Appendix F

Preliminary Geotechnical Investigation Report

December 9, 2020 Project No: 19048-01

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Subject: ***Summary of Geotechnical Conditions Relative to the Proposed Development of Elephant Hill, Pomona, California***

In accordance with your request, LGC Geotechnical, Inc. has prepared this summary of the anticipated geotechnical conditions for the proposed "Elephant Hill" residential development in Pomona, California. The project consists of an approximately 42-acre area site located at the west and south portion of the large rocky hill located east of the 57 Freeway, north of Mission Boulevard. Refer to Site Location Map, attached.

The subsurface evaluation of the valley portions of the site was performed September through November of 2020, at the approximate locations on the attached Geotechnical Map (Sheet 1). This summary is intended to present the overall conclusions for site development to the preliminary plan by Hunsaker (2020) relative to the recent field evaluation, previous investigations performed at the site by others, and review of available documents.

Project Description and Development Overview

The proposed preliminary grading plan by Hunsaker (2020) indicates approximately 24 acres of the 42-acre site will consist of relatively level grades for the construction of buildings and associated improvements. The proposed building area will be flanked by an approximately 130-feet-high fill slope to the west over the 57 Freeway and an approximately 230-feet-high bedrock cut slope to the east. Overall, the height of the fill slope will extend about 80 feet above the level of the freeway. The proposed slope will be constructed using two, 25-feet tall Mechanically Stabilized Earth (MSE) Walls, each positioned midslope. The MSE Retaining Walls will be constructed during the earthwork operations with long, horizontally placed geotextile layers extending behind the plant-able facing blocks that will overlook the freeway.

The large, proposed slope at the eastern portion of the site consists of a 1.5:1 (horizontal to vertical) cut slope that will expose a highly variable hard volcanic rock. Excavation of the rocky portion of the site, the hill itself, will require excavation of up to 130 vertical feet into the rocky hillside. The proposed cut and fill grading will proceed beginning with removal of unsuitable/soft soils in the low-lying, valley portion of the site near the freeway. Earthmovers will remove the upper unsuitable soils until competent removal bottoms are reached. As the valley portion of the site is prepared to accept fill

placement, the upper rippable portion of the design cut will be excavated into increasingly hard rock materials with depth of cut. While portions of the design cut can be excavated with conventional heavy-duty equipment, the majority of the design cut is anticipated to require heavy duty equipment specialized for ripping and blasting. Blasting must be performed under highly controlled conditions by qualified professionals.

The following geotechnical discussion is intended to provide an idea of the constraints to rough grading and site development.

LGC Geotechnical Subsurface Evaluation

A subsurface evaluation of the valley portions of the Elephant Hill site consisted of the excavation of eight small-diameter hollow-stem borings, eight backhoe test pits, and eight Cone Penetrometer Tests (CPT), at the approximate locations shown on the Geotechnical Map, Sheet 1, attached. The small diameter borings were advanced to bedrock where possible, and material sampled at regular intervals. The backhoe test pits were excavated under the observation and geologic interpretation of an engineering geologist and representative samples of site material types were collected. CPT testing consists of an instrument that pushes a rod into the ground while a computer collects resistance data to identify soil characteristics. CPT locations were positioned near the borings in order to compare similar soils using two methods; the samples collected in the boring are tested in the laboratory and the results correlated to the data from the CPT recordings.

LGC Geotechnical's subsurface investigation for the large volume of design cut required a previously existing access road across the top of Elephant Hill to be partially cleared. A small bulldozer was utilized to clear the road from the east side of Elephant Hill near Humane Way, under monitoring by a biologist. Once access was established, the subsurface investigation at the upper portions of the proposed design cut began with excavation of 16 air track hydraulic diagnostic testing boreholes using a large, track mounted drill rig. The air track drilling was performed by Arizona Drilling and Blasting; the driller took notes on the diagnostic drilling while LGC Geotechnical correlated the time required for each foot of excavation. The next part of the hilltop investigation consisted of setting seismic lines in locations accessible by a rubber-tired rig fitted with a percussive instrument. The percussive instrument was required in order to overcome the high level of background noise at the site including the 57 Freeway and active train lines to the north. The LGC Geotechnical geologist performed surface mapping of site geologic outcrops in order to correlate the site materials with the air track diagnostic drilling and seismic line results. Seismic reports by others (Alta, 2013) and surface mapping by others were considered and incorporated into our study that focused on characterizing the material in comparison to the rippability and potential for rockfall after site rough grading.

Logs for borings, backhoe test pits, CPT data, and air track data are provided in Appendix B. Seismic reports for each of the two phases of seismic line exploration are provided in Appendix C. The locations of subsurface investigation are presented on the Geotechnical Map, Sheet 1.

GEOTECHNICAL FINDINGS

Regional Geology

The large, steep rocky hillside that is Elephant Hill is known to be the remnant of a volcanic neck; the feeder vent of a volcano that was subsequently eroded away to expose the volcanic rock hillside terrain seen today. Portions of the hill have been excavated over the years to expose the various material types that make up the hillside and surrounding terrain. In the Tertiary Period, the volcanic neck was crowded with various flows and pyroclastic eruptions of silica-rich molten rock from a much deeper magma chamber. Materials derived from molten rock flow include andesite, rhyolite and inclusions of brecciated siliceous rock. Materials from pyroclastic eruptions consisting of tuff and welded tuff materials were included in the chaotic volcanic neck zone; some tuffaceous materials were observed on a portion of the face of the existing cut slope behind the condominiums at Sorrento Drive.

Eventually the materials cooled in-place and were subsequently exposed by erosion. Defects in the rock include irregular zones of softer material such as tuff, and the presence of foliation or flow banding in the emplaced rock. The depth of weathering that may produce defects such as jointing within the various volcanic rocks generally varies based on material type. The hardest material weathered the least and appears the most cliff-like, while the "less hard" materials weathered the most, forming rounded ridges or topographic swales between zones of cliffy material. Relatively thin zones of "soft rock" (i.e., rock that is less hard than surrounding rock) can be expected at depth in irregular zones between much harder material types.

Alluvium eroded over millennia from the rocky hillside has produced a gently inclined layer of alluvium that thickens under the fill placed for the 57 Freeway to the west. A smaller alluvial deposit extends from the low area north of Mission Boulevard and thickens to the east.

Geologic Conditions

Geologic units encountered at the site includes undocumented older artificial fill from various sources, alluvium, and three general categories of volcanic rock that have an irregular spatial relationship. Material types are discussed below, and approximate limits depicted on the Geotechnical Map, Sheet 1.

Undocumented Artificial Fill

Artificial fill has been placed over many decades around the edges in the canyon areas of the subject site, and it is our understanding that there is no available documentation of fill placement, so they are called 'undocumented' fill. Several of the recent hollow stem borings and CPT soundings encountered the various materials typically including clayey sand with gravels and scattered cobbles up to 12-inch diameter, dry to moist, moderately dense to dense. The most prominent existing artificial fill is the north-south trending hill constructed for the 57 Freeway at the west side of the site. Excess fill for the freeway construction was placed across the bottom of the valley portion of the site and it overlies the existing native alluvium in the valley. Fill was also placed during construction of the former Brea Canyon Road as relatively small zones of fill placed to maintain road gradient for Brea Canyon and later

Mission Boulevard. The condominiums currently located adjacent to Sorrento Drive were constructed on portions of the former Brea Canyon undocumented road fill.

The undocumented artificial fill is recommended to be removed to competent native soils or heavily benched for areas where new compacted fill abuts older fill slopes that are 2:1 (Horizontal to Vertical) or steeper.

Quaternary Alluvium

Quaternary Alluvium encountered on the Elephant Hill site was generally within the low-lying western valley area, underlying the undocumented artificial fill placed during 57 Freeway construction. The material was observed to have a thick, dark brown clayey silt to clayey sand upper zone that graded to rockier light brown clayey sand with gravel and cobbles with depth, moderately dense, moist to very moist, however no free water was encountered. Alluvium thickens to the west under the 57 Freeway and beyond to the west. The majority of the upper portion of the alluvium is recommended to be removed to the approximate depths shown on the Geotechnical Map.

Tertiary Glendora Volcanics

Tertiary Glendora Volcanics can be generally categorized into three geologic units that have also been preliminarily correlated to ease of rippability in the area if the design cut slope. Note that some areas were only accessible for surface mapping due to constraints of biology/habitat and steep terrain. The three units consist of the following:

Tertiary Glendora Volcanics Rhyolite (Tgr)

The rhyolite unit of the volcanic rock formation consists of light brown to orangish or reddish gray, hard rock, with weathering fractures and foliation, or flow banding, observed to parallel fractures and partings in the weathered portion of rock. The rhyolite is a silica-rich crystalline rock that has weathered over time to the lower, more rounded ridgeline of the western portion of the design cut in comparison to the prominent, cliffy portion of the top of hillside and knife ridge at the eastern portion of the cut. Rippability in this unit may be estimated based on seismic lines performed by Subsurface Surveys, provided in Appendix C and notated with the proposed grades for the 2020 design. Seismic lines in this material indicate the "weathered-to-unweathered" horizon in bedrock as approximately presented on Cross Section A-A'-A'' (Sheet 2).

Tertiary Glendora Volcanic Breccia (Tgb)

The breccia unit of the volcanic rock formation consists of light brown matrix of crystalline rock with brecciated hard rock inclusions. The hard-volcanic rock has been observed to cap the prominent cliffy hilltop and the top of the majority of the sharp ridge at the eastern portion of the design cut slope (Cross Section C-C', Sheet

2). The material has foliation, and the upper portion is weathered; however, this unit is the hardest encountered based on-air track and seismic line data. The recent Geovision Seismic Lines (GSL-1 through GSL-5) were generally performed in this material and show a variable but relatively shallow horizon between potentially rippable materials and marginally rippable/blast materials as defined in the section below titled "Rippability of Rock Units during Rough Grading."

Tertiary Glendora Volcanic Tuff (Tgt)

The tuff unit of the volcanic rock formation consists of a dull off-white to light reddish gray tuff (weathers to sandy clay) with various colored gravel inclusions, dry, friable to "welded tuff", varies considerably. This is the "softest" of the rock units at the site (estimated to be generally rippable), and the least extant within the design cut area. The limits and locations of the tuff unit are irregular or obscured, and may have been encountered below the harder rock units as indicated by air track logs such as AT-10, Appendix B. The material noted as "soft with clay" on AT-4 was likely this unit.

Groundwater

A review of the California Department of Conservation, Division of Mines and Geology (CDMG) report for the 7.5-Minute San Dimas Quadrangles indicates that the historically highest groundwater level for the site could be as shallow as approximately 20 feet below ground surface in the low-lying alluvial portions of the site; however, groundwater was not encountered during our field evaluation. Note that seasonal fluctuations can occur, and perched groundwater could be encountered during grading.

Liquefaction

The subject site is located in an area considered to be potentially susceptible to earthquake-induced liquefaction (CDMG, 1999) requiring an evaluation of the potential of liquefaction induced settlement. Samples collected from our field evaluation indicate that the majority of alluvial soils are dense to very dense and the potential for liquefaction induced settlement is considered very low provided remedial rough grading is performed as recommended.

Landslides and Rockfall

The subject site is located in an area considered to be potentially susceptible to landslides (CDMG, 1999) requiring an evaluation of the potential of landslides that may require mitigation. Based on our field evaluation, the site does not have any existing landslides and the bedrock material encountered in the steeper slopes is not known to be prone to landslides. However, potential for rockfall is high and any improvements at the base of the proposed large cut slope is recommended to have a toe-of-slope debris wall (rock catching fence). Refer to section below titled "Debris Fences" for further discussion.

Faulting

The site is not located within a mapped State of California Earthquake Fault Rupture Zone (Alquist-Priolo Special Studies Zone) and no known active or potentially active faults cross the site. Therefore, the potential for surface ground rupture at the site is considered very low.

PRELIMINARY RECOMMENDATIONS & CONCLUSIONS

Rough Grading with Rock Fill

In general, the site is a large design cut in the hillside area and large fill in the valley area. The material that will be generated in the design cut is anticipated to be suitable for placement as fill, however much of the material generated from the cut will be oversized and will need to be reduced in size or placed as "rock blankets".

The following considerations apply to rock fills:

- Rock will be ripped and/or blasted into relatively angular rock fragments that cannot be self-loaded by scrapers, so excavators and rock trucks will likely be preferred by contractors for the majority of the rock cut.
- Rock will be generated in a large range of sizes and will have significant volume of oversize (defined as rock greater than 8 inches in maximum dimension).
- Rock fills require a large amount of water during fill placement.

The following limitations apply to the placement of fill using oversize rock:

- The upper 10 feet of finished grades should consist of fill with maximum particle dimension of up to 8 inches.
- "Rock blankets" consisting of fill with maximum particle dimension of up to 3 feet should be placed a minimum of 10 feet below finished grade, a minimum of 1-foot below the deepest utility and a minimum of 15 feet away from any slope face.
- Rocks greater than 3 feet in maximum dimension should be reduced in size or removed from the site.

Note: One method for reduction of rock size is setting up an on-site crushing operation. Benefits of a rock-crushing operation would include generation of consistent MSE Wall select backfill material in lieu of significant additional handling by the grader to sort and sieve the required material size (the majority of the MSE select backfill is anticipated to require 2-inch minus). Another benefit of a rock-crushing operation on-site would be to provide a steady source of rock fragments smaller than 8 inches diameter (such as 3-inch minus) for fill placement within the proposed foundation and/or utility trenching areas, in order to avoid concrete overpour and facilitate ease of construction.

Rippability of Rock Units During Rough Grading

Rippability of the three volcanic rock units described in the section "Geologic Conditions" has been explored using diagnostic air track boreholes and two series of seismic lines. In general, the material may be considered "Trap Rock" on the referenced Ripper Performance Chart for a multi or single shank Caterpillar D9 Ripper (Subsurface Surveys, 2013; Appendix C), which considers the material rippable to 7,000 feet per second. The Geovision geophysicist who performed the recent seismic lines

(GSL-1 through GSL-5; report included in Appendix C), also considered the upper zone of rock that shows approximately 7,000 feet per second velocity or less on seismic lines, to be "rippable rock" using a Caterpillar D9R or larger (Geovision, 2020). Please note that seismic lines can only show an interface between rock hardness when the softer material overlies the harder material, and they therefore miss "softer" material that may be at depth. Refer to respective seismic reports for details.

The air track data included in Appendix B describes three zones of rock encountered during drilling; soft, medium hard, and hard. The three degrees of hardness are color-coded green, yellow and red respectively on-air track logs and representative cross sections. Based on personal communication with the air track driller representatives, the material described as "soft" may also be considered "rippable rock" using a Caterpillar D9R or larger, in their opinions.

Please note that opinions vary with regards to estimated rippability of rock and contractors may interpret the results of the exploratory data presented herein differently than the referenced sources. Additionally, production rate should be considered when estimating blasting quantities.



Photograph of typical rock cut slope excavation showing generation of oversize rock.

Enhanced Compaction of Deep Fills

Deep fills up to 120 feet (not including remedial grading) will be necessary to reach the proposed design grades. With the necessary remedial grading, total fill thicknesses will be as much as approximately 155 feet. Where fill depths exceed 50 feet, fill material should be placed at a higher level of relative compaction (e.g., 93%) to reduce the amount and duration of fill settlement. The contractor may have a higher yardage price for the enhanced compaction zone.

Shrink/Bulk Estimates

Bedrock materials excavated to be placed as new fill material will bulk in volume whereas the native and existing fill soils are expected to shrink as described below. Please note these are estimates and highly dependent on the methods of the contractor.

- Bedrock
  - Estimate 10-20% bulking
- Alluvium
  - Estimate 10-15% shrinkage
- Undocumented Artificial Fill (approximately the upper 20 feet of the valley area, to be removed during grading and recompacted)
  - Estimate 5-10% shrinkage

Slope Stability Analysis

Global slope stability analyses were performed on cross-sections (A-A' and E-E') on the proposed design profile. Slope stability analysis was performed using the computer program GSTABL7 with STEDwin version 2.005.3 (Gregory Geotechnical Software, 2013). Potential rotational failure mode was analyzed using Bishop's Modified Method utilizing shear strength values presented in the referenced Alta report (Alta, 2013) and the San Dimas Quadrangle Seismic Hazard Report (CDMG, 1998). A minimum factor of safety of 1.5 is typically required for static loading conditions. Seismic slope stability analysis was performed utilizing a horizontal seismic coefficient (Kh) of 0.15 with a minimum resulting factor of safety of 1.1.

Geogrid reinforcement (beyond requirements for local stability) is required for the planned mid-slope MSE retaining walls located within the proposed slope descending to the 57 Freeway. Please see the discussion in the next section.

Based on the proposed grading plan, slope stability analysis indicates a global factor of safety greater than 1.5 and 1.1 for static and pseudo-static (seismic) loading conditions, respectively. Slope stability analysis is provided in Appendix D. Please note, the analysis conducted and presented within is to address the global stability of the site. Additional slope stability analysis will need to be performed once the rough grading plans have been prepared and more details are available regarding finalized

slope and MSE wall configurations, etc. This additional analysis may include additional cross-sections and static and pseudo-static slope stability analysis.

Global Geogrid for MSE Walls

Mid slope MSE wall(s) will add more buildable space to the project by effectively steepening the slope, and they typically require "global" geogrid in addition to "local" geogrid to achieve adequate slope stability. Typical MSE geogrid lengths for level toe and level top conditions vary from 75% to 100% of the wall height and require select backfill materials to satisfy "local" stability. Sloped conditions of significant height, such as those proposed at this site, often require geogrid lengths 200% to 500% of the wall height to satisfy "global" stability. Geogrid reinforced soil zones will require significant select grading and handling of crushed on-site rock from the hillside excavation or imported sandy backfill with very low expansion. Longer geogrid lengths needed for "global" slope stability do not require select backfill in that extended zone.

For preliminary cost estimating purposes, LGC Geotechnical performed preliminary global stability analyses to determine geogrid lengths, strengths and spacing to reach a static slope stability factor of safety of 1.5 for the two proposed MSE Walls within the proposed slope descending to the 57 Freeway. Please note that due to the expected sharpness of crushed native rock to be used in the geogrid zone we utilized the most conservative strength reduction factors to arrive at the grid Long Term Design Strength (LTDS) of 13,244 lbf for Miragrid 24XT.

Based on our preliminary analyses we recommend the following:

Upper Wall
Geogrid Type: Miragrid 24XT
LTDS: 13,244 lbf
Number of Layers: 14
Vertical Spacing: 2 feet
Horizontal Length: 45 feet

Lower Wall*
Geogrid Type: Miragrid 24XT
LTDS: 13,244 lbf
Number of Layers: 14
Vertical Spacing: 2 feet
Horizontal Length: 110 feet

*Where Lower Wall becomes upper wall at south end of fill slope; Horizontal Length may be estimated at 70 feet long for preliminary cost estimating purposes.

Settlement of Deep Fill Areas after Rough Grading

Settlement monitoring is recommended for fills deeper than 40 feet. We estimate 10 to 15 settlement monuments (surface points) will be necessary for the size of the development. The attached Figure 2 is an updated exhibit showing deep fill depths. The attached Figure 3 is an exhibit showing units that will be categorized by the expected guidelines listed below. Please note that gravity dependent utilities such as sewer and storm drain should be installed after completion of settlement monitoring or be designed with a gradient steeper than standard should expected fill settlement continue to occur.

Settlement monitoring will be critical to the project with the following guidelines:

- 40 to 80 feet – Usually 3-6 months of monitoring then released
- 80 to 100 feet – Usually 12 months of monitoring but can be more
- 100 to 155 feet – Up to approximately 2 years of settlement monitoring

Debris Fences & Surficial Slope Stability

Due to the proposed 230-high rock cut slope proposed for the site, a debris fence is recommended around the base of the slope in order to protect the development from potential rock fall. Typical debris fences have strong posts and steel netting that can locally expand to catch falling rock. The approximate recommended location of proposed debris fences are depicted on the Geotechnical Map, Sheet 1. The majority of the debris fencing is proposed around the base of the large design rock cut slope, and a shorter section of fencing is proposed at the base of the existing native slope above the proposed development near Mission Blvd.

We recommend a "catchment ditch" be provided at the base of the rock slope between the slope and debris fence. A catchment ditch is a narrow setback with a low point that would collect rock fall, reduce bounce height of rocks, and allow rock removal maintenance behind the proposed debris fence.

Debris fences require engineered design based on the final rock face exposed at completion of grading. The final rock slope face will have some amount of loose rock that is left on the slope; the size and shape of any rocks that may fall must be evaluated in order to size the debris fence. Size and shape of loose rock, and smoothness of rock face, will influence the height and rock-catching capacity of the debris fence. Height of fence is based on potential for rocks to bounce over the top. Therefore, the wider the area behind the debris fence (catchment ditch), the smaller the debris fence.



Photo of a typical debris fence for reference.

Foundation Design

Upon completion of grading, we anticipate near-surface soils will have expansion potential that requires the design of post-tensioned foundations or equivalent stiff conventionally reinforced foundations. Geotechnical recommendations regarding foundation parameters will need to be provided based on the expansion potential of the site soils at the completion of grading. It should be noted that the site has materials including topsoil and alluvium that are potentially highly expansive, and materials including rock fill and blasted or crushed rock that are not anticipated to be expansive. Therefore, the materials utilized in the upper few feet of rough grading the final development pad will be critical for foundation design.

Closure

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report

Should you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

LGC Geotechnical, Inc.





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Project Geologist

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Project Engineer

KTM/BJE/amm

Attachments: Figure 1 – Site Location Map (Rear of Text)
Figure 2 – Deep Fill Depths (Rear of Text)
Figure 3 – Units & Utilities Influenced by Deep Fills (Rear of Text)
Appendix A - References
Appendix B – Boring, CPT & Trench Logs
Appendix C- Seismic Reports
Appendix D – Preliminary Slope Stability
Sheet 1 – Geotechnical Map
Sheet 2 – Cross Sections

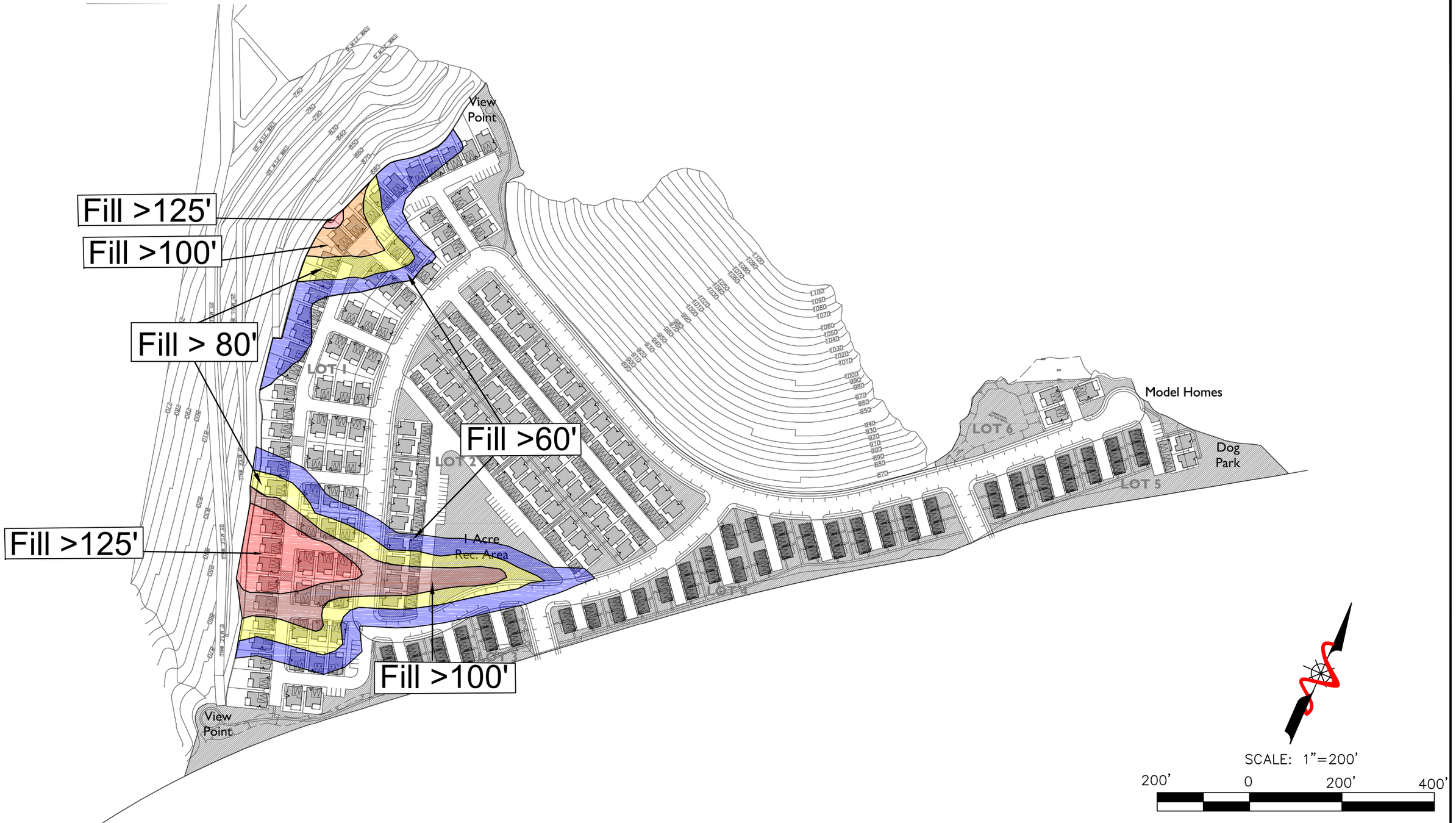
Distribution: (1) Addressee (electronic copy)



LGC Geotechnical, Inc.

FIGURE 1
Site Location Map

PROJECT NAME	Trumark- Elephant Hill, Pomona
PROJECT NO.	19048-01
ENG. / GEOL.	BJE / KTM
SCALE	Not to Scale
DATE	December 2020

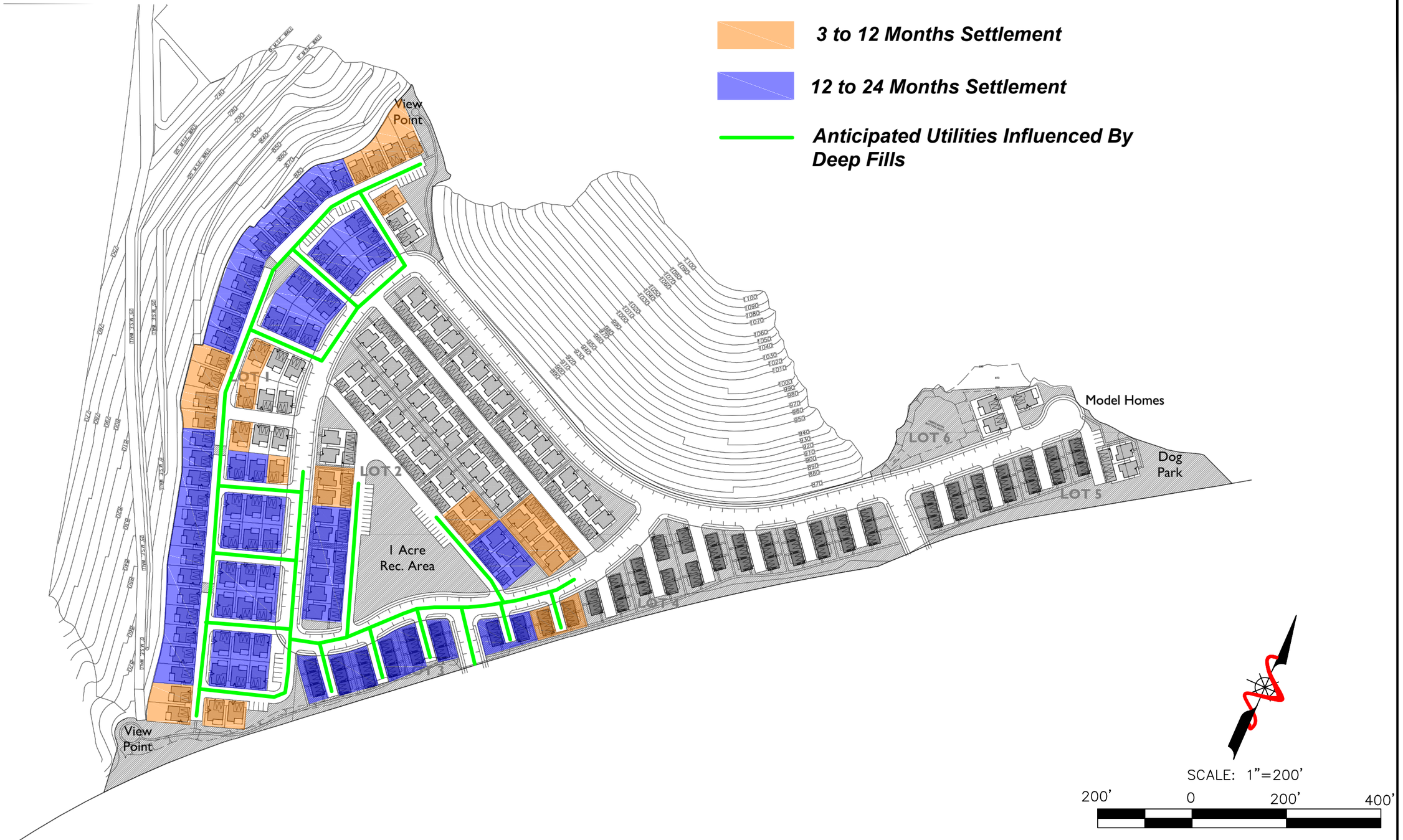


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FIGURE 2
Deep Fill Depths

PROJECT NAME	*Trumark - Elephant Hill*
PROJECT NO.	*19048-01*
ENG. / GEOL.	*BJE / KTM*
SCALE	*1" = 200'*
DATE	*December 2020*



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FIGURE 3
Units and Utilities Influenced by Deep Fills

PROJECT NAME	Trumark - Elephant Hill
PROJECT NO.	19048-01
ENG. / GEOL.	BJE / KTM
SCALE	1" = 200'
DATE	December 2020

Appendix A
References

Appendix A

References

Alta California Geotechnical Inc., 2013, Geotechnical Feasibility Study, Amen Property, Southwest Portion of Elephant Hill, City of Pomona, California, Project Number 1-0106, dated April 30, 2013

California Department of Conservation, Division of Mines and Geology (CDMG), 1998, Seismic Hazard Evaluation of the San Dimas 7.5-Minute, Quadrangle, Los Angeles County, California, dated 1998

_____, 1999, State of California Seismic Hazard Zones, San Dimas Quadrangle, Official Map, dated March 25, 1999

Ducco Engineering, Inc., 1992, In Grading Report #1, Through September 11, 1992, Panorama Plaza, Pomona, California, Job No. 2-68, dated September 14, 1992

Hunsaker, 2020, Preliminary Rough Grading Plan for Elephant Hill, received November 24, 2020

Leighton and Associates, 1984, Preliminary Rippability Investigation and Assessment of Potential Aggregate Source, Elephant Hill Area, City of Pomona, California, Project No. 2830163-01, dated August 3, 1984

_____, 2003, General Geotechnical Conditions at Elephant Hill, North of Mission Boulevard, East of State Route 57, City of Pomona, California, Project No. P02000-594, dated March 4, 2003

