



GEOTECHNICAL INVESTIGATION

1305 EAST MISSION ROAD
FALLBROOK, CALIFORNIA

NOVEMBER 11, 2025
PROJECT NO. G3322-42-01

PREPARED FOR:

BOULDER RIDGE CAPITAL
CARLSBAD, CALIFORNIA



Project No. G3322-42-01
November 11, 2025

Boulder Ridge Capital
3220 Grey Hawk Court
Carlsbad, California 92010

Attention: Mr. Andrew Bertha

Subject: GEOTECHNICAL INVESTIGATION
1305 EAST MISSION ROAD
FALLBROOK, CALIFORNIA

Dear Mr. Bertha:

In accordance with your request and authorization of our proposal (SD-24-0806-P-GT dated April 23, 2024) and subsequent change order, we herein submit the results of our geotechnical investigation for the subject project. We performed our investigation to evaluate the underlying soil and geologic conditions, potential geologic hazards, and to assist in the design of the proposed improvements.

The accompanying report contains the results of our study with conclusions and recommendations pertinent to the geotechnical aspects of the proposed project. The site is suitable for the proposed self-storage facility provided that the recommendations presented in this report are incorporated into the design and construction of the planned project.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Lilian E. Rodriguez
RCE 83227



LER:RCM:RSA:am

(e-mail) Addressee

Rodney C. Mikesell
GE 2533



Rupert S. Adams
CEG 2561

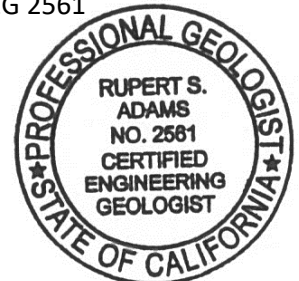


TABLE OF CONTENTS

1.	PURPOSE AND SCOPE.....	1
2.	SITE AND PROJECT DESCRIPTION	2
3.	SOIL AND GEOLOGIC CONDITIONS.....	2
3.1	Undocumented Fill (Qudf)	3
3.2	Topsoil (unmapped).....	3
3.3	Alluvium (Qal)	3
3.4	Granitic Rock (Kgr)	4
4.	GROUNDWATER.....	4
5.	GEOLOGIC HAZARDS	4
5.1	Ground Rupture.....	4
5.2	Seismicity	4
5.3	Liquefaction	5
5.4	Tsunamis, and Seiches	5
5.5	Landslides	5
5.6	Flooding	5
6.	ROCK RIPPABILITY	5
6.1	Seismic Refraction Surveys	5
7.	CONCLUSIONS AND RECOMMENDATIONS	9
7.1	General	9
7.2	Excavation and Soil Characteristics	9
7.3	Subdrains	10
7.4	Grading Recommendations	10
7.5	Excavation Slopes and Shoring	13
7.6	Seismic Design Criteria – 2022 California Building Code	13
7.7	Shallow Foundation Recommendations.....	15
7.8	Interior Concrete Slabs on Grade	18
7.9	Exterior Concrete Flatwork.....	19
7.10	Retaining Wall Recommendations	21
7.11	Lateral Loading	24
7.12	Site Drainage and Moisture Protection	25

LIMITATIONS AND UNIFORMITY OF CONDITIONS

MAPS AND ILLUSTRATIONS

Figure 1, Geologic Map

Figure 2, Geologic Cross-Section

APPENDIX A

FIELD INVESTIGATION

APPENDIX B

LABORATORY TESTING

APPENDIX C

SEISMIC SURVEY REPORT

APPENDIX D

STORMWATER MANAGEMENT INVESTIGATION

APPENDIX E

RECOMMENDED GRADING SPECIFICATIONS

LIST OF REFERENCES

GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report contains the results of our geotechnical investigation for a proposed self-storage facility located at 1305 East Mission Road in Fallbrook, California (see Site Location Map).



Site Location Map

The purpose of the investigation is to evaluate surface and subsurface soil conditions and general site geology, and to identify geotechnical constraints that could affect construction of the improvements including faulting, liquefaction, and seismic shaking based on the 2022 CBC seismic design criteria. We are providing recommendations for remedial grading, shallow foundations, concrete slab-on-grade, concrete flatwork, and retaining walls.

The scope of this investigation included our review of readily available, pertinent geologic literature; field work; performing engineering analyses; and preparing this report.

Field work consisted of excavating 19 exploratory trenches to a maximum depth of about 13 feet; drilling 9 exploratory borings to a maximum depth of about 21.5 feet; sampling soil; and performing laboratory tests on selected soil samples. Appendix A contains the trench and boring logs and details of the field investigation. The details of the laboratory testing and a summary of the test results are shown in Appendix B and on the trench and boring logs in Appendix A. The results of a seismic survey are presented in Appendix C, and a storm water management investigation is presented in Appendix D.

The recommendations presented herein are based on our analysis of data and our observations obtained during a previous investigation and our experience with similar soil and geologic conditions.

2. SITE AND PROJECT DESCRIPTION

The rectangular approximately 5-acre property is currently undeveloped and is occupied by grasses, trees, end-dumped piles of trash, and old farming tracks. The site is bounded by residential lots and open space to the north and south, a commercial development to the west, and SDGE facilities to the east and west. Review of historical aerial photographs indicates that the property was used for agricultural purposes, and that several farm or residential buildings were demolished circa 2020. Site topography slopes northwards with elevations ranging from approximately 761 to 804 feet Mean Sea Level (MSL).

Based on a review of the architectural plans (Jordan Architects, 2025), we understand that the development will consist of the construction of 10 prefabricated, single- or two-story, steel framed, storage buildings (Buildings A through J), with associated driveways and utility improvements. Two bio-filtration basins are planned at the north end of the site. The grading plan prepared by Omega Engineering Consultants Incorporated indicates that grading will consist of cuts and fills up to approximately 10 feet to achieve planed grades.

The locations, site descriptions, and proposed development are based on our site reconnaissance, review of published geologic literature, and discussions with project personnel. If development plans differ from those described herein, we should be contacted to review the final plan and possibly provide revisions to the recommendations presented in this report.

3. SOIL AND GEOLOGIC CONDITIONS

We encountered undocumented fill, topsoil, alluvium and granitic rock in our exploratory borings and trenches. The occurrence, distribution, and description of each unit encountered is shown on the

Geologic Map, Figure 1 and on the boring and trench logs in Appendix A. The Geologic Cross-Section, Figure 2, shows the approximate subsurface relationship between the geologic units. We prepared the geologic cross-section using interpolation between exploratory excavations and observations; therefore, actual geotechnical conditions may vary from those illustrated and should be considered approximate. The units are described below.

3.1 Undocumented Fill (Qudf)

Undocumented fill was encountered in trenches T-2 through T-5, T-9 and T-11 and borings B-2, and B-4 through B-9 to depths ranging from 1.5 to 5 feet below existing grade. The fill is likely associated with previous site development and minor grading, and generally consisted of loose to medium dense, silty and clayey sand. Various end-dumped piles of trash and landscaping debris are also present on the site. The fill is unsuitable to support the planned improvements and will require remedial grading. This soil may be reused as fill provided debris is removed.

3.2 Topsoil (unmapped)

Topsoil was encountered at grade or below undocumented fill in trenches T-1, T-6 through T-8, T-10, T-11 and T-16, and boring B-3 to depths ranging from approximately 1.5 to 4 feet below existing grades. The topsoil encountered consisted of loose, silty sand and stiff, sandy clay. The topsoil is not suitable to support settlement sensitive improvements and should be removed and replaced with properly compacted fill within structural improvement areas. The topsoil can be reused as fill during grading operations provided it is free of roots and debris.

3.3 Alluvium (Qal)

Alluvium was observed at grade in trenches T-12 through T-15, and T-17 through T-19, and boring B-1 at the north end of the site to depths ranging from 5.5 feet to greatest depth explored of 13 feet. The alluvium generally consisted of loose to medium dense, silty to clayey sand, and soft to stiff sandy clay and silt. The alluvium is not suitable to support settlement sensitive improvements and should be removed and replaced with properly compacted fill within structural improvement areas, where practical. Due to depth of the alluvium and presence of groundwater, we expect the removals of alluvium will be limited in some areas, and potentially compressible alluvium might be left in place at the north end of the property in the area of the BMP basins.

3.4 Granitic Rock (Kgr)

We encountered Cretaceous-age granitic rock (mapped as undivided tonalite [Kt] in Kennedy and Tan, 2007) below undocumented fill, topsoil and alluvium. The granitic rock encountered consisted of weak, completely to highly weathered rock, and likely possesses a “very low” to “low” expansion potential (expansion index of 50 or less). Buried corestones and zones of strong rock are possible during grading and construction operations, where excavations extend into granitic rock. The granitic rock is suitable to support proposed fill and structural loads.

4. GROUNDWATER

Groundwater was encountered in trench T-18 at a depth of approximately 12.5 feet below existing grade. It is not uncommon for groundwater or seepage conditions to develop where none previously existed. Groundwater and seepage conditions are dependent on seasonal precipitation, irrigation, land use, among other factors, and vary as a result. Proper surface drainage will be important to future performance of the project. Groundwater may be encountered during site grading.

5. GEOLOGIC HAZARDS

5.1 Ground Rupture

The USGS (2016) and Kennedy & Tan (2007) show that there are no mapped Quaternary faults crossing or trending toward the site. The site is not located within a currently established Alquist-Priolo Earthquake Fault Zone (CEG, 2021a). The closest active fault is the Newport-Inglewood-Rose Canyon fault zone located approximately 4.5 miles to the west. The risk associated with ground rupture hazard is low.

There are no active faults, potentially active faults, inactive faults, presumed inactive faults, or activity unknown faults at the site or trending toward the site. The risk associated with ground rupture hazard is low

5.2 Seismicity

Considerations important in seismic design include frequency and duration of motion and soil conditions underlying the site. The seismic design of structures should be evaluated in accordance with the 2022 California Building Code currently adopted by the local agency. The risk associated with strong seismic ground motion hazard is high; however, the risk is no greater than that for the site vicinity.

5.3 Liquefaction

Considering the undocumented fill and alluvium will be removed and replaced as compacted fill throughout the building pads, and the density and age of the underlying geologic units, the risk associated with seismically induced soil liquefaction hazard is low.

5.4 Tsunamis, and Seiches

The site is not located within a California Tsunami Hazard Area (CGS, 2021b). There are no lakes or reservoirs located near the site. The risk associated with inundation hazard due to tsunami or seiche is low.

5.5 Landslides

No evidence of landsliding was observed during our investigation. Kennedy & Tan (2007) show that there are no landslides mapped at the site or in an area that could impact the site. The risk associated with ground movement hazard due to landsliding is low.

5.6 Flooding

The site is not mapped in a Special Flood Hazard Area as defined by FEMA (2019). The risk of inundation hazard due to flooding is low.

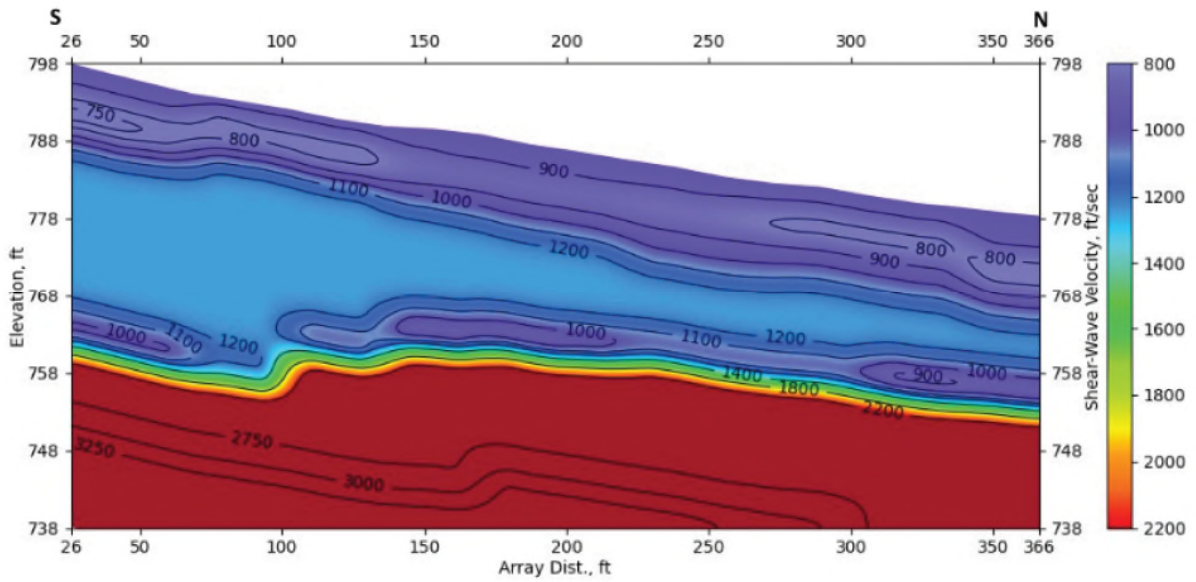
6. ROCK RIPPABILITY

6.1 Seismic Refraction Surveys

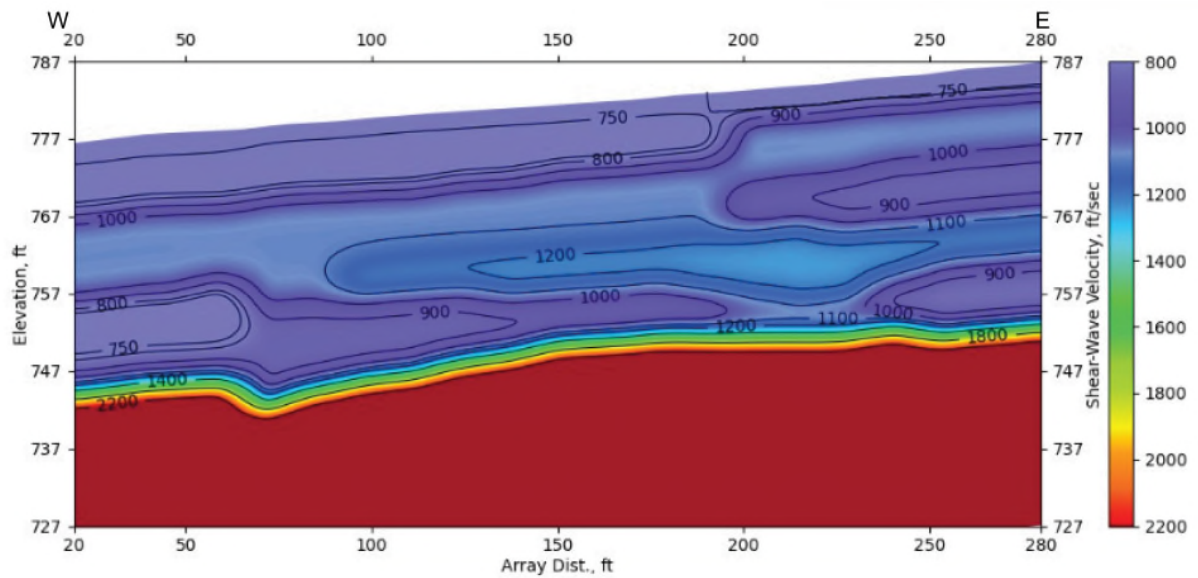
We performed an S-wave seismic refraction survey to aid in evaluating the rippability characteristics of the underlying rock materials at the project site. The survey included four seismic traverses (SL-1 through SL-4) at the locations shown on the Geologic Map (Figure 1). A discussion of the analysis is provided in Appendix C. Survey line locations were generally selected to bisect the deepest planned cuts or pad undercuts, however, lines were field adjusted to work around trees and debris piles present on the property.

Based on the observed velocity variations, the results suggest the site has predominantly rippable characteristics to depths of approximately 10 to 20 feet below the ground surface using D8R ripper performance.

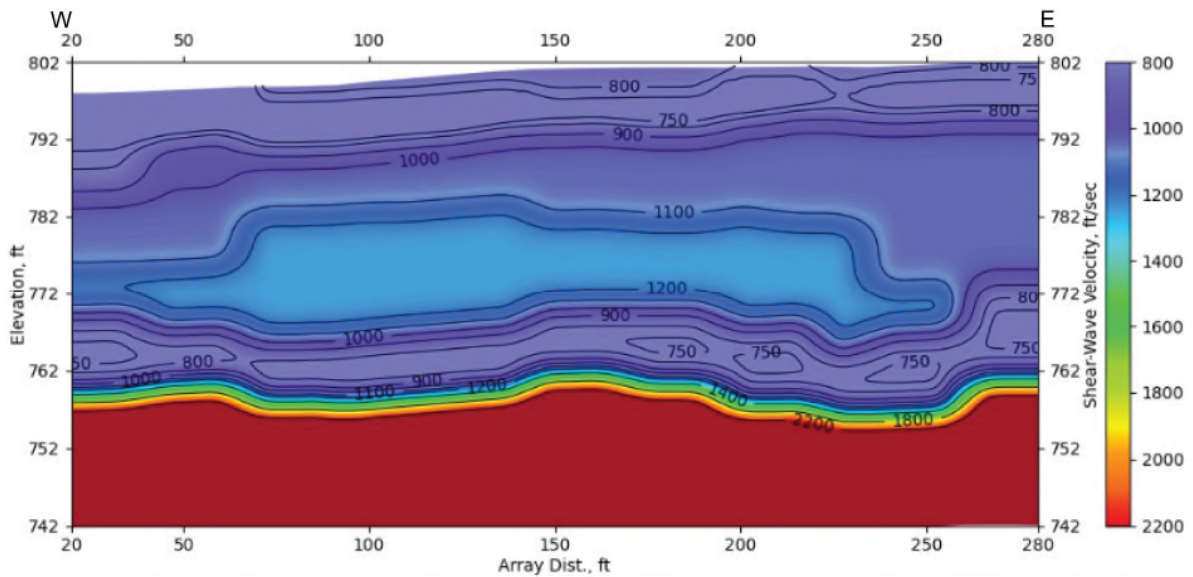
The following figures show the S-wave tomography model seismic lines SL-1 through SL-4.



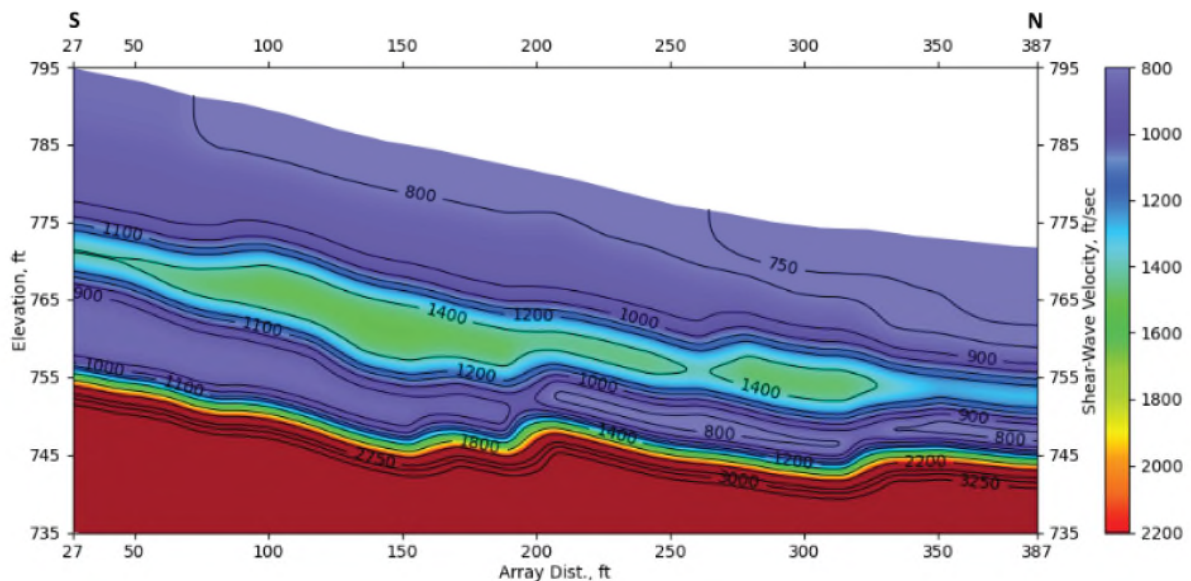
Seismic Result: SL-1



Seismic Result: SL-2



Seismic Result: SL-3



Seismic Result: SL-4

The following table is commonly used for rippability analyses and shows the generalized correlation between S-wave velocity and rippability based on experience with similar rock materials using a D8R/D8T Caterpillar dozer. Although seismic velocities are commonly used to help evaluate rock density, rippability is also dependent on other physical characteristics of the rock (i.e., the degree and orientation of joints, fractures, foliation, and mineralogic discontinuities) and the type of equipment, methods, and techniques used to rip the material. Therefore, perspective contractors should use their

own judgment and interpretation of the data presented in this report to evaluate rippability and production rates. Consideration should also be given to performing test pits, air-track borings, and/or trial ripping to assist in corroborating the data presented in this report and to determine the appropriate excavation methods, equipment, and costs associated with excavating the materials on site.

