119.70709	0
Slice 3	83.75	62.861046	0	469.58409	170.91463	0
Slice 4	97.916667	60.640617	0	600.60736	218.6032	0
Slice 5	110.83333	58.696521	0	675.72457	245.94363	0
Slice 6	122.5	57.012994	0	696.47844	253.49742	0
Slice 7	134.16667	55.39472	0	710.89422	258.74434	0
Slice 8	145.82677	53.842387	0	728.32166	265.0874	0
Slice 9	157.48031	52.355779	0	748.79142	272.53779	0
Slice	169.13386	50.933851	0	762.95443	277.6927	0

10						
Slice 11	181.46457	49.501562	0	753.90006	274.39718	0
Slice 12	194.47244	48.066694	0	720.6926	262.31065	0
Slice 13	207.48031	46.71193	0	679.28521	247.2396	0
Slice 14	220.48819	45.437116	0	629.5685	229.14419	0
Slice 15	233.49606	44.242111	0	571.43332	207.98472	0
Slice 16	246.45833	43.130412	0	543.70388	197.89203	0
Slice 17	259.375	42.10134	0	546.61582	198.95189	0
Slice 18	272.29167	41.150594	0	541.29983	197.01703	0
Slice 19	285.20833	40.27807	0	527.6707	192.05643	0
Slice 20	298.125	39.483671	0	505.65477	184.04328	0
Slice 21	311.04167	38.767312	0	475.19509	172.95687	0
Slice 22	323.75	38.137975	0	459.54763	167.26166	0
Slice 23	336.25	37.59312	0	459.04777	167.07972	0
Slice 24	348.75	37.121158	0	450.65887	164.02642	0
Slice 25	361.25	36.72204	0	434.36675	158.09657	0
Slice 26	374.16667	36.387356	0	401.31434	146.06648	0
Slice 27	387.5	36.122084	0	350.98855	127.74938	0
Slice 28	400.83333	35.939577	0	291.80161	106.2071	0
Slice 29	415.37073	35.838952	0	197.93847	72.043713	0
Slice 30	431.11218	35.836489	0	67.918539	24.720326	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (STATIC) ADDITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 110
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:23:56
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:25:15

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (63.93757, 68.79493) ft
Left-Zone Right Coordinate: (172.5, 58.05149) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (615.86238, 30.2933) ft
Right-Zone Right Coordinate: (775, 17.37037) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.724
Volume: 2,042.6351 ft³
Weight: 2,14,476.68 lbs
Resisting Moment: 1.3523224e+008 lbs-ft
Activating Moment: 4,96,40,335 lbs-ft
Resisting Force: 45,312.572 lbs
Activating Force: 16,633.194 lbs
F of S Rank: 1
Exit: (615.86238, 30.293297) ft
Entry: (63.93757, 68.794931) ft
Radius: 2,972.4794 ft
Center: (545.85626, 3,001.9482) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	74.203178	67.145142	0	101.41441	21.556299	0
Slice 2	94.734393	63.919113	0	296.48278	63.019361	0
Slice 3	113.75	61.057232	0	408.1283	86.750349	0
Slice 4	131.25	58.539073	0	438.60743	93.228887	0
Slice 5	148.74016	56.128323	0	472.4428	100.42082	0
Slice 6	166.22047	53.824605	0	509.69408	108.33882	0
Slice 7	183.09055	51.699453	0	514.14526	109.28495	0
Slice 8	199.35039	49.745565	0	486.51322	103.41158	0
Slice 9	215.61024	47.882465	0	449.52116	95.548672	0

Slice 10	231.87008	46.109984	0	403.15163	85.692525	0
Slice 11	250.68978	44.179605	0	401.16465	85.270178	0
Slice 12	272.06934	42.124017	0	440.28087	93.584587	0
Slice 13	291.44434	40.389099	0	462.53344	98.314519	0
Slice 14	308.81478	38.948176	0	470.61673	100.03267	0
Slice 15	325.83333	37.634821	0	498.24106	105.90441	0
Slice 16	342.5	36.444839	0	545.88477	116.03139	0
Slice 17	359.16667	35.348969	0	583.75762	124.08151	0
Slice 18	376.04636	34.335516	0	602.10783	127.98197	0
Slice 19	393.13908	33.406816	0	600.61431	127.66451	0
Slice 20	404.59272	32.828825	0	594.92601	126.45543	0
Slice 21	418.125	32.233509	0	553.44111	117.63754	0
Slice 22	439.375	31.395654	0	466.93593	99.250295	0
Slice 23	458.125	30.774884	0	397.46548	84.483896	0
Slice 24	474.375	30.339528	0	348.47397	74.07043	0
Slice 25	491.25	29.983313	0	287.40123	61.089016	0
Slice 26	510	29.701905	0	247.15761	52.534972	0
Slice 27	530	29.527924	0	227.97961	48.458561	0
Slice 28	550	29.48852	0	194.56711	41.356516	0
Slice 29	561.25	29.508934	0	171.27105	36.404785	0
Slice 30	571.39373	29.591819	0	145.77599	30.985643	0
Slice 31	589.18119	29.797875	0	95.259804	20.248096	0
Slice 32	606.96865	30.110407	0	33.600333	7.1419712	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 114
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:30:23
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:30:25

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (12.50934, 69.77761) ft
Left-Zone Right Coordinate: (254.09093, 47.77778) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (589.08127, 30.70373) ft
Right-Zone Right Coordinate: (842.5, 14.05093) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.579
Volume: 3,610.7035 ft³
Weight: 3,79,123.86 lbs
Resisting Moment: 2.4909419e+008 lbs-ft
Activating Moment: 9,65,76,317 lbs-ft
Resisting Force: 80,041.66 lbs
Activating Force: 31,033.157 lbs
F of S Rank: 1
Exit: (589.08127, 30.703735) ft
Entry: (12.50934, 69.777612) ft
Radius: 3,098.6679 ft
Center: (509.39642, 3,128.3469) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	20.841117	68.447329	0	122.4369	26.024767	0
Slice 2	37.50467	65.833232	0	362.38853	77.028061	0
Slice 3	54.168223	63.311957	0	592.61415	125.96403	0
Slice 4	73.125	60.563509	0	789.75022	167.86659	0
Slice 5	94.375	57.61651	0	951.00079	202.14146	0
Slice 6	113.75	55.054051	0	1,029.4985	218.82666	0
Slice 7	131.25	52.851749	0	1,027.6918	218.44264	0
Slice 8	148.6073	50.76685	0	1,029.842	218.89967	0
Slice 9	166.08761	48.768648	0	1,036.0714	220.22378	0

Slice 10	185.80052	46.641243	0	1,001.5733	212.89098	0
Slice 11	207.48031	44.441763	0	923.3792	196.27031	0
Slice 12	229.1601	42.396156	0	829.17221	176.24599	0
Slice 13	247.4981	40.775767	0	783.1478	166.4632	0
Slice 14	262.49429	39.540396	0	789.59495	167.83359	0
Slice 15	281.86929	38.066583	0	785.19362	166.89806	0
Slice 16	305.6231	36.409382	0	764.11759	162.41821	0
Slice 17	329.43801	34.932148	0	766.58908	162.94354	0
Slice 18	353.31404	33.635561	0	792.56648	168.46521	0
Slice 19	366.37603	32.981533	0	800.93405	170.24379	0
Slice 20	377.5	32.503556	0	788.04279	167.50367	0
Slice 21	397.5	31.716164	0	754.79198	160.43599	0
Slice 22	414.9679	31.127132	0	697.22937	148.20068	0
Slice 23	429.90371	30.707806	0	618.40627	131.44631	0
Slice 24	443.68581	30.382232	0	539.0809	114.58518	0
Slice 25	458.125	30.113845	0	467.76468	99.426452	0
Slice 26	474.375	29.887552	0	396.53312	84.285716	0
Slice 27	491.25	29.744473	0	312.79462	66.486549	0
Slice 28	510	29.695178	0	247.92797	52.698716	0
Slice 29	530	29.76362	0	203.09081	43.168283	0
Slice 30	550	29.961161	0	144.65435	30.747232	0
Slice 31	561.25	30.113129	0	107.49558	22.848892	0
Slice 32	575.79063	30.418892	0	51.457781	10.937689	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 122
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:52:24
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:52:26

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (26.11806, 69.53568) ft
Left-Zone Right Coordinate: (117.5, 64.52381) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (599.7058, 30.54091) ft
Right-Zone Right Coordinate: (720, 20.87301) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.589
Volume: 3,200.073 ft³
Weight: 3,36,007.66 lbs
Resisting Moment: 2.1968382e+008 lbs-ft
Activating Moment: 8,48,50,372 lbs-ft
Resisting Force: 70,942.476 lbs
Activating Force: 27,400.903 lbs
F of S Rank: 1
Exit: (599.7058, 30.540907) ft
Entry: (26.11806, 69.535679) ft
Radius: 3,083.3321 ft
Center: (521.13552, 3,112.8718) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	35.213545	68.084118	0	133.58955	28.395335	0
Slice 2	53.404515	65.236642	0	394.87458	83.933184	0
Slice 3	73.125	62.280337	0	612.10991	130.10798	0
Slice 4	94.375	59.235052	0	783.42088	166.52125	0
Slice 5	113.75	56.583832	0	870.9436	185.12478	0
Slice 6	131.25	54.302118	0	877.19589	186.45374	0
Slice 7	148.74016	52.123329	0	887.36102	188.61441	0
Slice 8	166.22047	50.047136	0	901.4755	191.61453	0
Slice 9	180.80571	48.38521	0	890.64073	189.31153	0

Slice 10	195.54233	46.791868	0	847.54433	180.15111	0
Slice 11	213.3254	44.955553	0	786.6037	167.19778	0
Slice 12	231.10847	43.223356	0	714.83771	151.94344	0
Slice 13	249.6875	41.527075	0	686.34462	145.88705	0
Slice 14	269.0625	39.876235	0	700.23037	148.83856	0
Slice 15	288.4375	38.348378	0	701.34342	149.07515	0
Slice 16	307.8125	36.94332	0	689.63007	146.5854	0
Slice 17	325.83333	35.74256	0	697.59348	148.27807	0
Slice 18	342.5	34.730039	0	726.95465	154.51898	0
Slice 19	359.16667	33.808066	0	746.81594	158.74063	0
Slice 20	377.5	32.903351	0	745.4632	158.45309	0
Slice 21	397.5	32.035692	0	720.71125	153.1919	0
Slice 22	420.45956	31.211006	0	642.86937	136.6461	0
Slice 23	441.70956	30.573994	0	534.98095	113.71371	0
Slice 24	458.125	30.194286	0	459.17509	97.600678	0
Slice 25	474.375	29.904974	0	394.65319	83.886125	0
Slice 26	491.25	29.696925	0	317.82104	67.554947	0
Slice 27	510	29.575995	0	260.54603	55.380769	0
Slice 28	530	29.568629	0	223.71934	47.553015	0
Slice 29	550	29.690998	0	173.19844	36.814464	0
Slice 30	561.25	29.800881	0	140.45789	29.855245	0
Slice 31	571.80145	29.97001	0	105.2213	22.365478	0
Slice 32	590.40435	30.331891	0	37.019489	7.8687352	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 126
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:59:44
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:59:46

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (64.7782, 68.73999) ft
Left-Zone Right Coordinate: (302.5, 43.96058) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (668.1743, 26.11996) ft
Right-Zone Right Coordinate: (752.5, 18.53703) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 3.207
Volume: 3,141.7559 ft³
Weight: 3,29,884.37 lbs
Resisting Moment: 2.2783092e+008 lbs-ft
Activating Moment: 7,10,40,461 lbs-ft
Resisting Force: 69,812.513 lbs
Activating Force: 21,768.484 lbs
F of S Rank: 1
Exit: (668.1743, 26.119962) ft
Entry: (64.7782, 68.739988) ft
Radius: 3,252.7096 ft
Center: (594.66289, 3,277.9988) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	74.83365	67.112052	0	100.75767	21.416704	0
Slice 2	94.94455	63.920716	0	295.4001	62.789229	0
Slice 3	113.75	61.049247	0	409.59271	87.061618	0
Slice 4	131.25	58.481716	0	445.15385	94.620371	0
Slice 5	148.74016	56.012616	0	484.9731	103.08421	0
Slice 6	166.22047	53.641614	0	529.10344	112.46441	0
Slice 7	185.80052	51.106784	0	537.48381	114.24571	0
Slice 8	207.48031	48.433757	0	507.48399	107.86905	0
Slice 9	229.1601	45.908359	0	462.279	98.260434	0

Slice 10	247.92316	43.83307	0	459.37525	97.643225	0
Slice 11	266.12194	41.940383	0	507.3726	107.84538	0
Slice 12	286.67316	39.919787	0	549.58201	116.81726	0
Slice 13	307.22439	38.030807	0	578.23328	122.90728	0
Slice 14	330	36.098713	0	638.16174	135.64547	0
Slice 15	355	34.154706	0	726.22153	154.36315	0
Slice 16	377.5	32.562044	0	777.66126	165.297	0
Slice 17	397.5	31.285641	0	795.97691	169.19012	0
Slice 18	418.125	30.100856	0	775.63338	164.86596	0
Slice 19	439.375	29.015508	0	715.6697	152.12029	0
Slice 20	462.32605	28.005771	0	663.21078	140.9698	0
Slice 21	478.57605	27.363733	0	636.35291	135.26099	0
Slice 22	487.40164	27.061877	0	616.80001	131.10489	0
Slice 23	496.15164	26.783548	0	595.18247	126.50994	0
Slice 24	510	26.406569	0	593.91603	126.24075	0
Slice 25	530	25.947359	0	605.09242	128.61636	0
Slice 26	550	25.611198	0	603.19342	128.21272	0
Slice 27	561.25	25.461033	0	597.97186	127.10284	0
Slice 28	574.36061	25.374161	0	585.60328	124.47382	0
Slice 29	598.41592	25.314199	0	552.89914	117.52234	0
Slice 30	622.8053	25.433783	0	500.59625	106.40502	0
Slice 31	643.29358	25.663306	0	354.35448	75.32037	0
Slice 32	659.88073	25.953639	0	119.55081	25.411309	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 131
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 12:07:51
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 12:07:52

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (123.479, 63.76457) ft
Left-Zone Right Coordinate: (227.80513, 50.55556) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (717.08249, 21.15087) ft
Right-Zone Right Coordinate: (865, 13.00926) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 21
F of S: 3.699
Volume: 5,909.8163 ft³
Weight: 6,20,530.71 lbs
Resisting Moment: 5.2552436e+008 lbs-ft
Activating Moment: 1.420671e+008 lbs-ft
Resisting Force: 1,31,463.81 lbs
Activating Force: 35,539.208 lbs
F of S Rank: 1
Exit: (865, 13.009262) ft
Entry: (123.479, 63.764573) ft
Radius: 3,988.0222 ft
Center: (765.38773, 3,999.7873) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	131.7395	62.435189	0	29.15993	6.1981345	0
Slice 2	157.48031	58.409689	0	136.3781	28.98806	0
Slice 3	185.80052	54.121277	0	225.85295	48.006526	0
Slice 4	207.48031	50.997461	0	242.42141	51.528261	0
Slice 5	229.1601	47.995049	0	246.40629	52.375274	0
Slice 6	250.41474	45.167945	0	300.82542	63.942416	0
Slice 7	271.24423	42.511246	0	406.19408	86.339216	0
Slice 8	299.57949	39.103164	0	528.23649	112.28013	0
Slice 9	327.8456	35.853613	0	671.58137	142.74903	0

Slice 10	352.8456	33.187542	0	833.70807	177.21012	0
Slice 11	377.5	30.686157	0	969.0041	205.96818	0
Slice 12	397.5	28.782454	0	1,052.1501	223.64141	0
Slice 13	418.125	26.927301	0	1,101.4846	234.12779	0
Slice 14	439.375	25.127091	0	1,116.2875	237.27424	0
Slice 15	466.25	23.033248	0	1,154.867	245.47457	0
Slice 16	491.25	21.207992	0	1,201.7109	255.43154	0
Slice 17	515	19.661445	0	1,285.9803	273.34355	0
Slice 18	545	17.887591	0	1,417.5046	301.2999	0
Slice 19	561.25	16.993312	0	1,481.858	314.97863	0
Slice 20	573.33333	16.406926	0	1,524.2704	323.99367	0
Slice 21	595	15.421331	0	1,594.0008	338.81532	0
Slice 22	616.66667	14.553775	0	1,651.3091	350.99658	0
Slice 23	631.25	14.023293	0	1,684.2291	357.99394	0
Slice 24	652.5	13.401519	0	1,529.4341	325.09124	0
Slice 25	676.25	12.766217	0	1,305.0715	277.4015	0
Slice 26	695.625	12.396853	0	1,136.0532	241.47555	0
Slice 27	721.875	12.024006	0	912.65968	193.9918	0
Slice 28	747.5	11.824724	0	734.02048	156.02087	0
Slice 29	772.5	11.790949	0	601.10435	127.76867	0
Slice 30	797.5	11.913898	0	451.61222	95.993141	0
Slice 31	816.67491	12.100402	0	331.1365	70.385236	0
Slice 32	833.76236	12.364801	0	219.99001	46.760321	0
Slice 33	854.58745	12.776306	0	75.213231	15.987066	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.05g) ADDITIONAL TRIALS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 111
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:27:20
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:27:22

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (63.93757, 68.79493) ft
Left-Zone Right Coordinate: (172.5, 58.05149) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (615.86238, 30.2933) ft
Right-Zone Right Coordinate: (775, 17.37037) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.656
Volume: 2,042.6351 ft^3
Weight: 2,14,476.68 lbs
Resisting Moment: 1.3470706e+008 lbs-ft
Activating Moment: 8,13,65,296 lbs-ft
Resisting Force: 45,137.059 lbs
Activating Force: 27,263.753 lbs
F of S Rank: 1
Exit: (615.86238, 30.293297) ft
Entry: (63.93757, 68.794931) ft
Radius: 2,972.4794 ft
Center: (545.85626, 3,001.9482) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	74.203178	67.145142	0	100.58904	21.380861	0
Slice 2	94.734393	63.919113	0	294.10063	62.513019	0
Slice 3	113.75	61.057232	0	404.8872	86.061431	0
Slice 4	131.25	58.539073	0	435.16594	92.497377	0
Slice 5	148.74016	56.128323	0	468.8087	99.648366	0
Slice 6	166.22047	53.824605	0	505.88167	107.52847	0
Slice 7	183.09055	51.699453	0	510.41591	108.49225	0
Slice 8	199.35039	49.745565	0	483.09726	102.68549	0
Slice	215.61024	47.882465	0	446.48359	94.903018	0

9						
Slice 10	231.87008	46.109984	0	400.54474	85.138412	0
Slice 11	250.68978	44.179605	0	398.75964	84.758979	0
Slice 12	272.06934	42.124017	0	437.92117	93.083018	0
Slice 13	291.44434	40.389099	0	460.32364	97.84481	0
Slice 14	308.81478	38.948176	0	468.61724	99.607668	0
Slice 15	325.83333	37.634821	0	496.38819	105.51057	0
Slice 16	342.5	36.444839	0	544.13286	115.65901	0
Slice 17	359.16667	35.348969	0	582.17008	123.74407	0
Slice 18	376.04636	34.335516	0	600.7581	127.69508	0
Slice 19	393.13908	33.406816	0	599.54734	127.43772	0
Slice 20	404.59272	32.828825	0	594.04697	126.26858	0
Slice 21	418.125	32.233509	0	552.81686	117.50485	0
Slice 22	439.375	31.395654	0	466.65974	99.191591	0
Slice 23	458.125	30.774884	0	397.40506	84.471053	0
Slice 24	474.375	30.339528	0	348.53923	74.084299	0
Slice 25	491.25	29.983313	0	287.55323	61.121327	0
Slice 26	510	29.701905	0	247.35994	52.577979	0
Slice 27	530	29.527924	0	228.20815	48.50714	0
Slice 28	550	29.48852	0	194.78791	41.403448	0
Slice 29	561.25	29.508934	0	171.47319	36.447751	0
Slice 30	571.39373	29.591819	0	145.95326	31.023322	0
Slice 31	589.18119	29.797875	0	95.378136	20.273249	0
Slice 32	606.96865	30.110407	0	33.642882	7.1510153	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 115
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:32:42
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:32:44

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (12.50934, 69.77761) ft
Left-Zone Right Coordinate: (254.09093, 47.77778) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (589.08127, 30.70373) ft
Right-Zone Right Coordinate: (842.5, 14.05093) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.601
Volume: 3,610.7035 ft^3
Weight: 3,79,123.86 lbs
Resisting Moment: 2.4807322e+008 lbs-ft
Activating Moment: 1.5498909e+008 lbs-ft
Resisting Force: 79,714.528 lbs
Activating Force: 49,803.763 lbs
F of S Rank: 1
Exit: (589.08127, 30.703735) ft
Entry: (12.50934, 69.777612) ft
Radius: 3,098.6679 ft
Center: (509.39642, 3,128.3469) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	20.841117	68.447329	0	121.43922	25.812704	0
Slice 2	37.50467	65.833232	0	359.41665	76.396367	0
Slice 3	54.168223	63.311957	0	587.73322	124.92655	0
Slice 4	73.125	60.563509	0	783.24751	166.4844	0
Slice 5	94.375	57.61651	0	943.25372	200.49477	0
Slice 6	113.75	55.054051	0	1,021.2639	217.07633	0
Slice 7	131.25	52.851749	0	1,019.6537	216.73409	0
Slice 8	148.6073	50.76685	0	1,022.0563	217.24478	0
Slice	166.08761	48.768648	0	1,028.5977	218.63518	0

9						
Slice 10	185.80052	46.641243	0	994.7987	211.45099	0
Slice 11	207.48031	44.441763	0	917.6533	195.05323	0
Slice 12	229.1601	42.396156	0	824.56799	175.26734	0
Slice 13	247.4981	40.775767	0	779.30338	165.64605	0
Slice 14	262.49429	39.540396	0	786.18448	167.10867	0
Slice 15	281.86929	38.066583	0	782.4084	166.30604	0
Slice 16	305.6231	36.409382	0	762.13303	161.99638	0
Slice 17	329.43801	34.932148	0	765.30513	162.67063	0
Slice 18	353.31404	33.635561	0	791.90233	168.32404	0
Slice 19	366.37603	32.981533	0	800.59909	170.17259	0
Slice 20	377.5	32.503556	0	787.97719	167.48972	0
Slice 21	397.5	31.716164	0	755.14228	160.51045	0
Slice 22	414.9679	31.127132	0	697.8513	148.33287	0
Slice 23	429.90371	30.707806	0	619.16948	131.60854	0
Slice 24	443.68581	30.382232	0	539.90138	114.75958	0
Slice 25	458.125	30.113845	0	468.59155	99.60221	0
Slice 26	474.375	29.887552	0	397.31634	84.452194	0
Slice 27	491.25	29.744473	0	313.4712	66.63036	0
Slice 28	510	29.695178	0	248.48252	52.81659	0
Slice 29	530	29.76362	0	203.52281	43.260108	0
Slice 30	550	29.961161	0	144.93461	30.806802	0
Slice 31	561.25	30.113129	0	107.68553	22.889267	0
Slice 32	575.79063	30.418892	0	51.544724	10.956169	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 123
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:55:25
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:55:26

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (26.11806, 69.53568) ft
Left-Zone Right Coordinate: (117.5, 64.52381) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (599.7058, 30.54091) ft
Right-Zone Right Coordinate: (720, 20.87301) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.604
Volume: 3,200.073 ft^3
Weight: 3,36,007.66 lbs
Resisting Moment: 2.1878664e+008 lbs-ft
Activating Moment: 1.3637152e+008 lbs-ft
Resisting Force: 70,653.557 lbs
Activating Force: 44,039.309 lbs
F of S Rank: 1
Exit: (599.7058, 30.540907) ft
Entry: (26.11806, 69.535679) ft
Radius: 3,083.3321 ft
Center: (521.13552, 3,112.8718) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	35.213545	68.084118	0	132.50316	28.164415	0
Slice 2	53.404515	65.236642	0	391.66073	83.250058	0
Slice 3	73.125	62.280337	0	607.12759	129.04895	0
Slice 4	94.375	59.235052	0	777.09794	165.17727	0
Slice 5	113.75	56.583832	0	864.01748	183.65258	0
Slice 6	131.25	54.302118	0	870.34417	184.99736	0
Slice 7	148.74016	52.123329	0	880.6249	187.1826	0
Slice 8	166.22047	50.047136	0	894.89887	190.21663	0
Slice	180.80571	48.38521	0	884.39263	187.98346	0

9						
Slice 10	195.54233	46.791868	0	841.85836	178.94252	0
Slice 11	213.3254	44.955553	0	781.65635	166.14619	0
Slice 12	231.10847	43.223356	0	710.67792	151.05926	0
Slice 13	249.6875	41.527075	0	682.76031	145.12518	0
Slice 14	269.0625	39.876235	0	697.06466	148.16567	0
Slice 15	288.4375	38.348378	0	698.67344	148.50762	0
Slice 16	307.8125	36.94332	0	687.50102	146.13285	0
Slice 17	325.83333	35.74256	0	695.90237	147.91862	0
Slice 18	342.5	34.730039	0	725.61516	154.23426	0
Slice 19	359.16667	33.808066	0	745.84735	158.53475	0
Slice 20	377.5	32.903351	0	744.91349	158.33625	0
Slice 21	397.5	32.035692	0	720.58211	153.16446	0
Slice 22	420.45956	31.211006	0	643.13061	136.70163	0
Slice 23	441.70956	30.573994	0	535.46702	113.81703	0
Slice 24	458.125	30.194286	0	459.74378	97.721558	0
Slice 25	474.375	29.904974	0	395.24592	84.012114	0
Slice 26	491.25	29.696925	0	318.37825	67.673386	0
Slice 27	510	29.575995	0	261.0434	55.486487	0
Slice 28	530	29.568629	0	224.14523	47.643539	0
Slice 29	550	29.690998	0	173.51449	36.881644	0
Slice 30	561.25	29.800881	0	140.70113	29.906949	0
Slice 31	571.80145	29.97001	0	105.39587	22.402584	0
Slice 32	590.40435	30.331891	0	37.075311	7.8806006	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 127
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 12:03:52
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 12:03:53

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (64.7782, 68.73999) ft
Left-Zone Right Coordinate: (302.5, 43.96058) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (668.1743, 26.11996) ft
Right-Zone Right Coordinate: (752.5, 18.53703) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.824
Volume: 3,141.7559 ft^3
Weight: 3,29,884.37 lbs
Resisting Moment: 2.2707994e+008 lbs-ft
Activating Moment: 1.2446673e+008 lbs-ft
Resisting Force: 69,583.046 lbs
Activating Force: 38,140.08 lbs
F of S Rank: 1
Exit: (668.1743, 26.119962) ft
Entry: (64.7782, 68.739988) ft
Radius: 3,252.7096 ft
Center: (594.66289, 3,277.9988) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	74.83365	67.112052	0	99.93027	21.240835	0
Slice 2	94.94455	63.920716	0	292.98414	62.275701	0
Slice 3	113.75	61.049247	0	406.24977	86.351055	0
Slice 4	131.25	58.481716	0	441.52825	93.849727	0
Slice 5	148.74016	56.012616	0	481.05974	102.2524	0
Slice 6	166.22047	53.641614	0	524.90419	111.57183	0
Slice 7	185.80052	51.106784	0	533.3083	113.35818	0
Slice 8	207.48031	48.433757	0	503.64987	107.05408	0
Slice	229.1601	45.908359	0	458.91012	97.544357	0

9						
Slice 10	247.92316	43.83307	0	456.19187	96.966575	0
Slice 11	266.12194	41.940383	0	504.09792	107.14932	0
Slice 12	286.67316	39.919787	0	546.3351	116.12711	0
Slice 13	307.22439	38.030807	0	575.14288	122.25039	0
Slice 14	330	36.098713	0	635.17521	135.01066	0
Slice 15	355	34.154706	0	723.35494	153.75384	0
Slice 16	377.5	32.562044	0	775.09251	164.751	0
Slice 17	397.5	31.285641	0	793.79618	168.72659	0
Slice 18	418.125	30.100856	0	773.9553	164.50928	0
Slice 19	439.375	29.015508	0	714.54692	151.88164	0
Slice 20	462.32605	28.005771	0	662.57607	140.83489	0
Slice 21	478.57605	27.363733	0	636.00039	135.18606	0
Slice 22	487.40164	27.061877	0	616.58861	131.05995	0
Slice 23	496.15164	26.783548	0	595.10024	126.49246	0
Slice 24	510	26.406569	0	593.98945	126.25636	0
Slice 25	530	25.947359	0	605.35521	128.67222	0
Slice 26	550	25.611198	0	603.61083	128.30144	0
Slice 27	561.25	25.461033	0	598.45831	127.20624	0
Slice 28	574.36061	25.374161	0	586.14611	124.5892	0
Slice 29	598.41592	25.314199	0	553.49179	117.64831	0
Slice 30	622.8053	25.433783	0	501.16181	106.52523	0
Slice 31	643.29358	25.663306	0	354.76124	75.406829	0
Slice 32	659.88073	25.953639	0	119.69243	25.441412	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 132
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 12:09:07
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 12:09:08

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (123.479, 63.76457) ft
Left-Zone Right Coordinate: (227.80513, 50.55556) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (717.08249, 21.15087) ft
Right-Zone Right Coordinate: (865, 13.00926) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 21
F of S: 1.975
Volume: 5,909.8163 ft^3
Weight: 6,20,530.71 lbs
Resisting Moment: 5.24022e+008 lbs-ft
Activating Moment: 2.6533903e+008 lbs-ft
Resisting Force: 1,31,089.15 lbs
Activating Force: 66,377.43 lbs
F of S Rank: 1
Exit: (865, 13.009262) ft
Entry: (123.479, 63.764573) ft
Radius: 3,988.0222 ft
Center: (765.38773, 3,999.7873) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	131.7395	62.435189	0	28.917203	6.1465412	0
Slice 2	157.48031	58.409689	0	135.17541	28.73242	0
Slice 3	185.80052	54.121277	0	223.77008	47.5638	0
Slice 4	207.48031	50.997461	0	240.09656	51.034099	0
Slice 5	229.1601	47.995049	0	243.97193	51.857836	0
Slice 6	250.41474	45.167945	0	297.87852	63.316034	0
Slice 7	271.24423	42.511246	0	402.3366	85.519284	0
Slice 8	299.57949	39.103164	0	523.40875	111.25396	0
Slice	327.8456	35.853613	0	665.77327	141.51448	0

9						
Slice 10	352.8456	33.187542	0	826.9567	175.77507	0
Slice 11	377.5	30.686157	0	961.71939	204.41977	0
Slice 12	397.5	28.782454	0	1,044.7786	222.07456	0
Slice 13	418.125	26.927301	0	1,094.3894	232.61965	0
Slice 14	439.375	25.127091	0	1,109.7939	235.89397	0
Slice 15	466.25	23.033248	0	1,149.1507	244.25952	0
Slice 16	491.25	21.207992	0	1,196.7773	254.38286	0
Slice 17	515	19.661445	0	1,281.7412	272.4425	0
Slice 18	545	17.887591	0	1,414.2231	300.60239	0
Slice 19	561.25	16.993312	0	1,479.1795	314.40931	0
Slice 20	573.33333	16.406926	0	1,522.0623	323.52432	0
Slice 21	595	15.421331	0	1,592.6575	338.5298	0
Slice 22	616.66667	14.553775	0	1,650.8196	350.89255	0
Slice 23	631.25	14.023293	0	1,684.2883	358.00653	0
Slice 24	652.5	13.401519	0	1,530.2386	325.26226	0
Slice 25	676.25	12.766217	0	1,306.4275	277.68973	0
Slice 26	695.625	12.396853	0	1,137.6294	241.81059	0
Slice 27	721.875	12.024006	0	914.27691	194.33556	0
Slice 28	747.5	11.824724	0	735.4929	156.33384	0
Slice 29	772.5	11.790949	0	602.34529	128.03244	0
Slice 30	797.5	11.913898	0	452.51966	96.186024	0
Slice 31	816.67491	12.100402	0	331.75786	70.517311	0
Slice 32	833.76236	12.364801	0	220.36917	46.840914	0
Slice 33	854.58745	12.776306	0	75.327264	16.011304	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.1g) ADITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 112
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:28:57
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:28:58

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (63.93757, 68.79493) ft
Left-Zone Right Coordinate: (172.5, 58.05149) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (615.86238, 30.2933) ft
Right-Zone Right Coordinate: (775, 17.37037) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.187
Volume: 2,042.6351 ft^3
Weight: 2,14,476.68 lbs
Resisting Moment: 1.3418374e+008 lbs-ft
Activating Moment: 1.1309026e+008 lbs-ft
Resisting Force: 44,962.173 lbs
Activating Force: 37,894.569 lbs
F of S Rank: 1
Exit: (615.86238, 30.293297) ft
Entry: (63.93757, 68.794931) ft
Radius: 2,972.4794 ft
Center: (545.85626, 3,001.9482) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	74.203178	67.145142	0	99.770603	21.206896	0
Slice 2	94.734393	63.919113	0	291.73698	62.01061	0
Slice 3	113.75	61.057232	0	401.66861	85.377298	0
Slice 4	131.25	58.539073	0	431.74496	91.770224	0
Slice 5	148.74016	56.128323	0	465.19208	98.879629	0
Slice 6	166.22047	53.824605	0	502.08286	106.72101	0
Slice 7	183.09055	51.699453	0	506.69501	107.70135	0
Slice 8	199.35039	49.745565	0	479.68444	101.96008	0
Slice	215.61024	47.882465	0	443.44466	94.257073	0

9						
Slice 10	231.87008	46.109984	0	397.93307	84.583286	0
Slice 11	250.68978	44.179605	0	396.34762	84.246287	0
Slice 12	272.06934	42.124017	0	435.55319	92.579689	0
Slice 13	291.44434	40.389099	0	458.10562	97.373356	0
Slice 14	308.81478	38.948176	0	466.6107	99.181165	0
Slice 15	325.83333	37.634821	0	494.53013	105.11562	0
Slice 16	342.5	36.444839	0	542.37813	115.28603	0
Slice 17	359.16667	35.348969	0	580.58265	123.40665	0
Slice 18	376.04636	34.335516	0	599.41174	127.4089	0
Slice 19	393.13908	33.406816	0	598.487	127.21234	0
Slice 20	404.59272	32.828825	0	593.17653	126.08356	0
Slice 21	418.125	32.233509	0	552.20296	117.37436	0
Slice 22	439.375	31.395654	0	466.39544	99.135411	0
Slice 23	458.125	30.774884	0	397.35669	84.460771	0
Slice 24	474.375	30.339528	0	348.61595	74.100607	0
Slice 25	491.25	29.983313	0	287.71542	61.1558	0
Slice 26	510	29.701905	0	247.57082	52.622801	0
Slice 27	530	29.527924	0	228.44344	48.557152	0
Slice 28	550	29.48852	0	195.01344	41.451387	0
Slice 29	561.25	29.508934	0	171.67896	36.49149	0
Slice 30	571.39373	29.591819	0	146.13329	31.06159	0
Slice 31	589.18119	29.797875	0	95.49794	20.298714	0
Slice 32	606.96865	30.110407	0	33.68589	7.1601569	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 116
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:34:48
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:34:50

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (12.50934, 69.77761) ft
Left-Zone Right Coordinate: (254.09093, 47.77778) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (589.08127, 30.70373) ft
Right-Zone Right Coordinate: (842.5, 14.05093) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.158
Volume: 3,610.7035 ft^3
Weight: 3,79,123.86 lbs
Resisting Moment: 2.4705623e+008 lbs-ft
Activating Moment: 2.1340186e+008 lbs-ft
Resisting Force: 79,388.695 lbs
Activating Force: 68,574.668 lbs
F of S Rank: 1
Exit: (589.08127, 30.703735) ft
Entry: (12.50934, 69.777612) ft
Radius: 3,098.6679 ft
Center: (509.39642, 3,128.3469) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	20.841117	68.447329	0	120.44961	25.602355	0
Slice 2	37.50467	65.833232	0	356.46803	75.769618	0
Slice 3	54.168223	63.311957	0	582.88767	123.8966	0
Slice 4	73.125	60.563509	0	776.78514	165.11078	0
Slice 5	94.375	57.61651	0	935.5426	198.85572	0
Slice 6	113.75	55.054051	0	1,013.0533	215.33113	0
Slice 7	131.25	52.851749	0	1,011.625	215.02753	0
Slice 8	148.6073	50.76685	0	1,014.2657	215.58884	0
Slice	166.08761	48.768648	0	1,021.106	217.04278	0

9						
Slice 10	185.80052	46.641243	0	987.99473	210.00476	0
Slice 11	207.48031	44.441763	0	911.89127	193.82847	0
Slice 12	229.1601	42.396156	0	819.92759	174.28099	0
Slice 13	247.4981	40.775767	0	775.42675	164.82204	0
Slice 14	262.49429	39.540396	0	782.7471	166.37803	0
Slice 15	281.86929	38.066583	0	779.60609	165.71039	0
Slice 16	305.6231	36.409382	0	760.1463	161.57408	0
Slice 17	329.43801	34.932148	0	764.03496	162.40064	0
Slice 18	353.31404	33.635561	0	791.26702	168.189	0
Slice 19	366.37603	32.981533	0	800.30026	170.10907	0
Slice 20	377.5	32.503556	0	787.95221	167.48441	0
Slice 21	397.5	31.716164	0	755.53843	160.59465	0
Slice 22	414.9679	31.127132	0	698.51969	148.47494	0
Slice 23	429.90371	30.707806	0	619.97653	131.78008	0
Slice 24	443.68581	30.382232	0	540.76156	114.94242	0
Slice 25	458.125	30.113845	0	469.45295	99.785304	0
Slice 26	474.375	29.887552	0	398.12767	84.624649	0
Slice 27	491.25	29.744473	0	314.16885	66.778651	0
Slice 28	510	29.695178	0	249.05151	52.937533	0
Slice 29	530	29.76362	0	203.96363	43.353807	0
Slice 30	550	29.961161	0	145.21926	30.867306	0
Slice 31	561.25	30.113129	0	107.87799	22.930176	0
Slice 32	575.79063	30.418892	0	51.632713	10.974872	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 124
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 11:58:00
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 11:58:02

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (26.11806, 69.53568) ft
Left-Zone Right Coordinate: (117.5, 64.52381) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (599.7058, 30.54091) ft
Right-Zone Right Coordinate: (720, 20.87301) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.160
Volume: 3,200.073 ft^3
Weight: 3,36,007.66 lbs
Resisting Moment: 2.1789286e+008 lbs-ft
Activating Moment: 1.8789268e+008 lbs-ft
Resisting Force: 70,365.746 lbs
Activating Force: 60,678.037 lbs
F of S Rank: 1
Exit: (599.7058, 30.540907) ft
Entry: (26.11806, 69.535679) ft
Radius: 3,083.3321 ft
Center: (521.13552, 3,112.8718) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	35.213545	68.084118	0	131.42553	27.935358	0
Slice 2	53.404515	65.236642	0	388.47158	82.572184	0
Slice 3	73.125	62.280337	0	602.17975	127.99726	0
Slice 4	94.375	59.235052	0	770.81095	163.84093	0
Slice 5	113.75	56.583832	0	857.12082	182.18665	0
Slice 6	131.25	54.302118	0	863.51111	183.54495	0
Slice 7	148.74016	52.123329	0	873.8962	185.75237	0
Slice 8	166.22047	50.047136	0	888.31882	188.81799	0
Slice	180.80571	48.38521	0	878.13272	186.65287	0

9						
Slice 10	195.54233	46.791868	0	836.15371	177.72996	0
Slice 11	213.3254	44.955553	0	776.68496	165.08949	0
Slice 12	231.10847	43.223356	0	706.49221	150.16955	0
Slice 13	249.6875	41.527075	0	679.151	144.358	0
Slice 14	269.0625	39.876235	0	693.8774	147.48819	0
Slice 15	288.4375	38.348378	0	695.98812	147.93684	0
Slice 16	307.8125	36.94332	0	685.3649	145.67881	0
Slice 17	325.83333	35.74256	0	694.2128	147.55949	0
Slice 18	342.5	34.730039	0	724.28543	153.95162	0
Slice 19	359.16667	33.808066	0	744.89653	158.33264	0
Slice 20	377.5	32.903351	0	744.38912	158.22479	0
Slice 21	397.5	32.035692	0	720.48413	153.14363	0
Slice 22	420.45956	31.211006	0	643.42522	136.76425	0
Slice 23	441.70956	30.573994	0	535.98451	113.92702	0
Slice 24	458.125	30.194286	0	460.34063	97.848421	0
Slice 25	474.375	29.904974	0	395.86274	84.143223	0
Slice 26	491.25	29.696925	0	318.95458	67.79589	0
Slice 27	510	29.575995	0	261.55487	55.595204	0
Slice 28	530	29.568629	0	224.58062	47.736084	0
Slice 29	550	29.690998	0	173.83602	36.949987	0
Slice 30	561.25	29.800881	0	140.94796	29.959414	0
Slice 31	571.80145	29.97001	0	105.57273	22.440177	0
Slice 32	590.40435	30.331891	0	37.131759	7.8925989	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 128
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 12:05:03
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 12:05:05

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (64.7782, 68.73999) ft
Left-Zone Right Coordinate: (302.5, 43.96058) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (668.1743, 26.11996) ft
Right-Zone Right Coordinate: (752.5, 18.53703) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.272
Volume: 3,141.7559 ft^3
Weight: 3,29,884.37 lbs
Resisting Moment: 2.2633254e+008 lbs-ft
Activating Moment: 1.7789301e+008 lbs-ft
Resisting Force: 69,354.772 lbs
Activating Force: 54,512.07 lbs
F of S Rank: 1
Exit: (668.1743, 26.119962) ft
Entry: (64.7782, 68.739988) ft
Radius: 3,252.7096 ft
Center: (594.66289, 3,277.9988) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	74.83365	67.112052	0	99.110755	21.066641	0
Slice 2	94.94455	63.920716	0	290.58962	61.76673	0
Slice 3	113.75	61.049247	0	402.93378	85.64622	0
Slice 4	131.25	58.481716	0	437.92842	93.084559	0
Slice 5	148.74016	56.012616	0	477.16993	101.4256	0
Slice 6	166.22047	53.641614	0	520.72531	110.68358	0
Slice 7	185.80052	51.106784	0	529.14701	112.47367	0
Slice 8	207.48031	48.433757	0	499.82206	106.24046	0
Slice	229.1601	45.908359	0	455.54064	96.828152	0

9						
Slice 10	247.92316	43.83307	0	453.00369	96.288906	0
Slice 11	266.12194	41.940383	0	500.81558	106.45164	0
Slice 12	286.67316	39.919787	0	543.07801	115.43479	0
Slice 13	307.22439	38.030807	0	572.04107	121.59108	0
Slice 14	330	36.098713	0	632.17746	134.37347	0
Slice 15	355	34.154706	0	720.47911	153.14256	0
Slice 16	377.5	32.562044	0	772.51829	164.20383	0
Slice 17	397.5	31.285641	0	791.61466	168.26289	0
Slice 18	418.125	30.100856	0	772.28212	164.15363	0
Slice 19	439.375	29.015508	0	713.43494	151.64528	0
Slice 20	462.32605	28.005771	0	661.95747	140.7034	0
Slice 21	478.57605	27.363733	0	635.66693	135.11518	0
Slice 22	487.40164	27.061877	0	616.39746	131.01933	0
Slice 23	496.15164	26.783548	0	595.0392	126.47949	0
Slice 24	510	26.406569	0	594.08492	126.27665	0
Slice 25	530	25.947359	0	605.64027	128.73281	0
Slice 26	550	25.611198	0	604.04938	128.39466	0
Slice 27	561.25	25.461033	0	598.96479	127.3139	0
Slice 28	574.36061	25.374161	0	586.70719	124.70846	0
Slice 29	598.41592	25.314199	0	554.09879	117.77733	0
Slice 30	622.8053	25.433783	0	501.7374	106.64758	0
Slice 31	643.29358	25.663306	0	355.17395	75.494554	0
Slice 32	659.88073	25.953639	0	119.8361	25.471949	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 133
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 30-06-2020
Time: 12:10:32
File Name: Analysis.gsz
Directory: F:\LD\Project 2020\Project 0280\Additional trails\Without water table\
Last Solved Date: 30-06-2020
Last Solved Time: 12:10:34

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface
- Direction of movement: Left to Right

Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 12 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (123.479, 63.76457) ft
Left-Zone Right Coordinate: (227.80513, 50.55556) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (717.08249, 21.15087) ft
Right-Zone Right Coordinate: (865, 13.00926) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 21
F of S: 1.345
Volume: 5,909.8163 ft^3
Weight: 6,20,530.71 lbs
Resisting Moment: 5.2252713e+008 lbs-ft
Activating Moment: 3.8861096e+008 lbs-ft
Resisting Force: 1,30,716.39 lbs
Activating Force: 97,215.898 lbs
F of S Rank: 1
Exit: (865, 13.009262) ft
Entry: (123.479, 63.764573) ft
Radius: 3,988.0222 ft
Center: (765.38773, 3,999.7873) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	131.7395	62.435189	0	28.677133	6.0955129	0
Slice 2	157.48031	58.409689	0	133.98624	28.479656	0
Slice 3	185.80052	54.121277	0	221.70946	47.1258	0
Slice 4	207.48031	50.997461	0	237.79418	50.544713	0
Slice 5	229.1601	47.995049	0	241.55751	51.344633	0
Slice 6	250.41474	45.167945	0	294.95096	62.693762	0
Slice 7	271.24423	42.511246	0	398.49839	84.703447	0
Slice 8	299.57949	39.103164	0	518.59373	110.2305	0
Slice	327.8456	35.853613	0	659.9672	140.28036	0

9						
Slice 10	352.8456	33.187542	0	820.19501	174.33783	0
Slice 11	377.5	30.686157	0	954.41062	202.86624	0
Slice 12	397.5	28.782454	0	1,037.3732	220.50049	0
Slice 13	418.125	26.927301	0	1,087.2533	231.10283	0
Slice 14	439.375	25.127091	0	1,103.2572	234.50456	0
Slice 15	466.25	23.033248	0	1,143.3949	243.0361	0
Slice 16	491.25	21.207992	0	1,191.8133	253.32774	0
Slice 17	515	19.661445	0	1,277.4845	271.53772	0
Slice 18	545	17.887591	0	1,410.9446	299.90554	0
Slice 19	561.25	16.993312	0	1,476.5171	313.8434	0
Slice 20	573.33333	16.406926	0	1,519.8797	323.06041	0
Slice 21	595	15.421331	0	1,591.3563	338.25321	0
Slice 22	616.66667	14.553775	0	1,650.3862	350.80042	0
Slice 23	631.25	14.023293	0	1,684.4109	358.0326	0
Slice 24	652.5	13.401519	0	1,531.1107	325.44763	0
Slice 25	676.25	12.766217	0	1,307.8492	277.99193	0
Slice 26	695.625	12.396853	0	1,139.2651	242.15828	0
Slice 27	721.875	12.024006	0	915.94156	194.68939	0
Slice 28	747.5	11.824724	0	736.99956	156.65409	0
Slice 29	772.5	11.790949	0	603.60858	128.30096	0
Slice 30	797.5	11.913898	0	453.43941	96.381521	0
Slice 31	816.67491	12.100402	0	332.38578	70.650779	0
Slice 32	833.76236	12.364801	0	220.75165	46.922211	0
Slice 33	854.58745	12.776306	0	75.442184	16.035731	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (STATIC) ADDITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 139
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:09:12
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:09:15

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (18.45686, 69.67188) ft
Left-Zone Right Coordinate: (130, 62.93651) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (592.06419, 30.65802) ft
Right-Zone Right Coordinate: (702.5, 22.53968) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 2.137
Volume: 2,523.7124 ft³
Weight: 2,64,989.8 lbs
Resisting Moment: 1.370977e+008 lbs-ft
Activating Moment: 6,41,63,250 lbs-ft
Resisting Force: 46,408.804 lbs
Activating Force: 21,719.967 lbs
F of S Rank: 1
Exit: (592.06419, 30.658019) ft
Entry: (46.412826, 69.174884) ft
Radius: 2,941.2866 ft
Center: (525.44766, 2,971.1901) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	54.456413	67.870013	0	120.30106	21.212323	0
Slice 2	73.125	64.911505	0	339.75145	59.907348	0
Slice 3	94.375	61.683668	0	529.85058	93.426952	0
Slice 4	113.75	58.87253	0	633.74298	111.74599	0
Slice 5	131.25	56.452217	0	654.16915	115.34767	0
Slice 6	148.74016	54.140139	0	677.93354	119.53797	0
Slice 7	166.22047	51.93592	0	705.08795	124.32603	0
Slice 8	184.24265	49.776316	0	697.06822	122.91194	0
Slice 9	202.8067	47.66786	0	653.13487	115.1653	0

Slice 10	221.37075	45.678721	0	596.87821	105.24573	0
Slice 11	235.32639	44.250697	0	547.59414	96.555622	0
Slice 12	249.6875	42.875169	0	545.37752	96.164771	0
Slice 13	269.0625	41.115226	0	570.44418	100.5847	0
Slice 14	288.4375	39.484384	0	582.1521	102.64912	0
Slice 15	307.8125	37.982427	0	580.44939	102.34889	0
Slice 16	325.83333	36.696782	0	597.19578	105.30173	0
Slice 17	342.5	35.61058	0	634.1903	111.82486	0
Slice 18	359.16667	34.619371	0	661.25414	116.59695	0
Slice 19	377.5	33.643859	0	667.3018	117.66331	0
Slice 20	397.5	32.704795	0	650.04339	114.62019	0
Slice 21	412.4357	32.079592	0	617.18428	108.82624	0
Slice 22	425.52855	31.612539	0	558.67569	98.509597	0
Slice 23	441.84285	31.103312	0	477.9564	84.27661	0
Slice 24	458.125	30.685332	0	407.28899	71.816038	0
Slice 25	474.375	30.358206	0	346.75685	61.142589	0
Slice 26	491.25	30.11536	0	273.60106	48.243249	0
Slice 27	510	29.961097	0	219.84854	38.765229	0
Slice 28	530	29.924054	0	186.16164	32.825321	0
Slice 29	550	30.023009	0	138.13253	24.356492	0
Slice 30	561.25	30.121704	0	106.59098	18.794866	0
Slice 31	569.89105	30.248614	0	78.915313	13.914899	0
Slice 32	584.67314	30.509163	0	27.592527	4.865307	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 145
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:15:10
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:15:12

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (45.24923, 69.19557) ft
Left-Zone Right Coordinate: (169.96628, 58.33333) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (677.57683, 25.02025) ft
Right-Zone Right Coordinate: (770, 17.62963) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.572
Volume: 4,124.0179 ft³
Weight: 4,33,021.88 lbs
Resisting Moment: 2.5973905e+008 lbs-ft
Activating Moment: 1.0098199e+008 lbs-ft
Resisting Force: 75,996.411 lbs
Activating Force: 29,546.216 lbs
F of S Rank: 1
Exit: (677.57683, 25.02025) ft
Entry: (45.24923, 69.19557) ft
Radius: 3,405.8728 ft
Center: (597.74378, 3,429.9573) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	53.874615	67.800311	0	128.88347	22.725633	0
Slice 2	73.125	64.748668	0	357.38648	63.016879	0
Slice 3	94.375	61.504526	0	549.4937	96.890565	0
Slice 4	113.75	58.660589	0	656.84654	115.81977	0
Slice 5	131.25	56.19454	0	681.86995	120.23207	0
Slice 6	148.74016	53.822285	0	711.68291	125.4889	0
Slice 7	166.22047	51.543526	0	746.3297	131.59806	0
Slice 8	184.24422	49.291645	0	747.54301	131.812	0
Slice 9	202.8114	47.072334	0	714.72156	126.0247	0

Slice 10	226.0475	44.456674	0	657.00729	115.84811	0
Slice 11	250.28661	41.869901	0	644.0154	113.55729	0
Slice 12	270.85984	39.823126	0	688.88754	121.46946	0
Slice 13	291.43306	37.902363	0	720.80651	127.09764	0
Slice 14	309.60984	36.303552	0	738.88581	130.2855	0
Slice 15	330	34.647936	0	789.75893	139.25581	0
Slice 16	355	32.769045	0	871.30975	153.63542	0
Slice 17	377.5	31.227848	0	917.59553	161.79685	0
Slice 18	397.5	29.990872	0	931.95462	164.32874	0
Slice 19	418.125	28.840789	0	908.11764	160.12564	0
Slice 20	439.375	27.785078	0	845.16369	149.02516	0
Slice 21	458.125	26.957138	0	798.06945	140.72118	0
Slice 22	474.375	26.329284	0	769.81571	135.73928	0
Slice 23	491.25	25.761056	0	731.5532	128.99257	0
Slice 24	508.66276	25.260675	0	717.29025	126.47762	0
Slice 25	525.98829	24.851471	0	728.2317	128.4069	0
Slice 26	547.32553	24.481275	0	727.47693	128.27381	0
Slice 27	561.25	24.280235	0	722.63225	127.41956	0
Slice 28	572.03456	24.194866	0	713.8704	125.87461	0
Slice 29	591.10368	24.104304	0	692.48914	122.10452	0
Slice 30	610.17281	24.12051	0	659.73883	116.32976	0
Slice 31	627.35368	24.221783	0	621.0177	109.50218	0
Slice 32	645.64421	24.437977	0	454.53858	80.147416	0
Slice 33	666.93262	24.803972	0	153.76752	27.113362	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 153
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:22:09
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:22:11

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (52.05023, 69.07466) ft
Left-Zone Right Coordinate: (122.5, 63.88889) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (735.31065, 19.42833) ft
Right-Zone Right Coordinate: (802.5, 15.94445) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 2.698
Volume: 5,514.8279 ft³
Weight: 5,79,056.93 lbs
Resisting Moment: 3.7647837e+008 lbs-ft
Activating Moment: 1.3955841e+008 lbs-ft
Resisting Force: 1,01,669.12 lbs
Activating Force: 37,688.274 lbs
F of S Rank: 1
Exit: (735.31065, 19.428332) ft
Entry: (52.05023, 69.074664) ft
Radius: 3,691.1885 ft
Center: (660.02613, 3,709.8491) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	57.275115	68.209859	0	80.150472	14.132691	0
Slice 2	73.125	65.633898	0	265.70381	46.85075	0
Slice 3	94.375	62.275059	0	469.80507	82.839309	0
Slice 4	113.75	59.318001	0	588.88164	103.83572	0
Slice 5	131.25	56.742089	0	625.22704	110.2444	0
Slice 6	148.74016	54.253121	0	667.03419	117.61613	0
Slice 7	166.22047	51.850824	0	714.34633	125.95853	0
Slice 8	184.01766	49.493146	0	729.57315	128.64343	0
Slice 9	202.13171	47.183051	0	712.41665	125.61828	0

Slice 10	225.59437	44.343432	0	674.53211	118.93821	0
Slice 11	249.72982	41.54782	0	681.12688	120.10105	0
Slice 12	269.18945	39.423492	0	742.91327	130.99565	0
Slice 13	288.56445	37.411839	0	793.84641	139.97654	0
Slice 14	307.85482	35.511788	0	834.02077	147.06036	0
Slice 15	330	33.465219	0	911.10112	160.65171	0
Slice 16	355	31.306599	0	1,021.6365	180.14208	0
Slice 17	377.5	29.502432	0	1,095.3307	193.13635	0
Slice 18	397.5	28.021738	0	1,135.2487	200.17497	0
Slice 19	418.125	26.610896	0	1,138.9426	200.82631	0
Slice 20	439.375	25.276807	0	1,105.5642	194.9408	0
Slice 21	466.25	23.786266	0	1,081.5113	190.69961	0
Slice 22	491.25	22.531498	0	1,068.8524	188.46752	0
Slice 23	510	21.724211	0	1,084.816	191.28232	0
Slice 24	530	20.964949	0	1,128.0501	198.90567	0
Slice 25	550	20.314256	0	1,159.7598	204.49694	0
Slice 26	561.25	19.982583	0	1,173.9282	206.99521	0
Slice 27	573.33333	19.694614	0	1,184.6797	208.891	0
Slice 28	595	19.249229	0	1,196.9107	211.04764	0
Slice 29	616.66667	18.931087	0	1,195.5096	210.80059	0
Slice 30	631.25	18.774585	0	1,188.367	209.54116	0
Slice 31	643.75	18.706767	0	1,081.6286	190.72031	0
Slice 32	661.2862	18.671183	0	869.28421	153.27826	0
Slice 33	676.2862	18.701555	0	681.22016	120.11749	0
Slice 34	695.83931	18.858357	0	454.28368	80.10247	0
Slice 35	722.08931	19.204897	0	154.56341	27.253699	0
Slice 36	735.15533	19.42517	0	1.1792786	0.20793863	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.05g) ADDITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 140
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:11:16
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:11:19

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (18.45686, 69.67188) ft
Left-Zone Right Coordinate: (130, 62.93651) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (592.06419, 30.65802) ft
Right-Zone Right Coordinate: (702.5, 22.53968) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 1.327
Volume: 2,523.7124 ft^3
Weight: 2,64,989.8 lbs
Resisting Moment: 1.3653473e+008 lbs-ft
Activating Moment: 1.0292743e+008 lbs-ft
Resisting Force: 46,218.752 lbs
Activating Force: 34,842.529 lbs
F of S Rank: 1
Exit: (592.06419, 30.658019) ft
Entry: (46.412826, 69.174884) ft
Radius: 2,941.2866 ft
Center: (525.44766, 2,971.1901) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	54.456413	67.870013	0	119.31337	21.038166	0
Slice 2	73.125	64.911505	0	336.96649	59.416283	0
Slice 3	94.375	61.683668	0	525.53726	92.666398	0
Slice 4	113.75	58.87253	0	628.64414	110.84692	0
Slice 5	131.25	56.452217	0	648.97925	114.43255	0
Slice 6	148.74016	54.140139	0	672.68201	118.61199	0
Slice 7	166.22047	51.93592	0	699.80989	123.39537	0
Slice 8	184.24265	49.776316	0	692.06489	122.02971	0
Slice	202.8067	47.66786	0	648.67893	114.3796	0

9						
Slice 10	221.37075	45.678721	0	593.05174	104.57102	0
Slice 11	235.32639	44.250697	0	544.27121	95.969698	0
Slice 12	249.6875	42.875169	0	542.31444	95.624667	0
Slice 13	269.0625	41.115226	0	567.62308	100.08726	0
Slice 14	288.4375	39.484384	0	579.67005	102.21147	0
Slice 15	307.8125	37.982427	0	578.37435	101.983	0
Slice 16	325.83333	36.696782	0	595.44258	104.99259	0
Slice 17	342.5	35.61058	0	632.68659	111.55972	0
Slice 18	359.16667	34.619371	0	660.03832	116.38256	0
Slice 19	377.5	33.643859	0	666.44155	117.51163	0
Slice 20	397.5	32.704795	0	649.56482	114.5358	0
Slice 21	412.4357	32.079592	0	616.96644	108.78783	0
Slice 22	425.52855	31.612539	0	558.66054	98.506927	0
Slice 23	441.84285	31.103312	0	478.12619	84.306548	0
Slice 24	458.125	30.685332	0	407.56953	71.865504	0
Slice 25	474.375	30.358206	0	347.09122	61.201547	0
Slice 26	491.25	30.11536	0	273.93804	48.302667	0
Slice 27	510	29.961097	0	220.16013	38.820171	0
Slice 28	530	29.924054	0	186.433	32.873167	0
Slice 29	550	30.023009	0	138.3306	24.391418	0
Slice 30	561.25	30.121704	0	106.73744	18.820691	0
Slice 31	569.89105	30.248614	0	79.02119	13.933568	0
Slice 32	584.67314	30.509163	0	27.627716	4.8715117	0

SLOPE/W Analysis

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File Information

Created By: Admin
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Time: 16:16:32
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:16:35

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (45.24923, 69.19557) ft
Left-Zone Right Coordinate: (169.96628, 58.33333) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (677.57683, 25.02025) ft
Right-Zone Right Coordinate: (770, 17.62963) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.484
Volume: 4,124.0179 ft^3
Weight: 4,33,021.88 lbs
Resisting Moment: 2.5885386e+008 lbs-ft
Activating Moment: 1.7438882e+008 lbs-ft
Resisting Force: 75,738.174 lbs
Activating Force: 51,024.966 lbs
F of S Rank: 1
Exit: (677.57683, 25.02025) ft
Entry: (45.24923, 69.19557) ft
Radius: 3,405.8728 ft
Center: (597.74378, 3,429.9573) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	53.874615	67.800311	0	127.82865	22.539639	0
Slice 2	73.125	64.748668	0	354.45369	62.499749	0
Slice 3	94.375	61.504526	0	544.98142	96.094928	0
Slice 4	113.75	58.660589	0	651.46597	114.87103	0
Slice 5	131.25	56.19454	0	676.30318	119.2505	0
Slice 6	148.74016	53.822285	0	705.93471	124.47534	0
Slice 7	166.22047	51.543526	0	740.41113	130.55446	0
Slice 8	184.24422	49.291645	0	741.74659	130.78994	0
Slice	202.8114	47.072334	0	709.32697	125.07348	0

9						
Slice 10	226.0475	44.456674	0	652.26154	115.01131	0
Slice 11	250.28661	41.869901	0	639.68039	112.79291	0
Slice 12	270.85984	39.823126	0	684.63002	120.71874	0
Slice 13	291.43306	37.902363	0	716.76445	126.38491	0
Slice 14	309.60984	36.303552	0	735.12962	129.62319	0
Slice 15	330	34.647936	0	786.2348	138.63441	0
Slice 16	355	32.769045	0	868.08391	153.06662	0
Slice 17	377.5	31.227848	0	914.81012	161.30571	0
Slice 18	397.5	29.990872	0	929.6664	163.92527	0
Slice 19	418.125	28.840789	0	906.42407	159.82702	0
Slice 20	439.375	27.785078	0	844.09931	148.83748	0
Slice 21	458.125	26.957138	0	797.47142	140.61573	0
Slice 22	474.375	26.329284	0	769.55198	135.69278	0
Slice 23	491.25	25.761056	0	731.59525	128.99998	0
Slice 24	508.66276	25.260675	0	717.57927	126.52859	0
Slice 25	525.98829	24.851471	0	728.71736	128.49253	0
Slice 26	547.32553	24.481275	0	728.15436	128.39326	0
Slice 27	561.25	24.280235	0	723.40509	127.55583	0
Slice 28	572.03456	24.194866	0	714.69184	126.01945	0
Slice 29	591.10368	24.104304	0	693.35534	122.25725	0
Slice 30	610.17281	24.12051	0	660.59145	116.4801	0
Slice 31	627.35368	24.221783	0	621.81145	109.64214	0
Slice 32	645.64421	24.437977	0	455.11675	80.249363	0
Slice 33	666.93262	24.803972	0	153.96378	27.147968	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 154
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:23:05
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:23:08

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (52.05023, 69.07466) ft
Left-Zone Right Coordinate: (122.5, 63.88889) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (735.31065, 19.42833) ft
Right-Zone Right Coordinate: (802.5, 15.94445) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.526
Volume: 5,514.8279 ft^3
Weight: 5,79,056.93 lbs
Resisting Moment: 3.7525493e+008 lbs-ft
Activating Moment: 2.45955e+008 lbs-ft
Resisting Force: 1,01,339.8 lbs
Activating Force: 66,422.069 lbs
F of S Rank: 1
Exit: (735.31065, 19.428332) ft
Entry: (52.05023, 69.074664) ft
Radius: 3,691.1885 ft
Center: (660.02613, 3,709.8491) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	57.275115	68.209859	0	79.483726	14.015125	0
Slice 2	73.125	65.633898	0	263.45475	46.454181	0
Slice 3	94.375	62.275059	0	465.76483	82.126907	0
Slice 4	113.75	59.318001	0	583.75495	102.93175	0
Slice 5	131.25	56.742089	0	619.72548	109.27432	0
Slice 6	148.74016	54.253121	0	661.1491	116.57843	0
Slice 7	166.22047	51.850824	0	708.07671	124.85303	0
Slice 8	184.01766	49.493146	0	723.22133	127.52343	0
Slice	202.13171	47.183051	0	706.2814	124.53647	0

9						
Slice 10	225.59437	44.343432	0	668.85901	117.93789	0
Slice 11	249.72982	41.54782	0	675.66642	119.13822	0
Slice 12	269.18945	39.423492	0	737.315	130.00853	0
Slice 13	288.56445	37.411839	0	788.26308	138.99205	0
Slice 14	307.85482	35.511788	0	828.59428	146.10353	0
Slice 15	330	33.465219	0	905.77926	159.71332	0
Slice 16	355	31.306599	0	1,016.4626	179.22978	0
Slice 17	377.5	29.502432	0	1,090.5443	192.29238	0
Slice 18	397.5	28.021738	0	1,130.988	199.4237	0
Slice 19	418.125	26.610896	0	1,135.3934	200.20048	0
Slice 20	439.375	25.276807	0	1,102.8484	194.46193	0
Slice 21	466.25	23.786266	0	1,079.7263	190.38488	0
Slice 22	491.25	22.531498	0	1,067.8396	188.28893	0
Slice 23	510	21.724211	0	1,084.2886	191.18933	0
Slice 24	530	20.964949	0	1,127.9721	198.89191	0
Slice 25	550	20.314256	0	1,160.0978	204.55654	0
Slice 26	561.25	19.982583	0	1,174.4799	207.0925	0
Slice 27	573.33333	19.694614	0	1,185.4293	209.02316	0
Slice 28	595	19.249229	0	1,197.9502	211.23093	0
Slice 29	616.66667	18.931087	0	1,196.7337	211.01643	0
Slice 30	631.25	18.774585	0	1,189.6553	209.76832	0
Slice 31	643.75	18.706767	0	1,082.8681	190.93886	0
Slice 32	661.2862	18.671183	0	870.34226	153.46482	0
Slice 33	676.2862	18.701555	0	682.06759	120.26692	0
Slice 34	695.83931	18.858357	0	454.8488	80.202116	0
Slice 35	722.08931	19.204897	0	154.74713	27.286095	0
Slice 36	735.15533	19.42517	0	1.1804711	0.20814891	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.1g) ADDITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 141
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:12:28
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:12:31

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (18.45686, 69.67188) ft
Left-Zone Right Coordinate: (130, 62.93651) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (592.06419, 30.65802) ft
Right-Zone Right Coordinate: (702.5, 22.53968) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 0.960
Volume: 2,523.7124 ft^3
Weight: 2,64,989.8 lbs
Resisting Moment: 1.3597378e+008 lbs-ft
Activating Moment: 1.416916e+008 lbs-ft
Resisting Force: 46,029.391 lbs
Activating Force: 47,965.383 lbs
F of S Rank: 1
Exit: (592.06419, 30.658019) ft
Entry: (46.412826, 69.174884) ft
Radius: 2,941.2866 ft
Center: (525.44766, 2,971.1901) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	54.456413	67.870013	0	118.33373	20.86543	0
Slice 2	73.125	64.911505	0	334.20291	58.928991	0
Slice 3	94.375	61.683668	0	521.25306	91.910977	0
Slice 4	113.75	58.87253	0	623.57368	109.95286	0
Slice 5	131.25	56.452217	0	643.8113	113.5213	0
Slice 6	148.74016	54.140139	0	667.44493	117.68855	0
Slice 7	166.22047	51.93592	0	694.53833	122.46585	0
Slice 8	184.24265	49.776316	0	687.05952	121.14713	0
Slice	202.8067	47.66786	0	644.21352	113.59223	0

9						
Slice 10	221.37075	45.678721	0	589.21092	103.89378	0
Slice 11	235.32639	44.250697	0	540.93207	95.380919	0
Slice 12	249.6875	42.875169	0	539.23465	95.081617	0
Slice 13	269.0625	41.115226	0	564.78626	99.587056	0
Slice 14	288.4375	39.484384	0	577.17549	101.77161	0
Slice 15	307.8125	37.982427	0	576.29191	101.61581	0
Slice 16	325.83333	36.696782	0	593.68768	104.68316	0
Slice 17	342.5	35.61058	0	631.18692	111.29528	0
Slice 18	359.16667	34.619371	0	658.83238	116.16993	0
Slice 19	377.5	33.643859	0	665.59699	117.36271	0
Slice 20	397.5	32.704795	0	649.10665	114.45502	0
Slice 21	412.4357	32.079592	0	616.771	108.75337	0
Slice 22	425.52855	31.612539	0	558.66802	98.508246	0
Slice 23	441.84285	31.103312	0	478.31744	84.340271	0
Slice 24	458.125	30.685332	0	407.86931	71.918364	0
Slice 25	474.375	30.358206	0	347.44196	61.263391	0
Slice 26	491.25	30.11536	0	274.28783	48.364345	0
Slice 27	510	29.961097	0	220.48098	38.876746	0
Slice 28	530	29.924054	0	186.71042	32.922084	0
Slice 29	550	30.023009	0	138.53199	24.426928	0
Slice 30	561.25	30.121704	0	106.88595	18.846876	0
Slice 31	569.89105	30.248614	0	79.128403	13.952472	0
Slice 32	584.67314	30.509163	0	27.663293	4.8777849	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 147
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:17:52
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:17:54

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (45.24923, 69.19557) ft
Left-Zone Right Coordinate: (169.96628, 58.33333) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (677.57683, 25.02025) ft
Right-Zone Right Coordinate: (770, 17.62963) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.041
Volume: 4,124.0179 ft^3
Weight: 4,33,021.88 lbs
Resisting Moment: 2.5797306e+008 lbs-ft
Activating Moment: 2.4779565e+008 lbs-ft
Resisting Force: 75,481.342 lbs
Activating Force: 72,504.233 lbs
F of S Rank: 1
Exit: (677.57683, 25.02025) ft
Entry: (45.24923, 69.19557) ft
Radius: 3,405.8728 ft
Center: (597.74378, 3,429.9573) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	53.874615	67.800311	0	126.78367	22.355382	0
Slice 2	73.125	64.748668	0	351.54673	61.987174	0
Slice 3	94.375	61.504526	0	540.50507	95.305627	0
Slice 4	113.75	58.660589	0	646.12289	113.9289	0
Slice 5	131.25	56.19454	0	670.76907	118.27469	0
Slice 6	148.74016	53.822285	0	700.21329	123.46649	0
Slice 7	166.22047	51.543526	0	734.51258	129.51438	0
Slice 8	184.24422	49.291645	0	735.9616	129.76989	0
Slice	202.8114	47.072334	0	703.93467	124.12267	0

9						
Slice 10	226.0475	44.456674	0	647.50851	114.17322	0
Slice 11	250.28661	41.869901	0	635.33137	112.02606	0
Slice 12	270.85984	39.823126	0	680.35486	119.96492	0
Slice 13	291.43306	37.902363	0	712.70299	125.66877	0
Slice 14	309.60984	36.303552	0	731.35428	128.95749	0
Slice 15	330	34.647936	0	782.69353	138.00999	0
Slice 16	355	32.769045	0	864.84569	152.49563	0
Slice 17	377.5	31.227848	0	912.01907	160.81357	0
Slice 18	397.5	29.990872	0	927.37994	163.5221	0
Slice 19	418.125	28.840789	0	904.74056	159.53017	0
Slice 20	439.375	27.785078	0	843.05322	148.65303	0
Slice 21	458.125	26.957138	0	796.8978	140.51458	0
Slice 22	474.375	26.329284	0	769.31678	135.6513	0
Slice 23	491.25	25.761056	0	731.6688	129.01295	0
Slice 24	508.66276	25.260675	0	717.90147	126.5854	0
Slice 25	525.98829	24.851471	0	729.23653	128.58408	0
Slice 26	547.32553	24.481275	0	728.86367	128.51833	0
Slice 27	561.25	24.280235	0	724.20789	127.69739	0
Slice 28	572.03456	24.194866	0	715.54115	126.16921	0
Slice 29	591.10368	24.104304	0	694.24506	122.41413	0
Slice 30	610.17281	24.12051	0	661.46274	116.63373	0
Slice 31	627.35368	24.221783	0	622.61949	109.78461	0
Slice 32	645.64421	24.437977	0	455.70411	80.352929	0
Slice 33	666.93262	24.803972	0	154.16311	27.183117	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 155
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 01-07-2020
Time: 16:24:17
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Trail New\
Last Solved Date: 01-07-2020
Last Solved Time: 16:24:19

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (52.05023, 69.07466) ft
Left-Zone Right Coordinate: (122.5, 63.88889) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (735.31065, 19.42833) ft
Right-Zone Right Coordinate: (802.5, 15.94445) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.062
Volume: 5,514.8279 ft^3
Weight: 5,79,056.93 lbs
Resisting Moment: 3.7403789e+008 lbs-ft
Activating Moment: 3.523516e+008 lbs-ft
Resisting Force: 1,01,012.36 lbs
Activating Force: 95,156.45 lbs
F of S Rank: 1
Exit: (735.31065, 19.428332) ft
Entry: (52.05023, 69.074664) ft
Radius: 3,691.1885 ft
Center: (660.02613, 3,709.8491) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	57.275115	68.209859	0	78.823669	13.898739	0
Slice 2	73.125	65.633898	0	261.22776	46.061501	0
Slice 3	94.375	62.275059	0	461.76168	81.421043	0
Slice 4	113.75	59.318001	0	578.67091	102.03529	0
Slice 5	131.25	56.742089	0	614.26406	108.31133	0
Slice 6	148.74016	54.253121	0	655.29998	115.54707	0
Slice 7	166.22047	51.850824	0	701.83729	123.75285	0
Slice 8	184.01766	49.493146	0	716.89088	126.4072	0
Slice	202.13171	47.183051	0	700.15692	123.45656	0

9						
Slice 10	225.59437	44.343432	0	663.18358	116.93716	0
Slice 11	249.72982	41.54782	0	670.19291	118.17309	0
Slice 12	269.18945	39.423492	0	731.69678	129.01788	0
Slice 13	288.56445	37.411839	0	782.65409	138.00303	0
Slice 14	307.85482	35.511788	0	823.13835	145.1415	0
Slice 15	330	33.465219	0	900.42605	158.76941	0
Slice 16	355	31.306599	0	1,011.2586	178.31217	0
Slice 17	377.5	29.502432	0	1,085.7327	191.44398	0
Slice 18	397.5	28.021738	0	1,126.7101	198.66939	0
Slice 19	418.125	26.610896	0	1,131.8376	199.57351	0
Slice 20	439.375	25.276807	0	1,100.1389	193.98418	0
Slice 21	466.25	23.786266	0	1,077.9637	190.07408	0
Slice 22	491.25	22.531498	0	1,066.8625	188.11664	0
Slice 23	510	21.724211	0	1,083.805	191.10406	0
Slice 24	530	20.964949	0	1,127.9441	198.88697	0
Slice 25	550	20.314256	0	1,160.4892	204.62556	0
Slice 26	561.25	19.982583	0	1,175.0858	207.19934	0
Slice 27	573.33333	19.694614	0	1,186.2323	209.16476	0
Slice 28	595	19.249229	0	1,199.0397	211.42305	0
Slice 29	616.66667	18.931087	0	1,198.0012	211.23994	0
Slice 30	631.25	18.774585	0	1,190.9815	210.00217	0
Slice 31	643.75	18.706767	0	1,084.1396	191.16306	0
Slice 32	661.2862	18.671183	0	871.42391	153.65555	0
Slice 33	676.2862	18.701555	0	682.93213	120.41936	0
Slice 34	695.83931	18.858357	0	455.42434	80.303599	0
Slice 35	722.08931	19.204897	0	154.93412	27.319065	0
Slice 36	735.15533	19.42517	0	1.1816948	0.20836468	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (STATIC) ADDITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 172
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:35:07
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:35:09

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (0, 70) ft
Left-Zone Right Coordinate: (300, 44.15771) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (308.88565, 43.45705) ft
Right-Zone Right Coordinate: (799.28578, 16.11111) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 1.530
Volume: 769.23933 ft^3
Weight: 80,770.13 lbs
Resisting Moment: 1,85,08,366 lbs-ft
Activating Moment: 1,20,93,145 lbs-ft
Resisting Force: 14,055.392 lbs
Activating Force: 9,183.6472 lbs
F of S Rank: 1
Exit: (308.88565, 43.457048) ft
Entry: (75.309816, 68.051646) ft
Radius: 1,307.1235 ft
Center: (328.42237, 1,350.4345) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	79.021089	67.330274	0	49.12296	8.6617032	0
Slice 2	86.443635	65.909772	0	145.00986	25.569151	0
Slice 3	93.866181	64.533683	0	236.26325	41.659585	0
Slice 4	101.28873	63.201866	0	322.97174	56.948632	0
Slice 5	109.375	61.803326	0	384.47161	67.792718	0
Slice 6	118.125	60.346474	0	419.97984	74.053777	0
Slice 7	126.875	58.950548	0	449.43447	79.247423	0
Slice 8	135.625	57.61535	0	472.8654	83.378929	0
Slice 9	144.37008	56.341375	0	497.36479	87.698831	0

Slice 10	153.11024	55.128376	0	522.95815	92.211632	0
Slice 11	161.85039	53.975434	0	542.55932	95.667847	0
Slice 12	170.59055	52.882388	0	556.13459	98.061533	0
Slice 13	179.02559	51.883151	0	552.86798	97.485542	0
Slice 14	187.15551	50.973573	0	533.06759	93.994199	0
Slice 15	195.28543	50.11546	0	507.84933	89.547539	0
Slice 16	203.41535	49.308712	0	477.16711	84.137436	0
Slice 17	211.54528	48.553233	0	440.98184	77.756996	0
Slice 18	219.6752	47.848933	0	399.26449	70.401102	0
Slice 19	227.80512	47.19573	0	351.99871	62.06687	0
Slice 20	235.93504	46.593547	0	299.18287	52.754012	0
Slice 21	243.82698	46.057002	0	265.86692	46.879511	0
Slice 22	251.48094	45.583143	0	252.43473	44.511054	0
Slice 23	259.1349	45.154337	0	234.17371	41.291144	0
Slice 24	266.78886	44.77054	0	211.09557	37.221845	0
Slice 25	274.44282	44.431712	0	183.22162	32.306915	0
Slice 26	282.09679	44.137818	0	150.58222	26.551709	0
Slice 27	289.75075	43.888829	0	113.21571	19.962985	0
Slice 28	297.40471	43.684717	0	71.166778	12.548623	0
Slice 29	305.05867	43.525463	0	24.484331	4.3172481	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 175
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:40:48
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:40:51

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (43.54898, 69.2258) ft
Left-Zone Right Coordinate: (210, 52.98897) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (416.88264, 37.59744) ft
Right-Zone Right Coordinate: (632.5, 30.03831) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.813
Volume: 1,747.6993 ft³
Weight: 1,83,508.42 lbs
Resisting Moment: 6,58,59,865 lbs-ft
Activating Moment: 3,63,32,093 lbs-ft
Resisting Force: 32,054.192 lbs
Activating Force: 17,683.03 lbs
F of S Rank: 1
Exit: (416.88264, 37.597437) ft
Entry: (43.54898, 69.225797) ft
Radius: 2,043.0776 ft
Center: (401.9584, 2,080.6205) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	48.286735	68.393083	0	77.218457	13.615697	0
Slice 2	57.762245	66.750626	0	229.20709	40.415395	0
Slice 3	69.583333	64.772975	0	376.56411	66.398413	0
Slice 4	83.75	62.488205	0	516.50209	91.073255	0
Slice 5	97.916667	60.305356	0	646.07031	113.91963	0
Slice 6	110.83333	58.399585	0	718.59766	126.70816	0
Slice 7	122.5	56.754326	0	735.74049	129.7309	0
Slice 8	134.16667	55.177603	0	745.98955	131.53808	0
Slice 9	145.82677	53.670066	0	758.8407	133.80409	0

Slice 10	157.48031	52.231487	0	774.31419	136.53248	0
Slice 11	169.13386	50.860834	0	782.91256	138.04861	0
Slice 12	180.68479	49.568851	0	769.54899	135.69225	0
Slice 13	192.13312	48.354227	0	734.26248	129.47029	0
Slice 14	203.58145	47.204784	0	692.17995	122.05	0
Slice 15	215.02978	46.120411	0	643.2585	113.42383	0
Slice 16	226.47811	45.101003	0	587.45729	103.58457	0
Slice 17	236.10113	44.289969	0	535.65796	94.450951	0
Slice 18	246.47002	43.478574	0	512.25106	90.323683	0
Slice 19	259.41007	42.532211	0	505.41312	89.11797	0
Slice 20	272.35011	41.668409	0	489.82685	86.369689	0
Slice 21	285.29016	40.887064	0	465.45619	82.072485	0
Slice 22	298.19514	40.189752	0	432.39003	76.242028	0
Slice 23	311.06505	39.575945	0	390.66581	68.884923	0
Slice 24	323.75	39.049954	0	363.66291	64.123584	0
Slice 25	336.25	38.609415	0	351.67034	62.008969	0
Slice 26	348.75	38.245475	0	331.49992	58.452381	0
Slice 27	361.25	37.958092	0	303.16742	53.456596	0
Slice 28	374.16667	37.74284	0	257.41939	45.389984	0
Slice 29	387.5	37.604965	0	193.75366	34.163998	0
Slice 30	400.83333	37.554114	0	120.97798	21.331682	0
Slice 31	412.19132	37.57394	0	41.157755	7.2572226	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 169
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:29:44
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:29:45

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (49.50489, 69.11991) ft
Left-Zone Right Coordinate: (215.61025, 52.22222) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (407.08425, 38.35643) ft
Right-Zone Right Coordinate: (632.5, 30.03831) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556
Point 29	80	55.55556

Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft²)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.768
Volume: 1,508.5209 ft³
Weight: 1,58,394.69 lbs
Resisting Moment: 5,45,10,253 lbs-ft
Activating Moment: 3,08,28,219 lbs-ft
Resisting Force: 27,654.252 lbs
Activating Force: 15,639.912 lbs
F of S Rank: 1
Exit: (407.08425, 38.356427) ft
Entry: (49.50489, 69.119914) ft
Radius: 1,959.6326 ft
Center: (395.56064, 1,997.9552) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	56.002445	67.976742	0	105.94307	18.680621	0
Slice 2	67.8125	65.932357	0	268.89561	47.413552	0
Slice 3	78.4375	64.159948	0	379.85681	66.979005	0
Slice 4	89.0625	62.447488	0	484.66607	85.459704	0
Slice 5	99.6875	60.794818	0	583.40159	102.86944	0
Slice 6	110.83333	59.126754	0	643.27503	113.42674	0
Slice 7	122.5	57.449253	0	663.69766	117.0278	0
Slice 8	134.16667	55.843285	0	676.92522	119.36018	0
Slice 9	145.82677	54.309495	0	692.45069	122.09774	0

Slice 10	157.48031	52.847634	0	710.29769	125.24465	0
Slice 11	169.13386	51.45664	0	720.97632	127.12758	0
Slice 12	181.46457	50.06398	0	707.05563	124.67299	0
Slice 13	194.47244	48.678173	0	667.54224	117.70571	0
Slice 14	207.48031	47.380095	0	618.86271	109.12219	0
Slice 15	220.48819	46.169572	0	560.94991	98.910603	0
Slice 16	233.49606	45.04644	0	493.74264	87.060149	0
Slice 17	245.53571	44.081652	0	456.9594	80.574271	0
Slice 18	256.60714	43.263083	0	451.9877	79.697626	0
Slice 19	267.67857	42.507541	0	440.34126	77.644045	0
Slice 20	278.75	41.814953	0	421.99556	74.409203	0
Slice 21	289.82143	41.185252	0	396.93286	69.989973	0
Slice 22	300.89286	40.618377	0	365.14377	64.384699	0
Slice 23	311.96429	40.114274	0	326.62843	57.593404	0
Slice 24	323.75	39.648722	0	300.62017	53.007447	0
Slice 25	336.25	39.230285	0	286.22966	50.470011	0
Slice 26	348.75	38.891693	0	263.33243	46.432612	0
Slice 27	361.25	38.632907	0	231.95334	40.899632	0
Slice 28	374.09738	38.451196	0	183.07928	32.281816	0
Slice 29	387.29212	38.351095	0	116.30234	20.507241	0
Slice 30	400.48687	38.339842	0	40.289457	7.1041184	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.05g) ADDITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 173
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:37:18
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:37:20

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (0, 70) ft
Left-Zone Right Coordinate: (300, 44.15771) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (308.88565, 43.45705) ft
Right-Zone Right Coordinate: (799.28578, 16.11111) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 1.062
Volume: 769.23933 ft^3
Weight: 80,770.13 lbs
Resisting Moment: 1,84,02,265 lbs-ft
Activating Moment: 1,73,24,760 lbs-ft
Resisting Force: 13,975.063 lbs
Activating Force: 13,156.797 lbs
F of S Rank: 1
Exit: (308.88565, 43.457048) ft
Entry: (75.309816, 68.051646) ft
Radius: 1,307.1235 ft
Center: (328.42237, 1,350.4345) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	79.021089	67.330274	0	48.631196	8.5749919	0
Slice 2	86.443635	65.909772	0	143.52278	25.306938	0
Slice 3	93.866181	64.533683	0	233.79033	41.223542	0
Slice 4	101.28873	63.201866	0	319.55317	56.345846	0
Slice 5	109.375	61.803326	0	380.38071	67.071382	0
Slice 6	118.125	60.346474	0	415.5343	73.269908	0
Slice 7	126.875	58.950548	0	444.78047	78.426797	0
Slice 8	135.625	57.61535	0	468.15515	82.548385	0
Slice	144.37008	56.341375	0	492.68874	86.874318	0

9						
Slice 10	153.11024	55.128376	0	518.40819	91.409351	0
Slice 11	161.85039	53.975434	0	538.27598	94.912578	0
Slice 12	170.59055	52.882388	0	552.23746	97.374363	0
Slice 13	179.02559	51.883151	0	549.49247	96.890348	0
Slice 14	187.15551	50.973573	0	530.29242	93.504862	0
Slice 15	195.28543	50.11546	0	505.67105	89.16345	0
Slice 16	203.41535	49.308712	0	475.55588	83.853333	0
Slice 17	211.54528	48.553233	0	439.88471	77.563542	0
Slice 18	219.6752	47.848933	0	398.61024	70.28574	0
Slice 19	227.80512	47.19573	0	351.7041	62.014922	0
Slice 20	235.93504	46.593547	0	299.1599	52.749962	0
Slice 21	243.82698	46.057002	0	266.00205	46.903338	0
Slice 22	251.48094	45.583143	0	252.64724	44.548525	0
Slice 23	259.1349	45.154337	0	234.41809	41.334234	0
Slice 24	266.78886	44.77054	0	211.33014	37.263206	0
Slice 25	274.44282	44.431712	0	183.41322	32.340698	0
Slice 26	282.09679	44.137818	0	150.71046	26.57432	0
Slice 27	289.75075	43.888829	0	113.27663	19.973725	0
Slice 28	297.40471	43.684717	0	71.175519	12.550164	0
Slice 29	305.05867	43.525463	0	24.476779	4.3159165	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 176
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:42:35
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:42:37

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (43.54898, 69.2258) ft
Left-Zone Right Coordinate: (210, 52.98897) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (416.88264, 37.59744) ft
Right-Zone Right Coordinate: (632.5, 30.03831) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.193
Volume: 1,747.6993 ft^3
Weight: 1,83,508.42 lbs
Resisting Moment: 6,55,41,247 lbs-ft
Activating Moment: 5,49,46,524 lbs-ft
Resisting Force: 31,899.585 lbs
Activating Force: 26,743.183 lbs
F of S Rank: 1
Exit: (416.88264, 37.597437) ft
Entry: (43.54898, 69.225797) ft
Radius: 2,043.0776 ft
Center: (401.9584, 2,080.6205) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	48.286735	68.393083	0	76.529024	13.494132	0
Slice 2	57.762245	66.750626	0	227.13937	40.0508	0
Slice 3	69.583333	64.772975	0	373.11949	65.791032	0
Slice 4	83.75	62.488205	0	511.75244	90.235763	0
Slice 5	97.916667	60.305356	0	640.17947	112.88091	0
Slice 6	110.83333	58.399585	0	712.1508	125.5714	0
Slice 7	122.5	56.754326	0	729.2779	128.59137	0
Slice 8	134.16667	55.177603	0	739.64454	130.41929	0
Slice	145.82677	53.670066	0	752.67029	132.71608	0

9						
Slice 10	157.48031	52.231487	0	768.37519	135.48528	0
Slice 11	169.13386	50.860834	0	777.32172	137.06279	0
Slice 12	180.68479	49.568851	0	764.49197	134.80056	0
Slice 13	192.13312	48.354227	0	729.88171	128.69784	0
Slice 14	203.58145	47.204784	0	688.50138	121.40137	0
Slice 15	215.02978	46.120411	0	640.28431	112.8994	0
Slice 16	226.47811	45.101003	0	585.16664	103.18067	0
Slice 17	236.10113	44.289969	0	533.90893	94.14255	0
Slice 18	246.47002	43.478574	0	510.92917	90.090599	0
Slice 19	259.41007	42.532211	0	504.51889	88.960293	0
Slice 20	272.35011	41.668409	0	489.33206	86.282445	0
Slice 21	285.29016	40.887064	0	465.31068	82.046828	0
Slice 22	298.19514	40.189752	0	432.52633	76.266062	0
Slice 23	311.06505	39.575945	0	391.00703	68.945089	0
Slice 24	323.75	39.049954	0	364.12578	64.205199	0
Slice 25	336.25	38.609415	0	352.19146	62.100858	0
Slice 26	348.75	38.245475	0	332.02297	58.544609	0
Slice 27	361.25	37.958092	0	303.63997	53.53992	0
Slice 28	374.16667	37.74284	0	257.79174	45.455639	0
Slice 29	387.5	37.604965	0	193.99351	34.206289	0
Slice 30	400.83333	37.554114	0	121.08999	21.351432	0
Slice 31	412.19132	37.57394	0	41.183146	7.2616997	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 170
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:32:28
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:32:29

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (49.50489, 69.11991) ft
Left-Zone Right Coordinate: (215.61025, 52.22222) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (407.08425, 38.35643) ft
Right-Zone Right Coordinate: (632.5, 30.03831) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.05
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 1.173
Volume: 1,508.5209 ft^3
Weight: 1,58,394.69 lbs
Resisting Moment: 5,42,39,840 lbs-ft
Activating Moment: 4,62,36,724 lbs-ft
Resisting Force: 27,517.461 lbs
Activating Force: 23,457.375 lbs
F of S Rank: 1
Exit: (407.08425, 38.356427) ft
Entry: (49.50489, 69.119914) ft
Radius: 1,959.6326 ft
Center: (395.56064, 1,997.9552) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	56.002445	67.976742	0	104.98545	18.511768	0
Slice 2	67.8125	65.932357	0	266.44173	46.980867	0
Slice 3	78.4375	64.159948	0	376.36104	66.362605	0
Slice 4	89.0625	62.447488	0	480.20422	84.672961	0
Slice 5	99.6875	60.794818	0	578.0717	101.92964	0
Slice 6	110.83333	59.126754	0	637.47479	112.40401	0
Slice 7	122.5	57.449253	0	657.83478	115.99402	0
Slice 8	134.16667	55.843285	0	671.13507	118.33922	0
Slice	145.82677	54.309495	0	686.79245	121.10004	0

9						
Slice 10	157.48031	52.847634	0	704.83098	124.28072	0
Slice 11	169.13386	51.45664	0	715.8214	126.21863	0
Slice 12	181.46457	50.06398	0	702.4463	123.86023	0
Slice 13	194.47244	48.678173	0	663.67082	117.02307	0
Slice 14	207.48031	47.380095	0	615.75555	108.57432	0
Slice 15	220.48819	46.169572	0	558.59697	98.495717	0
Slice 16	233.49606	45.04644	0	492.09984	86.770478	0
Slice 17	245.53571	44.081652	0	455.81271	80.37208	0
Slice 18	256.60714	43.263083	0	451.17291	79.553958	0
Slice 19	267.67857	42.507541	0	439.83954	77.555579	0
Slice 20	278.75	41.814953	0	421.77352	74.370051	0
Slice 21	289.82143	41.185252	0	396.94562	69.992223	0
Slice 22	300.89286	40.618377	0	365.33873	64.419076	0
Slice 23	311.96429	40.114274	0	326.94954	57.650025	0
Slice 24	323.75	39.648722	0	301.01338	53.076781	0
Slice 25	336.25	39.230285	0	286.64718	50.543632	0
Slice 26	348.75	38.891693	0	263.72476	46.50179	0
Slice 27	361.25	38.632907	0	232.27818	40.956911	0
Slice 28	374.09738	38.451196	0	183.30213	32.32111	0
Slice 29	387.29212	38.351095	0	116.41258	20.526679	0
Slice 30	400.48687	38.339842	0	40.315806	7.1087644	0

SLOPE STABILITY ANALYSIS WITH WATERTABLE (SEISMIC Kh=0.1g) ADDITIONAL TRAILS

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 174
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:39:29
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:39:31

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (0, 70) ft
Left-Zone Right Coordinate: (300, 44.15771) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (308.88565, 43.45705) ft
Right-Zone Right Coordinate: (799.28578, 16.11111) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 26
F of S: 0.811
Volume: 769.23933 ft^3
Weight: 80,770.13 lbs
Resisting Moment: 1,82,96,473 lbs-ft
Activating Moment: 2,25,56,376 lbs-ft
Resisting Force: 13,894.975 lbs
Activating Force: 17,130.193 lbs
F of S Rank: 1
Exit: (308.88565, 43.457048) ft
Entry: (75.309816, 68.051646) ft
Radius: 1,307.1235 ft
Center: (328.42237, 1,350.4345) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	79.021089	67.330274	0	48.144316	8.489142	0
Slice 2	86.443635	65.909772	0	142.05249	25.047687	0
Slice 3	93.866181	64.533683	0	231.34681	40.792684	0
Slice 4	101.28873	63.201866	0	316.17445	55.750086	0
Slice 5	109.375	61.803326	0	376.33351	66.357752	0
Slice 6	118.125	60.346474	0	411.12845	72.493038	0
Slice 7	126.875	58.950548	0	440.15729	77.611606	0
Slice 8	135.625	57.61535	0	463.46382	81.721176	0
Slice	144.37008	56.341375	0	488.01899	86.050915	0

9						
Slice 10	153.11024	55.128376	0	513.85286	90.606124	0
Slice 11	161.85039	53.975434	0	533.97796	94.154722	0
Slice 12	170.59055	52.882388	0	548.31993	96.683598	0
Slice 13	179.02559	51.883151	0	546.09514	96.291307	0
Slice 14	187.15551	50.973573	0	527.49786	93.012106	0
Slice 15	195.28543	50.11546	0	503.47844	88.776834	0
Slice 16	203.41535	49.308712	0	473.93682	83.567849	0
Slice 17	211.54528	48.553233	0	438.78643	77.369886	0
Slice 18	219.6752	47.848933	0	397.96063	70.171197	0
Slice 19	227.80512	47.19573	0	351.4183	61.964528	0
Slice 20	235.93504	46.593547	0	299.14803	52.747869	0
Slice 21	243.82698	46.057002	0	266.14796	46.929066	0
Slice 22	251.48094	45.583143	0	252.86794	44.58744	0
Slice 23	259.1349	45.154337	0	234.66718	41.378156	0
Slice 24	266.78886	44.77054	0	211.56585	37.304768	0
Slice 25	274.44282	44.431712	0	183.60305	32.374172	0
Slice 26	282.09679	44.137818	0	150.83536	26.596343	0
Slice 27	289.75075	43.888829	0	113.33419	19.983876	0
Slice 28	297.40471	43.684717	0	71.182187	12.55134	0
Slice 29	305.05867	43.525463	0	24.468739	4.3144989	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 177
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:44:04
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:44:06

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (43.54898, 69.2258) ft
Left-Zone Right Coordinate: (210, 52.98897) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (416.88264, 37.59744) ft
Right-Zone Right Coordinate: (632.5, 30.03831) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 0.887
Volume: 1,747.6993 ft^3
Weight: 1,83,508.42 lbs
Resisting Moment: 6,52,23,754 lbs-ft
Activating Moment: 7,35,60,955 lbs-ft
Resisting Force: 31,745.541 lbs
Activating Force: 35,803.439 lbs
F of S Rank: 1
Exit: (416.88264, 37.597437) ft
Entry: (43.54898, 69.225797) ft
Radius: 2,043.0776 ft
Center: (401.9584, 2,080.6205) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	48.286735	68.393083	0	75.845158	13.373548	0
Slice 2	57.762245	66.750626	0	225.0877	39.689034	0
Slice 3	69.583333	64.772975	0	369.69883	65.187879	0
Slice 4	83.75	62.488205	0	507.02881	89.402859	0
Slice 5	97.916667	60.305356	0	634.30973	111.84592	0
Slice 6	110.83333	58.399585	0	705.71409	124.43644	0
Slice 7	122.5	56.754326	0	722.81251	127.45135	0
Slice 8	134.16667	55.177603	0	733.28407	129.29777	0
Slice	145.82677	53.670066	0	746.47333	131.62339	0

9						
Slice 10	157.48031	52.231487	0	762.4011	134.43188	0
Slice 11	169.13386	50.860834	0	771.69066	136.06988	0
Slice 12	180.68479	49.568851	0	759.39393	133.90164	0
Slice 13	192.13312	48.354227	0	725.46351	127.91879	0
Slice 14	203.58145	47.204784	0	684.79267	120.74742	0
Slice 15	215.02978	46.120411	0	637.29007	112.37143	0
Slice 16	226.47811	45.101003	0	582.86775	102.77531	0
Slice 17	236.10113	44.289969	0	532.16208	93.834533	0
Slice 18	246.47002	43.478574	0	509.62031	89.85981	0
Slice 19	259.41007	42.532211	0	503.6504	88.807154	0
Slice 20	272.35011	41.668409	0	488.87365	86.201615	0
Slice 21	285.29016	40.887064	0	465.20898	82.028895	0
Slice 22	298.19514	40.189752	0	432.70998	76.298445	0
Slice 23	311.06505	39.575945	0	391.39516	69.013527	0
Slice 24	323.75	39.049954	0	364.63232	64.294516	0
Slice 25	336.25	38.609415	0	352.75088	62.199498	0
Slice 26	348.75	38.245475	0	332.57679	58.642261	0
Slice 27	361.25	37.958092	0	304.13476	53.627165	0
Slice 28	374.16667	37.74284	0	258.17773	45.523699	0
Slice 29	387.5	37.604965	0	194.23984	34.249724	0
Slice 30	400.83333	37.554114	0	121.20406	21.371545	0
Slice 31	412.19132	37.57394	0	41.20885	7.2662321	0

SLOPE/W Analysis

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File Information

Created By: Admin
Last Edited By: Admin
Revision Number: 171
File Version: 8.3
Tool Version: 8.13.4.13430
Date: 13-07-2020
Time: 10:33:33
File Name: Analysis.gsz
Directory: G:\My Drive\AGS ENGINEERING\AGS 2020 ENG PROJECTS\0280-WS20 Richard Coba 39.553792, -107.345697 Glenwood Springs, CO\Slope Stability Analysis\Additional trails\Additional Trails\
Last Solved Date: 13-07-2020
Last Solved Time: 10:33:36

Project Settings

Length(L) Units: Feet
Time(t) Units: Seconds
Force(F) Units: Pounds
Pressure(p) Units: psf
Strength Units: psf
Unit Weight of Water: 62.4 pcf
View: 2D
Element Thickness: 1

Analysis Settings

SLOPE/W Analysis

Kind: SLOPE/W
Method: Morgenstern-Price
Settings
- Side Function
  - Interslice force function option: Half-Sine
- Lambda
  - Lambda 1: -1
  - Lambda 2: -0.8
  - Lambda 3: -0.6
  - Lambda 4: -0.4
  - Lambda 5: -0.2
  - Lambda 6: 0
  - Lambda 7: 0.2
  - Lambda 8: 0.4
  - Lambda 9: 0.6
  - Lambda 10: 0.8
  - Lambda 11: 1
- PWP Conditions Source: Piezometric Line
- Apply Phreatic Correction: No
- Use Staged Rapid Drawdown: No

Slip Surface

Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack
Tension Crack Option: (none)
F of S Distribution
F of S Calculation Option: Constant
Advanced
Number of Slices: 30
F of S Tolerance: 0.001
Minimum Slip Surface Depth: 0.1 ft
Optimization Maximum Iterations: 2,000
Optimization Convergence Tolerance: 1e-007
Starting Optimization Points: 8
Ending Optimization Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °

Materials

Silty gravel

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Clayey Silty Sand

Model: Mohr-Coulomb
Unit Weight: 105 pcf
Cohesion': 0 psf
Phi': 10 °
Phi-B: 0 °

Bedrock

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 500 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Projection: Range
Left-Zone Left Coordinate: (49.50489, 69.11991) ft
Left-Zone Right Coordinate: (215.61025, 52.22222) ft
Left-Zone Increment: 4
Right Projection: Range
Right-Zone Left Coordinate: (407.08425, 38.35643) ft
Right-Zone Right Coordinate: (632.5, 30.03831) ft
Right-Zone Increment: 4
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (0, 70) ft
Right Coordinate: (900, 10.55556) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X (ft)	Y (ft)
Coordinate 1	0	60.55556
Coordinate 2	482.5	27.41667
Coordinate 3	560	23.33333
Coordinate 4	875	10
Coordinate 5	900	10

Seismic Coefficients

Horz Seismic Coef.: 0.1
Ignore seismic load in strength: No

Points

	X (ft)	Y (ft)
Point 1	0	0
Point 2	174.96063	57.77778
Point 3	240	48.88889
Point 4	317.5	42.77778
Point 5	367.5	40.55556
Point 6	407.5	38.33333
Point 7	450	35
Point 8	500	32.22222
Point 9	562.5	31.11111
Point 10	635	30
Point 11	682.5	24.44444
Point 12	735	19.44444
Point 13	810	15.55556
Point 14	870	12.77778
Point 15	900	10.55556
Point 16	140	61.66667
Point 17	0	70
Point 18	62.5	68.88889
Point 19	105	66.11111
Point 20	0	60.55556
Point 21	735	17.22222
Point 22	670	21.66667
Point 23	627.5	23.88889
Point 24	562.5	26.11111
Point 25	500	27.22222
Point 26	450	27.77778
Point 27	235	41.11111
Point 28	142.5	50.55556

Point 29	80	55.55556
Point 30	25	58.88889
Point 31	0	35
Point 32	270	25
Point 33	480	16.66667
Point 34	700	11.11111
Point 35	872.5	8.33333
Point 36	900	8.33333
Point 37	900	0

Regions

	Material	Points	Area (ft^2)
Region 1	Silty gravel	20,17,18,19,16,2,3,4,5,6,7,8,9,10,11,12,13,21,22,23,24,25,26,27,28,29,30	5,676.8
Region 2	Clayey Silty Sand	31,32,33,34,35,36,15,14,13,21,22,23,24,25,26,27,28,29,30,20	11,492
Region 3	Bedrock	1,31,32,33,34,35,36,37	17,437

Current Slip Surface

Slip Surface: 1
F of S: 0.875
Volume: 1,508.5209 ft^3
Weight: 1,58,394.69 lbs
Resisting Moment: 5,39,70,327 lbs-ft
Activating Moment: 6,16,45,229 lbs-ft
Resisting Force: 27,381.141 lbs
Activating Force: 31,274.924 lbs
F of S Rank: 1
Exit: (407.08425, 38.356427) ft
Entry: (49.50489, 69.119914) ft
Radius: 1,959.6326 ft
Center: (395.56064, 1,997.9552) ft

Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	56.002445	67.976742	0	104.03539	18.344247	0
Slice 2	67.8125	65.932357	0	264.00577	46.551341	0
Slice 3	78.4375	64.159948	0	372.88757	65.75014	0
Slice 4	89.0625	62.447488	0	475.76532	83.890262	0
Slice 5	99.6875	60.794818	0	572.76135	100.99328	0
Slice 6	110.83333	59.126754	0	631.68551	111.3832	0
Slice 7	122.5	57.449253	0	651.97096	114.96007	0
Slice 8	134.16667	55.843285	0	665.33207	117.31599	0
Slice	145.82677	54.309495	0	681.11081	120.09821	0

9						
Slice 10	157.48031	52.847634	0	699.33272	123.31123	0
Slice 11	169.13386	51.45664	0	710.63008	125.30326	0
Slice 12	181.46457	50.06398	0	697.80013	123.04099	0
Slice 13	194.47244	48.678173	0	659.76741	116.33479	0
Slice 14	207.48031	47.380095	0	612.62559	108.02242	0
Slice 15	220.48819	46.169572	0	556.23331	98.07894	0
Slice 16	233.49606	45.04644	0	490.45947	86.481238	0
Slice 17	245.53571	44.081652	0	454.68024	80.172394	0
Slice 18	256.60714	43.263083	0	450.38237	79.414564	0
Slice 19	267.67857	42.507541	0	439.3705	77.472874	0
Slice 20	278.75	41.814953	0	421.59026	74.337737	0
Slice 21	289.82143	41.185252	0	397.00048	70.001895	0
Slice 22	300.89286	40.618377	0	365.57618	64.460943	0
Slice 23	311.96429	40.114274	0	327.3108	57.713724	0
Slice 24	323.75	39.648722	0	301.44247	53.152441	0
Slice 25	336.25	39.230285	0	287.09453	50.622512	0
Slice 26	348.75	38.891693	0	264.13938	46.5749	0
Slice 27	361.25	38.632907	0	232.61757	41.016754	0
Slice 28	374.09738	38.451196	0	183.53256	32.361741	0
Slice 29	387.29212	38.351095	0	116.52549	20.546587	0
Slice 30	400.48687	38.339842	0	40.342574	7.1134843	0

GEOPHYSICAL

SETTING &

WATER WELL DETAILS

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

GLENWOOD MEADOWS HOUSING
WULFSOHN ROAD
GLENWOOD SPRINGS, CO 81601

TARGET PROPERTY COORDINATES

Latitude (North):	39.554395 - 39° 33' 15.82''
Longitude (West):	107.348062 - 107° 20' 53.02''
Universal Tranverse Mercator:	Zone 13
UTM X (Meters):	298257.4
UTM Y (Meters):	4380725.5
Elevation:	5915 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5957205 GLENWOOD SPRINGS, CO
Version Date:	2013
West Map:	5957249 STORM KING MOUNTAIN, CO
Version Date:	2013

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
Not Reported	

Additional Panels in search area:	FEMA Source Type
Not Reported	

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Paleozoic
System:	Ordovician
Series:	Lower Paleozoic
Code:	lPz *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Chilton

Soil Surface Texture: channery loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	channery loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 42.34 Min: 14.11	Max: 8.4 Min: 7.9
2	12 inches	22 inches	very channery sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 42.34 Min: 14.11	Max: 8.4 Min: 7.9
3	22 inches	59 inches	very cobbly sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 42.34 Min: 14.11	Max: 8.4 Min: 7.9

Soil Map ID: 2

Soil Component Name: Begay

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42.34 Min: 14.11	Max: 8.4 Min: 7.9
2	9 inches	59 inches	stony sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42.34 Min: 14.11	Max: 8.4 Min: 7.9

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
E23	USGS40000208918	1/2 - 1 Mile East
G29	USGS40000208899	1/2 - 1 Mile East
G34	USGS40000208906	1/2 - 1 Mile East

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	CO7000000324417	1/4 - 1/2 Mile ENE
A2	CO7000000349413	1/4 - 1/2 Mile ENE
3	CO7000000166980	1/4 - 1/2 Mile WNW
A4	CO7000000258803	1/4 - 1/2 Mile ENE
5	CO7000000090604	1/4 - 1/2 Mile NE
6	CO7000000298041	1/2 - 1 Mile ENE
7	CO7000000150535	1/2 - 1 Mile NNW
B8	CO7000000365873	1/2 - 1 Mile WNW
B9	CO7000000133567	1/2 - 1 Mile WNW
B10	CO7000000313658	1/2 - 1 Mile WNW
B11	CO7000000393080	1/2 - 1 Mile WNW
C12	CO7000000150536	1/2 - 1 Mile NE
C13	CO7000000256265	1/2 - 1 Mile NE
B14	CO7000000256424	1/2 - 1 Mile WNW
15	CO7000000112971	1/2 - 1 Mile WNW
D16	CO7000000425543	1/2 - 1 Mile NW
E17	CO7000000299859	1/2 - 1 Mile East
D18	CO7000000011033	1/2 - 1 Mile NW
D19	CO7000000012473	1/2 - 1 Mile WNW
E20	CO7000000073001	1/2 - 1 Mile East
E21	CO7000000248384	1/2 - 1 Mile East
D22	CO7000000011034	1/2 - 1 Mile NW
24	CO7000000284603	1/2 - 1 Mile ENE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
25	CO7000000009536	1/2 - 1 Mile SSE
26	CO7000000160074	1/2 - 1 Mile SW
F27	CO7000000183771	1/2 - 1 Mile WNW
F28	CO7000000091690	1/2 - 1 Mile WNW
30	CO7000000010345	1/2 - 1 Mile East
H31	CO7000000092945	1/2 - 1 Mile NNE
H32	CO7000000322929	1/2 - 1 Mile NNE
33	CO7000000348987	1/2 - 1 Mile NNW
35	CO7000000150553	1/2 - 1 Mile NNE
36	CO7000000097341	1/2 - 1 Mile East
I37	CO7000000352550	1/2 - 1 Mile NW
38	CO7000000104162	1/2 - 1 Mile North
39	CO7000000011413	1/2 - 1 Mile ESE
J40	CO7000000253039	1/2 - 1 Mile NW
I41	CO7000000122552	1/2 - 1 Mile NW
J42	CO7000000071993	1/2 - 1 Mile NW
J43	CO7000000395992	1/2 - 1 Mile NW
J44	CO7000000429147	1/2 - 1 Mile NW
J45	CO7000000104686	1/2 - 1 Mile NW
K46	CO7000000229226	1/2 - 1 Mile North
K47	CO7000000229225	1/2 - 1 Mile North
K48	CO7000000229224	1/2 - 1 Mile North
K49	CO7000000229227	1/2 - 1 Mile North
K50	CO7000000469712	1/2 - 1 Mile North
K51	CO7000000313945	1/2 - 1 Mile North
K52	CO7000000229228	1/2 - 1 Mile North
I53	CO7000000122553	1/2 - 1 Mile NW
54	CO7000000012620	1/2 - 1 Mile NW
L55	CO7000000076247	1/2 - 1 Mile NE
L56	CO7000000321216	1/2 - 1 Mile NE
M57	CO7000000010707	1/2 - 1 Mile East
M58	CO7000000010708	1/2 - 1 Mile East
M59	CO7000000010709	1/2 - 1 Mile East

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

A1
ENE
1/4 - 1/2 Mile
Lower

CO WELLS **CO7000000324417**

CO DWR ID #:	Not Reported	Permit #:	36945-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	09/10/1999
Expiration Date:	12/10/1999	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	UNKNOWN	Water District:	45
Division:	5	Comments:	Not Reported

A2
ENE
1/4 - 1/2 Mile
Lower

CO WELLS **CO7000000349413**

CO DWR ID #:	Not Reported	Permit #:	36139-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	05/19/1999
Expiration Date:	08/19/1999	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

3
WNW
1/4 - 1/2 Mile
Lower

CO WELLS **CO7000000166980**

CO DWR ID #:	Not Reported	Permit #:	24572-F
Well Name:	Not Reported	Well Status:	Not Reported
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Commercial	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	12/31/1979

Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

A4
ENE **CO WELLS** **CO7000000258803**
1/4 - 1/2 Mile
Lower

CO DWR ID #:	Not Reported	Permit #:	221874-
Well Name:	MW 2	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	11/12/1999
Expiration Date:	11/12/2001	Construction Date:	09/15/1999
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	02/16/2000	Surface Elevation (ft):	5720
Well Depth (ft):	20	Top of First Perf Casing:	10
Base of Last Perf Casing:	20	Yield (gal/min):	0
Static Water Depth (ft):	17	Groundwater Basin:	Not Reported
Mgmt District:	UNKNOWN	Water District:	45
Division:	5	Comments:	Not Reported

5
NE **CO WELLS** **CO7000000090604**
1/4 - 1/2 Mile
Lower

CO DWR ID #:	Not Reported	Permit #:	221873-
Well Name:	MW 1	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	11/12/1999
Expiration Date:	11/12/2001	Construction Date:	05/12/1999
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	02/16/2000	Surface Elevation (ft):	5720
Well Depth (ft):	24	Top of First Perf Casing:	14
Base of Last Perf Casing:	24	Yield (gal/min):	0
Static Water Depth (ft):	18	Groundwater Basin:	Not Reported
Mgmt District:	UNKNOWN	Water District:	45
Division:	5	Comments:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

6
ENE
1/2 - 1 Mile
Lower

CO WELLS **CO7000000298041**

CO DWR ID #:	Not Reported	Permit #:	21029-F
Well Name:	WEST GLEN #1	Well Status:	Permit Expired
Water Court Case #:	W2997	Parcel Size:	0
Well Use:	Domestic	Addtl Well Use:	Commercial
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	05/25/1976
Expiration Date:	05/25/1978	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	39
Division:	5		
Comments:	X-refer case no. W2997, Abandoned by court 06/10/82. dmw 06/17/11		

7
NNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000150535**

CO DWR ID #:	Not Reported	Permit #:	9992-AD
Well Name:	MITCHELL-COOPER WELL NO. 2		
Well Status:	Application Denied	Water Court Case #:	79CW0381
Parcel Size:	0	Well Use:	Municipal
Addtl Well Use:	Not Reported	Special Use:	Not Reported
Primary Aquifer:	All Unnamed Aquifers	Addtl Aquifer:	Not Reported
Irrigation Area:	0 acres	Yrly Appropriation:	0
Issue Date:	03/10/1983	Expiration Date:	Not Reported
Construction Date:	Not Reported	Start Use Date:	Not Reported
Pump Install Date:	Not Reported	Well Plug Date:	Not Reported
Surface Elevation (ft):	0	Well Depth (ft):	0
Top of First Perf Casing:	0	Base of Last Perf Casing:	0
Yield (gal/min):	0	Static Water Depth (ft):	0
Groundwater Basin:	Not Reported	Mgmt District:	Not Reported
Water District:	45	Division:	5
Comments:	APPLICATION DENIED! X-refer case no. 79CW0381, dismissed & not decreed. dmw 06/16/11		

B8
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000365873**

CO DWR ID #:	Not Reported	Permit #:	53-GX
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Geothermal	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	Not Reported

Expiration Date:	Not Reported	Construction Date:	06/26/2007
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	300	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5		
Comments:	Well located at 0120 Midland Ave Glenwood Springs		

B9
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000133567**

CO DWR ID #:	Not Reported	Permit #:	53-GX
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Geothermal	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	Not Reported
Expiration Date:	Not Reported	Construction Date:	01/02/2008
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5		
Comments:	Property location: 0120 Midland Ave, Glenwood Springs, CO 81601		

B10
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000313658**

CO DWR ID #:	Not Reported	Permit #:	1-GX
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Geothermal	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	Not Reported
Expiration Date:	Not Reported	Construction Date:	07/21/2008
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5	Comments:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

B11
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000393080**

CO DWR ID #:	Not Reported	Permit #:	53-GX
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Geothermal	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	Not Reported
Expiration Date:	Not Reported	Construction Date:	01/02/2008
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	300	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5		
Comments:	Well located at 0120 Midland Ave Glenwood Springs		

C12
NE
1/2 - 1 Mile
Lower

CO WELLS **CO7000000150536**

CO DWR ID #:	Not Reported	Permit #:	154190--A
Well Name:	MARTIN WATER WELL NO. 1	Well Status:	Well Constructed
Water Court Case #:	W1609	Parcel Size:	0
Well Use:	Domestic	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	05/23/1989
Expiration Date:	Not Reported	Construction Date:	05/25/1989
Start Use Date:	Not Reported	Pump Install Date:	06/07/1989
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	66	Top of First Perf Casing:	36
Base of Last Perf Casing:	66	Yield (gal/min):	10
Static Water Depth (ft):	53	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5		
Comments:	X-refer file no. 154190 & case no. W1609 (Martin Well no. 1), domestic an other beneficial purposes.		

C13
NE
1/2 - 1 Mile
Lower

CO WELLS **CO7000000256265**

CO DWR ID #:	Not Reported	Permit #:	154190-
Well Name:	MARTIN WATER WELL NO. 1	Well Status:	Well Abandoned
Water Court Case #:	W1609	Parcel Size:	0
Well Use:	Domestic	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	1.5	Issue Date:	05/23/1989

Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	03/03/1963	Pump Install Date:	Not Reported
Well Plug Date:	06/17/1989	Surface Elevation (ft):	0
Well Depth (ft):	20	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	15
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5		
Comments:	X-refer file no. 154190-A & case no. W1609 (Martin Well no. 1), domestic an other beneficial purposes.		

B14
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000256424**

CO DWR ID #:	Not Reported	Permit #:	493-G
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	5.7399998
Well Use:	Geothermal	Addtl Well Use:	Not Reported
Special Use:	Closed Loop Geothermal	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	07/26/2004
Expiration Date:	07/26/2005	Construction Date:	11/06/2004
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	275	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

15
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000112971**

CO DWR ID #:	Not Reported	Permit #:	2000026-AB
Well Name:	Not Reported	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	Not Reported
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	04/01/1995	Surface Elevation (ft):	0
Well Depth (ft):	35	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

D16
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000425543**

CO DWR ID #:	Not Reported	Permit #:	166102-
Well Name:	MW-1	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	09/09/1992
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	04/01/1995	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

E17
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000299859**

CO DWR ID #:	Not Reported	Permit #:	27676-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	03/26/1996
Expiration Date:	06/26/1996	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5	Comments:	Not Reported

D18
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000011033**

CO DWR ID #:	Not Reported	Permit #:	166103-
Well Name:	MW-2	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	09/09/1992
Expiration Date:	Not Reported	Construction Date:	Not Reported

Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	04/01/1995	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

D19
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000012473**

CO DWR ID #:	Not Reported	Permit #:	170892-
Well Name:	MW-4	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	07/01/1993
Expiration Date:	07/01/1995	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	04/01/1995	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	MONITORING AND OBSERVATION WELL

E20
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000073001**

CO DWR ID #:	Not Reported	Permit #:	17-G
Well Name:	Not Reported	Well Status:	Permit Expired
Water Court Case #:	83CW0150	Parcel Size:	0
Well Use:	Geothermal	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	01/21/1987
Expiration Date:	01/21/1988	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	2500
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	39
Division:	5	Comments:	SEE 87CW208

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

E21
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000248384**

CO DWR ID #:	Not Reported	Permit #:	460-G
Well Name:	REDSTONE WELL	Well Status:	Well Constructed
Water Court Case #:	83CW0150	Parcel Size:	13.41
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	03/19/2004
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	155	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	39
Division:	5		
Comments:	Type A-OS. Also Case Nos. 00CW171, 01CW162, 94CW253		

D22
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000011034**

CO DWR ID #:	Not Reported	Permit #:	166104-
Well Name:	MW-3	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	09/09/1992
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	04/01/1995	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

E23
East
1/2 - 1 Mile
Lower

FED USGS **USGS40000208918**

Organization ID:	USGS-CO	Organization Name:	USGS Colorado Water Science Center
Monitor Location:	SC00608909BBA USGS 393313107200401		
Type:	Well	Description:	Not Reported
HUC:	14010005	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	Not Reported
Formation Type:	Leadville Limestone	Aquifer Type:	Not Reported
Construction Date:	19810101	Well Depth:	Not Reported

Well Depth Units:	Not Reported	Well Hole Depth:	155
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	1	Level reading date:	1984-11-12
Feet below surface:	-13.20	Feet to sea level:	Not Reported
Note:	Other conditions existed that would affect the measured water level.		

24
ENE **CO WELLS** **CO7000000284603**
1/2 - 1 Mile
Lower

CO DWR ID #:	Not Reported	Permit #:	36-G
Well Name:	DUNNING NO. 03	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Commercial	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	11/17/1987
Expiration Date:	11/17/1988	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

25
SSE **CO WELLS** **CO7000000009536**
1/2 - 1 Mile
Higher

CO DWR ID #:	Not Reported	Permit #:	19912-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	10/20/1992
Expiration Date:	01/18/1993	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5	Comments:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

26
SW
1/2 - 1 Mile
Higher

CO WELLS **CO7000000160074**

CO DWR ID #:	Not Reported	Permit #:	50760-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	06/27/2012
Expiration Date:	09/25/2012	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	37
Division:	5	Comments:	3 holes - Location based upon UTM

F27
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000183771**

CO DWR ID #:	Not Reported	Permit #:	51379-MH
Well Name:	Not Reported	Well Status:	Well Abandoned
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	04/02/2013
Expiration Date:	07/01/2013	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	04/12/2013	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5		
Comments:	20 holes - 51171 Hwy 6 & 24 - Glenwood Springs, CO		

F28
WNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000091690**

CO DWR ID #:	Not Reported	Permit #:	37534-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0

Yrly Appropriation:	0	Issue Date:	12/27/1999
Expiration Date:	03/27/2000	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	UNKNOWN	Water District:	45
Division:	5	Comments:	Not Reported

G29
East
1/2 - 1 Mile
Lower

FED USGS **USGS40000208899**

Organization ID:	USGS-CO	Organization Name:	USGS Colorado Water Science Center
Monitor Location:	SC00608909BBD	Type:	Well
Description:	Not Reported	HUC:	14010005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Alluvium and Terrace Deposits
Aquifer Type:	Not Reported	Construction Date:	19821001
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	78	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1984-11-12
Feet below surface:	12.11	Feet to sea level:	Not Reported
Note:	Not Reported		

30
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000010345**

CO DWR ID #:	Not Reported	Permit #:	37-G
Well Name:	DUNNING NO. 02	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Commercial	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	11/17/1987
Expiration Date:	11/17/1989	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

H31
NNE
1/2 - 1 Mile
Higher

CO WELLS **CO7000000092945**

CO DWR ID #:	Not Reported	Permit #:	37727-MH
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	02/09/2000
Expiration Date:	05/09/2000	Construction Date:	03/02/2000
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	436	Top of First Perf Casing:	136
Base of Last Perf Casing:	436	Yield (gal/min):	15
Static Water Depth (ft):	102	Groundwater Basin:	Not Reported
Mgmt District:	UNKNOWN	Water District:	45
Division:	5	Comments:	Not Reported

H32
NNE
1/2 - 1 Mile
Higher

CO WELLS **CO7000000322929**

CO DWR ID #:	Not Reported	Permit #:	36135-MH
Well Name:	Not Reported	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	05/10/1999
Expiration Date:	08/10/1999	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5		
Comments:	Expired notice. Drillers log not submitted. dmw 04/17/11		

33
NNW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000348987**

CO DWR ID #:	Not Reported	Permit #:	39674-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	05/03/2001

Expiration Date:	08/03/2001	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

G34
East
1/2 - 1 Mile
Lower

FED USGS **USGS40000208906**

Organization ID:	USGS-CO	Organization Name:	USGS Colorado Water Science Center
Monitor Location:	SC00608909BAC	Type:	Well
Description:	Not Reported	HUC:	14010005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Alluvium and Terrace Deposits
Aquifer Type:	Not Reported	Construction Date:	19821001
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	84	Well Hole Depth Units:	ft

Ground water levels,Number of Measurements:	1	Level reading date:	1984-11-12
Feet below surface:	8.05	Feet to sea level:	Not Reported
Note:	Not Reported		

35
NNE
1/2 - 1 Mile
Higher

CO WELLS **CO7000000150553**

CO DWR ID #:	Not Reported	Permit #:	131628-
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Irrigation	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	1 acres
Yrly Appropriation:	0	Issue Date:	07/25/1983
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	07/01/1948	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	140	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	15
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	39
Division:	5		
Comments:	Registration of existing well. Limit to historic use prior May 8, 1972. dmw 06/14/11		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

36
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000097341**

CO DWR ID #:	Not Reported	Permit #:	108656-
Well Name:	Not Reported	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	5
Well Use:	Domestic	Addtl Well Use:	Stock
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 ACRES
Yrly Appropriation:	0	Issue Date:	Not Reported
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	UNKNOWN	Water District:	45
Division:	5	Comments:	Not Reported

I37
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000352550**

CO DWR ID #:	Not Reported	Permit #:	52468-MH
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	04/28/2014
Expiration Date:	07/27/2014	Construction Date:	05/07/2014
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	5719
Well Depth (ft):	34	Top of First Perf Casing:	14
Base of Last Perf Casing:	34	Yield (gal/min):	0
Static Water Depth (ft):	16	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5		
Comments:	OPS VARIANCE - 3 holes - 51171 Hwy 6 & 24 - Glenwood Springs, CO. Seven WCR received.		