Appendix B
Boring, CPT & Trench Logs

LGC Geotechnical, Inc.		**Project Name:** Elephant Hill		**Date:** 10/28/20
		Boring Number: AT-1		
		Project Number: 18009-01		
		Elevation at top of Boring: 1056		
RIPPABLE		**Boring Location:** See Boring Location Map		
MARGINAL blasting		**Driller:** Arizona Drilling and Blasting		
BLASTING may be required		**Drill Type:** Power Rock Drill		**Boring Diameter:** 3.5"
Depth		Time (sec)	*Percussion	Driller's Notations
1		14	on	
2		46	on/off	
3		15	on	
4		8	on	
5		9	on	
6		13	on	
7		8	on	Medium Hard Rock, grayish brown cuttings; Percussion
8		10	on	
9		10	on	
10		11	on	
11		8	on	
12		7	on	
13		9	on	
14		9	on	
15		8	on	
16		10	on	Soft Rock; brown cuttings; Percussion
17		5	on	
18		21	on/off	
19		14	on	
20		8	on	
21		11	on	
22		9	on	
23		10	on	
24		8	on	Medium Hard Rock, blue gray and brown cuttings;
25		13	on	Percussion
26		6	on	
27		7	on	
28		10	on	
29		14	on	
30		9	on	
31		9	on	
32		12	on	
33		9	on	
34		11	on	
35		11	on	
36		10	on	
37		8	on	Hard Rock, blue gray cuttings; Percussion
38		12	on	
39		9	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		10	on	Hard Rock, blue gray cuttings; Percussion
41		13	on	
42		13	on	Medium Hard Rock, grayish brown cuttings; Percussion
43		11	on	
44		10	on	
45		10	on	Soft Rock; brown cuttings; Percussion
46		6	on	
47		7	on	
48		12	on	Hard Rock, blue gray cuttings; Percussion
49		7	on	
50		7	on	
51		11	on	
52		6	on	
53		11	on	Medium Hard Rock, grayish brown cuttings; Percussion
54		9	on	
55		10	on	
56		8	on	
57		9	on	
58		12	on	
59		9	on	
60		7	on	Hard Rock, blue gray cuttings; Percussion
61		8	on	
62		8	on	
63		9	on	
64		9	on	
65		9	on	
66		10	on	
67		11	on	
68		10	on	
69		9	on	
70		11	on	
71		9	on	
72		10	on	Medium Hard Rock, grayish brown cuttings; Percussion
73		9	on	
74		9	on	
75		11	on	
76		9	on	
77		8	on	
78		12	on	
79		8	on	
80		9	on	
81		12	on	
82		11	on	
83		11	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20
			Boring Number: AT-2	
			Project Number: 18009-01	
			Elevation at top of Boring: 1065	
RIPPABLE			**Boring Location:** See Boring Location Map	
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting	
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		12	on/off	
2		9	on	
3		6	on	Soft Rock; brown cuttings; Percussion
4		6	on	
5		8	on	
6		8	on	
7		10	on	
8		11	on	
9		10	on	
10		13	on/off	Medium Hard Rock, grayish brown cuttings; Percussion
11		9	on	
12		9	on	
13		7	on	
14		8	on	
15		7	on	
16		10	on	Hard Rock, blue gray cuttings; Percussion
17		8	on	
18		10	on/off	
19		11	on	
20		6	on	
21		8	on	
22		12	on/off	
23		34	on/off	
24		7	on	Soft Rock; blue gray and brown cuttings; Percussion
25		10	on	
26		17	on	
27		7	on	
28		5	on	
29		7	on	
30		9	on	
31		8	on	
32		8	on/off	
33		8	on/off	
34		9	on	
35		18	on	
36		4	on	
37		10	on	
38		5	on	
39		9	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		8	on	
41		8	on	
42		10	on	
43		8	on	
44		10	on	
45		10	on	
46		9	on	
47		8	on	
48		6	on	
49		5	on	
50		9	on	
51		6	on	
52		9	on	
53		8	on	
54		10	on	
55		13	on	
56		11	on	
57		10	on	
58		7	on	
59		9	on	
60		11	on	
61		8	on	
62		8	on	
63		8	on	
64		13	on	Soft Rock; blue gray and brown cuttings; Percussion
65		9	on	
66		17	on	
67		8	on	
68		10	on	
69		17	on	
70		10	on	
71		8	on	
72		10	on	
73		7	on	
74		7	on	
75		9	on	
76		11	on	
77		8	on	
78		12	on	
79		11	on	
80		10	on	
81		10	on	
82		10	on	
83		11	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20
			Boring Number: AT-3	
			Project Number: 18009-01	
			Elevation at top of Boring: 1074	
RIPPABLE			**Boring Location:** See Boring Location Map	
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting	
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		9	on	
2		8	on	Soft Rock; gray and brown cuttings; Percussion
3		9	on	
4		5	on	
5		10	on	
6		8	on	
7		9	on	
8		10	on	
9		10	on	
10		9	on	Medium Hard Rock, grayish brown cuttings; Percussion
11		10	on	
12		7	on	
13		11	on	
14		10	on	
15		7	on	
16		7	on	
17		5	on	
18		9	on	
19		9	on	
20		9	on	
21		13	on	
22		8	on	
23		13	on/off	
24		10	on	
25		11	on	
26		8	on	
27		9	on	
28		8	on	Hard Rock, blue gray cuttings; Percussion
29		10	on	
30		12	on	
31		7	on	
32		8	on	
33		9	on	
34		8	on	
35		12	on	
36		9	on	
37		10	on	
38		8	on	
39		9	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		9	on	
41		9	on	
42		8	on	
43		7	on	
44		9	on	
45		9	on	
46		9	on	
47		8	on	
48		9	on	
49		13	on	
50		10	on	
51		9	on	
52		9	on	
53		9	on	
54		8	on	Hard Rock, blue gray cuttings; Percussion
55		9	on	
56		9	on	
57		8	on	
58		9	on	
59		9	on	
60		10	on	
61		12	on	
62		10	on	
63		14	on	
64		11	on	
65		9	on	
66		15	on	
67		8	on	
68		9	on	
69		8	on	
70		10	on	
71		6	on	
72		10	on/off	Soft Rock; blue gray and brown cuttings; Percussion
73		9	on	
74		9	on	
75		11	on	
76		9	on	
77		8	on	
78		10	on	Hard Rock, blue gray cuttings; Percussion
79		7	on	
80		12	on	
81		10	on	
82		9	on	
83		10	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20
			Boring Number: AT-4	
			Project Number: 18009-01	
			Elevation at top of Boring: 1100	
RIPPABLE			**Boring Location:** See Boring Location Map	
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting	
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		6	on	
2		5	on	
3		18	on/off	
4		8	on	
5		5	on	
6		4	on	
7		5	on	
8		5	on	
9		4	on	
10		4	on	
11		8	on	Soft Rock, brown cutting; Percussion
12		6	on	
13		5	on	
14		5	on	
15		7	on	
16		10	on	
17		10	on	
18		9	on	
19		5	on	
20		5	on	
21		5	on	
22		5	on	
23		10	on	
24		11	on	
25		13	on	
26		8	on	
27		6	on	
28		7	on	
29		6	on	
30		7	on	
31		8	on	
32		12	on	
33		7	on	
34		8	on	
35		7	on	Medium Hard Rock; brown; Percussion
36		9	on	
37		13	on	
38		10	on	
39		15	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)

Percussion on indicates use of percussion hammer

Percussion on/off indicates periodic use of percussion hammer

40		12	on	
41		5	on	
42		7	on	
43		9	on	
44		10	on	
45		8	on	
46		10	on	
47		8	on	
48		11	on	
49		10	on	
50		9	on	
51		11	on	
52		10	on	
53		9	on	Medium Hard Rock; orange brown and blue gray cuttings;
54		11	on	Percussion
55		6	on	
56		9	on	
57		9	on	
58		11	on	
59		8	on	
60		12	on	
61		11	on	
62		9	on	
63		15	on	
64		13	on	
65		10	on	
66		13	on	
67		10	on	
68		9	on	
69		10	on	
70		10	on	
71		9	on	
72		12	on	
73		8	on	
74		11	on	
75		9	on	
76		12	on	
77		8	on	
78		16	on/off	
79		4	on/off	
80		16	on	
81		8	on	Soft Rock; orange brown and blue cuttings; Percussion
82		6	on	
83		11	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20	
			Boring Number: AT-5		
			Project Number: 18009-01		
			Elevation at top of Boring: 1115		
RIPPABLE			**Boring Location:** See Boring Location Map		
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting		
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"	
Depth		Time (sec)	*Percussion	Driller's Notations	
1		8	on		
2		13	on		
3		12	on		
4		9	on		
5		8	on		
6		10	on		
7		9	on		
8		5	on		
9		8	on		
10		9	on		
11		11	on		
12		3	on	Medium Hard Rock; blue gray and brown cuttings;	
13		7	on	Percussion	
14		7	on		
15		7	on		
16		9	on		
17		7	on		
18		8	on		
19		7	on		
20		8	on		
21		12	on		
22		8	on		
23		13	on		
24		10	on		
25		16	on		
26		11	on		
27		9	on		
28		9	on		
29		11	on		
30		10	on		
31		10	on		
32		10	on		
33		13	on		
34		7	on		
35		10	on		
36		11	on		
37		11	on		
38		8	on		
39		9	on		

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		12	on	
41		8	on	
42		8	on	
43		8	on	
44		11	on	
45		9	on	
46		8	on	
47		7	on	
48		12	on	
49		11	on	
50		12	on	Medium Hard Rock; blue gray and brown cuttings;
51		10	on	Percussion
52		11	on	
53		8	on	
54		11	on	
55		10	on	
56		8	on	
57		11	on	
58		7	on	
59		8	on	
60		12	on/off	
61		9	on	
62		7	on	
63		6	on	
64		11	on	
65		12	on	
66		11	on	
67		10	on	
68		9	on	Medium Hard Rock; brown cuttings; Percussion
69		11	on	
70		12	on	
71		11	on	
72		17	on	Soft Rock; brown cuttings; Percussion
73		17	on	
74		10	on	
75		10	on	
76		12	on	
77		10	on	
78		10	on	Medium Hard Rock; gray blue and brown; Percussion
79		16	on	
80		4	on	
81		8	on	
82		8	on	
83		9	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20	
			Boring Number: AT-6		
			Project Number: 18009-01		
			Elevation at top of Boring: 1059		
RIPPABLE			**Boring Location:** See Boring Location Map		
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting		
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"	
Depth		Time (sec)	*Percussion	Driller's Notations	
1		7	on		
2		5	on		
3		4	on		
4		10	on		
5		9	on		
6		9	on		
7		8	on		
8		8	on		
9		9	on		
10		9	on	Hard Rock; blue gray cuttings; Percussion	
11		10	on		
12		11	on		
13		9	on		
14		8	on		
15		9	on		
16		9	on		
17		13	on		
18		10	on		
19		8	on		
20		10	on		
21		9	on		
22		6	on		
23		11	on		
24		12	on		
25		11	on		
26		11	on		
27		10	on		
28		10	on		
29		9	on	Hard Rock; gray and brown cuttings; Percussion	
30		13	on		
31		9	on		
32		10	on		
33		10	on		
34		11	on		
35		8	on		
36		14	on		
37		7	on		
38		9	on		
39		10	on		

*Percussion off indicates no use of percussion hammer (ie. rotation only)

Percussion on indicates use of percussion hammer

Percussion on/off indicates periodic use of percussion hammer

40		10	on	
41		10	on/off	
42		10	on/off	
43		11	on/off	
44		9	on	
45		9	on	
46		7	on	
47		7	on	
48		11	on	
49		7	on	Hard Rock; blue gray cuttings; Percussion
50		7	on	
51		8	on	
52		11	on	
53		10	on	
54		8	on	
55		10	on	
56		11	on	
57		9	on	
58		11	on	
59		11	on	
60		13	on/off	Soft Rock; brown cuttings; Percussion
61		2	on	
62		3	on	
63		11	on	
64		11	on	
65		12	on	
66		15	on	
67		10	on	
68		16	on	Hard Rock; blue gray cuttings; Percussion
69		12	on	
70		11	on	
71		8	on	
72		15	on	
73		29	on/off	
74		23	on/off	
75		18	on/off	
76		8	on	
77		11	on	
78		10	on	
79		11	on	Hard Rock; brown cuttings; Percussion
80		9	on	
81		12	on	
82		8	on	
83		11	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill		**Date:** 10/28/20
			Boring Number: AT-7		
			Project Number: 18009-01		
			Elevation at top of Boring: 1073		
RIPPABLE			**Boring Location:** See Boring Location Map		
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting		
BLASTING may be required			**Drill Type:** Power Rock Drill		**Boring Diameter:** 3.5"
Depth		Time (sec)	*Percussion	Driller's Notations	
1		6	on	Soft Rock; brown cuttings; Percussion	
2		7	on		
3		15	on		
4		6	on		
5		5	on		
6		7	on		
7		5	on		
8		7	on		
9		9	on	Medium Hard Rock; blue gray and red brown; Percussion	
10		8	on		
11		5	on		
12		6	on		
13		11	on		
14		6	on		
15		8	on		
16		11	on		
17		6	on		
18		4	on		
19		13	on/off		
20		7	on		
21		6	on		
22		8	on	Soft Rock; brown cuttings; Percussion	
23		5	on		
24		12	on		
25		9	on		
26		7	on		
27		9	on	Medium Hard Rock; blue gray cuttings; Percussion	
28		11	on		
29		11	on		
30		11	on		
31		10	on		
32		11	on		
33		13	on	Hard Rock; blue gray cuttings; Percussion	
34		11	on		
35		9	on		
36		13	on		
37		11	on		
38		10	on		
39		12	on		

*Percussion off indicates no use of percussion hammer (ie. rotation only)

Percussion on indicates use of percussion hammer

Percussion on/off indicates periodic use of percussion hammer

40		9	on	
41		14	on	
42		11	on	
43		11	on	
44		10	on	
45		13	on	Hard Rock; blue gray cuttings; Percussion
46		12	on	
47		11	on	
48		13	on	
49		6	on	
50		9	on	
51		9	on	
52		9	on	
53		8	on	
54		22	on/off	
55		6	on	
56		7	on	
57		29	on/off	
58		22	on/off	
59		17	on	
60		15	on	
61		8	on	
62		10	on	
63		7	on	
64		9	on	
65		13	on	
66		20	on	
67		8	on	Medium Hard Rock; blue gray and brown cuttings;
68		10	on	Percussion
69		13	on	
70		0	on	
71		9	on	
72		12	on	
73		12	on	
74		8	on	
75		12	on	
76		12	on	Soft Rock; brown and red brown cuttings; Percusion
77		9	on	
78		8	on	
79		7	on	
80		9	on	
81		10	on	
82		8	on	
83		18	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20
			Boring Number: AT-7	
			Project Number: 18009-01	
			Elevation at top of Boring: 1075	
RIPPABLE			**Boring Location:** See Boring Location Map	
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting	
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		6	on	
2		9	on	
3		20	on/off	
4		6	on	
5		6	on	
6		9	on	
7		10	on	
8		6	on	
9		6	on	
10		7	on	
11		7	on	
12		14	on	
13		0	on	
14		7	on	
15		6	on	
16		6	on	Soft Rock; gray brown cuttings; Percusion
17		6	on	
18		5	on	
19		11	on	
20		7	on	
21		5	on	
22		17	on/off	
23		5	on	
24		9	on	
25		6	on	
26		6	on	
27		6	on	
28		8	on	
29		10	on	
30		5	on	
31		9	on	
32		10	on	
33		8	on	
34		9	on	
35		8	on	
36		9	on	
37		20	on	
38		10	on	
39		15	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		10	on	
41		9	on	
42		9	on	Soft Rock; gray brown cuttings; Percusion
43		8	on	
44		14	on/off	
45		8	on	
46		5	on	
47		15	on	
48		7	on	
49		8	on	
50		10	on	
51		25	on/off	
52		9	on	
53		15	on	
54		9	on	
55		10	on	
56		9	on	
57		8	on	Soft Rock; blue gray and orange brown cuttings;
58		10	on	Percussion
59		6	on	
60		19	on	
61		6	on	
62		5	on	
63		13	on	
64		8	on	
65		13	on	
66		12	on	
67		14	on	
68		14	on	
69		13	on	
70		12	on	
71		10	on	
72		10	on	
73		7	on	
74		3	on	
75		5	on	
76		4	on	
77		5	on	Very Soft Rock; Percussion
78		6	on	
79		6	on	
80		7	on	
81		6	on	
82		5	on	
83		6	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.		**Project Name:** Elephant Hill	**Date:** 10/28/20	
		Boring Number: AT-9		
		Project Number: 18009-01		
		Elevation at top of Boring: 1089		
RIPPABLE		**Boring Location:** See Boring Location Map		
MARGINAL blasting		**Driller:** Arizona Drilling and Blasting		
BLASTING may be required		**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"	

Depth		Time (sec)	*Percussion	Driller's Notations
1		5	on	
2		10	on	
3		7	on	
4		7	on/off	
5		6	on/off	
6		9	on/off	
7		5	on	
8		7	on	
9		6	on	
10		9	on	
11		6	on	Soft Rock; orangish brown cuttings; Percussion
12		14	on	
13		5	on	
14		5	on	
15		8	on	
16		6	on	
17		8	on	
18		6	on	
19		5	on	
20		8	on	
21		6	on/off	
22		11	on/off	
23		7	on	
24		6	on	
25		6	on	
26		7	on	
27		6	on	
28		6	on	
29		10	on	
30		7	on	
31		4	on	
32		5	on	Hard Rock; brown and blue gray cuttings; Percussion
33		6	on	
34		6	on	
35		5	on	
36		10	on	
37		9	on	
38		10	on	
39		11	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		11	on	
41		10	on	
42		10	on	
43		7	on	
44		10	on	Hard Rock; blue gray cuttings; Percussion
45		9	on	
46		10	on	
47		11	on	
48		12	on	
49		9	on	
50		9	on	
51		8	on	
52		6	on	
53		6	on	
54		5	on	
55		11	on	Soft Rock; brown and blue gray cuttings; Percussion
56		7	on/off	
57		9	on	
58		11	on	
59		14	on/off	
60		10	on/off	
61		11	on/off	
62		7	on	
63		5	on	
64		8	on	
65		11	on	
66		10	on	
67		10	on	Hard Rock; brown and blue gray cuttings; Percussion
68		10	on	
69		10	on	
70		0	on	
71		9	on	
72		7	on	
73		13	on	
74		9	on	
75		8	on	
76		13	on/off	
77		9	on	
78		11	on	
79		9	on	Medium Hard Rock; blue gray cuttings; Percussion
80		10	on	
81		9	on	
82		9	on	
83		5	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20
			Boring Number: AT-10	
			Project Number: 18009-01	
			Elevation at top of Boring: 1105	
RIPPABLE			**Boring Location:** See Boring Location Map	
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting	
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		6	on	
2		12	on	
3		8	on	
4		9	on	
5		10	on	Hard Rock; blue gray material; Percussion
6		9	on	
7		10	on	
8		8	on	
9		10	on	
10		8	on	
11		9	on	
12		1	on	
13		2	on/off	
14		8	on/off	
15		6	on	
16		7	on	
17		7	on	
18		5	on	
19		11	on	
20		5	on	
21		9	on	
22		8	on	
23		7	on	
24		7	on	Soft Rock; brown cuttings; Percussion
25		13	on	
26		9	on	
27		6	on	
28		9	on	
29		5	on	
30		5	on	
31		6	on	
32		11	on	
33		7	on	
34		6	on	
35		8	on	
36		10	on	
37		3	on	
38		5	on	
39		12	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		10	on	
41		8	on	
42		9	on	
43		10	on	
44		10	on	
45		10	on	
46		9	on	
47		12	on	
48		8	on	
49		10	on	
50		11	on	Hard Rock; blue gray cuttings; Percussion
51		12	on	
52		10	on	
53		9	on	
54		10	on	
55		11	on	
56		10	on	
57		9	on	
58		11	on	
59		10	on	
60		13	on	
61		13	on	
62		8	on	Void at 62'
63		8	on	
64		8	on	
65		11	on	
66		11	on	
67		12	on	
68		9	on	
69		10	on	
70		10	on	Medium Hard Rock; blue cuttings; Percussion
71		12	on	
72		9	on	
73		10	on	
74		9	on	
75		4	on	
76		10	on	
77		8	on	
78		13	on	
79		11	on	
80		44	on	Void at 80'
81		-18	on	
82		14	on	Hard Rock; blue gray cuttings; Percussion
83		10	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.		**Project Name:** Elephant Hill		**Date:** 10/28/20
		Boring Number: AT-11		
		Project Number: 18009-01		
		Elevation at top of Boring: 1130		
RIPPABLE		**Boring Location:** See Boring Location Map		
MARGINAL blasting		**Driller:** Arizona Drilling and Blasting		
BLASTING may be required		**Drill Type:** Power Rock Drill		**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		4	on	
2		9	on	
3		7	on	
4		10	on	
5		3	on	
6		10	on	
7		8	on	
8		11	on	
9		10	on	
10		10	on	Soft Rock; blue gray cuttings; Percussion
11		7	on	
12		7	on	
13		10	on	
14		9	on	
15		6	on	
16		7	on	
17		8	on	
18		4	on	
19		7	on	Soft Rock; brown cuttings; Percussion
20		7	on	
21		3	on	
22		5	on	
23		8	on	
24		9	on	
25		5	on	
26		9	on	
27		14	on/off	
28		12	on	
29		12	on	
30		12	on	
31		10	on	Hard Rock; Hard Rock; blue gray cuttings; Percussion
32		12	on	
33		13	on	
34		11	on	
35		9	on	
36		13	on	
37		12	on	
38		7	on	
39		15	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		11	on	
41		13	on	
42		9	on	
43		10	on	
44		10	on	
45		10	on	
46		8	on	
47		8	on	
48		13	on	
49		12	on	Hard Rock; Hard Rock; blue gray cuttings; Percussion
50		9	on	
51		16	on	
52		9	on	
53		13	on	
54		11	on	
55		12	on	
56		13	on	
57		16	on	
58		8	on	
59		7	on	
60		9	on	
61		11	on	
62		11	on	Medium Hard Rock; blue gray cuttings; Percussion
63		12	on	
64		14	on	
65		10	on	
66		13	on	
67		15	on	
68		13	on	
69		13	on	Hard Rock; blue gray cuttings; Percussion
70		0	on	
71		12	on	
72		17	on	
73		15	on	
74		12	on	
75		13	on	
76		11	on	
77		14	on	
78		11	on	Medium Hard Rock; blue gray cuttings; Percussion
79		10	on	
80		10	on	
81		11	on	
82		11	on	
83		18	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20	
			Boring Number: AT-12		
			Project Number: 18009-01		
			Elevation at top of Boring: 1063		
RIPPABLE			**Boring Location:** See Boring Location Map		
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting		
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"	
Depth		Time (sec)	*Percussion	Driller's Notations	
1		6	on		
2		6	on		
3		9	on		
4		7	on	Soft Rock; brown cuttings; Percussion	
5		11	on		
6		4	on		
7		10	on		
8		9	on		
9		10	on		
10		10	on		
11		11	on		
12		10	on	Medium Hard Rock; brown cuttings; Percussion	
13		7	on		
14		10	on		
15		11	on		
16		10	on		
17		9	on		
18		8	on		
19		13	on		
20		9	on		
21		13	on		
22		11	on		
23		8	on		
24		13	on		
25		10	on		
26		11	on	Hard Rock; blue gray cuttings; Percussion	
27		12	on		
28		10	on		
29		10	on		
30		10	on		
31		10	on		
32		11	on		
33		14	on		
34		10	on		
35		10	on		
36		10	on		
37		10	on		
38		8	on	Medium Hard Rock; brown and blue gray cuttings;	
39		8	on	Percussion	

*Percussion off indicates no use of percussion hammer (ie. rotation only)

Percussion on indicates use of percussion hammer

Percussion on/off indicates periodic use of percussion hammer

40		11	on	
41		9	on	
42		11	on	
43		10	on	
44		11	on	
45		10	on	
46		12	on	
47		12	on	
48		13	on	
49		11	on	
50		10	on	
51		10	on	
52		12	on	
53		9	on	
54		9	on	
55		10	on	
56		13	on	
57		12	on	
58		11	on	
59		9	on	
60		13	on	Medium Hard Rock; blue gray and intermittent brown
61		9	on	cuttings; Percussion
62		10	on	
63		12	on	
64		10	on	
65		13	on	
66		12	on	
67		13	on	
68		9	on	
69		12	on	
70		16	on	
71		14	on	
72		18	on	
73		12	on	
74		13	on	
75		11	on	
76		14	on	
77		10	on	
78		17	on	
79		13	on	
80		11	on	
81		13	on	
82		12	on	
83		14	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20
			Boring Number: AT-13	
			Project Number: 18009-01	
			Elevation at top of Boring: 1070	
RIPPABLE			**Boring Location:** See Boring Location Map	
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting	
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		3	on	
2		7	on	
3		7	on	
4		8	on	
5		9	on	
6		11	on	
7		8	on	Soft Rock; blue gray and brown cuttings; Percussion
8		8	on	
9		6	on	
10		7	on	
11		10	on	
12		8	on	
13		6	on	
14		10	on	
15		10	on	
16		6	on	
17		5	on	
18		6	on	
19		7	on	
20		9	on	
21		7	on	Soft Rock; brown cuttings; Percussion
22		7	on	
23		5	on	
24		13	on	
25		7	on	
26		9	on	
27		6	on	
28		9	on	
29		5	on	
30		10	on	
31		7	on	
32		8	on	
33		11	on	
34		8	on	
35		8	on	
36		5	on	
37		10	on	Medium Hard Rock; light brown cuttings; Percussion
38		8	on	
39		10	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		9	on	
41		8	on	
42		10	on	Medium Hard Rock; light brown cuttings; Percussion
43		8	on	
44		8	on	
45		7	on	
46		6	on	
47		8	on	Soft Rock; light brown cuttings; Percussion
48		6	on	
49		9	on	
50		14	on	
51		9	on	
52		9	on	
53		11	on	
54		16	on	
55		8	on	
56		16	on	
57		10	on	
58		7	on	
59		7	on	
60		10	on	
61		8	on	
62		16	on	
63		6	on	
64		10	on	
65		12	on	Medium Hard Rock; blue gray cuttings; Percussion
66		17	on	
67		7	on	
68		17	on	
69		14	on	
70		0	on	
71		15	on	
72		11	on	
73		14	on	
74		12	on	
75		12	on	
76		19	on	
77		15	on	
78		13	on	
79		14	on	
80		11	on	
81		11	on	
82		17	on	
83		19	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20	
			Boring Number: AT-14		
			Project Number: 18009-01		
			Elevation at top of Boring: 1085		
RIPPABLE			**Boring Location:** See Boring Location Map		
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting		
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"	
Depth		Time (sec)	*Percussion	Driller's Notations	
1			on		
2			on		
3			on	Hard Rock; bluish gray cuttings; Percussion	
4			on		
5			on		
6			on		
7			on	Soft Rock; brownish blue cuttings; Percussion	
8			on		
9			on		
10			on		
11			on		
12			on		
13			on		
14			on		
15			on		
16			on		
17			on		
18			on		
19			on		
20			on		
21			on		
22			on	Medium Hard Rock; brown and blue gray cuttings;	
23			on	Percussion	
24			on		
25			on		
26			on		
27			on		
28			on		
29			on		
30			on		
31			on		
32			on		
33			on		
34			on		
35			on		
36			on		
37			on		
38			on		
39			on		

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40			on	
41			on	
42			on	
43			on	
44			on	Medium Hard Rock; brown and blue gray cuttings;
45			on	Percussion
46			on	
47			on	
48			on	
49			on	
50			on	
51			on	
52			on	
53			on	
54			on	
55			on	
56			on	
57			on	
58			on	
59			on	
60			on	
61			on	
62			on	
63			on	
64			on	
65			on	
66			on	
67			on	
68			on	
69			on	
70			on	Soft Rock; blue and brown cuttings; Percussion
71			on	
72			on	
73			on	
74			on	
75			on	
76			on	
77			on	
78			on	
79			on	
80			on	
81			on	
82			on	
83			on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.		**Project Name:** Elephant Hill		**Date:** 10/28/20
		Boring Number: AT-15		
		Project Number: 18009-01		
		Elevation at top of Boring: 1110		
RIPPABLE		**Boring Location:** See Boring Location Map		
MARGINAL blasting		**Driller:** Arizona Drilling and Blasting		
BLASTING may be required		**Drill Type:** Power Rock Drill		**Boring Diameter:** 3.5"

Depth		Time (sec)	*Percussion	Driller's Notations
1		4	on	
2		6	on	
3		5	on	
4		6	on	
5		8	on	
6		7	on	
7		7	on	
8		8	on	
9		9	on	
10		7	on	
11		7	on	
12		10	on	
13		5	on	
14		10	on	
15		10	on	
16		2	on	
17		4	on	
18		5	on	Soft Rock; light brown cuttings; Percussion
19		7	on	
20		6	on	
21		7	on	
22		6	on	
23		6	on	
24		6	on	
25		9	on	
26		8	on	
27		6	on	
28		9	on	
29		10	on	
30		5	on	
31		6	on	
32		7	on	
33		6	on	
34		8	on	
35		14	on	
36		10	on	
37		10	on	Soft Rock; brown and blue gray cuttings; Percussion
38		8	on	
39		7	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)

Percussion on indicates use of percussion hammer

Percussion on/off indicates periodic use of percussion hammer

40		10	on	
41		7	on	
42		10	on	
43		7	on	
44		9	on	
45		10	on	
46		8	on	
47		8	on	
48		7	on	
49		9	on	
50		7	on	
51		9	on	
52		9	on	
53		8	on	
54		14	on	
55		11	on	
56		11	on	
57		11	on	
58		6	on	
59		9	on	
60		16	on	
61		15	on	Soft Rock; brown and blue gray cuttings; Percussion
62		15	on	
63		10	on	
64		13	on	
65		9	on	
66		10	on	
67		11	on	
68		8	on	
69		10	on	
70		0	on	
71		12	on	
72		11	on	
73		12	on	
74		13	on	
75		14	on	
76		13	on	
77		12	on	
78		12	on	
79		11	on	
80		13	on	
81		14	on	
82		15	on	
83		11	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

LGC Geotechnical, Inc.			**Project Name:** Elephant Hill	**Date:** 10/28/20	
			Boring Number: AT-16		
			Project Number: 18009-01		
			Elevation at top of Boring: 1090		
RIPPABLE			**Boring Location:** See Boring Location Map		
MARGINAL blasting			**Driller:** Arizona Drilling and Blasting		
BLASTING may be required			**Drill Type:** Power Rock Drill	**Boring Diameter:** 3.5"	
Depth		Time (sec)	*Percussion	Driller's Notations	
1		7	on		
2		10	on		
3		7	on		
4		10	on		
5		9	on		
6		12	on	Soft Rock; blue and brown cuttings; percussion	
7		8	on		
8		4	on		
9		8	on		
10		9	on		
11		12	on		
12		8	on		
13		9	on		
14		11	on		
15		19	on		
16		9	on		
17		12	on		
18		7	on		
19		10	on		
20		13	on	Medium Hard Rock; bluish gray cuttings; Percussion	
21		12	on		
22		13	on		
23		10	on		
24		12	on	Soft Rock; blue and brown cuttings; percussion	
25		10	on		
26		10	on		
27		10	on		
28		6	on		
29		13	on		
30		14	on		
31		7	on		
32		10	on	Medium Hard Rock; soft bluish gray cuttings; Percussion	
33		12	on		
34		13	on		
35		9	on		
36		6	on		
37		4	on		
38		15	on		
39		13	on		

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

40		11	on	
41		9	on	
42		12	on	
43		11	on	
44		10	on	Medium Hard Rock; soft bluish gray cuttings; Percussion
45		6	on	
46		7	on	
47		7	on	
48		15	on	
49		5	on	
50		7	on	
51		6	on	
52		5	on	
53		4	on	
54		8	on	
55		14	on	
56		7	on	
57		6	on	
58		6	on	
59		17	on	
60		5	on	
61		11	on	
62		13	on	Soft Rock; brown and occasional blue cuttings;
63		15	on	Percussion
64		11	on	
65		11	on	
66		7	on	
67		10	on	
68		13	on	
69		11	on	
70		27	on	
71		13	on	
72		15	on	
73		16	on	
74		9	on	
75		11	on	
76		13	on	
77		9	on	
78		10	on	
79		12	on	
80		13	on	
81		13	on	
82		12	on	
83		13	on	

