



PRELIMINARY DRAINAGE REPORT

**100 CAPITOL ST.
EAGLE, COLORADO**

PREPARED FOR:

Eagle Multi-Family, LLC
100 Capitol St
Eagle, CO 81631

PREPARED BY:

Timberline Engineering, LLC.
218 E. Valley Road
STE104-PMB177
Carbondale, Colorado 81623

January 26, 2026

CERTIFICATION

Engineers Certificate:

I hereby certify that this Drainage Report (plan) for the design of 100 Capitol St. was prepared by me (or under my direct supervision) in accordance with the provisions of the Town of Eagle Municipal Code for the owners thereof. I understand that the Town of Eagle does not and will not assume liability for the drainage facilities designed by others.

David John Anderson License No. 39276
Registered Professional Engineer, State of Colorado



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I. INTRODUCTION

A. BACKGROUND

The project is identified as Capitol & Grand. The site is composed of several city lots which make up one city block. The purpose of the project is to remove all existing structures and infrastructure and construct a group of multi-story single-family residences which will be placed on top of a below grade parking garage. There are no known known city reviews for this parcel.

B. PROJECT LOCATION

The project is Block 13 in the Town of Eagle, CO. The address is 100 Capitol St. Intersecting streets surrounding the property include Grand Ave. on the north, Capitol St. on the west, E. 2nd St. on the south, and E. Howard St. on the east. There is no access to the site from Grand Ave. The site is accessible from the 3 remaining streets. The proposed conditions will only allow for vehicle access from the north end of Howard St. where there will be an entrance and ramp to a parking garage below the site. See appendix for project location map.

C. PROPERTY DESCRIPTION

The site includes 20 original town lots and the alley between Capitol St. and Howard St. This is Block 13 of the Town of Eagle and has a total area of 66,500 sf, or 1.53 acres. The current zoning includes a combination of Commercial Mixed Use 1 (CMU1) and Old Town Residential (OTR). The property is planned to be rezoned to be CMU1 entirely. The site is owned and/or operated by:

Eagle MultiFamily, LLC
PO Box 421
Gypsum, CO 81637

During summer of 2025 there were 5 single-family residences on the south half of the site. The north half of the site was grassy open space with traces of residences which were removed some time ago. Demolition and removal of remaining structures is ongoing currently. Other existing ground cover includes gravel and asphalt parking areas and the gravel alley. There is also a variety of deciduous and coniferous trees surrounding the residences. Soils have been identified as Hydrologic Soil Group B. The site slopes in a north and westerly direction. There are no existing drainage or irrigation facilities on this site. There are no known drainage or irrigation tracts or easements.

The existing site has a calculated imperviousness of 20%. The proposed site is 76% calculated imperviousness. The proposed disturbance area is the entire site of 1.53 ac.

The Town of Eagle plans to change Grand Ave. with construction anticipated to commence in spring of 2027. The Capitol Flats project expects to have a similar construction schedule. The projects have many improvements in common and will

require continuous coordination. Some of these elements include drainage, retaining walls and sidewalks along the frontage along Grand Ave. Additionally, the Town of Eagle plans to make improvements to E. 2nd St. Street frontage and drainage improvements will need to be coordinated as plans develop and construction proceeds.

D. PREVIOUS INVESTIGATIONS / REPORTS

The Town of Eagle provided the following regional drainage studies associated with the site:

1. Town of Eagle, Colorado: Old Town Drainage Master Plan, Icon Engineering, Inc. 8100 South Akron Street, Suite 300, Englewood, Colorado 80112 dated August 2002.
2. CDOT & the Town of Eagle: I-70 Eagle Interchange Upgrade Final Drainage Report, Atkins, 4601 DTC Boulevard, Suite 700, Denver, Colorado 80237.

FEMA FIRM indicates there is no flood hazard associated with the site.

II. DRAINAGE SYSTEM

A. EXISTING DRAINAGE CONDITIONS.

The existing drainage basins are shown on the Existing Drainage Map, which is included as an appendix to this report. Stormwater runoff for this site begins at the intersection of E. 2nd St. and Church St. Above this point, topography and drainage structures route stormwater around the site. Below this point, stormwater from the surrounding areas gathers and flows across the site from southeast to northwest. There are no curbs or gutters surrounding the site. As such, storm water generated above the property flows through the site over the surface. A crown in E. 2nd St. creates a drainage basin boundary from which half of the street drains toward the site. Drainage from Howard St. also flows onto the site.

On the site, topography is such that stormwater drainage is split; approximately half of the drainage flows north toward the round-about. The remaining stormwater flows west through town. Both drainage paths deliver stormwater to the Eagle River a short distance away via existing storm sewers or over the surface. Stormwater runoff generated from the existing site is:

Historic Flow Rate: Site 1.53 ac			
Event	10-yr	25-yr	100-yr
Flow Rate (cfs)	0.54	1.16	2.13

B. PROPOSED DRAINAGE SYSTEMS

Onsite, stormwater will be captured using roof and area drains. Runoff will be piped through the structure and parking garage to a discharge point at the northeast corner

of the site. This discharge will be tied directly to a new storm sewer in Grand Ave. which ultimately ties to the existing drainage system in the roundabout.

Proposed offsite drainage improvements include adding curb & gutters, drain inlets and storm sewers to gather and direct stormwater from the surrounding areas to existing infrastructure.

As mentioned above, the Town of Eagle is planning for the Grand Avenue Project. This project includes enlarging and reconstructing Grand Ave. from the roundabout, toward town, beyond E. 2nd St. These future conditions have been considered and are shown in the proposed plans. There is an existing storm drain at the southwest side of the roundabout which carries stormwater to the Eagle River. The Grand Ave. project does not indicate making changes to the existing storm sewer.

As part of the Capitol Project, drainage inlets are proposed to be installed on Howard St and Grand Ave. These locations are shown on the Proposed Drainage Map (see Appendix) and identified as design points 1, 2& 3, respectively. A proposed storm sewer will tie in these inlets and the site discharge (design point B1) to the existing storm sewer at the roundabout. The existing storm sewer discharges to the river past the northwest edge of the roundabout. There are no other changes planned for the existing storm drain.

Changes to E. 2nd St. are also being planned by the Town. These changes are reflected in the Capitol plans with respect to driving lanes, parking, and curb & gutters. However, the Town plans to add a storm sewer and a drain inlet on the street which is not addressed. Further coordination will be required as the Town drainage plans and construction schedules develop. These changes will not adversely affect drainage associated with the Capitol project or other downstream structures.

Onsite runoff generated from roofs, walks and landscaping will be collected at the courtyard level and piped to discharge point B1 directly. Permanent Sand/oil separation devices will be sized appropriately and installed at the lower level of the parking garage. Drainage from all parking and driving areas within the building will be routed to the treatment device. Treated outflow from this device will be pumped to the discharge location.

Temporary erosion control and pollution control devices will be permitted and in place prior to construction. See appendix for Storm Water Management Plan.

All drainage features, including pipes, curb & gutters, valley pans, inlet & outlet structures, etc., are to be inspected regularly to be sure they are in place, clean and free from debris. Any debris should be removed and disposed of properly offsite. Accumulated sediment is to be removed from the system as required. Minimally, inspections should be performed biannually, once in the spring and once in the fall. Additional inspections should occur after major storm events such as heavy rains, winds, and hailstorms, which may cause damage to the system or produce extra debris. Lawn maintenance shall include removal of lawn clippings, leaves, sticks and

debris. All onsite proposed drainage features will be owned and maintained by the property owner.

III. ANALYSIS AND CRITERIA

Runoff for the hydrological design calculations is determined using NOAA website and software: NOAA Atlas 14, Volume 8 Version 2, Point Precipitation Frequency. Data is included in the appendix.

The drainage facilities are designed using storm recurrence intervals of 10-year and 100-year, for the minor and major events, respectively. The Rational Method is used for runoff calculation estimates. The procedure for determining time of concentration and runoff coefficients is in accordance with the Urban Storm Drainage Criteria Manual. Excel workbooks, provided by MHFD (Mile High Flood District), were used for runoff calculations. Peak Runoff Predicted by the Rational Method, Version 3.00, Urban Drainage and Flood Control District, Denver is included in the index.

Hydraulic design calculations for the drainage facility are analyzed using the same MHFD software. The Combined Peak Runoff Calculations for Inlets and Storm Drains is included in the appendix. Calculations indicate the 100-yr storm event will be captured and contained in the proposed and existing storm sewer.

IV. CONCLUSION

The drainage facilities are designed in accordance with the Town of Eagle criteria and direction. The proposed design presented in this report can manage the minor and major storm runoff if properly constructed and maintained. It will protect subject property and surrounding properties from stormwater damage. The site is not in a floodplain; therefore, no regulations are applicable.

Appendix A

Project Location Map



Project Location Map: Town of Eagle, Colorado

Appendix B

Precipitation Data



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

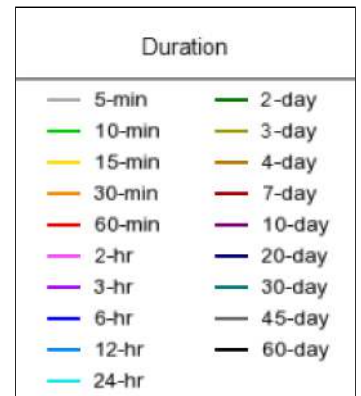
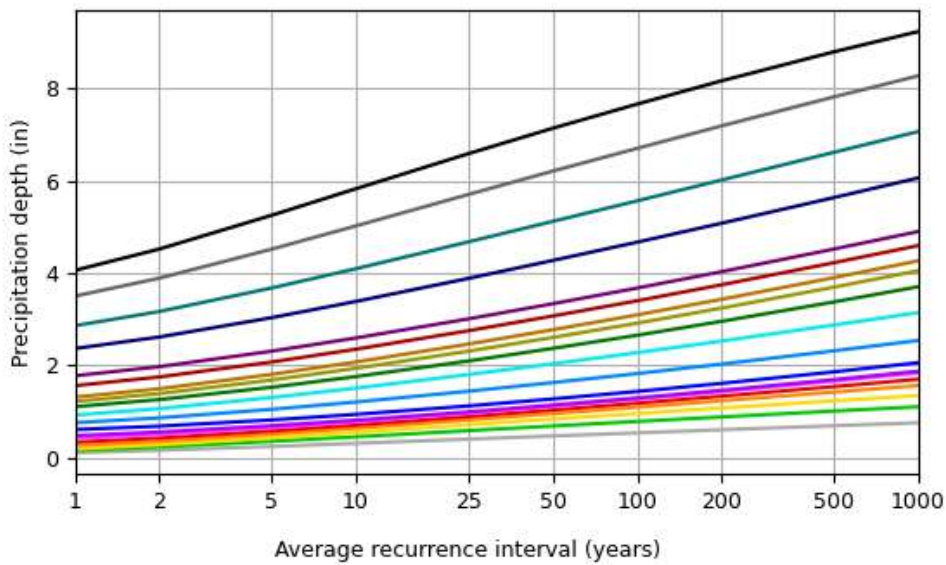
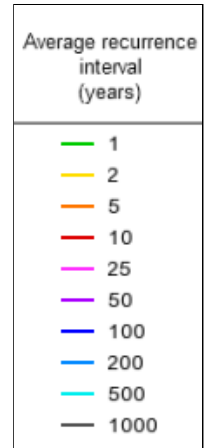
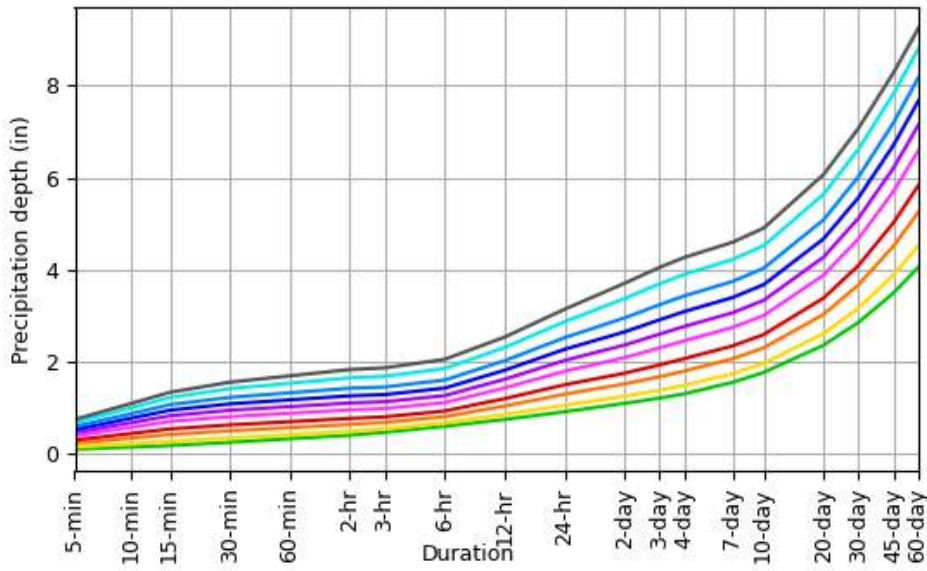
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.103 (0.085-0.129)	0.155 (0.127-0.193)	0.238 (0.194-0.298)	0.306 (0.248-0.385)	0.397 (0.305-0.522)	0.466 (0.349-0.626)	0.533 (0.383-0.742)	0.601 (0.410-0.868)	0.688 (0.447-1.03)	0.752 (0.476-1.16)
10-min	0.152 (0.124-0.188)	0.227 (0.186-0.283)	0.349 (0.284-0.436)	0.448 (0.363-0.563)	0.581 (0.447-0.764)	0.682 (0.511-0.916)	0.781 (0.561-1.09)	0.879 (0.600-1.27)	1.01 (0.655-1.52)	1.10 (0.697-1.70)
15-min	0.185 (0.152-0.230)	0.277 (0.227-0.345)	0.425 (0.347-0.532)	0.546 (0.442-0.687)	0.709 (0.545-0.932)	0.832 (0.623-1.12)	0.952 (0.684-1.32)	1.07 (0.731-1.55)	1.23 (0.799-1.85)	1.34 (0.850-2.07)
30-min	0.255 (0.209-0.318)	0.350 (0.287-0.436)	0.505 (0.412-0.631)	0.634 (0.514-0.798)	0.813 (0.628-1.07)	0.951 (0.715-1.28)	1.09 (0.785-1.52)	1.23 (0.842-1.79)	1.42 (0.925-2.14)	1.56 (0.988-2.41)
60-min	0.332 (0.273-0.413)	0.423 (0.346-0.527)	0.574 (0.469-0.718)	0.703 (0.570-0.885)	0.886 (0.687-1.17)	1.03 (0.776-1.39)	1.18 (0.850-1.65)	1.33 (0.912-1.94)	1.54 (1.00-2.32)	1.70 (1.08-2.62)
2-hr	0.409 (0.338-0.505)	0.496 (0.409-0.613)	0.644 (0.529-0.799)	0.773 (0.630-0.965)	0.959 (0.752-1.26)	1.11 (0.844-1.49)	1.26 (0.923-1.75)	1.43 (0.990-2.06)	1.66 (1.10-2.48)	1.84 (1.17-2.79)
3-hr	0.472 (0.391-0.580)	0.551 (0.456-0.677)	0.688 (0.567-0.849)	0.809 (0.663-1.00)	0.988 (0.781-1.30)	1.14 (0.870-1.52)	1.29 (0.948-1.78)	1.46 (1.02-2.08)	1.69 (1.12-2.50)	1.87 (1.20-2.82)
6-hr	0.604 (0.504-0.736)	0.679 (0.566-0.829)	0.813 (0.675-0.996)	0.935 (0.770-1.15)	1.12 (0.891-1.45)	1.27 (0.982-1.68)	1.43 (1.06-1.95)	1.61 (1.13-2.27)	1.86 (1.25-2.72)	2.06 (1.34-3.06)
12-hr	0.752 (0.631-0.909)	0.859 (0.721-1.04)	1.04 (0.871-1.27)	1.20 (0.998-1.47)	1.44 (1.15-1.84)	1.62 (1.26-2.11)	1.82 (1.36-2.44)	2.03 (1.44-2.82)	2.31 (1.57-3.33)	2.54 (1.67-3.72)
24-hr	0.918 (0.776-1.10)	1.06 (0.894-1.27)	1.30 (1.09-1.56)	1.50 (1.26-1.82)	1.80 (1.45-2.27)	2.03 (1.59-2.61)	2.27 (1.71-3.01)	2.53 (1.81-3.46)	2.87 (1.97-4.07)	3.14 (2.09-4.53)
2-day	1.10 (0.937-1.31)	1.26 (1.07-1.50)	1.52 (1.29-1.82)	1.76 (1.48-2.11)	2.09 (1.70-2.62)	2.37 (1.87-3.01)	2.65 (2.01-3.48)	2.96 (2.14-4.00)	3.37 (2.34-4.72)	3.71 (2.49-5.26)
3-day	1.21 (1.04-1.44)	1.39 (1.18-1.64)	1.68 (1.43-2.00)	1.94 (1.63-2.31)	2.30 (1.88-2.87)	2.60 (2.07-3.29)	2.91 (2.22-3.79)	3.24 (2.36-4.35)	3.70 (2.57-5.12)	4.05 (2.74-5.70)
4-day	1.31 (1.12-1.54)	1.49 (1.28-1.76)	1.80 (1.54-2.13)	2.07 (1.75-2.46)	2.46 (2.01-3.05)	2.77 (2.21-3.49)	3.09 (2.37-4.00)	3.43 (2.51-4.58)	3.90 (2.73-5.37)	4.27 (2.90-5.96)
7-day	1.56 (1.34-1.82)	1.75 (1.50-2.05)	2.07 (1.77-2.44)	2.35 (2.00-2.78)	2.75 (2.26-3.37)	3.07 (2.46-3.82)	3.40 (2.62-4.35)	3.75 (2.76-4.94)	4.22 (2.98-5.74)	4.60 (3.15-6.34)
10-day	1.77 (1.53-2.07)	1.97 (1.70-2.30)	2.30 (1.98-2.70)	2.59 (2.21-3.05)	3.00 (2.48-3.66)	3.34 (2.68-4.13)	3.68 (2.85-4.67)	4.03 (2.98-5.27)	4.52 (3.21-6.09)	4.90 (3.38-6.71)
20-day	2.36 (2.06-2.73)	2.61 (2.27-3.03)	3.03 (2.62-3.52)	3.39 (2.91-3.95)	3.88 (3.23-4.67)	4.27 (3.46-5.22)	4.67 (3.65-5.85)	5.08 (3.80-6.54)	5.64 (4.04-7.46)	6.07 (4.22-8.16)
30-day	2.86 (2.50-3.29)	3.17 (2.76-3.65)	3.68 (3.19-4.24)	4.10 (3.54-4.75)	4.68 (3.90-5.57)	5.12 (4.17-6.20)	5.57 (4.37-6.90)	6.02 (4.52-7.67)	6.62 (4.77-8.67)	7.07 (4.96-9.43)
45-day	3.50 (3.07-4.01)	3.89 (3.41-4.46)	4.52 (3.94-5.19)	5.02 (4.36-5.80)	5.70 (4.76-6.74)	6.21 (5.07-7.45)	6.71 (5.28-8.23)	7.20 (5.42-9.07)	7.82 (5.66-10.1)	8.28 (5.84-10.9)
60-day	4.06 (3.57-4.63)	4.52 (3.97-5.16)	5.25 (4.59-6.01)	5.83 (5.07-6.70)	6.59 (5.51-7.73)	7.14 (5.84-8.50)	7.67 (6.05-9.34)	8.18 (6.18-10.2)	8.80 (6.39-11.3)	9.24 (6.55-12.1)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