P-WAVE REFRACTION RIPPABILITY CHARACTERISTICS

Excavation Method	Approximate S-Wave Velocity (Feet/Second)	Estimated Rippability
Mass Grading	Less than 1,000	Rippable
	1,000 to 2,200	Marginal Ripping (Possible Blasting)
	Greater than 2,200	Non-Rippable (Pre-Blasting Required)
Trenching	Less than 1,100	Rippable
	1,100 to 1,200	Marginal Ripping
	Greater than 1,200	Non-Rippable

*Site Specific Seismic D8R S-wave velocity (Vs) correlation for rock rippability (Modified from Caterpillar 2000 P-wave using ASCE 2021 S-wave guidelines).

To check the results of our S-wave seismic refraction survey , we drilled 9 small-diameter borings using a CME 95 truck-mounted drill rig to depths ranging from 15 to 21.5 feet below existing grade at the locations shown on the Geologic Map, Figure 1. Boring locations were selected to approximately correspond the maximum cut or undercut depths anticipated during grading. We expect the granitic rock to be predominantly rippable at the locations of the borings to the depths explored using D8R ripper performance. The boring logs and summary of the investigation are presented in Appendix A.

Excavations, undercutting, and blasting techniques (if required) can be expected to generate oversized rock (rocks larger than 12 inches), which will necessitate typical hard rock handling and placement procedures during grading operations.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

- 7.1.1 It is our opinion that the site is suitable for the planned improvements, provided the recommendations presented herein are implemented during the design and construction of the project.
- 7.1.2 The site is underlain by undocumented fill, topsoil and alluvium overlying granitic rock. The fill, topsoil and alluvium are not suitable to support settlement-sensitive improvements and will require remedial grading. The granitic rock is suitable to support compacted fill and settlement-sensitive improvements.
- 7.1.3 Based on the results of our rippability study, the site should be rippable to depths up to 20 feet below site grades.
- 7.1.4 Groundwater was encountered at a depth of 12.5 feet in trench T-12 located in the north end of the site. Groundwater and seepage could be encountered during the grading operations, especially during the rainy seasons.
- 7.1.5 No significant geologic hazards were observed or are known to exist on the site that would adversely impact the proposed development.
- 7.1.6 The proposed structures can be supported on conventional shallow foundations bearing entirely on undisturbed granitic rock or entirely on compacted fill.

7.2 Excavation and Soil Characteristics

- 7.2.1 Excavation of the in-situ soil should be possible with moderate to heavy effort using conventional heavy-duty equipment. Excavation of the granitic rock will require very heavy effort and may generate minor amounts of oversized rock (rocks greater than 12 inches in dimension). Oversize rock, if present, can be buried onsite in accordance with guidelines provided in Appendix E. The grading and improvement contractors should review this report and evaluate the proper equipment to use for the planned excavations.
- 7.2.2 The soil encountered in the field investigation is considered “expansive” (EI of greater than 20) as defined by 2022 California Building Code (CBC) Section 1803.5.3. We expect most of

the soil encountered possess a “very low” to “medium” expansion potential (EI of 90 or less) in accordance with ASTM D 4829. The following table presents soil classifications based on the expansion index.

EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	ASTM D 4829 Expansion Classification	2022 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

7.2.3 Laboratory tests were performed on a sample of the site soil to evaluate the percentage of water-soluble sulfate content. Appendix B presents test results, which indicate the on-site soils at the locations tested possess “S0” sulfate exposure to concrete structures as defined by 2022 CBC Section 1904 and ACI 318. The presence of water-soluble sulfates is not a visually discernible characteristic; therefore, other soil samples from the site could yield different concentrations. Over time, landscaping activities (i.e., addition of fertilizers and other additives) may affect the water-soluble sulfate concentration.

7.2.4 Geocon Incorporated does not practice in the field of corrosion engineering; therefore, further evaluation by a corrosion engineer may be needed if improvements susceptible to corrosion are planned.

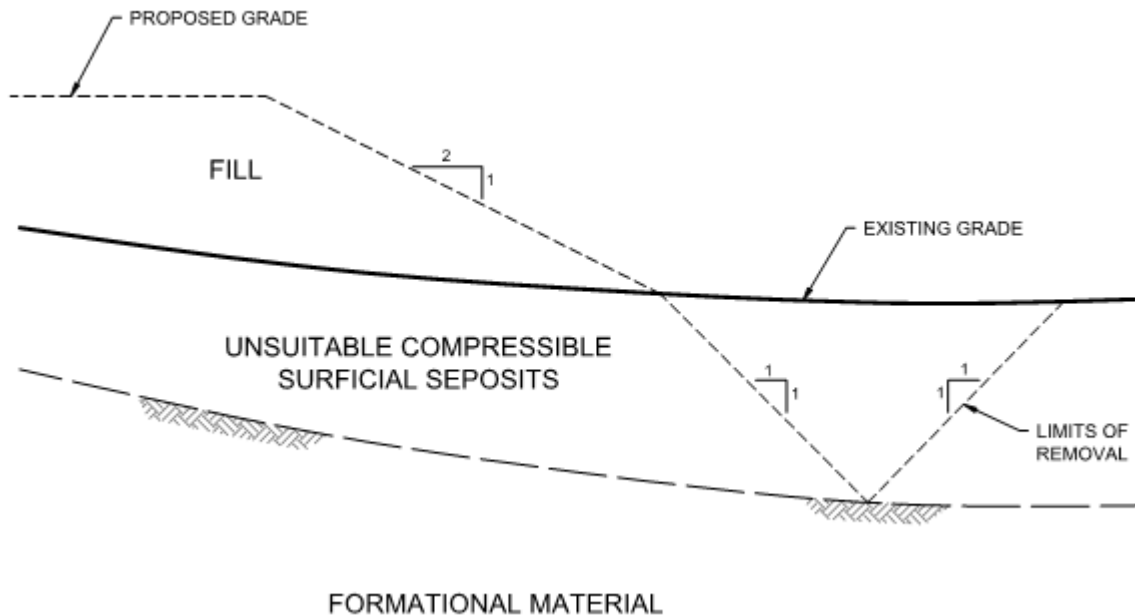
7.3 Subdrains

7.3.1 Subdrains will not be required for this project.

7.4 Grading Recommendations

7.4.1 Grading should be performed in accordance with the recommendations provided in this report, the *Recommended Grading Specifications* contained in Appendix E and the local Grading Ordinances. Where the recommendations of this report conflict with Appendix E, the recommendations of this section take precedence.

- 7.4.2 Earthwork should be observed, and compacted fill tested by Geocon Incorporated.
- 7.4.3 A preconstruction conference should be held at the site with the City representative, owner, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and the grading plans can be discussed at that time.
- 7.4.4 Site preparation should begin with the removal of deleterious material, debris, and vegetation. Material generated during stripping and demolition should be exported from the site and should not be mixed with the fill soil. Existing building foundations and underground improvements within the proposed building area should be removed.
- 7.4.5 Abandoned foundations and buried utilities should be removed and the resulting depressions or trenches backfilled with properly compacted soil as part of the remedial grading.
- 7.4.6 We recommend surficial soil (undocumented fill, topsoil and alluvium) within areas of planned grading be removed to expose the underlying granitic rock and properly compacted prior to placing additional fill and/or structural loads. Overly wet soils might be encountered near the groundwater table. These soils may require drying and/or mixing with drier soils to facilitate proper compaction. Removals should extend laterally beyond the edge of building pads and structural improvements to a horizontal distance of at least 5 feet or to a lateral distance equal to the depth of the remedial excavation (whichever is deeper).
- 7.4.7 Removal of compressible surficial soils should extend beyond the toe of fill slopes a horizontal distance equal to the depth of the remedial removal (see figure below). The actual extent of remedial grading should be determined in the field by the geotechnical engineer or engineering geologist. Where removals are restricted due to property lines, slot cutting might be needed depending of the location and depth of compressible soils.



- 7.4.8 Where grading results in a cut to fill transition within building pads, the cut portion of the pad should be undercut at least 3 feet or 1 foot below the deepest footing (whichever is deeper) and replaced with properly compacted “very low” to “medium” expansive soil. The base of the undercuts should be sloped towards the deeper fill area on the pad. The undercut should extend to at least 5 feet beyond the building footprint, where practical. As an alternative to undercutting cut to fill transitions, the footings can be deepened to extend through the fill to bear on the underlying granitic rock. The deepened footing can be accomplished by extending the footing to the granitic rock, or alternatively, overexcavating compacted fill from below the footing and replacing the excavated soil with a minimum 3-sack cement slurry back to the footing bottom.
- 7.4.9 Prior to placing fill, the ground surface should be scarified to a depth of at least 12 inches, moisture conditioned and compacted. Fill soils should then be placed and compacted in layers to the design finish-grade elevation. The fill layers should be no thicker than will allow for adequate bonding and compaction. Fill (including scarified ground surfaces) should be compacted to at least 90 percent of maximum dry density (as determined by ASTM D 1557) at or slightly above optimum moisture content.

- 7.4.10 Imported soil should have the characteristics presented in the following table. We should be notified of the imported soil source and should be provided with samples in order to perform testing of imported soil prior to its arrival at the site to evaluate its suitability as fill material.

SUMMARY OF IMPORT FILL RECOMMENDATIONS

Soil Characteristic	Values
Expansion Potential	“Very Low” to “Medium” (Expansion Index of 90 or less)
Particle Size	Maximum Dimension Less Than 3 Inches
	Generally Free of Debris

7.5 Excavation Slopes and Shoring

- 7.5.1 The recommendations included herein are provided for stable excavations. Geocon Incorporated is not responsible for site safety and the stability of the proposed excavations. It is the contractor’s responsibility to ensure that all excavations, temporary slopes, and trenches are properly constructed and maintained in accordance with applicable OSHA guidelines in order to maintain the safety and stability of the excavations and adjacent improvements. The walls of the excavations should not be allowed to become saturated or to dry out. Surcharge loads should not be permitted to a distance equal to the height of the excavation from the top of the excavation unless the shoring system is designed to accommodate the surcharge loading. The top of sloped excavations should be a minimum of 15 feet from the edge of existing improvements. Vertical excavations should be shored in accordance with applicable OSHA codes and regulations.

7.6 Seismic Design Criteria – 2022 California Building Code

- 7.6.1 The following table summarizes site-specific design criteria obtained from the 2022 California Building Code (CBC; Based on the 2021 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. We used SEAOC (2020) to calculate the seismic design parameters. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2022 CBC and Table 20.3-1 of ASCE 7-16. The values presented herein are for the risk-targeted maximum considered earthquake (MCE_R).

2022 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2022 CBC Reference
Site Class	C	Section 1613.2.2
MCE _R Ground Motion Spectral Response Acceleration – Class B (short), S_s	1.066g	Figure 1613.2.1(1)
MCE _R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.388g	Figure 1613.2.1(2)
Site Coefficient, F_A	1.2	Table 1613.2.3(1)
Site Coefficient, F_V	1.5	Table 1613.2.3(2)
Site Class Modified MCE _R Spectral Response Acceleration (short), S_{MS}	1.279g	Section 1613.2.3 (Eqn 16-36)
Site Class Modified MCE _R Spectral Response Acceleration – (1 sec), S_{M1}	0.582	Section 1613.2.3 (Eqn 16-37)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.853g	Section 1613.2.4 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.388g	Section 1613.2.4 (Eqn 16-39)

7.6.2 The following table presents the mapped maximum considered geometric mean (MCE_G) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

ASCE 7-16 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-16 Reference
Site Class	C	Section 1613.2.2 (2022 CBC)
Mapped MCE _G Peak Ground Acceleration, PGA	0.459g	Figure 22-7
Site Coefficient, F_{PGA}	1.2	Table 11.8-1
Site Class Modified MCE _G Peak Ground Acceleration, PGA_M	0.551g	Section 11.8.3 (Eqn 11.8-1)

7.6.3 Conformance to the seismic design criteria presented in the above tables does not constitute a guarantee or assurance that significant structural damage or ground failure will not occur in the event of a large earthquake. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

- 7.6.4 The project structural engineer or architect should determine the appropriate Risk Category and Seismic Design Category for the planned structures. The values presented herein assume a Risk Category of II resulting in a Seismic Design Category D. The following table presents a summary of the risk categories in accordance with ASCE 7-16.

ASCE 7-16 RISK CATEGORIES

Risk Category	Building Use	Examples
I	Low risk to Human Life at Failure	Barn, Storage Shelter
II	Nominal Risk to Human Life at Failure (Buildings Not Designated as I, III or IV)	Residential, Commercial and Industrial Buildings
III	Substantial Risk Human Life at Failure	Theaters, Lecture Halls, Dining Halls, Schools, Prisons, Small Healthcare Facilities, Infrastructure Plants, Storage for Explosives/Toxins
IV	Essential Facilities	Hazardous Material Facilities, Hospitals, Fire and Rescue, Emergency Shelters, Police Stations, Power Stations, Aviation Control Facilities, National Defense, Water Storage

7.7 Shallow Foundation Recommendations

- 7.7.1 The foundation recommendations herein are for the proposed one- to two-story structures. The foundation recommendations have been separated into three categories based on either the maximum and differential fill thickness or Expansion Index as shown in the following table.

FOUNDATION CATEGORY CRITERIA

Foundation Category	Maximum Fill Thickness, T (Feet)	Differential Fill Thickness, D (Feet)	Expansion Index (EI)
I	$T < 20$	--	$EI \leq 50$
II	$20 \leq T < 50$	$10 \leq D < 20$	$50 < EI \leq 90$
III	$T \geq 50$	$D \geq 20$	$90 < EI \leq 130$

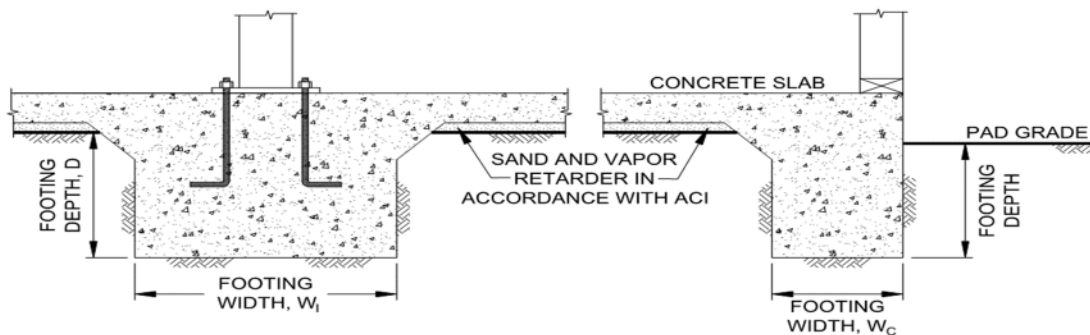
- 7.7.2 We will provide final foundation categories for each building after finish pad grades have been achieved and we perform laboratory testing of the subgrade soil.

7.7.3 The following table presents minimum foundation and interior concrete slab design criteria for conventional foundation systems.

CONVENTIONAL FOUNDATION RECOMMENDATIONS BY CATEGORY

Foundation Category	Minimum Footing Embedment Depth, D (inches)	Minimum Continuous Footing Reinforcement	Minimum Footing Width (Inches)
I	12	Two No. 4 bars, one top and one bottom	12 – Continuous, W_c 24 – Isolated, W_i
II	18	Four No. 4 bars, two top and two bottom	
III	24	Four No. 5 bars, two top and two bottom	

7.7.4 The foundations should be embedded in accordance with the recommendations herein and the Wall/Column Footing Dimension Detail. The embedment depths should be measured from the lowest adjacent pad grade for both interior and exterior footings. Footings should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope (unless designed with a post-tensioned foundation system as discussed herein).



Wall/Column Footing Dimension Detail

7.7.5 The proposed structures can be supported on a shallow foundation system founded entirely in the compacted fill or entirely in granitic rock using the design recommendations in the following table.

SUMMARY OF FOUNDATION RECOMMENDATIONS

Parameter	Value
Allowable Bearing Capacity (Compacted Fill)	2,500 psf
Allowable Bearing Capacity (Granitic Rock)	8,000 psf
Bearing Capacity Increase	500 psf per Foot of Depth
	300 psf per Foot of Width
Maximum Allowable Bearing Capacity (Compacted fill)	4,000 psf
Maximum Allowable Bearing Capacity (Granitic Rock)	10,000 psf
Estimated Total Settlement	1 Inch
Estimated Differential Settlement	½ Inch in 40 Feet
Design Expansion Index	90 or less

- 7.7.6 The recommendations for shallow foundations embedded in properly compacted fill herein assume compressible surficial soils (undocumented fill, topsoil and alluvium) will be removed and replaced with properly compacted fill during grading operations. We may need to provide modified recommendations if complete removal of surficial deposits is not practical.
- 7.7.7 The bearing capacity values presented herein are for dead plus live loads and may be increased by one-third when considering transient loads due to wind or seismic forces.
- 7.7.8 Overexcavation of footings in compacted fill and replacement with 3-sack cement-slurry back to footing bottom can be used in areas where a cut to fill transition occurs or where building footings are designed to be founded on granitic rock. The overexcavation should extend through compacted fill and at least 6 inches into granitic rock prior to the placement of the cement-slurry.
- 7.7.9 We should observe the foundation excavations prior to the placement of reinforcing steel and concrete to check that the exposed soil conditions are similar to those expected and that they have been extended to the appropriate bearing strata. Foundation modifications may be required if unexpected soil conditions are encountered.
- 7.7.10 We should be consulted to provide additional design parameters as required by the structural engineer.

7.8 Interior Concrete Slabs on Grade

- 7.8.1 Interior concrete slabs on grade for the structure should be constructed in accordance with the following table.

MINIMUM INTERIOR CONCRETE SLAB-ON-GRADE RECOMMENDATIONS

Parameter	Value
Minimum Concrete Slab Thickness	5 inches
Minimum Concrete Reinforcement	No. 3 Bars 18 Inches on Center, Both Directions
Typical Slab Underlayment	3 to 4 Inches of Sand/Gravel
Design Expansion Index	90 or less

- 7.8.2 A modulus of subgrade reaction of 150 to 200 pounds per cubic inch (pci) is recommended for compacted fill and 350 to 400 pci for granitic rock. This value is for a foundation measuring 1-foot by 1-foot and should be modified for design using standard equations.
- 7.8.3 A vapor retarder should underlie slabs that receive moisture-sensitive floor coverings or could be used to store moisture-sensitive materials. The vapor retarder design should be consistent with the guidelines presented in the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06). The vapor retarder should be installed in a manner that prevents puncture in accordance with manufacturer's requirements and ASTM recommendations. The project architect or developer should specify the vapor retarder used based on the type of floor covering that will be installed and if the structure will possess a humidity-controlled environment.
- 7.8.4 The project foundation engineer, architect, or developer should determine the bedding sand thickness. It is common to have 3 to 4 inches of sand in the southern California region. We should be contacted to provide recommendations if the bedding sand is thicker than 6 inches.
- 7.8.5 The foundation-design engineer should provide appropriate concrete-mix-design criteria and curing measures to assure proper curing of the slab including reducing potential rapid moisture loss which could result in shrinkage cracking and slab curl.

- 7.8.6 The foundation-design engineer should present the concrete-mix design and proper concrete-curing methods on the foundation plans. It is critical that the foundation contractor understands and follows the recommendations presented on the foundation plans.
- 7.8.7 Concrete slabs should be provided with adequate crack-control joints, construction joints and expansion joints to reduce concrete-shrinkage cracking. The American Concrete Institute (ACI) criteria should be used when establishing crack-control spacing. Crack-control joints should be spaced at intervals no greater than 12 feet. Additional concrete reinforcement, concrete admixtures or closer crack control joint spacing should be considered where exposed-concrete finished floors are planned.
- 7.8.8 Subgrade presaturation prior to placing concrete is not deemed necessary; however, the subgrade soil should be moisturized to maintain a moist condition as would be expected in any such concrete placement.
- 7.8.9 The concrete-slab-on-grade recommendations are based on soil support characteristics only. The project structural engineer should evaluate the structural requirements of the concrete slabs for supporting expected loads.
- 7.8.10 The recommendations of this report are intended to reduce potential cracking of slabs due to expansive soil, differential settlement of existing soil or soil with varying thicknesses. Even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade placed on such conditions may still exhibit cracking due to soil movement and/or shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.
- 7.9 Exterior Concrete Flatwork**
- 7.9.1 Exterior concrete flatwork not subject to vehicular traffic should be constructed in accordance with the recommendations presented in the following table. The recommended reinforcing steel could help reduce potential cracking.

MINIMUM CONCRETE FLATWORK RECOMMENDATIONS

Expansion Index, EI	Minimum Concrete Reinforcement* Options	Minimum Thickness
EI ≤ 90	6x6-W2.9/W2.9 (6x6-6/6) welded wire mesh	4 Inches
	No. 3 Bars 24 inches on center, Both Directions	

*In excess of 8 feet square.