*Percussion off indicates no use of percussion hammer (ie. rotation only)
Percussion on indicates use of percussion hammer
Percussion on/off indicates periodic use of percussion hammer

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0106	PROJECT NAME	Elephant Hill		
DATE STARTED	3/29/13	GROUND ELEV.	730	BORING DESIG.	BA-1
DATE FINISHED	3/29/13	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Alroy	DRIVE WT.	See Note	NOTE	0-29':4800lbs
TYPE OF DRILL RIG	Bucket Auger	DROP	12 in.		30-58':3501bs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	730				ML	**ARTIFICIAL FILL - UNDOCUMENTED (afu_{57})**: SANDY SILT; gray brown, moist, medium dense, fine grained sand.				
						@ 4 ft. yellowish brown, more sand.				
5	725	R	3				23.5	97	89	
		B				@ 6 ft. light gray brown.				MAX, EI, HY, DSR, CHEM
10	720	R	4		SM	@ 10 ft. SILTY SAND; yellowish brown, moist, medium dense, fine grained, some iron oxide, some visible porosity.	15.1	116	93	CON, HY
						@ 14 ft. one foot thick fine to medium grained sand lense. Sharp contact with underlying alluvium.				
15	715	R	1		SM	**ALLUVIUM (Qal)**: SILTY SAND; dark reddish brown, very moist, medium dense, fine to coarse grained, some angular volcanic clasts to 2 inch diameter, some clay.	22.8	102	98	
		B								
20	710	R	2		SP-SM	@ 20 ft. GRAVELLY SAND; dark reddish brown, very moist, dense, fine to coarse grained, some silt and clay.	24.3	98	93	CON, HY
						@ 24 ft. very moist to wet.				
25	705	R	10				20.6	105	95	
30	700	R	7				24.6	99	97	
35	695	R	10			@ 35 ft. very dense, wet to very moist.	24.1	99	96	
40	690	R	20			**GLENDORA VOLCANICS - RHYOLITE (Tgvr)**: Yellow, highly weathered, moist, hard, highly fractured, soft.	25.4	96	92	
						@ 41 ft. slightly moist, moderately weathered, very dense.				
						@ 42 ft. slow drilling				
						TOTAL DEPTH = 42 FT NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- [R] RING (DRIVE) SAMPLE
- [S] SPT (SPLIT SPOON) SAMPLE
- [B] BULK SAMPLE [T] TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0106 PLATE B-1

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0106	PROJECT NAME	Elephant Hill		
DATE STARTED	3/29/13	GROUND ELEV.	752	BORING DESIG.	BA-2
DATE FINISHED	3/29/13	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Alroy	DRIVE WT.	See Note	NOTE	0-29':4800lbs
TYPE OF DRILL RIG	Bucket Auger	DROP	12 in.		30-58':3501bs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**ARTIFICIAL FILL - UNDOCUMENTED (afu_{57})**: SILTY SAND; light brown, dry, loose, fine to coarse grained, abundant volcanic clasts and asphalt clasts to 2 inch diameter.				
	750									
5		R	6		SP-SM	@ 4 ft. GRAVELLY SAND; yellowish brown, moist, dense, fine to coarse grained, some clay, volcanic clast to 5 1/2 inch diameter, one clast to 11 inch diameter.	12.6	116	78	CON, HY
	745									
10		R	6				15.6	116	97	
	740					@ 13 ft. some gray clayey sand lenses.				
15		R	4				15.5	114	90	
	735									
		B			ML	**ALLUVIUM (Qal)**: SANDY SILT; dark gray to black, moist, firm, fine grained sand, some clay, slight organic smell.				MAX, HY, DSR
20		R	2			@ 20 ft. grades to dark reddish brown, some angular gravel to 1/2 inch diameter.	21.7	101	90	CON, HY
	730					@ 23 ft. angular volcanic clasts to 5 inch diameter, fine to coarse grained sand.				
25		B	13				17.3	101	73	
	725									
30		R	20			@ 30 ft. very stiff.	17.6	109	90	
	720									
35		R	16				23.1	99	92	
	715					@ 36 ft. very moist.				
						Continued				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0106 PLATE B-2

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0106	PROJECT NAME	Elephant Hill		
DATE STARTED	3/29/13	GROUND ELEV.	752	BORING DESIG.	BA-2
DATE FINISHED	3/29/13	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Alroy	DRIVE WT.	See Note	NOTE	0-29':4800lbs
TYPE OF DRILL RIG	Bucket Auger	DROP	12 in.		30-58':3501bs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
		R	11			**ALLUVIUM (Qal)**: Continued. @ 40 ft. some iron oxide, trace of translocated clay.	27.1	97	98	
	710									
45		R	50 for 7"			**GLENDORA VOLCANICS - RHYOLITE (Tgvr)**: Yellowish red, moist, highly weathered, hard.	16.8	108	84	
	705									
50						@ 50 ft. hard, slow drilling.				
						TOTAL DEPTH = 50 FT. NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0106 PLATE B-2

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0106	PROJECT NAME	Elephant Hill		
DATE STARTED	3/29/13	GROUND ELEV.	766	BORING DESIG.	BA-3
DATE FINISHED	3/29/13	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Alroy	DRIVE WT.	See Note	NOTE	0-29':4800lbs
TYPE OF DRILL RIG	Bucket Auger	DROP	12 in.		30-58':350lbs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
	765				SM	**ARTIFICIAL FILL - UNDOCUMENTED (afu_{57})**: SILTY SAND, yellowish brown, dry, loose, fine to coarse grained, some concrete clasts to 4 inch diameter.				
5		R	7		SP-SM	@ 4 ft. GRAVELLY SAND; gray brown and yellowish brown, layered, moist, dense, some clay and silt, angular volcanic clasts to 3 inch diameter, slow drilling @ 7 ft.	21.0	96	76	CON, HY
	760					@ 8 ft. volcanic clasts to 5 inch diameter.				
10		R	5				22.5	104	99	
	755					@ 13 ft. light yellowish brown, moist to very moist.				
15		R	11				19.9	101	82	CON, HY
	750					@ 18 ft. tabular volcanic clasts to 8 inch diameter, slow drilling. no sample collected @ 20 ft. due to rock.				
20	745									
		R	3		ML	**ALLUVIUM (Qal)**: SANDY SILT W/GRAVEL; black, moist, firm, fine to coarse grained, some angular gravel to 1/4 inch diameter.	20.4	98	79	CON, HY
25		R	4			@ 25 ft. grades to dark reddish brown, stiff.	19.5	104	88	
	740									
30		R	8			@ 30 ft. some angular gravel to 1/2 inch diameter.	19.9	97	75	
	735									
35		R	22			**GLENDORA VOLCANICS - RHYOLITE (Tgvr)**: Reddish yellow, moist, hard, highly weathered.	18.7	103	82	
	730					@ 37 ft. moderately weathered, slow drilling.				
						PRACTICAL REFUSAL @ 38 ft. NO GROUNDWATER ENCOUNTERED.				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0106 PLATE B-3

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0106	PROJECT NAME	Elephant Hill		
DATE STARTED	3/29/13	GROUND ELEV.	752	BORING DESIG.	BA-4
DATE FINISHED	3/29/13	GW DEPTH (FT)		LOGGED BY	FE
DRILLER	Alroy	DRIVE WT.	See Note	NOTE	0-29':4800lbs
TYPE OF DRILL RIG	Bucket Auger	DROP	12 in.		30-58':3501bs

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SP-SM	**ARTIFICIAL FILL - UNDOCUMENTED (afu_{57})**: GRAVELLY SAND; light yellowish brown, dry, medium dense, fine to coarse grained, some silt and clay, angular volcanic clasts to 4 inch diameter.				
	750					@ 3 ft. yellowish brown, moist, dense, large clasts slowing drilling.				
5						@ 5 ft. sampler bouncing on large clast-no recovery				
	745									
		B			SC	@ 9 ft. some CLAYEY SAND; light gray and yellowish brown, very moist, dense (highly weathered volcanic material)				
10		R	9			@ 10 ft. some very moist, brown, silty sand.	16.1			
	740									
15		R	3			@ 15 ft. no recovery.				
					SM	**ALLUVIUM (Qal)**: SILTY SAND; dark gray, very moist, medium dense, fine to medium grained.				
	735	R	2			@ 18 ft. grades to dark reddish brown.	21.4	100	86	
					SP-SM	@ 19 ft. GRAVELLY SAND; dark reddish brown, moist, dense, fine to coarse grained, angular volcanic clasts to 1/2 inch diameter.				
20		R	5				17.5	105	82	CON, HY
	730									
25		R	13			@ 25 ft. angular volcanic clasts to 3/4 inch diameter.	18.2	100	74	
	725				SM	@ 27 ft. SILTY SAND; dark reddish brown, moist, dense, fine to coarse grained, some clay.				
30		R	14				21.3	99	84	
	720									
					SC	@ 33 ft. GRAVELLY SAND; yellowish red, moist, dense, fine to coarse grained, some angular volcanic clasts to 4 inch diameter (possible lag deposit).				
						@ 34 ft. very large clast/boulder. Refusal with bucket auger.				
						PRACTICAL REFUSAL @ 34.5 FT NO GROUNDWATER ENCOUNTERED				

SAMPLE TYPES:
- [R] RING (DRIVE) SAMPLE
- [S] SPT (SPLIT SPOON) SAMPLE
- [B] BULK SAMPLE [T] TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

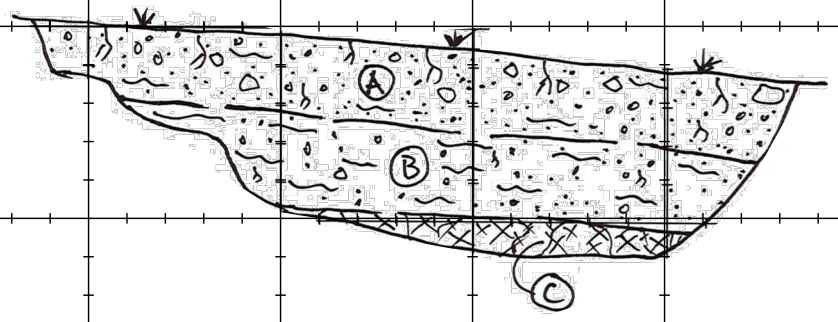
Alta California Geotechnical, Inc.

P.N. 1-0106 PLATE B-4

Project Name: Elephant Hill	Logged By: KTM	Trench No: T-1	LGC Geotechnical, Inc.
Project Number : 19048-01	Date : 9/17/2020	Engineering Properties:	
Equipment: JCB Backhoe	Location: See Geotechnical Map		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 2' - Undocumented Artificial Fill: Light yellowish brown to light gray, gravelly SAND with Silt & scattered cobbles, dry to slightly moist, loose, rootlets. Tilled surface, subangular clasts to 4" with few boulders (12"+/-).	afu				
	B	@ 2' to 4.5' - moderate to dark brown, Sandy SILT with gravels. Slightly moist to moist, medium dense. Gravels subangular.	Topsoil		B-1 @ 2'-3'		
	C	@ 4.5' to T.D. - Glendora Volcanics Rhyolite: Light reddish gray, orangish yellow mottled, rhyolititic volcanic rock, slightly moist, hard. Weathered, fractured, "chippy", iron oxide stained.	Tgr				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 739 ' MSL** **Surface Slope: 2 deg.** **Trend: N35W**



Total Depth: 5'
Groundwater: None
Backfilled: 9/17/2020

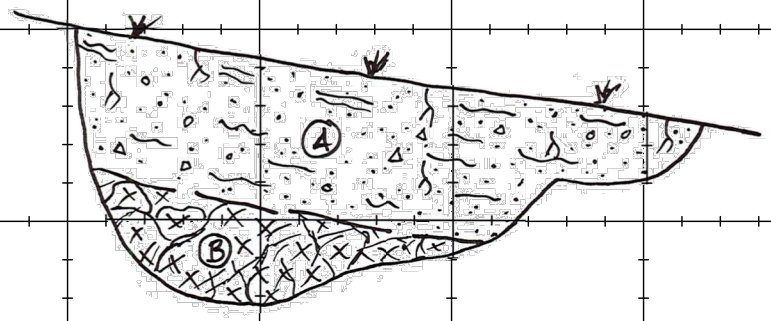
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Last Edited: 10/1/2020

Project Name: Elephant Hill	**Logged By: KTM**	**Trench No: T-2**	
Project Number : 19048-01	**Date : 9/17/2020**	**Engineering Properties:**	
Equipment: JCB Backhoe	**Location: See Geotechnical Map**		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
Fol: N38W, 36N	A	@ 0' to 3.5' - Light to moderate brown, silt with sand and scattered gravels, dry, slightly stiff, porous, rootlets, sub-angular clasts.	Topsoil				
	B	@ 3.5' to T.D. - Glendora Volcanics Rhyolite: Light gray, reddish gray, orangish yellow banded & mottled, rhyolite volcanic rock, dry, angular fractured, extensive weathering, (silt infill, fractures). Attitude on Flow banding/Foliation.	Tgr				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 760 ' MSL** **Surface Slope: 5 deg.** **Trend: N70E**



Total Depth: 6'
Groundwater: None
Backfilled: 9/17/2020

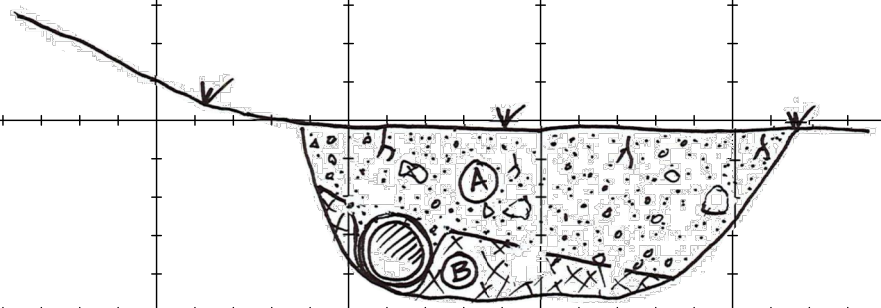
scale : 1 in = 5 ft

Last Edited: 10/1/2020

Project Name: Elephant Hill	Logged By: KTM	Trench No: T-3	
Project Number : 19048-01	Date : 9/17/2020	Engineering Properties:	
Equipment: JCB Backhoe	Location: See Geotechnical Map		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 2.5' - Undocumented Artificial Fill (afu): Light orangish brown, silty SAND with gravels & scattered cobbles, dry, loose to medium dense, subangular clasts. Clay pipe exposed (>12" diameter), empty.	afu				
	B	@ 2.5' to T.D. - Glendora Volcanics Rhyolite: Light pinkish gray, orange brown banded/mottled rhyolite volcanic rock, dry to slightly moist, hard (rock), extensive weathering in upper 1'-2', Flow banded.	Tgr				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 759 ' MSL** **Surface Slope: 0 deg.** **Trend: N52W**



Total Depth: 4.5'
Groundwater: None
Backfilled: 9/17/2020

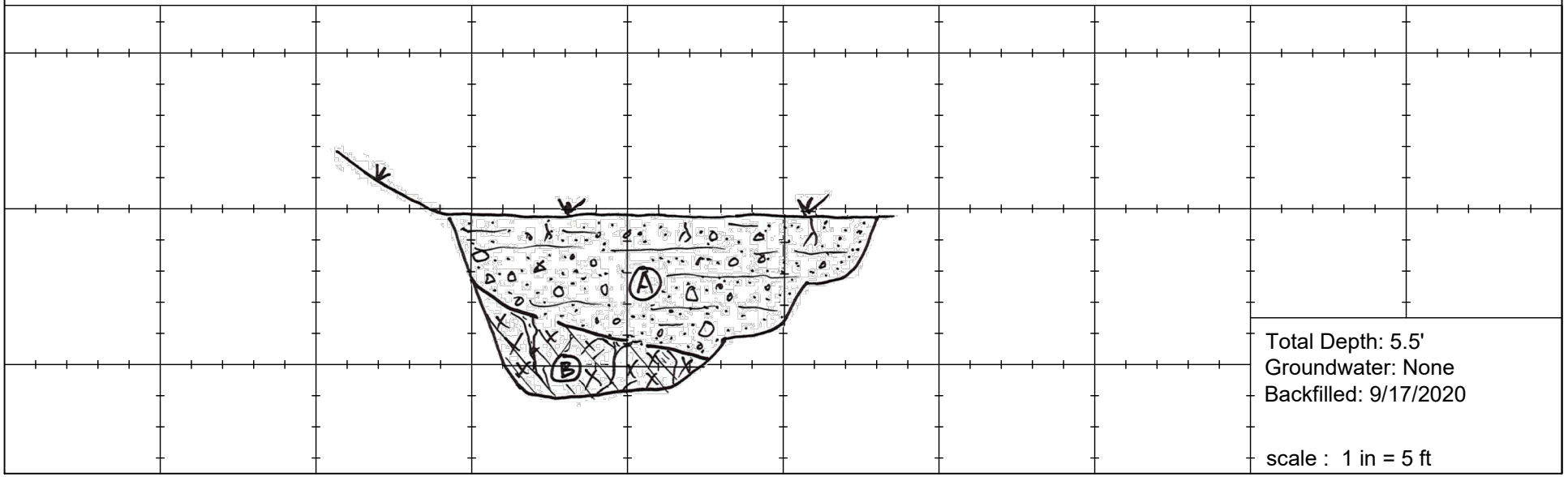
scale : 1 in = 5 ft

Last Edited: 10/1/2020

Project Name: Elephant Hill	Logged By: KTM	Trench No: T-4	LGC Geotechnical, Inc.
Project Number : 19048-01	Date : 9/17/2020	Engineering Properties:	
Equipment: JCB Backhoe	Location: See Geotechnical Map		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 2.5' - Undocumented Artificial Fill (afu): Brown to gray with light reddish gray (varies) gravelly SAND with some silt & few cobbles, slightly moist, medium dense to dense, scattered 4" to 12" subangular clasts.	afu				
Fol: N14W, 82SW	B	@ 2.5' to T.D. - Glendora Volcanics Rhyolite: Dark brown infill between upper weathered (old topsoil) light reddish gray, light greenish gray and brown banded, rhyolite, volcanic rock, hard rock, Attitude on Flow banding/Foliation.	Tgr				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 778' MSL** **Surface Slope: 0 deg.** **Trend: N15E**



Total Depth: 5.5'
Groundwater: None
Backfilled: 9/17/2020

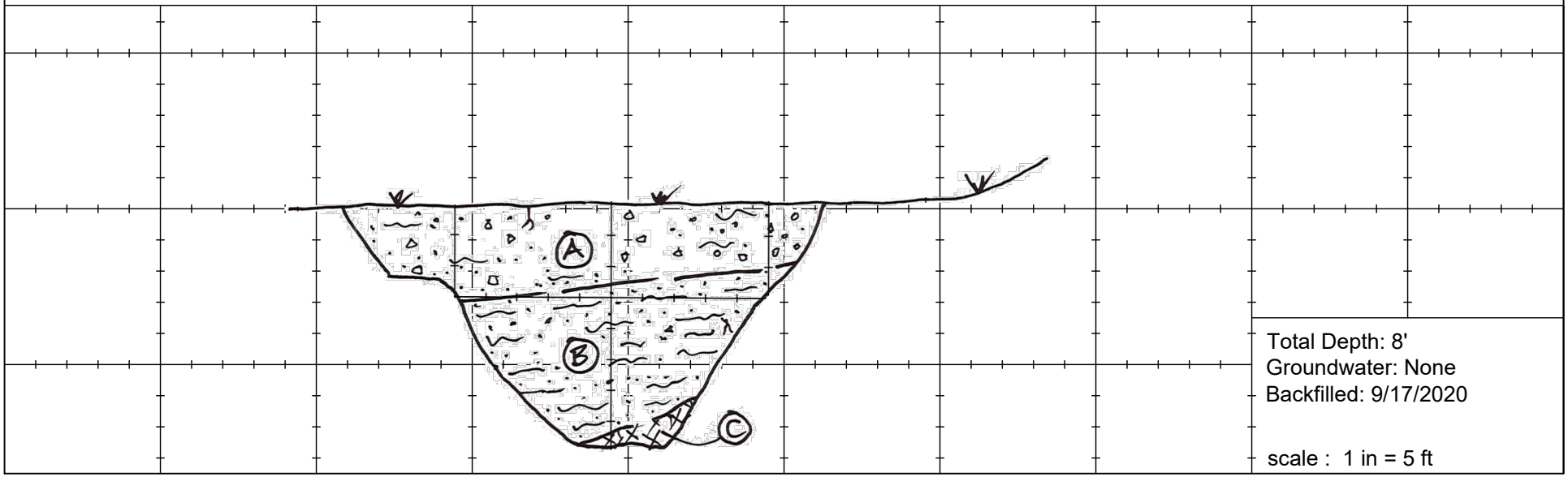
scale : 1 in = 5 ft

Last Edited: 10/1/2020

Project Name: Elephant Hill	Logged By: KTM	Trench No: T-5	LGC Geotechnical, Inc.
Project Number : 19048-01	Date : 9/17/2020	Engineering Properties:	
Equipment: JCB Backhoe	Location: See Geotechnical Map		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 2' - Undocumented Artificial Fill (afu): Light yellowish brown, silty SAND with gravels & few cobbles, slightly moist, loose to slightly dense. Subangular crystalline rock & weathered sandstone clasts in fill.	afu				
	B	@ 2' to 6' - Dark brown SILT with Clay and Sand and few gravels, slightly moist, soft to slightly stiff, porous.	Topsoil				
	C	@ 6' to T.D. - Glendora Volcanics Rhyolite: Light orangish brown, rock observed at bottom, rhyolite volcanic rock, dry, weathered.	Tgr				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 778 ' MSL** **Surface Slope: 0 deg.** **Trend: N20W**



Total Depth: 8'
Groundwater: None
Backfilled: 9/17/2020

scale : 1 in = 5 ft

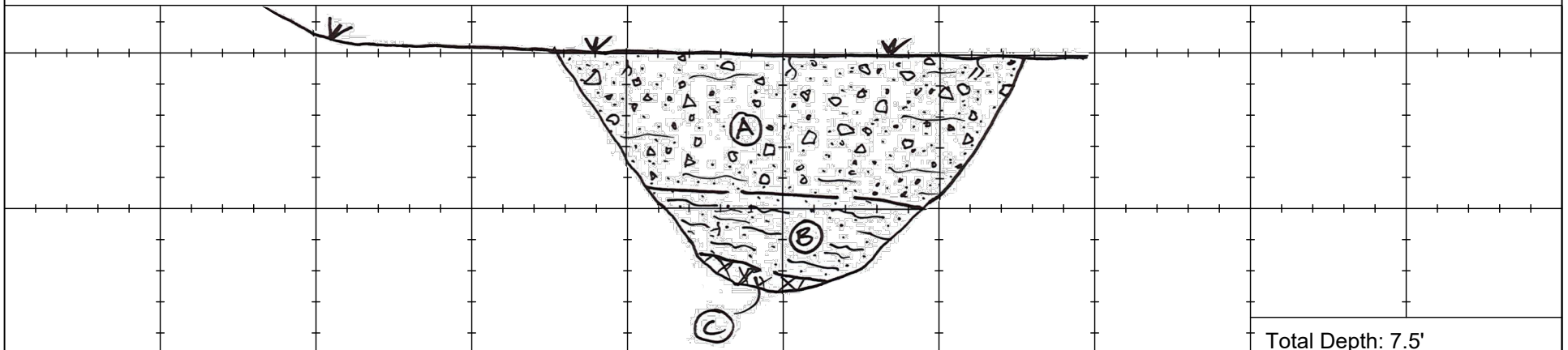
Last Edited: 10/1/2020

Project Name: Elephant Hill	**Logged By: KTM**	**Trench No: T-6**
Project Number : 19048-01	**Date : 9/17/2020**	**Engineering Properties:**
Equipment: JCB Backhoe	**Location: See Geotechnical Map**	

LGC Geotechnical, Inc.

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 4.5' - Undocumented Artificial Fill (afu): Light brown and light gray (varies), gravelly SAND with cobbles (localized clay), moist, medium dense, subangular, volcanic clasts (weathered clasts).	afu		@ 0' to 4' B-1		
	B	@ 4.5' to 7' Moderate brown SILT with clay and SAND, scattered gravels, moist, slightly stiff.	Topsoil				
	C	@ 7' to T.D. - Glendora Volcanics Rhyolite: Orangish brown, rhyolitic volcanic rock.	Tgr				

GRAPHICAL REPRESENTATION BELOW: **Elevation : 775 ' MSL** **Surface Slope: 0 deg.** **Trend: N17W**



Total Depth: 7.5'
Groundwater: None
Backfilled: 9/17/2020

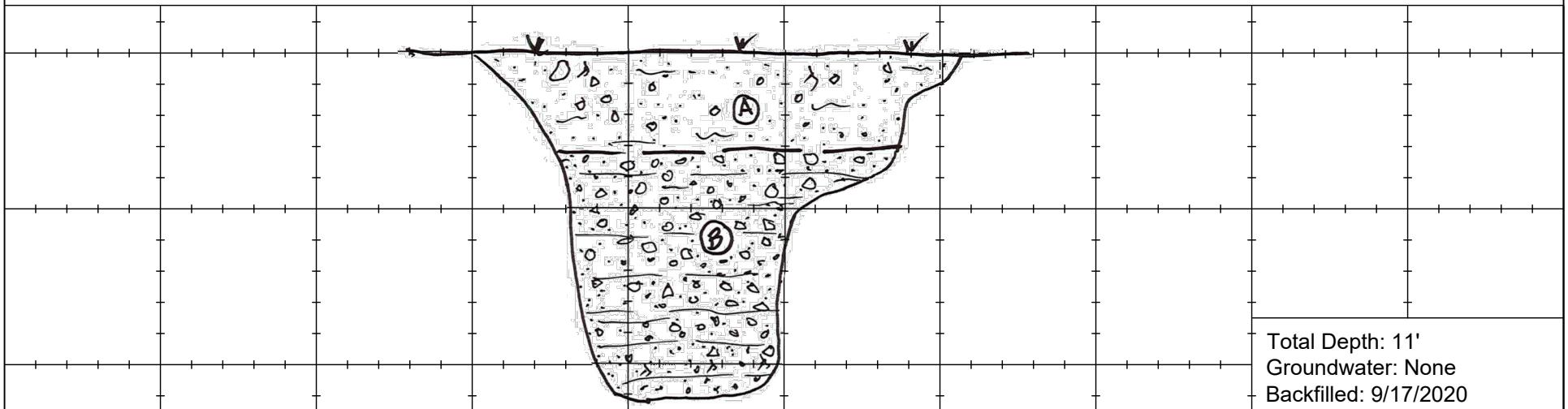
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Last Edited: 10/1/2020

Project Name: Elephant Hill	Logged By: KTM	Trench No: T-7	
Project Number : 19048-01	Date : 9/17/2020	Engineering Properties:	
Equipment: JCB Backhoe	Location: See Geotechnical Map		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to 3' - Undocumented Artificial Fill (afu): Light orangish brown, gravelly SAND with Silt and scattered cobbles, slightly moist, medium dense, rootlets.	afu				
	B	@ 3' to T.D. - Quaternary Alluvium: Light reddish gray layer (lenses) & light orange brown, gravelly, cobbly sand with clay, moist, dense. Clay rinds on cobbles (sub angular) volcanic clasts, various colors (purple/green orange). Thin organic layer at 10'.	Qal		B-1 @7'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 777 ' MSL** **Surface Slope: 0 deg.** **Trend: N70E**



Total Depth: 11'
Groundwater: None
Backfilled: 9/17/2020

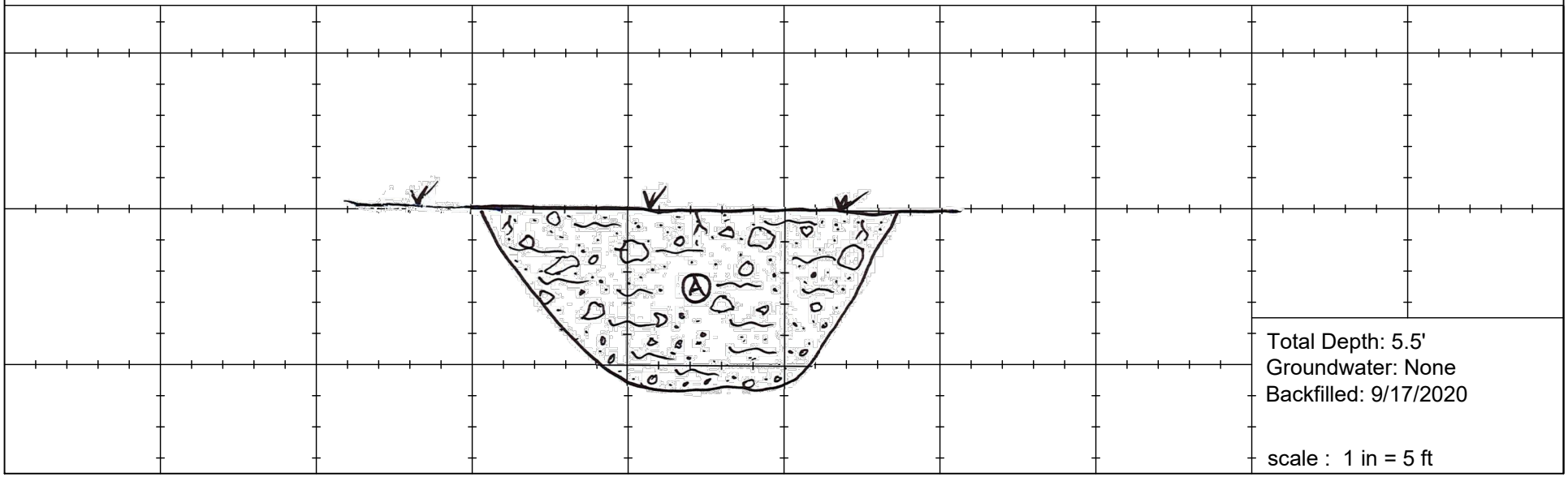
scale : 1 in = 5 ft

Last Edited: 10/1/2020

Project Name: Elephant Hill	**Logged By: KTM**	**Trench No: T-8**	
Project Number : 19048-01	**Date : 9/17/2020**	**Engineering Properties:**	
Equipment: JCB Backhoe	**Location: See Geotechnical Map**		

Geologic Attitudes	Unit	SOIL DESCRIPTION:	GEOLOGIC UNIT	USCS	SAMPLE No	MOISTURE (%)	DRY DENSITY (PCF)
	A	@ 0' to T.D. Undocumented Artificial Fill (afu): Light moderate brown matrix with gray & orange clasts, Silty to Clayey SAND with gravels and scattered cobbles (to 12") dry grades to slightly moist to 2', moist below, dense, upper 3' dry, scattered oversize (>8" diameter), subangular rock (volcanic and others).	afu		B-1 @0' to 4'		

GRAPHICAL REPRESENTATION BELOW: **Elevation : 852 ' MSL** **Surface Slope: 0 deg.** **Trend: N45E**



Total Depth: 5.5'
Groundwater: None
Backfilled: 9/17/2020

scale : 1 in = 5 ft

Last Edited: 10/1/2020

Geotechnical Boring Log Borehole LGC-HS-1

Date: 9/17/2020	**Drilling Company:** 2R Drilling
Project Name: Elephant Hill	**Type of Rig:** CME 75
Project Number: 19048-01	**Drop:** 30" **Hole Diameter:** 8"
Elevation of Top of Hole: ~748' MSL	**Drive Weight:** 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 1

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
745	0							@0' - Dry Grass Field	
								Quaternary Alluvium (Qal)	
	5		R-1	10 13 17	104.0	14.6	ML	@5' - Silty SAND: brownish red, slightly moist, medium dense, various angular ~1" clasts	
740									
	10		SPT-1	10 17 30		17.2	SM	@10' - Silty SAND: brownish red to tan, dense, ~2" rock fragments	
735								***Tertiary Glendora Volcanics Rhyolite (Tgr)***	
	15		SPT-2	50/5.5"		15.2	SM	@15' - Silty SAND: miscellaneous volcanic clasts, ~1" angular clasts, moist to slightly moist, very dense	
730								Total Depth = 17' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
	20								
725									
	25								
720									
	30								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Last Edited: 11/13/2020

Geotechnical Boring Log Borehole LGC-HS-2

Date: 9/17/2020	**Drilling Company:** 2R
Project Name: Elephant Hill	**Type of Rig:** CME 75
Project Number: 19048-01	**Drop:** 30" **Hole Diameter:** 8"
Elevation of Top of Hole: ~745' MSL	**Drive Weight:** 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' - Dry grass field	
								Undocumented Artificial Fill (afu)	
740	5	B-1	R-1	10 17 17	117.1	10.0	SM	@5' - Upper sample is silt matrix, dark brown, moist, with rock ~2-3" in diameter, lower sample is silty sand, yellow brown, moist, off-white mottling, medium dense, oxidation	
735	10		R-2	18 10 13	118.0	12.8	SC	@10' - Clayey SAND with some gravel: yellow, some angular rock fragments, moist, med dense	
								Quaternary Alluvium (Qal)	
730	15		R-3	7 7 7	97.9	21.2	CL	@15' - Silt with gravel: dark brown, moist, medium dense, 1-3" angular fragments	
725	20	B-2	R-4	4 8 8	104.0	20.5	CL	@20' - Sandy SILT: dark brown to black with red/tan mottling, moist, medium dense, trace clay & rock fragments (1" in diameter)	CN
720	25		R-5	20 50/5"	89.1	16.6	ML	@25' - Silty SAND: yellow with gray, red mottling, angular rock fragments, moist, very dense	
								Tertiary Glendora Volcanics Rhyolite (Tgr)	
	30								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Last Edited: 11/16/2020

Geotechnical Boring Log Borehole LGC-HS-2

Date: 9/17/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** CME 75

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 8"

Elevation of Top of Hole: ~745' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6	50/6"	95.4	17.3	ML	@30' - Upper sample - Silty SAND: moist; Lower sample - Volcanic bedrock: light red, very dense, oxidized	
715	35							Total Depth = 30' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
710	40								
705	45								
700	50								
695	55								
	60								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Geotechnical Boring Log Borehole LGC-HS-3

Date: 9/17/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** CME 75

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 8"

Elevation of Top of Hole: ~755' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' - Dry Grass Field	
								Undocumented Artificial Fill (afu)	
750	5		R-1	10 14 14	111.6	12.3	SC	@5' - Silty SAND: yellow brown, moist, medium dense	
745	10		R-2	12 43 21	122.7	9.8	SM	@10' - Silty SAND: tan to yellow gray, moist, dense, trace clay	
740	15		R-3	6 17 20	100.7	14.7	SC	@15' - Sandy CLAY: grey to yellow, <1" rock frags, moist, medium dense, some oxidation	
								Quaternary Alluvium (Qal)	
735	20		R-4	5 9 13	103.5	19.4	CL	@20' - SILT: red brown, moist, medium dense, ~2" rock in bottom of sampler	CN
730	25		R-5	16 20 24	105.1	18.0	ML	@25' - SILT: red brown, moist, dense, angular fragments	
	30								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Last Edited: 11/16/2020

Geotechnical Boring Log Borehole LGC-HS-3

Date: 9/17/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** CME 75

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 8"

Elevation of Top of Hole: ~755' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6	20 40 38	107.4	17.7	SC-SM	@30' - SILT: red brown, some rock fragments (1-2") moist, very dense	CN
725	35		R-7	12 27 33	105.5	20.2	CL	@35' - Clayey SILT: red brown, moist, very dense, some 1" rock fragments	
								Tertiary Glendora Volcanics Rhyolite (Tgr)	
720	40		R-8	48 50/3"	106.1	15.5	SM	@40' - Volcanic rock: brown, slightly moist, very dense, oxidized, heavily weathered	
								Total Depth = 40' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
715	45								
710	50								
705	55								
	60								

LGC Geotechnical, Inc.