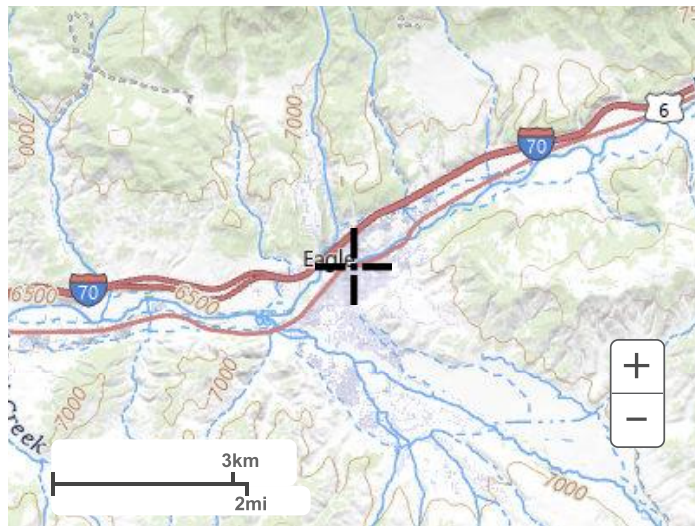
PDS-based depth-duration-frequency (DDF) curves
 Latitude: 39.6557°, Longitude: -106.8261°



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Maps & aerials

Small scale terrain



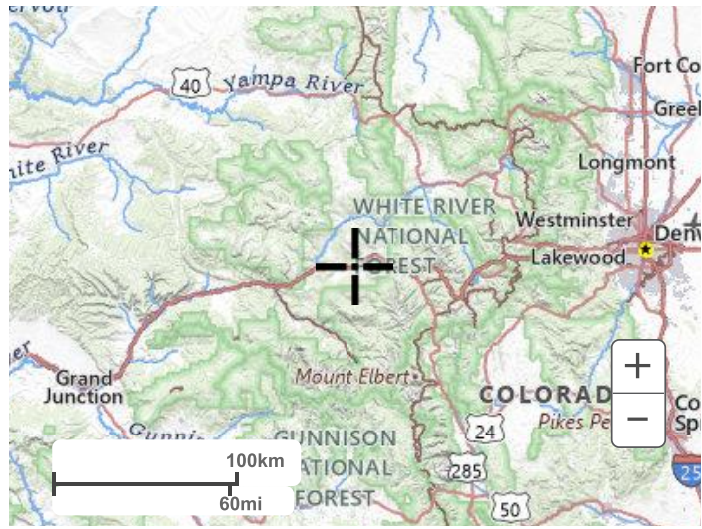
Large scale terrain



Large scale map



Large scale aerial



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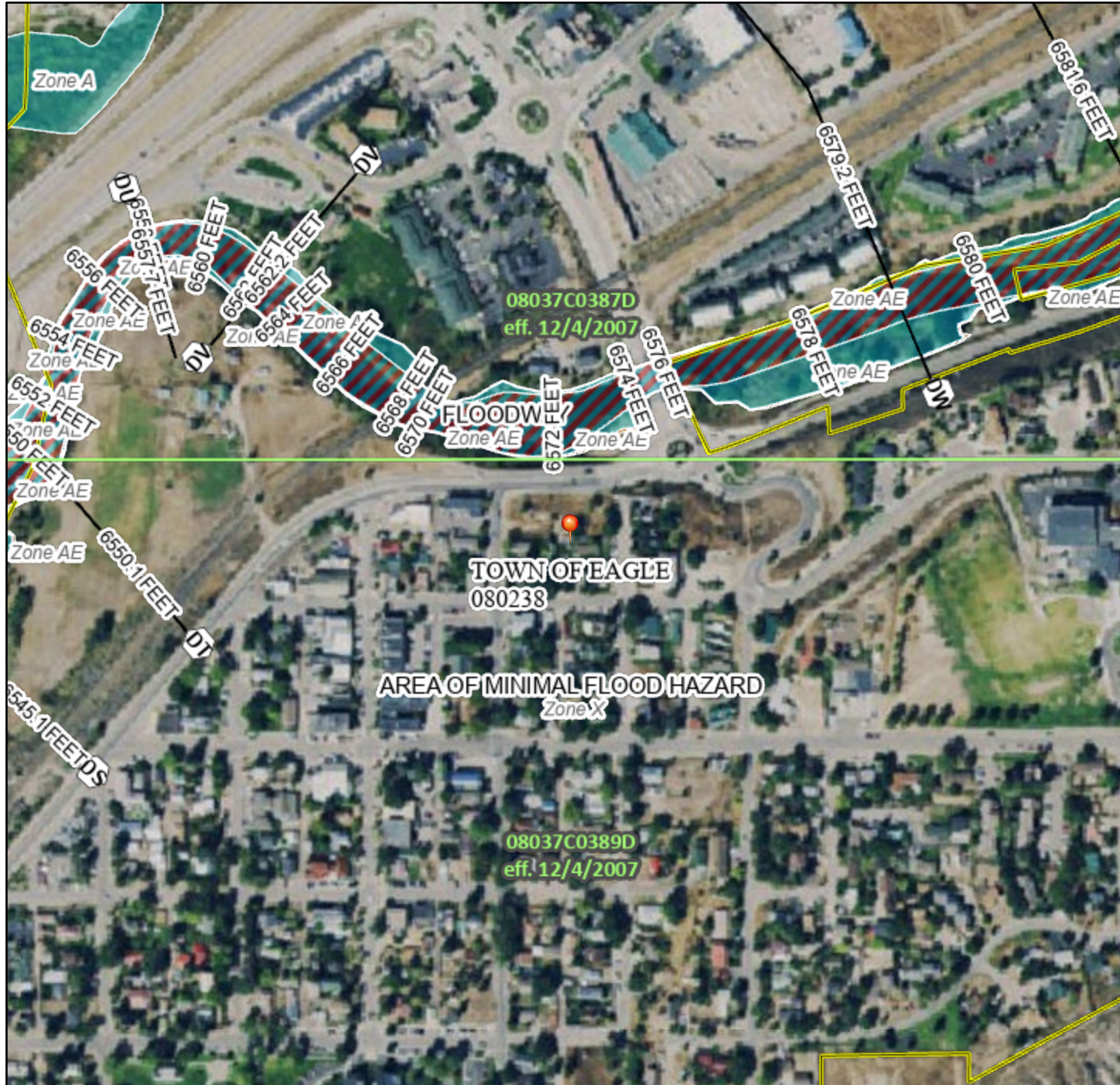
Appendix C

FEMA FIRMette

National Flood Hazard Layer FIRMMette



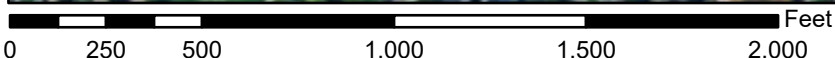
106°49'52"W 39°39'34"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



1:6,000

106°49'15"W 39°39'7"N

Basemap Imagery Source: USGS National Map 2023

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **12/22/2025 at 12:55 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix D

USGS Soils Report



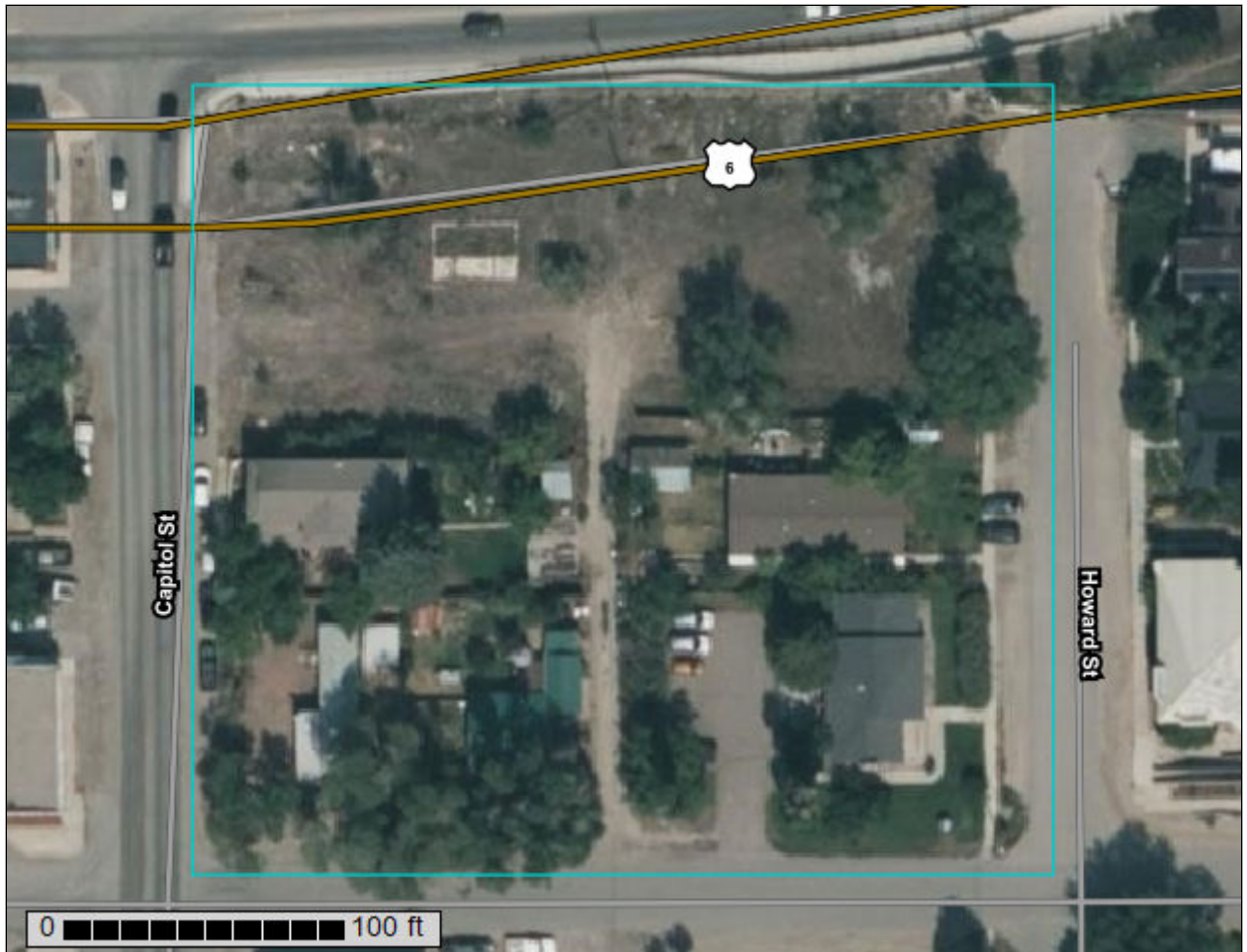
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Aspen-Gypsum Area, Colorado, Parts of Eagle, Garfield, and Pitkin Counties



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

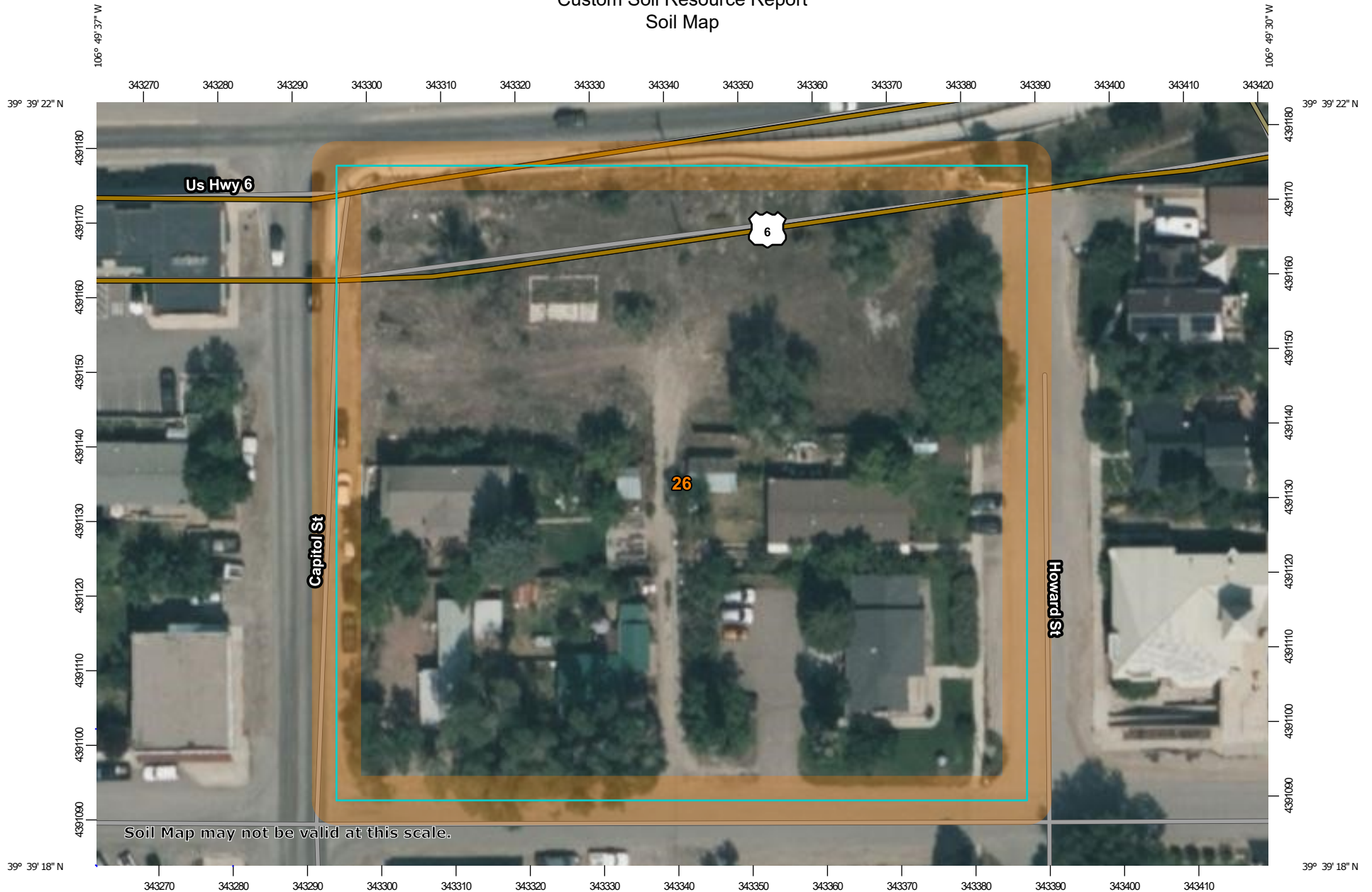
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