- 7.9.2 The subgrade soil should be properly moisturized and compacted prior to the placement of reinforcing steel and concrete. The subgrade soil should be compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content in accordance with ASTM D 1557.
- 7.9.3 Even with the incorporation of the recommendations presented in this report, the exterior concrete flatwork can experience differential movement. Flatwork should be structurally connected to the curbs, where practical, to reduce potential offset between the curb and the flatwork.
- 7.9.4 Concrete flatwork should be provided with crack-control joints. The project structural engineer should determine the spacing of the crack-control joints based on the slab thickness and the intended use. American Concrete Institute (ACI) criteria should be used when establishing crack control spacing.
- 7.9.5 Subgrade soil for exterior slabs that are not subjected to vehicle loads should be compacted in accordance with criteria presented in the grading section of this report. Subgrade soil should be properly compacted, and the moisture content of subgrade soil should be verified prior to placing concrete.
- 7.9.6 Where exterior flatwork abuts the structure at entrance or exit points, the exterior slab should be dowelled into the foundation stem wall. This recommendation is intended to reduce potential differential elevations that could result from differential settlement or minor heave of the flatwork. The project structural engineer should provide dowelling details.
- 7.9.7 The recommendations presented herein are intended to reduce potential cracking of exterior slabs resulting from differential movement; however, even with the incorporation

of the recommendations presented herein, slabs-on-grade could still crack. The occurrence of concrete shrinkage cracks is independent of the soil supporting characteristics. Their occurrence may be controlled by limiting the slump of the concrete; the use of crack control joints; and proper concrete placement and curing. Crack control joints should be spaced at intervals no greater than 12 feet. The Portland Concrete Association (PCA) and American Concrete Institute (ACI) provide recommendations for proper concrete mix, construction, and curing practices, and should be incorporated into project construction.

7.10 Retaining Wall Recommendations

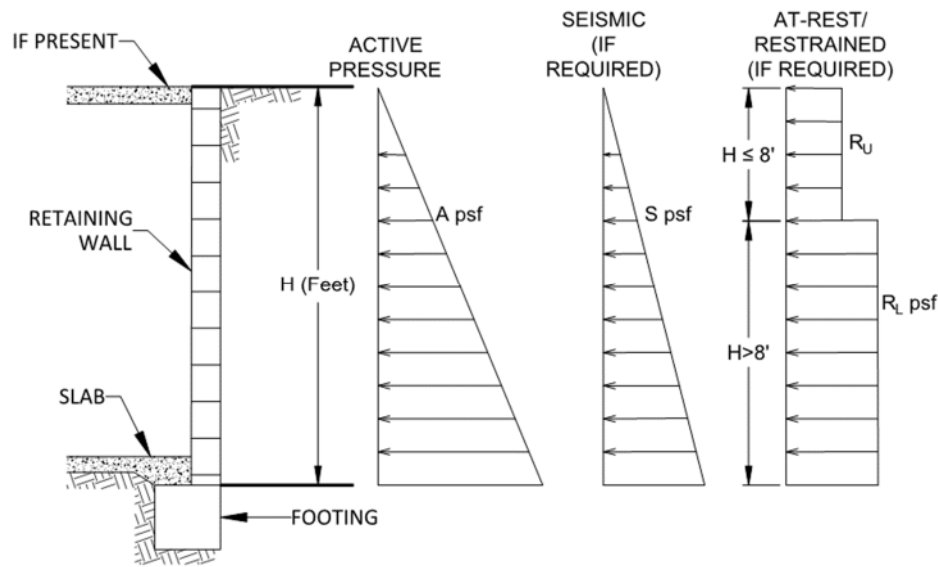
- 7.10.1 Walls that are allowed to rotate more than $0.001H$ (where H equals the height of the retaining portion of the wall) at the top of the wall should be designed using the values presented in the following table. Soil with an expansion index (EI) greater than 90 should not be used as backfill material behind retaining walls.

RETAINING WALL DESIGN RECOMMENDATIONS

Parameter	Value
Active Soil Pressure, A (Level Backfill)	40H psf
Active Soil Pressure, A (2:1 max Sloping Backfill)	55H psf
Seismic Pressure, S	15H psf
At-Rest/Restrained Walls Additional Uniform Pressure (0 to 8 Feet High)	7H psf
At-Rest/Restrained Walls Additional Uniform Pressure (8+ Feet High)	13H psf
Expected Expansion Index for the Subject Property	$EI \leq 90$

H equals the height of the retaining portion of the wall in feet.

- 7.10.2 The project retaining walls should be designed as shown in the Retaining Wall Loading Diagram.



Retaining Wall Loading Diagram

- 7.10.3 Where walls are restrained from movement at the top (at-rest condition), an additional uniform pressure should be applied to the wall.
- 7.10.4 The structural engineer should determine the Seismic Design Category for the project in accordance with Section 1613.3.5 of the 2022 CBC or Section 11.6 of ASCE 7-10. For structures assigned to Seismic Design Category of D, E, or F, retaining walls that support more than 6 feet of backfill should be designed with seismic lateral pressure in accordance with Section 1803.5.12 of the 2022 CBC. The seismic load is dependent on the retained height where H is the height of the wall, in feet, and the calculated loads result in pounds per square foot (psf) exerted at the base of the wall and zero at the top of the wall.
- 7.10.5 Retaining walls should be designed to ensure stability against overturning sliding, and excessive foundation pressure. Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, it is not necessary to consider active pressure on the keyway.
- 7.10.6 Drainage openings through the base of the wall (weep holes) should not be used where the seepage could be a nuisance or otherwise adversely affect the property adjacent to the base of the wall.

CONCRETE BROWDITCH

GROUND SURFACE

PROPOSED RETAINING WALL

WATERPROOFING PER ARCHITECT

H

2/3 H

PROPOSED GRADE

FOOTING

12"

PROPERLY COMPACTED BACKFILL

TEMPORARY BACKCUT PER OSHA

MIRAFI 140N FILTER FABRIC (OR EQUIVALENT)

OPEN GRADED 1" MAX. AGGREGATE

1"

4" DIA. PERFORATED SCHEDULE 40 PVC PIPE EXTENDED TO APPROVED OUTLET

OR

CONCRETE BROWDITCH

GROUND SURFACE

RETAINING WALL

WATER PROOFING PER ARCHITECT

DRAINAGE PANEL (MIRADRAIN 6000 OR EQUIVALENT)

2/3 H

PROPOSED GRADE

FOOTING

12"

3/4" CRUSHED ROCK (1 CU. FT./FT.) OR WRAP DRAINAGE PANEL AROUND PIPE

12"

FILTER FABRIC ENVELOPE MIRAFI 140N OR EQUIVALENT

4" DIA. SCHEDULE 40 PERFORATED PVC PIPE OR TOTAL DRAIN EXTENDED TO APPROVED OUTLET

7.10.8 In general, wall foundations should be designed in accordance with the following table. The proximity of the foundation to the top of a slope steeper than 3:1 could impact the allowable soil bearing pressure. Therefore, retaining wall foundations should be deepened such that the bottom outside edge of the footing is at least 7 feet horizontally from the face of the slope.

SUMMARY OF RETAINING WALL FOUNDATION RECOMMENDATIONS

Parameter	Value
Minimum Retaining Wall Foundation Width	12 inches
Minimum Retaining Wall Foundation Depth	12 Inches
Minimum Concrete Reinforcement	Per Structural Engineer
Allowable Bearing Capacity	2,500 psf
Bearing Capacity Increase	500 psf per Foot of Depth
	300 psf per Foot of Width
Maximum Allowable Bearing Capacity	4,000 psf
Estimated Total Settlement	1 Inch
Estimated Differential Settlement	½ Inch in 40 Feet

- 7.10.9 The recommendations presented herein are applicable for the design of rigid concrete or masonry retaining walls. Should other types of walls (such as mechanically stabilized earth [MSE] walls) be planned, Geocon should be consulted for additional recommendations.
- 7.10.10 Soil contemplated for use as retaining wall backfill, including imported soils, should be identified in the field prior to backfill. At that time, Geocon should be provided samples for laboratory testing to evaluate its suitability. Modified lateral earth pressures may be necessary if the backfill soil does not meet the required expansion index or shear strength.
- 7.10.11 City or regional standard wall designs, if used, are based on a specific active lateral earth pressure and/or soil friction angle. In this regard, on-site soil to be used as backfill may or may not meet the values for standard wall designs. Geocon should be consulted to assess the suitability of the on-site soil for use as wall backfill if standard wall designs are used.

7.11 Lateral Loading

- 7.11.1 The following table provides design parameters to resist lateral loads and for the design of footings or shear keys. The allowable passive pressure assumes a horizontal surface extending at least 5 feet, or three times the surface generating the passive pressure, whichever is greater. The upper 12 inches of soil in areas not covered by floor slabs or pavement should not be included in the determination of passive resistance.

SUMMARY OF LATERAL LOAD DESIGN RECOMMENDATIONS

Parameter	Value
Passive Pressure Fluid Density	350 pcf
Coefficient of Friction (Concrete and Soil)	0.35
Coefficient of Friction (Along Vapor Barrier)	0.2 to 0.25*

*Per manufacturer's recommendations.

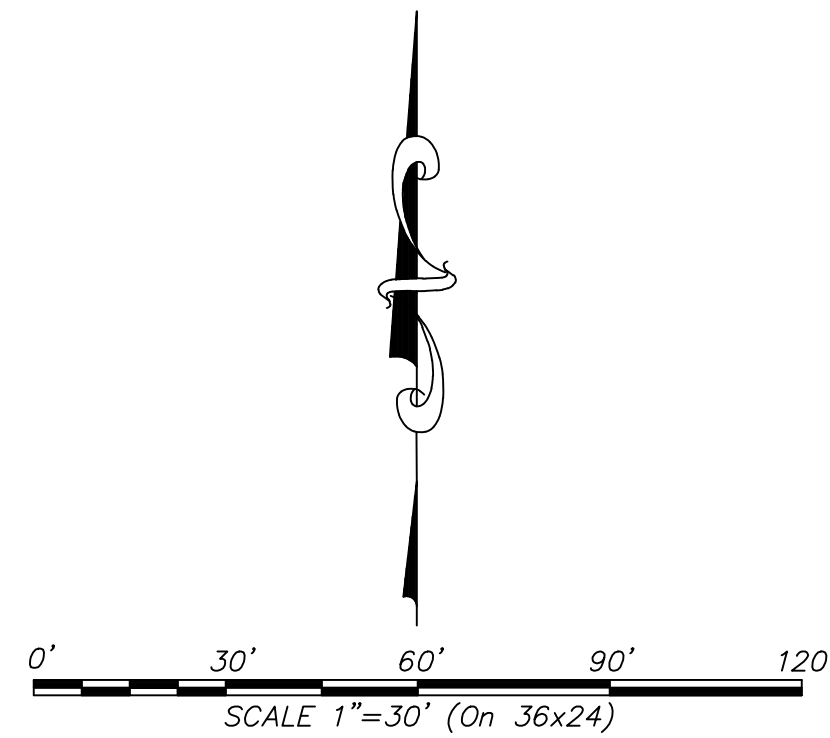
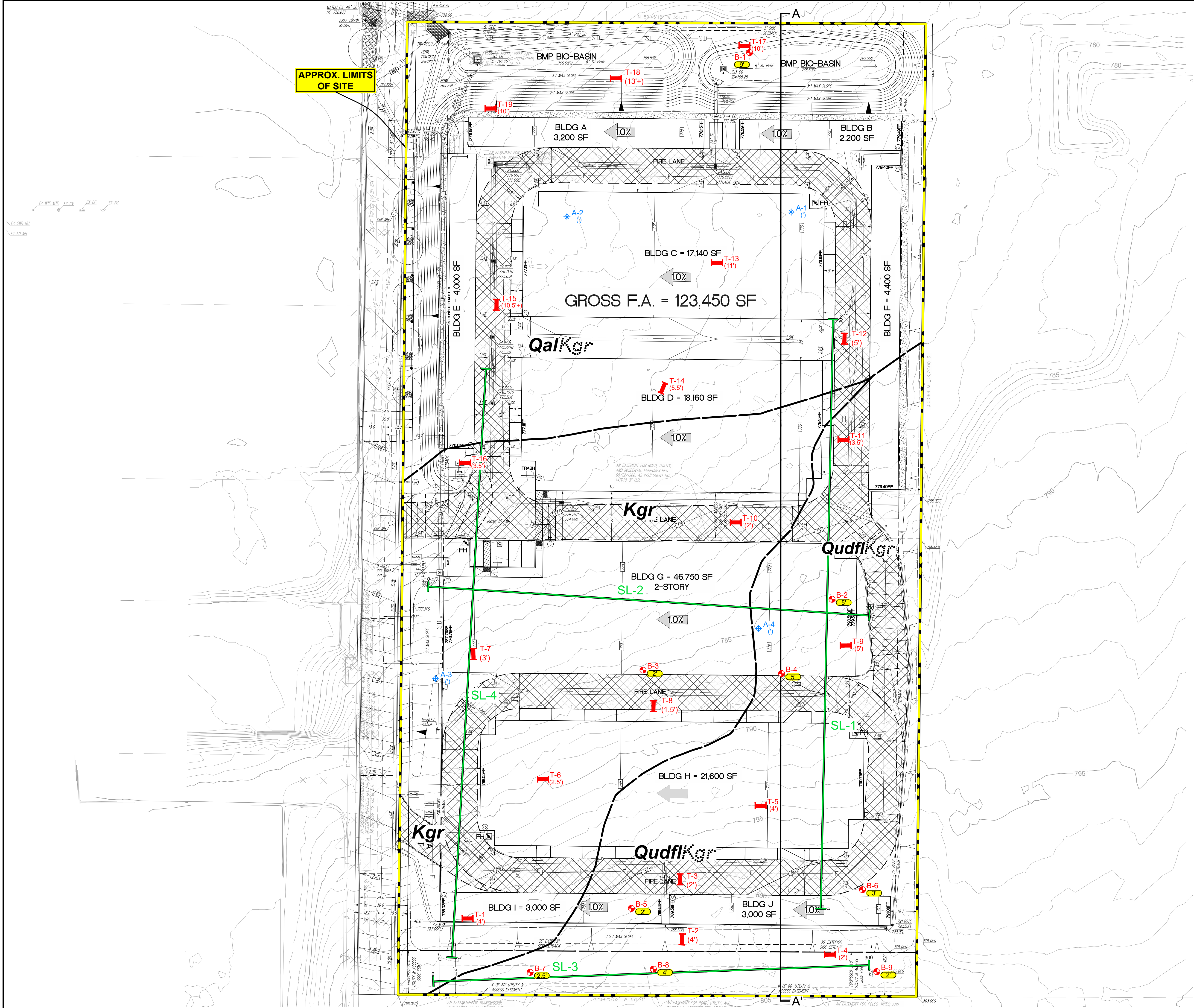
- 7.11.2 The passive and frictional resistant loads can be combined for design purposes. The lateral passive pressures may be increased by one-third when considering transient loads due to wind or seismic forces.

7.12 Site Drainage and Moisture Protection

- 7.12.1 Adequate site drainage is critical to reduce the risk for differential soil movement, erosion, and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2022 CBC 1804.4. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.
- 7.12.2 Underground utilities should be leak free. Utility and irrigation lines should be checked at appropriate intervals for leaks. Detected leaks should be promptly repaired. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.
- 7.12.3 Landscaping planters adjacent to paved areas are not recommended due to the risk for surface or irrigation water to infiltrate the pavement subgrade and base course. Area drains to collect excess irrigation water and transmit it to drainage structures, or impervious above-grade planter boxes should be used. A cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base material should be considered where landscaping is planned next to pavement.
- 7.12.4 We have prepared a storm water management investigation, and it is included in Appendix D herein.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

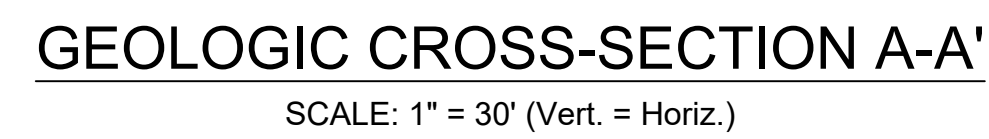
1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.
2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.
3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.
4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



- GEOCON LEGEND**
- Qudf** UNDOCUMENTED FILL
 - Qal** ALLUVIUM
 - Kgr** GRANITIC ROCK (Dotted Where Buried)
 - A-4** APPROX. LOCATION OF INFILTRATION TEST
 - T-19** APPROX. LOCATION OF TRENCH
 - (5)** DEPTH TO GRANITIC ROCK (In Feet)
 - B-9** APPROX. LOCATION OF BORING
 - (5)** APPROX. DEPTH OF REMEDIAL GRADING (In Feet)
 - SL-4** APPROX. LOCATION OF GEOLOGIC CONTACT
 - SL-1** APPROX. LOCATION OF SEISMIC LINE
 - A-A'** APPROX. LOCATION OF GEOLOGIC CROSS-SECTION

GEOLOGIC MAP
1305 E. MISSION ROAD
FALLBROOK, CALIFORNIA

GEOCON INCORPORATED GEO TECHNICAL ■ ENVIRONMENTAL ■ MATERIALS 6940 FLANDERS DRIVE • SAN DIEGO, CALIFORNIA 92121 • 2974 PHONE 658-538-6900 • FAX 658-538-6159		SCALE 1" = 30'	DATE 11 - 11 - 2025
		PROJECT NO. G3322 - 42 - 01	FIGURE 1
		SHEET 1 OF 1	



APPENDIX

A

APPENDIX A

FIELD INVESTIGATION

We performed the trenching operations on May 6, 2024, and the drilling operations on October 10, 2025. The approximate locations of the exploratory trenches and borings are shown on the Geologic Map, Figure 1 and the trench and borings logs are presented in this appendix. The trenches were excavated to a maximum depth of approximately 13 feet below existing grade using a CAT 430F rubber tire backhoe equipped with an 18-inch bucket. The borings were drilled to a maximum depth of approximately 21.5 feet using a CME 95.

We obtained undisturbed soil samples from the borings using a California-Modified split-spoon sampler or a Standard Penetration Test (SPT) sampler. We also collected bulk soil samples from the boring and trench spoils. The type of sample collected is noted on the trench and boring logs.

We visually examined, classified, and logged the soil encountered in the trenches and borings in general accordance with American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual-Manual Procedure D 2488). The logs depict the soil and geologic conditions observed and the depth at which samples were obtained.

**BORING NUMBER: B-1**

Page 1 of 1

DATE STARTED 10/10/2025 COMPLETED 10/10/2025 PROJECT NUMBER G3322-42-01
PROJECT NAME 1305 E. Mission Rd Storage LATITUDE / LONGITUDE 33.386504, -117.235538
CONTRACTOR Baja Exploration EQUIPMENT CME-95
LOGGED BY J. Peach DEPTH 21.5' SURFACE ELEVATION ~774'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	774								
2				ML	ALLUVIUM (Qal) Firm to stiff, dry to damp, light brown to light reddish brown, Sandy SILT with trace roots and gravel;				
4	770			SM	Dense, damp, light brown to brown, Silty , fine to coarse SAND with trace gravel; micaceous			B1-1	31
6				ML	Hard, damp to moist, reddish brown, Sandy SILT with trace gravel; micaceous				
8	765								
10					GRANITIC ROCK (Kgr) Completely weathered, GRANITIC ROCK ; excavates as dense damp to moist, reddish brown, Clayey, fine to coarse SAND with trace gravel; micaceous			B1-2	31
12					Highly weathered, GRANITIC ROCK ; excavates as dense, moist, light grayish brown, Silty, fine to coarse SAND with trace gravel; micaceous				
14	760								
16									
18	755								
20					-Becomes moderately weathered and wet			B1-3	79/11"

BORING TERMINATED AT 21.5 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

**BORING NUMBER: B-2**

Page 1 of 1

DATE STARTED 10/10/2025 COMPLETED 10/10/2025 PROJECT NUMBER G3322-42-01
PROJECT NAME 1305 E. Mission Rd Storage LATITUDE / LONGITUDE 33.385486, -117.235343
CONTRACTOR Baja Exploration EQUIPMENT CME-95
LOGGED BY J. Peach DEPTH 15' SURFACE ELEVATION ~786'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	786								
	785			SM	UNDOCUMENTED FILL (Qudf) Medium dense to dense, dry to damp, reddish brown, Silty , fine to coarse SAND with trace roots and gravel				
2									
4									
6	780				GRANITIC ROCK (Kgr) Highly to moderately weathered , GRANITIC ROCK ; excavates as dense, damp to moist, light grayish brown, Silty, fine to coarse SAND with trace gravel			B2-1	82/10"
8									
10									
12	775								
14									

BORING TERMINATED AT 15 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.



