CITY OF SALEM
EAST PUMP STATION PRV

DOCUMENT 00 90 00.1
ADDENDUM NO. 1

PART 1 - GENERAL

A. Receipt of this Addendum must be acknowledged by indicating acknowledgement on Document 00 40 00 Bid.

1.1 DOCUMENT INCLUDES

A. Geotechnical Report, AGEC, Inc., Geotechnical Investigation, Approximately Woodland Hills Drive & Salem Canal Road, Approximately Elk Ridge Drive & Salem Canal Road, Salem Utah, Project Number 1220156
B. Pre-Bid Conference Notes and Attendance List
C. Responses to Bidder Questions

1.2 CONSTRUCTION CONTRACT

A. The Construction Contract is known as: **EAST PUMP STATION PRV**

B. Date of this Addendum: January 27, 2026.

1.3 PRE-BID CONFERENCE NOTES

A. The Pre-Bid Conference Notes and Attendance List are attached.

1.4 ENGINEER'S RESPONSE TO BIDDER QUESTIONS

Q: Looks like we will be cutting into the Asphalt to Tee off of the 12 PI line? I noticed that you included the Concrete Slab Replacement, but not the asphalt area. I have included a picture:

A: Asphalt shall be replaced. Revised Drawings will be issued in a future addendum.

Q: With the water table, where would the location where we can discharge the water?
A: Groundwater can be discharged to the existing storm drain box at the northeast corner of the site.

Q: Requesting that the Geotechnical Report be made available?
A: Attached to this addendum. Refer to Boring B-2 in Geotechnical Report.

Q: Do you have an engineer estimate for this project?
A: There is not a cost estimate for this project.

Q: What is to be done about the fence posts?
A: The intent is to pull and replace fence panels. Fence posts are to protected in place.

Q: For the storm drain trench in the Woodland Hills Drive can native material be used for trench backfill or does it have to be imported material?
A: Woodland Hills Drive is a Utah County road. Imported material is to be used for trench backfill.

Q: How long can the PI system be down?
A: Depends on the time of the year. The PI system begins to be filled on May 10th-15th. Ideally the connection to the existing system will be made before then.

Q: Does the contractor need to relocate the gas service?
A: Contractor shall provide trench excavation. Enbridge Gas will install the lateral.

Q: When is CLSM to be used?
A: CLSM only used for close utility crossings as noted on the Drawings.

Q: What permits/coordination needs to be done with CUWCD?
A: CUWCD permits are not required. All work is located on Salem City property.

Q: Does the existing power pole on the east side of the pump station, outside the fence, need to be removed?
A: Power pole has been removed by others.

Q: Does the electrical on the plans reflect recent electrical updates on site?
A: The location of new electrical equipment shown on the site plan is based on CUWCD design drawings and does not reflect the as-constructed conditions. The site plan will be revised. A new drawing sheet will be issued in an addendum.

Q: Is the site gravel?
A: The site is UBC.

Q: Are there any federal requirements (i.e. Davis-Bacon wages) for this project?
A: There are no federal requirements as this is a Salem City project.

Q: When will the Geotech report be provided?
A: Geotechnical report shall be included in an addendum.

Q: What are the lead times for flow meters/PRV's?
A: Based on conversations with Jake Baum, the lead times should not be an issue.

Q: Is there special waterproofing for the vault?
A: No. Refer to Specification Section 09 90 00.

Q: What is the thickness of the road?
A: Thickness of asphalt shall be 4-inch minimum.

Q: Is the road allowed to be completely shut down?
A: Traffic control will have to be submitted through Utah County not Salem. It is assumed that the work can be completed without closing the road.

PART 2 – CHANGES

2.1 CHANGES TO PRIOR ADDENDA

A. NONE

2.2 CHANGES TO INTRODUCTORY INFORMATION

A. NONE

2.3 CHANGES TO BIDDING REQUIREMENTS

A. NONE

2.4 CHANGES TO AGREEMENT AND OTHER CONTRACT FORMS

A. NONE

2.5 CHANGES TO CONDITIONS OF THE CONTRACT

A. NONE

2.6 CHANGES TO SPECIFICATIONS

A. NONE

2.7 CHANGES TO CONTRACT DRAWINGS

A. NONE

THIS ADDENDUM IS HEREBY ATTACHED TO AND MADE A PART OF THE CONTRACT DOCUMENTS, AND EACH BIDDER SHALL ACKNOWLEDGE RECEIPT OF THIS ADDENDUM WITH THE BID.

END OF DOCUMENT 00 90 00

CITY OF SALEM
EAST PUMP STATION PRV
PRE-BID MEETING
JANUARY 21, 2026

INTRODUCTION

City Engineer: Bradey Wilde, P.E.
Assistant City Engineer: Deven Serr P.E.
Public Works Director: James Thomas
Assistant Public Works Director: McKay Lloyd
Designer: Greg Thomas, P.E. and Ethan Youngberg, E.I.T., Hansen, Allen & Luce, Inc., & Robert Conder, S.E., Conder Engineering, LLC, & Bob Hillyer, P.E. Heath Engineering

BRIEF DESCRIPTION OF THE WORK

Construction of a new cast-in-place pressure reducing valve (PRV) vault and associated piping and appurtenances. The vault is to be a below grade cast-in-place concrete structure. The vault will include two PRVs, valves, flowmeters, pressure relief valves, and associated piping. The project includes the installation of ductile iron pipe, PVC pipe, RCP pipe, storm drain manholes, and associated site restoration. Detailed information on the scope of work is contained in the project plans and specifications.