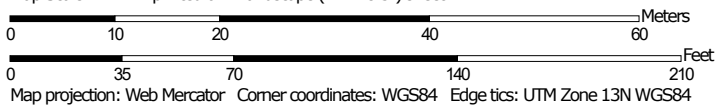
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map




Map Scale: 1:721 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Aspen-Gypsum Area, Colorado, Parts of Eagle, Garfield, and Pitkin Counties
 Survey Area Data: Version 16, Aug 29, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 5, 2021—Sep 7, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
26	Dahlquist-Southace complex, 6 to 12 percent slopes	2.0	100.0%
Totals for Area of Interest		2.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Aspen-Gypsum Area, Colorado, Parts of Eagle, Garfield, and Pitkin Counties

26—Dahlquist-Southace complex, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: jq5d
Elevation: 6,200 to 7,400 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 42 to 46 degrees F
Frost-free period: 75 to 95 days
Farmland classification: Not prime farmland

Map Unit Composition

Dahlquist and similar soils: 50 percent
Southace and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dahlquist

Setting

Landform: Terraces, alluvial fans
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 6 inches: cobbly sandy loam
H2 - 6 to 13 inches: very cobbly sandy clay loam
H3 - 13 to 23 inches: very cobbly sandy loam
H4 - 23 to 60 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
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 content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: R048AY303CO - Loamy Slopes
Other vegetative classification: LOAMY SLOPES (null_31)
Hydric soil rating: No

Description of Southace

Setting

Landform: Terraces, alluvial fans
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 10 inches: very stony sandy loam
H2 - 10 to 22 inches: extremely stony sandy loam
H3 - 22 to 60 inches: extremely stony loamy coarse sand

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): 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: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R048AY287CO - Stony Foothills
Other vegetative classification: Stony Foothills (null_81)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 10 percent
Hydric soil rating: No

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Appendix E

Subsoil Study: Kumar & Associates



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**SUBSOIL STUDY
FOR FOUNDATION DESIGN
PROPOSED CAPITOL FLATS APARTMENTS PROJECT
BLOCK 13, CAPITOL AND SECOND STREETS
EAGLE, COLORADO**

PROJECT NO. 23-7-498.02

FEBRUARY 25, 2025

PREPARED FOR:

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PURPOSE AND SCOPE OF STUDY

This report presents the results of a subsoil study for the proposed Capitol Flats Apartment complex to be located on Block 13, bounded by Capitol and Second Streets, in Eagle, Colorado. The project site is shown on Figures 1A and 1B. The purpose of the study was to develop recommendations for the foundation design. The study was supplemental to our agreement for geotechnical engineering services to Precision West Construction, LLC dated August 21, 2023.

A field exploration program consisting of exploratory borings was conducted to obtain information on the subsurface conditions. Samples of the subsoils obtained during the field exploration were tested in the laboratory to determine their classification and other engineering characteristics. The results of the field exploration and laboratory testing were analyzed to develop recommendations for foundation types, depths and allowable pressures for the proposed building foundation. This report summarizes the data obtained during this study and presents our conclusions, design recommendations and other geotechnical engineering considerations based on the proposed construction and the subsurface conditions encountered.

BACKGROUND INFORMATION

We previously performed a subsoil study for a proposed apartment building located in about the northern half the project site submitting our findings in a report dated February 12, 2024, Project No. 23-7-498.01. Additional borings for the current subsoil study were subsequently drilled for the southern portion of the site as the project was expanded to consist of multiple buildings. The information from the February 12, 2024 report has been incorporated into the current report to cover the entire site and current proposed development area.

We also performed a preliminary subsoil study for the northern portion of the site under our Project No. 23-7-498, report dated October 4, 2023. That study had shallow backhoe pits that only profiled depths to the coarse granular soils.

PROPOSED CONSTRUCTION

The development as currently planned will consist of a group of five, 3-story apartment buildings over a two level below ground parking structure occupying most of the property shown on Figures 1A and 1B. The ground floor of the parking structure will be slab-on-grade. We expect cut depths may be up to about 20 to 25 feet below the existing ground surface for the parking garage. We assume moderate to moderately heavy foundation loadings carried by isolated columns and continuous walls. There may also be some shallow foundations for support of site walls for access into the parking garage.

When building location, grading and foundation loading information have been better developed, we should be notified to re-evaluate the recommendations presented in this report and perform additional analyses as needed.

SITE CONDITIONS

The property, shown on Figure 1A, is vacant in the northern portion and in the southern portion occupied with several one- and two-story residences and several outbuildings. The site is bordered by US Highway 6 to the north, Capitol Street to the west, Howard Street to the east, and Second Street along the south side.

The terrain is relatively flat with a gentle slope down to the northwest. Elevation difference across the site is about 7 feet. The ground surface has undergone some apparent minor grading for previous development on the site. Vegetation consists of grass and weeds with scattered deciduous trees and landscaping on the south end. A concrete slab shown on Figure 1 (existing concrete ruins) from our 2024 report had been removed at the time of our field exploration.

SUBSIDENCE POTENTIAL

Bedrock of the Pennsylvanian age Eagle Valley Evaporite underlies the site and downtown area of Eagle. These rocks are a sequence of gypsiferous shale, fine-grained sandstone and siltstone with some massive beds of gypsum and limestone. There is a possibility that massive gypsum deposits associated with the Eagle Valley Evaporite underlie portions of the site. Dissolution of the gypsum under certain conditions can cause sinkholes to develop and can produce areas of localized subsidence. During previous work in the area, several sinkholes were observed scattered in the Eagle area. These sinkholes appear similar to others associated with the Eagle Valley Evaporite in other areas of Brush Creek and Eagle River Valleys underlain by the Evaporite.

Sinkholes were not observed on the ground surface of the subject site, however, overlot grading may have covered any previous surface depressions. No evidence of cavities was encountered in the subsurface materials and the coarse granular soils were dense and extended to below expected excavation depths. Based on our present knowledge of the subsurface conditions at the site, it cannot be said for certain that sinkholes will not develop. The risk of future ground subsidence throughout the service life of the proposed apartment building, in our opinion, is low.

FIELD EXPLORATION

The field exploration for the project was conducted in two phases. Initially six exploratory borings (Borings 1 through 6) were drilled on January 30 and 31, 2024. The five exploratory borings (Borings 7 through 11) were drilled on January 15 and 16, 2025 to evaluate the subsurface conditions at the locations shown on Figures 1A and 1B. Borings 1 through 4, and 6 through 9 were advanced with 4-inch diameter continuous flight augers powered by a truck-mounted CME-55 drill rig. Borings 5, 6, 10, and 11 were drilled with 6-inch diameter ODEX downhole hammer and casing method with a truck-mounted CME-55 drill rig to evaluate the subsurface conditions below auger refusal depth. The borings were logged by a representative of Kumar & Associates. The locations of the shallow backhoe pits excavated at the site for our preliminary study are also shown on Figures 1A and 1B.

Samples of the subsoils were taken with 1 $\frac{3}{8}$ inch and 2-inch I.D. spoon samplers. The samplers were driven into the subsurface materials at various depths with blows from a 140-pound hammer falling 30 inches. This test is similar to the standard penetration test described by ASTM Method D-1586. The penetration resistance values are an indication of the relative density or consistency of the subsoils. Depths at which the samples were taken and the penetration resistance values are shown on the Logs of Exploratory Borings, Figures 2 and 3. The samples were returned to our laboratory for review by the project engineer and testing.

SUBSURFACE CONDITIONS

Graphic logs of the subsurface conditions encountered at the site are shown on Figures 2 and 3 with Legend and Notes shown on Figure 4. The subsoils encountered, below about $\frac{1}{2}$ to 3 feet of topsoil and/or fill including pavement in a couple of areas, consisted of from about 2 to 9 feet of medium stiff to very stiff, sandy silt and clay overlying dense to very dense, silty sandy gravel and cobbles with boulders (coarse granular soils) that, in general, extended down to the maximum depth drilled of 31 feet at Boring 5, 10, and 11. At Boring 6, a layer of dense slightly silty sand was encountered within the coarse granular soil deposit at a depth of from about 23 to 27 feet. At Boring 8, below about 2 feet of fill, about 1 foot of topsoil was encountered above the silt and clay soils. Pavement was encountered at the ground surface at the Borings 8 and 10 locations. Drilling in the dense coarse granular soils with auger equipment was difficult due to the cobbles and boulders and drilling refusal was encountered at Borings 1 through 4 and 7 through 9 in the deposit after shallow penetration. Boring 6 was terminated in a boulder at 30 feet depth.

Laboratory testing performed on samples obtained from the borings included natural moisture content and density, gradation analyses, Atterberg limits and unconfined compressive strength. Results of swell-consolidation testing performed on relatively undisturbed drive samples of the fine-grained natural soils, presented on Figures 4 through 7, indicate moderate compressibility under conditions of loading and wetting with a nil to minor collapse or swell potential when wetted under a constant 1,000 psf surcharge. Results of gradation analyses performed on small diameter drive samples (minus $\frac{3}{4}$ to 1 $\frac{1}{2}$ -inch fraction) of the natural granular subsoils are shown on Figures 8 and 9. Results of unconfined compressive strength testing indicate a sample of the fine-grained soils to have stiff consistency. The laboratory testing is summarized in Table 1.

No groundwater was encountered in the borings at the time of drilling and the subsoils were slightly moist to moist with depth.

ENGINEERING ANALYSIS

The dense coarse granular soils encountered at relatively shallow depth at the site possess moderately high bearing capacity and relatively low settlement potential and are suitable for spread footings to support the proposed building foundations. A seismic Site Class C for very

dense soil can be used for structural design unless site specific shear wave analysis is performed to show a different IBC Site Class can be used.

The coarse granular soils contain boulders which could be large and could make excavations at the site difficult. The perimeter excavation cut slopes will likely need to be shored to maintain stability. The dense coarse sand soils, if encountered at excavation subgrade, should be feasible for foundation support but should be further evaluated at the time of excavation. If needed, sub-excavated areas below footings can be replaced with structural fill such as CDOT Class 2, 5 or 6 aggregate base course, or the onsite granular soils devoid of debris, topsoil and rocks larger than about 4 inches.

The near surface natural silt and clay soils possess low bearing capacity and moderate settlement potential but should be suitable to support lightly loaded ancillary structures separate from the buildings (such as site and/or landscape walls) that can tolerate differential settlement, as well as support pavement and walkway areas.

DESIGN RECOMMENDATIONS

FOUNDATIONS

Considering the subsurface conditions encountered in the exploratory borings and the nature of the proposed construction, we recommend the buildings be founded with spread footings bearing entirely on the natural dense coarse granular soils, or on properly placed and compacted structural fill placed on the natural coarse granular soils after complete removal of all fill, topsoil, fine-grained soils and any loose sand soils.

The design and construction criteria presented below should be observed for a spread footing foundation system.

- 1) Footings placed on the undisturbed natural coarse granular soils, or on compacted structural fill should be designed for an allowable bearing pressure of 5,000 psf. Based on experience, we expect settlement of footings designed and constructed as discussed in this section will be up to about 1 to possibly 1½ inches depending on the subgrade conditions and foundation loadings, and essentially occur during the construction phase as the loading is applied.
- 2) For lightly loaded ancillary structures separate from the main buildings, footings placed on the undisturbed natural soils or compacted structural fill should be designed for an allowable bearing pressure of 1,500 psf. Based on experience, we expect settlement of footings designed and constructed as discussed in this section will be about 1 to 1½ inches.
- 3) The footings should have a minimum width of 18 inches for continuous walls and 2 feet for isolated pads.
- 4) Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection. Placement

of foundations at least 48 inches below exterior grade is typically used in this area.

- 5) Continuous foundation walls should be reinforced top and bottom to span local anomalies such as by assuming an unsupported length of at least 10 feet. Foundation walls acting as retaining structures should also be designed to resist lateral earth pressures as discussed in the "Foundation and Retaining Walls" section of this report.
- 6) Existing fill, topsoil and any loose disturbed soils should be removed, and the footing bearing level extended down to the respective natural bearing soils. The exposed subgrade should then be moistened and compacted. For the building foundation footings, all overburden soils should also be removed down to the dense coarse granular soils.
- 7) A shallow depth of structural fill (up to about 5 or 6 feet) can be used to reestablish design footing bearing level if needed. The suitability of structural fill as foundation bearing material should be evaluated at the time of construction. The structural fill should consist of relatively well graded granular soils placed in uniform lifts of about 8 inches and compacted to at least 100% of standard Proctor density at a moisture content within about 2% of optimum for a 5,000 psf bearing pressure, and 95% of standard Proctor density for a 1,500 psf bearing pressure.
- 8) A representative of the geotechnical engineer should observe all foundation to evaluate bearing conditions and test structural fill for compaction on a regular basis prior to the concrete placement.

FOUNDATION AND RETAINING WALLS

Foundation walls and retaining structures up to about 15 feet high which are laterally supported and can be expected to undergo only a slight amount of deflection should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of at least 50 pcf for backfill consisting of the on-site granular soils. Building foundation walls taller than 15 feet should be designed for a uniform lateral earth pressure of $25H$ in psf where H is the retained wall height in feet. Cantilevered retaining structures which are separate from the building and can be expected to deflect sufficiently to mobilize the full active earth pressure condition should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of at least 45 pcf for backfill consisting of the on-site granular soils. The granular backfill material should meet the recommendations provided below and not contain topsoil, debris or rocks larger than 6 inches. Permanent type shoring systems could reduce the lateral earth pressure values and we can review our lateral earth pressure recommendations if permanent shoring is planned.

All foundation and retaining structures should be designed for appropriate hydrostatic and surcharge pressures such as adjacent footings, traffic, construction materials and equipment. The pressures recommended above assume drained conditions behind the walls and a horizontal

backfill surface. The buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on a foundation wall or retaining structure. An underdrain should be provided to prevent hydrostatic pressure buildup behind walls.

Backfill should be placed in uniform lifts and compacted to at least 90% of the maximum standard Proctor density at near optimum moisture content. Backfill placed in pavement and walkway areas should be compacted to at least 95% of the maximum standard Proctor density. Care should be taken not to overcompact the backfill or use large equipment near the wall, since this could cause excessive lateral pressure on the wall. Some settlement of deep foundation wall backfill should be expected, even if the material is placed correctly, and could result in distress to facilities constructed on the backfill. A relatively well graded granular soil such as base course and compaction to at least 98% of standard Proctor density can be used to reduce settlements.

We recommend granular soils for backfilling foundation walls and retaining structures because their use results in lower lateral earth pressures and lower ground settlement potential, and the backfill can be incorporated into the underdrain system. Subsurface drainage recommendations are discussed in more detail in the "Underdrain System" section of this report. Granular wall backfill should contain less than about 25% passing the No. 200 sieve and have a maximum size of 6 inches. The onsite coarse granular soils should be suitable as backfill material with processing. We should evaluate the backfill material for suitability prior to placement.

The lateral resistance of foundation or retaining wall footings will be a combination of the sliding resistance of the footing on the foundation materials and passive earth pressure against the side of the footing. Resistance to sliding at the bottoms of the footings can be calculated based on a coefficient of friction of 0.50. Passive pressure of compacted backfill against the sides of the footings can be calculated using an equivalent fluid unit weight of 450 pcf. The coefficient of friction and passive pressure values recommended above assume ultimate soil strength. Suitable factors of safety should be included in the design to limit the strain which will occur at the ultimate strength, particularly in the case of passive resistance. Fill placed against the sides of the footings to resist lateral loads should be a well graded granular material such as the on-site sand and gravel soils, or imported base course, compacted to at least 95% of the maximum standard Proctor density at a moisture content near optimum.

FLOOR SLABS

The natural on-site soils or compacted structural fill are suitable to support lightly loaded slab-on-grade construction. Existing fill below slab areas should be removed and replaced with compacted structural fill. We should evaluate the need for subexcavation and replacement of existing fill and fine-grained soils at the time of construction.

To reduce the effects of some differential movement, floor slabs should be separated from all bearing walls and columns with expansion joints which allow unrestrained vertical movement.