38
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000104162**

CO DWR ID #:	Not Reported	Permit #:	236600-
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Irrigation	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	1 ACRES
Yrly Appropriation:	2.5	Issue Date:	10/16/2001
Expiration Date:	10/16/2003	Construction Date:	Not Reported

Start Use Date:	01/01/1952	Pump Install Date:	05/24/2002
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	220	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	15
Static Water Depth (ft):	197	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	72
Division:	5	Comments:	registration of existing well

39
ESE
1/2 - 1 Mile
Lower

CO WELLS **CO7000000011413**

CO DWR ID #:	Not Reported	Permit #:	78338-
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	W2718	Parcel Size:	0
Well Use:	Domestic	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	1 acres
Yrly Appropriation:	0	Issue Date:	03/24/1975
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	06/30/1953	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	40	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	15
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

J40
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000253039**

CO DWR ID #:	Not Reported	Permit #:	27302-F
Well Name:	Not Reported	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Municipal	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	05/15/1984
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

I41
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000122552**

CO DWR ID #:	Not Reported	Permit #:	262669-
Well Name:	SP-1	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	04/06/2005
Expiration Date:	Not Reported	Construction Date:	10/30/2001
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	20	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

J42
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000071993**

CO DWR ID #:	Not Reported	Permit #:	27098-MH
Well Name:	Not Reported	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	12/01/1995
Expiration Date:	03/01/1996	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	no data

J43
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000395992**

CO DWR ID #:	Not Reported	Permit #:	27686-MH
Well Name:	Not Reported	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	03/26/1996
Expiration Date:	06/26/1996	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported

Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	no data

J44
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000429147**

CO DWR ID #:	Not Reported	Permit #:	36560-MH
Well Name:	Not Reported	Well Status:	Permit Expired
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	07/14/1999
Expiration Date:	10/08/1999	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	no data

J45
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000104686**

CO DWR ID #:	Not Reported	Permit #:	40184-MH
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	10/23/2001
Expiration Date:	01/23/2002	Construction Date:	10/30/2001
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	no data

K46
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000229226**

CO DWR ID #:	Not Reported	Permit #:	285768-
Well Name:	CHARO IRRIGATION WELL NO 2		

Well Status:	Permit Extended	Water Court Case #:	Not Reported
Parcel Size:	12.51	Well Use:	Other
Addtl Well Use:	Not Reported	Special Use:	Monitoring Well
Primary Aquifer:	All Unnamed Aquifers	Addtl Aquifer:	Not Reported
Irrigation Area:	0	Yrly Appropriation:	0
Issue Date:	05/24/2011	Expiration Date:	05/24/2017
Construction Date:	Not Reported	Start Use Date:	Not Reported
Pump Install Date:	Not Reported	Well Plug Date:	Not Reported
Surface Elevation (ft):	0	Well Depth (ft):	0
Top of First Perf Casing:	0	Base of Last Perf Casing:	0
Yield (gal/min):	0	Static Water Depth (ft):	0
Groundwater Basin:	Not Reported	Mgmt District:	Not Reported
Water District:	39	Division:	5
Comments:	RULE 6.2.3 = LOCATION! Monitoring/Observation Hole. Tax #R530062 (totaling 12.51 acres). Phy address: 0325 Charo (aka Sunny Acres), GWS, CO 81601. dmw 05/14/13		

K47
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000229225**

CO DWR ID #:	Not Reported	Permit #:	285767-
Well Name:	CHARO IRRIGATION WELL NO 1		
Well Status:	Permit Extended	Water Court Case #:	Not Reported
Parcel Size:	12.51	Well Use:	Other
Addtl Well Use:	Not Reported	Special Use:	Monitoring Well
Primary Aquifer:	All Unnamed Aquifers	Addtl Aquifer:	Not Reported
Irrigation Area:	0	Yrly Appropriation:	0
Issue Date:	05/24/2011	Expiration Date:	05/24/2017
Construction Date:	Not Reported	Start Use Date:	Not Reported
Pump Install Date:	Not Reported	Well Plug Date:	Not Reported
Surface Elevation (ft):	0	Well Depth (ft):	0
Top of First Perf Casing:	0	Base of Last Perf Casing:	0
Yield (gal/min):	0	Static Water Depth (ft):	0
Groundwater Basin:	Not Reported	Mgmt District:	Not Reported
Water District:	39	Division:	5
Comments:	RULE 6.2.3 = LOCATION! Monitoring/Observation Hole. Tax #R530062 (totaling 12.51 acres). Phy address: 0325 Charo (aka Sunny Acres), GWS, CO 81601. dmw 05/14/13		

K48
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000229224**

CO DWR ID #:	Not Reported	Permit #:	285766-
Well Name:	CHARO DOMESTIC WELL	Well Status:	Permit Extended
Water Court Case #:	Not Reported	Parcel Size:	12.51
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	05/24/2011
Expiration Date:	05/24/2017	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	39

Division:	5
Comments:	RULE 6.2.3 = LOCATION! Monitoring/Observation Hole. Tax #R530062 (totaling 12.51 acres). Phy address: 0325 Charo (aka Sunny Acres), GWS, CO 81601. dmw 05/14/13

K49
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000229227**

CO DWR ID #:	Not Reported	Permit #:	285769-
Well Name:	CHARO GEOTHERMAL WELL NO 1		
Well Status:	Permit Extended	Water Court Case #:	Not Reported
Parcel Size:	12.51	Well Use:	Other
Addtl Well Use:	Not Reported	Special Use:	Monitoring Well
Primary Aquifer:	All Unnamed Aquifers	Addtl Aquifer:	Not Reported
Irrigation Area:	0	Yrly Appropriation:	0
Issue Date:	05/24/2011	Expiration Date:	05/24/2017
Construction Date:	Not Reported	Start Use Date:	Not Reported
Pump Install Date:	Not Reported	Well Plug Date:	Not Reported
Surface Elevation (ft):	0	Well Depth (ft):	0
Top of First Perf Casing:	0	Base of Last Perf Casing:	0
Yield (gal/min):	0	Static Water Depth (ft):	0
Groundwater Basin:	Not Reported	Mgmt District:	Not Reported
Water District:	39	Division:	5
Comments:	RULE 6.2.3 = LOCATION! Monitoring/Observation Hole. Tax #R530062 (totaling 12.51 acres). Phy address: 0325 Charo (aka Sunny Acres), GWS, CO 81601. dmw 05/14/13		

K50
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000469712**

CO DWR ID #:	Not Reported	Permit #:	285772-
Well Name:	CHARO GEO-REINJECTION WELL NO 2		
Well Status:	Permit Extended	Water Court Case #:	Not Reported
Parcel Size:	12.51	Well Use:	Other
Addtl Well Use:	Not Reported	Special Use:	Monitoring Well
Primary Aquifer:	All Unnamed Aquifers	Addtl Aquifer:	Not Reported
Irrigation Area:	0	Yrly Appropriation:	0
Issue Date:	05/24/2011	Expiration Date:	05/24/2017
Construction Date:	Not Reported	Start Use Date:	Not Reported
Pump Install Date:	Not Reported	Well Plug Date:	Not Reported
Surface Elevation (ft):	0	Well Depth (ft):	0
Top of First Perf Casing:	0	Base of Last Perf Casing:	0
Yield (gal/min):	0	Static Water Depth (ft):	0
Groundwater Basin:	Not Reported	Mgmt District:	Not Reported
Water District:	39	Division:	5
Comments:	RULE 6.2.3 = LOCATION! Monitoring/Observation Hole. Tax #R530062 (totaling 12.51 acres). Phy address: 0325 Charo (aka Sunny Acres), GWS, CO 81601. dmw 05/14/13		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

K51
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000313945**

CO DWR ID #:	Not Reported	Permit #:	285770-
Well Name:	CHARO GEOTHERMAL WELL NO 2		
Well Status:	Permit Extended	Water Court Case #:	Not Reported
Parcel Size:	12.51	Well Use:	Other
Addtl Well Use:	Not Reported	Special Use:	Monitoring Well
Primary Aquifer:	All Unnamed Aquifers	Addtl Aquifer:	Not Reported
Irrigation Area:	0	Yrly Appropriation:	0
Issue Date:	05/24/2011	Expiration Date:	05/24/2017
Construction Date:	Not Reported	Start Use Date:	Not Reported
Pump Install Date:	Not Reported	Well Plug Date:	Not Reported
Surface Elevation (ft):	0	Well Depth (ft):	0
Top of First Perf Casing:	0	Base of Last Perf Casing:	0
Yield (gal/min):	0	Static Water Depth (ft):	0
Groundwater Basin:	Not Reported	Mgmt District:	Not Reported
Water District:	39	Division:	5
Comments:	RULE 6.2.3 = LOCATION! Monitoring/Observation Hole. Tax #R530062 (totaling 12.51 acres). Phy address: 0325 Charo (aka Sunny Acres), GWS, CO 81601. dmw 05/14/13		

K52
North
1/2 - 1 Mile
Higher

CO WELLS **CO7000000229228**

CO DWR ID #:	Not Reported	Permit #:	285771-
Well Name:	CHARO GEO-REINJECTION WELL NO 1		
Well Status:	Permit Extended	Water Court Case #:	Not Reported
Parcel Size:	12.51	Well Use:	Other
Addtl Well Use:	Not Reported	Special Use:	Monitoring Well
Primary Aquifer:	All Unnamed Aquifers	Addtl Aquifer:	Not Reported
Irrigation Area:	0	Yrly Appropriation:	0
Issue Date:	05/24/2011	Expiration Date:	05/24/2017
Construction Date:	Not Reported	Start Use Date:	Not Reported
Pump Install Date:	Not Reported	Well Plug Date:	Not Reported
Surface Elevation (ft):	0	Well Depth (ft):	0
Top of First Perf Casing:	0	Base of Last Perf Casing:	0
Yield (gal/min):	0	Static Water Depth (ft):	0
Groundwater Basin:	Not Reported	Mgmt District:	Not Reported
Water District:	39	Division:	5
Comments:	RULE 6.2.3 = LOCATION! Monitoring/Observation Hole. Tax #R530062 (totaling 12.51 acres). Phy address: 0325 Charo (aka Sunny Acres), GWS, CO 81601. dmw 05/14/13		

I53
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000122553**

CO DWR ID #:	Not Reported	Permit #:	262670-
Well Name:	MW-9	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers

Addtl Aquifer:	Not Reported	Irrigation Area:	0
Yrly Appropriation:	0	Issue Date:	04/06/2005
Expiration Date:	Not Reported	Construction Date:	10/30/2001
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	20	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

54
NW
1/2 - 1 Mile
Lower

CO WELLS **CO7000000012620**

CO DWR ID #:	Not Reported	Permit #:	21470-MH
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	09/10/1993
Expiration Date:	12/10/1993	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	45
Division:	5	Comments:	Not Reported

L55
NE
1/2 - 1 Mile
Higher

CO WELLS **CO7000000076247**

CO DWR ID #:	Not Reported	Permit #:	24229-F
Well Name:	Not Reported		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Municipal	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	07/17/1979
Expiration Date:	07/17/1980	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	39
Division:	5	Comments:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

L56
NE
1/2 - 1 Mile
Higher

CO WELLS **CO7000000321216**

CO DWR ID #:	Not Reported	Permit #:	133311-
Well Name:	Not Reported	Well Status:	Well Constructed
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Household Use Only	Addtl Well Use:	Not Reported
Special Use:	Not Reported	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	Not Reported
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	12/31/1949	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	205	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	15
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	39
Division:	5	Comments:	Not Reported

M57
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000010707**

CO DWR ID #:	Not Reported	Permit #:	37725-M
Well Name:	MW-1		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	10/04/1990
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5	Comments:	Not Reported

M58
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000010708**

CO DWR ID #:	Not Reported	Permit #:	37726-M
Well Name:	MW-2		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	10/04/1990

Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5	Comments:	Not Reported

M59
East
1/2 - 1 Mile
Lower

CO WELLS **CO7000000010709**

CO DWR ID #:	Not Reported	Permit #:	37727-M
Well Name:	MW-3		
Well Status:	Permit Issued; Completion Status Unknown		
Water Court Case #:	Not Reported	Parcel Size:	0
Well Use:	Other	Addtl Well Use:	Not Reported
Special Use:	Monitoring Well	Primary Aquifer:	All Unnamed Aquifers
Addtl Aquifer:	Not Reported	Irrigation Area:	0 acres
Yrly Appropriation:	0	Issue Date:	10/04/1990
Expiration Date:	Not Reported	Construction Date:	Not Reported
Start Use Date:	Not Reported	Pump Install Date:	Not Reported
Well Plug Date:	Not Reported	Surface Elevation (ft):	0
Well Depth (ft):	0	Top of First Perf Casing:	0
Base of Last Perf Casing:	0	Yield (gal/min):	0
Static Water Depth (ft):	0	Groundwater Basin:	Not Reported
Mgmt District:	Not Reported	Water District:	38
Division:	5	Comments:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CO Radon

Radon Test Results

Zip	Total Sites	Avg	% sites<=4 pCi/L	% sites>4&<10 pCi/L	% sites>=10&<20 pCi/L	% sites>20 pCi/L
81601	16	5.04	56.25	37.50	0.00	6.25

Federal EPA Radon Zone for GARFIELD County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 81601

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	7.400 pCi/L	0%	100%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Riparian Vegetation Data
Source: Division of Wildlife
Telephone: 970-416-3360

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Colorado GIS Well Database
Source: Office of State Engineer, Division of Water Resources
Telephone: 303-866-3581
The GIS Well database includes all wells that the Division of Water Resources permits.

OTHER STATE DATABASE INFORMATION

Oil and Gas Well Locations
Source: Department of Natural Resources
Telephone: 303-894-2100

RADON

State Database: CO Radon
Source: Department of Public Health & Environment
Telephone: 303-692-3090
Radon Study in Colorado

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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SOIL SURVEY

DATA

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

2—Arle-Ansari-Rock outcrop complex, 12 to 65 percent slopes

Map Unit Setting

National map unit symbol: jnxh
Elevation: 5,500 to 7,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Arle and similar soils: 45 percent
Ansari and similar soils: 35 percent
Rock outcrop: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arle

Setting

Landform: Alluvial fans, mountainsides
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 10 inches: very stony loam
H2 - 10 to 32 inches: very stony loam
H3 - 32 to 36 inches: weathered bedrock

Properties and qualities

Slope: 12 to 65 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 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: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: Loamy Slopes (R048AY303CO)

Hydric soil rating: No

Description of Ansari

Setting

Landform: Alluvial fans, mountainsides
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 10 inches: loam
H2 - 10 to 18 inches: stony loam
H3 - 18 to 22 inches: unweathered bedrock

Properties and qualities

Slope: 12 to 65 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very 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: 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 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Loamy Breaks (R048AY300CO)
Hydric soil rating: No

Description of Rock Outcrop

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 65 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 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

7—Ascalon-Pena complex, 6 to 25 percent slopes

Map Unit Setting

National map unit symbol: jnz8
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Ascalon and similar soils: 65 percent
Pena and similar soils: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Alluvial fans, valley sides
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: sandy clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Deep Loam (R048AY292CO)
Hydric soil rating: No

Description of Pena

Setting

Landform: Valley sides, alluvial fans
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 6 inches: stony loam
H2 - 6 to 12 inches: very stony loam
H3 - 12 to 60 inches: very stony sandy loam

Properties and qualities

Slope: 6 to 25 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 (0.60 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: 35 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Loamy Slopes (R048AY303CO)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

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

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

9—Badland

Map Unit Composition

Badland: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Badland

Setting

Landform: Mountainsides, drainageways

Landform position (three-dimensional): Mountainflank, base slope

Down-slope shape: Convex, concave

Across-slope shape: Convex, concave

Parent material: Soft sandstone and shale and/or soft shale and siltstone

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 99 percent

Depth to restrictive feature: 0 to 3 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): 8e

Hydrologic Soil Group: D

Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

11—Begay sandy loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: jnx6
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Begay and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Begay

Setting

Landform: Valley sides, alluvial fans
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 60 inches: stony sandy loam

Properties and qualities

Slope: 6 to 12 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): High (2.00 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: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: Rolling Loam (R048AY298CO)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

15—Chilton channery loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: jnxb
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Chilton and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chilton

Setting

Landform: Valley sides, alluvial fans
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 13 inches: channery loam
H2 - 13 to 23 inches: very channery sandy loam
H3 - 23 to 60 inches: very cobbly sandy loam

Properties and qualities

Slope: 12 to 25 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 (0.60 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: 15 percent
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Rolling Loam (R048AY298CO)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

26—Farlow-Rock outcrop association, steep

Map Unit Setting

National map unit symbol: jnxq
Elevation: 8,000 to 10,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Farlow and similar soils: 65 percent
Rock outcrop: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Farlow

Setting

Landform: Mountainsides
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 10 inches: channery loam
H2 - 10 to 35 inches: very channery loam
H3 - 35 to 42 inches: extremely flaggy loam
H4 - 42 to 46 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: 40 to 60 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: 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 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Shallow Subalpine (R048AY251CO)

Hydric soil rating: No

Description of Rock Outcrop

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: 25 to 50 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

Minor Components

Dateman

Percent of map unit: 10 percent
Landform: Mountainsides
Landform position (three-dimensional): Mountainflank
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

34—Ildefonso stony loam, 25 to 45 percent slopes

Map Unit Setting

National map unit symbol: jny0
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Ildefonso and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ildefonso

Setting

Landform: Alluvial fans, valley sides, breaks
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Mixed alluvium derived from basalt

Typical profile

H1 - 0 to 8 inches: stony loam
H2 - 8 to 60 inches: very stony loam

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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: 35 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Ascalon

Percent of map unit: 5 percent
Hydric soil rating: No

Potts

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

39—Jerry loam, 12 to 50 percent slopes

Map Unit Setting

National map unit symbol: jny5
Elevation: 7,000 to 9,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Jerry and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Jerry

Setting

Landform: Mountainsides
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from basalt and/or alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 10 inches: clay loam
H3 - 10 to 40 inches: cobbly clay loam
H4 - 40 to 60 inches: cobbly clay

Properties and qualities

Slope: 12 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very 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
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Brushy Loam (R048AY238CO)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

42—Lamphier loam, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: jny9
Elevation: 7,500 to 10,000 feet
Farmland classification: Not prime farmland

Map Unit Composition

Lamphier and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lamphier

Setting

Landform: Mountainsides, fans
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 30 inches: loam
H2 - 30 to 60 inches: loam

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Almy

Percent of map unit: 10 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

58—Potts-Ildefonso complex, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: jnyv
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Potts and similar soils: 60 percent
Ildefonso and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Potts

Setting

Landform: Valley sides, alluvial fans, mesas
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from basalt and/or alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 28 inches: clay loam
H3 - 28 to 60 inches: loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Rolling Loam (R048AY298CO)
Hydric soil rating: No

Description of Ildefonso

Setting

Landform: Mesas, valley sides, alluvial fans
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from basalt and/or alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: stony loam
H2 - 8 to 60 inches: very stony loam

Properties and qualities

Slope: 12 to 25 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 (0.60 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: 35 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

59—Potts-Ildefonso complex, 25 to 45 percent slopes

Map Unit Setting

National map unit symbol: jnyw
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Potts and similar soils: 60 percent
Ildefonso and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Potts

Setting

Landform: Valley sides, alluvial fans
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from basalt and/or alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 28 inches: clay loam
H3 - 28 to 60 inches: loam

Properties and qualities

Slope: 25 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Rolling Loam (R048AY298CO)
Hydric soil rating: No

Description of Ildefonso

Setting

Landform: Alluvial fans, valley sides
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from basalt and/or alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: stony loam
H2 - 8 to 60 inches: very stony loam

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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: 35 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

66—Torriorthents-Camborthids-Rock outcrop complex, steep

Map Unit Setting

National map unit symbol: jnz4
Elevation: 5,000 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: 45 percent
Camborthids, steep, and similar soils: 20 percent
Rock outcrop, steep: 15 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: Convex
Across-slope shape: 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 Camborthids, Steep

Setting

Landform: Mountainsides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainflank, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Stony, basaltic alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 4 inches: variable
H2 - 4 to 30 inches: clay loam
H3 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 65 percent
Depth to restrictive feature: 15 to 60 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: 10 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
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 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

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 12, Sep 13, 2019

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

73—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 12, Sep 13, 2019

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

As the client of a consulting geotechnical engineer, you should know that site subsurface conditions cause more construction problems than any other factor. ASFE/the Association of Engineering Firms Practicing in the Geosciences offers the following suggestions and observations to help you manage your risks.

A GEOTECHNICAL ENG.NEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS Your geotechnical engineering report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. These factors typically include: the general nature of the structure involved, its size, and configuration; the location of the structure on the site; other improvements, such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask your geotechnical engineer to evaluate how factors that change subsequent to the date of the report may affect the report's recommendations.

Unless your geotechnical engineer indicates otherwise, do not use your geotechnical engineering report:

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL JUDGMENTS
Site exploration identifies actual subsurface conditions only at those points where samples are taken. The data were extrapolated by your geotechnical engineer who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates, Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations. you and your geotechnical engineer can work together to help minimize their impact. Retaining your geotechnical engineer to observe construction can be particularly beneficial in this respect.

- when the nature of the proposed structure is changed. for example, if an office building will be erected instead of a parking garage, or a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size, elevation. or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership; or .for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems that may occur if they are not consulted after factors considered in their report's development have changed.

A REPORT'S RECOMMENDATIONS CAN ONLY BE PRELIMINARY
The construction recommendations included in your geotechnical engineer's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site.

Because actual subsurface conditions can be discerned only during earthwork, you should retain your geo- technical engineer to observe actual conditions and to finalize recommendations. Only the geotechnical engineer who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations are valid and whether or not the contractor is abiding by applicable recommendations. The geotechnical engineer who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

SUBSURFACE CONDITIONS CAN CHANGE A geotechnical engineering report is based on conditions that existed at the time of subsurface exploration. Do not base construction decisions on a geotechnical engineering report whose adequacy may have been affected by time. Speak with your geotechnical consult- ant to learn if additional tests are advisable before construction starts. Note, too, that additional tests may be required when subsurface conditions are affected by construction operations at or adjacent to the site, or by natural events such as floods, earthquakes, or ground water fluctuations. Keep your geotechnical consultant apprised of any such events.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS
Consulting geotechnical engineers prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your geotechnical engineer prepared your report expressly for you and expressly for purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the geotechnical engineer. No party should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.

GEOENVIRONMENTAL CONCERNS ARE NOT AT ISSUE
Your geotechnical engineering report is not likely to relate any findings, conclusions, or recommendations

about the potential for hazardous materials existing at the site. The equipment, techniques, and personnel used to perform a geoenvironmental exploration differ substantially from those applied in geotechnical engineering. Contamination can create major risks. If you have no information about the potential for your site being contaminated. you are advised to speak with your geotechnical consultant for information relating to geoenvironmental issues.

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION Costly problems can occur when other design profes- sionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid misinterpretations, retain your geotechnical engineer to work with other project design professionals who are affected by the geotechnical report. Have your geotechnical engineer explain report implications to design professionals affected by them. and then review those design professionals' plans and specifications to see how they have incorporated geotechnical factors. Although certain other design professionals may be fam- iliar with geotechnical concerns, none knows 'as much about them as a competent geotechnical engineer.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE REPORT Geotechnical engineers develop final boring logs based upon their interpretation of the field logs (assembled by site personnel) and laboratory evaluation of field samples. Geotechnical engineers customarily include only final boring logs in their reports. Final boring logs should not under any circumstances be redrawn for inclusion in architectural or other design drawings. because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs. delays. disputes. and unanticipated costs ara the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, give contractors ready access to the complete geotechnical engineering report prepared or authorized for their use. (If access is provided only to the report prepared for you, you should advise contractors of the report's limitations. assuming that a contractor was not one of the specific persons for whom the report was prepared and that developing construction cost estimates was not one of the specific purposes for which it was prepared. In other words. while a contractor may gain important knowledge from a report prepared for another party, the contractor would be well-advised to discuss the report with your geotechnical engineer and to perform the additional or alternative work that the contractor believes may be needed to obtain the data specifically appropriate for construction cost estimating purposes.) Some clients believe that it is unwise or unnecessary to give contractors access to their geo- technical engineering reports because they hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems. It also helps reduce the adversarial attitudes that can aggravate problems to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical engineers. To help prevent this problem, geotechnical engineers have developed a number of clauses for use in their contracts, reports, and other documents. Responsibility clauses are not exculpatory clauses designed to transfer geotechnical engineers' liabilities to other parties. Instead, they are definitive clauses that identify where geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report. Read them closely. Your geotechnical engineer will be pleased to give full and frank answers to any questions.

RELY ON THE GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE Most ASFE-member consulting geotechnical engineering firms are familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a construction project, from design through construction. Speak with your geotechnical engineer not only about geotechnical issues, but others as well, to learn about approaches that may be of genuine benefit. You may also wish to obtain certain ASFE publications. Contact a member of ASFE of ASFE for a complimentary directory of ASFE publications.

ASFE

8811 Colesville Road/Suite G106/Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017

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PARTNER

July 6, 2021

Alex Levin
BLD Group
1500 Codova Road, Suite 300
Ft. Lauerdale, Florida 33316

Subject: **Response to Community Comments**
Glenwood Meadow
Glenwood Springs, Colorado 81601
Partner Project No. 21-306905.1

Dear Alex Levin:

Partner Assessment Corporation (Partner) is pleased to submit this letter to respond to comments from the community for the subject property.

Scope of Work

Partner's services included the review of documents from publicly available sources pertaining to site geologic conditions, as well as the provided reports issued for the site. A general list of site-specific documents reviewed is shown below:

- American Geoservices (AGS), Initial Geotechnical Evaluation Report – Glenwood Meadows No. 6 Housing, Wulfsohn Road and West Meadows, Glenwood Spring, dated July 22, 2020.
- BLD Group, Preliminary Plan Set for Glenwood Meadows Multi-family Housing (including Civil, Landscape, Architecture Drawings), 54 Pages, dated December 28, 2020.
- City of Glenwood Springs, Colorado – Memorandum of understanding, dated July 16, 2013
- HCE – Master Drainage Report for Glenwood Meadows, Master Drainage Plan Submittal, Revised May 24, 2002
- Lincoln – Devore Engineering and Geologists, Open-File Report 7810 – Geologic Hazard of the Glenwood Springs Metropolitan Area – Garfield County, Colorado – Prepared by, dated 1978
- Numerous/Other Geotechnical Consultants, Geotechnical Reports for surrounding projects: Lofts, Target, Etc.
- Partner Engineering and Science, inc. – Limited Geotechnical Evaluation / Peer Review, dated March 4, 2021
- Unknown Author – Untitled, unsealed topographic survey overlaid on aerial of the area, undated provided by Client
- V3 Consultants – Final Drainage Report for Glenwood Meadows Lots 1-10 and Tracts A, B, and C, Revised July 30, 2004

Response to Community Comments

Partner is pleased to provide the below responses to the transcribed and lettered comments issued by Glenwood Springs:

2.3 Please add a geologic hazards disclosure similar to the following: "This property is subject to geologic hazards per the adopted mapping by the City of Glenwood Springs. Hazards to note are _____. A final Geologic Hazard Report will be submitted upon application of a building permit

RESPONSE: The following text can be placed used as the "geologic hazard disclosure" requested in the comment above:

Per the General Geologic hazard map of the Glenwood Springs Metropolitan Area prepared by the Colorado Geologic Survey (CGS) this property is located within a zone with severe potential for hydrocompaction and related settlement hazards. In addition, the Map of Debris Fan Deposits and Hazards Property prepared by CGS shows that the property is also located within a debris fan with moderate hazard potential for damage to structures. Mitigation is recommended or major cleanup is probable. It is our understanding that a Geologic Hazard Report was submitted as a part of the original Meadows application and the recommended mitigation completed within the first phase of development. Special care should be taken during construction to maintain the mitigations completed during the first phase of development.

3.12 Full depth pavement will not be accepted in any areas that are deemed public ROW and possibly maintained by the City. Full depth asphalt is not recommended, it has shown not to be successful in other areas of the Glenwood Meadows Development.

RESPONSE: Alternative pavement sections for areas to be dedicated into right of way, will be provided in our final design geotechnical report. These will be based on traffic loads provided by the City of Glenwood Springs. The below table provides alternate sections as stated in the report by American Geoservices for use in non-right of way areas.

Paving Structural Sections

Pavement Sections		
Roadway Type	**Subgrade Preparation [a]**	**Pavement Section [b]**
Asphalt Parking Spaces	Proof rolled/Compacted Subgrade	3.5 in. asphalt / 6.0 in. Aggregate base
Asphalt Driveways	Proof rolled/Compacted Subgrade	4.5 in. asphalt / 6.0 in. Aggregate base

3.13 4.5" of asphalt over 6" of ABC for heavy traffic areas is not recommended, it has shown not to be successful in other areas of the Glenwood Meadows Development. Thicker asphalt and base course sections have shown promise in stability and longevity.

RESPONSE: The response to comment 3.12 provides pavement sections as stated in the report by American Geoservices in our Response to Community Comments dated June 16, 2021 is for use in non-right of way areas and intended for initial planning purposes. Alternative pavement sections for areas to be dedicated into right of way and/or heavy traffic loading, will be provided in our final design geotechnical report. These will be based on the traffic loads provided by the City of Glenwood Springs.

3.14 The Geotech report notes that asphalt overlays should be completed every 5-6 years on asphalt sections of pavement. What does the Geotech considered an appropriate overlay material and thickness being that overlay is a generic term.

RESPONSE: As the new geotechnical engineer of record, we do not agree with the above statement. It is our experience that properly designed pavements should have a 20-year design life. We recommend regular maintenance consisting of cleaning and sealing cracks and re-coating paved surfaces on a roughly 5-year interval.

3.1 On page 20 of 30, under surface drainage the report states under bullet point 2 that landscaping of gravel adjacent to buildings should have a minimum slope of 6 inches in 5 feet (or 10%), but in bullet point 5, it states that landscaped areas within 10 feet of the foundation should be sloped at a minimum of 8%. This is inconsistent.

RESPONSE: As the new geotechnical engineer of record, we recommend that structures or site features that are not a part of the surface water drainage system should not be exposed to surface water flows, standing water, or water infiltration. In general, roof drains and scuppers, exterior slabs, pavements, landscaping, etc. should be constructed to drain water away from structures and foundations. The purpose of this is to reduce the opportunity for water damage, erosion, and/or altering of structural soil properties by wetting. In general, a 5 percent or more slope away from foundations, structural fills, slopes, structures, etc. should be maintained for 10 feet, per the International Building Code. 2% slopes can be used, where hardened surfaces, such as concrete or asphalt are placed up to the edge of structure. Our final design report for the project will update this information.

3.2 In general full-depth asphalt is not recommended in this area. As you can see from the meadows Development, it has not performed well over time and meeting subgrade requirements with the native soil is challenging. As these roadways are private and will remain private, the city does not have a requirement for the asphalt within the development, but will require any patches in City ROW to meet the requirements of the City's Engineering Standards. a. The report provides a recommendation for a full-depth asphalt section, but Figure 17 does not provide an exhibit of that section.

RESPONSE: We do not recommend the use of full depth asphalt for this project, please see updated pavement recommendations provided in our response to comment 3.12

3.5 After review of the soils report it seems that there are risks associated with the site that the report did not review in detail due to those risks not being part of the consultant's scope of services. See comments in the inherent risks section that are labelled "outside scope of services" and owner is completely responsible for taking all risks associated with any future potential for instability at the site or in the site vicinity area type comments.

RESPONSE: As the new engineer of record, we will fully address this in our updated report.

3.6 No topographic slopes were labeled thus these comments are generic. Geotech report calls for no structures within 25' of a crest of a slope that is 2.5:1. The lower row of structures appears to be within 25' of a crest of a slope, but the slopes below are not labeled for verification of the report note.

RESPONSE: Our review of the report indicates that no structures are to be within 25 feet of a crest of slope that is STEEPER than 2.5:1 (horizontal to vertical). Upon review, the slopes in that area are not steeper than 2.5:1.

3.11 Contractor should confirm the trenching backfill material that is acceptable in this area, previous potions of the development have utilized gravel materials, which has caused underground water to use the trenches as river passages and flood manhole locations during certain times of the year.

RESPONSE: Trenching backfill for City of Glenwood or private utility lines should be completed according to the specifications of the owner. In the even that the utility owner has specifications that differ from the preferences of the City of Glenwood, that matter should be addressed, directly between those parties. For private plumbing under the discretion of the geotechnical engineer, we recommend pipe bedding and shading consists of roadway aggregate base material, and that trench backfill consists of soil with less than 50% retained the No. 4 sieve and less than 35% retained on the ¾ inch sieve. Backfill soil should also contain 12 % to 75% fines and have a liquid limit less than 50. This information will be provided in our updated geotechnical design report.

Closing

Partner does not guarantee the future performance of the building, pavements, flatwork, or other site features related to geotechnical conditions. Soil samples were not obtained under this scope of work, and we have formulated our opinion based on our background research. Our document review and geologic research study made a good-faith effort to review readily available documents that we could access and were aware of at the time, as listed in this letter. We are not able to guarantee that we have discovered, observed, and reviewed all relevant site documents and conditions.

We appreciate the opportunity to be of service during this phase of the work.

Sincerely,

COLORADO LICENSED MATTHEW MARCUS 0053050 PROFESSIONAL ENGINEER

Matthew Marcus, PE, PG
Technical Director – Geotechnical Engineering

Andrew J. Atry, PE*
Project Engineer

**Licensed in California*

PRELIMINARY DRAINAGE REPORT

FOR

GLENWOOD MEADOWS MULTI-FAMILY PHASE 1

GLENWOOD SPRINGS, COLORADO

PREPARED FOR:

BLD Group, LLC.
1500 Cordova Rd. Suite 300
Fort Lauderdale, FL 33316

PREPARED BY:

High Country Engineering, Inc.
1517 Blake Avenue, Suite 101
Glenwood Springs, CO 81601
(970) 945-8676

December 8, 2020
Revised June 25, 2021

HCE JOB NUMBER: 2201044.00

TABLE OF CONTENTS

SECTION PAGE

I. GENERAL LOCATION AND DESCRIPTION 4
III. DRAINAGE DESIGN CRITERIA 6
IV. DRAINAGE FACILITY DESIGN 7
V. CONCLUSION 8
VI. REFERENCES 8

EXHIBITS

1. Vicinity Map
2. Soils Map
3. FEMA FIRM Maps

APPENDICES:

A. NOAA ATLAS 14 - Rainfall Data
B. Glenwood Meadows Master Drainage Study 2004
C. Proposed Conditions Drainage Map – Glenwood Meadows Multi-Family
D. Proposed Hydrologic Calculations

Engineers Certification

I hereby affirm that this report and the accompanying plans for the Phase 1 of Glenwood Meadows Multi-Family was prepared by me (or under my direct 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.



License No._____
Licensed Professional Engineer, State of Colorado

I. GENERAL LOCATION AND DESCRIPTION

A. Location

The site, located within the Glenwood Meadows development, is platted as Lots 11C-B and 11C-C of the Glenwood Meadows No. 6 Subdivision, which is located within Section 8, Township 6 South, Range 89 West, of the 6th Principal Meridian, in the City of Glenwood Springs, Colorado. The proposed site is located on the south side of Wulfsohn Road across from the existing Target and Lowe's commercial sites. The major drainage way downstream of the site is the Colorado River which is approximately 1,700 feet north of the site. A Vicinity Map has been included in **Exhibit 1**.

B. Description of Existing Property

The property is approximately 49.54 acres in size. The site slopes downward from southwest to northeast at approximately 15-pecrent towards Wulfsohn Road. The site receives offsite drainage from undeveloped drainage basins uphill to the southwest. The existing site is undeveloped consisting of scrub oak and juniper and native vegetation ground cover. There are existing debris flow ponds uphill of the development that serve to capture both offsite debris flow events and drainage attenuation in non-debris flow events.

C. Proposed Improvements

The proposed development consists of 13 multi-unit apartment buildings, a club house, roadways, parking areas, sidewalks and landscaping. Amenities include a playground, outdoor fitness area, basketball court, community patios, community garden, dog park and outdoor yoga area. Phase 1 consists of 13 apartment buildings, a club house and amenities.

D. Soils Description

Per the NRCS Web Soil Survey, there are two soil unit types within the property:
11 – Begay sandy loam, 6 to 12 percent slopes, well drained, low runoff, high permeability and low water storage capacity, hydrologic soil group (HSG) "A".
15 – Chilton channery loam, 12 to 25 percent slopes, well drained, low runoff, moderately high to high permeability and low water storage capacity, HSG "A".

Under the Glenwood Meadows Master Drainage Plan completed in 2004, the NRCS classified onsite soils to be HSG "C" and "D" at that time. The NRCS has subsequently reclassified onsite soils to HSG "A" since the Master Drainage Plan was completed. The upgraded soil types from HSG "C and "D" to "A" represents a conservative modeling for the regional drainage facilities in-place.

Additional soils information and a soils map can be referenced in **Exhibit 2**.

A site specific geotechnical investigation has been performed by Partner Engineering and Science. Generally subsurface conditions consist of a native debris fan deposit composed

of medium dense to dense mixtures of sands, silt, gravel, cobble and occasional boulders and extends to depths of 100-125 feet. Groundwater was not encountered during exploration. The geotechnical investigation may be referenced as a stand-alone document for reference as necessary.

E. Major Drainage Way Planning and Influential Parameters

The proposed site is located within FEMA's Flood Insurance Rate (FIRM) Maps 0802051431B, effective date January 3, 1986, and 0802051432B, effective date January 3, 1986. According to both maps, the site is located in Zone D which is designated as areas of undetermined, but possible flood hazards. Both FEMA FIRM Maps can be referenced in **Exhibit 4**.

F. Master Drainage Plan

The site is located within the Glenwood Meadows development and is subject to the requirements and recommendations of the Glenwood Meadows Master Drainage Plan completed by High Country Engineering, project no. 2000031.00-0316 dated May 6, 2004. The Master Drainage Plan can be referenced in **Appendix B**.

G. Effects of Adjacent Drainage Issues

The existing offsite debris flow ponds uphill of the site intercept drainage and debris flows prior to reaching the site. The debris pond outlet structures are currently piped through the proposed development and will be modified accordingly to accommodate the proposed grading and site improvements. There are small offsite drainage basins below the debris ponds that will produce limited offsite drainage onto the site.

All drainage from impervious areas of the proposed site will be collected and routed to Glenwood Meadows stormwater conveyance facilities. To our knowledge there are currently no adverse drainage impacts on adjacent properties from this site. There are no wetlands or irrigation ditches present on the site.

II. Drainage Basins and Sub-basins

B. Sub-Basin Description

The analyzed proposed drainage basins correspond to the proposed basins delineated in the project location within the Glenwood Meadows Master Drainage Study. The existing drainage pattern from the site is from southwest to northeast toward to Wulfsohn Road.

Runoff from proposed parking areas and roadways is to be routed to inlets via curb and gutter and collected with proposed storm sewer systems. Runoff from the proposed buildings is to be collected within roof drain leaders and piped to proposed storm sewer systems. Piping roof drainage instead of surface discharging will reduce the adverse effects of introducing surface drainage back onto the moderately sloped site where there's the potential for

scouring and erosion.

The proposed storm sewers will connect to the existing storm sewers serving the debris ponds and ultimately routing to existing Glenwood Meadows storm sewer at Wulfsohn Road. The existing debris pond outlet storm sewer will be modified to accommodate the proposed site plan and grade modifications and maintain conveyance of the debris pond discharge and proposed runoff.

III. DRAINAGE DESIGN CRITERIA

A. Criteria

This drainage study was prepared in conformance with Chapter 4 – Stormwater; of the City of Glenwood Springs engineering standards. Proposed improvements include development disturbance of approximately 17.3 acres, thus this site is subject to "Major Drainage Report" requirements.

This site is subject to the Glenwood Meadows Master Drainage Plan. This site is required to meet or exceed the post development drainage requirements of that study. The site improvements are located within drainage basins PR-J and PR-R of the master drainage plan, and shall not exceed the post development drainage conditions as summarized in Table 1. A copy of the Master Drainage Plan can be referenced in **Appendix B**.

Table 1 – Master Drainage Plan Post-Development Requirements

BASIN	AREA (AC)	CN	Q_{25}	Q_{100}
PR-J	20.96	86	24.1	33.19
PR-R	20.87	88	28.03	37.60
PR-B	18.49	85	22.05	30.85
PR-DD	3.37	84	3.73	5.29

The site has been analyzed for the post-development drainage conditions using HydroCAD. Post development drainage characteristics are summarized in Table 2 below. Proposed drainage basins correspond to the delineated drainage basins from the Master Drainage Study.

Table 2 –Post-Development Drainage Conditions

BASIN	AREA (AC)	CN	Q_{25}	Q_{100}
PR-J	20.96	68	3.28	8.83
PR-R	20.87	57	0.19	1.30
PR-B	18.49	49	0.00	0.10
PR-DD	3.37	49	0.00	0.02

Post-development hydrologic calculations can be referenced in **Appendix D**.

IV. DRAINAGE FACILITY DESIGN

A. General Concept

Runoff from the site shall be collected within a proposed storm sewer system and routed to the existing Glenwood Meadows storm sewer system. Stormwater management for the development is to be performed by the existing regional detention ponds located northwest and east of Target as outlined in the Master Drainage Plan.

B. Proposed Drainage Basin Description

The current drainage pattern onsite generally slopes from southwest to northeast and surface discharges to existing catch basins along the south side of Wulfsohn Road.

The site has been analyzed as four proposed basins; PR-B, PR-DD, PR-J and PR-R respectively. The proposed basin delineation is corresponds with the basin boundaries from the Master Drainage Plan. A proposed drainage conditions map, PRDR can be referenced in **Appendix C.**

Basin PR-B comprises the western portion of the access drive connection to Wulfsohn Road. Ground cover consists of asphalt road, concrete sidewalk and undisturbed open space. Runoff from the open space drains to the existing swale south of Wulfsohn road at design point 4. Runoff from the proposed road is collected within a proposed storm sewer and piped east to the existing regional storm sewer at design point 3.

Basin PR-DD consists of a portion of the west access drive connection to Wulfsohn Road. Ground cover consists of asphalt road, concrete sidewalk and undisturbed open space. Runoff from the open space drains to a proposed storm sewer south of the access road and is piped to the regional storm sewer at design point 3. Runoff from the proposed road is collected within a proposed storm sewer at Wulfsohn Road and piped east to the existing regional storm sewer at design point 3.

Basin PR-J comprises approximately the western half of the development. Ground cover consists of the asphalt roads and parking areas, proposed buildings, concrete sidewalks, developed park space, pervious landscaping and undisturbed open space areas. Runoff is split to the northwest and southeast via sheet flow and curb and gutter channel flow. A proposed storm sewer collects all development drainage from the basin and connects to the existing debris pond storm sewer "1B". The basin discharges at design point 1 within the existing storm sewer at Wulfsohn Road, and ultimately discharges to the regional detention pond located northwest of Target.

Basin PR-R comprises approximately the eastern half of the development. Ground cover consists of the asphalt roads and parking areas, proposed buildings, concrete sidewalks, pervious landscaping and undisturbed open space areas. Runoff drains to the southeast via sheet flow and curb and gutter channel flow. A proposed storm sewer collects all

development drainage from the basin and connects to the existing debris pond storm sewer "1C". The basin discharges at design point 2 within the existing storm sewer at Wulfsohn Road, and ultimately discharges to the regional detention pond located east of Target.

V. CONCLUSION

This drainage report has been prepared in accordance with the City of Glenwood Springs requirements, and the Glenwood Meadows Master Drainage Plan requirements. The proposed development shall utilize best management practices, (BMPs), both for construction and long-term to minimize erosion and promote stabilization. Temporary construction BMPs may include sediment control fence, straw bales, erosion control logs, inlet protection and vehicle tracking control. Long-term control includes the existing Glenwood Meadows stormwater management facilities. The proposed drainage design should be effective in providing the required conveyance for stormwater drainage to the existing facilities.

VI. REFERENCES

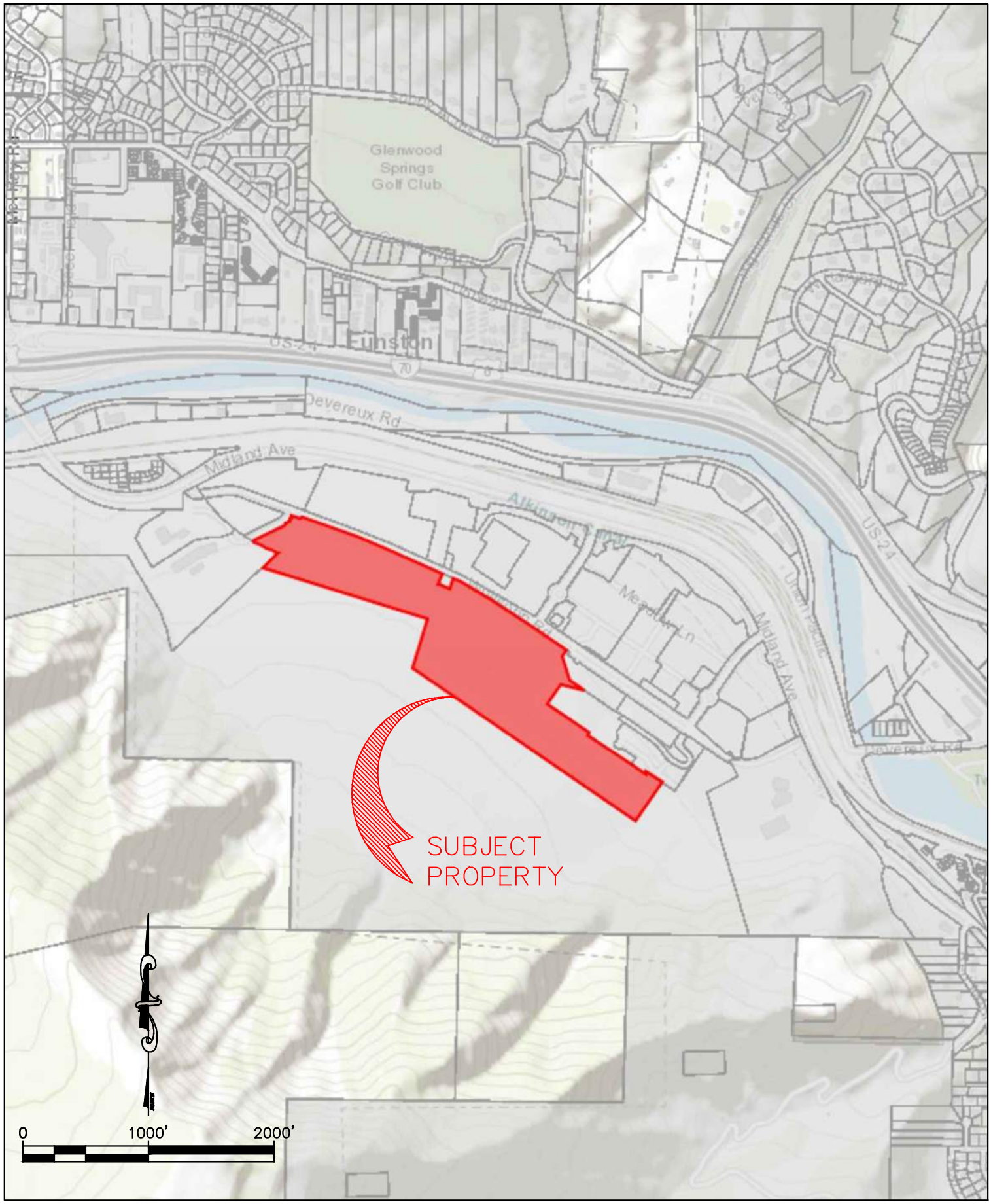
United States Department of Agriculture, Soil Conservation Service: Rifle Area, Colorado, Parts of Garfield and Mesa Counties

National Oceanic and Atmospheric Administration, Atlas of the Western United States, Volume 111, Precipitation-Frequency Atlas.

Natural Resources Conservation Service, Urban Hydrology for Small Watersheds, Technical Release 55 (TR-55) June 1986.

EXHIBIT 1

VICINITY MAP



HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101,
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 FAX (970) 945-2555
WWW.HCENG.COM

BLD GROUP LLC
GLENWOOD SPRINGS, CO

MEADOWS MULTI-FAMILY

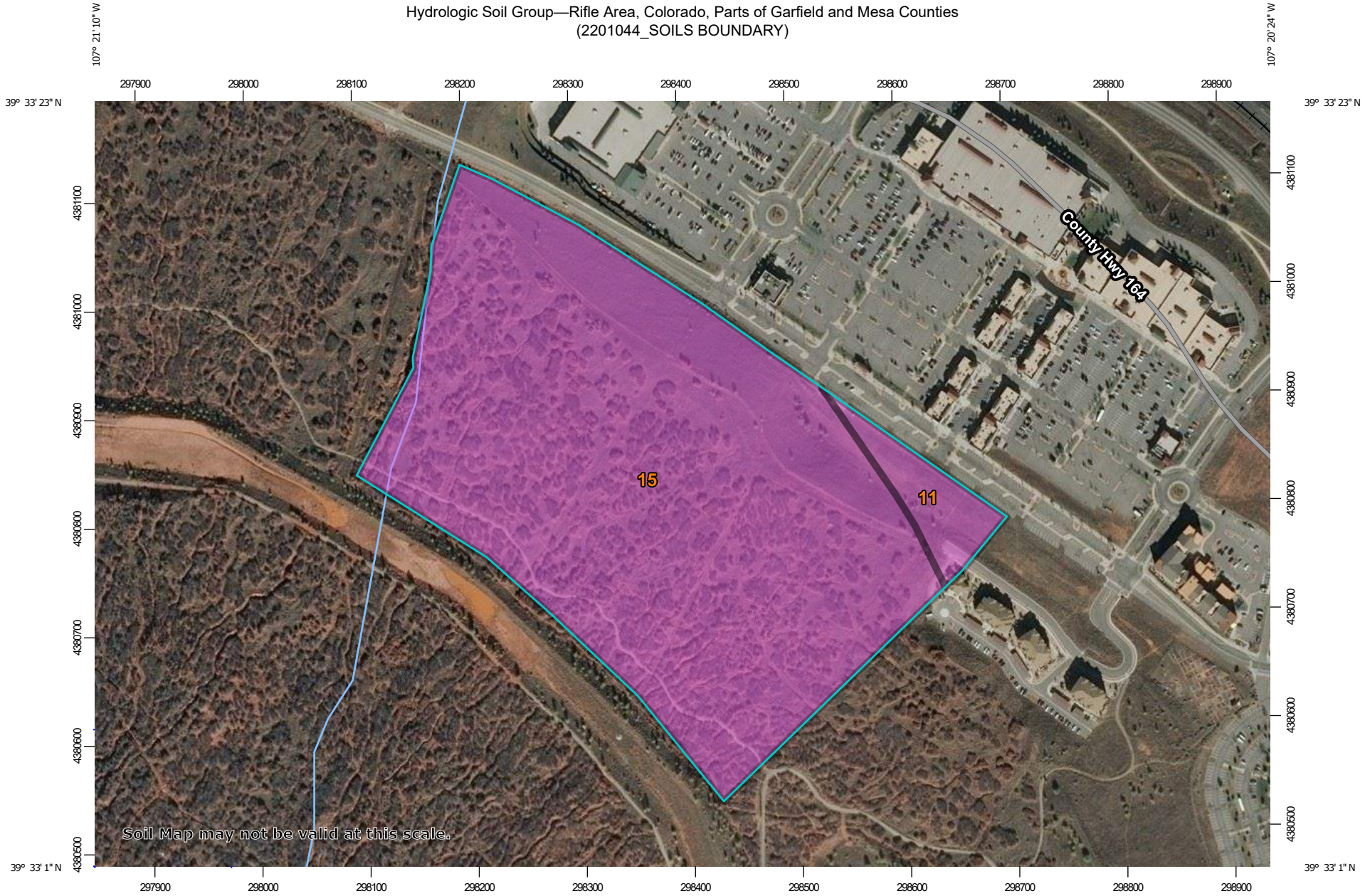
VICINITY MAP

DRAWN BY: MGG	SCALE: 1" = 1000'
CHECKED BY: MGG	PROJECT NO: 2201044.00
DATE:	PAGE:
FILE:	

EXHIBIT 2

SCS SOILS MAP

Hydrologic Soil Group—Rifle Area, Colorado, Parts of Garfield and Mesa Counties
(2201044_SOILS BOUNDARY)



Map Scale: 1:4,970 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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 13, Jun 5, 2020

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
11	Begay sandy loam, 6 to 12 percent slopes	A	2.1	4.9%
15	Chilton channery loam, 12 to 25 percent slopes	A	39.8	95.1%
Totals for Area of Interest			**41.8**	**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

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

11—Begay sandy loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: jnx6
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Begay and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Begay

Setting

Landform: Valley sides, alluvial fans
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 60 inches: stony sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R048AY298CO - Rolling Loam

Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 13, Jun 5, 2020

Rifle Area, Colorado, Parts of Garfield and Mesa Counties

15—Chilton channery loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: jnxb
Elevation: 5,000 to 6,500 feet
Farmland classification: Not prime farmland

Map Unit Composition

Chilton and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chilton

Setting

Landform: Valley sides, alluvial fans
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 13 inches: channery loam
H2 - 13 to 23 inches: very channery sandy loam
H3 - 23 to 60 inches: very cobbly sandy loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: 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 content: 15 percent
Available water capacity: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R048AY298CO - Rolling Loam

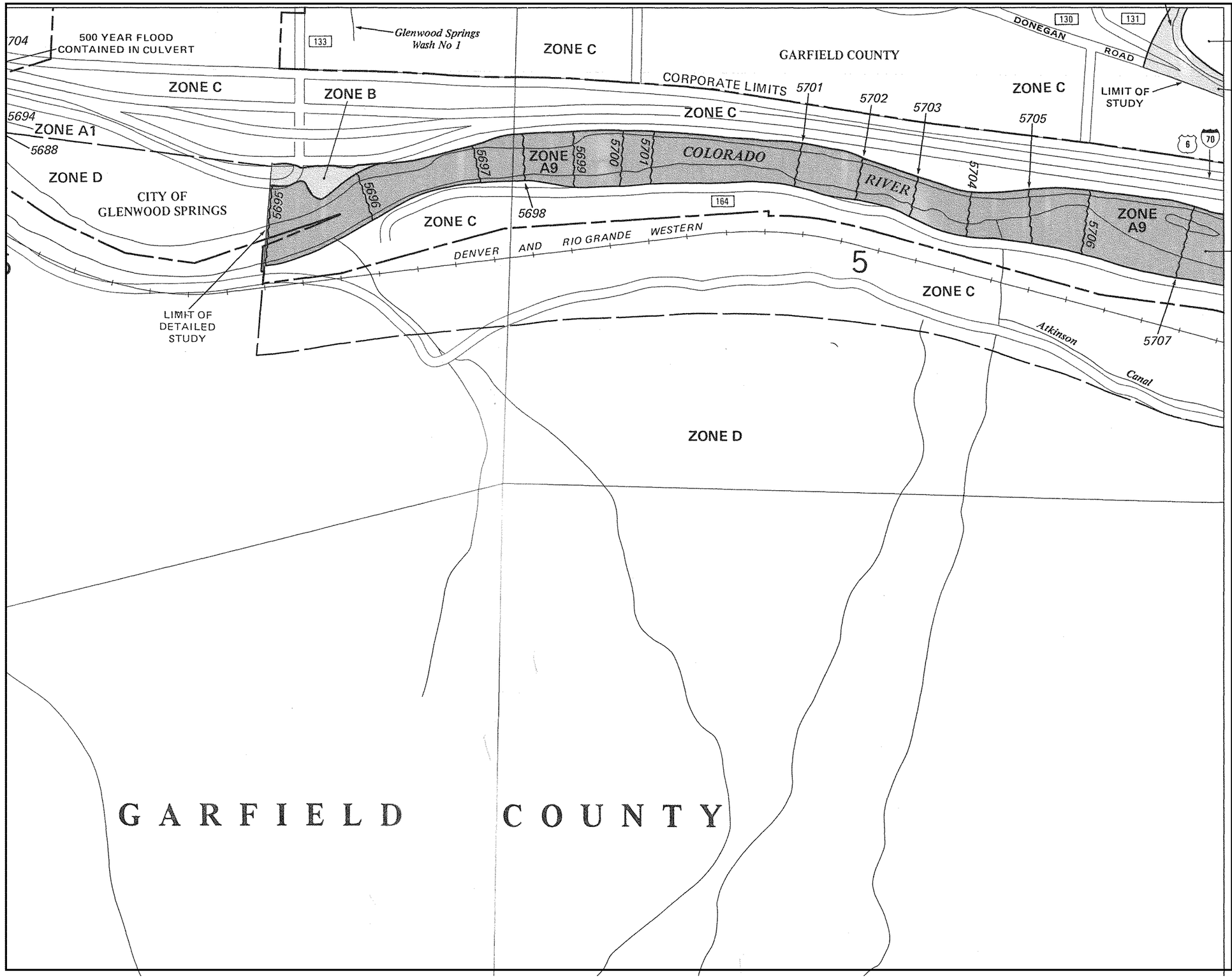
Hydric soil rating: No

Data Source Information

Soil Survey Area: Rifle Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 13, Jun 5, 2020

EXHIBIT 3

FEMA FIRM MAPS



APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

GARFIELD COUNTY, COLORADO
(UNINCORPORATED AREAS)

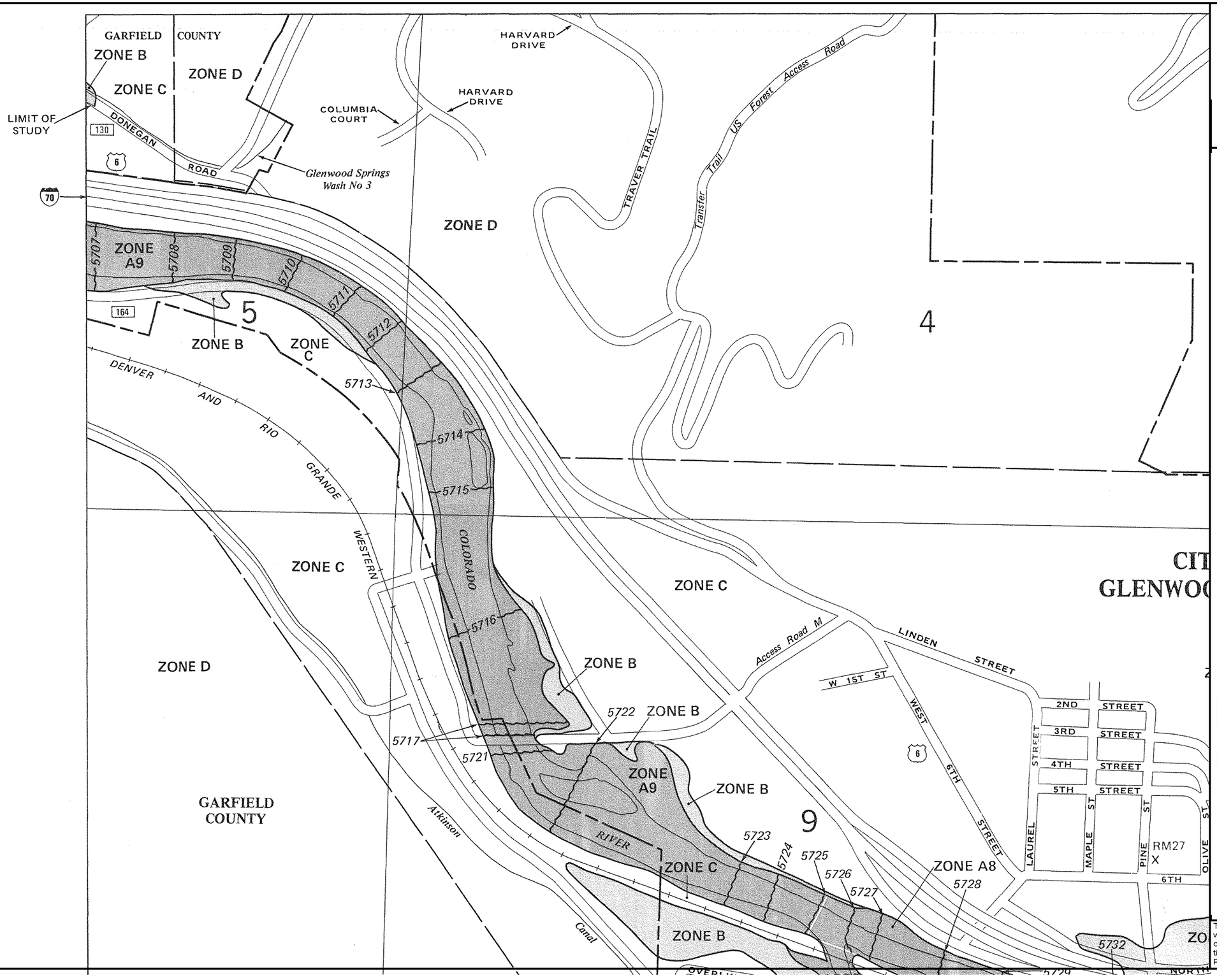
PANEL 1431 OF 1900
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
080205 1431 B

MAP REVISED:
JANUARY 3, 1986

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

GARFIELD COUNTY, COLORADO
(UNINCORPORATED AREAS)

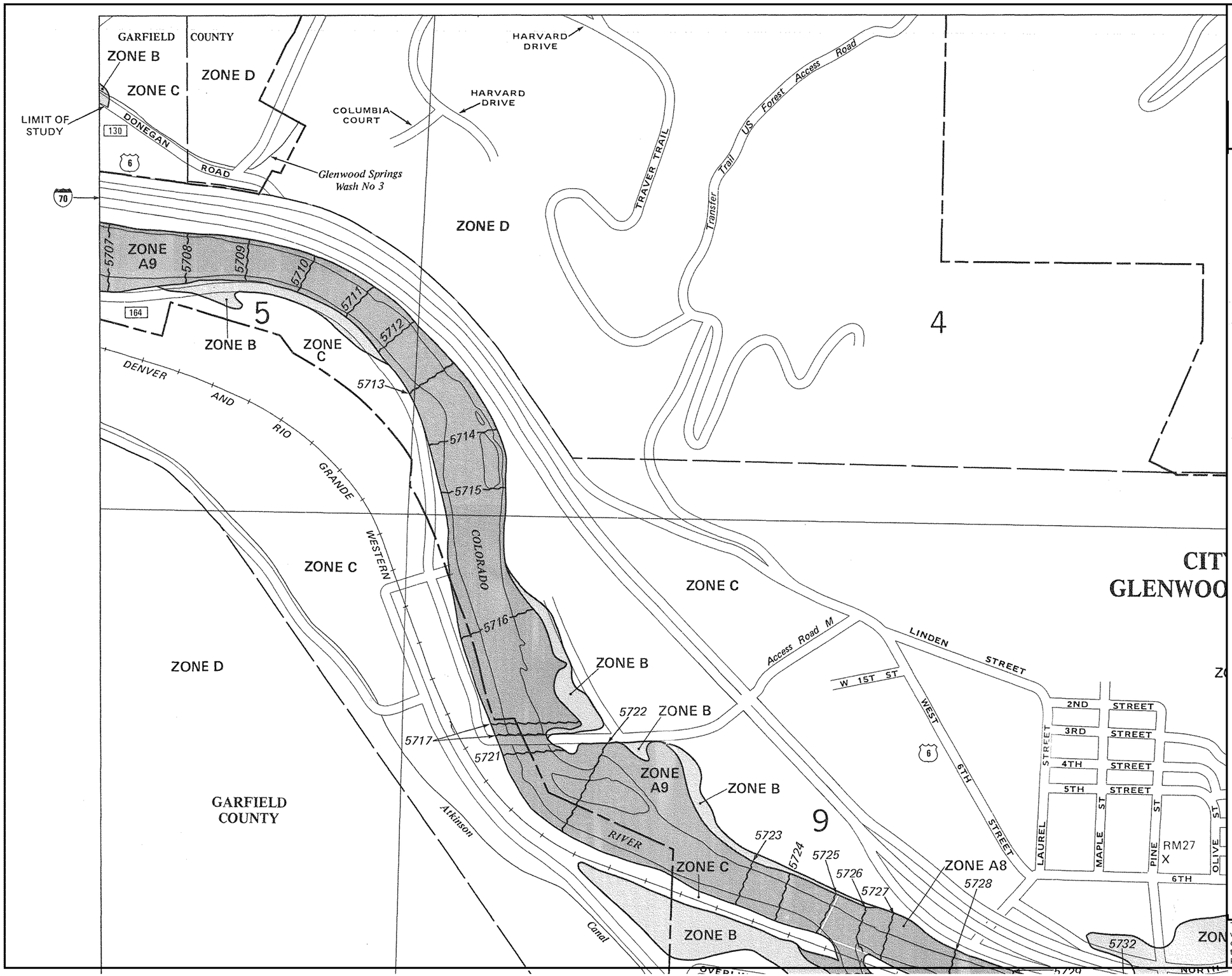
PANEL 1432 OF 1900
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
080205 1432 B

MAP REVISED:
JANUARY 3, 1986

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE IN FEET

500 0 500

KEY TO MAP

500-Year Flood Boundary	
100-Year Flood Boundary	ZONE B
Zone Designations	ZONE A1 / ZONE A5
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7X
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; depths are shown, or areas of 100-year alluvial fan flooding, depths and velocities shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX A

NOAA ATLAS 14 – RAINFALL DATA

NOAA Atlas 14, Volume 8, Version 2
Location name: Glenwood Springs, Colorado, USA*
Latitude: 39.5531°, Longitude: -107.3464°
Elevation: 5922.12 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.123** (0.097-0.159)	**0.177** (0.140-0.229)	**0.263** (0.206-0.341)	**0.331** (0.258-0.431)	**0.420** (0.313-0.563)	**0.485** (0.354-0.663)	**0.548** (0.385-0.770)	**0.608** (0.409-0.882)	**0.683** (0.442-1.02)	**0.736** (0.466-1.13)
10-min	**0.180** (0.142-0.233)	**0.260** (0.205-0.336)	**0.385** (0.302-0.499)	**0.484** (0.378-0.632)	**0.615** (0.458-0.825)	**0.711** (0.518-0.971)	**0.802** (0.564-1.13)	**0.890** (0.599-1.29)	**1.00** (0.647-1.50)	**1.08** (0.682-1.66)
15-min	**0.220** (0.174-0.284)	**0.317** (0.250-0.410)	**0.469** (0.369-0.609)	**0.591** (0.461-0.771)	**0.750** (0.558-1.01)	**0.867** (0.632-1.18)	**0.978** (0.688-1.38)	**1.09** (0.731-1.58)	**1.22** (0.789-1.83)	**1.32** (0.832-2.02)
30-min	**0.294** (0.232-0.379)	**0.414** (0.326-0.535)	**0.601** (0.472-0.780)	**0.748** (0.584-0.976)	**0.939** (0.698-1.26)	**1.08** (0.784-1.47)	**1.21** (0.847-1.69)	**1.33** (0.893-1.92)	**1.48** (0.954-2.21)	**1.58** (1.00-2.43)
60-min	**0.389** (0.307-0.503)	**0.513** (0.405-0.664)	**0.708** (0.556-0.919)	**0.862** (0.673-1.12)	**1.06** (0.790-1.42)	**1.21** (0.879-1.64)	**1.34** (0.944-1.88)	**1.47** (0.991-2.13)	**1.63** (1.05-2.44)	**1.74** (1.10-2.68)
2-hr	**0.485** (0.387-0.618)	**0.613** (0.489-0.782)	**0.815** (0.648-1.04)	**0.975** (0.770-1.25)	**1.18** (0.892-1.56)	**1.34** (0.985-1.80)	**1.48** (1.05-2.05)	**1.62** (1.10-2.31)	**1.79** (1.17-2.63)	**1.90** (1.22-2.88)
3-hr	**0.567** (0.456-0.717)	**0.685** (0.550-0.867)	**0.873** (0.698-1.11)	**1.02** (0.813-1.31)	**1.22** (0.930-1.60)	**1.37** (1.02-1.83)	**1.51** (1.08-2.07)	**1.65** (1.13-2.34)	**1.82** (1.20-2.67)	**1.94** (1.25-2.92)
6-hr	**0.740** (0.602-0.923)	**0.843** (0.685-1.05)	**1.01** (0.820-1.27)	**1.16** (0.930-1.45)	**1.36** (1.05-1.77)	**1.51** (1.15-2.01)	**1.67** (1.22-2.28)	**1.84** (1.28-2.59)	**2.06** (1.38-2.99)	**2.23** (1.45-3.30)
12-hr	**0.921** (0.758-1.13)	**1.05** (0.864-1.29)	**1.27** (1.04-1.56)	**1.45** (1.18-1.80)	**1.72** (1.35-2.21)	**1.93** (1.48-2.52)	**2.14** (1.58-2.88)	**2.37** (1.67-3.29)	**2.67** (1.81-3.83)	**2.91** (1.91-4.24)
24-hr	**1.12** (0.934-1.36)	**1.29** (1.07-1.56)	**1.57** (1.30-1.91)	**1.81** (1.49-2.21)	**2.15** (1.72-2.74)	**2.43** (1.89-3.14)	**2.72** (2.03-3.61)	**3.02** (2.16-4.14)	**3.43** (2.35-4.85)	**3.76** (2.49-5.39)
2-day	**1.35** (1.14-1.62)	**1.54** (1.30-1.84)	**1.87** (1.57-2.24)	**2.15** (1.80-2.59)	**2.57** (2.07-3.22)	**2.90** (2.28-3.70)	**3.25** (2.46-4.26)	**3.62** (2.62-4.89)	**4.14** (2.86-5.76)	**4.54** (3.05-6.41)
3-day	**1.52** (1.29-1.79)	**1.74** (1.47-2.05)	**2.11** (1.78-2.50)	**2.43** (2.04-2.90)	**2.89** (2.34-3.58)	**3.25** (2.57-4.10)	**3.64** (2.77-4.71)	**4.04** (2.93-5.39)	**4.59** (3.19-6.32)	**5.02** (3.39-7.02)
4-day	**1.65** (1.41-1.94)	**1.89** (1.62-2.23)	**2.29** (1.95-2.71)	**2.64** (2.23-3.13)	**3.12** (2.55-3.85)	**3.51** (2.79-4.39)	**3.91** (2.99-5.02)	**4.32** (3.15-5.73)	**4.89** (3.42-6.68)	**5.33** (3.61-7.40)

7-day	**2.01** (1.73-2.33)	**2.26** (1.95-2.63)	**2.69** (2.31-3.14)	**3.06** (2.61-3.58)	**3.57** (2.94-4.34)	**3.98** (3.19-4.91)	**4.39** (3.39-5.57)	**4.83** (3.55-6.31)	**5.41** (3.82-7.30)	**5.86** (4.01-8.04)
10-day	**2.31** (2.01-2.67)	**2.58** (2.24-2.98)	**3.03** (2.62-3.50)	**3.41** (2.93-3.96)	**3.95** (3.27-4.75)	**4.37** (3.53-5.34)	**4.80** (3.73-6.04)	**5.25** (3.89-6.80)	**5.86** (4.16-7.83)	**6.33** (4.35-8.60)
20-day	**3.17** (2.80-3.60)	**3.51** (3.09-3.98)	**4.06** (3.56-4.63)	**4.53** (3.94-5.18)	**5.17** (4.34-6.11)	**5.68** (4.64-6.82)	**6.19** (4.86-7.64)	**6.71** (5.02-8.54)	**7.40** (5.31-9.72)	**7.93** (5.52-10.6)
30-day	**3.89** (3.46-4.38)	**4.31** (3.82-4.85)	**4.99** (4.41-5.63)	**5.55** (4.87-6.30)	**6.32** (5.33-7.38)	**6.90** (5.68-8.20)	**7.48** (5.91-9.13)	**8.06** (6.08-10.1)	**8.82** (6.36-11.5)	**9.40** (6.58-12.4)
45-day	**4.82** (4.31-5.37)	**5.36** (4.79-5.98)	**6.23** (5.55-6.97)	**6.93** (6.13-7.79)	**7.86** (6.67-9.07)	**8.55** (7.07-10.0)	**9.22** (7.33-11.1)	**9.87** (7.48-12.3)	**10.7** (7.76-13.7)	**11.3** (7.97-14.8)
60-day	**5.62** (5.06-6.22)	**6.29** (5.65-6.96)	**7.33** (6.56-8.14)	**8.16** (7.26-9.10)	**9.24** (7.86-10.6)	**10.0** (8.32-11.7)	**10.8** (8.59-12.9)	**11.5** (8.72-14.1)	**12.3** (8.97-15.7)	**12.9** (9.16-16.8)

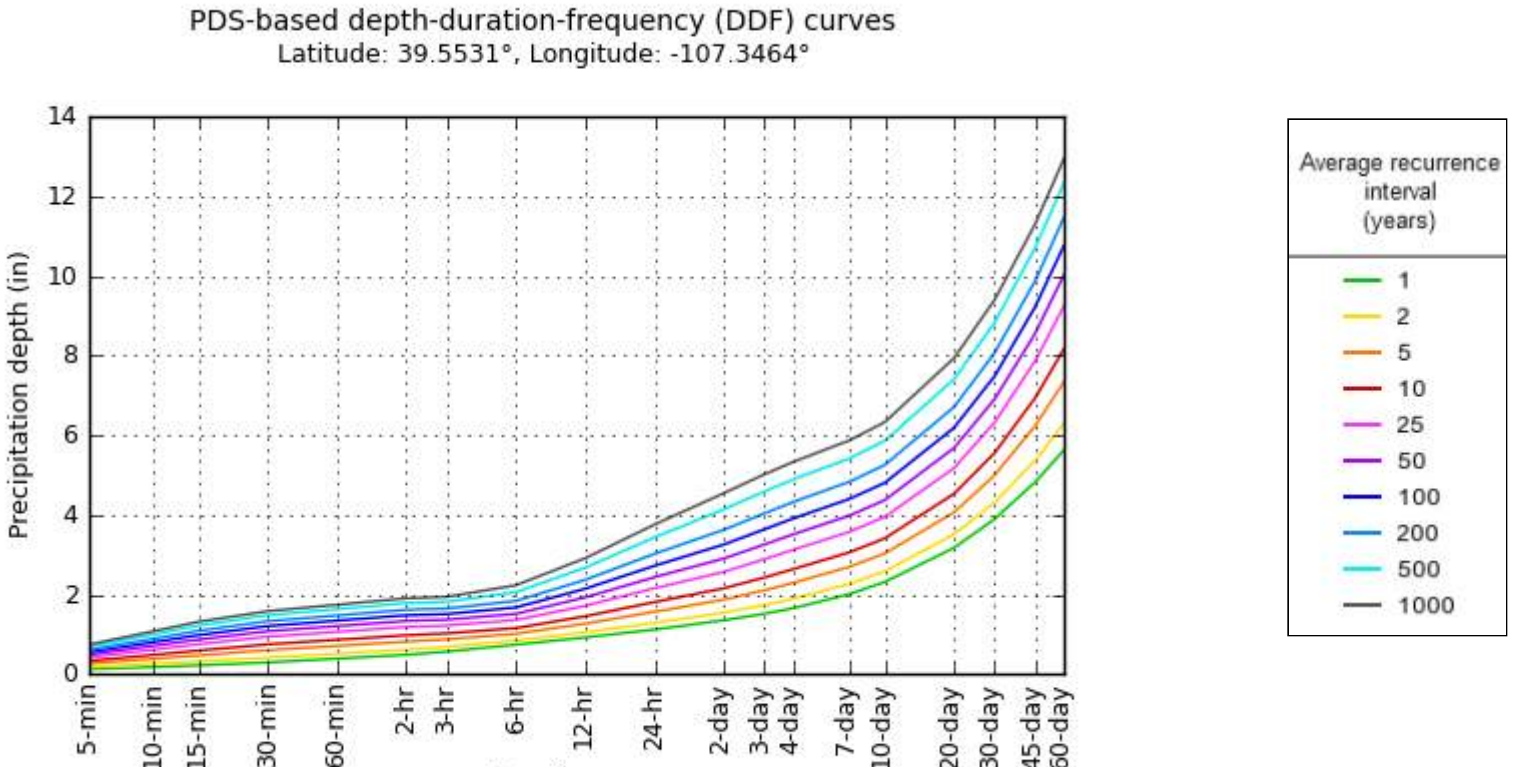
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

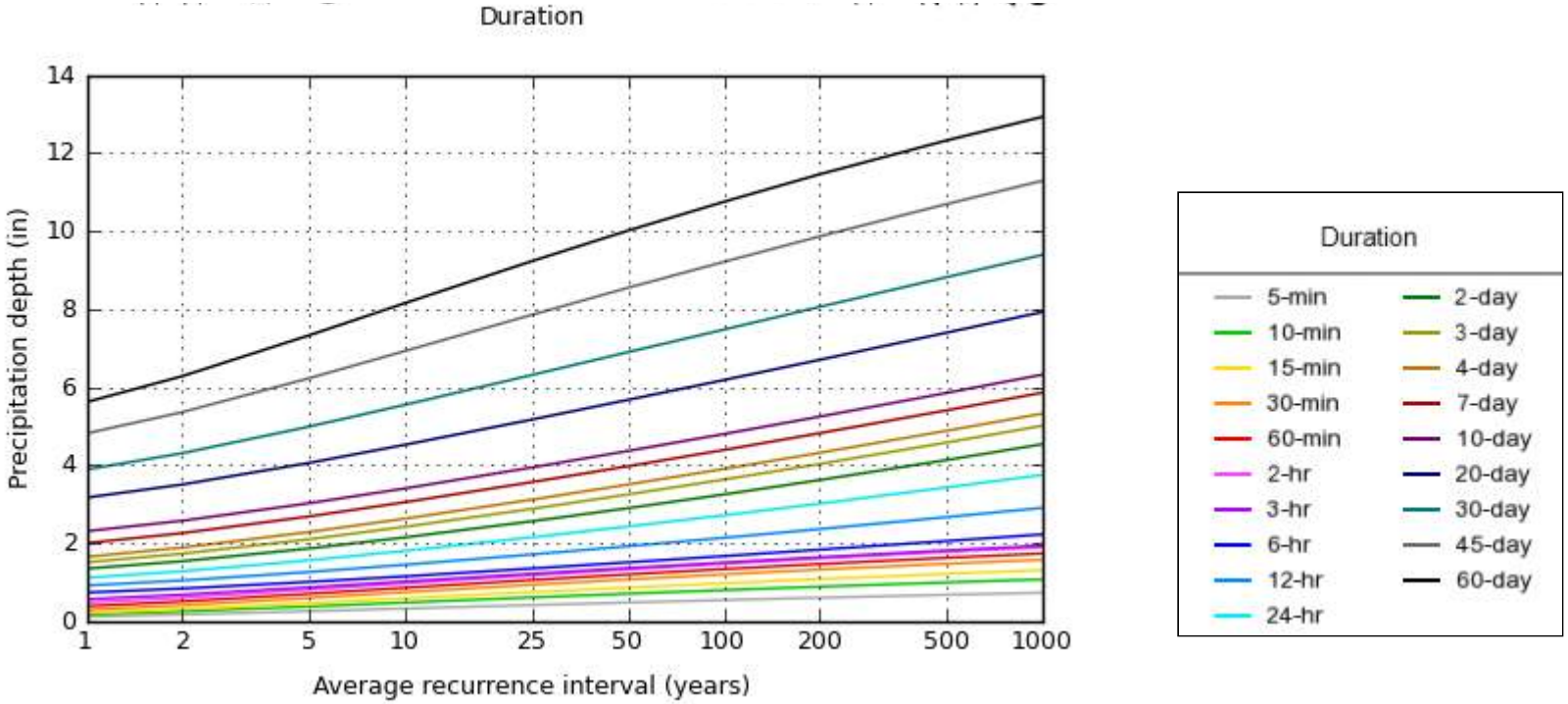
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical





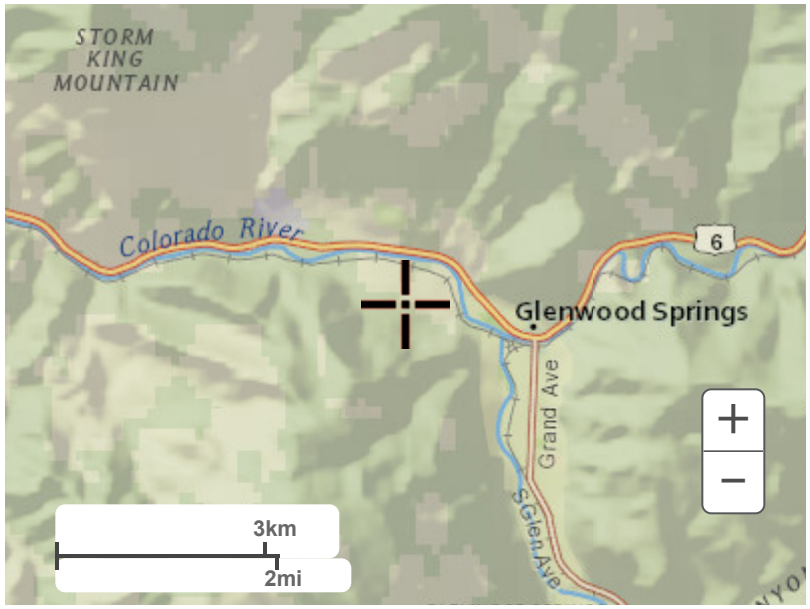
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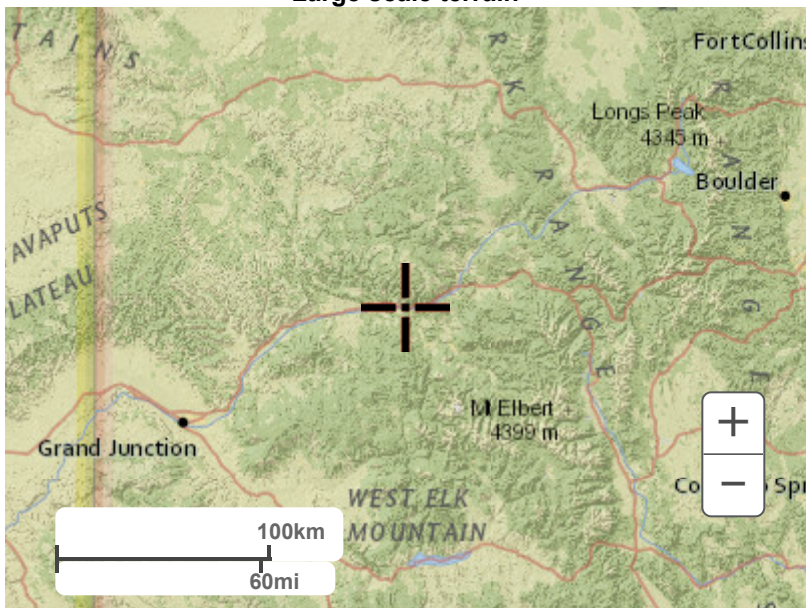
Back to Top

Maps & aerials

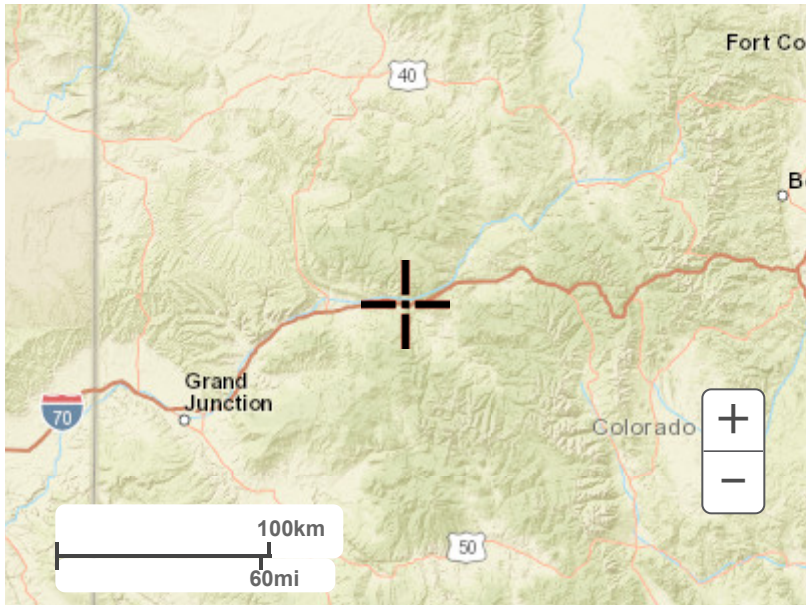
Small scale terrain



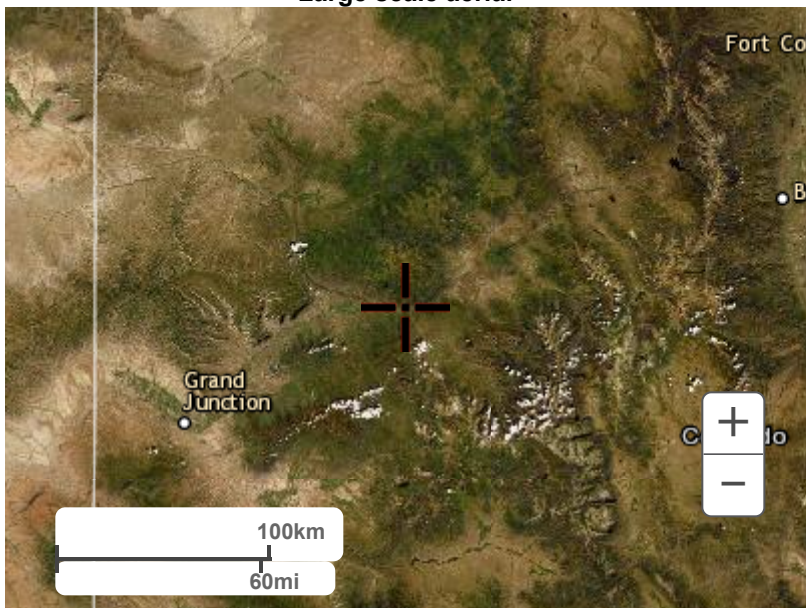
Large scale terrain



Large scale map



Large scale aerial



Back to Top

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National Weather Service
National Water Center
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Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX B

PROPOSED CONDITIONS DRAINAGE MAP – GLENWOOD MEADOWS MASTER DRAINAGE STUDY

CIVIL ENGINEERING

LAND SURVEYING

An Employee-Owned Company

MASTER DRAINAGE REPORT

FOR

GLENWOOD MEADOWS

GLENWOOD SPRINGS, COLORADO

MASTER DRAINAGE PLAN SUBMITTAL

HCE JOB NO. 2000031.00 x 0316
FILE: K:\WP\2000\031\master drainage report.doc

REVISED: MAY 24, 2002
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May 6, 2004

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TABLE OF CONTENTS

SECTION	PAGE
INTRODUCTION	3
DESIGN CRITERIA	3
EXISTING CONDITIONS	3
PROPOSED CONDITIONS	5
PROPOSED OFFSITE CONTRIBUTING BASINS	5
PROPOSED OFFSITE NON-CONTRIBUTING BASINS	5
PROPOSED ONSITE DRAINAGE BASINS	6
DEBRIS FLOW PONDS	6
DESIGN POINTS	8
CULVERT SUMMARY	9
CONCLUSION	11

DRAWINGS: Vicinity Map
Soil Survey Map
FEMA Floodplain Map
Pondpack Routing Map – Historic and Proposed
Historic Drainage Conditions
Proposed Grading and Drainage Plans

APPENDIX: Historic Flow Calculations - PONDPACK
Proposed Flow Calculations - PONDPACK
Culvert Calculations
Area Calculations

roximately 345 acres located
icinity Map, **Figure 1**. The
development, 33.3 acres of

l development. This project
are multiple off-site basins
ated, and potentially subject

n the Appendix. A 25-year,
year, 24-hour event was used
s Regulations. The design
24-hour storm flows under
nd 2) pass the 100-year, 24-
sting drainage structures and
s of basins and channels to
opments. This analysis does
rge rates but instead limits
ures.

y 5750 feet along Midland
t an elevation of 7500 feet is
ood events (below 7500 feet)
drainage basins should be
ysis was performed using the
historically designated flood

basin was delineated from
umbers range from 70-77,
as shown in Table 1. These
unt the vegetation that was
of 2002. Pre-fire conditions
present when the existing

INTRODUCTION

The proposed Glenwood Meadows is a planned unit development of app
along Midland Avenue in West Glenwood Springs. See the enclosed V
development will consist of approximately 36.8 acres of commercial
mixed use, 10.7 acres of hospitality, and 54.2 acres of residential.

The Colorado River is located to the north and northeast of the propose
is not affected by the 100 year floodplain of the Colorado River. There
that drain to the site from the south. These basins are steep, non-veget
to mitigatable debris flow events.

DESIGN CRITERIA

The stormwater flow calculations for the off-site basins are provided i
24-hour storm event has been adopted for the minor storm and the 100-
for the major event in accordance with the City of Glenwood Spring
criteria used for this study will be as follows: 1) pass the 25-year,
Midland Avenue through existing and proposed drainage structures, a
hour storm flows under the Railroad and Devereux Road through the ex
3) control the release rate from potential debris flow events in a serie
provide protection to the downstream residential and commercial devel
not limit the development to release stormwater at historical discha
discharge rates from the site to the capacities of the downstream struc

EXISTING CONDITIONS

The existing site varies in elevation from 7900 feet to approximate
Avenue. Stream gage record analysis in western Colorado indicates tha
approximately the dividing elevation between rainfall derived critical fl
and snowmelt derived events (above 7500 feet). Based on this, the
considered as governed by rainfall runoff. Therefore the hydrology anal
SCS method. There is no future development on the site that lies in a
prone area according to FEMA floodplain maps (**Figure 3**).

Sixteen historic drainage basins were analyzed in this report. Each
existing culverts along Midland Avenue (**Figure 4**). The curve
representing woods, juniper and brush and moderately steep slopes,
curve numbers represent pre-fire conditions and do not take into acc
destroyed on the steep portions of the drainage basins in Coal Seam Fir
were analyzed in order to represent the historic conditions that wer

Table 1. Historic Basin Characteristics

Basin	Area	Curve Number
D1	7.79	77
D2	18.45	77
DE3	21.69	77
E4	85.30	77
E5	84.41	75
F6	36.15	77
F7	6.39	74
F8	9.19	74
P-A	11.19	74
F9	8.33	73
F10	10.20	71
F11	6.43	71
F12	18.53	70
F13	70.17	71
G	121.69	73
H	16.81	77

Historically, as shown in Table 2, the existing conditions have a total flowrate to Midland Avenue of 454.75 during the 100-year storm and the combined culverts that drain the site have a total full flow capacity of 830.12 cfs. (Note: Culvert 16 is for the Atkinson Canal, not storm drainage.)

Table 2. Historic Runoff

Design Point	Basin #	Culvert	Size (in)	Capacity (cfs)	Historic Flow (cfs)	
					25 Year	100 Year
1	D1	1	18	11.4	4.75	7.55
2	D2	2	18	12.47	11.06	17.35
3	DE3	3	48	109.0	12.54	19.75
4	E-4	4	48	96.0	49.35	77.69
5	E-5	5	48	121.5	38.24	63.50
6	F-6	6	48	134.0	21.13	33.34
7	F-7	7	18	13.90	2.92	4.82
8	F-8	8	18	13.4	4.07	6.83
9	P-A	9	18	13.75	4.70	8.02
4	F-9	10	18	13.95	2.97	5.26
12	F-10	11	18	11.83	5.23	9.62
	F-11	12	18	9.83		
	F-12	13	18	11.71		
10	F-13, ex-G	14	30	46.78	66.76	119.67
15	G	15	(2) 29x42	126.8	47.06	82.03
16	H	16	48	0	0	0
Total				**746.32**	**270.25**	**454.75**

PROPOSED CONDITIONS

Stormwater runoff and debris flows from offsite contributing drainage basins south of the proposed development will be captured in one of four debris flow ponds and released at a controlled rate utilizing proposed outfall structures. Discharge from the ponds shall be conveyed to the development through open channels to a series of proposed storm drains under Wolfsohn Road. Off-site flows will be combined with on-site flows and conveyed through the development in a series of proposed storm sewers that shall discharge to Midland Avenue. There are 15 existing culverts conveying stormwater runoff under Midland Avenue (excluding culvert #16). The existing culverts have adequate capacity to convey the 25-year storm event under Midland Avenue except for a pair of 18-inch pipes that should be replaced with a 48-inch culvert and the existing 30" replaced with a 48" culvert. The runoff shall then be conveyed to one of five culverts under the Railroad to Devereux Road. The runoff will pass under Devereux Road and discharge to the Colorado River. The historic drainage pattern will be maintained with the developed drainage flow.

Each parcel inside the property will be required to evaluate their site-specific design to ensure they meet or exceed the requirements of this study and the City of Glenwood Springs Development Code. All inlets shall be per CDOT standards. All piping material for storm drains shall be either RCP or ADS-N12 (or approved equal).

In addition to this study, each parcel will be required to implement best management practices and erosion control measures to reduce stormwater sediment and pollutant transport to downstream sources. Water quality measures are the responsibility of individual lot owners and may include detaining the 2 year storm (the water quality capture volume) and/or providing baffled oil skimmers or vortechnics systems to reduce potential pollutants. Erosion control measure should include the following: geo-textile mats or riprap for open channels with high flow velocities (greater than 5 feet per second) or slopes at or greater than 2:1, straw bales for channels and swales, and silt fencing for grading. See the City of Glenwood Springs Development Code for additional Best Management Practices.

PROPOSED OFFSITE CONTRIBUTING DRAINAGE BASINS

There are fourteen offsite drainage basins to the south of the proposed development as shown on the proposed Grading and Drainage Plan (**Figure 5**). They consist of SCS hydrologic Type C & D soils (**Figure 2**). Due to the Coal Seam Fire of 2002, the majority of the vegetation on the site has been destroyed. This has increased the potential for a debris flow, and increased the runoff rate on the site. A curve number of 91 was utilized for those drainage basins that were considered to be potential major debris generators due to their steepness and their lack of vegetation (0-5% vegetation) resulting from the Fire. Curve numbers for the remaining off-site basins were determined based upon the apparent re-growth of vegetation since the Fire.

PROPOSED OFFSITE NON-CONTRIBUTING BASINS

There are seven offsite drainage basins to the north of the proposed development as shown on the proposed Grading and Drainage Plan (**Figure 5**). These basins are located between Midland Avenue and the Railroad tracks and between the Railroad tracks and Devereux Road. The runoff from these basins has been combined with the runoff from the development to ensure that the drainage

structures located under the Railroad tracks and Devereux Road are adequate to handle the additional discharge from these drainage basins.

PROPOSED ONSITE DRAINAGE BASINS

There are twenty on-site drainage basins as shown on the proposed Grading and Drainage Plan **(Figure 5)**. They consist of SCS hydrologic Type C & D soils (**Figure 2**). The development will consist of approximately 36.8 acres of commercial development, 33.3 acres of mixed use, 10.7 acres of hospitality, and 54.2 acres of residential. The developed drainage basins have corresponding developed curve numbers as shown in **Table 3**.

Table 3. Proposed Basin Characteristics

Basin	Area	Curve Number	Basin	Area	Curve Number
*OS-1	39.27	91	PR-C	1.63	92
*OS-2	52.11	91	PR-DD	3.37	84
*OS-4	49.58	91	PR-E	25.80	92
*OS-5	14.93	88	PR-J	20.96	86
*OS-6	56.73	91	PR-L	23.26	92
*OS-7	11.3	88	PR-R	20.87	88
*OS-8	10.45	88	PR-M	16.07	92
*OS-9	7.13	88	PR-Q	11.30	92
*OS-11	22.31	91	PR-P	6.55	88
*OS-12	7.60	91	PR-S	5.01	78
PR-24	65.39	84	PR-T	6.79	88
PR-28	16.55	84	PR-U	8.54	91
PR-AA	7.73	92	COMM	63.43	70
PR-A	15.23	92			
PR-A	21.42	92			
PR-BB	10.67	85			
PR-B	18.49	85			
PR-D	3.52	84			

*Basins that are considered debris flow generators in the calculations due to grade and vegetation.

DEBRIS FLOW PONDS

Debris flow ponds have been placed just south of the proposed development in order to contain the debris flow before it enters the developed portions of the site. These ponds will serve a dual purpose as they will also act to attenuate storm water discharge during non-debris flow events. The total required volume for each debris flow pond can be seen in **Table 4**. The required pond volume is determined by applying a bulking factor to the runoff for the 100-year storm event for those drainage basins that are considered to be debris flow generators then adding the runoff for the 100-yr storm event from those drainage basins that do not generate debris flows. The bulking factor for debris flows is used to account for the additional material that could be accumulated during a debris flow event.

In this analysis a bulking factor of 2.4 was utilized with a solids concentration of 50%. Greater

solids concentrations are considered to be landslides and do not behave as a flowing liquid. Approximately 50% of the solids in the debris flow are greater than 6 inches in diameter. These large particles present the most concern to the proposed residential and commercial structures downstream of the debris flow ponds. Therefore the debris flow ponds are sized to capture the solids in excess of 6-inches in diameter plus an equivalent amount of stormwater runoff produced during the 100-year storm event.

$$\text{Volume}_{\text{stormwater}} * 2.4 = \text{Volume}_{\text{stormwater+debris}}$$

$$\text{Required Detention Volume} = (\text{Volume}_{\text{stormwater+debris}}) * 50\%$$

All grading on the site, including the debris flow ponds, shall have maximum slopes of 2:1 (H:V), with slopes of 2:1 being armored. Due to high velocities through the proposed channels, erosion control measures must be taken. The ponds shall have a maximum depth of 10-feet. The bottom of the ponds up to the 10 year water surface elevations shall be lined with bentonite per the Geotechnical Engineer's recommendations. The outlets will be 12" ADS-N12 with 8" diameter orifice plates installed on the ends. The ponds will also have a standpipe located within the berm in the event of clogging.

Table 4. Required Debris Flow Pond Volumes

Debris Flow Pond	Required Volume (ac-ft)
MOC	6.28
Pond 1	31.37
Pond 2	2.20
Pond 3	9.71

Debris Flow Pond MOC

A portion of the offsite and open space area drains to the existing MOC debris flow pond indicated by the MOC Design Point in the calculations. This runoff was accounted for previously by the MOC drainage report. This pond will capture the debris flow from basins OS-11 and OS-12 and the runoff from basin PR-28. A portion of the runoff that historically went to the MOC debris flow basin will instead be captured by Pond 1, reducing the required size of the MOC debris flow basin from 8.02 ac-ft to 6.28 ac-ft. The existing MOC pond currently encroaches onto the residential neighborhood. The MOC pond could be reduced in size in order to contain it within the city property because the required volume for the MOC pond will be reduced to less than the existing ponds volume. The MOC pond has two outlet structures, one at the east end and one at the west end of the existing structure. If a portion of the pond is removed, the pond would need to be regraded such that all of the drainage would go to the west end of the pond requiring some redesign of that outlet structure.

Debris Flow Pond #1

Debris Flow Pond 1 requires a volume of 31.37 ac-ft for debris flow and runoff detention of which 19.491 ac-ft will be used for stormwater only during the 100-year event. This pond will capture the debris flow from basins OS-1, OS-2, OS-4, OS-5, OS-8, OS-9 and the runoff from basin PR-24. This pond has 3 outlet structures designed to convey a portion of the runoff to Design Points 5, 6,

and 12. The proposed debris flow pond has a combined discharge rate for the three outlet structures of 7.1 cfs for the 25-year storm event and 8.86 cfs for the 100-year storm event.

Debris Flow Pond #2
Debris Flow Pond 2 requires a volume of 2.20 ac-ft for debris flow and runoff detention of which 0.948 ac-ft will be used for stormwater only during the 100-year event. This pond will capture the debris flow from basins OS-7 and the runoff from PR-T. This pond will replace the berm along the southwest side of the Community Center. The proposed debris flow pond has a discharge rate of 1.41 cfs for the 25-year storm event and 1.69 cfs for the 100-year storm event.

Debris Flow Pond #3
Debris Flow Pond 3 requires a volume of 9.71 ac-ft for debris flow and runoff detention of which 6.488 ac-ft will be used for stormwater only during the 100-year event. This pond will capture the debris flow from basin OS-6 and the runoff from PR-U. The proposed debris flow pond has a discharge rate of 2.34 cfs for the 25-year storm event and 2.79 cfs for the 100-year storm event.

DESIGN POINTS

DP 3
Design Point 3 is an existing 48" culvert with a capacity of 71 cfs. It has the capacity to convey the 100-year flow of 36.17 cfs contributed from basins PR-AA and PR-BB under Midland Avenue.

DP 4
Design Point 4 is an existing 48" CMP culvert with a capacity of 96 cfs that passes under Midland Avenue (Midland Culvert No. 4). It has the capacity to convey the 100-year flow released from Detention Pond 4. Basin PR-D and PR-DD flow along the path of the historic basin E-5; this basin historically outfalls into an existing pond constructed by CDOT. This pond has no outlet structures and High Country was unable to obtain any design information on this pond, therefore we do not recommend the use of this pond. The proposed basin PR-D bypasses this pond and discharges to Pond 4 which outfalls to Design Point 4.

Detention Pond 4 is a proposed 0.763 ac-ft volume pond required for runoff detention. This pond will capture a portion of the discharge from Debris Flow Pond 1 (outlet 1A), OS-1, and basins PR-A, PR-B, PR-D, PR-24a and PR-DD. This pond is required in order to convey the 100-year flow under the railroad and Devereux Road and has a discharge rate of 45.44 cfs for the 25-year storm event and 62.37 cfs for the 100-year storm event.

DP 5
Design Point 5 is an existing 48" culvert with a capacity of 122 cfs. It has the capacity to convey the 100-year flow of 4.07 cfs contributed from basin PR-C under Midland Avenue.

DP 6
Design Point 6 is an existing 48" culvert with a capacity of 134 cfs. It has the capacity to convey the 100-year flow of 86.59 cfs contributed from a portion of the discharge from Pond 1 (outlet 1B) and basins PR-E, PR-J, PR-24b and OS-2 under Midland Avenue.

DP 10
Design Point 10 includes an existing 18" CMP culvert and an existing 30" CMP culvert with a total

capacity of 58.49 cfs that pass under Midland Avenue. These culverts will convey the 25-year flow of 55.52 cfs from Ponds 2 and 3 and basins PR-U, PR-S, OS-6, OS-7, PR-Q, PR-P, PR-M, PR-T, and the Community Center. The 100-year flow of 84.03 cfs will overtop Midland Avenue at this point. Thus, we recommend replacing the 30" CMP with a 48" culvert that has the capacity 106 cfs.

DP 12

Design Point 12 includes two existing 18" culverts with a total capacity of 21.5 cfs that pass under Midland Avenue. These culverts are unable to convey the 25-year flow under Midland Avenue. These culverts should be replaced with one 48" culvert under Midland Avenue capable of carrying the flow from a portion of the discharge from Pond 1 (outlet 1C) and basins Pr-L, Pr-R, OS-4, PR-24C, OS-5, OS-8, and OS-9. It will have the capacity to convey the 100-year flow of 88.82 cfs contributed by these basins. The proposed culvert under Midland will be able to convey the 100-year flow released at this point to Railroad Culvert RR3.

DP's RR1 and DR1

Design Points RR1 and DR1 are existing 48" culverts that pass under the railroad and Devereux Road with capacities of 100 and 170 cfs respectively. The Design Point RR1 collects flow from Design Points 5 & 4 and conveys the flow under the railroad and to Design Point DR1 culvert which conveys the flow under Devereux Road. Both Design Point RR1 and DR1 culverts have the capacity to convey the 100-year flows of 67 and 97 cfs.

DP's RR2 and DR2

Design Points RR2 and DR2 are existing 48" culverts that pass under the railroad and Devereux Road with capacities of 95 and 110 cfs respectively. The Design Point RR2 collects flow from Design Point 6 and conveys the flow under the railroad and to Design Point DR2 culvert which conveys the flow under Devereux Road. Both Design Points RR2 and DR2 culverts have the capacity to convey the 100-year developed flows of 88 and 88 cfs respectively.

DP's RR3 and DR3

Design Points RR3 and DR3 are existing 48" culverts that pass under the railroad and Devereux Road with capacities of 124 and 132 cfs respectively. The Design Point RR3 collects flow from Design Point 12 and conveys the flow under the railroad and to Design Point DR3 culvert which conveys the flow under Devereux Road. Both Design Points RR3 and DR3 culverts have the capacity to convey the 100-year flow of 91 and 104 cfs respectively.

DP RR4

Design Point RR4 is an existing 48" culvert that passes under the railroad and discharges into the Colorado River. The culvert has a capacity of 124 cfs. The Design Point RR4 collects flow from Design Point 10 and conveys the flow under the railroad. Design Point RR4 culvert has the capacity to convey the 100-year flow of 85 cfs.

DP RR5

Design Point RR5 is an existing 42" culvert that passes under the railroad and Devereux Road and discharges into the Colorado River. The culvert has a capacity of 71 cfs. The Design Point RR4 collects flow from Design Point 3 and conveys the flow under the railroad. Design Point RR5 culvert has the capacity to convey the 100-year flow of 36 cfs.

TABLE 5 CULVERT SUMMARY

Design Point	Culvert No.	Pipe Size	Inv. In	Inv. Out	Length of Pipe	Pipe Slope (ft/ft)	Culvert Capacity (cfs)	25 year Historic Flow	100 year Historic Flow	25 Year Proposed Flow	100 Year Proposed Flow	Additional Culvert (cfs)	100YR Stormwater Detention Required (ac ft)
Midland Avenue Culverts													
	1	18	5755.24	5751.10	73.05	0.057	11.40	4.75	7.55				
	2	18	5751.52	5747.30	66.65	0.063	12.47	11.06	17.35				
3	3	42	5761.06	5749.47	63.15	0.184	109.00	12.54	19.75	26.98	36.17		
4	4	48	5759.25	5744.81	121.79	0.119	96.00	49.35	77.69	45.44	62.37		
													Pond 1a + 4=
5	5	48	5764.13	5746.84	125.46	0.138	121.50	38.24	63.50	3.17	4.07		4.937 + 0.763
6	6	48	5746.11	5744.48	101.66	0.016	134.00	21.13	33.34	65.74	86.59		
	7	18	5744.34	5742.27	67.44	0.031	13.90	2.92	4.82				Pond 1b =
	8	18	5746.18	5743.28	75.15	0.039	13.40	4.07	6.83				6.19
12	9	18	5743.19	5741.00	70.02	0.031	13.75	4.70	8.02	67.98	88.82		
	10	18	5739.96	5737.86	74.59	0.028	13.95	2.97	5.26				
	11	18	5736.51	5735.58	66.01	0.014	11.83	5.23	9.62			25 yr overtops	Pond 1c=
	12	18	5737.54	5736.71	78.86	0.011	9.83					48"	8.364
10	13	18	5738.94	5738.60	82.92	0.004	11.71	4.52	8.99	62.40	84.03	100-yr overtops -48"	Pond 2 + Pond 3
	14	30	5741.80	5740.62	80.48	0.015	46.78	66.76	119.67				0.948+6.488
	15	(2) 29x42	5760.31	5756.08	68.16	0.062	126.80	47.06	82.03				
	16	48	5763.63	5763.68	144.67		83.80	11.02	17.02				Atkinson Canal
Railroad Culverts													
RR1	RR1	48	5725.94	5719.83	118.25	0.052	100.00	87.59	141.19	48.77	67.32		
RR2	RR2	48	5726.8	5718.17	168.28	0.052	95.00	24.05	38.16	66.46	87.89		
RR3	RR3	48	5727.12	5722.89	329.23	0.013	122.00	14.00	24.47	68.83	90.53		
RR4	RR4	54	5728.31	5723.33	257.02	0.091	124.00	21.00	41.49	62.73	84.72		
RR5	RR5	42	5728.2	5723.89	118	0.037	71.00			27.73	37.76		
RR6	RR6	42	5728.3	5727.81	63	0.008	87.00						
Devereaux Road Culverts													
DR1	DR1	48	5694	5691.87	40	0.053	169.59	44.83	141.75	50.12	70.08		
DR2	DR2	48	5707.44	5705	70	0.035	110.00	26.62	41.77	69.16	93.31		
DR3	DR3	48	5715.42	5713.46	40	0.049	132.09	12.34	22.56	72.56	98.13		

* Culvert numbers 1-16 are located on Midland Avenue.
* Culvert numbers RR1-RR6 are located underneath the railroad.
* Culvert number DR1-DR3 are located underneath Devereaux Road.
* Design Point 4 and 5 continue to Design Point RR1 and DR1
* Design Point 6 continues to Design Point RR2 and DR2.
* Design Point 12 continues to Design Point RR3 and DR3.
* Design Point 10 continues to Design Point RR4.
* Design Point 3 continues to Design Point RR5.

CONCLUSION

The master drainage plan for Glenwood Meadows recommends many types of drainage improvements and structures, all of which will act together to convey expected surface runoff across the site while mitigating impacts to expected building types or the environment. The historic debris flow potential will be reduced significantly with the proposed debris flow ponds and the potential for downstream affects due to the debris flow will be greatly reduced. The proposed stormwater discharge for the 25-year storm event can be conveyed under Midland Avenue. The 100-year storm event can be conveyed under the Railroad and Devereux Road utilizing on-site detention.

REFERENCES

1. United States Geological Survey Magnitude and Frequency of Flood in the Western United States, Part 9, Colorado River Basin, 1966.

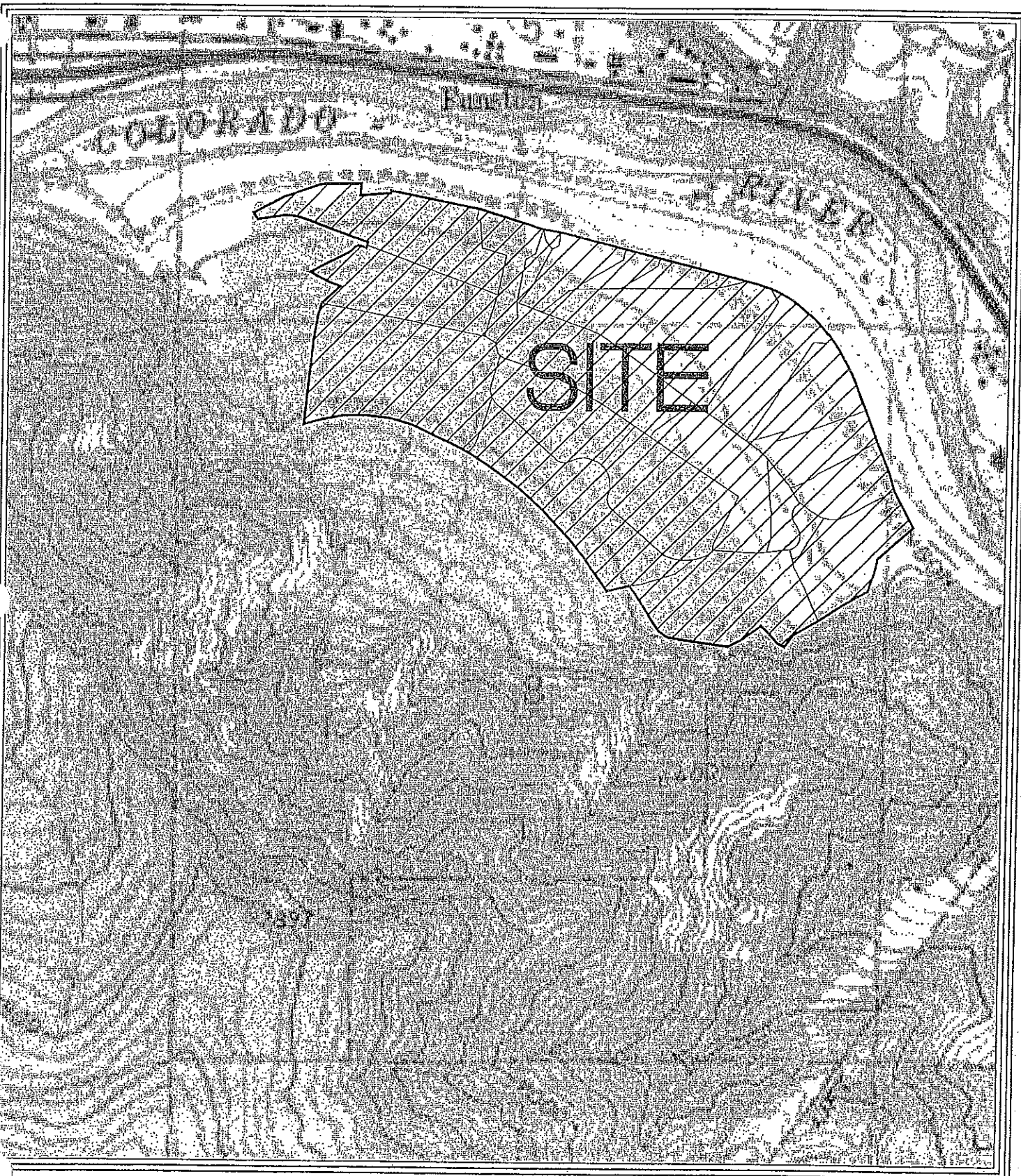
2. National Oceanic and Atmospheric Administration: Precipitation-Frequency Atlas of the Western United States, Volume III-Colorado. Silver Springs, MD 1973.

3. United States Department of Agriculture, Soil Conservation Service: Soil Survey of Aspen-Gypsum Area, Colorado, Parts of Eagle, Garfield, and Pitkin Counties, May 1992.

4. Hydrologic Analysis and Design, Richard H. McCuen: Prentice-Hall, Inc., 1989.

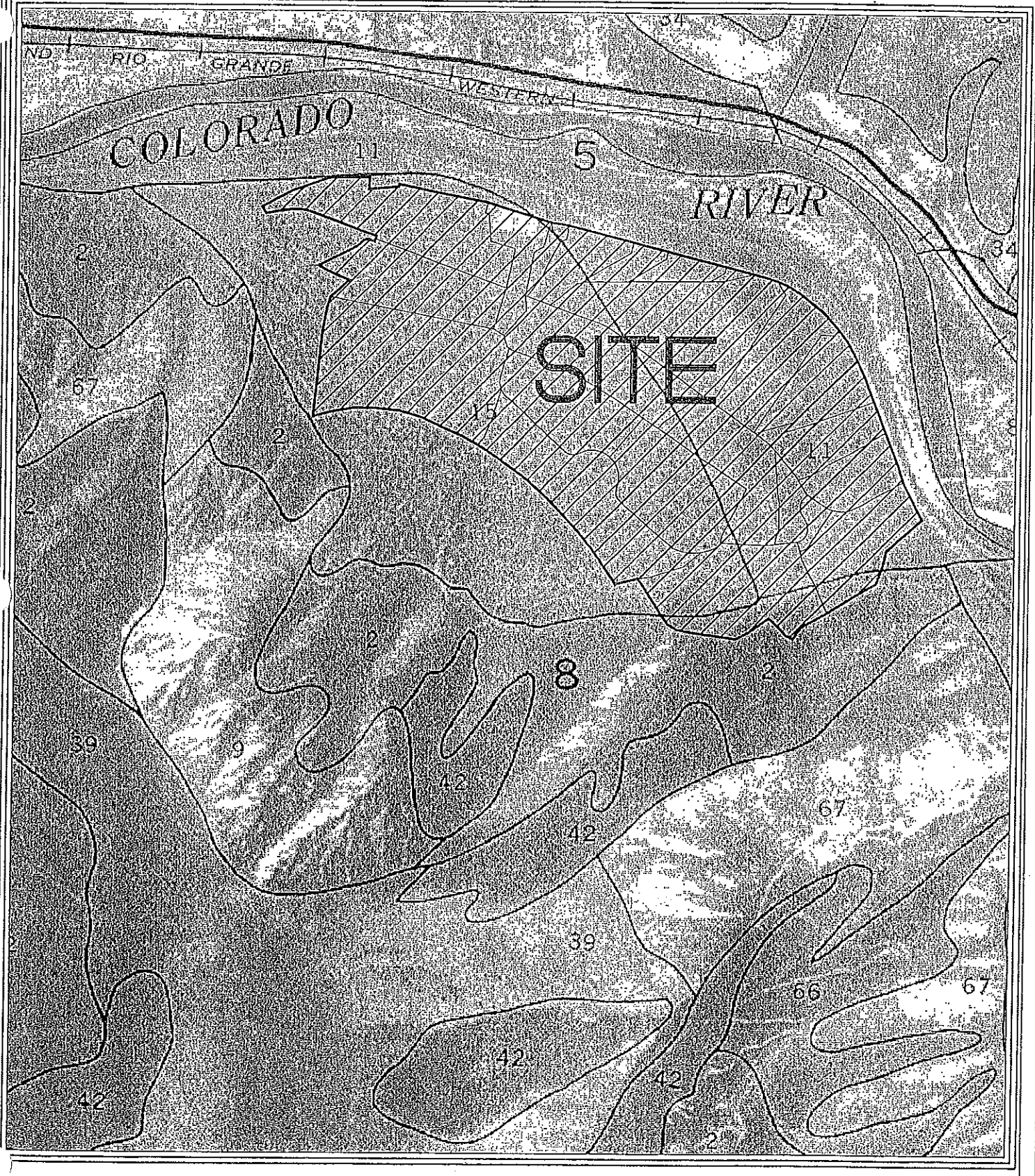
REFERENCE MATERIAL

VICINITY MAP



HIGH COUNTRY ENGINEERING, INC. 923 COOPER AVENUE GLENWOOD SPRINGS, CO 81601 (970) 945-8676 VICINITY-01.DWG	GLENWOOD MEADOWS, LLC GLENWOOD SPRINGS, CO GLENWOOD MEADOWS VICINITY MAP FIGURE 1	1" = 2000'			
		DES. JMW	CK.	FILE NO.	SHEET 1
		DR. JMW	DATE 5/9/02	2000031.01	OF 1

SCS SOILS MAP



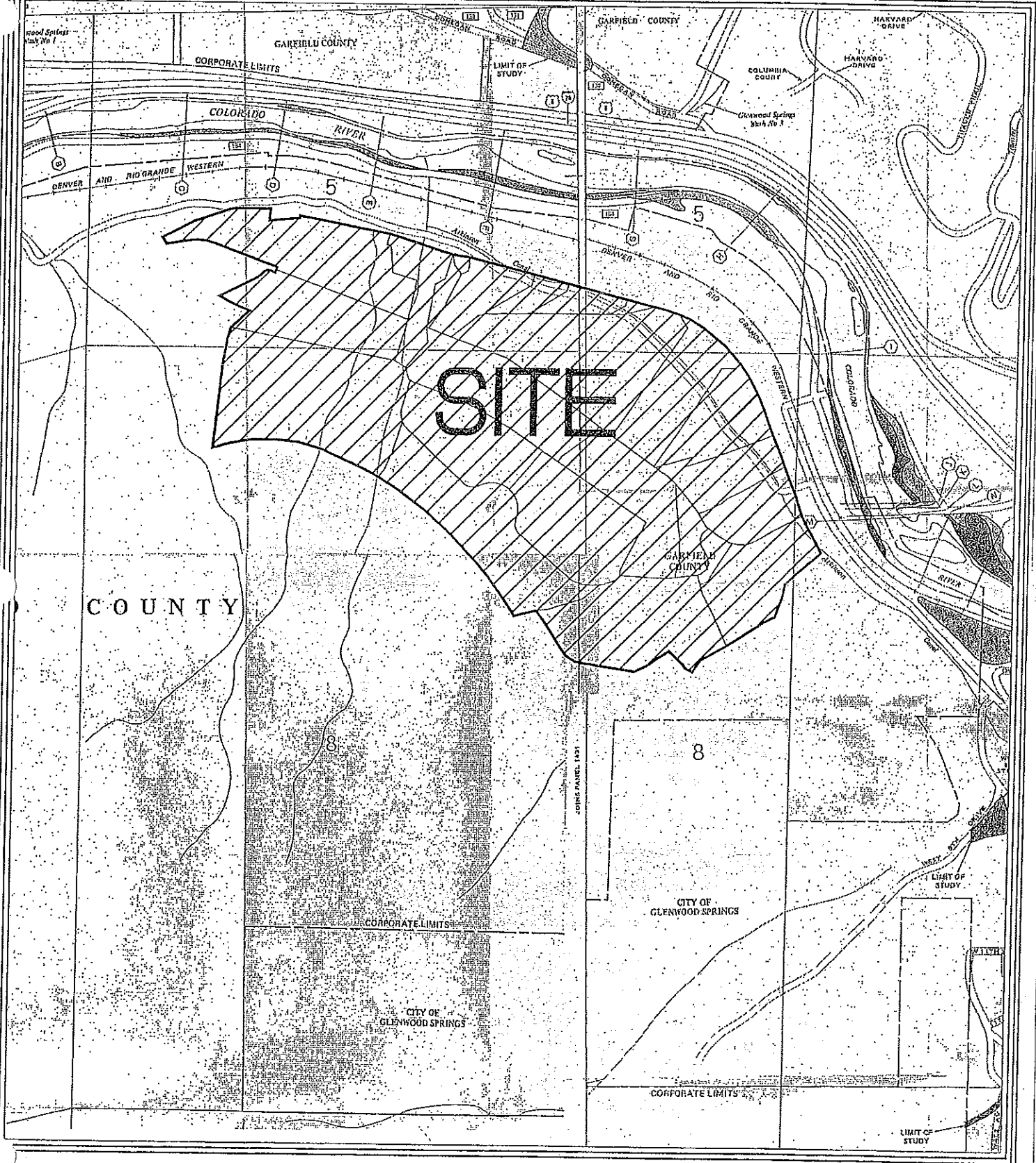
HIGH COUNTRY ENGINEERING, INC.
923 COOPER AVENUE
GLENWOOD SPRINGS, CO 81601
(970) 945-8676
SCS-02.DWG

GLENWOOD MEADOWS, LLC
GLENWOOD SPRINGS, CO
GLENWOOD MEADOWS
SCS SOILS MAP
FIGURE 2

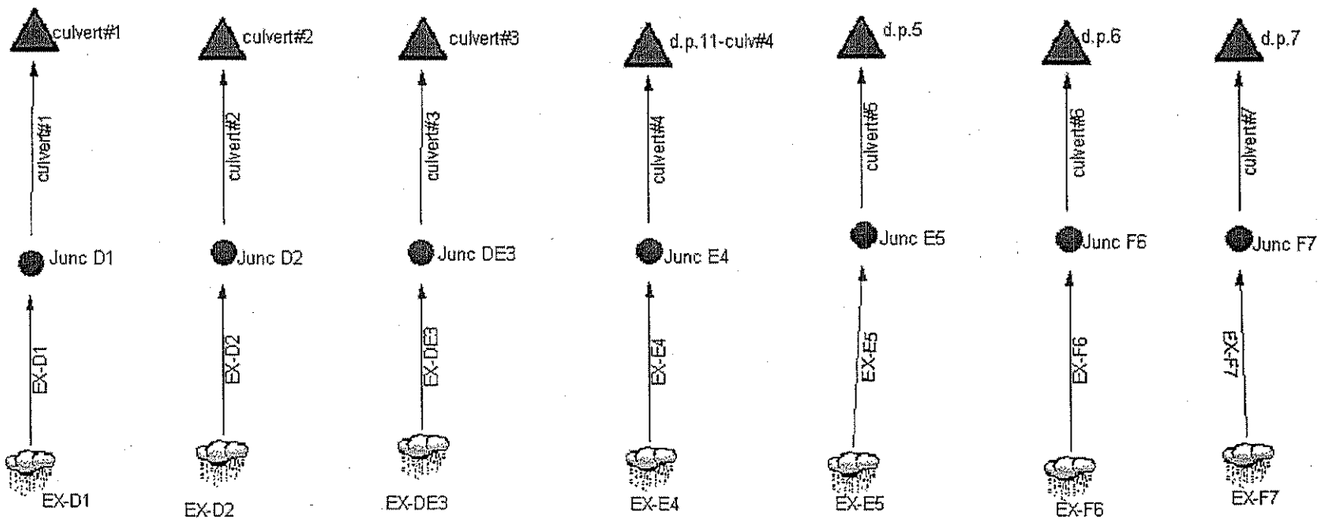
1" = 2000'

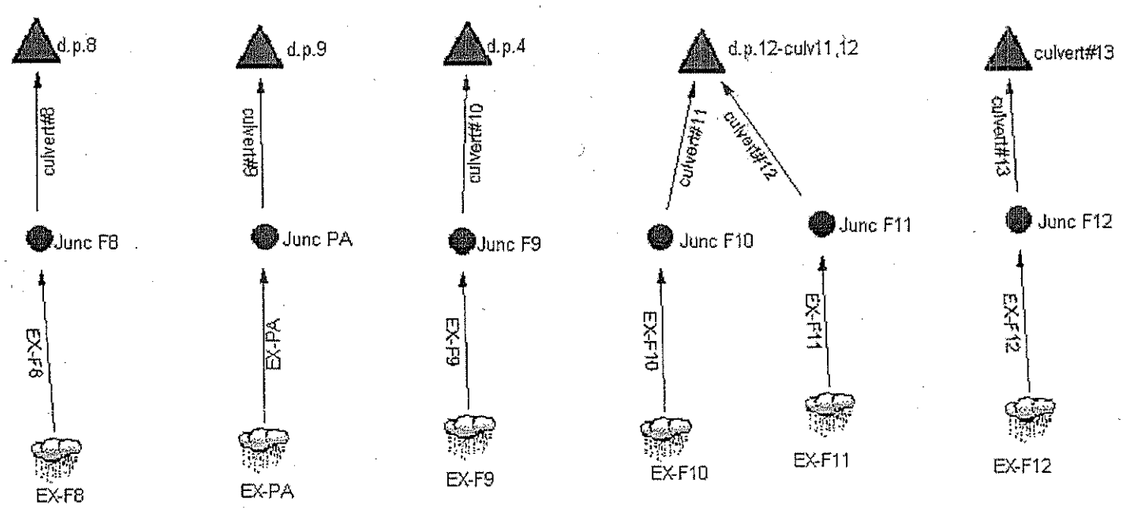
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DR. JMW	DATE 5/9/02	2000031.01	OF 1

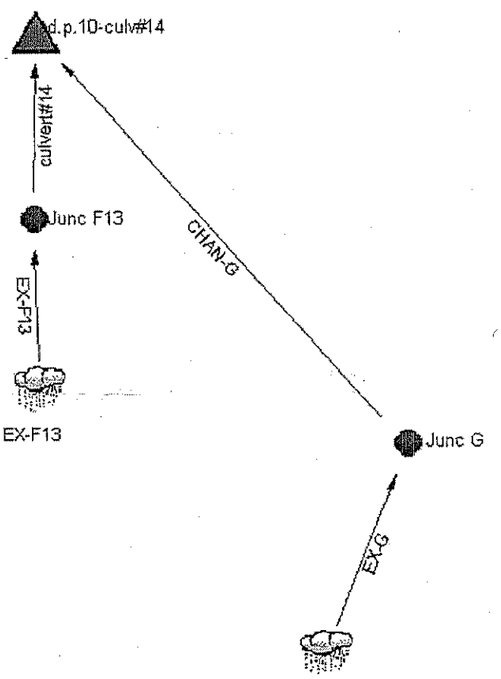
FEMA FLOODPLAIN MAP



HIGH COUNTRY ENGINEERING, INC. 923 COOPER AVENUE GLENWOOD SPRINGS, CO 81601 (970) 945-8676 fema-02	GLENWOOD MEADOWS, LLC GLENWOOD SPRINGS, CO GLENWOOD MEADOWS FEMA FLOODPLAIN MAP FIGURE 3	1" = 2000'		
		DES. JMW	CK.	FILE NO. 2000031.01
		DR. JMW	DATE 5/9/02	SHEET 1 OF 1



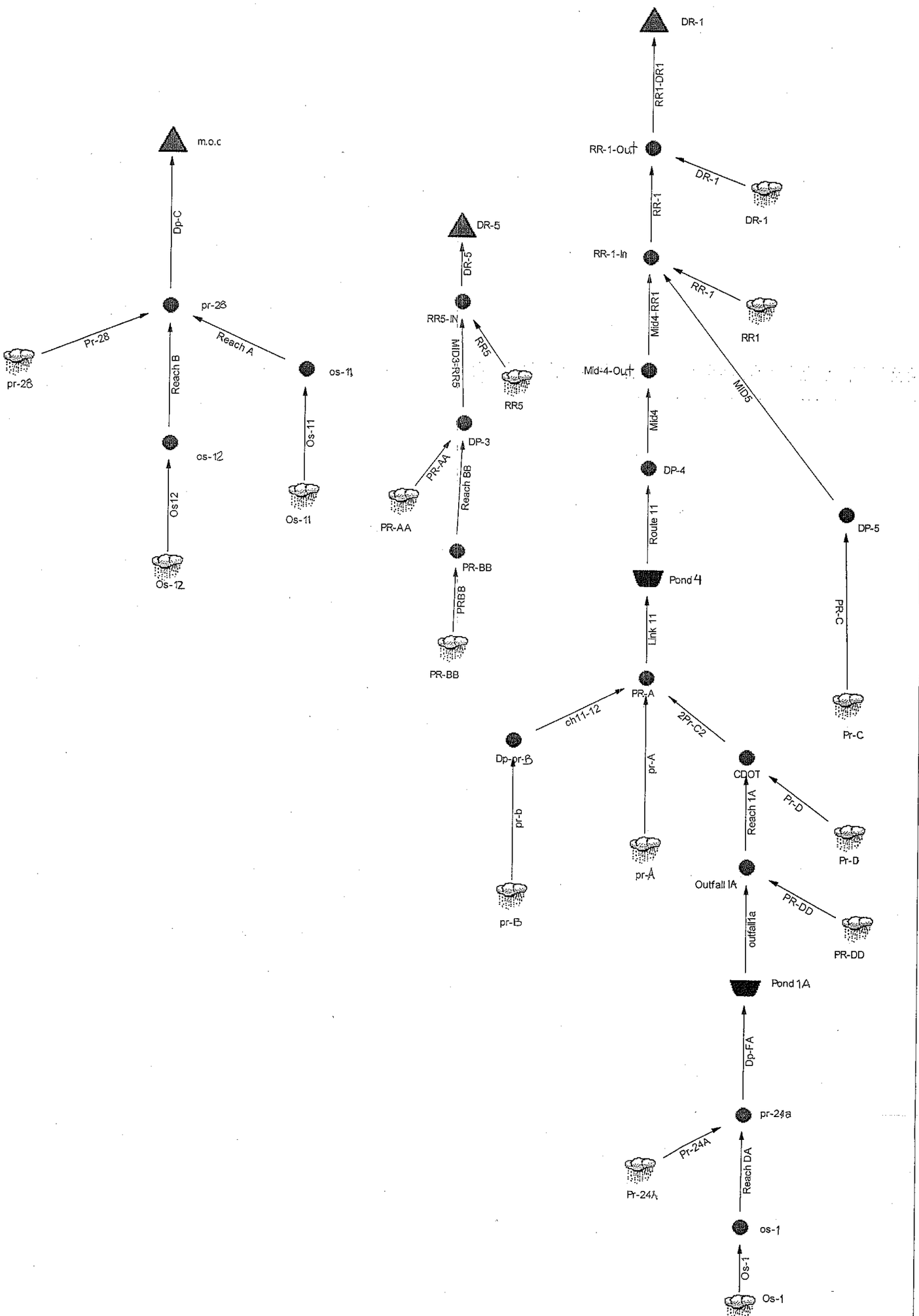




HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, SUITE 101
GLENWOOD SPRINGS, CO 81601
PH.(970) 945-8676
FX.(970) 945-2555
14 INVERNESS DRIVE EAST, SUITE D136
ENGLEWOOD, CO 80112
PH.(303) 925-0554
FX.(303) 925-0547

GLENWOOD SPRINGS, CO
GLENWOOD MEADOWS
POND PACK ROUTING
EXISTING CONDITIONS

SCALE: N.T.S.			PONDP.DWG
DES. JRR	CK: LAH	FILE NO.	SHEET
DR. JRR	DATE: 1/25/04	2031027.00	1



HIGH COUNTRY ENGINEERING, INC.