INSTRUCTION TO BIDDERS

A. Contract Time: As per Agreement Section 00 52 00 Part 4.02 of the Project Manual – The Project shall be substantial completed by **July 1, 2026** with final completion on **August 1, 2026**. The Project shall begin upon execution of the Agreement.
B. Liquidated Damages: As per Agreement Section 00 52 00 Part 4.03 of the Project Manual, the following Liquidated Damages shall apply - If the Project is not completed on schedule, CONTRACTOR agrees to pay CITY **$500.00** as liquidated damages for each day the Project continues beyond the date set forth in Section 00 52 00 Part 4.02 without substantial completion (unless the date is extended by amendment to the Agreement).
C. Interruption of Public Services: No interruption of public services shall be caused by Contractor, its agents, or employees without Engineer's prior written approval.
D. Regular Working Hours: 7:30 AM to 5:00 PM, five days per week, Monday through Friday.
E. Utility Coordination: Contractor is responsible to notify Blue Stakes (801) 208-2100 for all utility locations.
F. Testing & Certification Requirement: Contractor is required to have their own quality control program, see APWA Section 01 45 00.
G. Construction Staking: Contractor is responsible for own construction staking and layout.
H. Measurement & Documentation of Quantities: Coordinate with the City Inspector and field person on site.
I. Safety: Contractor is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.
J. Bid Documents: Refer to Section 00 41 00 and Section 00 21 13 Part 2.04, identifies all forms comprising the bid documents. Submission of the bid is to include a preliminary work schedule.
K. Bid Opening: Bids for construction of the Project will be received at Salem City located at 30 W 100 South, PO Box 901, Salem, UT 84653, until Thursday, **February 5, 2026, at 2:00 PM**

local time. At that time the Bids received will be Publicly opened and read by OWNER. Bids received after 2:00 PM. will not be accepted.

L. Bid Bonds required or Certified Check: Per 00 21 13 Part 8.01 the bond amount must equal at least 5% percent of the bidder's maximum amount of the bid.
M. The Bid shall contain an acknowledgement of receipt of all Addenda. The addenda numbers must be filled in on the Bid Form.
N. Questions: Refer to Section 00 21 13 Part 7.2.A. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

GENERAL DISCUSSION

A. All provisions of the 2025 Edition of the Manual of Standard Specifications and Manual of Standard Plans published by the Utah Chapter of the American Public Works Association that are applicable to the Work are hereby made a part of the Contract Documents by reference.
B. All work is within OWNER owned property. Additional easements or rights of entry to be obtained by CONTRACTOR.
C. OWNER will provide special inspections.
D. Refer to Drawing Sheet G-3 for traffic control and site access requirements.
E. CONTRACTOR shall confirm tie-in point with turnout constructed by VanCon.
F. Project includes the relocation of a gas service lateral. Salem has been coordinating with Enbridge.

QUESTIONS

Q: What is to be done about the fence posts?
A: The intent is to pull and replace fence panels. Fence posts are to be protected in place.

Q: For the storm drain trench in the Woodland Hills Drive can native material be used for trench backfill or does it have to be imported material?
A: Woodland Hills Drive is a Utah County road. Imported material is to be used for trench backfill.

Q: How long can the PI system be down?
A: Depends on the time of the year. The PI system begins to be filled on May 10th-15th. Ideally the connection to the existing system will be made before then.

Q: Does the contractor need to relocate the gas service?
A: Contractor shall provide trench excavation. Enbridge Gas will install the lateral.

Q: When is CLSM to be used?
A: CLSM only used for close utility crossings as noted on the Drawings.

Q: What permits/coordination needs to be done with CUWCD?
A: CUWCD permits are not required. All work is located on Salem City property.

Q: Does the existing power pole on the east side of the pump station, outside the fence, need to be removed?
A: Power pole has been removed by others.

Q: Does the electrical on the plans reflect recent electrical updates on site?

A: The location of new electrical equipment shown on the site plan is based on CUWCD design drawings and does not reflect the as-constructed conditions. The site plan will be revised. A new drawing sheet will be issued in an addendum.

Q: Is the site gravel?
A: The site is UBC.

Q: Are there any federal requirements (i.e. Davis-Bacon wages) for this project?
A: There are no federal requirements as this is a Salem City project.

Q: When will the Geotech report be provided?
A: Geotechnical report shall be included in an addendum.

Q: What are the lead times for flow meters/PRV's?
A: Based on conversations with Jake Baum, the lead times should not be an issue.

Q: Is there special waterproofing for the vault?
A: No. Refer to Specification Section 09 90 00.

Q: What is the thickness of the road?
A: Thickness of asphalt shall be **4**-inch minimum.

Q: Is the road allowed to be completely shut down?
A: Traffic control will have to be submitted through Utah County not Salem. It is assumed that the work can be completed without closing the road.

SALEM CITY
EAST PUMP STATION PRV
PRE-BID MEETING
January 21, 2026

ATTENDANCE

NAME	REPRESENTING	PHONE	EMAIL
Mikey Lloyd	Salem City Public Works	385-225-4178	mikey1@salemutah.gov
David Lancaster	Van Con	385-224-6738	bid@wedigutah.com
Tyler Stoker	FX Construction	801-376-7223	Tyler@fxconstruction.com
Brett Eggett	Corrio Construction	801-864-1224	brette@corrioconstruction.com
RHETT HOUSLEY	CONDIE CONSTRUCTION	801-404-1083	rhousley@condicconstruction.com
Mike Demke	mikede@Red Pine	385-628-8176	mikede@redpineconstruction.com
Neri Granados	Rain for Rent	(801) 292-9666	ngranados@rainforrent.com
Tim Ard	COP Construction	801/514-3739	tima@copconstruction.com
Deven Serr	Salem City Engineering	385-448-6056	devens@salemutah.gov
Brodey Wilde	Salem City Engineering	385-406-7122	bradeyw@salemutah.gov
James Thomas	Salem City Public Works	801-420-0343	jamest@salemutah.gov

AGEC
Applied GeoTech

GEOTECHNICAL INVESTIGATION

SALEM TRAIL CULVERTS

APPROXIMATELY WOODLAND HILLS DRIVE & SALEM CANAL ROAD

APPROXIMATELY ELK RIDGE DRIVE & SALEM CANAL ROAD

SALEM, UTAH

PREPARED FOR:

HANSEN ALLEN & LUCE
859 SOUTH JORDAN PARKWAY #200
SOUTH JORDAN, UTAH 84095

ATTENTION: STEVE JONES
EMAIL: Sjones@halengineers.com

PROJECT NO. 1220156 **AUGUST 26, 2022**

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. The subsurface soil encountered at the Woodland Hills Drive site consists of approximately 5 to 9 feet of fill overlying natural interlayered lean clay and silty sand. The interlayered deposits encountered extend to the maximum depth investigated of approximately 20½ feet.