Floor slab control joints should be used to reduce damage due to shrinkage cracking. The requirements for joint spacing and slab reinforcement should be established by the designer based on experience and the intended slab use. A minimum 4-inch layer of free-draining gravel should be placed immediately beneath basement level slabs to facilitate drainage. This material should consist of minus 2-inch aggregate with at least 50% retained on the No. 4 sieve and less than 2% passing the No. 200 sieve.

All fill materials for support of floor slabs should be compacted to at least 95% of maximum standard Proctor density at a moisture content near optimum. Required fill can consist of the on-site granular soils or a suitable imported gravel soils devoid of debris, topsoil and oversized (plus 4-inch) rocks.

UNDERDRAIN SYSTEM

Although groundwater was not encountered during our exploration, it has been our experience in the area that local perched groundwater can develop during times of heavy precipitation or seasonal runoff. Frozen ground during spring runoff can also create a perched condition. We recommend below-grade construction, such as retaining walls, crawlspace and basement areas, be protected from wetting and hydrostatic pressure buildup by an underdrain system.

The drains should consist of minimum 4-inch diameter perforated PVC drainpipe placed in the bottom of the wall backfill surrounded above the invert level with free-draining granular material. The drain should be placed at each level of excavation and at least 1 foot below lowest adjacent finish grade and sloped at a minimum ½% to a suitable gravity outlet or to a properly designed and constructed drywell based in the coarse granular soils. Free-draining granular material used in the underdrain system should contain less than 2% passing the No. 200 sieve, less than 50% passing the No. 4 sieve and have a maximum size of 2 inches. The drain gravel backfill should be at least 1½ feet deep and be covered by filter fabric such as Mirafi 140N or 160N.

SITE GRADING

There is a risk of construction-induced slope instability at the site due to the relatively deep excavation planned for the building. Due to the nearby facilities, most of the cut slopes will probably need to be shored if the cut slopes cannot be laid back to a stable grade. Care should be taken not to undermine adjacent buildings, roadways and utilities with the excavation.

Based on our experience in the area, temporary cut slopes up to about 20 feet high graded no steeper than 1 horizontal to 1 vertical should be feasible for dry slope conditions. If seepage is encountered in cuts, flatter temporary slopes may be needed. We should review the excavation and grading plans for the project prior to construction, especially if temporary cut slopes are planned to be used and additional recommendations made at that time.

Permanent unretained cut and fill slopes should be graded at 2 horizontal to 1 vertical or flatter and protected against erosion by revegetation or other means.

SURFACE DRAINAGE

The following drainage precautions should be observed during construction and maintained at all times after the buildings have been completed:

- 1) Inundation of the foundation excavations and underslab areas should be avoided during construction.
- 2) Exterior backfill should be adjusted to near optimum moisture and compacted to at least 95% of the maximum standard Proctor density in pavement and slab areas and to at least 90% of the maximum standard Proctor density in landscape areas.
- 3) The ground surface surrounding the exterior of the buildings should be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 6 inches in the first 10 feet in unpaved areas and a minimum slope of 2½ inches in the first 10 feet in paved areas. Free-draining wall backfill should be covered with filter fabric and capped with about 2 feet of the on-site finer graded soils or pavement to reduce surface water infiltration.
- 4) Roof downspouts and drains should discharge well beyond the limits of all backfill.

PAVEMENT SECTION THICKNESS

The subgrade soils encountered at the site are generally low plasticity silt and clay which are considered poor support for pavement sections. We expect the only new pavement areas will be the access drive into the parking garage. Based on our experience, an assumed 18 kip EDLA of 20, a Regional Factor of 2.0 and a serviceability index of 2.0, we recommend the minimum pavement section thickness at the site consist of 4 inches of asphalt on 8 inches of base course or 6 inches of Portland cement concrete on 4 inches of base course. Pavement sections for the adjacent streets, especially Capitol Street, will likely need thicker pavement sections.

The asphalt should be a batched hot mix, approved by the engineer and placed and compacted to the project specifications. The base course should meet CDOT Class 6 specifications. All base course and any subbase or required subgrade fill should be compacted to at least 95% of the maximum standard Proctor density at a moisture content within about 2% of optimum.

Required fill to establish design subgrade level can consist of the on-site soils or suitable imported granular soils approved by the geotechnical engineer. Prior to fill placement the subgrade should be scarified to a depth of 8 inches, adjusted to near optimum moisture and compacted to at least 95% of standard Proctor density. The subgrade should be proof-rolled. Areas that deflect excessively should be corrected before placing pavement materials. The subgrade improvements and placement and compaction of base and asphalt materials should be monitored on a regular basis by a representative of the geotechnical engineer. Once traffic loadings are better known, we should review our pavement section recommendations.

LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering principles and practices in this area at this time. We make no warranty either express or implied. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory borings drilled at the locations indicated on Figures 1A and 1B, the proposed type of construction and our experience in the area. Our services do not include determining the presence, prevention or possibility of mold or other biological contaminants (MOBC) developing in the future. If the client is concerned about MOBC, then a professional in this special field of practice should be consulted. Our findings include interpolation and extrapolation of the subsurface conditions identified at the exploratory borings and variations in the subsurface conditions may not become evident until excavation is performed. If conditions encountered during construction appear different from those described in this report, we should be notified so that re-evaluation of the recommendations may be made.

This report has been prepared for the exclusive use by our client for design purposes. We are not responsible for technical interpretations by others of our information. As the project evolves, we should provide continued consultation and field services during construction to review and monitor the implementation of our recommendations, and to verify that the recommendations have been appropriately interpreted. Significant design changes may require additional analysis or modifications to the recommendations presented herein. We recommend on-site observation of excavations and foundation bearing strata and testing of structural fill by a representative of the geotechnical engineer.

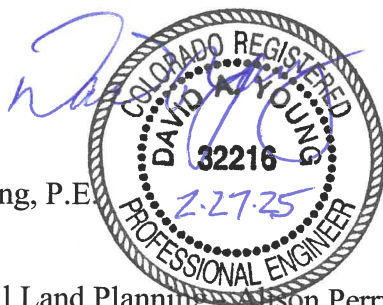
Respectfully Submitted,

Kumar & Associates, Inc.



David A. Noteboom, P.E.

Reviewed By:



David A, Young, P.E.

DAN/kac

cc Vail Land Planning & Design, Inc. (perry@vailland.com)

U.S. HIGHWAY 6
VARIABLE WIDTH
RIGHT OF WAY

BASIS OF BEARINGS
S89°27'00"W 266.00' (PLATTED)
S89°27'00"W 266.04' (MEASURED)

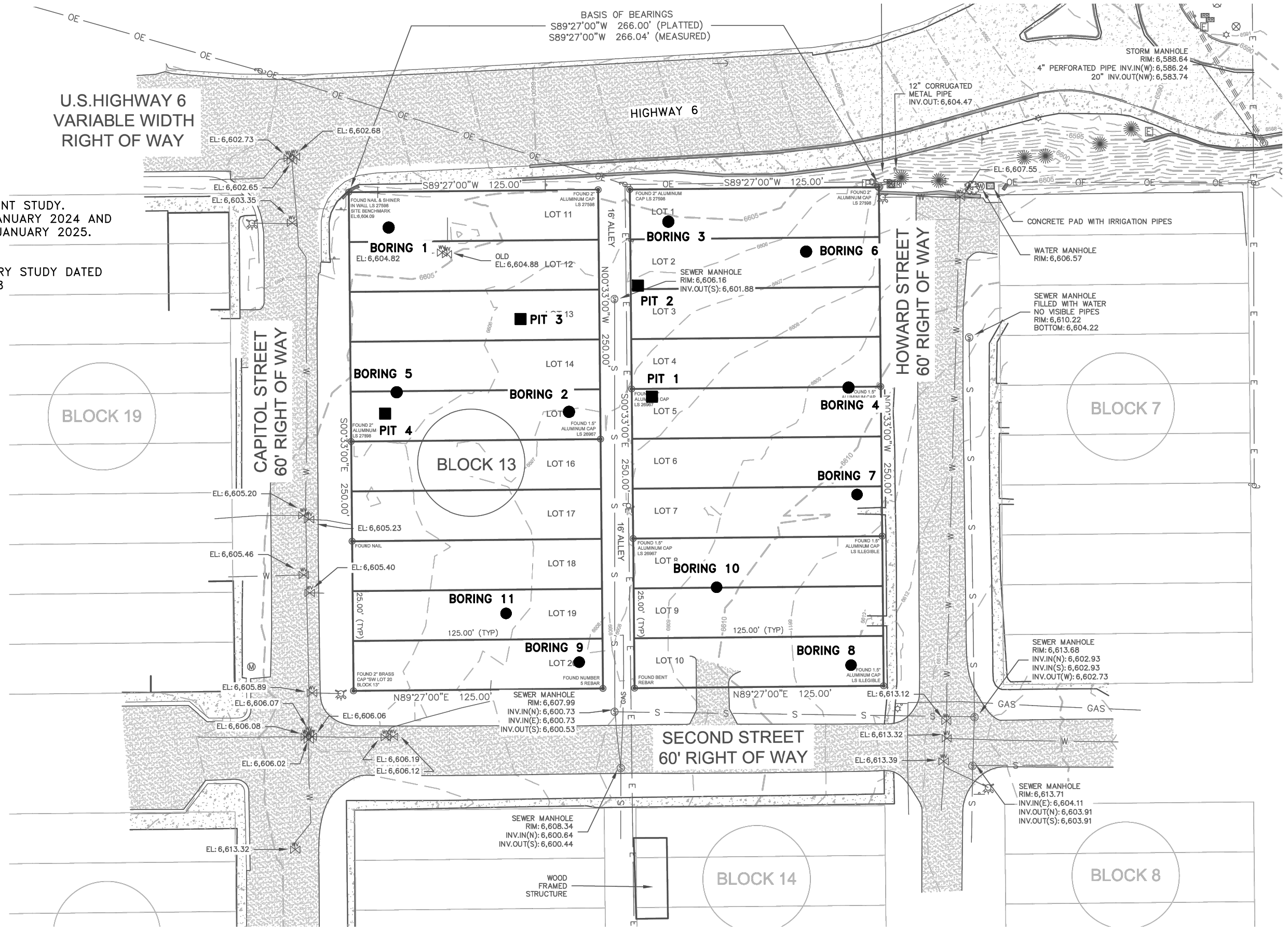
HIGHWAY 6

STORM MANHOLE
RIM: 6,588.64
4" PERFORATED PIPE INV. IN (W): 6,588.24
20" INV. OUT (NW): 6,583.74

12" CORRUGATED
METAL PIPE
INV. OUT: 6,604.47

LEGEND:

- EXPLORATORY BORINGS FOR CURRENT STUDY.
BORINGS 1-6 WERE DRILLED IN JANUARY 2024 AND
BORINGS 7-11 WERE DRILLED IN JANUARY 2025.
- EXPLORATORY PITS FOR PRELIMINARY STUDY DATED
10-4-23, PROJECT NO. 23-7-498



BLOCK 19

CAPITOL STREET
60' RIGHT OF WAY

BLOCK 13

HOWARD STREET
60' RIGHT OF WAY

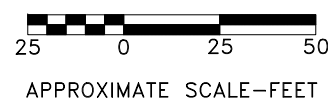
BLOCK 7

SECOND STREET
60' RIGHT OF WAY

BLOCK 14

BLOCK 8

EXISTING BLOCK/LOT MAP AND GROUND CONTOURS



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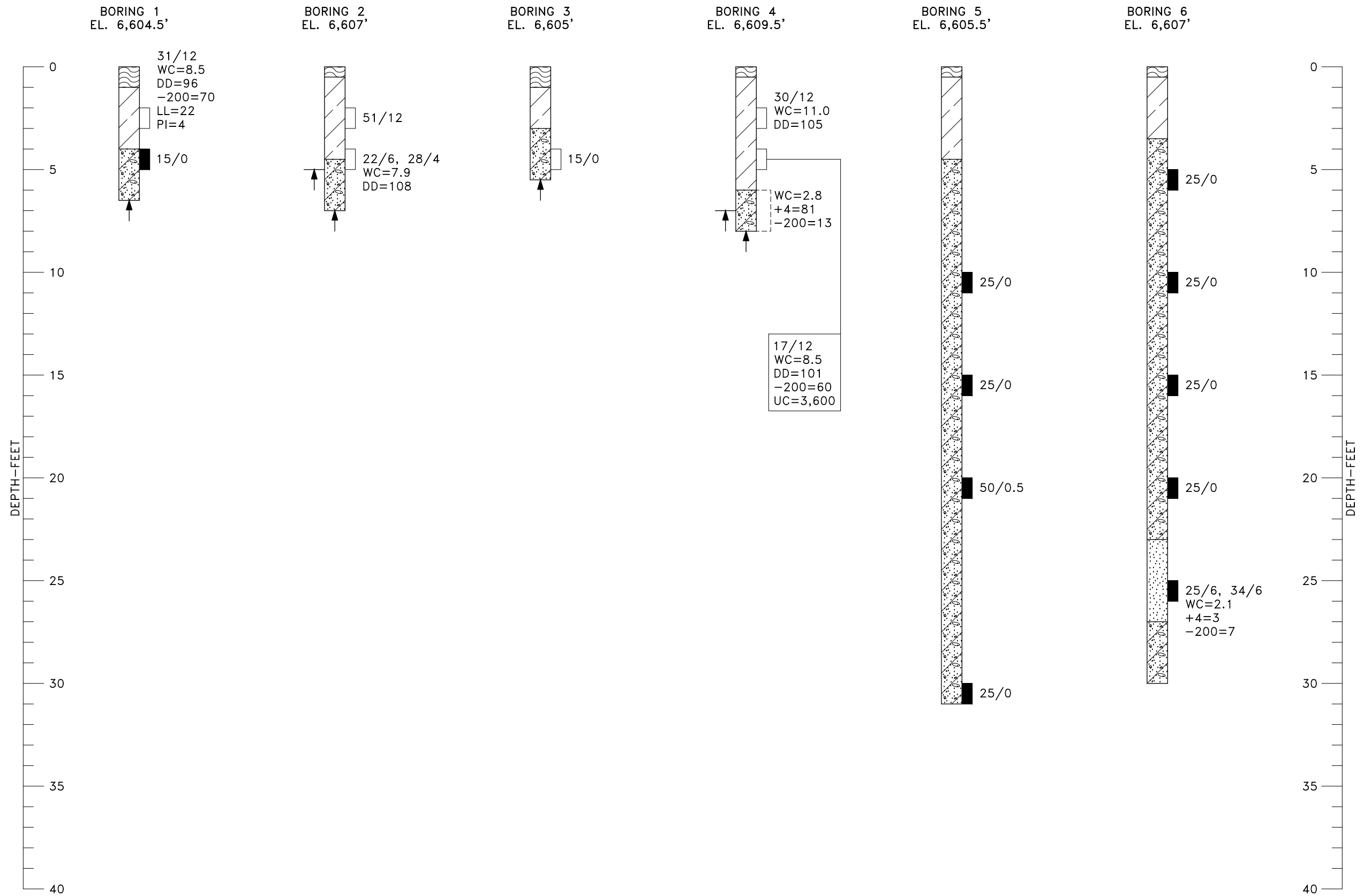
- EXPLORATORY BORINGS FOR CURRENT STUDY.
BORINGS 1-6 WERE DRILLED IN JANUARY 2024 AND
BORINGS 7-11 WERE DRILLED IN JANUARY 2025.
- EXPLORATORY PITS FOR PRELIMINARY STUDY DATED
10-4-23, PROJECT NO. 23-7-498