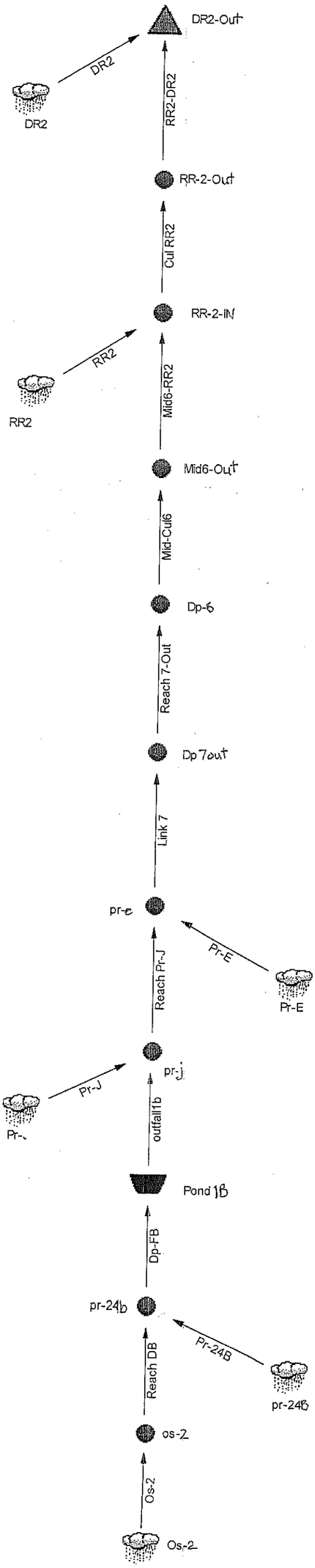
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14 INVERNESS DRIVE EAST,
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PH.(303) 925-0554
FX.(303) 925-0547

GLENWOOD SPRINGS, CO
GLENWOOD MEADOWS
POND PACK ROUTING

SCALE: N.T.S.		PONDPACK	
DES. LAH	CK: LAH	FILE NO.	SHEET
DR. LAH	DATE: 5/5/04	2000031.00	1

Packet Page 1027



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FX.(970) 945-2555

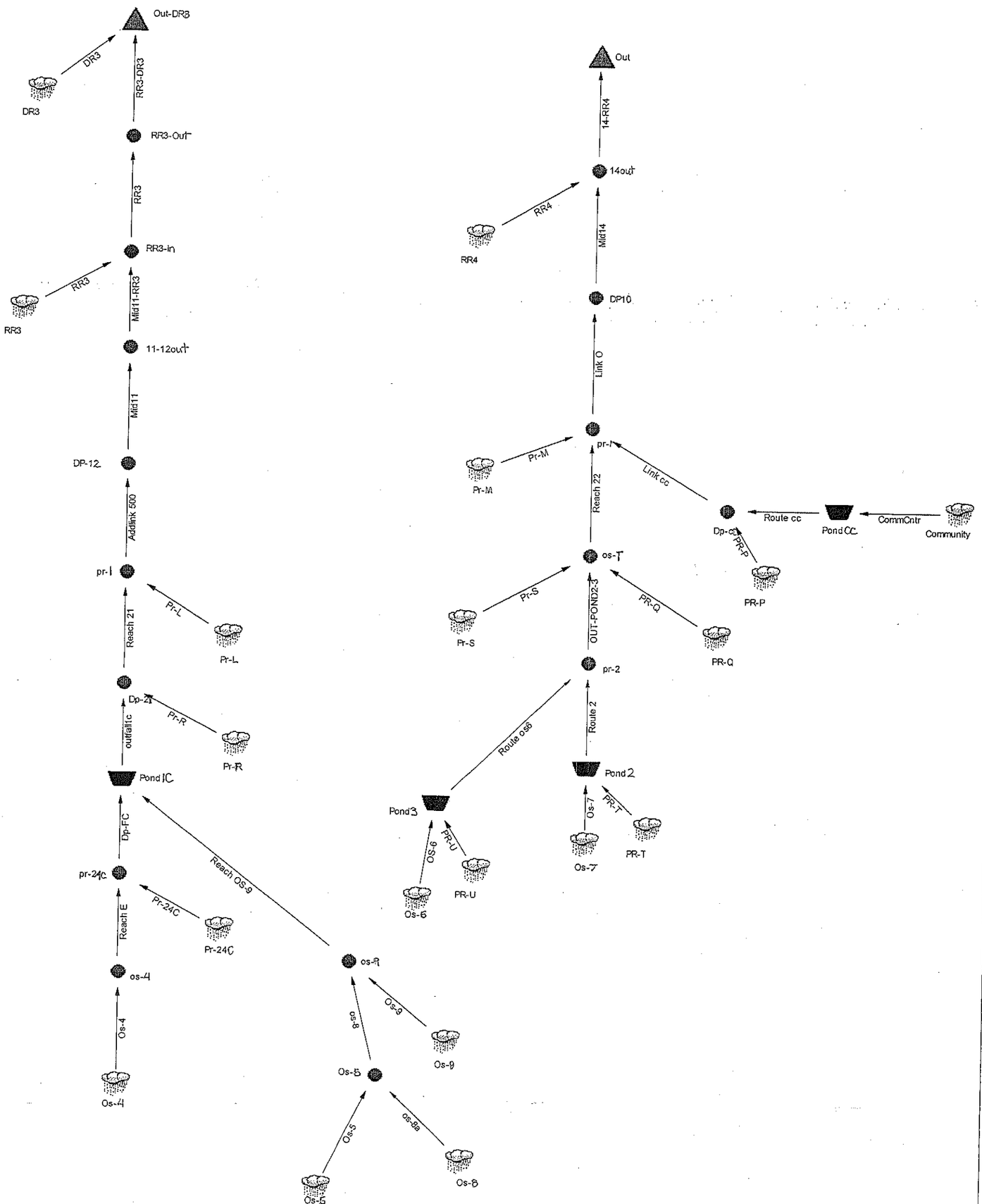
14 INVERNESS DRIVE EAST,
SUITE D136
ENGLEWOOD, CO 80112
PH.(303) 925-0554
FX.(303) 925-0547

GLENWOOD SPRINGS, CO
GLENWOOD MEADOWS
POND PACK ROUTING

SCALE: N.T.S. PONDPACK

DES. LAH	CK: LAH	FILE NO.	SHEET
DR. LAH	DATE: 5/5/04	2000031.00	2

Packet Page 1028



HIGH COUNTRY ENGINEERING, INC.

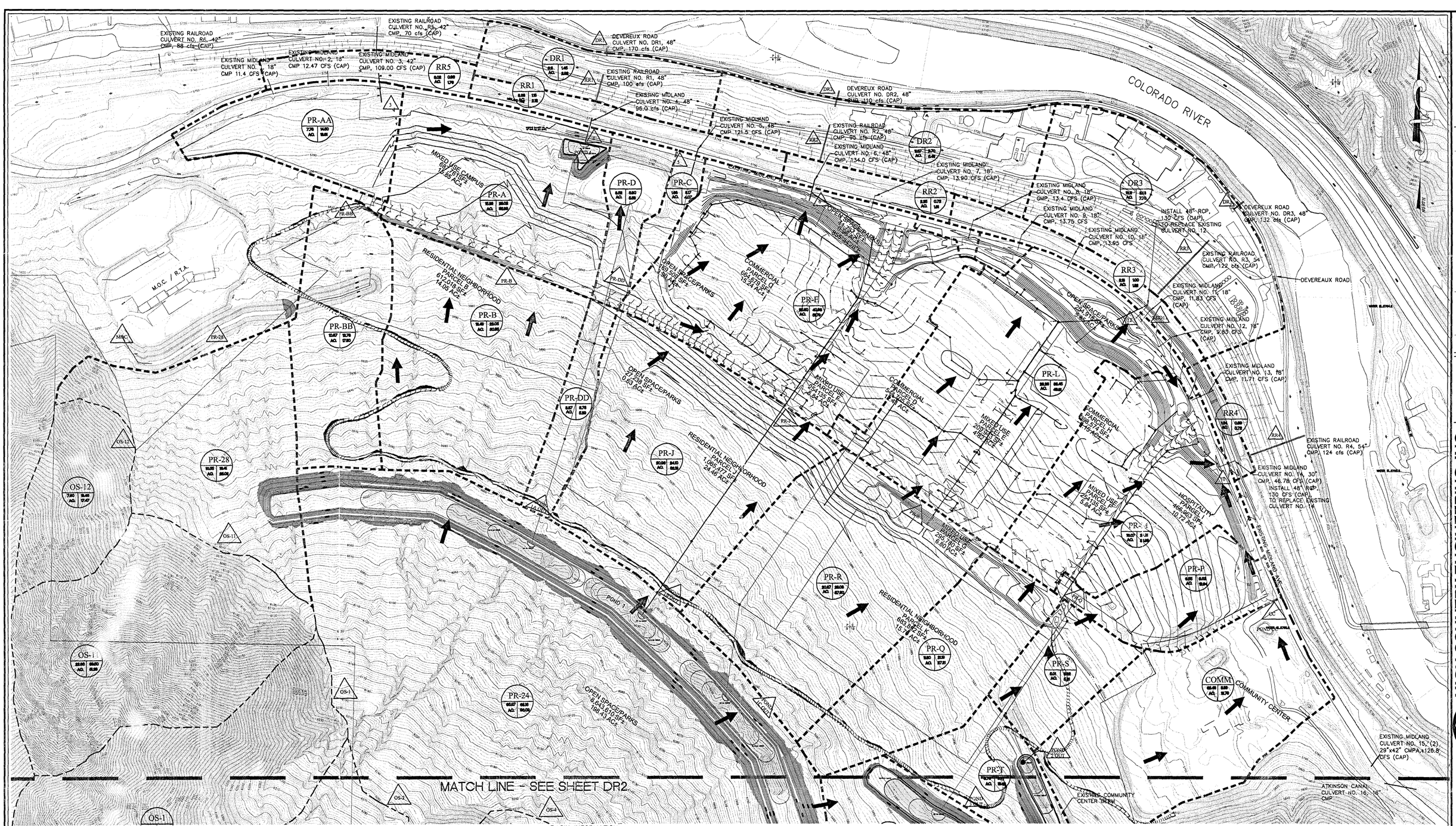
1517 BLAKE AVENUE,
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FX.(303) 925-0547

GLENWOOD SPRINGS, CO
GLENWOOD MEADOWS
POND PACK ROUTING

SCALE: N.T.S.			PONDPACK
DES. LAH	CK: LAH	FILE NO.	SHEET
DR. LAH	DATE: 5/5/04	2000031.00	3

Packet Page 1029


EXISTING RAILROAD CULVERT NO. R6, 42" CMP, 88 cfs (CAP)
EXISTING MIDLAND CULVERT NO. 1, 18" CMP 11.4 CFS (CAP)
EXISTING MIDLAND CULVERT NO= 2, 18" CMP 12.47 CFS (CAP)
EXISTING MIDLAND CULVERT NO. 3, 42" CMP, 109.00 CFS (CAP)
EXISTING RAILROAD CULVERT NO. R5, 42" CMP, 70 cfs (CAP)
DEVEREUX ROAD CULVERT NO. DR1, 48" CMP, 170 cfs (CAP)
EXISTING RAILROAD CULVERT NO. R1, 48" CMP, 100 cfs (CAP)
EXISTING MIDLAND CULVERT NO. 4, 48" 96.0 cfs (CAP)
EXISTING MIDLAND CULVERT NO. 5, 48" CMP 121.5 CFS (CAP)
DEVEREUX ROAD CULVERT NO. DR2, 48" CMP, 110 cfs (CAP)
EXISTING RAILROAD CULVERT NO. R2, 48" CMP, 95 cfs (CAP)
EXISTING MIDLAND CULVERT NO. 6, 48" CMP, 134.0 CFS (CAP)
EXISTING MIDLAND CULVERT NO. 7, 18" CMP, 13.90 CFS (CAP)
EXISTING MIDLAND CULVERT NO. 8, 18" CMP, 13.4 CFS (CAP)
EXISTING MIDLAND CULVERT NO. 9, 18" CMP, 13.75 CFS
EXISTING MIDLAND CULVERT NO. 10, 18" CMP, 13.95 CFS
INSTALL 48" RCP, 130 CFS (CAP) TO REPLACE EXISTING CULVERT NO. 12
DEVEREUX ROAD CULVERT NO. DR3, 48" CMP, 132 cfs (CAP)
EXISTING RAILROAD CULVERT NO. R3, 54" CMP, 122 cfs (CAP)
DEVEREAUX ROAD
EXISTING MIDLAND CULVERT NO. 11, 18" CMP, 11.83 CFS (CAP)
EXISTING MIDLAND CULVERT NO. 12, 78" CMP, 9.85 CFS (CAP)
EXISTING MIDLAND CULVERT NO. 13, 78" CMP, 11.71 CFS (CAP)
EXISTING RAILROAD CULVERT NO. R4, 54" CMP, 124 cfs (CAP)
EXISTING MIDLAND CULVERT NO. 14, 30" CMP, 46.78 CFS (CAP) INSTALL 48" RCP, 130 CFS (CAP) TO REPLACE EXISTING CULVERT NO. 14
EXISTING MIDLAND CULVERT NO. 15, (2) 29"x42" CMPA, 126.8 CFS (CAP)
ATKINSON CANAL CULVERT NO. 16, 18" CMP
COLORADO RIVER
NORTH
PR-AA 7.76 AC, 14.60 AC, 19.68
PR-A 15.59 AC, 28.05 AC, 69.66
PR-B 19.49 AC, 28.05 AC, 60.85
PR-BB 10.67 AC, 15.70 AC, 17.80
PR-C 1.65 AC, 4.07 AC, 4.07
PR-D 8.05 AC, 6.80 AC, 6.80
PR-DD 5.67 AC, 8.78 AC, 8.78
PR-F 26.05 AC, 40.98 AC, 40.98
PR-J 20.08 AC, 34.15 AC, 68.15
PR-L 28.08 AC, 58.46 AC, 68.46
PR-P 6.55 AC, 9.62 AC, 12.94
PR-Q 1.50 AC, 2.39 AC, 9.72 AC
PR-R 30.47 AC, 58.28 AC, 67.80
PR-S 0.5 AC, 1.96 AC, 1.96
PR-T 3.04 AC, 5.84 AC, 5.84
PR-24 65.97 AC, 68.16 AC, 96.09
PR-28 16.05 AC, 19.41 AC, 23.08
OS-1 23.60 AC, 69.40 AC, 69.40
OS-10 7.00 AC, 13.40 AC, 37.40
OS-12 7.00 AC, 13.40 AC, 37.40
RR1 1.15 AC, 2.28 AC
RR2 2.82 AC, 5.72 AC, 5.72
RR3 5.52 AC, 10.0 AC, 10.0
RR4 1.55 AC, 5.89 AC, 5.72
RR5 5.02 AC, 0.89 AC, 3.79
DR1 3.52 AC, 1.45 AC, 8.88
DR2 9.60 AC, 3.70 AC, 5.40
DR3 8.25 AC, 8.25 AC, 7.25
COMM 66.46 AC, 5.89 AC, 18.79
MIXED USE PARCEL P 295,435 SF+/- 6.84 ACRES
MIXED USE PARCEL R 260,186 SF+/- 6.80 ACRES
COMMERCIAL PARCEL S 685,974 SF+/- 15.75 ACRES
HOSPITAL PARCEL 446,863 SF+/- 10.72 ACRES
MIXED USE PARCEL M 295,435 SF+/- 6.84 ACRES
COMMERCIAL PARCEL Q 534,972 SF+/- 12.28 ACRES
COMMERCIAL PARCEL O 534,972 SF+/- 12.24 ACRES
MIXED USE PARCEL L 295,435 SF+/- 6.84 ACRES
RESIDENTIAL NEIGHBORHOOD PARCEL K 1,065,477 SF+/- 24.46 ACRES
RESIDENTIAL NEIGHBORHOOD PARCEL H 663,894 SF+/- 15.24 ACRES
RESIDENTIAL NEIGHBORHOOD PARCEL G 614,502 SF+/- 14.05 ACRES
MIXED USE CAMPUS 65,000 SF+/- 14.65 ACRES
OPEN SPACE/PARKS 1,065,477 SF+/- 24.46 ACRES
OPEN SPACE/PARKS 663,894 SF+/- 15.24 ACRES
OPEN SPACE/PARKS 614,502 SF+/- 14.05 ACRES
OPEN SPACE/PARKS 0.63,238 SF+/- 14.65 ACRES
OPEN SPACE/PARKS 8,643,618 SF+/- 198.43 ACRES
OPEN SPACE/PARKS 295,435 SF+/- 6.84 ACRES
OPEN SPACE/PARKS 534,972 SF+/- 12.28 ACRES
OPEN SPACE/PARKS 534,972 SF+/- 12.24 ACRES
OPEN SPACE/PARKS 295,435 SF+/- 6.84 ACRES
OPEN SPACE/PARKS 260,186 SF+/- 6.80 ACRES
OPEN SPACE/PARKS 685,974 SF+/- 15.75 ACRES
OPEN SPACE/PARKS 446,863 SF+/- 10.72 ACRES
OPEN SPACE/PARKS 295,435 SF+/- 6.84



*BASINS THAT ARE CONSIDERED DEBRIS FLOW GENERATORS IN THE CALCULATIONS DUE TO GRADE AND VEGETATION.

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)

1 inch = 200 ft.

LEGEND

- PROPOSED CULVERTS
- PROPOSED DESIGN POINT
- PROPOSED ROADWAY GRADES
- PROPOSED CURB INLET
- OFFSITE DRAINAGE BASINS (OS-0; Q25 AC; Q100 AC; AREA IN ACRES; FLOW RATE CFS 1YR, 100 YRS)
- PROPOSED STORM PIPES
- OFFSITE BASIN BOUNDARY
- ONSITE BASIN BOUNDARY
- CONTOUR 2'
- CONTOUR 10'
- PROPOSED DRAINAGE BASINS (P-0; Q25 AC; Q100 AC; AREA IN ACRES; FLOW RATE CFS 1YR, 100 YRS)
- PROPOSED CONTOUR 2'
- PROPSED CONTOUR 10'
- FLOW DIRECTION

BASIN INFORMATION

BASIN	AREA	CURVE NUMBER	BASIN	AREA	CURVE NUMBER	BASIN	AREA	CURVE NUMBER
*OS-1	39.27	91	PR-A	21.42	92	PR-S	5.40	78
*OS-2	52.11	91	PR-B	26.19	85	OS-T	2.50	92
*OS-4	49.58	91	PR-C	1.69	92	OS-U	1.10	92
*OS-5	14.93	88	PR-D	6.55	92	COMM	63.43	70
*OS-6	56.73	91	PR-E	22.09	92	RR1	3.63	71
*OS-7	11.30	88	PR-J	10.41	86	RR2	2.25	71
*OS-8	10.45	88	PR-K	11.16	85	RR3	3.13	71
*OS-9	7.13	88	PR-L	20.63	92	RR4	1.24	71
*OS-11	22.31	91	PR-M	5.23	92	DR1	6.11	69
*OS-12	7.60	91	PR-N	3.21	92	DR2	11.37	69
PR-20	13.03	84	PR-O	5.10	92	DR3	16.11	69
PR-23	13.19	82	PR-P	6.14	92			
PR-24	65.39	84	PR-Q	10.77	85			
PR-28	16.55	84	PR-R	9.19	88			

DESIGN POINT INFORMATION

DESIGN POINT	Q25	Q100
POND 1A OUTLET	1.99	2.43
POND 1B OUTLET	2.31	2.79
POND 1C OUTLET	2.80	3.64
POND 2 OUTLET	1.41	1.69
POND 3 OUTLET	2.34	2.79
POND 4 OUTLET	45.44	62.37

DESIGN POINT INFORMATION

DESIGN POINT	CONTRIBUTING BASINS	Q25	Q100
OS-1	OS-1	69.53	90.29
OS-2	OS-2	87.03	112.96
OS-4	OS-4	82.17	106.63
OS-5	OS-5	21.93	29.50
OS-8	OS-8	13.97	18.79
OS-9	OS-9	7.02	9.45
OS-6	OS-6	100.99	131.25
OS-7	OS-7	13.75	18.50

CALL UTILITY NOTIFICATION CENTER OF COLORADO 1-800-922-1987 OR 534-0700 IN METRO DENVER

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION	BY
1	12/24/03	REVISIONS PER CITY COMMENTS	
2	2/27/04	REVISIONS TO DRAINAGE BASINS	

DRAWN BY: LAH
CHECKED BY: LAH
DATE: 5/6/04
FILE: DR01-05-03-04

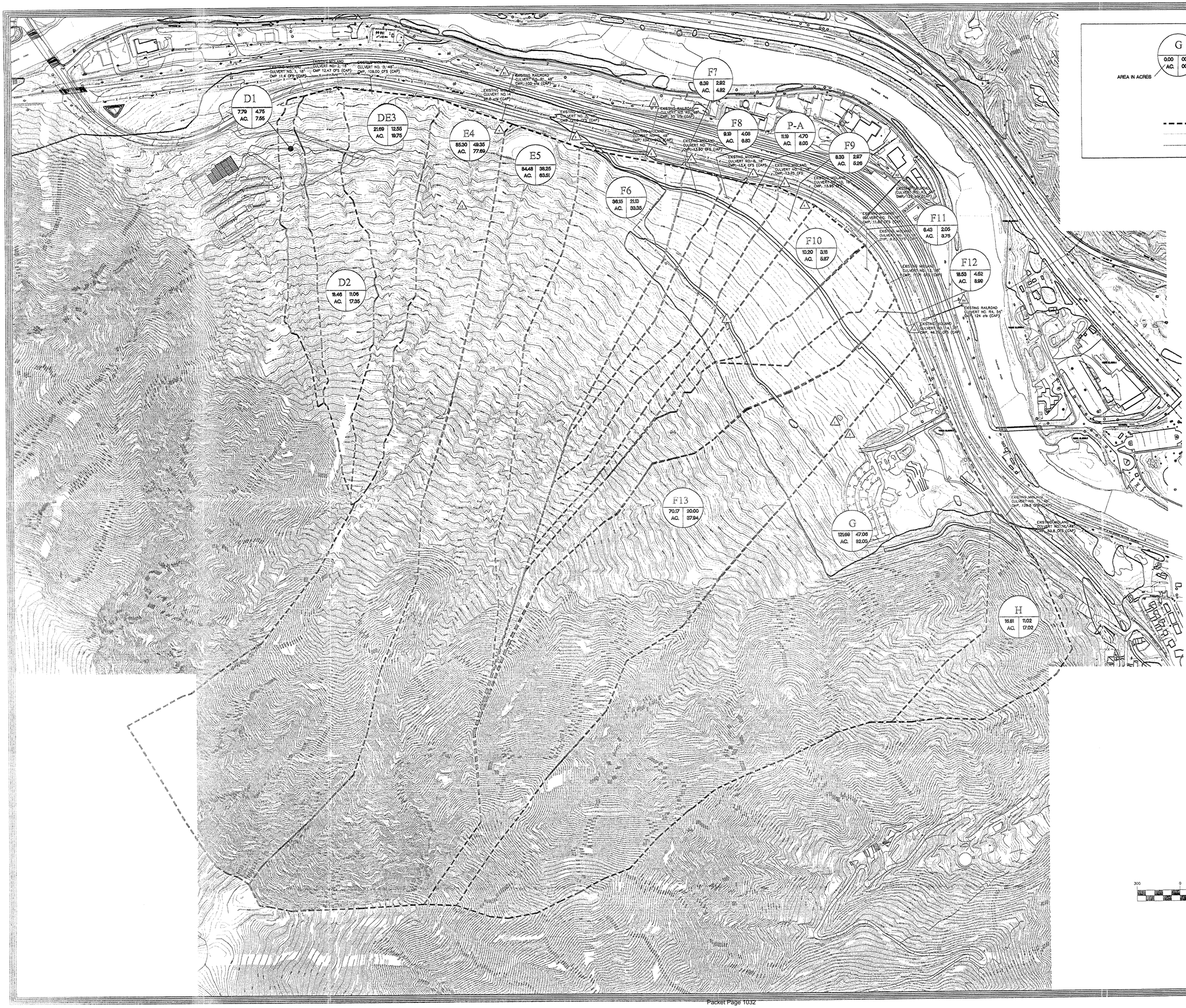
HIGH COUNTRY ENGINEERING, INC.
14 INVERNESS DRIVE EAST, STE F-120, ENGLEWOOD, CO 80112
PHONE (303) 925-0544 FAX (303) 9250547
1517 BLAKE AVENUE, STE 101, GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8576 FAX (970) 945-2555
WWW.HCENG.COM

GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MASTER DRAINAGE PLAN PROPOSED CONDITIONS

PROJECT NO. 2000031.0316

DR2



LEGEND

- G — 0.00 AC. | 00.00 AC. — AREA IN ACRES / FLOW RATE (25 YR, 100 YR) — EXISTING DRAINAGE BASINS
- EXISTING DESIGN POINT
- EXISTING STORM PIPES
- EXISTING BASIN BOUNDARY
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR

BASIN	AREA	CURVE NUMBER
D1	7.79	77
D2	18.45	77
DE3	21.69	77
E4	85.30	77
E5	84.41	75
F6	36.15	77
F7	6.39	74
F8	9.19	74
P-A	11.19	74
F9	8.33	73
F10	10.20	71
F11	6.43	71
F12	18.53	70
F13	70.17	71
G	121.69	73
H	16.81	77

NORTH

GRAPHIC SCALE

300 0 150 300 600 1200

(IN FEET)
1 inch = 300 ft.

NO	DATE	REVISION	BY
2	2/27/04	REVISIONS TO DRAINAGE BASINS	JRR

DES JRR
DR JRR
CK LAH
DATE 09/19/03
FILE HIST_01

HIGH COUNTRY ENGINEERING, INC.
557 BLAKE AVENUE, STE 101, GLENWOOD SPRINGS, CO 81601
PH:(970) 945-3976 FX:(970) 945-2585
14 INVERNESS DRIVE EAST, STE D-136, ENGLEWOOD, CO 80112
PH:(303) 925-0554 FX:(303) 925-0547

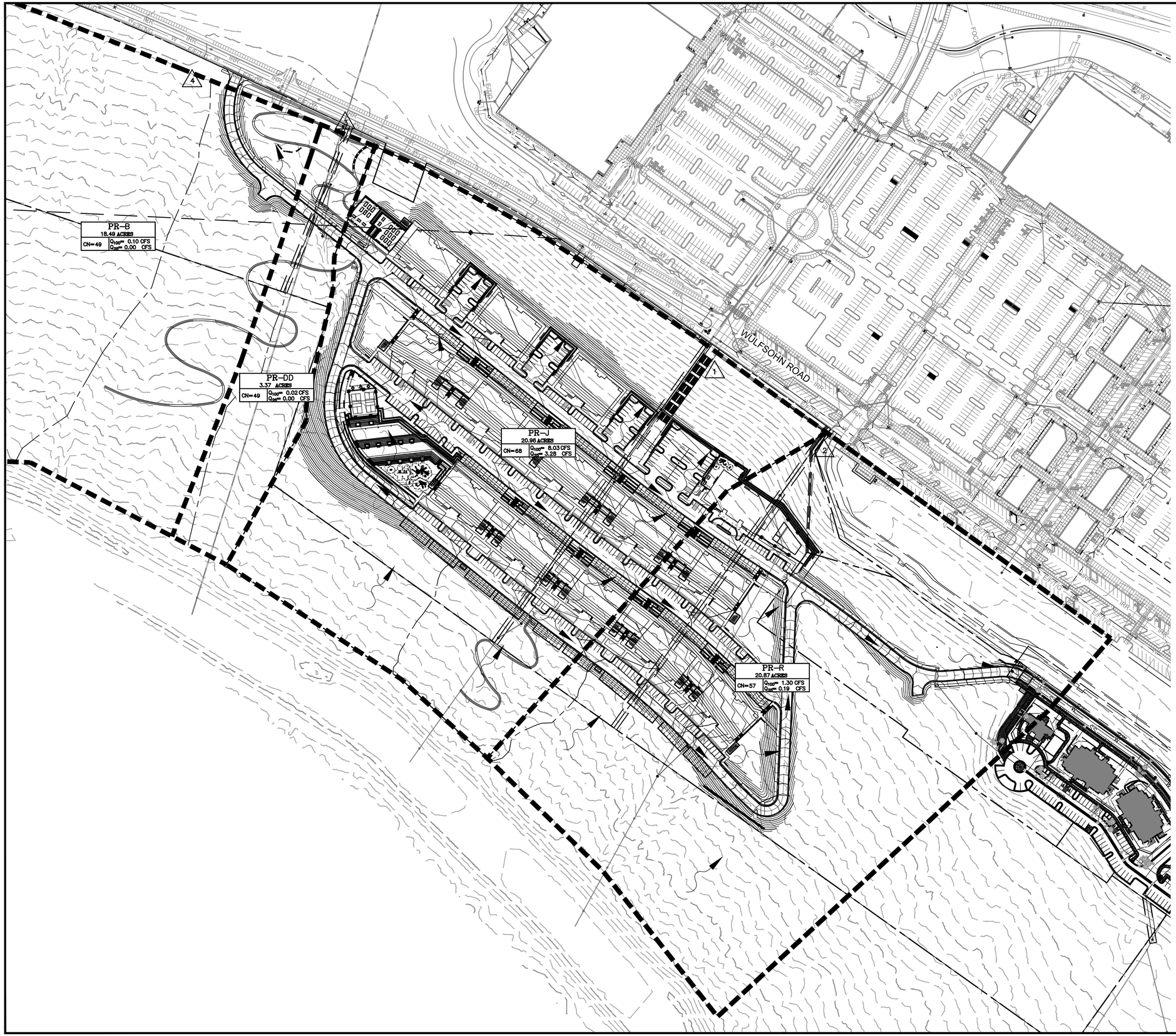
GLENWOOD SPRINGS
GLENWOOD MEADOWS
HISTORIC FLOW CONDITIONS

PROJECT NO
200031.01

SHEET H1

APPENDIX C

PROPOSED CONDITIONS DRAINAGE MAP – GLENWOOD MEADOWS MULTI-FAMILY



GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

PRELIMINARY NOT FOR CONSTRUCTION

LEGEND

- EXISTING PROPERTY BOUNDARY
- 8010 EXISTING MAJOR CONTOUR
- 8008 EXISTING MINOR CONTOUR
- 8160 PROPOSED MAJOR CONTOUR
- 8158 PROPOSED MINOR CONTOUR
- OFFSITE DRAINAGE BASIN BOUNDARY
- EXISTING DRAINAGE BASIN BOUNDARY
- PROPOSED DRAINAGE BASIN BOUNDARY

EX-1	PR-1
## ACRES	### ACRES
CN=##	Q_{100}=#.## CFS
	Q_{25}=#.## CFS

DRAINAGE BASIN ID
DRAINAGE BASIN SIZE (ACRES)
CN= RUNOFF CURVE NUMBER
Q_{100}=100 YEAR RUNOFF FLOW (CFS)
Q_{25}=25 YEAR RUNOFF FLOW (CFS)

DRAINAGE FLOW PATTERN

1 DESIGN POINT

DESIGN POINTS

1 **DESIGN POINT 1: RECEIVES CHANNEL FLOW (PIPE) FROM BASIN PR-J.**

2 **DESIGN POINT 2: RECEIVES CHANNEL FLOW (PIPE) FLOW FROM BASIN PR-R.**

NOTES:

1. A SITE SPECIFIC GEOTECHNICAL REPORT WAS COMPLETED FOR GLENWOOD MEADOWS NO. 6 HOUSING, CITY OF GLENWOOD SPRINGS, COLORADO BY AMERICAN GEOSERVICES, DATED JULY 22, 2002, JOB NUMBER 0280-WS2020.
2. THE ENTIRE SITE IS LOCATED WITHIN ZONE D ON THE FIRM MAPS 0802051431B AND 0802051432B.
3. EXISTING SURVEY INFORMATION COMPLETED BY TUTTLE SURVEYING SERVICES.
4. PROPOSED BASIN DELINEATION FROM GLENWOOD MEADOWS MASTER DRAINAGE REPORT COMPLETED BY HIGH COUNTRY ENGINEERING, INC. (PROJECT NO. 2000031) DATED MAY 6, 2004.

COLORADO 811
CALL BEFORE YOU DIG
Utility Notification Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	6/25/21	MAJOR SITE / ARCH. REVIEW #3 DRAFT	

DRAWN BY: MGG
CHECKED BY: MGG
DATE:
FILE:
SCALE 1" = 100'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101,
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 · FAX (970) 945-2555
WWW.HCENG.COM

BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

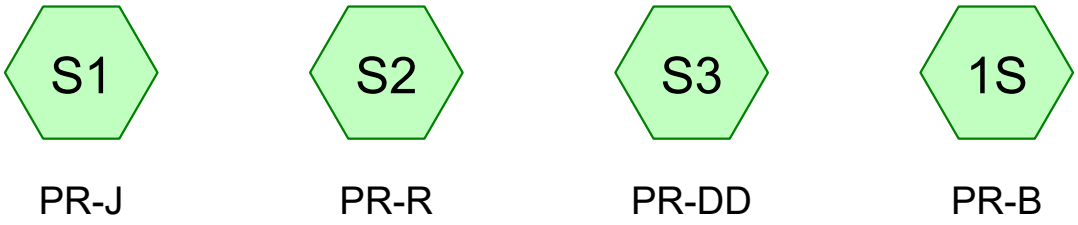
PROPOSED DRAINAGE BASIN MAP

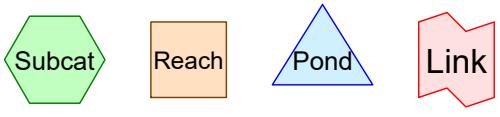
PROJECT NO.
2201044.00

PRDR

APPENDIX D

PROPOSED HYDROLOGIC CALCULATIONS





Routing Diagram for 220100-Proposed

Prepared by HydroCAD SAMPLER 1-800-927-7246 www.hydrocad.net, Printed 6/25/2021

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
12.458	98	Impervious (1S, S1, S2, S3)
46.792	48	Oak-aspen, fair, HSG B (1S, S1, S2, S3)
4.441	49	Open space, fair, HSG A (S1, S2)
63.691	**58**	**TOTAL AREA**

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
4.441	HSG A	S1, S2
46.792	HSG B	1S, S1, S2, S3
0.000	HSG C	
0.000	HSG D	
12.458	Other	1S, S1, S2, S3
63.691		**TOTAL AREA**

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-B Runoff Area=18.490 ac 1.24% Impervious Runoff Depth=0.00"
Flow Length=976' Slope=0.1609 '/' Tc=16.1 min CN=49 Runoff=0.00 cfs 0.000 af

Subcatchment S1: PR-J Runoff Area=20.961 ac 40.75% Impervious Runoff Depth>0.22"
Flow Length=2,082' Tc=16.8 min CN=68 Runoff=3.28 cfs 0.384 af

Subcatchment S2: PR-R Runoff Area=20.871 ac 17.23% Impervious Runoff Depth>0.04"
Flow Length=1,765' Tc=16.3 min CN=57 Runoff=0.19 cfs 0.069 af

Subcatchment S3: PR-DD Runoff Area=3.369 ac 2.67% Impervious Runoff Depth=0.00"
Flow Length=1,000' Tc=16.6 min CN=49 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 63.691 ac Runoff Volume = 0.452 af Average Runoff Depth = 0.09"
80.44% Pervious = 51.233 ac 19.56% Impervious = 12.458 ac

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Summary for Subcatchment 1S: PR-B

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

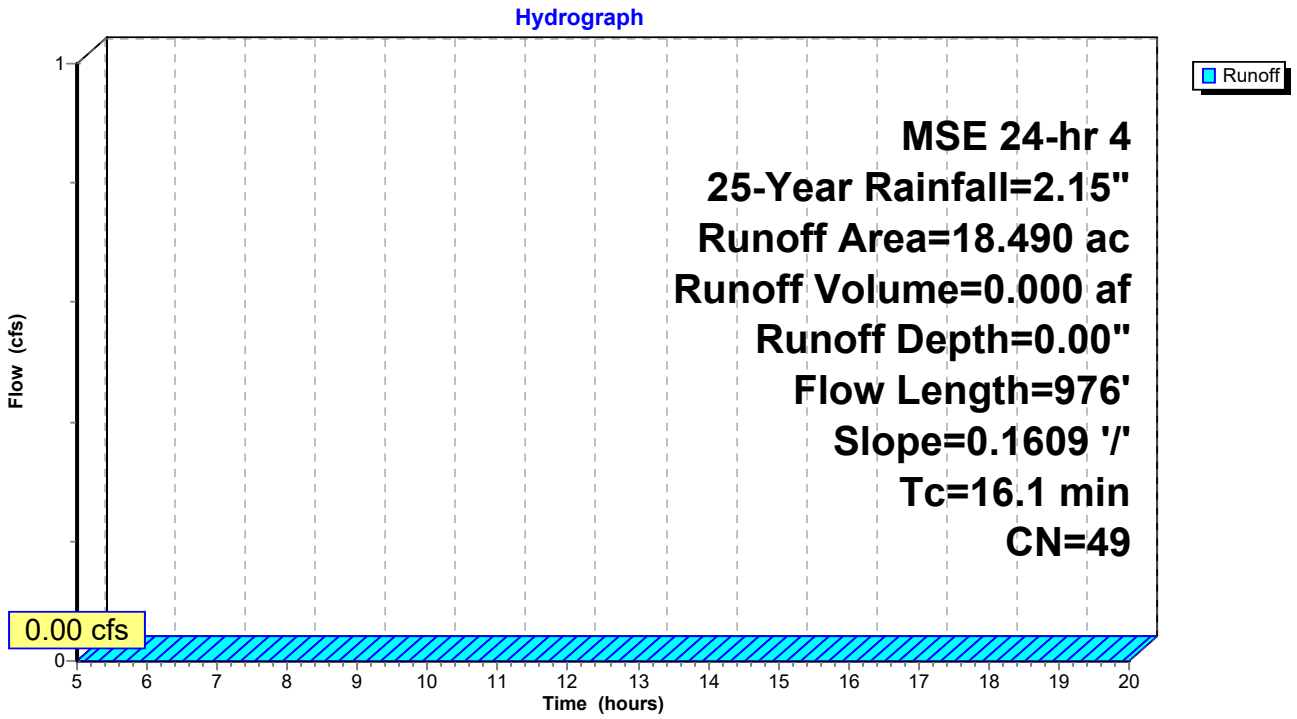
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 25-Year Rainfall=2.15"

	Area (ac)	CN	Description
*	18.260	48	Oak-aspen, fair, HSG B
*	0.230	98	Impervious
	18.490	49	Weighted Average
	18.260		98.76% Pervious Area
	0.230		1.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	300	0.1609	0.35		**Sheet Flow,** Range n= 0.130 P2= 1.29"
1.7	676	0.1609	6.46		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.1	976	Total			

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Subcatchment 1S: PR-B



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Summary for Subcatchment S1: PR-J

Runoff = 3.28 cfs @ 12.34 hrs, Volume= 0.384 af, Depth> 0.22"

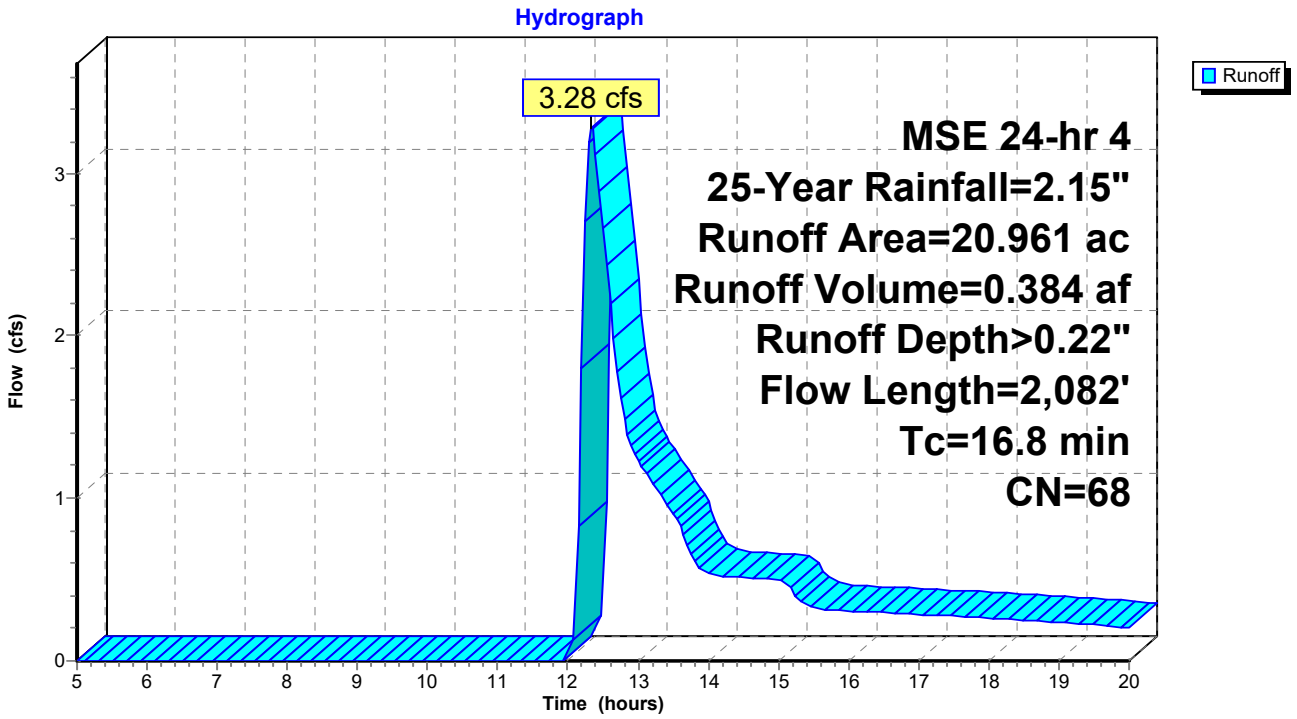
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 25-Year Rainfall=2.15"

	Area (ac)	CN	Description
*	10.013	48	Oak-aspen, fair, HSG B
*	2.407	49	Open space, fair, HSG A
*	8.541	98	Impervious
	20.961	68	Weighted Average
	12.420		59.25% Pervious Area
	8.541		40.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	300	0.1682	0.35		**Sheet Flow,** Range n= 0.130 P2= 1.29"
1.0	326	0.0680	5.29		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	1,456	0.0840	14.24	11.19	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
16.8	2,082	Total			

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Subcatchment S1: PR-J



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Summary for Subcatchment S2: PR-R

Runoff = 0.19 cfs @ 13.39 hrs, Volume= 0.069 af, Depth> 0.04"

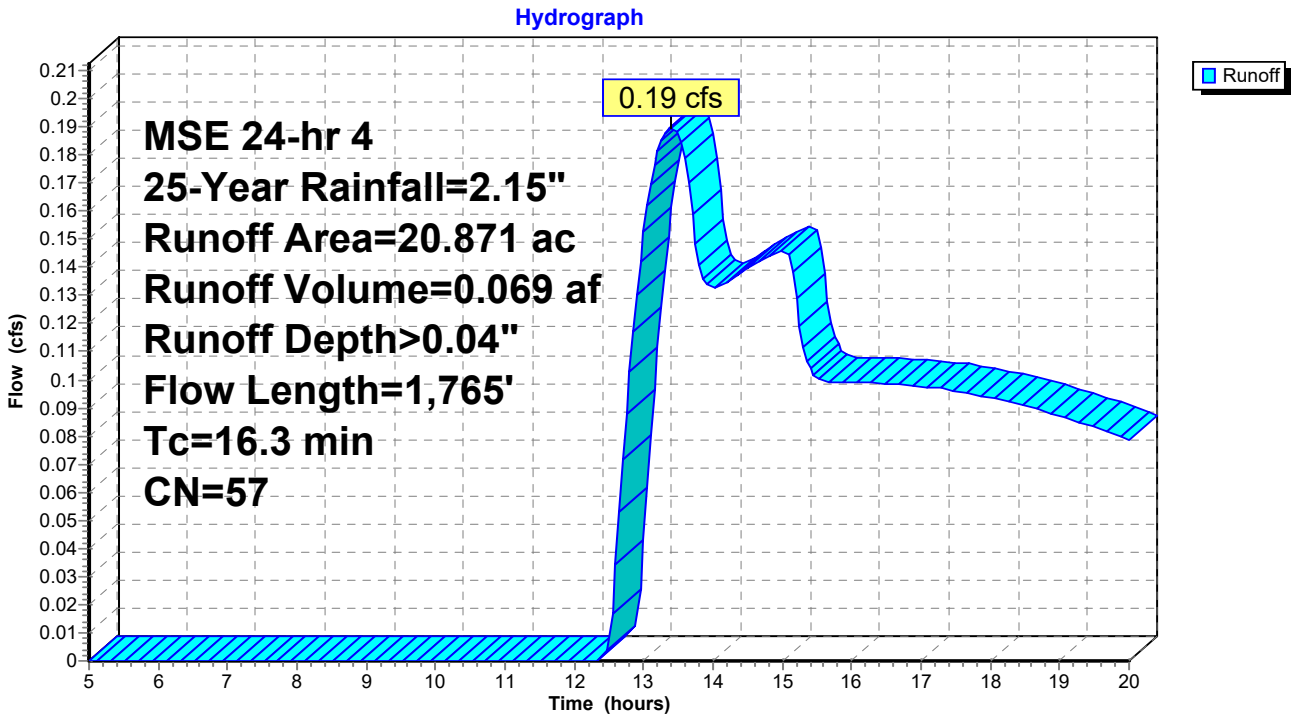
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 25-Year Rainfall=2.15"

	Area (ac)	CN	Description
*	15.240	48	Oak-aspen, fair, HSG B
*	2.034	49	Open space, fair, HSG A
*	3.597	98	Impervious
	20.871	57	Weighted Average
	17.274		82.77% Pervious Area
	3.597		17.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	300	0.1570	0.34		**Sheet Flow,** Range n= 0.130 P2= 1.29"
0.3	106	0.0650	5.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	1,359	0.0980	15.38	12.08	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
16.3	1,765	Total			

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Subcatchment S2: PR-R



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Summary for Subcatchment S3: PR-DD

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

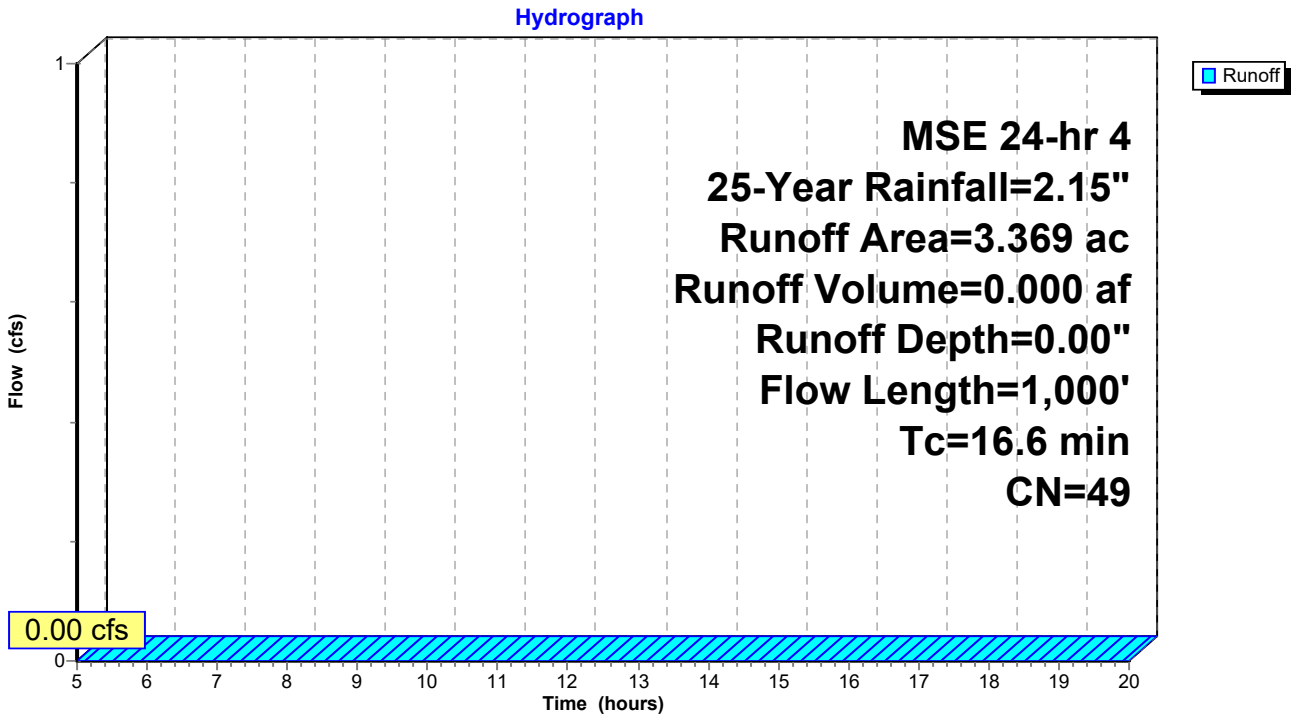
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 25-Year Rainfall=2.15"

	Area (ac)	CN	Description
*	3.279	48	Oak-aspen, fair, HSG B
*	0.090	98	Impervious
	3.369	49	Weighted Average
	3.279		97.33% Pervious Area
	0.090		2.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	300	0.1518	0.34		**Sheet Flow,** Range n= 0.130 P2= 1.29"
1.9	700	0.1506	6.25		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.6	1,000	Total			

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Subcatchment S3: PR-DD



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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-B Runoff Area=18.490 ac 1.24% Impervious Runoff Depth>0.03"
Flow Length=976' Slope=0.1609 '/' Tc=16.1 min CN=49 Runoff=0.10 cfs 0.043 af

Subcatchment S1: PR-J Runoff Area=20.961 ac 40.75% Impervious Runoff Depth>0.45"
Flow Length=2,082' Tc=16.8 min CN=68 Runoff=8.83 cfs 0.782 af

Subcatchment S2: PR-R Runoff Area=20.871 ac 17.23% Impervious Runoff Depth>0.15"
Flow Length=1,765' Tc=16.3 min CN=57 Runoff=1.30 cfs 0.254 af

Subcatchment S3: PR-DD Runoff Area=3.369 ac 2.67% Impervious Runoff Depth>0.03"
Flow Length=1,000' Tc=16.6 min CN=49 Runoff=0.02 cfs 0.008 af

Total Runoff Area = 63.691 ac Runoff Volume = 1.086 af Average Runoff Depth = 0.20"
80.44% Pervious = 51.233 ac 19.56% Impervious = 12.458 ac

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Summary for Subcatchment 1S: PR-B

Runoff = 0.10 cfs @ 15.05 hrs, Volume= 0.043 af, Depth> 0.03"

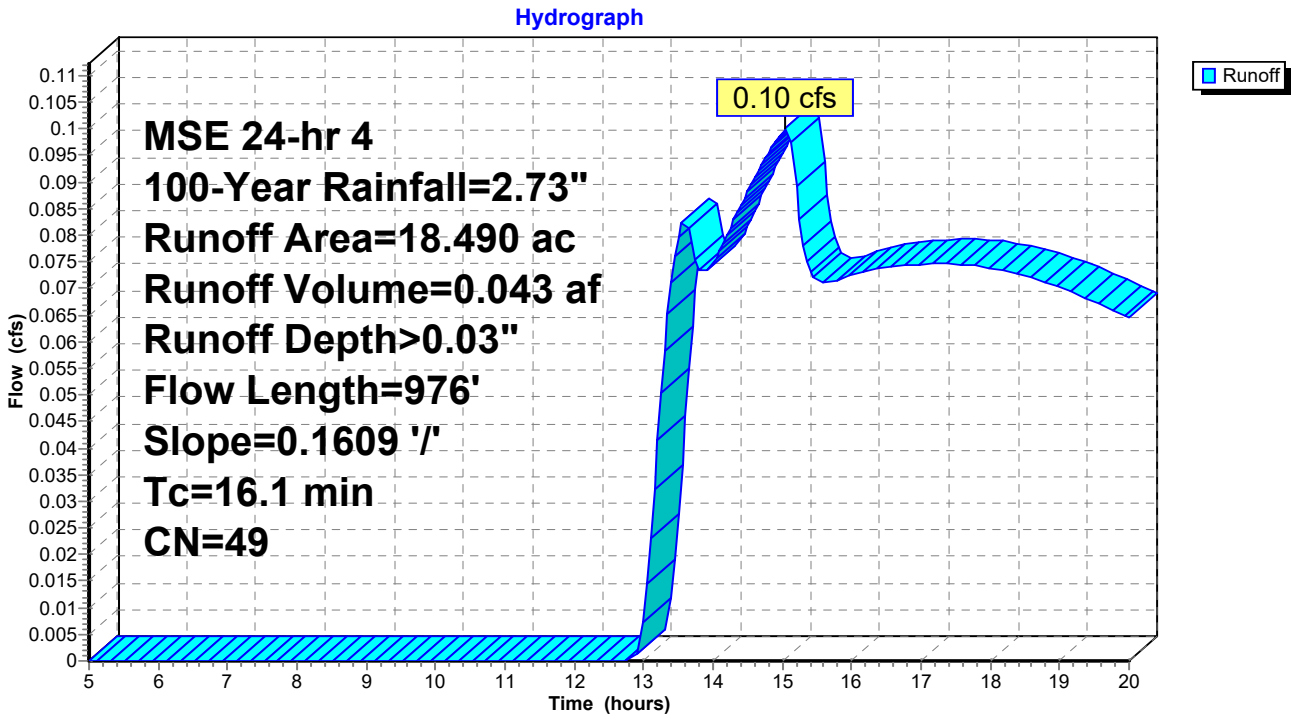
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=2.73"

	Area (ac)	CN	Description
*	18.260	48	Oak-aspen, fair, HSG B
*	0.230	98	Impervious
	18.490	49	Weighted Average
	18.260		98.76% Pervious Area
	0.230		1.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.4	300	0.1609	0.35		**Sheet Flow,** Range n= 0.130 P2= 1.29"
1.7	676	0.1609	6.46		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.1	976	Total			

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Subcatchment 1S: PR-B



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Summary for Subcatchment S1: PR-J

Runoff = 8.83 cfs @ 12.30 hrs, Volume= 0.782 af, Depth> 0.45"

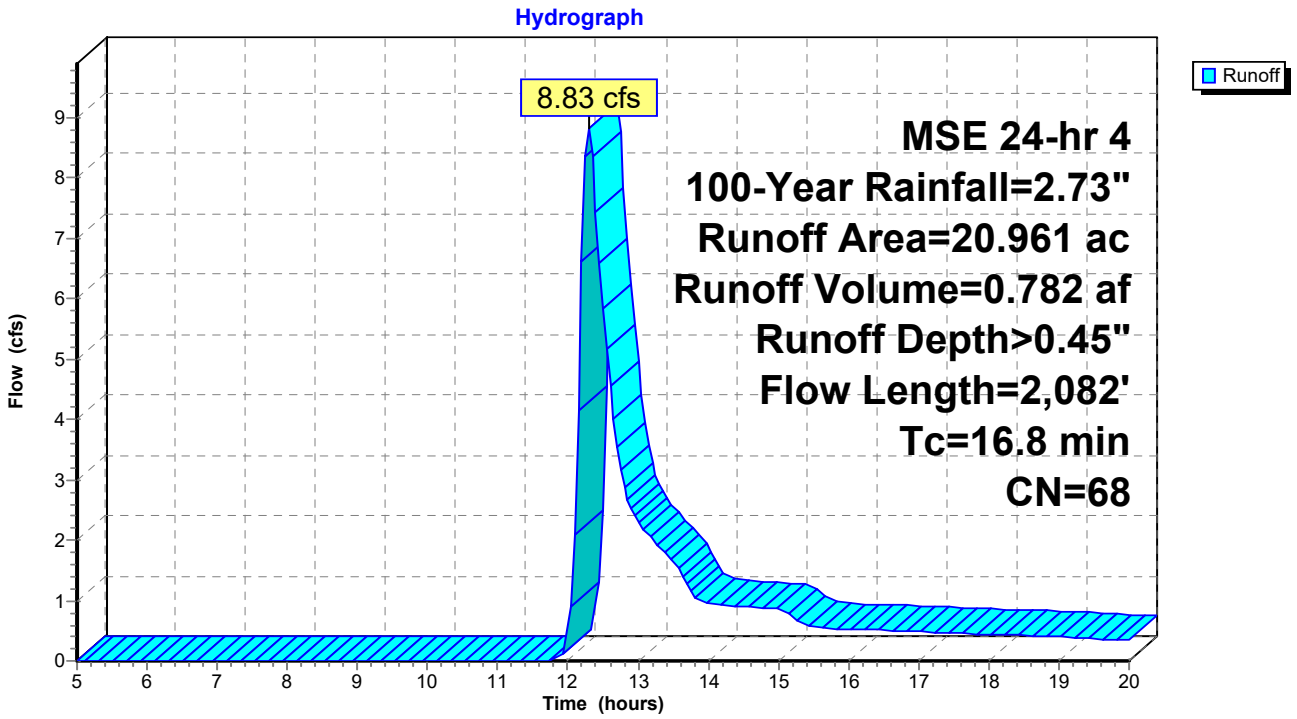
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=2.73"

	Area (ac)	CN	Description
*	10.013	48	Oak-aspen, fair, HSG B
*	2.407	49	Open space, fair, HSG A
*	8.541	98	Impervious
	20.961	68	Weighted Average
	12.420		59.25% Pervious Area
	8.541		40.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	300	0.1682	0.35		**Sheet Flow,** Range n= 0.130 P2= 1.29"
1.0	326	0.0680	5.29		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	1,456	0.0840	14.24	11.19	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
16.8	2,082	Total			

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Subcatchment S1: PR-J



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Summary for Subcatchment S2: PR-R

Runoff = 1.30 cfs @ 12.50 hrs, Volume= 0.254 af, Depth> 0.15"

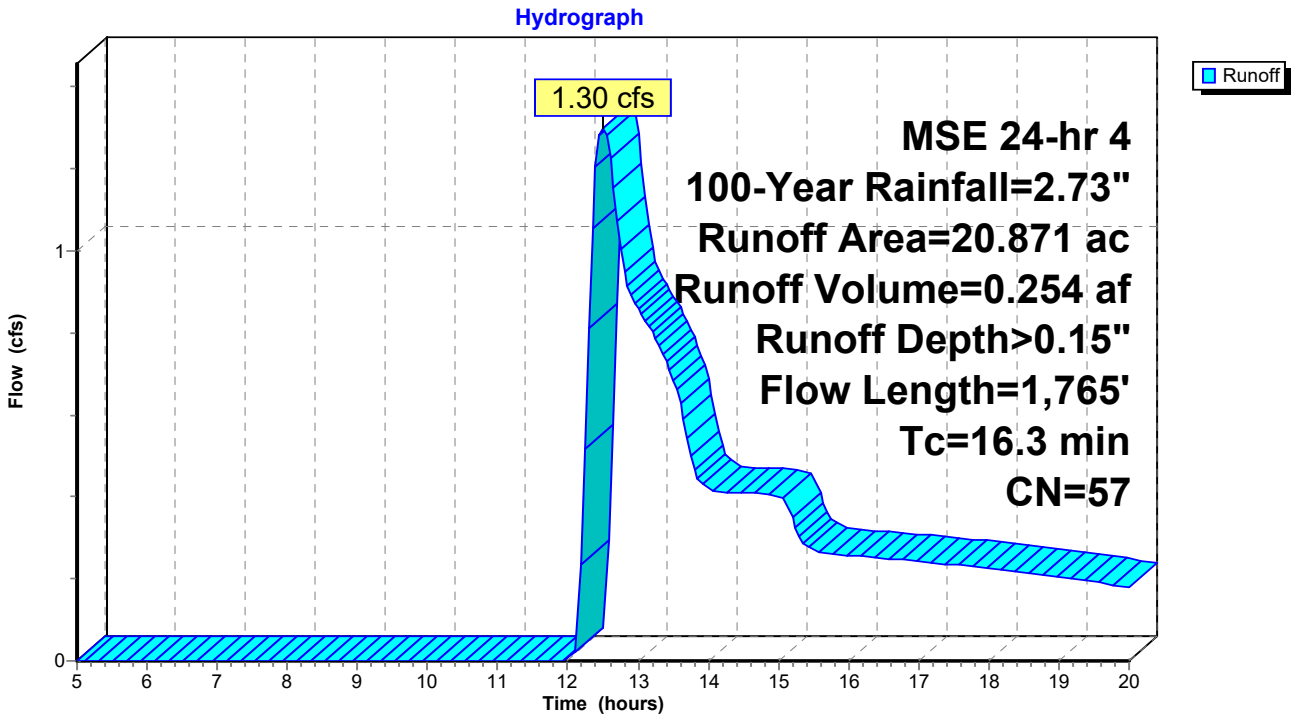
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=2.73"

	Area (ac)	CN	Description
*	15.240	48	Oak-aspen, fair, HSG B
*	2.034	49	Open space, fair, HSG A
*	3.597	98	Impervious
	20.871	57	Weighted Average
	17.274		82.77% Pervious Area
	3.597		17.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	300	0.1570	0.34		**Sheet Flow,** Range n= 0.130 P2= 1.29"
0.3	106	0.0650	5.18		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	1,359	0.0980	15.38	12.08	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
16.3	1,765	Total			

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Subcatchment S2: PR-R



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Summary for Subcatchment S3: PR-DD

Runoff = 0.02 cfs @ 15.05 hrs, Volume= 0.008 af, Depth> 0.03"

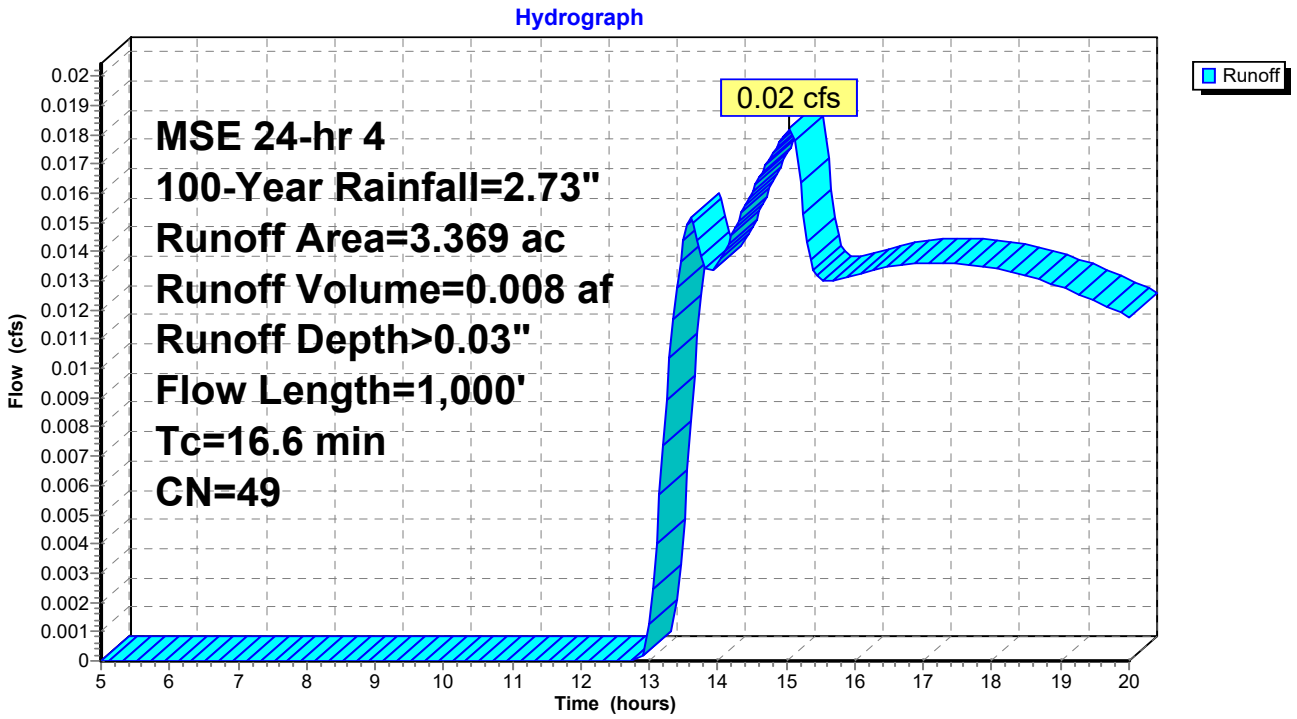
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=2.73"

	Area (ac)	CN	Description
*	3.279	48	Oak-aspen, fair, HSG B
*	0.090	98	Impervious
	3.369	49	Weighted Average
	3.279		97.33% Pervious Area
	0.090		2.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	300	0.1518	0.34		**Sheet Flow,** Range n= 0.130 P2= 1.29"
1.9	700	0.1506	6.25		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.6	1,000	Total			

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Subcatchment S3: PR-DD



Chad J. Lee, Esq.
Telephone (970) 945-6546
clee@balcombgreen.com

December 28, 2020

Via Electronic Submission:
Trent Hyatt, Planning Director
City of Glenwood Springs
Community Development Department
101 West 8th Street
Glenwood Springs, CO 81601
trent.hyatt@cogs.us

Re: ***Glenwood Meadows – Phase 1***
Applications for a Major Site Architectural Review and Minor Subdivision

Dear Trent:

BLD Group, LLC ("Applicant") is proud to present the enclosed Major Site/Architectural Review application for a 14 building apartment complex ("Application") within the Residential-High Zone District of Glenwood Meadows. This Application is for 300 units, ranging from studio to three bedroom apartments focused on 27 acres and designed specifically to conform Design Guidelines within Glenwood Meadows. The original Glenwood Meadows approvals authorize and anticipate 475 housing units in this zone district given its proximity to retail, recreation, and public transit, not to mention Glenwood's persistent shortage of attainable housing to meet the needs of local employers. This Application conforms with the permitted 300 commercial apartment units within Glenwood Meadows residential zone district. Indeed, our Comprehensive Plan "strongly encourage[s] the development of the planned residential component for Glenwood Meadows, including live-work housing, apartments, etc." (Pg. 77, emphasis added). This Application represents the majority of the planned residential component of Meadows. We look forward to working with your team throughout the Site/Architectural Review process.

I. Existing Approvals and Conditions

This Application is for a 300 unit apartment complex located on approximately 27.5 acres of Lot 11C-B (Parcel No. 218508141003) and Lot 11C-C (Parcel No. 218508141002), GM Subdivision No. 6 (the "Property"). The Property consists of portions of the 49.414 acre Residential-High Zone District land owned by Glenwood Meadows, LLC. Applicant is under contract to purchase the Property. We are also preparing an application for Minor Subdivision to create one additional lot, the general configuration of which is shown on the Site Plan in this Application. We anticipate filing the subdivision application within the next month. This Application is for major site/architectural review of the apartment complex envisioned by the Meadows approvals.

As you know, the Glenwood Meadows development is on 345 acres of land west of downtown. The Glenwood Meadows property was annexed into the City of Glenwood Springs in 2002 following a three year application process. Two hundred and ten acres of land was dedicated by the developer of Glenwood Meadows to the City as public open space. The vast majority of this dedicated public open space is located just behind and adjacent to this project.

Throughout the three year approval and annexation process, impacts of housing and other approved uses and densities within Glenwood Meadows were considered and mitigated, including traffic, water and sewer facilities, debris flow mitigation, and on and off-site pedestrian flow and connections. The Applicant is fully committed to paying the City's current impact fees, which were specifically quantified by the City to offset the impacts of development on the City's infrastructure.

During the Meadows annexation and zoning process, City Staff and City Council also implemented an exhaustive process to establish guidelines and enhanced zoning to ensure that the development of Glenwood Meadows achieves the highest quality of development standards. The Glenwood Meadows Annexation and Development Agreement codifies those standards, including in a Zoning and Development plan which governs development of the Property. (See, Annexation and Development Agreement Glenwood Meadows, LLC Annexation, recorded December 6, 2002 as Reception No. 816083 ("ADA")). Pursuant to the ADA, the Property was zoned R-3, the most flexible and intense residential zone district. In 2018, the City's R-3 District was re-zoned to RH (Residential High). Multi-family use is a permitted use in the RH District.

The ADA, together with subsequent amendments, set forth specific entitlements regarding density of the various zone districts and parcels within Glenwood Meadows. The ADA contemplated full residential build out of the planned residential component of the Meadows and specifically entitles this parcel for up to 475 residential units, no more than 300 of which were permitted as commercial apartments. (See ADA § 9(c); Fourth Amendment to ADA[1] § I(A)(iii)). This application is for the remaining 300 commercial apartments envisioned within the RH District of Glenwood Meadows.

II. Need for Housing / Consistency with Comprehensive Plan

The multi-family represented by this Application is a key component to the overall Glenwood Meadows development as contemplated by City Council in the 2002 ADA. It allows for the overall balance of the approved mixed-use, master planned community and specifically reacts to one of the most important issues facing our community – the need for a diverse stock of housing. Over the past 15 years, various strategic documents prepared by professional City planners after substantial public participation have expressed the importance of creating more and diverse housing for Glenwood's workforce. But for the vast majority of this period, policy and land use approvals did not keep up with demand. As a result, until a couple years ago, Glenwood was one of the slowest growing municipalities in eastern Garfield County despite a huge pent-up demand for housing.

As a result, despite a recent uptick of approved residential projects, Glenwood still needs housing, specifically the rental housing proposed in this Application. In 2005, Glenwood commissioned a Housing Study, which found that over the next 10 years, 2,885 units would need to be added to Glenwood's Housing inventory, including 1,295 rental units. Less than 10% of this goal was achieved by 2015. In 2010, Glenwood's Strategic Housing Plan again affirmed the desperate need for local housing, including both "catch up" and "keep up" needs. "Catch-up", of course, being housing needed to catch up to the current deficient housing conditions, and "keep up" generally defined as housing needed to keep up with future demand in relation to job and population growth. The current pandemic has only amplified the need for rental housing to house our growing workforce and maintain a healthy community.

[1] Fourth Amendment to Annexation and Development Agreement Glenwood Meadows LLC Annexation, recorded April 10, 2015 as Reception No. 861345.

Our Comprehensive Plan recognizes that "to create a more sustainable community, it is necessary to increase the supply of housing relative to employment. Doing so would increase affordable housing options for employees of Glenwood Springs businesses." (Page 71). Additionally, "[D]ue to the physical limitations to growth and the approaching built-out nature of the community, there are few large tracts of land left to develop, and some may not be suitable for housing. Therefore, it will be important to take advantage of every opportunity to increase the supply of housing in general…." (Page 76, emphasis added).

Indeed, the Comprehensive Plan speaks specifically to this Application when one of the stated goals of our community is to:

> ***"Strongly encourage the development of the planned residential component for Glenwood Meadows, including live-work housing, apartments, etc."*** (Page 77, emphasis added).

This Application is the majority of the planned residential component of Glenwood Meadows. This Application represents one of the final and perhaps most important pieces of the planned residential components of Glenwood Meadows. As a result, the Comprehensive Plan "strongly encourages" this Application.

III. Summary of Proposed Development

This project was designed to fit neatly within all requirements of the ADA and City Code, including all design guidelines set forth in the ADA. One of the main reasons this Property was planned for residential development is its location within Glenwood Meadows in proximity to public transit, retail, and recreation and open space amenities, all of which make this a desirable location to increase the City's attainable housing stock and diversify the housing options within the City limits.

Primary access to the site will be on the east side of the property, continuing up from East Meadows Drive past the existing Glenwood Greens development. A secondary access point is provided on the west side of the property, closer to the West Glenwood Park and Ride. A pedestrian access point will be located across from the intersection of Wulfsohn Road and West Meadows Drive.

One main consideration for the layout was to limit the amount of earthmoving on the site and to the extent possible, work with the existing site grading conditions as prioritized by the ADA. This is a priority in the ADA itself. The hillside on the north of the site, sloping up from Wulfsohn Road, is shown as un-disturbed from its current condition. The lowest tier of buildings will be situated at the top of this existing slope. The site will be terraced above this point where the existing slope is more moderate. There are three tiers of buildings. The lower tier incudes the clubhouse and three multi-family buildings. The middle and upper tiers have five multifamily buildings each. The tiers will connected by a well-designed internal network of sidewalks, paths and open space.

The architecture has been specifically designed to meet the design guidelines of the ADA. A total of 14 buildings are being proposed for the site, including a neighborhood clubhouse building and 13 residential apartment buildings that make up the 300 housing units. There are three types of buildings in order to provide diversity in the style and form of the architecture as required in the ADA. The total number of units per building type are 168 units, 60 units and 72 units respectively. The maximum length of the buildings will be 125 feet per the design standards in the ADA. The minimum spacing between the

buildings ranges from 40-60 feet with common open space surrounding the buildings. The buildings have been designed to work with the existing slope conditions, with approximately 10' of grade taken up within the footprint of the 3 story buildings. The maximum building height is approximately 35' and will not exceed the Maximum building height of 40'.

The Application also includes all required parks, amenities, and open space required by the ADA. These parks, amenities, and open space within the subject property are intended to be enjoyed by residents of the apartment complex. There are two one-acre parks as required in the ADA, generally located on the west side of the development. The first one acre park is adjacent to the secondary access road and lower tier of housing. The amenities in this park are designed for passive recreation and include a soft surface trail that leads from the sidewalk along Wulfsohn Road through the park leading to a proposed new connecting trail from the south side of the park to the Wulfsohn Mountain Trail Network. In addition to the trail, the park includes park benches, picnic tables and a community garden with raised planter boxes.

The second park is located between the middle and upper tiers of housing. The park has been terraced to create three level areas for more active recreation. Park amenities include two pickle ball courts, a flexible open space, a playground with play equipment, park benches, picnic tables, seating areas and shade trees. A second proposed trail connection to the Wulfsohn Mountain Trail Network is located on the upper street in the center of the development.

Additional community and open space amenities will be located throughout the neighborhood. The covered parking area on the lower and middle tiers will include roof deck patios with common gathering areas and amenities such as grills, fire tables, seating areas, umbrellas or shade structures and outdoor furniture. A neighborhood club house is another amenity space that will include a fitness center, gathering space, an outdoor pool and a day care center and associated outdoor play area. Consistent with the ADA's preferred community amenities, this Application includes an outdoor swimming pool, for Glenwood's seemingly increasingly hot summers, and to provide residents an alternative to Glenwood's busy indoor community center pool (See ADA, Page 71, recommending swimming pools as outdoor amenities). The pool will be engineered to ensure solid foundation, as well as monitored for leakage. Additional common open space is located throughout the neighborhood including in between the building units and at the ends of the middle and upper tiers of housing.

IV. Approval Criteria (070.060.050(a)(6))

The review criteria for a major site/architectural plan review is contained in in Subsection 070.060.050(a)(6), and set forth below.

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

This Application is consistent with the general purpose and intent of the Code, including RH District, the intent of which is to accommodate various housing types ranging from single family detached on small lots to multifamily dwellings. This Application is for multifamily dwellings in the RH District on a parcel specifically contemplated for up to 300 multifamily units within Glenwood Meadows.

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

This Application is consistent with the Design Guidelines of the Glenwood Meadows ADA.

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

The Glenwood Meadows ADA entitled this property for up to 475 residential units, including up to 300 commercial apartments. This application is for 300 commercial apartments, and is otherwise consistent with prior land use approvals, including the Glenwood Meadows ADA.

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

One of the stated goals in our Comprehensive Plan is to "[S]trongly encourage the development of the planned residential component for Glenwood Meadows, including live-work housing, apartments, etc." (Page 77, emphasis added). This Application is the vast majority of the remaining planned residential component of Glenwood Meadows. This application is not only consistent with our Comprehensive Plan, our Comprehensive Plan explicitly and "strongly" encourages development of this apartment complex.

V. Conclusion

This Application represents a critical housing element envisioned in 2002 in the Glenwood Meadows ADA, and re-affirmed in our 2010 Comprehensive Plan. The Application is designed specifically to all standards within the ADA and the City Code. The project will include studio to three bedroom units, within walking distance of Glenwood Springs Community Center, public transit systems, and the shops and restaurants within Glenwood Meadows. Together with the Lofts and Glenwood Green, this project will create the level of vibrancy, community, and character originally envisioned within Glenwood Meadows. Residents of these units will enjoy an attainable, livable, small-town friendly living experience with easy access to employment and recreation within Glenwood Springs, and throughout the Roaring Fork Valley.

Sincerely,

BALCOMB & GREEN, P.C.

By:_____
Chad J. Lee, Esq.

Encl: Appendix A: Development Team
Appendix B: Submittal Materials

Appendix A: Development Team

Applicant:	BLD Group, LLC c/o Greg Baumann 1500 Cordova Road, Suite 300 Ft. Lauderdale, FL 33316 gbaumann@bldgroup.com	Engineer:	Michael Grzesiak, P.E. High Country Engineering 1517 Blake Avenue, Suite 100 Glenwood Springs
Landscape Architect:	Jennifer DiCuollo, P.L.A. DHM Design 311 Main Street, Suite 102 Carbondale, CO 81623 jdicuollo@dhmdesign.com	Legal:	Chad J. Lee, Esq. Balcomb & Green, P.C. 818 Colorado Avenue Glenwood Springs, CO 81601 clee@balcombgreen.com
Architect:	Richard Coba BLD Group, LLC 1500 Cordova Road, Suite 300 Ft. Lauderdale, FL 33316 rcoba@bldgroup.com		

Appendix B: Submittal Materials

Enclosed within this Application are the following materials:

1. Planning Application
2. Warranty Deed
3. Proof of Public Notice / Neighborhood Meeting Materials
4. Project Description / Narrative re: Compliance with Meadows and City Standards
5. Complete Plan Set
   a. Civil Sheet Set
   b. Landscape Sheet Set
   c. Architecture Sheet Set
6. Traffic Impact Statement
7. Geotechnical Report
8. Preliminary Drainage Study
   a. Preliminary Grading Plan
9. Preliminary Utility Report
   a. Preliminary Utility Plan

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY REPORT

PREPARED FOR:

BLD GROUP
1500 Cordova Road, Suite 300
Fort Lauderdale, FL 33316

Prepared By:

HIGH COUNTRY ENGINEERING, INC.
1517 Blake Avenue, Suite 101
Glenwood Springs, CO 81601
(970) 945-8676

HCE Project No. 2201044.00

December 10, 2020
Revised: July 2, 2021

TABLE OF CONTENTS

INTRODUCTION 2
Location 2
Existing Land Use 2
Proposed Land Use 2
WASTEWATER SYSTEM 2
Sanitary Sewer System 2
WATER DISTRIBUTION 3
Water Distribution 3
System Demand 3
DRY UTILITIES 4
Electric 4
Gas 4
Cable 4
Telecommunications 5
CONCLUSION 5
Water and Sewer 5
Dry Utilities 5
REFERENCES 6

APPENDICES

INTRODUCTION

Location

The subject property is located within the Glenwood Meadows development, is platted as Lots 11C-B and 11C-C of the Glenwood Meadows No. 6 Subdivision, in the City of Glenwood Springs, Colorado. The proposed site is located on the south side of Wulfsohn Road across from the existing Target and Lowe's commercial sites.

Existing Land Use

The parcel is approximately 49.54 acres in size. The existing lot consists of undeveloped open space. To the north the site is bordered by Wulfsohn Road and The Lofts residential development. To the west, south and east is undeveloped property owned by the City of Glenwood Springs. Access to the development is proposed by extension of Flat Tops View Drive to the east, and connection to Wulfsohn Road at an existing curb cut to the west.

Proposed Land Use

Proposed development consists of thirteen multi-unit residential apartment buildings and a clubhouse. Additional improvements include asphalt parking areas and roadways, sidewalks, site amenities such as pickleball courts, park areas, dog walks, hiking trails and open space areas.

WASTEWATER SYSTEM

Sanitary Sewer System

An existing sanitary sewer main is located east of the site within Flat Tops View Drive right-of-way and will serve the proposed development. The connection to this main will be an existing sanitary manhole currently located northwest as an extention off the terminus of Flat Tops View Drive. An 8-inch gravity sewer main is proposed to the site up the proposed road connecting to Flat Tops View Drive. Three roads are proposed to serve the apartment buildings within the development; a lower, middle, and upper road. Generally the profile

grade of the roads falls to the southeast. Two runs of sanitary main are proposed to serve the development; one run along the lower road which will serve eight apartment buildings and club house, and one run along the middle road which will serve the remaining five apartment buildings.

The proposed development has and will have minimal system flows and the proposed sanitary system will serve residential uses. A single service is proposed for each building. For calculation purposes, each unit has been considered a single-family residence. In total the system demand has been analyzed for 300 single-family residences. Effluent flows are estimated to be 84,000 gallons per day, with a peak flow of 210,000 gallons per day. These flows will be conveyed by 8" diameter main pipes, and 6" diameter building service pipes. At maximum capacity the pipes are under 80% capacity. Sanitary sewer demand calculations can be referenced in **Appendix A.**

WATER DISTRIBUTION

Water Distribution

The development will be served by connecting to existing water mains located to the northwest within Wulfsohn Road, and east within Flat Tops View Drive. An existing watermain stub is located at the terminus of Flat Tops View Drive. A loop will be completed by running 8-inch Class 52 Ductile Iron Pipe main through the site. This loop will connect to the existing Wulfsohn Road main by installing a new tee, route southeast up the lower road, through the site and connect to the Flat Tops View Drive stub east of the parcel. Additional loops will tee off the lower main, run up and through the middle and upper roads of the development. The propose 8-inch line provides system demand and fire flows to the development. Water demand calculations can be referenced in **Appendix A**, water line sizing calculations can be referenced in **Appendix B**.

System Demand

Glenwood Springs Municipal Code section 080.060.020 classifies multi-family residential units the greater of 0.25 EQR per bedroom or 0.06 EQR per 100 square feet, not to exceed

1.00 EQR. Assuming a demand of 1 EQR being the equivalent of 350 gpd and a 16-hour day for 300 multi-family residential units and other uses, the Average Daily Demand for the phase I development will be 59,850 gallons per day (62 gpm). Peak hour would typically be 4 times the average daily demand or 249.4 gpm. The overall 249 gpm will be used for determination of service sizes and demand on top of fire flows, which is the more conservative approach.

DRY UTILITIES

Electric

The point of contact for electrical service is Doug Hazzard with the City of Glenwood Springs Electric Department (970-384-6353).

A proposed underground electric line is to be installed along the south side of the access road connecting to Flat Tops View Drive. This line will connect to the existing line on the adjacent lot 11C-C. This line will serve as the main electric supply for the Glenwood Meadows Multi-Family development. The developer will contract with the City of Glenwood Springs Electric Department for costs associated with extending the electric utility to the site.

Gas

A proposed gas line is to be installed along the south side of the access road connecting to Flat Tops View Drive. This line will connect to the existing line on the adjacent lot 11C-C. This line will serve as the main electric supply for the Glenwood Meadows Multi-Family development. The contractor will contract with Black Hills Energy for gas service extension.

Cable

A proposed cable line is to be installed along the north side of the access road connecting to Wulfsohn Road. This line will serve as the main feed for the development. The point of

contact for Comcast Cable Television service is (970-945-7292). The contractor will contract with Comcast Cable for cable tv service extension.

Telecommunications

The point of contact for Telecommunications service is Michael Gardner with City of Glenwood Springs broadband.

A proposed telecommunications line is to be installed along the north side of the access road connecting to Wulfsohn Road. This line will serve as the main feed for the development. The contractor will contract with the City of Glenwood Springs broadband for telecommunications service extension.

CONCLUSION

Water and Sewer

This report and the associated plans identify the proposed water, sewer and dry utility layouts for the proposed Glenwood Meadows Multi-Family development. The proposed onsite sanitary sewer will provide adequate capacity to serve the proposed residential development. The existing water main within Flat Tops View Drive will provide adequate water service to meet the domestic water demands and fire flows required when construction is completed. All lots will be required to meet building code requirements when constructing the final water system for each building.

Dry Utilities

Dry utilities to service the site are to be installed along the south side of the connection to Flat Tops View Drive, and the north side of the connection to Wulfsohn Road. This includes gas, electric, telephone and cable to all buildings within the development.

REFERENCES

International Fire Code: International Code Council. International Conference of Building Officials, Whittier, CA, 2009.

Uniform Building Code: International Conference of Building Officials. Whittier, CA, 2009.

APPENDIX A

GLENWOOD MEADOWS MULTI-FAMILY

ESTIMATED WATER/SEWER REQUIREMENTS

Date:	7/2/2021
HCE Project No:	2201044.00
By:	MGG

WATER (OVERALL DEVELOPMENT)			NOTE
Total EQR's	171		1
Average Daily Domestic Demand @ 350 GPD/EQR	59,850	GPD	
Fire Flow Required	1,500	GPM	2
Max. Day (Average Daily x 2.0)	119,700	GPD	
Peak Flow (Average Daily x 2.5)	149,625	GPD	
Max. Day Demand	**1,625**	**GPM**	3,4

SANITARY SEWER (OVERALL DEVELOPMENT)			
Domestic Average Day Use	47,880.0	GPD	5
Peak Flow (Average Daily x 2.5)	119,700.0	GPD	
Peak Flow (CFS)	**0.185**	**CFS**	

Notes

1) EQR calculation based on B&G system improvement fees EQR calculation
2) 2 hour minimum duration.
3) 1 day calculated as 16 hours.
4) Fire flow included for 1 building in max day demand
5) Calculated as 80% of average daily domestic water demand

GLENWOOD MEADOWS - PHASE I				
EQR Calculation				
MULTI-FAMILY RESIDENTIAL UNITS	**QUANTITY**	**AREA (SF)**	**EQR/100-SF**	**TOTAL**
STUDIO	42	593	0.06	14.94
1 BEDROOM (B-2)	42	711	0.06	17.92
1 BEDROOM (B-1)	60	704	0.06	25.34
2 BEDROOM (C-2)	42	1109	0.06	27.95
2 BEDROOM (C-1)	72	1126	0.06	48.64
3 BEDROOM	42	1269	0.06	31.98
NON-RESIDENTIAL	**QUANTITY**		**EQR**	**TOTAL**
SANDWICH/COFFE SHOP W/DISHWASHER	1		0.65	0.65
CLUBHOUSE AND DAYCARE CENTER	1		2.10	2.10
SWIMMING POOL	1 EQR/25,000 GALLONS			1.00
HOT TUB	0.20 EQR/500 GALLONS			0.40
			TOTAL EQR	**170.92**

Notes

1) EQR values per City of Glenwood Springs Municipal Code Section 080.060.020 - Classification

APPENDIX B

Channel Report

8-IN SANITARY

Circular

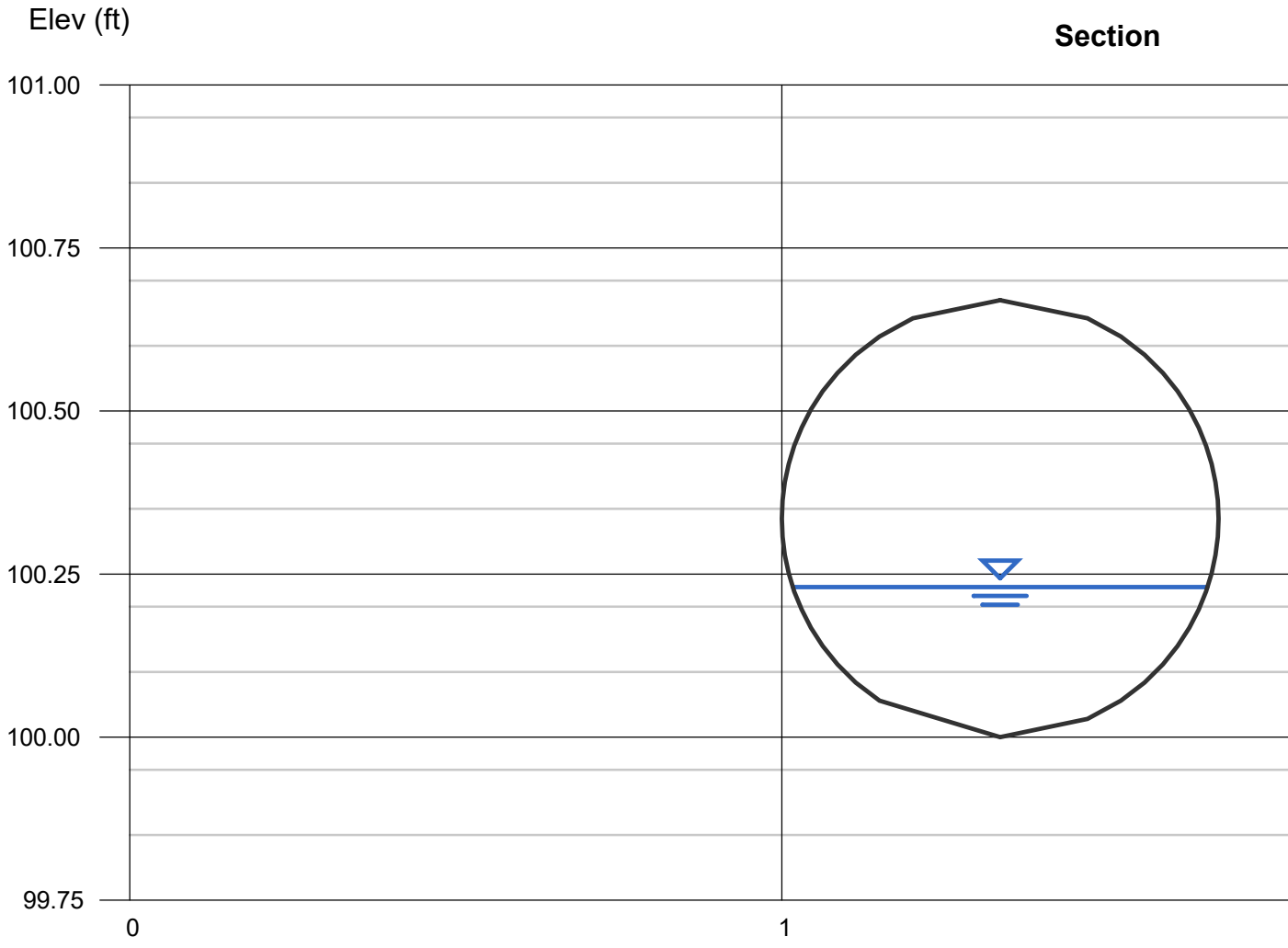
Diameter (ft)	= 0.67
Invert Elev (ft)	= 100.00
Slope (%)	= 0.40
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.19

Highlighted

Depth (ft)	= 0.23
Q (cfs)	= 0.190
Area (sqft)	= 0.11
Velocity (ft/s)	= 1.76
Wetted Perim (ft)	= 0.84
Crit Depth, Yc (ft)	= 0.20
Top Width (ft)	= 0.64
EGL (ft)	= 0.28



Depth	Q	Area	Veloc
(ft)	(cfs)	(sqft)	(ft/s)
0.07	0.016	0.018	0.88
0.13	0.069	0.051	1.35
0.20	0.152	0.089	1.70
0.27	0.261	0.132	1.98
0.34	0.390	0.177	2.20
0.40	0.522	0.221	2.36
0.47	0.650	0.264	2.46
0.54	0.757	0.302	2.50
0.60	0.825	0.334	2.47
0.67	0.774	0.353	2.20

Wp	Yc	TopWidth	Energy
(ft)	(ft)	(ft)	(ft)
0.43	0.06	0.40	0.08
0.62	0.12	0.54	0.16
0.78	0.18	0.61	0.25
0.92	0.24	0.66	0.33
1.06	0.29	0.67	0.41
1.19	0.34	0.66	0.49
1.33	0.38	0.61	0.56
1.48	0.41	0.54	0.63
1.68	0.43	0.40	0.70
2.10	0.42	0.00	0.74

Main - Fire & Domestic		
HAZEN-WILLIAMS EQUATION, CIRCULAR PIPE		
From	Wulfsohn Rd	
To	Highest Bldg Service Tee	
Input Data		
Pressure 1	95.00	psi
Elevation 1	5849.22	ft
Elevation 2	5941.43	ft
Roughness Coefficient	150	
Diameter	8	in
Flow	1749	gpm
Length	1165	feet
Results		
Elevation Head	92.21	ft
Friction Loss	45.97	ft
Velocity	11.16	fps
Total Head Loss	**138.18**	**ft**
Pressure Loss	**59.83**	**psi**
Pressure 2	**35.17**	**psi**

Highest Bldg - Fire & Domestic Service		
HAZEN-WILLIAMS EQUATION, CIRCULAR PIPE		
From	Service Tee	
To	Highest Bldg Service Tee	
Input Data		
Pressure 1	35.17	psi
Elevation 1	5941.43	ft
Elevation 2	5942.43	ft
Roughness Coefficient	150	
Diameter	6	in
Flow	1749	gpm
Length	65	feet
Results		
Elevation Head	1	ft
Friction Loss	10.41	ft
Velocity	19.84	fps
Total Head Loss	**11.41**	**ft**
Pressure Loss	**4.94**	**psi**
Pressure 2	**30.23**	**psi**

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

WULFSOHN RD.

CONNECT TO EXISTING WATERMAIN PER CITY OF GLENWOOD SPRINGS STANDARDS

INSTALL NEW MANHOLE ON EXISTING STORM SEWER

249.15'–12" HDPE @ 0.45%

EXISTING CURB CUT TO BE REMOVED

24.88'–12" HDPE @ 0.40%

12.19'–15" HDPE @ 19.23%

CONNECT TO EXISTING STORM SEWER STRUCTURE

116.60'–15" HDPE @ 17.79%

24.00'–12" HDPE @ 1.00%

141.58'–12" HDPE @ 6.97%

62.32'–12" HDPE @ 3.62%

24.00'–12" HDPE

95.95'–12" HDPE @ 9.05%

118.56'–12" HDPE @ 10.77%

63.43'–12" HDPE @ 2.24%

14.00'–12" HDPE @ 2.00%

229.99'–12" HDPE @ 0.75%

14.00'–12" HDPE @ 2.00%

229.98'–12" HDPE @ 0.75%

14.00'–12" HDPE @ 5.70%

EXISTING 24" STORM PIPE "1B"

INSTALL MANHOLE ON EXISTING STORM SEWER

144.48'

134.80'–12" HDPE @ 11.27%

333.20'–12" HDPE @ 1.09%

400.00'–8" PVC @ 1.10%

333.20'–12" HDPE @ 1.09%

227.44'–8" PVC @ 1.10%

8" D.I.P. WATER MAIN

SAN–MH8

SAN–MH7

57.58'

11.0' TYP. 10. MIN.

6" PVC SANITARY SERVICE, TYP.

6" D.I.P. WATER SERVICE, TYP.

51.17'–12" HDPE @ 4.12%

260.75'–8" PVC @ 1.66%

8" D.I.P. WATER MAIN

SAN–MH4

135.66'–12" HDPE @ 5.00%

56.04'–12" HDPE @ 6.00%

135.99'–12" HDPE @ 5.00%

COMBINED FIRE/DOMESTIC WATER SERVICE CONNECTIONS TO BE NFPA24 COMPLIANT, TYP.

EXISTING STORM SEWER TO BE ABANDONED/REMOVED

8" D.I.P. WATER MAIN

INSTALL MANHOLE ON EXISTING STORM SEWER

LEGEND

EXISTING	PROPOSED
STORM MANHOLE	WATER SHUTOFF VALVE
SANITARY CLEAN–OUT	WATER VALVE
SANITARY MANHOLE	TEE W/THRUST BLOCK
FIRE HYDRANT	BEND W/THRUST BLOCK
WATER VALVE	FIRE HYDRANT
WATER MANHOLE	INLET
GAS METER	CURB INLET
TELEPHONE PEDESTAL	STORM MANHOLE
LIGHT POLE	SANITARY MANHOLE
UTILITY POLE	SANITARY CLEANOUT
SIGN	CABLE MANHOLE
	ELECTRIC VAULT
	ELECTRIC TRANSFORMER

BOUNDARY	
RIGHT–OF–WAY	
EASEMENT	
STRUCTURE	
ASPHALT	
GRAVEL	
CONCRETE	
RETAINING WALL	
CENTERLINE ROAD	
CURB AND GUTTER	
FLOWLINE	
PAVEMENT STRIPING	
WATER MAIN	W
WATER SERVICE	WS
SEWER MAIN	S
SEWER SERVICE	SS
OVERHEAD ELECTRIC	OE
ELECTRIC	E
CATV	CTV
TELEPHONE	T
GAS	G
STORM SEWER	

NOTES

1. SURVEY COMPLETED BY TUTTLE SURVEYING SERVICES. REFER TO ALTA/ASCM LAND TITLE SURVEY DATED 10/08/20 FOR EXISTING CONDITIONS INFORMATION. DATE OF SURVEY SEPTEMBER 5–8, 2020.
2. BASIS OF BEARINGS: #5 REBAR WITH ALIMINUM CAP LS #5933 AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.
3. CONTOUR INFORMATION OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA, STATE PLANE NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY IN AREAS CRITICAL TO DESIGN.
4. ALL COMBINED FIRE/DOMESTIC WATER SERVICES SHALL BE NFPA24 COMPLIANT.
5. PUBLICLY DEDICATED UTILITIES SHALL HAVE UTILITY EASEMENT FOR ACCESS AND MAINTENANCE.
6. ALL FIRE HYDRANTS TO HAVE 15' EASEMENT FOR ACCESS AND MAINTENANCE.

COLORADO 811 CALL BEFORE YOU DIG Utility Notification Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

DRAWN BY: MGG
CHECKED BY: MGG
DATE: 7/1/2021
FILE: SCALE 1" = 40'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101,
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 · FAX (970) 945-2555
WWW.HCENG.COM

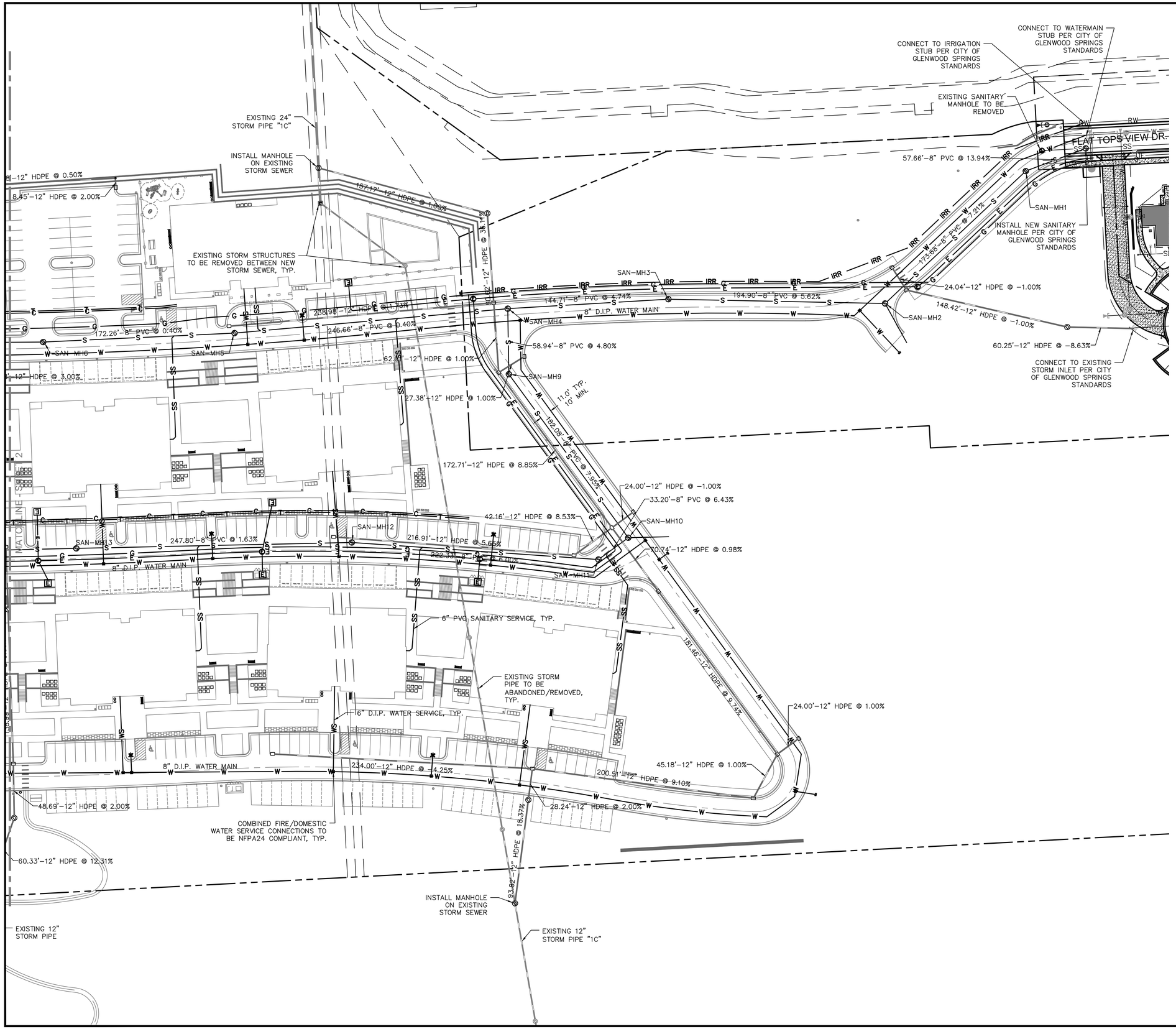
GLENWOOD MEADOWS MULTI-FAMILY

BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

PRELIMINARY UTILITY PLAN
SHEET 1

PROJECT NO.
2201044.00

UT1



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

PRELIMINARY NOT FOR CONSTRUCTION

LEGEND

	EXISTING	PROPOSED
	STORM MANHOLE	WATER SHUTOFF VALVE
	SANITARY CLEAN-OUT	WATER VALVE
	SANITARY MANHOLE	TEE W/THRUST BLOCK
	FIRE HYDRANT	BEND W/THRUST BLOCK
	WATER VALVE	FIRE HYDRANT
	WATER MANHOLE	INLET
	GAS METER	CURB INLET
	TELEPHONE PEDESTAL	STORM MANHOLE
	LIGHT POLE	SANITARY MANHOLE
	UTILITY POLE	SANITARY CLEANOUT
	SIGN	CABLE MANHOLE
		ELECTRIC VAULT
		ELECTRIC TRANSFORMER
BOUNDARY		
RIGHT-OF-WAY		
EASEMENT		
STRUCTURE		
ASPHALT		
GRAVEL		
CONCRETE		
RETAINING WALL		
CENTERLINE ROAD		
CURB AND GUTTER		
FLOWLINE		
PAVEMENT STRIPING		
WATER MAIN	W	W
WATER SERVICE		WS
SEWER MAIN	SS	S
SEWER SERVICE	SS SS	SS SS
OVERHEAD ELECTRIC	OE	
ELECTRIC	E	E
CATV	CTV	C
TELEPHONE	T	T
GAS	G	G
STORM SEWER		

NOTES

1. SURVEY COMPLETED BY TUTTLE SURVEYING SERVICES. REFER TO ALTA/ASCM LAND TITLE SURVEY DATED 10/08/20 FOR EXISTING CONDITIONS INFORMATION. DATE OF SURVEY SEPTEMBER 5-8, 2020.
2. BASIS OF BEARINGS: #5 REBAR WITH ALIMINUM CAP LS #5933 AT THE SOUTHEASTERLY, A FOUND #5 REBAR WITH ALUMINUM CAP L.S. 25954 FOUND AT THE NORTHEASTERLY CORNER OF SUBJECT LOT 1A, USING A BEARING OF N00°21'00"E BETWEEN THE TWO DESCRIBED MONUMENTS.
3. CONTOUR INFORMATION OBTAINED FROM US GEOLOGICAL SURVEY 2017 DATA, STATE PLANE NAD 83 CENTRAL ZONE. FIELD VERIFICATION MAY BE NECESSARY IN AREAS CRITICAL TO DESIGN.
4. ALL COMBINED FIRE/DOMESTIC WATER SERVICES SHALL BE NFPA24 COMPLIANT.
5. PUBLICLY DEDICATED UTILITIES SHALL HAVE UTILITY EASEMENT FOR ACCESS AND MAINTENANCE.
6. ALL FIRE HYDRANTS TO HAVE 15' EASEMENT FOR ACCESS AND MAINTENANCE.

COLORADO 811 CALL BEFORE YOU DIG Utility Notification Center of Colorado

NO.	DATE	REVISION	BY
1	12/11/20	MAJOR SITE / ARCH. REVIEW	MGG
2	1/22/21	MAJOR SITE / ARCH. REVIEW #2	MGG
3	7/2/21	MAJOR SITE / ARCH. REVIEW #3	MGG

DRAWN BY: MGG
CHECKED BY: MGG
DATE:
FILE: SCALE 1" = 40'

HIGH COUNTRY ENGINEERING, INC.
1517 BLAKE AVENUE, STE 101,
GLENWOOD SPRINGS, CO 81601
PHONE (970) 945-8676 FAX (970) 945-2555
WWW.HCENG.COM

BLD GROUP, LLC.
GLENWOOD SPRINGS, CO

GLENWOOD MEADOWS MULTI-FAMILY

PRELIMINARY UTILITY PLAN SHEET 2

PROJECT NO.
2201044.00

UT2

616083 12/06/2002 01:20P B1414 P526 M ALSDORF
1 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

526

ANNEXATION AND DEVELOPMENT AGREEMENT{PRIVATE}
GLENWOOD MEADOWS, LLC ANNEXATION

THIS ANNEXATION AND DEVELOPMENT AGREEMENT ("Agreement") is made and entered into this 18 day of September, 2002, by and between the CITY OF GLENWOOD SPRINGS, COLORADO, a Colorado municipal corporation (hereinafter "City"), and GLENWOOD MEADOWS, LLC, a Colorado limited liability company, its successors, assigns, and its legal or other representatives (hereinafter collectively "Owner");

W I T N E S S E T H:

WHEREAS, Owner owns approximately three hundred forty-five (345) acres of real property currently located in unincorporated Garfield County, Colorado, and more particularly described on Exhibit A, attached hereto and incorporated herein by this reference (hereinafter "Property"), which Property shall be known as "Glenwood Meadows"; and

WHEREAS, Owner and City entered into that certain Pre-Annexation Agreement concerning the Property dated August 20, 1999 and subsequently amended by instrument dated January 12, 2000 (as amended, the "PAA"); and

WHEREAS, in February, 2000, Owner filed with the City Clerk a petition and request for annexation of the Property into the City; and

WHEREAS, a duly noticed public hearing was held on March 2, 2000, whereat the City adopted a Resolution finding said petition and request to be in substantial compliance with the statutory requirements for annexation of the Property to the City; and

WHEREAS, Owner applied to the City for approval of certain Planned Unit Development zoning for the Property in March, 2000 (Zoning Application #42-99), which zoning application was subsequently withdrawn by Owner at a public hearing before the City Council on November 15, 2000; and

WHEREAS, upon the request of the City, approximately 4.63 acres of the Property was approved for annexation and zoning as C-1 Limited Commercial (the "MOC Entrance Parcel") and is subject a separate Annexation Agreement between the Owner and City; and

WHEREAS, on September 19, 2001 (Zoning Application #59-01) Owner submitted an application to the City for approval of a zoning plan for the Property which included C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial and R-3 Residential zoning districts for the portions of the Property not intended for public dedication (any portion of the Property intended for public dedication pursuant to this Agreement and the instruments incorporated herein may be zoned under the same application and review process as HP Hillside Preservation) as more fully described upon Exhibit B attached hereto and by this reference incorporated herein (the "Zoning Map"); and

WHEREAS, on March 21, 2002, the Owner did amend its original February, 2000 Annexation Petition to reflect the distinct characteristics of the Property subject to this Agreement and the MOC Entrance Parcel; and

514
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183

616083 12/06/2002 01:20P B1414 P527 M ALSDORF
2 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

WHEREAS, on March 21, 2002 a Public Hearing was held pursuant to C.R.S. Section 31-12-109, as amended, at which public hearing it was determined that the annexation petition had satisfied all requirements of C.R.S. Section 31-12-101 et. Seq.; and

WHEREAS, on July 18, 2002 the City Council of the City of Glenwood Springs ("Council") did adopt Ordinance No. , Series of 2002, and Ordinance No. , Series of 2002, which respectively approved the Owner's petition and request for annexation of the Property and approved the Owner's application for municipal zoning of the Property; and

WHEREAS, during the public review of the annexation and zoning processes, the parties hereto have agreed to amend and eliminate the provisions of the prior PAA and to set forth and memorialize all agreements regarding the annexation, zoning and development of the Property in the instant Agreement; and

WHEREAS, the City and Owner desire to enter into this Agreement to set forth their agreements in writing concerning the terms and conditions of annexation of the Property to the City, the zoning of the Property under the City's Municipal Code and the adopted Zoning and Development Plan (Exhibit C attached hereto and by this reference incorporated herein), as well as the other conditions of the development of the Property as hereinafter described; and

WHEREAS, Owner intends to submit its development proposal to the City for subdivision review and approval and to construct the development in phases which correspond to the Zoning Plan parcels, it being understood that nothing herein shall confer upon Owner any other or further rights not expressly contained herein or by instruments incorporated herein.

NOW, THEREFORE, for and in consideration of the mutual promises and covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and Owner agree as follows:

1. Purpose. The purpose of this Agreement is to set forth the terms and conditions of the annexation of the Property to the City, and the zoning and development of the Property in the City. Except as expressly provided for herein to the contrary, all conditions herein are in addition to any and all requirements concerning annexation and development contained in the Municipal Code of the City of Glenwood Springs, Colorado (hereinafter "Municipal Code"), the Municipal Annexation Act of 1965, as amended at C.R.S. §31-12-101 et seq., and other applicable laws.

Except as expressly provided herein to the contrary, the complete execution, delivery and recording of this Agreement shall render null and void the PAA between these same parties. Furthermore, and except as expressly stated otherwise herein, all terms and conditions of the following agreements, contracts and documents shall remain in full force and effect:

(i) Midland Avenue Right Of Way Extension Agreement, dated September 20, 1994;

(ii) Community Center Acquisition and Exchange Agreement, dated March 16, 1999;

816083 12/06/2002 01:20P B1414 P528 M ALSDORF
3 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

(iii) Municipal Operations Facility Site Acquisition Agreement, dated December 27, 1999

(iv) MOC Water and Sewer Fee Credits Assignment and Bill of Sale, dated January 17, 2000;

(v) MOC Entrance Parcel Annexation and Development Agreement.

2. Zoning Characteristics/Constraints/Requirements. The Zoning and Development Plan attached hereto as Exhibit C (the "Plan") shall govern the development of the Property. Any and all future site planning, whether in the form of an application for planned unit development, major or minor subdivision, major or minor development permit approval or any other form requiring the review and approval of the City, shall, as an element of its application for approval and review, evidence, to the satisfaction of the applicable City department, commission and/or City Council, compliance with the criteria and conditions of the Plan, as said Plan relates to such development application and the underlying Municipal Code requirements. All zoning and development hereunder is deemed to require the application of the more stringent of either (i) the Municipal Code or (ii) the Plan. An applicant may seek relief from specific elements of the Plan and/or the Municipal Code only through appropriate variance processes outlined in the City of Glenwood Springs Municipal Code.

Owner shall, within ninety (90) days after the mutual execution of this Agreement, submit a surveyed zoning map to the City. Such surveyed zoning map shall include legal descriptions for each of the twelve (12) zoning parcels (Parcels A through L, inclusive) identified by Exhibits B and C attached hereto. The City's Community Development Director and the City Attorney shall review such descriptions and, if generally consistent with the representations and approvals of the annexation and zoning public processes, shall approve the same. The City shall incorporate the surveyed zoning map into the Citywide zone district designation mapping and maintain an accurate and current copy thereof in accordance with State and local laws.

Prior to or contemporaneous with the first subdivision and/or development application for the Property, the Owner shall submit an overall geologic hazards map and mitigation plan of the Property to the City Engineer for his review and approval, which approval shall not be unreasonably withheld. The City shall incorporate the approved overall geologic hazards map and mitigation plan into the Citywide mapping and maintain an accurate and current copy thereof in accordance with applicable laws.

Prior to the first subdivision and/or development application for the Property, the Owner shall submit a Master Grading Plan and Master Drainage Plan for the development areas of the Property to the City Engineer. Said plans shall be consistent with the requirements of the Colorado Geologic Survey's letter dated October 23, 2001 and maintained on file with the City. Upon approval of said plans, Owner may apply for a grading permit to commence the preparation of all or part of the Property scheduled for development under the Plan. Based upon the detailed requirements and master planning of the Property as set forth herein and upon the Zoning and Development Plan attached hereto, such grading permit request may be granted by the City in advance of site specific development plans for an individual Parcel of the Property and may include certain off-site earth work, including, without limitation, (i) the "rough grading" of certain areas, as directed by the City, of Parcel L for said area's future use as active park facilities, and (ii) the

616083 12/06/2002 01:20P B1414 P529 M ALSDORF
4 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

construction of debris mitigation structures within Parcel L as more fully described in Section 14 hereinbelow. All Master Grading Plans, Master Drainage Plans and grading permit requests shall include revegetation plans acceptable to the City Engineer and City Planning Department. At a minimum said revegetation plans shall incorporate grass, forb and shrub species into any debris flow mitigation structure development in a manner beneficial to wildlife for forage and cover and shall adequately address erosion control.

Prior to the first subdivision and/or development application for the Property, the Owner shall submit a Master Utility Plan for the development areas of the Property to the City Engineer. The City shall incorporate the Master Utility Plan into the Citywide mapping and maintain an accurate and current copy thereof in accordance with State and local laws and with City policy.

3. Non-Specific Assessments/Credits/Fees-in-Lieu of School Land Dedication

a. Non-Specific Assessments/Credit. Any future impact fees, surcharges, special permit fees, special taxes or assessments, development fees or tap fees, and other items not addressed by this Agreement shall be exacted uniformly and non-discriminatorily on the Property and as exacted throughout the City. Notwithstanding the foregoing, nothing herein affects or shall affect the City's ability to exact impact fees for different facilities from certain residents or as to certain geographical areas. Owner shall receive full credit against any such future imposition for the full costs of all improvements, dedications, or payments made with respect to the matters to which such imposition relates. For example, in the event of a City's imposition of a fee for pedestrian trail facilities, Owner would be entitled to credit for the costs of all such trail improvements (as properly evidenced by invoices for design and construction) and dedications of land for trails (the value of which shall be established by the same appraisal mechanism described in Section 13.c. below) Owner had made up to that point in time on or concerning the Property.

Owner's credit for such costs shall include all costs incurred with respect to the applicable on-site or off-site improvements or dedications, including without limitation, all land costs (based upon the value of such land as vacant land, agricultural land or land for commercial or residential development, whichever is applicable, at the time the final plat for such land is approved), construction and construction management costs (excluding Owner's profit), and design, legal, consulting, and financing costs for the land so dedicated or on which the applicable improvements are constructed.

Notwithstanding the foregoing, Owner shall not receive credit as against such costs for the value of water rights dedicated or otherwise transferred to the City or the ownership shares of the attendant Atkinson ditch structure, both as more fully described by Section 11 hereinbelow. Further, in the case of an imposition of general applicability to provide general fund revenues, Owner shall not be entitled to credit against any impact fees or general assessments.

616083 12/06/2002 01:20P B1414 P530 M ALSDORF
5 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Except with respect to Parcel I as identified on Exhibits B and C hereof, Glenwood Meadows, its successors and assigns, shall not be required to pay any future Traffic/Transportation Impact Fee established by the City subsequent to the execution and recordation of this Agreement. The City and Glenwood Meadows have established the full and complete obligations of Glenwood Meadows with respect to on-site and off-site traffic/transportation improvements and financial contributions as set forth by Section 12 hereinbelow.

Owner does own, and the City acknowledges and ratifies such ownership herein, certain water and sewer system "Fee Credits" (specifically, 135 sewer system improvement fee credits and 135 water system improvement fee credits) arising from Owner's prior transfer to the City of certain lands for development of the Municipal Operations Center (see instruments dated December 27, 1999 "Municipal Operations Facility Site Acquisition Agreement" and January 17, 2000 "Assignment and Bill of Sale"). Owner and City shall maintain accurate records regarding Owner's use of such Fee Credits as the Property is developed.

b. Fee-in-Lieu of School Land Dedication. Owner shall pay and the City shall accept fees in lieu of land dedication for the benefit of schools in the RE-1 School District (the "District") pursuant to Ordinance No. 34 Series of 1999 and Municipal Code Section 070.030.150. D.; or any amended version thereof in force and effect at the time of the final development permit approval of a given portion of the Property by the City. Such fees shall be applicable to the number of units proposed for all residential phases scheduled for development and shall be payable upon the issuance of a building permit for a residential dwelling unit. Owner shall have the right to seek relief from the obligation to pay such school impact fees for any "affordable housing dwelling units" or "employee housing dwelling units" provided by Owner or its assignees within the Property.

c. Credit to Owner for Actual Development of Public Facilities. Owner is specifically entitled to a credit against any City parkland improvement fee or similar fees if eventually implemented and which would be otherwise applicable to development on the Property as follows:

(i) the value of land dedicated to public use and the costs of construction of pedestrian and bicycle trails within the Property as more fully described by Section 13(a) and 13 (b) below;

(ii) the value of land dedicated to public use and the costs of construction or Owner's contributions to the costs of construction of pedestrian and bicycle trails outside the boundaries of the Property as more fully described by Section 13(c) below;

(iii) the value of any "rough grading" performed by Owner, its successors and assigns, as requested by the City pursuant to the provisions of Section 15 below; and

(iv) the value of land, if any, dedicated by the Owner to the City for public use and enjoyment as open space, active parklands and passive parklands in

616083 12/06/2002 01:20P B1414 P531 M ALSDORF
6 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Parcel L, which lands represent a dedication in excess of the quantity of such lands otherwise required to be dedicated in support of the development on the Property.

Owner shall not be entitled to any credit against such fees for the development of commonly owned open spaces and recreation facilities within the development of Parcels A through K.

4. Conditions Precedent.

a. The provisions of this Annexation Agreement shall not be effective until the following conditions have been satisfied in full:

(1) Final approval has occurred as follows:

(a) For the purposes of this Agreement, final approval occurs on the thirtieth (30th) day following the effective date of the latest of the motion, ordinance and/or resolution by which the City Council (hereinafter "Council") approves:

(i) This Agreement;

(ii) The formal annexation of the Property to the City;

(iii) The zoning for the Property as C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial, R-3 Residential and HP Hillside Preservation; and

(2) Owner and City have mutually executed and delivered this Agreement for recordation with the Garfield County Clerk and Recorder.

b. If any legal proceedings, referenda, or elections are commenced regarding any of the items specified in Section 4(a) hereinabove, and in accordance with the City's Municipal Charter, but are not favorably concluded within fifteen (15) months thereafter (subject to each party's obligations pursuant to Section 5 below), this Agreement may be terminated by either party upon written notice to the other.

c. If none of the actions addressed in Section 4(b) above is taken or commenced within such thirty (30) days, or if an election is called pursuant to said Section 4(b) and ratification thereafter made by the voters of the City, then Final Approval shall occur upon conclusion of the election.

5. Cooperation in Defending Legal Challenges. If any legal or equitable action or other proceeding is commenced by a third party: (a) within one (1) year after the Final Approval, challenging the validity of the annexation of the Property into the City or the City's zoning of the Property or the City's execution and delivery of this Agreement, Owner and the City shall defend

616083 12/06/2002 01:20P B1414 P532 M ALSDORF
7 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

such action or proceeding; or (b) subsequent to such one-year period, challenging the validity of any provision of this Agreement (other than as set forth in clause (a) above), Owner and the City agree to cooperate in defending such action or proceeding, and in connection with any such action or proceeding, the City shall bear its own expenses and Owner shall bear Owner's expenses. Unless the City and Owner otherwise agree, each party shall select its own legal counsel to represent it in connection with any such action or proceeding.

6. Interim Use of Available Raw Water During Site Development. The parties agree that the developer of the Property may utilize the Atkinson Canal and associated water rights being dedicated to the City for dust mitigation and site preparation during the grading and construction activities on the Property. If the developer elects to so utilize the water structures and water rights, all cost, including but not limited to construction, maintenance and legal fees associated with such use shall be borne exclusively by said developer.

7. Deannexation. The provisions of this Agreement, as well as acceptable City zoning of the Property, are material considerations of Owner's agreement to annex the Property to the City. Therefore, in the event (a) the City fails to perform under the terms of this Agreement, or (b) Owner is unable to obtain, either before or after annexation proceedings are complete, C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial and R-3 Residential zoning and/or subdivision and/or development approval (subject to limitations herein set forth) which it in its sole discretion finds acceptable, Owner and the City stipulate and agree, pursuant to C.R.S. §31-12-501, that it shall be in the best interest of the City that the Property be de-annexed from the City. In such event, the City agrees that it shall initiate de-annexation proceedings, and to take all steps necessary to effect the de-annexation. The City further acknowledges and agrees that de-annexation is not prohibited by the City Charter or Municipal Code and ordinances, and that the City will not amend its ordinances to preclude a de-annexation permitted hereunder. The parties' right to de-annex shall be in addition to those rights set forth in Section 4, above. Upon the de-annexation of the Property from the municipal boundaries and specific jurisdiction of the City, the City agrees that it shall convey, assign, transfer and quitclaim to Owner, its successors and assigns, any and all land and water rights (the public dedication of which is more fully described by Section 11 hereof) previously dedicated by Owner hereunder to the City for the public use and benefit.

8. Owner Representations. All representations of Owner set forth in its annexation petition, annexation plat, public hearings on the application for C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial and R-3 Residential zone district classification, the Zoning and Development Plan and mapping and related documents shall, if accepted by the City, be considered incorporated into this Agreement as if set forth in full herein. Notwithstanding their incorporation by reference, the City makes no representations about the accuracy of such documents.

9. Site Planning/Density Limits/Plats/Subdivision Improvements Agreements. The City and Owner agree to the following terms and conditions regarding site planning, vested rights, subdivision improvements agreements (hereinafter "SIAs") or development permit agreements (hereinafter, "Development Permits") and plat recordation:

616083 12/06/2002 01:20P B1414 P533 M ALSDORF
8 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

a. Site Planning. Unless otherwise mutually agreed upon by the parties, Owner shall develop the property in eleven (11) distinct phases; each of which shall correspond, according to the surveyed zoning map described by Section 2 hereinabove, to one of the zoning parcels (A through K) generally set forth by Exhibit B and Exhibit C (hereinafter, a "Parcel" or the "Parcels"). One or more zone parcels may be commenced as a single phase of site specific planning and development, provided the developer thereof complies with all obligations of each parcel's development; to wit, the timing and amount of applicable Off-Site Transportation Improvements (Section 12 hereof), the Geotechnical Mitigation requirements (including debris flow detention facility extensions) (Section 14 hereof) and all other applicable fees and conditions of development associated with each zoning parcel. During any planned unit development ("PUD") review process, subdivision process, development permit process or other development process, Owner shall submit to the City a final plat for each encompassed Parcel, which plat shall correspond to and indicate the proposed plan of development in each Parcel of the Property (the "final plat"), which shall include, at a minimum, the intended locations and densities of such development. The parties agree that the final plat shall be recorded promptly following approval.

The City and Owner agree that, together with the application for the first subdivision and/or development on the Property, except the subdivision and or development of Parcel I, and otherwise regardless of which zoning parcel or phase is involved, an element of the approval of the final plat thereof shall be the public dedication to the City, either by such plat or by separate conveyance instrument, of the HP Hillside Preservation (Parcel L) lands. It is further agreed that such conveyance shall and does provide part of the consideration herein agreed to and accepted by the parties as support for Owner's enforceable vested rights as further described and defined in Section 10 hereinbelow. It is also agreed that the dedication and conveyance of other, future public lands and facilities (such as publicly dedicated streets and utility easements) will occur in conjunction with future subdivision and/or development application approvals.

b. Infrastructure Easements. Regardless of Owner's schedule, Owner agrees to provide infrastructure for roads, water and sewer facilities, electrical and natural gas service, and other facilities and services as mutually agreed upon by Owner and the City Engineer to serve the Property adequately during the period(s) between development of parcels. Such infrastructure shall be provided at Owner's expense, and shall be reviewed and subject to approval by the City. Owner will loop water or sewer lines or provide other stand-alone features of such infrastructure, all as approved by the City engineer, to accomplish this goal. The City shall accept easements for such public facilities pending the actual and final public dedication of the same upon the final platting of the affected Parcel(s).

c. Density Cap. Notwithstanding the zoning designation of the Property as: (i) a C-1 Limited Commercial zoning district (Parcels A, C, D and H on the Plan) or C-2 Core Commercial zoning district (Parcels E, F and G on the Plan), Owner agrees that it shall not plan, develop, construct or sell more than 490,000 total square feet of

615083 12/06/2002 01:20P B1414 P534 M ALSDORF
9 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

commercial space (exclusive of any development which may occur within that area of the C-4 Resort Commercial zone district identified as "Hospitality" [Parcel I on the Plan], the density maximums of which are separately limited by the City's Municipal Code) within the Property; and (ii) an R-3 Residential zoning district (Parcels B, J and K of the Plan), Owner agrees not to plan, develop, construct or sell more than 475 residential dwelling units (subject to the provisions of Section 9(c)(i) below) within Parcels B, J and K.

(i) *Specific Housing Agreements between Owner and City.* The Owner and its successors-in-interest shall comply with the City's community housing requirements contained in Ordinance #24, Series of 2001, Inclusionary Residential Requirements for Affordable Housing and the applicable Guidelines, as contained in Resolution #2001-16. Glenwood Meadows further agrees that a minimum of twenty (20) dwelling units shall be developed on the Property and shall be located within the mixed-use Parcels E, F and G. Finally, the City and Owner agree that no more than three hundred (300) of the total residential dwelling units permitted hereunder shall be commercial apartment rentals as "apartments" are now or may hereafter be defined in the City's Municipal Code.