   The subsurface soil encountered at the Elk Ridge Drive site consists of approximately 9 feet of fill overlying natural sandy silt, which extends to a depth of approximately 24 feet. Silty sand was encountered below the sandy silt, extending to the maximum depth investigated of approximately 30½ feet.

2. Subsurface water was encountered in the borings at the Woodland Hills Drive site at depths ranging from approximately 9½ to 10 feet, when measured 8 days after drilling. Water was encountered in the borings at the Elk Ridge Drive site at a depth of approximately 21½ feet, when measured 31 days after drilling.

3. The improvements may be supported on spread footings bearing on the undisturbed natural soil, or on compacted structural fill extending down to the undisturbed natural soil. The footings may be designed using a net allowable bearing pressure of 1,500 and 2,500 pounds per square foot (psf) at the Woodland Hills and Elk Ridge Drive sites, respectively.

   Footings bearing on at least 2 feet of structural fill, extending down to the undisturbed natural soil, may be designed using a net allowable bearing pressure of 2,500 psf at either site.

   Approximately 5 to 9 feet of fill was encountered in our borings at the site. Unsuitable fill, backfill and debris should be removed from below proposed footings and other settlement-sensitive improvements.

4. Geotechnical information related to foundations, subgrade preparation, pavement design and materials is included in the report.

SCOPE

This report presents the results of a geotechnical investigation for the proposed Salem Canal trail culverts along Salem Canal Road where it intersects with Woodland Hills Drive and Elk Ridge Drive in Salem, Utah. The locations of the two sites are shown on Figure 1. The report presents the subsurface conditions encountered, laboratory test results and recommendations for the proposed improvements. The study was conducted in general accordance with our proposals dated February 28 and June 13, 2022.

A field exploration program was conducted to obtain information on the subsurface conditions and samples for laboratory testing. Samples obtained during the field investigation were tested in the laboratory to determine physical and engineering characteristics of the on-site soil and to define conditions at the site for our engineering analysis. Results of the field exploration and laboratory tests were analyzed to develop recommendations for proposed improvements.

This report has been prepared to summarize the data obtained during the study and to present our conclusions and recommendations, based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to construction are included in the report.

SITE CONDITIONS

A. Woodland Hills Drive Site

The site for the proposed crossing at Woodland Hills Drive consists of a residential subdivision and landscaping to the west, and an undeveloped field to the east. The field contains grasses, weeds and occasional trees. A portion of the field is being used as a staging yard for construction activities in the area. The general area slopes down gently to the north northwest.

B. Elk Ridge Drive Site

The site for the proposed crossing at Elk Ridge Drive consists of an irrigated farm field to the west. The field is approximately 6 to 7 feet lower in elevation than Elk Ridge Drive. The area between the roadway and the farm field is vegetated with shrubs and trees. The area to the east of the proposed crossing consists of a residential subdivision currently under construction, and is only slightly lower in elevation than Elk Ridge Drive. The general area slopes down gently to the north northwest.

FIELD STUDY

Borings B-1 and B-2, at the proposed Woodland Hills Drive site, were drilled on May 12, 2022. The boring locations are shown on Figure 2 and the subsurface conditions encountered in the borings are graphically shown on Figure 3. Borings B-3 and B-4, at the proposed Elk Ridge Drive site, were drilled on July 15, 2022. The boring locations are shown on Figure 4 and logs of the subsurface conditions encountered in the borings are graphically shown on Figure 5.

The borings at both sites were drilled using 8-inch-diameter hollow-stem auger. The borings were logged and soil samples obtained by an engineer from AGEC.

SUBSURFACE CONDITIONS

A. Woodland Hills Drive Site

The subsurface soil encountered at the Woodland Hills Road site consists of approximately 5 to 9 feet of fill overlying natural interlayered lean clay and silty

sand. The interlayered deposits encountered extend to the maximum depth investigated of approximately 20½ feet.

A description of the soil encountered in the borings follows:

Fill - The fill consists predominantly of clay sand with occasional gravel. The fill is moist to very moist and brown to dark brown.

Laboratory tests performed on samples of the fill indicate it has an in-situ moisture content ranging from 10 to 20 percent and a dry density ranging from 107 to 116 pounds per cubic foot (pcf).

Interlayered Lean Clay and Silty Sand - The interlayered lean clay and silty sand is medium stiff to stiff, medium dense, slightly moist to wet and brown to grayish brown.

Laboratory tests performed on samples of the interlayered soil indicate it has in-situ moisture contents ranging from 24 to 30 percent and natural dry densities ranging from 90 to 99 pcf.

B. Elk Ridge Drive Crossing Site

The subsurface soil encountered at the Elk Ridge Drive site consists of approximately 9 feet of fill overlying natural sandy silt, which extends to a depth of approximately 24 feet. Silty sand was encountered below the sandy silt, extending to the maximum depth investigated of approximately 30½ feet.

A description of the soil encountered in the borings follows:

Granular Fill - The granular fill consists predominantly of well-graded gravel with silt and sand to clayey gravel with sand. The granular fill is slightly moist to moist and light brown to brown.

Laboratory tests performed on samples of the granular fill indicate it has in-situ moisture contents ranging from 3 to 6 percent and dry densities ranging from 131 to 134 pcf.

Cohesive Fill - The cohesive fill consists predominantly sandy lean clay with occasional gravel. The fill is slightly moist to moist and brown to dark brown.

Sandy Silt - The sandy silt is stiff to very stiff, slightly moist to wet and light brown to brown.

Laboratory tests performed on a sample of the sandy silt indicate that the sample has an in-situ moisture content of 12 percent and a natural dry density 101 pcf.

Silty Sand - The silty sand is medium dense, wet and brown.

Laboratory tests performed on a sample of the silty sand indicate it has a natural moisture content of 25 percent and a natural dry density of 94 pcf.

A summary of the laboratory test results is presented on Table I and test results are included on the logs of the borings.