PROPOSED CONSTRUCTION

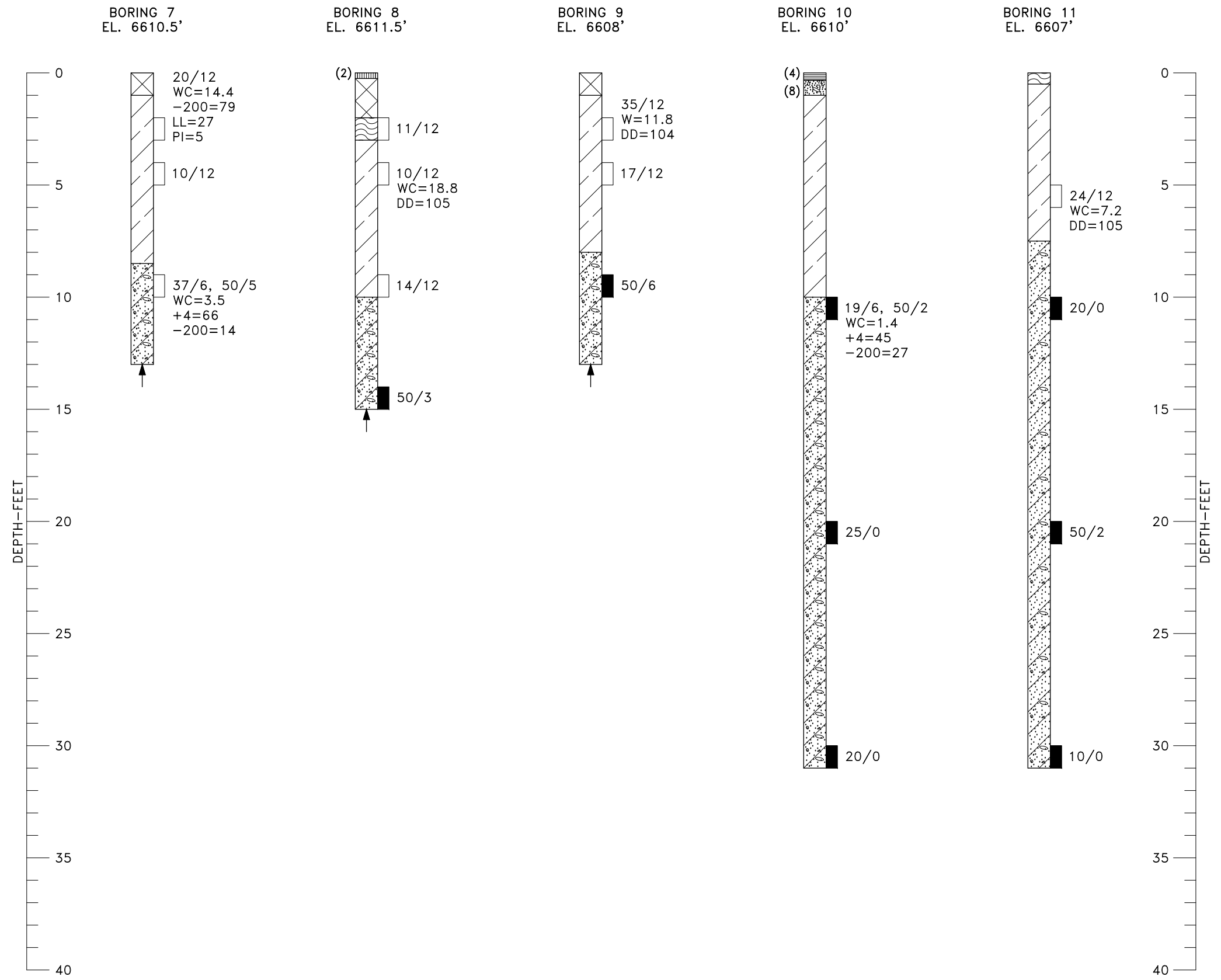


APPROXIMATE SCALE- FEET















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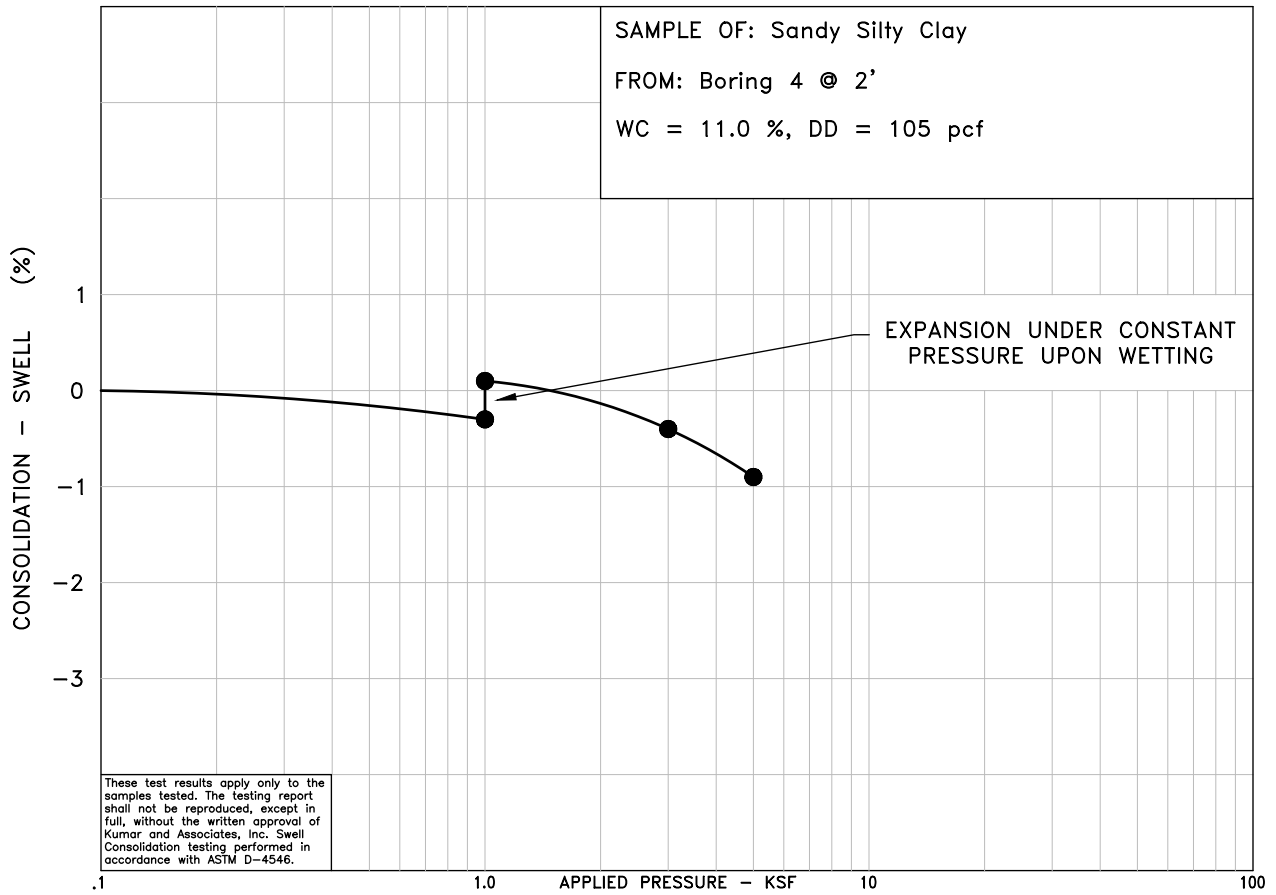
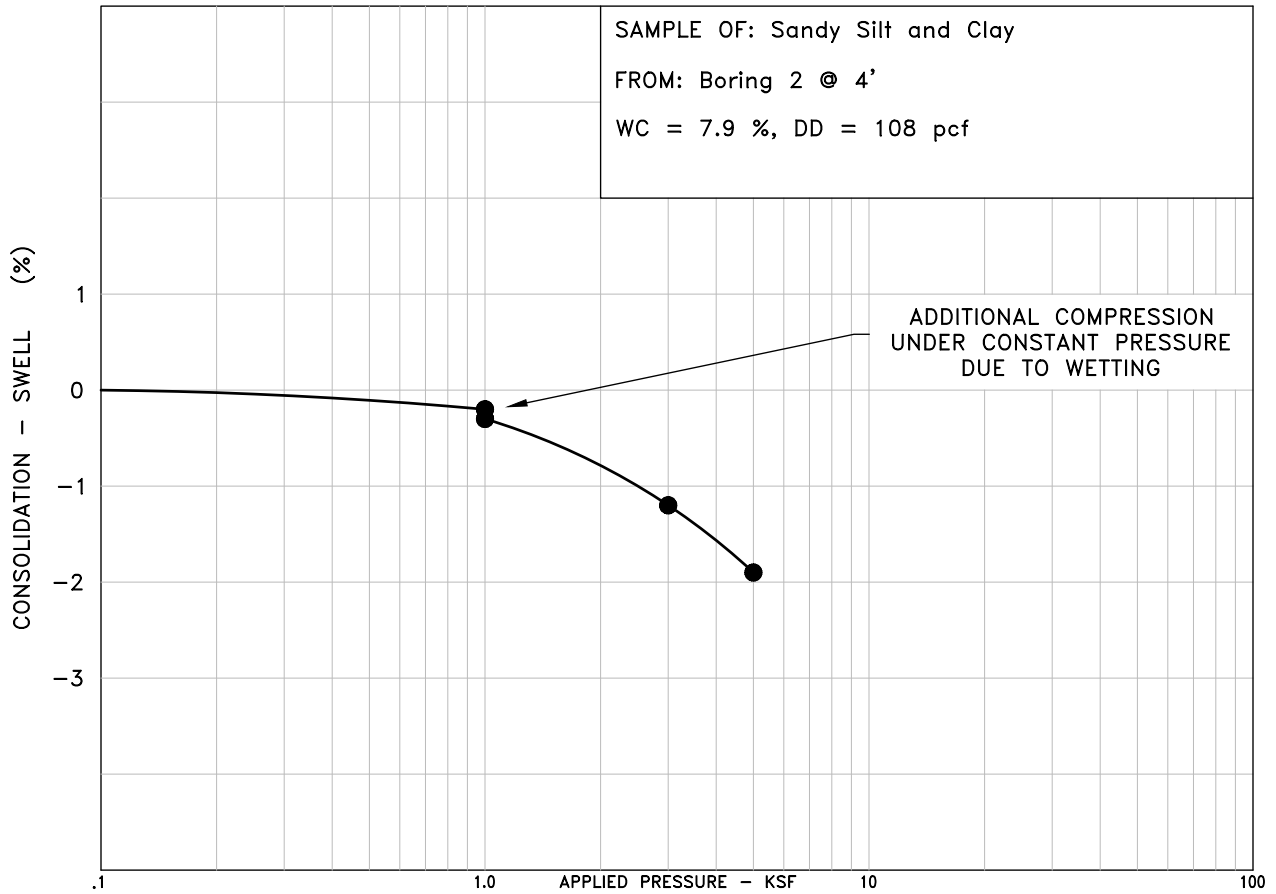


LEGEND

-  TOPSOIL; ORGANIC SANDY SILTY CLAY, MOIST, BROWN, ROOT ZONE, FROZEN.
- (2)  CONCRETE; THICKNESS IN INCHES SHOWN IN PARENTHESES TO LEFT OF THE LOG.
- (4)  ASPHALT; THICKNESS IN INCHES SHOWN IN PARENTHESES TO LEFT OF THE LOG.
- (8)  BASE COURSE; THICKNESS IN INCHES SHOWN IN PARENTHESES TO LEFT OF THE LOG.
-  FILL; SANDY SILTY GRAVEL MIXED WITH SILTY CLAY, MEDIUM DENSE, MOIST, BROWN.
-  SILT AND CLAY (ML-CL), SANDY TO OCCASIONALLY VERY SANDY, MEDIUM STIFF TO VERY STIFF, SLIGHTLY MOIST TO MOIST, BROWN, LOW PLASTICITY, HIGHLY CALCAREOUS AND/OR GYPSIFEROUS, FROZEN NEAR SURFACE.
-  GRAVEL AND COBBLES (GM); WITH BOULDERS, SANDY, SILTY, DENSE TO VERY DENSE, SLIGHTLY MOIST, LIGHT BROWN, ROCKS ARE ROUNDED TO SUBROUNDED.
-  SAND (SM-SP); SLIGHTLY SILTY, SCATTERED GRAVEL, DENSE, SLIGHTLY MOIST, BROWN.
-  DRIVE SAMPLE; 2-INCH I.D. CALIFORNIA LINER SAMPLE.
-  DRIVE SAMPLE; 1 3/8-INCH I.D. SPLIT SPOON STANDARD PENETRATION TEST.
-  DISTURBED BULK SAMPLE.
- 31/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 31 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.
-  PRACTICAL AUGER DRILLING REFUSAL. WHERE SHOWN ABOVE BOTTOM OF BORING, INDICATES THAT MULTIPLE ATTEMPTS WERE MADE TO ADVANCE THE HOLE.

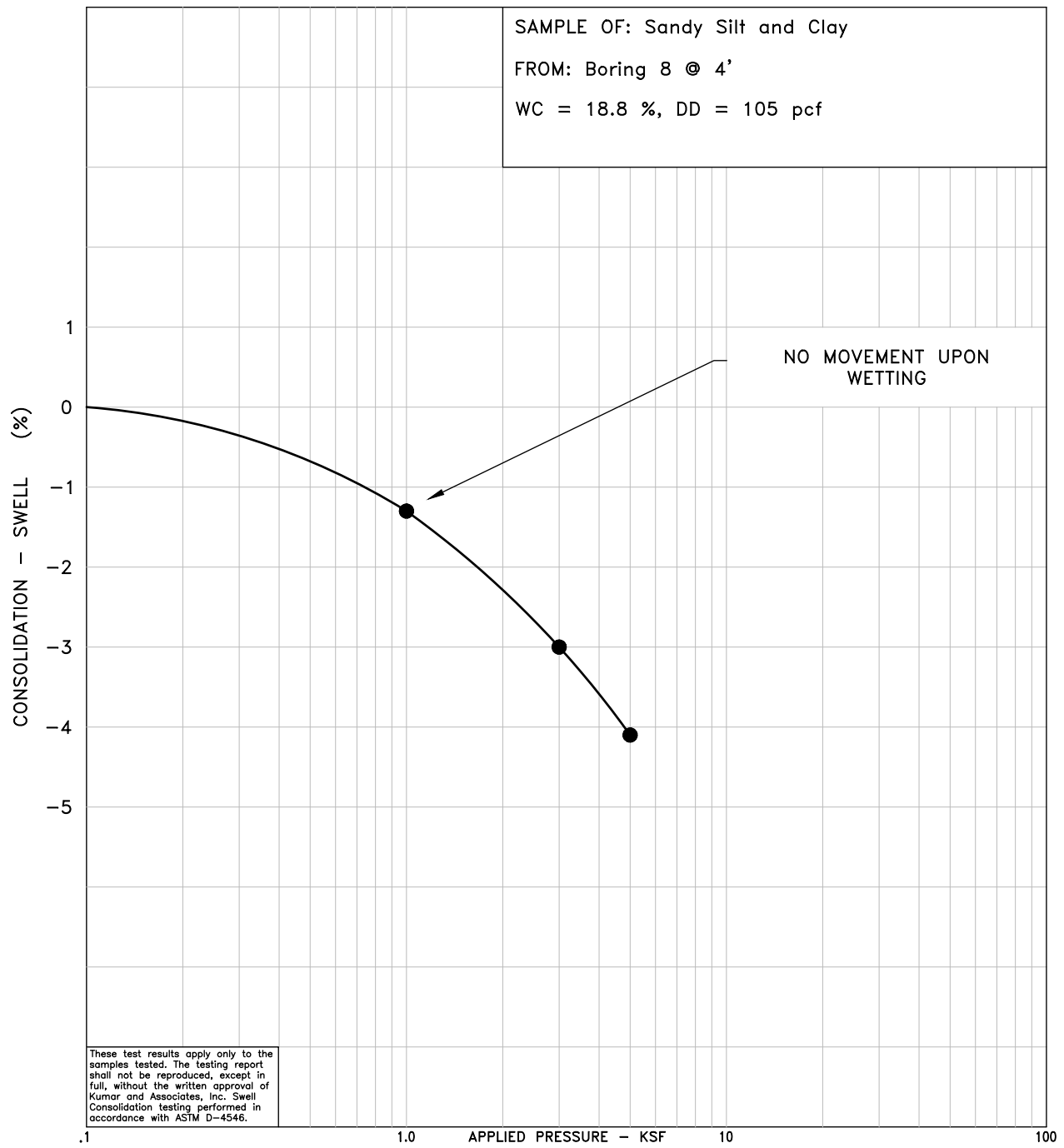
NOTES

1. EXPLORATORY BORINGS 1-4 WERE DRILLED ON JANUARY 30, 2024 WITH A CONTINUOUS FLIGHT POWER AUGER AND BORINGS 5 AND 6 WERE DRILLED ON JANUARY 30 AND 31, 2024 WITH A 6-INCH DIAMETER DOWNHOLE ODEX HAMMER METHOD. BORINGS 7, 8, 9 WERE DRILLED ON JANUARY 14, 2025 WITH A 4-INCH DIAMETER CONTINUES FLIGHT POWER AUGER AND BORINGS 10 AND 11 WERE DRILLED ON JANUARY 15, 2025 WITH A 6-INCH DIAMETER DOWNHOLE ODEX HAMMER METHOD.
2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE MEASURED APPROXIMATELY BY PACING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE OBTAINED BY INTERPOLATION BETWEEN CONTOURS ON THE SITE PLAN PROVIDED.
4. THE EXPLORATORY BORING LOCATIONS AND ELEVATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUNDWATER WAS NOT ENCOUNTERED IN THE BORINGS AT THE TIME OF DRILLING.
7. LABORATORY TEST RESULTS:
 WC = WATER CONTENT (%) (ASTM D2216);
 DD = DRY DENSITY (pcf) (ASTM D2216);
 +4 = PERCENTAGE RETAINED ON NO. 4 SIEVE (ASTM D6913);
 -200= PERCENTAGE PASSING NO. 200 SIEVE (ASTM D1140);
 LL = LIQUID LIMIT (ASTM D4318);
 PI = PLASTICITY INDEX (ASTM D4318).