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SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Geotechnical Boring Log Borehole LGC-HS-4

Date: 9/17/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** CME 75

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 8"

Elevation of Top of Hole: ~765' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' - Dry Grass Field	
								Undocumented Artificial Fill (afu)	
760	5		R-1	8 27 45				@5' - Sandy SILT: moist, very dense, trace clay, 2-3 inch rock fragments	
755	10		R-2	28 50/2"	89.1	14.4	CL	@10' - Silty CLAY: gravel in silty matrix in the upper portion of sample. Silty black clay in lower sample, moist, very dense, ~2" rock, angular	
								Quaternary Alluvium (Qal)	
750	15		R-3	15 20 22	100.5	18.9	CL	@15' - Clay with gravel: brown, moist, very dense; ~1" angular gravels in clay matrix	
745	20		R-4	35 20 12				@20' - SILT: red to brown, moist, very dense, rock clogged sampler and prevented full recovery	
740	25		R-5	2 5 9	104.8	19.5	CL-ML	@25' - Silty Sand: red brown, moist, medium dense	CN
	30								

LGC Geotechnical, Inc.

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SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Last Edited: 11/16/2020

Geotechnical Boring Log Borehole LGC-HS-4

Date: 9/17/2020	**Drilling Company:** 2R
Project Name: Elephant Hill	**Type of Rig:** CME 75
Project Number: 19048-01	**Drop:** 30" **Hole Diameter:** 8"
Elevation of Top of Hole: ~765' MSL	**Drive Weight:** 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6	12 22 40	112.4	15.1	SC-SM	@30' - Silty SAND: dark brown with red mottling, moist, very dense	CN DS
								Tertiary Glendora Volcanics Rhyolite (Tgr)	
735	35		R-7	14 50/6"	108.2	16.5	SC	@35' - Upper is Sandy SILT; lower is volcanic bedrock: moist, very dense	
730	40		R-8	50/4"				@40' - Poor recovery: bedrock, dry, very dense, weathered, oxidized	
								Total Depth = 40' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
725	45								
720	50								
715	55								
	60								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Geotechnical Boring Log Borehole LGC-HS-5

Date: 9/17/2020	**Drilling Company:** 2R
Project Name: Elephant Hill	**Type of Rig:** CME 75
Project Number: 19048-01	**Drop:** 30" **Hole Diameter:** 8"
Elevation of Top of Hole: ~770' MSL	**Drive Weight:** 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' - Dry grass field	
								Undocumented Artificial Fill (afu)	
765	5	B-1	R-1	15 26 24	111.4	12.7	CL	@5' - Clay with gravel: moist to slightly moist, medium dense	CR EI
760	10		R-2	10 14 13	99.4	20.4	CL	@10' - Silty CLAY with trace sand: tan with white brown mottle, ~85% clayey matrix, 15% rock fragments, moist, medium dense	
755	15		R-3	9 9 14	100.5	17.9	SC/CL	@15' - Silty SAND: yellow, gray, moist, medium dense, some ~1" rock fragments	
								Quaternary Alluvium (Qal)	
750	20		R-4	7 7 7	103.8	18.3	ML	@20' - SILT: dark brown, moist, medium dense	
745	25		R-5	9 14 12	103.4	19.1	ML	@25' - Clayey SILT: dark brown, moist, medium dense, 1-2" rock fragments, poor recovery	
	30								

LGC Geotechnical, Inc.

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SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Last Edited: 11/16/2020

Geotechnical Boring Log Borehole LGC-HS-5

Date: 9/17/2020	**Drilling Company:** 2R
Project Name: Elephant Hill	**Type of Rig:** CME 75
Project Number: 19048-01	**Drop:** 30" **Hole Diameter:** 8"
Elevation of Top of Hole: ~770' MSL	**Drive Weight:** 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6	18 20 23	103.0	11.6	SM	@30' - Silty SAND: brown, moist, very dense, ~40-50% rock fragments ***Tertiary Glendora Volcanics Rhyolite (Tgr)***	
740	35		R-7	35 50/6"	113.0	4.3	GP	@35' - Silty SAND: brown, slightly moist to moist	
735	40		R-8	50/3"				@40' - No recovery	
730	45		R-9	50/1.5"				@45' - Pulverized bedrock	
725	50							Total Depth = 45' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
720	55								
	60								

LGC Geotechnical, Inc.

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SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Geotechnical Boring Log Borehole LGC-HS-6

Date: 9/17/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** CME 75

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 8"

Elevation of Top of Hole: ~770' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' - Dry grass field	
								Undocumented Artificial Fill (afu)	
765	5		R-1	6 11 22	96.8	21.7	SC	@5' - Silty SAND with trace clay: gray/white with red mottle, medium dense, ~2" rock fragments	
760	10		R-2	6 11 15	99.8	20.5	CL	@10' - Sandy CLAY: light brown, moist, medium dense, ~1" rock fragments	
								Quaternary Alluvium (Qal)	
755	15		R-3	3 4 6	104.2	19.5	SC/CL	@15' - SILT: dark brown, moist, loose	
750	20		R-4	11 14 15	96.7	14.1	SC	@20' - Silty SAND: dark brown, moist, medium dense, ~1" rock frags	
745	25	B-1	R-5	38 50/6"	99.4	13.5	SM	@25' - Silty SAND with gravel: moist, very dense, 30-40% 1-2" rock fragments	
	30								

LGC Geotechnical, Inc.

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SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Last Edited: 11/16/2020

Geotechnical Boring Log Borehole LGC-HS-6

Date: 9/17/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** CME 75

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 8"

Elevation of Top of Hole: ~770' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6	12 20 25				@30' - Silty SAND: yellow/gray, moist, medium dense, trace clay	
								Tertiary Glendora Volcanics Rhyolite (Tgr)	
740	35		R-7	50/6"				@35' - Silty SAND with gravel: yellow and white mottle, moist, very dense, 1" rock fragments, some oxidation, weathered bedrock	
								Total Depth = 35' Groundwater Not Encountered Backfilled with Cuttings on 9/17/2020	
735	40								
730	45								
725	50								
720	55								
	60								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
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CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Geotechnical Boring Log Borehole LGC-HS-7

Date: 9/18/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** Limited Access

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 6"

Elevation of Top of Hole: ~850' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By MJG
Sampled By MJG
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' - Dry grass field ***Undocumented Artificial Fill (afu)***	
845	5		R-1	15 20 21	95.6	12.3	SM	@5' - Silty SAND with gravel: light brown, dry, loose to medium dense (rocks in sample)	
840	10		R-2	5 7 15	86.6	20.9	SC/CL	@10' - Clayey SAND: dark gray, moist, medium dense to dense, few gravels	
835	15		R-3	10 13 23	82.7	20.2	CL	@15' - SAA	
830	20		R-4	16 25 33	106.4	17.0	CL	@20' - Sandy CLAY: dark gray and light gray mottle, moist, dense to very dense, angular volcanic rock (2"), gravels	
825	25		R-5	50/3"	84.9	16.7	CL	@25' - Sandy CLAY and Gravels: light gray & light orangish gray, moist, dense, angular volcanic rocks in sample ***Tertiary Glendora Volcanics - Undifferentiated***	
	30								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
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AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Last Edited: 11/17/2020

Geotechnical Boring Log Borehole LGC-HS-7

Date: 9/18/2020 | **Drilling Company:** 2R

Project Name: Elephant Hill | **Type of Rig:** Limited Access

Project Number: 19048-01 | **Drop:** 30" | **Hole Diameter:** 6"

Elevation of Top of Hole: ~850' MSL | **Drive Weight:** 140 pounds

Hole Location: See Geotechnical Map

Logged By KTM
Sampled By KTM
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30		R-6	50/3"	100.2	14.9	SC	@30' - Clayey SAND with gravels: light gray & light orange, moist, very dense; angular chipped volcanic rocks	
820	35		R-7	50/3"	88.8	15.5	SC	@35' - Sand with gravels: light gray with some orange, slightly moist, very dense, trace fines	
815	40		R-8	50/3"	90.8	13.3	SM/SC	@40' - SAA	
810	45		R-9	50/3"	92.6	14.7	SM	@45' - SAA with large rock in spoils	
805	50		SPT-1	50/5"				@50' - No recovery	
800	55							Total Depth = 52' Groundwater Not Encountered Backfilled with Cuttings on 9/18/2020	
	60								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

SAMPLE TYPES:

B	BULK SAMPLE
R	RING SAMPLE (CA Modified Sampler)
G	GRAB SAMPLE
SPT	STANDARD PENETRATION TEST SAMPLE
▽	GROUNDWATER TABLE

TEST TYPES:

DS	DIRECT SHEAR
MD	MAXIMUM DENSITY
SA	SIEVE ANALYSIS
S&H	SIEVE AND HYDROMETER
EI	EXPANSION INDEX
CN	CONSOLIDATION
CR	CORROSION
AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Geotechnical Boring Log Borehole LGC-HS-8

Date: 9/18/2020	**Drilling Company:** 2R
Project Name: Elephant Hill	**Type of Rig:** Limited Access
Project Number: 19048-01	**Drop:** 30" **Hole Diameter:** 6"
Elevation of Top of Hole: ~835' MSL	**Drive Weight:** 140 pounds
Hole Location: See Geotechnical Map	Page 1 of 2

Logged By KTM
Sampled By KTM
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	0							@0' - Gravel	
								Undocumented Artificial Fill (afu)	
830	5		R-1	25 32 32	107.9	14.0	SM/SC	@5' - Gravely SAND with Clay: light orangish brown & yellow clay, moist, dense. Angular 3" rock (volcanic)	
825	10		R-2	25 50/6"	109.6	15.0	SM	@10' - No Recovery	
								Quaternary Alluvium (Qal)	
820	15		R-3	50/6"	87.7	13.7	SC	@15' - Clayey SAND with Gravels: orangish brown, moist to very moist, dense, angular gravel (volcanic)	
815	20			10 6 8				@20' - No Recovery, rock in sampler	
810	25			27 50/5"				@25' - No Recovery, rock in sampler	
	30								

LGC Geotechnical, Inc.

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-#200	% PASSING # 200 SIEVE

Last Edited: 11/17/2020

Geotechnical Boring Log Borehole LGC-HS-8

Date: 9/18/2020	**Drilling Company:** 2R
Project Name: Elephant Hill	**Type of Rig:** Limited Access
Project Number: 19048-01	**Drop:** 30" **Hole Diameter:** 6"
Elevation of Top of Hole: ~835' MSL	**Drive Weight:** 140 pounds
Hole Location: See Geotechnical Map	Page 2 of 2

Logged By KTM
Sampled By KTM
Checked By KTM

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
	30			35 50/4"				@30' - No Recovery, rock in sampler	
805	35							Total Depth = 35' Groundwater Not Encountered Backfilled with Cuttings on 9/18/2020	
800	40								
795	45								
790	50								
785	55								
	60								

LGC Geotechnical, Inc.

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED. THE DESCRIPTIONS PROVIDED ARE QUALITATIVE FIELD DESCRIPTIONS AND ARE NOT BASED ON QUANTITATIVE ENGINEERING ANALYSIS.

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AL	ATTERBERG LIMITS
CO	COLLAPSE/SWELL
RV	R-VALUE
-#200	% PASSING # 200 SIEVE

Appendix C
Seismic Reports

GEOPHYSICAL REPORT
SEISMIC REFRACTION SURVEY

Elephant Hill
Pomona, California

GEO*Vision* Project No. 20370

Prepared for

LGC Geotechnical Inc.
131 Calle Iglesia #200
San Clemente, CA 92672

Prepared by

GEO*Vision* Geophysical Services, Inc.
1124 Olympic Drive
Corona, CA 92881
(951) 549-1234

November 18, 2020

Report 20370-01

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3 METHODOLOGY 3
4 DATA REDUCTION AND MODELING 4
5 DISCUSSION OF RESULTS 5
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APPENDICES

Appendix A Technical Note - Seismic Refraction Method

1 INTRODUCTION

A geophysical survey was conducted in Pomona, California on November 4-6, 2020. The survey was conducted along five compressional-wave (P-wave) seismic refraction tomography lines, designated as Lines 1-5. The purpose of this investigation was to map bedrock rippability to a depth of approximately 80 feet, or as possible. The endpoints of each refraction line were surveyed by **GEO***Vision* personnel using a sub-foot capable GPS. Coordinates are provided in Table 1 and lines are plotted on a site map (Figure 1).

The geology in the vicinity of the seismic refraction lines was assumed to be unsaturated alluvium overlying silicious volcanics. Depending on the bedding, degree of weathering, jointing, etc., such rocks may broadly be characterized as rippable using a D8 ripper to P-wave velocities of 6,000 feet per second (ft/s), marginally-rippable to 8,000 ft/s, and non-rippable above 8,000 ft/s (Caterpillar, 2018). Charts for D9R for the same rocks indicate rippable to 7,000 ft/s, marginally-rippable to 8,000 ft/s, and non-rippable above 8,000 ft/s. Seismic velocities consistent with very hard, non-rippable rock are modeled beneath all five lines.

The following sections include a discussion of equipment and field procedures, methodology, data processing, and results of the geophysical survey.

2 EQUIPMENT AND FIELD PROCEDURES

Seismic refraction equipment used during this investigation consisted of three Geometrics Geode 24-channel signal enhancement seismographs, 10 Hz vertical geophones, seismic cables with 10-foot takeouts, piezo hammer switches, a 35-lb slidehammer, and 200-lb nitrogen-spring accelerated weight drop.

All five lines for this investigation used geophones spaced 10 feet apart, measured using a survey tape. Relative elevations and positions of the geophones were later surveyed using a Trimble R10 GPS with real-time Centerpoint RTX corrections.

Shot points included off-end shots (where possible), end shots, and multiple interior shot points. A minimum of 9 shot points were acquired per spread to facilitate tomographic modeling (described below). Space, access, and topography limited or prohibited the placement of some off-end shots.

A hammer switch was used to trigger the seismograph upon impact. The final seismic record at each shot point was the result of stacking 8 to 10 shots to increase the signal to noise ratio. All seismic records were stored on a laptop computer. Data acquisition parameters, file names, and other observations were recorded on a digital observers' log, which is retained in project files.

3 METHODOLOGY

Detailed discussions of the seismic refraction method can be found in Lankston (1990), Telford et al. (1990), Dobrin and Savit (1988), and Redpath (1973).

When conducting a seismic survey, acoustic energy is input to the subsurface by an energy source such as a sledgehammer impacting a metallic plate, weight drop, vibratory source, or explosive charge. The acoustic waves propagate into the subsurface at a velocity dependent upon the elastic properties of the material through which they travel. When the waves reach an interface where the density or velocity changes significantly, a portion of the energy is reflected back to the surface and the remainder is transmitted into the lower layer. Where the velocity of the lower layer is higher than that of the upper layer, a portion of the energy is also critically refracted along the interface. Critically refracted waves travel along the interface at the velocity of the lower layer and continually refract energy back to the surface. Receivers (geophones) laid out in linear array on the surface record the incoming refracted and reflected waves. The seismic refraction method involves analysis of the travel times of the first energy to arrive at the geophones. These first-arrivals are from either the direct wave (at geophones close to the source) or critically refracted waves (at geophones further from the source).

Errors in seismic refraction models can be caused by velocity inversions, hidden layers, or lateral velocity variations. At sites with steeply dipping or highly irregular bedrock surfaces, refractions from structures to the side of the line rather than from beneath the line may severely complicate modeling. A velocity inversion is a geologic layer with a lower seismic velocity than an overlying layer. Critical refraction does not occur along such a layer because velocity has to increase with depth for critical refraction to occur. This type of layer, therefore, cannot be recognized or modeled and depths to underlying layers would be overestimated.

A hidden layer is a layer with a velocity increase, but of sufficiently small thickness relative to the velocities of overlying and underlying layers, that refracted arrivals do not arrive at the geophones before those from the deeper, higher velocity layer. Because the seismic refraction method generally only involves the interpretation of first arrivals, a hidden layer cannot be recognized or modeled and depths to underlying layers would be underestimated. Saturated sediments overlying high velocity bedrock can be a hidden layer under many field conditions. Generally, saturated sediments generally have a much higher P-wave velocity than unsaturated sediments, typically in the 5,000 to 7,000 ft/s range and can occasionally be interpreted as a second arrival when the layer does not give rise to a first arrival.

A subsurface velocity structure that increases as a function of depth rather than as discrete layers will cause depths to subsurface refractors to be underestimated in a manner very similar to that of the hidden layer problem. Lateral velocity variations that are not adequately addressed in the seismic models also lead to depth errors. Tomographic imaging techniques can often resolve the complex velocity structures associated with hidden layers, velocity gradients, and lateral velocity variations. However, in the event of an abrupt increase in velocity at a geologic horizon, the velocity model generated using tomographic inversion routines will smooth the horizon with velocity possibly being underestimated at the interface and overestimated at depth.

4 DATA REDUCTION AND MODELING

The first step in data processing consisted of picking the arrival time of the first energy (first-arrival) received at each geophone for each shot point. The first arrivals on each seismic record are either a direct arrival from a P-wave traveling in the uppermost layer or a refracted arrival from a subsurface interface where there is a velocity increase. First-arrival times were selected using the manual picking routines in the SeisImager™ software suite (Geometrics, Inc., v5.8.02). These first-arrival times were saved in an ASCII file containing shot location, geophone locations, and associated first-arrival time. Errors in the first-arrival times were variable with error generally increasing with distance from the shot point, especially where data quality was affected by traffic noise.

Analysis of seismic refraction data depends upon the complexity of the subsurface velocity structure. Layer-based and tomographic inversion routines can be used to model the seismic data. Layer-based methods are better suited when subsurface units are arranged along distinct geologic boundaries, whereas tomographic methods may be better applied when gradational changes across geologic contacts. These different modeling schemes have their own strengths and weaknesses.

We evaluated layer-based modeling to fit the major trends in the travel time data. The vertical and lateral variations in velocity indicated that the data would best be represented by tomographic modeling. Refraction tomography techniques are often able to resolve complex velocity structure (e.g. velocity gradients) that can be observed in bedrock weathering profiles. Layer-based modeling techniques such as GRM are not able to accurately model the velocity gradients that can be observed in weathered or transitional zones. However, tomographic modeling methods force a velocity gradient across apparent geologic units or vertical cross-section, smoothing the velocity ranges presented in the model. Typically, this will result in an apparently slower seismic velocity at the layer contact compared to the layer-based model.

The final tomographic velocity models for the seismic line were exported as ASCII files and imported into the Golden Software Surfer v19 mapping system where the velocity model was gridded, contoured, and annotated for presentation.

5 DISCUSSION OF RESULTS

The site map showing the location of the seismic refraction profiles is presented as Figure 1. The seismic velocity models for Lines 1-5 are presented as Figures 2-6, respectively. In tomographic models, sharp layer contacts are not clearly defined and thus ranges of velocities are used to interpret possible rock conditions and competency. A color scalebar is used to visualize modeled velocities from the tomographic modeling process.

Tomographic inversion techniques will typically model a gradual increase in velocity with depth even if an abrupt velocity contact is present. Therefore, if velocity gradients are not present, tomographic inversion routines will overestimate and underestimate velocity above and below a layer contact, respectively. Velocity gradients can be very common in geologic environments with weathering zones, multiple types of rock, or areas with differential compaction and fill materials. The same color scale is used for all of the models to highlight the differences between the models. The yellow color contour roughly corresponds to the 6,000 ft/s velocity (transition between rippable-marginally rippable). Red tones would be marginally-rippable at best, and the magenta color contours should be considered non-rippable.

The models do not show strong correlation with velocity / depth at line intercepts. This is common when 2D refraction lines are oriented at various azimuths relative to bedrock strike of dipping units. The first-arrival times recorded at the geophones originate from the fastest travel path of the seismic wave. This travel path may be out-of-plane and is particularly evident when shooting oblique to a dipping unit. Additionally, anisotropy within the rock units may result in different apparent velocities.

All five lines showed weathered, rippable-to-marginally-rippable bedrock at or near the surface. Non-rippable rock is expected to be encountered in the upper 5-10-feet beneath the lines, though isolated zones of slower material are evident. The is supported by your verbal indication that there was variability in hardness observed during your own geotechnical analysis. The seismic results indicate that some of the material should be rippable to a D8R or D9R, but that non-rippable material is expected in the relatively shallow subsurface. Rippability is also a function of local jointing, fracturing, and weathering which cannot be fully characterized by seismic refraction surveying. Your verbal goal to identify soft material beneath hard (high velocity) material is not possible using seismic refraction methods, as described in the methodology section above.

6 CERTIFICATION

All geophysical data, analysis, interpretations, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by a **GEO***Vision* California Professional Geophysicist.

Prepared by,

Reviewed and approved by,



JB Shawver

November 18, 2020

JB Shawver
Geophysicist
GEO*Vision* Geophysical Services

Date

* This geophysical investigation was conducted under the supervision of a California Professional Geophysicist using industry standard methods and equipment. A high degree of professionalism was maintained during all aspects of the project from the field investigation and data acquisition, through data processing, interpretation, and reporting. All original field data files, field notes, observations, and other pertinent information are maintained in the project files and are available for the client to review for a period of at least one year.

  A professional geophysicist's certification of interpreted geophysical conditions comprises a declaration of his/her professional judgment. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations, or ordinances

7 REFERENCES

Caterpillar Performance Handbook, 2018, 48th Edition, A publication by Caterpillar, Peoria, Illinois, U.S.A.

Dobrin, M.S., and Savit, J., 1988, Introduction to Geophysical Prospecting, McGraw-Hill Co., New York.

Lankston, R. W., 1990, High-resolution refraction seismic data acquisition and interpretation, in Ward, S. H., ed., Geotechnical and Environmental Geophysics, Volume I: Review and Tutorial: Society of Exploration Geophysicists, Tulsa, Oklahoma, p. 45-74.

Redpath, B. B., 1973, Seismic refraction exploration for engineering site investigations: U. S. Army Engineer Waterway Experiment Station Explosive Excavation Research Laboratory, Livermore, California, Technical Report E-73-4, 51 p.

Telford, W. M., Geldart, L.P., Sheriff, R.E., 1990, Applied Geophysics, Second Edition, Cambridge University Press.

8 TABLES AND FIGURES

	Location (ft)	NAD83, California State Plane Zone 5, US Survey Feet	
		Northing (US Feet)	Easting (US Feet)
Line 1	0	1841146	6623036
	420	1840735	6623012
Line 2	0	1841018	6622875
	300	1840993	6623168
Line 3	0	1841069	6622975
	520	1840658	6623282
Line 4	0	1841064	6623181
	530	1840555	6623284
Line 5	0	1841047	6623054
	510	1840575	6622937