(ii) *Limitation.* The foregoing density limits shall not apply to portions of the Property conveyed to or developed as (i) governmental services facilities (including a public school district facility) or (ii) non-governmental, non-profit health and human services facilities. Except as expressly provided herein to the contrary, proposed land uses which exceed the maximum density limits established hereby and reiterated by the incorporated Zoning and Development Plan shall require the written mutual execution of a specific amendment to this Agreement. No such amendment shall be valid unless approved at a duly and properly noticed, public hearing before both the City's Planning & Zoning Commission and the Glenwood Springs City Council on the question.

d. SIAs/Development Permits and Plat Recordation. The City and Owner shall, following Council approval of the final plat of one or more of the Parcels of the Property's development, but before the final plat is recorded, negotiate acceptable terms of a separate subdivision improvements agreement ("SIA") for the Parcel(s) scheduled to proceed to development. The City shall authorize the Mayor to execute the SIA for the Parcel(s) following final plat approval. The City shall further authorize the Mayor to execute the SIAs for subsequent Parcel(s), subject to the foregoing:

i. No SIA for any Parcel shall be recorded until all necessary documents in support of that Parcel, including a financial guarantee acceptable to the City, updated cost estimates for public improvements, and an updated title commitment, all pursuant to the Municipal Code (the "Financial Items") have been provided to the City and approved by City staff. For purposes of this Agreement, both (i) Off-Site Transportation Improvements in

616083 12/06/2002 01:20P B1414 P535 M ALSDORF
10 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

accordance with the provisions of Section 12 hereinbelow and the Glenwood Meadows' Transportation Improvements Plan and (ii) Geotechnical mitigation requirements applicable to a given phase of development (including debris flow detention structure extensions) in accordance with the provisions of Section 14.a. hereinbelow, shall be deemed included within the definition of "Financial Items" requiring review and approval of the City's Community Development Director prior to recordation of the final plat of a given approved phase of development. Upon the City's receipt of the Financial Items, no public hearing shall be necessary if all City review departments approve the Financial Items without imposing conditions thereon and without recommending or requesting a public hearing. Nevertheless, the SIA for each phase of the Property's development shall be subject to Council review and approval at a regular Council meeting. Promptly following final approval and execution, the City shall record the SIA for the Parcel(s), which will thereafter proceed to be developed.

ii. The parties agree that any filing or other numbers which appear on the final plat for the various phases of development of the Property are for reference and identification purposes only and have no bearing on the sequence in which the Property may be developed.

iii. Owner may only sell lots on the Property located within a Parcel:

A. which includes within its final plat and design an identification of the lot(s) to be sold;

B. for which an SIA designating said lots has been executed and recorded; and

C. for which acceptable financial guarantees have been posted to secure construction of improvements.

In the absence of a specific "subdivision" request, the Financial Items and other obligations required hereunder may be enforced by the City through conditions of Major Development Permitting or other similar and enforceable mechanics.

e. Compliance With Agreement and Subsequent Obligations. Owner's compliance with all requirements of this Agreement, the Plan, the Municipal Code and other governing documents incorporated herein or as part of the zoning approval process, including future SIA/Development Permit instruments, is a condition of subdivision and/or major development permit approval. Notwithstanding the foregoing or Section 10 hereinbelow, nothing herein shall constitute a guarantee, covenant or agreement that the City shall approve such application(s) in the event of non-compliance.

616083 12/06/2002 01:20P B1414 P536 M ALSDORF
11 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

10. Vested Rights. In order to allow Owner a reasonable opportunity to develop the Property in accordance with this Agreement, the Zoning and Development Plan, the Final Approval and in consideration of the substantial public dedications of land as described herein and upon the attachments hereto, the development rights and uses approved thereby shall, to the extent allowed by law, constitute a "site specific development plan" under C.R.S. §§24-68-101 et seq., as amended. Subject to Owner's satisfactory completion of Parcel phases of development pursuant to this Agreement, the site specific development plan shall be vested in Owner under the following conditions:

a. The site specific development plan shall be vested for a period of ten (10) years, beginning on the date the final plat of the first phase of development on the Property is recorded (the "Vested Period"). The Property as to which rights have been vested shall be immune from changes in the City's land use regulations for the duration of the Vested Period, subject to the below provisions.

b. After the Vested Period expires, this Agreement shall be deemed terminated and of no further force or effect as to such phase; provided, however, that such termination shall not affect (a) annexation to and zone district designations of the Property in the City; (b) any common-law vested rights obtained prior to such termination; (c) any right arising from City permits, approvals or other entitlements for the Property which were granted or approved prior to, concurrently with, or subsequently to the approval of this Agreement; (d) any continuing obligations of Owner regarding providing services or facilities to such phase, performing covenants implied within this Agreement, or other Owner responsibilities under this Agreement, which shall survive termination; or (e) any rights of the City relating in any way to Owner's performance or nonperformance hereunder.

c. Notwithstanding the foregoing, if Owner does not complete the items listed and intended for each phase within the time period allotted for construction of such phase pursuant to an applicable SIA, the Vested Period as to all uncompleted work on the Property in connection with the subject phase(s) shall expire, vested rights as to such uncompleted work shall be extinguished, and this Agreement shall terminate in favor of the provisions of the applicable SIA. "Completion" for the purpose of this paragraph shall mean that all work for such phase shall have been performed, submitted to the City for approval, and finally approved pursuant to applicable City subdivision and platting requirements, and that Owner properly posted financial guarantees acceptable to the City to assure completion of that phase's improvements within the time period allotted by the subject SIA.

d. Except in instances of force majure, the requirements of federal or state law, cases of preemption or other superior jurisdictional mandate, the City shall not initiate any zoning or land use action which would alter, impair, prevent, diminish, impose a moratorium on development, or otherwise unreasonably delay any of Owner's rights set forth in this Agreement or Owner's plans for development or zoning, as approved by the City.

616083 12/06/2002 01:20P B1414 P537 M ALSDORF
12 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

e. Notwithstanding the foregoing, the establishment of vested property rights under this Agreement shall not prevent the City from enacting and enforcing regulations of general applicability (including, but not limited to, building, fire, plumbing, electrical and mechanical codes, including the preliminary plat and final plat subdivision requirements under the Municipal Code and other City ordinances), except where the approved plans for development of the Property or state or federal regulations provide otherwise, as all of such regulations exist on the date of this Agreement or may be enacted or amended after the date of this Agreement.

11. Water Rights Dedication and Ditch Structure Conveyance. At or before the time the recordation of the final plat for the first phase of subdivision and/or development (whereupon the land zoned as HP Hillside Preservation shall be dedicated to the City for public use and enjoyment as open space, active park lands and passive park lands), but in no event later than six (6) months after the mutual execution of this Agreement, Owner shall convey by special warranty deed to the City, free and clear of all liens and encumbrances (but subject to the provisions of Section 6 hereinabove), water rights acceptable to the City, as determined by mutual agreement to be satisfactory to provide a secure, legal water supply for appropriate useful application within the proposed development contemplated by this Agreement and the Plan; provided, however, Owner's obligations in this regard shall be limited to the historic water rights owned by Owner and used on the Property. Prior to dedication, the Owner and City shall agree to the maximum needs of the contemplated uses. The water rights dedicated shall be those historically associated with the subject Property and more specifically known as priorities 105A, 107A, 228 and 594 as decreed in Case Nos. 1056, 1225, 1338 and 4033 respectively. The Owner may retain water rights which exceed the needs described above, provided that the water rights retained are junior in priority to those dedicated and that any change in the point of diversions downstream of the point of diversion utilized to service the annexed Property. In addition, the Owner hereby agrees not to oppose any application by the City for an alternate point of diversion for the dedicated water rights in order to better serve the Property and the City's needs. Owner shall be entitled to sever and maintain ownership of those water rights not necessary for the City to offset the future use on the Property. Owner shall be solely responsible for the costs associated with any legal proceedings, including those related to approval of an augmentation plan or request for change in use, arising from the retention by Owner of any portion of its present water rights. By this conveyance, Owner shall fully satisfy any and all water rights dedication requirements of the City for annexation and development of the Property as set forth in the Municipal Charter and Municipal Code and as approved by the City Council.

As an element of the consideration hereunder, Owner agrees to assign one hundred percent (100%) of its ownership interest in and to the Atkinson Canal Company to the City contemporaneous with the dedication of water rights described by this Section 11. Such assignment shall include, without limitation, all right, title and interest of the Atkinson Canal Company in any agreements, contracts, easements, rights-of-way and other appurtenant benefits.

Owner, as an element of its Master Drainage Plan and its Master Utility Plan, shall at Owner's sole cost, design a raw water irrigation system, acceptable to the City Engineer, serving the Property and adjacent City-owned lands (i.e. Community Center, MOC Site and the Parcel L property). The City shall be the owner of any such raw water irrigation system and shall pay for the

616083 12/06/2002 01:20P B1414 P538 M ALSDORF
13 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

costs associated with construction of the same. Upon the City's development of a raw water irrigation system, all development within the Property shall be required to purchase such taps and pay such other fees as are generally applied to the system's use.

12. Off-Site Traffic Improvements Obligations. As an element of the City's approval of (i) Owner's Petition for Annexation, (ii) Owner's Application for Zoning and (iii) acceptance of this Agreement, the Owner has agreed to make certain improvements to the surrounding transportation system and to cooperate financially with the City on specified future transportation system improvements as described herein:

(a) As a specific requirement of any application for a Parcel's subdivision and/or development, the Owner shall calculate the estimated number of daily trips attributable to the site specific development's intended uses and provide the City with a complete copy of said calculations for the City's records.

(b) Owner shall cooperate with the City to obtain a CDOT Access Permit on behalf of, and in the name of the City. The City shall be provided a copy of any Access Permit granted hereunder. Said Access Permit shall describe the nature and impacts of construction and improvements affecting the Interstate 70/Midland Avenue right-of-way areas. Owner shall pay the costs of the Access Permitting process and shall comply with the terms associated therewith.

(c) Owner shall be responsible for the design and, upon approval of the City Engineer, the construction of improvements at the intersection of Midland Avenue and Eighth Street. Said improvements shall accommodate existing and anticipated traffic as described by the Owner's Transportation Improvements Plan through intersection modification, grade modification and/or signalization. Owner and or its assigns shall be responsible for all costs of administration, design and actual construction of the approved improvements; the City shall be responsible for all necessary costs of right-of-way acquisition for the approved improvements. The improvements contemplated hereby shall be completed prior to or contemporaneous with the issuance of a final and permanent certificate of occupancy by the City's Building Department for any structure within the first Parcel of commercial and/or residential development (exclusive of any proposed subdivision and development on Parcel I). Provided, however, Owner may apply for and obtain subdivision and/or development permit approval for development on the Property in advance of the actual construction of the improvements herein described; provided however that (i) the obligation to complete the improvement is included in the Financial Items of the respective SIA(s) (see Section 9(d) above) and thereby, the performance secured, and (ii) no permanent certificate of occupancy for any structure on Parcels A, B, C, D, E, F, G, H, J or K shall be issued until the completion of said improvements; provided, however, in the event circumstances warrant, the Owner may apply for relief from the constraints of this Section 12(c) by application to the City Council. Any such relief shall be within the sole and exclusive discretion of the

616083 12/06/2002 01:20P B1414 P539 M ALSDORF
14 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

City Council and may be subjected to such other conditions, as determined by the City Council at that time.

(d) Owner shall be responsible for the design and, upon approval of the Colorado Department of Transportation ("CDOT") and the City Engineer, the construction of two (2) roundabouts or other acceptable and approved improvements at the Interstate 70 and Midland Alternate Route highway interchange at Exit 114. Said improvements shall accommodate a potential full interchange at the North and at the South sides of said Exit 114. Owner and or its assigns shall be responsible for all costs of administration, design and actual construction of the approved improvements; the City shall be responsible for all necessary costs of right-of-way acquisition for the approved improvements. The improvements contemplated hereby shall be completed prior to or contemporaneous with the issuance of a final and permanent certificate of occupancy by the City's Building Department for any structure within the first Parcel of commercial and/or residential development (exclusive of any proposed subdivision and development on Parcel I). Provided, however, Owner may apply for and obtain subdivision and/or development permit approval for development on the Property in advance of the actual construction of the improvements herein described; provided however that (i) the obligation to complete the improvement is included in the Financial Items of the respective SIA(s) (see Section 9(d) above) and thereby, the performance secured, and (ii) no permanent certificate of occupancy for any structure on Parcels A, B, C, D, E, F, G, H, J or K shall be issued until the completion of said improvements; provided, however, in the event circumstances warrant, the Owner may apply for relief from the constraints of this Section 12(d) by application to the City Council. Any such relief shall be within the sole and exclusive discretion of the City Council and may be subjected to such other conditions, as determined by the City Council at that time.

The Owner and the City have agreed to jointly pursue the recovery of any funds which may be available from CDOT or other sources to reimburse the parties for the capital costs associated with the improvements contemplated by this Section 12(d). In the event the Owner and City are able to recapture any such funds within ten (10) years of the anniversary of this Agreement, Owner or its successors and assigns shall be entitled to recover therefrom only the amount of the actual costs of design, engineering and construction for the subject off-site transportation improvement project. All other recaptured funds, regardless of their source, shall be paid to the City and applied to other City transportation improvements.

(e) Owner shall, at the earlier of either (i) the completion of seventy-five percent (75%) of the total commercial square footage approved hereunder, or (ii) upon the request of the City Engineer following the commencement of actual construction and development on the Property (such request being evidenced by

616083 12/06/2002 01:20P B1414 P540 M ALSDORF
15 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

documentation of escalating traffic counts along the Midland Avenue corridor which the City Engineer has then determined warrants the improvement of the width of the Midland Avenue Alternate Route), pay all costs of administration, design and construction for the four-laning of the section of the Midland Avenue Alternate route from the present Community Center access point at Wulfsohn Road westerly to the present MOC access point at Wulfsohn Road, inclusive. Owner's responsibility for the four-laning of said section of the Midland Avenue Alternate Route is contingent upon the City's assumption of the obligation to simultaneously pay all of the costs for the administration and design of four lanes on two (2) other sections of the Midland Avenue corridor, to wit: (i) the section form the Colorado River to Wulfsohn Road at the present MOC access point and (ii) the section from Wulfsohn Road at the present Community Center access point to the Eighth Street and Midland intersection. Owner shall contribute to City twenty-five percent (25%) of the actual construction costs for these improvements. The City shall not attribute any financial responsibility for right-of-way acquisition for the improvements hereunder to the Owner. In the event the City Engineer has not required the four-laning of these sections of the Midland Avenue corridor prior to the Owner's commencement of any part of the final twenty-five (25%) of the total approved commercial square footage on the Property, the Owner may estimate, subject to the reasonable approval of the City Engineer, the costs of all improvements contemplated hereby and pay to the City as full and final discharge of Owner's obligations under this Section 12(e) its proportionate share of the estimated costs (i.e. 100% of the costs of the four-lane construction of Midland Avenue Alternate Route adjacent and contiguous to the Property and 25% of the costs of the four-lane construction of Midland Avenue Alternate Route at the two (2) non-adjacent, non-contiguous sections as described herein).

(f) Owner shall be responsible for one hundred percent (100%) of the costs associated with the design and construction of one new access point from the Property to Midland Avenue. The design of any such access point and roadway intersection shall require the prior approval of the City Engineer. Owner shall be responsible for one hundred percent (100%) of the costs associated with the design and construction of a new limited purpose (i.e. an unsignalized right-turn-in/right-turn-out only) access point from the Property to Midland Avenue. The design of any such secondary access point and roadway intersection shall require the prior approval of the City Engineer. Any new access points contemplated by this Section 12 (f) shall, as an element of their design and construction, incorporate a pedestrian grade separation, the design for which shall be subject to the review and approval of the City Engineer. The City may, upon the request of Owner, waive this pedestrian grade-separation obligation if the City has determined that a westward extension of the City-wide or regional trail system is not anticipated.

The City and Owner hereby agree that in the event a city-wide off-site transportation improvement fee program of general applicability within the City's municipal limits shall be hereafter duly

616083 12/06/2002 01:20P B1414 P541 M ALSDORF
16 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

adopted by the City, said program of general applicability shall apply only to the development of Parcel I on the Plan.

Owner's contribution to the construction and land dedication for on-site pedestrian and bicycle trail connections, including the costs incurred in developing grade-separated crossings, shall be credited to Owner, its successors and assigns, against any other applicable fee(s) now in the Municipal Code or hereafter adopted by the City for the express purpose of improving trails and similar parkland facilities. The Owner shall be responsible for providing to the City copies of all applicable cost records for such expenditures.

13. On-Site Pedestrian/Off-Site Pedestrian Commitments, Transportation Demand Management Commitment; and Transit Commitments. The following commitments regarding pedestrian and bicycle trails development are intended to be exclusive of obligations by the Owner or a future developer with respect to sidewalks and other connections which are distinctly required by the Zoning Plan, the City Code or other applicable requirements.

a. On-Site Hard Trail. The City and Owner have agreed that the City Rivertrail system shall be continued across the Property. Owner has agreed to design and build such a Rivertrail extension as set forth hereby in phases which correspond to the sections of such trail affected by the site specific development of the Parcels of the Property. Upon completion of any phase or section of the Rivertrail, the Owner or its successor-in interest shall dedicate a permanent easement for the Rivertrail's public use, benefit and maintenance using specific, as-built legal descriptions for such transfer of interest. Therefore, within any Parcel of the Property burdened by the existing thirty foot (30') wide underground Public Utility Easement granted by Owner to the City by that certain instrument dated August 8, 2000 (being, specifically, Parcels A, C, D, E, H and I), which Parcel is the subject of application for site specific development, the design and construction of the Rivertrail extension shall be included within such application and planning in a manner substantially in compliance with the City adopted Rivertrail Standards and at a minimum shall be designed in a quality similar to comparable existing Rivertrail improvements in the City. The estimated costs therefor shall be included in the Financial Items accompanying any approval of the Parcel's development. In the event the City desires to proceed with the design and construction of the Rivertrail extension on Parcels of the Property in advance of Owner's application for development on such Parcel(s), then at the time Owner or its successors do develop such Parcel(s), it shall be required, as a Financial Item of approval, to reimburse the City for its actual design and construction costs associated with said Rivertrail extension as determined on a per linear foot basis.

b. On-Site Soft Trail. The City and Owner have agreed that, in conjunction with Owner's development of any section of the debris flow mitigation structures as described in Section 14 hereinbelow, and whether the actual approved location of said debris flow mitigation structure is within the Parcel L lands or within portions of the Parcels B, J or K lands, that Owner or its successors-in-interest shall design

616083 12/06/2002 01:20P B1414 P542 M ALSDORF
17 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

and construct a "Soft Trail" (i.e. no asphalt or concrete) within, on or near the subject debris flow mitigation structure. The design characteristics of the Soft Trail shall, at a minimum, conform to the design characteristics of other City-owned soft trail systems within the City. In the event the City, at the time of the application for development requiring the construction of a section of the debris flow mitigation structures, determines that such a Soft Trail is, at that time, inconsistent with the City's goals, policies and plans for the public use and benefit of the Parcel L lands, then it may direct the Owner to eliminate the Soft Trail development from said application for development.

c. Off-Site Rivertrail Contribution. The City and Owner have agreed that Owner shall be responsible for contributing fifty percent (50%) of the actual costs of constructing the section of the City Rivertrail system, or other City-adopted pedestrian connection, from the existing Community Center access point at Wulfsohn Road (commencing at Owner's eastern boundary of Parcel I) to the intersection of Eighth Street and Midland Avenue. In no event shall Owner's obligation hereunder exceed the lesser amount of either (i) fifty percent (50%) of the actual construction costs of such off-site trail project as are presently set forth by that certain Pedestrian Feasibility Study dated March 6, 2002 and conducted by OTAK on behalf of the City (the "Study"), which Study estimates a total cost for the City-adopted Alternate B solution at $1,055,000.00 or (ii) fifty percent (50%) of the actual construction costs of such off-site trail project as determined upon completion of said project, regardless of the estimates set forth in the Study (each of the two foregoing limitations upon Owner's financial obligations are further subject to any credits for land dedication as set forth hereafter). Owner owns a 100% undivided interest in certain, presently unincorporated land situate on the northeastern boundary of the Midland Avenue Right-of-Way (commonly known and referred to as the "Wulfsohn East" parcel). Owner has agreed to grant the City an above ground permanent easement for the use of a part of the Wulfsohn East parcel for purposes of providing a safe and beneficial connection from the area of the Community Center to existing City pedestrian corridors. The value of the land dedicated to the City on the Wulfsohn East parcel, by easement or otherwise as hereafter agreed by the parties, shall be deducted from Owner's financial contribution obligations pursuant to this Section 13(c). The "value" shall include any diminution of the value of Owner's other land within the Wulfsohn East parcel, if any. In the event the parties are unable to agree as to the value of Owner's land contribution hereunder, each party shall engage a qualified, licensed appraiser to research and analyze such value. The value shall then be permanently established by the average of the two (2) appraisals. The City agrees that it shall be solely and exclusively responsible for the design and construction of the pedestrian improvements contemplated hereby and shall use all reasonable means to construct the same prior to the commencement of development on the Property; provided, however, that the City further agrees that it shall not unreasonably withhold any subsequent Permits or other development approvals based upon the City's inability to timely complete such trail/pedestrian path construction.

816083 12/06/2002 01:20P B1414 P543 M ALSDORF
18 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

d. West Property Park and Ride Land Reservation. Owner has agreed to reserve from development, for a period not to exceed five (5) years after the mutual execution of this Agreement, a section of land, not to exceed two and one-half (2.5) acres in size at the west end of Parcel A on the Property (hereafter, the West Park and Ride Site"), for the possible acquisition by the City or other appropriate governmental entity through purchase, exchange or other mutually agreeable mechanism of transfer, for the express use of such West Park and Ride Site as a public park-and-ride/transit facility. In the event the City, or other appropriate governmental authority as assignee of the City's rights hereunder, does not notify Owner or its successors and assigns in writing, on or before the established deadline described immediately above, of its intention to exercise the acquisition of the West Park and Ride Site, Owner shall be relieved from any obligation hereunder to further reserve the Site. In determining the price of the West Park and Ride Site, the parties shall either (i) agree to a price, or (ii) each party shall retain the services of a qualified, licensed Colorado real estate appraiser to appraise the value of the land as such land was zoned immediately prior to the annexation of the Property (Garfield County zone district A/R/R/D), with such value escalated for the passage of time during the reservation period at a rate equal to the published Denver/Boulder Consumer Price Index established as of the date of final annexation and adjusted annually on each anniversary thereof; the average of the appraised value by each appraiser shall be deemed the purchase price for the governmental acquisition of the West Park and Ride Site.

e. East Property Transit Center. This Agreement shall obligate the Owner and/or eventual developer of the land within Parcel I of the Property to negotiate in good faith, at the time of site specific development application, for the dedication to the City of an adequate land area, not to exceed one (1) acre, and location therefor for the City or its agent's development of a transit center facility and attendant parking area. In the event the City and Owner are unable to reach agreement as to the location, size and dedication of such a transit facility and parking area within the proposed development of Parcel I, then, upon the approval of a site specific development proposal for Parcel I, the Owner or is successors and assigns shall make a mandatory contribution to the City in an amount equal to the value of one (1) acre of land within said Parcel I as determined by mutual agreement or as determined by the average of two appraisals; one such appraisal shall be commissioned by the City and one such appraisal shall be commissioned by the Owner, its successors and assigns. In the event the parties do agree on a mutually acceptable size and location for the transit center and parking area, the City shall accept transfer of the site following the issuance of appropriate development approvals and the City shall accept sole and exclusive responsibility for the costs of designing and constructing the facility. The City agrees that any such development of a public transit center and parking area shall comply with all applicable underlying design criteria established by this Agreements and the exhibits hereto in addition to any applicable Municipal Code requirements.

816083 12/06/2002 01:20P B1414 P544 M ALSDORF
19 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

14. Public Improvements/Geotechnical Mitigation Improvements and Maintenance Obligations. All public improvements required by the Plan, including the development of internal public streets and public utility line extensions, shall be included and subject to performance and financial guarantee requirements referenced in the respective SIA(s)/Development Permit(s). Additionally, at the time a final plat is recorded, Owner shall commit to the dedication, conveyance and assignment to the City all public improvements within the subject phase, together with any land, by deed or easement instrument acceptable to the City, necessary to accommodate such public improvements, and shall, upon completion and acceptance by the City of said public improvements, so dedicate, convey and assign the same in perpetuity. Finally, Owner shall dedicate or convey such public improvements by bill of sale or special warranty deed, free and clear of any liens or encumbrances which would prevent the City from using said public improvements or associated land for their intended purposes.

a. Specific Geotechnical Mitigation Improvements Obligations. All land use and development undertaken on the Property shall comply with the recommendations and requirements of both the Geotechnical Analysis Summary prepared by High Country Engineering, dated September 17, 2001, as amended, and the Drainage Summary prepared by High Country Engineering, dated September 17, 2001, as amended; both of which were reviewed by the office of the Colorado Geological Survey and were incorporated into the City's approval of the Plan. Copies of each report are maintained in the records of the City. More specifically, any application for development of any phase of development on the Property shall, at a minimum, comply with the following conditions and recite the same as a plat note on the recorded plat instrument:

"Foundation/Grading Requirements. Preliminary soils investigations encountered low density and compressible silty sand and gravel debris fan deposits. These soils are hydro-compressive and tend to settle under load when wetted. Subsurface wetting is likely to occur as the result of surface runoff, irrigation and leaky utilities, therefore measures to mitigate settlement shall be required as a part of the site development. Foundation and grading requirements are as follows:

a. Foundations for the site may include driven or drilled pile, reinforced mat, spread footings placed on either pre-wetted soils or structural backfill.
b. Site Grading shall be performed prior to building pad and foundation construction. Site grading and building pad construction should be performed as early as possible to allow for settlement.
c. The ground surface should be sloped at a minimum of 5% for the first ten feet away from foundations in all directions in unpaved areas and 2.5% in paved areas.
d. The Owner shall be responsible for submitting an engineer certified soils report that includes a section on paving requirements. The soils report should include moisture and compaction requirements, excavation and backfill requirements, evaluation of swell and consolidation potential, slope stability and foundation recommendations for structures. The pavement section of the report should include traffic loadings, sub-grade preparation and pavement recommendations. This report must be submitted

616083 12/06/2002 01:20P B1414 P545 M ALSDORF
20 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

and approved prior to beginning either foundation construction or roadway/parking lot construction.

Surface/Subsurface Drainage Requirements.

Downspouts and drains should discharge outside the limits of the backfill.
Landscape requiring irrigation should be placed a minimum of ten feet from foundation walls.
An under-drain system will be required for all below-grade construction.

Utility Construction

a. Wet utilities will be required to utilize restrained joints throughout the project limits.

Debris Flow Mitigation

a. It is anticipated that the project area will be developed in phases. Each individual phase will be required to construct debris flow mitigation measures in accordance with the Debris Flow Mitigation Plan prepared for the entire development and as approved by the City Engineer. In the event the City desires to proceed with the design and construction of a portion or all of the structures required by the Debris Flow Mitigation Plan, as may be amended from time to time with the approval of the City, upon the lands identified as Parcel L of the Property in advance of Owner's application for development, then at the time Owner or its successors do develop such any Parcel(s) which would have required, as an element of development the construction of such debris flow mitigation structures, such Owner or its successor shall be required, as a Financial Item of approval, to reimburse the City for its actual construction costs associated with said debris flow mitigation structure(s), together with interest on such costs, from the time expended by the City to the time of such reimbursement, at a rate equal to the local construction price index.

b. Debris flow mitigation measures for the project include diversion ditches, berms and debris detention basins located along the southwest perimeter of the property.

c. The Owner's Association or a special district will be responsible for maintenance of the debris flow mitigation measures. Maintenance should include removal of debris following an event and routine mowing.

d. The Owner's Association or a special district will be responsible for irrigation of the slopes until permanent vegetation has been established.

Rockfall

618083 12/06/2002 01:20P B1414 P546 M ALSDORF
21 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

a. Rockfall hazards are limited to those areas identified in the Geologic and Preliminary Geotechnical Investigation Glenwood Meadows Glenwood Springs, Colorado prepared by CTL Thompson dated February 1, 2000. There is not a potential rockfall hazard associated with the development of this Property. The only rockfall hazard identified for the area is to the west of the land zoned for future development near the existing City Municipal Operations Center site."

Additionally, as an element of Owner's obligation to submit a Master Drainage Plan and a Master Debris Flow Mitigation Plan as set forth under Section 2 hereinabove, such plans submitted to the City shall specifically include (i) an analysis of acceptable outfall corridors from the low points in all identified detention basins, (ii) an analysis of the preferred routes for such flows from the basins to be conveyed through the Property to existing or improved drainage facilities along the north boundary of the Property, and (iii) an analysis of the capacity of the aforementioned existing or improved drainage facilities and related conveyance structures which are intended to deliver excess moisture to the Colorado River. All of the foregoing data shall be reviewed and approved by the City Engineer prior to the issuance of any building permit on the Property.

15. Open Space and Park Land Dedication. In full and complete compliance with relevant park land public dedication and open space public dedication requirements referenced in the Municipal Code, Owner will dedicate the area zoned as HP Hillside Preservation, shown on the Plan as Parcel L, to the City at final plat recordation for the first phase of land use on the Property. Neither the Owner nor its successors-in-interest shall be required by the City to develop any portion of the publicly dedicated lands for active recreation purposes, except as may be otherwise hereafter agreed as an element of the development of Parcel K of the Property's development (Owner or its assigns shall "rough grade" the area of Parcel L, adjacent to said Parcel K and the City's Community Center, for no more than two (2) baseball/softball fields, upon the direction of the City if such direction is provided to Owner prior to commencement of Owner's initial grading for the development of Parcel K of the Property). In partial consideration of the dedication of the Parcel L lands, the City has agreed to plan and develop a permanent water source retention structure for the benefit of indigenous wildlife; such structure shall be developed by the City, subject to the necessary appropriation of funding, following the dedication of the Parcel L land by Owner. The City agrees that its acceptance of the dedication of such lands shall be deemed a "governmental use" (as defined by the Glenwood Springs' Municipal Charter) of the same and thereby prohibits the City from conveying any of the publicly dedicated property to a third party without first submitting the matter to an election of the City's voters. Nothing contained herein is intended to limit or prevent the City from developing some or all of the public dedication lands for the use and benefit of the public as the City may deem appropriate and advisable in the future.

The City shall convey to the Owner or its successors-in-interest in providing, at the time of actual dedication of the HP zoned lands, a mutually acceptable, non-specific, easement for the development within the publicly dedicated land of (i) the geotechnical mitigation structures to be constructed and maintained by the Owner, or a special district established by Owner and assigned such responsibility, pursuant to the general description of such structures set forth by the Zoning and

616083 12/06/2002 01:20P B1414 P547 M ALSDORF
22 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Development Plan application materials provided by High Country Engineering, and maintained in the records of the City, (ii) any reasonable and necessary street and utility easements (i.e. for the connection of Wulfsohn Road between Parcels A and C as set forth by the Plan) and (iii) any reasonable and necessary street or public utility easements connecting Wulfsohn Road to Parcel K of the Property, which streets and/or utility easements shall require the review and approval of the City Council. The actual location of such geotechnical mitigation structures shall require the prior approval of the City, which approval shall not be unreasonably withheld. After completion of the actual construction of such geotechnical mitigation structures and any features attendant thereto (i.e. a Soft Trail), an amended permanent easement, complete with as-built legal descriptions, shall be excecuted by the parties and recorded in the Garfield County Clerk and Recorder's Office.

All "commonly-owned" parklands and open space within the Parcels A through K, shall be owned and maintained by the Owner and/or the developer thereof, its successors, an association or a special district.

16. Establishment of Special District(s) and Owners' Association/Downtown Development Authority Incorporation Petition.

(a) Owner agrees that it shall undertake the establishment of a drainage and erosion control special district for the purposes of managing and maintaining in perpetuity all Property drainage and debris flow mitigation functions. The City agrees to join such district to the extent of the City's proportional ownership of land and improvements on the Property which benefit from the geotechnical protections of said structures.

(b) Owner agrees to form, or have formed, a property owners' association as soon as practicable and agrees to include the City, upon the City's written request, as a third party beneficiary with respect to the association's enforcement of Covenants, Conditions, Restrictions, Declarations or other regulations governing the property owners or common areas within the Property, including but not limited to the ability to impose assessments or penalties for noncompliance therewith. At a minimum, the formed association shall include within in its adopted Covenants, Conditions and Restrictions, the recommendations of the Colorado Division of Wildlife ("CDOW") as set forth by letter dated October 1, 2001 and maintained on file with the City; provided, however, neither the Owner nor any association hereafter formed, shall be responsible for any land dedications or indemnification as referenced in said CDOW letter. In the absence of the prior formation of a special district responsible for the maintenance of debris flow mitigation structures within the Property, either (i) the Owner or (ii) such a property association shall be formed with the specific responsibility for such maintenance obligations.

(c) Owner agrees that within one (1) year after the effective date of annexation of the Property to the City as described by Section 4 hereof, but in no event later than the filing of the first application for subdivision and/or development, Owner or its successor-in-interest shall petition for inclusion within the boundaries of the Glenwood

616083 12/06/2002 01:20P B1414 P548 M ALSDORF
23 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Springs Downtown Development Authority (hereafter, the "DDA"). The DDA shall, at its discretion, forward such petition to the City Council for approval or disapproval, in whole or in part, of the request for inclusion. This provision in no way obligates the City to include any or all of the Property in the boundaries of the DDA. Should the City choose not to include all or any part of the Property in the boundaries of the DDA at the time of initial petition by Owner for inclusion, the City shall not be precluded from consideration of the same matter at some point in the future.

17. Provisions Exclusive. The City and Owner acknowledge and agree that this Agreement contains all basic requirements of Owner concerning the provision of water and sewer service to the property, potential joint development of a raw water irrigation system, public open space dedication, and public park land dedication, utilities, infrastructure, water rights dedications and other matters expressly addressed under this Agreement. Additional reasonable specifications and regulations may be imposed by the City upon Owner during the subdivision or development approval processes with regard to these enumerated items as well as other items, as appropriate.

18. Breach by Owner; City's Remedies. In the event of any default or breach by Owner of any term, condition, covenant or obligation under this Agreement, the Owner shall be notified immediately in writing. The City may take such action as it deems necessary to protect the public health, safety, and welfare; to protect lot buyers and builders, and to protect the citizens of the City from any and all damages and/or injury to persons and/or property. The City's remedies include:

a. The refusal to issue to Owner any building permit or certificate of occupancy; provided, however, that this remedy shall not be available to the City until after the affidavit described in subparagraph b. below has been recorded. This remedy shall not affect sales to bona fide purchasers nor be applied to bona fide purchasers;

b. The recording with the Garfield County Clerk and Recorder of an affidavit, approved in writing by the City Attorney and signed by the City Manager or his designee, stating that the terms and conditions of this Agreement have been breached by Owner. At the next scheduled Council meeting, the Council shall either approve the filing of said affidavit or direct the City Manager to file an affidavit stating that the breach, or default, has been cured. Upon the recording of such an affidavit, no further lots or parcels may be sold within the Property until the default has been cured. The execution and filing of an affidavit by the City Manager or his designee and approved by the Council stating that the default has been cured shall remove this restriction;

c. A demand that the security given for the completion of the public improvements be paid or honored;

d. The refusal to consider further development plans within the Property; and/or

e. Any other remedy available at law or in equity.

616083 12/06/2002 01:20P B1414 P549 M ALSDORF
24 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Unless necessary to protect the immediate health, safety, and welfare of the City or City residents, the City shall provide Owner thirty (30) days' written notice of its intent to take any action under this paragraph during which thirty-day period Owner may cure the breach described in said notice and prevent further action by the City. Furthermore, unless an affidavit as described in this paragraph has been recorded with the Garfield County Clerk and Recorder, any person dealing with Owner shall be entitled to assume that no default by Owner has occurred hereunder unless a notice of breach has been served upon Owner as described above, in which event Owner shall be expressly responsible for informing any such third party of the claimed default by the City.

19. Breach By City; Owner's Remedies.

a. A "breach" or "default" by the City under this Agreement shall be defined as:

i. any zoning or land use action by the City which would alter, impair, prevent, diminish, impose a moratorium on development, or unreasonably delay the development or use of the Property as set forth in the Zoning and Development Plan, and specifically excluding any non-discriminatory regulatory actions, inaction, or circumstances beyond the reasonable control of the City; or

ii. the City's failure to fulfill or perform any material obligation of the City contained in this Agreement.

b. If any default by the City under this Agreement is not cured as described herein, Owner shall have the right to pursue the defaulting party's remedies allowable by Colorado law, subject to the limitations herein. Although C.R.S. Sections 24-68-101 et seq. allow for certain monetary damages in the event of City breach or default, Owner's sole remedies hereunder shall be to enforce the City's obligations under this Agreement by an action for any available equitable remedy, including, without limitation, specific performance or mandatory or prohibitory injunction. Each remedy provided for in this Agreement is cumulative and is in addition to every other remedy provided for in this Agreement.

20. Miscellaneous.

a. Expenses. The costs and expenses associated with the recordation of this Agreement shall be paid by Owner.

b. Waiver of Defects. By executing this Agreement, Owner waives all objections it may have concerning defects, if any, in the formalities whereby it is executed, or concerning the power of the City to impose conditions on Owner as set forth herein, and concerning the procedure, substance, and form of the ordinances or resolutions adopting this Agreement.

616083 12/06/2002 01:20P B1414 P550 M ALSDORF
25 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

c. Final Agreement. This Agreement supersedes and controls all prior written and oral agreements and representations of the parties regarding annexation and zoning of the Property and is the total integrated agreement between the City and Owner as to those limited matters.

d. Modifications. This Agreement shall not be amended, except by subsequent written agreement of the City and Owner.

e. Captions. The captions in this Agreement are inserted only for convenience and in no way define, limit, or prescribe the scope or intent of this Agreement or any part thereof.

f. Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, successors, and assigns. Further, the terms and conditions of this Agreement shall constitute a covenant running with the land.

g. Invalid Provision. If any provisions of this Agreement shall be determined to be void by any court of competent jurisdiction, then such determination shall not affect any other provision hereof, all of which other provisions shall remain in full force and effect. It is the intention of the parties hereto that, if any provision of this Agreement is capable of two constructions, one of which would render the provision void, and the other of which would render the provision valid, then the provision shall have the meaning which renders it valid.

h. Governing Law. The laws of the State of Colorado shall govern the validity, performance, and enforcement of this Agreement. Should either party institute legal suit or action for enforcement of any obligation contained herein, it is agreed that the venue of such suit or action shall be in Garfield County, Colorado.

i. Attorneys' Fees; Survival. Should this Agreement become the subject of litigation between the City and Owner, the prevailing party shall be entitled to attorneys' fees and costs of suit actually incurred, including expert witness fees. All rights concerning remedies and/or attorneys' fees shall survive any termination of this Agreement.

j. Authority. Each person signing this Agreement represents and warrants that he, she or they is/are fully authorized to enter into and execute this Agreement, and to bind the party represented to the terms and conditions hereof.

k. Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original, and all of which, when taken together, shall be deemed one and the same instrument.

l. Notice. All notices required under this Agreement shall be in writing and shall be hand-delivered or sent by facsimile transmission or registered or certified mail, return receipt requested, postage prepaid, to the addresses of the parties herein set forth. All notices by hand delivery shall be effective upon receipt. All facsimile transmissions shall be effective upon transmission receipt. All notices by mail shall be considered effective seventy-two (72) hours after deposit in the United States mail with the proper address as set forth below. Either party by notice so given may change the address to which future notices shall be sent.

616083 12/06/2002 01:20P B1414 P551 M ALSDORF
26 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Notice to City:

City of Glenwood Springs
Michael Copp, City Manager
806 Cooper Avenue
Glenwood Springs, CO 81601

With copy to:

Teresa Williams, Esq.
City Attorney
806 Cooper Avenue
Glenwood Springs, CO 81601

Notice to Owner:

Glenwood Meadows, L.L.C.
Attn: Robert Macgregor
525 East Cooper
Aspen, CO 81611

With copy to:

Thomas J. Hartert, Esq.
802 Grand Avenue, Suite 303
Glenwood Springs, CO 81601

m. Nothing contained herein, or in any Exhibit hereto, shall affect or impair the City's powers of eminent domain or other similar authority.

n. Gender. Whenever the context shall require, the singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

WHEREFORE, the parties hereto have executed duplicate originals of this Agreement on the day and year first written above.

CITY OF GLENWOOD SPRINGS, COLORADO

By _____
Donald L. Vanderhoof, Mayor

ATTEST:

_____
Robin Clemons, City Clerk

COLORADO

616083 12/06/2002 01:20P B1414 P552 M ALSDORF
27 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

GLENWOOD MEADOWS, L.L.C., a Colorado limited liability company

By _____
Robert Duncan Macgregor as President of Dunrene Management, Inc., the Manager

STATE OF COLORADO)
) ss.
COUNTY OF GARFIELD)

Acknowledged, subscribed, and sworn to before me this 23rd day of August, 2002, by Donald Vanderhoof, as Mayor, and by Robin S. Clemons, as Clerk, on behalf of the City of Glenwood Springs, Colorado.

WITNESS my hand and official seal.

My Commission expires: MY COMMISSION EXPIRES 11/28/2005

Notary Public
Barbara Gately

NOTARY PUBLIC BARBARA M. CATELY STATE OF COLORADO

STATE OF COLORADO)
) ss.
COUNTY OF GARFIELD)

Acknowledged, subscribed, and sworn to before me this 18th day of September 2002, by Robert Duncan Macgregor as President of Dunrene Management, Inc., the Manager of Glenwood Meadows, L.L.C.

WITNESS my hand and official seal.

My Commission expires: 10/26/2005.

Notary Public
Barbara P. Kozelka

NOTARY PUBLIC BARBARA P. KOZELKA STATE OF COLORADO

616083 12/06/2002 01:20P B1414 P553 M ALSDORF
28 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

LIST OF EXHIBITS

Exhibit A	Property Description (from Annexation Plat – 345 acres)
Exhibit B	Zoning Map
Exhibit C	Zoning and Development Plan

EXHIBIT "A"

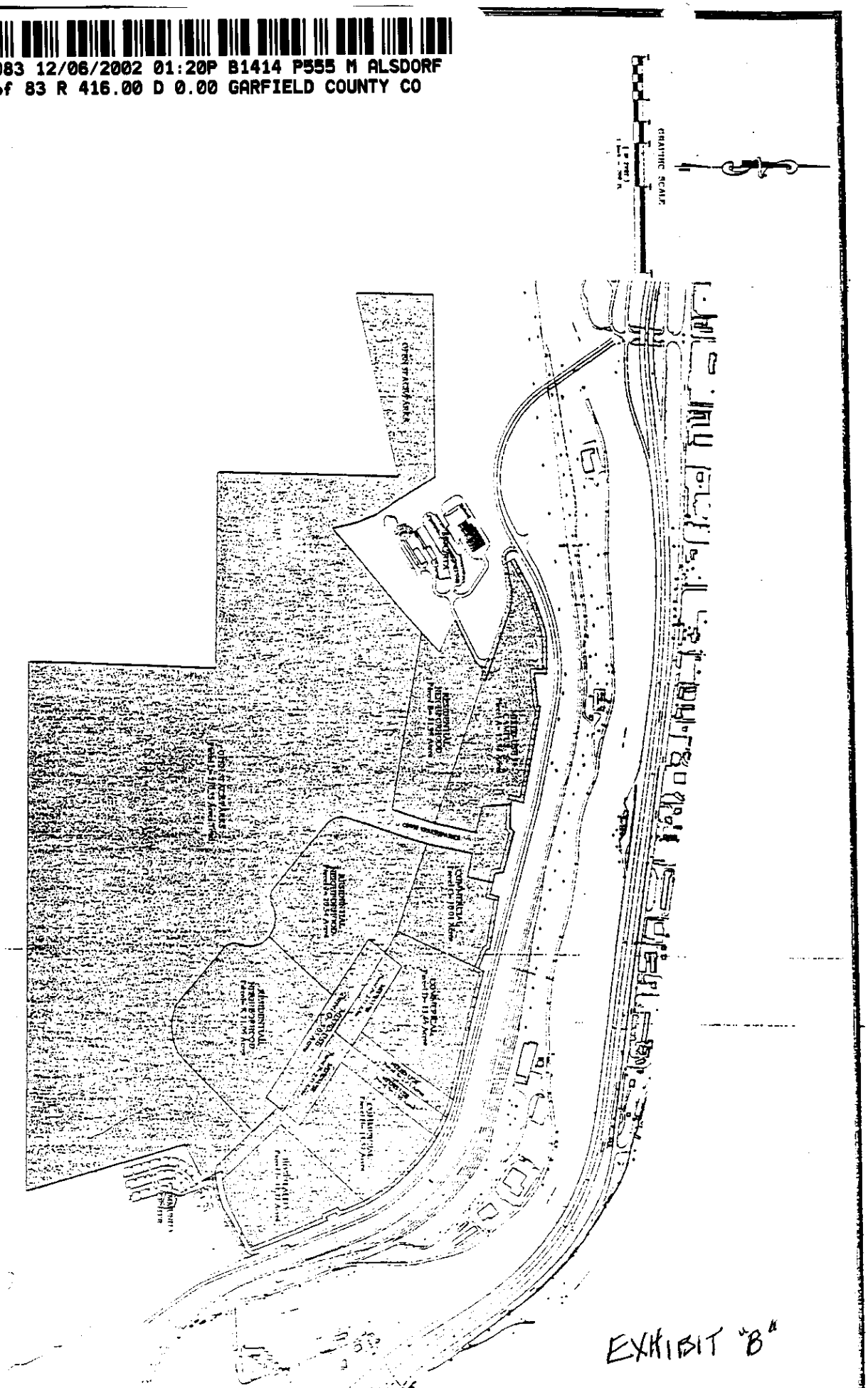
ANNEXATION DESCRIPTION

A PARCEL OF LAND SITUATED IN THE S1/2S1/2 OF SECTION 5, THE SE1/4SE1/4 OF SECTION 6, THE NE1/4NE1/4 OF SECTION 7, THE N1/2 OF SECTION 8 AND THE NW1/4NW1/4 OF SECTION 9, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN; SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 5, THE POINT OF BEGINNING; THENCE S75°55'37"W A DISTANCE OF 1316.16 FEET; THENCE N01°07'55"E A DISTANCE OF 582.46 FEET; THENCE N90°00'00"E A DISTANCE OF 1265.15 FEET; THENCE S30°38'55"E A DISTANCE OF 522.34 FEET; THENCE S19°31'13"E A DISTANCE OF 160.53 FEET; THENCE S12°53'54"E A DISTANCE OF 181.17 FEET; THENCE N47°17'45"E A DISTANCE OF 1171.28 FEET; THENCE ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 1260.00 FEET AND A CENTRAL ANGLE OF 10°27'43", A DISTANCE OF 230.07 FEET (CHORD BEARS N65°22'14"W 229.75 FEET); THENCE N63°26'47"E A DISTANCE OF 283.45 FEET; THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 137.50 FEET AND A CENTRAL ANGLE OF 24°20'19", A DISTANCE OF 58.41 FEET (CHORD BEARS N51°16'35"E 57.97 FEET); THENCE N63°30'55"E A DISTANCE OF 61.83 FEET; THENCE S70°03'24"E A DISTANCE OF 42.54 FEET; THENCE N19°56'36"E A DISTANCE OF 75.00 FEET; THENCE N70°03'24"W A DISTANCE OF 522.96 FEET; THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 337.50 FEET AND A CENTRAL ANGLE OF 28°23'27", A DISTANCE OF 167.24 FEET (CHORD BEARS N84°15'08"W 165.53 FEET); THENCE S81°33'05"W A DISTANCE OF 198.69 FEET; THENCE ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 1260.00 FEET AND A CENTRAL ANGLE OF 01°42'55", A DISTANCE OF 37.72 FEET (CHORD BEARS N31°49'38"W 37.72 FEET); TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF MIDLAND AVENUE; THENCE N62°28'35"E ALONG SAID RIGHT-OF-WAY A DISTANCE OF 262.30 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N70°48'52"E A DISTANCE OF 233.79 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 400.00 FEET AND A CENTRAL ANGLE OF 19°48'21", A DISTANCE OF 138.27 FEET (CHORD BEARS N80°43'04"E 137.58 FEET); THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S89°22'47"E A DISTANCE OF 220.22 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S04°05'51"W A DISTANCE OF 84.94 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S88°21'25"E A DISTANCE OF 29.12 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N84°12'24"E A DISTANCE OF 200.33 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N13°23'18"E A DISTANCE OF 18.04 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S79°22'12"E A DISTANCE OF 693.85 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S15°25'14"W A DISTANCE OF 81.35 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S72°50'58"E A DISTANCE OF 30.90 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S87°49'17"E A DISTANCE OF 164.69 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N47°19'34"E A DISTANCE OF 37.65 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S74°59'10"E A DISTANCE OF 294.83 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S08°06'53"E A DISTANCE OF 62.58 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S77°46'27"E A DISTANCE OF 150.75 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N14°20'16"E A DISTANCE OF 62.19 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S79°08'31"E A DISTANCE OF 369.05 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S18°40'31"E A DISTANCE OF 29.17 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S66°03'20"E A DISTANCE OF 143.01 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N25°40'28"E A DISTANCE OF 42.89 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S74°19'33"E A DISTANCE OF 339.00 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S76°23'22"E A DISTANCE OF 559.87 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 1190.00 FEET AND A CENTRAL ANGLE OF 53°10'47", A DISTANCE OF 1104.51 FEET (CHORD BEARS S48°18'54"E 1065.29 FEET); THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S21°43'32"E A DISTANCE OF 179.06 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S68°16'28"W A DISTANCE OF 31.36 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S23°26'58"E A DISTANCE OF 78.05 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N68°16'28"E A DISTANCE OF 29.01 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S21°43'32"E A DISTANCE OF 613.97 FEET; THENCE LEAVING SAID RIGHT-OF-WAY S62°49'19"W 292.63 FEET; THENCE ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 760.00 FEET AND A CENTRAL ANGLE OF 24°24'13", A DISTANCE OF 323.70 FEET (CHORD BEARS S75°01'26"W 321.26 FEET); THENCE S27°10'41"E 147.90 FEET; THENCE S62°49'19"W A DISTANCE OF 281.27 FEET; THENCE S16°27'24"E A DISTANCE OF 1206.11 FEET; THENCE N89°15'16"W A DISTANCE OF 3719.58 FEET; THENCE N01°13'52"E A DISTANCE OF 1360.08 FEET; THENCE N88°45'05"W A DISTANCE OF 1367.66 FEET; THENCE N01°04'56"E A DISTANCE OF 1369.90 FEET; TO THE POINT OF BEGINNING; SAID PARCEL CONTAINING 344.473 ACRES, MORE OR LESS.

616083 12/06/2002 01:20P B1414 P554 M ALSDORF
29 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

616083 12/06/2002 01:20P B1414 P555 M ALSDORF
30 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO



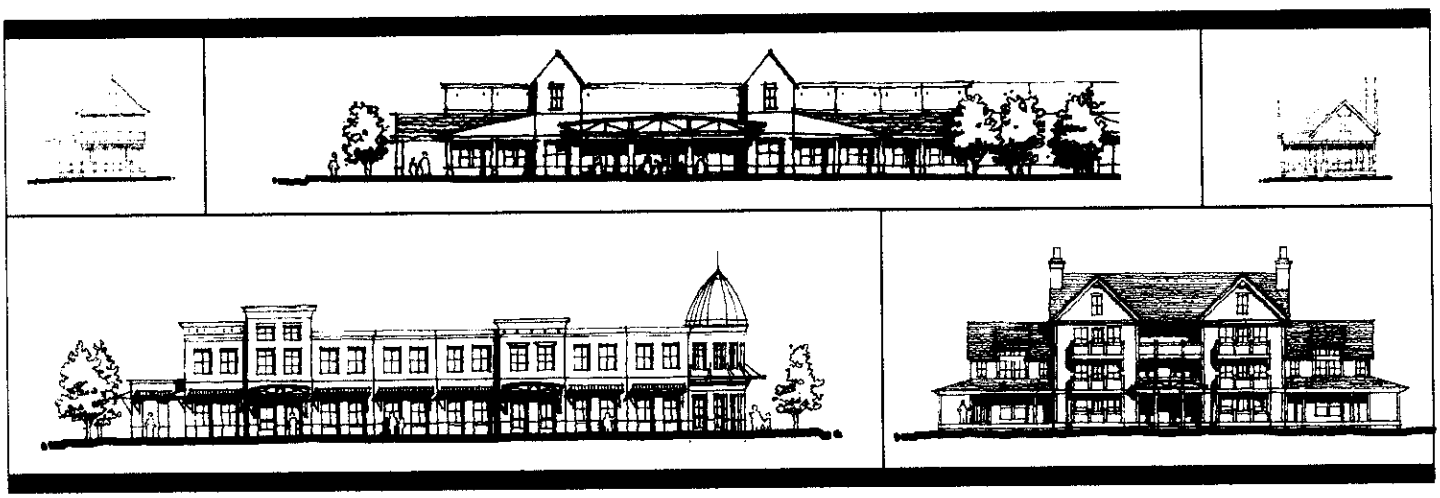
CLEANWOOD MEADOWS
ANNEXATION PARCEL MAP

HIGH COUNTRY ENGINEERING, INC.

616083 12/06/2002 01:20P B1414 P556 M ALSDORF
31 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

ZONING AND DEVELOPMENT PLAN

GLENWOOD MEADOWS



Glenwood Meadows, LLC

EXHIBIT "C"

I. INTRODUCTION....5
A. Project Background....5
B. Statement of Purpose and Intent....6
C. Relationship to Glenwood Springs Comprehensive Plan....7
II. AUTHORITY....8
III. ZONING MAP....9
IV. ZONING DISTRICTS....10
V. GENERAL DEVELOPMENT STANDARDS....11
A. General Intent....11
B. Applicability....11
C. Site Layout and Development Pattern....11
1. Intent....11
2. General....12
D. Building Design....12
1. Intent....12
2. Non-Residential....12
3. Residential....13
E. Building Materials....14
1. Intent....14
2. Non-Residential....14
3. Residential....15
F. Vehicular and Pedestrian Circulation and Access....15
1. Intent....15
2. Vehicle Access and Circulation....15
3. Pedestrian Access and Circulation....16
G. Parking....16
1. Intent....16
2. General....16
H. Landscaping and Screening....17
1. Intent....17
2. General....17
3. Streetscape Improvements....18
4. Site Furnishings....18
5. Parking Lot Landscaping....19
6. Retaining Walls....19
7. Detention/Retention Ponds/Debris Channels....20
8. Plant Materials....20
9. Landscape Requirements....20
I. Service Area and Mechanical/Utility Equipment Screening....20
1. Intent....20
2. Service Areas....20
3. Mechanical/Utility Equipment....21
J. Open Space and Parks....21
1. Intent....21
2. General....21
3. Non-Residential....22
4. Residential....22
K. Signage....23
1. Intent....23

616083 12/06/2002 01:20P B1414 P557 M ALSDORF
32 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

2. General 23
3. Freestanding Signs 24
4. Regulatory Signs 24
5. Building Mounted Signage 24
6. Colors and Materials 24
7. Informational/Directional 24
L. Lighting 25
1. Intent 25
2. General 25
VI. DEVELOPMENT STANDARDS: PARCEL "A", MIXED-USE CAMPUS (C-1) 26
A. General Intent 26
B. Applicability 26
C. Site Layout and Development Pattern 26
1. Intent 26
2. General 26
3. Landscaping 27
D. Building Design 27
1. Intent 27
2. General 27
3. Orientation 27
4. Transition 27
E. Mix of Uses 27
1. Intent 27
2. General 27
VII. DEVELOPMENT STANDARDS: PARCELS "C", "D", AND "H"-COMMERCIAL (C-1) 28
A. General Intent 28
B. Applicability 28
C. Site Layout and Development Pattern 28
1. Intent 28
2. General 29
D. Building Design 29
1. Intent 29
2. General 29
3. Large Format Commercial 30
VIII. DEVELOPMENT STANDARDS: PARCEL "E", "F", "G"-MIXED-USE (C-2) 31
A. General Intent 31
B. Applicability 32
C. Site Layout and Development Pattern 32
1. Intent 32
2. General 32
3. Mix of Uses 32
4. Location of Parking along Market Street and Wulfsohn Road 32
5. Building Setback from Market Street and Wulfsohn Road 33
6. Building Orientation 33
7. Sidewalk Width 33
D. Building Design 33
1. Intent 33
2. General 33
3. Building Height 34

616083 12/06/2002 01:20P B1414 P558 M ALSDORF
33 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

4. Façade Articulation 34
IX. DEVELOPMENT STANDARDS: PARCEL "I", HOSPITALITY (C-4) 35
A. General Intent 35
B. Site Layout and Development Pattern 35
1. Intent 35
2. General 36
3. Setbacks 36
4. Landscaping 36
5. Mix of Uses 36
6. Relationship to Community Center 36
7. Parking 36
C. Building Design 36
1. Intent 36
2. General 36
3. Building Height 36
X. DEVELOPMENT STANDARDS: PARCELS "B", "F", AND "G", RESIDENTIAL NEIGHBORHOODS (R-3) 37
A. General Intent 37
B. Applicability 37
C. Site Layout and Development Pattern 37
1. Intent 37
2. Mix of Housing Types 37
3. Block Layout 37
4. Lot Sizes 37
5. Setbacks 38
6. Site Grading 38
7. Site Layout 38
8. Development Transition 39
9. Community Amenities 39
10. Fencing 39
11. Storage of Personal Property 40
D. Parking 40
1. Intent 40
2. Location and Layout 41
E. Building Design 41
1. Intent 41
2. General 41
3. Architectural Detail 43
XI. PARCEL L: OPEN SPACE AND PARKS (HP) 43
A. General Intent 43
B. Applicability 43
C. Active Recreation 43
1. Intent 44
2. General 45
XII. APPENDIX 45
A. Plant list 45
1. Large Deciduous Trees 45
2. Ornamental Trees 45
3. Evergreen Trees 46
4. Semi-Evergreen and Broadleaf Evergreen Shrubs

616083 12/06/2002 01:20P B1414 P559 M ALSDORF
34 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

5. Evergreen Shrubs....46
6. Deciduous Shrubs....46
7. Perennials....47
B. Use table....48
XIII. DEFINITIONS....51

616083 12/06/2002 01:20P B1414 P560 M ALSDORF
35 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

616083 12/06/2002 01:20P B1414 P561 M ALSDORF
36 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

I. Introduction

A. PROJECT BACKGROUND

Glenwood Meadows is an approximately 345-acre parcel of unincorporated land surrounded on three sides by the municipal limits of Glenwood Springs, Colorado ("City"). The Midland Alternate Route, a 100 foot wide public right-of-way, serves as the northern border to the site and two new City facilities are under construction on the east and west ends; a new community center to the east of Glenwood Meadows and a municipal operations facility to the west of the site. While Red Mountain serves as a backdrop to the site on the south, it is not owned by or a part of the Glenwood Meadows' zoning application and development plan. The subject property, which is owned by Glenwood Meadows, L.L.C. was historically referred to as the "Wulfsohn" property.

Glenwood Meadows is situated west of the core of Downtown Glenwood Springs and directly across the Colorado River from the significant neighborhoods and commercial operations of West Glenwood. Glenwood Meadows and the City's Community Center are highly visible from Interstate 70, the primary entry point to the City from both the east and the west. Despite its juxtaposition with the City, Exit 114 to Interstate 70, the Midland Alternate Route and the two City facilities mentioned, Glenwood Meadows currently resides in the jurisdiction of Garfield County, Colorado. Prior to the completion of the Midland Alternate Route and the City's adoption of its Land Use Plan, annexation of the land was not feasible.

When the oil shale industry collapsed in the early 1980's, the then owner of the site, Union Oil Company, considered various development options. In the mid-1980s, Union Oil Company and the City of Glenwood embarked on negotiations for the joint development of the site as a municipal golf course, residential and commercial venture. The efforts failed, as did two subsequent attempts to pass open space and recreation tax measures aimed at the City's ability to purchase portions of the site.

In 1996, Glenwood Land Company, LLC purchased the property from the Union Oil Company. Approximately two years later Glenwood Meadows, LLC, the current owner of the property, acquired the land. Shortly thereafter, Glenwood Meadows undertook a land exchange with the City of Glenwood Springs, which provided the city with 37.24 acres for use as a Community Center. The city subsequently annexed the Community Center site and has provided a public access point to the property, which is currently under construction. This access point will be shared when the remaining property is developed. In early 2000, the City of Glenwood Springs and Glenwood Meadows undertook another land transaction by which the city acquired an additional 35.57 acres for development of a Municipal Operations Center (MOC). The MOC site was thereafter annexed and the City created a second public access point to Glenwood Meadows, which is also under construction. In addition to the City development of the MOC facility, the site west of Glenwood Meadows is also planned to provide the base operational facility for the newly organized Rural Transportation Authority ("RTA").

616083 12/06/2002 01:20P B1414 P562 M ALSDORF
37 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Regardless of how Glenwood Meadows is developed (i.e. for residential, commercial, mixed-use purposes, through the jurisdiction of either Garfield County or the City), Glenwood Meadows is entitled to use both City developed access points as well as two other access points along the Midland Route. Further, Glenwood Meadows has legal rights to utilize the City's municipal sewer and potable water systems.

For the past two years the City and Glenwood Meadows have mutually expressed their desire to annex the land to the City and to subject the property to stringent criteria which would result in the highest quality of future development specifically planned to address the present and future needs of the community as a whole. Through extensive discussions with City staff, it was determined that seeking "enhanced" traditional zoning for the property (traditional zoning with additional development standards and more restrictive uses) would be a more effective tool than the P.U.D. process to achieve the highest quality of future development. This decision was based on the fact that through the traditional zoning process; additional development standards and use restrictions could be applied to traditional zone districts in order to achieve a high level of development quality without the unnecessary analytical and administrative confusion of a cumbersome P.U.D. process. This Zoning Plan, together with the associated Annexation and Development Agreement and the additional information provided represents the culmination of these efforts.

B. STATEMENT OF PURPOSE AND INTENT

This Zoning Plan is intended to serve as a supporting document for the accompanying Annexation Agreement in order to establish appropriate zoning for the 12 individual development parcels within the overall site. In addition, the Zoning Plan establishes standards for the property to ensure that future planning and construction quality remains high, regardless of the phasing of development on different parcels. The following goals serve as the basis for this Zoning Plan and development standards. The goals were identified during an unprecedented and invaluable public hearing process, through community meetings dating back to the original adoption of the City's Comprehensive and Land Use Plans, during work sessions with City staff, citizen committees, the Planning Commission, and City Council members as items to be addressed by this Zoning Plan.

Land Use

- *Promote Glenwood Springs as the governmental hub and the local/tourism service center of the Roaring Fork and Colorado River Valleys.*
- *Establish Glenwood Meadows not as a development, but as a new Glenwood Springs neighborhood with housing opportunities, jobs, shopping, hospitality, and recreation.*
- *Enhance the City's Community Center project through placement of adjacent zoning for uses that include active and passive open areas as well as for tourism and hospitality.*

Development Quality

- *Preserve, maintain, and enhance the visual qualities of the west entrance to Glenwood Springs.*
- *Focus neighborhood retail around pedestrian-oriented streets to break up larger commercial uses.*
- *Provide development standards that supplement from the City's standard development regulations, encouraging creative, quality design.*

Housing

- *Provide a mix of housing types and densities within the Glenwood Meadows neighborhood.*

Open Space and Natural Amenities

- *Balance the quantity of development on the site with the natural characteristics of the site.*
- *Maximize dedicated open space and integrate open space corridors throughout the Glenwood Meadows neighborhood, minimizing impacts to existing site vegetation.*

616083 12/06/2002 01:20P B1414 P563 M ALSDORF
38 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Transportation

- *Encourage the allocation of future traffic west of the core Downtown and provide a West Glenwood mass transit option.*
- *Promote directed investment, through any development, aimed at the restoration and enhancement of the City's transportation infrastructure through adoption of an Off-Site Transportation Improvements Fee Program.*

C. RELATIONSHIP TO GLENWOOD SPRINGS COMPREHENSIVE PLAN

Vision

The Glenwood Springs Comprehensive Plan provides the community with a tool for managing its long-term growth and character. Ensuring that the goals and ideals of the Comprehensive Plan were addressed was a critical component of this zoning plan. The following excerpt from the City's Vision Statement outlined in the Comprehensive Plan echoes the overall development vision for Glenwood Meadows.

> *"The City of Glenwood Springs desires to maintain its small town character and preserve its cultural and natural resources...to achieve directed and balanced development, social and economic diversity and address its transportation needs."*

Maintaining Small Town Character

Today, the City consists of a series of individual neighborhoods. While these neighborhoods vary in their size, appearance, and mix of uses, they all function as part of the greater community; each providing different types of housing, shops, employment, and recreational opportunities. This proposed zoning plan focuses on establishing Glenwood Meadows as a new and independent neighborhood that contributes to the small-town character of Glenwood Springs and community need for housing and commercial services. Keeping this appealing character and scale in mind, the plan is focused around a central retail core designed to invoke an intimate, pedestrian-oriented feeling enhanced by plazas, seating areas, and public art. These smaller retail uses will flank the center's two regional commercial anchors along Market Street and Wulfsohn Road, helping to create a more inviting and active space. Other spaces along Wulfsohn will provide offices and additional neighborhood-type retail to serve the adjacent neighborhoods, which will provide a variety of housing types and prices, ranging from apartments to town homes, duplexes, and single-family homes. The plan has been designed so that none of the residences are located farther than ¼ mile away from the retail core, which will give the neighborhood a friendly, walk able scale similar to that found in many of Glenwood's existing neighborhoods. A small employment campus will also contribute to the "small town" feeling of the neighborhood, providing the opportunity for individuals to live near their jobs, reducing commute time and local traffic. Hospitality uses are located across from the new Community Center where both will be easily accessed by adjoining neighborhoods and downtown. Each of the uses identified in the proposed zoning plan has been specified within the Land Use Plan as an appropriate "Regional Use", as designated for the Glenwood Meadows site.

Preserving Natural Resources

Another core community value that has been integrated into the development plan is the careful treatment of the site's natural resources. In fact, approximately 215 acres, or +/- 62 percent of the site will be dedicated as open space and parkland, providing recreational opportunities, such as hiking trails or a public golf venue. The public dedication of this significant parcel of land is specifically designed to provide direct public access to the area through sections of major contiguity with existing publicly owned property at the Community Center and MOC sites. The dedication land

616083 12/06/2002 01:20P B1414 P564 M ALSDORF
39 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

also specifically provides direct connection to the surrounding BLM land adjacent to it in compliance with the direction of the Glenwood Springs Comprehensive Plan.

The site's topography and dramatic Red Mountain backdrop make it highly visible from major roadways, such as I-70, State Highway 6&24 and the Midland Alternate Route as each enters Glenwood Springs from the east and west. Glenwood Meadows is also visible from other areas of Glenwood Springs where a higher elevation provides a birds-eye vantage of the site. A thick Gambel Oak stand, which blankets the upper 2/3's of the site providing scenic value and wildlife habitat, is another of the site's significant natural features. Each of these factors was given strong consideration in the development of the proposed zoning plan. As a result, the residential neighborhoods at the southern edge of the site have been focused below the 6000-foot Urban Development Boundary contour. Not only does this protect the scenic quality of the site, but also leaves much of the Gambel Oak stand intact.

Addressing Transportation Needs

Transportation is another component of the Land Use Plan that was an important consideration during the development of the zoning plan. The plan strives to provide a mix of uses within a walk able proximity of one another to minimize short automobile trips. However, it is acknowledged that some uses, such as the retail and employment components will draw from a more regional customer base, generating additional trips along the Midland Alternate Route. Perhaps more significant, though, is that the location of the site on the western fringe of Glenwood Springs will be serving a market that currently must travel through downtown along the often congested Grand Avenue to reach similar uses on the south side of town, or even further south in neighboring communities, potentially minimizing the need for many of these cross-town trips. The project will provide funding for several necessary road improvements along the Midland Alternate Route that will result in improved future traffic conditions. The specifics of this are addressed in the Annexation Agreement. With these proposed road improvements, an efficient traffic flow would be maintained. In addition, the compact form of the development plan was conceived with the intention of being able to efficiently incorporate future bus service and future regional rail connections into the community. The plan provides the flexibility, not to exceed 2.5 acres, at the west end of Parcel A for the construction of a park and ride/transit facility. The park and ride would be complemented by the site's retail uses and the potential for limited shared parking where appropriate.

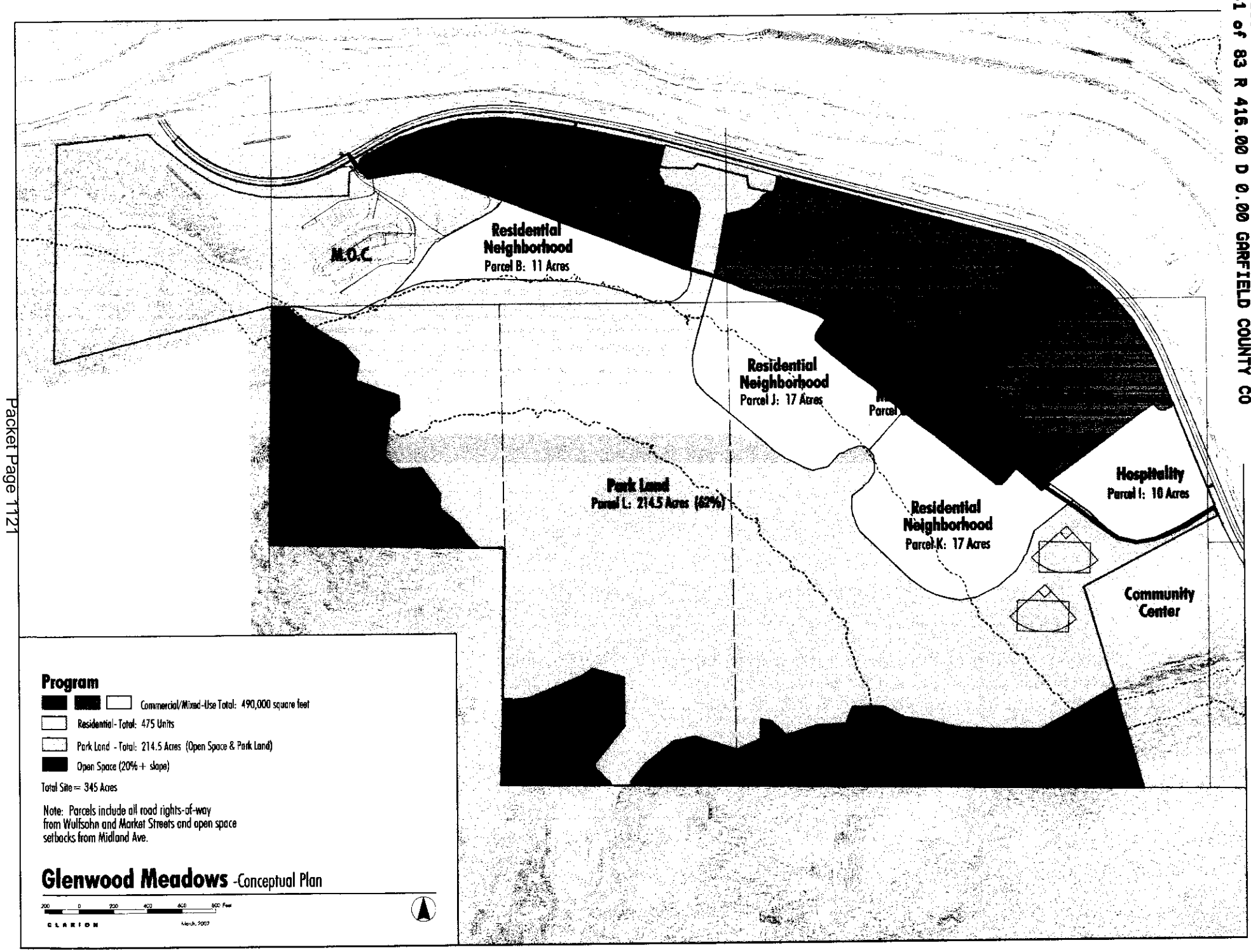
II. Authority

These standards shall apply to all property contained within the approved Glenwood Meadows Annexation Plat and the Annexation Agreement. The regulations and requirements shall become the governing standards for review, approval, and modification of all development activities occurring on the Glenwood Meadows site. Provisions of this guide shall prevail and govern the development of Glenwood Meadows superseding existing zoning ordinances. The proposed zoning regulations and design standards are intended to be more restrictive than the underlying Municipal Code standards. The Glenwood Springs zoning ordinance shall apply where the provisions of this guide do not address a specific subject.

616083 12/06/2002 01:20P B1414 P565 M ALSDORF
40 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

III. Zoning Map

616083 12/06/2002 01:20P B1414 P566 M ALSDORF
41 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO



616083 12/06/2002 01:20P B1414 P567 M ALSDORF
42 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

IV. Zoning Districts

There are 12 distinct parcels within Glenwood Meadows. Each of these parcels falls within one of 5 zoning categories according to the City of Glenwood's Zoning Ordinance: Multi-family Residential District (R-3), Limited Commercial District (C-1), Core Commercial District (C-2), Resort District (C-4), and Hillside Preservation (HP). The actual boundaries of the parcels may be modified during the preliminary and final design of each area, prior to approval by the City. A table of prohibited uses for each zone district is provided in the Appendix of this document.

The following table provides a brief summary of each zoning category as it applies to individual parcels identified on the zoning map on the following page:

Parcel	Zoning	Acreage	Percentage
A (Mixed-Use Campus)	C-1	20	6%
B (Residential Neighborhood)	R-3	11	3.25%
C (Commercial)	C-1	11	3.25%
D (Commercial)	C-1	12	3%
E (Mixed-Use)	C-2	7.5	2%
F (Mixed-Use)	C-2	7	2%
G (Mixed-Use)	C-2	5	1.5%
H (Commercial)	C-1	13	4%
I (Hospitality)	C-4	10	3%
J (Residential Neighborhood)	R-3	17	5%
K (Residential Neighborhood)	R-3	17	5%
L (Open Space)	HP	214	62%
TOTAL:		345	
Residential Total: 475 units Commercial Total: 490,000 square feet			

*Acreages are subject to change upon completion of final legal descriptions.

*Parcels include all road-rights-of way and open space setbacks from Midland Avenue.

V. General Development Standards

A. GENERAL INTENT

The intent of these General Development Standards is to establish an indigenous style and high level of development quality for Glenwood Meadows that is derived from and builds upon established neighborhoods in Glenwood Springs. These standards set the framework for a new, mixed-use neighborhood that strives to incorporate the most desirable features of Glenwood's most appreciated areas, such as the downtown core and it's attractive, pedestrian-friendly residential neighborhoods. In order to identify these desirable features, existing neighborhoods and developments throughout Glenwood Springs and the Western Slope were evaluated and "dissected" for successful site and building design elements. The result of this evaluation are these standards for character defining features such as appropriate building mass, scale, and materials based on lessons learned, both positive and negative. The standards also establish a cohesive pedestrian and vehicular circulation network within and between neighborhoods, a unified landscape theme for streetscapes and common open space areas, and general standards for parking, and signage. These standards have been developed to provide an additional level of quality to Glenwood Meadows, not required within the City Code, and will be applied *in addition to* those existing standards.





B. APPLICABILITY

These General Development Standards shall apply to *all* development within Glenwood Meadows, including C-1 (Commercial), C-2 (Mixed Use), C-4 (Hospitality), and R-3 (Mixed-Use Campus and Residential Neighborhoods). *These standards shall be applied in addition to standards outlined in the City of Glenwood Springs Municipal Code.*

C. SITE LAYOUT AND DEVELOPMENT PATTERN

1. Intent

The intent of these standards is to ensure that all non-residential and residential development on the site works creatively within the site's natural constraints, such as slope, geologic hazards, and significant vegetation.

616083 12/06/2002 01:20P B1414 P568 M ALSDORF
43 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

2. General

a) The siting of all buildings shall respond to existing site features to minimize the need for retaining walls, excavation, and other unnecessary site disturbances. Non-residential zones are purposefully located near primary roads on land with lesser degrees of slope.



D. BUILDING DESIGN

1. Intent

These standards are intended to encourage creative, quality commercial and residential building design that utilizes a variety of design techniques to break up larger building masses and emphasizes a pedestrian orientation at the street level.

2. Non-Residential

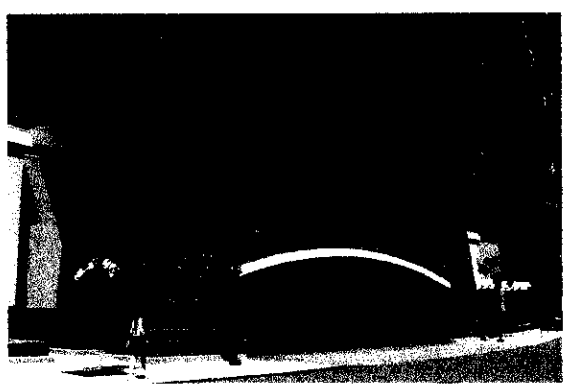
a) No single-user building footprint shall exceed a maximum of 130,000 square feet of enclosed floor area, nor shall the total useable area of any one user exceed 130,000 square feet.

b) Buildings shall have recessed, highly visible customer entrances that feature no less than 2 of the following:



(1) Canopies or porticos;
(2) Overhangs, recesses/projections;
(3) Arcades;
(4) Distinctive roof forms;
(5) Arches;
(6) Outdoor patios;
(7) Display windows;
(8) Planters or wing walls that incorporate landscaped areas and/or places for sitting.

c) For buildings less than 60,000 square feet, two or more of the following design elements shall be incorporated for each 30 horizontal feet of a building façade or wall. For buildings equal to and greater than 60,000 square feet, two or more of the following elements shall be incorporated for each 50 horizontal feet of a building façade or wall:



(1) Changes in color, texture, or materials;
(2) Projections, recesses, and reveals, expressing structural bays, entrances, or other aspects of the architecture with a minimum change of plane of 4-6 inches;
(3) Arcades or pergolas providing pedestrian interest;
(4) Trellises with vines, or
(5) An equivalent element that subdivides the wall into human scale proportions.

d) Building facades or walls that face public

616083 12/06/2002 01:20P B1414 P569 M ALSDORF
44 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO
Packet Page 1124

streets, adjacent developments, or connecting pedestrian frontage shall be subdivided and proportioned along 60% of their horizontal length using features such as:

(1) Windows;
(2) Entrances;
(3) Arcades;
(4) Awnings; or
(5) Other such features.

e) Parapet walls shall be incorporated when a flat roofline is required. The design or height of the parapet shall include a minimum of one change in setback or height along each 60 lineal feet of façade.

f) Sloping roofs shall have a minimum of one of following elements incorporated into their design for each 60 lineal feet of roof:

(1) Projecting gables;
(2) Hips;
(3) Horizontal/vertical breaks; or
(4) Other similar techniques.

g) Sloping roofs shall be integrated into the building architecture and shall be consistent with the characterized architectural style.

h) Sloping roofs shall be used at entries and other prominent features to add prominence. Other features intended to accent entries may be considered.

i) Intense, bright, or fluorescent colors shall not be used on any roof area visible from a public or private right-of-way or open space.

3. Residential



a) A building's special architectural features and treatments shall not be restricted to a single façade. All sides of a multi-family building open to view by the public, whether viewed from public or private property, shall display a similar level of quality and architectural interest.

b) All multi-family buildings shall be designed to provide complex massing configurations with a variety of different wall planes and roof planes. Plain, monolithic structures with long, monotonous, unbroken wall and roof plane surfaces are prohibited. At least every 50 linear feet, wall planes shall contain offsets or setbacks with a differential in horizontal plane of at least 5 feet.

c) The maximum length of a multi-family building shall be 125 feet.

d) All elevations on multi-family buildings shall contain windows.

An eave or overhang of at least 12-inches shall be provided on the perimeter of all residential buildings, except gable roof ends, where an 8-inch overhang shall be required.

For additional specificity, see Section X.

616083 12/06/2002 01:20P B1414 P570 M ALSDORF
45 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

E. BUILDING MATERIALS

1. Intent

The intent of these standards is to establish a palette of high-quality building materials to be used to add texture, color, and visual interest to the overall development.

2. Non-Residential

a) One or more of the following building materials shall be incorporated into a structure's design:

(1) Stucco;
(2) EIFS (Exterior Insulation and Finish Systems);
(3) Brick;
(4) Stone (cultured and natural);
(5) Tinted, textured and integral color masonry block.

b) Exterior building materials shall not include the following:

(1) Smooth-faced gray concrete block, painted concrete block, tilt-up concrete panels;
(2) Field-painted or pre-finished standard corrugated metal siding; or
(3) Standard single or double tee concrete systems.



c) Ribbed metal siding is prohibited as a primary exterior surface material. It may be used as trim material covering no more than 10% of the façade.

d) Exterior building material shall be continued down to within 9 inches of finished grade on any elevation.

e) High-intensity primary, metallic, or fluorescent colors are prohibited on any roof area visible from any public or private property.

f) All sloping roof areas with a pitch of 3:12 or greater, and visible from any public or private right-of-way, shall be surfaced with attractive and durable materials such as:

(1) Concrete, clay, or slate tiles; or
(2) Seamed architectural metals such as tin or copper; or
(3) Asphalt shingles.

616083 12/06/2002 01:20P B1414 P571 M ALSDORF
46 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

3. Residential

a) One or more of the following building materials shall be incorporated into a structure's design:

(1) Split shakes;
(2) Rough-sawn wood; or
(3) Board and batten wood.

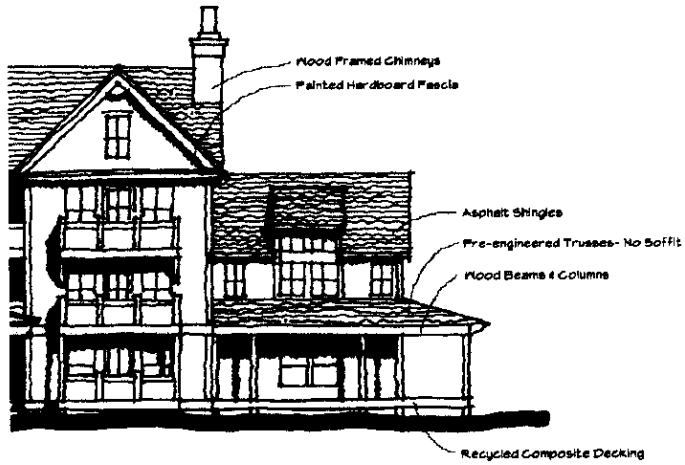
b) Exterior building materials shall not include the following:

(1) Concrete block (including split face and ground face block), or

c) High-intensity primary, metallic, or fluorescent colors are prohibited on any roof area visible from any public or private property.

d) All sloped roofs visible from the ground or from a surrounding property shall be clad with one of the following:

(1) High profile composition shingles; or
(2) Seamed architectural metals.



F. VEHICULAR AND PEDESTRIAN CIRCULATION AND ACCESS

1. Intent

The intent of these standards is to create a hierarchy of streets within Glenwood Meadows that efficiently facilitate traffic flow, yet are designed to discourage speeds and volumes that impede pedestrian activity.



2. Vehicle Access and Circulation

a) Traffic calming devices, such as bulb-outs or curb extensions, traffic calming circles, and narrower street widths shall be used in residential neighborhoods to discourage through traffic and excessive speeds.

b) To the maximum extent feasible, common or shared service and delivery access shall be provided between adjacent parcels and/or buildings.

c) Internal vehicle circulation patterns shall provide a clear and direct path to the principal entrance of the primary building, to outlying pad sites where applicable, and to each parking area.

d) Internal vehicle circulation patterns shall provide the most direct vehicular route(s) between the development site's main entrance and the primary building's main customer entrance.

e) Main drive aisles shall be continuous and connect to the main entrance to the development site.

616083 12/06/2002 01:20P B1414 P572 M ALSDORF
47 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

f) Internal intersections shall have adequate sight lines, design geometrics, and/or traffic controls to minimize accident potential.

3. Pedestrian Access and Circulation



a) Continuous sidewalks or trails shall provide connections to and between:
   (1) The primary entrance or entrances to each building, including pad site buildings;
   (2) All parking lots or parking structures that serve such buildings;
   (3) Any sidewalks or walkways on adjacent properties that extend to the boundaries shared with the development;
   (4) Any public sidewalk system along the perimeter streets adjacent to the development;
   (5) Adjoining land uses;
   (6) Any greenway on or adjacent to the property; and
   (7) Other community amenities or gathering spaces.

b) Covered shelters shall be provided at transit shuttle sites in locations as determined by the landowner and the City.

G. PARKING

1. Intent

The intent of these standards is to minimize the visual impacts of large blocks of parking, both from within the development and from other areas of Glenwood Springs that, because of their higher elevation, view Glenwood Meadows from above, by breaking it into a series of smaller "rooms". These rooms may be defined by landscaped medians, pedestrian walkways, or tree plantings.

2. General

a) Parking quantities shall be no less than current city requirements, unless specifically noted otherwise.

b) Structured parking is strongly encouraged. Incentives shall be provided to the maximum extent feasible.



c) To the maximum extent feasible, parking shall be distributed between the front, sides, and rear of a building to further break up large parking areas.

d) In addition to the above standard, the visual appearance of parking blocks shall be further mitigated through the establishment of a shady canopy created by orchard plantings or regularly spaced tree diamonds within each parking block.

e) The use of terracing to further break up parking areas is strongly encouraged where grade changes allow. Where terracing is utilized, the standards for retaining walls and

616083 12/06/2002 01:20P B1414 P573 M ALSDORF
48 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

terracing outlined in Section V.H.6, shall be applied.

f) The above standards shall be applied in addition to the standards outlined in Section V.H. Landscaping and Screening.

H. LANDSCAPING AND SCREENING

1. Intent



The intent of these standards is to provide a high quality appearance for building sites, rights-of-way, parks, and open spaces within Glenwood Meadows. These standards exceed City of Glenwood requirements in some cases in order to enhance the appearance and pedestrian-oriented feeling of all development in Glenwood Meadows. For instance, additional landscape coverage is required for parking areas in order to ensure that the visual impacts of parking on this highly visible site are adequately mitigated by generally improving the appearance of these areas from both within the site and from surrounding neighborhoods with a birds-eye view of Glenwood Meadows. In addition, the spacing of required street tree plantings are significantly smaller that those required in the City Code. This again, is in intended to further enhance the appearance of the overall project and to create an inviting environment for pedestrians.

2. General

a) All landscape areas shall comply with City of Glenwood Springs Municipal Code in addition to these regulations.

b) Landscape architectural design elements shall relate to the physical site and built structures. A combination of evergreen plantings and other landscape elements, as defined in Table 1-Landscape Requirements, shall be used to screen and buffer service areas, mechanical features and break up large lengths of building walls.

c) Unless prohibited by a particular site's geologic mitigation requirements, building foundations shall be planted with ornamental plant material, such as ornamental trees, flowering shrubs and perennials, and ground covers and shall include a variety of plant materials to provide year round interest.

d) Development entryways shall be planted with ornamental plant material, such as ornamental trees, flowering shrubs and perennials, and ground covers.

e) Planting shall be massed and scaled as appropriate for the entryway size and space.

f) Landscaping shall break down in scale and increase in detail, color, and variety to mark entryways into developments.

g) All turf areas within individual sites shall be established by sodding. Un-manicured natural areas may be seeded when adjacent to open space as a transition to turf areas.

h) Due to the site's soil conditions and the arid nature of the Glenwood climate, xeric or low-water plant materials shall be required.

i) The use of the following xeriscape principles shall be required:

616083 12/06/2002 01:20P B1414 P574 M ALSDORF
49 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

(1) Grouping plants with similar water requirements together;
(2) Utilizing mulch and soil amendment to reduce irrigation requirements;
(3) Utilizing drip irrigation where possible to minimize run-off from sprinklers; and
(4) Restricting the amount of water comsumptive sod.

i) Irrigation systems shall be professionally designed to limit water consumption. The use of moisture sensors to reduce water consumption shall be encouraged.

k) Each owner or owner's association shall be responsible for the maintenance and repair of all site landscaping, including common open space areas.

l) Landscaping and maintenance shall comply with the Glenwood Meadows Geotechnical Mitigation Requirement.

3. Streetscape Improvements

a) Landscaping, decorative paving, and/or other site amenities shall be required to promote and enhance a comfortable pedestrian scale and orientation of the property.



b) The property between curb and the adjacent property line shall be landscaped according to Table 1-Landscape Requirements or paved with decorative paving in heavily used pedestrian areas, such as Market Street and Wulfsohn Road, or be treated with some combination of the two alternatives. Approval of all paving materials shall be subject to review by the Architectural Review Committee.

c) Streetscape shall be developed in a consistent manner and be reviewed as part of the overall development permit, if areas within the pod are developed separately, the design shall be consistent with that previously approved.

d) Trees selected from the plant list in this document shall be required within the back of curb landscaping strip. Such trees shall be planted every 40 feet maximum on center or depending on species at some other distance to ensure their proper spacing so as to develop a continuous canopy when mature.

e) Streetscape plantings shall be provided according to Table 1-Landscape Requirements. Variations in the tree species used from street to street are encouraged to avoid creating monocultures of trees. Landscape in the right-of-way and on individual sites is subject to review by the City of Glenwood Springs and any Design Review Committee of an owner's association.

4. Site Furnishings

a) Site furnishings, including, but not limited to: benches, seating, trash receptacles, bike racks, lighting fixtures and tree grates shall be incorporated with the theme of the building's architecture. All materials shall be considered and approved by any Design Review Committee of an owner's association and be in conformance with the City of Glenwood Springs Standards and these regulations.

616083 12/06/2002 01:20P B1414 P575 M ALSDORF
50 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

5. Parking Lot Landscaping

a) For lots with less than 20 spaces, a minimum of 10 percent of the total uncovered parking area, including access ways, shall be devoted exclusively to landscaping. For lots with twenty or greater spaces, a minimum of 20 percent of the total uncovered parking area, including access ways, shall be devoted exclusively to landscaping.

b) Required parking area interior landscaping shall be distributed in such a configuration so as to divide groups of parking spaces. No grouping of parking spaces shall exceed 8 in a row.

c) Parking lot edges shall be screened from public streets and sidewalks, public open space, and adjacent properties.

d) Landscaped islands shall be planted with ground cover or sod and a minimum of 2 deciduous trees (minimum caliper of 3 inches) per 200 square feet of landscaped island area.

e) Where a landscaped setback of at least 25 feet is not present, the perimeter of all parking lots shall be screened from adjacent streets, public sidewalks, and adjacent uses, with the exception of the area reserved as a site triangle at intersections, by either of the following methods:

(1) A berm 3 feet high with a maximum slope of 2:1 in combination with coniferous and deciduous trees and shrubs, as specified in table V.H.9.a, or

(2) A low continuous landscaped hedge at least 3 feet high consisting of a double row of shrubs planted 3 feet on center in a triangular pattern; or

(3) A low decorative masonry wall at least 3 feet high in combination with landscaping; or

(4) A combination of any of these methods.

f) Non-living ground cover, such as wood, bark, and rock mulches, decorative stone, brick or concrete paving, shall not exceed 20 percent of the required landscaped area.

6. Retaining Walls

a) Use of designed retaining walls shall be encouraged to reduce the slope and to provide planting pockets or terraces for revegetation and landscaping.

b) Retaining walls may be permitted to support slopes but shall not exceed 10 feet in height in commercial areas or 6 feet in height in residential areas from the finished grade without stepping back a minimum of 3 feet between walls to create a terraced effect.

c) No more than three tiers of retaining walls, as described above, shall be permitted to create terracing on a slope. Terraces created between retaining walls shall be permanently landscaped or revegetated and shall not exceed a 2:1 slope.



d) Retaining walls shall be constructed of or faced with stone or earth-colored materials, or a material compatible with the primary building materials. Railroad ties, timber, and gabion-type retaining walls are prohibited. Retaining walls shall not exceed 50 feet in length without providing an offset at least 12 inches.

e) All exposed retaining walls shall be textured or colored.

616083 12/06/2002 01:20P B1414 P576 M ALSDORF
51 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

7. Detention/Retention Ponds/Debris Channels

a) Detention/retention ponds and debris channels shall be visually integrated into the surrounding landscape.

b) Embankment slopes shall not exceed a 2:1 ratio.

8. Plant Materials

a) To meet the above standards, Plant Materials shall be chosen from the Plant List provided in the Appendix of this document. Xeric or low-water plant materials shall be utilized to the maximum extent feasible.

9. Landscape Requirements

a) For the purposes of meeting the requirements in the table below, appropriate screening shall mean plant material, a low wall, or combination to provide an opaque barrier between the street and the adjoining use to be screened.

Use	Residential Neighborhood	Mixed-Use	Commercial	Hospitality	Mixed-Use Campus
Required Open Space	40%	15%	15%	30%	30%
Open Space Planting	▪ 1 tree/1200 s.f. ▪ 4-shrubs/1200 s.f.	▪ 1 tree/500 s.f. ▪ 4-shrubs/500 s.f.	▪ 1 tree/1000 s.f. ▪ 4-shrubs/1000 s.f.	▪ 1 tree/1000 s.f. ▪ 4-shrubs/1000 s.f.	▪ 1 tree/1000 s.f. ▪ 4-shrubs/1000 s.f.
Setbacks Buffers Screens	▪ 1 tree/25 l.f. ▪ 1/3 deciduous 2/3 evergreen ▪ 10 shrubs/25 l.f	▪ 1 tree/25 l.f. ▪ 1/3 deciduous 2/3 evergreen ▪ 10 shrubs/25 l.f	▪ 1 tree/25 l.f. ▪ 1/3 deciduous 2/3 evergreen ▪ 10 shrubs/25 l.f	▪ 1 tree/25 l.f. ▪ 1/3 deciduous 2/3 evergreen ▪ 10 shrubs/25 l.f	▪ 1 tree/25 l.f. ▪ 1/3 deciduous 2/3 evergreen ▪ 10 shrubs/25 l.f
Midland Avenue ROW	N/A	▪ 1tree/40 l.f. ▪ Irregular spacing	▪ 1tree/40 l.f. ▪ Irregular spacing	▪ 1tree/40 l.f. ▪ Irregular spacing	▪ 1tree/40 l.f. ▪ Irregular spacing
Wulfson Road ROW	▪ 1tree/35 l.f. ▪ Irregular spacing	▪ 1tree/35 l.f. ▪ Regular spacing	▪ 1tree/35 l.f. ▪ Irregular spacing	▪ 1tree/35 l.f. ▪ Irregular spacing	▪ 1tree/35 l.f. ▪ Irregular spacing
Internal Neighborhood Streets	1 deciduous tree/35 l.f. Evenly spaced	▪ 1 deciduous tree/40 l.f. Evenly spaced	▪ 1 deciduous tree/35 l.f.	▪ 1 deciduous tree/35 l.f.	▪ 1 deciduous tree/35 l.f.

Table 1—Landscape Requirements

I. SERVICE AREA AND MECHANICAL/UTILITY EQUIPMENT SCREENING

1. Intent

The intent of these standards is to minimize the visual and noise impacts created by service areas and mechanical equipment on surrounding uses and neighborhoods from public rights-of-way, surrounding high elevation neighborhoods, and adjacent uses within Glenwood Meadows.

2. Service Areas

a) No areas for outdoor storage, trash collection or compaction, loading, or other such uses shall be located within 20 feet of any public street, public sidewalk, or internal pedestrian

616083 12/06/2002 01:20P B1414 P577 M ALSDORF
52 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

walkway.

b) Loading docks, truck parking, outdoor storage, trash collection, trash compaction, and other service functions shall be incorporated into the overall design of the building and landscaping so that the visual and acoustic impacts of these functions are fully contained and out of view from adjacent properties and public streets.

c) Screening materials shall be the same as, or of equal quality to, the materials used for the primary building and landscaping.

3. Mechanical/Utility Equipment

a) Mechanical/utility screening shall be an integral part of the building structure and architecture and not give the appearance of being "tacked on" to the exterior surfaces.

b) All mechanical, electrical, and communications equipment, including but not limited to air-conditioning, heating and soft water tanks, television antennas, satellite dishes, security apparatus, transformers, electric and gas meters, shall be integrated into the building design, screened from public view, or when appropriate, enclosed in a suitable structure.

c) Roof-mounted equipment shall be contained within a completely enclosed structure. Such structure shall be an integral part of the building's architectural design and shall use materials compatible with those used on the façade of the building. However, if it can be demonstrated that the roof mounted equipment shall be screened or shall be placed such that the equipment can not be viewed or silhouetted in profile from public vantage points and neighboring properties, this may be considered as an alternative by the City.

d) Roof mounted equipment shall be clustered to the maximum extent feasible.

e) Roof mounted equipment shall utilize neutral colors and/ or materials that are compatible with adjacent natural or constructed colors.

f) A decorative wall constructed of materials compatible with the overall architectural design of the development and softened with landscaping shall screen ground-mounted equipment.

J. OPEN SPACE AND PARKS

1. Intent

The intent of these standards is to provide an interconnected network of open spaces and parks within non-residential and residential areas of Glenwood Meadows as well as to provide a high level of visual interest and a variety of recreational and leisure opportunities within a short walk of each residence in Glenwood Meadows.

2. General

a) Open spaces and parks within Glenwood Meadows shall include traditional, urban gathering spaces such as a village green, plaza, or town square in addition to a network of pathways and informal trails that help integrate the built environment of the neighborhood with adjacent open space and the natural environment. Appropriate locations for the above amenities shall be determined in part by the type of use they are integrated with.

b) Existing trees and vegetation shall be preserved whenever possible to act as buffers between adjoining developments and as site amenities within the neighborhood.

616083 12/06/2002 01:20P B1414 P578 M ALSDORF
53 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

3. Non-Residential

a) Outdoor Spaces

(1) Pedestrian-oriented outdoor spaces shall be placed near activity generating uses, such as street corners, shops, stores, offices, day care, and dwellings.

(2) To the maximum extent feasible, outdoor spaces shall be linked and visible from streets and sidewalks.

(3) Sculpture, fountains, kiosks, or shelters shall be prominently placed in outdoor spaces.

(4) In developments with multiple buildings, outdoor spaces and landscaped areas shall be integrated into an overall open space system in conjunction with streets and connections and not merely assembled from residual land remaining after buildings and parking lots have been sited.



b) Community Amenities

(1) A minimum of 1,000 s.f. of community amenities, open areas, and public gathering places per 50,000 s.f. of Commercial building area or a percentage thereof. This shall be considered a component of the landscape requirements as referenced in Section H.9.Community amenities may consist of any of the following:

(a) Patio or plaza with seating area;
(b) Mini-parks, squares, or village greens;
(c) Water feature,
(d) Clock tower;
(e) Public art;
(f) Any other, similar deliberately shaped area and/or focal feature that, in the City's judgment, adequately enhances such community and serves as a gathering place.

(2) All community amenities within a commercial development shall be an integral part of the overall design and within easy walking distance of major buildings, major tenants, and any transit stops.

4. Residential

a) Common Open Space

(1) Common open space shall be organized to create integrated systems of open space that connect with the following types of lands located within or adjacent to the development:

(a) Dedicated public park or greenway lands;
(b) Other dedicated open spaces;
(c) Common open space located within or adjacent to the development;
(d) Portions of the trail and open space system;
(e) Neighborhood retail and commercial centers; and
(f) Adjacent employment centers.

Common open space with pedestrian access shall be reasonably accessible to all of the residents of the Glenwood Meadows:

616083 12/06/2002 01:20P B1414 P579 M ALSDORF
54 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

(2) Where provided, access to common open space shall be a minimum of six feet wide and shall be located where such access is visible to dwelling units and shall not be isolated by walls, screening, landscaping, or any other kind of barrier that would prevent resident surveillance of the open space.

(3) If an applicant constructs recreational facilities in the common open space as a community amenity, such recreational facilities shall be constructed in accordance with applicable city standards regarding, but not limited to, size, siting, use, materials, and similar matters.

(4) Where common open space is bordered by private rear or side yards, opaque fences and walls shall not be erected in such yards bordering the open space. Open style fences, with a maximum 50% opacity (e.g., post and rail), shall be allowed on the perimeter of open space.

b) Parks

(1) One neighborhood park shall be provided within each residentially zoned parcel or "neighborhood". Each park shall be at least 1acre in size.

(2) Each neighborhood park shall be located where the network of local streets provides access and where direct pedestrian and bicycle access are provided from adjacent uses.

(3) Neighborhood parks shall be located in a visible, secure setting that is easily observed from streets. Rear facades of multi-family dwellings that do not contain building entrances shall not abut more than two sides of the park's perimeter.

(4) Each neighborhood park shall contain one or more of the following features:

(a) Multi-use areas;
(b) Community gardens;
(c) Walking paths;
(d) Plazas;
(e) Pavilions;
(f) Picnic tables;
(g) Benches; or
(h) Other similar features for various age groups to enjoy.

K. SIGNAGE

1. Intent

The intent of these standards is to provide consistent, high quality signage for Glenwood Meadows. All signage must be reviewed and approved by the Architectural Review Committee prior to permit application and must conform to all City of Glenwood Springs standards.

2. General

a) Each building group, user, or tenant shall be allowed at least one sign on the primary storefront elevation, providing such signage meets these standards and does not exceed the ordinance and requirements of the City of Glenwood Springs.

b) Signage placed at locations other than site locations and/or storefront elevation (such as rear and side wall locations) shall be considered provided that the total square footage allowance of all signage does not exceed the total aggregate area allowed by requirements of the City of Glenwood Springs Code.

c) All attachment devices, wiring, clips, transformers, lamps, tubes, and other mechanisms for signs shall be concealed.

d) Permanent signage may be illuminated providing it is designed so the source is not visible.

616083 12/06/2002 01:20P B1414 P580 M ALSDORF
55 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

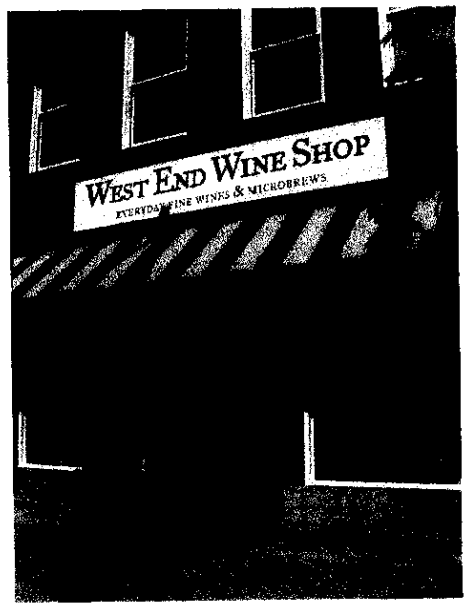
Individual internally lit channel letter signs or accent lighting, which is incorporated to enhance the signage, is acceptable. All signage lighting shall conform to lighting standards provided by the City of Glenwood Springs.

e) Each tenant shall provide signage at its expense and shall apply for and obtain their individual signage permits and approvals from the City of Glenwood Springs.

3. Freestanding Signs

a) No individual sign shall exceed 200 square feet in area nor shall the total sign area of any tenant exceed 600 square feet.

b) The placement of all signs shall be based on visibility and legibility. All freestanding identification signs shall be integrated into the surrounding landscape with good visibility to approaching vehicular traffic.



c) All freestanding signs shall be set back a minimum of 10 feet from the edge of curb and/or property line and six feet from all sidewalks.

d) Freestanding signs shall not be placed within the site triangle of an intersection as defined in the City of Glenwood Springs Code.

e) The information contained on freestanding identification signs shall be limited to company and corporate logos, and may include building names and addresses.

4. Regulatory Signs

a) The basic design and mounting heights of regulatory signs shall follow Federal Highway Administration standards.

5. Building Mounted Signage

a) Building mounted signage shall be allowed only for commercial developments for the specific purpose to provide identification to the tenant.

b) Signage style shall be as approved by the Architectural Review Committee.

6. Colors and Materials

a) The Architectural Review Committee shall consider all colors for approval.

7. Informational/Directional

a) Informational/directional signs shall be designed to conform to the proportions shown in these guidelines and shall not have a sign face which exceeds 20 square feet.

b) The number of informational/directional signs may vary by site, but shall be sufficient to accommodate both vehicular and pedestrian traffic.

c) Informational/directional signs for motorists shall be located between 100 and 200 feet from intersections.

d) Signs for pedestrians shall be placed at decision points in parking lots, in plazas, and where highly traveled walkways intersect.

616083 12/06/2002 01:20P B1414 P581 M ALSDORF
56 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

L. LIGHTING

1. Intent

The intent of these standards is to ensure that building, site, street, and signage lighting is sensitive to adjoining uses and is compatible with the overall development character in terms of scale and design.

2. General

a) All development shall by in compliance with the City of Glenwood Spring's Lighting Standards or comparable document as provided by the City.

816083 12/06/2002 01:20P B1414 P582 M ALSDORF
57 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

VI. Development Standards: Parcel "A", Mixed-Use Campus (C-1)



A. GENERAL INTENT

The intent of these standards, when combined with the General Development Standards, is to provide a framework for the development of a quality office and business park for Glenwood Springs. The Campus is envisioned to accommodate a variety of office, research and development activities in addition to complementary secondary uses such as restaurants, convenience shopping, childcare and housing. Additionally, the Campus is intended to function as an integral part of the overall Glenwood Meadows development, providing a range of employment opportunities for nearby residents.

B. APPLICABILITY

These standards shall apply to all development within Parcel "A", Mixed-Use Campus as defined on the accompanying Zoning Map. These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.

C. SITE LAYOUT AND DEVELOPMENT PATTERN

1. Intent

The intent of these standards is to encourage the creation of a park-like campus environment within the mixed-use campus zone and to ensure that non-residential uses within the mixed-use campus environment provide appropriate height and scale transitions to adjacent or adjoining residential uses.

2. General

a) All uses shall be carried out within completely enclosed buildings or structures, except for off-street parking and loading areas.

616083 12/06/2002 01:20P B1414 P583 M ALSDORF
58 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

3. Landscaping

a) All open space areas shall be landscaped according to Table 1-Landscape Requirements.

D. BUILDING DESIGN

1. Intent

The intent of these standards is to create a cohesive, office park environment through the use of common materials, architectural features, and colors.

2. General

a) See Section V. General Development Standards.

3. Orientation

a) Buildings shall be oriented towards the adjacent street or towards the center of a campus or park-like development block with an internal framework of outdoor spaces or connecting walkway.

4. Transition

a) Buildings abutting a residential area shall provide a gradual transition in height and scale to minimize conflicts between uses.

E. MIX OF USES

1. Intent

The intent of these standards is to provide general standards for appropriate percentages and locations of supporting uses within the mixed-use campus environment. Secondary uses are envisioned to include restaurants, convenience shopping, childcare, housing, or similar uses to complement primary office and research and development activities.

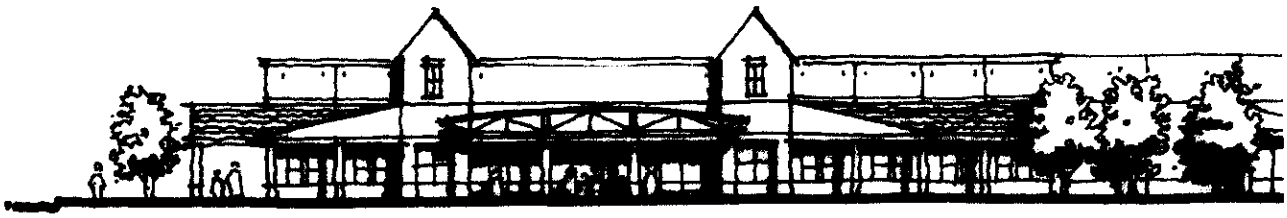
2. General

a) All supporting uses shall be visually and functionally integrated into an overall plan that emphasizes the primary uses of office and employment uses.

b) Retail uses shall not occupy more than 25 percent of the total gross area of the zone district.

616083 12/06/2002 01:20P B1414 P584 M ALSDORF
59 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

VII. Development Standards: Parcels "C", "D", and "H"-Commercial (C-2)



A. GENERAL INTENT

The intent of these standards is to achieve a high quality, pedestrian-friendly commercial core within Glenwood Meadows. This core will be anchored by large format retail anchors such as a grocery store and/or discount store and will be supplemented with a variety of smaller retail businesses. The purpose of this zone district is to serve both the needs of regional consumers for goods and services and the day-to-day needs of the surrounding residential neighborhoods in a functional and inviting environment that strays from the typical auto-oriented designs found in many commercial centers. The district is intended to function as an integrated center of activity within the overall Glenwood Meadows development through the establishment of clear pedestrian and vehicular circulation patterns and through transitions in the scale and character of development where they abut adjacent uses.

B. APPLICABILITY

These standards shall apply to all development within Parcels "C", "D", and "H", Commercial as defined on the accompanying Zoning Map. *These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.*

C. SITE LAYOUT AND DEVELOPMENT PATTERN

1. Intent

The intent of these standards is to ensure that primary and secondary retail uses utilize careful building placement and orientation to create and enhance an active, attractive, pedestrian environment within the commercial core of Glenwood Meadows. Primary Commercial Buildings will serve as "anchors" for the commercial and mixed-use zones. These larger uses will be flanked by a variety of supporting, pedestrian-oriented retail storefronts and secondary commercial uses located on pad sites. The siting and design of smaller retail stores, or "pads," can create a more inviting appearance along Midland Ave and with in the neighborhood by visibly reducing the project's scale and by expanding the range of activities and businesses found within the neighborhood. The location, orientation of the entry, and architecture of pad site buildings also provide opportunities to frame the entry into the neighborhood and contribute to the development's visual interest by placing storefront spaces closer to the street and creating a street scene. Accordingly, pad site structures shall be compatible with the main buildings on a commercial site. The layout of pad site buildings shall relate coherently to the public streets and surroundings (outward) as well as to the main center (inward), and specific siting decisions shall further the general intent of creating a "sense of place," focal points,

816083 12/06/2002 01:20P B1414 P585 M ALSDORF
60 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

community amenities, and arrival into the commercial center.

2. General

a) See Section V. General Development Standards.

b) Pad Sites The primary façade of a building located on a pad site, typically the façade containing the primary customer entrance, may be oriented in a variety of ways, including:

(1) Toward the primary access street;
(2) Toward an internal "main street";
(3) Framing a primary entrance to the development or center;
(4) Toward the side (especially when that side faces another pad site building); or
(5) Toward the interior of the center.

c) Regardless of primary orientation, all sides of a pad site building that directly face and have access to a public street shall contain a customer entrance.

d) Pad sites shall be clustered together to define street edges and entry points or to enclose and create community amenities and visual interest between buildings.

e) Wherever practicable, spaces between adjacent pad site buildings shall be improved to provide small pockets (preferably heavily landscaped) of customer parking, pedestrian connections, small-scale project amenities, or focal points. Examples include, without limitation:

(1) A landscaped pedestrian way linking customer entrances between two or more pad site buildings;
(2) A public seating or outdoor eating area;
(3) An area landscaped with living materials emphasizing 4-season colors, textures, and varieties; or
(4) Sculptures or fountains.

D. BUILDING DESIGN

1. Intent

The intent of these standards is to ensure that the design of buildings located in parcels "C", "D", and "H", present a cohesive appearance through the use of common materials, architectural features, and colors.

2. General

a) See Section V. General Development Standards.

b) Pad site buildings and other accessory uses shall incorporate a similar façade and building design as those on the primary commercial building(s) in the zone district, including:



616083 12/06/2002 01:20P B1414 P586 M ALSDORF
61 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

(1) Exterior building materials;
(2) Roofline or roof materials;
(3) Façade colors;
(4) Pedestrian entry locations and entryway architecture/design;
(5) Amounts of glazing on facades visible from public streets; and
(6) Other distinctive architectural features.

c) Pad site buildings and other accessory uses shall select their exterior building materials from the material palette used on the primary commercial building(s).

3. Large Format Commercial

a) Large format commercial buildings of 60,000 square feet or greater shall have a minimum of one side of the building "wrapped" with independent retail storefronts. Uses adjoining Market Street shall "wrap" the edge closest to the street to help establish a pedestrian-oriented environment and create a transition to the mixed-use zone along Market Street, as discussed in Section VIII.

616083 12/06/2002 01:20P B1414 P587 M ALSDORF
62 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

VIII. Development Standards: Parcel "E", "F", "G"-Mixed-Use (C-2)

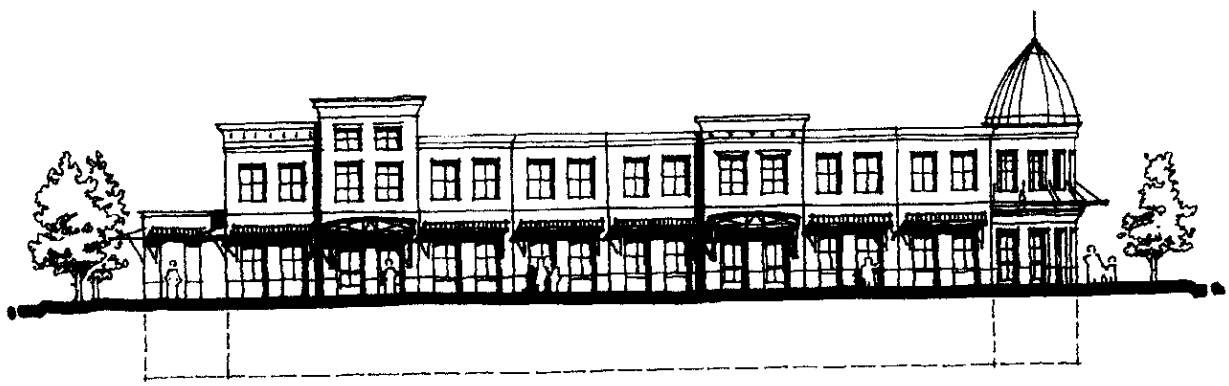
A. GENERAL INTENT

The intent of these standards is to create the framework for a pedestrian-oriented neighborhood retail street that will serve as the focal point for Glenwood Meadows. Oriented along a key connection between Midland Avenue and Wulfsohn Road, Market Street will be defined by a variety of smaller-scale retail shops and restaurants and will be designed with the pedestrian in mind. Storefronts will frame the broad sidewalk, while outdoor seating, landscaping, fountains, and other amenities will combine to create an inviting destination for nearby residents and retail customers alike. Diagonal parking will line either edge of the street, further enhancing the comfortable, pedestrian-oriented feeling by creating a buffer between outdoor activity and through traffic.



Market Street

Along the north side of Wulfsohn Road, bi-level structures will be used to help accommodate a transition in grade between larger commercial uses below and uses at grade with Wulfsohn Road. A variety of retail, offices and flex spaces, and upper-story residential will complement uses along Market Street and on the south side of Wulfsohn Road. Upper stories also help screen views from residential neighborhoods stepping up the hillside over large format uses below. Lower level uses will be oriented towards adjacent commercial and retail while primary uses located on the upper level along Wulfsohn Road will be oriented towards the street and the adjoining neighborhood. Buildings will be pulled up to the sidewalk to create a defined edge along the broad sidewalk. Off-street parking will be focused behind buildings to the extent feasible to enhance the pedestrian nature of the street and diagonal or parallel parking will be provided along Wulfsohn Road. Wulfsohn Road shall be designed to accommodate on-street bicycle circulation.



Wulfsohn Road

616083 12/06/2002 01:20P B1414 P588 M ALSDORF
83 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

On the south side of Wulfsohn Road, the zone takes on a more neighborhood-oriented character; with small-scale first floor retail uses lining the street and the opportunity for upper-story residences. The addition of residential uses within the zone would provide a transition between commercial uses to the north and residential neighborhoods to the south and provide attainable options within an already varied mix of housing products. This also provides opportunities for live/work units if desired and creates more of an active street environment. The pedestrian nature of the street along Wulfsohn Road provides opportunities for pedestrian-oriented uses such as sidewalk cafes.

B. APPLICABILITY

These standards shall apply to all development within Parcels "E", "F", and "G", Mixed-Use as defined on the accompanying Zoning Map. *These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.*

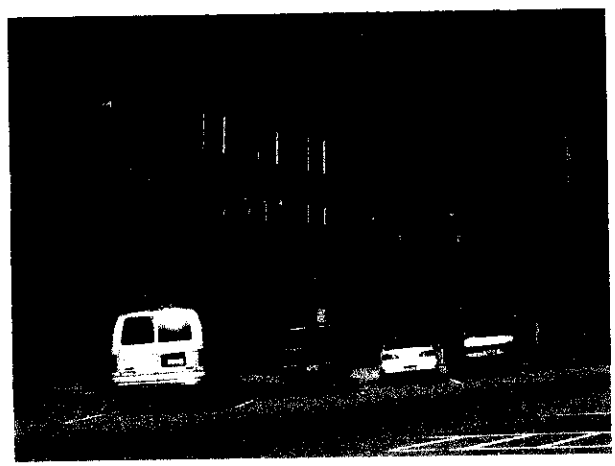
C. SITE LAYOUT AND DEVELOPMENT PATTERN

1. Intent

The intent of these standards is to ensure that building placement, setbacks, and orientation support the creation of a pedestrian scaled neighborhood retail street to serve as the retail core of the larger commercial development and Glenwood Meadows as a whole.

2. General

a) Compatible uses (i.e., office building and a movie theatre) shall explore opportunities for shared-use parking to minimize overall space requirements for parking.

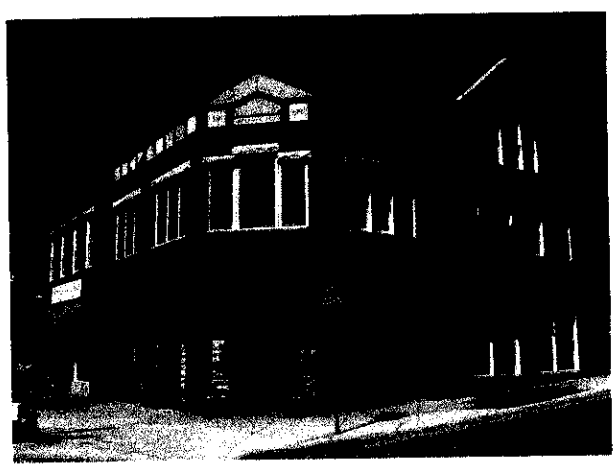


3. Mix of Uses

a) Each pod of development within the zone shall contain at least 2 of the following uses:

(1) Residential;
(2) Retail; or
(3) Office.

b) A minimum of 20 residential units shall be provided within the E, F and G mixed use parcels.

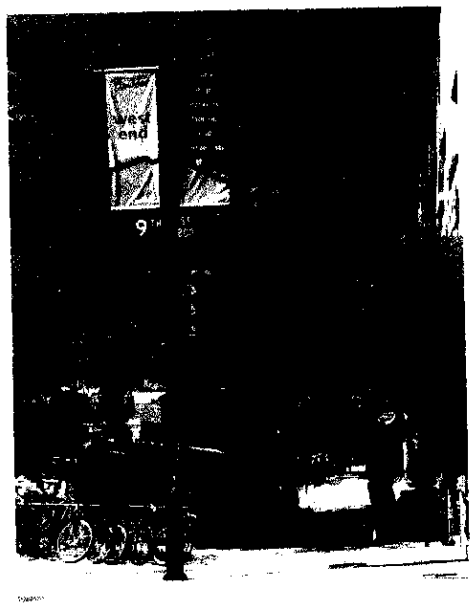


4. Location of Parking along Market Street and Wulfsohn Road

a) Parking shall be angled or parallel on-street parking.

b) Off-street parking shall not be permitted between buildings and either Market or Wulfsohn.

618083 12/06/2002 01:20P B1414 P589 M ALSDORF
64 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO



5. Building Setback from Market Street and Wulfsohn Road

a) There shall be no minimum front, rear, and side yard setbacks required to promote a more urban, pedestrian-oriented environment along the street, provided local building code requirements are met.

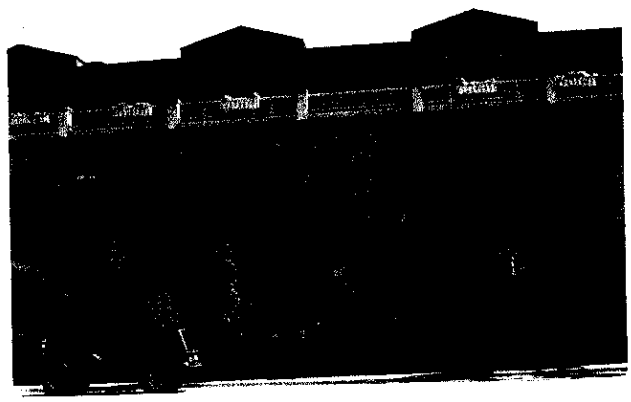
b) Should retail be constructed in phases, the front setback of later structures shall be built to equal the average setback of those structures already in place.

c) Buildings at the corners of Market Street and Wulfsohn Road shall be anchored, or brought up to meet the sidewalk edge and shall utilize a similar scale and massing as other buildings along the street edge.

6. Building Orientation

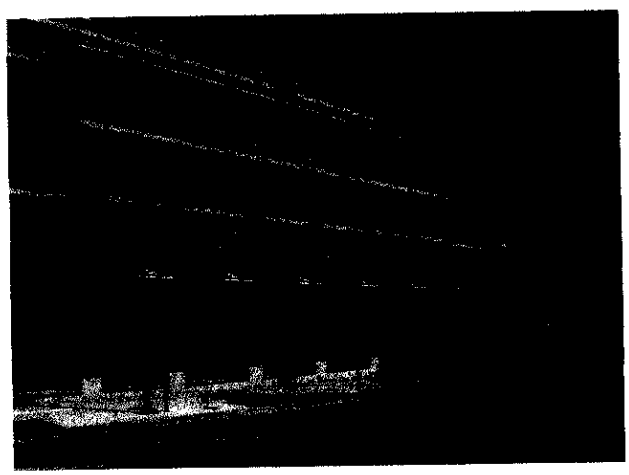
a) All buildings and building entries shall be oriented towards the primary street.

b) New buildings shall be aligned with existing buildings located across the intersecting streets to "complete" the space around the corner and create visual continuity.



7. Sidewalk Width

a) Sidewalk widths shall be a minimum of 10 feet along Market Street and Wulfsohn Road in order to provide ample space for outdoor seating and smooth pedestrian movement.



D. BUILDING DESIGN

1. Intent

The intent of these standards is to create a pedestrian-oriented feeling for the facades of retail establishments along Market Street and along Wulfsohn Road.

2. General

a) See Section V. General Development Standards.

616083 12/06/2002 01:20P B1414 P590 M ALSDORF
65 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO
Packet Page 1145

3. Building Height

a) Buildings shall be a minimum of 2 stories in height along the street edge. However, in order to create an active street environment along Market Street, especially at the intersection of Market St. and Midland Ave., portions of building or key buildings may be less than 2 stories if it can be demonstrated that the establishments add to the vitality of the street environment.

b) Along the north edge of Wulfsohn Road, buildings may need to be 3 stories in height to accommodate changes in grade and meet the above requirement.

4. Façade Articulation

a) One or more of the following design elements shall be incorporated for each 25 horizontal feet of a building façade or wall:

(1) Changes in color, texture, or materials;

(2) Projections, recesses, and reveals, expressing structural bays, entrances, or other aspects of the architecture with a minimum change of plane of 4-6 inches;

(3) Arcades or pergolas providing pedestrian interest.

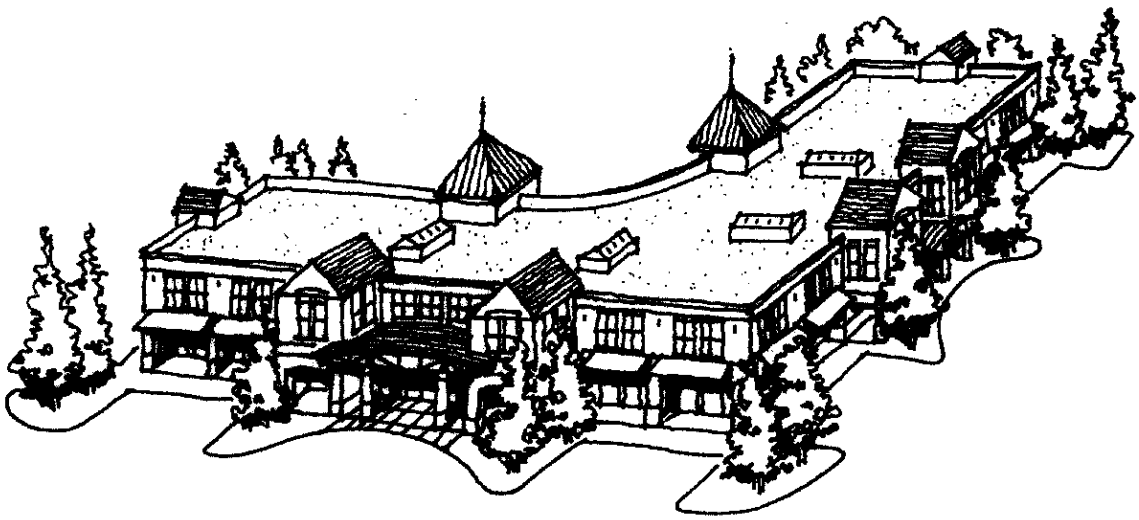
b) Retail storefronts shall consist of predominantly transparent display windows on the first floor sidewalk edge.

c) Darkly tinted glass or other opaque materials shall not be used in display windows.

d) Traditionally, windows in multi-story commercial buildings have a width to height ratio of one to two. Second story or upper story windows should generally be smaller than the storefront windows at ground level and shall be evenly spaced across all facades adjacent to the street.

616083 12/06/2002 01:20P B1414 P591 M ALSDORF
66 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

IX. Development Standards: Parcel "I", Hospitality (C-4)



A. GENERAL INTENT

The general intent of these standards is to create a full service hospitality site within Glenwood Meadows that accommodates a hotel with conference space or meeting rooms, a multi-screen movie theatre or other entertainment venue, such as a performing arts facility or outdoor amphitheater, visitor center, and/or a limited assortment of supporting retail uses such as restaurants or small stores, outdoor recreational opportunities, and the potential integration of a future park and ride and transit stop. The hospitality site is intended to function as more of a "campus" type environment, with more flexibility regarding the placement and relationship of uses as compared to the site's adjacent commercial areas based on the "campus" concept, meeting rooms or a separate dedicated facility on the site could serve as an extended learning facility or a business education and training facility. In addition to the adjacent commercial uses, all uses found on this site are also intended to complement the adjacent Community Center.

B. APPLICABILITY

These standards shall apply to all development within Parcel "I", Hospitality as defined on the accompanying Zoning Map. These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.

C. SITE LAYOUT AND DEVELOPMENT PATTERN

1. Intent

The intent of these standards are to ensure that the design of hospitality uses are compatible in terms of scale and mass with adjacent residential and commercial development and with the

616083 12/06/2002 01:20P B1414 P592 M ALSDORF
67 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Community Center.

2. General

a) Compatible uses (i.e., office building and a movie theatre) shall explore opportunities for shared-use parking to minimize overall space requirements for parking.

3. Setbacks

a) Minimum front yard setbacks shall be as follows:

(1) From Midland Avenue and Wulfsohn Road: 25 ft.

(2) From uses in ajacent commercial parcel: 20 ft.

b) There shall be no minimum side or rear yard setback to promote a more urban, pedestrian-oriented environment within the Hospitality zone district.

c) At the time of the development permit application, a build to line shall be established to create a strong relationship to Wulfsohn Road, the Community Center, and adjacent mixed-use structures. The location of this line may vary depending on the site layout concept.

4. Landscaping

a) All open space areas shall be landscaped according to Table 1-Landscape Requirements.

5. Mix of Uses

a) Retail uses shall be limited to 25% of the total square footage permitted within the zone district. For the purposes of this standard, a theater shall not be defined as a retail use.

6. Relationship to Community Center

a) All uses with frontage along Wulfsohn Road shall provide an entrance along that frontage.

7. Parking

a) Large areas of parking shall be distributed between at least two sides of the primary structure, with not more than 35% of the parking for the entire Hospitality parcel remaining between the principal building and Wulfsohn Road.

D. BUILDING DESIGN

1. Intent

The intent of these standards are to ensure that the design of full service hospitality uses are compatible in terms of scale and mass with adjacent residential and commercial development and with the Community Center.