DATE STARTED10/10/2025COMPLETED10/10/2025

PROJECT NUMBERG3322-42-01

PROJECT NAME1305 E. Mission Rd Storage

LATITUDE / LONGITUDE33.385350, -117.235762

CONTRACTORBaja Exploration

EQUIPMENTCME-95

LOGGED BYJ. Peach

DEPTH15'SURFACE ELEVATION~785'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	785								
2				ML	TOPSOIL Firm to stiff, dry to damp, reddish brown, Sandy SILT with trace gravel				
4	780				GRANITIC ROCK (Kgr) Highly to moderately weathered , GRANITIC ROCK ; excavates as dense, damp to moist, light grayish brown, Silty, fine to coarse SAND with trace gravel				
6								B3-1	50/5"
8									
10	775								
12									
14	770								

BORING TERMINATED AT 15 FEET
No groundwater/seepage encountered

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

**BORING NUMBER: B-4**

Page 1 of 1

DATE STARTED 10/10/2025 COMPLETED 10/10/2025 PROJECT NUMBER G3322-42-01
PROJECT NAME 1305 E. Mission Rd Storage LATITUDE / LONGITUDE 33.385346, -117.235454
CONTRACTOR Baja Exploration EQUIPMENT CME-95
LOGGED BY J. Peach DEPTH 20' SURFACE ELEVATION ~788'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	788								
2	785			ML	UNDOCUMENTED FILL (Qudf) Firm to stiff, dry to damp, reddish brown, Sandy SILT with trace gravel and roots				
4									
6					GRANITIC ROCK (Kgr) Completely to highly weathered, GRANITIC ROCK ; excavates as dense, damp to moist, light grayish brown, Silty, fine to coarse SAND with trace gravel			B4-1	77/11"
8	780								
10					-Moderately weathered; becomes moist			B4-2	50/5"
12	775								
14									
16									
18	770								
20									

BORING TERMINATED AT 20 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.



DATE STARTED 10/10/2025COMPLETED 10/10/2025PROJECT NUMBER G3322-42-01

PROJECT NAME 1305 E. Mission Rd StorageLATITUDE / LONGITUDE 33.384906, -117.235783

CONTRACTOR Baja ExplorationEQUIPMENT CME-95

LOGGED BY J. PeachDEPTH 15'SURFACE ELEVATION ~798'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	798								
2				ML	UNDOCUMENTED FILL (Qudf) Firm to stiff, dry to damp, reddish brown, Sandy SILT with trace gravel				
4	795				GRANITIC ROCK (Kgr) Highly weathered, GRANITIC ROCK ; excavates as dense, damp, light grayish brown, Silty, fine to coarse SAND with trace gravel			B5-1	92/11"
6									
8	790								
10					-Moderately weathered (drill slowed)			B5-2	75/10"
12									
14	785								

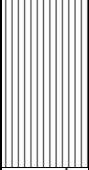
BORING TERMINATED AT 15 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

**BORING NUMBER: B-6**

Page 1 of 1

DATE STARTED 10/10/2025 COMPLETED 10/10/2025 PROJECT NUMBER G3322-42-01
PROJECT NAME 1305 E. Mission Rd Storage LATITUDE / LONGITUDE 33.384945, -117.235270
CONTRACTOR Baja Exploration EQUIPMENT CME-95
LOGGED BY J. Peach DEPTH 15' SURFACE ELEVATION ~798'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	798								
2	795			ML	UNDOCUMENTED FILL (Qudf) Firm to stiff, dry to damp, reddish brown, Sandy SILT with trace gravel and roots				
4					GRANITIC ROCK (Kgr) Completely to highly weathered, GRANITIC ROCK ; excavates as dense, damp, light grayish brown, Silty, fine to coarse SAND with trace gravel			B6-1	78/11"
6									
8	790								
10					-Moderately weathered			B6-2	50/4"
12	785								
14									

BORING TERMINATED AT 15 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

**BORING NUMBER: B-7**

Page 1 of 1

DATE STARTED 10/10/2025 COMPLETED 10/10/2025 PROJECT NUMBER G3322-42-01
PROJECT NAME 1305 E. Mission Rd Storage LATITUDE / LONGITUDE 33.384785, -117.236007
CONTRACTOR Baja Exploration EQUIPMENT CME-95
LOGGED BY J. Peach DEPTH 15' SURFACE ELEVATION ~798'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	798								
2	795			SM	UNDOCUMENTED FILL (Qudf) Medium dense to dense, dry to damp, light reddish brown to brown, Silty , fine to coarse SAND with trace gravel				
4					GRANITIC ROCK (Kgr) Highly weathered, GRANITIC ROCK ; excavates as dense, damp, light grayish brown, Silty, fine to coarse SAND with trace gravel				
6								B7-1	81
8	790								
10					-Moderately weathered			B7-2	50/5"
12	785								
14									

BORING TERMINATED AT 15 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

**BORING NUMBER: B-8**

Page 1 of 1

DATE STARTED 10/10/2025 COMPLETED 10/10/2025 PROJECT NUMBER G3322-42-01
PROJECT NAME 1305 E. Mission Rd Storage LATITUDE / LONGITUDE 33.384793, -117.235733
CONTRACTOR Baja Exploration EQUIPMENT CME-95
LOGGED BY J. Peach DEPTH 17.5' SURFACE ELEVATION ~801'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	801								
	800			SM	UNDOCUMENTED FILL (Qudf) Medium dense to dense, dry to damp, light reddish brown to brown, Silty , fine to coarse SAND with trace gravel and roots				
2									
4									
6	795				GRANITIC ROCK (Kgr) Highly weathered, GRANITIC ROCK ; excavates as dense, damp, light grayish brown, Silty, fine to coarse SAND with trace gravel			B8-1	80/9.5"
8									
10	790				-Moderately weathered			B8-2	50/4"
12									
14									
16	785								

BORING TERMINATED AT 17.5 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.



DATE STARTED 10/10/2025COMPLETED 10/10/2025PROJECT NUMBER G3322-42-01

PROJECT NAME 1305 E. Mission Rd StorageLATITUDE / LONGITUDE 33.384792, -117.235236

CONTRACTOR Baja ExplorationEQUIPMENT CME-95

LOGGED BY J. PeachDEPTH 20'SURFACE ELEVATION ~802'

Depth (ft)	Elevation (ft)	Water Levels	Graphic Log	USCS	Material Description	Bulk	Driven	Sample Number	Penetration Resistance (blows/foot)
	802								
2	800			ML	UNDOCUMENTED FILL (Qudf) Firm to stiff, dry to damp, reddish brown, Sandy SILT with trace gravel and roots				
4					GRANITIC ROCK (Kgr) Highly weathered, GRANITIC ROCK ; excavates as dense, damp, light grayish brown, Silty, fine to coarse SAND with trace gravel				
6								B9-1	50/6"
8	795								
10								B9-2	50/2"
12	790								
14									
16	785								
18									
20									

BORING TERMINATED AT 20 FEET
No groundwater/seepage encountered
Backfilled 10-10-2025

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN APPLIES ONLY TO THE SPECIFIC BORING OR TRENCH LOCATION AT THE DATE INDICATED AND MIGHT NOT REPRESENT SUBSURFACE CONDITIONS AT OTHER LOCATIONS OR TIMES. THE STRATIGRAPHY PRESENTED REPRESENTS THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES; THESE TRANSITIONS COULD BE GRADUAL.

UNIFIED SOIL CLASSIFICATION

MAJOR DIVISIONS			TYPICAL NAMES		
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 12% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO.4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC CLAYS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
	HIGHLY ORGANIC SOILS		PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

GRAVEL/COBBLE/BOULDER DESCRIPTIONS

CRITERIA	DESCRIPTION
PASS THROUGH A 3-INCH SIEVE AND BE RETAINED ON A NO. 4 SIEVE (#4 TO 3")	GRAVEL
PASS A 12-INCH SQUARE OPENING AND BE RETAINED ON A 3-INCH SIEVE (3"-12")	COBBLE
WILL NOT PASS A 12-INCH SQUARE OPENING (>12")	BOULDER

BEDDING SPACING DESCRIPTIONS

THICKNESS/SPACING	DESCRIPTOR
GREATER THAN 10 FEET	MASSIVE
3 TO 10 FEET	VERY THICKLY BEDDED
1 TO 3 FEET	THICKLY BEDDED
3 3/4-INCH TO 1 FOOT	MODERATELY BEDDED
1 1/4-INCH TO 3 3/4-INCH	THINLY BEDDED
3/8-INCH TO 1 1/4-INCH	VERY THINLY BEDDED
LESS THAN 3/8-INCH	LAMINATED

STRUCTURE DESCRIPTIONS

CRITERIA	DESCRIPTION
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS AT LEAST 1/2-INCH THICK	STRATIFIED
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS LESS THAN 1/2-INCH THICK	LAMINATED
BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING	FISSURED
FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED	SLICKENSIDED
COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALLER ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN	BLOCKY
INCLUSION OF SMALL POCKETS OF DIFFERENT SOIL, SUCH AS SMALL LENSES OF SAND SCATTERED THROUGH A MASS OF CLAY	LENSED
SAME COLOR AND MATERIAL THROUGHOUT	HOMOGENOUS

CEMENTATION/INDURATION DESCRIPTIONS

FIELD TEST	DESCRIPTION
CRUMBLES OR BREAKS WITH HANDLING OR LITTLE FINGER PRESSURE	WEAKLY CEMENTED/INDURATED
CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE	MODERATELY CEMENTED/INDURATED
WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE	STRONGLY CEMENTED/INDURATED

IGNEOUS/METAMORPHIC ROCK STRENGTH DESCRIPTIONS

FIELD TEST	DESCRIPTION
MATERIAL CRUMBLES WITH BARE HAND	WEAK
MATERIAL CRUMBLES UNDER BLOWS FROM GEOLOGY HAMMER	MODERATELY WEAK
1/2-INCH INDENTATIONS WITH SHARP END FROM GEOLOGY HAMMER	MODERATELY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH ONE BLOW FROM GEOLOGY HAMMER	STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH COUPLE BLOWS FROM GEOLOGY HAMMER	VERY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH MANY BLOWS FROM GEOLOGY HAMMER	EXTREMELY STRONG

IGNEOUS/METAMORPHIC ROCK WEATHERING DESCRIPTIONS

DEGREE OF DECOMPOSITION	FIELD RECOGNITION	ENGINEERING PROPERTIES
SOIL	DISCOLORED, CHANGED TO SOIL, FABRIC DESTROYED	EASY TO DIG
COMPLETELY WEATHERED	DISCOLORED, CHANGED TO SOIL, FABRIC MAINLY PRESERVED	EXCAVATED BY HAND OR RIPPING (Saprolite)
HIGHLY WEATHERED	DISCOLORED, HIGHLY FRACTURED, FABRIC ALTERED AROUND FRACTURES	EXCAVATED BY HAND OR RIPPING, WITH SLIGHT DIFFICULTY
MODERATELY WEATHERED	DISCOLORED, FRACTURES, INTACT ROCK-NOTICEABLY WEAKER THAN FRESH ROCK	EXCAVATED WITH DIFFICULTY WITHOUT EXPLOSIVES
SLIGHTLY WEATHERED	MAY BE DISCOLORED, SOME FRACTURES, INTACT ROCK-NOT NOTICEABLY WEAKER THAN FRESH ROCK	REQUIRES EXPLOSIVES FOR EXCAVATION, WITH PERMEABLE JOINTS AND FRACTURES
FRESH	NO DISCOLORATION, OR LOSS OF STRENGTH	REQUIRES EXPLOSIVES

IGNEOUS/METAMORPHIC ROCK JOINT/FRACTURE DESCRIPTIONS

FIELD TEST	DESCRIPTION
NO OBSERVED FRACTURES	UNFRACTURED/UNJOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1 TO 3 FOOT INTERVALS	SLIGHTLY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 4-INCH TO 1 FOOT INTERVALS	MODERATELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1-INCH TO 4-INCH INTERVALS WITH SCATTERED FRAGMENTED INTERVALS	INTENSELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT LESS THAN 1-INCH INTERVALS; MOSTLY RECOVERED AS CHIPS AND FRAGMENTS	VERY INTENSELY FRACTURED/JOINTED

BORING/TRENCH LOG LEGEND

 No Recovery (NOREC)  Chunk Sample (CHK)  Shelby Tube Sample (ST)  Bulk Sample (B)  Standard Penetration Test Sample (SPT)  Modified California Sample (MC)  Continuous Push (CP)  Groundwater Level (At Time of Drilling)  Groundwater Level (After Drilling)  Groundwater Level (Seepage Encountered)	PENETRATION RESISTANCE					
	SAND AND GRAVEL			SILT AND CLAY		
	RELATIVE DENSITY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	CONSISTENCY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*
	VERY LOOSE	0 - 4	0 - 6	VERY SOFT	0 - 2	0 - 3
	LOOSE	5 - 10	7 - 16	SOFT	3 - 4	4 - 6
	MEDIUM DENSE	11 - 30	17 - 48	FIRM	5 - 8	7 - 13
	DENSE	31 - 50	49 - 79	STIFF	9 - 15	14 - 24
	VERY DENSE	OVER 50	OVER 79	VERY STIFF	16 - 30	25 - 48
				HARD	OVER 30	OVER 48
	*NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE LAST 12 INCHES					
	COMPRESSIVE STRENGTH (tsf)					
					0 - 0.25	
					0.25 - 0.50	
					0.50 - 1.0	
					1.0 - 2.0	
					2.0 - 4.0	
					OVER 4.0	

MOISTURE DESCRIPTIONS

FIELD TEST	APPROX. DEGREE OF SATURATION, S (%)	DESCRIPTION
NO INDICATION OF MOISTURE; DRY TO THE TOUCH	S<25	DRY
SLIGHT INDICATION OF MOISTURE	25<S<50	DAMP
INDICATION OF MOISTURE; NO VISIBLE WATER	50<S<75	MOIST
MINOR VISIBLE FREE WATER	75<S<100	WET
VISIBLE FREE WATER	100	SATURATED

QUANTITY DESCRIPTIONS

APPROX. ESTIMATED PERCENT	DESCRIPTION
<5%	TRACE
5 - 10%	FEW
11 - 25%	LITTLE
26 - 50%	SOME
>50%	MOSTLY



KEY TO LOGS

**TRENCH NUMBER T-1**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.384884 **LONGITUDE** -117.236147
TRENCH DEPTH 7.0 ft
TOP OF TRENCH ELEVATION 795.0 ft

GROUNDWATER DEPTHS

▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	TOPSOIL ; Loose, moist, dark brown, Silty, fine to medium SAND	
				1.50 793.5		
				SC-SM	Medium dense, moist, reddish brown, Silty and Clayey, fine to medium SAND	
				3.50 791.5		
					GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, light brown to brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	790					
				7.00 788.0		
					TRENCH TERMINATED AT 7 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	785					
15	780					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



TRENCH NUMBER T-2

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 COMPLETED 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja +N. Borja

LATITUDE 33.384849 LONGITUDE -117.235669
TRENCH DEPTH 7.0 ft
TOP OF TRENCH ELEVATION 800.0 ft
GROUNDWATER DEPTHS
GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
		B T2-1		SM	UNDOCUMENTED FILL (Qudf); Loose, damp, dark grayish brown, Silty, fine to medium SAND	
				2.00 798.0		
				SP-SC	Loose to medium dense, moist, reddish brow, Clayey, fine to coarse SAND; trace gravel	
				4.00 796.0		
5	795				GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown to yellowish brown, GRANITIC ROCK; excavates as silty, fine to coarse sand	
				7.00 793.0		
					TRENCH TERMINATED AT 7 FEET No groundwater Backfilled on 05-06-2024.	
10	790					
15	785					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



TRENCH NUMBER T-3

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.384960 **LONGITUDE** -117.235674
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 798.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	UNDOCUMENTED FILL (Qudf); Loose, damp, dark brown, Silty, fine to medium SAND - -Becomes brown to dark reddish brown	
				2.00 796.0	
				GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown to yellowish brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				4.50 793.5	
5	793			TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	788				
15	783				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



TRENCH NUMBER T-4

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 COMPLETED 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.384823 LONGITUDE -117.235341
TRENCH DEPTH 4.0 ft
TOP OF TRENCH ELEVATION 801.0 ft
GROUNDWATER DEPTHS
GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
		B T4-1		SM	UNDOCUMENTED FILL (Qudf); Loose, moist, dark brown, Silty, fine to medium SAND	
				2.00 799.0	GRANITIC ROCK (Kgr); Weak, highly weathered, damp, light brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				4.00 797.0		
5	796				TRENCH TERMINATED AT 4 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	791					
15	786					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



TRENCH NUMBER T-5

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 COMPLETED 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385099 LONGITUDE -117.235498
TRENCH DEPTH 6.0 ft
TOP OF TRENCH ELEVATION 794.0 ft
GROUNDWATER DEPTHS
GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	UNDOCUMENTED FILL (Qudf); Loose, moist, dark brown, Silty, fine to medium SAND; trace clay	
			SM	Loose to medium dense, damp, dark brown, Silty, fine to coarse SAND	
				GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	789			TRENCH TERMINATED AT 6 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	784				
15	779				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



TRENCH NUMBER T-6

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385145 **LONGITUDE** -117.235982
TRENCH DEPTH 4.0 ft
TOP OF TRENCH ELEVATION 790.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	TOPSOIL ; Loose, dry to damp, dark brown, Silty, fine to medium SAND	
				SM	2.00 788.0 Loose to medium dense, damp, brown to dark brown, Silty, fine to coarse SAND; trace clay	
					2.50 787.5 GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
					4.00 786.0 TRENCH TERMINATED AT 4 FEET No groundwater encountered Backfilled on 05/06/2024.	
5	785					
10	780					
15	775					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-7**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385377 **LONGITUDE** -117.236139
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 781.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	TOPSOIL ; Loose, moist, dark brown, Silty, fine to medium SAND	
				CL	1.50 779.5 Stiff, moist, dark reddish brown and olive brown, Sandy CLAY	
					3.00 778.0 GRANITIC ROCK (Kgr) ; Weak, highly weathered, brown to light brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
					4.50 776.5 TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
5	776					
10	771					
15	766					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



TRENCH NUMBER T-8

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385283 **LONGITUDE** -117.235738
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 788.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	TOPSOIL ; Loose, damp, brown, Silty, fine to medium SAND	
				1.50 786.5	GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				4.50 783.5		
5 783					TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10 778						
15 773						

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-9**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385400 **LONGITUDE** -117.235312
TRENCH DEPTH 7.0 ft
TOP OF TRENCH ELEVATION 789.0 ft

GROUNDWATER DEPTHS

▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
5	784	B T9-1		SM	UNDOCUMENTED FILL (Qudf) ; Loose, damp, dark brown, Silty, fine to medium SAND - Contains chunks of granitic rock GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
7.00	782.0				TRENCH TERMINATED AT 7 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	779					
15	774					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 COMPLETED 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe w/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385627 LONGITUDE -117.235559
TRENCH DEPTH 3.5 ft
TOP OF TRENCH ELEVATION 781.0 ft
GROUNDWATER DEPTHS
GROUNDWATER ENCOUNTERED NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	TOPSOIL; Loose, damp, brown to dark brown, Silty, fine to coarse SAND; metal pipe encountered below surface	
			2.00 779.0	GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
			3.50 777.5	TRENCH TERMINATED AT 3.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
5	776				
10	771				
15	766				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-11**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385783 **LONGITUDE** -117.235321
TRENCH DEPTH 5.5 ft
TOP OF TRENCH ELEVATION 780.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	UNDOCUMENTED FILL (Qudf); Loose, moist, brown to grayish brown, Silty, fine to medium SAND	
	1.50		778.5		
			CL	TOPSOIL; Stiff, moist, dark reddish brown and olive brown, Sandy CLAY	
	3.50		776.5		
				GRANITIC ROCK (Kgr); Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	775		5.50	774.5	
				TRENCH TERMINATED AT 5.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	770				
15	765				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-13**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386111 **LONGITUDE** -117.235606
TRENCH DEPTH 12.0 ft
TOP OF TRENCH ELEVATION 775.0 ft

GROUNDWATER DEPTHS

▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			CL	ALLUVIUM (Qal) ; Soft to firm, moist, dark, Sandy CLAY	
			SM-ML	3.00 772.0 Loose, moist, mottled tan brown and gray, Silty, fine to medium SAND to Sandy SILT	
5	770			- Becomes gray; increase in fines content	
			SM	9.50 765.5 Loose, moist to wet, gray, fine to coarse SAND; little silt	
10	765			11.00 764.0 GRANITIC ROCK (Kgr) ; Weak, weathered, moist, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				12.00 763.0 TRENCH TERMINATED AT 12 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	760				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.