Table 1 - Line Location Summary

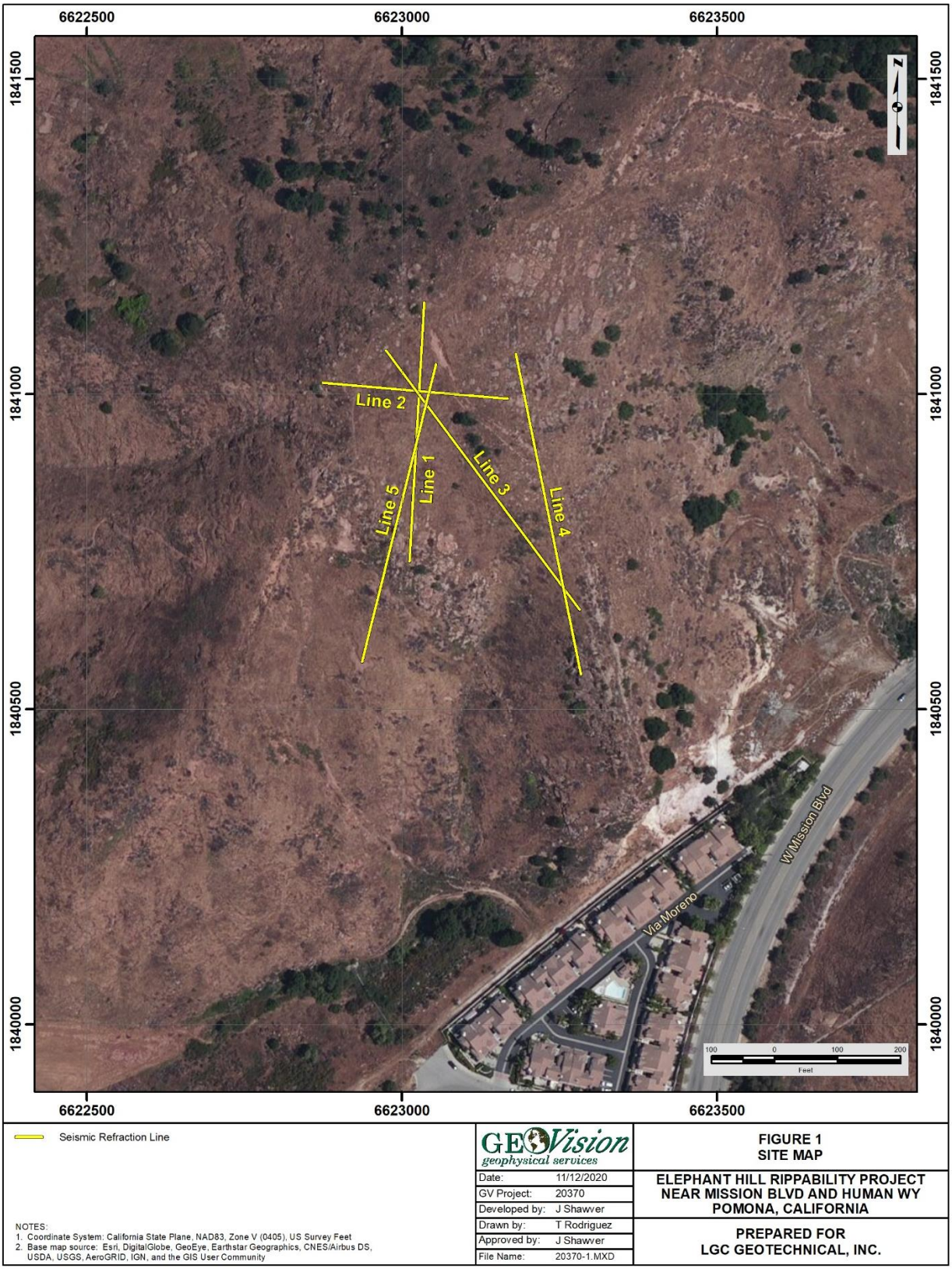


Figure 1 - Site Map

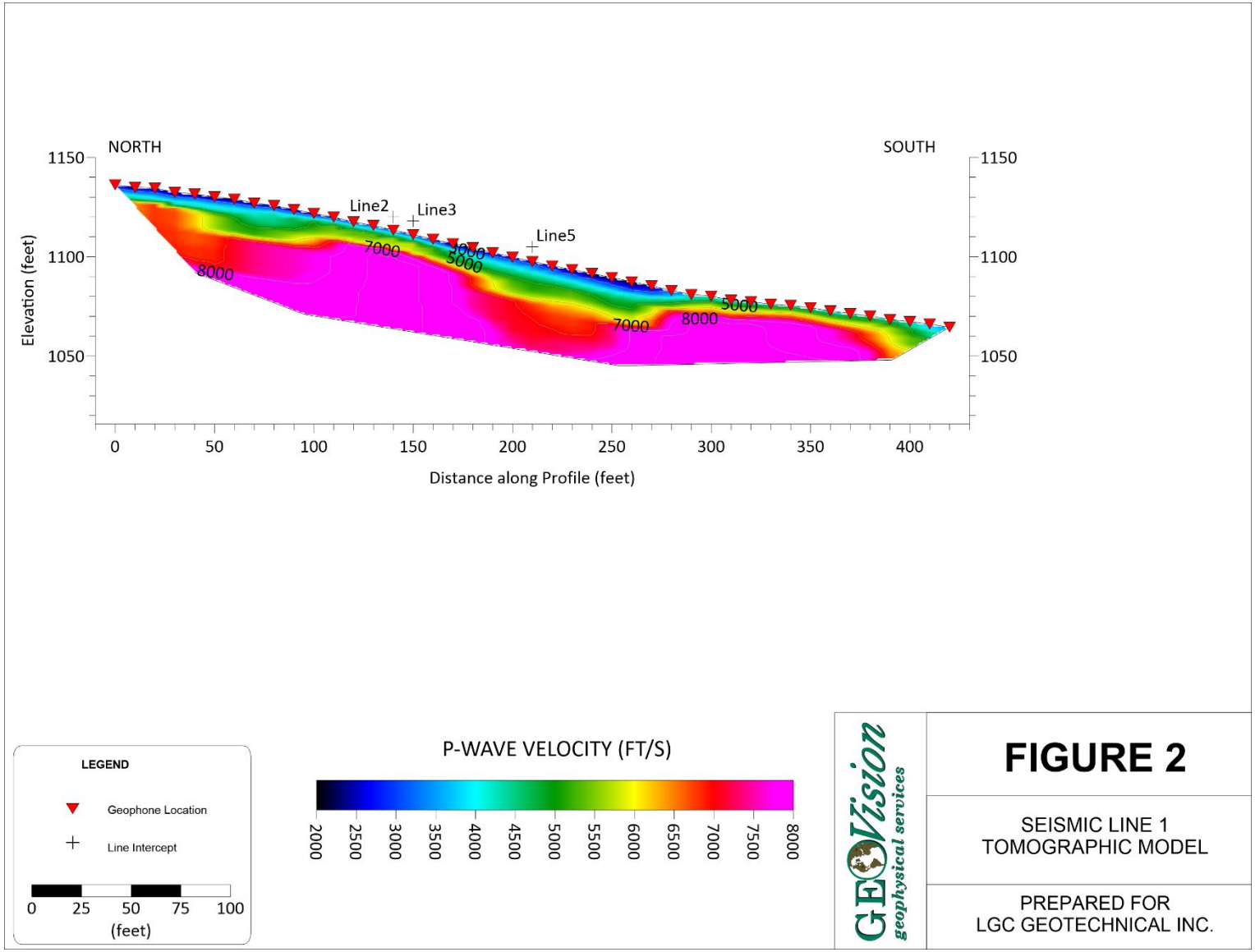


Figure 2 - Line 1 Tomographic P-Wave Refraction Models

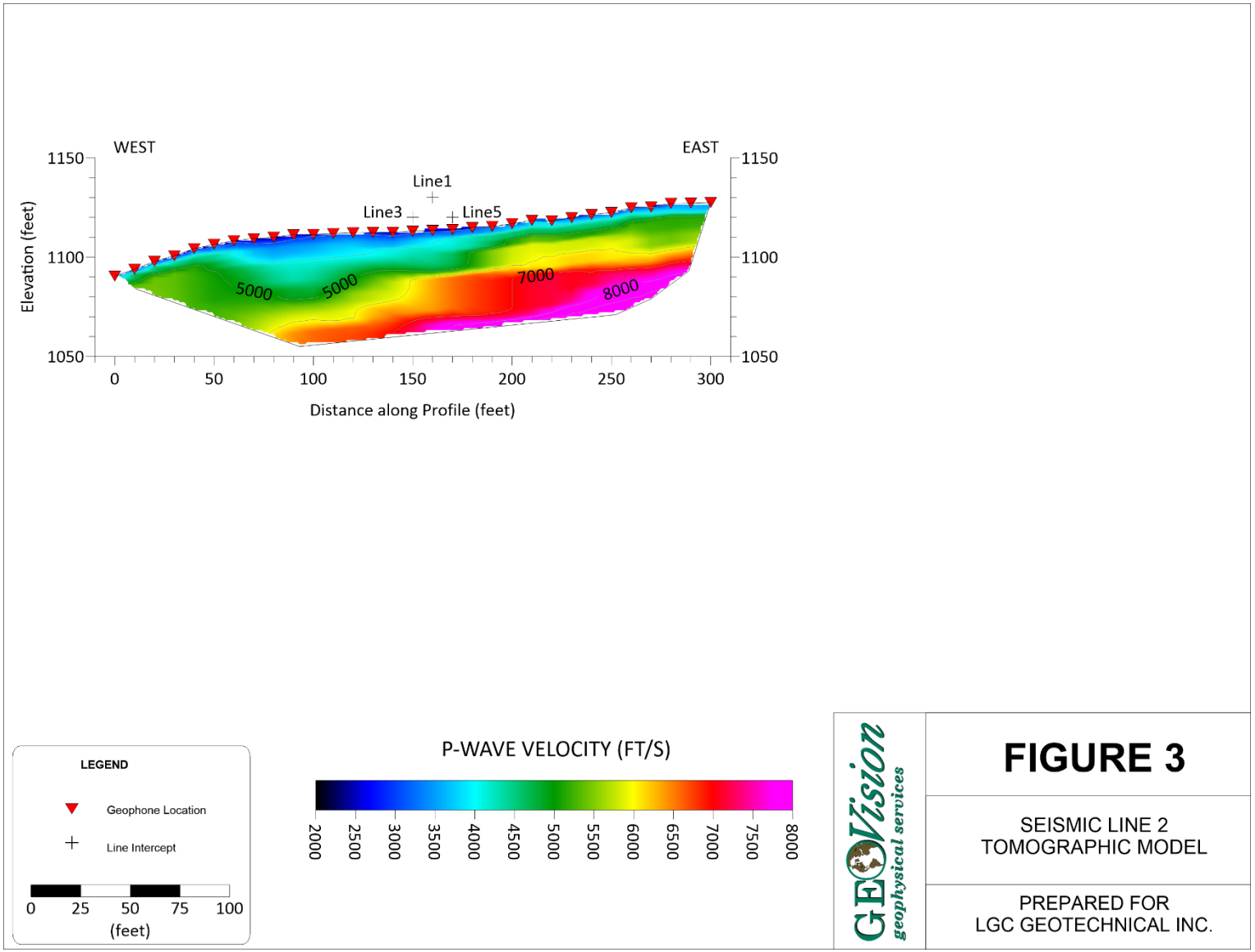


Figure 3 - Line 2 Tomographic P-Wave Refraction Models

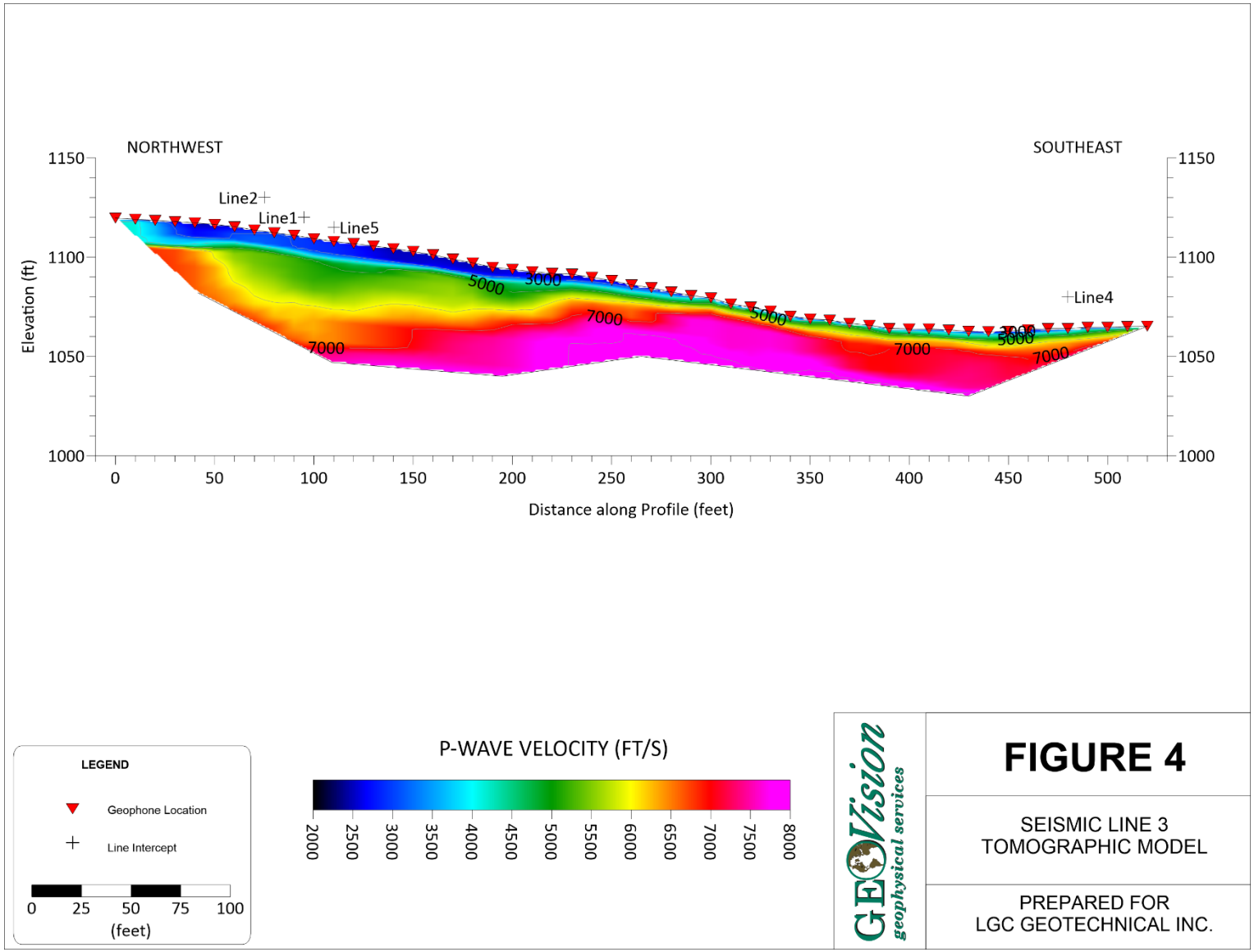


Figure 4 - Line 3 Tomographic P-Wav e Refraction Models

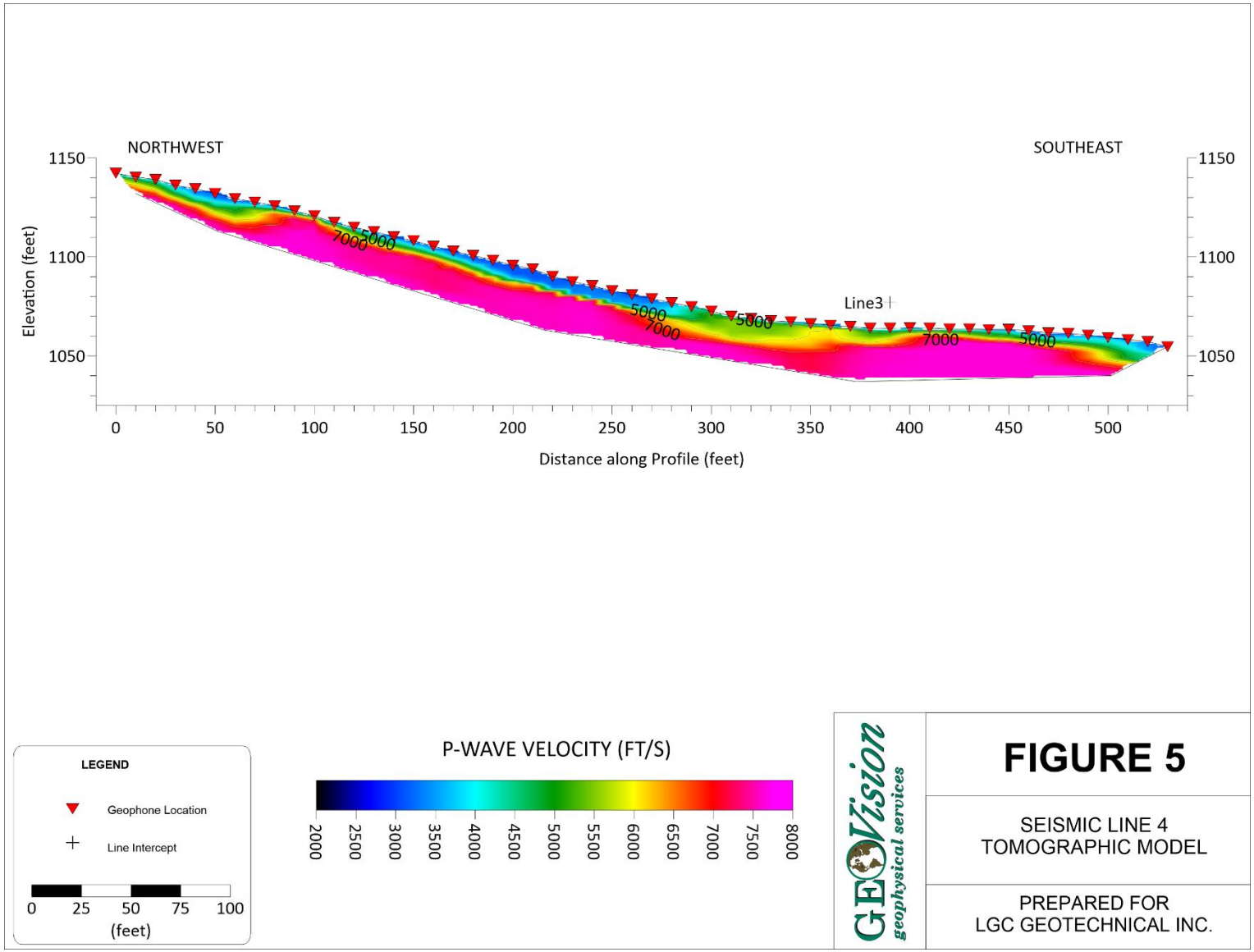


Figure 5 - Line 4 Tomographic P-Wave Refraction Models

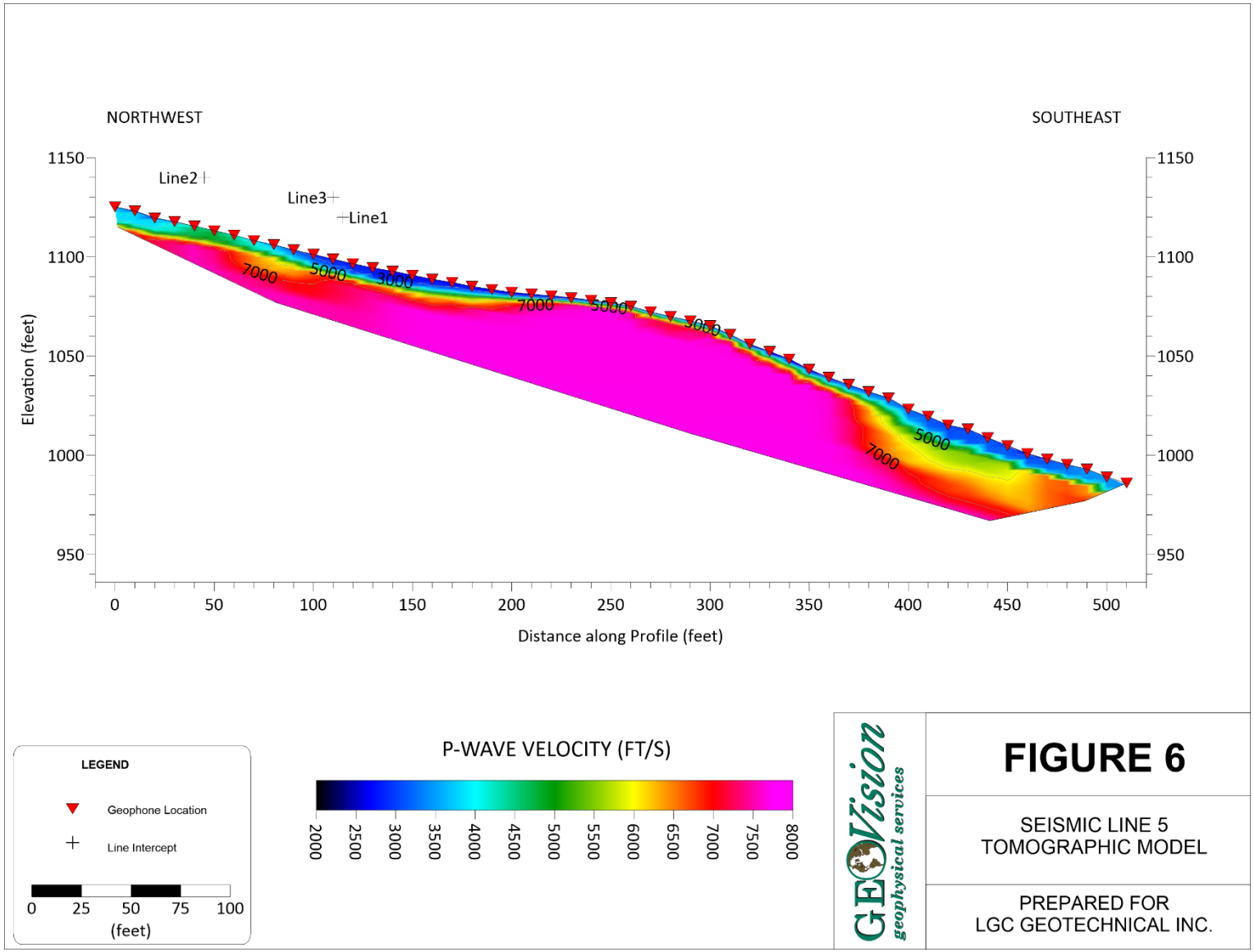


Figure 6 - Line 4 Tomographic P-Wave Refraction Models

SEISMIC REFRACTION METHOD

GEO*Vision* conducts high-resolution seismic refraction and seismic reflection surveys in support of a variety of engineering, environmental, and hydrogeologic investigations.

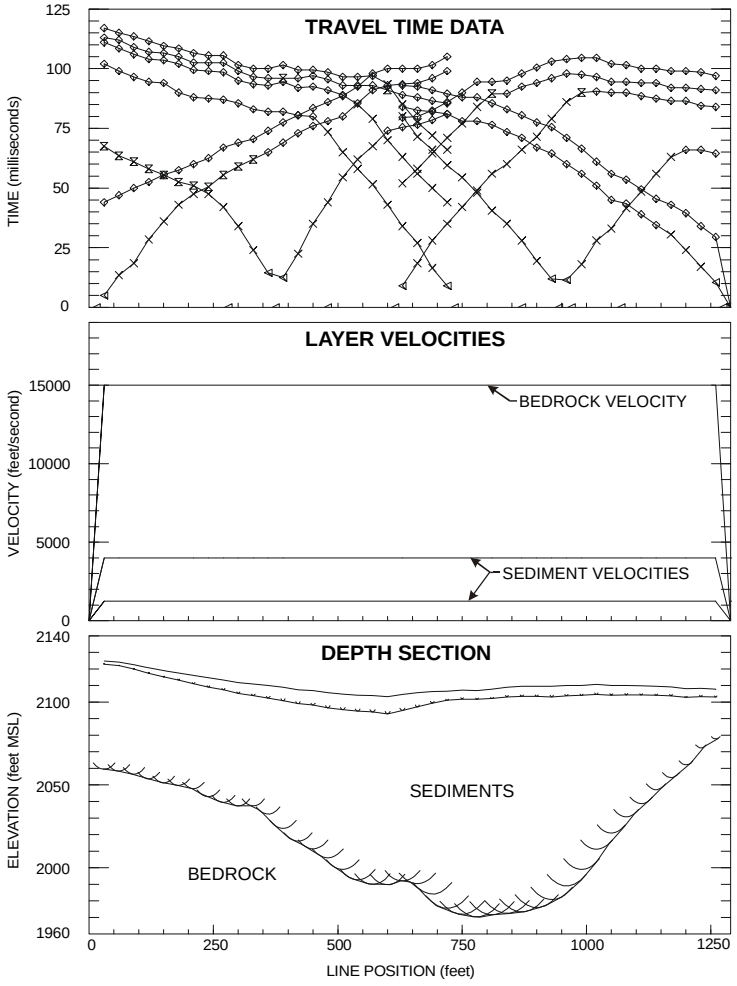
When conducting seismic surveys, acoustic energy is input to the subsurface by an energy source such as a sledgehammer impacting a metallic plate, weight drop, vibratory source, or explosive charge. The acoustic waves propagate into the subsurface at a velocity dependent upon the elastic properties of the material through which they travel. When the waves reach an interface where the density or velocity changes significantly, a portion of the energy is reflected back to the surface, and the remainder is transmitted into the lower layer. Where the velocity of the lower layer is higher than that of the upper layer, a portion of the energy is also critically refracted along the interface. Critically refracted waves travel along the interface at the velocity of the lower layer and continually refract energy back to surface. Receivers (geophones), laid out in linear array on the surface, record the incoming refracted and reflected waves. The seismic refraction method involves analysis of the travel times of the first energy to arrive at the geophones. These first arrivals are from either the direct wave (at geophones close to the source), or critically refracted waves (at geophones further from the source). The seismic reflection method involves the analysis of reflected waves, which occur later in the seismic record.

GEO*Vision* uses the seismic refraction method to:

- **Map bedrock topography**
- **Map depth to groundwater**
- **Map faults in bedrock**
- **Map faults forming groundwater barriers**
- **Characterize landslides**
- **Estimate bedrock rippability**
- **Evaluate soil and rock properties**



Seismic Refraction Survey in Mojave Desert, California using XLR8 2700 lb Accelerated Weight Drop Energy Source



Seismic Refraction Survey to Map Bedrock Topography

1124 Olympic Drive, Corona, California 92881 ph 951-549-1234 fx 951-549-1236 www.geovision.com

GEO*Vision* seismic refraction equipment includes:

- Multiple Geometrics Geode 24-channel seismographs
- Oyo DAS-1 seismograph with 144-channel capability
- Seismic refraction cables with 10 to 55 ft takeouts
- 4.5, 8 and 10 Hz geophones
- 40 and 100 kg accelerated weight drop energy sources
- Betsy downhole percussion firing rod
- Seismic Source and Gisco radio trigger modules
- High-voltage blaster

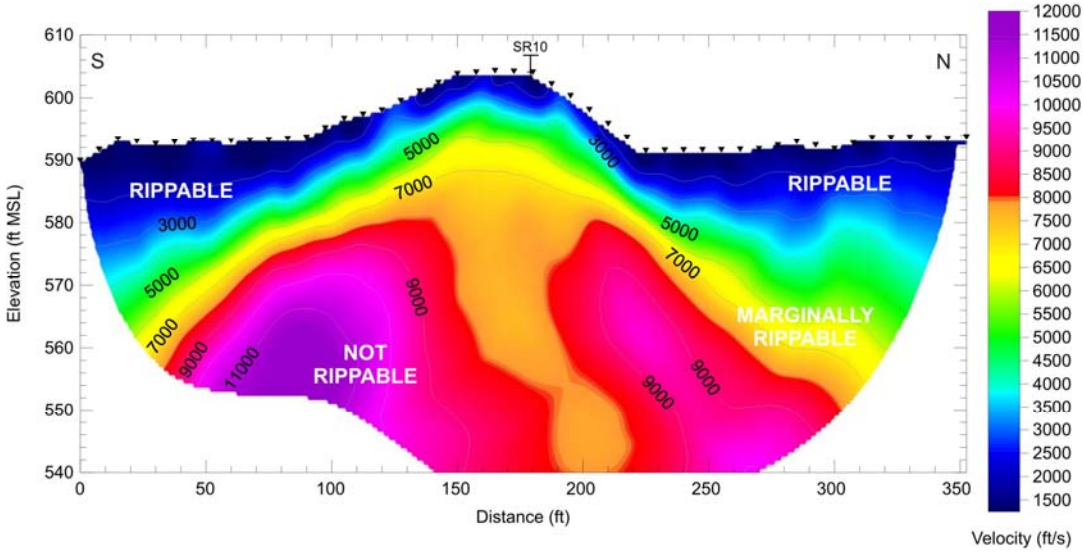


100 kg Accelerated Weight Drop



Geometrics Geode Seismographs

Analysis of seismic refraction data depends upon the complexity of the subsurface seismic velocity structure. If the subsurface target is planar in nature then the slope intercept method can be used to model multiple horizontal or dipping planar layers. A minimum of one end shot is required to model horizontal layers and reverse end shots are required to model dipping planar layers. If the subsurface target is undulating and exhibits an abrupt velocity increase (e.g. basement surface) then layer based analysis routines such as the generalized reciprocal method, delay time method, time-term method, plus-minus method and wavefront method are required to model subsurface velocity structure. These methods generally require a minimum of 5 to 7 shot points per spread (end shots, off end shots and a center shot). If subsurface velocity structure is complex and cannot be adequately modeled using layer-based modeling techniques (e.g., complex weathering profile in bedrock, numerous lateral velocity variations), then tomographic inversion techniques are best suited to model the seismic refraction data. These techniques require a high shot density (typically every 2 to 6 stations/ geophones).



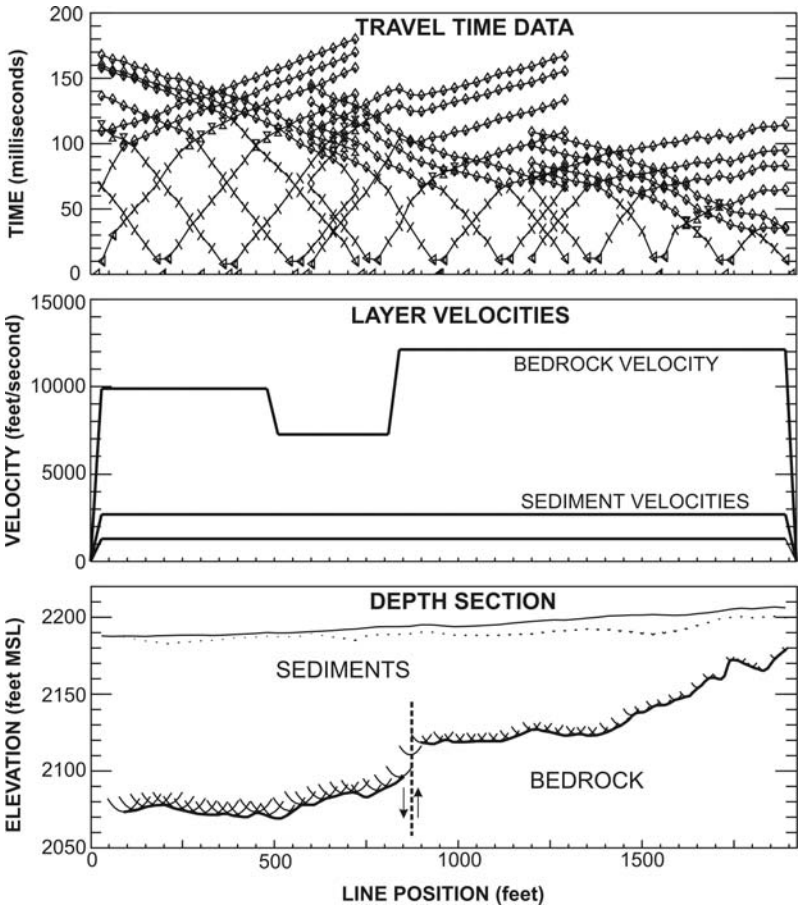
Seismic Refraction Survey to Map Bedrock Rippability

GEO*Vision* maintains several software packages to model seismic refraction data including:

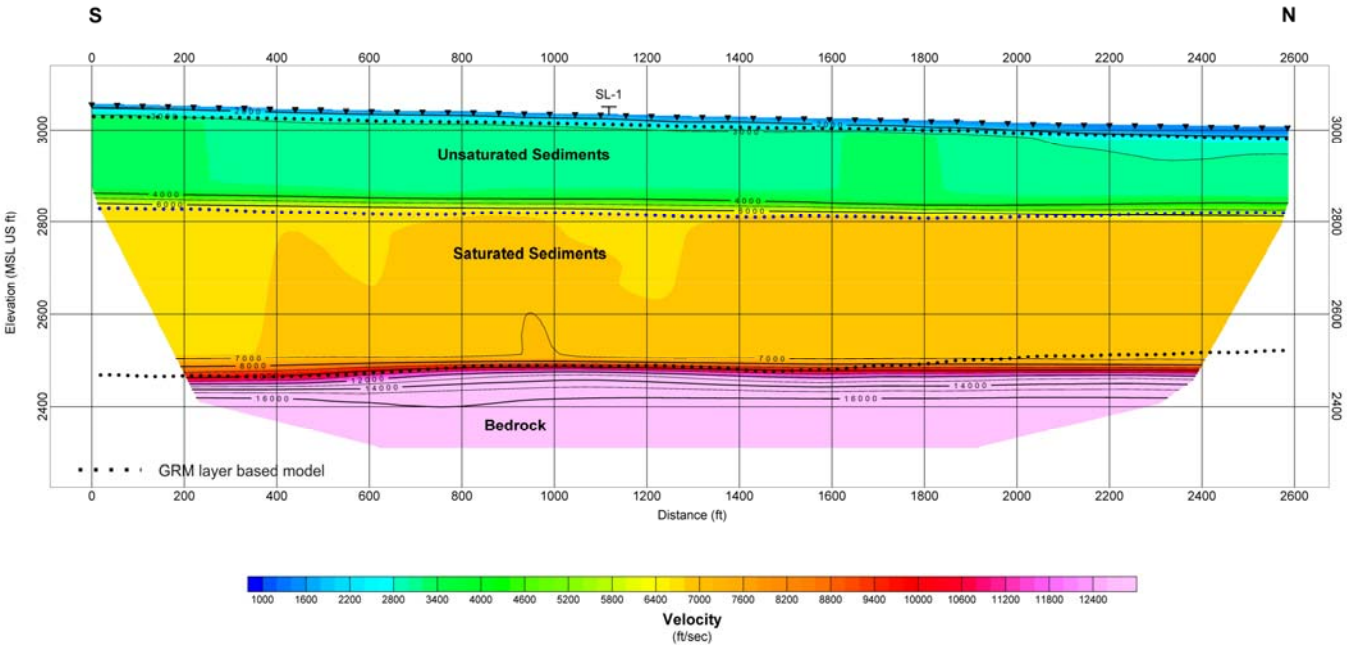
- Firstpix™ by Interpex, Ltd.
- IXrefraX by Interpex ,Ltd.
- Viewseis™ by Viewlog Systems, Ltd.
- Refract by Geogiga
- Seisimager™ by Geometrics, Inc./Oyo Corporation
- Rayfract™ by Intelligent Resources, Inc.
- SeisOpt™ Pro by Optim LLC

These software packages allow processing of seismic refraction data using the following layer based and smooth velocity model techniques:

- Generalized reciprocal method (GRM)
- Reciprocal method/delay time method
- Time-Term method
- Plus-Minus method
- Wavefront method
- Monte Carlo based inversion
- Delta t-V tomographic inversion
- Wavepath Eikonal traveltime tomographic inversion
- Nonlinear traveltime tomographic analysis



Seismic Refraction Survey to Map Bedrock Fault



Seismic Refraction Survey to Map Depth to Groundwater (200 ft deep) and Bedrock (500 to 600 ft deep) as part of a Groundwater Resources Investigation. Energy Source Consisted of XLR8 2700 lb Accelerated Weight Drop. Data modeled using Nonlinear Traveltime Tomographic Analysis with a Layer-Based Starting Model.