2. General

a) See Section V. General Development Standards.

b) When public or semi-public spaces such as the hotel/motel lobby, restaurants, meeting rooms, and banquet-facilities are sited at ground level adjacent to a connecting pedestrian walkway, these spaces shall be accented with the use of glass and transparent materials between the height of 3 feet and 8 feet above the walkway or street grade.

3. Building Height

a) The maximum height of buildings shall not exceed 45 feet.

b) A variety of heights within the zone are encouraged. In addition, the use of height to create a focal point or prominent structure within the zone is also encouraged.

616083 12/06/2002 01:20P B1414 P593 M ALSDORF
68 of 83 R 415.00 D 0.00 GARFIELD COUNTY CO

X. Development Standards: Parcels "B", "F", and "G", Residential Neighborhoods (R-3)

A. GENERAL INTENT

The intent of these standards is to establish general criteria for the development of a series of compact residential neighborhoods that provide a range of housing types within a short walk of community amenities, such as parks and open space, retail and commercial services, and employment.

B. APPLICABILITY

These standards shall apply to all development within Parcels "B", "F", and "G", Residential Neighborhoods as defined on the accompanying Zoning Map. *These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.*

C. SITE LAYOUT AND DEVELOPMENT PATTERN

1. Intent

The intent of these standards is to ensure that residential neighborhoods within Glenwood Meadows provide a variety of housing types in a cohesive, pedestrian-oriented environment and provide appropriate transitions to adjacent non-residential uses and open space, and work with the more pronounced topographical features of the site.

2. Mix of Housing Types

a) A range of housing types is strongly encouraged to promote a diverse community of mixed ages, family-types and incomes. Out of the 475 approved residential units, a maximum of 300 apartments shall be provided.

3. Block Layout

a) Residential neighborhoods shall be designed in a pattern of blocks and interconnecting streets and/ or alleys, defined by buildings, streetscape, sidewalks, and trails.

b) The maximum block length for a block shall be 500 feet. Where mid-block pedestrian walkways are provided, blocks may be up to 800 feet.



4. Lot Sizes

a) Lot sizes shall be a minimum of 3000 square feet where permitted by Glenwood Springs Municipal Code.

5. Setbacks

a) Homes shall be setback a minimum of 20 feet from the front property line.

616083 12/06/2002 01:20P B1414 P594 M ALSDORF
69 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

6. Site Grading

a) The use of extensive grading or unusual site improvements to force a preconceived design onto a particular piece of property is strongly discouraged. Modifying the design of a multifamily development to fit the site generally results in a reduced potential for environmental problems and an improved level of visual interest and variety.

b) To the maximum extent feasible, the layout of residential developments shall follow and respect the natural topography of the site.

c) Berms, channels, swales, and similar man-made changes to the landscape shall be designed and graded to be an integral part of the natural landscape and to provide a smooth transition in changes of slope.

7. Site Layout

a) Each of the three residential parcels within the Glenwood Meadows shall be considered an individual "neighborhood". A mix of housing types is encouraged within each neighborhood.



b) Multifamily buildings shall be separated by common open space, public open space (e.g., a greenway), natural features located on the site (e.g., a stream corridor), or community amenities such as swimming pools or other recreational facilities.



c) To the maximum extent practicable, multi-family buildings shall be oriented or arranged in a manner to enclose common open spaces required above (*Common Open Space*). Such common open spaces should include gardens, courtyards, recreation, or play areas and shall contain at least 3 of the following features:

(1) Seasonal planting areas;
(2) Large, flowering trees;
(3) Seating;
(4) Pedestrian-scaled lighting;
(5) Gazebos or other decorative shelters;
(6) Play structures for children; or
(7) Natural features or areas.

8. Development Transition

a) When any portion of a building or structure within a multifamily development is located adjacent to property used or zoned for lower-density residential, the following standards shall apply to ensure the privacy of nearby residents:

(1) The developer shall site multifamily structures with either fewer units or structures with two-story "end" units adjacent to property zoned or used for single-family residential.

b) Accessory structures, including garages and recreational facilities, shall be set back at least

616083 12/06/2002 01:20P B1414 P595 M ALSDORF
70 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

5 feet from the adjacent residential property line or zoning district boundary, and the developer shall provide a buffer between the structure and adjacent property. The buffer may be a fence, wall, heavy landscaping, or combination thereof. Fences and walls used for buffer purposes shall be a maximum of 6 feet in height, with finished side facing out.

c) Residential neighborhoods adjacent to open space shall incorporate one or more of the following techniques to create a visual transition between development and surrounding open space:

(1) Staggering building setbacks to create a softer development edge.
(2) Establishing a landscape buffer along the rear or visible edge(s) of the property to create a soft visual edge to the development.
(3) Locating structures near or behind existing stands of significant trees or vegetation so that the cluster of vegetation provides a buffer between the development and the adjoining open space. When siting structures in such a manner, care should be taken to not disturb existing vegetation either during or following construction.
(4) Utilizing a variety of native plant species and planting forms similar to those found on the adjoing open space, to create the appearance of a natural transition in the landscape.

9. Community Amenities

a) All residential projects with more than 10 dwelling units shall reserve and develop internal open space/outdoor leisure space, at a minimum ratio of 200 s.f. per unit. These open spaces/outdoor leisure areas shall be improved with a variety of community amenities, including, but not limited to the following:

(1) Community Garden;
(2) Grove of trees;
(3) Village green;
(4) Pocket park;
(5) Swimming pool;
(6) Resident clubhouse;
(7) Tot lots;
(8) Basketball, volleyball, or other sport court; or
(9) Picnic areas.

b) To the maximum extent feasible, internal open spaces/outdoor leisure spaces as required above shall be consolidated to create larger common spaces for residents.

10. Fencing

a) Perimeter fencing shall be of an open style, such as 2, 3, or 4 rail, split rail, wood post, or other similar style characteristic of the area's rural heritage.

b) Consistent styles of fencing shall be used throughout the neighborhood in order to achieve a cohesive appearance.

11. Storage of Personal Property

a) Dedicated storage for Recreational Vehicles (RV's), snowmobiles, trailers, and other personal property, not including personal automobiles, shall be provided off-street. Such property shall not be stored within the public right-of-way.

b) Storage areas, as outlined above, shall be screened to minimize visibility from adjacent streets and property lines as follows:

616083 12/06/2002 01:20P B1414 P596 M ALSDORF
71 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

(1) One continuous row of evergreen trees (minimum of 6 feet tall) shall be planted with a minimum spacing of 10 feet on center; or

(2) One continuous row of evergreen shrubs (minimum of 5gallon in size) planted at a minimum spacing of 3 feet on center, and deciduous trees planted at an average of one tree every 15 linear feet.

D. PARKING

1. Intent

The intent of these standards is to ensure that garages and parking areas within Glenwood Meadow's residential neighborhoods are appropriately scaled and sited to minimize their visual impact upon the street.

2. Location and Layout

a) To the maximum extent feasible within slope constraints, garage entries, carports, parking areas, and parking structures shall be internalized in building groupings or oriented away from street frontage.

b) Parking areas and freestanding parking structures (detached garages or carports) shall not occupy more than 50% of each perimeter street frontage.

c) To the maximum extent practicable, freestanding parking structures (detached garages or carports) that are visible from perimeter public streets shall be sited perpendicular to the perimeter street in order to reduce visual impacts on the streetscape.

d) Carports shall be limited to 72 feet in length, with a maximum of 8 parking spaces per carport structure.

e) If a carport backs to the street, a landscape buffer shall be provided according to the requirements contained in Table 1-Landscape Requirements., within Section V.

f) A detached garage structure shall contain parking for no more than 8 cars.

g) No more than 2 detached garage structures or 2 carport structures shall be located adjacent to each other end to end.

h) The minimum separation between adjacent detached parking structures (detached garages or carports) shall be 10 feet, and such separation area shall be landscaped with at least 1 deciduous tree and ground cover or sod. A pedestrian access way may be included within the separation area.

616083 12/06/2002 01:20P B1414 P597 M ALSDORF
72 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

E. BUILDING DESIGN



1. Intent

These standards are intended to encourage a variety of residential building character within Glenwood Meadow's neighborhoods by encouraging the use of identifiable design features and detailing to emphasize the façade at the street and create visual interest.

2. General

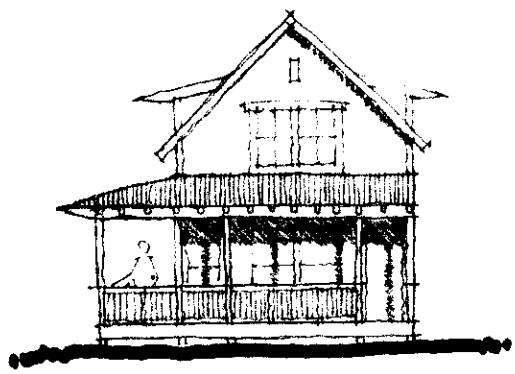
a) See Section V. General Development Standards.

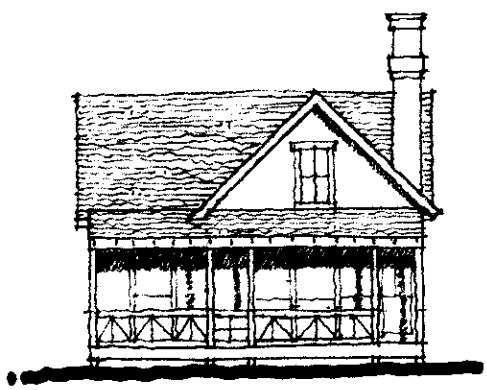
3. Architectural Detail

a) The incorporation of porches, balconies, and patios shall be strongly encouraged for all residential types.

b) Building entries shall be called out as a prominent streetscape feature for all residential types by extending the front of the main façade and emphasizing with materials and detailing.

c) Garages shall not be the prominent streetscape element. They shall be recessed and/or oriented towards the side or rear of the lot.





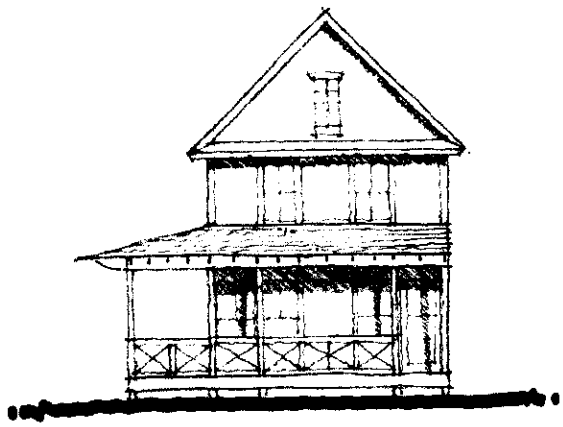
616083 12/06/2002 01:20P B1414 P598 M ALSDORF
73 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

d) The facades of single-family attached town homes shall be articulated to differentiate individual units.

e) All sides of a multi-family building shall display a similar level of quality and architectural interest. The majority of a building's architectural features and treatments shall not be restricted to a single façade.

f) Fronts of buildings shall be articulated through the use of bays, insets, balconies, porches, or stoops related to entrances and windows.

g) No more than 5 town home dwelling units shall be attached in any single row.



616083 12/06/2002 01:20P B1414 P599 M ALSDORF
74 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

XI. Parcel L: Open Space and Parks (HP)



A. GENERAL INTENT

The intent of these standards is to provide guidance for the range of appropriate uses that could occur within this portion of the Glenwood Meadow's site. The site is characterized by its dramatic views of Red Mountain, which frames the site on the south side, by its varied and sometimes dramatic topography, and by its lush stand of Gambel oaks. The site encompasses over 62% of the total area of Glenwood Meadows presents an opportunity to establish public open space for the neighborhood and for the larger Glenwood Spring's community that accommodates year-round active and passive recreational uses.

Many of the sites potential uses will vary from season to season, providing a range of activities for the community. For example, the north aspect of Red Mountain's slopes retain snow cover, creating a haven in its shadows for winter sports such as snow shoeing or cross-country skiing, while lower slopes with more solar exposure provide more opportunities for year-round activities such as hiking, biking, and possibly a golf course.

B. APPLICABILITY

These standards shall apply to all development within Parcels "L", Open Space and Parks as defined on the accompanying Zoning Map. *These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.*

C. ACTIVE RECREATION

1. Intent

The intent of these standards is to suggest a range of appropriate active recreational uses for particular areas of the site, based on its varying landscape characteristics, such as slope,

616083 12/06/2002 01:20P B1414 P600 M ALSDORF
75 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

vegetative cover, and proximity to the residential neighborhoods of Glenwood Meadows. As a general rule, more land intensive, active uses, such as a golf course or a community park shall be located adjacent to or be partially integrated with nearby residential neighborhoods. By locating active uses near developed areas, where slopes are typically between 10 and 20 percent, pedestrian access to the sites would be more easily facilitated and a wider range of uses could be accommodated. Steeper slopes located towards the base of Red Mountain can be utilized to accommodate multi-use trails with little disturbance to existing landforms or views of the site. All development on the site, regardless of its intensity or location, shall work with existing site features to minimize overall disturbance and visual impacts.

2. General

a) Appropriate uses shall include, but not be limited to the following:

(1) Hiking trails;
(2) Golf courses;
(3) Mountain bike trails;
(4) Cross-country skiing trails;
(5) Equestrian trails;
(6) Snow shoeing trails; or
(7) Neighborhood parks.

b) Any of the above uses, as well as any additional non-prohibited uses as identified in the Appendix-Prohibited Uses for Parcel L, shall be required to undergo a special use review prior to approval. Soft surfaced trails and debris flow mitigation structures shall be allowed uses, the design and location of which shall be approved by City staff.

c) The use of motorized recreational vehicles such as snowmobiles, motorcycles, or similar vehicles shall not be permitted.

d) All uses shall use all practical means of preserving natural grade, drainage patterns, soil cover, and vegetation.

e) All uses shall be designed to minimize visual disturbances and scarring to the site, as viewed from within the site, from surrounding developments, and from Interstate-70.

f) All uses shall preserve and integrate outstanding natural physical features such as hill and ridge crests, natural rock outcroppings, major tree belts, watercourses, and other physical features.

g) Public access points shall be provided from residential neighborhoods to adjoining open space. To the maximum extent feasible, access points shall be provided a minimum of every 500 feet.

616083 12/06/2002 01:20P B1414 P601 M ALSDORF
76 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

XII. Appendix

A. PLANT LIST

1. Large Deciduous Trees

a) Narrow leaf Cottonwood-Populus angustifolia
b) Cottonwood 'Siouxland'-Populus deltoides 'Siouxland'
c) Lanceleaf Cottonwood-Populus x acuminata
d) Norway Maple-Acer plantanoides
e) Red Maple-Acer rubrum
f) Northern Catalpa-Catalpa speciosa
g) Common Hackberry-Celtis occidentalis (spring planting)
h) American Ash-Fraxinus americana 'Autumn Purple'
i) Green Ash-Fraxinus pennsylvanica
j) Thornless Honeylocust 'Shademaster'-Gleditsia triacanthos inermis
k) Bur Oak- Quercus macrocarpa
l) English Oak-Quercus robur
m) American Linden-Tilia americana
n) Littleleaf Linden-Tilia cordata 'Greenspire'
o) Redmond Linden-Tilia x euchlora 'Redmond'
p) American Elm-Ulmus Americana

2. Ornamental Trees

a) Amur Maple-Acer ginnala
b) Thinleaf Alder-Alnus tenuifolia
c) Shadblow Serviceberry-Amelanchier canadensis
d) Rocky Mountain or water birch-Betula occidentalis
e) Cockspur Hawthorn-Crataegus crus-galli
f) Washington Hawthorn-Crataegus phaenophyrum
g) Quaking Aspen-populus tremuloidies
h) Newport Plum-Prunus cerasifera 'Newport'
i) Canadian Red Cherry-Prunus virginiana 'Shubert'
j) Callery Pear-Pyrus calleryana
k) Gambel Oak-Quercus gambelii

3. Evergreen Trees

a) Subalpine or Rocky Mountain Fir-Abies lasiocarpa

816083 12/06/2002 01:20P B1414 P602 M ALSDORF
77 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

b) Douglas Fir-Pseudotsuga menziesii glauca
c) Rocky Mountain Juniper-Juniperus scopulorum
d) Bristlecone Pine-Pinus aristata
e) Lodgepole Pine-Pinus contorta latifolia
f) Pinyon Pine-pinus edulis
g) Limber Pine-Pinus flexilis
h) Southwestern White Pine-Pinus flexilis reflexa
i) Austrian Pine-Pinus nigra
j) Ponderosa Pine-Pinus ponderosa
k) Scotch Pine-Pinus sylvestris
l) Engelmann Spruce-Picea engelmannii
m) Black Hills Spruce-Picea glauca densta
n) Colorado Spruce-Picea pungens
o) Colorado Blue Spruce-Picea pungens glauca

4. Semi-Evergreen and Broadleaf Evergreen Shrubs

a) Kinnikinnick-Arctostaphylos uva-ursi
b) Euonymus-Euonymus fortunei
c) Manhattan Euonymus-Euonymus kiautschovicus 'Manhattan'
d) Oregon Grape Holly-Mahonia aquifolium
e) Compact Oregon Grape Holly-Mahonia aquifolium 'Compacta'
f) Creeping Oregon Grape Holly-Mahonia repens
g) Soapweed Yucca-Yucca glauca

5. Evergreen Shrubs

a) Armstrong Juniper-Juniper chinensis 'Armstrong'
b) Blue Rug Juniper-Juniperous horizontalis 'Wiltonii'
c) Sea Green Juniper-Juniperous media 'Sea Green'
d) Green Mound Juniper-Juniperous procumbens 'Green Mound'
e) Tammy Juniper-Juniperus sabina 'Tamariscifolia'
f) Table Top Juniper-Juniperus scopulorum 'Table Top'
g) Blue Star Juniper-Junperus squamata 'Blue Star'
h) Wichita Blue Juniper-Juniperus scopulorum 'Wichita Blue'
i) Hillspire Juniper-Juniperus virginiana 'Cupress'
j) Mugo Pine-Pinus mugo

6. Deciduous Shrubs

a) Serviceberry-Amelanchier spp.
b) Barberry-Berberis thunbergii atropurpurea

616083 12/06/2002 01:20P B1414 P603 M ALSDORF
78 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

c) Butterfly Bush-Buddleia davidii
d) Siberean Peashrub-Caragana arborescens
e) Flowering Quince-Chaenomeles speciosa
f) Blue Mist Spirea-Caryopteris spp.
g) Dogwood-Cornus sericea
h) Smoketree-Cotinus coggygria
i) Peking Cotoneaster-Cotoneaster acutifolia
j) Cranberry Cotoneaster-Cotoneaster apiculatus
k) Burning Bush-Euonymus alatus
l) Forsythia-Ligustrum vugare
m) Honeysuckle- Lonicera spp.
n) Russian Sage-Periovskia atriplicifolia
o) Common Ninebark-Physocarpus opulifolius
p) Potentilla (Shrubby Cinquefoil)-Potentilla fruiticosa
q) Plum-Prunus spp.

7. Perennials

a) Yarrow-Achilles filipendula
b) Columbine-Aquilegia (hybrids)
c) Hollyhock-Althaea rosea
d) Pearly Everlasting-Anaphalis spp.
e) Clustered Bellflower-Campanula glomerata
f) Canterbury Bells-Campanula medium
g) Cup-n-Saucer-Campanula medium calycanterma
h) Shasta Daisy-Chrysanthemum maximum
i) Delphinium-Delphinium elatum
j) Cottage Pink-Dianthus pulmarius
k) Bleeding Heart-Dicentra spectabillis
l) Foxglove-Digitalis purpurea
m) Blanket Flower-Gaillardia aristata
n) Bearded Iris-Iris germanica
o) Perennial Sweet Pea-Lathyrus latifolius
p) Blue Flax-Linum perenne
q) Lupine-Lupinus polyphyllus
r) Daffodil-Narcissus spp.
s) Perennial Phlox-Phlox paniculata
t) Buttercup-Ranunculus asiaticus
u) Johnny Jump-up-Viola kitaibeliana

616083 12/06/2002 01:20P B1414 P804 M ALSDORF
79 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

B. USE TABLE

In the event a use is permitted in the Glenwood Meadows standards but is not permitted in the underlying zone districts, the stricter obligations of the Code shall prevail.

Prohibited Use

Special Use

Use	A-Mixed-Use Campus (C-1)	C, D, and H-Commercial (C-1)	E, F, and G-Mixed-Use (C-2)	I-Hospitality (C-4)	B, J, and K-Residential Neighborhood (R-3)	L- Parks and Open Space (HP)
Accessory Uses						
Apartments						
Auto Rental						
Auto Repair						
Auto Parking						
Auto Sales						
Auto Service						
Auto Washing and/or Polishing Facility						
Banks with Drive Thru/ Accessory ATM Facilities						
Bed & Breakfast						
Child Care Home						
Commercial Indoor Cinema						
Daycare Facilities						
Sanitariums, Rest Homes, Homes for the Aged, Nursing or Convalescent Homes						
Emergency Services Facilities						
Golf Course						
Gas Sales						
Governmental Facilities and Non-Governmental Health and Human Services Facilities						
Government or Public Utility Service						
Commercial Health and Fitness Centers						
Home Improvement and Garden Supply						
Hospitals and their Related Facilities						
Hotels						

616083 12/06/2002 01:20P B1414 P605 M ALSDORF
80 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Use	A-Mixed-Use Campus (C-1)	C, D, and H-Commercial (C-1)	E, F, and G-Mixed-Use (C-2)	I-Hospitality (C-4)	B, J, and K-Residential Neighborhood (R-2)	L- Parks and Open Space (NP)
Indoor Commercial Recreational Facilities						
Light Assembly						
Major Home Occupation						
Membership Warehouse						
Minor Home Occupation						
Mobile Home Manufacturing						
Mobile Home Park						
Mobile Home Sales						
Mortuary						
Multi-family Dwellings						
Museum						
Non-Bank Drive-Through Facilities						
Office Uses						
Office-Showroom						
Outdoor Display						
Outdoor Recreational Facilities						
Outdoor Storage						
Clinical and their Related Facilities						
Pedestrian-oriented Accessory Uses and Outdoor Seating for Restaurants						
Public Park						
Radio Transmission Facilities						
Recreation Vehicle Parking						
Religious Institutions						
Restaurants						
Retail						
Road, Driveway, Bikeway, Parking						
Schools						
Schools: Colleges or Universities						
Self-Storage Facilities						
Service and Repair of Appliances & Building Components						
Personal Service such as Photo Shop, Tailor, Dry Cleaning, Barber						
Single Family Detached Dwellings						
Single-Family Attached Housing e.g. Townhouses and						

616083 12/06/2002 01:20P B1414 P606 M ALSDORF
81 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Use	A-Mixed-Use Campus (C-1)	C, D, and H-Commercial (C-1)	E, F, and G-Mixed-Use (C-2)	I-Hospitality (C-4)	B, J, and K-Residential Neighborhood (R-3)	L- Parks and Open Space (NP)
Roughhouses						
Skating Rinks, Public Recreational and Sports Facilities						
Small Animal Hospitals and Clinics						
Transient Housing/Boarding Houses						
Transit Park and Ride/ Bus Station						
Utility Substations						

616083 12/06/2002 01:20P B1414 P607 M ALSDORF
82 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

XIII. Definitions

Accessory Use—A use incidental and subordinate to the principal use of the lot.
Apartment- A type of multi-family dwelling unit, typically renter-rather than owner-occupied. See definition for multi-family dwellings below.
Auto Parking—Shall mean an off-street parking area or vehicular use area, an off-street parking area within a building or parking structure, or on street parallel or diagonal parking.
Day Care—A child care facility or day nursery, which is maintained for the whole or part of a day for the care of 7 or more children unrelated to the owner on a full time basis and/or requiring a day care nursery or a center license in accordance with the regulations of the State of Colorado Department of Social Services, whether such facility is operated with or without compensation for such care and with or without stated educational purposes.
Indoor Recreation—A commercial recreational land use conducted entirely within a building, including: an arcade, arena, art gallery and studio, art center, assembly hall, athletic and health clubs, auditorium, bowling alley, club or lounge, community center, conference center, exhibit hall, gymnasium, library, movie theater, museum, performance theater, pool or billiard hall, skating rink, swimming pool, or tennis court.
Multi-family dwellings—A building containing 3 or more dwelling units, not including hotels, motels, and similar group accommodations.
Non-banking Drive Thru—An establishment which by design, physical facilities, services, or packaging procedures encourages or permits customers to receive services, obtain goods, or be entertained while remaining in their motor vehicles.
Open Space—That portion of a building lot which is open to the sky, except as provided in the definition of lot coverage.
Outdoor Recreation—A commercial recreational land use conducted outside of a building, characterized by a minimal impact on traffic, the natural environment, or the surrounding neighborhood, including: an arboretum, botanical garden, bridle or hiking trails, country club, golf course, or historic site.
Pedestrian-oriented Development—Development that is designed with a primary emphasis on the street sidewalk and/or connecting walkway access to the site and building rather than on auto access and parking lots. This type of development typically warrants buildings being placed relatively close to the street with the main entrance oriented towards the street sidewalk or a walkway. Parking areas are provided but are not emphasized in the design of the site.
Transit-oriented Development—A development pattern characterized by mixed-use development at transit corridors, a high level of activities and extensive facilities for transit users, pedestrians, and bicyclists to provide easy movement between living and working environments.

616083 12/06/2002 01:20P B1414 P608 M ALSDORF
83 of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

MEMORANDUM OF UNDERSTANDING
REGARDING RESIDENTIAL DEVELOPMENT WITHIN RH DISTRICT OF GLENWOOD MEADOWS

The following Memorandum of Understanding ("MOU" or "Agreement") sets forth the terms and conditions upon which the City of Glenwood Springs, Colorado, a Colorado municipal corporation (the "City") and Glenwood Meadows, LLC, a Colorado limited liability company ("GM") agree to resolve certain infrastructure issues related to future development in Glenwood Meadows as related to future development on lots retained by GM.

RECITALS

WHEREAS, GM originally annexed approximately three hundred and forty-five (345) acres of real property within the City of Glenwood Springs, which Property is commonly known as "Glenwood Meadows" pursuant to that certain Ordinance No. 17, Series of 2002, and Ordinance No. 18, Series of 2002; and

WHEREAS, on September 18, 2002, the City and Owner entered into an Annexation and Development Agreement to set forth their agreements in writing concerning the terms and conditions of annexation of the Property to the City, the zoning of the Property under the City's Municipal Code and the adopted and incorporated Zoning and Development Plan, as well as the other conditions of the development of the Property, which Annexation and Development Agreement was recorded in the records of the Garfield County Clerk and Recorder on December 6, 2002 as Reception No. 616083 (the "Original ADA"); and

WHEREAS, the City and Owner have since entered into: (i) the First Amendment to the Original ADA, which First Amendment was recorded May 6, 2004, as Reception No. 651648, and (ii) the Second Amendment to the Original ADA, which Second Amendment was recorded July 26, 2004 as Reception No. 656670, and (iii) the Third Amendment to the Original ADA, which Third Amendment was recorded December 2, 2010 as Reception No. 795138, and (iv) the Amended and Restated Third Amendment to the Original ADA, which Amended and Restated Third Amendment was recorded August 16, 2011 as Reception No. 806719; (v) the Fourth Amendment to the Original ADA, recorded April 10, 2015 as Reception No. 861345; (the Original ADA, together with all subsequent, recorded amendments thereto is hereafter referenced to as the "ADA"); and

WHEREAS, the City and Owner entered into a Memorandum of Understanding dated July 16, 2013; and

WHEREAS, Glenwood Meadows, LLC is the present owner of certain vacant, undeveloped lots within Glenwood Meadows: (i) Lots 12 and 13 of GM #2 Plat; (ii) Lot 10C of GM #3 Plat; (iii) Lot 11C-B of GM #6 Plat; and (vi) Lot 11C-C of GM #6 Plat (collectively, "GM Retained Lots"); and

WHEREAS, BLD Group, LLC is under contract to purchase portions of Lot 11C-B and 11C-C of GM #6 Plat and has submitted a Major Architectural Review and Minor Subdivision Application with the City of Glenwood Springs on December 29, 2020 and January 26, 2021 respectively (the "Applications"); and

WHEREAS; on March 1, 2021 the City's Assistant City Manager issued a letter to BLD and GM ("Interpretation Letter") that the City is unable to process the Applications because it would exceed the residential unit limits established for the Glenwood Meadows Development based on the City's interpretation of the ADA, as amended; and

WHEREAS, BLD and GM dispute such interpretation, but have agreed to enter into this MOU to resolve the difference of opinion and to expedite the processing of the Applications.

AGREEMENT

1. **Contribution Towards Lift Station Upgrades.** In the event BLD's Applications are approved for at least 300 multi-family units and BLD or its successor is issued a building permit pursuant to such approvals, GM will, in addition to City standard system improvement fees including Sewer System Improvement fees, make a payment of $475,000 to the City at the time of issuance of a building permit which funds shall be used directly for the necessary upgrade of the Midland Sewer lift station to an estimated capacity sufficient to serve all future development within all of Glenwood Meadows. The parties agree that this contribution represents 50% of the estimated costs to upgrade the lift station to such capacity and that the City will fund the balance of the actual costs required and commits to completion of the necessary lift station upgrades and any other necessary sewer system work prior to BLD's request for a certificate of occupancy. In the event the costs required to upgrade the lift station are less than $950,000, the City shall promptly reimburse GM's pro rata for its excess contribution. In the event such costs exceed $950,000, GM shall not be required to contribute any additional funds.

2. **Cost Reimbursement**. GM shall be entitled to cost recovery from any future impact or other fees paid by any future development within Glenwood Meadows, including on the GM Retained Lots, at a rate of $814 per EQR which amount shall increase annually with CPI. The City shall make payment to GM at the time a building permit is issued for such development. This obligation shall expire 20 years after the GM payment.

3. **Traffic Impact Fee.** In the event BLD's application and/or other residential development is approved on GM's Lot 12 of GM #2, Plat Lot 11C-B and/or Lot 11C-C of GM #6 Plat and a building permit is issued for the same, GM will fund an equitable share attributable to 415 additional residential units pursuant to the City's 2021 Glenwood Meadows area traffic study of improving Glenwood Meadows' Midland Avenue intersections, not to exceed $500.00 per fully permitted residential unit. Such funding will occur at the later of issuance of a building permit or at time the City contracts for design of such intersection improvements.

4. **Interpretation of ADA**. The City agrees that, upon the execution of this Agreement, its interpretation of the ADA is that the ADA remains in full force and effect, including but not limited to Section I. A. of the Fourth Amendment to the Original ADA, recorded April 10, 2015 as Reception No. 861345 and therefore 415 additional residential units,

of which 300 may be commercial apartments, are permitted within the RH zoned Lot 12 of GM #2 and Lot 11C-B and Lot 11C-C of GM #6 Plat and these 415 residential units, of which 300 may be commercial apartments, are independent of residential development completed or permitted on other lots and zone districts within Glenwood Meadows, the capacity of which is defined by the zoning of such lots. City agrees that this interpretation shall be binding upon the City for future applications within the GM Retained Lots.

5. **Withdrawal of Interpretation**. Concurrent with execution of this MOU, the City formally withdraws the Interpretation Letter and shall continue to or begin formally processing the Applications, and any other heretofore submitted Glenwood Meadows development applications, pursuant to the City's standard development review process. GM and BLD shall request a continuance of their appeal of the Interpretation Letter and the Planning and Zoning Commission Appeal hearing scheduled for May 10, 2021. Upon ratification of this Agreement by City Council, GM and BLD shall formally withdraw their appeal and cancel the agenda item. The parties understand that the City cannot guarantee approval of the Applications or other pending development applications, but rather such applications shall be subject to the approval of City Council according to the criteria set forth in the Glenwood Springs Land Use Code.

6. **Contingency**. The Paragraph 1 Contribution and Paragraph 2 Cost Reimbursement of this Agreement is contingent upon approval of the Applications for at least 300 multi-family units. In the event the Applications are withdrawn, denied, or approved but the Final Plat is never recorded, or approved but such approvals expire, and no building permit and corresponding payment is made, then Paragraph 1 Contribution and Paragraph 2 Cost Reimbursement provision of this Agreement shall be null and void and terminate automatically. In the event any building permits for any other residential units are issued for all or portions of RH zoned Lot 12 of GM #2 and Lot 11C-B and Lot 11C-C of GM #6 Plat, such residential units shall, in addition to City standard Sewer System Improvement fees, fund Lift Station improvements at a rate $814 per EQR, which amount shall increase annually with CPI.

7. **No Further Exactions.** Consistent with Paragraph 3(a) of the ADA, The City shall not charge any future impact fee, surcharge, special permit fees, special taxes or assessments, development fees or tap fees, or any other item against the GM Retained Lots unless the same is exacted uniformly and non-discriminatorily throughout the City, except as otherwise set forth in this MOU.

8. **Recordation of Final Agreement.** The terms of this Agreement shall be memorialized in a written agreement between GM, or its successor owners, recorded against all of the GM Retained Lots within the RH zone - Lot 12 of GM #2, Lot 11C-B and Lot 11C-C of GM #6 Plat. Such recordation shall occur at the time a Subdivision Improvements or Development Agreement is recorded.

9. **Ratification.** This MOU shall be presented for ratification by the City Council on the next meeting following execution. In the event this MOU is not ratified by the City Council by May 21, 2021, this Agreement shall be null and void.

Executed this 6th day of May 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

By: _____
Debra Figueroa, City Manager

ATTEST:

_____
Ryan Muse, City Clerk

GLENWOOD MEADOWS, LLC,
a Colorado limited liability company
By: Dunrene Management, Inc., Manager

By: _____
Michael Maple, Chief Operating Officer

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Planning Item 68-21, Silver Sage Planned Unit Development Extension of Vested Rights

Action Requested: Consideration of a request for a three (3) year extension of the vested rights for the Silver Sage Planned Unit Development to July 17, 2025.

Department: Economic and Community Development

Presented By: Hannah Klausman, Assistant Director, Economic & Community Development

Background Info: On February 7, 2013, the City Council approved a Major Development, Major Subdivision and Planned Unit Development Plan at the Property as amended on December 1, 2016 allowing for the development of 38 duplex units and 21 multi-family units.
Pursuant to a Development Subdivision and Improvements Agreement dated July 17, 2017 (DSIA), land parcels were contributed to the City of Glenwood Springs and the Glenwood Springs Historical Society and the multifamily units known as Cardiff Mesa were completed in 2018. Pursuant to the DSIA, vested rights allowing for the development of 38 duplex units currently expire on July 17, 2022.

With this date approaching, the property owner submitted a written request to extend the filing deadline to July 17, 2025 citing an ongoing effort to dedicate 50 acres of land as a conservation easement, and noted the lengthy permitting process associated with that effort.

Issues: The current Land Use Code-Municipal Code Article 070.060.040 requires that the owner file a site-specific development plan within three years of PUD approval or as determined by the development agreement. If that does not occur, the Community Development Director may initiate a public hearing to consider whether the property should be rezoned to its prior classification or to another classification. This property was zoned Hillside Preservation (HP) prior to approval of the PUD.

Attached to this report is an applicant Cover letter dated 08-31-21 referencing the following attachments:

City of Glenwood Springs action letter dated February 13, 2013 memorializing City Council Approvals
Development Subdivision and Improvements Agreement dated July 17, 2017
Recorded Silver Sage Preserve PUD Subdivision recorded July 20, 2017
50 Acre Silver Sage Preserve Conservation Easement Map
Completed Land Use Application

Staff Recommendation: Staff recommends approval of the three (3) year extension of vested rights request with the following suggested conditions:

Suggested conditions:

1. A complete site-specific development plan that meets the requirements of Title 070 for one or more phases of construction within the Silver Sage Planned Unit Development shall be filed with the Community Development Department on or before July 17, 2025.
2. All applicable prior approvals ad conditions related to the Silver Sage Planned Unit Development shall remain in full force and effect.

DUNRENE GROUP

710 East Durant Avenue W-6
Aspen Colorado 81611 USA
www.dunrene.com
Tel 970 925 9046

August 31, 2021

Ms. Hannah Klausman, AICP
Assistant Director, Economic and Community Development
City of Glenwood Springs
101 W. Eighth Street
Glenwood Springs, CO 81601

Re: Silver Sage PUD - Extension of vested rights

Dear Ms. Klausman:

Glenwood Land Company LLC, through a wholly owned entity, Silver Sage Preserve LLC, are the owners of the 32 acre Silver Sage PUD development parcel known as Lot 3.

On February 7, 2013, the City Council approved a Major Development, Major Subdivision and PUD Development Plan of the Property as amended on December 1, 2016 allowing for the development of 38 duplex units and 21 multi-family units. Pursuant to a Development Subdivision and Improvements Agreement dated July 17, 2017 (DSIA), land parcels were contributed to the City of Glenwood Springs and the Glenwood Springs Historical Society and the multifamily units known as Cardiff Mesa were completed in 2018. 17 of the 21 units are deed restricted affordable housing units owned by the Roaring Fork RE-1 School District. Pursuant to the DSIA, vested rights allowing for the development of 38 duplex units currently expire on July 17, 2022. Owner requests a three (3) year extension of the vested rights to July 17, 2025.

As you may be aware, for the last couple of years, we have placed development of the site pursuant to the PUD on hold in favor of working to place a conservation easement on this property as well as an adjacent 18 acre parcel located in Garfield County. Once completed, we would then dedicate/contribute the conserved 50 acres to the City of Glenwood Springs as open space. This land has a long history of heavy bandit trail use by members of the Glenwood Springs' community and features outstanding views of Sopris Mountain and the valley.

Unfortunately, the conservation easement process and obtaining necessary approvals have proven to be a long process, with many of the reports and other requirements for completing the conservation easement and proposed dedication still outstanding. Correspondingly, we would like to extend the vested rights for three (3) additional years.

Attached please find:

- City of Glenwood Springs action letter dated February 13, 2013 memorializing City Council Approvals
- Development Subdivision and Improvements Agreement dated July 17, 2017
- Recorded Silver Sage Preserve PUD Subdivision recorded July 20, 2017
- Proposed 50 Acre Silver Sage Preserve Conservation Easement Map

Please review this request and the attached materials and let me know if you have any questions or require additional information.

Thank you.

Michael C Maple
Dunrene Management, Inc.
710 East Durant Ave. Unit W-6
Aspen, CO 81611
970.925.9046

Sent via email and regular mail

February 13, 2013

Mr. Peter Waller, President
Klomhaus & Waller, Inc
PO Box 1027
Glenwood Springs, CO 81602

RE: Silver Sage – Comprehensive Plan Amendment – Rezoning – Major Subdivision - Major Development – Planning Item #20-12

Dear Pete:

As you know at its February 7th meeting, the Glenwood Springs City Council approved your request for a -

- Comprehensive Plan Amendment;
- Rezoning from Hillside Preservation (HP) to Planned Unit Development (PUD);
- Major Subdivision dividing the parcel into Tracts and Lots; and
- Major Development, allowing for the development of 38 duplex units and 17 multi-family units.

The approvals came with a number of conditions, some of which need to be satisfied prior to recording the subdivision plat and entering into a Development and Subdivision Improvement Agreement. Below is a list of the conditions under each action item.

Action 1: Comprehensive Plan Amendment.
No conditions.

Action 2: Rezone a property from Hillside Preservation (HP) to Planned Unit Development (PUD).

Conditions:

1. Prior to recording the Planned Unit Development documents (which include but are not exclusive of the PUD Zone District Regulations; General Development Standards; Declaration of Covenants, Conditions, Restrictions, Reservations and Easements; Project Design Guidelines and Silver Sage Owners Association bylaws), the owner shall:
    a. Work with the Community Development Department and City Attorney to correct typographical errors, errors in formatting, and removing references to Cardiff Mesa condominiums.
    b. Revise landscape plans and recreation facilities summary to change the soft trail material in both the Silver Sage and Cardiff Mesa neighborhoods from wood chips to crusher fines, the depth of which shall be specified on the drawings.
    c. Revise colored exterior building elevations to correct the name of the development;
    d. Submit draft easement deeds for City review and approval. This includes the recreational easement allowing Cardiff Mesa residents to use the trails in Tract 3;
    e. Revise phasing plan to complete incomplete entries under the heading "Commencement", and to revise entries regarding the development of the Silver

Sage plaza and gardens to read that the amenity will be completed upon issuance of a certificate of occupancy of the second duplex building.

f. Submit manufacturer information for all park/recreational structures and equipment. This includes but is not exclusive of gazebo, benches, picnic tables, trash containers, interpretive sign poles and panels, play equipment.

g. Submit final drafts of all PUD documents for Community Development Department and City Attorney review and approval.

2. The owner shall pay a fee for recording the PUD documents made payable to the Garfield County Clerk and Recorder. Recording fees currently are $10 for the first page, $5 for every page thereafter and $1 surcharge, or as otherwise established by the Garfield County Clerk and Recorder's office at the time of recording.

Action 3: Major Subdivision that legally separates a 42 acre parcel into five tracts and 19 lots.

Conditions:

1. The owner shall enter into a Subdivision Improvement Agreement with the City of Glenwood Springs that memorializes land use approvals granted by the City Council. The owner shall pay a fee for recording the Subdivision Improvement Agreement payable to the Garfield County Clerk and Recorder. The recording fees currently are $10 for the first page, $5 every page thereafter, and $1 surcharge, or as otherwise established by the Clerk and Recorder at the time of recording.
2. The project vesting period shall be for a five-year period.
3. Prior to the execution of the Subdivision Improvement Agreement and recordation of the subdivision plat, the applicant shall process an application with, and obtain approval from, the Community Development Department, the Planning and Zoning Commission and City Council for a Community Housing Plan as required by 070.130.090 of the Glenwood Springs Municipal Code, or as amended.
4. Prior to recording the plat, the owner shall:
    a. Revise the plat, Sheets 1 through 3, to remove all notes and labels referencing the Emergency Access Easement.
    b. Revise the plat to eliminate the roadway connection between the proposed Silver Sage Preserve subdivision and Four Mile Ranch.
    c. Revise plat note #15 to indicate that no individual lots shall be sold, conveyed or transferred until the Silver Sage Loop road, and water and sewer infrastructure have been completed.
    d. Add a plat note that prevents the sale, conveyance or transfer of Tract 3 from Tract 4.
    e. Revise the plat to show all common elements and easements that are referenced in the PUD documents.
    f. Provide the Community Development Department two copies of the final plat on 24 x 36 inch paper for review and approval.
5. Upon approval of the final plat, the owner shall provide the City with two copies on 24 x 26 inch mylar paper. The owner shall pay a fee for recording the plat made payable to the Garfield County Clerk and Recorder. Plat recording fees currently are $10 per page, and $1 surcharge, or as otherwise established by the Clerk and Recorder at the time of recording.
6. Upon approval of the final plat, the owner shall provide the City with the plat on CD in .dwg format, or as otherwise required at the time of recording.

Action 4: Major Development Permit to construct 17 multi-family units and 38 duplex units in the Silver Sage Preserve planned unit development.

Conditions:

1. The owner shall enter into a Development Permit and Development Agreement with the City of Glenwood Springs that memorializes land use approvals. The Owner shall pay a fee for recording the Development Agreement with the Garfield County Clerk & Recorder. The recording fees currently are $10 first page, $5 every page thereafter and $1 surcharge or as otherwise established by the Garfield County Clerk and Recorder's office.
2. The project vesting period shall be for a five-year period.
3. Prior to the execution of the Subdivision Improvement Agreement and recordation of the subdivision plat, the applicant shall process an application with, and obtain approval from, the Community Development Department, the Planning and Zoning Commission and City Council for a Community Housing Plan as required by 070.130.090 of the Glenwood Springs Municipal Code, or as amended.
4. Prior to entering into the Development Permit and Development Agreement, the owner shall:
    a. Revise all applicable civil plans to eliminate the roadway between the proposed Silver Sage neighborhood and Four Mile Ranch.
    b. Revise sheet C2.1 general note to read: "On-lot retaining wall color, material, and specifications will be final designed at the time of building construction and will be subject to the review and approval of the Silver Sage HOA and the City of Glenwood Springs."
    c. Revise sheet C2.2, general note 9 shall read: "Retaining walls over 5 feet in total height will need to be designed by a Colorado licensed structural engineer, or as otherwise required at the time of construction".
    d. Revise sheet C2.3 and C3.3, general utility note 8 shall read: "Maintain a distance of 10 feet between water lines and sanitary sewer lines (edge to edge). If this is not possible, the elevation of the crown of the sewer should be at least 18 inches below the invert of the water main. If neither of these is possible, construction shall be directed by the City Engineer"; and Utility note 9 shall read: All water line and wastewater line construction shall be in accordance with the rules and regulations of the City of Glenwood Springs upon application of any grading, building or other applicable city permit."
    e. Revise sheet C3.2, note 8 of the civil drawings to delete all references to a Cardiff Mesa HOA. Proposed drywells within Tract 1, known as Cardiff Mesa shall be maintained by owner.
    f. Revise sheet C 2.3 and C3.3 utility note 10 that requires Badger meters. Add "or as otherwise directed by the City of Glenwood Springs upon application of any grading, building or other applicable city permit.
    g. Revise sheet C3.3 utility note 12 to allow a master water meter in each building rather than individual water meters.
    h. Revise sheet C5.1 General Utility Note 6 shall read: "Maintain a distance of 10 feet between water lines and sanitary sewer lines (edge to edge). If this is not possible, the elevation of the crown of the sewer should be at least 18 inches below the invert of the water main. If neither of these is possible, construction shall be directed by the City Engineer."
    i. Revise sheet C5.1 General Utility Note 7 shall read: "All water line construction shall be in accordance with the rules and regulations of the City of Glenwood Springs upon application of any grading, building or other applicable city permit."

j. Revise sheet C5.1 General Utility Note 8 shall read: "All sewer line construction shall be in accordance with the rules and regulations of the City of Glenwood Springs upon application of any grading, building or other applicable city permit."
k. Revise Lighting plans sheet LP1: Add column to Site Luminaire Schedule that provides the total number of lights per each fixture type. (7 Pole mounted fixtures); (1 pole mounted fixture with house-side shield); (3 wall mounted fixtures per building or 15 total fixtures).
l. Revise engineering related studies to the satisfaction of the Public Works and/or Engineering departments (reference Tab "I" of the supplemental submission).

5. Prior to entering into the Development Permit and Development Agreement, the owner shall provide the Community Development Department and Public Works Department with one set each of revised civil plans (on 24 x 36 inch paper), and one copy each of revised engineering-related studies for review and approval. Following approval of the revisions, the owner shall provide the Community Development with one complete set of civil plans on 24 x 36 inch mylar paper. Specifically these plans are sheets C1.1 through C5.2.
6. Construction of the project shall comply with all applicable building and fire codes that are adopted upon application of any grading, building or other applicable city permit.
7. Prior to issuance of grading or building permit, the owner shall:
    a. Provide an updated Engineer's estimate of the public improvements (listed in the approved phasing plan). Security for public improvements shall be collected upon issuance of the first building or grading permit.
    b. Submit updated civil engineering plans and specification of the water and wastewater systems for review and approval of the City of Glenwood Springs Water/Wastewater Division. Said systems shall be designed to City specifications upon application of any grading, building or other applicable city permit.
    c. Organize and attend a pre-construction meeting with the City of Glenwood Springs and outside utility agencies.
    d. Install snow or silt fencing at the limits of construction activities to contain disturbance to surrounding native vegetation.
    e. Demonstrate compliance with the City Electric Department's line extension policy in effect upon application of any grading, building or other applicable city permit.
    f. Demonstrate compliance with the model of fire hydrant and depth of bury in effect upon application of any grading, building or other applicable city permit.
    g. Obtain a stormwater discharge permit from the State of Colorado Department of Public Health and Environment, Water Quality Control Division, or the authorizing agency upon application of any grading, building or other applicable city permit.
8. Prior to placing the sewer main and manholes into service and subject to the approval of the Water/Wastewater Department, Applicant shall test and televise the sewer mains and manholes.
9. Prior to placing the water utilities into service and subject to the approval of the Water/Wastewater Department, Applicant shall bacteria test, pressure test, and sterilize the water utilities.
10. Owner and City understand that the water and wastewater systems servicing the Silver Sage neighborhood will be owned and maintained by the City of Glenwood Springs after said systems are constructed by the Silver Sage owner, and after said systems are accepted by the City.

11. Prior to issuance of a certificate of occupancy and subject to the approval of the City Public Works Director, the owner shall provide easements for all fire hydrants based on as-built locations of the fire hydrants.
12. Changes to the approved lighting plan reflected on Sheet LP1 shall be reviewed and approved by the Glenwood Springs Community Development Department prior to purchase and installation. Lighting revisions shall conform to the city's exterior lighting standards upon application of any grading, building or other applicable city permit.
13. Prior to issuance of a certificate of occupancy and subject to the approval of the Public Works Director, the owner shall provide easements for all fire hydrants based on as-built locations of the fire hydrants.
14. Prior to the issuance of a certificate of occupancy, the owner shall deliver as-built drawings to the city in a format that will be determined upon application of any grading, building or other applicable city permit.

I believe that your first order of business is to address the condition requiring that you submit a Community Housing plan (condition 3 under Action 3 & 4). Please note that the condition requires that your plan be processed by this department, and approved by the Planning & Zoning Commission AND City Council. At this time, the process requires the formal approval of only Council, and this needs to occur prior to recording your Subdivision Plat and executing your Subdivision Agreement. After that, or in conjunction with that, you may want to address or finalize the PUD documents (conditions under Action 2) and make the necessary revisions to your subdivision plat (conditions under Action 3).

Regarding the land dedications to the City and the Frontier Historical Society, we understand that the dedications will occur when the plat is recorded. We also understand that you are reluctant to dedicate the land now, as you do not have immediate plans to develop the property. We agreed that you can delay recording the plat until such a time that you are ready to develop the property or until the time that you want to subdivide the property for a prospective buyer. In other words, we see no pressing reason why you need to record the plat now. Your approvals are vested for a five year period (February 7, 2013 – February 7, 2018), which includes subdividing your property.

Regarding your vesting period, if you near the February 7, 2018 expiration of your vested rights, and you want to ask Council for an extension, you should begin the process about 6 months prior to the expiration. So, no later than September 7, 2017, contact the City's Community Development Department to discuss your extension request. Please save a copy of this letter for your records. I've also placed a copy in Planning File #20-12.

If you have any questions, please do not hesitate to call me at 384-6428. Congratulations, and it was a pleasure working with you and your design team on this project.

Sincerely,

Gretchen E. Ricehill
Senior Planner
Community Development Department

cc: Ron Liston, Land Design Partnership
918 Cooper Avenue, Glenwood Springs

Reception#: 895015
07/20/2017 12:59:19 PM Jean Alberico
1 of 35 Rec Fee:$183.00 Doc Fee:0.00 GARFIELD COUNTY CO

CONFORMED COPY

DEVELOPMENT AND SUBDIVISION IMPROVEMENTS AGREEMENT FOR SILVER SAGE PRESERVE PLANNED UNIT DEVELOPMENT

THIS DEVELOPMENT IMPROVEMENTS AGREEMENT (this "Agreement") is made and entered into on the 17th day of July, 2017, by and between the CITY OF GLENWOOD SPRINGS, Colorado (the "City") and SILVER SAGE PRESERVE, LLC, a Colorado limited liability company (the "Owner").

WITNESSETH:

1. The Owner has a legal interest in certain real property located in the City (the "Property"), as more particularly described on **Exhibit A** ("Legal Description"), attached and incorporated by this reference, and as follows:

Section: 27 Township: 6 Range: 89 Subdivision: KINGDOM HALL SUBDIVISION Lot: 2;

2. The Owner intends to subdivide the Property into five tracts and 19 lots and to construct a residential multi-family development as provided by the "Current Approvals" more particularly described in **Exhibit B**, attached and incorporated by this reference;

3. On February 7, 2013, the City Council for the City of Glenwood Springs approved a Major Development, Major Subdivision, and PUD Development Plan at the Property. Amendments to those approvals were subsequently made and approved following review by the City Planning and Zoning Commission and the City Council on December 1, 2016;

4. The City has determined that the Development is an appropriate use for the Property and, therefore, desires to enter into this Agreement to establish planning principles, standards, and procedures to eliminate uncertainty in planning and to guide the orderly progress of the Development consistent with the City's Comprehensive Plan, Land Use Plan, and Municipal Code;

5. The Owner shall by this Agreement receive assurance that it may proceed with the Development on the Property in accordance with the Current Approvals and, therefore, desires to enter into this Agreement;

6. The City has taken certain actions relating to the Current Approvals including, without limitation, the following:

(a) Rezoning of the Property from Hillside Preservation (HP) to Planned Unit Development (PUD);

(b) Approval of the Major Subdivision that legally separates a 42-acre parcel into five tracts and 19 lots;

(c) Approving a Major Development Permit to construct 21 multi-family units and 38 duplex units in the Silver Sage PUD; and

(d) Approving an Amended Major Development Permit to allow the construction of 21 units in 5 buildings to be located in the Cardiff Mesa Development.

NOW, THEREFORE, in consideration of the promises, covenants, and provisions set forth herein, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

Section 1. EFFECTIVE DATE AND TERM.

1.1 Effective Date. This Agreement shall be effective from the date of the PUD Amendment.

1.2 Term. The term of this Agreement (the "Term") shall commence upon the Effective Date and continue for three (3) years, except as otherwise stated in Section 3 of this Agreement.

1.3 Development. This Agreement shall govern the development of the Cardiff Mesa Development, 21 Units in five buildings, and the extension of the vestment of development rights for the Silver Sage PUD, 38 duplex units (the Cardiff Mesa Development and Silver Sage PUD are together, the "Development"), approved by the Glenwood Springs City Council February 7, 2013.

Section 2. DEFINITIONS.

Unless otherwise clear from the context of usage, the terms below shall have the following meanings:

"Council" means the City Council of the City of Glenwood Springs, Colorado.

"Current Approvals" has the meaning set forth in Recital 2 of this Agreement.

"Development" has the meaning set forth in Section 1.3 of this Agreement.

"Effective Date" has the meaning set forth in Section 1.1 of this Agreement.

"Improvements" means all physical and structural alterations to the Property identified in the Major Development, Major Subdivision, and PUD Development Plan, as amended on December 1, 2016.

"Municipal Code" or "Code" means the Municipal Code of the City of Glenwood Springs as it may be amended from time to time.

"Owner" has the meaning set forth in the preamble, and shall further include, unless otherwise provided, the Owner's successors, heirs, assigns, and transferees.

"Property" has the meaning set forth in Recital 1 of this Agreement.

"Public Improvements" means all securitized improvements to be completed at the expense of the Owner and identified in Section 070.030.190 of the Glenwood Springs Municipal Code, including, but not limited to, the following:

- Survey monuments to each lot;
- Water lines, stubs to each lot, and appurtenant water facilities;
- Sewer lines, stubs to each lot, sewer facilities, hydrants, water and sewer distribution facilities;
- Drainage and soil-stabilizing structures;
- Landscaping and irrigation;
- Gas lines;
- Electrical facilities;
- Cable T.V., internet, broadband, and telephone lines;
- Utility systems;
- Curbs and gutters;
- Streets (public and/or private);
- Sidewalks and trails;
- Lighting;
- Traffic control devices and signage; and
- All other public improvements required by the development permit.

Section 3. OBLIGATION OF OWNER.

3.1 Current Approvals; Representations. The Owner shall comply with the requirements of the Municipal Code except where specific variances have been granted. All Current Approvals and representations of the Owner made in its application and materials, and in statements during the public hearings before the Planning & Zoning Commission and City Council shall be considered "Conditions of Approval" with which the Owner shall comply.

3.2 Revisions Prior to Development Permit. In accordance with the terms and conditions of approval by the Glenwood Springs City Council, the Owner agrees to provide to the City revised Major Development application documents/plans, specifications, estimates and necessary approvals reflecting the project as approved for review and approval by the City Engineer and Community Development Director. All such documentation shall fully comply with the requirements of the Glenwood Springs Municipal Code Titles 070, 080, and 090, as well as any further requirements of the City in **Exhibit B**.

3.3 Conditions of Building Permit. In addition to all requirements of the Glenwood Springs Municipal Code, other sections of this Agreement and any requirements imposed by operation of state, federal, or local law, no building permits shall be issued for the Property until:

(a) This Agreement has been recorded in the Office of the Garfield County Clerk and Recorder, and a recorded copy is on file in the Office of the City Clerk.

(b) The Final Plat has been recorded in the Office of the Garfield County Clerk and Recorder, and a recorded copy is on file in the Office of the City Clerk.

(c) All Public Improvements have been accepted, or a performance guarantee to secure all Public Improvements has been provided in accordance with this Agreement.

(d) Any fees enacted by ordinance and made applicable to the Owner pursuant to the Current Approvals have been paid to the City.

(e) The Owner obtains and presents to the City all land boundary surveys, permits, licenses, and easements of a temporary or permanent nature, if any, necessary for the construction or maintenance of Public Improvements. All easements, including, but not limited to, utility easements, drainage easements, pedestrian easements, streets, and alleys shall be dedicated to the City by means of a deed prior to the issuance of a Certificate of Occupancy.

3.4 Pre-Construction Meeting. Prior to commencing construction of any of the Improvements, the Owner shall arrange and attend a pre-construction meeting with the Owner's contractor(s) and the City's representatives from the Public Works Department, Electric Department, Water/Wastewater Department, Community Development Department, Building Department, Black Hills Energy, CenturyLink, Engineering Department and others as required. The Owner shall perform all obligations outlined in the approvals granted by the City as outlined in Recital 6.

3.5 Approved Plans. All Public Improvements to be constructed on the Property shall conform to the site plans and representative drawings attached as **Exhibit C**, incorporated by this reference. Any amendments to such plans and drawings shall require approval by the City. The Owner shall perform all obligations outlined in the approvals granted by the City as outlined in Recital 6

Section 4. SECURITY FOR PUBLIC IMPROVEMENTS.

4.1 Assurance for Completion. In order to secure the construction and installation of the Public Improvements described above, for which the Owner is responsible, the Owner shall provide security to the City in the form required under Section 070.030.190 of the Glenwood Springs Municipal Code prior to the issuance of grading permits for each the Cardiff Mesa Development and Silver Sage PUD, subject to approval by the City Manager and City Attorney. Such assurances shall be subject to increase if deemed reasonable and necessary in the sole opinion of the City. The total amount of required security for the Public Improvements in the Cardiff Mesa Development shall be as specified on **Exhibit D**, attached and incorporated by this reference. The Owner shall be required to provide additional security to the City prior to the issuance of a grading permit for the Silver Sage PUD based upon the estimated cost of the Public Improvements therein and as determined by the City.

(a) In the event the Public Improvements are not constructed or completed as required in this Agreement, the City may require that the funds necessary to complete the Public Improvements shall be put directly to an escrow account under the control of the City Manager and shall be used to complete the Public Improvements called for herein.

(b) Within ten (10) days of timely completion and acceptance of the Public Improvements, and performance of the conditions and requirements of this Agreement

secured by the performance guarantee, and upon the approval of the City Manager, the performance guarantee shall be released to the Owner. If the Public Improvements are not completed within the required time, the security may be called by the City and the monies may be used to complete the Public Improvements; provided, however, that if such guarantee is not sufficient to pay the actual costs, the Owner shall be responsible for the balance.

(c) The required security for the Public Improvements is the amount mutually agreed upon by the Owner and the City Engineer as set forth above. The Parties agree that this amount does not necessarily reflect the City Engineer's estimate of what the actual cost to the City would be if the City were required to fund construction of all of the Public Improvements. In the event the costs of the Public Improvements exceed the amount set forth above, the Owner shall be solely responsible for the actual cost. The purpose of Exhibit D is solely to determine the amount of security and shall be revised as necessary to reflect the actual costs, and the assurance for completion required by this Agreement shall be adjusted accordingly. No representations are made as to the accuracy of these estimates, and the Owner agrees to pay the actual costs of all such Public Improvements.

(d) The Parties expressly agree that the Owner's preparation and submission to the City of "as-built drawings" and a summary of actual construction costs for the Public Improvements to be dedicated to the City or owners' association—and approval by the City of the as-built drawings and summary—are essential requirements of this Agreement. In the event the Owner fails to provide the as-built drawings and summary to the City thirty (30) days prior to the expiration of the performance guarantee or any extension thereof, such failure shall constitute a breach of this Agreement with regard to the completion of the Public Improvements, damages for which are impossible to ascertain, entitling the City to call upon the performance guarantee in an amount equal to ten percent (10%) of the total amount set forth on Exhibit D, which amount the City may retain as liquidated damages due to the Owner's breach. No releases of the letter of credit or deposit agreement shall be granted by the City until such as-built drawings are provided and all Public Improvements are accepted by the City.

4.2 Completion of Public Improvements; Approval. The Owner shall complete all Public Improvements at its sole expense. Upon the Owner's completion of construction of the Public Improvements, the Owner's engineer shall certify in writing that the improvements have been completed in conformance with the Plans and Specifications and submit to the City a completed acceptance checklist utilizing a form approved by the City. Thereafter, the City Public Works Director or his/her designee shall inspect the Public Improvements and certify in writing and with specificity their conformity or lack thereof to the Plans and Specifications. The Owner shall make all corrections necessary to bring the Public Improvements into conformity with the Plans and Specifications. The Owner shall at its expense have as-built drawings prepared by a professional engineer and a registered land surveyor, which drawings shall include all legal descriptions the City may require. The Owner shall also prepare a summary of the actual construction costs of all Public Improvements to be dedicated to the City. The as-built drawings and costs summary shall be forwarded to the City for review and approval.

Once the as-built drawings and costs summary are approved, and any and all corrections are completed, the City Public Works Director or his/her designee shall certify in writing that all Public Improvements are in conformity with the Plans and Specifications, and the date of such certification shall be known as the "Acceptance Date". The City shall be under no obligation to provide any water or sewer service until all Public Improvements are brought into conformance with the Plans and Specifications and the approved revised final Major Development Plan, and are certified and approved by the City Public Works Director or his/her designee pursuant to this Agreement. However, upon certification and approval, the City shall be obligated to provide water and sewer service to the Property, subject to all provisions of the Glenwood Springs Municipal Code, and in particular to the availability of water or sewer taps, which shall be on a first-come, first-served basis. The City does not guarantee an adequate number of taps will be available to serve the Property at the time the Owner intends to proceed with development.

4.3 Certificates of Occupancy. Unless otherwise required herein, all Public Improvements in the Cardiff Mesa Development must be completed no later than twelve (12) months from the Effective Date. Each residential building shall be granted an individual Certificate of Occupancy. The Certificate of Occupancy for the first residential building completed shall not be issued until the Owner has improved Airport Road by the overlay of 3" of asphalt. The Certificate of Occupancy for the second residential building shall not be issued until the following improvements are completed: (a) the Cardiff Mesa picnic area and access, (b) the lower trail, and (c) the park/sod field. The Certificate of Occupancy for the third residential building completed shall not be issued until the following improvements are completed: (a) the internal sidewalk adjacent to the access road including trees and landscaping, (b) the roughly 100-foot long section of Four Mile Trail from the access road to Airport Road, and (c) the crosswalk across Airport Road. The Certificate of Occupancy for the fifth building completed shall not be issued until all Improvements have been completed as depicted on the revised and amended plans approved December 1, 2016.

4.4 Acceptance; Conveyance. Within thirty (30) days of the Acceptance Date, the Owner shall execute a deed to the City conveying all rights-of-way and easements required for the operation, maintenance, repair and replacement of the Public Improvements. The Owner agrees to dedicate to the public and to convey or, with respect to off-site easements, to assign, to the City, in such form as may be required by the City, such easements and other rights as acquired by the Owner as may be reasonably required for the construction of the Public Improvements. Such conveyance and dedication shall be free and clear of all liens and encumbrances that might adversely affect the use of the Public Improvements for their intended purpose. The Owner shall also execute a bill of sale conveying the Public Improvements to the City, free and clear of all liens and encumbrances. All Public Improvements conveyed to the City shall be warranted for a period of two (2) years from the Acceptance Date, as provided below.

4.5 Warranty. The Owner shall warrant any and all Public Improvements and facilities which are conveyed to the City or an owners' association pursuant to this Agreement for a period of two (2) years (the "Warranty Period") from the Acceptance Date. Such Warranty shall automatically terminate at the expiration of Warranty Period or two (2) years from the final repair or replacement required under the Warranty, whichever is sooner, unless otherwise agreed by the Parties. Specifically, but not by way of limitation, the Owner shall warrant that:

(a) The title conveyed shall be good and its transfer rightful;

(b) Any and all facilities conveyed shall be free from any security interest or other lien or encumbrance; and

(c) Any and all facilities so conveyed shall be free of any defects in materials or workmanship for a period of two (2) years, as stated above.

4.6 Title Policy. The Owner shall provide the City a commitment for a title insurance policy, indicating that the Property is free and clear of all encumbrances whatsoever which would impair the use of the Property as proposed by the approved revised Major Development Permit. Further, said title commitment, and/or an additional title commitment, shall show that all other property to be dedicated to the City is free and clear of all encumbrances which would make said dedications unacceptable as the City in its sole discretion determines. At the time the building permit is issued, the title insurance policy(s) shall be provided to the City, and the premium(s) for the title insurance shall be paid by the Owner. In the event the title commitment(s) reflect encumbrances which would impair the use of the Property as proposed or which would make the public dedications unacceptable, the City shall notify the Owner, who shall cure or otherwise remove or subordinate said encumbrances to the satisfaction of the City.

Section 5. STANDARDS, LAWS AND PROCEDURES.

5.1 Vested Rights, Permitted Uses, Applicable Law.

(a) Vested Rights. Upon dedication of all land required by the Glenwood Springs Municipal Code or the Current Approvals, and the City's approval of the community housing plan, specifically the 12 units to be purchased by RE-1 School District and the entering into of the Deed Restriction Agreements between the City and RE-1 School District, as referenced in Section 8 of this Agreement, satisfies any and all community housing community housing obligations that may be imposed upon the Silver Sage Preserve's 21 residential units on Tract 1 or 19 duplex lots on Tracts 3and 4, both the Cardiff Mesa Development and the Silver Sage PUD constituted vested property interests in accordance with and subject to the provisions of C.R.S. §24-68-101 et seq. Upon the Effective Date of this Agreement, the Owner shall be required to substantially begin all Improvements in the Cardiff Mesa Development. The vestment of Current Approvals for the Silver Sage PUD, shall be renewed for a period of five (5) years from the Effective Date.

(b) Permitted Uses, Etc. The permitted uses of the Development on the Property and the density and intensity of use of the Development on the Property, the maximum height, bulk and size of proposed buildings, provisions for reservation or dedication of land for public purposes and the location of Public Improvements, the location of public utilities, and other terms and conditions of development applicable to the Development on the Property, shall be as set forth in the Current Approvals.

(c) Applicable Law. The rules, regulations, official policies, standards and specifications applicable to the Development on the Property ("Applicable Law") shall be those rules, regulations, official policies, standards and specifications, including City

ordinances and resolutions, in force and effect on the Approval Date, including without limitation, all duly adopted uniform construction codes. It is acknowledged that pursuant to C.R.S. §24-68-105, the City may adopt subsequent regulations of general applicability that may apply to the Development on the Property.

5.2 State and Federal Law. This Agreement shall not preclude the application to the Owner of changes in laws, regulations, plans or policies, to the extent that such changes are specifically mandated and required by changes in state or federal laws or regulations ("Changes in the Law"). In the event Changes in the Law prevent or preclude compliance with one or more provisions of this Agreement, such provisions of the Agreement shall be modified or suspended, or performance thereof delayed, as may be necessary, to comply with the Changes in the Law, and the City and the Owner shall take action as may be reasonably required in good faith to meet the intent of this Agreement.

Section 6. INSPECTION.

The City may enter any portion of the Development to make inspections and determine whether the Owner is in compliance with the obligations set forth in this Agreement. If the City determines that any Improvements as set forth in this Agreement have not been constructed and installed as required, the City shall furnish the Owner with a list of deficiencies. Except as provided in Section 4 above and in respect to any structure for which a building permit has been issued, the City shall not be required to issue any Certificate of Occupancy so long as the listed deficiencies remain. If the City determines the Owner has not cured the deficiencies within thirty (30) days after presentation of the list to the Owner, the City may, but need not, cause such additional work to be done as it deems necessary to complete any Public Improvements or to cure any listed deficiencies. Owner shall be liable to the City for the entire cost of such additional work, whether performed by the City's employees or by others at the direction of the City. If the Owner does not pay the City the cost of such additional work including, as may be appropriate, the cost the City expended for materials, for services of those not employed by the City, and for the apportioned cost of wages and benefits paid for by the City for hours of the City employees, then the City may, upon ten (10) days' notice to the Owner, have a first and prior lien against all or any part of the Property. The City may certify the amount of such lien to the Garfield County Treasurer for collection, enforcement and remittance of general property taxes or assessments. In addition, if attorneys' fees are incurred by the City to enforce this Agreement, they shall be paid by the Owner.

Section 7. UTILITY AND DRAINAGE EASEMENTS.

All utility and drainage easements shall be accessible to the City at all times. In the event any structure is constructed which obstructs partially or wholly City access to said easements, the City retains the right to remove such obstruction at the sole cost of the Owner. The City shall not be responsible for any costs associated with the replacement of said obstructions. The easements shown on the Plat shall be modified to show the actual "as built" placement of utilities.

Section 8. IMPROVEMENT FEES.

8.1 System Improvement and In-Lieu-of-Dedication Fees. The Owner contemplates conveying three of five buildings in the Cardiff Mesa Development to the Roaring Fork RE-1 School District consistent with the Current Approvals and may, in Owner's sole discretion,

develop the remaining two buildings in the Cardiff Mesa Development pursuant to the deed restricted development provisions authorized in Section 070.130.110 of the Glenwood Springs Municipal Code. Each Deed Restriction Agreement shall be recorded in the real property records for Garfield County and attached hereto as **Exhibit E** ("Deed Restriction Agreements"). Where the Owner contracts with a separate entity for the purchase and sale of any building(s) within the Development, the Deed Restriction Agreement shall be between the City and the Owner or the City and purchasing entity; provided, however, that if the Deed Restriction Agreement is with a purchasing entity, the impact and improvement fees shall be deferred only if they are identified as a part of the last contingency in the purchase contract, and no Certificate of Occupancy shall be issued until the Deed Restriction Agreement is recorded or the impact and improvement fees paid in full. All applicable fees shall be identified in **Exhibit F** ("Fees/Taxes in Abeyance"), incorporated by the reference.

The Owner shall be entitled to reduction in impact and improvement fees, as follows:

(a) RE-1 School District. For each building within the Cardiff Mesa Development that is deed restricted pursuant to an agreement with the RE-1 School District, the following shall be deferred:

i. development review fees required under GSMC 070.010.040;

ii. building permit fees required under GSMC Title 060;

iii. building plan review fees required under GSMC Title 060;

iv. water and sewer improvement fees required under GSMC Article 080.060;

v. water and sewer tap fees required under GSMC 080.040.010(c) and 080.030.010(c);

vi. school land dedication fees required under GSMC 070.030.150(d);

vii. fire and emergency service impact fees required under 070.030.150(e).

(b) Section 070.130.110. For each building within the Cardiff Mesa Development that is deed restricted under the Deed Restricted Development program set forth in Section 070.130.110 of the Glenwood Springs Municipal Code, the Owner shall be entitled to deferment of the following:

i. water and sewer improvement fees required under GSMC Article 080.060;

ii. water and sewer tap fees required under GSMC 080.040.010(c) and 080.030.010(c);

iii. school land dedication fees required under GSMC 070.030.150(d);

iv. fire and emergency service impact fees required under 070.030.150(e).

8.2 Use Taxes. Use taxes relating to building materials and supplies shall be collected for any building(s) not constructed to be owned by a tax exempt entity, as evidenced by an executed

purchase contract between the Owner and the purchasing entity. Where any building(s) are contracted for sale to a tax exempt entity, the collection of all use taxes relating to building materials and supplies shall be deferred only if they are a part of the last contingency in a purchase contract between the Owner and a tax exempt entity, and no Certificate of Occupancy shall be issued until said purchase contract is closed or the use taxes are paid.

8.3 Parkland Dedication. The Parties agree that the Property is subject to the City parkland dedication requirements set forth in Glenwood Springs Municipal Code Section 070.030.150. Pursuant to the approvals granted by City Council February 7, 2013, the Owner shall dedicate to the City a portion of land for incorporation into the Four Mile Trail, Tract 5 to the City of Glenwood Springs, and Tract 2 to the Glenwood Springs Historical Society.

8.4 Traffic Improvements and Traffic Impact. As a requirement of approval of the amended Major Development and Major Subdivision, the Owner is required to complete the following:

(a) Lay a 3" asphalt overlay on Airport Road extending the full length of the Development parcel.

(b) Construct an approximately 100' long portion of the Four Mile Trail extending from the Cardiff Mesa access road to Airport Road, as depicted on sheet 3.2 of the civil plans approved February 7, 2013.

(c) Paint a crosswalk across Airport Road safe access to the Four Mile Trail from the nearest public sidewalk.

8.5 Specific Conditions.

(a) The Owner, HOA, or other owner(s) shall for ten (10) years following the issuance of a Certificate of Occupancy make an annual contribution to the South Midland Improvement Fund of $120 per unit. Owner agrees to incorporate said fee into the Covenants for the Development and pay said fee to the City as directed.

Section 9. AMENDMENT.

This Agreement may be amended from time to time, in whole or in part, by mutual written consent of the Parties or their successors in interest. Any amendment to this Agreement that would, in the opinion of the Community Development Director, result in a material modification to the Current Approvals shall require additional development review pursuant to the City's Municipal Code.

Section 10. DEFAULT; TERMINATION.

10.1 Default and Termination. Any failure by either Party to perform any term or provision of this Agreement, which failure continues uncured for a period of thirty (30) days following written notice of such failure from the other Party, unless such period is extended by written mutual consent, shall constitute a default under this Agreement. Any notice given pursuant to the preceding sentence shall specify the nature of the alleged failure and, where appropriate, the

manner in which said failure satisfactorily may be cured. If the nature of the alleged failure is such that it cannot reasonably be cured within such thirty (30) day period, then the commencement of the cure within such time period, and the diligent prosecution to completion of the cure thereafter, shall be deemed to be a cure within such thirty (30) day period. Upon the occurrence of a default under this Agreement, the non-defaulting Party may take action pursuant to the Code or institute legal proceedings to enforce the terms of this Agreement. If the default is cured, then no default shall exist and the noticing Party shall take no further action.

10.2 Enforced Delay; Extension of Time of Performance. Notwithstanding anything to the contrary contained herein, neither Party shall be deemed to be in default where delays in performance or failures to perform are due to, and a necessary outcome of war, insurrection, strikes or other labor disturbances, walk-outs, riots, floods, earthquakes, fires, casualties, acts of God, restrictions imposed or mandated by other governmental entities, enactment of conflicting state or federal laws or regulations, new or supplemental environmental regulations, or similar basis for excused performance which is not within the reasonable control of the Party to be excused. Upon the request of either Party hereto, an extension of time, including an extension of applicable contract dates, for such cause shall be granted in writing for the period of the enforced delay, or longer as may be mutually agreed upon.

Section 11. ADDITIONAL AFFORDABLE UNITS.

11.1 Impact/Improvement Fees. The City and Owner agree that the Owner shall have the right, on its own or by contract with a separate entity, to subject any or all of the residential units in the Cardiff Mesa Development to deed restriction substantially in the form required in Section 070.130.110 of the City Code, and in doing so shall be entitled to a unit-proportional reduction in applicable impact and improvement fees consistent with the terms and conditions of this Agreement. The deed restriction required in Section 070.130.110 of the City Code must be agreed to by the City prior to the City's waiver or reimbursement of said impact and improvement fees.

Section 12. DEFENSE AND INDEMNITY.

12.1 Owner's Actions. The Owner shall hold harmless and indemnify City and its elected and appointed officers, agents, employees, and representatives from claims, costs, and liabilities for any personal injury, death, or physical damage (including inverse condemnation) which arises directly or indirectly, as a result of the construction of the Development, or of operations performed under this Agreement, by Owner or by the Owner's contractors, subcontractors, agents or employees, whether such operations were performed by the Owner or any of the Owner's contractors, subcontractors, or any one or more persons directly or indirectly employed by, or acting as agent for, the Owner or any of the Owner's contractors or subcontractors.

12.2 City's Actions. Nothing in this section shall be construed to mean that the Owner shall indemnify or hold the City or its elected and appointed representatives, officers, agents and employees harmless from any claims of personal injury, death or property damage arising from, or alleged to arise from any act or omission of the City with regard to improvements that have been offered for dedication and accepted by City for maintenance. Nothing contained herein is

intended to nor shall be construed as a waiver of the City's governmental immunity under state or federal law.

Section 13. NO AGENCY, JOINT VENTURE OR PARTNERSHIP.

It is specifically understood and agreed to by and between the Parties that: (1) the subject Development is a private development; (2) the City has no interest or responsibilities for, or due to, third parties concerning any improvements until such time, and only until such time, that the City accepts the same pursuant to the provisions of this Agreement or in connection with the Current Approvals; (3) the Owner shall have full power over and exclusive control of construction of the Development on the Property herein described, subject only to the limitations and obligations of the Owner under the Current Approvals; and (4) the City and Owner hereby renounce the existence of any form of agency relationship, joint venture or partnership between the City and Owner and agree that nothing contained herein or in any document executed in connection herewith shall be construed as creating any such relationship between the City and Owner. It is expressly understood that the City cannot be legally bound by the representations of any of its officers or agents or their designees except in accordance with the Municipal Code and Ordinances and the laws of the State of Colorado, and that the Owner, when dealing with the City, acts at its own risk as to any representation or undertaking by the City officers or agents or their designees which is subsequently held unlawful by a court of law or unratified by authoritative bodies.

Section 14. MISCELLANEOUS.

14.1 Incorporation of Recitals and Introductory Paragraph. The recitals contained in this Agreement, and the introductory paragraph preceding the recitals, are hereby incorporated into this Agreement as is fully set forth herein.

14.2 Assignment. This Agreement may not be assigned by the Owner without prior written consent by the City, which consent shall not be unreasonably withheld. In the event the Owner desires to assign its rights and obligations herein, it shall so notify the City in writing together with the proposed assignee's written agreement to be bound by the terms and conditions contained herein.

14.3 Severability. If any term or provision of this Agreement, or the application of any term or provision of this Agreement to a particular situation, is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining terms and provisions of this Agreement, or the application of this Agreement to other situations, shall continue in full force and effect unless amended or modified by mutual consent of the Parties.

14.4 Other Necessary Acts. Each Party shall execute and deliver to the other all such other further instruments and documents as may be reasonably necessary to carry out the Current Approvals and to provide and secure to the other Party the full and complete enjoyment of its rights and privileges hereunder.

14.5 Cost Reimbursement. The Owner shall reimburse the City for the cost of making corrections or additions to the master copy of the official City map. The Owner shall also pay any unidentified fees required pursuant to the Glenwood Springs Municipal Code. Interest shall be

imposed at rate of one and one-half percent (1.5%) per month on all balances not paid within thirty (30) days of the date of the statement. In addition to any and all remedies available to the City and in the event the City is forced to pursue collection of any amounts due and unpaid under this provision or under this Agreement, the City shall be entitled to collect attorney's fees and costs incurred in said collection efforts in addition to the amount due and unpaid.

14.6 Construction. Each reference in this Agreement to any of the Current Approvals shall be deemed to refer to the Current Approval as it may be amended from time to time pursuant to the provisions of this Agreement, whether or not the particular reference refers to such possible amendment. This Agreement has been reviewed and revised by legal counsel for both the City and Owner, and no presumption or rule that ambiguities shall be construed against the drafting party shall apply to the interpretation or enforcement of this Agreement.

14.7 Other Miscellaneous Terms. The singular shall include the plural; the masculine gender shall include the feminine; "shall" is mandatory; "may" is permissive.

14.8 Covenants Running with the Land. All the provisions contained in this Agreement constitute covenants running with the land. Each covenant herein to act or refrain from acting is for the benefit of or a burden upon the Property.

14.9 Remedies. Either Party may, in addition to any other rights or remedies, institute an equitable action to cure, correct, or remedy any default, enforce any covenant or agreement herein, enjoin any threatened or attempted violation thereof, enforce by specific performance the obligations and rights of the Parties hereto, or to obtain any remedies consistent with the foregoing and the purpose of this Agreement.

14.10 Colorado Law. This Agreement shall be construed and enforced in accordance with the laws of the State of Colorado. Venue for any action instituted relating to this Agreement shall be in Garfield County, Colorado.

14.11 Attorneys' Fees; Survival. In the event of any litigation or arbitration between the Parties regarding an alleged breach of this Agreement, the prevailing Party shall be entitled to reasonable attorneys' fees. All rights concerning remedies and/or attorneys' fees shall survive any termination of this Agreement.

Section 15. NOTICES; REPRESENTATIVE.

15.1 Any notice or communication required hereunder between the City and Owner must be in writing, and may be given either personally or by registered or certified mail, return receipt requested. If given by registered or certified mail, such notice or communication shall be deemed to have been given and received on the first to occur of (i) actual receipt by any of the addressees designated below as the Party to whom notices are to be sent, or (ii) five (5) days after a registered or certified letter containing such notice, properly addressed, with postage prepaid, is deposited in the United States mail. If personally delivered, a notice shall be deemed to have been given when delivered to the Party to whom it is addressed. Any Party may at any time, by giving ten (10) days written notice to the other Party, designate any other address in such notice or communication shall be given. Such notices or communications shall be given to the Parties at their addresses set forth below:

If to City, to:
City Manager
City of Glenwood Springs
101 West 8th Street
Glenwood Springs, CO 81601

With copy to:
City Attorney
KARP NEU HANLON PC
201 14th Street, Suite 200
P.O. Drawer 2030
Glenwood Springs, CO 81602

If to Owner, to:
Silver Sage Preserve, LLC
1487 Walz Avenue
P.O. Box 1027
Glenwood Springs, CO 81602

With copy to:

15.2 Each person signing this Agreement represents and warrants that he or she is fully authorized to enter into and execute this Agreement, and to bind the Party it represents to the terms and conditions hereof.

Section 16. ENTIRE AGREEMENT, COUNTERPARTS, AND EXHIBITS.

This Agreement including exhibits constitute in full, the final and exclusive understanding and agreement of the Parties and supersedes all negotiations or previous agreements between the Parties with respect to all or any part of the subject matter hereof. All waivers of the provisions of this Agreement shall be in writing and signed by the appropriate authorities of the City and the Owner. This Agreement may be executed in counterparts, including any facsimile copies, each of which shall be deemed an original and all of which together shall constitute one and the same instrument. The following exhibits are attached to this Agreement and incorporated herein for all purposes:

Exhibit A – Legal Description
Exhibit B – Current Approvals
Exhibit C – Representative Drawings
Exhibit D – Security
Exhibit E – Deed Restriction
Exhibit F –Fees/Taxes in Abeyance/Straight Line Depreciation

Section 17. RECORDATION OF DEVELOPMENT AGREEMENT.

Upon full execution of this Agreement, it shall be recorded with the Garfield County, Colorado Clerk and Recorder's Office.

IN WITNESS WHEREOF, this Agreement has been entered into by and between the City and Owner as of the date and year first above written.

CITY OF GLENWOOD SPRINGS

SEAL — THE CITY OF GLENWOOD SPRINGS COLORADO

SILVER SAGE PRESERVE, LLC

By: _____

Michael Gamba, Mayor

Name: Michael C Maple
Title: Authorized Representative

Attest:

Catherine Mythen Fletcher
Catherine Mythen, City Clerk

APPROVED AS TO FORM:

Karl J. Hanlon, City Attorney

STATE OF COLORADO)
) ss.
COUNTY OF PITKIN)

The foregoing Development Agreement was acknowledged before me this 17TH day of July, 2016 by MICHAEL C. MAPLE as AUTHORIZED REPRESENTATIVE of **Silver Sage Preserve, LLC**.

Witness my hand and official seal.

AUDREY ELLIS
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #20034024415
My Commission Expires July 23, 2019

Notary Public

Exhibit A
Legal Description

Lot 2, Kingdom Hall Subdivision
According to the Plan thereof recorded April 15, 2002 under Reception No. 601233

Together with that parcel of land as described in quit claim deed recorded April 16, 2002 in Book 1346 at Page 674

Less and except a parcel of land as described in the quit claim deed recorded April 16, 2002 in Book 1346 at page 673

City of Glenwood Springs
County of Garfield
State of Colorado

Exhibit B
Current Approvals

The City has taken various planning actions relating to the Subdivision and Development on the Property. These actions include, without limitation, the following:

1. Rezone of the property from Hillside Preservation (HP) to Planned Unit Development (PUD);
2. Major Subdivision that legally separates the 42 acre Property into five tracts and 19 lots;
3. Major Development that allows:
    a. The construction of 38 duplex units in the area of the Silver Sage Preserve PUD referred to as Silver Sage;
    b. The construction of 17 multi-family units in 5 buildings in the area of the Silver Sage Preserve PUD referred to as Cardiff Mesa;
4. Amendment of the Major Development Permit to add 4 units to the multi-family units in Cardiff Mesa;
5. Variance from providing the required number of off-street parking for a multi-family development;
6. Amendment of the Major Development Permit to reduce the amount of landscaping within Cardiff Mesa;
7. Amendment of the Major Development Permit to eliminate Airport Road improvements which include but are not exclusive of pavement, curb, gutter, sidewalk, planting strip, and street trees;
8. Adoption of the Silver Sage Housing Mitigation Plan which satisfies the community housing requirement for the Silver Sage Preserve.
9. Accepted land dedication of Tract 5 to the City of Glenwood Springs, and Tract 2 to the Glenwood Springs Historical Society.

The following are conditions of the Current Approvals:

1. The owner shall pay a fee for recording the Development and Subdivision Improvement Agreement payable to the Garfield County Clerk and Recorder.
2. Upon recording of the final plat the owner shall:
    a. Dedicate Tract 5 to the City of Glenwood Springs;
    b. Dedicate Tract 2 to the Glenwood Springs Historical Society.
3. Construction of the project shall comply with all applicable building and fire codes that are adopted upon application of any grading, building or other applicable city permit.
4. Prior to issuance of grading or building permit for each of the Cardiff Mesa and Silver Sage phases of development, the owner shall:
    a. Provide an updated Engineer's estimate of the public improvements (listed in the approved phasing plan). Security for public improvements shall be collected upon issuance of the first building or grading permit.
    b. Submit updated civil engineering plans and specification of the water and wastewater systems for review and approval of the City of Glenwood Springs Water/Wastewater Division. Said systems shall be designed to City specifications upon application of any grading, building or other applicable city permit.

c. Organize and attend a pre-construction meeting with the City of Glenwood Springs and outside utility agencies.
d. Install snow or silt fencing at the limits of construction activities to contain disturbance to surrounding native vegetation.
e. Demonstrate compliance with the City Electric Department's line extension policy in effect upon application of any grading, building or other applicable city permit.
f. Demonstrate compliance with the model of fire hydrant and depth of bury in effect upon application of any grading, building or other applicable city permit.
g. Obtain a stormwater discharge permit from the State of Colorado Department of Public Health and Environment, Water Quality Control Division, or the authorizing agency upon application of any grading, building or other applicable city permit.

5. Prior to the issuance of a certificate of occupancy for each of the Cardiff Mesa and Silver Sage phases of development, the owner shall deliver as-built drawings to the city in a format that will be determined upon application of any grading, building or other applicable city permit.

Conditions applicable to the Silver Sage phase of the Silver Sage Preserve PUD:

6. Prior to placing the sewer main and manholes into service and subject to the approval of the Water/Wastewater Department, Applicant shall test and televise the sewer mains and manholes.
7. Prior to placing the water utilities into service and subject to the approval of the Water/Wastewater Department, Applicant shall bacteria test, pressure test, and sterilize the water utilities.
8. Owner and City understand that the water and wastewater systems servicing the Silver Sage neighborhood will be owned and maintained by the City of Glenwood Springs after said systems are constructed by the Silver Sage owner, and after said systems are accepted by the City.
9. Prior to issuance of a certificate of occupancy and subject to the approval of the City Public Works Director, the owner shall provide easements for all fire hydrants based on as-built locations of the fire hydrants.
10. Changes to the approved lighting plan reflected on Sheet LP1 shall be reviewed and approved by the Glenwood Springs Community Development Department prior to purchase and installation. Lighting revisions shall conform to the city's exterior lighting standards upon application of any grading, building or other applicable city permit.

Conditions applicable to the Cardiff Mesa phase of the Silver Sage Preserve PUD:

11. The sizes of each building in the Cardiff Mesa development shall not deviate from those approved by City Council on February 7, 2013.
12. Further subdivision of the Cardiff Mesa development area, which would allow the sale of individual buildings and/or units shall be subject to application and review per Municipal Code requirements that are in effect at the time.
13. The on-site storage and parking of seasonal recreational vehicles and equipment shall be prohibited.

14. The owner shall construct the "Lower Trail" as depicted on the Active Open Space Compliance Plan dated 8/8/12 and as approved on February 7, 2013 which will bring the development to within 0.04 acres of compliance with the Municipal Code active open space requirement.
15. With the exception of the granted amendment, all approvals and conditions granted by City Council on February 7, 2013 shall remain in full force and effect.
16. Submit a 24 x 36 inch mylar of the revised landscape plan, stamped by a Colorado licensed Landscape Architect or qualified professional. The revisions shall reflect the approved amendments and shall call-out each plant type.
17. The owner shall provide a 3-inch asphalt overlay on Airport Road as per representations made during the August 23, 2016 Planning & Zoning Commission public hearing.
18. The owner shall provide 60% of the required street trees with flexibility as to the location of the street trees. However, the trees shall be generally located in an area between the location as shown on the original landscape plan and the property boundary, but also in a location to achieve screening of uses on the opposite side of Airport Road from view of the proposed new buildings.
19. The owner shall paint the crosswalk and construct an approximately 100-foot long portion of the Four Mile Trail which extends from the Cardiff Mesa access road to Airport Road as depicted on sheet 3.2 of the civil plans, approved February 7, 2013.
20. Should plans change and the School District not purchase and/or rent the Cardiff Mesa units, the owner shall submit a revised community housing plan for review and approval to ensure that the Silver Sage development meets its community housing obligation.
21. There shall be a mutually acceptable and executed master deed restriction between the Roaring Fork School District and the City of Glenwood Springs for units purchased by the District which addresses items in the draft deed restriction provided to the applicant during the August 23, 2016 Planning and Zoning Commission hearing.
22. Prior to execution, the terms of the master deed restriction between the Roaring Fork School District and the City of Glenwood Springs, referenced in condition #11, shall be reviewed and approved by City Council.

EXHIBIT C
SITE PLANS AND REPRESENTATIVE DRAWINGS INDEX

SILVER SAGE PRESERVE PUD CIVIL ENGINEERING PLANS Sopris Engineering LLC		
Site Plan – Silver Sage Preserve PUD	Sheet C1.4	2-7-2012
SILVER SAGE NEIGHBORHOOD – TRACT 4 CIVIL ENGINEERING PLANS Sopris Engineering LLC		
Site Plan – Silver Sage neighborhood	Sheet C2.1	2-7-2012
Utility Plan – Silver Sage neighborhood	Sheet C2.3	2-7-2012
SILVER SAGE NEIGHBORHOOD – TRACT 4 ARCHITECTURAL PLANS Palomino Design Build PC		
Architectural Elevations-D1	Sheet A3.1	Undated
Architectural Elevations-D1	Sheet A3.2	Undated
Architectural Elevations-D2	Sheet A3.1	Undated
Architectural Elevations-D2	Sheet A3.2	Undated
Architectural Elevations-D2 Reverse	Sheet A3.1	Undated
Architectural Elevations-D2 Reverse	Sheet A3.2	Undated
Architectural Elevations-D3 Reverse	Sheet A3.1	Undated
Architectural Elevations-D3 Reverse	Sheet A3.2	Undated
Architectural Elevations-H1	Sheet A3.1	Undated
Architectural Elevations-H1	Sheet A3.2	Undated
Architectural Elevations-H5	Sheet A3.1	Undated
Architectural Elevations-H5	Sheet A3.2	Undated
Architectural Elevations-H6	Sheet A3.1	Undated
Architectural Elevations-H6	Sheet A3.2	Undated
Architectural Elevations-H7	Sheet A3.1	Undated
Architectural Elevations-H7	Sheet A3.2	Undated
Architectural Elevations-H7 Reverse	Sheet A3.1	Undated
Architectural Elevations-H7 Reverse	Sheet A3.2	Undated
SILVER SAGE NEIGHBORHOOD – TRACT 4 LANDSCAPE PLANS Land Design Partnership		
Landscape Plan	Unnumbered	8-9-2012
Lot 13 Example Landscape Plan	Unnumbered	1-27-2012
CARDIFF MESA NEIGHBORHOOD – TRACT 1 CIVIL ENGINEERING PLANS Sopris Engineering LLC		
Site Plan	Sheet C3.1	6-1-2017
Grading & Drainage Plan	Sheet C3.2	6-1-2017
Utility Plan & Profile	Sheet C3.3	6-1-2017
Airport Road Plan/Profile	Sheet C3.4	6-1-2017
CARDIFF MESA NEIGHBORHOOD – TRACT 1 ARCHITECTURAL PLANS Palomino Design Build PC		
Building B Front and Right Side Elevations	Sheet A3.1	Undated

Building B Back and Left Side Elevations	Sheet A3.2	Undated
Building G Ground Level Floor Plan	Sheet A2.1	Undated
Building G North Elevation	Sheet A3.1	Undated
Building G West and East Elevations	Sheet A3.2	Undated
Building G South Elevation	Sheet A3.3	Undated
CARDIFF MESA NEIGHBORHOOD – TRACT 1 LANDSCAPE PLANS Land Design Partnership		
Cardiff Mesa Landscape Plan	Unnumbered	7/6/2016

Exhibit D

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS
SILVER SAGE PUD - MAJOR DEVELOPMENT PERMIT
SE JOB NO. 27045
JULY 10, 2017

CARDIFF MESA - PUBLIC IMPROVEMENTS COST ESTIMATE

	ITEM	QUANTITY	UNIT	UNIT COST		COST
SITE WORK						
S1	MOBILIZATION	JOB	L.S.	20,000.00	$	20,000.00
S2	LAYOUT, OBSERVATION, TESTING & AS-BUILTS	JOB	L.S.	30,000.00	$	30,000.00
S3	CLEAR AND GRUB	JOB	L.S.	1,000.00	$	1,000.00
S6	STREET/STOP SIGNS	4	E.A.	500.00	$	2,000.00
S7	TRAFFIC CONTROL	JOB	L.S.	6,000.00	$	6,000.00
				SUBTOTAL SITE =	$	**59,000.00**
PAVING & CONCRETE IN RIGHT OF WAY						
R1	CLASS 6 AGGREGATE	60	C.Y.	36.00	$	2,160.00
R2	4" ASPHALTIC PAVEMENT	90	S.Y.	31.50	$	2,835.00
R3	3" ASPHALTIC PAVEMENT (TRAIL)	45	S.Y.	26.00	$	1,170.00
R4	5' CONCRETE SIDEWALK	40	L.F.	30.00	$	1,200.00
R5	CONCRETE CURB & GUTTER	185	L.F	32.00	$	5,920.00
R6	CONCRETE APRONS	480	S.F.	7.50	$	3,600.00
				SUBTOTAL PAVING =	$	**16,885.00**
AIRPORT ROAD						
A1	SUBGRADE PREP	JOB	L.S.	1,500.00	$	1,500.00
A2	CLASS 6 AGGREGATE	108	C.Y.	36.00	$	3,888.00
A3	3" ASPHALTIC PAVEMENT	1,620	S.Y.	26.00	$	42,120.00
A4	3' VALLEY PAN	97	L.F.	30.00	$	2,910.00
A5	DRYWELL	2	E.A.	5,000.00	$	10,000.00
A6	12" DRAIN BASIN	2	E.A.	1,200.00	$	2,400.00
				SUBTOTAL AIRPORT ROAD =	$	**62,818.00**
WATER						
W1	12" DIP WATER LINE	510	L.F.	156.00	$	79,560.00
W2	12" WATER VALVES	2	E.A.	3,900.00	$	7,800.00
W3	4" WATER SERVICE W/ 4" VALVE	5	E.A.	6,500.00	$	32,500.00
W4	2" WATER SERVICE FOR IRRIGATION	2	E.A.	3,000.00	$	6,000.00
W5	FIRE HYDRANT ASSEMBLY	3	E.A.	5,000.00	$	15,000.00
				SUBTOTAL WATER =	$	**140,860.00**
SANITARY SEWER						
SS1	8" SDR 35 SEWER LINE	1,098	L.F.	100.00	$	109,800.00
SS2	4' SEWER MANHOLE	4	E.A.	4,800.00	$	19,200.00
SS3	6" SEWER SERVICE	5	E.A.	5,000.00	$	25,000.00
SS4	SEWER INTERCONNECT	1	E.A.	4,000.00	$	4,000.00
SS5	REMOVE/REPLACE HARDSCAPE @ ROAD CROSSING	JOB	L.S.	3,500.00	$	3,500.00
SS6	REMOVE/REPLACE LANDSCAPE (1,100 LF+/- X 20' WIDTH)	0.50	A.C.	3,500.00	$	1,750.00
				SUBTOTAL SEWER =	$	**163,250.00**
EROSION CONTROL						
E1	EROSION CONTROL (SILT FENCE, STRAW BAILS, ETC)	JOB	L.S.	2,500.00	$	2,500.00
				SUBTOTAL EROSION =	$	**2,500.00**
SHALLOW UTILITIES						
U1	3' UTILITY TRENCH (GAS)	150	L.F.	6.00	$	900.00
U2	4' UTILITY TRENCH (ELECTRIC, TELEPHONE, CABLE)	1,130	L.F.	12.00	$	13,560.00
U3	4" CONDUIT-FURNISH AND INSTALL (ELECTRIC)	2,120	L.F.	4.00	$	8,480.00
U4	4" CONDUIT-FURNISH AND INSTALL-(COMCAST)	800	L.F.	4.00	$	3,200.00
U5	ELECTRIC TRANSFORMERS	3	E.A.	7,000.00	$	21,000.00
				SUBTOTAL SHALLOW UTILITIES =	$	**47,140.00**
PUBLIC LANDSCAPE IMPROVEMENTS						
L1	RECLAIM / REVEGETATE DISTURBED SITE	1	L.S.	5,000.00	$	5,000.00
L2	LANDSCAPE TREES	1	L.S.	10,000.00	$	10,000.00
				SUBTOTAL LANDSCAPE =	$	**15,000.00**
TOTAL ALL ITEMS =					$	**507,453.00**
10% CONTINGENCY						50,745.30
TOTAL					$	**558,198.30**

COLORADO REGISTERED
JANICE L. SOPRIS
28377
7/11/2017
PROFESSIONAL ENGINEER

Cardiff Mesa public improvements include utility main lines and service lines, road and storm improvements in the right of way, and the onsite landscape trees (that replace the required street trees in the right of way). The onsite hardscape and landscape improvements will be privately owned and maintained, therefore they are not included here. Onsite improvement design will be completed with the site building permits. These improvements will be required to be complete prior to certificate of occupancy.

NOTE: This opinion of probable construction cost was prepared for budgeting purposes only. Sopris Engineering, LLC cannot be held responsible for variances from this estimate as actual costs may vary due to bid and market fluctuations.

Reception#: 894964
07/19/2017 11:33:12 AM Jean Alberico
1 of 12 Rec Fee:$68.00 Doc Fee:0.00 GARFIELD COUNTY CO

CONFORMED COPY

AFFORDABLE HOUSING AGREEMENT
MASTER DEED RESTRICTION AND AGREEMENT CONCERNING THE SALE, OCCUPANCY, AND RESALE OF PROPERTY

THIS DECLARATION OF MASTER DEED RESTRICTION AND AGREEMENT CONCERNING THE SALE, OCCUPANCY, AND RESALE OF PROPERTY ("Agreement" or "Deed Restriction") is entered into this 29th day of June, 2017 by the Roaring Fork RE-1 School District ("District") and the City Council for the City of Glenwood Springs, Colorado ("City").

RECITALS

WHEREAS, the District has signed a contract to purchase certain real property more particularly described and displayed on **Exhibit A**, attached hereto and incorporated herein (the "Property"); and

WHEREAS, the District has represented and volunteered that it will thereafter rent the apartment/condominium units (the "Units") to qualifying, low-income tenants employed by the District, preferably teachers; and

WHEREAS, the District agrees that if the District does not rent the Units as required herein or in the future sells the Units, certain fees shall be paid and improvements shall be made for the benefit of the City, as further detail on **Exhibit B**, attached hereto and incorporated herein.

NOW, THEREFORE, in consideration of the promises and covenants hereinafter set forth, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto declare, covenant, and agree as follows:

ARTICLE 1
DEFINITIONS

1.1 "City" shall mean the City of Glenwood Springs, Colorado.

1.2 "Employee Housing Rental Guidelines" or "Rental Guidelines" shall mean those certain guidelines promulgated by the District, which may contain the eligibility standards for certifying and prioritizing Qualified Residents.

1.3 "Qualified Residents" shall mean one or more natural persons who are certified

by the District as District teachers or other District employees, and in accordance with this Deed Restriction.

1.4 "Property Manager" ("Manager") shall mean the District or a property manager retained by the District to operate the Project in accordance with this Deed Restriction.

1.5 "Unit" shall mean one or more of the residential dwelling units constructed on the Property for rent.

ARTICLE 2
AGREEMENT BINDS THE PROJECT

2.1 Binding Nature. This Agreement shall constitute a covenant running with the title to the Property as a burden thereon, for the benefit of, and enforceable by, the City. This Agreement shall bind the District and all District employees or occupants of the Units. Each and every occupant of a Unit within the Property shall be personally obligated hereunder for the full and complete performance and observance of all covenants, conditions, and restrictions contained herein during each occupant's respective period of occupancy of a Unit. Any conveyance of the Units or a portion thereof, or interest therein, for all purposes, shall be deemed to include and incorporate by this reference, the covenants contained in this Agreement, even without reference to this Agreement in any document of conveyance.

ARTICLE 3
PURCHASE BY DISTRICT

3.1 Intent. It is the District's intent to purchase Units in the Development to provide affordable housing to District employees, preferably teachers. In the event the District fails to purchase the Units, this Agreement will be void, and the developer of the Property shall be indebted to the City in the amount of any and all fees and improvements identified on **Exhibit B**.

ARTICLE 4
IMPACT FEES IN ABEYANCE

4.1 Fee Waiver. The impact and improvement fees set forth in the Glenwood Springs Municipal Code and identified on **Exhibit B** shall be held in abeyance and, except as otherwise provided in this Agreement, be waived for each deed restricted Unit. All impact and improvement fees held in abeyance shall be depreciated over a

period of thirty (30) years, using straight line depreciation, from the issuance of a Certificate of Occupancy for the Unit(s).

4.2 Annual Report. The District shall annually, between December 1 and December 15, provided a report and proof to the City of its compliance with the rental requirements set forth in this Agreement for the prior twelve (12) month period. Said report shall contain, at a minimum: (a) the number of deed restricted Units rented pursuant to this Agreement; (b) the period each Unit was rented and the status by which the occupant(s) qualified as Qualified Residents; (c) the monthly rental price; and (d) the taxes, special assessments, and homeowners' association and management fees, and any other fees or charges, including common utilities, assessed to each Unit.

4.3 Payment to City. The District shall be liable to the City for the proportional, depreciated cost of the impact and improvement fees held in abeyance upon the sale of any Unit to a third party, except in the event such sale is in conformance with the then-applicable Community Housing Guidelines as permitted by Paragraph 7 below. In the event that the District rents any Unit(s) at an amount exceeding the maximum rents established by the District's Rental Guidelines, the District shall pay to the City the full remaining pro-rata depreciated cost of said impact and improvement fees for the Unit(s).

ARTICLE 5
QUALIFIED TENANTS; AFFORDABILITY

5.1 Occupancy. The District shall restrict the occupancy and use of the Units to Qualified Residents, except as expressly permitted by this Deed Restriction. A Qualified Resident may not sublease the Unit or any part thereof. A Qualified Resident may only have a roommate who is not a Qualified Resident with the District's written consent.

5.2 Priority. The District has the right to select all Qualified Residents to occupy the Unit in its sole discretion according to the restrictions contained herein and the Rental Guidelines promulgated by the District. The first priority for Qualified Residents shall be employees of the District. If the District is unable to secure a lease with a first priority tenant, the District may expand its search for a tenant to a natural person employed within Glenwood Springs, and who is approved by the City, who will occupy the unit as his or her principal place of residence for a lease term not to exceed six (6) months, after which the District must take reasonably diligent steps to

lease the Units to an employee of the District. In no event shall a Unit be leased to any resident who will not occupy the Unit as his or her principal place of residence.

5.3 Affordability. The District's Rental Guidelines shall ensure that the Units remain affordable to Qualified Tenants. In no event shall any Unit be rented at a rate exceeding the maximum rents established by the District's Rental Guidelines. The maximum rents will include taxes, homeowners' association fees, and any other special assessments, but not utilities.

ARTICLE 6
OCCUPANCY AND LEASE RESTRICTIONS

6.1 Occupancy. No occupants of the Unit shall engage in any business activity on or in a Unit.

6.2 No Discrimination. In the rental and occupancy of the Units, there shall be no discrimination on the basis of age, race, creed, color, sex, sexual orientation, disability, religion, national origin, marital status, gender identity, or affiliation.

6.3 Vacancy. When a Unit becomes vacant, Manager shall promptly make it available and actively market said Unit for lease to another Qualified Tenant in accordance with this Deed Restriction and the Rental Guidelines.

6.4 Principal Residence. Each Unit shall only be leased and occupied by residents who will utilize the Unit as his or her principal place of residence. A principal place of residence shall mean the dwelling in which one's habitation is fixed and to which a person, whenever he or she is absent, has a present intention of returning after a departure or absence there from.

6.5 Leases. No Unit shall be leased or otherwise occupied unless the occupant has executed a lease in a form approved by the District. The lease shall contain a statement that incorporates the terms and conditions of this Agreement.

6.6 Change of Employment. In the event the employment status of the occupant of any Unit is altered so as to no longer meet the qualifications provided herein, said occupant shall be permitted to reside in the Unit under the same terms and conditions of the Unit lease and this Agreement, except that no extension of the lease term shall be granted.

ARTICLE 7
CONVERSION TO FOR-SALE AFFORDABLE HOUSING UNIT

7.1. Conversion to Ownership. The District may convert a Unit into an affordable housing ownership unit for the purposes of use and occupancy. Conversion shall require approval from the City, which shall not be unreasonably withheld. In the event the District receives approval to convert one or more Unit(s) to Ownership, the District shall record a substitute deed restriction which shall ensure conformance with the City's then-applicable Community Housing Guidelines or, if none are then enforced, Garfield County's Inclusionary Zoning for Housing. Upon recording of such For Sale Deed Restriction, this Deed Restriction as applied to said Unit shall automatically without the requirement of recording further documentation be released from and no longer subject to this Deed Restriction. In such event, the City shall execute a release of such Unit from this Deed Restriction upon request by the District.

7.2. Administration of Sale. The District shall work with the City to administer any future sale of a Unit. Such Unit shall be sold in accordance with the then-applicable provisions of the City Code regarding affordable housing.

7.3. Appreciation. Any Unit converted to ownership and sold as affordable housing shall be entitled to appreciate above the initial sales price paid by the District, but such annual appreciation shall be no more than 3% simple interest or CPI whichever is less, plus the cost of Permitted Capital Improvements. The Parties shall cooperate to establish an initial sales price for each Unit and to record the same as an amendment to this Deed Restriction as soon as practicable after the construction of the Units.

ARTICLE 8
CONVERSION FOR MARKET RENTAL OR SALE

8.1 Market Conversion. The District may rent or sell any or all Units at market rate, thereby removing the Units from affordable housing inventory in the City. In order to converts a Unit to a free market Unit, the District may record an amendment to this Deed Restriction which will have the effect of unilaterally terminating this Deed Restriction as it applies the converted Unit(s). Upon the conversion or sale of a Unit at market rate, the District shall pay to the City the amount of any and all proportional, amortized, and depreciated impact and improvement fees due for such Unit(s) being sold as such fees are identified on **Exhibit B**. Said amount shall be paid to the City upon the City's demand.

ARTICLE 9
GENERAL PROVISIONS

9.1. Notices. All notices and demands required or permitted under this Agreement shall be in writing as follows: (1) by actual delivery of the notice to the party entitled to receive it; (2) by mailing such notice by certified mail, return receipt requested, in which case the notice shall be deemed to be given three days after the date of its mailing; or (3) by Federal Express or any other overnight carrier, in which case the notice shall be deemed to be given as of the date it is sent. All notices which concern this Agreement shall be sent or delivered, as the case may be, to the address of the appropriate party as set forth below, except if changed by a party by notice pursuant hereto:

If addressed to District:
Roaring Fork RE-1 School District
1405 Grand Avenue
Glenwood Springs, CO 81601

With a copy to:
Balcomb & Green, P.C.
Attn: Chad J. Lee, Esq.
P.O. Drawer 790
Glenwood Springs, CO 81601
clee@balcombgreen.com

If to City:
City of Glenwood Springs
101 W. 8th Street
Glenwood Springs, CO 81601

9.2 Severability. Whenever possible, each provision of this Agreement and any other related document shall be interpreted in such a manner as to be valid under applicable laws, ordinances, rules, regulations, rulings, orders, requirements and guidelines of federal, state and local authorities and agencies applicable to the Project; but if any provision of any of the foregoing shall hold to be invalid or otherwise prohibited under said laws, ordinances, rules, regulations, rulings, orders, requirements or guidelines of federal, state and local authorities and agencies applicable to the Project, such provisions shall be ineffective to the extent of such invalidity or prohibition without invalidating the remaining provisions of the Agreement.

9.3 Choice of Law. This Agreement and each and every related document are to be governed and construed in accordance with the laws of the State of Colorado.

9.4 Waiver. No claim of waiver, consent or acquiescence with respect to any provision of this Agreement shall be valid against any party hereto except on the basis of a written instrument executed by the Parties to this Agreement. However, the party whose benefit a condition is inserted herein shall have the unilateral right to waive such condition.

9.5 Term of Deed Restriction. This Deed Restriction shall terminate and be of no further effect thirty (30) years from the date of its recordation with the Garfield County Clerk and Recorder, or upon unilateral action by the District as set forth in Paragraph 8 above.

IN WITNESS WHEREOF, the Parties hereto have executed this Deed Restriction on the day and year first written above.

ROARING FORK RE-1 SCHOOL DISTRICT:

Mary E Geiger

By: Mary Elizabeth Geiger
Board President

STATE OF COLORADO)
) ss.
COUNTY OF Garfield)

The foregoing instrument was acknowledged before me June 29, 2017, by Mary Elizabeth Geiger, President of the Roaring Fork RE-1 School District Board of Education.

WITNESS my hand and official seal.

My commission expires: 11-2-18

Kathy Thissen

Notary Public

KATHY THISSEN
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #19984030478
My Commission Expires November 2, 2018

ACCEPTANCE BY THE CITY OF GLENWOOD SPRINGS, COLORADO

The foregoing Declaration of Master Deed Restriction and Agreement concerning the Sale, Occupancy and Resale of Property and its terms are hereby adopted and declared by the City of Glenwood Springs.

CITY OF GLENWOOD SPRINGS

By:_____
Michael Gamba, Mayor

ATTEST:

_____
Jill Peterson Deputy City Clerk

THE CITY OF GLENWOOD SPRINGS SEAL COLORADO

EXHIBIT A – Property Description

EXHIBIT MAP OF:

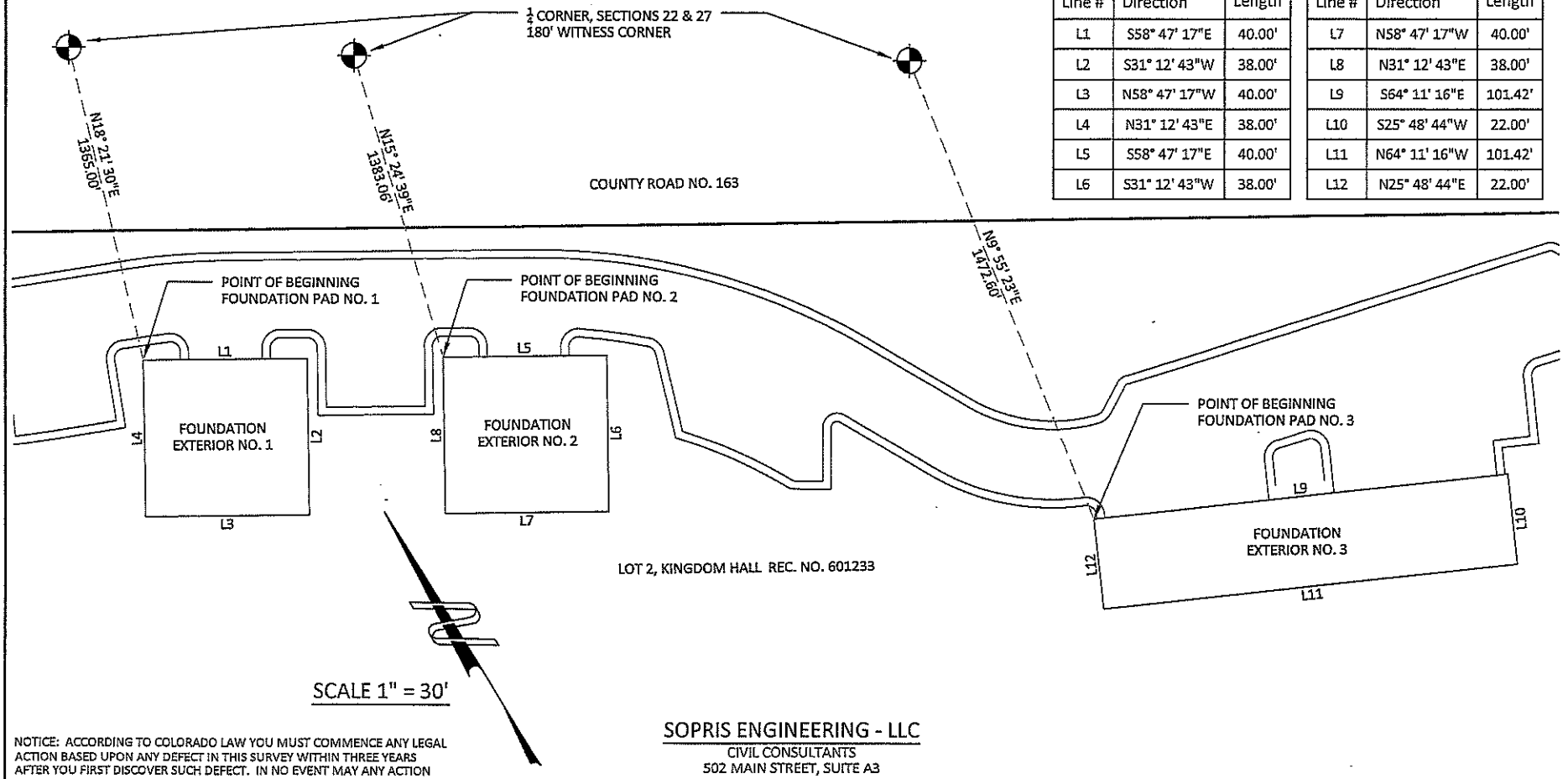
CARDIFF MESA FOUNDATION

SITUATED IN OF SECTION 27, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.,
COUNTY OF GARFIELD, STATE OF COLORADO.

SHEET 1 OF 2

Line Table		
Line #	Direction	Length
L1	S58° 47' 17"E	40.00'
L2	S31° 12' 43"W	38.00'
L3	N58° 47' 17"W	40.00'
L4	N31° 12' 43"E	38.00'
L5	S58° 47' 17"E	40.00'
L6	S31° 12' 43"W	38.00'

Line Table		
Line #	Direction	Length
L7	N58° 47' 17"W	40.00'
L8	N31° 12' 43"E	38.00'
L9	S64° 11' 16"E	101.42'
L10	S25° 48' 44"W	22.00'
L11	N64° 11' 16"W	101.42'
L12	N25° 48' 44"E	22.00'



SCALE 1" = 30'

NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER 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 CERTIFICATION SHOWN HEREON.

SOPRIS ENGINEERING - LLC
CIVIL CONSULTANTS
502 MAIN STREET, SUITE A3
CARBONDALE, COLORADO 81623
(970) 704-0311 SOPRISENG@SOPRISENG.COM

GRK 17101 5/4/2017 G:\2017\17101\SURVEY\Survey DWGs\Descriptions\17101 DESCRIPTIONS.dwg

EXHIBIT MAP OF:

CARDIFF MESA FOUNDATIONS

SITUATED IN OF SECTION 27, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH P.M.,
COUNTY OF GARFIELD, STATE OF COLORADO.

SHEET 2 OF 2

FOUNDATION EXTERIOR DESCRIPTIONS

FOUNDATION NO. 1

A PROPOSED RECTANGULAR FOUNDATION PAD LOCATED WITHIN LOT 2 OF THE KINGDOM HALL SUBDIVISION RECORDED APRIL 15, 2002 AS RECEPTION NO. 601233 OF THE GARFIELD COUNTY RECORDS; SAID PAD ALSO LOCATED WITHIN SECTION 27, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN; THE BASIS OF BEARING FOR THIS DESCRIPTION IS N87°30'45"W BETWEEN THE NORTH QUARTER CORNER FOR SAID SECTION 27 AND THE NORTHWEST SECTION CORNER OF SAID SECTION 27 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT FROM WHICH SAID QUARTER CORNER BEARS N18°21'30"E, A DISTANCE OF 1365.00 FEET; THENCE THE FOLLOWING FOUR (4) COURSES ALONG THE PROPOSED FOUNDATION EXTERIOR:

1) S58°47'17"E, 40.00 FEET;
2) S31°12'43"W, 38.00 FEET;
3) N58°47'17"W, 40.00 FEET;
4) N31°12'43"E, 38.00 FEET TO THE POINT OF BEGINNING; SAID PAD CONTAINS 0.035 AC., MORE OR LESS.

FOUNDATION NO. 2

A PROPOSED RECTANGULAR FOUNDATION PAD LOCATED WITHIN LOT 2 OF THE KINGDOM HALL SUBDIVISION RECORDED APRIL 15, 2002 AS RECEPTION NO. 601233 OF THE GARFIELD COUNTY RECORDS; SAID PAD ALSO LOCATED WITHIN SECTION 27, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN; THE BASIS OF BEARING FOR THIS DESCRIPTION IS N87°30'45"W BETWEEN THE NORTH QUARTER CORNER FOR SAID SECTION 27 AND THE NORTHWEST SECTION CORNER OF SAID SECTION 27 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT FROM WHICH SAID QUARTER CORNER BEARS N15°24'39"E, A DISTANCE OF 1383.06 FEET; THENCE THE FOLLOWING FOUR (4) COURSES ALONG THE PROPOSED FOUNDATION EXTERIOR:

1) S58°47'17"E, 40.00 FEET;
2) S31°12'43"W, 38.00 FEET;
3) N58°47'17"W, 40.00 FEET;
4) N31°12'43"E, 38.00 FEET TO THE POINT OF BEGINNING; SAID PAD CONTAINS 0.035 AC., MORE OR LESS.

FOUNDATION NO. 3

A PROPOSED RECTANGULAR FOUNDATION PAD LOCATED WITHIN LOT 2 OF THE KINGDOM HALL SUBDIVISION RECORDED APRIL 15, 2002 AS RECEPTION NO. 601233 OF THE GARFIELD COUNTY RECORDS; SAID PAD ALSO LOCATED WITHIN SECTION 27, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN; THE BASIS OF BEARING FOR THIS DESCRIPTION IS N87°30'45"W BETWEEN THE NORTH QUARTER CORNER FOR SAID SECTION 27 AND THE NORTHWEST SECTION CORNER OF SAID SECTION 27 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT FROM WHICH SAID QUARTER CORNER BEARS N9°55'23"E, A DISTANCE OF 1472.60 FEET; THENCE THE FOLLOWING FOUR (4) COURSES ALONG THE PROPOSED FOUNDATION EXTERIOR:

1) S64°11'16"E, 101.42 FEET;
2) S25°48'44"W, 22.00 FEET;
3) N64°11'16"W, 101.42 FEET;
4) N25°48'44"E, 22.00 FEET TO THE POINT OF BEGINNING; SAID PAD CONTAINS 0.051 AC., MORE OR LESS.

NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER 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 CERTIFICATION SHOWN HEREON.

SOPRIS ENGINEERING - LLC
CIVIL CONSULTANTS
502 MAIN STREET, SUITE A3
CARBONDALE, COLORADO 81623
(970) 704-0311 SOPRISENG@SOPRISENG.COM

GRK 17101 5/4/2017 G:\2017\17101\SURVEY\Survey DWGs\Descriptions\17101 DESCRIPTIONS.dwg

Exhibit B
Improvement Fees/Taxes in Abeyance

The following fees/taxes will be held in abeyance:

1. Building Plan Review;
2. Building Permit;
3. Water and Sewer Improvement;
4. Water and Sewer Tap;
5. Fire & Emergency Services;
6. School land dedication; and
7. Use Taxes relating to building materials and supplies.

Exhibit F
Fees/Taxes in Abeyance

The following fees have been held in abeyance:

RE-1 School District

1. Development Review fees required under the Glenwood Springs Municipal Code (GSMC) section 070.010.040;
2. Building Permit fees required under GSMC Title 060;
3. Building Plan Review fees required under GSMC Title 060;
4. Water and Sewer Improvement fees required under SCMC Article 080.060;
5. Water and Sewer Tap fees required under GSMC sections 080,040.010(c) and 080.030.010(c);
6. School land dedication fees required under GSMC 070.030.150(d); and,
7. Fire & Emergency Services required under GSMC 070.030.150(e).
8. Use taxes relating to building materials and supplies.

Remaining Cardiff Mesa buildings that are deed restricted under the Deed Restricted Development program set forth in GSMC Section 070.130.110:

1. Water and Sewer Improvement fees required under SCMC Article 080.060;
2. Water and Sewer Tap fees required under GSMC sections 080,040.010(c) and 080.030.010(c);
3. School land dedication fees required under GSMC 070.030.150(d); and,
4. Fire & Emergency Services required under GSMC 070.030.150(e).

FINAL SUBDIVISION PLAT OF:

SILVER SAGE PRESERVE P.U.D.

A PARCEL OF LAND SITUATED IN SECTION 27
TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6th P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO

SHEET 1 OF 2

CERTIFICATE OF DEDICATION AND OWNERSHIP

KNOW ALL MEN BY THESE PRESENTS THAT SILVER SAGE PRESERVE, LLC, BEING SOLE OWNER IN FEE SIMPLE OF ALL THAT REAL PROPERTY DESCRIBED AS FOLLOWS:

LOT 2, KINGDOM HALL SUBDIVISION
ACCORDING TO THE PLAT THEREOF RECORDED APRIL 15, 2002 UNDER RECEPTION NO. 601233 (SEE SURVEY NOTE 6)

SAID PARCEL OF LAND CONTAINING 42.597 ACRES, MORE OR LESS; HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO TRACTS AS SHOWN HEREON AND DESIGNATE THE SAME AS SILVER SAGE PRESERVE P.U.D. IN THE CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, COLORADO; AND OWNER DOES HEREBY SUBJECT THE ABOVE DESCRIBED PROPERTY TO THE DEDICATIONS AND GRANTS OUTLINED IN THE PLAT NOTES CONTAINED HEREON. THIS SUBDIVISION SHALL BE SUBJECT TO THE DEVELOPMENT AND SUBDIVISION IMPROVEMENT AGREEMENT FILED AND RECORDED FOR THIS SUBDIVISION IN THE OFFICE OF THE CLERK AND RECORDER OF GARFIELD COUNTY, COLORADO AS RECEPTION NO 893019 AND TO THAT CERTAIN TO BE RECORDED DECLARATION OF COVENANTS, CONDITIONS, RESTRICTIONS, RESERVATIONS AND EASEMENTS FOR SILVER SAGE PRESERVE P.U.D., AND ALL DULY-ADOPTED AMENDMENTS AND SUPPLEMENTS THERETO AS MAY BE RECORDED HEREAFTER.

EXECUTED THIS 12th DAY OF July, A.D. 2017.

OWNER: SILVER SAGE PRESERVE, LLC

BY: MICHAEL C. MAPLE

STATE OF COLORADO)
COUNTY OF GARFIELD) SS.
CITY OF GLENWOOD SPRINGS)

THE FOREGOING DEDICATION WAS ACKNOWLEDGED BEFORE ME THIS 12th DAY OF July, A.D. 2017, BY MICHAEL C. MAPLE AUTHORIZED REPRESENTATIVE OF SILVER SAGE PRESERVE, LLC, A COLORADO LIMITED LIABILITY COMPANY.

MY COMMISSION EXPIRES 7/23/2019.

WITNESS MY HAND AND SEAL

NOTARY PUBLIC

AUDREY ELLIS
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20004001445
My Commission Expires July 23, 2019

SHEET INDEX

1) CERTIFICATIONS, DEDICATIONS, VICINITY MAP, ADJOINERS
2) EXISTING EASEMENTS, PROPOSED TRACTS AND EASEMENTS

CITY COUNCIL CERTIFICATE

THIS PLAT WAS APPROVED BY THE CITY COUNCIL OF GLENWOOD SPRINGS, GARFIELD COUNTY, COLORADO THE 7TH DAY OF FEBRUARY, A.D. 2013, FOR FILING WITH THE CLERK AND RECORDER OF GARFIELD COUNTY AND FOR CONVEYANCE TO THE CITY OF THE PUBLIC DEDICATIONS SHOWN HEREON SUBJECT TO THE PROVISION THAT THE APPROVAL IN NO WAY OBLIGATES THE CITY OF GLENWOOD SPRINGS FOR FINANCING OR CONSTRUCTION OF IMPROVEMENTS ON LAND, STREETS OR EASEMENTS DEDICATED TO THE PUBLIC EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL IN THE DEVELOPMENT AND SUBDIVISION IMPROVEMENT AGREEMENT.

MAYOR

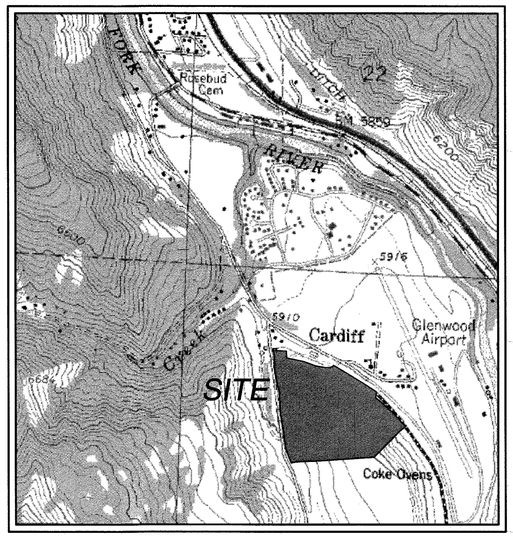
WITNESS MY HAND AND THE SEAL OF THE CITY OF GLENWOOD SPRINGS.
ATTEST:

CITY CLERK

PLANNING COMMISSION CERTIFICATE

THIS PLAT WAS APPROVED BY THE CITY OF GLENWOOD SPRINGS, PLANNING AND ZONING COMMISSION THE 27TH DAY OF NOVEMBER, A.D. 2012.