SUBSURFACE WATER

A. Woodland Hills Drive Site

Subsurface water was encountered in the Boring B-1 and B-2 at the Woodland Hills Drive site at depths or 10 and 9½ feet, respectively, when measured 8 days after drilling.

B. Elk Ridge Drive Site

Subsurface water was encountered in Borings B-3 and B-4 at the Elk Ridge Drive site, at a depth of approximately 21½ feet, when measured 31 days after drilling.

Fluctuations in the depth to water can be expected over time.

PROPOSED CONSTRUCTION

As part of a pedestrian trail project along the Salem Canal, we understand the trail is proposed to cross Woodland Hills and Elk Ridge Drive. We understand that either trail culverts or pedestrian bridges are being considered at both crossing locations. We have assumed column loads up to 100 kips and wall loads up to 5 kips per lineal foot for the proposed structures.

We understand parking areas are being considered adjacent to the proposed trail. We have assumed traffic loads will consist primarily of passenger vehicle traffic, with two garbage trucks per week.

If the proposed construction, structural loads or traffic is significantly different from what is described above, we should be notified so that we can reevaluate the recommendations given.

RECOMMENDATIONS

Based on the subsurface conditions encountered, laboratory test results and the proposed construction, the following recommendations are given:

A. Site Grading

1. Existing Fill

   Approximately 5 to 9 feet of fill was encountered in our borings at the site. Unsuitable fill, backfill and debris should be removed from below proposed footings and other settlement-sensitive improvements.

2. Excavation

   Excavation at the site can be accomplished with typical excavation equipment. Consideration should be given to using excavation equipment with a flat cutting edge when excavating for building foundations, to reduce disturbance of the bearing soil.

   Excavations that extend to very moist soil near the groundwater level will require the use of excavation equipment supported from outside and above excavations. If excavations should extend below the water level, care should be taken to dewater the excavations. The water level should be maintained below the base of the excavation during placement of fill and concrete. Free-draining gravel with less than 5 percent passing the No. 200 sieve should be used for fill and backfill below the original water level. Consideration could be given to using a support fabric above the subgrade prior to placement of free-draining gravel.

3. Cut and Fill Slopes

Temporary unretained excavation slopes above the water level may be constructed at 1½ horizontal to 1 vertical or flatter.

Permanent unretained cut and fill slopes may be constructed at 2 horizontal to 1 vertical or flatter. Slopes should be protected from erosion by revegetation or other methods. Surface drainage should be directed away from cut and fill slopes.

4. Materials

Materials used as fill for the project are anticipated to consist of imported fill and the on-site soil. Recommendations for these materials are shown below:

a. Imported Fill

Structural fill placed below footings should consist of non-expansive granular soil. The fill should have less than 35 percent passing the No. 200 Sieve, a liquid limit no greater than 30% and a maximum particle size of less than 4 inches.

b. On-Site Soil

The on-site sand that fits the criteria given above may be used for structural fill beneath footings, if the organics, debris and other deleterious materials are removed. The on-site sand, silt and clay may be used as site-grading fill, retaining wall backfill and utility trench backfill outside proposed settlement-sensitive improvements.

Depending on the moisture content of the soil at the time of construction, the soil may require wetting or drying prior to use as fill. Drying of the soil may not be practical during cold or wet times of the year.

5. Compaction

Compaction of materials placed at the site should equal or exceed the minimum densities as indicated below when compared to the maximum dry density as determined by ASTM D 1557.

Fill To Support	Compaction Criteria
Foundations	≥ 95%
Concrete Flatwork	≥ 90%
Pavement	
Base Course	≥ 95%
Fill placed below Base Course	≥ 90%
Landscaping	≥ 85%
Retaining Wall Backfill	85 - 90%

To facilitate the compaction process, the fill should be compacted at a moisture content within 2 percent of optimum. Fill should be placed in thin enough lifts to allow for proper compaction and be frequently tested for compaction.

6. Drainage

The ground surface surrounding the proposed structures should be sloped to drain away from the foundations in all directions.

The collection and diversion of drainage away from the pavement surface is important to the performance of the pavement section. Proper surface drainage should be provided.

7. Construction Observation

An engineer from AGEC should observe excavations for footings prior to structural fill or footing placement.

B. Foundations

1. Bearing Material

Footings for the proposed structure may be supported on the undisturbed natural soil or on compacted structural fill extending down to the undisturbed natural soil. Structural fill placed to support footings should extend out away from the footings a distance at least equal to the depth of fill placed beneath the footings.

Prior to placing structural fill, unsuitable fill, organics, topsoil, debris and other deleterious materials should be removed from areas of the proposed footings.

2. Bearing Pressure

Footings may be designed using net allowable bearing pressures of 1,500 and 2,500 pounds per square foot (psf) at the Woodland Hills Drive and Elk Ridge Drive sites, respectively.

Footings bearing on at least 2 feet of structural fill, extending down to the natural undisturbed soil, may be designed using a net allowable bearing pressure of 2,500 psf at either site.

3. Temporary Loading Conditions

The bearing pressure indicated above may be increased by one-half for temporary loading conditions such as for wind and seismic loads.

4. Settlement

We estimate that total and differential settlement will be on the order of 1 and ¾ inch, respectively, for footings designed and constructed as described above.

5. Minimum Footing Width and Embedment

Spread footings should have a width of at least 1½ feet and a depth of embedment of at least 2½ feet, for adequate bearing capacity and frost protection.

C. Lateral Earth Pressures

1. Lateral Resistance for Footings

Lateral resistance for spread footings placed on the natural soil or on compacted structural fill is controlled by sliding resistance between the footing and the foundation soil. Friction values of 0.35 and 0.45 may be used in the design for ultimate lateral resistance where footings are supported on native soil or granular structural fill, respectively.

2. Subgrade Walls and Retaining Structures

The following lateral earth pressures are given for design of subgrade walls and retaining structures. The active condition is where the wall moves away from the soil. The passive condition is where the wall moves into the soil. The at-rest condition is where the wall does not move.

The values listed are equivalent fluid weights and assume a horizontal surface adjacent the top and bottom of the wall.