TRENCH NUMBER T-14

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385877 **LONGITUDE** -117.235723
TRENCH DEPTH 8.0 ft
TOP OF TRENCH ELEVATION 775.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	ALLUVIUM (Qal) ; Loose, moist, dark brown, Silty, fine to medium SAND; few clay	
			SC	Loose, moist, mottled gray and brown, Clayey, fine to medium SAND	
5	770			GRANITIC ROCK (Kgr) ; Weak, highly weathered, moist, tan brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				TRENCH TERMINATED AT 8 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	765				
15	760				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NAME	E. Mission Road		
PROJECT NUMBER	G3322-42-01		
DATE STARTED	05-06-2024	COMPLETED	05-06-2024
TRENCHING CONTRACTOR	Dave's Backhoe		
EQUIPMENT TYPE	CAT 430F RT Backhoe W/18" Bucket		
LOGGED BY	N. Borja		

LATITUDE	33.386029	LONGITUDE	-117.236095
TRENCH DEPTH	10.5 ft		
TOP OF TRENCH ELEVATION	770.0 ft		
GROUNDWATER DEPTHS			
▼ GROUNDWATER ENCOUNTERED	NA		

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	ALLUVIUM (Qal); Loose, damp, dark brown, Silty, fine to medium SAND	
				CL	1.50 768.5 Firm to stiff, moist, dark brown, Sandy CLAY	
5	765			SC	5.50 764.5 Medium dense, moist, brown to dark brown, Clayey, fine to medium SAND	
				SM	7.00 763.0 Medium dense to dense, damp, tan brown, Silty, fine to medium SAND; hard digging	
10	760	B T15-1			10.50 759.5 TRENCH TERMINATED AT 10.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	755					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-16**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.385734 **LONGITUDE** -117.236162
TRENCH DEPTH 4.5 ft
TOP OF TRENCH ELEVATION 773.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	TOPSOIL ; Loose, moist, dark brown, Silty, fine to medium SAND	
	1.50		CL	771.5 Stiff, moist, dark brown, Sandy CLAY	
	3.50			769.5	
	4.50			GRANITIC ROCK (Kgr) ; Weak, highly weathered, damp, brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
5	768			TRENCH TERMINATED AT 4.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
10	763				
15	758				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-17**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386516 **LONGITUDE** -117.235550
TRENCH DEPTH 12.5 ft
TOP OF TRENCH ELEVATION 774.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE NUMBER	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
				SM	ALLUVIUM (Qal) ; Loose, damp, dark brown, Silty, fine to medium SAND	
				1.50 772.5 ML	Firm, moist, brown to reddish brown, Sandy SILT	
				4.00 770.0 SM	Medium dense, moist, mottled gray and brown, Silty, fine to medium SAND	
5	769	B T17-1			- Becomes medium dense to dense below 5 feet	
					- -Becomes reddish brown to brown	
10	764	CHNK T17-2		10.00 764.0	GRANITIC ROCK (Kgr) ; Weak, completely weathered, moist, brown to tan brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				12.50 761.5		
					TRENCH TERMINATED AT 12.5 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	759					

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-18**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386453 **LONGITUDE** -117.235835
TRENCH DEPTH 13.0 ft
TOP OF TRENCH ELEVATION 771.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** 12.5

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	ALLUVIUM (Qal); Loose, damp, dark brown, Silty, fine to medium SAND	
			1.50 769.5		
			CL	Firm, moist, dark brown, Sandy CLAY	
			4.00 767.0		
			SM	Loose to medium dense, moist, mottled gray and tan brown, Silty, fine to medium SAND	
5	766			- Becomes gray, fine to coarse	
				- Becomes medium dense to dense, brown to grayish brown	
10	761				
			12.50 758.5	▼	
			13.00 758.0		
				TRENCH TERMINATED AT 13 FEET Groundwater encountered at 12.5 feet Backfilled on 05/06/2024.	
15	756				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

**TRENCH NUMBER T-19**

Sheet 1 of 1

PROJECT NAME E. Mission Road
PROJECT NUMBER G3322-42-01
DATE STARTED 05-06-2024 **COMPLETED** 05-06-2024
TRENCHING CONTRACTOR Dave's Backhoe
EQUIPMENT TYPE CAT 430F RT Backhoe W/18" Bucket
LOGGED BY N. Borja

LATITUDE 33.386395 **LONGITUDE** -117.236113
TRENCH DEPTH 11.0 ft
TOP OF TRENCH ELEVATION 768.0 ft
GROUNDWATER DEPTHS
▼ **GROUNDWATER ENCOUNTERED** NA

DEPTH (ft)	ELEVATION (ft)	LITHOLOGY	USCS	MATERIAL DESCRIPTION	BLOW COUNTS (Blows per 6")
			SM	ALLUVIUM (Qal) ; Loose, damp, dark brown, Silty, fine to medium SAND	
			CL	2.00 766.0 Soft to firm, moist, dark brown, Sandy CLAY	
			SM	4.00 764.0 Loose, moist, brown, Silty, fine to coarse SAND	
5	763				
10	758			10.00 758.0 GRANITIC ROCK (Kgr) ; Weak, highly weathered, moist, brown to yellowish brown and reddish brown, GRANITIC ROCK; excavates as Silty, fine to coarse SAND	
				11.00 757.0 TRENCH TERMINATED AT 11 FEET No groundwater encountered Backfilled on 05/06/2024.	
15	753				

THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

APPENDIX

B

APPENDIX B

LABORATORY TESTING

We performed laboratory tests in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. We tested selected soil samples for maximum density/optimum moisture content, expansion index, water-soluble sulfate, chloride, plasticity index, and grain size characteristics. The results of our laboratory tests are presented herein.

SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS ASTM D 1557

Sample No.	Description (Geologic Unit)	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
T1-2	Reddish brown, Silty, fine to medium SAND (Topsoil)	129.1	10.0
T12-1	Dark brown, Sandy CLAY (Qal)	127.0	10.0

SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS ASTM D 4829

Sample No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index	2022 CBC Expansion Classification	ASTM Soil Expansion Classification
	Before Test	After Test				
T7-1	13.3	29.2	97.3	73	Expansive	Medium
T12-1	9.6	21.0	109.6	38	Expansive	Low

SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS CALIFORNIA TEST NO. 417

Sample No.	Depth (feet)	Geologic Unit	Water-Soluble Sulfate (%)	ACI 318 Sulfate Exposure
T7-1	1.5-3	Topsoil	0.001	S0
T12-1	2-4	Qal	0.008	S0

**SUMMARY OF LABORATORY CHLORIDE TEST RESULTS
AASHTO T 291**

Sample No.	Depth (Feet)	Geologic Unit	Chloride Ion Content (ppm)	Chloride Ion Content (%)
T7-1	1.5-3	Topsoil	83	0.008
T12-1	2-4	Qal	88	0.009

**SUMMARY OF LABORATORY PLASTICITY INDEX TEST RESULTS
ASTM D 4318**

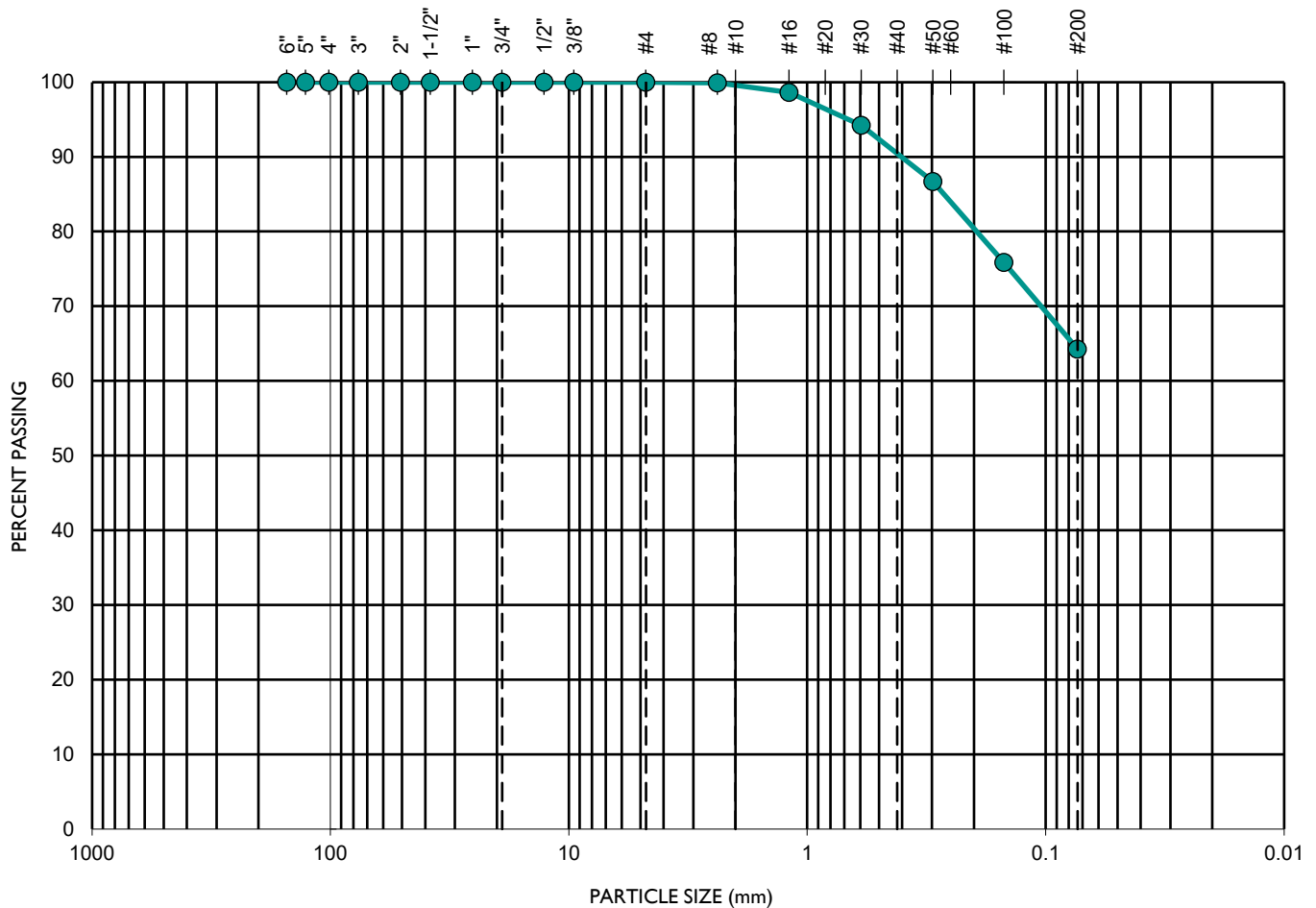
Sample No.	Depth (Feet)	Geologic Unit	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification
T7-1	1.5-3	Topsoil	51	21	30	CH
T12-1	2-4	Qal	31	15	16	CL

SAMPLE NO.: **T7-1**
 SAMPLE DEPTH (FT.): **1.5-3'**

GEOLOGIC UNIT: **Topsoil**

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE



TEST DATA					
D ₁₀ (mm)	D ₃₀ (mm)	D ₆₀ (mm)	C _c	C _u	SOIL DESCRIPTION
0.012	0.034	0.069	1.5	6.0	CH - Sandy, fat CLAY

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
 PHONE 858 558-6900 - FAX 858 558-6159

SIEVE ANALYSES - ASTM D 6913

1305 EAST MISSION ROAD

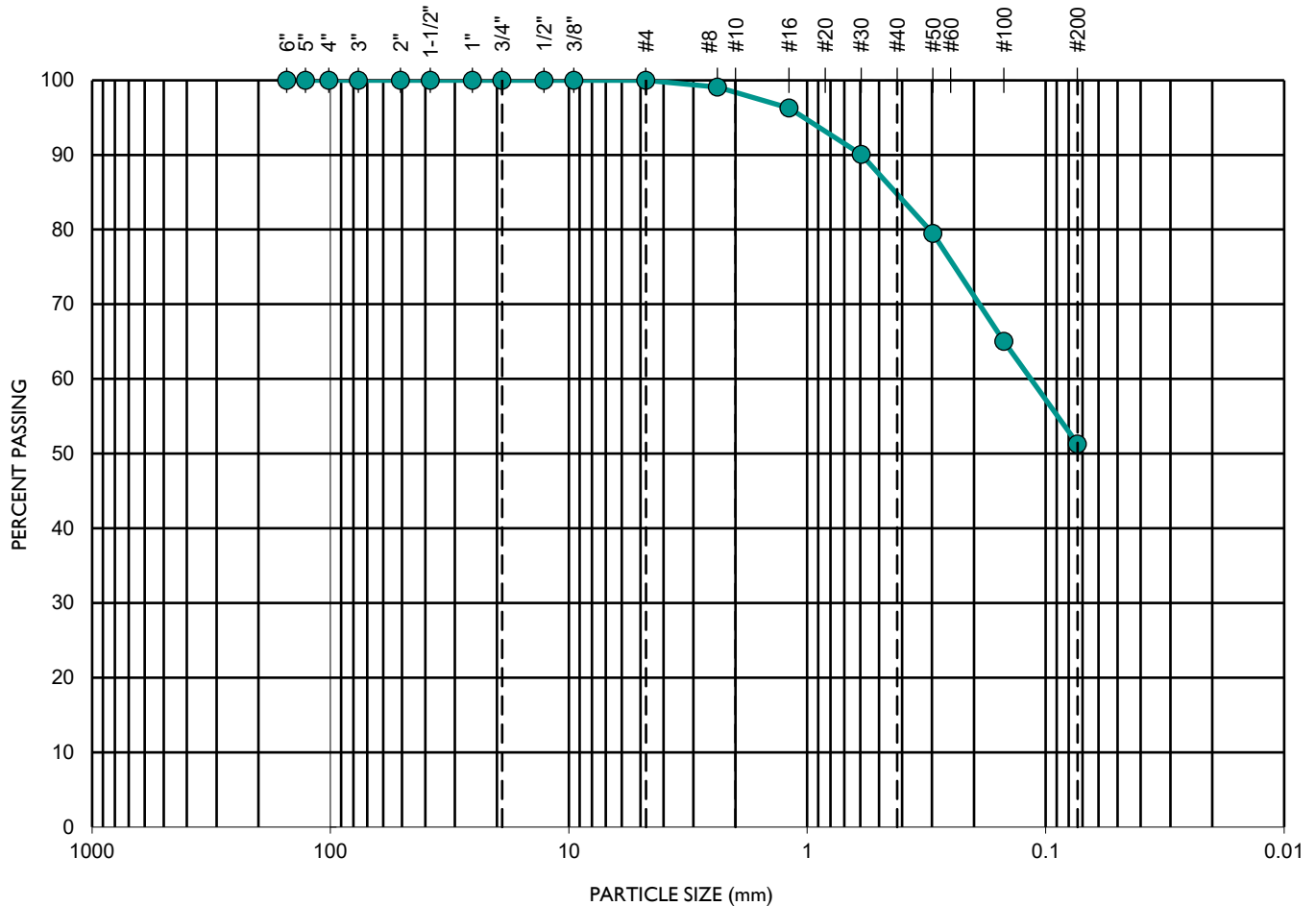
PROJECT NO.: G3322-42-01

SAMPLE NO.: **T12-1**
 SAMPLE DEPTH (FT.): **2-4'**

GEOLOGIC UNIT: **Qal**

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE



TEST DATA					
D ₁₀ (mm)	D ₃₀ (mm)	D ₆₀ (mm)	C _c	C _u	SOIL DESCRIPTION
0.014	0.043	0.122	1.1	8.4	CL - Sandy, lean CLAY

GEOCON
INCORPORATED



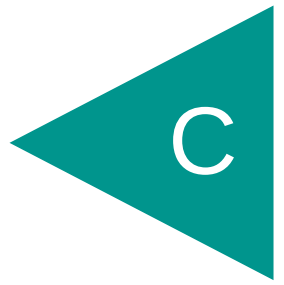
GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
 PHONE 858 558-6900 - FAX 858 558-6159

SIEVE ANALYSES - ASTM D 6913

1305 EAST MISSION ROAD

PROJECT NO.: G3322-42-01

APPENDIX



APPENDIX C

SEISMIC SURVEY REPORT

FOR

1305 EAST MISSION ROAD
FALLBROOK, CALIFORNIA

PROJECT NO. G3322-42-01

APPENDIX C

SEISMIC SURVEY REPORT

INTRODUCTION

We performed a 2-D refraction microtremor (2-D ReMi) seismic survey to aid in evaluating the subsurface characteristics of the underlying rock materials at the project site located south of East Mission Road and east of Industrial Way in Fallbrook, California (see Vicinity Map).



Vicinity Map

The survey included four seismic traverses (SL-1 through SL-4) at designated areas within the project site as shown in the Site Map and Site Layout figures.

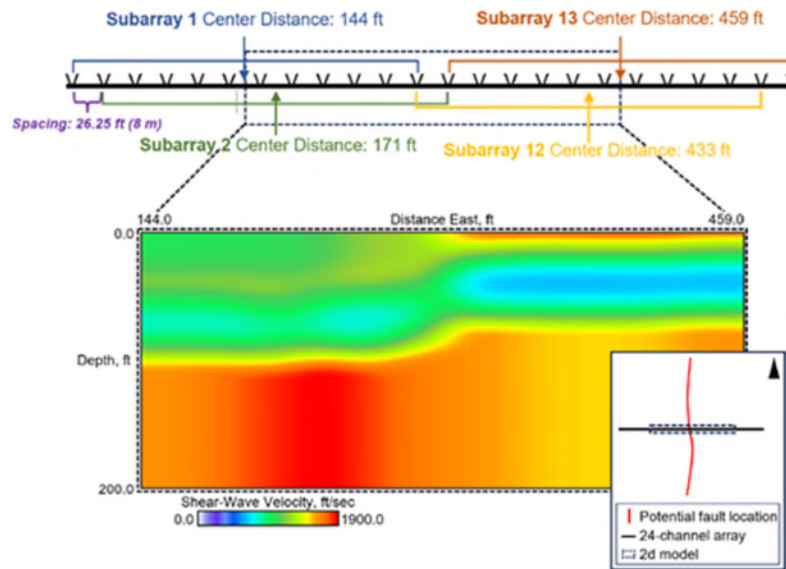
METHODOLOGY: S-WAVE SEISMIC SURVEY

The 2D S-wave seismic method uses the propagation of surface waves to evaluate subsurface geologic conditions. This method combines aspects of Multichannel Analysis of Surface Waves (MASW) and Refraction Microtremor (ReMi) to create a two-dimensional velocity model of the subsurface. We collect S-wave and P-wave data using a seismograph and vertical-component geophones. The geophones are evenly spaced along the seismic line to capture detailed spatial information. Several signal generation points (shots) are conducted along the line including active sources and passive ambient noise recording. The active sources include the shots performed at the ends of the line and at regular intervals along the spread. Surface waves generated by the source propagate through the subsurface and their velocity is controlled by the elastic properties of the layers they travel through. The energy from these waves is recorded by the geophones capturing surface wave dispersion characteristics. Data collection includes both low-frequency waves for deeper penetration and higher-frequency waves for shallow detail.

Due to elevated background noise levels and surface conditions that limited the effectiveness of traditional P-wave refraction methods, we used the 2D Refraction Microtremor (ReMi) technique to acquire shear-wave (V_s) velocity data. We used the resulting 2D V_s profiles correlating with empirical rippability criteria to help evaluate subsurface material competence and potential rippability characteristics.

The depth of exploration for 2D S-wave seismic surveys depends on the length of the seismic line and the frequency content of the recorded surface waves. Typically, the depth of penetration is approximately 25 percent of the line length. Deeper exploration is achievable when low-frequency energy is well-recorded.

In addition, the recovered sectional length of a 2D S-wave velocity model is about 50 percent of the full array length because the model is built by combining smaller sections (subarrays), each imaging the center of its section. The ends of the array (e.g., geophones 1 through 6 and 19 through 24 in a 24-channel array) are not included in the model as shown in the Example Model Figure.



Example Model Figure

We positioned 24 vertical-component 4.5-Hertz geophones approximately 17 feet apart for Seismic Line SL-1, 13 feet apart for Seismic Lines SL-2 and SL-3, and 18 feet apart for Seismic Line SL-4. We also performed several shots (signal generation points) by striking a high-density polyethylene (HDPE) plate with a 16-pound hammer at the ends of each line to capture data from multiple signal generation points. We evaluated the data collected and prepared the 2ds tomographic models using Terēan’s 2ds software.

Although seismic velocities are commonly used to help evaluate rock density, rippability is also dependent on other physical characteristics of the rock (i.e., the degree and orientation of joints, fractures, foliation, and mineralogic discontinuities) and the type of equipment, methods, and techniques used to rip the material. Therefore, perspective contractors should use their own judgment and interpretation of the data presented in this report to evaluate rippability and production rates. Consideration should also be given to performing test pits, air-track borings, and/or trial ripping areas to help assist in corroborating the data presented herein and to help evaluate the appropriate excavation methods, equipment, and costs associated with excavating the materials on site.

The following table provides estimated rippability characteristics and shows the generalized correlation between S-wave velocity, P-wave velocity and rippability based on experience with similar rock materials using a D9 single shank caterpillar dozer.

S-WAVE AND P-WAVE REFRACTION RIPPABILITY CHARACTERISTICS*

Excavation Method	Approximate S-Wave Velocity (Feet/Second)	Approximate P-Wave Velocity (Feet/Second)	Estimated Rippability
Mass Grading	Less than 1,000	Less than 4,000	Rippable
	1,000 to 2,200	4,000 to 5,500	Marginal Ripping (Possible Blasting)
	Greater Than 2,200	Greater than 5,500	Non-Rippable (Pre-Blasting Required)
Trenching	Less than 1,100	Less than 3,500	Rippable
	1,100 to 1,200	3,500 to 4,000	Marginal Ripping
	Greater Than 1,200	Greater than 4,000	Non-Rippable

*Site Specific Seismic S-wave velocity (V_s) and P-wave (V_p) correlation for rock rippability (Modified from Caterpillar 2000 P-wave using ASCE 2021 S-wave guidelines).