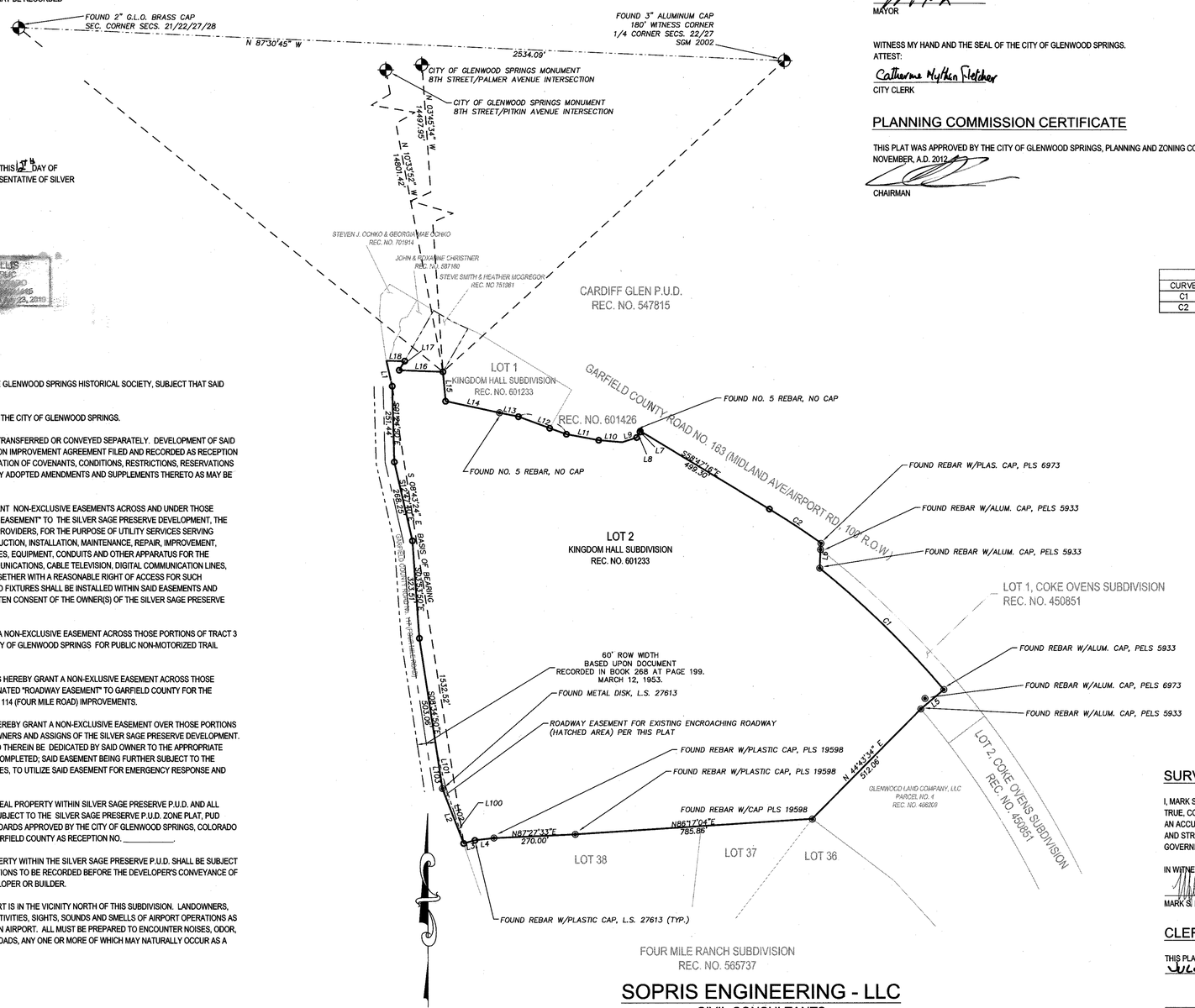
CHAIRMAN



VICINITY MAP
SCALE 1"=1000'

CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	DELTA	BEARING	CHORD
C1	575.05'	3025.36'	288.39'	10°53'26"	S 45°31'07" E	574.18'
C2	203.39'	2646.00'	101.75'	4°24'15"	S 56°35'34" E	203.34'

LINE TABLE		
LINE	LENGTH	BEARING
L1	86.70'	N 12°44'47" W
L2	194.59'	N 21°00'49" W
L3	38.23'	S 74°27'55" W
L4	63.31'	S 83°13'08" W
L5	100.00'	S 49°55'36" W
L6	84.17'	S 02°28'28" W
L7	3.14'	N 15°32'24" E
L8	21.50'	N 31°01'11" E
L9	49.96'	N 71°46'35" E
L10	78.27'	S 85°01'33" E
L11	108.63'	S 79°19'23" E
L12	169.39'	S 69°54'43" E
L13	63.76'	S 78°23'42" E
L14	182.01'	S 77°54'37" E
L15	97.79'	S 04°59'02" E
L16	144.88'	S 87°50'23" E
L17	33.96'	S 29°55'56" W
L18	59.38'	S 87°53'34" E
L100	2.11'	S 74°27'55" W
L101	120.17'	S 13°35'46" E
L102	202.96'	S 18°04'32" E
L103	130.11'	S 08°34'50" E



SURVEY NOTES

1) DATE OF FIELD SURVEY: NOVEMBER, 2007; MAY 2, 2008; SEPTEMBER, 2008 AND JUNE, 2017.

2) DATE OF PREPARATION: JULY - SEPTEMBER, 2008; DECEMBER, 2011; JANUARY - FEBRUARY, 2012; NOVEMBER, 2012; SEPTEMBER, 2013 AND MAY - JUNE, 2017.

3) BASIS OF BEARING: A BEARING OF S 08°43'24" E ALONG EASTERLY RIGHT-OF-WAY OF FOUR MILE ROAD (COUNTY RD. 117) BETWEEN TWO FOUND REBARS AND PLASTIC CAPS (L.S. 27613), AS SHOWN HEREON. THIS IS CONSISTENT WITH THE MONUMENTED LAND AND IMPROVEMENT SURVEY REFERENCED IN NOTE NO. 4 BELOW. THEREFORE THIS SURVEY HAS BEEN ROTATED 01°06'55" CLOCKWISE FROM THE MONUMENTED LAND AND IMPROVEMENT SURVEY REFERENCED IN NOTE NO. 4 BELOW AND COUNTER-CLOCKWISE 01°11'10" FROM THE CITY OF GLENWOOD SPRINGS DATUM BASED ON A BEARING OF N 88°28'00" W ON THE CENTERLINE OF THE 8TH STREET RIGHT-OF-WAY.

4) BASIS OF SURVEY: THE FINAL PLAT OF FOUR MILE RANCH SUBDIVISION, RECORDED JULY 3, 2000 AS RECEPTION NO. 565737; THE PLAT OF CARDIFF GLEN, P.U.D. AND SUBDIVISION PLAT OF CARDIFF GLEN, P.U.D., FILING ONE RECORDED JUNE 24, 1999 AS RECEPTION NO. 547815; THE FINAL PLAT OF KINGDOM HALL SUBDIVISION RECORDED APRIL 15, 2002 AS RECEPTION NO. 601233; THE MONUMENTED LAND AND IMPROVEMENT SURVEY PREPARED BY SURVCO, INC. JOB NO. 07.003 DATED JANUARY 31, 2007.

5) THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY SOPRIS ENGINEERING (SE) TO DETERMINE OWNERSHIP OR EASEMENTS OF RECORD. FOR ALL INFORMATION REGARDING EASEMENTS, RIGHTS OF WAY AND/OR TITLE OF RECORD, SE RELIED UPON THE ABOVE SAID PLATS DESCRIBED IN NOTE 4 AND THE TITLE COMMITMENT PREPARED BY LAND TITLE GUARANTEE COMPANY UNDER ORDER NO. GW63002744, EFFECTIVE DATE APRIL 11, 2008.

6) THE FINAL PLAT OF KINGDOM HALL SUBDIVISION RECORDED APRIL 15, 2002 AS RECEPTION NO. 601233 CONTAINS ERRORS IN THE BOUNDARY DESCRIPTION. THE SURVEYOR OF RECORD FOR SAID PLAT AMENDED THE BOUNDARY WITH A MONUMENTED LAND AND IMPROVEMENT SURVEY PREPARED BY SURVCO, INC. JOB NO. 07.003 DATED JANUARY 31, 2007. BESIDES CORRECTING THE ERROR CLOSURE, THE REVISED DESCRIPTION RECTIFIES THE SUBJECT PROPERTY BOUNDARY TO THE FOUND MONUMENTS AND ADJOINING PROPERTIES.

PLAT NOTES

1. TRACT 2. OWNER DOES HEREBY DEDICATE IN FEE TRACT 2 TO THE GLENWOOD SPRINGS HISTORICAL SOCIETY, SUBJECT THAT SAID TRACT 2 SHALL BE ZONED AS PUBLIC OPEN SPACE.

2. TRACT 5. AND OWNER DOES HEREBY DEDICATE IN FEE TRACT 5 TO THE CITY OF GLENWOOD SPRINGS.

3. TRACT 3 & 4, FUTURE FILING. TRACT 3 AND 4 SHALL NOT BE SOLD, TRANSFERRED OR CONVEYED SEPARATELY. DEVELOPMENT OF SAID TRACTS SHALL BE SUBJECT TO THE DEVELOPMENT AND SUBDIVISION IMPROVEMENT AGREEMENT FILED AND RECORDED AS RECEPTION NO. _____ AND TO THAT CERTAIN TO BE RECORDED DECLARATION OF COVENANTS, CONDITIONS, RESTRICTIONS, RESERVATIONS AND EASEMENTS FOR SILVER SAGE PRESERVE P.U.D. AND ALL DULY ADOPTED AMENDMENTS AND SUPPLEMENTS THERETO AS MAY BE RECORDED HEREAFTER.

4. EASEMENT FOR UTILITY SERVICES. AND OWNER DOES HEREBY GRANT NON-EXCLUSIVE EASEMENTS ACROSS AND UNDER THOSE PORTIONS OF THE TRACTS SHOWN HEREON, DESIGNATED "UTILITY EASEMENT" TO THE SILVER SAGE PRESERVE DEVELOPMENT, THE CITY OF GLENWOOD SPRINGS AND AUTHORIZED UTILITY SERVICE PROVIDERS, FOR THE PURPOSE OF UTILITY SERVICES SERVING SILVER SAGE PRESERVE, INCLUDING BUT NOT LIMITED TO CONSTRUCTION, INSTALLATION, MAINTENANCE, REPAIR, IMPROVEMENT, REPLACEMENT AND OPERATION OF WIRES, CABLES, PIPES, FIXTURES, EQUIPMENT, CONDUITS AND OTHER APPARATUS FOR THE TRANSMISSION OF ELECTRICAL CURRENT, TELEPHONE, TELECOMMUNICATIONS, CABLE TELEVISION, DIGITAL COMMUNICATION LINES, WATER, SEWER, NATURAL GAS, AND OTHER UTILITY SERVICES, TOGETHER WITH A REASONABLE RIGHT OF ACCESS FOR SUCH PURPOSES. SUBJECT TO THE LOCATION OF SAID UTILITY LINES AND FIXTURES SHALL BE INSTALLED WITHIN SAID EASEMENTS AND SHALL NOT BE MOVED OR CHANGED WITHOUT THE ADVANCE WRITTEN CONSENT OF THE OWNER(S) OF THE SILVER SAGE PRESERVE DEVELOPMENT.

5. EASEMENT FOR PUBLIC TRAIL. AND OWNER DOES HEREBY GRANT A NON-EXCLUSIVE EASEMENT ACROSS THOSE PORTIONS OF TRACT 3 AND 4, FUTURE FILING, DESIGNATED "TRAIL EASEMENT" TO THE CITY OF GLENWOOD SPRINGS FOR PUBLIC NON-MOTORIZED TRAIL PURPOSES.

6. EASEMENT FOR COUNTY ROAD IMPROVEMENTS: AND OWNER DOES HEREBY GRANT A NON-EXLUSIVE EASEMENT ACROSS THOSE PORTIONS OF TRACT 3 AND 4, FUTURE FILING, AND TRACT 5 DESIGNATED "ROADWAY EASEMENT" TO GARFIELD COUNTY FOR THE PURPOSE OF THE PUBLIC USE OF THE EXISTING COUNTY ROAD NO. 114 (FOUR MILE ROAD) IMPROVEMENTS.

7. EASEMENT FOR PRIVATE ROADWAY ACCESS: AND OWNER DOES HEREBY GRANT A NON-EXCLUSIVE EASEMENT OVER THOSE PORTIONS OF TRACT 1 DESIGNATED "PRIVATE ACCESS EASEMENT" TO THE OWNERS AND ASSIGNS OF THE SILVER SAGE PRESERVE DEVELOPMENT. SUBJECT TO SAID EASEMENT AND THE IMPROVEMENTS CONTAINED THEREIN BE DEDICATED BY SAID OWNER TO THE APPROPRIATE SILVER SAGE PRESERVE ASSOCIATION AFTER CONSTRUCTION IS COMPLETED; SAID EASEMENT BEING FURTHER SUBJECT TO THE RIGHTS OF EMERGENCY SERVICE PROVIDERS, GUESTS AND INVITEES, TO UTILIZE SAID EASEMENT FOR EMERGENCY RESPONSE AND EMERGENCY EGRESS PURPOSES.

8. ALL PROPERTY AND IMPROVEMENTS SUBJECT TO PUD PLAN. ALL REAL PROPERTY WITHIN SILVER SAGE PRESERVE P.U.D. AND ALL IMPROVEMENTS AND LANDSCAPING CONSTRUCTED THEREON IS SUBJECT TO THE SILVER SAGE PRESERVE P.U.D. ZONE PLAT, PUD ZONE DISTRICT REGULATIONS AND GENERAL DEVELOPMENT STANDARDS APPROVED BY THE CITY OF GLENWOOD SPRINGS, COLORADO AND RECORDED IN THE OFFICE OF THE CLERK AND RECORDER, GARFIELD COUNTY AS RECEPTION NO. _____.

9. RESTRICTIVE COVENANTS, CONDITIONS AND RESTRICTIONS. PROPERTY WITHIN THE SILVER SAGE PRESERVE P.U.D. SHALL BE SUBJECT TO LAWFUL RESTRICTIVE COVENANTS, CONDITIONS AND RESTRICTIONS TO BE RECORDED BEFORE THE DEVELOPER'S CONVEYANCE OF TITLE TO ANY LOT TO A PERSON OTHER THAN A SUCCESSOR DEVELOPER OR BUILDER.

10. AIRPORT OPERATIONS. THE EXISTING GLENWOOD SPRINGS AIRPORT IS IN THE VICINITY NORTH OF THIS SUBDIVISION. LANDOWNERS, RESIDENTS AND VISITORS MUST BE PREPARED TO ACCEPT THE ACTIVITIES, SIGHTS, SOUNDS AND SMELLS OF AIRPORT OPERATIONS AS A NORMAL AND NECESSARY ASPECT OF LIVING IN PROXIMITY TO AN AIRPORT. ALL MUST BE PREPARED TO ENCOUNTER NOISES, ODOR, LIGHTS, AIRPORT DELIVERY AND SUPPORT VEHICLES ON PUBLIC ROADS, ANY ONE OR MORE OF WHICH MAY NATURALLY OCCUR AS A PART OF A LEGAL AND NON-NEGLIGENT AIRPORT OPERATIONS.

SURVEYOR'S CERTIFICATE

I, MARK S. BECKLER, DO HEREBY CERTIFY THAT I AM A REGISTERED LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF SILVER SAGE PRESERVE P.U.D. AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY SUPERVISION AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE LOTS, EASEMENTS AND STREETS OF SAID SUBDIVISION AS THE SAME ARE STAKED UPON THE GROUND IN COMPLIANCE WITH THE CITY OF GLENWOOD SPRINGS REGULATIONS GOVERNING SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 12th DAY OF July, A.D. 2017.

MARK S. BECKLER, P.L.S. #28643

CLERK AND RECORDER'S CERTIFICATE

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER OF GARFIELD COUNTY AT 12:59 O'CLOCK P.M. ON THE 20 DAY OF July, 2017, AS RECEPTION NO. 893016

DRAWER 22 A
FEE 23.00

CLERK AND RECORDER

CONFORMED COPY

BY_____
DEPUTY

DRAWING SCALE
1"=200'

SOPRIS ENGINEERING - LLC
CIVIL CONSULTANTS
502 MAIN STREET, SUITE A3
CARBONDALE, COLORADO 81623
(970) 704-0311

GRK ab 17101 7/11/2017 G:\2017\17101\SURVEY\Survey DWGs\Plat LDD\27045-preplat LDD.dwg

FINAL SUBDIVISION PLAT OF:

SILVER SAGE PRESERVE P.U.D.

A PARCEL OF LAND SITUATED IN SECTION 27
TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6th P.M.
CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO

SHEET 2 OF 2

EXISTING EASEMENTS, PROPOSED TRACTS AND EASEMENTS

EASEMENT CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	DELTA	BEARING	CHORD
CE1	42.40'	30.00'	25.61'	80°58'59"	N 83°06'56" E	38.96'
CE2	15.21'	100.00'	7.62'	8°42'57"	S 52°02'06" E	15.20'
CE3	18.23'	100.00'	9.14'	10°26'41"	N 52°53'58" W	18.20'
CE4	60.94'	200.00'	30.71'	17°27'33"	N 66°51'05" W	60.71'
CE5	41.71'	50.00'	22.15'	47°47'41"	S 51°41'00" E	40.51'
CE6	81.16'	150.00'	41.60'	31°00'08"	N 43°17'13" W	80.18'
CE7	22.01'	150.00'	11.03'	8°24'29"	N 62°59'32" W	21.99'
CE8	22.01'	150.00'	11.03'	8°24'29"	S 62°59'32" E	21.99'
CE9	40.06'	30.00'	23.65'	76°30'39"	S 20°31'58" E	37.15'
CE9a	21.61'	30.00'	11.30'	41°16'33"	S 38°09'01" E	21.15'
CE9b	18.45'	30.00'	9.53'	35°14'07"	S 00°06'19" W	18.16'

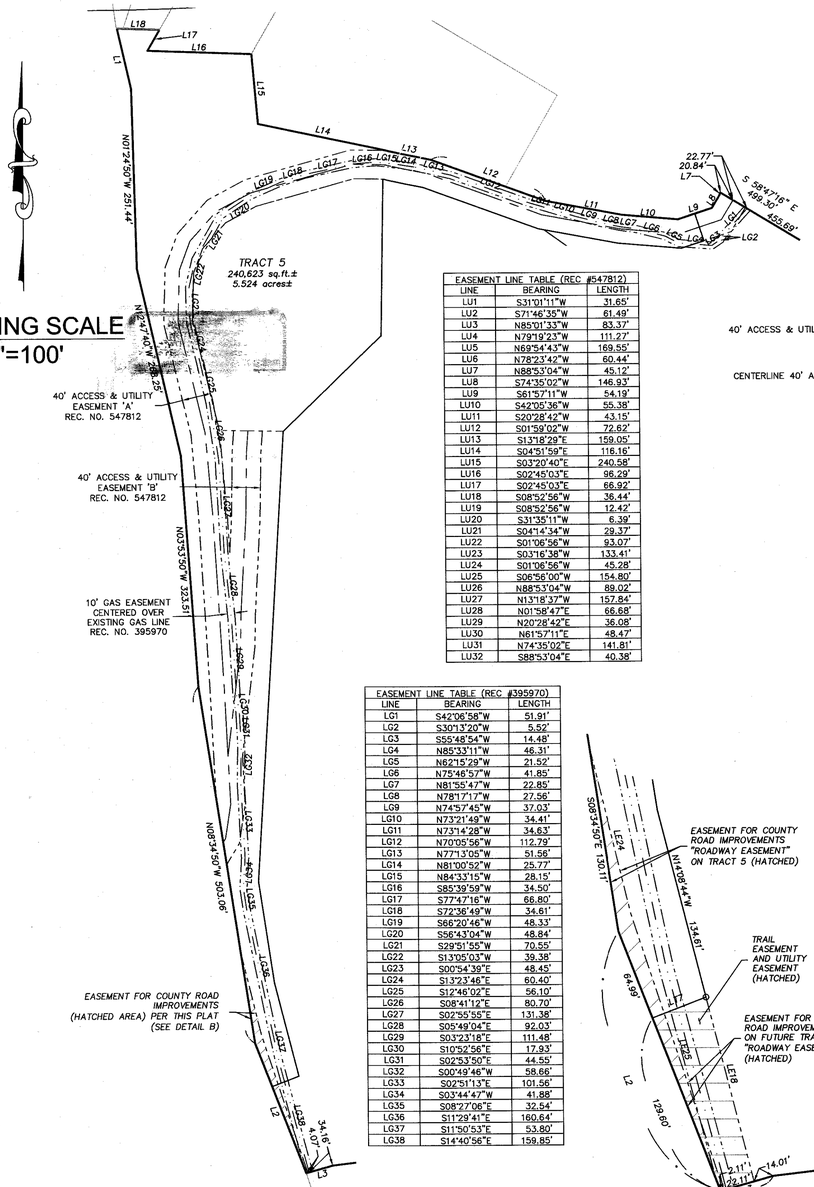
EASEMENT LINE TABLE		
LINE	BEARING	LENGTH
LE1	N56°23'34"W	19.44'
LE2	N47°40'38"W	46.63'
LE3	N58°07'18"W	69.53'
LE4	N75°34'51"W	113.75'
LE5	N27°47'09"W	29.01'
LE6	N58°47'17"W	73.77'
LE7	N67°11'46"W	25.82'
LE8	N58°47'17"W	7.25'
LE9	N33°06'21"E	49.49'
LE17	N42°07'02"W	48.13'
LE18	S14°08'44"E	132.87'
LE19	N28°55'17"E	15.00'
LE20	S61°04'43"E	15.00'
LE21	S28°55'17"W	15.00'
LE22	N61°04'43"W	15.00'
LE23	S50°41'35"E	64.45'
LE24	S13°35'46"E	120.17'
LE25	S18°04'32"E	202.96'

TRACT LINE TABLE		
LINE	BEARING	LENGTH
LT1	S42°31'35"E	156.95'
LT2	S41°59'47"W	131.85'
LT3	S79°19'23"E	113.91'
LT4	S85°01'33"E	88.47'
LT5	N71°46'35"E	33.20'
LT6	N18°14'11"W	40.00'
LT7	S68°59'11"W	40.00'
LT8	S78°23'57"E	57.13'

EXTERIOR BOUNDARY LINE TABLE		
LINE	BEARING	LENGTH
L1	N 12°44'47" W	86.70'
L2	N 21°00'49" W	194.59'
L3	S 74°27'55" W	38.23'
L4	S 83°13'08" W	63.31'
L5	S 49°55'36" W	100.00'
L6	S 02°28'28" W	84.17'
L7	N 15°32'24" E	3.14'
L8	N 31°01'11" E	21.50'
L9	N 71°46'35" E	49.96'
L10	S 85°01'33" E	78.27'
L11	S 79°19'23" E	108.63'
L12	S 69°54'43" E	169.39'
L13	S 78°23'42" E	63.76'
L14	S 77°54'37" E	182.01'
L15	S 04°59'02" E	97.79'
L16	S 87°50'23" E	144.88'
L17	S 29°55'56" W	33.96'
L18	S 87°53'34" E	59.38'

DETAIL A

10' GAS EASEMENT
40' ACCESS AND UTILITY EASEMENT 'A'
40' ACCESS AND UTILITY EASEMENT 'B'
ROADWAY EASEMENT FOR EXISTING ENCROACHING ROADWAY



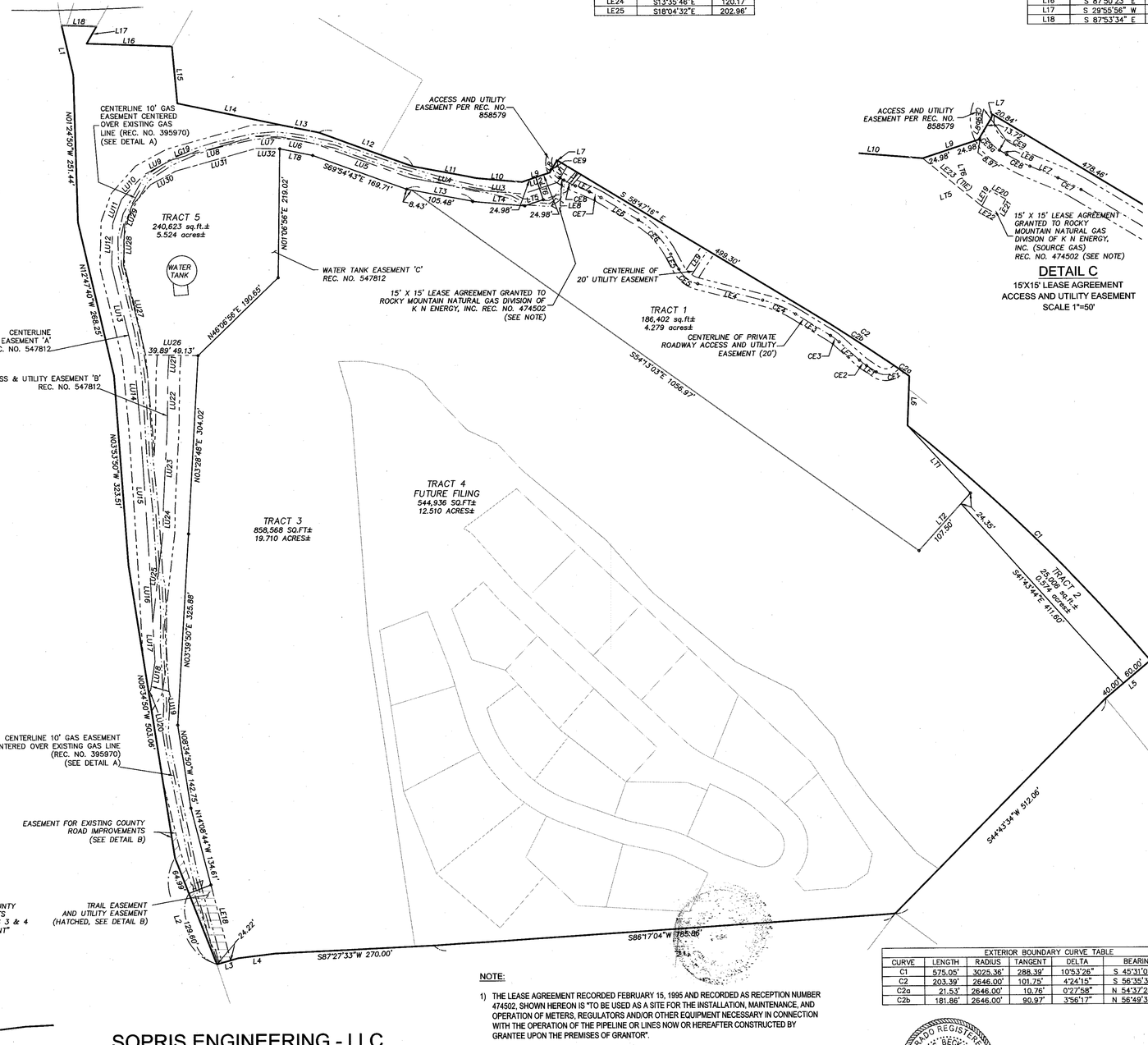
DRAWING SCALE
1"=100'

EASEMENT LINE TABLE (REC #547812)		
LINE	BEARING	LENGTH
LU1	S31°01'11"W	31.65'
LU2	S71°46'35"W	61.49'
LU3	N85°01'33"W	83.37'
LU4	N79°19'23"W	111.27'
LU5	N69°54'43"W	169.55'
LU6	N78°23'42"W	60.44'
LU7	N88°53'04"W	45.12'
LU8	S74°35'02"W	146.93'
LU9	S61°57'11"W	54.19'
LU10	S42°05'36"W	55.38'
LU11	S20°28'42"W	43.15'
LU12	S01°59'02"W	72.62'
LU13	S13°18'29"E	159.05'
LU14	S04°51'59"E	116.16'
LU15	S03°20'40"E	240.58'
LU16	S02°45'03"E	96.29'
LU17	S02°45'03"E	66.92'
LU18	S08°52'56"W	36.44'
LU19	S08°52'56"W	12.42'
LU20	S31°35'11"W	6.39'
LU21	S04°14'34"W	29.37'
LU22	S01°06'56"W	93.07'
LU23	S03°16'38"W	133.41'
LU24	S01°06'56"W	45.28'
LU25	S06°56'00"W	154.80'
LU26	N88°53'04"W	89.02'
LU27	N13°18'37"W	157.84'
LU28	N01°58'47"E	66.68'
LU29	N20°28'42"E	36.08'
LU30	N61°57'11"E	48.47'
LU31	N74°35'02"E	141.81'
LU32	S88°53'04"E	40.38'

EASEMENT LINE TABLE (REC #395970)		
LINE	BEARING	LENGTH
LG1	S42°06'58"W	51.91'
LG2	S30°13'20"W	5.52'
LG3	S55°48'54"W	14.48'
LG4	N85°33'11"W	46.31'
LG5	N62°15'29"W	21.52'
LG6	N75°46'57"W	41.85'
LG7	N81°55'47"W	22.85'
LG8	N78°17'17"W	27.56'
LG9	N74°57'45"W	37.03'
LG10	N73°21'49"W	34.41'
LG11	N73°14'28"W	34.63'
LG12	N70°05'56"W	112.79'
LG13	N77°13'05"W	51.56'
LG14	N81°00'52"W	25.77'
LG15	N84°33'15"W	28.15'
LG16	S85°39'59"W	34.50'
LG17	S77°47'16"W	66.80'
LG18	S72°36'49"W	34.61'
LG19	S66°20'46"W	48.33'
LG20	S56°43'04"W	48.84'
LG21	S29°51'55"W	70.55'
LG22	S13°05'03"W	39.38'
LG23	S00°54'39"E	48.45'
LG24	S13°23'46"E	60.40'
LG25	S12°46'02"E	56.10'
LG26	S08°41'12"E	80.70'
LG27	S02°55'55"E	131.38'
LG28	S05°49'04"E	92.03'
LG29	S03°23'18"E	111.48'
LG30	S10°52'56"E	17.93'
LG31	S02°53'50"E	44.55'
LG32	S00°49'46"W	58.66'
LG33	S02°51'13"E	101.56'
LG34	S03°44'47"W	41.88'
LG35	S08°27'06"E	32.54'
LG36	S11°29'41"E	160.64'
LG37	S11°50'53"E	53.80'
LG38	S14°40'56"E	158.85'

DETAIL B

ACCESS AND UTILITY EASEMENT
SCALE 1"=50'



EXTERIOR BOUNDARY CURVE TABLE						
CURVE	LENGTH	RADIUS	TANGENT	DELTA	BEARING	CHORD
C1	575.05'	3025.36'	288.39'	10°53'26"	S 45°31'07" E	574.18'
C2	203.39'	2646.00'	101.75'	4°24'15"	S 56°35'34" E	203.34'
C2a	21.53'	2646.00'	10.76'	0°27'58"	N 54°37'26" W	21.53'
C2b	181.86'	2646.00'	90.97'	3°56'17"	N 56°49'33" W	181.83'

NOTE:

1) THE LEASE AGREEMENT RECORDED FEBRUARY 15, 1995 AND RECORDED AS RECEPTION NUMBER 474502, SHOWN HEREON IS "TO BE USED AS A SITE FOR THE INSTALLATION, MAINTENANCE, AND OPERATION OF METERS, REGULATORS AND/OR OTHER EQUIPMENT NECESSARY IN CONNECTION WITH THE OPERATION OF THE PIPELINE OR LINES NOW OR HEREAFTER CONSTRUCTED BY GRANTEE UPON THE PREMISES OF GRANTOR".

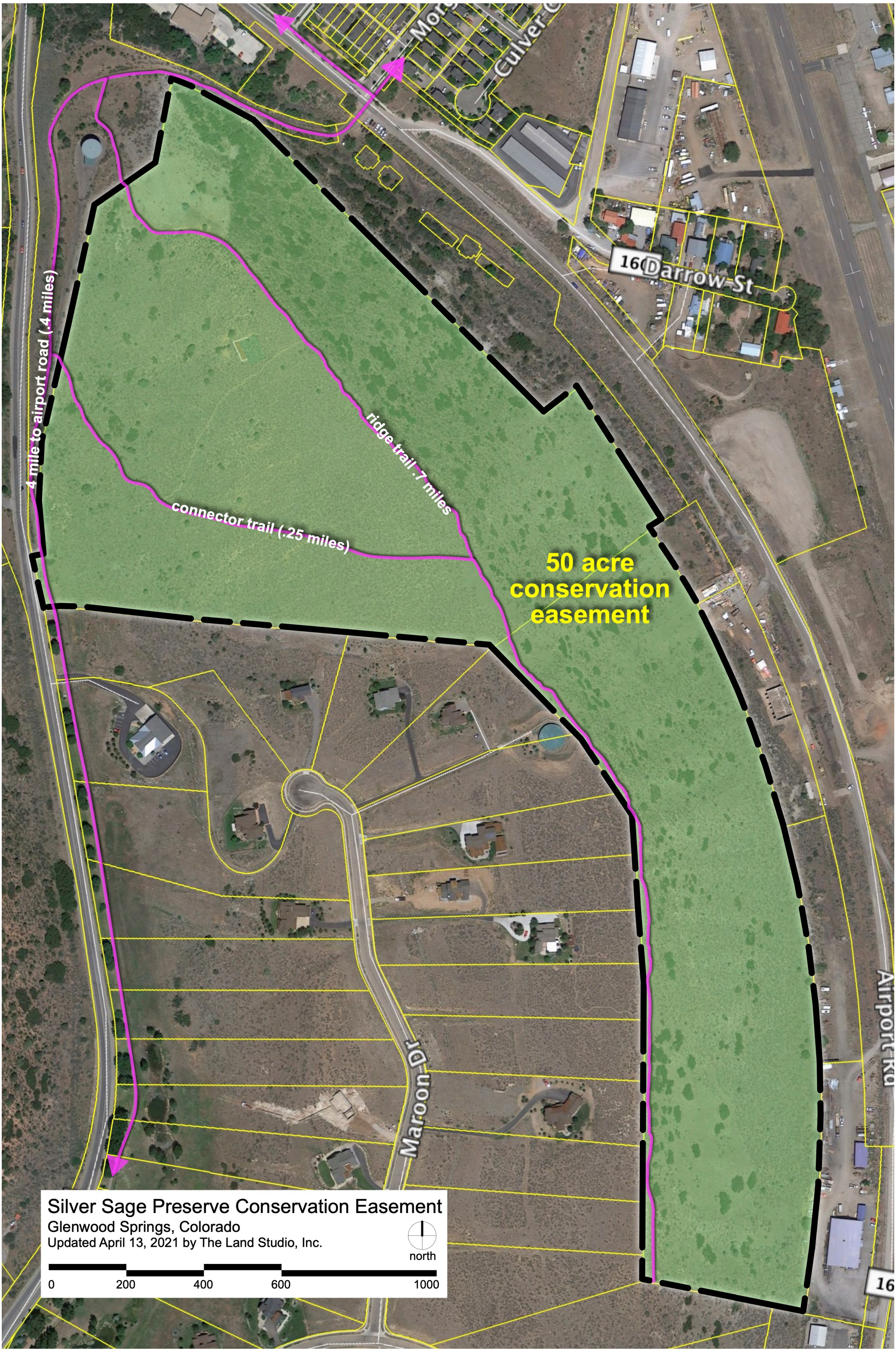
SOPRIS ENGINEERING - LLC
CIVIL CONSULTANTS
502 MAIN STREET, SUITE A3
CARBONDALE, COLORADO 81623
(970) 704-0311

COLORADO REGISTERED PROFESSIONAL LAND SURVEYOR
MARK S. BECKER
29643
LAND SURVEYOR

MARK S. BECKER, P.L.S. #29643

NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER 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 CERTIFICATION SHOWN HEREON.

DRK 05/31/06 - 7/11/2017 C:\2017\17101\SURVEY\Survey DWGs\Plat LDD\27045-preplat LDD.dwg


Darrow St
16
4 mile to airport road (.4 miles)
ridge trail .7 miles
connector trail (.25 miles)
50 acre
conservation
easement
Maroon Dr
Airport Ro
16
Silver Sage Preserve Conservation Easement
Glenwood Springs, Colorado
Updated April 13, 2021 by The Land Studio, Inc.
north
0
200
400
600
1000

LAND USE APPLICATION

City of Glenwood Springs
Economic and Community Development Dept.
101 West 8th Street
Glenwood Springs, CO 81601
970-384-6411

Ordinance Amendments		Development Permits	
☐	Rezoning	☐	Site/Architectural Plan Review
☐	Rezoning to Planned Unit Development (PUD)	☐	☐ Administrative
☐	Annexation		☐ Minor
☐	Condominiumization		☐ Major
☐	Annexation	☐	Master Plan
☐	Street Vacation	☐	Construction Plans
		☐	Location & Extent
Subdivisions		☐	Right of Way Encroachment License
☐	Minor Subdivision	☐	Floodplain Development Permit
☐	Preliminary Plat	☐	Special Use Permit
☐	Final Plat		**Flexibility and Relief Procedures**
☐	Vacation of Right-of-Way	☐	Variance
		☐	Administrative Adjustment
Other Land Use Applications		☐	Appeal
☐	Outdoor Seating		

Applicant/Property Owner Information:			
Applicant		Owner	
Silver Sage Preserve, LLC		Silver Sage Preserve, LLC	
Relationship to Owner		Owner	
		Glenwood Land Company, LLC	
Applicant Address		Owner Address	
	710 East Durant Ave. Unit W-6 Aspen CO 81611		710 East Durant Ave. Unit W-6 Aspen CO 81611
Phone 970-925-9046	Email Address mmaple@dunrene.com	Phone 970-925-9046	Email Address mmaple@dunrene.com

Property Information:	
Address	Parcel Number
0 116 COUNTY RD, GLENWOOD SPRINGS, CO 81601	218527235007
Subdivision	Lot and Block Number
SILVER SAGE PRESERVE PUD	TRACT 3 AS PER FINAL SUBDIVISION PLAT RECEPTION NUMBER 895016
Zone District Planned Unit Development (PUD)	Existing Land Use Vacant Land

General Project Description:

On February 7, 2013, the City Council approved a Major Development, Major Subdivision and PUD Development Plan at the Property as amended on December 1, 2016 allowing for the development of 38 duplex units and 17 multi-family units. The multi family units were completed in 2018. Owner requests a three (3) year extension of vested rights allowing for the development of 38 duplex units currently expiring July 17, 2022.

Signatures:

The owner or applicant must be present at the hearing. All public hearings must be property noticed according to G.S.M.C. Section 070.010.030. Signatures of all owners of the property must appear before the application is accepted. Partnerships or corporations may have the authorized general partner or corporate officer sign the

Applicant	Date 8/31/21
Owner	Date 8/31/21

application. (Attach additional incorporation documents if necessary.) I declare under the penalty of perjury that the above information is true and correct to the best of my knowledge.	Owner	8/31/21 Date

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Ordinance 17 Series of 2021; An Emergency Ordinance of the City of Glenwood Springs, Colorado, Imposing a Temporary Moratorium on Residential Development within the Geographical Limits of the City for the Immediate Preservation of the Public Health, Safety and Welfare. (First Reading)

Action Requested: Approval of Ordinance 17, Series 2021

Department: Economic and Community Development

Presented By: Karl Hanlon

Background Info: Please see the attached ordinance. There are a few development thresholds included for consideration by Council regarding the ordinance's implementation.

Issues:

Staff Recommendation: Approval of Ordinance 17, Series 2021

Ordinance No. 17

Series of 2021

AN EMERGENCY ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, IMPOSING A TEMPORARY MORATORIUM ON RESIDENTIAL DEVELOPMENT WITHIN THE GEOGRAPHICAL LIMITS OF THE CITY FOR THE IMMEDIATE PRESERVATION OF THE PUBLIC HEALTH, SAFETY, AND WELFARE.

WHEREAS, The City of Glenwood Springs (the "City") is a Colorado home rule municipality organized pursuant to Article XX of the Colorado Constitution and with the authority of the Glenwood Springs Home Rule Charter; and

WHEREAS, Title 060 of the Glenwood Springs Municipal Code provides Construction Building Codes and Regulations; and

WHEREAS, Title 070 of the Glenwood Springs Municipal Code provides regulations for the Subdivision, Development, and Use of Land within the City; and

WHEREAS, City Council has received significant public comment regarding the impact of proposed residential developments on affordable housing, parking, traffic, safety, emergency access and evacuation, childcare, and water use; and

WHEREAS, the City's Community Needs Survey indicated that affordable housing, traffic and congestion, population growth, and childcare needs are important issues for City residents and that a significant number of residents believe that residential development in the City has been too rapid over the last five years; and

WHEREAS, the City Council finds and believes that is in the interest of the public health, welfare, and safety to pause residential development in the City to facilitate public input and provide time to develop a Growth Management Plan; and

WHEREAS, the City Council declares the subject matter of this ordinance to be an emergency due to the significant current and anticipated impacts of residential development in the City.

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

Section 1. The recitals above are hereby adopted as findings and incorporated herein.

Section 2.

[Alternative 1: new development applications and new building permits] A Temporary Moratorium is hereby imposed on the acceptance by the City of all new land use development applications for residential or mixed-use projects within the City regardless

of number of units submitted pursuant to Glenwood Springs Municipal Code Title 070 on or after the effective date of the Temporary Moratorium. New applications means any application which was not deemed complete before the effective date of the Temporary Moratorium.

[Alternative 2: new development applications] A Temporary Moratorium is hereby imposed on the acceptance by the City of all new land use development applications for residential or mixed-use projects within the City regardless of number of units submitted pursuant to Glenwood Springs Municipal Code Title 070 on or after the effective date of the Temporary Moratorium. New applications means any application which was not deemed complete before the effective date of the Temporary Moratorium excepting Final Plans applications.

[Alternative 3: new development applications for 9 or more units] A Temporary Moratorium is hereby imposed on the acceptance by the City of all new land use development applications for residential or mixed-use projects within the City of nine (9) residential units or more submitted pursuant to Glenwood Springs Municipal Code Title 070 on or after the effective date of the Temporary Moratorium. New applications means any application which was not deemed complete on or before the effective date of the Temporary Moratorium.

[Alternative 4: new development applications for 9 or more units] A Temporary Moratorium is hereby imposed on the acceptance by the City of all new land use development applications for residential or mixed-use projects within the City of nine (9) residential units or more submitted pursuant to Glenwood Springs Municipal Code Title 070 on or after the effective date of the Temporary Moratorium. New applications means any application which was not deemed complete on or before the effective date of the Temporary Moratorium excepting Final Plans applications.

Section 3. The effective date of the Temporary Moratorium is November 18, 2021.

Section 4. During the Temporary Moratorium the City Council and the City Staff shall receive public input and develop a Growth Management Plan that addresses the impacts of new development on community issues including, but not limited to, affordable housing, parking, traffic, safety, emergency access and evacuation, childcare, and water use. The Growth Management Plan shall provide input for the City's Comprehensive Plan and discuss solutions to resident concerns identified through public comment and consultation with City Council and City Staff.

Section 5. The Temporary Moratorium shall be in effect from the effective date for a period of six (6) months, unless extended by a duly adopted ordinance of City Council.

Section 6. Pursuant to the City of Glenwood Charter Section 4.4(k), it is hereby declared that, in the opinion of the City Council, an emergency exists; that there is need for the immediate preservation of the public peace, health, and safety of the City; and this Temporary Moratorium provides the time necessary to evaluate and develop a Growth Management Plan to address the growing impacts of residential development on the City.

Section 7. If any section, subsection, clause, phrase, or portion of this ordinance is for any reason held invalid or unconstitutional in a court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision and shall not affect the validity of the remaining portions thereof.

Section 8. Any and all ordinances or parts of ordinances in conflict herewith shall hereby be repealed to the extent of the conflict only.

INTRODUCED AS AN EMERGENCY ORDINANCE, READ ON FIRST READING, PASSED, AND ORDERED PUBLISHED BY TITLE ONLY THIS ___ DAY OF_____ 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____
Jonathan Godes, Mayor

ATTEST:

_____
Ryan Muse, City Clerk

INTRODUCED AS AN EMERGENCY ORDINANCE, READ ON SECOND READING, PASSED, TO BE EFFECTIVE IMMEDIATELY, AND ORDERED PUBLISHED BY TITLE ONLY THIS ___ DAY OF _____2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____
Jonathan Godes, Mayor

ATTEST:

_____
Ryan Muse, City Clerk

THE LANDSTUDIO INC.
landscape architecture land planning community planning

365 River Bend Way • Glenwood Springs, CO 81601 • Tel 970 927 3690 • landstudio2@comcast.net

November 17, 2021

Hannah Klausman, Assistant Director, Economic and Community Development
City of Glenwood Springs
101 W. Eighth Street
Glenwood Springs, CO 81601

Re: Potential City of Glenwood Springs Residential Moratorium

Dear Hannah:

As you know, The Land Studio, Inc. has been working with a project team and owner/developer for an infill project at 2525 South Grand Avenue in Glenwood Springs. Though we have developed concepts for the seventeen unit for sale townhome project, shared them with Community Development, submitted the Land Use Application Form for a Pre-Application Conference, met with City Staff for the Pre-Application Conference, and sent out notice for a neighborhood meeting, we are now being told that this project may be shelved for six to twelve months pending a residential moratorium decision on November 18, 2021, by the Glenwood Springs City Council.

As this project has Zoning in place for the proposed use, it is required to only go through the Minor Site/Architectural Plan review process. We request that City Council consider allowing Minor Site/Architectural Plan review projects to move forward if Pre-Application conferences have been completed by the potential moratorium date. While there may be a handful of projects that fall into this category, we as planners for projects within the City of Glenwood Springs have always tried to follow the schedule and standards within the City of Glenwood Springs code for our projects, and we respectfully ask that City Council do the same. Please forward this to City Council for their discussion on November 18, 2021.

Kind regards,

THE LAND STUDIO, INC

By: _____
Douglas J Pratte

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item:	2020 Comprehensive Annual Financial Report (Audit) Presentation from McMahan and Associates
Action Requested:	Accept 2020 Audited Financial Report
Department:	Finance
Presented By:	Yvette Gustad, Finance Director
Background Info:	Each year the City completes a full third-party audit. The audit firm will be here to present findings. No material weaknesses were identified in the 2020 audit.
Issues:	None
Staff Recommendation:	Acceptance of 2020 Audit

City of Glenwood Springs, Colorado
Comprehensive Annual Financial Report



For the Year Ended December 31, 2020

City of Glenwood Springs, Colorado
Comprehensive Annual Financial Report

For the Year ended December 31, 2020

Prepared by the Finance Department of the City of Glenwood Springs
Steve Boyd, Chief Operating Officer
Yvette Gustad, Finance Director

City of Glenwood Springs, Colorado
Comprehensive Annual Financial Report
December 31, 2020

Table of Contents

	Page(s)
INTRODUCTORY SECTION	
Letter of Transmittal	i - iv
GFOA Certificate of Achievement	v
Organizational Chart	vi
List of Elected and Administrative Officials	vii
FINANCIAL SECTION	
INDEPENDENT AUDITOR'S REPORT	A1 - A2
Management's Discussion and Analysis	B1 - B8
Government-wide Financial Statements:	
Statement of Net Position	C1
Statement of Activities	C2
Fund Financial Statements:	
Balance Sheet - Governmental Funds	C3
Reconciliation of Governmental Funds Balance Sheet to the Statement of Net Position	C4
Statement of Revenues, Expenditures and Changes in Fund Balance - Governmental Funds	C5
Reconciliation of Revenues, Expenditures, and Changes in Fund Balances of Governmental Funds to the Statement of Activities	C6
Statement of Net Position - Proprietary Funds	C7
Statement of Revenues, Expenses and Changes in Fund Net Position - Proprietary Funds	C8
Combining Statement of Cash Flows- Proprietary Funds	C9
Statement of Fiduciary Net Position	C10
Statement of Changes in Fiduciary Net Position	C11
Notes to the Financial Statements	D1 - D32

Table of Contents

	Page(s)
FINANCIAL SECTION (continued)	
Required Supplementary Information:	
Schedule of Revenues, Expenditures and Changes in Fund Balance - Budget (GAAP Basis) and Actual: General Fund	E1 - E2
Schedule of Revenues, Expenditures and Changes in Fund Balance - Budget (GAAP Basis) and Actual: Fire and Ambulance Fund	E3
Schedule of Revenues, Expenditures and Changes in Fund Balance - Budget (Non-GAAP Basis) and Actual with Reconciliation to GAAP Basis: Downtown Development Authority	E4
Schedule of Revenues, Expenditures and Changes in Fund Balance - Budget (GAAP Basis) and Actual: Street Tax Fund	E5
Schedule of City's Net Pension Liability	E6
Schedule of City's Contributions	E7
Notes to the Required Supplementary Information	E8 - E9
Supplementary Information:	
Schedule of Revenues, Expenditures and Changes in Fund Balance - Budget (GAAP Basis) and Actual: Capital Projects Fund	F1
Schedule of Revenues, Expenditures and Changes in Fund Balance - Budget (GAAP Basis) and Actual: Acquisition and Improvement Fund	F2
Non-Major Funds: Combining Balance Sheets - Non-major Governmental Funds	F3
Combining Schedule of Revenues, Expenditures and Changes in Fund Balances - Non-major Governmental Funds	F4

Table of Contents

	Page(s)
FINANCIAL SECTION (continued)	
Supplementary Information (continued):	
Schedule of Revenues, Expenditures and Changes in Fund Balances - Budget (GAAP Basis) and Actual:	
Tourism Fund	F5
V.A.L.E. Fund	F6
Conservation Trust Fund	F7
Bus Tax Fund	F8
Marijuana Tax Fund	F9
Tobacco Sales Tax Fund	F10
General Improvement District No. 1980	F11
Emergency Services Equipment Replacement Fund	F12
Schedule of Revenues and Expenses - Budget (Non-GAAP Basis) and Actual with Reconciliation to GAAP Basis:	
Water and Sewer Fund	F13
Electric System Fund	F14
Airport Operations Fund	F15
Landfill Operations Fund	F16
Fleet Service Fund	F17
Schedule of Changes in Fiduciary Net Position - Budget (GAAP Basis) and Actual:	
Cemetery Reserve Fund	F18
Local Highway Finance Report	F19 - F23

Table of Contents

STATISTICAL SECTION

	Page(s)
Net Position by Component	G1
Changes in Net Position	G2 - G3
Fund Balances – Governmental Funds	G4
Changes in Fund Balances – Governmental Funds	G5
History of General Fund Revenues, Expenditures, and Changes in Fund Balance	G6
Major Revenues Sources – Governmental Funds	G7
Sales & Lodging Tax Receipts	G8
Sales Tax Receipts by Month	G9
Assessed Value and Actual Value of Taxable Property	G10
Property Tax Levies and Collections	G11
Direct and Overlapping Property Tax Rates	G12
Principal Property Tax Payers	G13
Ten Largest Sales Tax Remitters	G14
Taxable Retail Sales by Industry	G15
Legal Debt Margin	G16
Outstanding Debt by Type	G17
Ratios of Outstanding Debt by Type	G18
Direct and Overlapping Governmental Activities Debt	G19
Pledged Revenue Coverage	G20
Demographic and Economic Statistics	G21
Principal Employers	G22
Full Time Equivalent City Government Employees by Function/Program	G23
Operating Indicators by Function	G24
Capital Asset Statistics by Program	G25

Table of Contents

STATUTORY SECTION

Report on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with Governmental Auditing Standards H1 - H2

Report on Compliance for Each Major Federal Program; Report on Internal Control Over Compliance Required by Uniform Guidance H3 - H4

Schedule of Findings and Questioned Costs H5

Schedule of Prior Audit Findings and Questioned Costs H6

Schedule of Expenditures of Federal Awards H7

INTRODUCTORY SECTION

CITY OF GLENWOOD SPRINGS FINANCE

101 W. 8th Street, Glenwood Springs, CO 81601

September 30, 2021

To the Honorable Mayor, members of the City Council,
City Manager and Citizens of the City of Glenwood Springs:

It is with great pleasure that we present the Comprehensive Annual Financial Report (CAFR) for the City of Glenwood Springs (the "City") for the year ended December 31, 2020. The City Charter, in conjunction with State law, requires a complete set of financial statements presented in conformity with generally accepted accounting principles (GAAP) to be published within six months of the close of each fiscal year (exception granted this year resulting from the COVID-19 crisis) and audited in accordance with generally accepted auditing standards by a firm of certified public accountants. This Comprehensive Annual Financial Report is hereby issued and submitted to you in accordance with these requirements.

The report consists of management's representations concerning the finances of the City of Glenwood Springs. Consequently, management assumes full responsibility for the completeness and reliability of all the information presented in this report. To provide a reasonable basis for making these representations, management has established an internal control framework that is designed to both protect the assets of the City from loss, theft, or misuse and to allow for the compiling of sufficient reliable information for the preparation of the City's financial statements in conformity with GAAP. Because the cost of internal controls should not outweigh their benefits, the City's internal control procedures have been designed to provide reasonable, rather than absolute assurance that the financial statements will be free from material misstatement. To the best of management's knowledge and belief, this financial report is complete and reliable in all material respects.

McMahan and Associates, L.L.C., a firm of certified public accountants, performed the annually required independent audit of the City's annual financial report. This independent audit provides reasonable assurance that the financial statements of the City of Glenwood Springs for the fiscal year ended December 31, 2020, are free of material misstatement. The independent audit involved examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. The independent auditor concluded, based upon the audit, that there was a reasonable basis for rendering an unmodified opinion that the City of Glenwood Springs' financial statements for the fiscal year ended December 31, 2020, are fairly presented in conformity with GAAP. The independent auditor's report is presented on page A1 & A2 in the financial section of this report.

Generally accepted accounting principles require that management provides a narrative introduction, overview, and analysis to accompany the basic financial statements in the form of Management's Discussion and Analysis (MD&A). The City of Glenwood Springs' MD&A can be found immediately following the report of the independent auditors. This letter of transmittal and the MD&A are designed to complement each other and should be read in that context.

Profile of the City of Glenwood Springs

The City of Glenwood Springs was incorporated as a home rule City under provisions of the Constitution of Colorado. The City is located in the Western Slope of Colorado, situated within the Rocky Mountains, approximately 170 miles west of Denver and is the county seat of Garfield County. The estimated current population of the City is 9,963.

The City has all the powers granted to municipal corporations and to cities by the constitution and general laws of the State of Colorado, including the power to acquire property within or outside its corporate limits for any City purpose, to sell, lease, mortgage, hold, manage, and control such property as its interests may require, except as prohibited by the state constitution or the City Charter.

Policy-making and legislative authority are vested in a City Council consisting of seven members, one of which is a Mayor selected by Council. The Council is responsible, among other things, for passing ordinances, adopting the budget, appointing boards and commissions, and hiring the City Manager and City Attorney. The City Manager is responsible for carrying out the policies and ordinances of the Council, for overseeing the day-to-day operations of the City, and for appointing the heads of the various departments. The Council is elected on a non-partisan basis. Council members serve four-year staggered terms. The Mayor's term is two years.

While the City Council exercises the legislative power of the City, other City officials oversee the daily operation of the City. Glenwood Springs is a Council-Manager form of City government and provides full-service municipal services. As noted above, the City Council appoints the City Manager and City Attorney, both of whom serve at the pleasure of the Council.

The City has approximately 192 full-time equivalent employees. General Government Services provided include police, parks and recreation, public transportation, public works, community and economic development, city clerk, financial management, information technology, street maintenance, capital project management, a municipal court and engineering. Fire protection and emergency medical services, water, wastewater, electric service and broadband service are provided to City residents. The City also operates a landfill facility and airport.

Financial Management and Factors Affecting General Conditions

The City of Glenwood Springs' economy experienced a downturn starting in 2008 and transitioned into recovery in 2010. Since then the local economy has experienced sustained improvements. However, indicators include a decrease in sales tax in 2017 when compared to the prior year of 1.9% primarily due to the interruption the local economy experienced from the replacement of the Grand Avenue Bridge. In 2018 the City did see a recovery of sales tax revenue with an increase of 5.9% over 2017 and 3.8% over the pre-bridge construction revenue of 2016. The City's sales tax revenue grew 4.5% in 2019 from 2018 but the COVID pandemic caused a 7% decrease in 2020 tax revenues.

Additional, and more complete information regarding the City's overall financial condition and changes in net position, can be found in the Management's Discussion and Analysis, found on page B1 of this report.

From a financial management standpoint, the City has maintained strong controls, both in the areas of internal controls and budgetary controls. The City's reliance on consumption-based tax revenues for ongoing operations requires recognition that contraction of the local retail economy will result in a

decrease in revenues to support operations. These controls create an environment that permits the City to quickly adapt to changes in revenue forecasts, modifying spending plans accordingly.

The Finance Director oversees a set of City-wide internal controls that provide reasonable assurances that financial activity transacted by and among City departments is managed in a way that results in complete, accurate, and timely accounting for all financial transactions. All bank statements and accounts are closed and reconciled monthly. The objective of the City's budgetary controls is twofold: to ensure compliance with legal provisions embodied in the annually appropriated budget approved by the City Council, and to provide funding allocations to City departments sufficient to permit them to effectively and efficiently deliver services to their customers, the citizens, and Glenwood Springs visitors.

Activities of the general fund, special revenue funds, capital project funds, business-type funds, and internal service funds are included in the annually appropriated budget resolution. Appropriations for all funds lapse at year end. The level of budgetary control (that is, the level at which expenditures cannot legally exceed the appropriated amount) is established at the individual fund level. Even though the budget enacted by the City Council is at the fund level, the City prepares a program-based budget by department for control at the departmental level in its General Fund, referred to as each department's operating budget. Department heads have the authority to reallocate the distribution of budget amounts within and among programs within their department as necessary to accomplish priority goals and achieve their departmental mission.

The City utilizes a fund balance policy as another form of budgetary control. This policy ensures sufficient cash is on hand (typically 60 to 90 days of annual appropriations in the General Fund) to cover all current cash flow and budgetary requirements, and sets targets for fund balances sufficient to permit the City to absorb an economic downturn without having to significantly reduce services or ask Glenwood's citizens for emergency funding to cover the cost of necessary operating costs. As noted above, budget-to-actual comparisons are provided in this report for each major individual governmental fund for which an appropriated annual budget has been adopted.

Long-term Financial Planning

Management's long-term financial plans for each major City fund assume reasonable growth rates for revenues, based upon historical results and current economic conditions, and pragmatic expenditure estimates that account for increasing cost pressures in the energy, construction and transportation sectors of the economy, and the reality of increasing health care and wage costs for City employees. Apart from that, conservative budgets are still in place to ensure sufficient reserves in the case of another shift in the economy. Please see the Management Discussion and Analysis for more complete information regarding the City's multi-year financial planning process and the predicted future financial condition of all budgeted funds.

Compliance with the Taxpayer Bill of Rights (TABOR)

The Colorado Constitutional Amendment passed in November 1992 known as TABOR restricts growth in governmental revenues and property tax revenues to amounts adjusted for inflation and a local growth factor. Glenwood Springs has historically complied with TABOR requirements and has done so again in 2019.

Major Initiatives and Accomplishments

The City completed its replacement of its 27th Street Bridge in 2020. The project includes a pedestrian bridge in addition to the vehicular bridge, significant street improvements at each end and the installation of a roundabout on the east side.

The City also designed a re-build of a section of South Midland, the major thoroughfare to the south end of town and accessing the turn-off to 4-mile road. This project was bid in 2019, construction began in 2020 and will be completed in 2022. The City applied for and was awarded a Build America grant of approximately $7 million to offset a portion of the project cost.

The City completed a shoreline renovation of Two Rivers Park in 2020 that includes a retaining wall, restrooms, beach area and shoreline work. During 2020 the City also completed or progressed on a number of construction projects including streets and water infrastructure underneath.

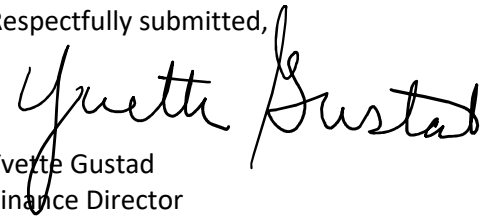
On March 1, 2019 the City went live with the financial module of a new Enterprise Resource Planning (ERP) software called Munis and will go live with Phase 2, HR and payroll, on January 1, 2020. COVID caused the Revenue (Accounts Receivable/Cash Receipting/Utility Billing) module implementation to be pushed into 2021 and EnerGov (community development) is now scheduled to kick off in 2022.

The City established a Broadband enterprise fund and made substantial progress in 2020 in building services out on a city-wide basis. We believe the entire project will be completed sometime in 2022 at which point all City residents will have access to reliable, ultrafast broadband.

The timely preparation of this report was accomplished through the efficient and dedicated services of the entire City of Glenwood Springs' Finance Department staff. I would like to express my appreciation of all members of the Department who assisted and contributed to its preparation. It should be noted, that staff from other departments provide great assistance in the preparation of the report and their work is also appreciated. On behalf of the administration, I would also like to thank the Mayor and City Council for their interest and support in planning and conducting the financial operations of the City in a responsible and progressive manner.

The City's external auditors, McMahan and Associates, L.L.C., are also commended for their comprehensive and efficient examination of the various funds of the City for the fiscal year ended December 31, 2020.

Respectfully submitted,



Yvette Gustad
Finance Director

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

City of Glenwood Springs
Colorado

For its Comprehensive Annual
Financial Report
For the Fiscal Year Ended

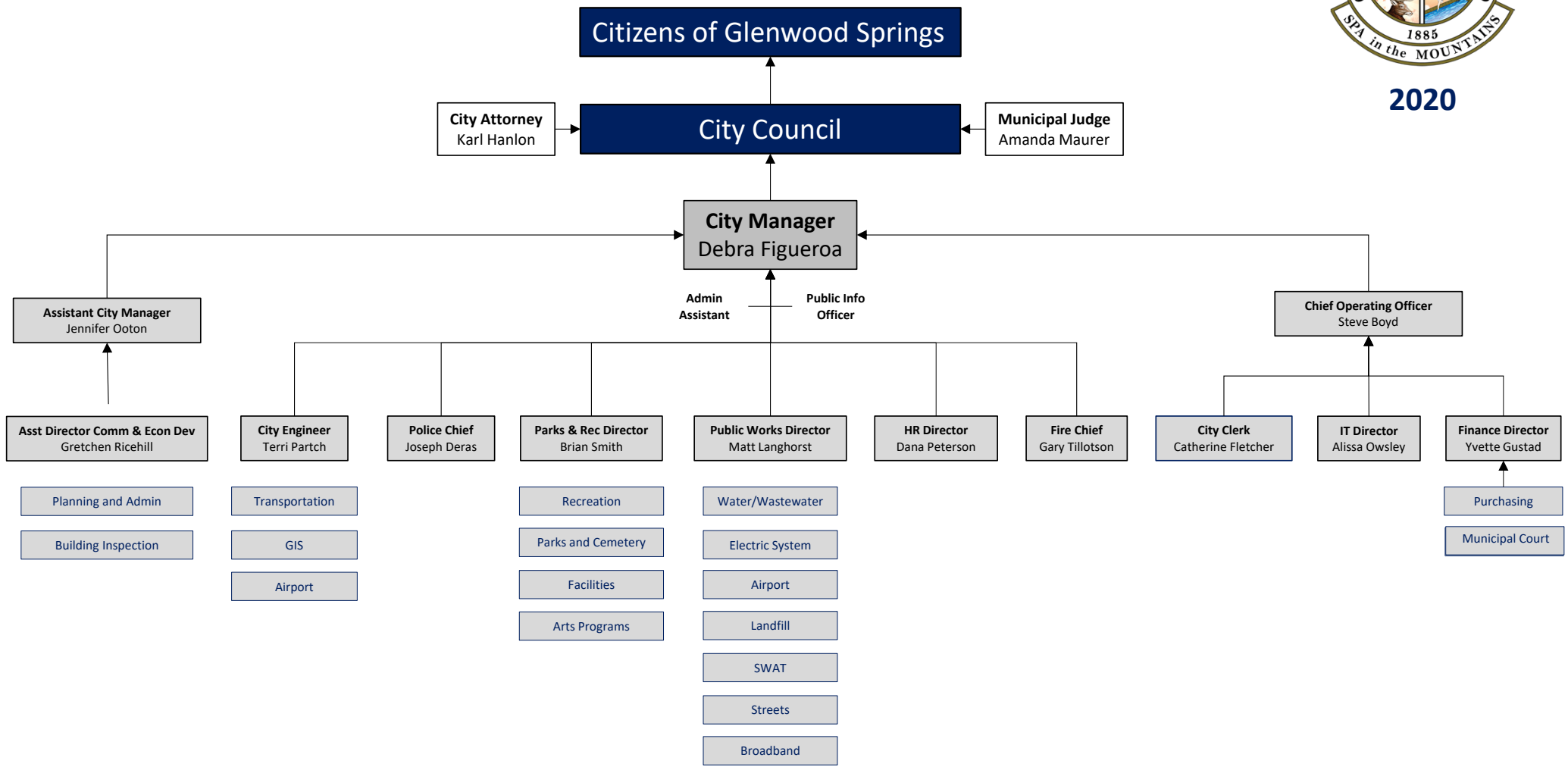
December 31, 2019

Christopher P. Morrill

Executive Director/CEO

City of Glenwood Springs Organizational Chart

2020



CITY OF GLENWOOD SPRINGS, COLORADO
LIST OF ELECTED AND ADMINISTRATIVE OFFICIALS
December 31, 2020

Elected Officials

Mayor	Jonathan Godes
Mayor Pre-tem	Shelley Kaup
Council Members	Steve Davis
	Ingrid Wussow
	Charlie Willman
	Paula Stepp
	Tony Hershey

Administrative Officials

City Manager	Debra Figueroa
Chief Operating Officer	Steve Boyd
Asst City Mgr/Community Dev Director	Jennifer Ooton
City Clerk	Ryan Muse
Finance Director	Yvette Gustad
IT Director	Alissa Owsley
Police Chief	Joseph Deras
Public Works Director	Matthew Langhorst Brian
Parks and Recreation Director	Smith
City Engineer	Terri Partch
Municipal Court Administrator	Robin Bustad
City Attorney	Karl Hanlon

FINANCIAL SECTION

McMahan and Associates, L.L.C.
Certified Public Accountants and Consultants

Chapel Square, Bldg C
245 Chapel Place, Suite 300
P.O. Box 5850, Avon, CO 81620

Web Site: www.mcmahancpa.com
Main Office: (970) 845-8800
Facsimile: (970) 845-8108
E-mail: mcmahan@mcmahancpa.com

INDEPENDENT AUDITOR'S REPORT

To the Members of City Council
City of Glenwood Springs
Glenwood Springs, Colorado

Report on the Financial Statements

We have audited the accompanying financial statements of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of City of Glenwood Springs, Colorado (the "City"), as of and for the year ended December 31, 2020, and the related notes to the financial statements, which collectively comprise the City's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit includes performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the City's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the City's internal control. Accordingly, we express no such opinion. An audit also includes evaluation of the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall financial statement presentation.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

To the Members of City Council
Glenwood Springs, Colorado

Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of City of Glenwood Springs, Colorado as of December 31, 2020, and the respective changes in financial position and, where applicable, cash flows thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Accounting principles generally accepted in the United States of America require that Management's Discussion and Analysis in Section B and the Schedule of Employer's Proportionate Share of the Net Pension Asset / Liability and the Schedule of City Contributions in Section E be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

The budgetary comparison information is not a required part of the basic financial statements but are supplementary information required by accounting principles generally accepted in the United States of America. The budgetary comparison information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statement or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements as a whole.

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the City's financial statements taken as a whole. The introductory section, combining fund financial statements, individual fund budgetary information, the Local Highway Finance Report, and the statistical section listed in the accompanying table of contents are presented for purposes of additional analysis and are not a required part of the City's financial statements. The combining fund financial statements, the individual fund budgetary information, and the Local Highway Finance Report are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the financial statements. Such information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements as a whole. The introductory and statistical sections have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we express no opinion on them.

Additionally, the Schedule of Expenditures of Federal Awards included in the Single Audit section are presented for the purpose of additional analysis, as required by Title 2 U.S. Code of Federal Regulations Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards ("Uniform Guidance"), and are not a required part of the City's financial statements. Such information has been subjected to the auditing procedures applied audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statement or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Expenditures of Federal Awards is fairly stated in all material respects in relation to the financial statements as a whole.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards,* we have also issued our report dated September 30, 2021 on our consideration of the City's internal control over financial reporting and on our tests of its compliance with provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the City's internal control over financial reporting and compliance.

McMahan and Associates, L.L.C.

McMahan and Associates, L.L.C.
September 30, 2021

MANAGEMENT'S DISCUSSION AND ANALYSIS

City of Glenwood Springs, Colorado

Management's Discussion and Analysis
December 31, 2020

As management of the City of Glenwood Springs (the “City”), we offer readers of the City’s financial statements this narrative overview and analysis of the financial activities of the City for the fiscal year ended December 31, 2020.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the City’s basic financial statements. The City’s basic financial statements are comprised of three components: 1) government-wide financial statements; 2) fund financial statements; and 3) notes to the financial statements. This report also contains other supplementary information in addition to the basic financial statements.

Government-wide Financial Statements: The government-wide financial statements are designed to provide readers with a broad overview of the City’s finances, in a manner similar to a private-sector business.

The Statement of Net Position presents information on all the City’s assets and liabilities, with the difference between the two reported as net position. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the City is improving or deteriorating.

The Statement of Activities presents information showing how the government's net position changed during the most recent fiscal year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, regardless of the timing of related cash flows. Thus, revenues and expenses are reported in this statement for some items that will only result in cash flows in future fiscal periods (e.g. uncollected taxes).

Both of the government-wide financial statements distinguish functions of the City that are principally supported by taxes and intergovernmental revenues (governmental activities). The governmental activities of the City include general government, transportation, public safety, community development, public works and culture and recreation. The business-type activities of the City include water and sewer operations, electric distribution operation, airport and landfill operations.

The government-wide financial statements can be found in Section C of this report.

Fund Financial Statements: A fund is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objectives. The City, like other state and local governments, uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. All of the funds of the City can be divided into three categories: governmental funds, proprietary funds and fiduciary funds.

Governmental Funds: Governmental funds are used to account for essentially the same functions reported as governmental activities in the government-wide financial statements. However, unlike the government-wide financial statements, governmental fund financial statements focus on near-term inflows and outflows of spendable resources, as well as on balances of spendable resources available at the end of the fiscal year. Such information may be useful in evaluating a government's near-term financing requirements. The City’s major governmental funds include the General Fund, Fire and Ambulance Fund, Downtown Development Authority, Capital Projects Fund, Street Tax Fund, and the Acquisition and Improvement Fund. The City also reports a number of non-major governmental funds.

Overview of the Financial Statements (continued)

Governmental Funds (continued): Because the focus of governmental funds is narrower than that of the government-wide financial statements, it is useful to compare the information presented for governmental funds with similar information presented for governmental activities in the government-wide financial statements. By doing so, readers may better understand the long-term impact of the government's near-term financing decisions. The Balance Sheet and the Statement of Revenues, Expenditures and Changes in Fund Balances provide a reconciliation to facilitate this comparison between governmental funds and governmental activities.

The City adopts an annual appropriated budget for all governmental funds. A budgetary comparison statement has been provided for all funds to demonstrate compliance with state budget statute.

The basic major governmental fund financial statements can be found in Section C.

Proprietary Funds: The City reports two categories of proprietary funds - Internal Service and Enterprise. The Fleet Service Fund, an internal service fund created in 2007, provides vehicle and equipment replacement and maintenance services to the City's governmental and enterprise activities. Enterprise funds are used to report the same functions presented as business-type activities in the government-wide financial statements. The City uses Enterprise Funds to account for its Water and Sewer, Electric Distribution, Airport and Landfill Operations.

Proprietary Funds provide the same type of information as the government-wide financial statements, only in more detail. The Proprietary Fund financial statements provide separate information for each of the business-type services provided by the City, each of which is considered to be a major fund of the City.

The basic Proprietary Fund financial statements can be found in Section C of this report.

Fiduciary Funds: Fiduciary Funds are used to account for resources held for the benefit of parties outside the government. Fiduciary Funds are not reflected in the government-wide financial statements because the resources of those funds are not available to support the City’s own programs. The accounting used for Fiduciary Funds is much like that used for Proprietary Funds. The Fiduciary Fund used by the City is the Cemetery Reserve.

The basic Fiduciary Fund financial statements can be found in Section C of this report.

Notes to the Financial Statements: The notes provide additional information that is essential to a full understanding of the data provided in the government-wide and fund financial statements. The Notes to the Financial Statements can be found in Section D of this report.

Government-wide Financial Analysis:

City of Glenwood Spring's Net Position

	Governmental Activities		Business-type Activities		Total	
	2020	2019	2020	2019	2020	2019
Assets:		(restated)				
Current and other assets	40,560,465	45,915,620	23,881,532	20,709,969	64,441,997	66,625,589
Capital assets, net	107,126,206	104,131,247	74,908,827	69,833,276	182,035,033	173,964,523
Total Assets	147,686,671	150,046,867	98,790,359	90,543,245	246,477,030	240,590,112
Deferred Outflows of Resources:	34,643	56,259	-	-	34,643	56,259
Liabilities:						
Other liabilities	5,230,503	10,389,358	5,604,900	4,478,233	10,835,403	14,867,591
Long-term liabilities	22,164,440	23,829,571	29,301,839	21,086,847	51,466,279	44,916,418
Total Liabilities	27,394,943	34,218,929	34,906,739	25,565,080	62,301,682	59,784,009
Deferred Inflows of Resources:	2,327,976	2,337,864	-	-	2,327,976	2,337,864
Net Position:						
Net investment in capital assets	88,653,549	84,475,343	56,113,082	48,786,026	144,766,631	133,261,369
Restricted	1,410,970	12,673,537	-	-	1,410,970	12,673,537
Unrestricted	27,933,876	16,397,453	7,770,538	16,192,139	35,704,414	32,589,592
Total Net Position	117,998,395	113,546,333	63,883,620	64,978,165	181,882,015	178,524,498

Government-wide Net Position and Activities:

Traditionally, the largest portion of any municipality's investments is in its capital assets. Land, buildings, equipment, machinery, and specialized tools are necessary in order to deliver and/or provide services to the City's residents and visitors. The City's capital assets account for 80% of its net position; these assets are not an available source for payment of future spending. Of the remaining $37,115,384 in net position, $1,000,000 is restricted for TABOR reserve, $69,965 is restricted for police asset forfeitures, and $341,005 is restricted by enabling legislation.

At the end of the 2020 fiscal year, the City is able to report positive balances in all three categories of net position, first for the government as a whole, and then as separate governmental and business-type activities.

The City's net position increased by $3,357,517 during the current fiscal year from $178,524,498 to $181,882,015. Governmental activities continued to increase as the City contributed to ongoing downtown projects. The decrease in business-type activities can primarily be attributed to the City's Electric operations.

Government-wide Financial Analysis (continued):

City of Glenwood Spring's Changes in Net Position

	Governmental Activities		Business-type Activities		Total	
	2020	(restated) 2019	2020	2019	2020	2019
Revenues:						
Program revenues:						
Charges for services	5,577,001	7,558,365	24,590,471	25,127,544	30,167,472	32,685,909
Grants and contributions	3,447,304	2,225,727	471,883	206,551	3,919,187	2,432,278
General revenue:						
Sales and use taxes	20,524,445	20,795,147	-	-	20,524,445	20,795,147
Property taxes	2,318,200	2,088,955	-	-	2,318,200	2,088,955
Other taxes	1,262,273	1,624,850	-	-	1,262,273	1,624,850
Interest and other revenues	1,435,620	1,028,548	147,733	301,462	1,583,353	1,330,010
Total Revenues	34,564,843	35,321,592	25,210,087	25,635,557	59,774,930	60,957,149
Expenses:						
General government	6,675,439	5,817,361	-	-	6,675,439	5,817,361
Transportation	1,850,028	1,977,200	-	-	1,850,028	1,977,200
Public safety	7,948,086	8,168,163	-	-	7,948,086	8,168,163
Community development	1,863,719	2,349,002	-	-	1,863,719	2,349,002
Public works	8,681,277	3,189,680	-	-	8,681,277	3,189,680
Culture and recreation	4,034,359	5,525,717	-	-	4,034,359	5,525,717
Interest on long-term debt	766,040	714,643	-	-	766,040	714,643
Water and sewer	-	-	6,129,405	6,750,295	6,129,405	6,750,295
Electric system	-	-	15,652,988	14,069,521	15,652,988	14,069,521
Airport operations	-	-	174,994	176,025	174,994	176,025
Landfill	-	-	2,641,078	2,685,913	2,641,078	2,685,913
Total Expenses	31,818,948	27,741,766	24,598,465	23,681,754	56,417,413	51,423,520
Change in Net Position Before Transfers	2,745,895	7,579,826	611,622	1,953,803	3,357,517	9,533,629
Transfers	1,706,167	2,661,724	(1,706,167)	(2,661,724)	-	-
Change in Net Position	4,452,062	10,241,550	(1,094,545)	(707,921)	3,357,517	9,533,629
Net Position - Beginning	113,546,333	103,304,783	64,978,165	65,686,086	178,524,498	168,990,869
Net Position - Ending	117,998,395	113,546,333	63,883,620	64,978,165	181,882,015	178,524,498

Governmental Activities: Governmental activities increased the City's net position by $2,745,895 before transfers. Significantly impacting the 2020 results was a general increase in grants and contributions, much of which related to COVID-19 pandemic funding.

Business-type Activities: Business-type activities increased the City's net position by $611,622 before transfers. Key elements of this increase are as follows:

- The Water and Sewer Fund's net position increased by $874,568, before transfers. Consumer usage has increased and overall user fees have been increased routinely by the City to help pay for the debt associated with construction of the new wastewater facility. During 2020 the City had decreased operational costs due to budget cuts from pandemic related uncertainty. The loan agreement is in the amount of $31,460,100 and will require principal and interest payments until 2032. For the year ended December 31, 2020 principal and interest expenses totaled $1,940,061.

- The Electric Fund's net position decreased by $734,413 before transfers. This decrease can be attributable to usage decreases as a result of business closures downtown during COVID-19.

Government-wide Financial Analysis (continued):

Business-type Activities (continued):

- The Airport Operations Fund's net position increased by $139,443 before transfers. This increase can be attributable to usage increases and facility rentals.

- The Landfill Fund's net position increased by $232,979 before transfers. This increase is a direct result of intergovernmental awards.

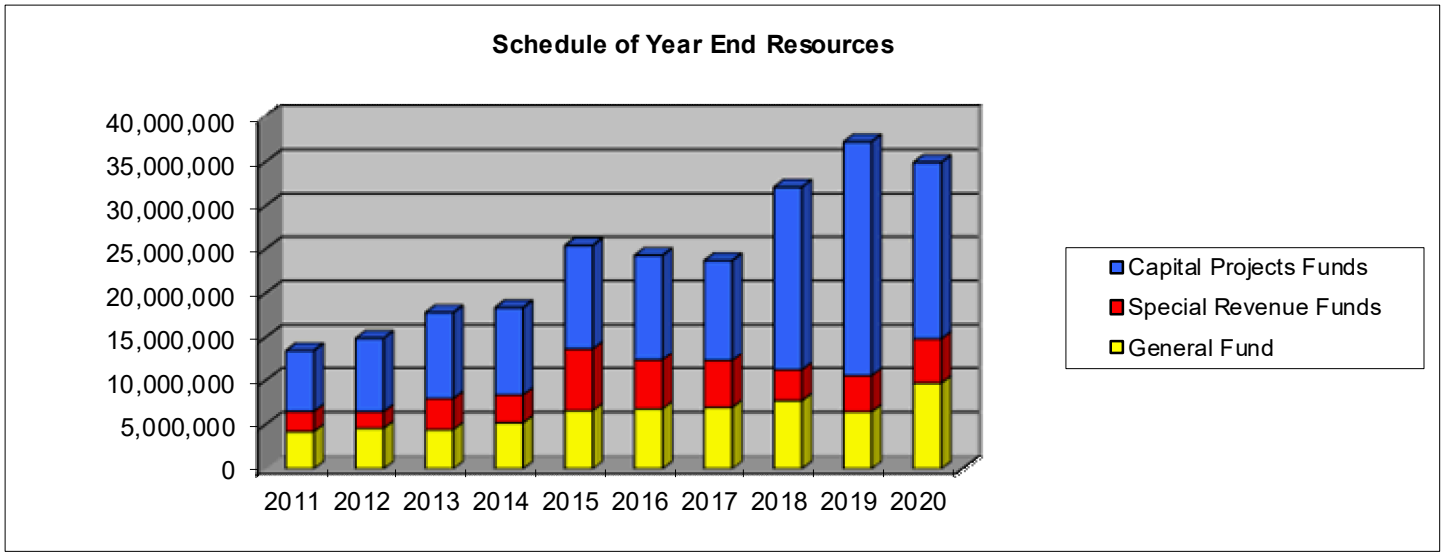
  In 2007, the Landfill Fund advanced $435,767 to the Downtown Development Authority for the purchase of property, which is being repaid in installments. In 2012, the Landfill advanced an additional $1,000,000 to the Downtown Development Authority for the construction of the Cooper Street parking structure. There are annual principal and interest payments through August 2027 required on these advances.

Financial Analysis of the City's Funds

As mentioned earlier, the City uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements.

Governmental Funds: The focus of the City's governmental funds is to provide information on near-term inflows, outflows, and balances of spendable resources. Such information is useful in assessing the City's financing requirements. In particular, unreserved fund balances may serve as a useful measure of a government's net resources available for spending at the end of the fiscal year.

As of the end of the current fiscal year, the City's governmental funds reported combined ending fund balances of $34,973,905, a decrease of $489,038 from the prior year ending fund balances. The following graph provides a view of the City's ending fund balances:



Financial Analysis of the City's Funds (continued)

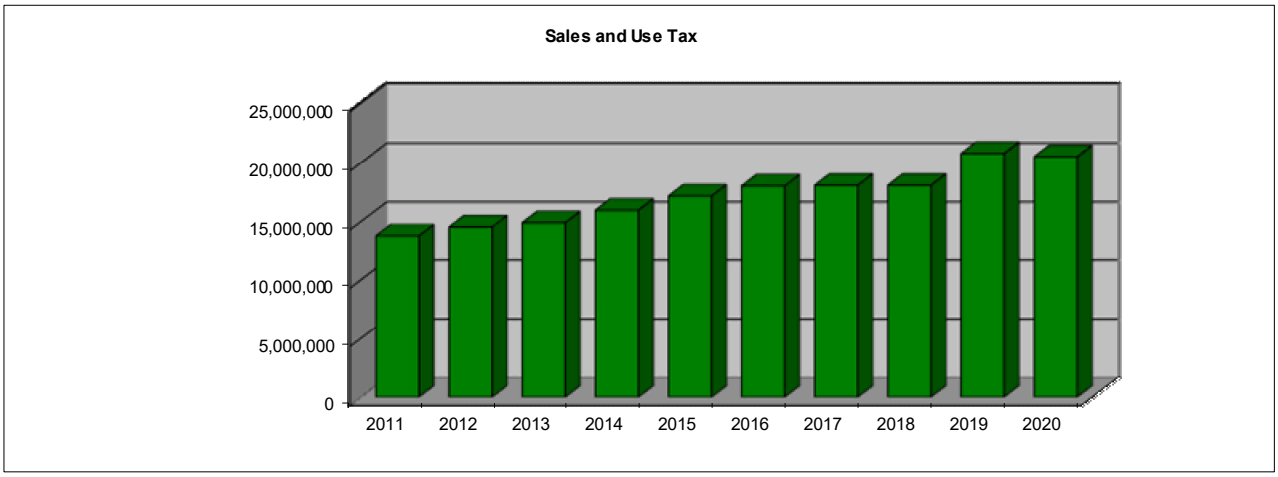
The increase of $3,262,513 in the fund balance for the General Fund was as a result of decreased expenditures in response to the uncertainty of sales tax collections during the COVID-19 pandemic.

The increase of $1,035,819 in the fund balance for the Special Revenue Funds is primarily as a result of an increase in the Bus Tax Fund due to an increase in intergovernmental activity as a result of new programs in response to the COVID-19 pandemic as well as the collection of Tobacco tax, which began in January of 2020. The Downtown Development Authority also had conservative expenditures in 2020.

The decrease of $4,015,091 is as a result of the Capital Projects Fund and Acquisition and Improvement Fund spending down previous years bond money on various projects.

Governmental Funds (continued):

The City's primary funding of governmental activities is sales and use tax. The following chart represents changes in the City's sales and use tax revenue:



Sales and use tax in 2020 decreased 1% over 2019 results.

Proprietary Funds: The City's proprietary funds provide the same type of information found in the government-wide financial statements, but in more detail.

The City's proprietary funds ending net position was $63,883,620, which is a decrease of $1,094,545, which is broken down by fund as follows: Water and Sewer - $36,318,498, Electric - $23,748,425, Airport - $644,265 and Landfill - $3,172,432. The net position includes each fund's net investment of capital assets. Unrestricted net position available at year-end broken down by fund is: Water and Sewer - $1,879,137, Electric System - $5,015,532, Airport - $337,428, and Landfill Operations - $538,441.

The approved budget for 2020 included transfers from the Enterprise funds only for debt requirements and the funding of capital costs.

Financial Analysis of the City's Funds (continued)

Original to Final Budget Variances in the General Fund: The following significant budgetary variances between the original budget and the final amended budget were noted in the General Fund:

Account	Increase (Decrease)	Reason
Expenses:		
Intergovernmental - Grants	$ 763,500	CARES funding and other grants not originally anticipated by the City.
General Government - Non-departmental	1,149,636	Increased expenditures related to pandemic spending which is as a result of increased revenues

Budget Variances in the General Fund: The following significant variances were noted in the General Fund:

Account	Variance Positive (Negative)	Reason
Revenues:		
General sales tax	$ 997,184	Increased sales tax revenue due to re-allocation of sales tax originally allocated to Capital Projects Fund
Charges and fees	(1,361,553)	Due to COVID-19 the recreaction center was closed and many programs did not occur.
Expenses:		
Culture and Recreation - Parks and cemetery	294,061	Significant decrease in employee salaries and benefits due to COVID-19 uncertainty
Public Safety - Police department	1,052,472	Significant decrease in employee salaries and benefits due to COVID-19 uncertainty
Culture and Recreation - Recreation	903,108	Significant decrease in employee salaries and benefits due to COVID-19 uncertainty, recreation center closure, and savings of supplies due to closure.

Financial Analysis of the City's Funds (continued)

Capital Assets: The City's capitalization policy pertains to assets with a purchase value of $5,000 or greater. Assets of lesser value are treated as operational expenditures. As of December 31, 2020, the City's investment in capital assets (less accumulated depreciation) for governmental activities was $107,126,206. The investment in capital assets (less accumulated depreciation) for business-type activities was $74,908,827.

During 2020, the major capital expenditures included:

- Street Tax Fund:
  - Cedar Crest, totaling $2,162,740
  - 22nd Street Construction continued, totaling $63,954
- Capital Projects Fund:
  - Municipal Operations Center improvements, totaling $467,994
  - Implementation of the City enterprise resource planning system was ongoing, totaling $486,865
  - 6th Street connection continued, totaling $282,579
- Acquisition and Improvement Fund:
  - 27th Street Bridge construction began, totaling $1,422,640
  - South Bridge Improvements continued, totaling $2,215,907
  - Two rivers construction continued, totaling $3,389,642
  - South Midland construction continued, totaling $532,773
- Water and Sewer Fund:
  - Water treatment system upgrades continued, totaling $4,834,739
- Electric Fund:
  - Upgrades to distribution systems totaled $3,419,989
- Landfill Fund:
  - Land purchase of $249,986
  - Recycle center improvements of $190,867
  - Compost project of $495,099
- Fleet Service Fund:
  - Purchased a tandem dump truck for $148,916
  - Fuel depot project $251,016
  - Purchased a ram 5500 for $129,739

For the year ended December 31, 2020, the City had governmental activities depreciation of $5,072,777 and business-type activities depreciation of $2,907,037.

Additional information as well as a detailed classification of the City's net capital assets can be found in the Notes to the Financial Statement in section D.

Long-term Debts: As of the end of the current fiscal year, the City's long-term liabilities totaled $55,043,167. During 2020, the City issued Enterprise loans of $9,122,000 for broadband improvements. During 2020 the City governmental funds had principal payments totaling $1,802,000. The City enterprise funds had principal payments totaling $1,329,300. In addition to City bond activity, the City compensated absence liabilities decreased $12,370 and the landfill closure and post closure liability increased $455,945.

Additional information as well as a detailed classification of the City's total long-term liabilities can be found in the Notes to the Financial Statements in section D of this report.

Next Year's Budget and Rates: The City's General Fund balance at the end of fiscal year 2020 totaled $5,975,416. The original 2021 budget anticipates decreasing this balance by approximately $24,578.

Request for Information

This financial report is designed to provide a general overview of the City's finances for all those with an interest. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the City of Glenwood Springs, City Finance Director, 101 W. 8th Street, Glenwood Springs, CO 81601.

GOVERNMENT-WIDE FINANCIAL STATEMENTS

City of Glenwood Springs, Colorado
Statement of Net Position
December 31, 2020

	Governmental Activities	Business Type Activities	Total
Assets:			
Current Assets:			
Cash and investments - unrestricted	28,387,174	8,317,998	36,705,172
Cash and investments - restricted	4,197,343	10,740,541	14,937,884
Accounts, taxes, and interest receivable	6,237,843	3,775,940	10,013,783
Due from other governments	1,975,290	-	1,975,290
Prepaid items	3,411	-	3,411
Internal balances	(248,678)	248,678	-
Inventory	8,082	798,375	806,457
Total current assets	40,560,465	23,881,532	64,441,997
Capital assets not being depreciated:			
Land and water rights	14,149,612	1,584,843	15,734,455
Construction in progress	35,144,175	3,762,159	38,906,334
Capital assets being depreciated:			
Buildings and improvements	110,926,580	116,377,173	227,303,753
Equipment and vehicles	16,891,569	4,632,651	21,524,220
Less accumulated depreciation	(69,985,730)	(51,447,999)	(121,433,729)
Total capital assets (net)	107,126,206	74,908,827	182,035,033
Total Assets	147,686,671	98,790,359	246,477,030
Deferred Outflows of Resources:			
Deferred pension expenses	34,643	-	34,643
Total Deferred Outflows of Resources	34,643	-	34,643
Liabilities:			
Current Liabilities:			
Accounts, retainage, arbitrage & deposits payable	2,429,681	3,384,986	5,814,667
Accrued compensation	326,455	105,847	432,302
Interest payable	56,906	243,542	300,448
Unearned revenue	9,900	79,067	88,967
Deposits	397,473	224,658	622,131
Compensated absences - Due within one year	395,088	184,750	579,838
Long-term debt - Due within one year	1,615,000	1,382,050	2,997,050
Total current liabilities	5,230,503	5,604,900	10,835,403
Noncurrent liabilities:			
Compensated absences	603,113	277,125	880,238
Long-term debt	21,055,000	29,024,714	50,079,714
Net pension liability	506,327	-	506,327
Total noncurrent liabilities	22,164,440	29,301,839	51,466,279
Total Liabilities	27,394,943	34,906,739	62,301,682
Deferred Inflows of Resources:			
Property taxes	2,310,811	-	2,310,811
Deferred pension expenses	17,165	-	17,165
Total Deferred Inflows of Resources	2,327,976	-	2,327,976
Net Position:			
Net investment in capital assets	88,653,549	56,113,082	144,766,631
Restricted for:			
Emergencies	1,000,000	-	1,000,000
Asset forfeiture	69,965	-	69,965
Conservation trust fund	341,005	-	341,005
Unrestricted	27,933,876	7,770,538	35,704,414
Total Net Position	117,998,395	63,883,620	181,882,015

The notes to the financial statements are an integral part of this statement.

City of Glenwood Springs, Colorado
Statement of Activities
For the Year Ended December 31, 2020

Functions/Programs:	Expenses	Program Revenues: Charges for Services	Program Revenues: Operating Grants and Contributions	Program Revenues: Capital Grants and Contributions	Net (Expense) Revenue and Changes in Net Position: Governmental Activities	Net (Expense) Revenue and Changes in Net Position: Business-type Activities	Net (Expense) Revenue and Changes in Net Position: Total
Governmental Activities:							
General government	6,675,439	2,746,307	270,041	-	(3,659,091)	-	(3,659,091)
Public transportation	1,850,028	43,037	1,216,453	-	(590,538)	-	(590,538)
Public safety	7,948,086	1,570,422	1,323,444	-	(5,054,220)	-	(5,054,220)
Community and economic development	1,863,719	341,630	-	-	(1,522,089)	-	(1,522,089)
Public works	8,681,277	29,919	470,091	-	(8,181,267)	-	(8,181,267)
Culture and recreation	4,034,359	845,686	35	167,240	(3,021,398)	-	(3,021,398)
Interest on long-term debt	766,040	-	-	-	(766,040)	-	(766,040)
Total Governmental Activities	31,818,948	5,577,001	3,280,064	167,240	(22,794,643)	-	(22,794,643)
Business-type Activities:							
Water and sewer	6,129,405	6,755,337	-	198,278	-	824,210	824,210
Electric system	15,652,988	14,848,967	-	126,045	-	(677,976)	(677,976)
Airport operations	174,994	314,437	-	-	-	139,443	139,443
Landfill operations	2,641,078	2,671,730	6,190	141,370	-	178,212	178,212
Total Business-type Activities	24,598,465	24,590,471	6,190	465,693	-	463,889	463,889
Total	56,417,413	30,167,472	3,286,254	632,933	(22,794,643)	463,889	(22,330,754)
General Revenues:							
Taxes:							
Property tax, levied for general purposes					2,318,200	-	2,318,200
Specific ownership tax					146,836	-	146,836
Sales and use tax					20,524,445	-	20,524,445
Severance tax					68,193	-	68,193
Franchise tax					165,025	-	165,025
Accommodations tax					846,111	-	846,111
Other miscellaneous taxes					36,108	-	36,108
Unrestricted investment earnings					246,752	147,733	394,485
Grants, contributions and miscellaneous income not restricted for specific purposes					1,188,868	-	1,188,868
Transfers					1,706,167	(1,706,167)	-
Total General Revenues and Transfers					27,246,705	(1,558,434)	25,688,271
Change in Net Position					4,452,062	(1,094,545)	3,357,517
Net Position - Beginning (as restated)					113,546,333	64,978,165	178,524,498
Net Position - Ending					117,998,395	63,883,620	181,882,015

The accompanying notes are an integral part of these financial statements.

FUND FINANCIAL STATEMENTS

City of Glenwood Springs, Colorado
Balance Sheet
Governmental Funds
December 31, 2020

	General	Fire and Ambulance Fund	Downtown Development Authority	Street Tax Fund	Capital Projects Fund	Acquisition and Improvement	Non-major Governmental Funds	Total
Assets:								
Cash and investments	8,356,577	48,801	1,290,327	1,629,111	3,280,130	8,347,883	5,293,883	28,246,712
Cash and investments - restricted	-	-	-	-	-	4,197,343	-	4,197,343
Taxes receivable	3,506,230	-	97,332	286,230	-	-	344,674	4,234,466
Accounts receivable, net	934,360	254,350	-	-	-	572,460	234,313	1,995,483
Interest receivable	5,038	-	-	-	2,801	-	55	7,894
Due from other governments	-	-	-	-	-	1,975,290	-	1,975,290
Due from other funds	204,957	-	-	-	-	-	-	204,957
Prepaid items	-	-	-	-	-	-	3,411	3,411
Total Assets	13,007,162	303,151	1,387,659	1,915,341	3,282,931	15,092,976	5,876,336	40,865,556
Liabilities:								
Accounts/vouchers payable	475,636	18,610	549	135,838	162,335	265,760	1,343,229	2,401,957
Other liabilities	397,473	-	-	-	-	-	-	397,473
Accrued payroll and related liabilities	217,914	90,170	-	-	9,791	-	-	317,875
Due to other funds	-	194,371	259,264	-	-	-	-	453,635
Unearned revenue	7,400	-	-	2,500	-	-	-	9,900
Total Liabilities	1,098,423	303,151	259,813	138,338	172,126	265,760	1,343,229	3,580,840
Deferred Inflows of Resources:								
Unavailable property taxes	2,170,810	-	97,332	-	-	-	42,669	2,310,811
Total Deferred Inflows of Resources	2,170,810	-	97,332	-	-	-	42,669	2,310,811
Fund Balances:								
Nonspendable	562,101	-	-	-	-	-	3,411	565,512
Restricted	1,069,965	-	-	-	-	4,197,343	341,005	5,608,313
Committed	1,906,018	-	1,030,514	1,777,003	951,067	-	1,984,320	7,648,922
Assigned	-	-	-	-	2,159,738	10,629,873	2,161,702	14,951,313
Unassigned	6,199,845	-	-	-	-	-	-	6,199,845
Total Fund Balance	9,737,929	-	1,030,514	1,777,003	3,110,805	14,827,216	4,490,438	34,973,905
Total Liabilities, Deferred Inflows and Fund Balances	13,007,162	303,151	1,387,659	1,915,341	3,282,931	15,092,976	5,876,336	40,865,556

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Reconciliation of Governmental Funds Balance Sheet to the Statement of Net Position
December 31, 2020

Governmental Funds Total Fund Balance	34,973,905
Add:	
Capital assets used in governmental activities are not considered current financial resources and, therefore, not reported in the governmental funds.	102,680,896
Internal Service Funds are used by the City to account for the repair and replacement costs of the City's heavy equipment and vehicles. The assets and liabilities of the Internal Service Fund are included in governmental activities in the Statement of Activities.	4,547,075
Less:	
Long-term liabilities, including bonds payable, are not due and payable in the current period and therefore are not reported in the funds. This is the amount of City long-term liabilities, including accrued interest, accrued compensation, and deferred costs.	(23,714,632)
Long-term liabilities, including net pension obligations, are not due and payable in the current period and therefore are not reported in the funds. This is the amount of the City's net pension liability, adjusted for changes in pension related actuarial assumptions, proportion of collective pension amounts, differences between actual and expected experience and investments earnings, and differences between actual and annualized contributions to the pension plan, that are amortized over the average remaining service life of all active and inactive plan participants.	(488,849)
Governmental Activities Net Position	117,998,395

The notes to the financial statements are an integral part of this statement.

City of Glenwood Springs, Colorado
Statement of Revenues, Expenditures and Changes in Fund Balance
Governmental Funds
For the Year Ended December 31, 2020

	General	Fire and Ambulance Fund	Downtown Development Authority	Street Tax Fund	Capital Projects Fund	Acquisition and Improvement	Non-major Governmental Funds	Total Governmental Funds
Revenues:								
Taxes	11,472,157	-	919,112	2,511,729	1,079,480	5,023,458	3,311,386	24,317,322
Permits and licenses	328,625	-	-	-	-	-	-	328,625
Intergovernmental revenue	1,782,518	202,782	-	-	-	2,400,384	1,437,081	5,822,765
Charges for services	829,447	1,419,204	-	-	24,777	-	55,010	2,328,438
Investment income (loss)	153,345	-	8,634	25,760	47,871	200,578	6,194	442,382
Miscellaneous	2,886,710	-	3,050	248,276	38,351	128,482	1,078,313	4,383,182
Total Revenues	17,452,802	1,621,986	930,796	2,785,765	1,190,479	7,752,902	5,887,984	37,622,714
Expenditures:								
General government	5,621,627	-	355,077	-	825,440	706,736	43,795	7,552,675
Transportation	-	-	-	3,141,680	-	-	1,984,380	5,126,060
Public safety	3,450,251	4,107,446	-	-	-	-	1,340,046	8,897,743
Community and economic development	786,589	-	-	-	-	-	1,127,323	1,913,912
Public works	1,732,603	-	-	-	1,280,351	4,795,039	-	7,807,993
Culture and recreation	3,335,191	-	-	-	126,787	2,634,930	-	6,096,908
Debt service:				-				
Principal	250,000	-	-	275,000	-	1,295,000	-	1,820,000
Interest	-	-	8,617	46,512	-	682,440	-	737,569
Total Expenditures	15,176,261	4,107,446	363,694	3,463,192	2,232,578	10,114,145	4,495,544	39,952,860
Excess (Deficiency) of Revenues Over Expenditures	2,276,541	(2,485,460)	567,102	(677,427)	(1,042,099)	(2,361,243)	1,392,440	(2,330,146)
Other Financing Sources (Uses):								
Sale of assets	-	-	-	-	-	1,206,813	-	1,206,813
Transfers in	3,942,067	2,485,460	-	-	100,000	268,000	370,635	7,166,162
Transfers (out)	(2,956,095)	-	(100,000)	-	(909,500)	(1,540,000)	(1,026,272)	(6,531,867)
Total Other Financing Sources (Uses)	985,972	2,485,460	(100,000)	-	(809,500)	(65,187)	(655,637)	1,841,108
Net Change in Fund Balance	3,262,513	-	467,102	(677,427)	(1,851,599)	(2,426,430)	736,803	(489,038)
Fund Balance - Beginning of Year	6,475,416	-	563,412	2,454,430	4,962,404	17,253,646	3,753,635	35,462,943
Fund Balance - End of Year	9,737,929	-	1,030,514	1,777,003	3,110,805	14,827,216	4,490,438	34,973,905

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Reconciliation of Revenues, Expenditures and Changes in Fund Balances
of Governmental Funds to the Statement of Activities
For the Year Ended December 31, 2020

Net Change in Fund Balances of Governmental Funds	(489,038)
Amounts reported for governmental activities in the Statement of Activities are different because:	
Governmental funds report capital outlays as expenditures. However, in the statement of activities the cost of those assets is allocated over their estimated useful lives and reported as depreciation expense. This is the amount of by which depreciation exceeded capital outlay expenses for the year.	7,638,622
The City has sold assets which are shown at their sales price on governmental funds but are shown as a gain or loss on the sale of assets based upon the sale price less the asset's book value.	(4,349,128)
Repayment of bond principal and leases are expenditures in the governmental funds, but the repayment reduces long term liabilities in the Statement of Net Position. This represents the total principal repayments, the change in accrued interest at year end and amortization of debt-related deferrals.	1,797,004
Changes in the City employees' accrued compensated absences are considered changes in long-term liabilities. This is the amount that accrued compensated absences increased.	49,036
Internal service funds are used by management to charge costs of various activities to the general and other funds. The net income or loss of the internal service funds are included in the governmental activities statement of activities.	(181,107)
Changes in the City's net pension obligation reported in the statement of activities do not require the use of current financial resources and, therefore, are not reported as expenditures in governmental funds. This is the change in City's net pension obligation during the year, including differences between employer contributions to the pension plan and amortization of pension-related deferrals.	(13,327)
Governmental Activities Change in Net Position	4,452,062

The notes to the financial statements are an integral part of this statement.

City of Glenwood Springs, Colorado
Statement of Net Position
Proprietary Funds
December 31, 2020

	Water and Sewer	Electric System	Airport Operations	Landfill Operations	Totals	Governmental Activities Internal Service Fund
Assets:						
Current:						
Cash and equivalents - Unrestricted	22,663	4,462,347	301,455	93,603	4,880,068	140,462
Cash and equivalents - Restricted	2,649,018	7,395,187	-	696,336	10,740,541	-
Investments - Unrestricted	1,413,216	1,061,859	-	962,855	3,437,930	-
Accounts receivable - Trade (net of allowance for doubtful accounts)	904,738	2,389,256	11,732	470,214	3,775,940	-
Inventory	399,131	368,338	30,906	-	798,375	8,082
Due from other funds	-	-	-	259,264	259,264	-
Total Current Assets	5,388,766	15,676,987	344,093	2,482,272	23,892,118	148,544
Property and Equipment:						
Land	-	1,305,057	-	249,986	1,555,043	-
Construction in progress	936,728	2,324,699	-	500,732	3,762,159	-
Building, plant and system	80,246,094	33,952,770	391,225	1,787,084	116,377,173	833,125
Water rights	29,800	-	-	-	29,800	-
Equipment	1,156,443	2,751,560	90,388	597,723	4,596,114	3,906,382
Vehicles	-	13,693	-	22,844	36,537	4,600,524
Total	82,369,065	40,347,779	481,613	3,158,369	126,356,826	9,340,031
Less accumulated depreciation	(30,860,772)	(19,888,073)	(174,776)	(524,378)	(51,447,999)	(4,894,721)
Net Property and Equipment	51,508,293	20,459,706	306,837	2,633,991	74,908,827	4,445,310
Total Assets	56,897,059	36,136,693	650,930	5,116,263	98,800,945	4,593,854
Liabilities and Fund Equity:						
Current Liabilities:						
Accounts payable	432,405	2,648,785	6,643	297,153	3,384,986	27,724
Deposits	-	224,658	-	-	224,658	-
Accrued interest	241,695	1,847	-	-	243,542	-
Accrued payroll and taxes	39,133	42,648	22	24,044	105,847	8,580
Accrued vacation and sick pay	100,668	315,187	-	46,020	461,875	10,475
Due to other funds	10,586	-	-	-	10,586	-
Unearned revenue	36,124	33,143	-	9,800	79,067	-
Current portion of long-term debt	1,382,050	-	-	-	1,382,050	-
Total Current Liabilities	2,242,661	3,266,268	6,665	377,017	5,892,611	46,779
Long-term Liabilities:						
Long-term debt - net of current portion	18,335,900	9,122,000	-	-	27,457,900	-
Landfill closure liability	-	-	-	1,566,814	1,566,814	-
Total Long-term Liabilities	18,335,900	9,122,000	-	1,566,814	29,024,714	-
Total Liabilities	20,578,561	12,388,268	6,665	1,943,831	34,917,325	46,779
Net Position:						
Net investment in capital assets	34,439,361	18,732,893	306,837	2,633,991	56,113,082	4,445,310
Unrestricted	1,879,137	5,015,532	337,428	538,441	7,770,538	101,765
Total Net Position	36,318,498	23,748,425	644,265	3,172,432	63,883,620	4,547,075

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Statement of Revenues, Expenditures and Changes in Net Position
Proprietary Funds
For the Year Ended December 31, 2020

	Water and Sewer	Electric System	Airport Operations	Landfill Operations	Totals	Governmental Activities Internal Service Funds Totals
Operating Revenues:						
Rentals	-	-	126,650	-	126,650	-
Charges and fees	6,740,518	14,042,964	187,787	2,634,322	23,605,591	496,220
Other	14,819	806,003	-	37,408	858,230	21,967
Total Operating Revenues	6,755,337	14,848,967	314,437	2,671,730	24,590,471	518,187
Operating Expenses:						
Purchased power	-	9,813,427	-	-	9,813,427	-
Operations and maintenance	2,512,920	2,406,503	138,000	1,588,216	6,645,639	860,365
General and administrative	1,245,774	878,380	27,895	943,936	3,095,985	-
Improvements	-	38,414	-	-	38,414	-
Depreciation	1,761,533	1,027,479	9,099	108,926	2,907,037	924,356
Total Operating Expenses	5,520,227	14,164,203	174,994	2,641,078	22,500,502	1,784,721
Operating Income (Loss)	1,235,110	684,764	139,443	30,652	2,089,969	(1,266,534)
Non-Operating Revenues (Expenses):						
Disposition of assets	-	(1,407,602)	-	-	(1,407,602)	9,000
Investment income	50,358	42,608	-	54,767	147,733	4,555
Intergovernmental awards	198,278	27,000	-	141,370	366,648	-
Other	-	-	-	6,190	6,190	-
Interest expense	(609,178)	(81,183)	-	-	(690,361)	-
Total Non-Operating Revenues (Expenses)	(360,542)	(1,419,177)	-	202,327	(1,577,392)	13,555
Income (Loss) Before Transfers and Capital Contributions	874,568	(734,413)	139,443	232,979	512,577	(1,252,979)
Transfer (out)	(489,381)	(1,166,786)	-	(50,000)	(1,706,167)	-
Transfer in	-	-	-	-	-	1,071,872
Capital contributions	-	99,045	-	-	99,045	-
Change in Net Position	385,187	(1,802,154)	139,443	182,979	(1,094,545)	(181,107)
Net Position - Beginning of Year	35,933,311	25,550,579	504,822	2,989,453	64,978,165	4,728,182
Net Position - End of Year	36,318,498	23,748,425	644,265	3,172,432	63,883,620	4,547,075

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Combining Statement of Cash Flows
Proprietary Funds
For the Year Ended December 31, 2020

	Water and Sewer	Electric System	Airport Operations	Landfill Operations	Totals	Governmental Activities Internal Service Funds Totals
Cash Flows From Operating Activities:						
Cash received from customers	6,366,010	13,675,077	311,774	2,465,151	22,818,012	-
Cash received from interfund services	-	-	-	-	-	499,843
Cash paid to suppliers and employees	(3,306,572)	(12,410,612)	(158,487)	(1,988,223)	(17,863,894)	(884,723)
Cash paid for interfund services used	(83,615)	(36,031)	(2,813)	(26,914)	(149,373)	-
Other operating revenues	-	806,003	-	39,003	845,006	21,967
Net Cash Provided (Used) by Operating Activities	2,975,823	2,034,437	150,474	489,017	5,649,751	(362,913)
Cash Flows From Non-Capital Financing Activities:						
Net refunds of customer deposits	-	10,089	-	-	10,089	-
Transfers from other funds	-	-	-	-	-	1,071,872
Transfers (to) other funds	(478,795)	(1,166,786)	-	(50,000)	(1,695,581)	-
Intergovernmental awards	-	27,000	-	-	27,000	-
Net Cash (Used) by Non-Capital Financing Activities	(478,795)	(1,129,697)	-	(50,000)	(1,658,492)	1,071,872
Cash Flows From Capital and Related Financing Activities:						
Sale of assets	-	(693,840)	-	-	(693,840)	8,999
Intergovernmental awards	198,278	-	-	141,370	339,648	-
Insurance proceeds	-	-	-	6,190	6,190	-
Loan proceeds		9,122,000				
Repayments from other funds	-	-	-	90,180	90,180	-
Interest paid on bonds and equipment contracts	(609,178)	(80,716)	-	-	(689,894)	-
Principal paid on bonds and equipment contracts	(1,329,300)	-	-	-	(1,329,300)	-
Acquisition and construction of capital assets	(4,986,790)	(2,621,910)	-	(988,605)	(8,597,305)	(629,816)
Net Cash Provided (Used) by Capital and Related Financing Activities	(6,726,990)	5,725,534	-	(750,865)	(10,874,321)	(620,817)
Cash Flows From Investing Activities:						
Interest income received	6,694	21,950	-	54,071	82,715	4,555
Proceeds from sales and maturities of investments	1,535,738	2,487,838	-	809,197	4,832,773	47,765
Purchase of investments	-	(245,000)	-	-	(245,000)	-
Net Cash Provided by Investing Activities	1,542,432	2,264,788	-	863,268	4,670,488	52,320
Net Change in Cash and Cash Equivalents	(2,687,530)	8,895,062	150,474	551,420	6,909,426	140,462
Cash and Cash Equivalents - Beginning of Year	5,359,211	2,962,472	150,981	238,519	8,711,183	-
Cash and Cash Equivalents - End of Year	2,671,681	11,857,534	301,455	789,939	15,620,609	140,462
Cash and Cash Equivalents Consists of the Following:						
Cash in bank - Unrestricted	22,663	4,462,347	301,455	93,603	4,880,068	140,462
Cash in bank - Restricted	2,649,018	7,395,187	-	696,336	10,740,541	-
Total	2,671,681	11,857,534	301,455	789,939	15,620,609	140,462
Reconciliation of Operating Income (Loss) to Net Cash Provided (Used) by Operating Activities:						
Operating income (loss)	1,235,110	684,764	139,443	30,652	2,089,969	(1,266,534)
Adjustments to reconcile operating income (loss) to net cash provided (used) by operating activities:						
Depreciation	1,761,533	1,027,479	9,099	108,926	2,907,037	924,356
(Increase) decrease in accounts receivable	(369,265)	(368,908)	(2,665)	(169,166)	(910,004)	3,623
(Increase) decrease in inventories	38,254	(42,010)	7,308	-	3,552	-
(Increase) decrease in prepaid items/other assets	-	-	-	(6)	(6)	7,077
Increase (decrease) in accounts payable	330,254	732,099	(2,711)	61,071	1,120,713	(31,435)
Increase (decrease) in landfill closure liability	-	-	-	455,945	455,945	-
Increase (decrease) in unearned revenue	(20,063)	1,013	-	1,595	(17,455)	-
Total Adjustments	1,740,713	1,349,673	11,031	458,365	3,559,782	903,621
Net Cash Provided (Used) by Operating Activities	2,975,823	2,034,437	150,474	489,017	5,649,751	(362,913)
Schedule of Non-Cash Investing, Capital and Financing Activities:						
Assets contributed from others	-	99,045	-	-	99,045	-
Unrealized gain (loss) on investments	25,191	20,658	-	3,565	49,414	-

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Statement of Fiduciary Net Position
December 31, 2020

	Cemetery Reserve Fund
Assets:	
Cash and investments	52,838
Total Assets	52,838
Net Position:	
Held in Trust	52,838

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Statement of Changes in Fiduciary Net Position
For the Year Ended December 31, 2020

	Cemetery Reserve Fund
Additions:	
Charges and fees	750
Total Additions	750
Deductions:	
Capital outlay	-
Total Deductions	-
Change in Net Position	750
Net Position - Beginning of Year	52,088
Net Position - End of Year	52,838

The accompanying notes are an integral part of these financial statements.

NOTES TO THE FINANCIAL STATEMENTS

I. Summary of Significant Accounting Policies

The City of Glenwood Springs, Colorado, ("City"), is located in Garfield County, Colorado and its major operations include police and fire protection, road maintenance, ambulance, airport, utilities and culture and recreation.

The City's financial statements are prepared in accordance with generally accepted accounting principles ("GAAP"). The Governmental Accounting Standards Board ("GASB") is responsible for establishing GAAP for state and local governments through its pronouncements (Statements and Interpretations). The more significant accounting policies established by GAAP used by the City are discussed below.

A. Reporting Entity

In 1966, the City became a "Home Rule City" (a municipal corporation, as defined by Colorado Revised Statutes). The City is governed by an appointed Mayor and an elected City Council which is responsible for setting policy, appointing administrative personnel and adopting an annual budget in accordance with state statutes. As required by generally accepted accounting principles, the financial statements of the reporting entity include those of the City (the primary government) and its component units. Additional separate governmental units, agencies, or non-profit corporations are included in the financial statements of the City since they were discovered to fall within the oversight responsibility based upon the application of the following criteria: financial accountability, appointment of a voting majority of the organization's governing body, ability to impose its will on the organization, a potential for the organization to provide specific financial benefits or burdens, and fiscal dependency.

B. Blended Component Units

In conformity with generally accepted accounting principles, the financial statements of the following component units have been included in the financial reporting entity as blended component units.

- General Improvement District Number 1980 (the "District"); the District's primary purpose is to provide infrastructure improvements to specific areas within the City's downtown area. The District's primary funding source is an ad valorem tax. The District's boundaries are entirely within the City's boundaries. Although the District is legally separate from the City, the District and the City are related through a common governing board. For financial reporting purposes, the District is reported as if it were part of the City's operations because the City is able to impose its will on the District and City Council acts as the District's *de facto* governing board.

- Downtown Development Authority (the "Authority"); the Authority is funded primarily with a Sales Tax Increment Financing (TIF) and its primary purpose is to develop and implement a downtown development and redevelopment plan for the central business area. The Authority's boundaries are entirely within the City's boundaries. The Authority exists only with the City's express consent. Although the Authority is legally separate from the City, the Authority and the City are related through a common governing board. For financial reporting purposes, the Authority is reported as if it were part of the City's operations because the City is able to impose its will on the Authority.

  Additional financial information for both component units can be obtained from the City of Glenwood Springs Finance Office at 101 W 8th Street, Glenwood Springs, Colorado 81601.

I. Summary of Significant Accounting Policies (continued)

C. Government-wide and Fund Financial Statements

The City's basic financial statements include both government-wide (reporting the City as a whole) and fund financial statements (reporting the City's major funds). Both the government-wide and fund financial statements categorize primary activities as either governmental or business-type. The City's police and fire protection, road maintenance, culture and recreation, community development, transportation systems, and administration are classified as governmental activities. The City's utilities, airport and landfill are classified as business-type activities.

1. Government-wide Financial Statements

The government-wide financial statements (i.e., the Statement of Net Position and the Statement of Activities) report information on all of the activities of the primary government and its component units. For the most part, the effect of interfund activity has been removed from these statements. *Governmental activities*, which normally are supported by taxes and intergovernmental revenues, are reported separately from *business-type activities*, which rely to a significant extent on fees and charges for support.

The Statement of Activities demonstrates the degree to which direct expenses of a given function or segment is offset by program revenues. *Direct expenses* are those that are clearly identifiable with a specific function or segment. *Program revenues* include 1) charges to customers or applicants who purchase, use, or directly benefit from goods, services, or privileges provided by a given function or segment and 2) grants and contributions, that are restricted to meeting the operational or capital requirements of a particular function or segment. Taxes and other items not properly included among program revenues are reported instead as *general revenues*.

The government-wide focus is on the sustainability of the City as an entity and the change in the City's net position resulting from the current year's activities.

As a general rule, the effect of interfund activity has been eliminated from the government-wide financial statements. Exceptions to this general rule are payments where the amounts are reasonably equivalent to the value of interfund services provided and other charges between the City's water and sewer function, electric function, and landfill function. Elimination of these charges would distort the direct costs and program revenues reported for the related functions.

I. Summary of Significant Accounting Policies (continued)

C. Government-wide and Fund Financial Statements (continued)

2. Fund Financial Statements

The financial transactions of the City are reported in individual funds in the fund financial statements. Each fund is accounted for by providing a separate set of self-balancing accounts that comprises its assets, liabilities, reserves, fund equity, revenues and expenditures/expenses.

The City reports the following major governmental funds:

(a) *General Fund* - This fund is established to account for resources devoted to financing the general services that the City performs for its citizens. General tax revenues and other sources of revenue used to finance the fundamental operations of the City are included in this fund. The fund is charged with all costs of operating the government for which a separate fund has not been established.

(b) *Fire & Ambulance Fund* - accounts for fire and ambulance services performed by the City and Rural Fire District.

(c) *Downtown Development Authority* – A blended component unit, was established by a vote of the citizens in 2001 for the purpose of revitalizing the downtown corridor and building a parking structure.

(d) *Capital Projects Fund* – accounts for major City Projects which are financed by a 0.50% sales tax.

(e) *Acquisitions and Improvements Fund* - accounts for revenues and expenditures received from a 1.00% sales tax and special assessments levied for capital improvements purposes.

(f) *Street Tax Fund* – accounts for revenues received from the 0.50% sales tax levied for transportation and related projects.

The City reports the following major proprietary funds:

(a) *Water and Sewer Fund* - accounts for activities of the fund that supplies water and sewer services to the citizens in the water and sewer service area. City water is provided on a metered basis.

(b) *Electric System Fund* - accounts for activities related to the purchase and delivery of power within the City electric service area.

(c) *Airport Operations Fund* - accounts for activities related to user charges and maintenance expenses for the airport.

(d) *Landfill Operations Fund* - accounts for the activities related to the operations of the City landfill and recycling program.

I. Summary of Significant Accounting Policies (continued)

C. Government-wide and Fund Financial Statements (continued)

2. Fund Financial Statements (continued)

The City reports the following non-major governmental funds:

(a) *Tourism Fund* - accounts for funds received from a two and one-half percent rent tax on accommodations. Expenditures are restricted for tourism promotion purposes.

(b) *Victims Assistance and Law Enforcement Fund (V.A.L.E.)* - accounts for funds received from a surcharge for violation of all municipal ordinances and violations of the Model Traffic Code. Expenditures are restricted to victims' and witnesses' services and reimbursements and to Police Department equipment purchases, training, and additional personnel costs.

(c) *Conservation Trust Fund* - accounts for funds received and restricted as to use in the acquisition, development and maintenance of new conservation sites pursuant to Colorado Revised Statutes.

(d) *Bus Tax Fund* - accounts for the 0.20% sales tax designated towards "Ride Glenwood Springs" bus service.

(e) *Marijuana Tax Fund* - accounts for the 5.00% sales tax and 5.00% excise tax designated towards marijuana regulation enforcement, education, and public health programs.

(f) *Tobacco Sales Tax Fund* - accounts for the 40.00% sales tax on tobacco products designated towards drug, alcohol, and tobacco prevention, youth mental and physical health, and other related city expenses.

(g) *General Improvement District Number 1980 Fund* - the District's primary purpose is to provide infrastructure improvements to specific areas within the downtown area. The District's primary funding source is an ad valorem tax.

(h) *Emergency Services Equipment Replacement Fund* - accounts for revenues received on a pro-rated basis from the Glenwood Springs Rural Fire Protection District and transfers from the General Fund for the purchase of emergency services, facilities and equipment.

The City also reports the following Internal Service Fund:

(a) *Fleet Service Fund* - accounts for the repair and maintenance costs and the capital replacement plan of the City's vehicles and heavy equipment, excluding fire trucks.

The City also reports the following fiduciary funds which are not included in the government-wide statements since the resources of the fund are not available to the City:

(a) The *Cemetery Reserve Fund* accounts for funds received and restricted for the maintenance and care of the Rosebud Cemetery.

I. Summary of Significant Accounting Policies (continued)

D. Measurement Focus, Basis of Accounting, and Financial Statement Presentation

Measurement focus refers to whether financial statements measure changes in current resources only (current financial focus) or changes in both current and long-term resources (long-term economic focus). Basis of accounting refers to the point at which revenues, expenditures, or expenses are recognized in the accounts and reported in the financial statements. Financial statement presentation refers to classification of revenues by source and expenses by function.

1. Long-term Economic Focus and Accrual Basis

Both governmental and business-type activities in the government-wide financial statements, proprietary fund financial statements, and fiduciary fund financial statements use the long-term economic focus and are presented on the accrual basis of accounting. Revenues are recognized when earned and expenses are recognized when incurred, regardless of the timing of the related cash flows.

2. Current Financial Focus and Modified Accrual Basis

The governmental fund financial statements use the current financial focus and are presented on the modified accrual basis of accounting. Under the modified accrual basis of accounting, revenues are recorded when susceptible to accrual; i.e., both measurable and available. “Available” means collectible within the current period or soon enough thereafter (60 days) to be used to pay liabilities of the current period. Property taxes, sales taxes, intergovernmental revenues, other taxes, and investment income associated with the current fiscal period are all considered to be susceptible to accrual and have been recognized as revenues of the current fiscal period. Expenditures are generally recognized when the related liability is incurred. The exception to this general rule is that principal and interest on general long-term debt, if any, is recognized when due.

3. Financial Statement Presentation

Amounts reported as program revenues include 1) charges to customers or applicants for goods, services or privileges provided, 2) operating grants and contributions, and 3) capital grants and contributions, including special assessments. Internally dedicated resources are reported as *general revenues* rather than as program revenues. Likewise, general revenues include all taxes.

Proprietary funds distinguish operating revenues and expenses from non-operating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund’s principal ongoing operations. The principal operating revenues of the City’s enterprise funds are charges to customers for sales and services. Operating expenses for the enterprise funds include the cost of sales and services, administrative expenses, and depreciation on capital assets. All revenues and expenses not meeting this definition are reported as non-operating revenues and expenses.

I. Summary of Significant Accounting Policies (continued)

E. Financial Statement Accounts

1. Cash, Cash Equivalents and Investments

Cash and cash equivalents are defined as deposits that can be withdrawn at any time without notice or penalty and investments with original maturities of three months or less. Investments are stated at fair value, net asset value, or amortized cost, which are detailed in note IV.A.

The change in fair value of investments is recognized as an increase or decrease to investment assets and investment income. The City allows investment in types of obligations that correspond to State Statutes, which are detailed in note IV.A.

2. Receivables

All receivables are reported at their gross value and, where appropriate, are reduced by the estimated portion that is expected to be uncollectible. Estimated unbilled revenues from the Electric System Fund and the Water and Sewer Fund are recognized at the end of each fiscal year on a pro rata basis. The estimated amount is based on billings during the month prior to the close of the fiscal year.

3. Property Taxes

Property taxes are assessed in one year as a lien on the property, but not collected by the governmental units until the subsequent year. In accordance with generally accepted accounting principles, the assessed but uncollected property taxes have been recorded as a receivable and a deferred inflow of resources.

4. Inventories

Inventories are valued at cost, using the first-in/first-out (FIFO) method. The costs of governmental fund-type inventories are recorded as expenditures when consumed rather than when purchased on the fund financial statements.

5. Prepaid Items

Payments to vendors that reflect costs applicable to future accounting periods are recorded as prepaid items in both government-wide and fund financial statements.

6. Compensated Absences

Vested or accumulated vacation leave that is expected to be liquidated with expendable available financial resources is reported as an expenditure and a fund liability of the governmental fund that will pay it. Amounts of vested or accumulated vacation leave that are not expected to be liquidated with expendable available financial resources are shown as long-term debt on the Government-wide Statement of Net Position. Vested or accumulated vacation leave of proprietary funds is recorded as an expense and liability of those funds as the benefits accrue to employees. No liability is recorded for non-vesting accumulating rights to receive sick pay benefits. However, a liability is recognized for that portion of accumulating sick leave benefits that is estimated to be taken as "terminal leave" at retirement.

I. Summary of Significant Accounting Policies (continued)

E. Financial Statement Accounts (continued)

7. Pensions

The City participates in an agent multiple-employer defined benefit plan administered by the Fire and Police Pension Association of Colorado ("FPPA"). The net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, pension expense, information about the fiduciary net position and additions to/deductions from the fiduciary net position of the plans have been determined using the economic resources measurement focus and the accrual basis of accounting. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

8. Capital Assets

Capital assets, which include land, buildings, equipment, vehicles, and infrastructure assets, are reported in the applicable governmental or business-type activity columns in the government-wide financial statements. The City defines capital assets as assets with an initial cost of $5,000 or more and an estimated useful life in excess of two years. Such assets are recorded at historical cost. Donated capital assets are recorded at fair value at the date of donation.

Capital outlay for projects is capitalized as projects are constructed. Interest incurred during the construction phase is capitalized as part of the value of the assets constructed in the business-type activities.

Capital assets are depreciated using the straight-line method over the following estimated useful lives:

	Years
Infrastructure	25-40
Buildings	30
Electric plant	40
Electric system and equipment	25
Water and sewer, plant and distribution system	40
Office furniture and equipment	10
Vehicles and tools	5

9. Deferred Outflows and Inflows of Resources

Deferred outflows of resources represent a consumption of net position that applies to a future period and so will not be recognized as an outflow of resources (expenses/expenditures) until then. The City has one item that qualifies for reporting under this category on the Statement of Net Position. The item is the collective deferred outflows related to the City's net pension obligation. Pension contributions made after the measurement date, and pension related deferrals will be recognized in future periods. See Note V.B.

I. Summary of Significant Accounting Policies (continued)

E. Financial Statement Accounts (continued)

9. Deferred Outflows and Inflows of Resources (continued)

Deferred inflows of resources represent an acquisition of net position that applies to a future period and so will not be recognized as an inflow of resources (revenue) until that time. The City has two item that qualify for reporting in this category. Unavailable revenue from property taxes, reported in the governmental balance sheet and on the Statement of Net Position. Pension difference between projected and actual earnings on pension plan investments will be recognized in future periods. These amounts are deferred and recognized as an inflow from resources in the period that the amounts become available.

10. Fund Balance Classifications

Governmental accounting standards establishes fund balance classifications that comprise a hierarchy based primarily on the extent to which a government is bound to observe constraints imposed upon the use of the resources reported in governmental funds. Fund balance classifications include Non-spendable, Restricted, Committed, Assigned and Unassigned. These classifications reflect not only the nature of the funds, but also provide clarity to the level of restraint, such as external versus internal compliance requirements. Unassigned fund balance is a residual classification within the General Fund. The General Fund should be the only fund that reports a positive unassigned balance. In all other funds, unassigned fund balance is limited to negative residual fund balance. For further details on the various fund balance classifications, refer to Note IV.J.