Backfill Type	Active	At-Rest	Passive
Clay/Silt	40 pcf	55 pcf	250 pcf
Sand/Gravel	35 pcf	50 pcf	300 pcf

3. Seismic Conditions

Under seismic conditions, equivalent fluid weights should be modified by the values provided below:

	Active	At-Rest	Passive
Woodland Hills Drive Crossing	+46 pcf	+31 pcf	- 46 pcf
Elk Ridge Drive Crossing	+49 pcf	+34 pcf	- 49 pcf

These values assume peak ground accelerations of 0.76g and 0.82g at Woodland Hills and Elk Ridge Drives, respectively, representing a 2 percent probability of exceedance in a 50-year period (ICC, 2017).

4. Safety Factors

The values recommended above assume mobilization of the soil to achieve ultimate soil strength. Conventional safety factors used for structural analysis for such items as overturning and sliding resistance should be used in design.

D. Seismic Design Considerations

1. Building Code Parameters

Listed below is a summary of the mapped seismic parameters that may be used at each site with the 2018 International Building Code. The values were obtained from information provided by the ASCE 7 hazard tool at https://asce7hazardtool.online based on ASCE/SEI 7-16.

Description	Woodland Hills	Elk Ridge
Site Class	D[1]	D[1]
S_s - MCE_R ground motion (period = 0.2s)	1.51g	1.62g
S_1 - MCE_R ground motion (period = 1.0s)	0.57g	0.61g
F_a - Site amplification factor at 0.2s	1.00	1.00
F_v - Site amplification factor at 1.0s	1.78[2]	1.70[2]
PGA - MCE_G peak ground acceleration	0.69g	0.74g
PGA_M - Site modified peak ground acceleration	0.76g	0.82g

[1]Site Class D is recommended (not Default D) based on the boring logs, and our understanding of the geology of the area.

[2]See requirements for site-specific ground motions in ASCE 7-16 §11.4.8. F_v is used only to calculate T_s, determine the seismic design category and determine linear interpolation for intermediate values of S_1 when taking the exceptions under Items 1 and 2 within §11.4.8.

2. Faulting

There are no mapped active faults extending near or through the project sites. Both sites are located within a right-stepping portion of the Wasatch Fault Zone, between the Nephi and Provo Segments. This is the closest mapped active fault trace to the sites.

The closest mapped active trace of the Wasatch Fault to the Woodland Hills Drive site is a portion of the Provo Segment. The nearest surface trace of the fault is located approximately 1 mile to the southeast of the site (UGS, 2022).

The closest mapped active trace to the Elk Ridge Drive site is a portion of the Nephi Segment fault. The nearest surface trace is located approximately 1¾ miles to the west of the site (UGS, 2022).

3. Liquefaction

The sites are located in an area mapped as having a "low" to "very low" potential for liquefaction (Anderson et al, 1994). A site-specific liquefaction analysis was not requested as part of this study and is beyond the scope of this report.

E. Water Soluble Sulfates

A sample of the natural soil was tested in the laboratory from each site for water soluble sulfate content. Results of the tests indicate there is less than 0.001 percent water soluble sulfate in the samples tested. Based on the results of the test and published literature, the natural soil at both sites has a negligible sulfate attack potential on concrete. Sulfate resistant cement is not needed for concrete placed in contact with the natural soil. Other conditions may dictate the type of cement to be used in concrete for the project.

F. Pavement

Based on the subsoil conditions encountered, laboratory test results and the assumed traffic as indicated in the Proposed Construction section of the report, the following pavement support recommendations are given:

1. Subgrade Support

We anticipate that subgrade materials could consist of clay, silt, sand or gravel. We have assumed a California Bearing Ratio (CBR) value of 3, representing a clay subgrade.

2. Pavement Thicknesses

Based on the subsurface conditions encountered, the assumed traffic as described in the proposed construction section, a design life of 20 years for

flexible pavement and 30 years for rigid pavement, and methods presented by AASHTO, we recommend a flexible pavement section consisting of at least 3 inches of asphaltic concrete overlying 6 inches of base course. Alternatively, 5 inches of Portland Cement could be used.

A pavement section consisting of at least 6½ inches of Portland Cement concrete over 4 inches of base course is recommended for dumpster approach slabs.

3. Pavement Material

a. Flexible Pavement (Asphaltic Concrete)

The pavement materials should meet the specifications for the applicable jurisdiction. The use of other materials may result in different pavement material thicknesses.

b. Rigid Pavement (Portland Cement Concrete)

The rigid pavement thicknesses given above assume that a concrete shoulder or curb will be placed at the edge of the pavement and that the pavement will have aggregate interlock joints.

The pavement materials should meet the specifications for the applicable jurisdiction. The pavement thicknesses indicated above assume that the concrete will have a 28-day compressive strength of 5,000 pounds per square inch. Concrete should be air entrained with approximately 6 percent air. Maximum allowable slump will depend on the method of placement but should not exceed 4 inches.

4. Jointing

Joints for concrete pavement should be laid out in a square or rectangular pattern. Joint spacings should not exceed 30 times the thickness of the slab

or 15 feet, whichever is smallest. The joint spacings indicated should accommodate the contraction of the concrete and under these conditions steel reinforcing will not be required. The depth of joints should be approximately one-fourth of the slab thickness.

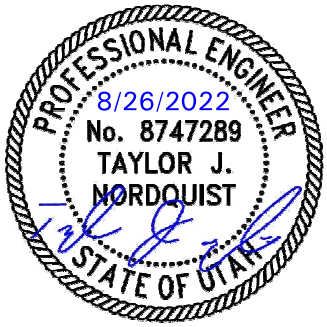
G. Preconstruction Meeting

A preconstruction meeting should be held with representatives of the owner, project architect, geotechnical engineer, civil engineer, general contractor, earthwork contractor and other members of the design team to review construction plans, specifications, methods and schedule.

LIMITATIONS

This report has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the proposed construction, the information obtained from the borings drilled, laboratory test results and our experience in the area. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface conditions, proposed construction or groundwater level is found to be significantly different from what is described above, we should be notified to reevaluate our recommendations.