RESULTS

We performed seismic surveys along four traverses (SL-1 through SL-4) to help evaluate the subsurface conditions within the proposed construction area as shown on the Site Plan and the Site Layout figures. We generated the 2D tomographic models from the seismic data as shown in the Seismic Results figures.

The seismic refraction survey results indicate layering stratigraphic features across exist below the ground surface. Near-surface materials are generally characterized by relatively low to moderate shear-wave velocities ($\leq 1,200$ feet per second) within the upper 10 to 30 feet, reflecting rippable material. Beneath these layers, shear-wave velocities typically increase to 1,100 to 1,400 feet per second in localized intervals before transitioning to a continuous higher-velocity interface where shear-wave velocities exceed 2,200 feet per second. At greater depths, velocities reach and exceed 3,250 feet per second, indicative of marginally rippable to non-rippable competent rock. Overall, the results demonstrate 25 to 40 feet of rippable material underlain by marginally rippable to competent rock, with localized variations in stiffness across the survey area.

Based on the observed velocity variations, excavations within the proposed area will likely encounter varying ripping conditions. Areas with higher S-wave velocities typically indicate denser, more competent materials, which are likely to pose greater challenges during excavation. In contrast, lower velocities are indicative of softer, less consolidated materials, suggesting conditions more conducive to easier ripping.

Further geotechnical investigations, such as borehole drilling and soil sampling, can be performed to help refine these preliminary interpretations and provide more accurate predictions of excavation difficulty.

Excavations, undercutting, and blasting techniques (if required) can be expected to generate oversized rock (rocks larger than 12 inches), which will necessitate typical hard rock handling and placement procedures during grading operations.

The Seismic Results figure shows the ReMi 2-D S-wave tomography model for Seismic Lines SL-1 through SL-4.

LIMITATIONS

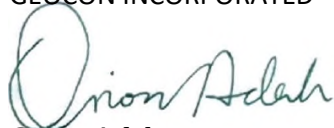
We performed the geophysical field investigation and evaluation in this report in general accordance with the current practice and standard of care exercised by consultants performing similar tasks in the project area. Evaluations are not detailed enough to reveal every subsurface feature or condition, and no warranty (expressed or implied) is made regarding the conclusions and opinions in this report. Variations and conditions not observed or described in this report may be present.

Even though care was taken during the geophysical survey, results have been evaluated by computer modeling that may not result unique solutions for a given dataset. Therefore, results should be considered interpretive and approximate, and only provide information at the locations of geophysical data collection.

Should you have any questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

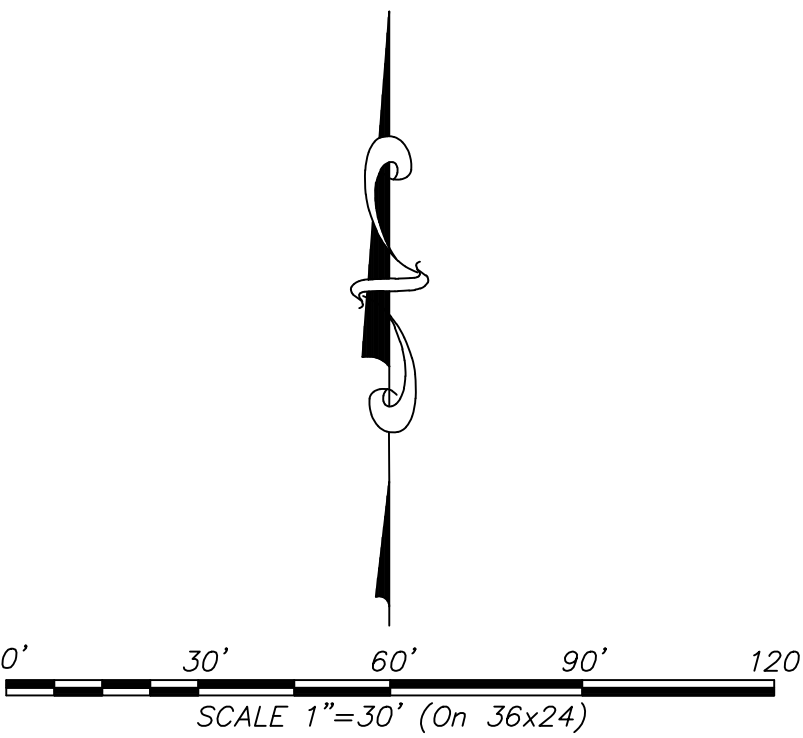
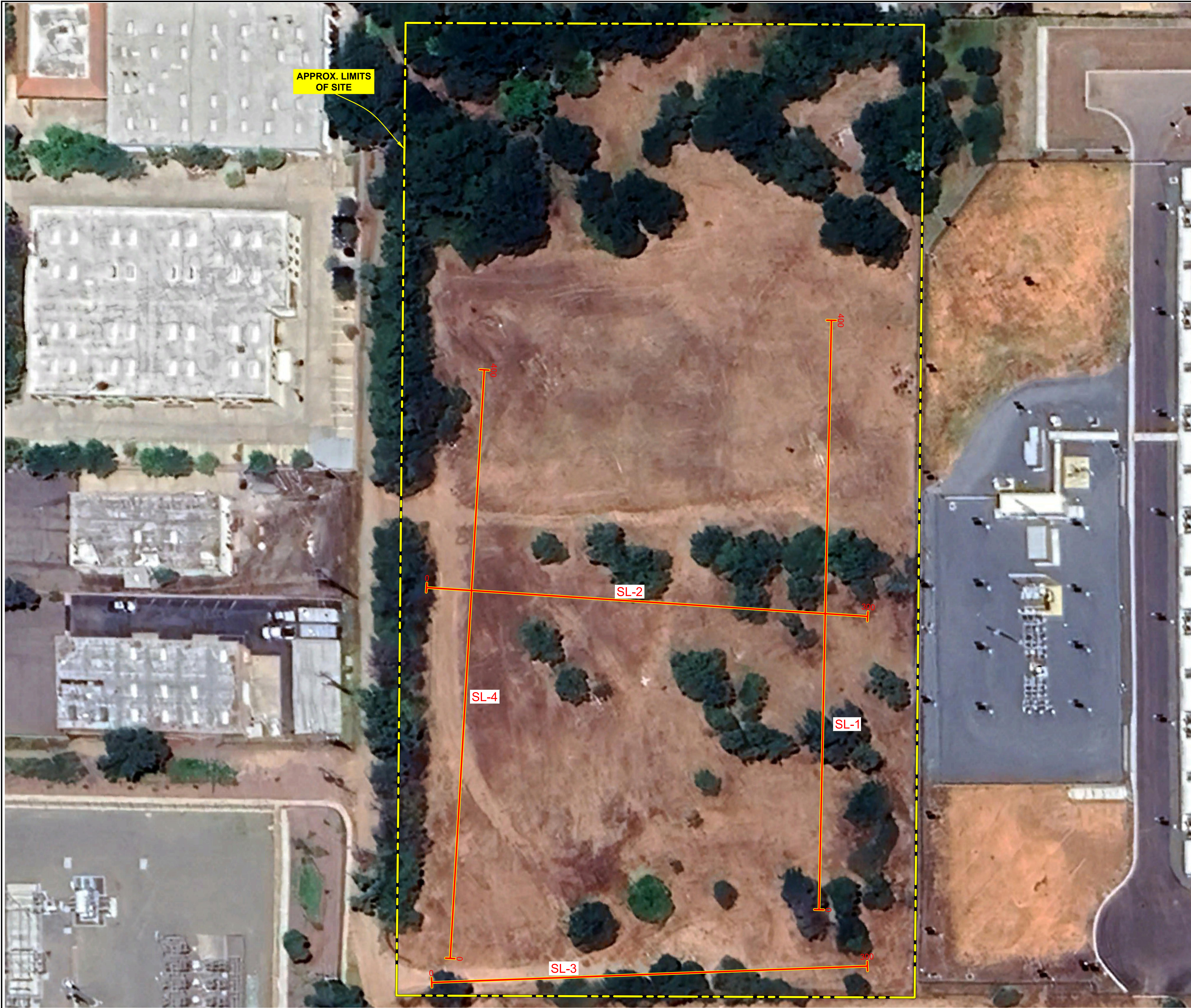
GEOCON INCORPORATED



Orion Adah
Geophysical Services Manager

OA:kv

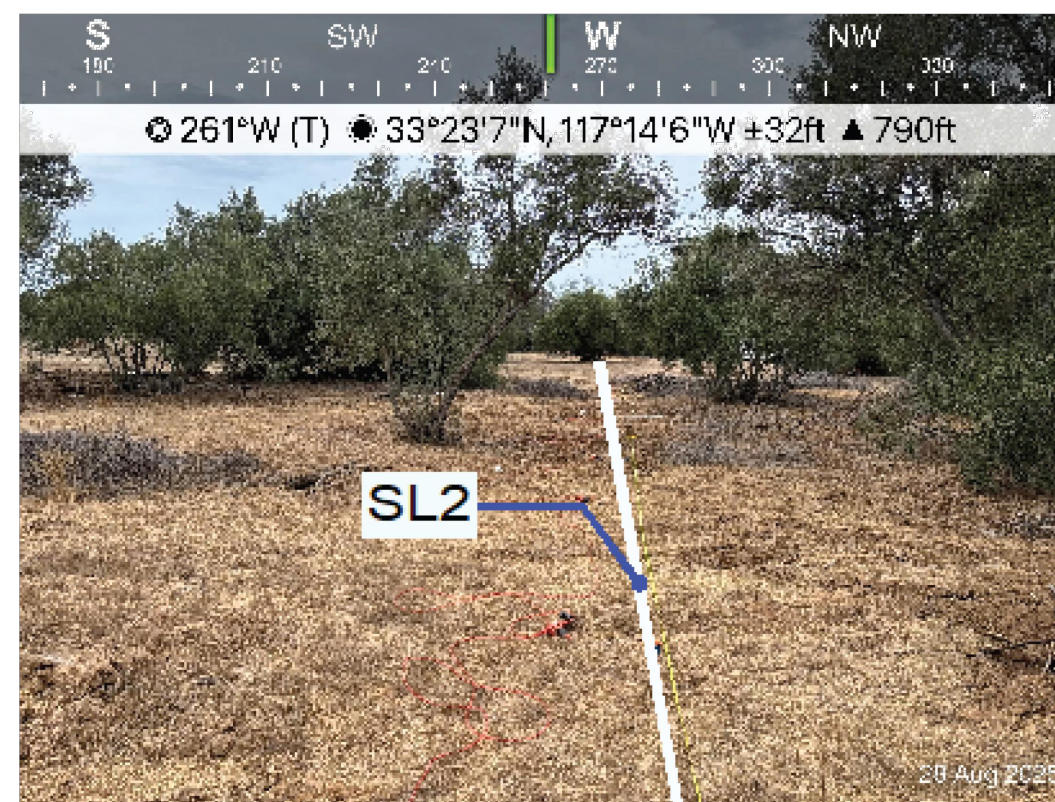
(e-mail) Addressee

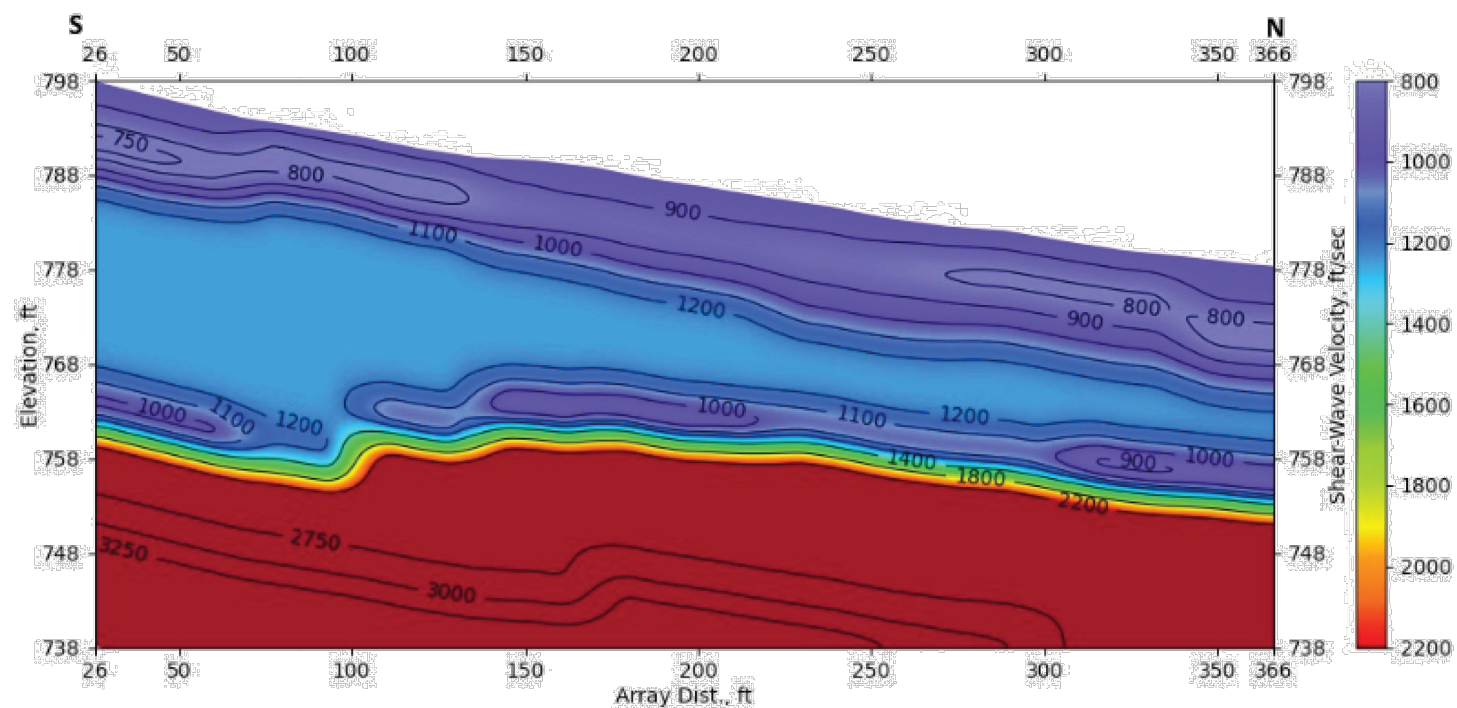


GEOCON LEGEND

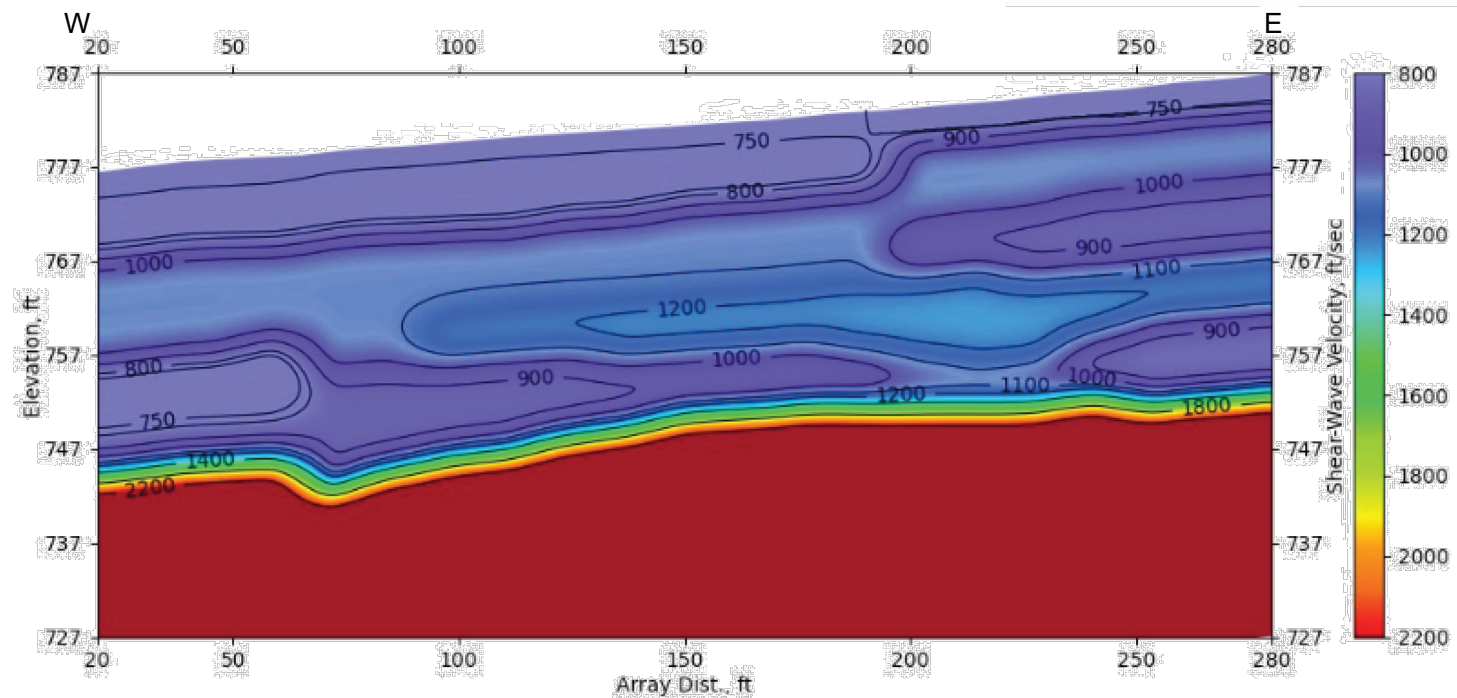
0' SL-4 400'APPROX. LOCATION OF SEISMIC LINE

SITE PLAN			
1305 E. MISSION ROAD FALLBROOK, CALIFORNIA			
GEOCON INCORPORATED GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974 PHONE 658 538-6900 - FAX 658 538-6159	SCALE 1" = 30'		DATE
	PROJECT NO.	G3322 - 42 - 01	FIGURE
SHEET 1 OF 1			