11. Interfund Transactions

Interfund services provided and used are accounted for as revenues, expenditures, or expenses. Transactions that constitute reimbursements to a fund for expenditures or expenses initially made from it that are properly applicable to another fund, are recorded as “due from other funds” or “due to other funds” on the balance sheet when they are expected to be liquidated within a reasonable amount of time. Any residual balances outstanding between the governmental activities and business-type activities are reported in the government-wide financial statements as “internal balances”.

F. Significant Accounting Policies

1. Use of Estimates

The preparation of financial statements in conformity with GAAP requires the City’s management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amount of revenues and expenditures or expenses during the reporting period. Actual results could differ from those estimates.

2. Credit Risk

Receivables in the City’s funds are primarily due from other governments. Management believes that the credit risk related to these receivables is minimal.

I. Summary of Significant Accounting Policies (continued)

F. Significant Accounting Policies (continued)

3. Restricted and Unrestricted Resources

When both restricted and unrestricted resources are available for use, it is the government's policy to use restricted resources first, then unrestricted resources as they are needed.

II. Reconciliation of Government-wide and Fund Financial Statements

A. Explanation of certain differences between the governmental fund Balance Sheet and the government-wide Statement of Net Position

The governmental fund Balance Sheet includes a reconciliation between *fund balance – total governmental funds* and *net position of governmental activities* as reported in the government-wide Statement of Net Position. One element of that reconciliation explains that "Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds." The $102,680,896 reconciling item represents capital assets of $167,771,905 net of accumulated depreciation of $65,091,009 at December 31, 2020.

Another element of that reconciliation states that "Long-term liabilities are not due and payable in the current period and, therefore, are not reported in the funds." The details of this $23,714,632 difference represent long-term bonds and loans of $22,670,000, accrued interest of $56,906, compensated absences of $987,726, deferred refunding costs of $0 and unamortized premium of $0. Additionally, long term liabilities for pension obligations are included in the amount of $488,849 which represents the net pension liability of $506,327, net of deferred pension expenses of ($34,643) and $17,165.

Another element of that reconciliation states that "Internal Service Funds are used by the City to account for the repair and replacement costs of the City's heavy equipment and vehicles. The assets and liabilities of the Internal Service Fund are included in governmental activities in the Statement of Net Position". The result is an increase in net position of $4,547,075 within governmental activities.

B. Explanation of certain differences between the governmental fund Statement of Revenues, Expenditures and Changes in Fund Balances and the government-wide Statement of Activities

The governmental fund Statement of Revenues, Expenditures and Changes in Fund Balance includes a reconciliation between *net change in fund balances of governmental funds* and *changes in net position of governmental activities* as reported in the government-wide Statement of Activities. One element of that reconciliation explains that "Governmental funds report capital outlays as expenditures. However, in the Statement of Activities, the cost of those assets is allocated over their estimated useful lives as depreciation expense". The details of the net difference of $7,638,622 are net capital outlay of $11,787,048 less depreciation expense of $4,148,420.

III. Stewardship, Compliance, and Accountability

A. Budgetary Information

As required by Colorado statutes and the Home Rule Charter, the City followed required timetables in preparing, approving, and enacting its budget for the ensuing year. The following is a summary of the budget calendar for the 2020 budget year:

(1) For the 2020 budget year, prior to December 10, 2019, the County Assessor sent to the City the final recertified assessed valuation of all taxable property within the City's boundaries.

(2) The City Manager, or other qualified persons appointed by the Council, submitted to the Council, on or before the first regularly Scheduled meeting in October, a recommended budget which detailed the necessary property taxes needed along with other available revenues to meet the City's operating requirements.

(3) Notice of a public hearing of the budget was announced, the budget was made available in the office of the Finance Director and a public hearing was held more than 10 days after the budget was submitted to Council.

(4) After the required public hearing, the City Council adopted the proposed budget by resolution on or before the first regular meeting in November. The ordinance which legally appropriates expenditures for the upcoming year was passed on or before the first regular Council meeting in December.

(5) The Council may make additional appropriations by ordinance during the fiscal year for unanticipated expenditures required by the City, but such additional appropriations shall not exceed the amount by which actual and anticipated revenues of the year are exceeding the revenues as estimated in the budget, unless the appropriations are necessary to relieve an emergency endangering the public health, peace or safety. At any time during the year, the City Council may, by affirmative vote of five or more members, transfer part or all of any unexpended funds from one department, fund, or office to another.

(6) For the 2020 budget, on or before the first regular meeting in December, or such other date required by law, the City Council computed and certified to the County Commissioners a rate of levy that derived the necessary property taxes as computed in the proposed budget.

Taxes levied in one year are collected in the succeeding year. Thus, taxes certified in 2019 were collected in 2020 and taxes certified in 2020 will be collected in 2021. Taxes are due on January 1st in the year of collection; however, they may be paid in either one installment (no later than April 30th) or two equal installments (not later than February 28th and June 15th) without interest or penalty. Taxes that are not paid within the prescribed time bear interest at the rate of one percent (1%) per month until paid. Unpaid amounts and the accrued interest thereon become delinquent on June 16th.

Budgets are adopted on a basis consistent with generally accepted accounting principles, except for the Water and Sewer Fund, Electric System Fund, Airport Operations Fund, Landfill Operations Fund, and Fleet Service Fund. Annual appropriated budgets are adopted for all funds. The level of control in the budget at which expenditures exceed appropriations is at the fund level. All appropriations lapse at fiscal year-end.

III. Stewardship, Compliance, and Accountability (continued)

A. Budgetary Information (continued)

During the year, $3,673,376 of supplemental appropriation ordinances were approved. The budgetary comparison statements reflect the original budget and the final budget after legally authorized revisions were made.

The following funds had supplementary budget appropriations:

Fund	Original Appropriation	Supplemental Appropriation
General	$ 21,036,014	$ 22,327,030
Fleet Service Fund	2,831,960	2,986,960
Street Tax Fund	4,044,097	4,291,143
Capital Projects	3,389,834	4,427,090
Bus Tax	2,101,730	2,160,233
Acquisition and Improvements	13,225,689	10,434,080
Conservation Trust	100,000	150,000
Downtown Development Authority	623,709	779,709
Emergency Services Equipment	1,122,800	2,062,964
Electric System	19,041,024	21,141,024
Landfill Operations	2,805,626	3,235,626

For the year ended December 31, 2020, the Acquisition and Improvement Fund, Marijuana Sales Tax Fund, Tobacco Sales Tax Fund, and Landfill Fund exceeded appropriations by $1,220,065, $50,126, $1,617 and $443,526, respectively, which may be a violation of State Statute.

Annual appropriated expenditure budgets are adopted for all governmental funds on a basis consistent with GAAP. Annual appropriation budgets are also adopted for certain proprietary funds on a non-GAAP budget basis and are reconciled to GAAP below:

	Water and Sewer Fund	Electric System Fund	Airport Operations Fund	Landfill Operations Fund	Fleet Service Fund
Excess (deficiency) of revenues over expenditures - budget basis	$ (4,601,602)	$ (3,809,347)	$ 139,443	$ (715,446)	$ (810,923)
Gain (loss) on disposal of assets	-	(1,412,796)	-	-	-
Interfund loan payments	-	-	-	(90,180)	-
Capital outlay	4,986,789	3,419,989	-	988,605	629,816
Total Adjustments	4,986,789	2,007,193	-	898,425	629,816
Net Income (Loss) - GAAP Basis	$ 385,187	$ (1,802,154)	$ 139,443	$ 182,979	$ (181,107)

III. Stewardship, Compliance, and Accountability (continued)

B. TABOR Amendment

In November 1992, Colorado voters amended Article X of the Colorado Constitution by adding Section 20; commonly known as the Taxpayer's Bill of Rights ("TABOR"). TABOR contains revenue, spending, tax and debt limitations that apply to the State of Colorado and local governments. TABOR requires, with certain exceptions, advance voter approval for any new tax, tax rate increase, mill levy above that for the prior year, extension of any expiring tax, or tax policy change directly causing a net tax revenue gain to any local government. Except for refinancing bonded debt at a lower interest rate or adding new employees to existing pension plans, TABOR requires advance voter approval for the creation of any multiple-fiscal year debt or other financial obligation unless adequate present cash reserves are pledged irrevocably and held for payments in all future fiscal years.

TABOR also requires local governments to establish an emergency reserve to be used for declared emergencies only. The reserve is calculated at 3% of fiscal year spending. Fiscal year spending excludes bonded debt service and enterprise spending. The City has reserved $1,000,000, which is the approximate required reserve at December 31, 2020.

The City's voters approved a ballot question which will allow the City to collect, retain, and expend the full proceeds of the City's sales and use tax, non-federal grants, fees and other revenues from the date of January 1, 1993 and thereafter. The City may not increase tax rates or add new debt without voter approval. The City's management believes it is in compliance with the financial provisions of TABOR. However, TABOR is complex and subject to interpretation. Many of its provisions, including the interpretation of how to calculate fiscal year spending limits, will require judicial interpretation.

IV. Detailed Notes on All Funds

A. Deposits and Investments

The Colorado Public Deposit Protection Act ("PDPA") requires that all units of local government deposit cash in eligible public depositories; eligibility is determined by State regulators. Amounts in deposit in excess of Federal insurance levels must be collateralized. The eligible collateral is determined by PDPA. The PDPA allows the institution to create a single collateral pool for all public funds. The pool is to be maintained by another institution or held in trust for all the uninsured public deposits as a group. The market value of collateral must be at least equal to the aggregate uninsured deposits.

The City's investment policy permits investments in the following type of obligations which corresponds with state statutes:

- U.S. Treasury Obligations (maximum maturity of 60 months)
- Federal Instrumentality Securities (maximum maturity of 60 months)
- FDIC-insured Certificates of Deposit (maximum maturity of 18 months)
- Corporate Bonds (maximum maturity of 36 months)
- Prime Commercial Paper (maximum maturity of 9 months)
- Eligible Bankers Acceptances
- Repurchase Agreements
- General Obligations and Revenue Obligations
- Local Government Investment Pools
- Money Market Mutual Funds

IV. Detailed Notes on All Funds (continued)

A. Deposits and Investments (continued)

Fair Value of Investments

The City measures and records its investments using fair value measurement guidelines established by generally accepted accounting principles. These guidelines recognize a three-tiered fair value hierarchy, as follows:

- Level 1: Quoted prices for identical investments in active markets;
- Level 2: Observable inputs other than quoted market prices; and,
- Level 3: Unobservable inputs.

At December 31, 2020 the City had the following recurring fair value measurements:

		Fair Value Measurements Using		
Investments Measured at Fair Value	**Total**	**Level 1**	**Level 2**	**Level 3**
United States Agencies	$ 153,320	$ 153,320	$ -	$ -
Certificates of Deposit	9,205,788	9,205,788	-	-

Investments Measured at Net Asset Value	**Total**
Colotrust	$ 3,150,036
CSIP	14,009,306

Investments Measured at Amortized Cost	**Total**
Csafe	$ 7,609,753

Debt and equity securities classified in Level 1 are valued using prices quoted in active markets for those securities. Debt and equity securities classified in Level 2 are valued using the following approaches:

- U.S. Treasuries, U.S. Agencies, and Commercial Paper: quoted prices for identical securities in markets that are not active;
- Repurchase Agreements, Negotiable Certificates of Deposit, and Collateralized Debt Obligations: matrix pricing based on the securities' relationship to benchmark quoted prices;

The City's holdings in government investment pools are comprised of balances with Colotrust, CSIP and Csafe, which are investment vehicles established for local government entities in Colorado to pool surplus funds. They operate similarly to money market funds, whereby each share is equal in value to $1. Investments of the trusts consist of U.S. Treasury bills, notes and note strips, and repurchase agreements collateralized by U.S. Treasury securities. The City has no regulatory oversight for the pools.

The City also has amounts invested with its pension fund trustee – FPPA.

Interest Rate Risk: As a means of limiting its exposure to interest rate risk, the City coordinates its investments maturities to closely match cash flow needs and restricts the maximum investments term to less than five years from the purchase date. As a result of the limited length on maturities, the City has limited its interest rate risk.

IV. Detailed Notes on All Funds (continued)

A. Deposits and Investments (continued)

Credit Risk: State law and City policy limit investments to those authorized by State statutes including U.S. Agencies and 2a7-like pools. The City's general investment policy is to apply the prudent-person rule: Investments are made as a prudent person would expect to act, with discretion and intelligence, to seek reasonable income, preserve capital, and, in general, avoid speculative investments.

Concentration of Credit Risk: The City diversifies its investments by security type and institution. Investments may only be made in those financial institutions which are insured by the Federal Deposit Insurance Corporation, the Federal Home Mortgage Association, the Federal Savings and Loan Insurance Corporation, Congressionally authorized mortgage lenders and investments that are federally guaranteed. Financial institutions holding City funds must provide the City with a statement of collateral in the form of a listing of securities pledged, and a copy of the certificate from the Banking Authority that states that the institution is an eligible public depository.

At December 31, 2020, unrealized gains or (losses) were $168,581 which reflects changes in the fair market value of investments. The City had the following cash and investments with the following maturities:

			Maturities	
	Standard & Poors Rating	Carrying amounts	Less than one year	One to five years
Deposits:				
Petty cash	Not Rated	$ 2,533	$ 2,533	$ -
Checking	Not Rated	17,234,020	17,234,020	-
Savings and money market	Not Rated	331,138	331,138	-
Investment pools	AAAm	24,769,095	24,769,095	-
Investments:				
Certificates of Deposit	Not Rated	9,205,788	3,552,579	5,653,209
United States Agencies	AA+	153,320	153,320	-
		$ 51,695,894		

The City has the following restricted cash and investments at December 31, 2020:

	Acquisition and Improvement	Water and Sewer	Electric System	Landfill Operations
Debt service reserves	$ 2,076,314	$ 2,649,018	$ -	$ -
Unspent bond proceeds	2,121,029	-	7,395,187	-
Landfill closure and post closure	-	-	-	696,336
	$ 4,197,343	$ 2,649,018	$ 7,395,187	$ 696,336

IV. Detailed Notes on All Funds (continued)

B. Receivables

Receivables as of year-end for the City's funds, including applicable allowances for uncollectible accounts, are as follows:

	General	Fire and Ambulance Fund	Downtown Development Authority	Street Tax Fund	Capital Projects Fund	Acquisition and Improvement
Receivables:						
Taxes	$ 3,506,230	$ -	$ 97,332	$ 286,230	$ -	$ -
Accounts	934,360	306,350	-	-	-	572,460
Interest	5,038	-	-	-	2,801	-
Intergovernmental	-	-	-	-	-	1,975,290
Gross receivables	4,445,628	306,350	97,332	286,230	2,801	2,547,750
Less: allowance for uncollectible	-	(52,000)	-	-	-	-
Net receivables	$ 4,445,628	$ 254,350	$ 97,332	$ 286,230	$ 2,801	$ 2,547,750

	Water and Sewer	Electric System	Airport Operations	Landfill Fund	Non-major and Other Funds	Total
Receivables:						
Taxes	$ -	$ -	-	$ -	$ 344,674	$ 4,234,466
Accounts	905,512	2,495,750	11,732	470,214	234,313	5,930,691
Interest	726	235	-	-	55	8,855
Intergovernmental	-	-	-	-	-	1,975,290
Gross receivables	906,238	2,495,985	11,732	470,214	579,042	12,149,302
Less: allowance for uncollectible	(1,500)	(106,729)	-	-	-	(160,229)
Net receivables	$ 904,738	$ 2,389,256	$ 11,732	$ 470,214	$ 579,042	$ 11,989,073

IV. Detailed Notes on All Funds (continued)

C. Capital Assets

The City had the following capital asset activity for the year:

	Beginning Balances (restated)	Increases	Decreases	Transfers	Ending Balances
Governmental Activities:					
Capital assets, not being depreciated:					
Land	$ 14,149,612	$ -	$ -	$ -	$ 14,149,612
Construction in progress	24,867,293	10,806,383	(529,501)	-	35,144,175
Total capital assets, not being depreciated	39,016,905	10,806,383	(529,501)	-	49,293,787
Capital assets, being depreciated:					
Buildings	39,441,659	535,280	(7,592,436)	-	32,384,503
Other improvements	9,440,993	-	-	-	9,440,993
Streets and trails	69,101,084	-	-	-	69,101,084
Machinery, equipment and vehicles	15,779,827	1,604,702	(492,960)	-	16,891,569
Total capital assets, being depreciated	133,763,563	2,139,982	(8,085,396)	-	127,818,149
Less accumulated depreciation for:					
Buildings	(18,126,618)	(1,329,494)	3,243,308	-	(16,212,804)
Other improvements	(1,718,723)	(279,983)	-	-	(1,998,706)
Streets and trails	(39,466,338)	(2,073,201)	-	-	(41,539,539)
Machinery, equipment and vehicles	(9,337,542)	(1,390,099)	492,960	-	(10,234,681)
Total accumulated depreciation	(68,649,221)	(5,072,777)	3,736,268	-	(69,985,730)
Total capital assets, being depreciated, net	65,114,342	(2,932,795)	(4,349,128)	-	57,832,419
Governmental Activities - Capital Assets, Net	$ 104,131,247	$ 7,873,588	$ (4,878,629)	$ -	$107,126,206
Business-type Activities					
Capital assets, not being depreciated:					
Land	$ 1,305,057	$ 249,986	$ -	$ -	$ 1,555,043
Water rights	29,800	-	-	-	29,800
Construction in progress	2,575,282	8,070,261	(6,883,384)	-	3,762,159
Total capital assets, not being depreciated	3,910,139	8,320,247	(6,883,384)	-	5,347,002
Capital assets, being depreciated:					
Buildings and plant	43,700,310	1,118,249	(2,533,111)	-	42,285,448
Distribution and collection system	67,423,917	6,720,961	(53,153)	-	74,091,725
Machinery, equipment and vehicles	4,513,341	119,310	-	-	4,632,651
Total capital assets, being depreciated	115,637,568	7,958,520	(2,586,264)	-	121,009,824
Less accumulated depreciation for:					
Buildings and plant	(14,413,178)	(1,073,608)	1,144,457	-	(14,342,329)
Distribution and collection system	(31,453,487)	(1,596,099)	29,012	-	(33,020,574)
Machinery, equipment and vehicles	(3,847,766)	(237,330)	-	-	(4,085,096)
Total accumulated depreciation	(49,714,431)	(2,907,037)	1,173,469	-	(51,447,999)
Total capital assets, being depreciated, net	65,923,137	5,051,483	(1,412,795)	-	69,561,825
Business-type Activities - Capital Assets, Net	$ 69,833,276	$ 13,371,730	$ (8,296,179)	$ -	$ 74,908,827

IV. Detailed Notes on All Funds (continued)

C. Capital Assets (continued)

The City had capital outlay and depreciation expense for the following functions:

	Capital Outlay	Depreciation Expense
Governmental Activities:		
General government	$ 818,425	$ 1,220,640
Transportation	1,184,925	110,451
Public safety	45,304	349,806
Community development	44,010	1,682
Public works	5,079,968	2,247,474
Culture and recreation	5,244,232	1,142,724
Total Governmental Activities	$ 12,416,864	$ 5,072,777
Business-type Activities:		
Water and sewer	$ 4,986,789	$ 1,761,533
Electric	3,419,989	1,027,479
Airport	-	9,099
Landfill	988,605	108,926
Total Business-type Activities	$ 9,395,383	$ 2,907,037

D. Interfund Receivables, Payables, and Transfers

In 2007, Landfill Operations loaned to the Downtown Development Authority $435,767 to acquire real property. Terms of the Interfund Loan are annual principal and interest payments beginning August 2008 through August 2027. The initial annual interest rate on this loan was fixed at 5.91%. In 2015, the fixed interest rate was reduced to 3%. At December 31, 2020, principal amount outstanding on this loan was $151,149.

In 2012, the City's Landfill Operating and Fleet Service Funds loaned a total of $2,000,000 to the Downtown Development Authority to pursue the construction of a parking garage within City limits. Terms of the Interfund Loan are annual principal and interest payments beginning in August 2013 through August 2027. Annual interest rates are at 1% on $500,000 for five years, 2% on $500,000 for ten years, and 3% on $1,000,000 for 15 years on the various interfund loans. At December 31, 2020, principal amount outstanding to Landfill Operations totaled $108,115. During 2018, the City Council passed resolution 2018-19 to forgive the remaining interfund loan balance between the Fleet Fund and Downtown Development Authority, totaling $775,356.

Interest payments made by the Downtown Development Authority to Landfill Operations during 2020 totaled $8,617.

IV. Detailed Notes on All Funds (continued)

D. Interfund Receivables, Payables, and Transfers (continued)

The City had the following interfund receivables or payables as of December 31, 2020:

	Due from	Due to
General Fund	$ 204,957	$ -
Landfill Operations	259,264	-
Water Fund	-	10,586
Fire and Ambulance Fund	-	194,371
Downtown Development	-	259,264
	$ 464,221	$ 464,221

Transfers were as follows:

Fund	Funds Transferred In	Funds Transferred (Out)	Reason
General Fund	$ 389,381		Allocated organizational costs and
Water and Sewer Fund		$ (389,381)	franchise fees
General Fund	986,414		Allocated organizational costs and
Electric Fund		(986,414)	franchise fees
General Fund	1,540,000		Infrastructure needs
Acquisition and Improvement Fund		(1,540,000)	
General Fund	276,272		Funding allocation
Marijuana Tax Fund		(276,272)	
General Fund	750,000		Drug, alcohol, tobacco prevention
Tobacco Sales Tax Fund		(750,000)	and mental health
Fire and Ambulance Fund	2,485,460		Capital purchases
General Fund		(2,485,460)	
Acquisition and Improvement Fund	100,000		Capital purchases
General Fund		(100,000)	
Acquisition and Improvement Fund	168,000		Capital purchases
Downtown Development Authority		(100,000)	
Capital Projects Fund		(68,000)	
Capital Projects Fund	25,000		Capital purchases
Landfill Fund		(25,000)	
Capital Projects Fund	50,000		Capital purchases
Water and Sewer Fund		(50,000)	
Capital Projects Fund	25,000		Capital purchases
Electric Fund		(25,000)	
Emergency Service Equipment Replacement	370,635		Capital purchases
General Fund		(370,635)	
Fleet Fund	1,071,872		Capital purchases
Capital Projects		(841,500)	
Water and Sewer Fund		(50,000)	
Landfill Fund		(25,000)	
Electric System		(155,372)	
	$ 8,238,034	$ (8,238,034)	

IV. Detailed Notes on All Funds (continued)

E. Governmental Funds Long-term Debt

1. Revenue and General Obligation Bonds

(a) $2,085,000 Limited Tax General Obligation bonds dated February 1, 2012, with stated interest rate at 2.190%. This offering advance refunded the City's Limited Tax General Obligation Bonds, Series 2001. This issuance will be serviced by the City's General Fund. This issuance matures December 1, 2020. These bonds were fully repaid as of December 31, 2020.

(b) $3,070,000 Sales and Use Tax Bonds dated December 8, 2015, with stated interest rate at 2.280%. This offering will be used toward completion of construction projects related to (a) relocation of State Highway 82, (b) constructing the South Bridge project over the Roaring Fork River, or (c) constructing the 8th Street connection from Midland Avenue to downtown Glenwood Springs. The revenue derived from the City's Street Tax Fund's sales and use taxes are pledged for payment of bonds of this issue. The City's Street Tax Fund will service these bonds. This issuance matures December 1, 2026.

(c) $10,000,000 Sales and Use Tax Bonds dated December 5, 2018, with stated interest rate at 3.140%. This offering will be used toward completion of construction projects related to (a) improving safety and traffic congestion by constructing bridge and road improvements, (b) constructing a river walk and other infrastructure, or (c) constructing a "gateway to Glenwood" on the 6th street corridor. The revenue derived from the City's Acquisition and Improvements Fund sales and use taxes are pledged for payment of bonds of this issue. The City's Acquisition and Improvement Fund will service these bonds. This issuance matures December 1, 2033.

(d) $12,200,000 Sales and Use Tax Bonds dated January 11, 2019 with stated interest rate at 3.020%. This offering will be used toward completion of construction projects related to (a) replacing the 27th street bridge and building a roundabout, (b) constructing a pedestrian and utility bridge to the north, and (c) reconstruction and improvement of roads. The revenue derived from the City's Acquisition and Improvements Fund sales and use taxes are pledged for payment of bonds of this issue. The City's Acquisition and Improvement Fund will service these bonds. This issuance matures December 1, 2033.

IV. Detailed Notes on All Funds (continued)

E. Governmental Funds Long-term Debt (continued)

2. Compensated Absences

The City has a policy for the accumulation of sick pay, vacation pay and compensatory time up to certain limits. Earned vacation pay accrues on a graduated scale from the date of employment but may not exceed 52 days. Sick pay may be accumulated to a maximum of 120 days; upon retirement, an employee's accrued sick leave may be converted to monetary payment at their current rate of pay for 100% of the amount accrued. In lieu of accruing and receiving additional sick leave, an employee who has accrued 120 days will be compensated as follows; in money at current salary or hourly rate for half of the accrued days in excess of the 120 days or in vacation leave at a ratio of 1 day for every 2 days sick leave. In lieu of overtime compensation, an employee may bank compensatory time at the rate of 1½ hours for every hour worked up to a maximum of 40 hours.

3. Annual Debt Service Requirements

Annual debt service requirements to maturity for governmental activities are as follows:

Governmental Activities:	Principal	Interest	Total
2021	$ 1,615,000	$ 682,877	$ 2,297,877
2022	1,660,000	635,456	2,295,456
2023	1,705,000	586,689	2,291,689
2024	1,755,000	536,582	2,291,582
2025	1,805,000	484,978	2,289,978
2026 - 2030	8,550,000	1,639,905	10,189,905
2031 - 2033	5,580,000	346,462	5,926,462
	22,670,000	**4,912,949**	**27,582,949**

The City is compliant in ongoing disclosure requirements to the secondary bond market in accordance with the Securities and Exchange Commission's Rule 15c2-12.

IV. Detailed Notes on All Funds (continued)

F. Business-Type Long-term Debt

1. Revenue and General Obligation Refunding Bonds

(a) $31,460,100 Water and Sewer Revenue Bonds, Series 2010, issued by Colorado Water Resources and Power Development Authority ("CWRPDA") on behalf of the City's utility enterprise, per a loan agreement dated May 1, 2010. Repayment terms are through August, 2032. The City's annual interest is 2.5%. The proceeds are to be used to construct a regional wastewater plant, lift station and upgrades to the distribution system.

(b) $9,122,000 Electric Revenue Promissory Note, Series 2020, issued by the City's utility enterprise, per a loan agreement dated June 23, 2020. Repayment terms are through July 1, 2040. The City's annual interest rate is 1.99% through June 1, 2030. At July 1, 2030 the interest rate will reset to the 10-year U.S. Treasury Rate then in effect, plus 1.35% per annum. The loan is subject to a floor rate of 1.99% per annum. The proceeds are to be used to construct a broadband capital improvement project.

2. Annual Debt Service Requirements

The following is a summary of annual debt service requirements to maturity for business-type activities:

Bussiness-type Activities:	Principal	Interest	Total
2021	$ 1,382,050	$ 761,596	$ 2,143,646
2022	1,429,525	710,146	2,139,671
2023	1,707,596	656,406	2,364,002
2024	1,992,444	594,327	2,586,771
2025	2,043,830	543,667	2,587,497
2026 - 2030	11,033,455	1,902,708	12,936,163
2031 - 2035	6,492,162	569,472	7,061,634
2036 - 2040	2,758,888	130,015	2,888,903
	28,839,950	**5,868,337**	**34,708,287**

IV. Detailed Notes on All Funds (continued)

G. Changes in Long-Term Debt

Changes in long-term obligations for the year ended December 31, 2020 are as follows:

	Balance January 1, 2020	Additions	Reductions	Balance December 31, 2020	Due Within One Year
Governmental Activities:					
2012 Limited Tax General Obligation	$ 250,000	$ -	$ (250,000)	$ -	$ -
2015 Sales and Use Tax Bonds	2,040,000	-	(275,000)	1,765,000	280,000
2018 Sales and Use Tax Bonds	10,000,000	-	(580,000)	9,420,000	600,000
2019 Sales and Use Tax Bonds	12,200,000	-	(715,000)	11,485,000	735,000
Net pension liability	531,781	-	(25,454)	506,327	-
Compensated Absences	1,042,400	149,730	(193,929)	998,201	395,088
Business-type Activities:					
Water and Sewer Revenue Loan	21,047,250	-	(1,329,300)	19,717,950	1,382,050
Broadband Loan	-	9,122,000	-	9,122,000	-
Landfill closure and post closure	1,110,869	455,945	-	1,566,814	-
Compensated Absences	430,046	69,281	(37,452)	461,875	184,750
Total	$ 48,652,346	$ 9,796,956	$ (3,406,135)	$ 55,043,167	$ 3,576,888

H. Landfill Closure and Post-Closure Costs

State and federal laws and regulations require the City to perform certain closure and post-closure maintenance of the landfill site for thirty years after closure. In addition to operating expenses relating to current activities of the landfill, an expense provision and related liability are being recognized based on the amount of landfill used during the year. The estimated liability for landfill closure and postclosure care are based upon an estimate of the landfill used during the year. The estimated liability for landfill closure and postclosure costs is $1,237,069 and $664,006, respectively. As of December 31, 2020, the liability for closure and postclosure is $1,019,559 and $547,256, respectively. The December 31, 2020 liability is based upon the usage (filled) of the landfill and is shown in these financial statements as an accrued liability in the Landfill Fund. The landfill is an estimated 80% filled as of December 31, 2020. It is estimated that an additional $334,260 will be recognized as closure and postclosure care expenses between the date of the balance sheet and 2027, the date the landfill is expected to be filled to capacity.

The estimated total current cost of the landfill closure and postclosure cost, $1,566,814 is based upon the estimated amount that would be paid if all equipment, facilities, and services required to close, monitor, and maintain the landfill were acquired as of December 31, 2020. The actual costs of closure and postclosure may be higher due to inflation, changes in technology, or changes in landfill laws and regulations.

The City is required by state and federal laws and regulations to provide adequate financial resources to pay for all closure and postclosure care. The remaining portion of anticipated future inflation costs and additional costs that might arise from changes in postclosure requirements (due to changes in technology or more rigorous environmental regulations, for example) may need to be covered by charges to future landfill users, taxpayers, or both.

IV. Detailed Notes on All Funds (continued)

I. Advance Refunding

The City has advance refunded several general obligation and revenue bonds. Sufficient U.S. government, state and local government securities were placed in an irrevocable trust for the purpose of generating resources for all future debt service payments of the refunded debt. As a result, the refunded bonds are considered to be defeased and the liability has not been recorded on the financial statements. The amount of defeased bonds outstanding at December 31, 2020 cannot be readily determined.

J. Fund Balance Disclosures

The City classifies governmental fund balances as follows:

Non-spendable – includes fund balance amounts inherently non-spendable since they represent inventories, prepaid items, and long-term portions of loans receivable.

Spendable Fund Balance:

Restricted - includes fund balance amounts that are constrained for specific purposes which are externally imposed by providers, such as creditors, or amounts constrained due to constitutional provisions or enabling legislation.

Committed - includes fund balance amounts that are constrained for specific purposes that are internally imposed by the government through formal action of the highest level of decision making authority, which is the City Council. The City's original budget legislation begins with combining historical data, assessment of needs for the upcoming year and the City's platform to review and/or make changes to each department's budget. The budget is formally presented to the City Council via an advertised public process for the review, revisions and final approval by year-end. All subsequent budget requests made during the year, after City Council approval, must be presented via a public process and again approved by the City Council. The City must take formal action through resolution to establish, modify, or rescind committed fund balance amounts.

Assigned – includes spendable fund balance amounts that are intended to be used for specific purposes that are neither considered restricted or committed. Fund balance may be assigned by the City Council or its management designees. The City Manager has the authority to establish, modify, or rescind assigned fund balance to a specific department or project within a fund, as stated in the City's adopted financial policies.

Unassigned – includes residual positive fund balance within the General Fund, which has not been classified within the other above mentioned categories. Unassigned fund balance may also include negative balances for any governmental fund if expenditures exceed amounts restricted, committed, or assigned for those specific purposes.

IV. Detailed Notes on All Funds (continued)

J. Fund Balance Disclosures (continued)

The City's restricted amounts are to be spent first when both restricted and unrestricted fund balance is available unless there are legal documents or contracts that prohibit this, such as grant agreements that require dollar for dollar spending. Additionally, the City would first use committed, then assigned, and lastly unassigned amounts when expenditures are made.

The City has the following fund balance classifications at December 31, 2020:

	General Fund	Fire and Ambulance Fund	Downtown Development Authority	Street Tax Fund	Capital Projects Fund	Acquisition and Improvement	Non-major Governmental Funds
Nonspendable:							
Prepaids	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,411
Housing Program Debenture	562,101	-	-	-	-	-	-
Total Nonspendable:	562,101	-	-	-	-	-	3,411
Restricted:							
Tabor Emergencies	1,000,000	-	-	-	-	-	-
Asset Forfeiture Accounts	69,965	-	-	-	-	-	-
Conservation Trust	-	-	-	-	-	-	341,005
Bond Reserve	-	-	-	-	-	2,076,314	-
Capital projects	-	-	-	-	-	2,121,029	-
Total Restricted:	1,069,965	-	-	-	-	4,197,343	341,005
Committed:							
Road & Housing Fees	184,366	-	-	-	-	-	-
Tourism Fund Reserves	-	-	-	-	-	-	159,718
Tourism Fund	-	-	-	-	-	-	55,460
V.A.L.E. Fund	-	-	-	-	-	-	32,660
Bus Tax Fund	-	-	-	-	-	-	1,090,480
Marijuana Sales Tax Fund	-	-	-	-	-	-	308,627
Tobacco Sales Tax Fund	-	-	-	-	-	-	205,024
Street Tax Fund	-	-	-	1,502,472	-	-	-
Other Capital Projects	-	-	1,030,514	274,531	951,067	-	132,351
Contingency Reserve	1,721,652	-	-	-	-	-	-
Total Committed:	1,906,018	-	1,030,514	1,777,003	951,067	-	1,984,320
Assigned:							
Other Capital Projects	-	-	-	-	-	9,933,186	-
Theater Project	-	-	-	-	-	696,687	-
Capital Projects Fund	-	-	-	-	2,159,738	-	2,161,702
Total Assigned:	-	-	-	-	2,159,738	10,629,873	2,161,702
Unassigned:	6,199,845	-	-	-	-	-	-

V. Other Information

A. Pension Plans

All City employees, except police and fire, participate in the Federal Social Security system for which the City has no liability except for amounts withheld and related statutory matching amounts. In addition, the City has established two contributory pension plans.

1. Contributory Pension Plan (IRS Section 401(k))

All full-time employees of the City are eligible to participate in the plan. Eligibility is after six months of employment with enrollment dates of the first day of each month. An employee must have six months of employment at the enrollment date. The City contributes 4% of the base pay of all eligible City employees. In addition, all eligible employees may contribute, for which the City will match up to an additional 3%. Employee contributions are fully vested and City contributions become fully vested after five years. The non-vested contributions that are forfeited are allocated to the remaining plan participants. Forfeitures during 2020 totaled $31,814. The City has no liability under the plan beyond the requirement to make the aforementioned contributions. The plan is administered by Newport Group. Total payroll for the year was $13,018,906 and current year payroll for employees covered under the plan was $12,127,314. The City's contributions were $559,438.

2. Contributory Pension Plan (IRS Section 401(a))

All City police and fire employees are eligible to participate in this plan, in lieu of Social Security benefits. Eligibility is at the date of employment. The employee and the City contribute 7 1/2% of compensation to this plan. Employee contributions are fully vested, and the City's contributions become fully vested after five years. If the employee does not become eligible for the benefits, the forfeitures are divided among the plan participants. Forfeitures during 2020 totaled $21,770. The City has no liability under the plan beyond the requirement to make the aforementioned contributions. The plan is administered by Newport Group. Total payroll for the year was $13,018,906 and current year payroll for employees covered under the plan was $4,200,890. The City's contributions were $315,067.

V. Other Information (continued)

B. Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

1. Volunteer Firemen's Pension Fund

Plan Description: The City is trustee of an agent multiple-employer defined benefit pension plan available to provide retirement income for volunteer firefighters in recognition of their service to the City. FPPA administers an agent multiple-employer Public Employee Retirement System ("PERS"). The PERS represents the assets of numerous separate plans that have been pooled for investment purposes. The pension plans have elected to affiliate with FPPA for plan administration and investment only. FPPA issues a publicly available comprehensive annual financial report that can be obtained at http://fppaco.org/annual-reports.html.

Benefits: The plan provides normal retirement benefits. The following benefit provisions were used to determine the City's pension liability at December 31, 2020:

Normal retirement benefit at age 50 with 20 year of service (monthly):		
Regular	$	550.00
Vested retirement benefit:		
With 10 to 20 years of service amount per year of service per minimum vesting years	$	27.50
Minimum vesting years		10
Disability retirement benefit (monthly):		
Short term disability for line of duty injury amount payable for not more than 1 year	$	-
Long term disability for line of duty injury lifetime benefit	$	-
Survivor benefits (monthly):		
Following death before retirement eligible: due to death in line of duty as volunteer firefighter	$	-
Following death after normal retirement	$	-
Following death after vested retirement with 10 to 20 years of service amount per year of service per minimum vesting rights	$	-
Following death after disability retirement	$	-
Funeral benefits (required benefit):		
Funeral benefit lump sum, one time only	$	1,000.00

As of January 1, 2020, the latest actuarial valuation date, there were 1 active, 23 retirees and beneficiaries and 1 inactive members.

Contributions: The funding of the plan by the City and members is authorized by the Board of Trustees. The contribution by the State of Colorado (the "State") toward fire pension funds has been a fixed dollar amount established by the legislature and allocated pro rata to all fire pension funds in the State who apply for State matching funds, based upon the amounts contributed by the employer up to a maximum of one half (1/2) mill on the assessed valuation or 90% of City contributions, whichever is less. Since the City currently offers maximum retirement benefits in excess of $500 per month, the State will match at the level determined above but no greater than the maximum of: (1) the amount necessary to fund a pension of $300 per month on an actuarially sound basis, and (2) the amount of State contributions provided in the prior year.

V. Other Information (continued)

B. Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions (continued)

1. Volunteer Firemen's Pension Fund (continued)

Net Pension (Asset) Liability: At December 31, 2020, the volunteer pension fund reported a net pension liability of $506,327 compared to a net pension liability of $531,781 at December 31, 2019. The net pension liability was measured as of December 31, 2019, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of January 1, 2020.

Actuarial Assumptions: Actuarially determined contribution rates are calculated as of January 1 of odd numbered years. The contribution rates have a one-year lag, so the actuarial valuation as of January 1, 2015 determines the contribution amounts for 2016 and 2017. The methods and assumptions used to determine contribution rates for the fiscal year ending December 31, 2019 were:

Actuarial method	Entry Age Normal
Amortization method	Level Dollar, Open
Remaining amortization period	20 years
Asset valuation method	5-Year smother fair value
Includes inflation at	2.50%
Salary increases	N/A
Investment rate of return	7.50%
Retirement age	50% per year of eligibility until 100% at age 65
Mortality	**Pre-retirement:** RP-2014 Mortality for Blue Collar employees projected with Scale BB, 55% multiplier for off duty mortality. **Post-retirement:** For ages less than 55, RP-2014 Mortality Table for Blue Collar. For ages 65 and older, RP-2014 Mortalisty Tables for Blue Collar Health Annuitants. For ages 55 through 64, a blend of the previous tables, all Scale BB.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighing the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

V. Other Information (continued)

B. Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions (continued)

1. Volunteer Firemen's Pension Fund (continued)

Best estimates of arithmetic real rates of return which eliminates the 2.5% inflation assumption, for each major asset class included in the Fund's target asset allocation as of December 31, 2020, are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Cash	2.00%	2.52%
Fixed Income	15.00%	5.20%
Managed Futures	4.00%	5.00%
Absolute Return	8.00%	5.50%
Equity Long/Short	8.00%	6.00%
Global Equity	38.00%	7.00%
Private Markets	25.00%	9.20%
Total	100.00%	

Discount Rate: Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) the long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits), and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits).

For purposes of this valuation, the expected rate of return on pension plan investments is 7.5%; the municipal bond rate is 3.31% (based on the weekly rate closest to but not later than the measurement date of the "state & local bonds" rate from the Federal Reserve statistical release (H.15)); and the resulting Single Discount Rate is 7.5%

Sensitivity of the net pension (asset)/liability to changes in the Single Discount Rate: The following represent the plan's net pension (asset)/liability, calculated using a Single Discount Rate of 7.00%, as well as what the plan's net pension (asset)/liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

	1% Decrease 6.00%	Current Single Discount Rate Assumption 7.00%	1% Increase 8.00%
Proportionate share of net pension (asset) liability	$ 593,302	$ 506,327	$ 430,893

V. Other Information (continued)

B. Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions (continued)

1. Volunteer Firemen's Pension Fund (continued)

Pension Plan Fiduciary Net Position: Detailed information about the Plan's fiduciary net position is available in FPPA's comprehensive annual financial report which can be obtained at http://fppaco.org/annual-reports.html.

Pension Expense, Deferred Outflows of Resources, and Deferred Inflows of Resources Related to Pensions: In connection with the City's Volunteer Fire and Police Protection Retirement Plan, for the year ended December 31, 2020, the City recognized pension expense of $13,327 and the City reported deferred outflow of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Net difference between projected and actual earnings on pension plan investments	$ -	$ 17,165
Contributions subsequent to measurement date	34,643	-
	$ 34,643	$ 17,165

Contributions subsequent to the measurement date of December 31, 2019, which are reported as deferred outflows of resources related to pensions, will be recognized as a reduction of the net pension liability in subsequent years. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Year Ended December 31,	Amortization
2021	$ (3,712)
2022	(6,845)
2023	1,264
2024	(7,872)
	$ (17,165)

V. Other Information (continued)

B. Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions (continued)

1. Volunteer Firemen's Pension Fund (continued)

The pension plan had the following activity for the year ended December 31, 2020:

Total Pension Liability		
Service Cost	$	1,070
Interest on the Total Pension Liability		74,746
Benefit Payments		(112,970)
Net Change in Total Pension Liability		(37,154)
Total Pension Liability - Beginning		1,122,804
Total Pension Liability - Ending (a)	$	1,085,650
Plan Fiduciary Net Position		
Employer Contributions	$	30,000
Pension Plan Net Investment Income		77,661
Benefit Payments		(112,970)
Pension Plan Administrative Expense		(6,391)
Net Change in Plan Fiduciary Net Position		(11,700)
Plan Fiduciary Net Position - Beginning		591,023
Plan Fiduciary Net Position - Ending (b)	$	579,323
Net Pension Liability - Ending (a) - (b)	$	506,327
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		53.36%

C. Post-Employment Health Care Benefits

All City employees covered by COBRA insurance may continue their health insurance due to a reduction in work hours or termination of employment (for reasons other than "gross misconduct") for up to 18 months after the occurrence of one of these events. Eligible dependents may continue coverage for up to 36 months. Employees who elect continued coverage must pay the City for premiums from the termination date of coverage and monthly thereafter. The employee pays the total premiums for any elections. No cost to the City is recognized as employees reimburse 100% of their premium cost.

V. Other Information (continued)

D. Cafeteria Plan

The City offers a cafeteria plan organized under IRS Sections 125 and 129. It allows employees to pay premiums for some insurances tax free, contribute to medical spending accounts and contribute to dependent care spending accounts. No cost to the City is recognized as the plan is a salary reduction plan.

E. Grants

Amounts received or receivable from grantor agencies are subject to audit and adjustment by grantor agencies, principally the federal government. Any disallowed claims, including amounts already collected, may constitute a liability of the applicable funds. The amount, if any, of expenditures which may be disallowed by the grantor cannot be determined at this time although the government expects such amounts, if any, to be immaterial.

F. Claims

The City is a defendant in various lawsuits. Although the outcome of these lawsuits is not presently determinable, it is the opinion of the City attorney the resolution of these matters will not have a material adverse effect on the financial condition of the government.

G. Risk Management

1. Colorado Intergovernmental Risk Sharing Agency

The City is also exposed to the risks of loss related to torts; theft of, damage to, and destruction of assets; and errors and omissions. To address such risks, the City is a participant in a public entity risk pool administered by Colorado Intergovernmental Risk Sharing Agency (“CIRSA”).

CIRSA’s operations are funded by contributions from member governments. Coverage is provided in the amount of $250,000 per claim or occurrence for property, $1,000,000 per claim or occurrence for liability, and $150,000 per claim or occurrence for crime. CIRSA has also acquired additional excess coverage from outside sources. While the City may be liable for any losses in excess of this coverage, the City does not anticipate such losses at December 31, 2020.

Surpluses or deficits realized by CIRSA for any given year are subject to change for such reasons as interest earnings on invested amounts for those years and funds, re-estimation of losses for those years and funds, and credits or distributions from surplus for those years and funds.

A copy of CIRSA’s audit report can be obtained by writing to CIRSA, 3665 Cherry Creek North Drive, Denver, CO 80209, or by calling (800)-228-7136.

V. Other Information (continued)

H. Authorized Unissued Debt

In November 2016, electors of the City approved the issuance of up to $54,000,000 in bonds to finance the costs of capital projects. After the issuances of the 2019 sales and use tax revenue bonds, the City has authorized unissued debt totaling $31,800,000 at December 31, 2020.

I. Restatement of Net Position

The beginning net position for governmental activities has been increased by a total of $1,068,707 to reflect capital expenditures not capitalized in previous years.

VI. Subsequent Event

$8,080,000 Intergovernmental Loan was issued by the Colorado Water Conservation Board ("CWCB") on behalf of the City's utility enterprise, per a loan agreement dated June 17, 2021. Repayment terms are through June, 2051. The City's annual interest rate is 0.00% through June, 2024. Starting in July, 2024 the interest rate will be 1.80%, per annum. The proceeds are to be used to upgrade the City's Water Treatment Plant.

REQUIRED SUPPLEMENTARY INFORMATION

General Fund - This fund is established to account for resources devoted to financing the general services that the City performs for its citizens. General tax revenues and other sources of revenue used to finance the fundamental operations of the City are included in this fund. The fund is charged with all costs of operating the government for which a separate fund has not been established.

MAJOR SPECIAL REVENUE FUNDS

Fire & Ambulance Fund - accounts for fire and ambulance services performed by the City and Rural Fire District.

Downtown Development Authority - A blended component unit, was established by a vote of the citizens in 2001 for the purpose of revitalizing the downtown corridor and building a parking structure.

Street Tax Fund - accounts for revenues received from the 0.50% sales tax levied for transportation and related projects.

City of Glenwood Springs, Colorado
General Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
Property taxes	2,130,967	2,130,967	2,159,481	28,514	1,932,670
Specific ownership	113,000	113,000	144,014	31,014	144,818
Special assessment	40,000	40,000	36,108	(3,892)	36,691
General sales tax	7,665,003	7,665,003	8,662,187	997,184	7,629,412
Use tax	350,000	350,000	305,342	(44,658)	473,981
Franchise tax	210,000	210,000	165,025	(44,975)	178,566
Total Taxes	10,508,970	10,508,970	11,472,157	963,187	10,396,138
Permits and Licenses:					
Contractors licenses	22,500	22,500	20,862	(1,638)	28,815
Liquor licenses	70,000	70,000	69,585	(415)	44,490
Dog licenses	-	-	45	45	105
Building permits	137,000	137,000	194,333	57,333	249,772
Sales tax license	75,000	75,000	43,800	(31,200)	96,900
Total Permits and Licenses	304,500	304,500	328,625	24,125	420,082
Intergovernmental:					
Cigarette tax	80,000	80,000	72,235	(7,765)	58,274
County sales tax	365,000	365,000	370,161	5,161	332,227
Highway use tax	525,000	525,000	265,031	(259,969)	359,020
Severance tax	90,000	90,000	79,312	(10,688)	162,497
Grants	460,000	1,223,500	995,779	(227,721)	342,656
Total Intergovernmental	1,520,000	2,283,500	1,782,518	(500,982)	1,254,674
Charges and Fees:					
Plan check and record fee	120,000	120,000	126,436	6,436	134,453
Cemetery fees	10,000	10,000	8,119	(1,881)	13,843
Police fines and court fees	256,000	256,000	71,741	(184,259)	155,250
Parking fees and fines	65,000	65,000	20,468	(44,532)	31,493
Impoundment fees	2,500	2,500	1,410	(1,090)	2,250
Recreation fees	1,607,500	1,607,500	467,522	(1,139,978)	1,346,646
Park and rafting fees	105,000	105,000	97,742	(7,258)	38,770
Downtown trash fees	-	-	28,616	28,616	8,194
Art fees	25,000	25,000	7,393	(17,607)	23,978
Total Charges and Fees	2,191,000	2,191,000	829,447	(1,361,553)	1,754,877
Other Revenues:					
Contributions	-	-	-	-	7,663
Interest	77,000	77,000	153,345	76,345	152,643
Police confiscated assets	-	-	300	300	743
Miscellaneous	152,000	152,000	119,396	(32,604)	96,159
Other lease revenue	309,000	309,000	118,494	(190,506)	376,492
Overhead reimbursement	2,576,852	2,576,852	2,574,827	(2,025)	2,501,801
Other reimbursements	65,500	65,500	73,693	8,193	176,103
Total Other Revenues	3,180,352	3,180,352	3,040,055	(140,297)	3,311,604
Total Revenues	17,704,822	18,468,322	17,452,802	(1,015,520)	17,137,375

(continued)

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
General Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)
(Continued)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Expenditures:					
General Government:					
Administration	715,049	664,130	652,459	11,671	841,459
Personnel/purchasing	363,456	363,456	321,181	42,275	294,379
City Clerk and elections	466,902	466,902	416,064	50,838	440,394
Finance	1,049,213	1,049,213	978,850	70,363	959,992
Information technology	762,577	813,496	804,115	9,381	794,547
Judicial	207,928	266,628	217,138	49,490	170,240
Legal	325,000	407,680	382,220	25,460	520,149
Legislative	140,548	140,548	90,282	50,266	-
Non-departmental	878,386	2,028,022	1,759,318	268,704	984,363
Total General Government	4,909,059	6,200,075	5,621,627	578,448	5,005,523
Public Safety:					
Police department	4,502,723	4,502,723	3,450,251	1,052,472	3,970,884
Total Public Safety	4,502,723	4,502,723	3,450,251	1,052,472	3,970,884
Community Development:					
Administration/planning	752,825	752,825	528,664	224,161	709,117
Building inspector	321,924	321,924	257,925	63,999	260,411
Total Community Development	1,074,749	1,074,749	786,589	288,160	969,528
Public Works:					
Administration/engineering	731,533	731,533	538,731	192,802	602,755
Facilities	185,145	185,145	195,570	(10,425)	170,566
Streets, alleys, snow removal	1,213,865	1,213,865	998,302	215,563	1,137,378
Total Public Works	2,130,543	2,130,543	1,732,603	397,940	1,910,699
Culture and Recreation:					
Recreation	2,680,844	2,680,844	1,777,736	903,108	2,397,948
Arts programs	442,482	442,482	233,945	208,537	355,435
Parks and cemetery	1,617,571	1,617,571	1,323,510	294,061	1,217,776
Total Culture and Recreation	4,740,897	4,740,897	3,335,191	1,405,706	3,971,159
Debt Service:					
Principal	250,000	250,000	250,000	-	240,000
Total Debt Service	250,000	250,000	250,000	-	240,000
Total Expenditures	17,607,971	18,898,987	15,176,261	3,722,726	16,067,793
Excess (Deficiency) of Revenues Over Expenditures	96,851	(430,665)	2,276,541	2,707,206	1,069,582
Other Financing Sources (Uses):					
Transfers in	3,372,064	4,098,336	3,942,067	(156,269)	2,731,664
Transfers (out)	(3,428,043)	(3,428,043)	(2,956,095)	471,948	(5,060,842)
Total Other Financing Sources (Uses)	(55,979)	670,293	985,972	315,679	(2,329,178)
Net Change in Fund Balance	40,872	239,628	3,262,513	3,022,885	(1,259,596)
Fund Balance - Beginning of Year	7,836,129	7,836,129	6,475,416	(1,360,713)	7,735,012
Fund Balance - End of Year	7,877,001	8,075,757	9,737,929	1,662,172	6,475,416

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Fire and Ambulance Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Intergovernmental:					
Grants and awards	-	-	202,782	202,782	57,627
Charges for Services:					
Permits	15,000	15,000	9,450	(5,550)	16,065
Ambulance fees	1,579,441	1,579,441	1,409,754	(169,687)	1,242,045
Other:					
Interest income	-	-	-	-	(760)
Total Revenues	1,594,441	1,594,441	1,621,986	27,545	1,314,977
Expenditures:					
Public Safety:					
Emergency services	4,157,567	4,157,567	4,107,446	50,121	4,261,186
Total Expenditures	4,157,567	4,157,567	4,107,446	50,121	4,261,186
Excess (Deficiency) of Revenues Over Expenditures	(2,563,126)	(2,563,126)	(2,485,460)	77,666	(2,946,209)
Other Financing Sources (Uses):					
Transfer in	2,563,126	2,801,943	2,485,460	(316,483)	2,946,209
Total Other Financing Sources (Uses)	2,563,126	2,801,943	2,485,460	(316,483)	2,946,209
Net Change in Fund Balance	-	238,817	-	(238,817)	-
Fund Balance - Beginning of Year	-	-	-	-	-
Fund Balance - End of Year	-	238,817	-	(238,817)	-

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Downtown Development Authority
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (Non-GAAP Basis) and Actual With Reconciliation to GAAP Basis
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
Property taxes	80,292	80,292	98,261	17,969	116,126
Sales taxes	628,708	628,708	820,851	192,143	766,538
Other:					
Interest income	15,000	15,000	8,634	(6,366)	26,138
Miscellaneous	-	-	3,050	3,050	4,000
Total Revenues	724,000	724,000	930,796	206,796	912,802
Expenditures:					
General Government:					
Capital outlay	423,000	423,000	48,935	374,065	444,225
Salaries	1,350	1,350	813	537	-
Other	186,609	342,609	305,329	37,280	115,065
Debt service:					
Interest	12,750	12,750	8,617	4,133	10,584
Total Expenditures	623,709	779,709	363,694	416,015	569,874
Excess (Deficiency) of Revenues Over Expenditures	100,291	(55,709)	567,102	622,811	342,928
Other Financing Sources (Uses):					
Transfer (out)	(100,000)	(100,000)	(190,180)	(90,180)	(82,547)
Total Other Financing Sources (Uses)	(100,000)	(100,000)	(190,180)	(90,180)	(82,547)
Net Change in Fund Balance - Budget Basis	291	(155,709)	376,922	532,631	260,381
Reconciliation to GAAP Basis:					
Adjustments:					
Interfund loan repayments and loan forgiveness			90,180		82,547
Net Income - GAAP Basis			467,102		342,928
Fund Balance - Beginning of Year			563,412		220,484
Fund Balance - End of Year			1,030,514		563,412

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Street Tax Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
General sales tax	2,554,970	2,554,970	2,420,711	(134,259)	2,543,106
Use tax	120,000	120,000	91,018	(28,982)	157,992
Other:					
Miscellaneous income	251,000	251,000	248,276	(2,724)	33,386
Interest income	28,000	28,000	25,760	(2,240)	75,480
Total Revenues	2,953,970	2,953,970	2,785,765	(168,205)	2,809,964
Expenditures:					
Transportation:					
Transit program	3,332,500	3,554,122	2,718,173	835,949	1,248,414
Other expenses	392,301	417,725	423,507	(5,782)	401,108
Total Transportation	3,724,801	3,971,847	3,141,680	830,167	1,649,522
Debt Service:					
Principal payment	255,000	255,000	275,000	(20,000)	265,000
Interest payment	64,296	64,296	46,512	17,784	52,554
Total Expenditures	4,044,097	4,291,143	3,463,192	827,951	1,967,076
Excess (Deficiency) of Revenues Over Expenditures	(1,090,127)	(1,337,173)	(677,427)	659,746	842,888
Other Financing Sources (Uses):					
Transfers (out)	-	-	-	-	(74,000)
Total Other Financing Sources (Uses)	-	-	-	-	(74,000)
Net Change in Fund Balance	(1,090,127)	(1,337,173)	(677,427)	659,746	768,888
Fund Balance - Beginning of Year	1,513,196	1,513,196	2,454,430	941,234	1,685,542
Fund Balance - End of Year	423,069	176,023	1,777,003	1,600,980	2,454,430

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs
Schedule of City's Net Pension Liability
Fire and Police Pension Association of Colorado
Last 10 Fiscal Years *

	2019	2018	2017	2016	2015	2014
Total Pension Liability						
Service Cost	$ 1,070	$ 1,097	$ 1,097	$ 1,995	$ 1,995	$ 3,072
Interest on the Total Pension Liability	74,746	77,283	79,620	72,956	75,406	81,959
Benefit Changes	-	-	-	-	-	47,785
Difference between Expected and Actual Experience	-	34,308	-	82,914	-	(110,697)
Assumption Changes	-	37,157	-	42,460	-	-
Benefit Payments	(112,970)	(111,870)	(111,870)	(110,220)	(109,923)	(108,045)
Net Change in Total Pension Liability	(37,154)	37,975	(31,153)	90,105	(32,522)	(85,926)
Total Pension Liability - Beginning	1,122,804	1,084,829	1,115,982	1,025,877	1,058,399	1,144,325
Total Pension Liability - Ending (a)	$ 1,085,650	$ 1,122,804	$ 1,084,829	$ 1,115,982	$ 1,025,878	$ 1,058,399
Plan Fiduciary Net Position						
City Contributions	$ 30,000	$ 30,000	$ 30,000	$ 33,105	$ 24,749	$ 24,749
Pension Plan Net Investment Income	77,661	1,183	86,174	32,396	13,061	47,208
Benefit Payments	(112,970)	(111,870)	(111,870)	(110,220)	(109,923)	(108,045)
Pension Plan Administrative Expense	(6,391)	(6,023)	(7,200)	(1,257)	(3,268)	(1,335)
State of Colorado supplemental discretionary payment	-	18,900	18,900	18,900	18,900	18,900
Net Change in Plan Fiduciary Net Position	(11,700)	(67,810)	16,004	(27,076)	(56,481)	(18,523)
Plan Fiduciary Net Position - Beginning	591,023	658,833	642,829	669,905	726,385	744,908
Plan Fiduciary Net Position - Ending (b)	$ 579,323	$ 591,023	$ 658,833	$ 642,829	$ 669,905	$ 726,385
Net Pension Liability - Ending (a) - (b)	$ 506,327	$ 531,781	$ 425,996	$ 473,153	$ 355,973	$ 332,014
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	53.36%	52.64%	60.73%	57.60%	65.30%	68.63%

***** The amounts presented for each fiscal year were determined as of the calendar year-end that occurred one year prior. Information is only available beginning in fiscal year 2014.

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs
Schedule of City Contributions
Fire and Police Pension Association of Colorado
Last 10 Fiscal Years *

	2020	2019	2018	2017	2016	2015	2014
Actuarially determined contribution	$ 53,543	$ 44,500	$ 33,105	$ 33,105	$ 43,649	$ 43,649	$ 43,649
Actual contribution, including State of Colorado discretionary payment	(53,543)	(48,900)	(48,900)	(52,005)	(43,649)	(43,649)	(43,649)
Contribution deficiency (excess)	$ -	$ (4,400)	$ (15,795)	$ (18,900)	$ -	$ -	$ -

***** The amounts presented for each fiscal year were determined as of the calendar year-end.
Information is only available beginning in fiscal year 2014.

The accompanying notes are an integral part of these financial statements.

I. Schedule of City's Proportionate Share of the Net Pension Liability/(Asset) – Volunteer Pension Fund

A. Changes of assumptions or other inputs

The assumptions shown in 2020 pertain to the actuarial valuation as of January 1, 2017 and the associated Actuarially Determined Contribution for the year ending December 31, 2018. Following an experience study in 2018, the Board adopted a new assumption set for first use in the January 1, 2019 valuations.

The primary changes, which can be observed in the January 1, 2019 valuation, as compared to the assumptions shown are as follows:

Investment Rate of Return	7.00%
Mortality	**Pre-retirement:** 2006 central rates from the RP-2014 Employee Mortality Tables for males and females projected to 2018 using the MP-2017 projection scales, and then projected prospectively using the ultimate rates of the scale for all years, 50% multiplier for off-duty mortality. **Post-retirement:** 2006 central rates from the RP-2014 Annuitant Mortality Tables for males and females projected to 2018 using the MP-2017 projection scales, and then projected prospectively using the ultimate rates of the scale for all years. **Disabled:** 2006 central rates from the RP-2014 Employee Mortality Tables for males and females projected to 2018 using the MP-2017 projection scales, and then projected prospectively using the ultimate rates of the scale for all years.

Following an experience study in 2015, the Board adopted a new assumption set for first use in the January 1, 2016 valuations.

The primary changes, which can be observed in the January 1, 2016 through December 31, 2018 valuation, are as follows:

Inflation	2.50%
Mortality	**Pre-retirement:** RP-2014 Mortality Tables for Blue Collar Employees, projected with Scale BB, 55% multiplier for off-duty mortality. Increased by 0.00020 for on-duty related Fire and Police experience. **Post-retirement:** For ages less than 55, RP-2014 Mortality Tables for Blue Collar Employees. For ages 65 and older, RP-2014 Mortality Tables for Blue Collar Healthy Annuitants. For ages 55 through 64, a blend of the previous tables. All tables are projected with Scale BB. **Disabled:** RP-2014 Disabled Generational Mortality Table generationally projected with Scale BB with a minimum 3% rate for males and 2% rate for females.

I. Schedule of City's Proportionate Share of the Net Pension Liability/(Asset) – Volunteer Pension Fund (continued)

B. Changes of benefit terms

No changes during the years presented.

C. Changes of size or composition of population covered by benefit terms

No changes during the years presented.

II. Notes to the Schedule of City's Contributions – Volunteer Pension Fund

A. Changes to assumptions or other inputs

The primary changes, which can be observed in the January 1, 2019 valuation, as compared to the inflation rate from 3.00% to 2.50%.

B. Changes of benefit terms.

No changes during the years presented.

C. Changes of size or composition of population covered by benefit terms.

No changes during the years presented.

SUPPLEMENTARY INFORMATION

MAJOR CAPITAL PROJECT FUNDS

Capital Projects Fund - accounts for major City Projects which are financed by a 0.50% sales tax.

Acquisitions and Improvements Fund - accounts for revenues and expenditures received from a 1.00% sales tax and special assessments levied for capital improvements purposes.

City of Glenwood Springs, Colorado
Capital Projects Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
Sales tax	2,554,970	926,370	1,020,746	94,376	2,543,106
Use tax	120,000	120,000	58,734	(61,266)	157,992
Total Taxes	2,674,970	1,046,370	1,079,480	33,110	2,701,098
Intergovernmental:					
Grants	-	-	-	-	30,000
Fees and Charges:					
Park land fees	-	-	24,777	24,777	34,649
Other:					
Interest income	37,000	37,000	47,871	10,871	87,886
Other income	6,000	6,000	38,351	32,351	20,181
Total Other	43,000	43,000	86,222	43,222	108,067
Total Revenues	2,717,970	1,089,370	1,190,479	101,109	2,873,814
Expenditures:					
General government	1,353,500	1,537,900	825,440	712,460	651,180
Public works	982,834	1,704,690	1,280,351	424,339	4,402,502
Culture and recreation	264,000	395,000	126,787	268,213	646,146
Total Expenditures	2,600,334	3,637,590	2,232,578	1,405,012	5,699,828
Excess (Deficiency) of Revenues Over Expenditures	117,636	(2,548,220)	(1,042,099)	1,506,121	(2,826,014)
Other Financing Sources (Uses):					
Transfers in	100,000	100,000	100,000	-	3,720,336
Transfers (out)	(789,500)	(789,500)	(909,500)	(120,000)	(847,000)
Total Other Financing Sources (Uses)	(689,500)	(689,500)	(809,500)	(120,000)	2,873,336
Net Change in Fund Balance	(571,864)	(3,237,720)	(1,851,599)	1,386,121	47,322
Fund Balance - Beginning of Year	4,243,598	4,243,598	4,962,404	718,806	4,915,082
Fund Balance - End of Year	3,671,734	1,005,878	3,110,805	2,104,927	4,962,404

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Acquisition and Improvement fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
Sales tax	5,109,938	5,109,938	4,841,422	(268,516)	5,086,212
Use tax	240,000	240,000	182,036	(57,964)	315,983
Total Taxes	5,349,938	5,349,938	5,023,458	(326,480)	5,402,195
Intergovernmental:					
Grants	595,000	695,000	2,400,384	1,705,384	3,787,147
Other:					
Interest income	145,000	145,000	200,578	55,578	505,990
Donations	-	-	60,700	60,700	3,410
Cost reimbursement	-	-	3,632	3,632	850,000
Other income	25,000	25,000	64,150	39,150	35,560
Total Other	170,000	170,000	329,060	159,060	1,394,960
Total Revenues	6,114,938	6,214,938	7,752,902	1,537,964	10,584,302
Expenditures:					
General Government:					
General and administrative	711,767	718,524	705,136	13,388	660,158
Bond fees	1,000	1,000	1,600	(600)	1,200
Total General Government	712,767	719,524	706,736	12,788	661,358
Culture and Recreation:					
Arts Center	250,000	2,632,331	2,624,225	8,106	1,164,576
Other projects	-	-	10,705	(10,705)	90,846
Total Culture and Recreation	250,000	2,632,331	2,634,930	(2,599)	1,255,422
Public Works:					
Streets and sidewalks	8,603,000	3,371,456	4,573,188	(1,201,732)	14,871,397
Other projects	169,922	220,769	221,851	(1,082)	207,172
Total Public Works	8,772,922	3,592,225	4,795,039	(1,202,814)	15,078,569
Debt Service:					
Principal	175,000	175,000	1,295,000	(1,120,000)	-
Interest	1,775,000	1,775,000	682,440	1,092,560	638,013
Debt issuance costs	-	-	-	-	94,317
Total Debt Service	1,950,000	1,950,000	1,977,440	(27,440)	732,330
Total Expenditures	11,685,689	8,894,080	10,114,145	(1,220,065)	17,727,679
Excess (Deficiency) of Revenues Over Expenditures	(5,570,751)	(2,679,142)	(2,361,243)	317,899	(7,143,377)
Other Financing Sources (Uses):					
Sale of assets	1,260,000	1,260,000	1,206,813	(53,187)	-
Issuance of debt	-	-	-	-	12,200,000
Transfers in	168,000	168,000	268,000	100,000	989,000
Transfers (out)	(1,540,000)	(1,540,000)	(1,540,000)	-	(3,145,223)
Total Other Financing Sources (Uses)	(112,000)	(112,000)	(65,187)	46,813	10,043,777
Net Change in Fund Balance	(5,682,751)	(2,791,142)	(2,426,430)	364,712	2,900,400
Fund Balance - Beginning of Year	16,337,807	16,337,807	17,253,646	915,839	14,353,246
Fund Balance - End of Year	10,655,056	13,546,665	14,827,216	1,280,551	17,253,646

The accompanying notes are an integral part of these financial statements.

NON-MAJOR GOVERNMENTAL FUNDS

SPECIAL REVENUE FUNDS

Special revenue funds are used to account for specific revenues that are legally restricted to expenditure for particular purposes.

Tourism Fund - accounts for funds received from a two and one-half percent rent tax on accommodations. Expenditures are restricted for tourism promotion purposes.

Victims Assistance and Law Enforcements Fund (V.A.L.E.) - accounts for funds received from a surcharge for violation of all municipal ordinances and violations of the Model Traffic Code. Expenditures are restricted to victims' and witnesses' services and reimbursements and to Police Department equipment purchases, training, and additional personnel costs.

Conservation Trust Fund - accounts for funds received and restricted as to use in the acquisition, development and maintenance of new conservation sites pursuant to Colorado Revised Statutes.

Bus Tax Fund - accounts for the 0.20% sales tax designated towards "Ride Glenwood Springs" bus service.

Marijuana Sales Tax Fund - accounts for the 5.00% sales tax and 5.00% excise tax designated towards marijuana regulation enforcement, education, and public health programs.

Tobacco Sales Tax Fund - accounts for the 40.00% sales tax on tobacco products designated towards drug, alcohol, and tobacco prevention, youth mental and physical health, and other related city expenses.

General Improvement District Number 1980 Fund - The District's primary purpose is to provide infrastructure improvements to specific areas within the downtown area. The District's primary funding source is an ad valorem tax.

CAPITAL PROJECT FUNDS

Emergency Services Equipment Replacement Fund - accounts for revenues received on a pro-rated basis from the Glenwood Springs Rural Fire Protection District and transfers from the General Fund for the purchase of emergency services, facilities and equipment.

City of Glenwood Springs, Colorado
Combining Balance Sheets
Non-major Governmental Funds
For the Year Ended December 31, 2020

	Special Revenue Funds							Capital Projects Fund	
	Tourism Fund	V.A.L.E. Fund	Conservation Trust Fund	Bus Tax Fund	Marijuana Sales Tax Fund	Tobacco Sales Tax Fund	General Improvement District No. 1980	Emergency Services Equipment Replacement	Totals
Assets:									
Cash and investments - Unrestricted	155,661	32,660	341,005	1,119,115	272,632	140,462	132,113	3,100,235	5,293,883
Taxes receivable	86,727	-	-	114,483	35,995	64,562	42,907	-	344,674
Accounts receivable, net of allowance	-	-	-	234,313	-	-	-	-	234,313
Interest receivable	55	-	-	-	-	-	-	-	55
Prepaid items	-	-	-	3,411	-	-	-	-	3,411
Total Assets	242,443	32,660	341,005	1,471,322	308,627	205,024	175,020	3,100,235	5,876,336
Liabilities and Fund Balance:									
Liabilities:									
Accounts payable	27,265	-	-	377,431	-	-	-	938,533	1,343,229
Total Liabilities	27,265	-	-	377,431	-	-	-	938,533	1,343,229
Deferred Inflows of Resources:									
Property taxes	-	-	-	-	-	-	42,669	-	42,669
Total Deferred Inflows of Resources	-	-	-	-	-	-	42,669	-	42,669
Fund Balances:									
Nonspendable	-	-	-	3,411	-	-	-	-	3,411
Restricted	-	-	341,005	-	-	-	-	-	341,005
Committed	215,178	32,660	-	1,090,480	308,627	205,024	132,351	-	1,984,320
Assigned	-	-	-	-	-	-	-	2,161,702	2,161,702
Total Fund Balance	215,178	32,660	341,005	1,093,891	308,627	205,024	132,351	2,161,702	4,490,438
Total Liabilities, Deferred Inflows and Fund Balances	242,443	32,660	341,005	1,471,322	308,627	205,024	175,020	3,100,235	5,876,336

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Combining Statement of Revenues, Expenditures and Changes in Fund Balances
Non-major Governmental Funds
For the Year Ended December 31, 2020

	Special Revenue Funds							Capital Projects Fund	
	Tourism Fund	V.A.L.E. Fund	Conservation Trust Fund	Bus Tax Fund	Marijuana Sales Tax Fund	Tobacco Sales Tax Fund	General Improvement District No. 1980	Emergency Services Equipment Replacement	Totals
Revenues:									
Taxes	846,111	-	-	1,004,618	458,237	939,141	63,279	-	3,311,386
Intergovernmental	-	-	103,519	1,131,492	-	-	-	202,070	1,437,081
Charges for services	-	11,972	-	43,038	-	-	-	-	55,010
Interest income	485	873	2,214	378	-	-	154	2,090	6,194
Miscellaneous income	-	6	-	84,961	-	17,500	-	975,846	1,078,313
Total Revenues	846,596	12,851	105,733	2,264,487	458,237	956,641	63,433	1,180,006	5,887,984
Expenditures:									
General governmental	-	16,574	-	-	-	-	27,221	-	43,795
Transportation	-	-	-	1,984,380	-	-	-	-	1,984,380
Public safety	-	-	-	-	50,726	1,617	-	1,287,703	1,340,046
Community and economic development	1,127,323	-	-	-	-	-	-	-	1,127,323
Total Expenditures	1,127,323	16,574	-	1,984,380	50,726	1,617	27,221	1,287,703	4,495,544
Excess (Deficiency) of Revenues Over Expenditures	(280,727)	(3,723)	105,733	280,107	407,511	955,024	36,212	(107,697)	1,392,440
Other Financing Sources (Uses):									
Transfers in	-	-	-	-	-	-	-	370,635	370,635
Transfers (out)	-	-	-	-	(276,272)	(750,000)	-	-	(1,026,272)
Total Other Financing Sources (Uses)	-	-	-	-	(276,272)	(750,000)	-	370,635	(655,637)
Net Change in Fund Balance	(280,727)	(3,723)	105,733	280,107	131,239	205,024	36,212	262,938	736,803
Fund Balance - Beginning of Year	495,905	36,383	235,272	813,784	177,388	-	96,139	1,898,764	3,753,635
Fund Balance - End of Year	215,178	32,660	341,005	1,093,891	308,627	205,024	132,351	2,161,702	4,490,438

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Tourism Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
Accommodations tax	1,148,795	1,148,795	846,111	(302,684)	1,211,106
Other:					
Interest income	1,300	1,300	485	(815)	3,808
Total Revenues	1,150,095	1,150,095	846,596	(303,499)	1,214,914
Expenditures:					
Economic Development:					
Salary and benefits	177,156	177,156	177,156	-	168,833
Administrative	11,199	11,199	21,599	-	21,060
Consulting services	26,100	26,100	5,495	20,605	24,860
Visitor services	115,000	115,000	115,000	-	115,000
Public relations	25,750	25,750	18,611	7,139	24,430
Printing and distribution (brochures, postcards, etc.)	709,384	709,384	672,239	37,145	857,348
Database and internet marketing	25,000	25,000	20,154	4,846	15,286
Advertising and promotion	62,510	62,510	76,586	(14,076)	71,654
Travel and booth expenses	33,655	33,655	18,939	14,716	34,832
Special event	-	-	-	-	450
Other expenses	-	-	1,544	(1,544)	2,542
Total Expenditures	1,185,754	1,185,754	1,127,323	68,831	1,336,295
Excess (Deficiency) of Revenues Over Expenditures	(35,659)	(35,659)	(280,727)	(245,068)	(121,381)
Other Financing Sources (Uses):					
Transfers (out)	(156,264)	(156,264)	-	156,264	(110,000)
Total Other Financing Sources (Uses)	(156,264)	(156,264)	-	156,264	(110,000)
Net Change in Fund Balance	(191,923)	(191,923)	(280,727)	(88,804)	(231,381)
Fund Balance - Beginning of Year	667,383	667,383	495,905	(171,478)	727,286
Fund Balance - End of Year	475,460	475,460	215,178	(260,282)	495,905

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
V.A.L.E. Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Charges for Services:					
Assessments	25,000	25,000	11,972	(13,028)	24,983
Other:					
Other income	-	-	6	6	-
Interest income	1,000	1,000	873	(127)	646
Total Revenues	26,000	26,000	12,851	(13,149)	25,629
Expenditures:					
General Government:					
Victim/witness assistance	30,000	30,000	16,574	13,426	23,060
Total Expenditures	30,000	30,000	16,574	13,426	23,060
Net Change in Fund Balance	(4,000)	(4,000)	(3,723)	277	2,569
Fund Balance - Beginning of Year	24,315	24,315	36,383	12,068	33,814
Fund Balance - End of Year	20,315	20,315	32,660	12,345	36,383

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Conservation Trust Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Intergovernmental:					
Colorado Lottery	107,398	107,398	103,519	(3,879)	114,298
Other:					
Interest income	1,000	1,000	2,214	1,214	1,581
Total Other	1,000	1,000	2,214	1,214	1,581
Total Revenues	108,398	108,398	105,733	(2,665)	115,879
Expenditures:					
Culture and Recreation:					
Other projects	100,000	150,000	-	150,000	1,123
Total Expenditures	100,000	150,000	-	150,000	1,123
Net Change in Fund Balance	8,398	(41,602)	105,733	147,335	114,756
Fund Balance - Beginning of Year	133,483	133,483	235,272	101,789	120,516
Fund Balance - End of Year	141,881	91,881	341,005	249,124	235,272

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Bus Tax Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
General sales tax	1,021,911	1,021,911	968,213	(53,698)	1,017,167
Use tax	48,000	48,000	36,405	(11,595)	63,192
Intergovernmental:					
Grants and awards	764,405	764,405	1,131,492	367,087	728,117
Charges for Services:					
Bus fares	95,000	95,000	42,037	(52,963)	98,959
Advertising fees	10,000	10,000	1,001	(8,999)	10,850
Other:					
Interest income	1,000	1,000	378	(622)	5,533
Miscellaneous income	5,000	5,000	84,961	79,961	8,455
Total Revenues	1,945,316	1,945,316	2,264,487	319,171	1,932,273
Expenditures:					
Transportation:					
Fixed labor	406,140	406,140	341,045	65,095	381,409
Direct labor	425,464	425,464	341,309	84,155	390,631
Employee bus pass	1,000	1,000	292	708	1,067
Direct mileage cost	242,760	242,760	190,043	52,717	200,858
Training	80,640	80,640	57,866	22,774	68,785
Transit operations	30,000	30,000	30,000	-	50,737
Capital costs	59,325	99,325	94,314	5,011	52,383
Other	857,451	875,954	929,511	(53,557)	784,582
Total Expenditures	2,102,780	2,161,283	1,984,380	176,903	1,930,452
Net Change in Fund Balance	(157,464)	(215,967)	280,107	496,074	1,821
Fund Balance - Beginning of Year	479,143	479,143	813,784	334,641	811,963
Fund Balance - End of Year	321,679	263,176	1,093,891	830,715	813,784

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Marijuana Sales Tax Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
General sales tax	280,000	280,000	390,044	110,044	286,724
Other tax	50,000	50,000	68,193	18,193	50,714
Other:					
Interest income	-	-	-	-	577
Total Revenues	330,000	330,000	458,237	128,237	338,015
Expenditures:					
Public Safety:					
Other expenses	600	600	50,726	(50,126)	502
Total Public Safety	600	600	50,726	(50,126)	502
Excess (Deficiency) of Revenues Over Expenditures	329,400	329,400	407,511	78,111	337,513
Other Financing Sources (Uses):					
Transfers (out)	(300,000)	(276,272)	(276,272)	-	(250,000)
Total Other Financing Sources (Uses)	(300,000)	(276,272)	(276,272)	-	(250,000)
Net Change in Fund Balance	29,400	53,128	131,239	78,111	87,513
Fund Balance - Beginning of Year	141,061	141,061	177,388	36,327	89,875
Fund Balance - End of Year	170,461	194,189	308,627	114,438	177,388

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Tobacco Sales Tax Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
General sales tax	-	-	939,141	939,141	-
Other:					
Miscellaneous income	-	-	17,500	17,500	-
Total Revenues	-	-	956,641	956,641	-
Expenditures:					
General Government:					
Other expenses	-	-	1,617	(1,617)	-
Total General Government	-	-	1,617	(1,617)	-
Excess (Deficiency) of Revenues Over Expenditures	-	-	955,024	955,024	-
Other Financing Sources (Uses):					
Transfers (out)	-	(750,000)	(750,000)	-	-
Total Other Financing Sources (Uses)	-	(750,000)	(750,000)	-	-
Net Change in Fund Balance	-	(750,000)	205,024	955,024	-
Fund Balance - Beginning of Year	-	-	-	-	-
Fund Balance - End of Year	-	(750,000)	205,024	955,024	-

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
General Improvement District No. 1980
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Taxes:					
Property taxes	43,981	43,981	60,457	16,476	40,158
Specific ownership taxes	2,200	2,200	2,822	622	2,955
Total Taxes	46,181	46,181	63,279	17,098	43,113
Other:					
Interest income	150	150	154	4	602
Total Revenues	46,331	46,331	63,433	17,102	43,715
Expenditures:					
General Government:					
Miscellaneous and treasurer's fees	50,000	50,000	843	49,157	806
Other	13,053	13,053	26,378	(13,325)	12,763
Total Expenditures	63,053	63,053	27,221	35,832	13,569
Net Change in Fund Balance	(16,722)	(16,722)	36,212	52,934	30,146
Fund Balance - Beginning of Year	94,936	94,936	96,139	1,203	65,993
Fund Balance - End of Year	78,214	78,214	132,351	54,137	96,139

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Emergency Services Equipment Replacement Fund
Schedule of Revenues, Expenditures and Changes in Fund Balances
Budget (GAAP Basis) and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Revenues:					
Rural Fire District contribution	300,718	300,718	202,070	(98,648)	272,181
Interest income	-	-	2,090	2,090	27,000
Impact fees	-	-	57,632	57,632	103,185
Other	-	918,214	918,214	-	-
Total Revenues	300,718	1,218,932	1,180,006	(38,926)	402,366
Expenditures:					
Public Safety:					
Equipment purchases	1,122,800	2,062,964	1,287,703	775,261	61,881
Total Expenditures	1,122,800	2,062,964	1,287,703	775,261	61,881
Excess (Deficiency) of Revenues Over Expenditures	(822,082)	(844,032)	(107,697)	736,335	340,485
Other Financing Sources (Uses):					
Transfer in	864,917	626,100	370,635	(255,465)	543,580
Total Other Financing Sources	864,917	626,100	370,635	(255,465)	543,580
Net Change in Fund Balance	42,835	(217,932)	262,938	480,870	884,065
Fund Balance - Beginning of Year	1,066,284	1,066,284	1,898,764	832,480	1,014,699
Fund Balance - End of Year	1,109,119	848,352	2,161,702	1,313,350	1,898,764

The accompanying notes are an integral part of these financial statements.

PROPRIETARY FUNDS

ENTERPRISE FUNDS

Enterprise funds are used to account for any activity for which a fee is charged to external users for goods or services.

Water and Sewer Fund - accounts for activities of the fund that supplies water and sewer services to the citizens in the water and sewer service area. City water is provided on a metered basis.

Electric System Fund - accounts for activities related to the purchase and delivery of power within the City electric service area.

Airport Operations Fund - accounts for activities related to user charges and maintenance expenses for the airport.

Landfill Operations Fund - accounts for the activities related to the operations of the City landfill and recycling program.

INTERNAL SERVICE FUND

Internal service funds are used to account for services to other departments or agencies of the government, or to other governments on a cost-reimbursement basis.

Fleet Service Fund - accounts for the repair and maintenance costs and the capital replacement plan of the City's vehicles and heavy equipment, excluding fire trucks.

City of Glenwood Springs, Colorado
Enterprise Funds
Water and Sewer Fund
Schedule of Revenues and Expenses
Budget (Non-GAAP Basis) and Actual With Reconciliation to GAAP Basis
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Operating Revenues:					
Charges and Fees:					
Water user fees	2,850,531	2,850,531	2,926,465	75,934	2,795,662
Sewer user fees	3,450,124	3,450,124	3,271,097	(179,027)	3,354,836
Water connection fees	3,500	3,500	5,872	2,372	3,747
Meter sales	10,200	10,200	15,861	5,661	14,211
Other	-	-	14,819	14,819	1,191
Water improvement fees	50,000	50,000	253,497	203,497	191,102
Sewer improvement fees	50,000	50,000	267,726	217,726	316,908
Total Operating Revenues	6,414,355	6,414,355	6,755,337	340,982	6,677,657
Operating Expenses:					
Administration	1,021,058	1,021,058	1,063,859	(42,801)	911,745
Water plant operation	800,891	800,891	708,558	92,333	737,750
Water transmission and distribution	731,492	731,492	554,774	176,718	547,730
Wastewater plant operation & improvement	842,504	842,504	856,423	(13,919)	1,632,782
Wastewater collection and transmission	489,965	489,965	393,165	96,800	364,703
Customer service	188,989	188,989	181,915	7,074	174,771
Depreciation	1,790,268	1,790,268	1,761,533	28,735	1,722,578
Capital outlay	6,775,000	6,775,000	4,986,789	1,788,211	746,999
Total Operating Expenses	12,640,167	12,640,167	10,507,016	2,133,151	6,839,058
Operating Income (Loss) - Budget Basis	(6,225,812)	(6,225,812)	(3,751,679)	2,474,133	(161,401)
Non-Operating Revenues (Expenses):					
Gain (loss) on disposition of assets	(2,000)	(2,000)	-	(2,000)	-
Investment income	60,000	60,000	50,358	(9,642)	139,353
Intergovernmental awards	-	-	198,278	198,278	-
Interest expense	(714,268)	(714,268)	(609,178)	105,090	(658,236)
Total Non-Operating Revenues (Expenses):	(656,268)	(656,268)	(360,542)	291,726	(518,883)
Transfers (out)	(489,380)	(489,380)	(489,381)	(1)	(1,391,040)
Change in Net Position - Budget Basis	(7,371,460)	(7,371,460)	(4,601,602)	2,765,858	(2,071,324)
Reconciliation to GAAP Basis:					
Adjustments:					
Capital outlay			4,986,789		746,999
Total Adjustments			4,986,789		746,999
Net Income - GAAP Basis			385,187		(1,324,325)
Net Position - Beginning of Year			35,933,311		37,257,636
Net Position - End of Year			36,318,498		35,933,311

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Enterprise Funds
Electric System Fund
Schedule of Revenues and Expenses
Budget (Non-GAAP Basis) and Actual With Reconciliation to GAAP Basis
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Operating Revenues:					
Charges and fees:					
Commercial	10,908,260	10,908,260	9,102,541	(1,805,719)	9,640,020
Residential	4,396,598	4,396,598	4,795,965	399,367	4,511,382
Municipal	141,500	141,500	117,695	(23,805)	134,830
Security lights	14,235	14,235	12,508	(1,727)	12,596
Service connect fees	13,954	13,954	14,255	301	17,345
Other	731,049	731,049	806,003	74,954	1,103,439
Total Operating Revenues	16,205,596	16,205,596	14,848,967	(1,356,629)	15,419,612
Expenses:					
Purchased power	9,900,000	9,900,000	9,813,427	86,573	9,869,566
Maintenance - Distribution	1,338,472	1,338,472	893,168	445,304	1,061,505
Customer accounts	1,017,277	524,070	546,513	(22,443)	524,232
Broadband	591,513	1,091,513	966,822	124,691	659,522
General and administrative	1,088,555	1,088,555	878,380	210,175	836,355
Capital improvements	3,500,000	5,100,000	3,458,403	1,641,597	569,609
Depreciation	997,000	997,000	1,027,479	(30,479)	1,023,831
Total Operating Expenses	18,432,817	20,039,610	17,584,192	2,455,418	14,544,620
Operating Income (Loss) Budget Basis	(2,227,221)	(3,834,014)	(2,735,225)	1,098,789	874,992
Non-Operating Revenues (Expenses):					
Sale of assets	-	-	5,194	5,194	7,855
Investment income	25,000	25,000	42,608	17,608	72,109
Intergovernmental awards	10,000	10,000	27,000	17,000	-
Interest expense	-	-	(81,183)	(81,183)	-
Total Non-Operating Revenues (Expenses):	35,000	35,000	(6,381)	(41,381)	79,964
Capital contributions	-	-	99,045	99,045	206,551
Transfers (out)	(608,207)	(1,101,414)	(1,166,786)	(65,372)	(1,245,684)
Change in Net Position - Budget Basis	(2,800,428)	(4,900,428)	(3,809,347)	1,091,081	(84,177)
Reconciliation to GAAP Basis:					
Adjustments:					
Gain (loss) on disposal of assets			(1,412,796)		(49,275)
Capital outlay			3,419,989		516,519
Total Adjustments			2,007,193		467,244
Net Income - GAAP Basis			(1,802,154)		383,067
Net Position - Beginning of Year			25,550,579		25,167,512
Net Position - End of Year			23,748,425		25,550,579

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Enterprise Funds
Airport Operations Fund
Schedule of Revenues and Expenses
Budget (Non-GAAP Basis) and Actual With Reconciliation to GAAP Basis
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Operating Revenues:					
Rentals:					
Airport/land lease	28,000	28,000	126,650	98,650	27,495
Charges and fees:					
Annual user fees	3,000	3,000	-	(3,000)	1,500
Long-term tie downs	9,000	9,000	9,980	980	11,865
Transient tie downs	-	-	1,730	1,730	2,400
Fuel sales	125,000	125,000	160,451	35,451	152,271
Other income	-	-	15,626	15,626	2,322
Total Operating Revenues	165,000	165,000	314,437	149,437	197,853
Operating Expenses:					
Administration	32,173	32,173	27,895	4,278	24,546
Operations	126,940	126,940	138,000	(11,060)	142,380
Depreciation	9,100	9,100	9,099	1	9,099
Capital outlay	11,000	11,000	-	11,000	-
Total Expenses	179,213	179,213	174,994	4,219	176,025
Operating Income (Loss) - Budget Basis	(14,213)	(14,213)	139,443	153,656	21,828
Non-Operating Revenues (Expenses):					
Investment income	200	200	-	(200)	789
Total Non-Operating Revenues	200	200	-	(200)	789
Change in Net Position - Budget Basis	(14,013)	(14,013)	139,443	153,456	22,617
Reconciliation to GAAP Basis:					
Adjustments:					
Capital outlay			-		-
Total Adjustments			-		-
Net Income - GAAP Basis			139,443		22,617
Net Position - Beginning of Year			504,822		482,205
Net Position - End of Year			644,265		504,822

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Enterprise Funds
Landfill Operations Fund
Schedule of Revenues and Expenses
Budget (Non-GAAP Basis) and Actual With Reconciliation to GAAP Basis
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Operating Revenues:					
Disposal fees	2,086,300	2,086,300	2,021,821	(64,479)	2,234,879
Composting fees	666,200	666,200	612,501	(53,699)	567,027
Other income	10,000	10,000	37,408	27,408	30,516
Total Operating Revenues	2,762,500	2,762,500	2,671,730	(90,770)	2,832,422
Operating Expenses:					
Personnel costs	862,714	862,714	885,589	(22,875)	663,589
Operating costs	1,070,300	1,070,300	987,658	82,642	1,486,639
Utilities	13,700	13,700	9,422	4,278	8,510
Insurance	50,300	50,300	48,925	1,375	45,581
Allocated costs	144,612	144,612	144,612	-	140,400
Landfill compliance costs	69,000	69,000	455,946	(386,946)	244,598
Depreciation	45,000	45,000	108,926	(63,926)	96,596
Capital outlay	500,000	930,000	988,605	(58,605)	450,311
Total Operating Expenses	2,755,626	3,185,626	3,629,683	(444,057)	3,136,224
Operating Income (Loss) Budget Basis	6,874	(423,126)	(957,953)	(534,827)	(303,802)
Non-Operating Revenues (Expenses):					
Interest income	50,000	50,000	54,767	4,767	89,211
Other	-	-	6,190	6,190	-
Intergovernmental awards	-	149,600	141,370	(8,230)	-
Transfers in	-	-	90,180	90,180	82,547
Transfers (out)	(50,000)	(50,000)	(50,000)	-	(25,000)
Total Non-Operating Revenues (Expenses)	-	149,600	242,507	92,907	146,758
Change in Net Position - Budget Basis	6,874	(273,526)	(715,446)	(441,920)	(157,044)
Reconciliation to GAAP Basis:					
Adjustments:					
Capital outlay			988,605		450,311
Interfund loan payments			(90,180)		(82,547)
Total Adjustments			898,425		367,764
Net Income - GAAP Basis			182,979		210,720
Net Position - Beginning of Year			2,989,453		2,778,733
Net Position - End of Year			3,172,432		2,989,453

The accompanying notes are an integral part of these financial statements.

City of Glenwood Springs, Colorado
Internal Service Funds
Fleet Service Fund
Schedule of Revenues, Expenditures and Changes in Fund Net Position
Budget (Non-GAAP Basis) and Actual With Reconciliation to GAAP Basis
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Operating Revenues:					
Charges and fees	564,000	564,000	496,220	(67,780)	571,433
Other operating revenue	11,000	11,000	21,967	10,967	18,108
Total Operating Revenues	575,000	575,000	518,187	(56,813)	589,541
Expenses:					
General government:					
Operations	1,650,460	1,805,460	860,365	945,095	875,112
Depreciation	525,000	525,000	924,356	(399,356)	837,040
Capital outlay	656,500	656,500	629,816	26,684	916,632
Total Operating Expenses	2,831,960	2,986,960	2,414,537	572,423	2,628,784
Operating Income (Loss) - Budget Basis	(2,256,960)	(2,411,960)	(1,896,350)	515,610	(2,039,243)
Non-Operating Revenues (Expenses):					
Investment income	35,000	35,000	4,555	(30,445)	23,490
Sale of asset	120,000	120,000	9,000	(111,000)	-
Transfers in	1,890,400	1,890,400	1,071,872	(818,528)	1,218,000
Total Non-Operating Revenues (Expenses)	2,045,400	2,045,400	1,085,427	(959,973)	1,241,490
Change in Net Position - Budget Basis	(211,560)	(366,560)	(810,923)	(444,363)	(797,753)
Reconciliation to GAAP Basis:					
Adjustments:					
Capital outlay			629,816		916,632
Total Adjustments			629,816		916,632
Operating Income (Loss) - GAAP Basis			(181,107)		118,879
Net Position - Beginning of Year			4,728,182		4,609,303
Net Position - End of Year			4,547,075		4,728,182

The accompanying notes are an integral part of these financial statements.

FIDUCIARY FUNDS

Fiduciary funds are used to account for assets held by the City as an agent for individuals, private organizations, and other governments.

The *Cemetery Reserve Fund* accounts for funds received and restricted for the maintenance and care of the Rosebud Cemetery.

City of Glenwood Springs, Colorado
Fiduciary Funds
Cemetery Reserve Fund
Schedule of Changes in Fiduciary Net Position
Budget (GAAP) Basis and Actual
For the Year Ended December 31, 2020
(With Comparative Actual Amounts for December 31, 2019)

	2020				2019
	Original Budget	Final Budget	Actual	Final Budget Variance Positive (Negative)	Actual
Additions:					
Perpetual care fees	1,000	1,000	750	(250)	1,750
Interest income	150	150	-	(150)	292
Total Additions	1,150	1,150	750	(400)	2,042
Deductions:					
Cemetery maintenance	-	-	-	-	-
Total Deductions	-	-	-	-	-
Change in Net Position	1,150	1,150	750	(400)	2,042
Net Position - Beginning of Year	51,096	51,096	52,088	992	50,046
Net Position - End of Year	52,246	52,246	52,838	592	52,088

The accompanying notes are an integral part of these financial statements.

ANNUAL SCHEDULE OF REVENUES AND EXPENDITURES
FOR ROADS, BRIDGES AND STREETS

COLORADO
Department of Transportation

Steps for printing your content and returning to 'Edit Mode

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2. Right-click your mouse and select Print.
3. Confirm that print settings are correct - make sure "selection only" isn't checked.
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6. Remember to click "Save" to save any changes.

Annual Highway Finance Report - CY20

Email address: yvette.gustad@cogs.us
City/County: Glenwood Springs

Receipts, Disbursements & Costs

II - Receipts for Road & Street Purposes

A. Receipts from local sources

2. General Fund Appropriations:	$	2,466,399.00
3. Other local imposts: *from A.3. 'Total' below)*	$	2,703,822.00
4. Miscellaneous local receipts: *from A.4. 'Total' below)*	$	730,379.00
5. Transfers from toll facilities	$	0.00
6. Proceeds of sale of bonds and notes		
a. Bonds - Original Issues:	$	0.00
b. Bonds - Refunding Issues:	$	0.00
c. Notes:	$	0.00
SubTotal:	$	5,900,600.00

B. Private Contributions $ 0.00

Receipts, Disbursements & Costs

II - Receipts for Road & Street Purposes (Detail)

A.3. Other local imposts

a. Property Taxes &and Assessments	$ 0.00
b. Other Local Imposts	
1. Sales Taxes:	$ 2,543,590.00
2. Infrastructure and Impact Fees:	$ 16,218.00
3. Liens:	$ 0.00
4. Licenses:	$ 0.00
5. Specific Ownership and/or Other:	$ 144,014.00
Total: *(a + b) carried to 'Other local imposts' above)*	$ 2,703,822.00

A.4. Miscellaneous local receipts

a. Interest on Investments:	$ 208,517.00
b. Traffic fines and Penalities:	$ 51,197.00
c. Parking Garage Fees:	$ 0.00
d. Parking Meter Fees:	$ 20,468.00
e. Sale of Surplus Property:	$ 0.00
f. Charges for Services:	$ 197.00
g. Other Misc. Receipts:	$ 0.00
h. Other:	$ 450,000.00
Total: *(a through h) carried to 'Misc local receipts' above)*	$ 730,379.00

C. Receipts from State Government

1. Highway User Taxes:	$ 265,031.00
3. Other State funds:	
c. Motor Vehicle Registrations:	$ 36,108.00
d. Other (Specify):	
Comments: DOLA EIAF	$ 239,454.00
e. Other (Specify):	
Comments: undefined	$ 0.00
Total: *(1+3c,d,e)*	$ 540,593.00

D. Receipts from Federal Government

2. Other Federal Agencies	
a. Forest Service:	$ 0.00

b. FEMA:	$	0.00
c. HUD:	$	0.00
d. Federal Transit Administration:	$	0.00
e. U.S. Corp of Engineers	$	0.00
f. Other Federal:	$	1,769,429.00
Total: *(2a-f)*	$	1,769,429.00

Receipts, Disbursements & Costs

III - Disbursements for Road & Street Purposes

A. Local highway disbursements

1. Capital outlay: *(from A.1.d. 'Total Capital Outlay' below)*	$	6,600,850.63
2. Maintenance:	$	912,028.00
3. Road and street services		
a. Traffic control operations:	$	67,307.00
b. Snow and ice removal:	$	311,396.00
c. Other:	$	0.00
4. General administration and miscellaneous	$	406,688.00
5. Highway law enforcement and safety	$	1,063,417.00
Total: *(A.1-5)*	$	9,361,686.63

B. Debt service on local obligations

1. Bonds		
a. Interest	$	728,952.00
b. Redemption	$	1,570,000.00
2. Notes		
a. Interest	$	0.00
b. Redemption	$	0.00
SubTotal: *(1+2)*	$	2,298,952.00

C. Payments to State for Highways:	$	0.00
D. Payments to Toll Facilities:	$	0.00

Total Disbursements: *(A+B+C+D)*	$	11,660,638.63

Receipts, Disbursements & Costs

III - Disbursements for Road & Street Purposes - (Detail)

	A. ON NATIONAL HIGHWAY SYSTEM	B. OFF NATIONAL HIGHWAY SYSTEM	C. TOTAL
A.1. Capital Outlay			
a. Right-Of-Way Costs:	$ 0.00	$ 370,552.11	$ 370,552.11
b. Engineering Costs:	$ 0.00	$ 2,346,780.72	$ 2,346,780.72
c. Construction			
1. New Facilities:	$ 0.00	$ 0.00	$ 0.00
2. Capacity Improvements:	$ 0.00	$ 3,435,872.03	$ 3,435,872.03
3. System Preservation:	$ 0.00	$ 447,645.77	$ 447,645.77
4. System Enhancement:	$ 0.00	$ 0.00	$ 0.00
5. Total Construction:			$ 3,883,517.80
d. Total Capital Outlay: *(Lines A.1.a. + 1.b. + 1.c.5)*			$ 6,600,850.63

Receipts, Disbursements & Costs

IV. Local Highway Debt Status

	OPENING DEBT	AMOUNT ISSUED	REDEMPTIONS	CLOSING DEBT
A. Bonds (Total)	$ 24,240,000.00	$ 0.00	$ 1,570,000.00	$ 22,670,000.00
1. Bonds (Refunding Portion)		$ 0.00	$ 0.00	$ 0.00
B. Notes (Total):	$ 0.00	$ 0.00	$ 0.00	$ 0.00

Receipts, Disbursements & Costs

V - Local Road & Street Fund Balance

A. Beginning Balance	B. Total Receipts	C.Total Disbursements	D. Ending Balance	E. Reconciliation
$ 4,834,091.55	$ 8,210,622.00	$ 11,660,638.63	$ 1,384,074.92	$ 0.00

Notes and Comments:

undefined

Please enter your name: Yvette Gustad

Please provide a telephone number where you may be reached: 970-384-6421

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Please click on the "Save" button before viewing the data in a print format.

Contact: Karen Peterson | Email: karenk.peterson@state.co.us

STATISTICAL SECTION

This part of the City of Glenwood Springs's comprehensive annual financial report presents detailed information as a context for understanding what the information in the financial statements, note disclosures, and required supplementary information says about the overall government's financial health.

The information in this statistical section of the comprehensive annual financial report is intended, when possible, to provide information about Garfield County's economic condition in the following areas.

Financial Trends – These schedules contain trend information to help the reader understand how the government's financial performance and well-being have changed over time.

Revenue Capacity – These schedules contain information to help the reader assess the government's most significant local revenue sources: City and county sales tax and property tax.

Debt Capacity – These schedules present information to help the reader assess the affordability of the government's current levels of outstanding debt and the government's ability to issue additional debt in the future.

Demographic and Economic Information – These schedules offer demographic and economic indicators to help the reader understand the environment within which the government's financial activities take place.

Operating Information – These schedules contain services and infrastructure data to help readers understand how the information in the government's financial report relates to the services the government provides and the activities it performs.

City of Glenwood Springs, Colorado
Net Position by Component
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Governmental activities										
Net investment in capital assets	$ 90,120,246	$ 66,598,004	$ 64,250,870	$ 70,515,452	$ 67,656,084	$ 71,788,636	$ 77,030,072	$ 73,224,736	$ 84,475,343	$ 88,653,549
Restricted	1,200,520	2,161,903	2,511,864	2,579,375	2,635,197	2,816,975	2,726,665	11,039,259	12,673,537	1,410,970
Unrestricted	16,172,425	16,066,617	18,004,488	17,315,693	24,175,592	20,712,703	19,163,754	19,040,788	16,397,453	27,933,876
Total governmental activities net position	107,493,191	84,826,524	84,767,222	90,410,520	94,466,873	95,318,314	98,920,491	103,304,783	113,546,333	117,998,395
Business-type activities										
Net investment in capital assets	22,627,362	44,536,207	46,705,739	46,127,746	45,746,700	47,574,725	47,445,095	48,691,749	48,786,026	56,113,082
Unrestricted	13,443,191	18,113,324	17,999,053	17,224,398	17,965,611	18,066,512	18,432,964	16,994,337	16,192,139	7,770,538
Total business-type activities net position	36,070,553	62,649,531	64,704,792	63,352,144	63,712,311	65,641,237	65,878,059	65,686,086	64,978,165	63,883,620
Primary government										
Net investment in capital assets	112,747,608	111,134,211	110,956,609	116,643,198	113,402,784	119,363,361	124,475,167	121,916,485	133,261,369	144,766,631
Restricted	1,200,520	2,161,903	2,511,864	2,579,375	2,635,197	2,816,975	2,726,665	11,039,259	12,673,537	1,410,970
Unrestricted	29,615,616	34,179,941	36,003,541	34,540,091	42,141,203	38,779,215	37,596,718	36,035,125	32,589,592	35,704,414
Total primary government net position	$ 143,563,744	$ 147,476,055	$ 149,472,014	$ 153,762,664	$ 158,179,184	$ 160,959,551	$ 164,798,550	$ 168,990,869	$ 178,524,498	$ 181,882,015

City of Glenwood Springs, Colorado
Changes in Net Position
Last Ten Years

Community and Economic Development

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Expenses:										
Governmental Activities:										
General Government	$ 3,731,639	$ 3,517,288	$ 3,539,192	$ 3,815,189	$ 4,166,082	$ 4,349,401	$ 5,100,430	$ 4,932,054	$ 5,817,361	$ 6,675,439
Public Transportation	1,097,498	1,091,656	1,121,527	1,152,362	1,196,010	1,244,768	1,419,650	1,264,945	1,977,200	1,850,028
Public Safety	6,492,262	6,452,872	6,686,488	7,035,443	7,087,348	7,530,539	8,093,471	8,264,614	8,168,163	7,948,086
Public Works	1,236,633	1,267,767	1,358,032	1,439,397	1,754,418	2,041,864	1,955,442	1,925,909	2,349,002	1,863,719
Community and Economic Development	4,309,107	5,023,280	5,119,655	5,282,755	5,112,315	7,347,003	5,612,325	7,748,769	3,189,680	8,681,277
Culture and Recreation	3,851,086	4,798,389	4,301,655	4,173,013	4,360,608	4,623,242	5,321,848	4,765,647	5,525,717	4,034,359
Interest on long-term debt	569,937	458,669	401,163	353,094	299,061	318,273	220,492	190,755	714,643	766,040
Total Governmental Activities	21,288,162	22,609,921	22,527,712	23,251,253	23,975,842	27,455,090	27,723,658	29,092,693	27,741,766	31,818,948
Business-type Activities:										
Water	4,431,679	4,661,012	5,440,210	5,644,304	5,391,721	5,541,316	5,413,524	6,108,628	6,750,295	6,129,405
Electric	9,530,276	9,782,733	11,581,132	12,542,429	12,877,200	13,009,845	13,824,453	14,049,475	14,069,521	15,652,988
Airport	161,143	137,295	125,672	137,340	133,240	135,866	145,759	157,878	176,025	174,994
Landfill	3,223,961	3,675,545	3,420,228	3,314,301	3,228,749	3,363,282	3,339,192	3,332,597	2,685,913	2,641,078
Total Business-type Activities	17,347,059	18,256,585	20,567,242	21,638,374	21,630,910	22,050,309	22,722,928	23,648,578	23,681,754	24,598,465
Total Primary Government Expenses	38,635,221	40,866,506	43,094,954	44,889,627	45,606,752	49,505,399	50,446,586	52,741,271	51,423,520	56,417,413
Program Revenues:										
Governmental Activities:										
Charges for services:										
General Government	2,281,659	2,328,855	2,213,980	2,206,776	2,555,687	2,463,142	2,634,509	2,683,814	2,676,368	2,746,307
Public Transportation	10,229	133,540	129,371	125,159	120,696	113,130	85,398	108,919	109,809	43,037
Public Safety	1,285,927	1,404,106	1,230,251	1,426,846	1,143,376	1,424,884	1,546,891	1,659,253	1,541,266	1,570,422
Community and Economic Development	103,359	144,975	158,392	155,536	164,498	214,690	269,552	240,826	413,040	341,630
Public Works	5,130	40,538	18,634	7,464	13,939	77,569	97,760	272,252	35,245	29,919
Culture and Recreation	1,104,011	1,189,383	1,296,522	1,309,306	1,289,038	1,364,717	1,284,146	1,399,167	2,782,637	845,686
Operating Grants and Contributions	2,031,615	2,264,021	1,781,838	2,556,927	2,083,603	2,090,330	2,183,989	2,062,423	2,046,996	3,280,064
Capital Grants and Contributions	83,265	95,751	120,255	1,319,291	118,439	129,503	734,245	714,572	178,731	167,240
Total Governmental Activities Program Revenues	6,905,195	7,601,169	6,949,243	9,107,305	7,489,276	7,877,965	8,836,490	9,141,226	9,784,092	9,024,305
Business-type Activities:										
Charges for services:										
Water and sewer	4,697,538	5,350,696	5,102,858	5,390,156	5,974,846	6,623,843	6,619,310	6,531,139	6,677,657	6,755,337
Electric system	9,315,755	9,844,504	10,725,633	12,327,052	13,570,105	14,055,933	14,191,610	15,494,018	15,419,612	14,848,967
Airport operations	149,349	136,431	127,064	144,775	143,692	147,435	151,992	173,437	197,853	314,437
Landfill operations	3,401,049	4,054,657	2,942,643	2,960,788	2,565,184	2,335,856	2,508,588	2,492,317	2,832,422	2,671,730
Operating grants and contributions	578,451	611,705	1,613,165	1,390	608	624	5,545	8,722	-	6,190
Capital grants and contributions	186,438	95,410	230,124	201,076	432,952	47,121	358,481	85,284	206,551	465,693
Total Business-Type Activities Program Revenues	18,328,580	20,093,403	20,741,487	21,025,237	22,687,387	23,210,812	23,835,526	24,784,917	25,334,095	25,062,354
Total Primary Government Program Revenues	25,233,775	27,694,572	27,690,730	30,132,542	30,176,663	31,088,777	32,672,016	33,926,143	35,118,187	34,086,659
Net (Expense)/Revenue										
Governmental activities	(14,382,967)	(15,008,752)	(15,578,469)	(14,143,948)	(16,486,566)	(19,577,125)	(18,887,168)	(19,951,467)	(17,957,674)	(22,794,643)
Business-type activities	981,521	1,836,818	174,245	(613,137)	1,056,477	1,160,503	1,112,598	1,136,339	1,652,341	463,889
Total Primary Government Net Expense	$ (13,401,446)	$ (13,171,934)	$ (15,404,224)	$ (14,757,085)	$ (15,430,089)	$ (18,416,622)	$ (17,774,570)	$ (18,815,128)	$ (16,305,333)	$ (22,330,754)

City of Glenwood Springs, Colorado
Changes in Net Position
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General Revenues and Other Changes in Net Position:										
Governmental Activities:										
Taxes:										
Property taxes	$ 1,344,378	$ 1,262,979	$ 1,156,140	$ 1,391,409	$ 1,381,226	$ 1,395,469	$ 1,417,416	$ 1,611,654	$ 2,088,955	$ 2,318,200
Specific ownership taxes	58,603	53,651	51,048	81,964	75,116	65,163	105,655	109,300	147,773	146,836
Sales and use taxes	13,793,060	14,545,502	14,897,961	15,965,053	17,167,543	18,020,517	18,088,784	19,087,273	20,795,147	20,524,445
Severance tax	-	-	-	-	-	-	-	-	50,714	68,193
Franchise tax	157,319	151,314	176,480	185,638	179,584	169,914	168,889	205,430	178,566	165,025
Accommodations Tax	646,255	721,787	756,542	870,902	965,502	1,032,987	1,067,669	1,160,433	1,211,106	846,111
Other miscellaneous Taxes	34,628	33,992	34,078	35,590	36,670	37,070	56,042	90,721	36,691	36,108
Unrestricted investment earnings	108,947	93,862	125,447	134,568	154,017	182,458	211,002	348,580	405,966	246,752
Grants and contributions not restricted to specific programs	120,844	89,561	121,570	162,609	114,957	141,300	346,914	165,147	622,582	1,188,868
Gain/Loss on Capital Assets	89,909	41,603	39,157	103,110	34,754	25,424	32,697	(11,143)	-	-
Transfers	17,721,408	(24,652,164)	(1,751,138)	856,403	808,216	(641,736)	994,277	1,568,364	2,661,724	1,706,167
Total General Revenues and Transfers	34,075,351	(7,657,913)	15,607,285	19,787,246	20,917,585	20,428,566	22,489,345	24,335,759	28,199,224	27,246,705
Business-type Activities:										
Unrestricted investment earnings	127,492	88,623	119,800	99,482	107,337	125,319	115,999	237,107	301,462	147,733
Grants and contributions not restricted to specific programs	-	800	-	-	-	-	-	-	-	-
Sale of capital assets	6,546	571	10,080	17,410	4,570	1,368	2,502	2,945	-	-
Transfers	(17,721,408)	24,652,164	1,751,138	(856,403)	(808,216)	641,736	(994,277)	(1,568,364)	(2,661,724)	(1,706,167)
Total Business-type Activities	(17,587,370)	24,742,158	1,881,018	(739,511)	(696,309)	768,423	(875,776)	(1,328,312)	(2,360,262)	(1,558,434)
Total Primary Government Revenues	16,487,981	17,084,245	17,488,303	19,047,735	20,221,276	21,196,989	21,613,569	23,007,447	25,838,962	25,688,271
Change in Net Position										
Governmental activities	19,692,384	(22,666,665)	28,816	5,643,298	4,431,019	851,441	3,602,177	4,384,292	10,241,550	4,452,062
Business-type activities	(16,605,849)	26,578,976	2,055,263	(1,352,648)	360,168	1,928,926	236,822	(191,973)	(707,921)	(1,094,545)
Total Change in Net Position	$ 3,086,535	$ 3,912,311	$ 2,084,079	$ 4,290,650	$ 4,791,187	$ 2,780,367	$ 3,838,999	$ 4,192,319	$ 9,533,629	$ 3,357,517

City of Glenwood Springs, Colorado
Fund Balances, Governmental Funds
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General Fund										
Nonspendable	$ 607,270	$ 569,271	$ 539,271	$ 589,270	$ 628,939	$ 671,271	$ 610,820	$ 610,000	$ 610,010	$ 562,101
Restricted	726,585	705,940	721,789	777,279	1,107,857	1,222,454	1,182,653	1,035,738	1,473,388	1,069,965
Committed	212,993	205,669	204,615	204,615	204,365	204,365	204,365	184,365	1,946,162	1,906,018
Assigned	-	-	-	-	-	-	-	-	-	-
Unassigned	2,684,113	3,131,743	2,985,885	3,661,086	4,666,329	4,712,546	4,971,480	5,904,909	2,445,856	6,199,845
Total General Fund	4,230,961	4,612,623	4,451,560	5,232,250	6,607,490	6,810,636	6,969,318	7,735,012	6,475,416	9,737,929
All Other Governmental Funds										
Nonspendable	1,977	2,061	2,335	2,333	5,415	4,064	3,532	3,254	2,264	3,411
Restricted	473,935	1,455,963	1,790,075	1,802,096	1,527,340	1,594,521	1,544,012	10,003,521	11,200,149	14,471,534
Committed	540,493	1,303,666	686,070	697,031	740,741	899,707	5,577,712	4,299,518	4,998,054	4,712,390
Assigned	8,400,846	7,562,359	11,161,559	11,224,344	17,088,907	14,095,852	9,196,298	9,732,207	12,787,060	6,048,641
Unassigned	(121,852)	(9,533)	(257,060)	(554,811)	(531,193)	(961,957)	(714,494)	-	-	-
Total All Other Governmental Funds	$ 9,295,399	$ 10,314,516	$ 13,382,979	$ 13,170,993	$ 18,831,210	$ 15,632,187	$ 15,607,060	$ 24,038,500	$ 28,987,527	$ 25,235,976
Total Governmental Funds	$ 13,526,360	$ 14,927,139	$ 17,834,539	$ 18,403,243	$ 25,438,700	$ 22,442,823	$ 22,576,378	$ 31,773,512	$ 35,462,943	$ 34,973,905

NOTE: GASB 54 Implemented in 2011

City of Glenwood Springs, Colorado
Changes in Fund Balances, Governmental Funds
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenues:										
Taxes	$ 15,959,019	$ 16,748,278	$ 17,233,787	$ 18,593,969	$ 19,953,205	$ 20,928,634	$ 21,253,306	$ 22,521,070	$ 24,755,209	$ 24,317,322
Licenses and permits	156,624	153,498	187,763	157,767	263,463	218,967	287,457	245,793	420,082	328,625
Intergovernmental	1,882,943	1,919,986	1,693,414	3,105,893	1,950,597	2,374,749	2,820,205	2,570,464	6,244,044	5,822,765
Charges for services	2,398,821	2,713,310	2,740,929	2,953,684	2,692,056	2,992,018	3,118,071	3,473,254	3,182,428	2,328,438
Investment Income	67,608	69,038	71,892	87,261	103,968	138,428	188,904	337,424	887,124	442,382
Miscellaneous	2,860,638	3,136,799	2,587,386	3,184,949	2,953,197	2,685,247	3,274,689	3,372,836	4,217,138	4,383,182
Total Revenues	23,325,653	24,740,909	24,515,171	28,083,523	27,916,486	29,338,043	30,942,632	32,520,841	39,706,025	37,622,714
Expenditures:										
General government	5,418,095	6,933,290	4,682,739	5,261,278	4,645,663	5,527,856	5,663,097	5,548,037	6,913,980	7,552,675
Transportation	3,284,494	2,205,053	1,763,179	3,878,417	2,957,433	7,843,584	3,789,395	5,397,342	3,579,974	5,126,060
Public Safety	2,989,958	6,001,028	6,290,692	7,212,960	6,806,024	7,261,412	8,419,289	8,417,417	8,294,453	8,897,743
Community and Economic Development	1,188,113	1,195,419	1,348,168	1,393,166	1,647,233	2,093,998	1,909,356	1,944,541	2,305,823	1,913,912
Public Works	20,486,971	4,782,402	3,046,655	5,200,179	2,508,871	2,878,556	5,095,018	6,583,461	21,391,770	7,807,993
Culture and recreation	3,006,711	3,199,093	3,553,936	4,603,674	3,666,343	4,355,260	3,850,273	4,454,925	5,873,850	6,096,908
Debt service:										
Principal retirement	1,970,935	2,080,831	1,631,519	1,677,316	1,730,414	2,023,410	2,092,158	3,163,725	505,000	1,820,000
Interest	597,713	492,348	436,756	378,828	320,300	328,821	257,491	200,552	701,151	737,569
Issuance costs	-	-	-	-	66,250	-	-	116,995	94,317	-
Total Expenditures	38,942,990	26,889,464	22,753,644	29,605,818	24,348,531	32,312,897	31,076,077	35,826,995	49,660,318	39,952,860
Excess (Deficiency) of Revenues Over Expenditures	(15,617,337)	(2,148,555)	1,761,527	(1,522,295)	3,567,955	(2,974,854)	(133,445)	(3,306,154)	(9,954,293)	(2,330,146)
Other Financing Sources (Uses):										
Proceeds from sale of fixed assets	8,118	-	-	41,150	-	-	-	901,390	-	1,206,813
Intergovernmental awards	-	-	16,758	119,533	23,674	-	-	-	-	-
Bond proceeds	-	-	-	-	3,070,000	-	-	10,000,000	12,200,000	-
Transfers in	20,694,380	6,434,299	4,440,871	5,961,097	5,056,688	5,780,647	5,440,825	6,225,672	10,930,789	7,166,162
Transfers (out)	(3,341,962)	(2,884,965)	(3,311,756)	(4,030,781)	(4,682,860)	(5,801,670)	(5,173,825)	(4,623,774)	(9,487,065)	(6,531,867)
Total Other Financing Sources (Uses)	17,360,536	3,549,334	1,145,873	2,090,999	3,467,502	(21,023)	267,000	12,503,288	13,643,724	1,841,108
Net change in fund balances	$ 1,743,199	$ 1,400,779	$ 2,907,400	$ 568,704	$ 7,035,457	$ (2,995,877)	$ 133,555	$ 9,197,134	$ 3,689,431	$ (489,038)
Debt Service as a percentage of noncapital expenditures	6.60%	9.57%	9.09%	6.95%	8.42%	7.28%	8.97%	11.89%	4.18%	9.08%

City of Glenwood Springs, Colorado
History of General Fund Revenues, Expenditures, and Changes in Fund Balance
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenues:										
Taxes	$ 6,799,846	$ 7,090,341	$ 7,253,024	$ 7,963,469	$ 8,454,280	$ 8,770,582	$ 8,801,574	$ 9,322,439	$ 10,396,138	$ 11,472,157
Licenses and permits	156,624	153,498	187,763	157,767	263,463	218,967	287,457	245,793	420,082	328,625
Intergovernmental	1,127,973	1,226,672	1,091,811	1,263,997	1,358,781	1,209,316	1,075,237	1,319,988	1,254,674	1,782,518
Charges for services	1,421,661	1,513,890	1,610,414	1,609,093	1,610,557	1,715,393	1,684,414	1,706,358	1,754,877	829,447
Investment income	16,334	16,778	14,636	13,675	20,054	26,556	41,868	87,033	152,643	153,345
Other Revenue	2,688,725	2,769,863	2,482,967	2,965,500	2,873,681	2,462,401	3,047,735	2,923,036	3,158,961	2,886,710
Total Revenues	12,211,163	12,771,042	12,640,615	13,973,501	14,580,816	14,403,215	14,938,285	15,604,647	17,137,375	17,452,802
Expenditures:										
General government	2,654,788	2,882,196	2,950,819	3,201,846	3,686,671	3,862,499	4,610,582	4,508,927	5,005,523	5,621,627
Public Safety	2,954,521	3,043,074	3,153,484	3,273,558	3,275,518	3,461,024	3,725,853	3,767,540	3,971,159	3,450,251
Community Development	695,703	581,510	631,010	597,240	777,570	1,017,197	858,556	936,235	3,970,884	786,589
Public Works	1,376,308	1,329,794	1,398,549	1,479,858	1,455,594	1,700,772	1,634,076	1,768,560	969,528	1,732,603
Culture and recreation	2,838,073	3,104,795	3,069,342	3,166,990	3,317,765	3,453,714	3,450,010	3,611,195	1,910,699	3,335,191
Debt service:										
Principal retirement	180,000	240,000	215,000	220,000	225,000	230,000	230,000	235,000	240,000	250,000
Interest	109,668	54,884	40,406	35,697	30,815	25,952	20,915	15,878	-	-
Issuance costs									-	-
Total Expenditures	10,809,061	11,236,253	11,458,610	11,975,189	12,768,933	13,751,158	14,529,992	14,843,335	16,067,793	15,176,261
Excess (Deficiency) of Revenues Over Expenditures	1,402,102	1,534,789	1,182,005	1,998,312	1,811,883	652,057	408,293	761,312	1,069,582	2,276,541
Other Financing Sources (Uses):										
Proceeds from sale of assets										
Transfers in	872,348	902,108	938,958	1,037,360	2,147,460	2,264,253	2,462,163	2,582,849	2,731,664	3,942,067
Transfers out	(2,224,254)	(2,055,235)	(2,282,026)	(2,254,981)	(2,584,103)	(2,713,164)	(2,711,773)	(2,578,467)	(5,060,842)	(2,956,095)
Total Other Financing Sources (Uses)	(1,351,906)	(1,153,127)	(1,343,068)	(1,217,621)	(436,643)	(448,911)	(249,610)	4,382	(2,329,178)	985,972
Net Change in Fund Balances	50,196	381,662	(161,063)	780,691	1,375,240	203,146	158,683	765,694	(1,259,596)	3,262,513
Fund Balances - Beginning	4,180,765	4,230,961	4,612,623	4,451,560	5,232,250	6,607,490	6,810,636	6,969,318	7,735,012	6,475,416
Fund Balances - Ending	$ 4,230,961	$ 4,612,623	$ 4,451,560	$ 5,232,250	$ 6,607,490	$ 6,810,636	$ 6,969,318	$ 7,735,012	$ 6,475,416	$ 9,737,929

City of Glenwood Springs, Colorado
Major Revenue Sources - Governmental Funds
Last Ten Years

Year	Taxes[1]	Licenses and Permits	Inter-governmental	Charges for Services[2]	Earnings on Investments	Other	Total
2011	15,959,019	156,624	1,882,943	2,398,821	67,608	2,860,638	23,325,653
2012	16,748,278	153,498	1,919,986	2,713,310	69,038	3,136,799	24,740,909
2013	17,233,787	187,763	1,693,414	2,740,929	71,892	2,587,386	24,515,171
2014	18,593,969	157,767	3,105,893	2,953,684	87,261	3,184,949	28,083,523
2015	19,953,205	263,463	1,950,597	2,692,056	103,968	2,953,197	27,916,486
2016	20,928,634	218,967	2,374,749	2,992,018	138,428	2,685,247	29,338,043
2017	21,253,306	287,457	2,820,205	3,118,071	188,904	3,274,689	30,942,632
2018	22,521,070	245,793	2,570,464	3,473,254	337,424	3,372,836	32,520,841
2019	24,755,209	420,082	6,244,044	3,182,428	887,124	4,217,138	39,706,025
2020	24,317,322	328,625	5,822,765	2,328,438	442,382	4,383,182	37,622,714

[1] Includes, among other tax revenues, sales taxes, real estate transfer taxes, and property taxes.
[2] Charges for Services are those revenues derived from services provided that are deemed to be mission-related for each fund. Examples include, but are not limited to, fees for the use of recreational facilities, building permits and sprinkler fees.
Source: City of Glenwood Springs Finance Department.

City of Glenwood Springs, Colorado
Sales & Lodging Tax Receipts
Last Ten Years

Year	Share of County Tax Receipts[1]	2.0% General/Capital Sales Tax Receipts	1.0% Aquisition & Improvements Sales Tax Receipts	0.5% Street Sales Tax Receipts	0.2% Transportation Sales Tax Receipts	5.0% Retail Marijuana Sales Tax Receipts[2]	40.00% Retail Tobacco Sales Tax Receipts[3]	2.5% Accommodations Tax Receipts	Total Sales & Accommodations Tax Receipts
2011	201,655	7,209,593	3,604,763	1,802,382	720,899	-	-	646,349	14,185,641
2012	227,329	7,682,172	3,841,050	1,920,525	768,153	-	-	721,787	15,161,017
2013	146,961	7,863,938	3,931,933	1,965,966	786,328	-	-	756,542	15,451,668
2014	196,608	8,453,485	4,226,704	2,113,352	845,278	-	-	870,902	16,706,329
2015	209,751	9,102,131	4,551,023	2,275,512	910,137	-	-	966,315	18,014,869
2016	197,729	9,489,721	4,744,816	2,372,408	948,893	-	-	1,033,152	18,786,719
2017	223,644	9,321,708	4,660,811	2,330,405	932,093	139,024	-	1,066,922	18,674,607
2018	262,926	9,559,316	4,985,038	2,389,829	996,934	358,050	-	1,153,213	19,705,306
2019	332,227	10,804,519	5,402,195	2,701,098	1,080,359	337,438	-	1,211,106	21,868,942
2020	370,161	10,047,009	5,023,458	2,511,729	1,004,618	458,237	939,141	846,111	21,200,464

[1] 75% of Garfield County's 1% sales tax is distributed to Garfield County and 12.5% of this is distributed to municipalities within Garfield County based upon actual sales taxes collected

[2] Voters approved a 5% additional sales tax on Retail Marijuana Sales effective July 1, 2017

[3] Voters approved a 40% additional sales tax on Retail Tobacco Sales effective January 1, 2020

Source: City of Glenwood Springs Finance Department

City of Glenwood Springs, Colorado
Sales Tax Receipts by Month
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	902,937	959,869	1,043,132	998,007	1,122,151	1,178,036	1,205,216	1,238,850	1,292,551	1,261,296
February	870,428	950,649	945,310	970,853	1,071,493	1,137,481	1,127,360	1,116,348	1,210,394	1,266,100
March	1,087,735	1,234,559	1,189,455	1,260,135	1,382,565	1,447,251	1,506,937	1,540,052	1,610,504	1,353,815
April	934,451	1,024,331	1,006,955	1,081,261	1,184,159	1,256,435	1,274,638	1,271,035	1,416,743	929,358
May	1,012,727	1,096,328	1,151,014	1,212,986	1,307,107	1,364,645	1,389,173	1,472,703	1,494,210	1,243,696
June	1,297,523	1,373,522	1,425,356	1,505,444	1,637,258	1,792,935	1,735,001	1,836,120	1,857,670	1,704,372
July	1,235,161	1,285,250	1,334,591	1,474,355	1,579,778	1,610,220	1,640,786	1,692,971	1,806,413	1,725,942
August	1,210,415	1,319,047	1,315,199	1,448,014	1,512,112	1,582,419	1,479,105	1,628,424	1,720,856	1,570,074
September	1,247,118	1,294,018	1,328,843	1,477,296	1,559,080	1,602,024	1,485,353	1,690,439	1,781,482	1,817,182
October	1,059,152	1,090,112	1,117,357	1,286,735	1,335,404	1,390,258	1,257,979	1,450,848	1,537,369	1,690,032
November	1,012,962	1,052,012	1,104,004	1,218,414	1,272,581	1,299,571	1,297,443	1,370,571	1,403,630	1,488,989
December	1,467,028	1,532,203	1,586,951	1,705,319	1,875,115	1,894,563	1,846,026	1,957,100	1,988,796	2,143,440
Total	13,337,637	14,211,901	14,548,165	15,638,819	16,838,803	17,555,838	17,245,017	18,265,461	19,120,618	18,194,297

Source: City of Glenwood Springs Finance Department.