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



Taylor J. Nordquist P.E.

Reviewed by Douglas R. Hawkes, P.E., P.G.

TJN/rs

REFERENCES

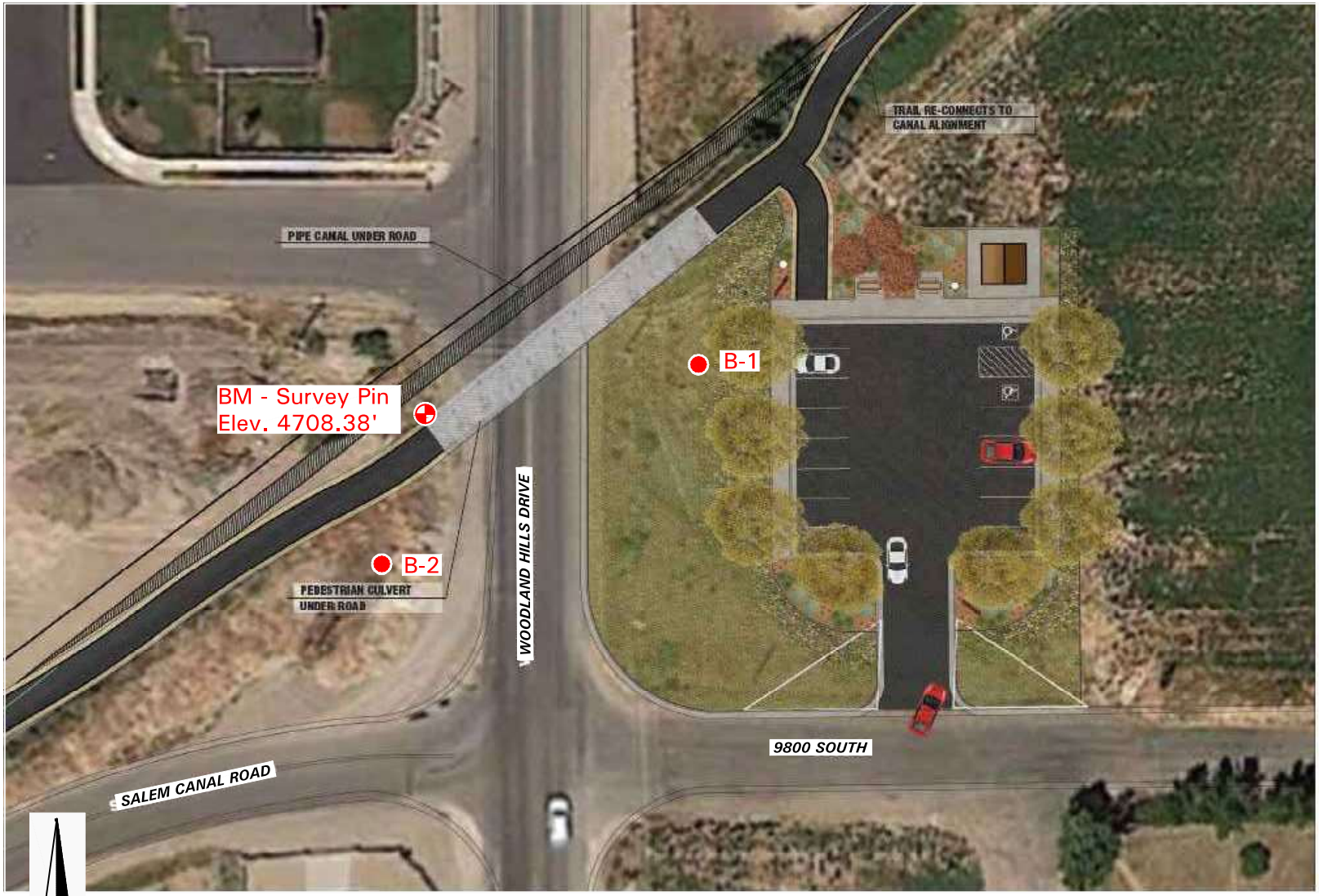
Anderson, L.R., Keaton, J.R. & Bischoff, J.E. (1994). "Liquefaction Potential map for Utah County, Utah" Utah Geological Survey Contract Report 94-3, pg. 46, scale 1:48,000.

American Society of Civil Engineers (ASCE), 2017 "Minimum Design Loads and Associated Criteria for Buildings and Other Structures, Provisions" ASCE / SEI 7-16, American Society of Civil Engineers, Reston, Virginia.

International Code Council Inc. (ICC), 2017; 2018; International Building Code. Falls Church, Virginia.

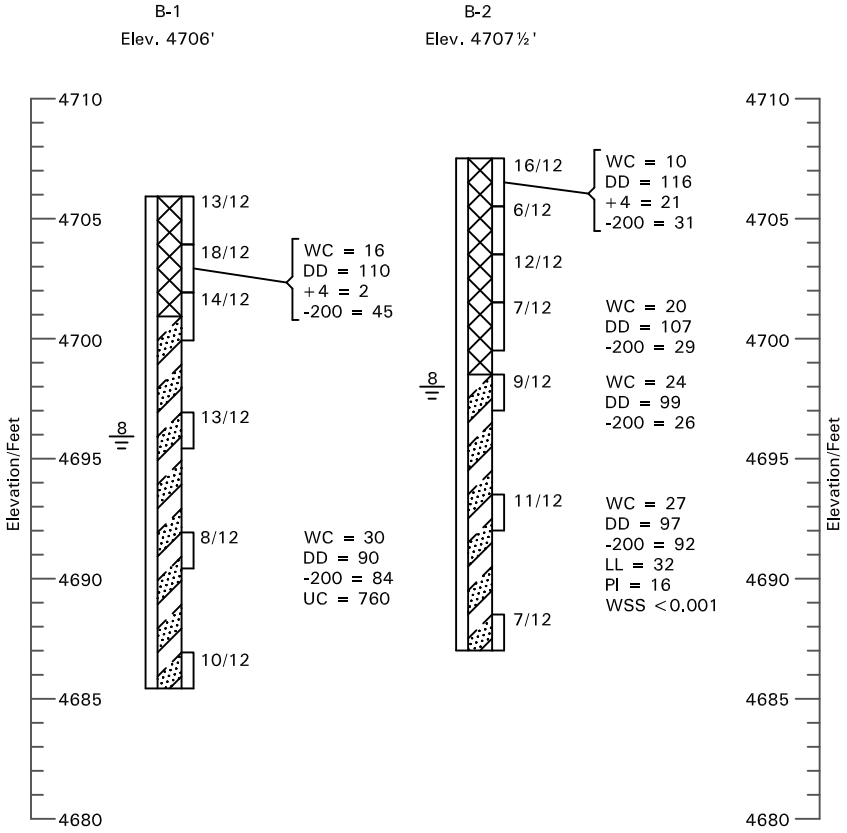
Utah Geological Survey, 2022; Utah Geologic Hazards Portal. Https://geology.utah.gov/apps/hazards. Accessed August 18, 2022.