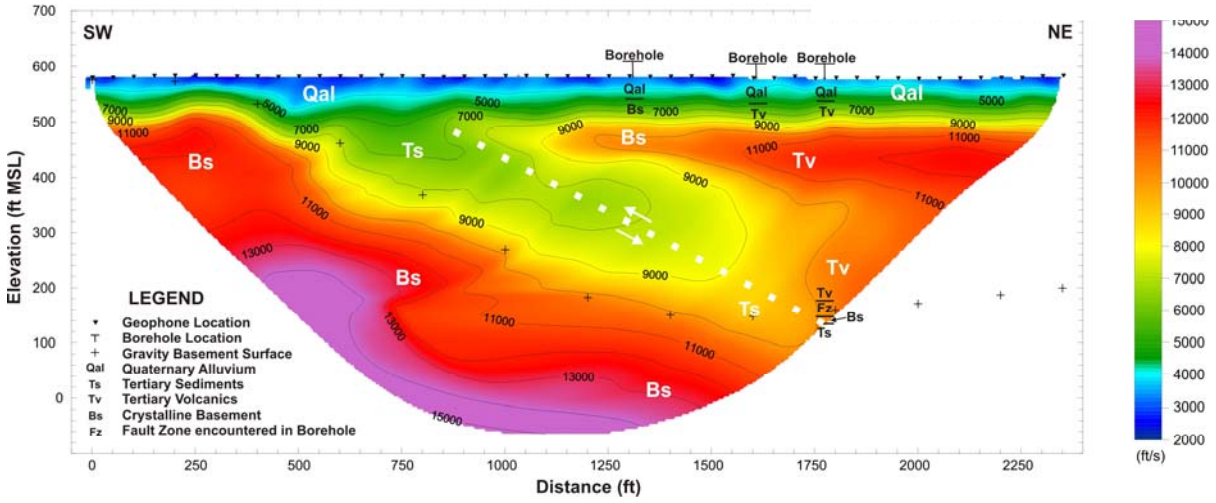
1124 Olympic Drive, Corona, California 92881 ph 951-549-1234 fx 951-549-1236 www.geovision.com



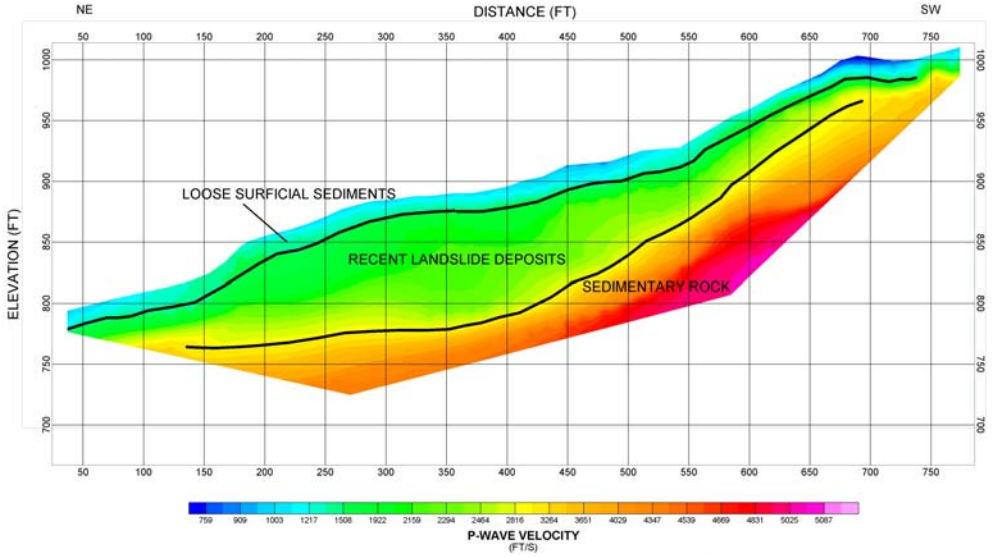
Drilling Shot Holes for Explosive Seismic Refraction Survey



Loading Explosive Charge



Seismic Refraction Imaging of Complex Geologic Structure consisting of Tertiary Volcanic Rocks and Basement Rocks Thrust over Tertiary Sediments and Basement Complex. Small Explosive Charges used as the Energy Source and Data Modeled using Wavepath Eikonal Traveltime Tomographic Inversion.



Seismic Refraction Survey to Characterize a Landslide

Subsurface Surveys & Associates, Inc.
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Phone: (760) 476-0492 Fax: (760) 476-0493

Alta California Geotechnical, Inc.
9707 Waples Street
San Diego, CA 92121

April 15, 2013

Attn: Dave Murphy

Re: Seismic Survey Summary Report
Elephant Hill Project Site – Pomona, CA

This report covers the results of a seismic refraction survey performed at the proposed Elephant Hill Development Site in Pomona, California. The purpose of the survey was to measure the compressional wave velocity of bedrock for rippability assessment and to provide cross sections showing thickness of the weathered zone and depth to the unweathered interface. This should be useful for planning cuts and other earthwork.

The field work was conducted on March 28, 2013. Five seismic lines were recorded at locations selected by Alta. A survey location map is provided on Figure 1 that shows the position and orientation of the traverses.

GEOLOGIC SETTING

A review of the "Geologic Map of California, San Bernardino Quadrangle", (California Division of Mines and Geology, 1988) indicates the local area is underlain by Glendora Volcanics (andesite, basalt, and rhyolite) of Miocene age and Cretaceous quartz diorite. Surface deposits are mainly colluvium and loose rock on the hillsides.

DATA ACQUISITION AND FIELD METHODS

Seismic refraction data were recorded with a Bison 9024 signal enhancement seismograph and 30 Hz geophones. The standard spread layout used 24 geophones with a 10-20 foot spacing. Each spread used five shotpoints, one off each end (10-foot offset) and three within the interior of the spread. Depth of investigation was approximately 90-110 feet for lines that used a 20-foot spacing and about 50 to 60 feet for lines laid out with 10-foot spacing.

Compressional wave energy was created by sledge hammer impacts on a metal plate. The signal enhancement feature of the seismograph allowed returns from repeated hits to be stacked, thus improving the signal. Noise from the adjacent freeway was a problem during the survey. Records from Lines 1 and 5 were the most affected and numerous shots had to be taken to obtain usable data.

Each record was stored digitally on an internal hard disk and printed copies of each seismogram were made in the field on thermal paper. Example seismic records from this survey are shown on Figure 2.

Relative elevations of all shotpoints and geophones were determined by differential leveling with a hand level. Geophone 1 (distance = 0 ft.) at the beginning of each line was assigned an elevation value based on data from Google Earth maps (licensed version). All other elevation measurements along the line are relative to this point.

The endpoints of each seismic line are marked by a labeled wooden stake. The latitude and longitude coordinates of the stakes were recorded with a hand held Garmin GPS receiver and used to prepare the line location map on Figure 1.

SEISMIC REFRACTION METHOD

The refraction method involves measuring the total time for compressional waves to travel from a shotpoint through the subsurface to a set of geophones placed linearly along the ground. Based on Snell's Law, when two or more layers are present with increasingly higher acoustic velocity, waves become critically refracted across the layer boundaries and begin traveling at the speed of the underlying layer. The advancing waves then generate new wavefronts back to the ground surface. The first surge of energy hitting the geophone is termed the "first arrival" and is depicted on the seismogram as a high angle deflection along each trace. Example field records from this survey that show the first arriving energy are provided on Figure 2.

Recognition of direct wave arrivals (non-refracted) verses refracted waves is a key element of refraction interpretation. To assist this process, the first arrival times measured from the seismic records are plotted on graphs of time verses distance called Time-Distance graphs. An example T-D graph from Line 1 is shown on Figure 3. Based on changes in slope on the graphs, a preliminary layer number (i.e. 1, 2, 3) is assigned to each segment of the graph. The layer assignments together with time, distance and elevation data are input to a computer for additional processing.

DATA REDUCTION AND VELOCITY DETERMINATION

Seismic data from this survey was processed using two methods for generating seismic velocity cross sections. One method produces layered earth models and uses the average velocity across the spread to calculate the thickness of the layers. This is the most widely used approach for rippability surveys because depths to refracting (velocity) horizons can be measured directly fro the cross sections. Layered models are best applied when there is not a significant lateral variation in velocity along the line and the layer interfaces are relatively flat.

The second modeling approach uses what is referred to as tomographic inversion and produces velocity gradient cross sections in color. Tomography does not perform refraction layer

calculations or attempt to measure discrete depths. Instead, the main objective is to create a velocity distribution grid in the subsurface. Each node of the grid has a specific velocity associated with it. The goal is to adjust or "iterate" the velocity matrix so that the computer derived travel-time curves match what was recorded in the field. The final velocity grid is then loaded into a contouring program that produces color-filled cross sections. This method is typically used for imaging the shape and configuration of complex structures such as faults, landslides and intrusions, and areas where strong lateral velocity gradients are suspected within the weathered profile.

Layered Models

Processing and interpretation of this data set was accomplished with "SIPT2", an interactive inversion modeling program developed by James Scott for the U.S. Bureau of Mines. The inversion algorithm uses the delay time method to construct a first pass depth model. The model is then adjusted by an iterative ray tracing process that attempts to minimize the discrepancies between the total travel times calculated along ray paths and the observed travel times measured in the field.

This program calculates refractor velocity in two ways. First, apparent velocities from each shot are determined by the inverse slope of a best fit (least squares) line through datum-corrected travel times. True velocity is estimated from the apparent velocities by using the following equation:

$$Vt = 2(Vu \times Vd)/(Vu + Vd)$$

where Vt = true velocity
Vu = apparent up dip velocity
Vd = apparent down dip velocity

The second method uses a more sophisticated set of equations (the Hobson-Overton formula) developed by the Canadian Geological Survey. The final velocity assigned to the refractor is a weighted average of the results of the two methods. The weighting is based on the number of arrival times used in the computations.

Velocity Gradient Models

The tomographic modeling program used for this survey is SeisOpt Version 3.5 from Optim LLC. It uses a proprietary inversion algorithm that applies a non-linear optimization technique called generalized simulated annealing to adjust the velocity grid points for the best statistical match. It is referred to as an optimization because it attempts to find the model that has the least minimum travel-time error between the calculated and observed (field) measurements.

SUMMARY OF RESULTS

Data from the survey were processed using our standard layer modeling software for rippability surveys. Results from refraction analysis show a three layer solution beneath Lines 1, 2, 4, and 5. On Line 3, the depth to layer 3 was greater than the depth of investigation (approximately 75 feet) consequently the velocity cross section was compiled as a two layer model.

Velocities posted on the cross sections represent averages as described in the previous section. Therefore, minor localized changes in velocity may occur along any profile. A description of the layers is provided below and a cross section summary is shown in Table 1.

Layer 1 - is mostly colluvium but may include highly decomposed and fractured bedrock.

Layer 2 - is interpreted to be weathered bedrock. The velocity range is 4628 - 5974 ft/sec and is considered rippable with a Caterpillar D-9.

Layer 3 - represents hard slightly weathered to unweathered bedrock.

Table 1. Cross Section Summary

Line	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Depth Range Layer 2/3 Interface
1	2836	4628	8239	75 - 103
2	2317	5166	7988	33 - 80
3	1896	4765	ND	> 75
4	2092	5974	11511	16 - 53
5	1818	4635	7951	44 to > 60

Velocity in (ft/sec), Depth in (feet)
ND - not detected

Weathering tends to be gradational for most rock types and usually produces a gradual increase in velocity with depth. Consequently, variation of $\pm$ 10% from the posted averages may occur between the top and bottom of Layer 2.

Figure 4 presents a rippability chart (courtesy of Caterpillar Tractor Co.) for a D9R Ripper. Bar graphs show the relationship between seismic compressional wave velocity and ripper performance for various rock types in three categories: rippable, marginal, and non-rippable. Basalt is listed as marginally rippable at approximately 7600 ft/sec and is considered non-rippable above 8600 ft/sec. This chart is provided only as a guide and should not be considered absolute. Other geologic factors that may influence bedrock rippability at this site include changes in composition of the volcanics and the presence of fractures and joints.

Data from Lines 4 showed high velocity gradients, both lateral and vertically. To provide better resolution and imaging of the velocity structure, a more robust modeling approach was applied that uses tomographic inversion processing. Results are displayed on Figure 9. The color cross section shows velocities in the marginal to unrippable range at depths of 20 - 30 feet beneath the southwest end of Line 4. This is most likely due to a change in volcanic rock type, or possibly, a zone of older quartz diorite.

All data acquired during this survey is considered confidential and is available for review by your staff at any time. We appreciate the opportunity to participate in this project.

Please call if there are any questions.

PAWalen

Phillip A. Walen
Senior Geophysicist
CA Registration No. GP917

Seismic Survey Location Map

Elephant Hill Project Site -- Pomona, California



Figure 1

Example Seismic Field Records

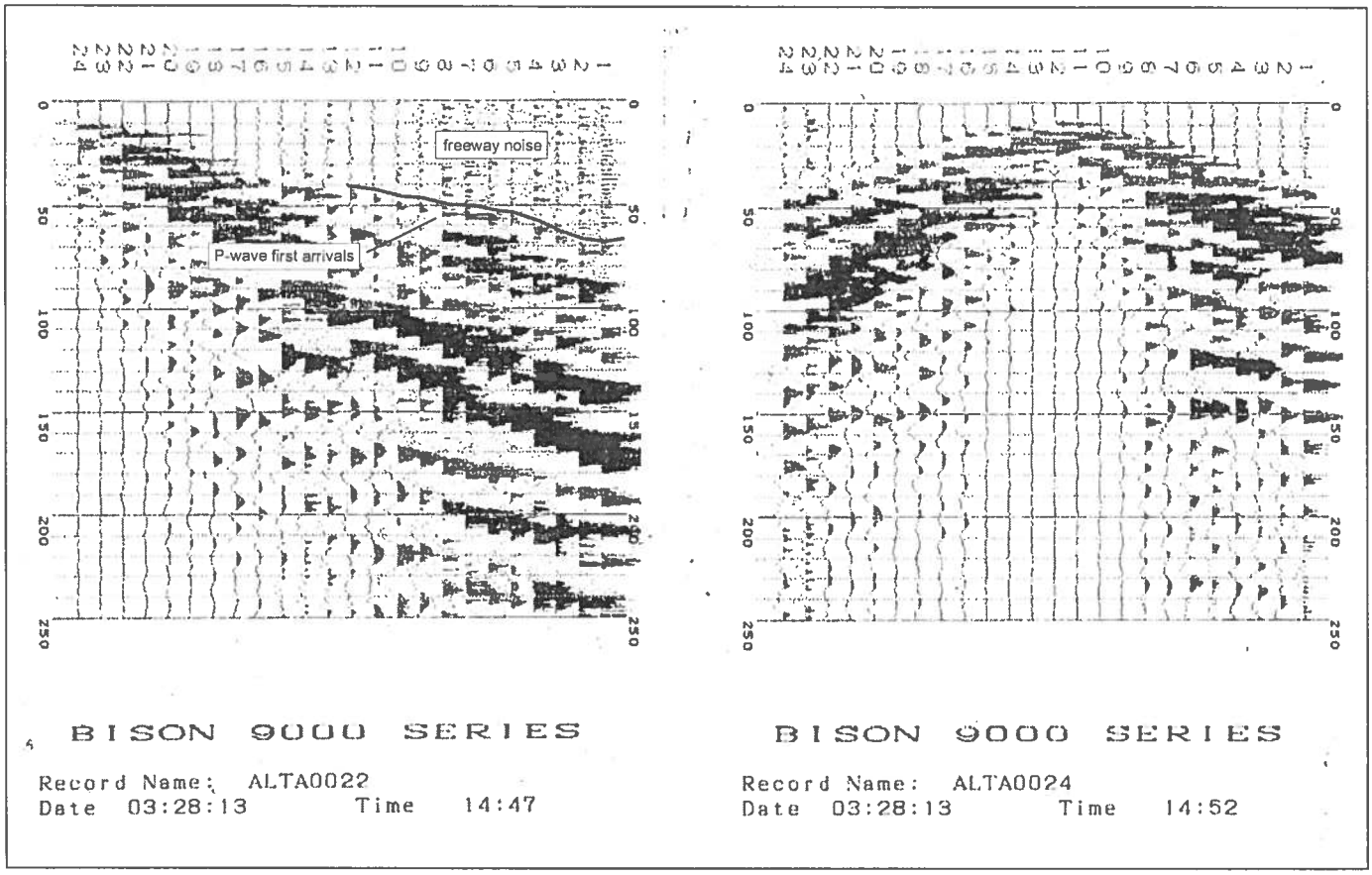
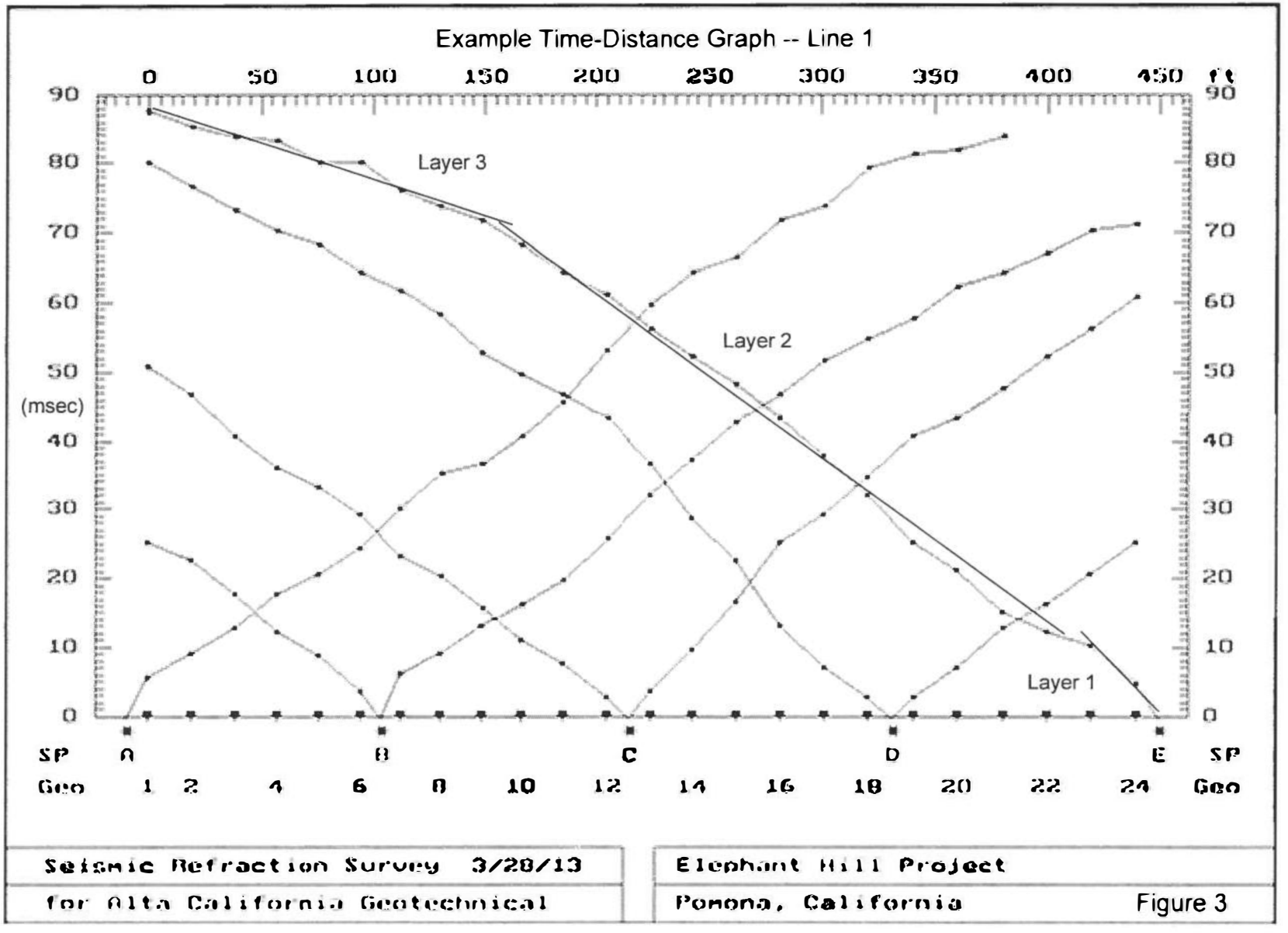


Figure 2



Seismic Refraction Survey 3/28/13
for Alta California Geotechnical

Elephant Hill Project
Pomona, California

Figure 3

Rippers | Ripper Performance
• D9R/D9T

D9R/D9T
- **Multi or Single Shank No. 9 Ripper**
- **Estimated by Seismic Wave Velocities**

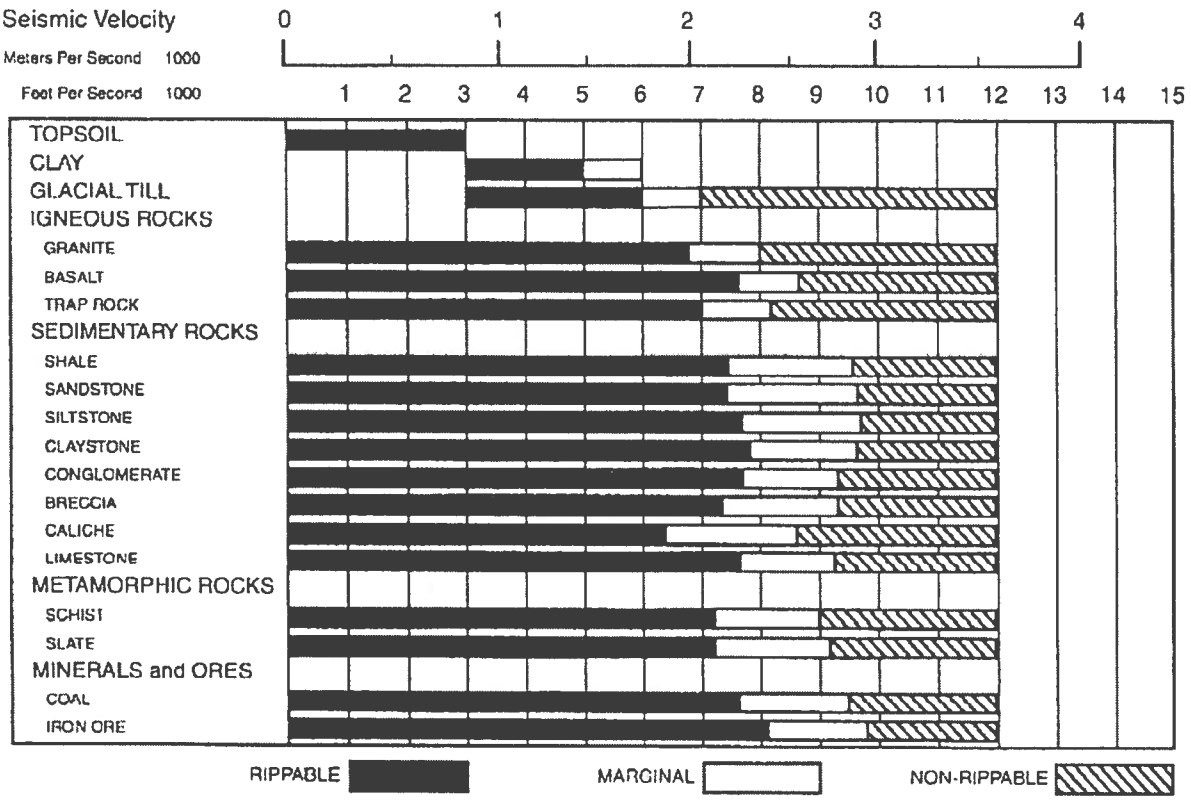
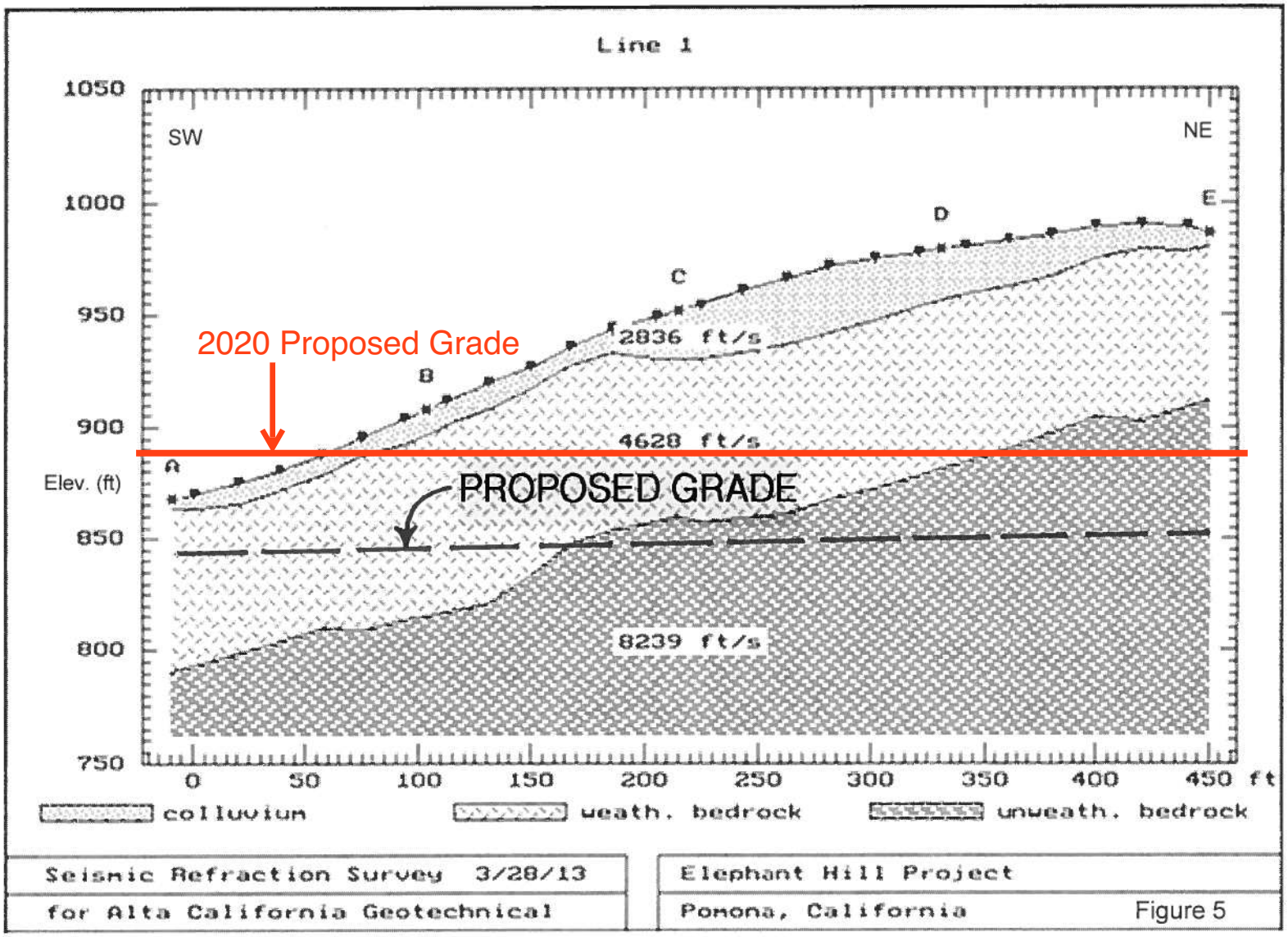
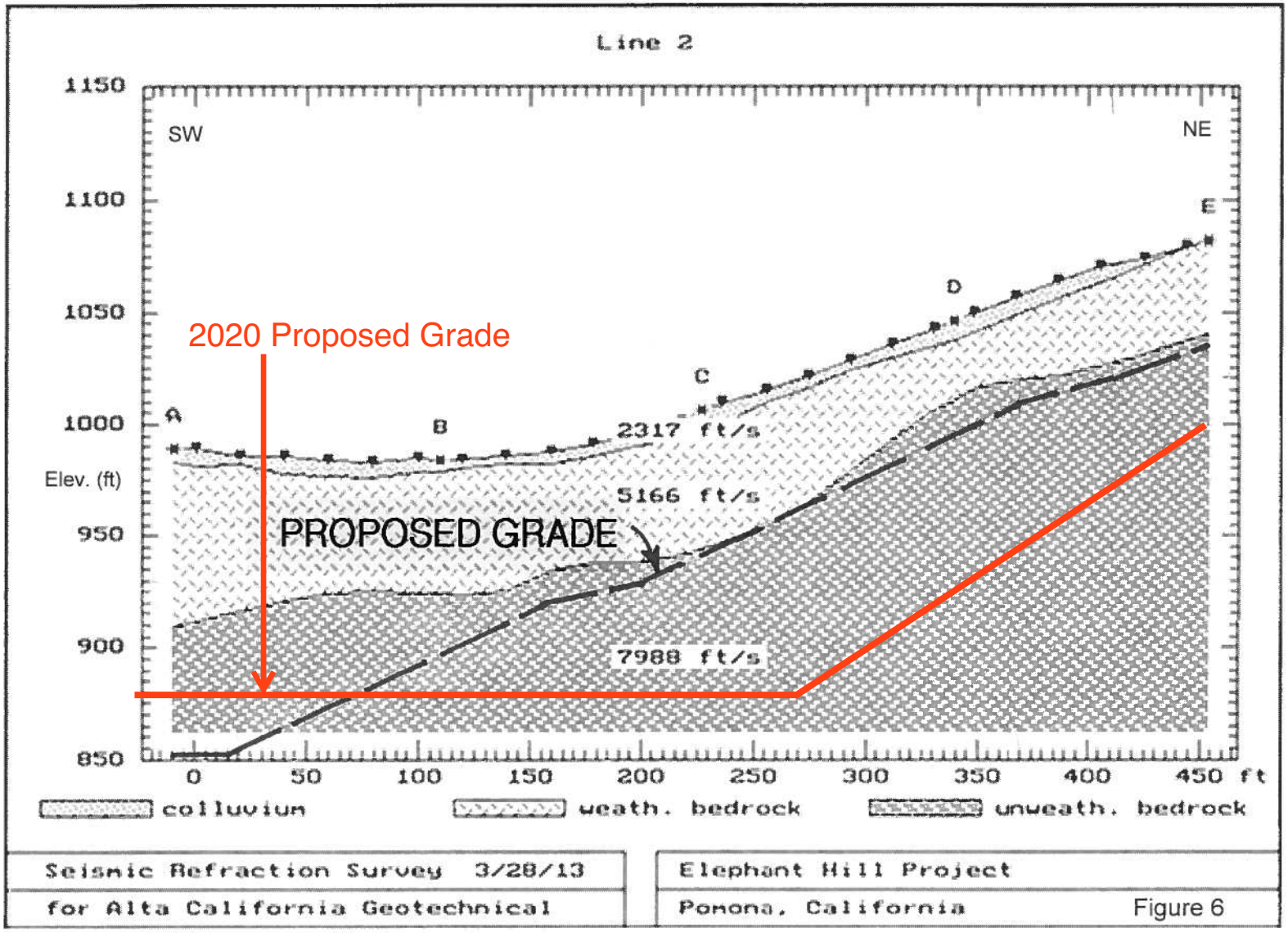