City of Glenwood Springs, Colorado
Assessed Value and Actual Value of Taxable Property
Last Ten Years

Fiscal Year Ended December 31[1]	Valuation Base Year[2]	Residential Property Assessment Rate[3]	Residential Property[4]	Commercial Property	Other Property	Tax-Exempt Property	Assessed Value	Estimated Actual Value[2]	Taxable Assessed Value as a Percentage of Estimated Actual Taxable Value	Total Direct Tax Rate [5]
2011	2010	7.96%	77,441,520	128,817,580	13,530,700	44,229,260	219,789,800	1,463,744,510	15.02%	4.654
2012	2010	7.96%	77,448,280	127,863,350	13,621,240	46,104,250	218,932,870	1,460,851,590	14.99%	7.051
2013	2012	7.96%	59,595,360	111,423,190	12,779,800	41,567,910	183,798,350	1,191,905,290	15.42%	7.022
2014	2012	7.96%	59,631,880	112,758,290	12,502,140	43,550,850	184,892,310	1,197,197,420	15.44%	6.126
2015	2014	7.96%	79,222,880	119,653,680	15,073,930	41,709,180	213,950,490	1,459,859,080	14.66%	6.179
2016	2014	7.20%	79,349,540	120,509,730	15,291,150	41,231,070	215,150,420	1,465,151,350	14.68%	6.179
2017	2016	7.20%	85,378,000	130,580,170	14,504,600	41,772,560	230,462,770	1,686,096,730	13.67%	8.615
2018	2016	7.20%	86,583,330	129,335,600	12,601,500	43,734,500	228,520,430	1,691,982,580	13.51%	8.704
2019	2018	7.20%	94,774,060	141,670,600	15,300,320	47,992,600	251,744,980	1,866,782,920	13.49%	8.704
2020	2018	7.20%	97,420,930	141,806,630	12,143,020	48,585,070	250,245,930	1,889,506,100	13.24%	8.603

[1] Property taxes levied on the valuation for the year indicated are collected in the following year.
[2] Actual value is reappraised biennially from sales that occurred in the 24 month period ending June 30 of the indicated valuation base year.
[3] Residential property is assessed at the indicated assessment rate of actual value. All other property is assessed at 29% of actual value.
[4] Residential property is valued at 100% of market value; all other property is valued considering the income, cost and market approaches to appraisal.
[5] Per $1,000 of assessed valuation.

Source: Garfield County Assessor

City of Glenwood Springs, Colorado
Property Tax Levies and Collections
Last Ten Years

	Collected within the Fiscal Year Following the Levy				Total Collections to Date	
Collection Year	**Taxes Levied for the Fiscal Year**	**Amount Collected**	**Percentage of Levy**	**Collections in Subsequent Years**	**Amount**	**Percentage of Levy**
2011	1,048,884	1,042,256	99.37%	71	1,042,327	99.37%
2012	1,053,493	1,048,818	99.56%	950	1,049,768	99.65%
2013	1,010,999	1,005,179	99.42%	346	1,005,525	99.46%
2014	1,288,579	1,280,308	99.36%	4,812	1,285,120	99.73%
2015	1,293,413	1,290,826	99.80%	390	1,291,216	99.83%
2016	1,306,130	1,304,024	99.84%	488	1,304,512	99.88%
2017	1,324,510	1,322,175	99.82%	77	1,322,253	99.83%
2018	1,493,801	1,493,403	99.97%	450	1,493,853	100.00%
2019	1,955,138	1,932,535	98.84%	856	1,933,391	98.89%
2020	2,179,862	2,133,685	97.88%	-	2,133,685	97.88%

Source: City of Glenwood Finance Department

City of Glenwood Springs, Colorado
Direct and Overlapping Property Tax Rates
Last Ten Years
(rate per $1,000 of assessed value)

	General Mill Levy					
Tax Year	General Fund	Voter Approved Increase[1]	Bond Fund	Capital	Refund / Abatements	Total Direct Tax Rate
2011	2.603	-	1.344	0.863	0.042	4.852
2012	2.602	-	1.176	0.857	0.019	4.654
2013	2.603	2.000	1.399	1.013	0.036	7.051
2014	2.603	2.000	1.389	1.004	0.026	7.022
2015	2.046	2.000	1.200	0.865	0.015	6.126
2016	2.137	2.000	1.170	0.862	0.010	6.179
2017	2.603	2.000	1.093	0.804	0.013	6.513
2018	8.603	-	-	-	0.012	8.615
2019	8.603	-	-	-	0.101	8.704
2020	8.603	-	-	-	0.097	8.700

	Overlapping Rates						
Tax Year	Garfield County	Colorado River Water Conservation	West Divide Water Conservation	Glenwood Springs Improvement District	RE-1 School District	Colorado Mountain College	Garfield County Public Library District
2011	13.655	0.228	0.042	2.458	39.589	3.997	1.000
2012	13.655	0.242	0.041	2.460	38.388	3.997	1.000
2013	13.655	0.254	0.041	2.484	42.445	3.997	1.000
2014	13.655	0.253	0.039	2.459	42.149	3.997	1.000
2015	13.655	0.243	0.039	2.291	46.300	3.997	1.000
2016	13.655	0.253	0.039	2.308	45.245	3.997	1.000
2017	13.655	0.254	0.039	2.138	44.038	3.997	1.001
2018	13.655	0.256	0.037	2.224	44.041	3.997	1.072
2019	13.655	0.235	0.038	2.022	42.903	4.013	2.505
2020	13.655	0.502	0.039	2.043	42.030	4.013	2.505

[1]Voters approved a 2 mill levy increase for 5 years
[2] Voters approved a combined General mill levy in 2018

Source: Garfield County Treasurer

City of Glenwood Springs, Colorado
Principal Property Tax Payers
Current Year and Nine Years Ago

	2020			2011		
Taxpayer	**Assessed Value**	**Rank**	**Percentage of Total City Assessed Value**	**Assessed Value**	**Rank**	**Percentage of Total City Assessed Value**
Bank Of Colorado	$2,744,130	1	1.10%			
Green Leaf Lofts Llc	2,702,440	2	1.08%			
Glenwood Hot Springs Lodge & Pool Inc	2,674,300	3	1.07%	$1,807,184	3	4.29%
Sre Colorado 8 Llc	2,314,870	4	0.93%	-		
Weingarten Miller Glenwood Llc	2,258,980	5	0.90%	2,962,252	1	9.05%
Terrapin Glenwood 401 Llc	2,068,450	6	0.83%	-		
Iron Mountain Hot Springs Llc	2,032,100	7	0.81%	-		
Sopris Suites, Llc	2,031,320	8	0.81%	1,812,376	2	4.27%
Weingarten Miller Glenwood Llc	1,998,010	9	0.80%	-		
Valley View Hospital Associates	1,962,850	10	0.78%	1,570,280	4	4.79%
Wal-Mark Real Estate Business Trust				1,075,373	5	3.28%
Qwest Corporation TL393				1,065,854	6	3.25%
Glenwood Springs Mall LLLP				1,029,198	7	3.14%
Glenwood Hot Springs Lodge & Pool Inc				951,435	8	2.91%
Lowe's HIW, Inc				934,796	9	2.85%
Glenwood Properties				911,615	10	2.78%
Total	$ 22,787,450		9.11%	$ 14,120,363		40.63%

Source: Garfield County Assessor

City of Glenwood Springs, Colorado
Ten Largest Sales Tax Remitters
Current Year and Five Years Ago

2020

Business Name[1]	Industry
Amazon.com Services	Miscellaneous Retail
City Market	Food and Drug
Garfield County	Automobile
Hot Springs Lodge & Pool	Lodging
Hotel Colorado	Lodging
Lowe's Home Centers, LLC	Building
Marshalls	Apparel and Accessories
Natural Grocers	Food and Drug
Target	Department Store
Walmart, Inc.	Department Store

2015

Business Name[1]	Industry
City Market	Food and Drug
Garfield County	Automobile
Hot Springs Lodge & Pool	Lodging
Lowe's Home Centers, LLC	Building
Ross	Department Store
Safeway	Food and Drug
Sports Authority	Sporting Goods
Target	Department Store
Vitamin Cottage	Food and Drug
Walmart, Inc.	Department Store

[1] Businesses' names are listed in alphabetic order.
Source: City of Glenwood Springs Finance Department.

City of Glenwood Springs, Colorado
Taxable Retail Sales by Industry
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Contractors	$ 420,172	$ 566,849	$ 366,016	$ 478,337	$ 580,531	$ 1,317,354	$ 1,221,802	$ 1,667,027	$1,525,311	$1,598,011
Transportation:Passenger/Freight/Storage	89,854	60,341	54,011	84,648	80,218	124,209	141,407	133,649	144,510	194,836
Travel Agencies	2,730	1,784	1,405	1,405	828	1,656	594	595	1,464	936
Communications Svcs - Cell, Phone, Cable	13,309,535	13,142,599	12,254,316	12,742,772	13,669,673	15,502,099	15,091,222	14,001,054	13,359,617	11,897,553
Utilites: Gas/Water/Elect	6,138,234	6,250,260	6,802,259	7,514,382	8,183,489	8,227,960	8,998,299	10,658,541	11,339,457	10,587,044
Wholesale	125,510	111,732	129,362	265,145	579,621	1,001,002	958,192	1,627,433	2,082,855	3,444,395
Building:Supplies, Paint, Nurseries	31,798,802	33,837,943	37,057,763	40,758,195	45,768,909	49,969,129	50,027,127	53,397,676	58,706,518	66,758,977
Department, Variety Stores	80,584,673	80,220,960	78,359,016	78,534,805	80,247,342	80,096,298	77,313,629	79,666,837	78,691,483	82,838,256
Food Suppliers	49,608,809	50,424,422	51,693,869	54,388,923	56,936,334	57,729,346	55,677,077	59,192,892	59,843,211	56,168,273
Auto: Dealers, Gas Stations, Parts, Wash	34,525,911	38,253,729	40,205,939	46,962,093	54,901,747	55,174,768	56,217,858	56,475,714	60,240,940	62,257,325
Apparel & Accessories	9,704,844	15,277,545	15,495,223	15,916,638	16,605,153	17,153,031	18,110,891	19,449,091	26,207,891	20,819,606
Furnishings: Furn, Carpet, Appl, Comptrs	7,616,090	8,300,109	7,636,140	8,694,991	8,245,742	8,149,252	7,901,883	8,036,044	8,566,602	7,332,268
Restaurants, Bars, Caterers	46,441,282	49,968,608	51,627,996	55,936,652	61,510,025	63,676,165	63,082,366	69,220,539	71,457,972	55,960,853
Misc. Retail: Vending, Jewelry, Liquor	41,905,720	39,730,203	40,734,976	42,634,781	42,449,979	43,993,237	37,681,260	42,061,680	40,460,349	46,095,533
Financial: Banks,Invstmnts,Leasing,Mort	829,593	1,089,521	981,329	1,140,070	1,405,501	1,329,660	1,355,019	1,740,219	1,599,828	1,383,572
Insurance	46,111	75,122	64,789	54,432	55,636	39,892	33,332	24,329	17,882	15,125
Real Estate: Prop Mgt,Condo Assn,Realtor	4,459	14,703	7,432	13,378	25,095	25,342	46,179	18,358	29,048	55,767
Lodging	29,169,871	32,311,722	33,756,515	38,543,395	43,517,275	46,683,042	47,566,309	49,909,637	52,756,644	34,879,870
Short term rental	-	-	-	-	-	-	-	1,626,018	2,018,154	1,899,073
Personal Svcs: Laundry, Salons, Photog	1,209,797	1,217,598	1,421,139	1,441,848	1,595,818	1,431,204	1,306,683	1,287,546	1,463,447	1,324,654
Business Svcs: Advert, Copy, Int Design	4,864,358	6,107,210	6,110,768	6,192,733	5,899,402	6,742,795	7,640,602	6,808,777	7,044,364	6,370,030
Recreation & Amusements	1,425,680	1,390,708	1,514,211	1,281,215	1,664,062	2,359,334	2,594,102	2,875,636	2,942,671	1,972,422
Health Services	1,852,835	1,770,483	2,469,832	2,185,670	2,144,788	2,350,212	2,191,717	2,577,191	2,580,966	2,275,885
Schools/Educational	7,496	7,700	12,449	20,649	17,294	21,662	37,053	37,753	29,712	29,952
Social Svcs	5,806	6,027	9,838	28,405	21,625	20,344	3,218	8,972	2,788	7,579
Membership Organ: Church, Civic, Social	526,045	459,560	477,959	497,727	736,301	645,610	589,198	553,095	755,946	289,075
Professionals: Acctng,Eng.,Legal,Mgmt	264,671	282,649	310,432	269,326	293,916	354,906	232,879	422,303	153,039	85,445
Misc. Services: Artists, Scientific	38,398	44,433	44,122	37,568	69,691	187,009	106,972	211,055	374,060	382,833
Other: Non-Licensed	2,021,332	2,131,393	2,116,602	1,132,043	1,638,261	3,326,648	3,099,478	3,514,872	5,674,435	5,505,957
Temporary/Special Event Vendor[1]	-	28,056	34,105	39,247	48,432	149,479	143,106	252,351	369,407	490,753
Marijuana[1]	-	1,021,459	1,449,541	4,879,311	6,301,182	6,704,972	6,712,096	6,204,216	6,332,882	7,314,872
Total Taxable Sales	$ 364,538,617	$ 384,105,429	$ 393,199,355	$ 422,670,785	$ 455,193,872	$ 474,487,618	$ 466,081,550	$ 493,661,099	516,773,452	$ 490,236,731

[1] In 2012, the City began reporting the sales in a separate category

Source: City of Glenwood Springs Finance Department

City of Glenwood Springs, Colorado
Legal Debt Margin Information
Last Ten Years
(in thousands)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Debt Limit	$ 6,594	$ 6,568	$ 5,514	$ 5,547	$ 6,419	$ 6,455	$ 6,914	$ 6,856	$ 7,552	$ 7,507
Total net debt applicable to limit	4,337	3,602	3,299	2,573	2,038	1,466	899	490	250	-
Legal Debt Margin	$ 2,256	$ 2,966	$ 2,215	$ 2,973	$ 4,381	$ 4,989	$ 6,015	$ 6,366	$ 7,302	$ 7,507

City of Glenwood Springs, Colorado
Outstanding Debt by Type
Last Ten Years

	Governmental Activities			Business-Type Activities				
Fiscal Year	**General Obligation Bonds**	**Sales and Use Tax Revenue Bonds**	**Colorado SIB Loan**	**Electric Revenue Bonds**	**Water and Sewer Revenue Loan**	**Total Government**	**Percentage of Estimated Personal Income**	**Per Capita**
2011	4,337,391	9,645,518	163,716	-	30,394,550	44,541,175	7.91%	4,615
2012	3,602,213	8,737,883	-	-	29,313,175	41,653,271	6.29%	4,255
2013	3,299,032	7,340,000	-	-	28,221,250	38,860,282	5.53%	3,963
2014	2,573,378	6,328,093	-	-	27,097,675	35,999,146	5.06%	3,653
2015	2,037,964	8,060,000	-	-	25,953,000	36,050,964	4.93%	3,606
2016	1,465,883	6,585,000	-	-	24,781,950	32,832,833	4.37%	3,314
2017	898,725	5,060,000	-	-	23,573,974	29,532,699	3.93%	2,981
2018	490,000	12,305,000	-	-	22,329,074	35,124,074	4.65%	3,526
2019	250,000	24,240,000	-	-	21,047,250	45,537,250	5.62%	4,563
2020	-	22,670,000	-	9,122,000	19,717,950	51,509,950	6.25%	5,170

Source: City Finance Department

City of Glenwood Springs, Colorado
Ratios of Bonded Debt Outstanding by Type
Last Ten Years

Fiscal Year	General Obligation Bonds	Sales and Use Tax Revenue Bonds	Colorado SIB Loan	Enterprise Revenue Bonds	Total Bonded General Obligation Debt Outstanding	Percentage of Actual Taxable Value of Property	Per Capita
2011	4,337,391	9,645,518	163,716	30,394,550	4,337,391	1.97%	449
2012	3,602,213	8,737,883	-	29,313,175	3,602,213	1.65%	368
2013	3,299,032	7,340,000	-	28,221,250	3,299,032	1.79%	336
2014	2,573,378	6,328,093	-	27,097,675	2,573,378	1.39%	261
2015	2,037,964	8,060,000	-	25,953,000	2,037,964	0.95%	204
2016	1,465,883	6,585,000	-	24,781,950	1,465,883	0.68%	148
2017	898,725	5,060,000	-	23,573,974	898,725	0.39%	91
2018	490,000	12,305,000	-	22,329,074	490,000	0.21%	49
2019	250,000	24,240,000	-	21,047,250	250,000	0.10%	25
2020	-	22,670,000	-	28,839,950	-	0.00%	-

Source: City of Glenwood Springs Finance Department

City of Glenwood Springs, Colorado
Direct and Overlapping Governmental Activities Debt
As of 12/31/2019
(in thousands)

Overlapping Debt	Outstanding Debt[2]	Estimated Percentage Applicable[1]	Estimated Share of Overlapping Debt
Roaring Fork School District	$ 177,700	35.544%	$ 63,162
Glenwood Meadows Metro District No. 3	8,534	100.000%	8,534
Total Overlapping Debt	$ 186,234		71,696
City of Glenwood Springs Direct Debt			22,670
Total Direct and Overlapping Debt			$ 94,366

[1] For debt repaid with property taxes, the percentage of overlapping debt applicable is estimated using taxable assessed property values. Applicable percentages were estimated by determining the portion of another governmental unit's taxable assessed value that is within the City's boundaries and dividing it by each unit's total taxable assessed value.

[2] Outstanding debt includes all long-term debt instruments of the governmental activities, including bonds, notes, certificates of participation, loans, and capital leases.

Note: Overlapping governments are those that coincide, at least in part, with the geographic boundaries of the City. This schedule estimates the portion of the outstanding debt of those overlapping governments that is borne by the residents and businesses of Glenwood Springs. This process recognizes that, when considering the City's ability to issue and repay long-term debt, the entire debt burden borne by the residents and the businesses should be taken into account. However, this does not imply that every taxpayer is a resident, and therefore responsible for repaying the debt, of each overlapping government.

Source: Assessed value data used to estimate applicable percentages provided by the Garfield County Assessor. Debt outstanding provided by each governmental unit.

City of Glenwood Springs, Colorado
Pledged Revenue Coverage
Last Ten Years

Fiscal Year	Sales and Use Tax Revenue Bonds[1 4]	Electric Revenue [2]	Water and Sewer Revenue [3]	Total Pledged Revenues	Debt Service		Coverage
					Principal	Interest	
2011	3,604,763	9,315,755	4,697,538	17,618,056	2,445,550	1,213,382	4.82
2012	3,841,050	9,844,504	5,350,696	19,036,250	2,171,375	1,191,472	5.66
2013	3,931,933	-	5,102,858	9,034,791	2,216,925	1,159,868	2.68
2014	4,226,704	-	5,390,156	9,616,860	2,278,575	1,100,020	2.85
2015	4,551,023	-	5,974,846	10,525,869	2,339,675	1,039,893	3.11
2016	4,744,816	-	6,623,843	11,368,659	2,646,050	1,045,283	3.08
2017	6,991,216	-	6,619,310	13,610,526	2,732,975	971,673	3.67
2018	7,374,867	-	6,531,139	13,906,006	3,999,900	885,937	2.85
2019	8,103,293	-	6,677,657	14,780,950	1,546,825	730,979	6.49
2020	7,535,187	14,848,967	6,755,337	29,139,491	1,604,300	756,153	12.34

[1] The City 1999 and 2010 Sales and Use Tax revenue bonds pledged revenues from the 1.0% tax within the City Acquisition & Improvement Fund. The 2010 issuance refunded the 1999 bonds.
The City 2015 Sales and Use Tax revenue bondspledged revenues from the 0.5% tax within the City Street Tax Fund.

[2] The City Electric Revenue Bonds were repaid in full in 2011.

[3] The City 2003 Water and Sewer Revenue Refunding Bonds were repaid in 2010 and the Water and Sewer Revenue Loan were issued in 2010.

[4] The City 2010 Sales and Use Tax Revenue Bonds were paid off in 2018.

City of Glenwood Springs, Colorado
Demographic and Economic Statistics
Last Ten Years

Fiscal Year	Population[1]	Estimated Personal Income (*in thousands)*	Per Capita Income[2]	Unemployment Rate[3]
2011	9,535	548,453	57,520	13.6%
2012	9,651	563,097	58,346	10.3%
2013	9,789	661,736	67,600	7.4%
2014	9,807	702,897	71,673	6.1%
2015	9,855	712,073	72,255	4.0%
2016	9,998	730,854	73,100	3.6%
2017	9,908	751,680	75,866	2.8%
2018	9,962	755,777	75,866	3.2%
2019	9,979	810,913	81,262	2.7%
2020	9,963	823,571	82,663	6.0%

[1] State of Colorado, Department of Local Affairs, Division of Local Government, Denver, Colorado

[2] Bureau of Economic Analysis

City of Glenwood Springs, Colorado
Principal Employers
Current Year and Nine Years Ago

		2020			2011		
Employer	**Type of Business**	**Employee Range**	**Rank**	**Estimated Percentage of Total City Employement**	**Employee Range**	**Rank**	**Estimated Percentage of Total City Employement**
Valley View Hospital	Healthcare	1000-1250	1	16%	500-999	1	11%
Lowe's Home Improvement	Retail	250-499	2	5%	250-499	5	5%
Walmart	Retail	250-499	3	5%	250-499	3	5%
City Market	Retail	250-499	4	5%	250-499	7	5%
Colorado Mountain College	Schools	250-499	5	5%	250-499	2	5%
Target	Retail	250-499	6	5%	250-499	4	5%
Glenwood Caverns	Attraction	100-249	7	3%	100-249		
**Glenwood Hot Springs Resort	Attraction	100-249	8	3%	100-249	9	3%
Roaring Fork School District RE-1	Schools	100-249	9	3%	100-249		
City of Glenwood Springs	Government	100-249	10	3%	100-249	8	3%
Sports Authority	Retail	100-249			100-249	10	3%
Safeway Store	Retail	100-249			100-249	6	3%

*The State of The State of Colorado is not legally permissable to report the exact number of employees by employer. Instead, they provide the number of employees of each within a range. With that in mind, Glenwood Springs is electing to present the names of the top ten principal employers and the number of employees of each within that range.

** Includes pool, athletic club and lodge

Source: Colorado Department of Labor Website

City of Glenwood Springs, Colorado
Full-time Equivalent City Government Employees by Function/Program
Last Ten Years

Program	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General government	31.0	30.8	31.0	30.8	31.8	30.8	32.0	30.3	30.3	30.3
Public Transportation	68.0	64.0	59.3	59.3	61.3	65.4	64.7	63.7	63.3	61.3
Public Safety	8.0	6.0	6.0	6.0	7.0	7.0	7.3	6.5	6.5	6.5
Public Works	20.9	19.9	19.9	19.9	21.0	21.0	21.5	21.5	23.0	20.0
Culture and Recreation	28.0	27.0	27.0	26.0	26.0	26.0	25.2	28.2	30.2	26.0
Water	17.5	16.5	16.2	17.5	17.2	17.2	17.0	19.8	19.8	17.0
Electric	16.0	15.0	15.5	16.0	13.3	13.3	15.3	15.3	15.3	15.3
Airport	0.7	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.2
Broadband	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5
Landfill	4.8	3.8	3.8	3.8	3.6	3.6	3.6	5.0	5.0	9.0
Total:	194.87	183.55	179.25	179.84	181.36	184.29	186.65	190.27	193.5	192.1

Estimated by actual employment as of 12/31/2020
Source: City of Glenwood Springs Finance Department

City of Glenwood Springs, Colorado
Operating Indicators by Function/Program
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
General Government										
Building permits issued	338	330	319	363	327	332	388	435	533	349
Total permit valuation & letters of completion issued	$11,480,654	$44,041,112	$11,813,101	$16,185,988	$28,829,089	$36,533,178	$15,458,436	$87,397,529	$59,063,875	$33,624,029
Public Safety										
Number of crimes	4,419	3,879	3,535	3,333	3,981	4,846	4,060	4,044	4,540	3,850
Traffic Citations	1,952	1,448	1,576	1,322	1,818	2,054	2,399	1,088	1,036	432
Traffic Accidents	443	538	515	592	632	686	678	561	632	422
Public Works										
Electric Residential Customers	4,593	4,597	4,635	4,677	4,680	4,683	4,702	3,936	3,946	4,301
Residential Average Monthly KWH	684	655	681	652	629	639	619	605	607	664
Electric Large Commercial Customers	77	81	72	72	88	72	91	90	90	86
Large Commercial Average KWH	55,495	52,455	64,658	60,645	61,650	60,650	52,397	49,031	41,362	41,233
Total KWH Purchased (in '000s)	130,299	130,437	129,755	128,480	128,861	127,200	125,617	129,934	130,848	127,696
Residential Water Meters	2,943	2,950	2,947	2,957	2,958	2,959	2,969	2,981	2,997	3,007
Total Residential Consumption ('000 gallons)	315,638	379,254	351,819	328,952	324,963	329,707	331,818	385,563	352,272	376,186
Commercial Water Meters	462	460	460	468	474	477	482	493	491	490
Total Commercial Consumption ('000 gallons)	165,762	188,363	168,213	173,461	182,227	183,999	176,460	190,808	185,269	186,448
Transit										
Passengers										
Free bus routes										

Source: City of Glenwood Springs Departmental Data

City of Glenwood Springs, Colorado
Capital Asset Statistics by Program
Last Ten Years

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Parks and Recreation										
Number of Zoned Parks	22	23	23	23	25	25	26	27	27	27
Estimated Bike Paths (linear miles)	20	20	20	24	24	24	27	32	34	38
Estimated unpaved trails (linear miles)	9	9	9	11	11	11	14	15	17	17
Public Safety										
Police Stations	1	1	1	1	1	1	1	1	1	1
Licensed Police Vehicles	16	16	16	17	18	22	19	20	20	21
Fire Stations	2	2	2	2	2	2	2	2	2	2
Rural Fire District Stations	1	1	1	1	1	1	1	1	1	1
										2162
Public Works										
Streets (lane miles)	86	86	86	86	86	86	86	86	86	
Street lights	590	605	605	610	614	618	618	618	618	
										86
Transit										624
Ride Glenwood Bus Stops	20	20	20	20	23	24	24	24	24	
Utility										24
Electric sub stations	3	3	3	3	3	3	3	3	3	
										3

Source: City of Glenwood Springs Departmental Data

SINGLE AUDIT REPORTS AND SCHEDULES



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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

To the Members of City Council
City of Glenwood Springs
Glenwood Springs, Colorado

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of City of Glenwood Springs (the "City") as of and for the year ended December 31, 2020, and the related notes to the financial statements, which collectively comprise the City's basic financial statements and have issued our report thereon dated September 30, 2021.

Internal Control Over Financial Reporting

In planning and performing our audit on the financial statements, we considered the City's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the City's internal control. Accordingly, we do not express an opinion on the effectiveness of the City's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the City's financial statements will not be prevented or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe that a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

INDEPENDENT AUDITOR'S REPORT
To the Members of City Council
City of Glenwood Springs

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the City's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the City's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the City's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

McMahan and Associates, L.L.C.

McMahan and Associates, L.L.C.
September 30, 2021

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Certified Public Accountants and Consultants

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INDEPENDENT AUDITOR'S REPORT ON COMPLIANCE FOR EACH MAJOR FEDERAL PROGRAM AND ON INTERNAL CONTROL OVER COMPLIANCE REQUIRED BY THE UNIFORM GUIDANCE

To the Members of City Council
City of Glenwood Springs
Glenwood Springs, Colorado

Report on Compliance for Each Major Program

We have audited the City of Glenwood Springs's (the "City") compliance with the types of compliance requirements described in the U.S. Office of Management and Budget *OMB Compliance Supplement* that could have a direct and material effect on each of the City's major federal programs for the year ended December 31, 2020. The City's major federal programs are identified in the Summary of Auditor's Results section of the accompanying Schedule of Findings and Questioned Costs.

Management's Responsibility

Management is responsible for compliance with the requirements of laws, regulations, contracts, and grants applicable to its federal programs.

Auditor's Responsibility

Our responsibility is to express an opinion on compliance for each of the City's major federal programs based on our audit of the types of compliance requirements referred to above, We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Title 2 U.S. Code of Federal Regulations Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements of Federal Awards* (the "Uniform Guidance"). Those standards and the Uniform Guidance require that we plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about the City's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances.

We believe that our audit provides a reasonable basis for our opinion on compliance for each major federal program. However, our audit does not provide a legal determination on the City's compliance with those requirements.

INDEPENDENT AUDITOR's REPOR
To the Members of City Council
City of Glenwood Springs

Opinion on Each Major Federal Program

In our opinion, the City complied, in all material respects, with the types of compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended December 31, 2020.

Report on Internal Control Over Compliance

Management of the City is responsible for establishing and maintaining effective internal control over compliance with the types of compliance requirements referred to above. In planning and performing our audit, we considered the City's internal control over compliance with types of requirements that could have a direct and material effect on each major federal program to determine our auditing procedures that are appropriate in the circumstances for the purpose of expressing an opinion on compliance for each major federal program and to test and report on internal control over compliance in accordance with the Uniform Guidance, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, we do no express an opinion on the effectiveness of the City's internal control over compliance.

A *deficiency in internal control over compliance* exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program or on a timely basis. A *material weakness in internal control over compliance* is a deficiency, or a combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency in internal control over compliance* is a deficiency, or combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charges with governance.

Our consideration of the internal control over compliance was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over compliance that might be material weaknesses or significant deficiencies. We did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

The purpose of this report in internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of that testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.

McMahan and Associates, L.L.C.

McMahan and Associates, L.L.C.
September 30, 2021

City of Glenwood Springs, Colorado
SCHEDULE OF FINDINGS AND QUESTIONED COSTS
For the Year Ended December 31, 2020

Part I – Summary of Auditor's Results

Financial Statements:

Type of auditor's report issued	Unmodified
Internal control over financial reporting:	
Material weakness identified	None noted
Significant deficiency identified	None noted
Noncompliance material to financial statements noted	None noted

Federal Awards:

Internal control over major programs:	
Material weakness identified	None noted
Significant deficiency identified	None noted
Type of auditor's report issued on compliance for major programs	Unmodified
Any audit findings disclosed that are required to be reported in accordance with Title 2 U.S. Code of Federal Regulations Part 200	No
Major programs:	
Bus and Bus Facilities Formula Program	ALN #20.526
Coronavirus Relief Funds	ALN #21.109
Assistance to Firefighters	ALN #97.044
Dollar threshold used to identify Type A from Type B programs:	$750,000
Identified as low-risk auditee	Yes

Part II – Findings Related to Financial Statements

Findings related to financial statements as required by *Government Auditing Standards*	None noted
Auditor-assigned reference number	Not applicable

Part III – Findings Related to Federal Awards

Internal control findings	None noted
Compliance findings	None noted
Questioned costs	None noted
Auditor-assigned reference number	Not applicable

City of Glenwood Springs
SCHEDULE OF PRIOR AUDIT FINDINGS AND QUESTIONED COSTS
For the Year Ended December 31, 2020
(continued)

There were no findings for the fiscal year ended December 31, 2019.

City of Glenwood Springs
Schedule of Expenditures of Federal Awards
For the Year Ended December 31, 2020

Program Title	Federal ALN Number	Pass-through Entity Identifying Number		Expenditures	Expenditures to Subrecipients
Bureau of Land Management:					
Wildlife Urban Interface Community Fire Assistance	15.228	N/A		$ 10,000	
Total Bureau of Land Management				10,000	
Department of Homeland Security:					
Assistance to Firefighters	97.044	EMW-2019-FG-06454		918,214	$ 715,023
Total Department of Homeland Security				918,214	715,023
Department of Justice:					
Passed through Colorado Department of Public Safety:					
High Intensity Drug Trafficking Assistance	95.001	N/A		64,789	
Total Department of Justice				64,789	
Department of Transportation:					
Passed through Colorado Department of Transportation:					
Highway Planning and Construction	20.205	16-HA3-ZH-00021	**A**	1,854,198	
Bus and Bus Facilities Formula Program - Section 5339	20.526	19-HTR-ZL-00033	**B**	444,087	
Formula Grants for Rural Areas - Section 5311 :					
Formula Grants for Rural Areas - Section 5311	20.509	20-HTR-ZL-03106		306,020	
COVID-19 - Formula Grants for Rural Areas - Section 5311	20.509	20-HTR-ZL-03244		381,388	
Total - Formula Grants for Rural Areas - Section 5311				687,408	
National Infrastructure Investments	20.933	N/A		76,845	
Total Department of Transportation				3,062,538	
Department of the Treasury:					
Passed through Colorado Department of Labor:					
Coronavirus Relief Funds	21.019	CVRF CM-083		863,500	115,681
Total Department of The Treasury				863,500	115,681
Total				$ 4,919,041	$ 830,704

Additional Information for Clusters:	**Amount**
A *- Highway Planning and Construction Cluster*	$ 1,854,198
B *- Federal Transit Cluster*	444,087

Notes to the Schedule of Expenditures of Federal Awards for the year ended December 31, 2020

Note 1. Basis of Presentation:
The Schedule of Expenditures of Federal Awards includes the federal grant activity of The City and is presented on the modified accrual basis of accounting. The information in this schedule is presented in accordance with the requirements on of Regulations Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* ("Uniform Guidance"). Therefore some amounts presented in this schedule may differ from amounts presented in or used in the preparation of the general purpose financial statements.

Note 2. Determining the Name of Non-cash Awards Expended:
Fair market value of assistance at the time of disbursement to the recipient, or the assessed value provided by the state or federal agency.

Note 3. Indirect Facilities and Administration costs:
The City does not use the 10% de minimis cost rate allowed in Title 2 U.S. Code of Federal Regulations (CFR) Part 200.414, indirect (F & A) costs.

COLORADO
Department of Transportation
Division of Audit

SINGLE AUDIT
CERTIFICATION FORM

SECTION A – Entity Information

Entity Name City of Glenwood Springs		Fiscal Year Ending (mm/dd/yyyy) 12 / 31 / 2020
Street Address 101 W 8th Street		
City Glenwood Springs	*State* CO	*ZIP* 81601
Contact Name Yvette Gustad		*Title* Finance Director
Phone 970-384-6421	*Fax* 970-945-2597	*Email* yvette.gustad@cogs.us

SECTION B – Independent Auditor Information

Firm Name McMahan and Associates, L.L.C.		
Street Address 245 Chapel Place, Suite 300		
City Avon	*State* CO	*ZIP* 81620
CPA Name Paul J. Backes, CPA, CGMA		
Phone 970-845-8800	*Fax* 970-845-8108	*Email* mcmahan@mcmahancpa.com

SECTION C – Subject to Single Audit Requirements

☑ ***AUDIT ELIGIBLE*** **–** Our entity *is subject* to the Single Audit requirements. Our agency expended $750,000 or more in total Federal awards for the fiscal year ending noted above. We will submit the following to CDOT no later than September 30, 2021 (check one):

- ☑ Single Audit report and any management letters, if applicable.
- ☐ Copy of extension letter from the Office of the State Auditor. We will submit the Single Audit report and any management letters, if applicable, by the extension date.

SECTION D – Exempt from Single Audit Requirements

☐ ***EXEMPT STATUS*** – Our entity *is exempt* from the Single Audit requirements for the following reason (check one):

- ☐ Our entity expended less than $750,000 in total Federal awards for the fiscal year noted above.
- ☐ Our entity is a for-profit organization and is not subject to the Single Audit requirements.

Your entity is not required to submit any other documentation. However, you are required to have your records available for audit.

SECTION E – SIGNATURE SECTION

I am this entity's representative who is authorized to sign its financial documents. I certify that we are in compliance with Federal laws and regulations. The statements made herein are true and correct to the best of my knowledge.

Representative: Print:	Yvette Gustad	10/08/2021	Finance Director
Signature:	Yvette Gustad (Digitally signed by Yvette Gustad DN: cn=Yvette Gustad, o=City of Glenwood Springs, ou=Finance, email=yvette.gustad@cogs.us, c=US Date: 2021.10.08 13:54:30 -06'00')	Date	Title

Please email a signed copy of this form and any applicable required documents in PDF format to dot_audit@state.co.us, with the subject line "Single Audit Administration – <Entity Name>." Please submit documents to CDOT Audit no later than September 30, 2021.

Questions? Page two of this form contains some frequently asked questions. You may also contact us at:

MAIL: *Colorado Department of Transportation*
Audit Division
Attn: Single Audit Administration
2829 W. Howard Pl.,
Denver, CO 80204

PHONE: *303-512-4061*

EMAIL: *dot_audit@state.co.us*

COLORADO
Department of Transportation
Division of Audit

Single Audit Frequently Asked Questions

Who is required to submit the requested information to CDOT?	State Governments, Local Governments, and Non-Profits (non-Federal entities) who expend Federal awards provided by CDOT.
When should I submit a Single Audit Report?	2 CFR 200 Section 200.512 requires report submissions to be made within the earlier of 30 days after receipt of the auditor's report(s), or nine months after the end of the fiscal year. A Single Audit examination is required when an entity has expended more than $750,000 in Federal awards in the entity's fiscal year.
When can I claim an exemption to the Single Audit requirement?	Exemptions are allowed when non-Federal entities expend less than $750,000 in Federal awards during the entity's fiscal year or they are a for-profit organization.
How do I submit the required information?	Submit all documentation to the Audit Division, Colorado Department of Transportation, via email** dot_audit@state.co.us with the subject line: *Single Audit Administration – Entity Name.* All documents are required to be in PDF (Portable Document Format). ***We strongly encourage that all correspondence be emailed to us. We receive many responses to our audit requests and are required to electronically file them in our system. Please contact us if email (or alternatively, fax) is not possible.*
What is your mailing address and fax number?	Colorado Department of Transportation Audit Division Attn: Single Audit Administration 2829 W. Howard Pl., Denver, CO 80204 Fax: 303-757-9671
My question or concern is not answered here. Who can I contact for additional information?	CDOT's Audit Division Kyle Oliveria, Lead Auditor Phone: 303-512-4061 Email: dot_audit@state.co.us

Glenwood Springs Rural Fire Protection District
Glenwood Springs, Colorado

Financial Statements
December 31, 2020

Glenwood Springs Rural Fire Protection District
Financial Report
December 31, 2020

Table of Contents

	Page
INDEPENDENT AUDITOR'S REPORT	A1 - A2
Management's Discussion and Analysis	B1 - B3
Basic Financial Statements:	
Balance Sheet/Statement of Net Position	C1
Statement of Revenues, Expenditures and Changes In Fund Balance/Statement of Activities	C2
Notes to the Financial Statements	D1 - D10
Required Supplementary Information:	
Schedule of Revenues, Expenditures and Changes In Fund Balance - Budget and Actual - General Fund	E1

McMahan and Associates, L.L.C.
Certified Public Accountants and Consultants

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P.O. Box 5850, Avon, CO 81620

Web Site: www.mcmahancpa.com
Main Office: (970) 845-8800
Facsimile: (970) 845-8108
E-mail: mcmahan@mcmahancpa.com

INDEPENDENT AUDITOR'S REPORT

Board of Directors
Glenwood Springs Rural Fire Protection District
Glenwood Springs, Colorado

Report on the Financial Statements

We have audited the accompanying financial statements of the governmental activities and each major fund of the Glenwood Springs Rural Fire Protection District (the "District"), as of and for the year ended December 31, 2020, and related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

INDEPENDENT AUDITOR'S REPORT
Board of Directors
Glenwood Springs Rural Fire Protection District
Glenwood Springs, Colorado

Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities and each major fund of the Glenwood Springs Rural Fire Protection District as of December 31, 2020, and the respective changes in financial position thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Accounting principles generally accepted in the United States of America require that Management's Discussion and Analysis in Section B be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the Management's Discussion and Analysis in Section B in accordance with auditing procedures generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

The budgetary fund information in section E is not a required part of the basic financial statements but is supplementary information required by accounting principles generally accepted in the United States of America. The budgetary comparison information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements, or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements as a whole.

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the District's financial statements taken as a whole. The individual fund budgetary schedule in Section F is presented for purposes of additional analysis and is not a required part of the District's financial statements. The individual fund budgetary schedule is the responsibility of management and was derived from and related directly to the underlying accounting and other records used to prepare the financial statements. Such information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the basic financial statements as a whole.

McMahan and Associates, L.L.C.

McMahan and Associates, L.L.C.
September 24, 2021

MANAGEMENT'S DISCUSSION AND ANALYSIS

GLENWOOD SPRINGS RURAL FIRE PROTECTION DISTRICT

Management's Discussion and Analysis
December 31, 2020

As management of the Glenwood Springs Rural Fire Protection District (the "District"), we offer readers of the District's financial statements this narrative summary of the financial activities of the District for the fiscal year ended December 31, 2020.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the District's basic financial statements. The District's basic financial statements are comprised of two components: 1) financial statements; and 2) notes to the financial statements. These components are discussed below.

Financial statements: The financial statements are designed to provide readers with an overview of the District's finances, from both a short-term fund perspective and a long-term economic perspective.

The Balance Sheet/Statement of Net Position presents information on all the District's assets, liabilities (both short-term and long-term), and deferred inflows of resources with the difference of assets less liabilities and deferred inflows of resource reported as fund balance or net position. The Balance Sheet columns present the financial position focusing on short-term available resources and are reported on a modified accrual basis of accounting. The Statement of Net Position column presents the financial position focusing on long-term economic resources and is reported on a full accrual basis. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the District is improving or deteriorating.

The Statement of Revenues, Expenditures and Changes in Fund Balance/Statement of Activities shows how the government's fund balance and net position changed during the most recent fiscal year. Again, the Statement of Revenues, Expenditures and Changes in Fund Balance columns focus on short-term available resources and are reported on a modified accrual basis. The Statement of Activities column focuses on long-term economic resources and is reported on a full accrual basis.

The District's financial statements can be found in section C of this report.

Notes to the Financial Statements: The notes provide a background of the entity, certain required statutes, and accounting policies utilized by the District. They also provide additional information that will aid in the interpretation of the financial statements. The Notes to the Financial Statements can be found in section D of this report.

Financial Analysis of the District

Glenwood Springs Rural Fire Protection District's Net Position

	2020	2019
Assets:		
Current and other assets	$ 1,091,973	$ 1,031,215
Capital assets	430,567	464,541
Total Assets	1,522,540	1,495,756
Liabilities:		
Other liabilities	3,162	-
Total Liabilities	3,162	-
Deferred Inflows of Resources:		
Property tax revenues	1,055,687	998,140
Net Position:		
Net investment in capital assets	430,567	464,541
Restricted for emergencies	31,382	31,611
Unrestricted	1,742	1,464
Total Net Position	$ 463,691	$ 497,616

At the end of the 2020 fiscal year, the District is able to report positive net position balances. Overall, the District's net position decreased $33,925 from the prior year. This decrease was a result of a change in the intergovernmental agreement between the City and District, which resulted in a transfer of revenues less expenses to the City's fire department.

Glenwood Springs Rural Fire Protection District's Change in Net Position

	2020	2019
Revenues:		
Property taxes	$ 978,373	$ 981,722
Specific ownership taxes	65,602	70,235
Interest	2,086	1,828
Other revenue	3	6
Total Revenues	1,046,064	1,053,791
Expenses:		
Operating expenses	1,026,037	1,037,248
Interest expense	-	458
Depreciation expense	33,974	33,974
Treasurer's fees	19,978	19,668
Total Expenses	1,079,989	1,091,348
Change in Net Position	(33,925)	(37,557)
Net Position - Beginning of the Year	497,616	535,173
Net Position - End of the Year	$ 463,691	$ 497,616

Financial Analysis of the District (continued)

Property taxes were the most significant source of income, accounting for 94% of total revenues. Specific ownership taxes of $65,602 were also significant sources of revenue for the District, accounting for 6% of total revenues.

When compared to 2019, revenues decreased by $7,727 in 2020. This increase is attributed to decreases in assessed values in the District and decreased specific ownership taxes.

Fire services expenditures totaled $1,026,037, or, expressed as a percentage, represented 95% of total expenses incurred by the District in 2020. Of this amount $810,463 was paid by the City of Glenwood Springs, ("City"). Also included in this amount was Emergency services equipment expense of $202,070. Emergency services equipment expense has contributed to the City's equipment replacement fund pursuant to the District and City's intergovernmental agreement. The District's contribution is made in exchange for the District's use of City fire equipment.

The District maintains one fund. The General Fund, which accounts for the operations of the District. The General Fund's ending fund balance decreased due to the property tax revenues noted above. The General Fund's ending fund balance was $33,124.

Budget Variances in the General Fund: The District's expenditures were $55,090 under budget during fiscal year 2020.

Capital Assets: The District has title to Station #3 which has a cost of $1,019,222 and is being depreciated over an estimated useful life of 30 years. Additional information can be found in the Notes to the Financial Statements in Section D of this report.

Emergency services equipment expense represents payment to the City of Glenwood Springs for purchase of equipment which is owned by the City but available for use by the District.

Long-term Debt: In 2001, the District issued limited tax general obligation bonds in the amount of $1,130,000 to finance fire station construction and remodeling, fire equipment, and vehicle replacement. In December 2011, the District authorized an early call on its December 1, 2020 principal payment in the amount of $85,000. In December 2014, the District authorized an additional early call on its December 1, 2019 principal payment in the amount of $70,000. The District's debt was paid in its entirety at its December 1, 2019 maturity.

Next Year's Budget and Rates: The District's General Fund balance at the end of the 2020 fiscal year totaled $33,124. The District's 2021 budget anticipates an increase in fund balance in the amount of $0.

Request for Information

This financial report is designed to provide a general overview of the District's finances for all those with an interest in the government's finances. Questions concerning any of the information provided in this report or requests for additional information should be addressed to: Glenwood Springs Rural Fire Protection District, 101 W. Eighth Street, Glenwood Springs, CO 81601.

BASIC FINANCIAL STATEMENTS

Glenwood Springs Rural Fire Protection District
Balance Sheet/Statement of Net Position
December 31, 2020

	General Fund	Adjustments	Statement of Net Position
Assets:			
Cash and cash equivalents	30,764	-	30,764
Property tax receivable	1,061,209	-	1,061,209
Capital assets, net of accumulated depreciation	-	430,567	430,567
Total Assets	1,091,973	430,567	1,522,540
Liabilities:			
Accounts payable	3,162	-	3,162
Total Liabilities	3,162	-	3,162
Deferred Inflows of Resources:			
Property tax revenues	1,055,687	-	1,055,687
Fund Balances/Net Position:			
Fund Balance:			
Restricted	31,382	(31,382)	-
Unassigned	1,742	(1,742)	-
Total Fund Balance	33,124	(33,124)	-
Total Liabilities, Deferred Inflows and Fund Balance	1,091,973		
Net Position:			
Net investment in capital assets		430,567	430,567
Restricted		31,382	31,382
Unrestricted		1,742	1,742
Total Net Position		463,691	463,691

The accompanying notes are an integral part of these financial statements.

Glenwood Springs Rural Fire Protection District
Statement of Revenues, Expenditures and Changes in Fund Balance /
Statement of Activities
For the Year Ended December 31, 2020

	General Fund	Adjustments	Statement of Activities
Revenues:			
Property taxes	978,373	-	978,373
Specific ownership taxes	65,602	-	65,602
Interest	2,086	-	2,086
Other revenue	3	-	3
Total Revenues	1,046,064	-	1,046,064
Expenditures/Expenses:			
Fire services	1,026,037	-	1,026,037
Treasurer's fees	19,978	-	19,978
Depreciation expense	-	33,974	33,974
Total Expenditures/Expenses	1,046,015	33,974	1,079,989
Change in Fund Balance/Net Position	49	(33,974)	(33,925)
Fund Balance/ Net Position:			
Beginning of the Year	33,075	-	497,616
End of the Year	33,124	-	463,691

The accompanying notes are an integral part of these financial statements.

NOTES TO THE FINANCIAL STATEMENTS

I. Summary of Significant Accounting Policies

The Glenwood Springs Rural Fire Protection District (the "District") is a political subdivision incorporated under the laws of the State of Colorado. The function of the District is to provide fire protection and emergency medical services to the District and its inhabitants. The District's boundaries border the City of Glenwood Springs (the "City"). Therefore, in order to improve intergovernmental efficiencies, the District has signed an intergovernmental agreement to share capital and certain operating costs. This agreement is further explained in footnote V.B. – Intergovernmental Agreements.

The financial statements of the District have been prepared in conformity with U.S. generally accepted accounting principles ("GAAP") as applied to government units. The Governmental Accounting Standards Board ("GASB") is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. The more significant of the government's accounting policies are described below.

A. Reporting Entity

The District is governed by an elected Board, which is responsible for setting policy, appointing administrative personnel and adopting an annual budget in accordance with state statutes. As required by GAAP, the financial statements of the reporting entity include those of the District. No additional separate governmental units, agencies, or non-profit corporations are included in the financial statements of the District since none were discovered to fall within the oversight responsibility based upon the application of the following criteria: financial accountability, appointment of a voting majority of the organization's governing body, ability to impose its will on the organization, a potential for the organization to provide specific financial benefits or burdens, and fiscal dependency.

B. Government-wide and Fund Financial Statements

The District's basic financial statements include both government-wide (reporting the District as a whole) and fund financial statements (reporting the District's major funds). Both the government-wide and fund financial statements categorize primary activities as either governmental or business-type.

1. Government-wide Financial Statements

In the Balance Sheet/Statement of Net Position, the Statement of Net Position column is reported on a full accrual, economic resource basis, which recognizes all long-term assets and receivables, as well as, long-term debt and obligations. The District's net position is reported in three parts—net investment in capital assets, restricted, and unrestricted net position. The government-wide focus is on the sustainability of the District as an entity and the change in the District's net position resulting from the current year's activities.

I. Summary of Significant Accounting Policies (continued)

B. Government-wide and Fund Financial Statements (continued)

2. Fund Financial Statements

The financial transactions of the District are reported in individual funds in the fund financial statements. Each fund is accounted for by providing a separate set of self-balancing accounts that comprises its assets, liabilities, deferred inflows of resources, reserves, fund equity, revenues and expenditures/expenses. The fund focus is on current available resources and budget compliance. The District reports the following governmental fund:

The *General Fund* is the District's primary operating fund. It accounts for all financial resources not required to be accounted for in another fund.

C. Measurement Focus, Basis of Accounting and Financial Statement Presentation

Measurement focus refers to whether financial statements measure changes in current resources only (current financial focus) or changes in both current and long-term resources (long-term economic focus). Basis of accounting refers to the point at which revenues, expenditures or expenses are recognized in the accounts and reported in the financial statements. Financial statement presentation refers to classification of revenues by source and expenses by function.

1. Long-term Economic Focus and Accrual Basis

Governmental activities in the government-wide financial statements use the long-term economic focus and are presented on the accrual basis of accounting. Revenues are recognized when earned and expenses are recognized when incurred, regardless of the timing of the related cash flows.

2. Current Financial Focus and Modified Accrual Basis

The governmental fund financial statements use the current financial focus and are presented on the modified accrual basis of accounting. Under the modified, accrual basis of accounting, revenues are recorded when susceptible to accrual; i.e., both measurable and available. "Available" means collectible within the current period or soon enough thereafter (within 60 days of December 31) to be used to pay liabilities of the current period. Expenditures are generally recognized when the related liability is incurred. The exception to this general rule is that principal and interest on general long-term debt, if any, is recognized when due.

D. Financial Statement Accounts

1. Cash and Cash Equivalents

Cash and cash equivalents are defined as deposits that can be withdrawn at any time without notice or penalty and investments with original maturities of three months or less.

I. Summary of Significant Accounting Policies (continued)

D. Financial Statement Accounts (continued)

2. Receivables

All receivables are reported at their gross value and, where appropriate, are reduced by the estimated portion that is expected to be uncollectible.

3. Property Taxes

Property taxes are assessed in one year as a lien on the property, but not collected by the governmental entities until the subsequent year. In accordance with GAAP, the assessed but unavailable property taxes have been recorded as a receivable and as a deferred inflow of resources.

4. Capital Assets

Capital assets, which include buildings, are reported in the government-wide financial statements. Capital assets are defined by the District as assets with an initial cost of $5,000 or more and an estimated useful life of at least 3 years. Such assets are recorded at historical cost. Donated capital assets are recorded at estimated fair value at the date of donation.

Capital expenditures for projects are capitalized as projects are constructed. Interest incurred during the construction phase is capitalized as part of the value of the asset.

Capital assets are depreciated using the straight-line method over the following estimated useful lives:

Assets	Years
Buildings	30

5. Deferred Outflows and Inflows of Resources

Deferred outflows of resources represent a consumption of net position that applies to a future period and so will not be recognized as an outflow of resources (expenses/expenditures) until then. The District does not have any items that qualify for reporting in this category.

Deferred inflows of resources represent an acquisition of net position that applies to a future period and so will not be recognized as an inflow of resources (revenue) until that time. The District has one item that qualifies for reporting in this category, unavailable revenue from property taxes, reported in the Balance Sheet and on the Statement of Net Position. These amounts are deferred and recognized as an inflow from resources in the period that the amounts become available.

I. Summary of Significant Accounting Policies (continued)

D. Financial Statement Accounts (continued)

6. Fund Equity

Governmental accounting standards establishes fund balance classifications that comprise a hierarchy based primarily on the extent to which a government is bound to observe constraints imposed upon the use of the resources reported in governmental funds. Fund balance classifications include Non-spendable, Restricted, Committed, Assigned and Unassigned. These classifications reflect not only the nature of the funds, but also provide clarity to the level of restraint, such as external versus internal compliance requirements. Unassigned fund balance is a residual classification within the General Fund. The General Fund should be the only fund that reports a positive unassigned balance. In all other funds, unassigned fund balance is limited to negative residual fund balance. For further details on the various fund balance classifications, refer to Note IV.C.

E. Significant Accounting Policies

1. Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. Actual results could differ from those estimates.

2. Credit Risk

Receivables in the District's funds are primarily due from other governments. Management believes that the credit risk related to these receivables is minimal.

3. Restricted and Unrestricted Resources

When both restricted and unrestricted resources are available for use, it is the District's policy to use restricted resources first, then unrestricted resources as they are needed.

II. Reconciliation of Government-wide and Fund Financial Statements

A. Explanation of differences between the governmental fund Balance Sheet and the government-wide Statement of Net Position

The governmental fund Balance Sheet and the government-wide Statement of Net Position includes a reconciling column. Explanation of the adjustments included in the reconciling column is as follows:

Capital assets used in government activities are not financial resources and are, therefore, not reported in the funds. The adjustment is detailed as follows:

Capital assets	$1,019,222
Accumulated depreciation	($588,655)

II. Reconciliation of Government-wide and Fund Financial Statements (continued)

B. Explanation of differences between the governmental fund Statement of Revenue, Expenditures and Changes in Fund Balance and the government-wide Statement of Activities

The governmental fund Statement of Revenue, Expenditures and Changes in Fund Balance and the government-wide Statement of Activities includes a reconciling column. Explanation of the adjustments included in the reconciling column is as follows:

Some expenses reported in the Statement of Activities do not require the use of current financial resources and therefore are not recorded as expenditures in governmental funds.

Depreciation expense	$33,974

III. Stewardship, Compliance, and Accountability

A. Budgets and Budgetary Accounting

In the fall of each year, the District's Board of Directors formally adopts a budget with appropriations by fund for the ensuing year pursuant to the Colorado Local Budget Law. The budget for the governmental funds is adopted on a basis consistent with GAAP.

(1) For the 2020 budget, prior to August 25, 2019, the County Assessor sent to the District a certified assessed valuation of all taxable property within the District's boundaries. The County Assessor may change the assessed valuation on or before December 10, 2019 only once by a single notification to the District.

(2) On or before October 15, 2019, the District's management submitted to the District's Board of Directors a recommended budget which detailed the necessary property taxes needed along with other available revenues to meet the District's operating requirements.

(3) After a required publication of "Notice of Proposed Budget", the District adopted the proposed budget and an appropriating resolution which legally appropriated expenditures for the upcoming year.

(4) For the 2020 budget, prior to December 15, 2019, the District computed and certified to the County Commissioners a rate of levy that derived the necessary property taxes as computed in the proposed budget.

(5) After adoption of the budget resolution, the District may make the following changes: (a) supplemental appropriations to the extent of revenues in excess of the estimated in the budget; (b) emergency appropriations; and (c) reduction of appropriations for which originally estimated revenues are insufficient.

III. Stewardship, Compliance, and Accountability (continued)

A. Budgets and Budgetary Accounting (continued)

Taxes levied in one year are collected in the succeeding year. Thus, taxes certified in 2019 were collected in 2020 and taxes certified in 2020 will be collected in 2021. Taxes are due on January 1st in the year of collection; however, they may be paid in either one installment (no later than April 30th) or two equal installments (not later than February 28th and June 15th) without interest or penalty. Taxes which are not paid within the prescribed time bear interest at the rate of one percent (1%) per month until paid. Unpaid amounts and the accrued interest thereon become delinquent on June 15th.

The level of control in the budget at which expenditures exceed appropriations is at the fund level. All appropriations lapse at year end.

Encumbrance accounting, under which purchase orders, contracts, and other commitments for the expenditure of monies are recorded in order to reserve that portion of the applicable appropriation, is not employed by the District because it is at present considered not necessary to assure effective budgetary control or to facilitate effective cash planning and control.

B. TABOR Amendment - Revenue and Spending Limitation Amendment

In November 1992, Colorado voters amended Article X of the Colorado Constitution by adding Section 20, commonly known as the Taxpayer's Bill of Rights (“TABOR”). TABOR contains revenue, spending, tax and debt limitations which apply to the State of Colorado and local governments. TABOR requires, with certain exceptions, advance voter approval for any new tax, tax rate increases, a mill levy above that for the prior year, extension of any expiring tax, or tax policy change directly causing a net tax revenue gain to any local government.

Except for refinancing bonded debt at a lower interest rate or adding new employees to existing pension plans, TABOR requires advance voter approval for the creation of any multiple-fiscal year debt or other financial obligation unless adequate present cash reserves are pledged irrevocably and held for payments in all future fiscal years.

TABOR also requires local governments to establish emergency reserves to be used for declared emergencies only. Emergencies, as defined by TABOR, exclude economic conditions, revenue shortfalls, or salary or fringe benefit increases. These reserves are required to be 3% or more of fiscal year spending (excluding bonded debt service). The District has reserved a portion of its December 31, 2020, year-end fund balance in the General Fund for emergencies as required under TABOR in the amount of $31,382 which is the required reserve at December 31, 2020.

On November 8, 1994, the District’s electorate voted to allow the District to collect, retain, and expend all revenues generated. The remaining TABOR restrictions, which require voter approval for (1) new taxes or tax rate increases, and (2) new or additional debt, are still applicable.

The District's management believes it is in compliance with the financial provisions of TABOR. However, TABOR is complex and subject to interpretation. Many of its provisions, including the interpretation of how to calculate fiscal year spending limits, will require judicial interpretation.

IV. Detailed Notes on all Funds

A. Deposits and Investments

The District's deposits are entirely covered by federal depository insurance ("FDIC") or by collateral held under Colorado's Public Deposit Protection Act ("PDPA"). The FDIC insures the first $250,000 of the District's deposits at each financial institution. Deposit balances over $250,000 are collateralized as required by PDPA. As of year-end, the carrying amounts of the District's demand deposits were $30,764.

At year end, the District had the following cash and investments and maturities:

			Maturities	
Type:	**Rating**	**Carrying Amount**	**Less Than One Year**	**Less Than Five Years**
Deposits:				
Checking		$ 30,764		
		$ 30,764		
Financial Statement Captions:				
Cash and cash equivalents		$ 30,764		
		$ 30,764		

Interest Rate Risk. As a means of limiting its exposure to interest rate risk, the District diversifies its investments by security type and institution, and limits holdings in any one type of investment with any one issuer. The District coordinates its investment maturities to closely match cash flow needs and restricts the maximum investment term to less than five years from the purchase date. As a result of the limited length of maturities the District has limited its interest rate risk.

Credit Risk. State law and District policy limit investments to those authorized by State statutes including U.S. Agencies and 2a7-like pools. The District's general investment policy is to apply the prudent-person rule: Investments are made as a prudent person would be expected to act, with discretion and intelligence, to seek reasonable income, preserve capital, and, in general, avoid speculative investments. Financial institutions holding District deposits are required to be an eligible public depository under the requirements of Colorado's Public Deposit Protection Act.

The PDPA requires that all units of local government deposit cash in eligible public depositories; eligibility is determined by State regulators. Amounts on deposit in excess of Federal insurance levels must be collateralized. The eligible collateral is determined by the PDPA. The PDPA allows the institution to create a single collateral pool for all public funds. The pool is to be maintained by another institution or held in trust for all the uninsured public deposits as a group. The market value of the collateral must be at least equal to the aggregate uninsured deposits.

Concentration of Credit Risk. The District diversifies its investments by security type and institution. Investments may only be made in those financial institutions which are insured by the Federal Deposit Insurance Corporation, the Federal Home Mortgage Association, the Federal Savings and Loan Insurance Corporation, congressionally authorized mortgage lenders and investments that are federally guaranteed.

IV. Detailed Notes on All Funds (continued)

B. Capital Assets

Capital asset activity for the year ended December 31, 2020 was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
Governmental activities:				
Capital assets, being depreciated:				
Buildings and improvements	$ 1,019,222	$ -	$ -	$ 1,019,222
Total capital assets being depreciated	1,019,222	-	-	1,019,222
Less accumulated depreciation for:				
Buildings and improvements	(554,681)	(33,974)	-	(588,655)
Total accumulated depreciation	(554,681)	(33,974)	-	(588,655)
Total capital assets, being depreciated, net	$ 464,541	$ (33,974)	$ -	$ 430,567

The District had the following capital outlay and depreciation expense for the following functions:

	Depreciation
Governmental activities:	
General government	$ 33,974
Total - governmental activities	$ 33,974

C. Fund Balance Disclosures

The District classifies governmental fund balances as follows:

Non-spendable – includes fund balance amounts inherently non-spendable since they represent inventories, prepaid items, and long-term portions of loans receivable.

Spendable Fund Balance:

Restricted – includes fund balance amounts that are constrained for specific purposes which are externally imposed by providers, such as creditors, or amounts constrained due to constitutional provisions or enabling legislation. The District has reported restrictions of $31,382 for TABOR and $0 for debt service.

Committed – includes fund balance amounts that are constrained for specific purposes that are internally imposed by the government through formal action of the highest level of decision making authority, which is the Board of Directors. The District's original budget legislation begins with combining historical data, assessment of needs for the upcoming year and the District's platform to review and/or make changes to each department's budget. The budget is formally presented to the Board of Directors via an advertised public process for the review, revisions and final approval by year-end. All subsequent budget requests made during the year, after Board of Director approval, must be presented via a public process and again approved by the Board of Directors.

Assigned – includes spendable fund balance amounts that are intended to be used for specific purposes that are neither considered restricted or committed. Fund balance may be assigned by the Board of Directors or its management designees.

Unassigned – includes residual positive fund balance within the General Fund, which has not been classified within the other above mentioned categories. Unassigned fund balance may also include negative balances for any governmental fund if expenditures exceed amounts restricted, committed, or assigned for those specific purposes.

The District's restricted amounts are to be spent first when both restricted and unrestricted fund balance is available unless there are legal documents or contracts that prohibit this, such as grant agreements that require dollar for dollar spending. Additionally, the District would first use committed, then assigned, and lastly unassigned amounts when expenditures are made.

V. Other Information

A. Legal Claims

During the normal course of business, the District incurs claims and other assertions against it from various agencies and individuals. Management of the District and their legal counsel feel none of these claims or assertions are significant enough that they would materially affect the fairness of the presentation of the financial statements at December 31, 2020.

B. Intergovernmental Agreements

Effective January 1, 1991, the District entered into an intergovernmental agreement with the City of Glenwood Springs, Colorado (the "City"). This agreement was revised during 2018, and subsequently amended, and will automatically be renewed on a year-to-year basis until January 1, 2029, or unless either party gives a two year advance written notice of termination.

The basic provisions of this agreement are to transfer to the City all fire and ambulance protection services, to acquire and maintain equipment and facilities, to hire and manage all personnel and the related costs and benefits, to manage volunteers and the related costs and benefits, to transfer administrative costs, and to transfer all other ancillary expenditures. The District transfers revenue less expenses to the City as the District's share of fire and ambulance costs for the year.

The agreement shall remain in effect for the purpose of retiring the District's bonded indebtedness. In addition, in accordance with a separate intergovernmental agreement between the District and City, dated March 16, 1990, the District must transfer property known as Glenwood Springs Rural Fire Protection District Station No. 1 upon retirement of the General Obligation Refunding Bonds. This retirement occurred during 2000 and all general fixed assets were transferred and are accounted for by the City.

C. Volunteer Firefighters Pension Plan

In accordance with an intergovernmental agreement with the City (see Note V. B), the City assumes the pension obligation of all District volunteers, who are subject to all of the rights and responsibilities of other volunteers in the City's fire and ambulance departments. The District's volunteers are included in the City's Fire and Police Pension Association Plan.

D. Risk Management

In accordance with an intergovernmental agreement with the City (see Note V.B), the District is included in the City's risk management policy.

REQUIRED SUPPLEMENTARY INFORMATION

Glenwood Springs Rural Fire Protection District
Schedule of Revenues, Expenditures and Changes in Fund Balance
Budget and Actual
General Fund
For the Year Ended December 31, 2020

	2020			
	Original Budget	Final Budget	Actual	Final Variance Positive (Negative)
Revenues:				
Property taxes	1,045,299	1,045,299	978,373	(66,926)
Specific ownership taxes	55,700	55,700	65,602	9,902
Interest	1,500	1,500	2,086	586
Other revenue	-	-	3	3
Total Revenues	1,102,499	1,102,499	1,046,064	(56,435)
Expenditures:				
Fire services - operations	1,079,059	1,079,059	1,026,037	53,022
Treasurer's fees	22,046	22,046	19,978	2,068
Total Expenditures	1,101,105	1,101,105	1,046,015	55,090
Net Change in Fund Balance	1,394	1,394	49	(1,345)
Fund Balance - Beginning of the Year	-	-	33,075	-
Fund Balance - End of the Year	-	-	33,124	-

The accompanying notes are an integral part of these financial statements.

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Lease of Boat Ramp in West Glenwood

Action Requested: Approval of lease renewal

Department: Attorney

Presented By: Glenwood Springs Legal, Legal

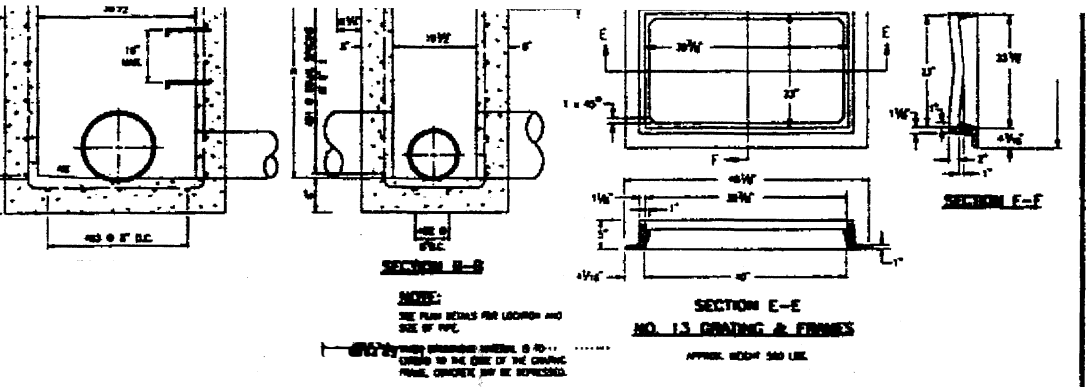
Background Info: Council has asked staff to bring renewals of leases of city-owned property to an agenda as they come due.

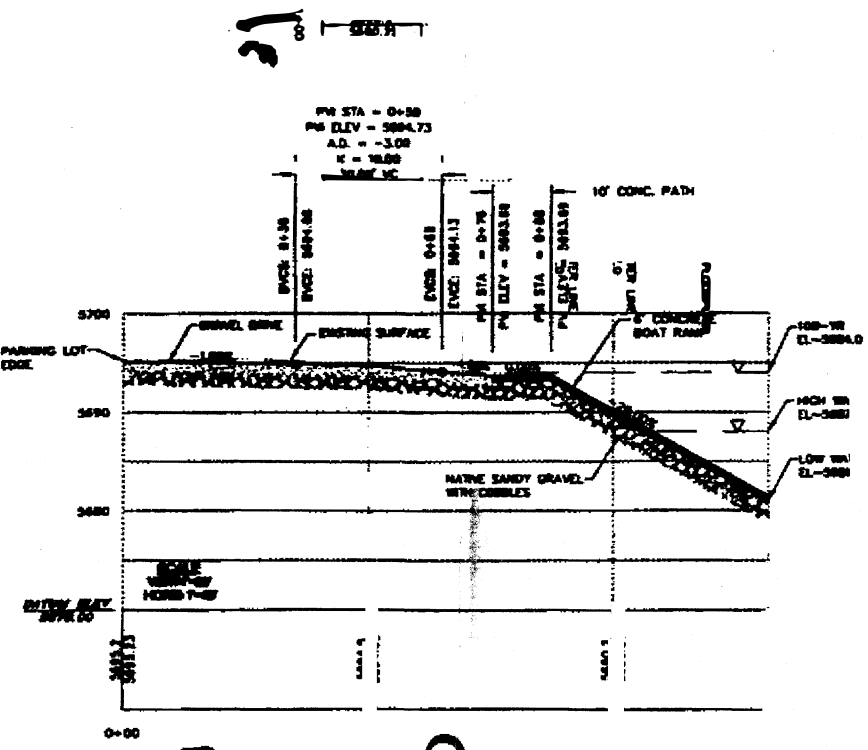
Glenwood Canyon Riverwalk, LLC, a Colorado Limited Liability Company has had an agreement with the City to access the Colorado River in West Glenwood for raft takeout and rafting operations since 2001.

The Lessee built the ramp per the original agreement and performs all necessary maintenance and repairs. The existing lease for $100 per year had a term of 20 years that is expiring.

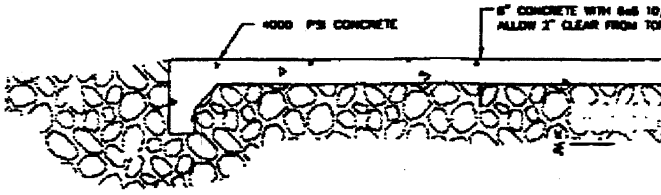
Issues: Whitewater Rafting operates its own ramp as well and pays the City $7,500 per year in rent. The Parks and Recreation Commission supports changing this lease's terms to match Whitewater's expiration date and lease amount.

Staff Recommendation: Staff defers to Council.



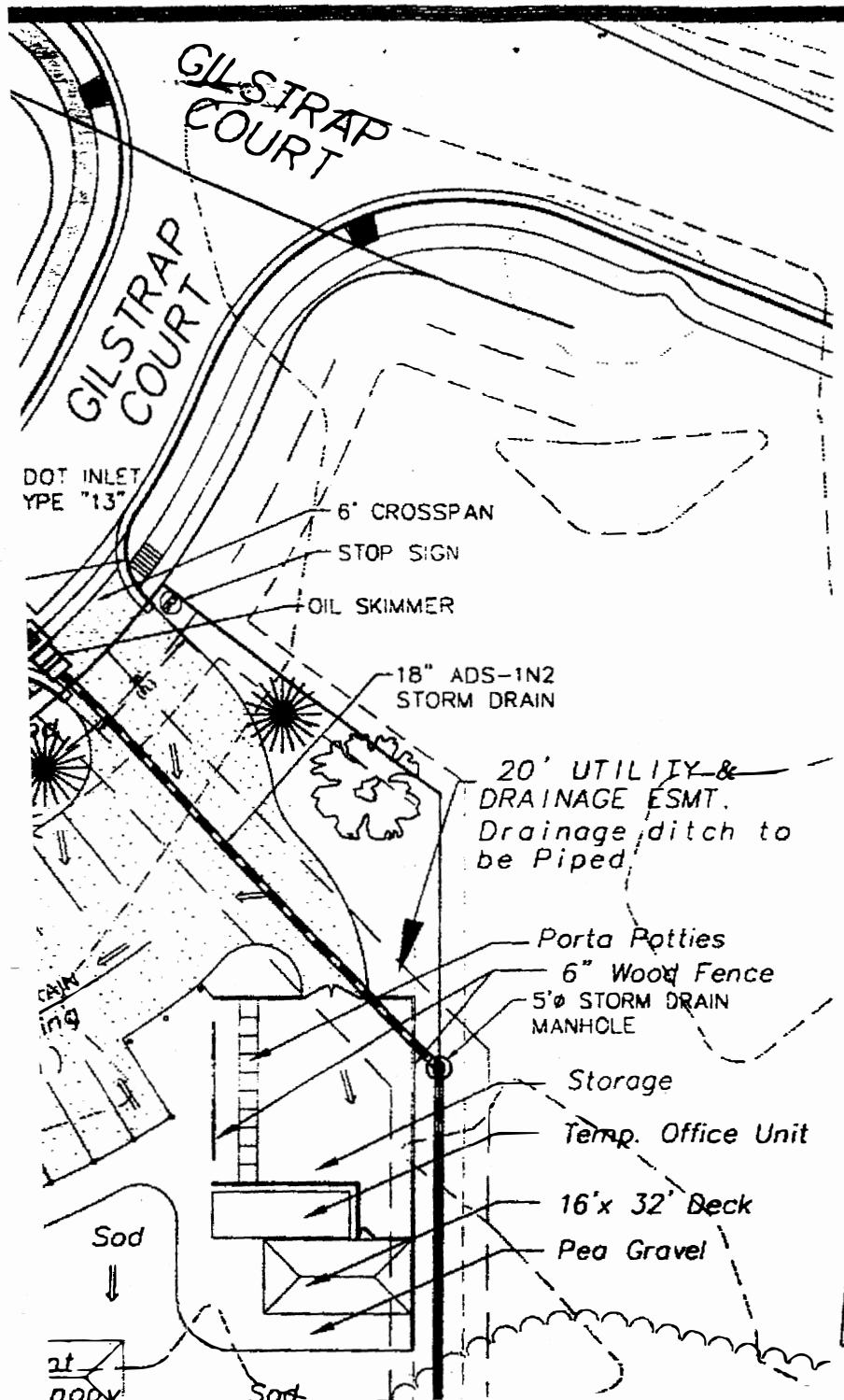


Ramp Pr



RAMP CROSS SECTION

EXHIBIT A, P.





GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

LEGEND

5 – Colorado Blue Spruce – 8'

4 – Autumn Purple Ash – 2" cal.

6 – Aspen – 2" cal.

Drainage Pattern Arrow

NO	DATE	REVISION	BY

DES. RDL
DR. DJW
CK. NOE
DATE 5/23/01
FILE: L016

HIGH COUNTRY ENGINEERING, INC.
820 COOPER AVENUE
GLENWOOD SPRINGS, CO 81601
PH (970) 945-8778 FX (970) 945-2555

AGREEMENT FOR LEASE OF PROPERTY

This AGREEMENT FOR LEASE OF PROPERTY ("Agreement") is made and entered into this ____ day of _____ 2021 by and between the CITY OF GLENWOOD SPRINGS, a Colorado home-rule municipality ("Lessor"), and GLENWOOD CANYON RIVERPARK, LLC, a Colorado limited liability limited company (the "Lessee"), each a "Party" to this Lease Agreement and collectively referred to as the "Parties".

WHEREAS, Lessor is the owner of real property located in Garfield County, Colorado as shown on Exhibit A attached hereto and incorporated herein by reference ("Leased Premises");

WHEREAS, Lessee is the owner of real property located in Garfield County, Colorado, more particularly described as Lot 6, Gilstrap Enterprises Subdivision as shown on Exhibit A; and

WHEREAS, pursuant to the Lease of City Owned Property for Construction and Use of Ramp between the Parties dated June 12, 2001 ("2001 Lease"), Lessee has constructed a soft boat ramp on the Leased Premises for purposes of raft takeout and rafting operations; and

WHEREAS, the 2001 Lease expired on May 17, 2021; and

WHEREAS, the Parties desire to enter into a new lease agreement that allows Lessee to use the Leased Premises for its rafting operations, subject to the terms and conditions set forth herein.

NOW THEREFORE, in consideration of the mutual covenants and considerations set forth herein, right granted to the City to install radio equipment on a tramway tower and the mutual promises contained herein, the Parties agree as follows:

1. Scope of Lease. Lessor hereby leases to Lessee the Leased Premises commencing on April 1, 2021 at 12:00 pm for purposes of the launch and removal of non-motorized watercraft as part of Lessee's rafting operations. Lessee may also use the Leased Premises as a picnic area for the rafting operations and is permitted to place tables, benches, and all other picnic furnishings within the Leased Premises subject to Lessor's approval. This Lease is specifically limited to the foregoing uses; no other uses are permitted without Lessor's written permission. The use of motorized vehicles within the Leased Premises is prohibited. Lessee may not restrict the use of the Leased Premises by the public.

2. Term. The Term of this Lease Agreement shall begin on April 1, 2021, and end on March 31, 2025.

3. Rent. Lessee shall pay Lessor annual rent of $7,500. Rent for the 2021 calendar year shall be due on the date this Lease Agreement is fully executed. Rent for the Premises in each subsequent year shall be paid by Lessee to the City, unless another date is stipulated in a City-produced invoice, on or before April 1st of each year. Should Lessee fail to pay such annual rent by April 1st in any year, or as otherwise stipulated by the Parties, this Lease shall immediately terminate without further action by the City. Nothing in this Section shall be read to preclude the City from accepting late payment of rent by the Lessee in the City's sole discretion.

4. Termination. At any time before the schedule expiration of the Term of this Lease Agreement, either party may terminate this Lease Agreement upon 30 days written notice to the other party, with or without prior notice.

5. Indemnification. The Lessee hereby agrees to indemnify, defend, and hold the City harmless against any and all claims and damages of any kind, including attorneys' fees, arising under this Lease or the Lessee's use of the Leased Premises. This provision shall survive the completion of the Term and the satisfaction, expiration or termination of this Lease Agreement.

6. Insurance. The Lessee shall be solely responsible for insuring its property located on the Leased Premises. In addition, the Lessee shall, at all times under this Lease Agreement, maintain bodily injury and property damage insurance covering the Leased Premises and any vehicles and/or personal property located thereon, as well as any persons using or present on such Leased Premises. Such coverages shall be in the amount of $1,000,000.00 per occurrence. The Lessee shall furnish the City a certificate of insurance evidencing such coverages upon demand and shall include the City as an additional insured.

7. Governmental Immunity. Nothing contained in this Lease shall be interpreted as a waiver or limitation of governmental immunity, to which the City is otherwise entitled under C.R.S. § 24-10-101, *et seq.*, as amended.

8. Maintenance. Any improvements, maintenance, including snow removal, and the security of the Leased Premises shall be the sole responsibility of the Lessee.

9. Compliance with Laws and Regulations. The Lessee shall at all times comply with any and all applicable laws and regulations regarding the Leased Premises and its use.

10. Assignment; Subletting. The Lessee shall not assign this Lease without prior written consent of the City.

11. Notice. Any notice or other communication required under this Lease shall be delivered in writing either in person or by U.S. mail to the following addresses, unless a new address is provided by either Party:

To City: City Manager
City of Glenwood Springs
101 West 8th Street
Glenwood Springs, CO 81601

To Lessee: Glenwood Canyon Riverpark LLC
P.O. Box 2152
Glenwood Springs, CO 81602

12. Savings. If any terms, covenants, conditions, or provisions of this Lease Agreement are for any reason held to be invalid or unenforceable, the remainder of this Lease Agreement shall not be affected, and each and every remaining term, covenant, condition, and provision shall remain valid and enforceable to the fullest extent permitted by law.

13. Binding Upon Successors. All terms of this Lease Agreement shall be binding upon and inure to the benefit of the Parties, as well as to their assignees and sublessees.

14. Jurisdiction and Venue. The laws of the State of Colorado shall govern the validity, performance, and enforcement of this Lease. Venue for any action instituted under this Lease Agreement shall be in Garfield County, Colorado.

15. Counterparts. This Lease Agreement may be executed in identical counterparts, and when each of the parties hereto has executed and delivered one or more counterparts of this Lease Agreement, this Lease Agreement shall be binding and effective, even though no single counterpart has been executed by both parties.

16. Entire Agreement. This Lease embodies the entire agreement between the parties hereto relative to the subject matter hereof. No amendment, alteration, modification of, or addition to the Lease will be valid or binding unless expressed in writing and signed by City and Tenant.

IN WITNESS WHEREOF, the Parties hereto have executed this Lease in duplicate originals, each of which shall have full force and effect.

CITY OF GLENWOOD SPRINGS, COLORADO

_____

ATTEST: Jonathan Godes, Mayor

_____

Ryan Muse, City Clerk

GLENWOOD CANYON RIVERPARK, LLC

_____

_____, _____

STATE OF COLORADO)
) SS.
COUNTY OF _____)

Subscribed before me this ___ day of _____ 2018, by _____, as _____ of GLENWOOD CANYON RIVERPARK, LLC, who acknowledged to me that he executed this Lease Agreement for the purposes herein stated.

_____
Notary Public

Glenwood Canyon River Park Lease Renewal Proposal

1) Comparison between current City Leases: A review of Attachment A outlines square footage comparisons between two existing City/Commercial Activity companies. Glenwood Canyon River Park's lease fees, highlighted in red, represent the application of the current price per square footage in these existing leases to the City-owned square footage implicated in any Glenwood Canyon River Park lease.
    a) Distinctions between leases.
        i) Amenities of Comparable Leases.
            (1) H2O Ventures: Building with restrooms and retail, bus parking with staging area, approximately 150 parking spaces., and ability to advertise other activities.
            (2) Whitewater Rafting, LLC: Use of City-owned riverbank to access boat ramp and private property.
            (3) Glenwood Canyon River Park: Use of City-owned riverbank to access boat ramp and private property.
        ii) Expenses incurred and City-benefiting revenues generated by Glenwood Canyon River Park.
            (1) Property taxes: Average $13,500/yr
            (2) Utilities: $6,000/yr
            (3) Landscaping and Snow removal: $8,000/yr
            (4) Property Insurance: $1,500/yr
            (5) Restrooms and Common area: $5,000/yr
            (6) Boat ramp upkeep and riverbank cleaning: $1,000/yr
            (7) City sales-tax revenue generated from retail sales from six separate entities.
        iii) Time spent on City-owned property.
            (1) H2O Ventures: Full-day occupancy and use by staff with multiple hours used by customers.
            (2) Whitewater Rafting, LLC: Amount of time it takes for guests to walk across approximately 110-feet of City-owned property and for staff to carry and load equipment.
            (3) Glenwood Canyon River Park: Amount of time it takes for guests to walk across approximately 16-feet of City-owned property. Equipment is loaded on private property.
2) Comparison between City-owned property and Land Management agency use agreements/permits: The use of Two Rivers Park and other Land Management agency boat ramps include developed and maintained ramps and multi-use spaces (including picnicking), restroom and changing facilities, administration and maintenance of permitting and use programs, and parking/staging areas.
    a) Distinction of use for Glenwood Canyon River Park specific to City-owned riverbank.
        i) All expenses and liabilities assumed by the private entity.

ii) Supportive infrastructure -- e.g.s. parking, picnicking, refuse removal, restrooms, boat ramp -- maintained and administered by the private entity.

b) Glenwood Canyon River Park members' use of Two RIvers Park.

i) Each member of the GCRP continues to pay into the City's permitting program and is responsible for annual use-fees associated with the use of Two River Park.

ii) With increased uses at Two Rivers Park, the access to private property downriver from Two Rivers Park -- even with recent site improvements -- takes substantial pressure off Two Rivers Park and helps ensure the City's intended experience for public users of Two Rivers Park's multi-use amenities.

3) Additionally, it is worth noting that the two apartments located on the property have served as employee housing units for a majority of the years since the building's construction.

4) Glenwood Canyon River Park proposed lease value based on an equitable evaluation of contemporary leaseholds held by H2O Ventures and Whitewater Rafting, LLC.

a) Full Use (Property Line to Property Line along bank): **$994 - $2,208.60/yr.**

b) Lease Term: **Ten year**.

c) Incorporation of appropriate current, best-practice municipal and private-party lease terms.

ATTACHMENT A

CURRENT CITY LEASE AGREEMENTS COMPARISON CHART

Current City Lease Agreements

H2O Ventures Lease		Sq. Ft.*	Lease Price	Price / Sq. Foot	
	Main Parking	65852	$30,000.00	$0.43	
	Bus Parking	1117			
	Building	2455			
		69424			

Whitewater Rafting LLC Lease		Sq. Ft.*	Lease Price	Price / Sq. Foot	
	Actual Used Area	14125	$7,500.00	$0.53	
	Full Use (Property Line to Property Line along bank)	38564	$7,500.00	$0.19	

GCRP COMPARISONS

RED TEXT = Potential Lease Price Comparison

Comparison #1		Sq. Ft.*	H2O Ventures Comparison (Price/Sq. Ft. Equivalent)		
	Current Use (Boat Ramp Area Only)	355			$153.41
	Full Use (Property Line to Property Line along bank)	5111			$2,208.60

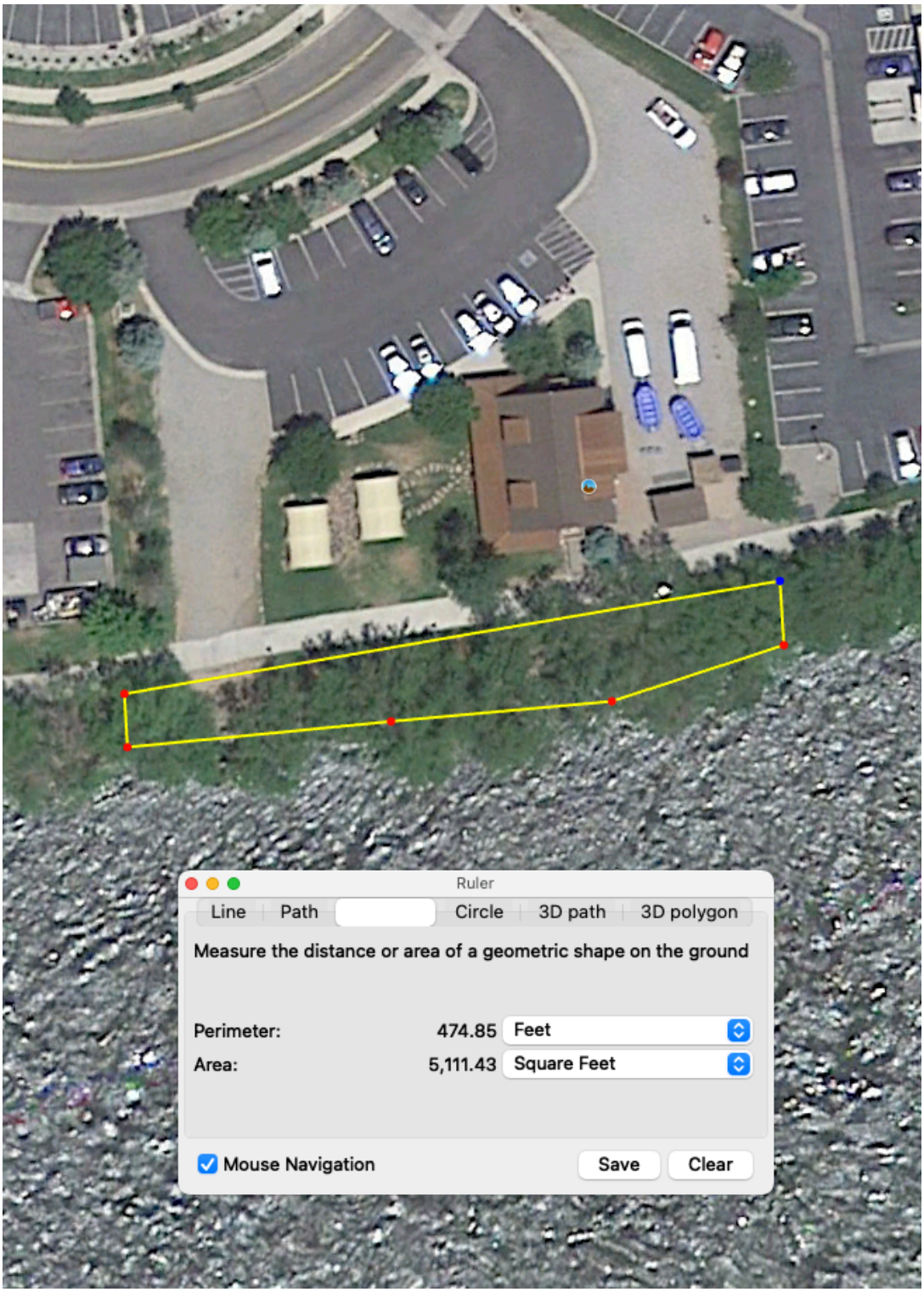
Comparison #2		Sq. Ft.*	Whitewater Rafting LLC Comparison (Price/Sq. Ft. Equivalent)		
	Current Use (Boat Ramp Area Only)	355			$188.50
	Full Use (Property Line to Property Line along bank)	5111			$994.00

* All Sq. Ft. numbers shown above are estimates that were gathered via Google Earth Sq. Ft. Tool. - Please review **Attachment B** for supporting information.

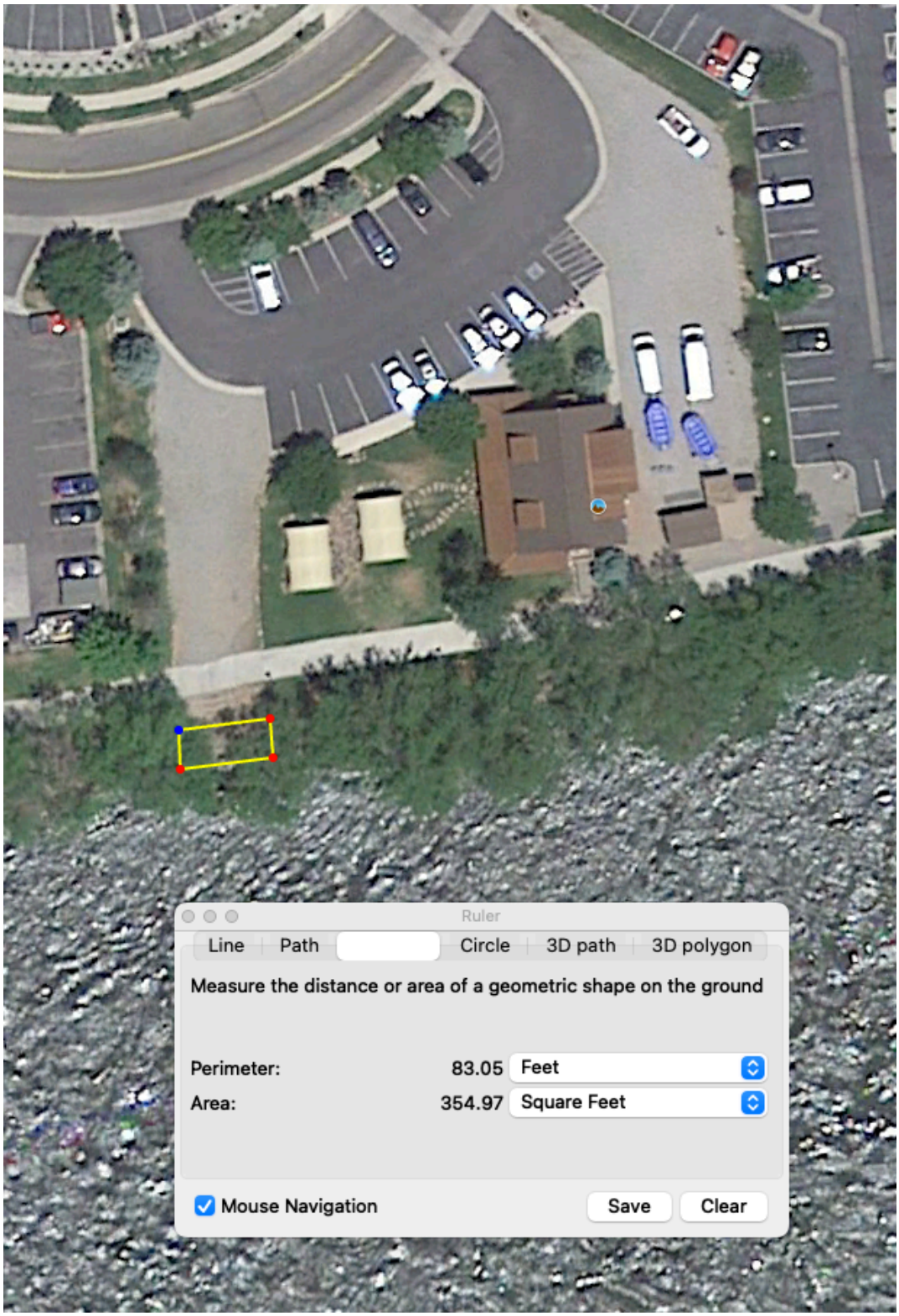
ATTACHMENT B

GOOGLE EARTH SQ. FT. AREA IMAGES OF:
GLENWOOD CANYON RIVER PARK
WHITEWATER RAFTING LLC
H2O VENTURES / GLENWOOD RECREATION CENTER

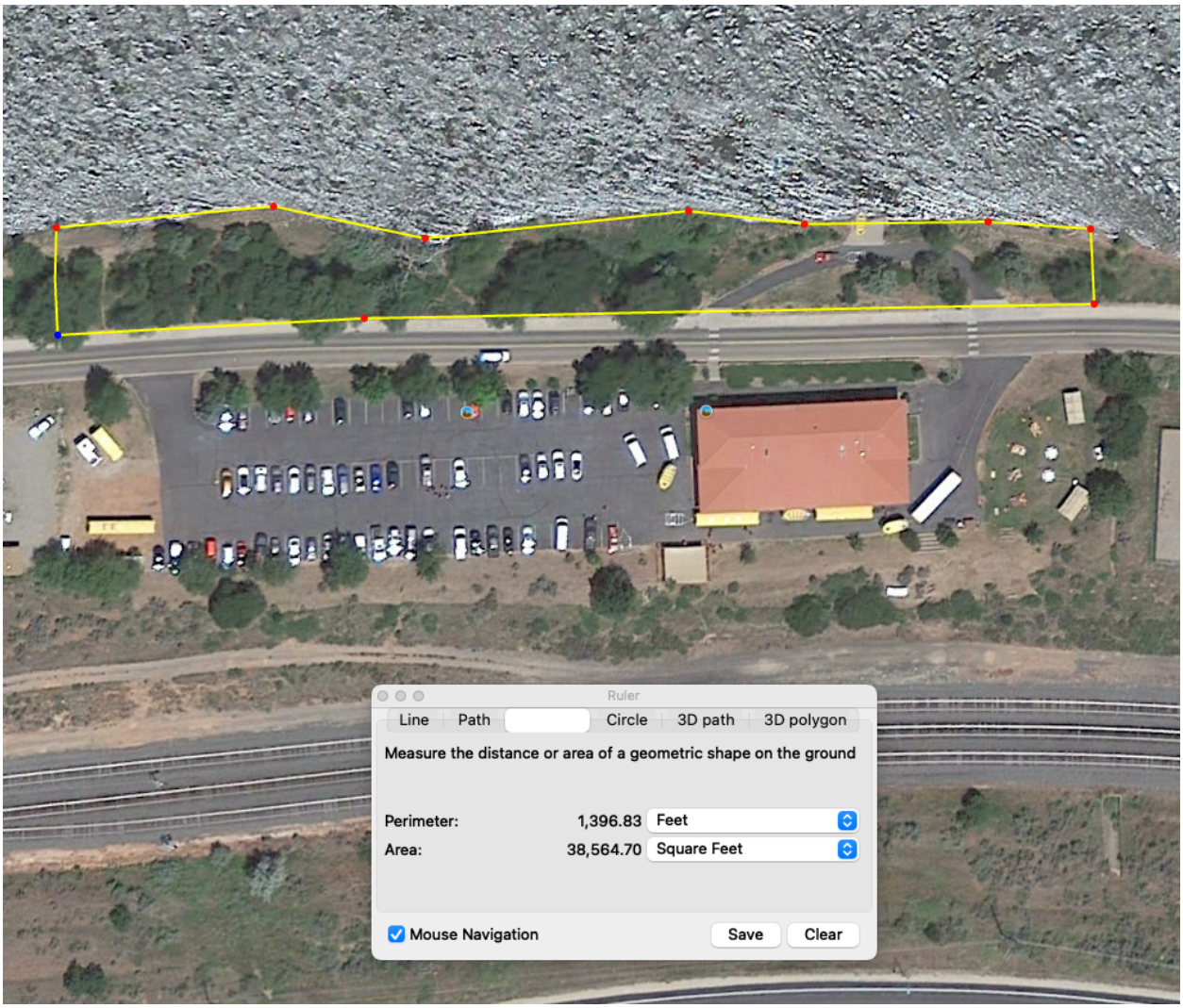
GLENWOOD CANYON RIVER PARK
(Highlighted Area = 5111 sq. ft.)



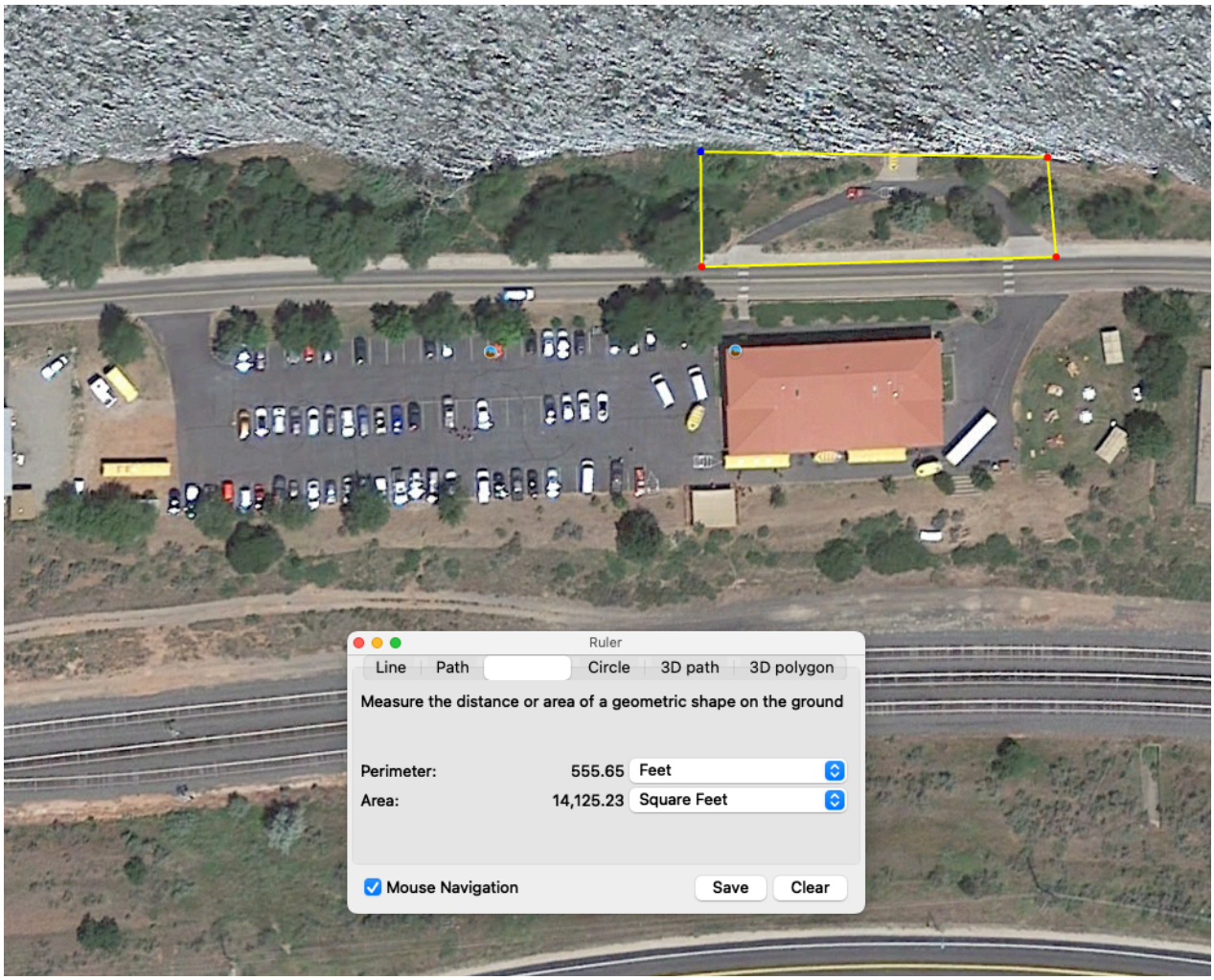
GLENWOOD CANYON RIVER PARK
(Highlighted Area = 355 sq. ft.)



WHITEWATER RAFTING LLC
(Highlighted Area = 38565 sq. ft.)



WHITEWATER RAFTING LLC
(Highlighted Area = 14125 sq. ft.)



H2O VENTURES / GLENWOOD RECREATION CENTER
Total Highlighted Area = 69424 sq. ft.
Main Parking = 65852 sq. ft.
Bus Parking = 1117 sq. ft.
Building/Retail Space = 2455 sq. ft.



ATTACHMENT C

GLENWOOD CANYON RIVER PARK BOAT RAMP PHOTOS









City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item:	Replacement of Fuel Tanks at the Airport
Action Requested:	Approve replacement of fuel tanks at the airport.
Department:	Parks & Recreation
Presented By:	Brian Smith, Recreation Director
Background Info:	Council directed staff to work on a solution that the airport commission supports. The attached memo outlines that solution.
Issues:	The replacement of the 100 Low-Lead tank is dependent upon a grant from CDOT Aeronautical.
Staff Recommendation:	Staff supports moving forward as outlined in the memo.

DAVID MERRITT
CHAIR, GLENWOOD SPRINGS AIRPORT COMMISSION
1504 MOUNTAIN DRIVE
GLENWOOD SPRINGS, CO 81601

MEMORANDUM

DATE: **11 November 2021**

TO: **Debra Figueroa**
Steve Boyd
Brian Smith

SUBJECT: **Purchase of Jet A Fueling Facilities**

At the November 4th, 2021 City Council Meeting, I expressed concern over the recommended purchase of this fueling facility absent a Pro Forma business assessment of the repayment ability. Additionally, a number of City Councilors expressed similar concerns, due to the amount of fuel which has been purchased by Classic Air Medical through the past few years. On Monday, after a meeting at the Airport with the Airport Commission, the Mayor, City Manager, senior management staff and a few airport users, I agreed to perform such an analysis.

What I determined is that Classic Air Medical, which bases one helicopter in Glenwood uses between 35,000 gallons and 50,000 gallons of fuel per year just for that helicopter. They have only been purchasing 10,000 to 12,000 gallons per year, based upon the limited capacity at KGWS (500 gallons) and their desire to always ensure that there is sufficient fuel for "tomorrow", should exigent circumstances arise. This does create some operational issues, necessitating refueling at another facility when enroute back to Glenwood. Thus, they would purchase significantly more fuel and improve their operational flexibility should we have a much-improved supply. Classic Air has confirmed through email exchanges that this would be their intent. I walked through this analysis with City staff including the airport manager, Parks and Recreation Director and staff, Finance Director and COO and everyone agreed with the analysis.

Additionally, there are regular other helicopter operations that will base out of KGWS for a few days to a week or so who bring their own fuel supplies due to a lack of facilities at KGWS. With the proposed new system, they would either purchase fuel from us, or pay an "flowage" charge to utilize their own supplies on our airport. We do occasionally get a Pilatus or similar Turbo Prop which requires JetA and has to go elsewhere to refuel. And any firefighting helicopter operations, which we hope don't occur, but should expect, would also benefit significantly from a secure fuel supply.

As we discussed in our review of the spreadsheet Pro Forma, I forecast a recovery period of 2 ½ years to 3 years on the purchase of this system. While I expressed skepticism last week due to a concern that the purchase would place an undue burden on the finances of the Glenwood Springs Municipal Airport, I wholeheartedly support the purchase as a good business. At the meeting on Monday evening the Airport Commission, which was duly noticed, the Airport Commission unanimously supported this action if the business Pro Forma justified it.

Currently the 100 low-led delivery system is operational, but the tank is aging and nearing end its life. We estimate its payback period to be longer than the Jet A tank, but cost savings exist if both systems are replaced at the same time from only staging for the install once and not having to purchase a second pedestal upon the eventual replacement of the low-lead tank. If implemented together the cost of each system would be approximately $225,000.

Also this week the Airport Manager and City Manager discussed with CDOT Aeronautical officials the possibility of a grant submittal that would potentially cover half of the cost of implementation. CDOT is confirming our airport's eligibility and should have an answer between one and two weeks from the date of this letter.

Based on the above City staff and the Airport Commission are in agreement to recommend to Council that we move forward with the installation of both tanks simultaneously, with the stipulation that if we are not awarded a grant from

CDOT the decision on whether to continue with the 100 low-lead tank would come back before Council.

If approved, staff is recommending the financing would come as a loan from available reserves in the Capital Project Fund. Staff will present Council with specific terms of the loan including its interest rate and repayment period which would be at market value. That would save the cost of underwriting a loan with the bank and pay market interest to the Capital Project Fund so it is not subsidizing an enterprise fund.

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Ordinance No. 14, Series of 2021; An Ordinance of the City Council of the City of Glenwood Springs, Colorado, Fixing and Certifying the Mill Levy on the 2021 Assessment for Collection in Fiscal Year 2022 and Providing for a Temporary Tax Credit (FIRST READING)

Action Requested: Approve Mill Levy Certifications for collection year 2022 for the City of Glenwood Springs.

Department: Finance

Presented By: Yvette Gustad, Finance Director

Background Info: Property Tax collection is set each year for the voter approved Mill Levy's. The amounts are set based on net assessed value of properties within the City of Glenwood Springs. This must be approved and certified to Garfield County by December 15th of each year. The numbers presented in Exhibit A reflect preliminary assessed valuation numbers provided by Garfield County and will be updated to actual when final assessments are received later in November.

Issues: None

Staff Recommendation: Staff recommends approval of the Ordinance to certify the Mill Levy for 2022.

ORDINANCE NO. 14

Series of 2021

AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, FIXING AND CERTIFYING THE MILL LEVY ON THE 2021 ASSESSMENT FOR COLLECTION IN FISCAL YEAR 2022.

WHEREAS, the City Council of the City of Glenwood Springs has adopted by Resolution 2021-30 the budget for fiscal year 2022 commencing January 1, 2022 and ending December 31, 2022; and

WHEREAS, the City Council of the Glenwood Springs desires to fix a mill levy pursuant to Section 9.7 of the Municipal Charter of the City of Glenwood Springs to enable the City to have sufficient revenues to pay the proposed expenditures for fiscal year 2022; and

WHEREAS, pursuant to Section 4.1 of the Municipal Charter of the City of Glenwood Springs, the City Council is required to levy taxes by ordinance.

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

Section 1. The mill levy for general purposes that shall be assessed upon each dollar of the assessed valuation of all taxable property within the corporate limits of the City of Glenwood Springs, shall be fixed at the rate set forth on **Exhibit A** attached hereto and incorporated herein.

Section 2. The City Manager is hereby directed to certify said mill levy to Garfield County as required by law, no later than the 16th day of December 2021.

INTRODUCED, READ ON FIRST READING, PASSED, AND ORDERED PUBLISHED BY TITLE ONLY THIS 18TH DAY OF NOVEMBER 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____
Jonathan Godes, Mayor

ATTEST:

_____
Ryan Muse, City Clerk

INTRODUCED, READ ON SECOND READING, AND ORDERED PUBLISHED BY TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND PUBLICATION THIS 2ND DAY OF DECEMBER 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____

Jonathan Godes, Mayor

ATTEST:

_____

Ryan Muse, City Clerk

EXHIBIT A

County Tax Entity Code _____ DOLA LGID/SID _____

CERTIFICATION OF TAX LEVIES for NON-SCHOOL Governments

TO: County Commissioners[1] of Garfield County, Colorado.

On behalf of the City of Glenwood Springs[A],

the City Council[B]

of the City of Glenwood Springs[C]

Hereby officially certifies the following mills to be levied against the taxing entity's GROSS assessed valuation of: $ 264,665,670

(GROSS[D] assessed valuation, Line 2 of the Certification of Valuation Form DLG 57[E])

Note: If the assessor certified a NET assessed valuation (AV) different than the GROSS AV due to a Tax Increment Financing (TIF) Area[F] the tax levies must be calculated using the NET AV. The taxing entity's total property tax revenue will be derived from the mill levy multiplied against the NET assessed valuation of: $ 263,830,740

(NET[G] assessed valuation, Line 4 of the Certification of Valuation Form DLG 57)

USE VALUE FROM FINAL CERTIFICATION OF VALUATION PROVIDED BY ASSESSOR NO LATER THAN DECEMBER 10

Submitted: _____ for budget/fiscal year 2022.
(no later than Dec. 15) (mm/dd/yyyy) (yyyy)

PURPOSE (see end notes for definitions and examples)	**LEVY**[2]		**REVENUE**[2]
1. General Operating Expenses[H]	8.603	mills	$ 2,269,736
2. <**Minus**> Temporary General Property Tax Credit/ Temporary Mill Levy Rate Reduction[I]	< >	mills	$ < >
SUBTOTAL FOR GENERAL OPERATING:	8.603	**mills**	**$** 2,269,736
3. General Obligation Bonds and Interest[J]		mills	$
4. Contractual Obligations[K]		mills	$
5. Capital Expenditures[L]		mills	$
6. Refunds/Abatements[M]	.01	mills	$ 2,638
7. Other[N] (specify): _____		mills	$
_____		mills	$
TOTAL: [Sum of General Operating Subtotal and Lines 3 to 7]	8.613	**mills**	**$** 2,272,374

Contact person: (print) Yvette Gustad Daytime phone: (970) 384-6421

Signed: _____ Title: Finance Director

Include one copy of this tax entity's completed form when filing the local government's budget by January 31st, per 29-1-113 C.R.S., with the Division of Local Government (DLG), Room 521, 1313 Sherman Street, Denver, CO 80203. Questions? Call DLG at (303) 864-7720.

[1] If the *taxing entity's* boundaries include more than one county, you must certify the levies to each county. Use a separate form for each county and certify the same levies uniformly to each county per Article X, Section 3 of the Colorado Constitution.
[2] Levies must be rounded to three decimal places and revenue must be calculated from the total *NET assessed valuation* (Line 4 of Form DLG57 on the County Assessor's **FINAL** certification of valuation).

_____ County Tax Entity Code

New Tax Entity? ☐ YES ☒ NO

CERTIFICATION OF VALUATION BY
Garfield County **COUNTY ASSESSOR**

DOLA LGID/SID _____

Date 08/21/2021

NAME OF TAX ENTITY: CITY OF GLENWOOD SPRINGS

USE FOR STATUTORY PROPERTY TAX REVENUE LIMIT CALCULATION ("5.5%" LIMIT) ONLY

IN ACCORDANCE WITH 39-5-121(2)(a) and 39-5-128(1), C.R.S., AND NO LATER THAN AUGUST 25, THE ASSESSOR CERTIFIES THE TOTAL VALUATION FOR ASSESSMENT FOR THE TAXABLE YEAR 2021 :

1.	PREVIOUS YEAR'S NET TOTAL TAXABLE ASSESSED VALUATION:	1. $249,518,400
2.	CURRENT YEAR'S GROSS TOTAL TAXABLE ASSESSED VALUATION: ‡	2. $264,665,670
3.	LESS TOTAL TIF AREA INCREMENTS, IF ANY:	3. $834,930
4.	CURRENT YEAR'S NET TOTAL TAXABLE ASSESSED VALUATION:	4. $263,830,740
5.	NEW CONSTRUCTION: *	5. $698,700
6.	INCREASED PRODUCTION OF PRODUCING MINE: ≈	6. $0
7.	ANNEXATIONS/INCLUSIONS:	7. $0
8.	PREVIOUSLY EXEMPT FEDERAL PROPERTY: ≈	8. $0
9.	NEW PRIMARY OIL OR GAS PRODUCTION FROM ANY PRODUCING OIL AND GAS LEASEHOLD OR LAND (29-1-301(1)(b), C.R.S.): Φ	9. $0
10.	TAXES RECEIVED LAST YEAR ON OMITTED PROPERTY AS OF AUG. 1 (29-1-301(1)(a), C.R.S.). Includes all revenue collected on valuation not previously certified:	10. $$666.77
11.	TAXES ABATED AND REFUNDED AS OF AUG. 1 (29-1-301(1)(a), C.R.S.) and (39-10-114(1)(a)(I)(B), C.R.S.):	11. $$2,617.74

‡ This value reflects personal property exemptions IF enacted by the jurisdiction as authorized by Art. X, Sec. 20(8)(b), Colo. Constitution

* New Construction is defined as: Taxable real property structures and the personal property connected with the structure.

≈ Jurisdiction must submit to the Division of Local Government respective Certifications of Impact in order for the values to be treated as growth in the limit calculation; use Forms DLG 52 & 52A.

Φ Jurisdiction must apply to the Division of Local Government before the value can be treated as growth in the limit calculation; use Form DLG 52B.

USE FOR TABOR "LOCAL GROWTH" CALCULATION ONLY

IN ACCORDANCE WITH ART.X, SEC.20, COLO. CONSTUTION AND 39-5-121(2)(b), C.R.S., THE Garfield County ASSESSOR CERTIFIES THE TOTAL ACTUAL VALUATION FOR THE TAXABLE YEAR 2021 :

1.	CURRENT YEAR'S TOTAL ACTUAL VALUE OF ALL REAL PROPERTY: ¶	1. $2,050,225,680
	ADDITIONS TO TAXABLE REAL PROPERTY	
2.	CONSTRUCTION OF TAXABLE REAL PROPERTY IMPROVEMENTS: *	2. $9,772,030
3.	ANNEXATIONS/INCLUSIONS:	3. $0
4.	INCREASED MINING PRODUCTION: §	4. $0
5.	PREVIOUSLY EXEMPT PROPERTY:	5. $9,570
6.	OIL OR GAS PRODUCTION FROM A NEW WELL:	6. $0
7.	TAXABLE REAL PROPERTY OMITTED FROM THE PREVIOUS YEAR'S TAX WARRANT: (If land and/or a structure is picked up as omitted property for multiple years, only the most current year's actual value can be reported as omitted property.):	7. $0
	DELETIONS FROM TAXABLE REAL PROPERTY	
8.	DESTRUCTION OF TAXABLE REAL PROPERTY IMPROVEMENTS:	8. $669,960
9.	DISCONNECTIONS/EXCLUSIONS:	9. $0
10.	PREVIOUSLY TAXABLE PROPERTY:	10. $1,988,660

¶ This includes the actual value of all taxable real property plus the actual value of religious, private school, and charitable real property.

* Construction is defined as newly constructed taxable real property structures.

§ Includes production from new mines and increases in production of existing producing mines.

IN ACCORDANCE WITH 39-5-128(1), C.R.S., AND NO LATER THAN AUGUST 25, THE ASSESSOR CERTIFIES TO SCHOOL DISTRICTS:
TOTAL ACTUAL VALUE OF ALL TAXABLE PROPERTY **$2,043,120,700**

IN ACCORDANCE WITH 39-5-128(1.5), C.R.S., THE ASSESSOR PROVIDES:
HB21-1312 ASSESSED VALUE OF EXEMPT BUSINESS PERSONAL PROPERTY (ESTIMATED): ** **$1,042,070**

** The tax revenue lost due to this exempted value will be reimbursed to the tax entity by the County Treasurer in accordance with 39-3-119.5(3), C.R.S.

NOTE: ALL LEVIES MUST BE CERTIFIED to the COUNTY COMMISSIONERS NO LATER THAN DECEMBER 15.

DLG 57 (Rev. 7/21)

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Ordinance No. 16, Series of 2021; An Ordinance of the City Council of the City of Glenwood Springs, Colorado, Fixing and Certifying the Mill Levy on the 2021 Assessment for Collection in Fiscal Year 2022 for the Glenwood Springs General Improvement District No. 1980 and Providing for a Temporary Tax Credit (FIRST READING)

Action Requested: Approve Mill Levy Certifications for collection year 2022 for the General Improvement District No. 1980.

Department: Finance

Presented By: Yvette Gustad, Finance Director

Background Info: Property Tax collection is set each year for the voter approved Mill Levy's. The amounts are set based on net assessed value of properties within the General Improvement District (GID). This must be approved and certified to Garfield County by December 15th of each year. The numbers presented in Exhibit A reflect preliminary assessed valuation numbers provided by Garfield County and will be updated to actual when final assessments are received.

Issues: None

Staff Recommendation: Recommend approval of Ordinance to certify the GID Mill Levy for 2022.

ORDINANCE NO. 16

Series of 2021

AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, FIXING AND CERTIFYING THE MILL LEVY ON THE 2021 ASSESSMENT FOR COLLECTION IN FISCAL YEAR 2022 FOR THE GLENWOOD SPRINGS GENERAL IMPROVEMENT DISTRICT NO. 1980.

WHEREAS, the City Council of the City of Glenwood Springs has established the Glenwood Springs General Improvement District No. 1980; and

WHEREAS, the City Council of the City of Glenwood Springs has adopted by Resolution 2021-30 the budget for fiscal year 2022 commencing January 1, 2022 and ending December 31, 2022; and

WHEREAS, the City Council of the Glenwood Springs, as the ex-officio Board of Directors of the Glenwood Springs General Improvement District No. 1980, desires to fix a mill levy pursuant to Section 9.7 of the Municipal Charter of the City of Glenwood Springs to enable the City to have sufficient revenues to pay the proposed expenditures for fiscal year 2022; and

WHEREAS, pursuant to Section 4.1 of the Municipal Charter of the City of Glenwood Springs, the City Council is required to levy taxes by ordinance.

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

Section 1. The mill levy for general purposes that shall be assessed upon each dollar of the assessed valuation of all taxable property within the Glenwood Springs General Improvement District No. 1980 shall be fixed at the rate set forth on **Exhibit A** attached hereto and incorporated herein.

Section 2. The City Manager is hereby directed to certify said mill levy to Garfield County as required by law, no later than the 15th day of December 2021.

INTRODUCED, READ ON FIRST READING, PASSED, AND ORDERED PUBLISHED BY TITLE ONLY THIS 18TH DAY OF NOVEMBER 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____

Jonathan Godes, Mayor

ATTEST:

_____

Ryan Muse, City Clerk

INTRODUCED, READ ON SECOND READING, AND ORDERED PUBLISHED BY TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND PUBLICATION THIS 2ND DAY OF DECEMBER 2021.

CITY OF GLENWOOD SPRINGS, COLORADO

_____

Jonathan Godes, Mayor

ATTEST:

_____

Ryan Muse, City Clerk

EXHIBIT A

County Tax Entity Code _____ DOLA LGID/SID _____

CERTIFICATION OF TAX LEVIES for NON-SCHOOL Governments

TO: County Commissioners[1] of Garfield County, Colorado.

On behalf of the G.I.D. #1980, (taxing entity)[A]

the City Council (governing body)[B]

of the City of Glenwood Springs (local government)[C]

Hereby officially certifies the following mills to be levied against the taxing entity's GROSS assessed valuation of: $ 22,818,170 (GROSS[D] assessed valuation, Line 2 of the Certification of Valuation Form DLG 57[E])

Note: If the assessor certified a NET assessed valuation (AV) different than the GROSS AV due to a Tax Increment Financing (TIF) Area[F] the tax levies must be calculated using the NET AV. The taxing entity's total property tax revenue will be derived from the mill levy multiplied against the NET assessed valuation of: $ 22,537,070 (NET[G] assessed valuation, Line 4 of the Certification of Valuation Form DLG 57)

USE VALUE FROM FINAL CERTIFICATION OF VALUATION PROVIDED BY ASSESSOR NO LATER THAN DECEMBER 10

Submitted: _____ for budget/fiscal year 2022.
(no later than Dec. 15) (mm/dd/yyyy) (yyyy)

PURPOSE (see end notes for definitions and examples)	**LEVY**[2]		**REVENUE**[2]
1. General Operating Expenses[H]	2.287	mills	$ 51,542
2. <**Minus**> Temporary General Property Tax Credit/ Temporary Mill Levy Rate Reduction[I]	< .170 >	mills	$ < 3,831 >
SUBTOTAL FOR GENERAL OPERATING:	2.117	**mills**	**$** 47,711
3. General Obligation Bonds and Interest[J]		mills	$
4. Contractual Obligations[K]		mills	$
5. Capital Expenditures[L]		mills	$
6. Refunds/Abatements[M]		mills	$
7. Other[N] (specify): _____		mills	$
_____		mills	$
TOTAL: [Sum of General Operating Subtotal and Lines 3 to 7]	2.117	**mills**	**$** 47,711

Contact person: (print) Yvette Gustad Daytime phone: (970) 384-6421

Signed: _____ Title: Finance Director

Include one copy of this tax entity's completed form when filing the local government's budget by January 31st, per 29-1-113 C.R.S., with the Division of Local Government (DLG), Room 521, 1313 Sherman Street, Denver, CO 80203. Questions? Call DLG at (303) 864-7720.

[1] If the *taxing entity's* boundaries include more than one county, you must certify the levies to each county. Use a separate form for each county and certify the same levies uniformly to each county per Article X, Section 3 of the Colorado Constitution.
[2] Levies must be rounded to three decimal places and revenue must be calculated from the total *NET assessed valuation* (Line 4 of Form DLG57 on the County Assessor's **FINAL** certification of valuation).

_____ County Tax Entity Code

New Tax Entity? ☐ YES ☒ NO

CERTIFICATION OF VALUATION BY
Garfield County **COUNTY ASSESSOR**

DOLA LGID/SID _____

Date 08/21/2021

NAME OF TAX ENTITY: GLENWOOD SPGS. IMP. DIST.

USE FOR STATUTORY PROPERTY TAX REVENUE LIMIT CALCULATION ("5.5%" LIMIT) ONLY

IN ACCORDANCE WITH 39-5-121(2)(a) and 39-5-128(1), C.R.S., AND NO LATER THAN AUGUST 25, THE ASSESSOR CERTIFIES THE TOTAL VALUATION FOR ASSESSMENT FOR THE TAXABLE YEAR 2021:

1.	PREVIOUS YEAR'S NET TOTAL TAXABLE ASSESSED VALUATION:	1. $20,885,340
2.	CURRENT YEAR'S GROSS TOTAL TAXABLE ASSESSED VALUATION: ‡	2. $22,818,170
3.	LESS TOTAL TIF AREA INCREMENTS, IF ANY:	3. $281,100
4.	CURRENT YEAR'S NET TOTAL TAXABLE ASSESSED VALUATION:	4. $22,537,070
5.	NEW CONSTRUCTION: *	5. $0
6.	INCREASED PRODUCTION OF PRODUCING MINE: ≈	6. $0
7.	ANNEXATIONS/INCLUSIONS:	7. $0
8.	PREVIOUSLY EXEMPT FEDERAL PROPERTY: ≈	8. $0
9.	NEW PRIMARY OIL OR GAS PRODUCTION FROM ANY PRODUCING OIL AND GAS LEASEHOLD OR LAND (29-1-301(1)(b), C.R.S.): Φ	9. $0
10.	TAXES RECEIVED LAST YEAR ON OMITTED PROPERTY AS OF AUG. 1 (29-1-301(1)(a), C.R.S.). Includes all revenue collected on valuation not previously certified:	10. $$131.65
11.	TAXES ABATED AND REFUNDED AS OF AUG. 1 (29-1-301(1)(a), C.R.S.) and (39-10-114(1)(a)(I)(B), C.R.S.):	11. $$9.70

‡ This value reflects personal property exemptions IF enacted by the jurisdiction as authorized by Art. X, Sec. 20(8)(b), Colo. Constitution

* New Construction is defined as: Taxable real property structures and the personal property connected with the structure.

≈ Jurisdiction must submit to the Division of Local Government respective Certifications of Impact in order for the values to be treated as growth in the limit calculation; use Forms DLG 52 & 52A.

Φ Jurisdiction must apply to the Division of Local Government before the value can be treated as growth in the limit calculation; use Form DLG 52B.

USE FOR TABOR "LOCAL GROWTH" CALCULATION ONLY

IN ACCORDANCE WITH ART.X, SEC.20, COLO. CONSTUTION AND 39-5-121(2)(b), C.R.S., THE Garfield County ASSESSOR CERTIFIES THE TOTAL ACTUAL VALUATION FOR THE TAXABLE YEAR 2021:

1.	CURRENT YEAR'S TOTAL ACTUAL VALUE OF ALL REAL PROPERTY: ¶	1. $113,440,680
	ADDITIONS TO TAXABLE REAL PROPERTY	
2.	CONSTRUCTION OF TAXABLE REAL PROPERTY IMPROVEMENTS: *	2. $0
3.	ANNEXATIONS/INCLUSIONS:	3. $0
4.	INCREASED MINING PRODUCTION: §	4. $0
5.	PREVIOUSLY EXEMPT PROPERTY:	5. $9,570
6.	OIL OR GAS PRODUCTION FROM A NEW WELL:	6. $0
7.	TAXABLE REAL PROPERTY OMITTED FROM THE PREVIOUS YEAR'S TAX WARRANT: (If land and/or a structure is picked up as omitted property for multiple years, only the most current year's actual value can be reported as omitted property.):	7. $0
	DELETIONS FROM TAXABLE REAL PROPERTY	
8.	DESTRUCTION OF TAXABLE REAL PROPERTY IMPROVEMENTS:	8. $669,960
9.	DISCONNECTIONS/EXCLUSIONS:	9. $0
10.	PREVIOUSLY TAXABLE PROPERTY:	10. $0

¶ This includes the actual value of all taxable real property plus the actual value of religious, private school, and charitable real property.

* Construction is defined as newly constructed taxable real property structures.

§ Includes production from new mines and increases in production of existing producing mines.

IN ACCORDANCE WITH 39-5-128(1), C.R.S., AND NO LATER THAN AUGUST 25, THE ASSESSOR CERTIFIES TO SCHOOL DISTRICTS:
TOTAL ACTUAL VALUE OF ALL TAXABLE PROPERTY **$111,499,140**

IN ACCORDANCE WITH 39-5-128(1.5), C.R.S., THE ASSESSOR PROVIDES:
HB21-1312 ASSESSED VALUE OF EXEMPT BUSINESS PERSONAL PROPERTY (ESTIMATED): ** **$223,810**

** The tax revenue lost due to this exempted value will be reimbursed to the tax entity by the County Treasurer in accordance with 39-3-119.5(3), C.R.S.

NOTE: ALL LEVIES MUST BE CERTIFIED to the COUNTY COMMISSIONERS NO LATER THAN DECEMBER 15.

DLG 57 (Rev. 7/21)

City Council
STAFF REPORT
City of Glenwood Springs
November 18, 2021

Agenda Item: Hotel Colorado Lighting Ceremony

Action Requested: Update to Council

Department: City Administration

Presented By: Debra Figueroa, City Manager

Background Info: The Hotel Colorado Lighting Ceremony will take place on Friday, November 26th. 6th Street will be closed between Pine and Olive between 10 AM - Midnight. Entertainment on the stage will end by 7:30 PM, but the street will remain closed while for takedown and for pedestrians looking at the lights.

Issues: NA

Staff Recommendation: NA