1220156	AGEC	Vicinity Map	Figure 1



PROPOSED SALEM TRAIL CULVERT
APPROX. SALEM CANAL ROAD &
WOODLAND HILLS DRIVE
SALEM, UTAH

1220156	AGEC	Exploratory Boring Locations - Woodland Hills Drive Crossing	Figure 2



Approximate Vertical Scale 1" = 8'

LEGEND:

Fill; clayey sand with occasional gravel, moist to very moist, brown to dark brown.

Interlayered Lean Clay and Silty Sand (CL/SM); medium stiff to stiff, medium dense, slightly moist to wet, brown to grayish brown.

10/12 California Drive sample taken. The symbol 10/12 indicates that 10 blows from a 140 pound automatic hammer falling 30 inches were required to drive the sampler 12 inches.

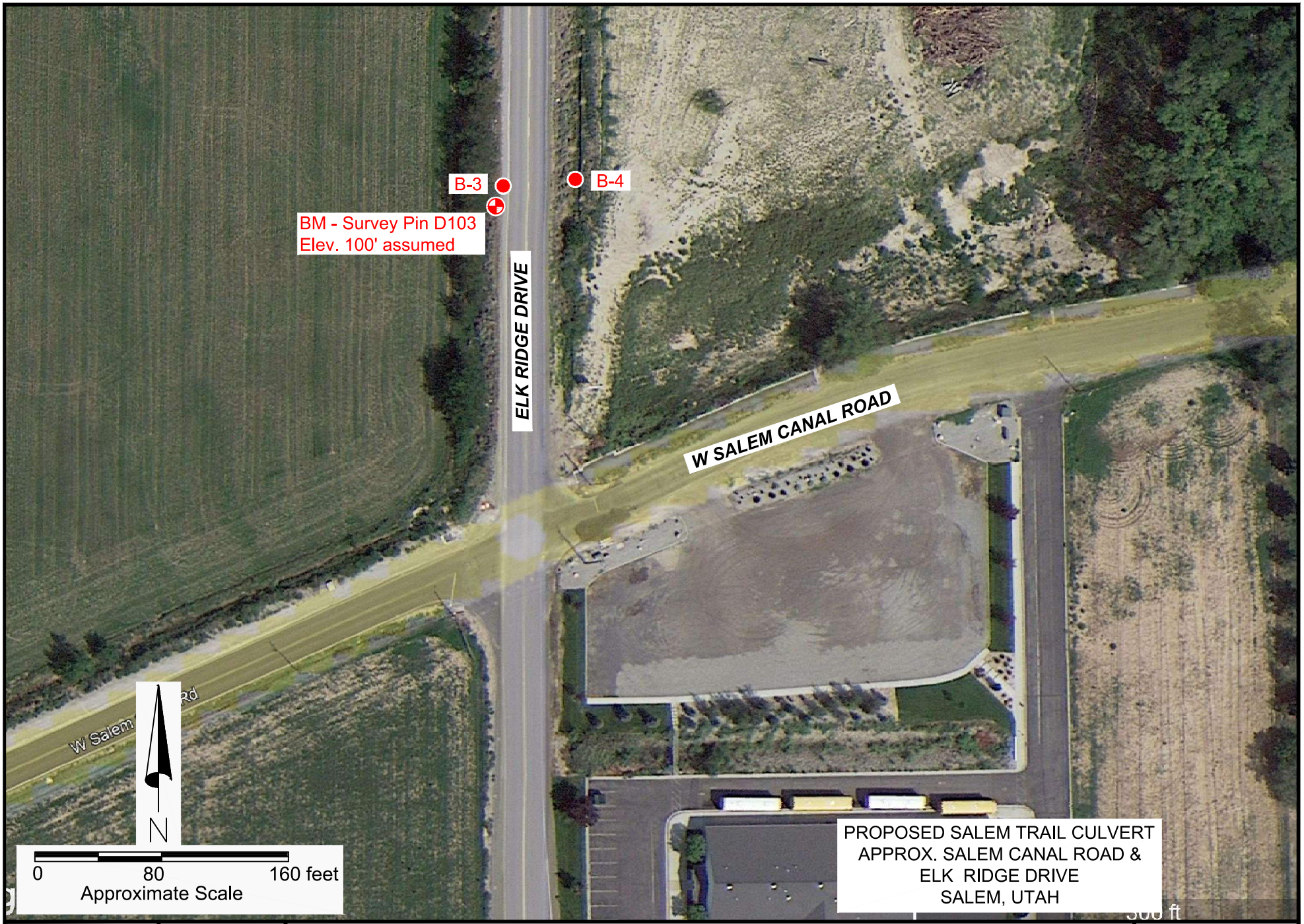
Indicates slotted 1½ inch PVC pipe installed in the boring to the depth shown.