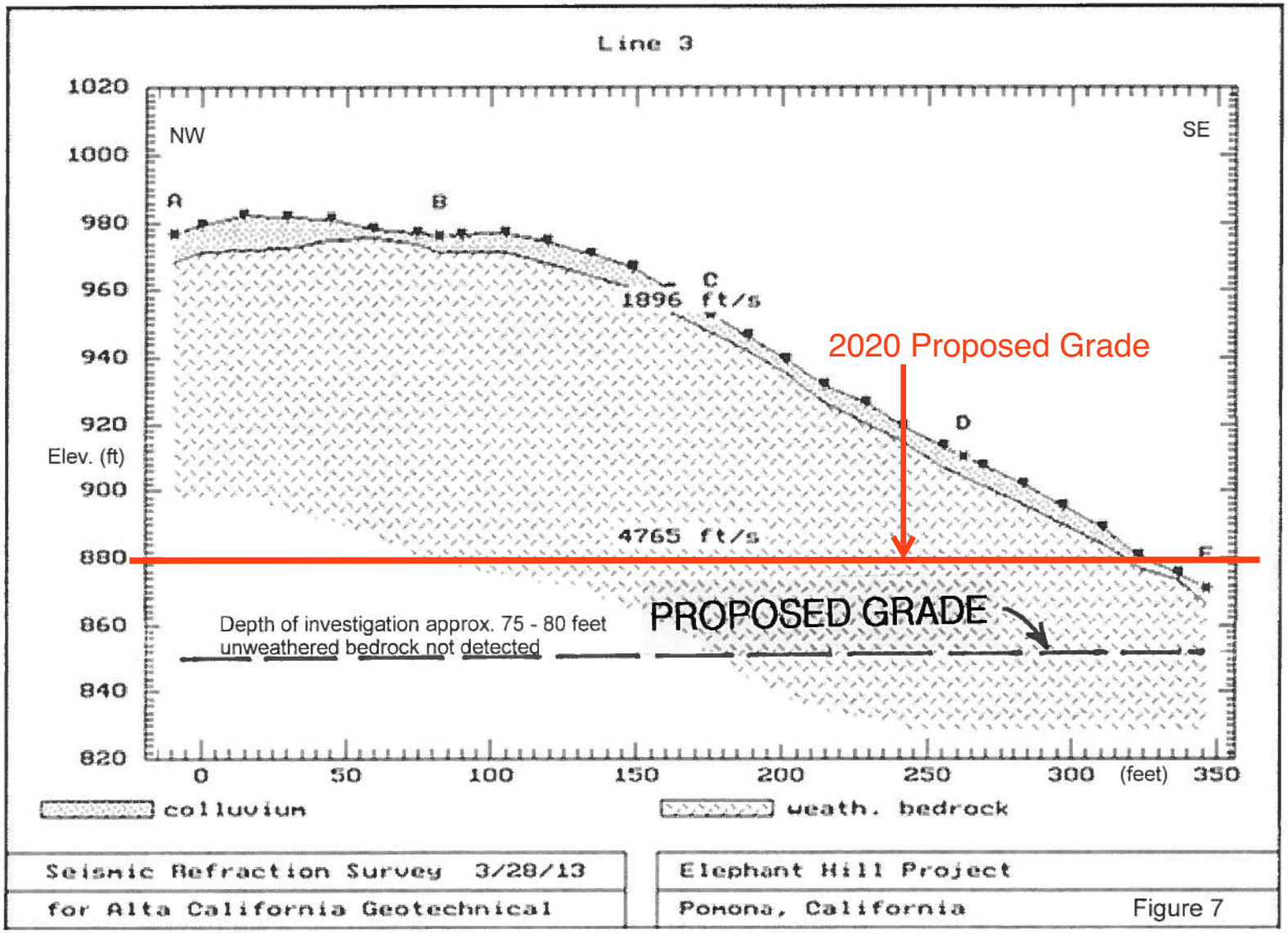
Figure 4



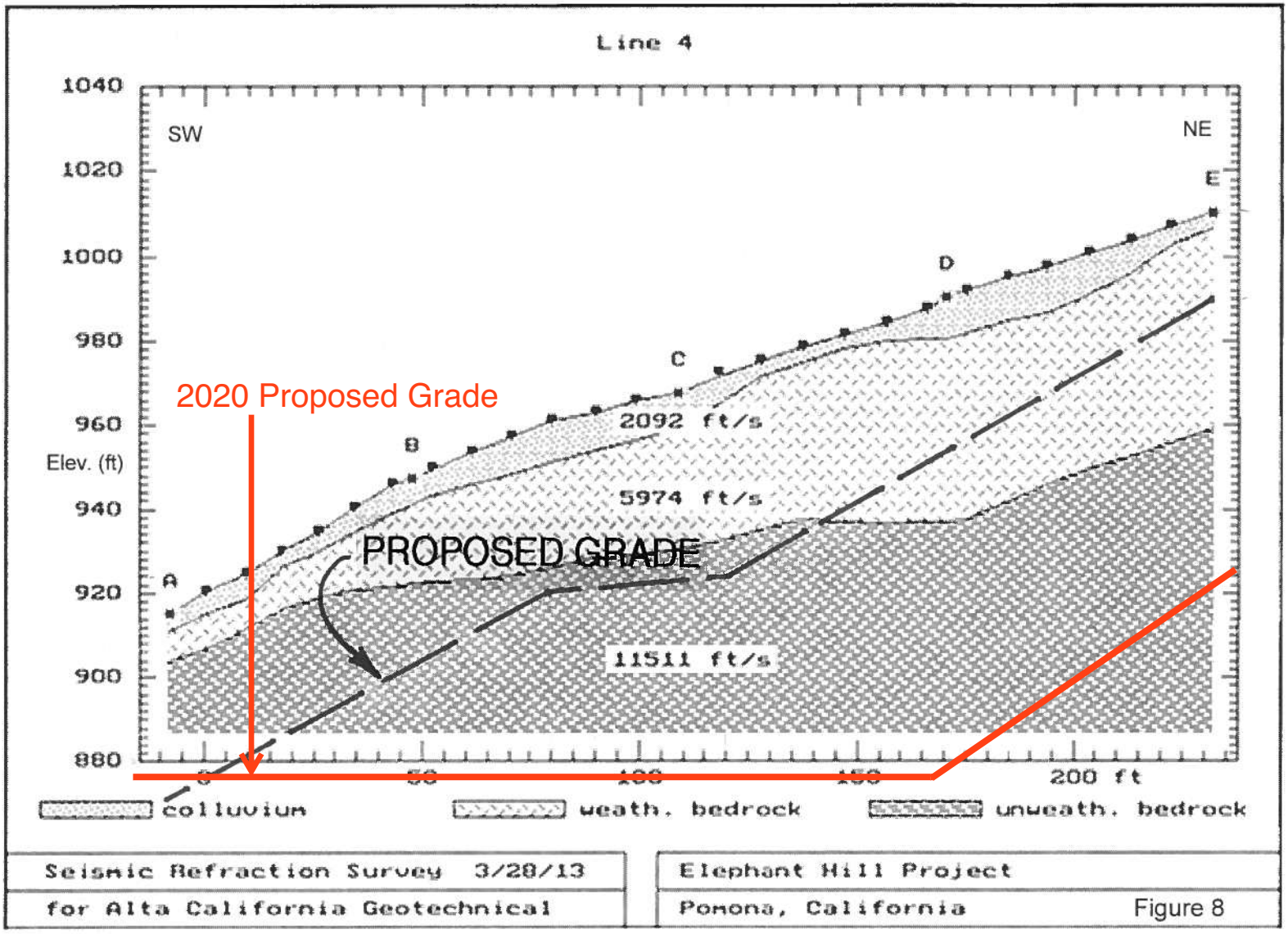
Seismic Refraction Survey 3/28/13	Elephant Hill Project
for Alta California Geotechnical	Pomona, California Figure 5



Seismic Refraction Survey 3/28/13	Elephant Hill Project
for Alta California Geotechnical	Pomona, California Figure 6



Seismic Refraction Survey 3/28/13	Elephant Hill Project
for Alta California Geotechnical	Pomona, California Figure 7

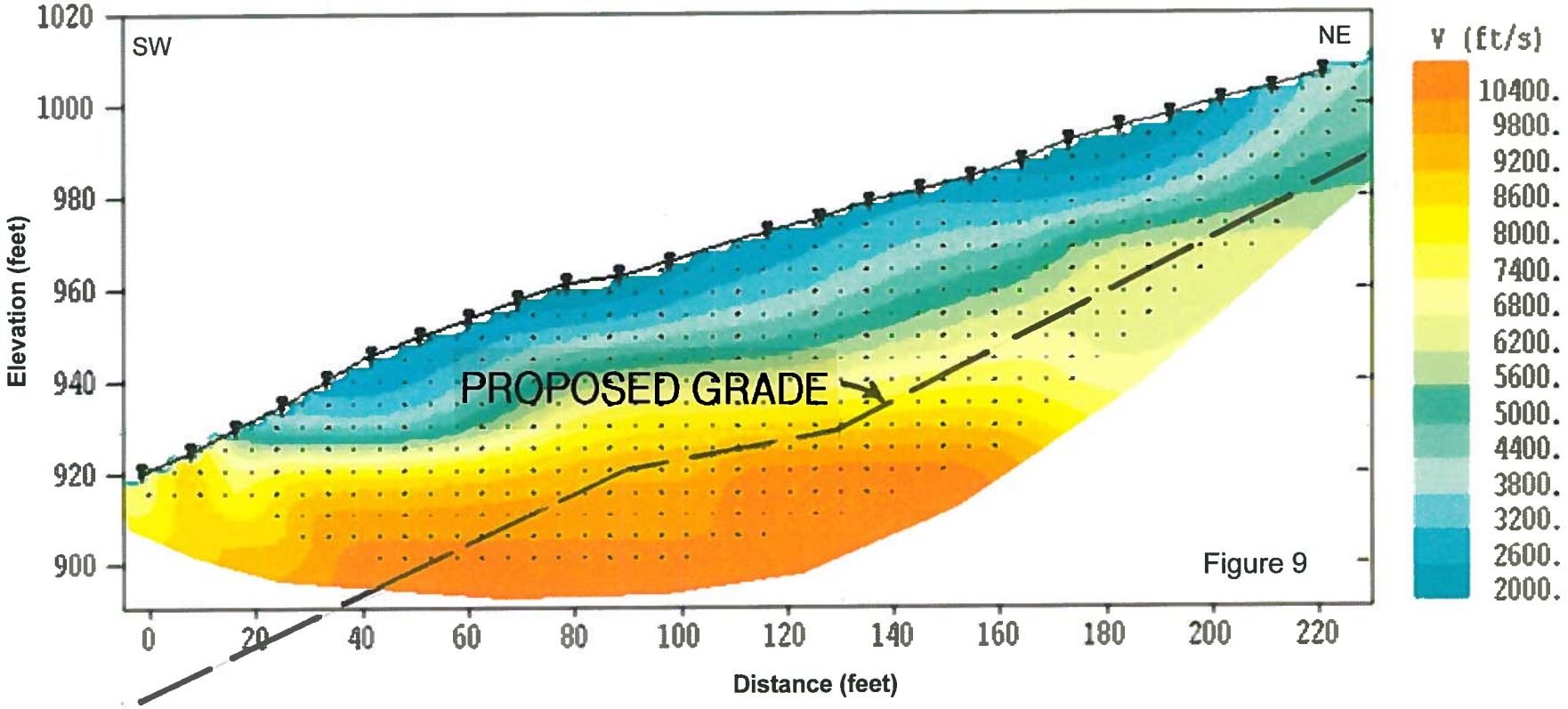


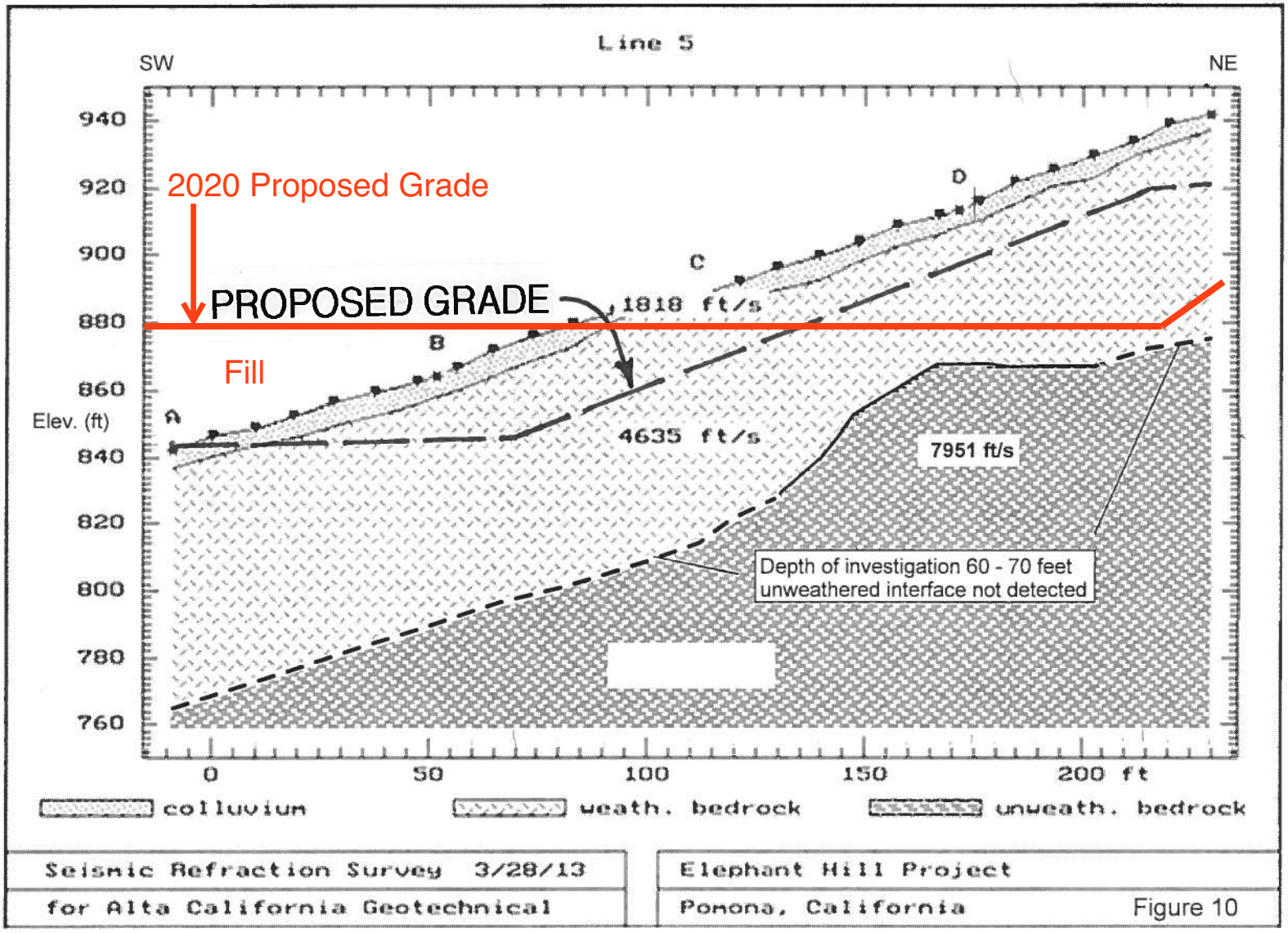
Seismic Refraction Survey 3/28/13
for Alta California Geotechnical

Elephant Hill Project
Pomona, California

Figure 8

Velocity Gradient Model -- Line 4





Seismic Refraction Survey 3/28/13
for Alta California Geotechnical

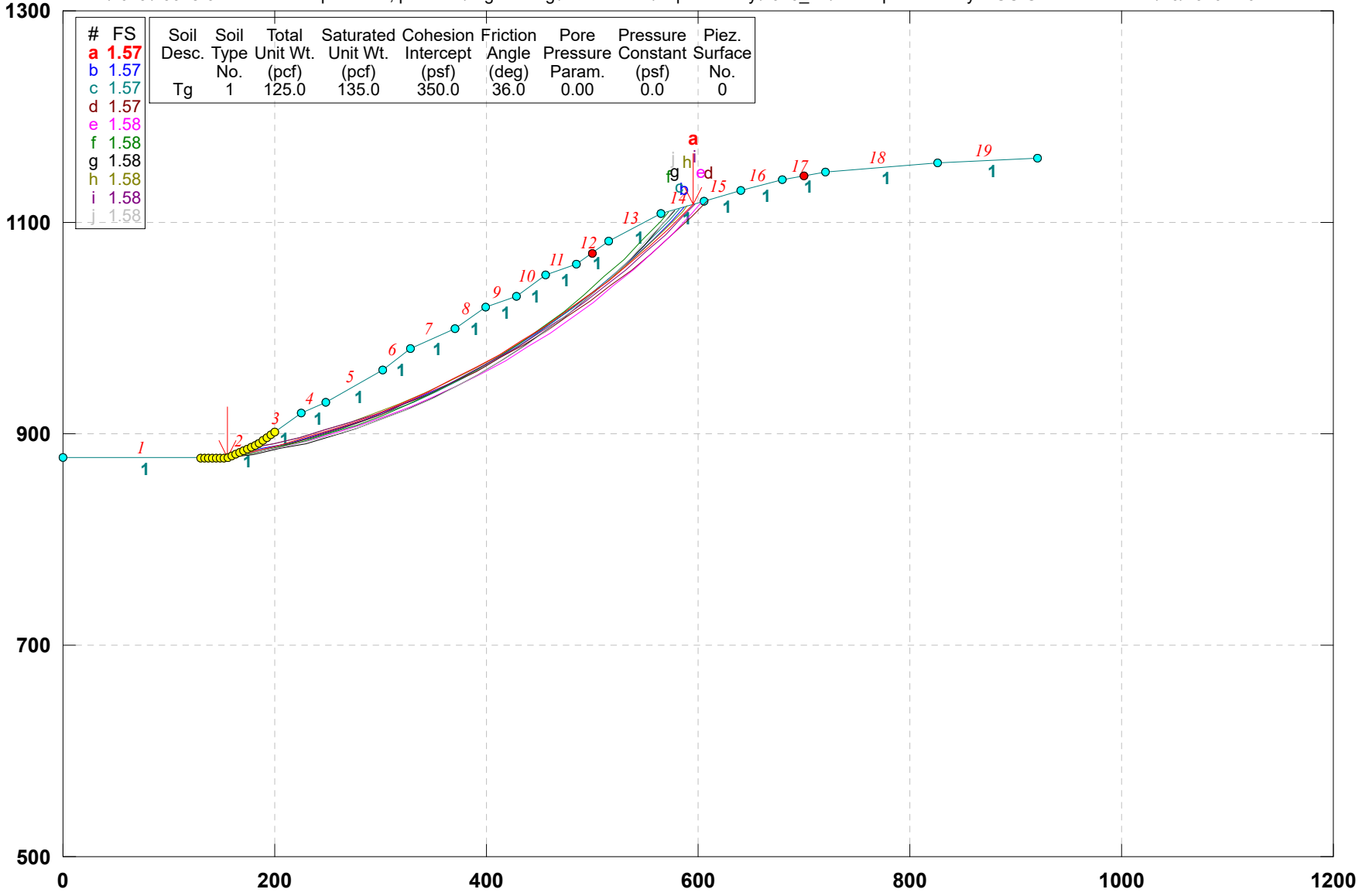
Elephant Hill Project
Pomona, California

Figure 10

Appendix D
Preliminary Slope Stability

Trumark / Elephant Hill / 19048-01 / A-A' Proposed / Circular / Static

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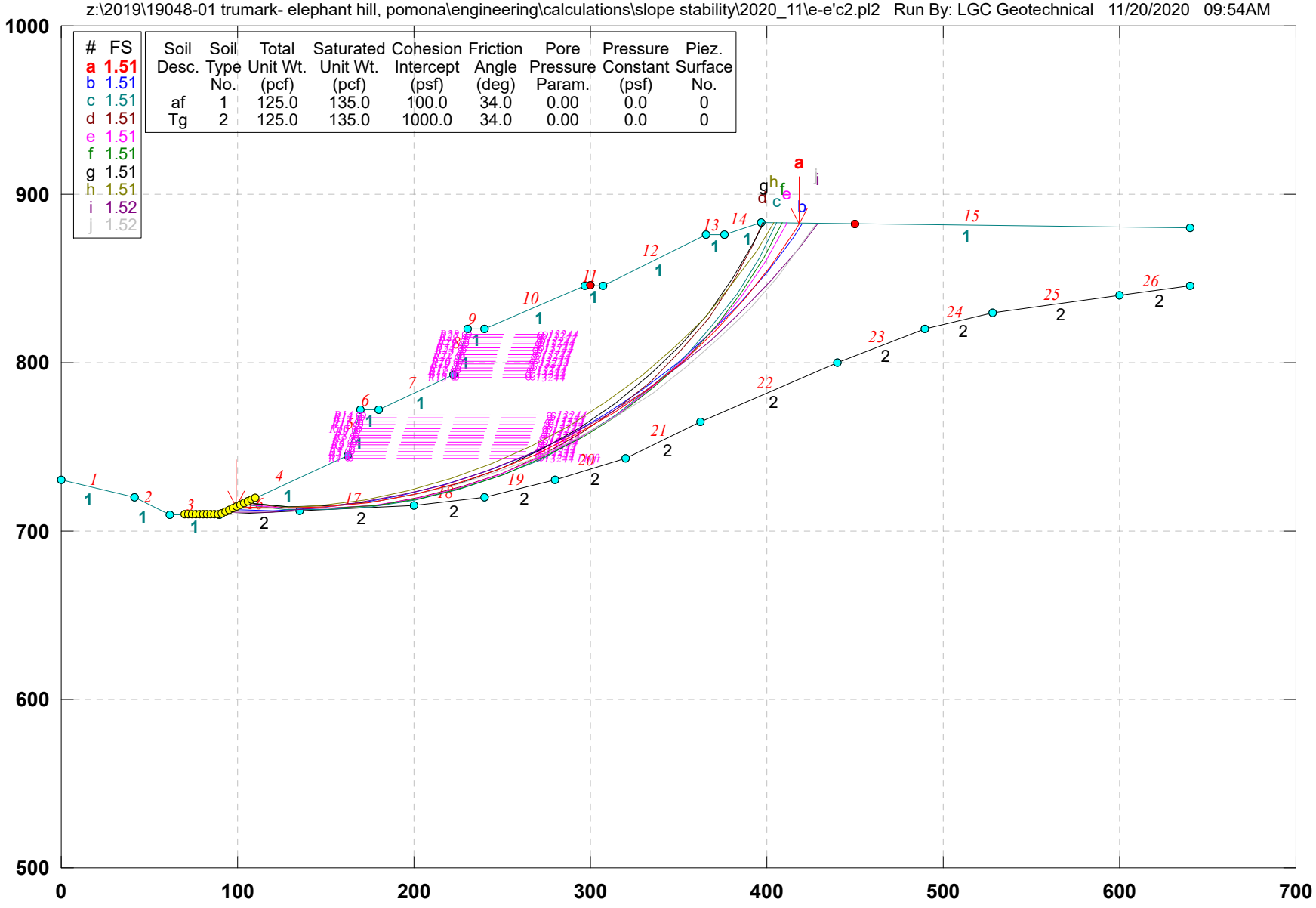
Safety Factors Are Calculated By The Modified Bishop Method

Trumark / Elephant Hill / 19048-01 / Proposed / Circ / Static / Lower Grid

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d	1.51
e	1.51
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g	1.51
h	1.51
i	1.52
j	1.52

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
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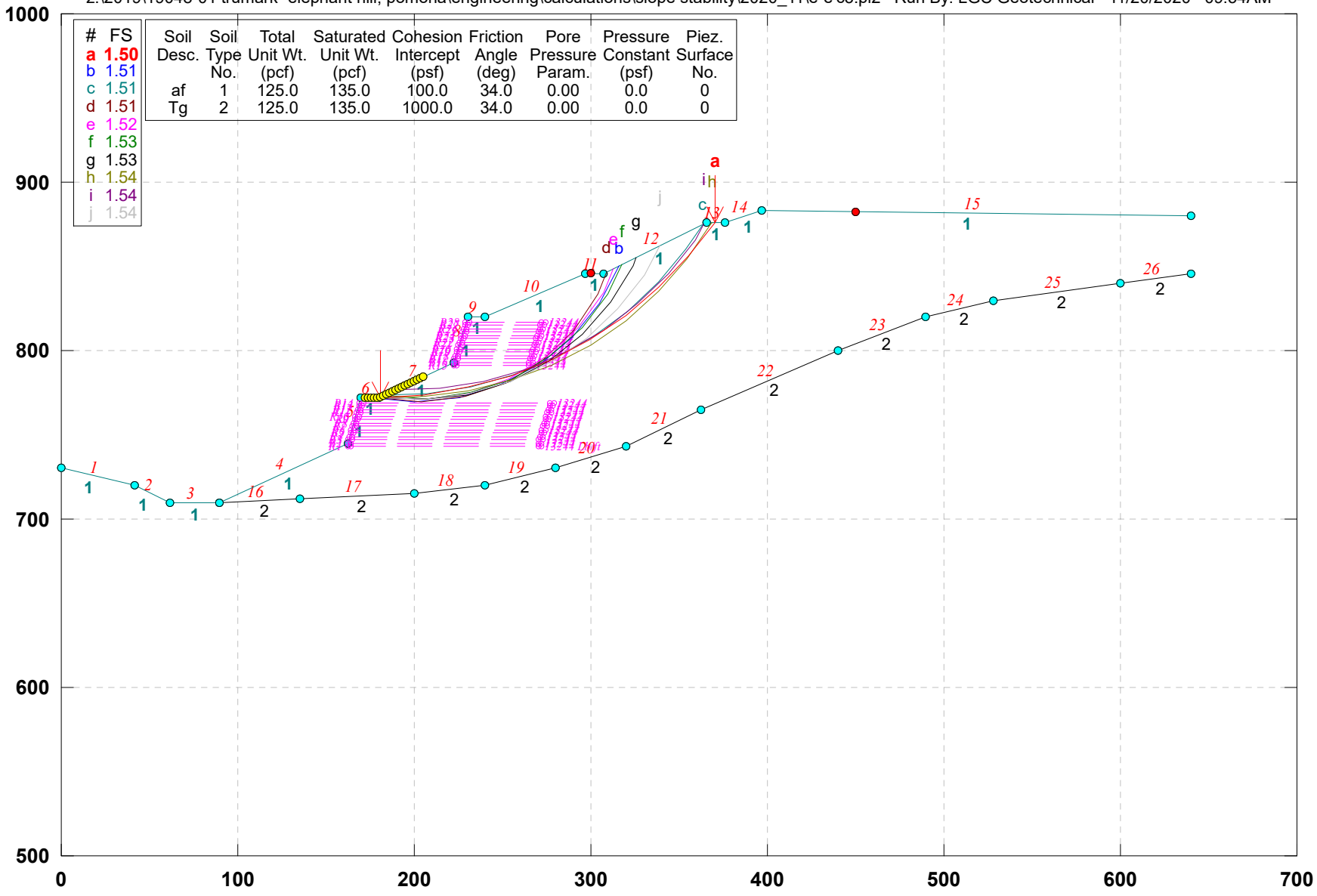


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Safety Factors Are Calculated By The Modified Bishop Method

Trumark / Elephant Hill / 19048-01 / Proposed / Circ / Static / Upper Grid

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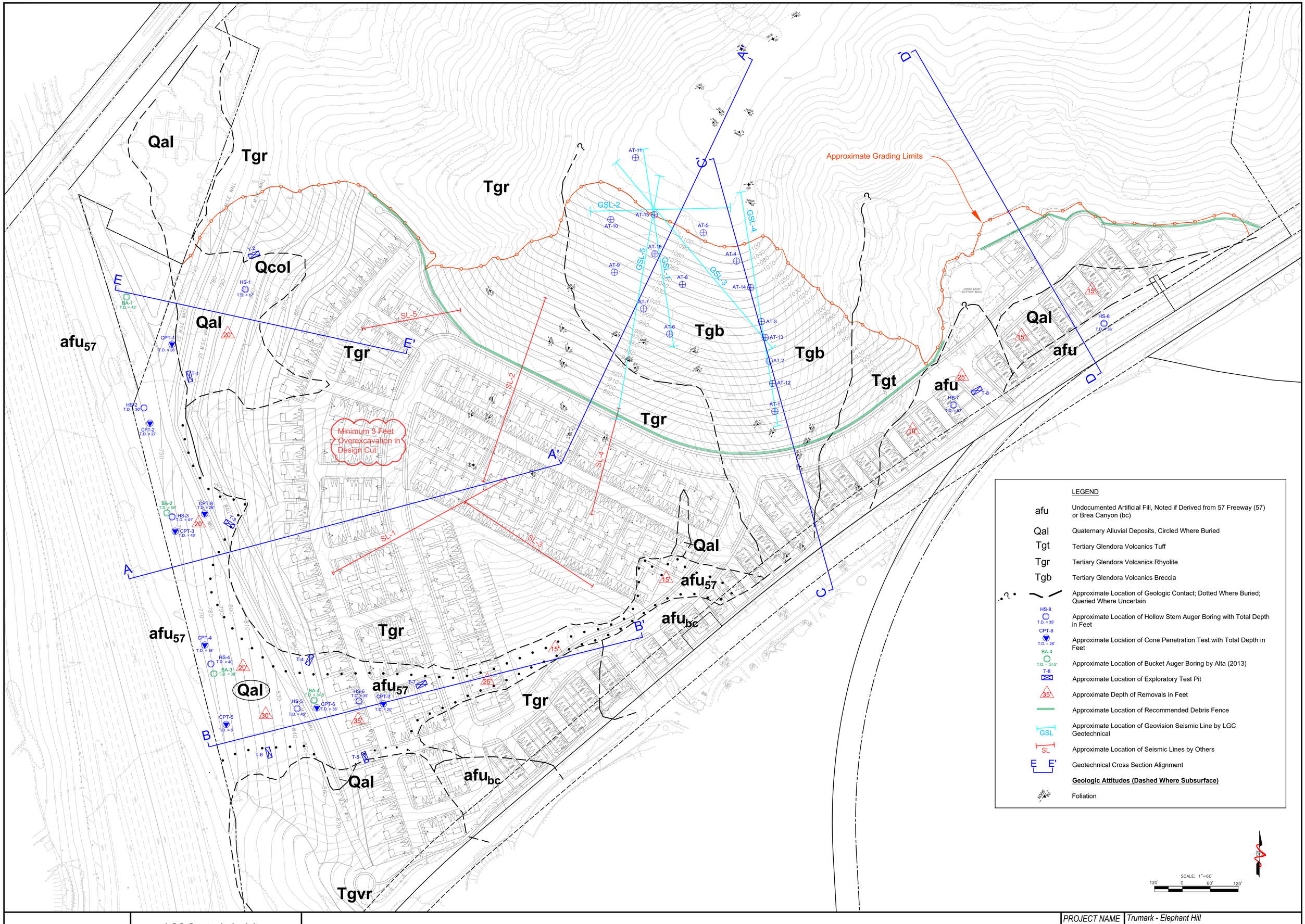


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i	1.54
j	1.54

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
af	1	125.0	135.0	100.0	34.0	0.00	0.0	0
Tg	2	125.0	135.0	1000.0	34.0	0.00	0.0	0

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Safety Factors Are Calculated By The Modified Bishop Method