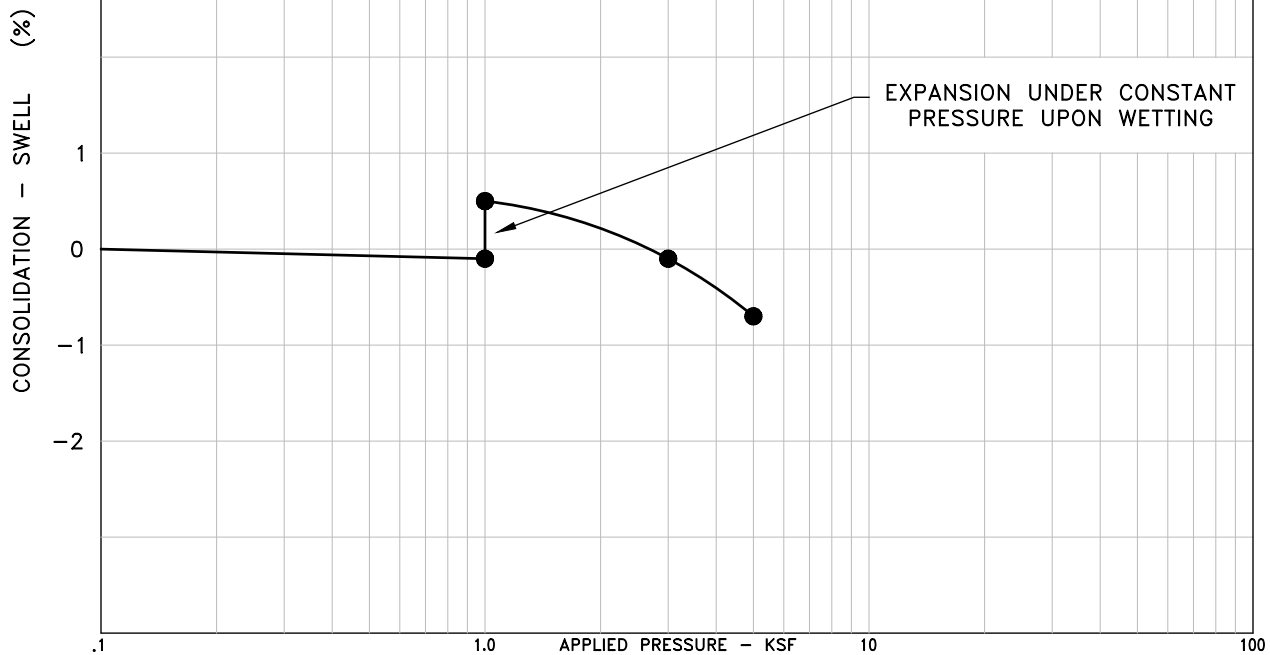
These test results apply only to the samples tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar and Associates, Inc. Swell Consolidation testing performed in accordance with ASTM D-4546.

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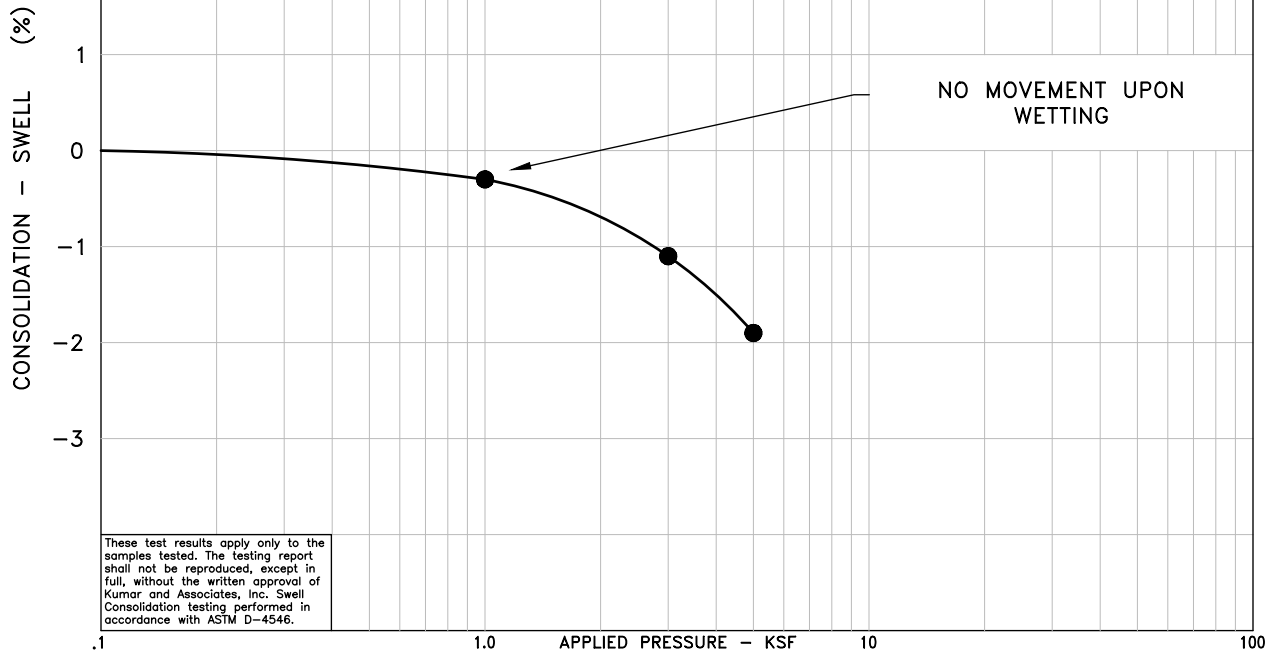


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SAMPLE OF: Sandy Silty Clay
 FROM: Boring 9 @ 2'
 WC = 11.8 %, DD = 104 pcf

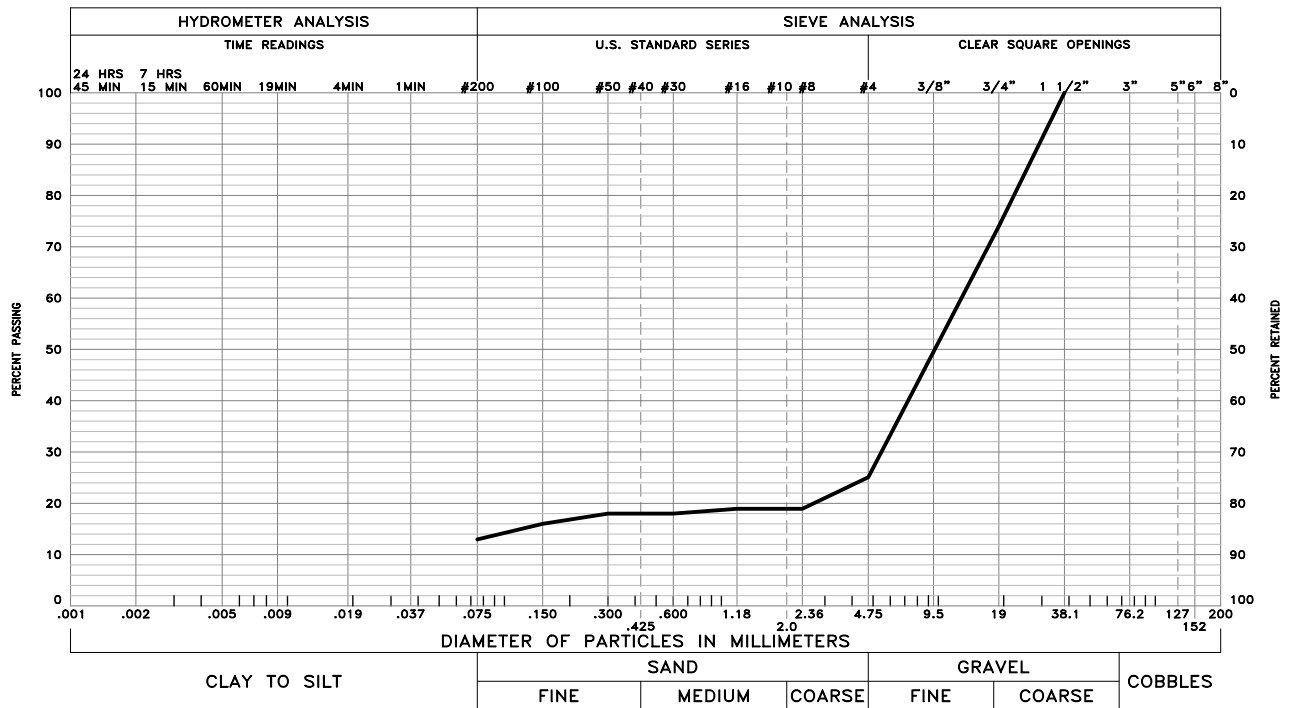


SAMPLE OF: Sandy Silt and Clay
 FROM: Boring 11 @ 5'
 WC = 7.2 %, DD = 105 pcf

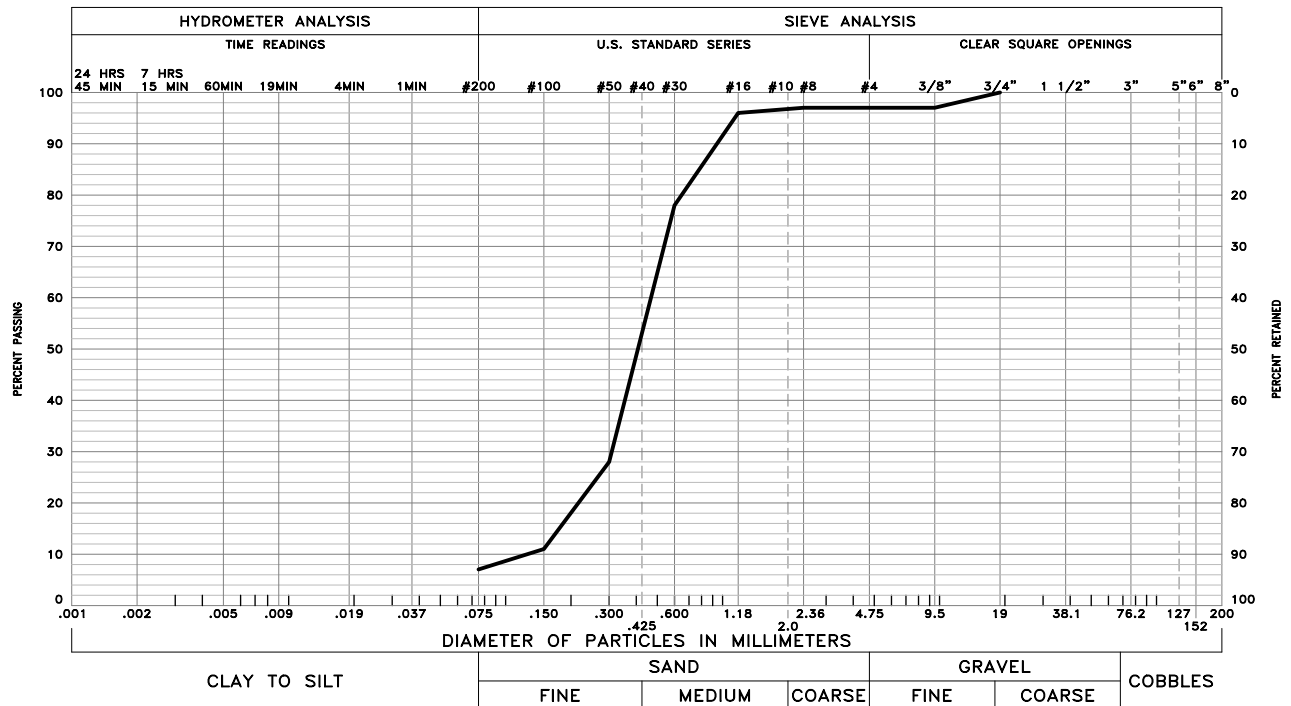


These test results apply only to the samples tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar and Associates, Inc. Swell Consolidation testing performed in accordance with ASTM D-4546.

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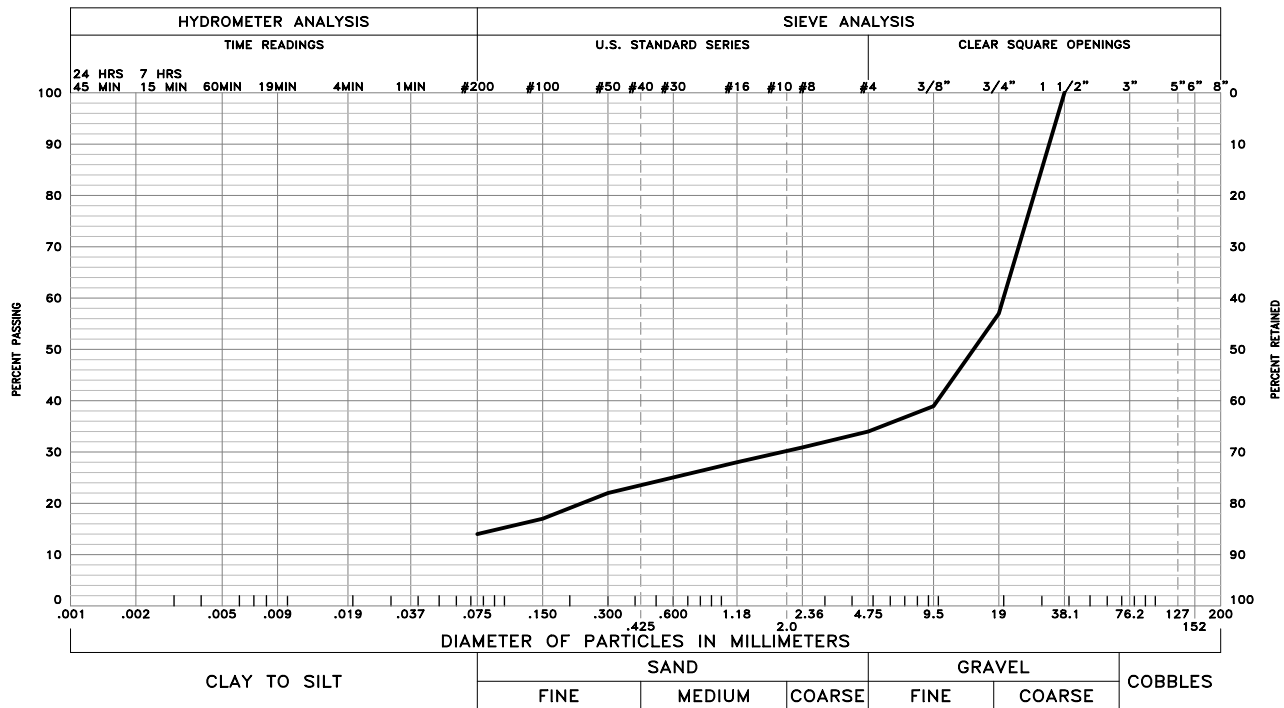


GRAVEL 81 % SAND 6 % SILT AND CLAY 13 %
 LIQUID LIMIT - PLASTICITY INDEX -
 SAMPLE OF: Silty Sandy Gravel FROM: Boring 4 @ 6'-8'

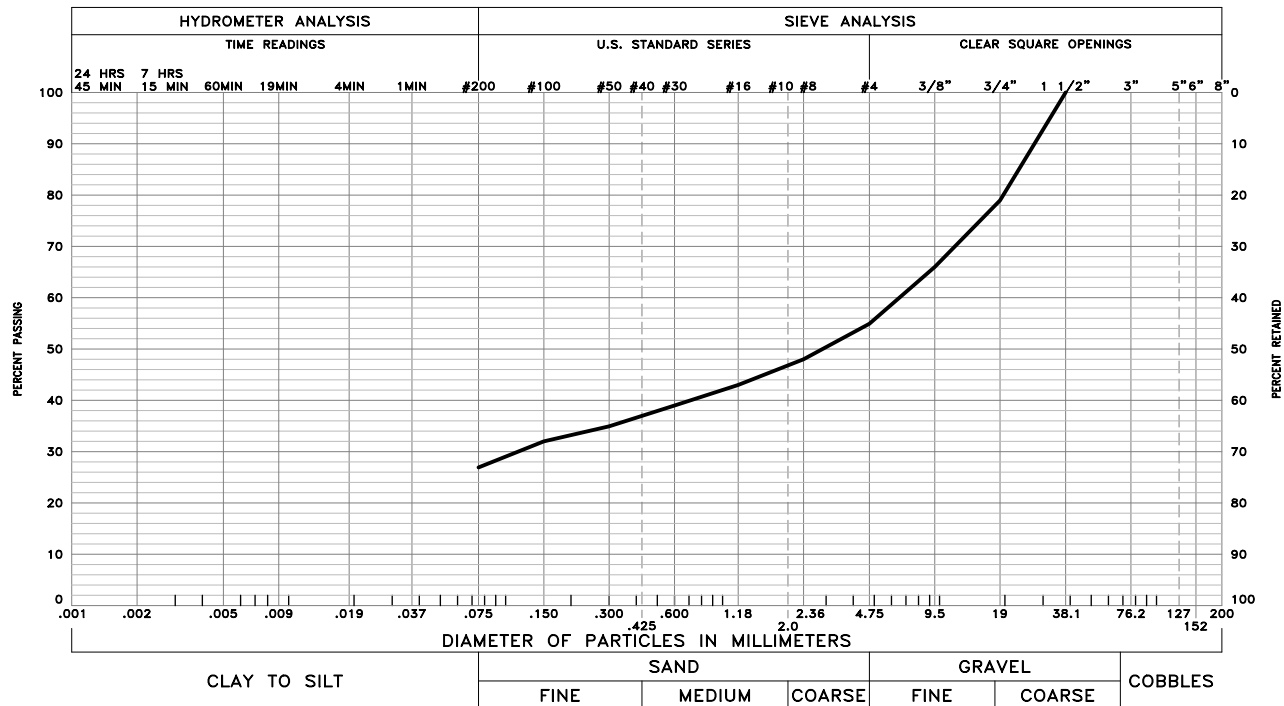


GRAVEL 3 % SAND 90 % SILT AND CLAY 7 %
 LIQUID LIMIT - PLASTICITY INDEX -
 SAMPLE OF: Slightly Silty Sand FROM: Boring 6 @ 25'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.