8 Indicates the depth to free water and the number of days after drilling the measurement was taken.

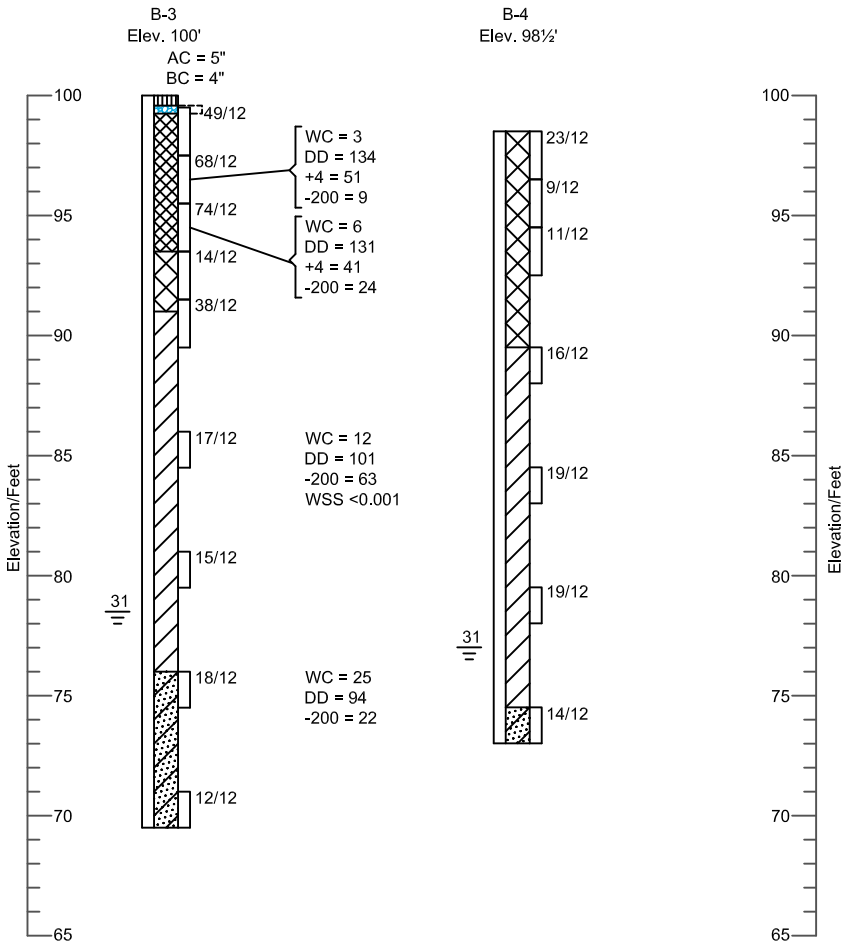
NOTES:

1. The borings were drilled on May 12, 2022 with 8-inch diameter hollow-stem auger.
2. The locations of the borings were measured approximately by pacing from features shown on the site plan provided.
3. The elevations of the borings were measured by automatic level and refer to the benchmark shown on Figure 2.
4. The 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 boring logs represent the approximate boundaries between material types and the transitions may be gradual.
6. The water level readings shown on the logs were made at the time and under the conditions indicated. Fluctuations in the water will occur with time.
7. WC = Water Content (%);
   DD = Dry Density (pcf);
   +4 = Percent Retained on the No. 4 Sieve;
   -200 = Percent Passing the No. 200 Sieve;
   LL = Liquid Limit (%);
   PI = Plasticity Index (%);
   UC = Unconfined Compressive Strength (psf);
   WSS = Water Soluble Sulfates (%).

1220156	AGEC	Exploratory Boring Logs, Legend and Notes - Woodland Hills Drive Crossing	Figure 3



1220156	AGEC	Exploratory Boring Locations - Elk Ridge Drive Crossing	Figure 4



LEGEND:

Fill; sandy lean clay with occasional gravel, slightly moist to moist, brown to dark brown.

Fill; well-graded gravel with silt and sand to clayey gravel with sand, slightly moist to moist, light brown to brown.

Sandy Silt (ML); stiff to very stiff, slightly moist to wet, light brown to brown.

Silty Sand (SM); medium dense, wet, brown.

10/12 California Drive sample taken. The symbol 10/12 indicates that 10 blows from a 140 pound automatic hammer falling 30 inches were required to drive the sampler 12 inches.

Indicates slotted 1½ inch PVC pipe installed in the boring to the depth shown.

31 Indicates the depth to free water and the number of days after drilling the measurement was taken.

NOTES:

1. The borings were drilled on July 15, 2022 with 8-inch diameter hollow-stem auger.
2. The locations of the borings were measured approximately by pacing from features shown on the site plan provided.
3. The elevations of the borings were measured by automatic level and refer to the benchmark shown on Figure 4.
4. The 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 boring logs represent the approximate boundaries between material types and the transitions may be gradual.
6. The water level readings shown on the logs were made at the time and under the conditions indicated. Fluctuations in the water will occur with time.
7. WC = Water Content (%);
   DD = Dry Density (pcf);
   +4 = Percent Retained on the No. 4 Sieve;
   -200 = Percent Passing the No. 200 Sieve;
   WSS = Water Soluble Sulfates (%);
   AC = Asphaltic Concrete Thickness;
   BC = Base Course Thickness.

Approximate Vertical Scale 1" = 8'

1220156	AGEC	Exploratory Boring Logs, Legend and Notes - Elk Ridge Drive Crossing	Figure 5

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NUMBER: 1220156

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (PCF)	GRADATION			ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH (PSF)	WATER SOLUBLE SULFATE (%)	SAMPLE CLASSIFICATION
BORING	DEPTH (FEET)			GRAVEL (%)	SAND (%)	SILT/ CLAY (%)	LIQUID LIMIT (%)	PLASTICITY INDEX			
B-1	2	16	110	2	53	45					Fill; Clayey Sand
	14	30	90			84			760		Lean Clay with Sand ((CL)
B-2	0	10	116	21	48	31					Fill; Clayey Sand with Gravel
	6	20	107			29					Fill; Clayey Sand
	9	24	99			26					Silty Sand (SM)
	14	27	97			92	32	16		<0.001	Lean Clay (CL)
B-3	2½	3	134	51	40	9					Fill; Well-graded Gravel with Silt and Sand
	4½	6	131	41	35	24					Fill; Clayey Gravel with Sand
	14	12	101			63				<0.001	Sandy Silt (ML)
	24	25	94			22					Silty Sand (SM)