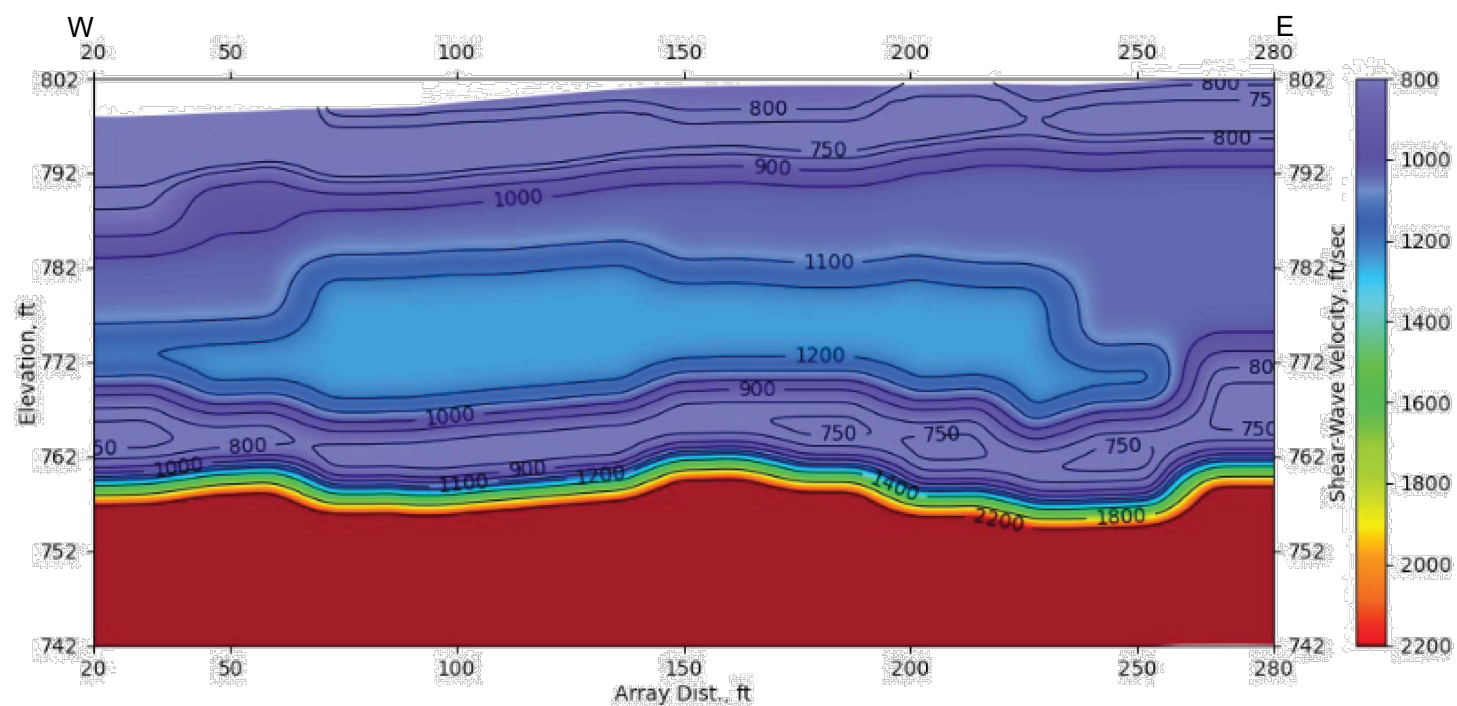




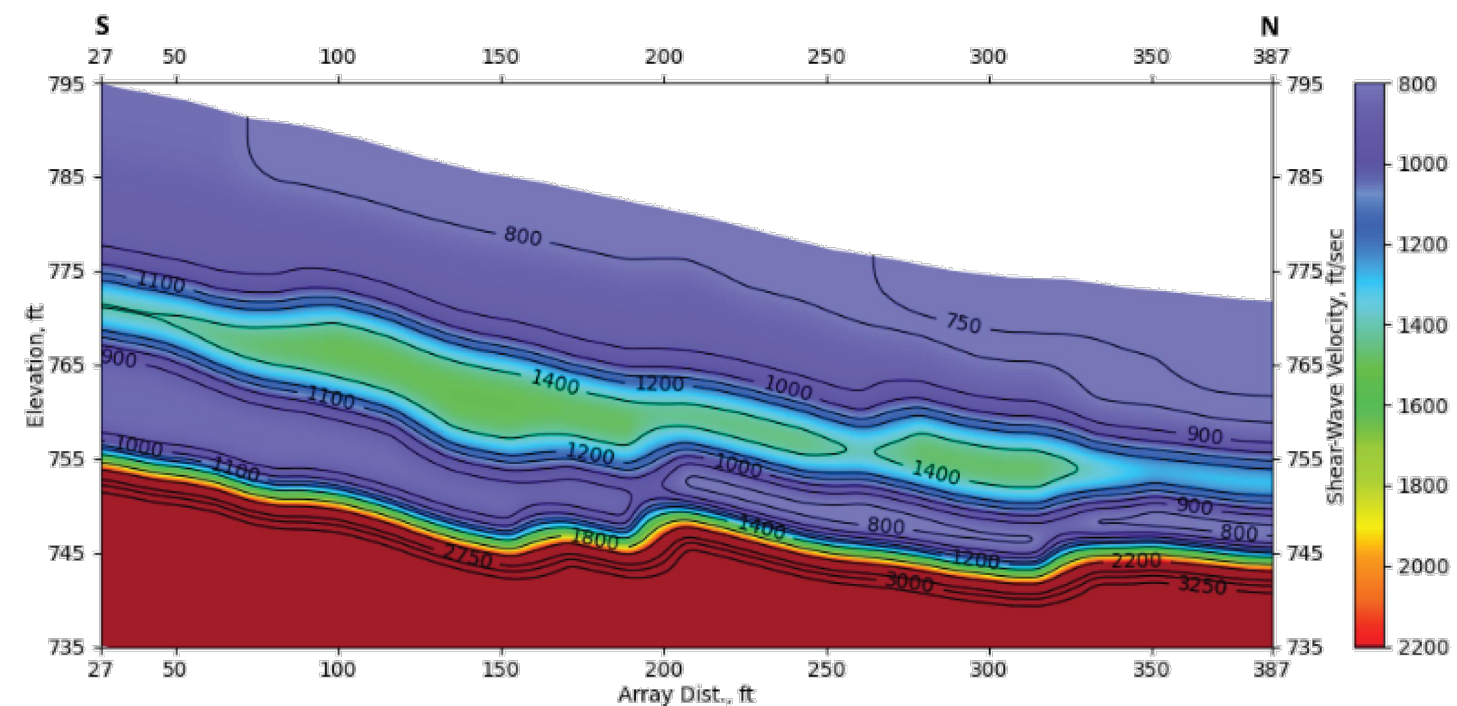
Seismic Result SL-1



Seismic Result SL-2



Seismic Result SL-3



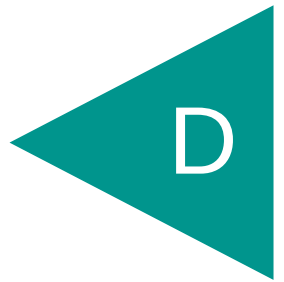
Seismic Result SL-4

GEOCON
INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159
PROJECT NO. G3322 - 42 - 01

SEISMIC RESULT (SL-1 SL-4)

APPENDIX



APPENDIX D

STORMWATER MANAGEMENT INVESTIGATION

We understand storm water management devices are being proposed in accordance with the 2020 County of San Diego BMP Design Manual. If not properly constructed, there is a risk for potential distress to improvements and properties located hydrologically down gradient or adjacent to these devices. Factors such as the amount of water to be detained, its residence time, and soil permeability have an important effect on seepage transmission and the potential adverse impacts that may occur if the storm water management features are not properly designed and constructed. We have not performed a hydrogeological study at the site. If infiltration of storm water runoff occurs, downstream properties may be subjected to seeps, springs, slope instability, raised groundwater, movement of foundations and slabs, or other undesirable impacts as a result of water infiltration.

Hydrologic Soil Group

The United States Department of Agriculture (USDA), Natural Resources Conservation Services, possesses general information regarding the existing soil conditions for areas within the United States. The USDA website also provides the Hydrologic Soil Group. The table below presents the descriptions of the hydrologic soil groups. In addition, the USDA website also provides an estimated saturated hydraulic conductivity for the existing soil.

HYDROLOGIC SOIL GROUP DEFINITIONS

Soil Group	Soil Group Definition
A	Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
B	Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
C	Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
D	Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The table below presents the information from the USDA website for the subject property.

USDA WEB SOIL SURVEY – HYDROLOGIC SOIL GROUP

Map Unit Name	Map Unit Symbol	Approximate Percentage of Property	Hydrologic Soil Group	k _{SAT} of Most Limiting Layer (Inches/ Hour)
Fallbrook-Vista sandy loams, 9 to 15 percent slopes	FvD	36	B	0.20 – 0.57
Placentia sandy loam, 2 to 9 percent slopes, warm MAAT MLRA 19	PeC	64	C	0.06 – 0.60

Infiltration Testing

We performed infiltration tests at the locations shown on the *Geologic Map*, Figure 1. The table below presents the results of the infiltration tests. Data sheets are attached. We applied an estimated feasibility factor of safety of 2.0 to our estimated infiltration rates to provide input in Table D.2-1 of Appendix B in the BMP manual. Soil infiltration rates from in-situ tests can vary significantly from one location to another due to the heterogeneous characteristics inherent to most soil.

INFILTRATION TEST RESULTS

Test No.	Geologic Unit	Test Elevation (feet, MSL)	Field-Saturated Hydraulic Conductivity/Infiltration Rate, k _{sat} (inch/hour)	Infiltration Rate ¹ (inch/hour)
A-1	Qal	776	0.011	0.005
A-2	Qal	771	0.009	0.004
A-3	Kgr	782	0.043	0.021
A-4	Kgr	785	0.010	0.005
Average			0.018	0.009

¹ Using a Factor of Safety of 2.

GEOTECHNICAL CONSIDERATIONS

Groundwater Elevations

We encountered groundwater at a depth of 12.5 feet below existing grade trench T-18. It is not uncommon for shallow seepage conditions to develop where none previously existed when sites are irrigated or infiltration is implemented. Groundwater and seepage are dependent on seasonal precipitation, irrigation, land use, among other factors, and varies as a result.

New or Existing Utilities

Utilities are located on the property and adjacent to the property within roadways. Infiltration within the areas near these utilities should be considered infeasible. Setbacks for infiltration should be incorporated if infiltration were to be considered. The setback for infiltration devices should be a minimum of 10 feet and a 1:1 plane of 1 foot below the closest edge of the deepest adjacent utility.

Existing and Planned Structures

Existing and proposed buildings are present on and adjacent to the site. In addition, water should not be allowed to infiltrate in areas where it could affect the neighboring properties and existing adjacent structures, improvements, and roadway. Mitigation for existing structures consists of not allowing water infiltration within a lateral distance of at least 10 feet from the new or existing foundations and property lines. The planned structure will extend over most of the property, and there will be no locations onsite that will be outside of a 10-foot setback from the planned building. Therefore, infiltration should be restricted.

Soil or Groundwater Contamination

We are unaware of contaminated soil on the property. Therefore, infiltration associated with this risk is considered unrestricted. In addition, groundwater mounding would not be a concern due to the lack of a near surface groundwater table.

CONCLUSIONS AND RECOMMENDATIONS

Infiltration Rates

Our test results indicated relatively low infiltration rates, with an average rate of 0.018 in/hr, which can be used as the corrected infiltration rate on Table D.2-1 of the County of San Diego Storm Water Manual. The table below provides the information from Table D.2-1 of the storm water manual.

ELEMENTS FOR DETERMINATION OF DESIGN INFILTRATION RATES
(TABLE D.2-1 OF APPENDIX D)

Item	Value	Unit
Initial Infiltration Rate: Identify per Section D.2.1	0.018	in/hr
Corrected Infiltration Rate: Identify per Section D.2.2	0.018	in/hr
*Safety Factor: Identify per Section D.2.3	2	unitless
Design Infiltration Rate: Corrected Infiltration Rate ÷ Safety Factor	0.009	in/hr

*The final Safety Factor should be determined by the civil engineer.

Infiltration Restrictions

We have evaluated proposed BMPs with respect to the infiltration restrictions contained in Form 4 in Appendix D of the City of Oceanside Storm Water Manual. The table below provides the information.

**INFILTRATION RESTRICTIONS FOR BASIC INFILTRATION ANALYSIS
(TABLE D.1-1 OF APPENDIX D)**

Restriction Element		Is Element Applicable? (Yes/No)
Mandatory Considerations	BMP is within 100' of Contaminated Soils	No
	BMP is within 100' of Industrial Activities Lacking Source Control	No
	BMP is within 100' of Well/Groundwater Basin	No
	BMP is within 50' of Septic Tanks/Leach Fields	No
	BMP is within 10' of Structures/Tanks/Walls	No
	BMP is within 10' of Sewer Utilities	No
	BMP is within 10' of Seasonal High Groundwater	No
	BMP is within Hydric Soils	No
	BMP is within Highly Liquefiable Soils and has Connectivity to Structures	No
	BMP is within 1.5 Times the Height of Adjacent Steep Slopes ($\geq 25\%$)	No
	County Staff has Assigned "Restricted" Infiltration Category	No
Optional Considerations	BMP is within Predominantly Type D Soil	No
	BMP is within 5' of Property Line	No
	BMP is within Fill Depths of $\geq 5'$ (Existing or Proposed)	No
	BMP is within 10' of Underground Utilities	No
	BMP is within 250' of Ephemeral Stream	No
Result	Based on examination of the best available information, I have not identified any restrictions above.	X
	Based on examination of the best available information, I have identified one or more restrictions above.	

Storm Water Evaluation Conclusion

Based on the information in the table above, there are no restrictions identified and the site is considered "unrestricted" for infiltration based on the County's guideline. However, infiltration tests performed within the existing alluvium and granitic rock indicate a very low average rate of 0.009 inches per hour (with a factor of safety of 2).

Storm Water Management Devices

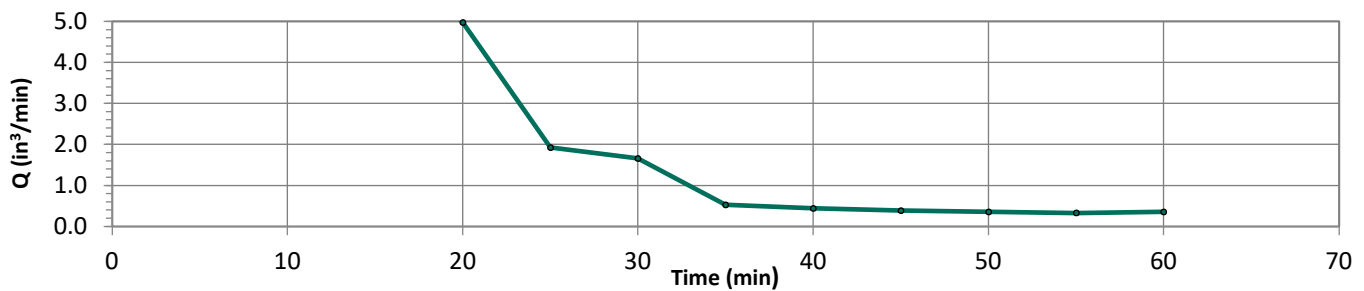
Liners and subdrains should be incorporated into the design and construction of the planned storm water devices. The liners should be impermeable (e.g. High-density polyethylene, HDPE, with a thickness of

about 30 mil or equivalent Polyvinyl Chloride, PVC) to prevent water migration. The subdrains should be perforated within the liner area, installed at the base and above the liner, be at least 3 inches in diameter and consist of Schedule 40 PVC pipe. The subdrains outside of the liner should consist of solid pipe. The penetration of the liners at the subdrains should be properly waterproofed. The subdrains should be connected to a proper outlet. The devices should also be installed in accordance with the manufacturer's recommendations.

TEST NO.: **A-1**GEOLOGIC UNIT: **Qal**EXCAVATION ELEVATION (MSL, FT): **776**

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	4.5
TEST/BOTTOM ELEVATION (MSL, FT):	772
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	6.2
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	0.351
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.011
FACTORED INFILTRATION RATE (IN/HR):	0.005



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	7.925	219.46	43.892
3	5.00	1.895	52.48	10.495
4	5.00	1.315	36.42	7.283
5	5.00	1.300	36.00	7.200
6	5.00	0.898	24.87	4.974
7	5.00	0.347	9.61	1.922
8	5.00	0.300	8.31	1.662
9	5.00	0.095	2.63	0.526
10	5.00	0.080	2.22	0.443
11	5.00	0.070	1.94	0.388
12	5.00	0.065	1.80	0.360
13	5.00	0.060	1.66	0.332
14	5.00	0.065	1.80	0.360

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

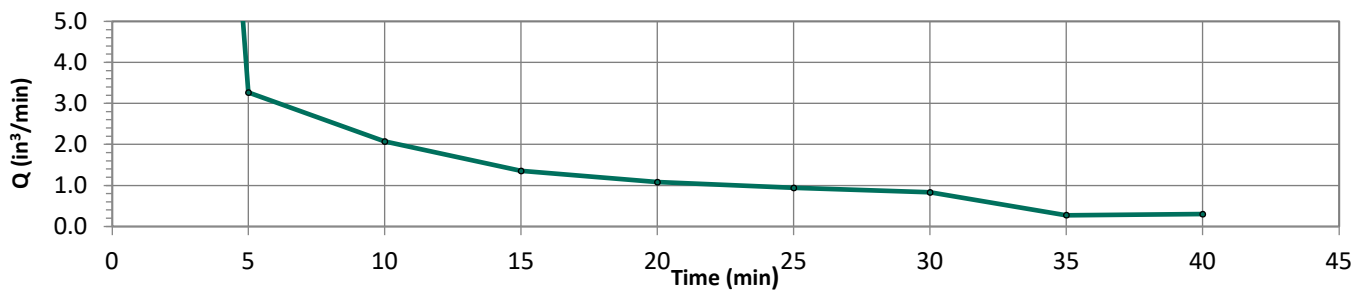
PROJECT NO.:

G3322-42-01

TEST NO.: A-2GEOLOGIC UNIT: QalEXCAVATION ELEVATION (MSL, FT): 771

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	4.0
TEST/BOTTOM ELEVATION (MSL, FT):	767
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	6.1
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	0.286
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.009
FACTORED INFILTRATION RATE (IN/HR):	0.004



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	8.590	237.88	47.575
3	5.00	0.590	16.34	3.268
4	5.00	0.375	10.38	2.077
5	5.00	0.245	6.78	1.357
6	5.00	0.195	5.40	1.080
7	5.00	0.170	4.71	0.942
8	5.00	0.150	4.15	0.831
9	5.00	0.050	1.38	0.277
10	5.00	0.055	1.52	0.305
11	5.00	0.050	1.38	0.277

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

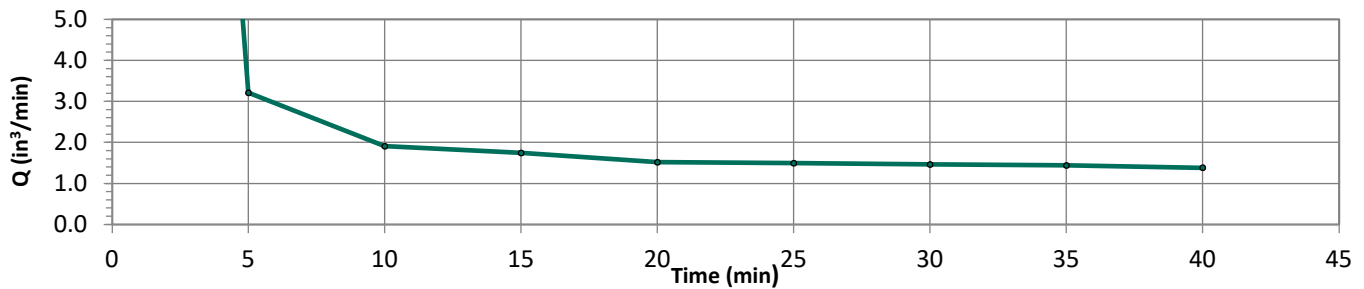
PROJECT NO.:

G3322-42-01

TEST NO.: A-3GEOLOGIC UNIT: KgrEXCAVATION ELEVATION (MSL, FT): 782

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	3.0
TEST/BOTTOM ELEVATION (MSL, FT):	779
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	5.9
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	1.394
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.043
FACTORED INFILTRATION RATE (IN/HR):	0.021



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	8.395	232.48	46.495
3	5.00	0.580	16.06	3.212
4	5.00	0.345	9.55	1.911
5	5.00	0.315	8.72	1.745
6	5.00	0.275	7.62	1.523
7	5.00	0.270	7.48	1.495
8	5.00	0.265	7.34	1.468
9	5.00	0.260	7.20	1.440
10	5.00	0.250	6.92	1.385
11	5.00	0.250	6.92	1.385
12	5.00	0.255	7.06	1.412

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

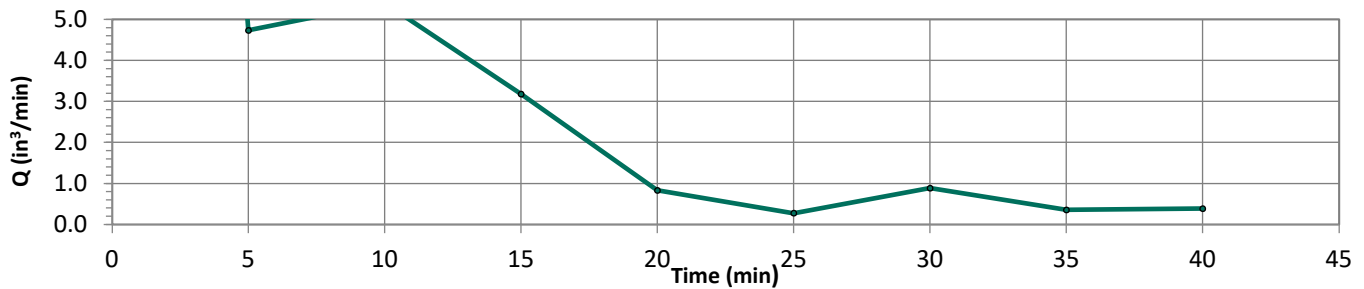
PROJECT NO.:

G3322-42-01

TEST NO.: A-4GEOLOGIC UNIT: KgrEXCAVATION ELEVATION (MSL, FT): 785

TEST INFORMATION	
BOREHOLE DIAMETER (IN):	8
BOREHOLE DEPTH (FT):	3.5
TEST/BOTTOM ELEVATION (MSL, FT):	782
MEASURED HEAD HEIGHT (IN):	4.3
CALCULATED HEAD HEIGHT (IN):	6.0
FACTOR OF SAFETY:	2.0

TEST RESULTS	
STEADY FLOW RATE (IN ³ /MIN):	0.342
FIELD-SATURATED INFILTRATION RATE (IN/HR):	0.010
FACTORED INFILTRATION RATE (IN/HR):	0.005



TEST DATA				
Reading	Time Elapsed (min)	Water Weight Consumed (lbs)	Water Volume Consumed (in ³)	Q (in ³ /min)
1	0.00	0.000	0.00	0.00
2	5.00	9.095	251.86	50.372
3	5.00	0.855	23.68	4.735
4	5.00	0.975	27.00	5.400
5	5.00	0.575	15.92	3.185
6	5.00	0.150	4.15	0.831
7	5.00	0.050	1.38	0.277
8	5.00	0.160	4.43	0.886
9	5.00	0.065	1.80	0.360
10	5.00	0.070	1.94	0.388
11	5.00	0.060	1.66	0.332
12	5.00	0.065	1.80	0.360
13	5.00	0.060	1.66	0.332

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
PHONE 858 558-6900 - FAX 858 558-6159

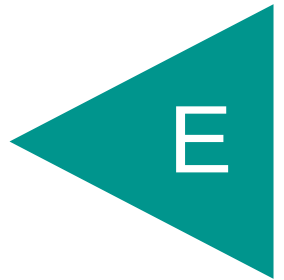
AARDVARK PERMEAMETER TEST RESULTS

1305 EAST MISSION ROAD

PROJECT NO.:

G3322-42-01

APPENDIX



APPENDIX E

RECOMMENDED GRADING SPECIFICATIONS

FOR

1305 EAST MISSION ROAD
FALLBROOK, CALIFORNIA

PROJECT NO. G3322-42-01

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

- 1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained herein in the event of conflict.
- 1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the Geotechnical Report recommendations and these specifications. The Consultant shall provide sufficient testing and observation services to assess whether, in their opinion, the work has been performed in substantial conformance with these specifications and the recommendations contained in the Geotechnical Report. It shall be the responsibility of the Contractor to keep the Consultant apprised of their work schedule and any changes, including planned placement of fill material, so that personnel may be scheduled accordingly. Fill placed in the absence of the geotechnical consultant is subject to removal.
- 1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications, the Geotechnical Report recommendations and the approved plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, improper moisture content, inadequate compaction, or adverse weather result in work not in conformance with these specifications and the Geotechnical Report recommendations, the Consultant will be empowered to reject the work and recommend to the Owner that grading be suspended until the unacceptable conditions are corrected.