GRAVEL 66 % SAND 20 % SILT AND CLAY 14 %
 LIQUID LIMIT - PLASTICITY INDEX -
 SAMPLE OF: Silty Sandy Gravel FROM: Boring 7 @ 9'



GRAVEL 45 % SAND 28 % SILT AND CLAY 27 %
 LIQUID LIMIT - PLASTICITY INDEX -
 SAMPLE OF: Silty Sandy Gravel FROM: Boring 10 @ 10'

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. Sieve analysis testing is performed in accordance with ASTM D6913, ASTM D7928, ASTM C136 and/or ASTM D1140.



**TABLE 1
 SUMMARY OF LABORATORY TEST RESULTS**

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH (psf)	AASHTO CLASS	SOIL TYPE
BORING	DEPTH (ft)			GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTIC INDEX (%)			
1	2	8.5	96			70	22	4		A-4 (1)	Sandy Silt and Clay
2	4	7.9	108								Sandy Silt and Clay
4	2	11.0	105								Sandy Silty Clay
	4	8.5	101			60			3,600		Very Sandy Silty Clay
	6-8	2.8		81	6	13					Silty Sandy Gravel
6	25	2.1		3	90	7					Slightly Silty Sand
7	2	14.4				79	27	5		A-4 (3)	Sandy Silt and Clay
	9	3.5		66	20	14					Silty Sandy Gravel

Appendix F

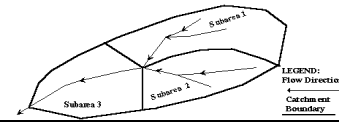
Determination of Runoff Coefficients for Rational Method

Determination of Runoff Coefficients for Rational Method

MHFD-Rational, Version 3.00 (August 2025)

Designer: David Anderson
 Company: Timberline Engineering
 Date: 1/11/2026
 Project: Capitol St. Multi-Family
 Location: 100 Capitol St, Eagle, CO

Cells of this color are for required user-input
 Cells of this color are for optional override values



Provide subcatchment names on the Rational Calcs worksheet to open up the table below.

Subcatchment Name	# of Subareas	Area (ac)	NRCS Hydrologic Soil Group	Percent Imperviousness			Runoff Coefficient, C								(Optional) Override Runoff Coefficient, C							Comments	
				Imperviousness Source	Imperviousness Category	Calculated Imperviousness	(Optional) Override Imperviousness	WQE & 2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	WQE & 2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr		
Existing Site	4	1.53	B			20.2%	20.2%	0.15	0.16	0.22	0.38	0.44	0.52	0.61	0.15	0.16	0.22	0.38	0.44	0.52	0.61		
		0.17	B	Surface Type	Roofs	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.03	B	Surface Type	Gravel - Low Traffic Areas	60%		0.46	0.49	0.54	0.63	0.66	0.71	0.76									
		0.07	B	Surface Type	Concrete Driveways and Walks	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		1.26	B	Land Use	Open Space, Undisturbed Native Grasses	5%		0.03	0.03	0.10	0.28	0.36	0.45	0.55									
Proposed Site	3	1.53	B			75.7%	75.7%	0.62	0.64	0.67	0.72	0.75	0.78	0.81	0.62	0.64	0.67	0.72	0.75	0.78	0.81		
		0.89	B	Surface Type	Roofs	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.31	B	Surface Type	Concrete Driveways and Walks	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.33	B	Land Use	Open Space, Undisturbed Native Grasses	5%		0.03	0.03	0.10	0.28	0.36	0.45	0.55									
S1	3	1.42	B			89.3%	89.3%	0.73	0.76	0.78	0.81	0.83	0.84	0.86	0.73	0.76	0.78	0.81	0.83	0.84	0.86		
		0.89	B	Surface Type	Roofs	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.26	B	Surface Type	Concrete Driveways and Walks	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
OS1	4	1.11	B			54.8%	54.8%	0.44	0.46	0.50	0.59	0.63	0.68	0.74	0.44	0.46	0.50	0.59	0.63	0.68	0.74	Landscape areas	
		0.22	B	Surface Type	Gravel - Low Traffic Areas	60%		0.46	0.49	0.54	0.63	0.66	0.71	0.76									
		0.28	B	Surface Type	Roadways and Paved Streets	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.20	B	Surface Type	Roofs	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
OS2	3	0.41	B	Land Use	Open Space, Undisturbed Native Grasses	5%		0.03	0.03	0.10	0.28	0.36	0.45	0.55									
		0.30	B			32.0%	32.0%	0.25	0.27	0.32	0.45	0.51	0.57	0.65	0.25	0.27	0.32	0.45	0.51	0.57	0.65		
		0.02	B	Surface Type	Roofs	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.07	B	Surface Type	Roadways and Paved Streets	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.21	B	Land Use	Open Space, Undisturbed Native Grasses	5%		0.03	0.03	0.10	0.28	0.36	0.45	0.55									
OS3	2	0.88	B			83.8%	83.8%	0.69	0.71	0.73	0.77	0.80	0.82	0.84	0.69	0.71	0.73	0.77	0.80	0.82	0.84		
		0.11	B	Land Use	Open Space, Undisturbed Native Grasses	5%		0.03	0.03	0.10	0.28	0.36	0.45	0.55									
		0.77	B	Surface Type	Roadways and Paved Streets	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
OS4	3	1.24	B			30.4%	30.4%	0.24	0.25	0.30	0.44	0.50	0.57	0.65	0.24	0.25	0.30	0.44	0.50	0.57	0.65		
		0.04	B	Surface Type	Roofs	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.31	B	Surface Type	Concrete Driveways and Walks	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									
		0.89	B	Land Use	Open Space, Undisturbed Native Grasses	5%		0.03	0.03	0.10	0.28	0.36	0.45	0.55									
OS5	1	0.38	B			95.0%	95.0%	0.79	0.81	0.82	0.85	0.86	0.87	0.88	0.79	0.81	0.82	0.85	0.86	0.87	0.88		
		0.38	B	Surface Type	Roadways and Paved Streets	95%		0.79	0.81	0.82	0.85	0.86	0.87	0.88									

Appendix G

Calculation of Peak Runoff using Rational Method

Calculation of Peak Runoff using Rational Method

Calculation of Peak Runoff using Rational Method

Calculation of Peak Runoff using Rational Method

Designer: David Anderson
 Company: Timberline Engineering
 Date: 1/11/2026
 Project: Capitol St. Multi-Family
 Location: 100 Capitol St, Eagle, CO

MHFD-Rational, Version 3.00 (August 2025)

Cells of this color are for required user-input
 Cells of this color are for optional override values

$$t_t = \frac{0.395(1.1 - C_s)\sqrt{L_t}}{S^{0.33}}$$

Computed $t_c = t_t + t_r$

$t_{c \text{ minimum}} = 5$ (urban)
 $t_{c \text{ minimum}} = 10$ (non-urban)

$$t_r = \frac{L_t}{60K\sqrt{S_t}} = \frac{L_t}{60V_t}$$

Regional $t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_t}}$

Selected $t_c = \max\{t_{c \text{ minimum}}, \min(\text{Computed } t_c, \text{Regional } t_c)\}$

Select MHFD location for NOAA Atlas 14 Rainfall Depths from the pulldown list OR enter your own depths obtained from the NOAA website (click this link)

WQE	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
0.42	0.42	0.57	0.70	0.89	1.03	1.18	1.54

1-hour rainfall depth, P1 (in) = $\frac{a}{28.50} + \frac{b}{10.00} + \frac{c}{0.786}$

Rainfall Intensity Equation Coefficients =

$$I(\text{in/hr}) = \frac{a * P_1}{(b + t_c)^c}$$

$Q(\text{cfs}) = CIA$

Provide input for area, soil type, and imperviousness on the Runoff Coeffs worksheet.

Subcatchment Name	Area (ac)	NRCS Hydrologic Soil Group(s)	Imperviousness	Runoff Coefficient, C							Overland (Initial) Flow Time							Channelized (Travel) Flow Time							Time of Concentration				Rainfall Intensity, I (in/hr)							Peak Flow, Q (cfs)						
				WQE & 2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	Overland Flow Length L _i (ft)	U/S Elevation (ft) (Optional)	D/S Elevation (ft) (Optional)	Overland Flow Slope S _i (ft/ft)	Overland Flow Time t _i (min)	Channelized Flow Length L _i (ft)	U/S Elevation (ft) (Optional)	D/S Elevation (ft) (Optional)	Channelized Flow Slope S _i (ft/ft)	NRCS Conveyance Factor K	Channelized Flow Velocity V _i (ft/sec)	Channelized Flow Time t _i (min)	Computed t _c (min)	Regional t _c (min)	Selected t _c (min)	(Optional) Override t _c (min)	WQE	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	WQE	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Existing Site	1.53	B	20.2%	0.15	0.16	0.22	0.38	0.44	0.52	0.61	90.00	6612.00	6609.00	0.033	10.78	210.00	6609.00	6606.00	0.014	7	0.84	4.18	14.96	25.04	14.96		0.95	0.95	1.30	1.59	2.02	2.34	2.68	3.50	0.22	0.22	0.32	0.54	1.16	1.58	2.13	3.27
Proposed Site	1.53	B	75.7%	0.62	0.64	0.67	0.72	0.75	0.78	0.81	50.00	6605.00	6604.00	0.020	4.63	200.00	6604.00	5994.00	3.050	20	34.93	0.10	4.73	13.22	5.00		1.42	1.42	1.93	2.37	3.02	3.49	4.00	5.22	1.36	1.36	1.90	2.42	3.34	4.01	4.76	6.49
S1	1.42	B	89.3%	0.73	0.76	0.78	0.81	0.83	0.84	0.86	50.00	6605.00	6604.00	0.020	3.47	200.00	6604.00	5994.00	3.050	20	34.93	0.10	3.57	10.91	5.00		1.42	1.42	1.93	2.37	3.02	3.49	4.00	5.22	1.48	1.48	2.08	2.62	3.47	4.10	4.78	6.40
OS1	1.11	B	54.8%	0.44	0.46	0.50	0.59	0.63	0.68	0.74	200.00	6626.00	6618.00	0.040	10.34	309.00	6618.00	6608.00	0.032	20	3.60	1.43	11.77	18.40	11.77		1.06	1.06	1.44	1.77	2.25	2.61	2.99	3.90	0.52	0.52	0.74	0.98	1.48	1.83	2.26	3.19
OS2	0.30	B	32.0%	0.25	0.27	0.32	0.45	0.51	0.57	0.65	187.00	6612.00	6609.00	0.016	17.61	58.00	6609.00	6607.50	0.026	20	3.22	0.30	17.91	21.01	17.91		0.87	0.87	1.19	1.46	1.85	2.14	2.46	3.21	0.07	0.07	0.09	0.14	0.25	0.33	0.42	0.63
OS3	0.88	B	83.8%	0.69	0.71	0.73	0.77	0.80	0.82	0.84	150.00	6614.00	6609.00	0.033	5.75	755.00	6609.00	6594.00	0.020	20	2.82	4.46	10.21	16.07	10.21		1.13	1.13	1.53	1.88	2.39	2.76	3.17	4.13	0.69	0.69	0.96	1.21	1.63	1.93	2.27	3.06
OS4	1.24	B	30.4%	0.24	0.25	0.30	0.44	0.50	0.57	0.65	195.00	6622.00	6591.50	0.156	8.62	143.00	6591.50	6588.00	0.024	20	3.13	0.76	9.39	21.98	9.39		1.16	1.16	1.58	1.94	2.47	2.86	3.27	4.27	0.35	0.35	0.49	0.73	1.35	1.76	2.30	3.43
OS5	0.38	B	95.0%	0.79	0.81	0.82	0.85	0.86	0.87	0.88	150.00	6604.50	6602.40	0.014	5.73	410.00	6602.40	5587.50	2.475	20	31.47	0.22	5.95	10.04	5.95		1.36	1.36	1.84	2.26	2.88	3.33	3.81	4.98	0.41	0.41	0.57	0.71	0.92	1.09	1.26	1.67

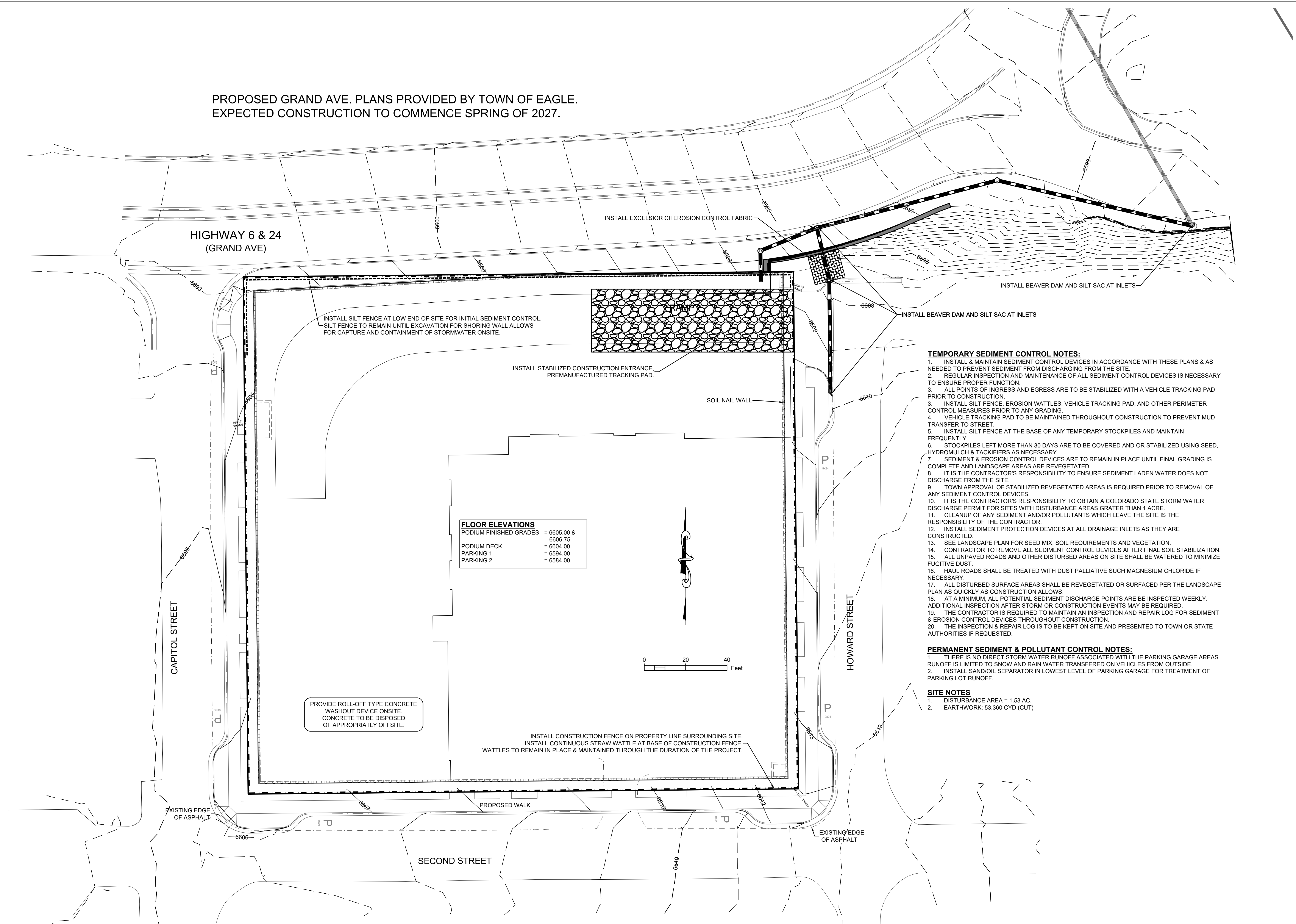
Appendix H

Combined Peak Runoff Calculations for Inlets and Storm Drains

Appendix I

Storm Water Management Plan
(Sediment & Erosion Control)

PROPOSED GRAND AVE. PLANS PROVIDED BY TOWN OF EAGLE.
 EXPECTED CONSTRUCTION TO COMMENCE SPRING OF 2027.