2. DEFINITIONS

- 2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.
- 2.2 **Contractor** shall refer to the Contractor performing the site grading work.

- 2.3 **Civil Engineer or Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.
- 2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.
- 2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for providing qualified representatives to be present on-site, as necessary, to observe and test the Contractor's work for conformance with these specifications.
- 2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.
- 2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

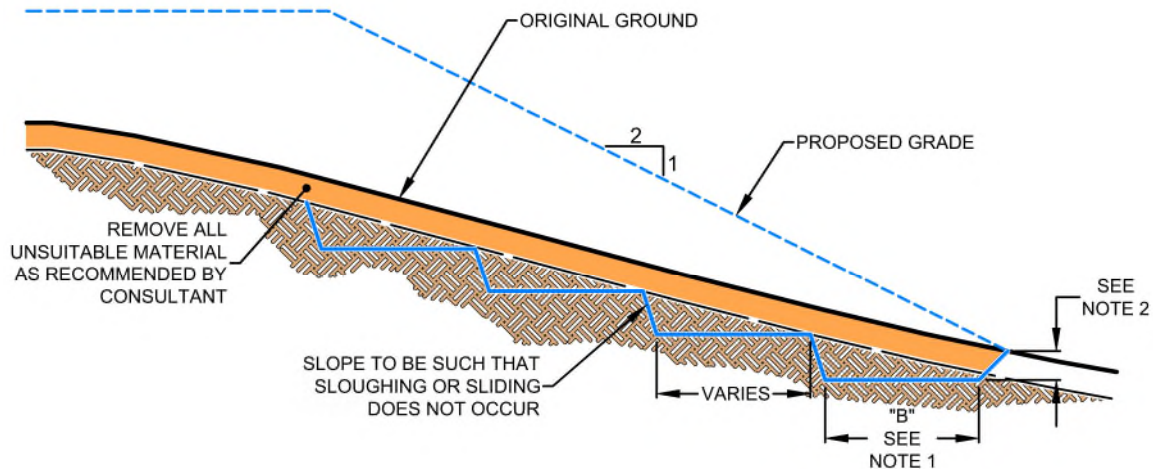
- 3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.
- 3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than $\frac{3}{4}$ inch in size.
- 3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

- 3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines (less than 20 percent). Fines are defined as material smaller than ¾ inch in maximum dimension.
- 3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.
- 3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Health and Safety Code Section 25501, and any other applicable local, state or federal laws. The Consultant is not responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request the termination of grading operations within the affected area until the Owner can be notified of the conditions. Prior to resuming grading operations, the Owner shall provide written documentation to the Consultant confirming that the suspected materials are not hazardous under applicable laws and regulations.

4. CLEARING AND PREPARING AREAS TO BE FILLED

- 4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal of trees, stumps, brush, vegetation, structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded.
- 4.2 Concrete fragments free of reinforcing steel may be placed in fills, provided they are placed in accordance with *Section 6.2* or *6.3* of this document.
- 4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.
- 4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



NOT TO SCALE

DETAIL NOTES:

- 1.....KEY WIDTH "B" SHOULD BE A MINIMUM OF 10 FEET, OR SUFFICIENTLY WIDE TO PERMIT COMPLETE COVERAGE WITH THE COMPACTION EQUIPMENT USED. THE BASE OF THE KEY SHOULD BE GRADED HORIZONTAL OR INCLINED TOWARDS THE NATURAL SLOPE.
- 2.....THE OUTSIDE OF THE KEY SHOULD BE BELOW THE UNSUITABLE SURFICIAL MATERIAL AND EXPOSE DENSE OR HARD FORMATIONAL MATERIAL. WHERE ROCK IS EXPOSED IN THE BOTTOM OF THE KEY, THE DEPTH AND CONFIGURATION OF THE KEY MAY BE MODIFIED AS APPROVED BY THE CONSULTANT.

- 4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content and compacted as recommended in *Section 6*.

5. COMPACTION EQUIPMENT

- 5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.
- 5.2 Compaction of *rock* fills shall be performed in accordance with *Section 6.3*.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in *Section 3.1.1*, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that should generally not exceed 8 inches when compacted. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of materials and moisture content in each layer. The entire fill shall be placed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with *Section 6.2* or *6.3* of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant (i.e., too wet to achieve proper compaction), the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the fill area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade. These soils should generally be moisture-conditioned to at or above optimum moisture content, or as otherwise approved by the Consultant.

6.1.7 The outer 15 feet (or a distance equal to the height of the slope, whichever is less) of fill slopes should be composed of properly compacted granular *soil* fill to

reduce the potential for surficial sloughing. To achieve proper compaction, fill slopes should be over-built by at least 3 feet and then cut to the design grade where possible.

- 6.1.8 As an alternative to over-building, fill slopes can be back-rolled with either a heavy-duty loaded sheepsfoot or track-walked with a D-8 dozer or larger equipment at vertical intervals every 4 feet during slope construction. Upon completion, the entire slope face should be track-walked promptly using a D-8 dozer or larger equipment to ensure uniform compaction of at least 90 percent relative compaction at or above optimum moisture content. If the fill slope cannot be constructed all at once, the finished portions of the slope should be compacted as described above.
- 6.1.9 Where fill slopes and fill-over-cut slopes are planned, a 15-foot-wide keyway should be constructed prior to placing compacted fill. The keyway should expose competent formational material all the way to the slope face and be inclined towards the inside portion of the slope. A subdrain may be recommended along the base of the keyway depending on the conditions encountered.
- 6.2 *Soil-rock* fill, as defined in *Section 3.1.2*, shall be placed by the Contractor in accordance with the following recommendations:
 - 6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.
 - 6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.
 - 6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.
 - 6.2.4 For windrow placement, the rocks should be positioned in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should

be filled with approved granular soil and properly compacted. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, provided this method is approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows should be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses should be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and compaction methods should be continuously observed by the Consultant.

6.3 *Rock fills*, as defined in *Section 3.1.3*, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill should be placed on a sloping surface (minimum slope of 2 percent). The surface should slope toward suitable subdrainage outlet facilities. The *rock* fills should be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains should be permanently connected to controlled drainage facilities to control post-construction infiltration of water. Modifications to these recommendations are at the discretion of the Consultant.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing the previous lifts and dumping at the front edge of the current lift. Spreading of the *rock* fill shall be by a dozer with sufficient water support to facilitate *seating* of the rock. Water support shall generally consist of water trucks traversing in front of the embankment and continuously spraying during rock placement. Spreading of the rock fill shall not occur without adequate water support.

6.3.3 Compaction shall be achieved using equipment that provides compactive energy equivalent to, or greater than, a 20-ton steel vibratory roller, a loaded rock truck, or other equipment approved by the Consultant capable of providing sufficient energy to meet the required compaction. Each *rock* fill lift shall be uniformly compacted, ensuring that the entire lift—including edges and ends—receives a

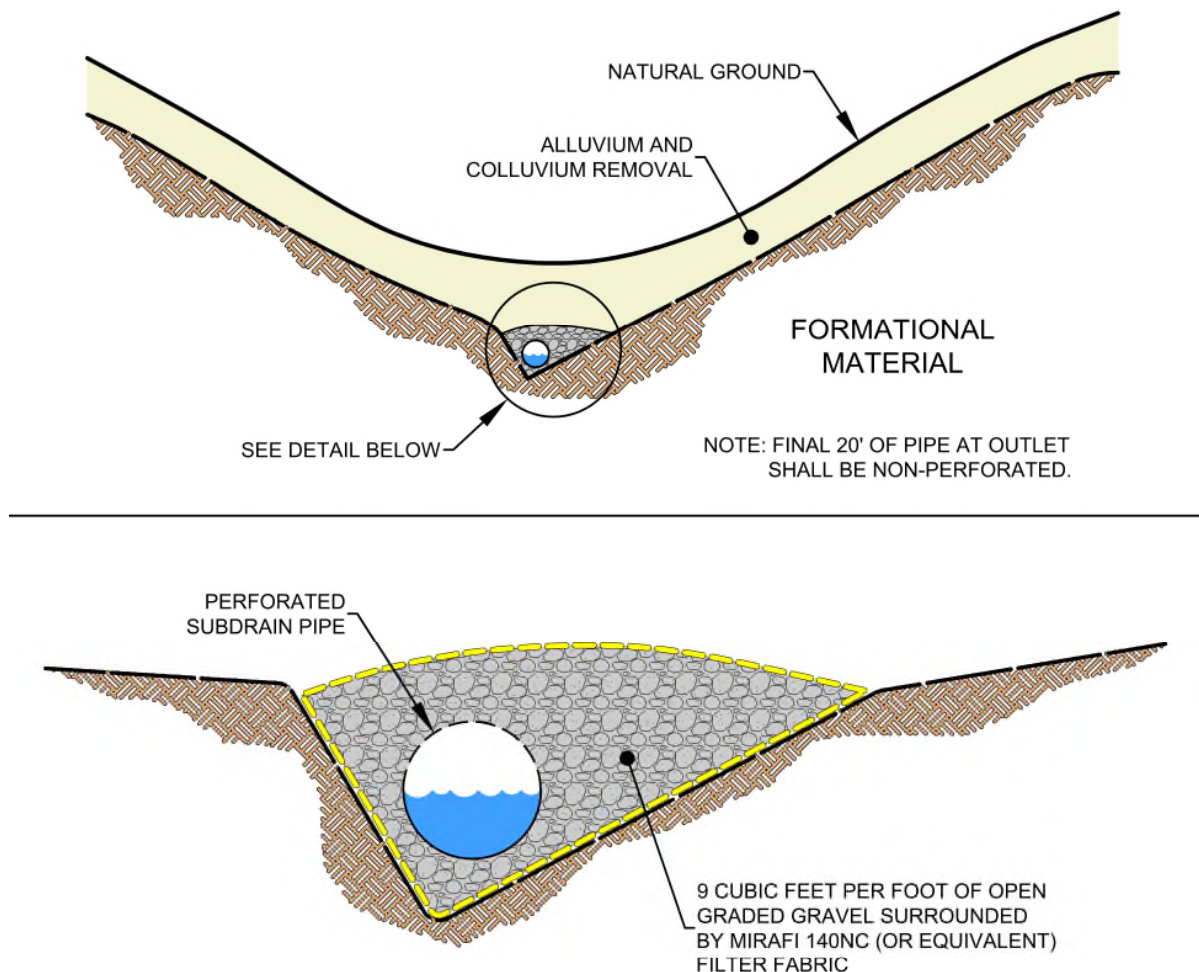
minimum of two passes with the compaction equipment before the next lift is placed. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts shall be permitted.

- 6.3.4 A representative of the Consultant should be present continuously during *rock* fill operations to observe and confirm that the necessary methods for compactive effort have been provided, that water is being properly applied and that the specified procedures are being followed. The appropriate number of rock truck passes during compaction will be determined by the Consultant during grading.
- 6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can observe the condition of the fill and state that, in their opinion, the rock has been properly placed. In-place density testing will not be required in the *rock* fills.
- 6.3.6 To reduce the potential for “piping” of fines into the *rock* fill from the overlying *soil* fill, a minimum 2-foot-thick layer of graded rock material shall be placed above the uppermost lift of *rock* fill. The gradation of this material and overall lift thickness will be determined by the Consultant.

7. SUBDRAINS

- 7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. The lower portion of canyon subdrains exceeding 500 feet in length, or extensions of existing offsite subdrains, shall use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch diameter pipes.

TYPICAL CANYON DRAIN DETAIL



NOTES:

- 1.....8-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.
- 2.....6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NOT TO SCALE

- ### TYPICAL CUT OFF WALL DETAIL

Diagram illustrating a detail of a concrete cut-off wall. The wall is shown in cross-section, with a subdrain pipe (indicated by a dashed line) embedded within the concrete. The wall is labeled "CONCRETE CUT-OFF-WALL". The subdrain pipe is labeled "SUBDRAIN PIPE". The diagram shows the wall extending 24" horizontally and 6" MIN. vertically. The subdrain pipe is shown with a 6" MIN. diameter and is positioned 6" MIN. from the top and bottom edges of the wall. The wall is shown with a cross-hatched pattern, and the subdrain pipe is shown with a dashed line.

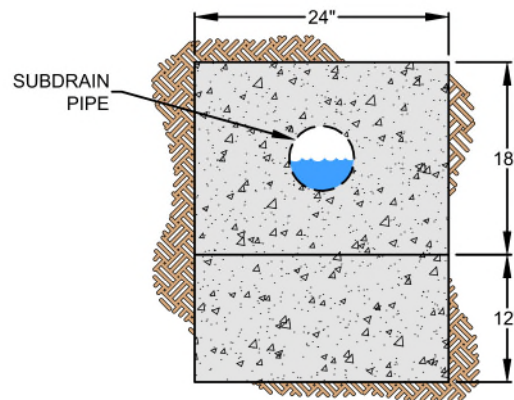
A cross-sectional diagram of a concrete cut-off wall and subdrain pipe assembly. The wall is shown as a vertical rectangular section with a stippled texture. A horizontal line represents the ground surface. Below the ground surface, a solid subdrain pipe is shown on the left, transitioning into a perforated subdrain pipe on the right. The concrete wall is 12 inches wide, with a minimum dimension indicated. The wall is 6 inches high, with a typical dimension indicated. The subdrain pipe is labeled 'SOLID SUBDRAIN PIPE' and 'PERFORATED SUBDRAIN PIPE'. The concrete wall is labeled 'CONCRETE CUT-OFF-WALL'.

GI rev. 09/2025

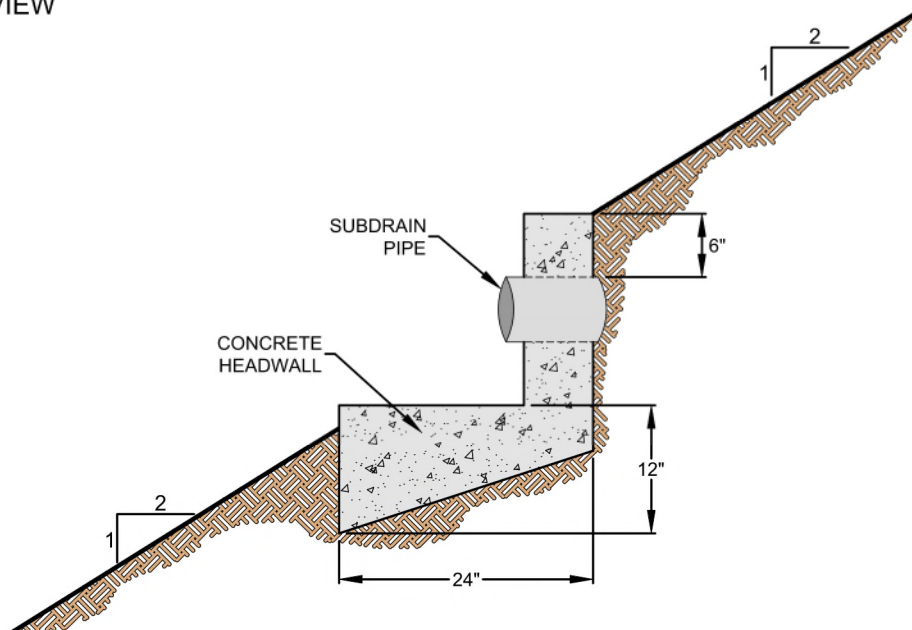
- 7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure per the detail below.

TYPICAL HEADWALL DETAIL

FRONT VIEW



SIDE VIEW



NOT TO SCALE

NOTE: HEADWALL SHOULD OUTLET AT TOE OF FILL SLOPE
OR INTO CONTROLLED SURFACE DRAINAGE.

- 7.7 The final grading plans should show the location of the proposed subdrains. Upon completion of remedial excavations and subdrain installation, the Project Civil Engineer should survey the drain locations and prepare an "as-built" map showing the drain locations and connection points. The final outlet and connection locations should be

determined during grading operations. A vertical riser should be installed at the end of any subdrain that is planned for future extension into adjacent areas. The grading contractor should consider video inspection of the subdrains shortly after burial to verify proper installation and functionality. The contractor is responsible for the proper construction and performance of all drains.

8. OBSERVATION AND TESTING

- 8.1 The Consultant shall be the Owner's representative to observe and perform in-place density tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In general, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.
- 8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.
- 8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes over the fill have been performed. The Contractor shall excavate observation pits, as requested by the Consultant, within the *rock* fill to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.
- 8.4 A settlement monitoring program designed by the Consultant may be required in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Geotechnical Report or in the final report of testing and observation services performed during grading.
- 8.5 The Consultant should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

- 8.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered. The Consultant shall be notified immediately to evaluate the significance of any unanticipated conditions.

9. PROTECTION OF WORK

- 9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly remediated prior to placing additional fill or structures.
- 9.2 It is the responsibility of the Contractor and their designated competent person to ensure that all excavations, temporary slopes and trenches are properly constructed and maintained in accordance with applicable OSHA regulations to maintain safety and the stability of adjacent existing improvements. Temporary backcuts for buttresses, shear keys, stability fills or any other remedial excavations shall be promptly backfilled with properly compacted fill to prevent raveling, sloughing or slope failure.
- 9.3 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

- 10.1 Upon completion of the work, a certification by the Project Civil Engineer shall be prepared stating that the graded surfaces have been constructed to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of each subdrain section, the Project Civil Engineer should survey its location and prepare an “as-built” plan showing the subdrain location. The Project Civil Engineer should also verify the proper outlet, and the Contractor should ensure that the drain system is free of obstructions.
- 10.2 The Owner is responsible for furnishing a final as-graded soil and/or geologic report satisfactory to the appropriate governing or accepting agencies. The report should be prepared and signed by a California licensed Civil Engineer experienced in geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Geotechnical Report, which includes these Recommended Grading Specifications.

LIST OF REFERENCES

- American National (2024), *Topographic Detail Sheet, 1305 East Mission Road, Fallbrook, California*, dated May 8, 2024;
- CGS (2021a), *EQ Zapp: California Earthquake Hazards Zone Application*, online map that queries California Geological Survey mapped earthquake hazard zones, <https://www.conservation.ca.gov/cgs/geohazards/eq-zapp>, accessed May 31, 2024;
- CGS (2021b), *Tsunami Inundation Maps and Data*, web application for accessing tsunami inundation hazard, <https://www.conservation.ca.gov/cgs/tsunami/maps>, accessed May 31, 2024;
- FEMA (2019), *Flood Map Service Center*, FEMA website, <https://msc.fema.gov/portal/home>, flood map number 06073C0165G, effective May 16, 2012, accessed May 31, 2024;
- Jordan Architects (2025), *Site Plan, Scheme B, Mission Road Self Storage, Fallbrook, California*, dated August 5, 2025, Job No. 24-719.
- Kennedy, M. P., and Tan, S. S., (2007), *Geologic Map of the Oceanside 30' x 60' Quadrangle, California*, USGS Regional Geologic Map Series, 1:100,000 Scale, Map No. 3;
- SEAOCC (2020), *Seismic Design Maps*, website interface that queries the U.S. Geological Survey (USGS) web servers and retrieves the seismic design variables using ASCE 7-16, ASCE 7-10, ASCE 41-13, ASCE 41-17, IBC 2015, IBC 2012, NEHRP-2015, and NEHRP 2009 seismic design map data, <http://seismicmaps.org>, accessed May 31, 2024;
- USGS (2019), *Quaternary Fault and Fold Database of the United States*: U.S. Geological Survey website, <https://www.usgs.gov/natural-hazards/earthquake-hazards/faults>, accessed May 31, 2024.