FLOOR ELEVATIONS	
PODIUM FINISHED GRADES	= 6605.00 & 6606.75
PODIUM DECK	= 6604.00
PARKING 1	= 6594.00
PARKING 2	= 6584.00

- TEMPORARY SEDIMENT CONTROL NOTES:**
1. INSTALL & MAINTAIN SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH THESE PLANS & AS NEEDED TO PREVENT SEDIMENT FROM DISCHARGING FROM THE SITE.
 2. REGULAR INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL DEVICES IS NECESSARY TO ENSURE PROPER FUNCTION.
 3. ALL POINTS OF INGRESS AND EGRESS ARE TO BE STABILIZED WITH A VEHICLE TRACKING PAD PRIOR TO CONSTRUCTION.
 3. INSTALL SILT FENCE, EROSION WATTLES, VEHICLE TRACKING PAD, AND OTHER PERIMETER CONTROL MEASURES PRIOR TO ANY GRADING.
 4. VEHICLE TRACKING PAD TO BE MAINTAINED THROUGHOUT CONSTRUCTION TO PREVENT MUD TRANSFER TO STREET.
 5. INSTALL SILT FENCE AT THE BASE OF ANY TEMPORARY STOCKPILES AND MAINTAIN FREQUENTLY.
 6. STOCKPILES LEFT MORE THAN 30 DAYS ARE TO BE COVERED AND OR STABILIZED USING SEED, HYDROMULCH & TACKIFIERS AS NECESSARY.
 7. SEDIMENT & EROSION CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL FINAL GRADING IS COMPLETE AND LANDSCAPE AREAS ARE REVEGETATED.
 8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE SEDIMENT LADEN WATER DOES NOT DISCHARGE FROM THE SITE.
 9. TOWN APPROVAL OF STABILIZED REVEGETATED AREAS IS REQUIRED PRIOR TO REMOVAL OF ANY SEDIMENT CONTROL DEVICES.
 10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A COLORADO STATE STORM WATER DISCHARGE PERMIT FOR SITES WITH DISTURBANCE AREAS GRATER THAN 1 ACRE.
 11. CLEANUP OF ANY SEDIMENT AND/OR POLLUTANTS WHICH LEAVE THE SITE IS THE RESPONSIBILITY OF THE CONTRACTOR.
 12. INSTALL SEDIMENT PROTECTION DEVICES AT ALL DRAINAGE INLETS AS THEY ARE CONSTRUCTED.
 13. SEE LANDSCAPE PLAN FOR SEED MIX, SOIL REQUIREMENTS AND VEGETATION.
 14. CONTRACTOR TO REMOVE ALL SEDIMENT CONTROL DEVICES AFTER FINAL SOIL STABILIZATION.
 15. ALL UNPAVED ROADS AND OTHER DISTURBED AREAS ON SITE SHALL BE WATERED TO MINIMIZE FUGITIVE DUST.
 16. HAUL ROADS SHALL BE TREATED WITH DUST PALLIATIVE SUCH MAGNESIUM CHLORIDE IF NECESSARY.
 17. ALL DISTURBED SURFACE AREAS SHALL BE REVEGETATED OR SURFACED PER THE LANDSCAPE PLAN AS QUICKLY AS CONSTRUCTION ALLOWS.
 18. AT A MINIMUM, ALL POTENTIAL SEDIMENT DISCHARGE POINTS ARE BE INSPECTED WEEKLY. ADDITIONAL INSPECTION AFTER STORM OR CONSTRUCTION EVENTS MAY BE REQUIRED.
 19. THE CONTRACTOR IS REQUIRED TO MAINTAIN AN INSPECTION AND REPAIR LOG FOR SEDIMENT & EROSION CONTROL DEVICES THROUGHOUT CONSTRUCTION.
 20. THE INSPECTION & REPAIR LOG IS TO BE KEPT ON SITE AND PRESENTED TO TOWN OR STATE AUTHORITIES IF REQUESTED.

- PERMANENT SEDIMENT & POLLUTANT CONTROL NOTES:**
1. THERE IS NO DIRECT STORM WATER RUNOFF ASSOCIATED WITH THE PARKING GARAGE AREAS. RUNOFF IS LIMITED TO SNOW AND RAIN WATER TRANSFERED ON VEHICLES FROM OUTSIDE.
 2. INSTALL SAND/OIL SEPARATOR IN LOWEST LEVEL OF PARKING GARAGE FOR TREATMENT OF PARKING LOT RUNOFF.

- SITE NOTES**
1. DISTURBANCE AREA = 1.53 AC.
 2. EARTHWORK: 53,360 CYD (CUT)



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STORM WATER MANAGEMENT PLAN

Sheet:
C.320

Appendix J: Maps

Existing Drainage Map

Proposed Site Drainage Map

Proposed Offsite Drainage Map

LEGEND

A DRAINAGE BASIN IDENTIFIER
 BASIN AREA (ACRES) 1.53
 C₁₀₀ 0.52
 C₁₀ 0.22

2 DESIGN POINT

— DRAINAGE BASIN BOUNDARY

→ INDICATES DIRECTION OF SURFACE DRAINAGE

▬ EXISTING STORM SEWER

--- FLOW PATH

▨ ROOFS

ASPHALT OR CONCRETE

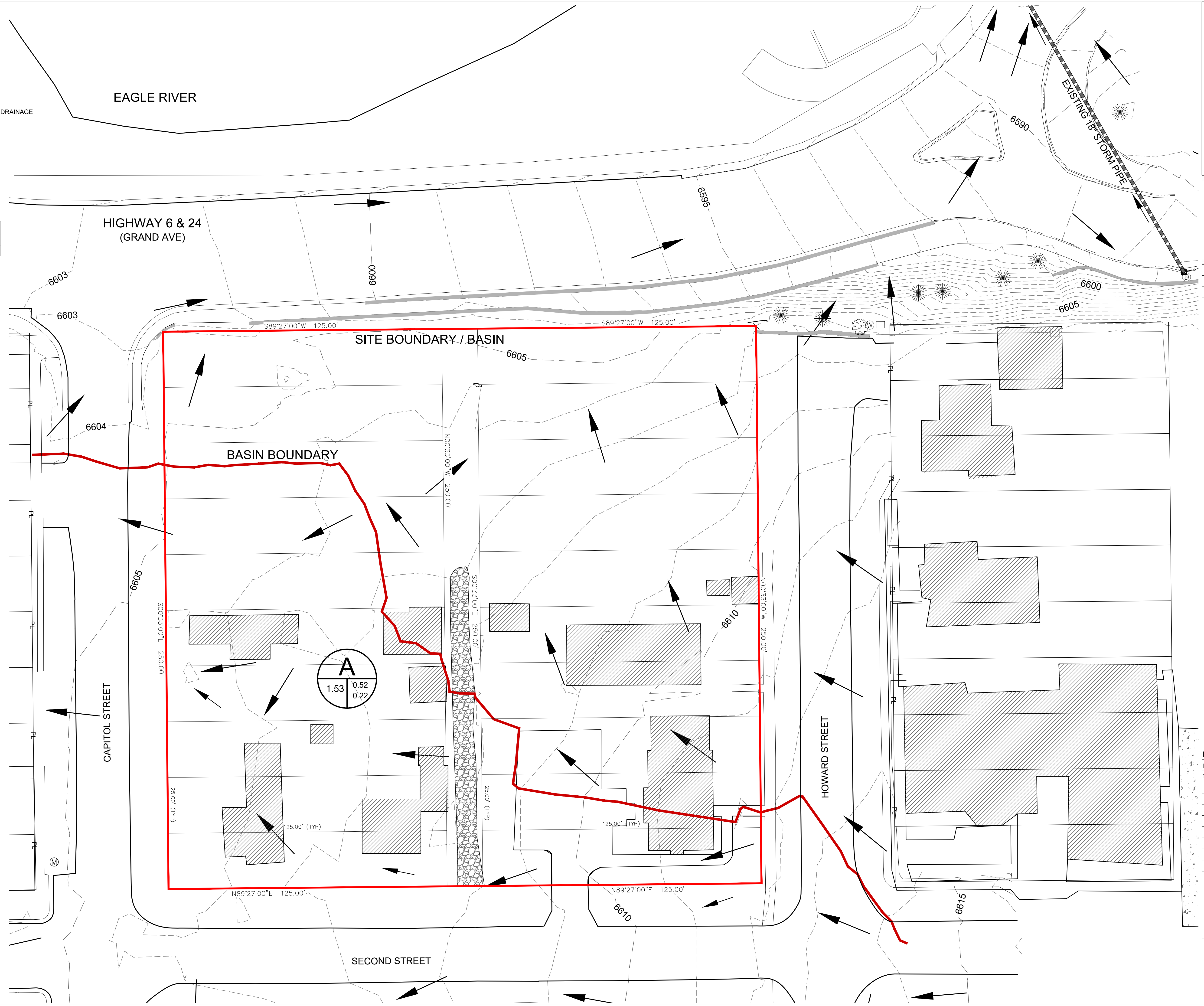
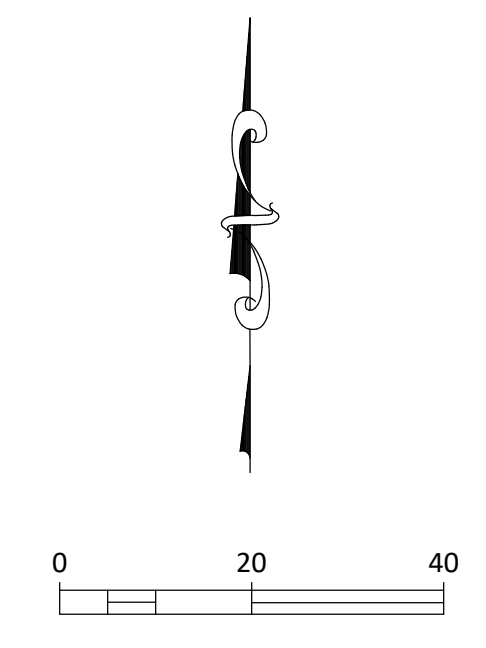
GRAVEL

HISTORIC FLOW RATE: SITE (1.53 AC)

EVENT	10-YR	25-YR	100-YR
FLOW RATE (CFS)	0.54	1.16	2.13

SITE COVERAGE

ID	AREA (AC)
ROOFS	0.17
GRAVEL	0.03
DRIVEWAYS & WALKS	0.07
GRASS & NATURAL VEG.	1.26
TOTAL	1.53



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Title: **EXISTING DRAINAGE MAP**

Sheet: **C.350**

LEGEND

A DRAINAGE BASIN IDENTIFIER

2 DESIGN POINT

— DRAINAGE BASIN BOUNDARY

— INDICATES DIRECTION OF SURFACE DRAINAGE

— EXISTING STORM SEWER

— FLOW PATH

▨ ROOFS

▨ HARDSCAPE

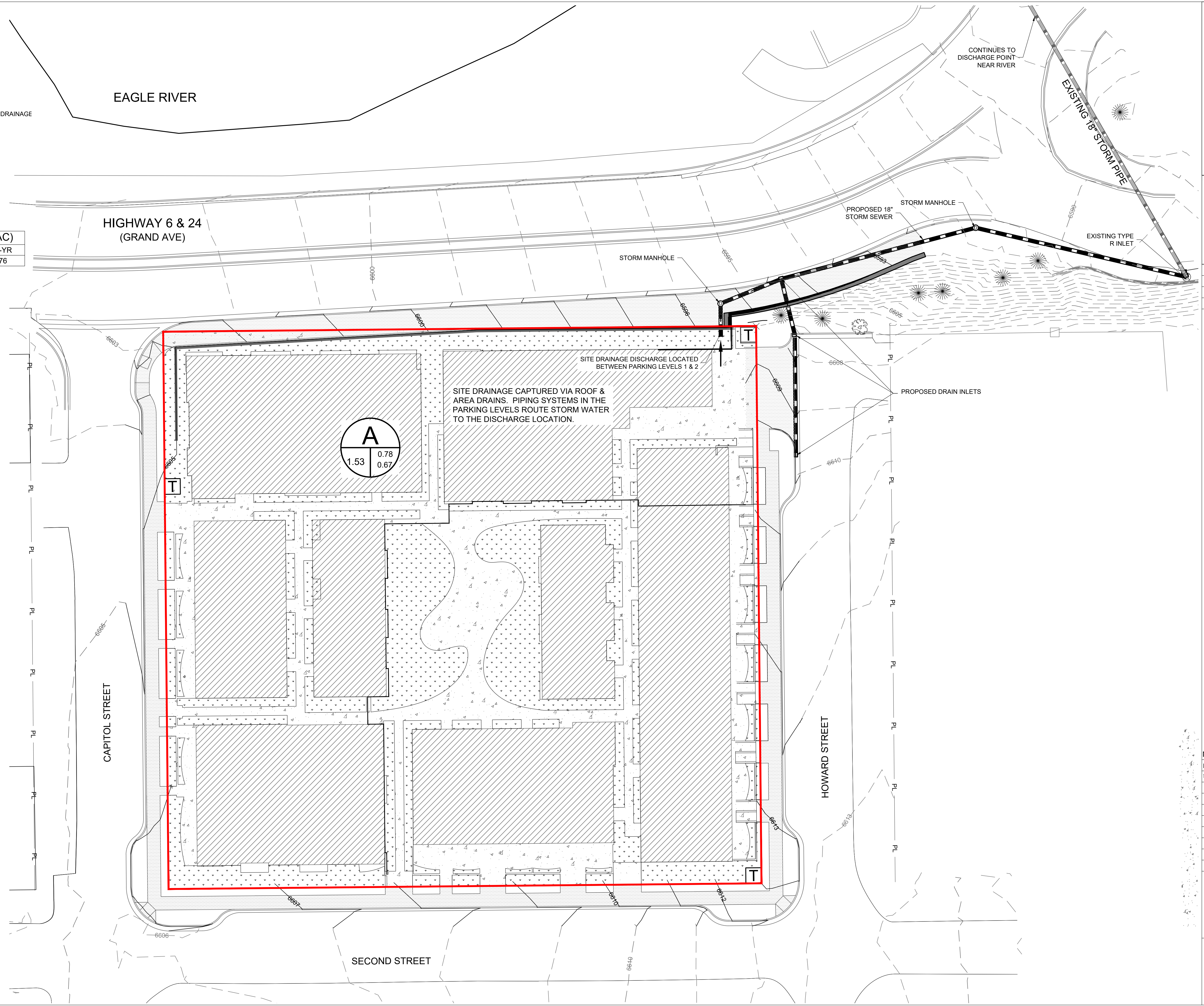
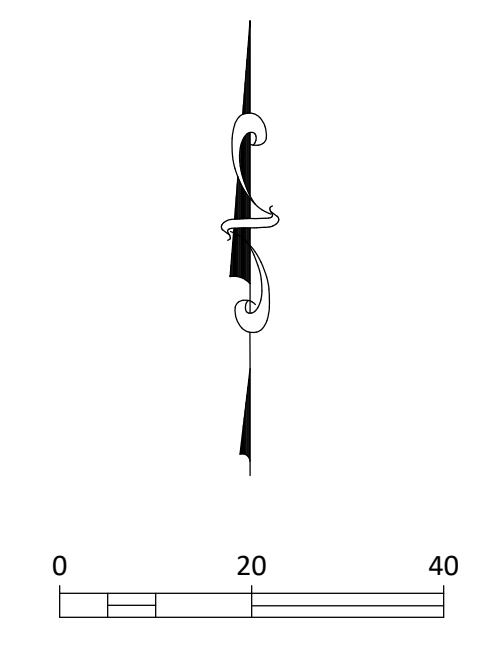
▨ LANDSCAPE

DEVELOPED FLOW RATE: SITE (1.53 AC)

EVENT	10-YR	25-YR	100-YR
FLOW RATE (CFS)	2.42	3.34	4.76

SITE COVERAGE

ID	AREA (AC)
ROOFS	0.89
HARDSCAPE	0.31
LANDSCAPE	0.33
TOTAL	1.53



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Title: **PROPOSED DRAINAGE MAP**

Sheet: **C.351**

Appendix K

Strom Sewer Construction Plans

See preliminary submittal drawings