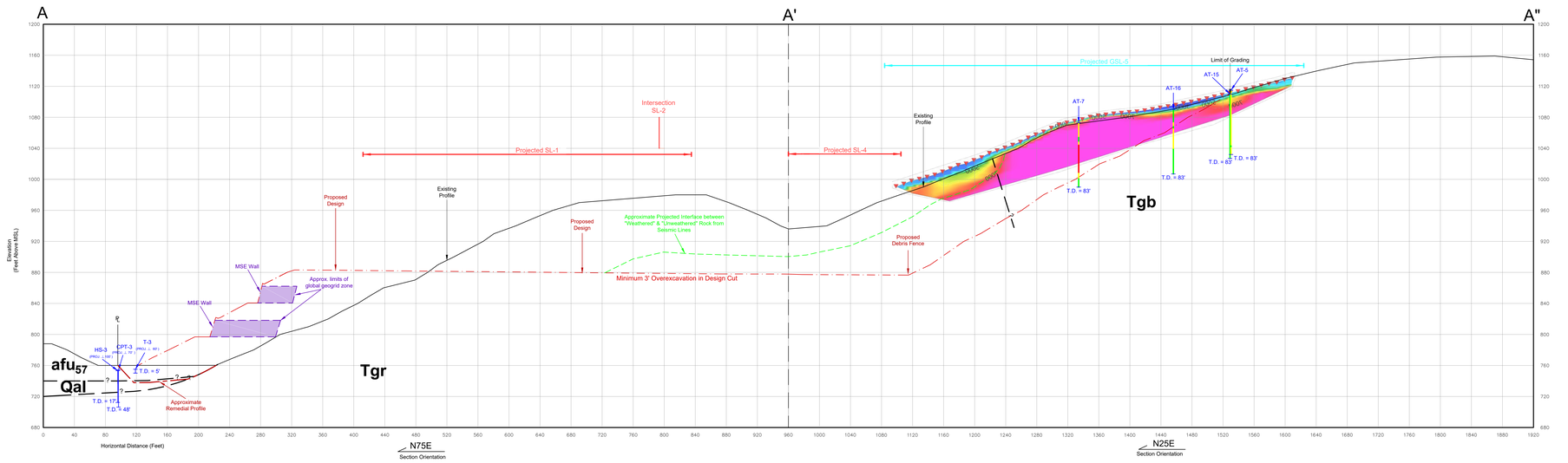


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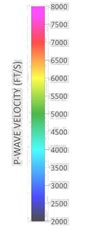
Geotechnical Map

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PROJECT NO.	19048-01
ENG. / GEOL.	BJE / KTM
SCALE	1" = 60'
DATE	December 2020

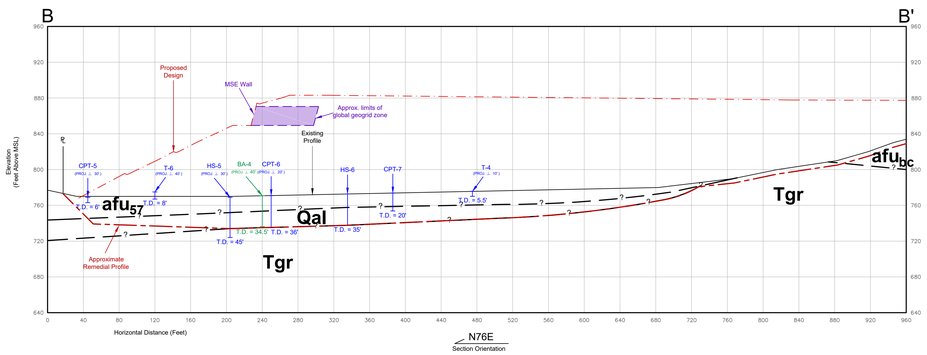
SHEET 1 of 2

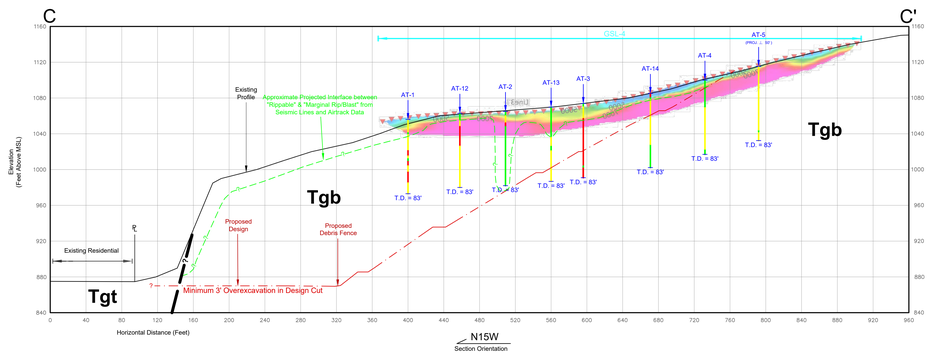


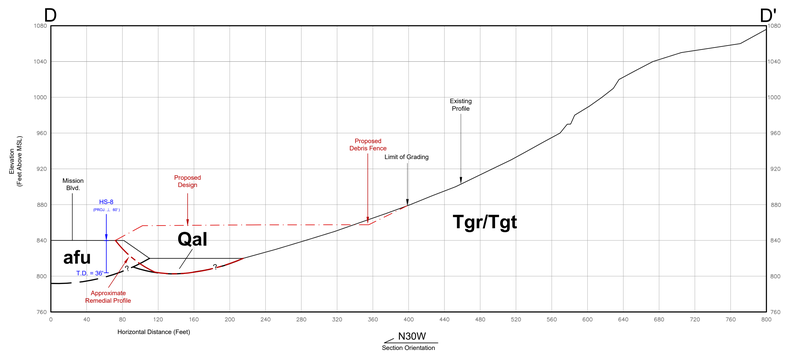
Seismic Velocity Chart

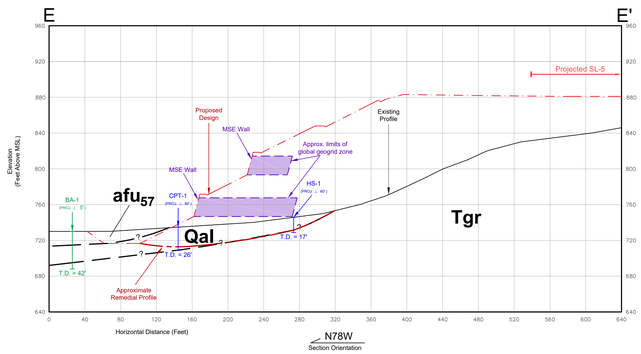


Note: Colors of Air Track (AT) Graphics Correspond to Colors Presented in Air Track logs









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Geotechnical Cross Sections

PROJECT NAME	Trumark - Elephant Hill
PROJECT NO.	19048-01
ENG. / GEOL.	BJE / KTM
SCALE	1" = 60'
DATE	December 2020

SHEET 2 of 2

VCS Environmental
EXPERTS IN STRATEGIC SOLUTIONS

Memorandum

Date: March 3, 2025 REVISED November 18, 2025

To: Alex Jimenez

From: Julie Beeman

Subject: Elephant Hill

Hi Alex,

Pursuant to your request, attached please find a geotechnical memorandum regarding the slope stability grading and an updated Conceptual Grading Plan.

The grading plan has not changed other than including the updated slope stabilization grading, as described in the attached LGC memo.

The earth movement quantity for the slope stabilization is 38,000 cubic yards of cut. This work will be performed during the overall grading operation. The material generated from the cut will be suitable for use in the general fill areas of the project.

There will be 3-4 pieces of equipment running for 3-4 months to complete the stabilization, which will be done during the overall grading operation. We have confirmed that no blasting is required for this work.

The schedule tasks remain the same except that the grading start date shifts to July of 2026. We assume that Dudek can rerun the Air Quality model with the new start date, utilizing the same grading and construction durations as before.

If you need any additional information, please let me know at jbeeman@vcsenvironmental.com. Thank you for your assistance.

Attachments: LGC Memo: Geotechnical Discussion, Safety Layback of Existing Slope Behind Via Moreno
Tentative Tract Map 72653 – Conceptual Grading Plan

PROJECT MEMORANDUM

To: ***Trumark Homes***
450 Newport Center Drive, Suite 300
Newport Beach, CA 92660

Date: February 28, 2025
Updated November 18, 2025
Project No.: 19048-01

Attention: Ms. Susan Lindquist

From: Katie Maes, CEG 2216



Subject: ***Geotechnical Discussion, Safety Layback of Existing Slope Behind Via Moreno, Proposed Elephant Hill Residential Development, City of Pomona, California***

Reference: Hunsaker & Associates, 2024, RE: Elephant Hill – Rock Cut Layback to 1:1 Conceptual Plan, dated October 29, 2025

LGC Geotechnical has prepared this project memorandum in support of the proposed safety layback of the existing, near-vertical cut slope behind the existing Sorrento Ridge condominiums along the northern side of Via Moreno, within the limits of the proposed Elephant Hill residential development in the City of Pomona, California. We have reviewed the concept for the safety layback as presented on the referenced plan by Hunsaker & Associates, 2025, utilized as a base for the attached figures. The following geotechnical discussion is based on consultation with a rockfall specialist and the earthwork grader for the site. The purpose of the proposed layback is intended to increase the safety of the slope both for the existing condominiums and for future proposed uses of the area along the toe of slope that will be used for emergency and pedestrian access for the proposed Elephant Hill project. Specific geotechnical recommendations will be provided in the future Grading Plan Review Report for the site.

The subject slope was reportedly a design cut slope for the old alignment of Brea Canyon Road, now abandoned. The slope was originally excavated through a relatively narrow ridgeline that resulted in the existing triangular facet of slope as tall as 115 feet. The existing slope has an irregular appearance due to the character of the variable volcanic bedrock and occurrence of rockfall over time. It is our understanding that the Sorrento Ridge condominiums along Via Moreno were approved by the City of Pomona and constructed during 1997 to 1999. The homes were elevated well above the abandoned road using a retaining wall system, in order to create a rockfall catchment area between the near-vertical slope and the residences.

Over the years, isolated boulders have rolled out into the catchment area and there has been a build-up of talus rock and soil at the base of the slope. Rolling boulders occasionally impact the base of the retaining wall. However, a more intense event occurred on February 7, 2024, during a year of

significant rainfall. Due to the larger volume of rockfall that occurred at that time, it is our opinion that there is potential for more unpredictable rockfall events in the existing condition, and that the final condition of the slope should be modified for long-term safety of proposed uses. The conceptual plan prepared by Hunsaker & Associates, dated October 29, 2025, depicts a proposed safety layback of the rockfall hazard slope to the inclination of 1:1 (horizontal to vertical) with a catchment area at the bottom, potential rockfall netting on the surface, and a debris fence located several feet in front of the base of the slope. Refer to attached Figure 1, Proposed Safety Layback of Via Moreno Slope, and Figure 2, Cross Section A-A', for details.

Excavation of approximately 38,000 cubic yards of bedrock will be required to achieve the proposed safety layback. This work will be performed during the overall grading operation. The material generated in the design cut will be suitable for use in the general fill for the Elephant Hill residential development. The proposed layback cut will necessitate the use of specialized equipment due to the limited available access to the area. It is our understanding that the contractor will install a robust temporary rockfall barrier to protect the existing properties adjacent to the layback from rockfall during earthwork activities. Methods of excavation are anticipated to include plucking, locally ripping, hydraulic breaking, and drilled breaking, and will not include blasting of rock. Excavated rock will be removed from the area with heavy equipment and the surface that remains will be evaluated on a regular basis by the rockfall consultant.

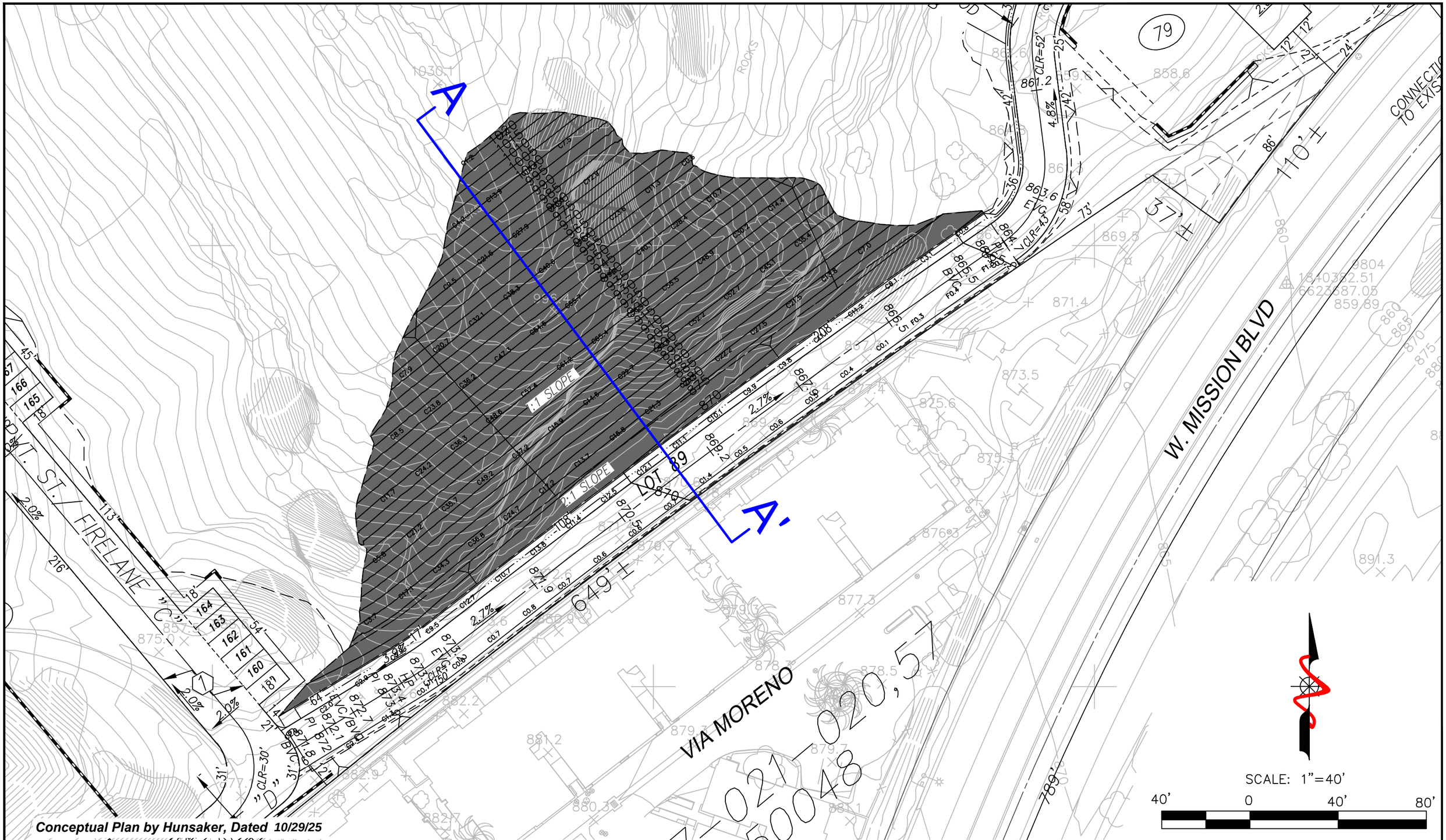
A debris fence is recommended to be constructed along the toe of slope at completion of the layback excavation to stop any rocks that may become dislodged from the slope in the future and to keep pedestrians out of the toe of slope area, as depicted on Figure 2, Cross Section A-A'. Type of debris fence and height of fence will be determined by the rockfall consultant based on the exposed geologic conditions.

Additionally, installation of rockfall netting over portions of the finished slope face may be recommended by the rockfall consultant based on observed conditions. Netting will be utilized where potential hazard due to rockfall is not fully mitigated by the safety layback and highly fractured rock is exposed in a way that may become dislodged from the slope in the future. If netting is recommended, we anticipate it will be a relatively "see-through" twisted-wire netting.

It is our opinion that the proposed safety layback for the existing slope north of the Via Moreno residences is feasible from a geotechnical standpoint. The proposed layback will benefit both existing and future uses of the area. The slope layback should be included in site plans and be geotechnically reviewed within the future Grading Plan Review Report for the Elephant Hill residential development. The rockfall consultant should evaluate the excavation methods and process and provide recommendations for the installation of final protective measures at the appropriate times during site earthwork.

Should you have any questions regarding this memorandum, please do not hesitate to contact our office.

Attachments: Figure 1 - Proposed Safety Layback of Via Moreno Slope
Figure 2 - Cross Section A-A'

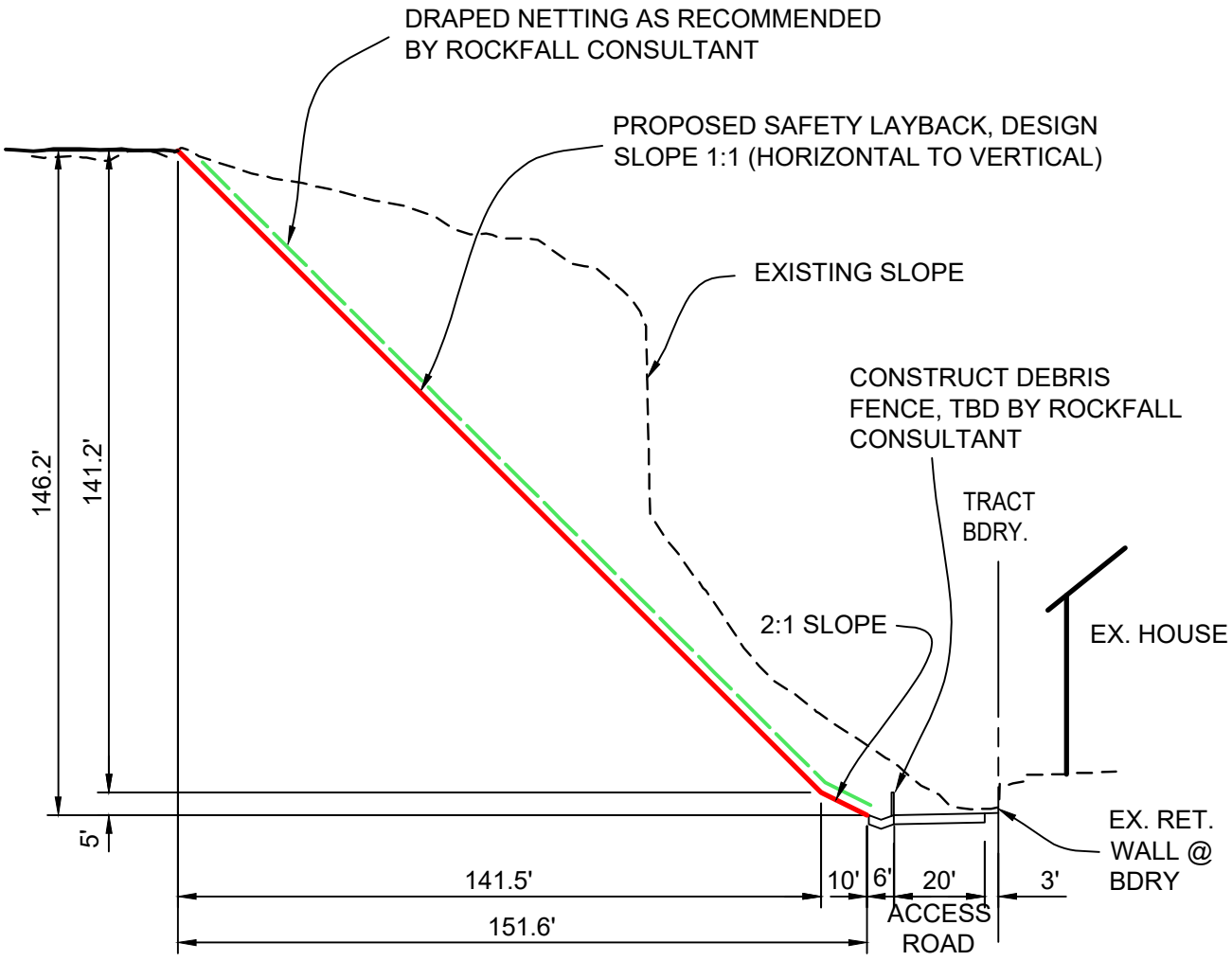


Conceptual Plan by Hunsaker, Dated 10/29/25

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131 Calle Iglesia, Ste. 200
San Clemente, CA 92672
TEL (949) 369-6141 FAX (949) 369-6142

FIGURE 1
Proposed Safety Layback of Via Moreno Slope

PROJECT NAME	Trumark - Elephant Hill, Pomona
PROJECT NO.	19048-01
ENG. / GEOL.	BJE / KTM
SCALE	1" = 40'
DATE	November 2025

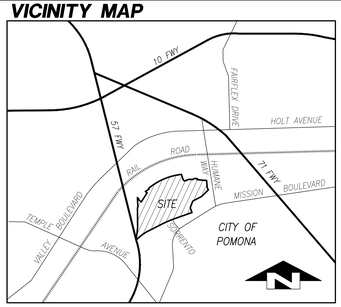


SECTION A-A'

SCALE 1"=40'

LGC Geotechnical, Inc.	**FIGURE 2** **Cross Section A-A'**	PROJECT NAME	Trumark - Elephant Hill, Pomona
		PROJECT NO.	19048-01
		ENG. / GEOL.	BJE / KTM
		SCALE	1" = 40'
		DATE	November 2025

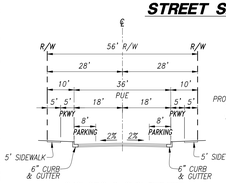
VICINITY MAP



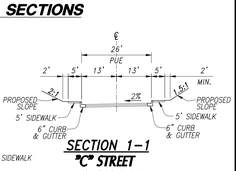
LOT SUMMARY

Lot No.	Land Use	Acres
LOTS 1–85	RESIDENTIAL	11.52
LOTS 86–104	PRIVATE STREET	7.70
LOTS 105–106	WATER QUALITY/DEBRIS BASIN	1.11
LOT 107	RECREATION CENTER	1.02
LOTS 108–126	OPEN SPACE	28.90
LOT 127	OPEN SPACE	68.80
LOT 128	STORM DRAIN AND MAINTENANCE EASEMENT	0.55
LOT 129	LIFT STATION	0.09
LOT A	PUBLIC STREET – MISSION BOULEVARD	0.69
LOT B	PUBLIC STREET – MISSION BOULEVARD	0.20
LOT C	PUBLIC STREET – MISSION BOULEVARD	0.03
TOTAL		120.61

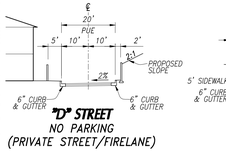
STREET SECTIONS



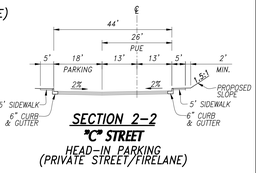
"A", "B" & "Y" STREET
TYPICAL DOUBLE LOADED LOCAL STREET
PARKING BOTH SIDES
(PRIVATE STREET/FIRELANE)



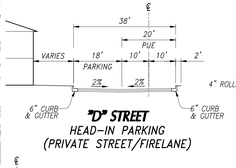
SECTION 1–1
"C" STREET
NO PARKING
(PRIVATE STREET/FIRELANE)



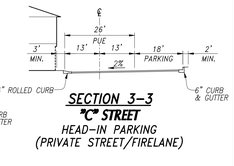
"D" STREET
NO PARKING
(PRIVATE STREET/FIRELANE)



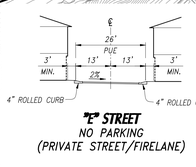
SECTION 2–2
"C" STREET
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)



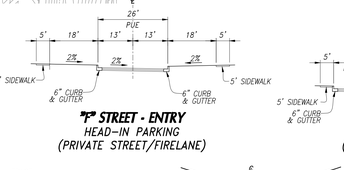
"D" STREET
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)



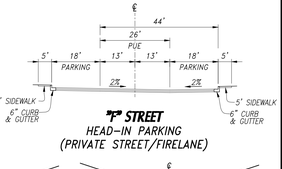
SECTION 3–3
"C" STREET
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)



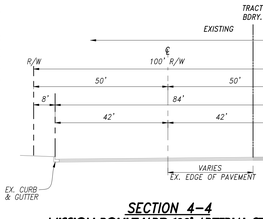
"E" STREET
NO PARKING
(PRIVATE STREET/FIRELANE)



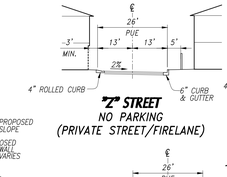
"F" STREET - ENTRY
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)



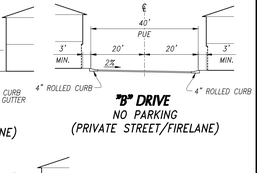
"F" STREET
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)



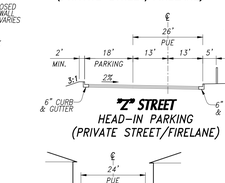
SECTION 4–4
MISSION BOULEVARD-100' ARTERIAL STREET
NO PARKING EITHER SIDES
(PUBLIC STREET)



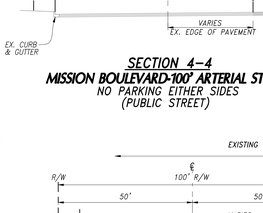
"Z" STREET
NO PARKING
(PRIVATE STREET/FIRELANE)



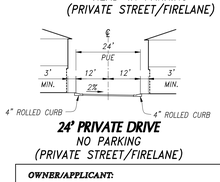
"B" DRIVE
NO PARKING
(PRIVATE STREET/FIRELANE)



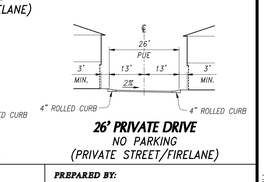
"Z" STREET
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)



SECTION 5–5
MISSION BOULEVARD-100' ARTERIAL STREET
NO PARKING EITHER SIDES
(PUBLIC STREET)



24' PRIVATE DRIVE
NO PARKING
(PRIVATE STREET/FIRELANE)



26' PRIVATE DRIVE
NO PARKING
(PRIVATE STREET/FIRELANE)

"E" STREET
NO PARKING
(PRIVATE STREET/FIRELANE)

"F" STREET - ENTRY
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)

"F" STREET
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)

SECTION 4–4
MISSION BOULEVARD-100' ARTERIAL STREET
NO PARKING EITHER SIDES
(PUBLIC STREET)

"Z" STREET
NO PARKING
(PRIVATE STREET/FIRELANE)

"B" DRIVE
NO PARKING
(PRIVATE STREET/FIRELANE)

"Z" STREET
HEAD–IN PARKING
(PRIVATE STREET/FIRELANE)

SECTION 5–5
MISSION BOULEVARD-100' ARTERIAL STREET
NO PARKING EITHER SIDES
(PUBLIC STREET)

24' PRIVATE DRIVE
NO PARKING
(PRIVATE STREET/FIRELANE)

26' PRIVATE DRIVE
NO PARKING
(PRIVATE STREET/FIRELANE)

SECTION 6–6
"D" STREET
NO PARKING
(PRIVATE STREET/FIRELANE)

SECTION 7–7
EMERGENCY VEHICLE ACCESS
ROAD & PEDESTRIAN LINKAGE

SECTION 8–8
EMERGENCY VEHICLE ACCESS
ROAD & PEDESTRIAN LINKAGE

LEGEND

- PROJECT BOUNDARY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- PROPOSED CURB
- EASEMENT LINE
- RETAINING WALL
- PROPOSED M.S.E. WALL
- TOP OF SLOPE
- TOE OF SLOPE

EARTHWORK SUMMARY

	CUT	FILL
MASS EX	1,138,000 CY	1,180,000 CY
(BULKING) AT 4% TO 18%		(110,800) CY
SHRINKAGE AT 10%		0 CY
REMEDIAL	379,000 CY	379,000 CY
STREET OVER-EX	71,000 CY	71,000 CY
LOT OVER-EX	0 CY	0 CY
STABILITY FILLS	0 CY	0 CY
(BULKING)		(8,000) CY
SHRINKAGE		41,000 CY
TOTAL VOL	1,588,000 CY	1,552,200 CY
FINAL EXPORT	35,800 CY	0 CY
TOTAL GRADED AREA:	36.27 AC	

REVISION	
DATE	DESCRIPTION

OWNER/APPLICANT:
TRUMARK HOMES
450 NEWPORT CENTER DRIVE, SUITE 300
NEWPORT BEACH, CA 92660
PH: (949) 999–9800

PREPARED BY:
HUNSAKER & ASSOCIATES
I R V I N E, I N C.
PLANNING • ENGINEERING • SURVEYING
157 Technology Drive • Irvine, CA 92618 • (949) 583-1010

CITY OF POMONA, COUNTY OF LOS ANGELES

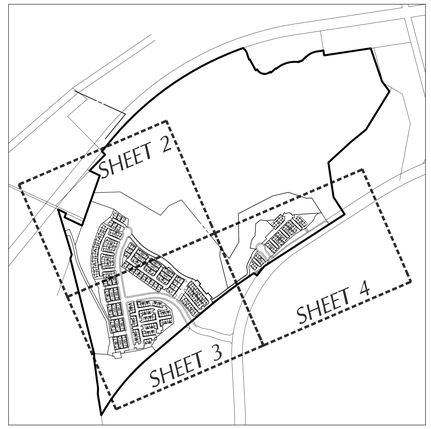
TENTATIVE TRACT MAP 72653
CONCEPTUAL GRADING PLAN
ELEPHANT HILL

DESIGNED BY:
DRAFTED BY:
CHECKED BY:
DATE: 10/29/2025
CITY FILE NO.:
SHEET 1 OF 4

W.O. 5593-4XX TTM 72653 ELEPHANT HILL

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KEY MAP

LOT SUMMARY

Lot No.	Land Use	Acres
LOTS 1–85	RESIDENTIAL	11.52
LOTS 86–104	PRIVATE STREET	7.70
LOTS 105–106	WATER QUALITY/DEBRIS BASIN	1.11
LOT 107	RECREATION CENTER	1.02
LOTS 108–126	OPEN SPACE	28.90
LOT 127	OPEN SPACE	68.80
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LOT 129	LIFT STATION	0.09
LOT A	PUBLIC STREET – MISSION BOULEVARD	0.69
LOT B	PUBLIC STREET – MISSION BOULEVARD	0.20
LOT C	PUBLIC STREET – MISSION BOULEVARD	0.03
TOTAL		120.61

LEGEND

- PROJECT BOUNDARY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- PROPOSED CURB
- EASEMENT LINE
- FUEL MOD
- PROPOSED CENTERLINE
- PROPOSED WATER
- PROPOSED SEWER
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- EXISTING SEWER
- EXISTING WATER
- RETAINING WALL/ RETAINING WALL HEIGHT
- PROPOSED M.S.E. WALL
- TOP OF SLOPE
- TOE OF SLOPE
- FIRE HYDRANT
- LOT NUMBER
- 1 / 35 — UNIT NUMBER / PLAN TYPE

NORTH

0 20' 40' 80'

SCALE: 1" = 40'

OWNER/APPLICANT:
TRUMARK HOMES
450 NEWPORT CENTER DRIVE, SUITE 300
NEWPORT BEACH, CA 92660
PH: (949) 999-9800

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC.
PLANNING • ENGINEERING • SURVEYING
157 Technology Drive, Irvine, CA 92618, (949) 583-1010

CITY OF POMONA, COUNTY OF LOS ANGELES

TENTATIVE TRACT MAP 72653
CONCEPTUAL GRADING PLAN
ELEPHANT HILL

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DATE	DESCRIPTION

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DATE: 10/29/2025
CITY FILE NO.:
SHEET 2 OF 4

W.O. 5593-44X TM 72653 ELEPHANT HILL

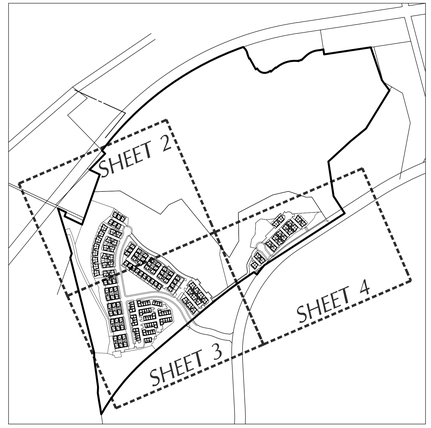
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CONTINUED ON SHEET 2

CONTINUED ON SHEET 2

CONTINUED ON SHEET 4

CONTINUED ON SHEET 4



KEY MAP

LOT SUMMARY

Lot No.	Land Use	Acres
LOTS 1–85	RESIDENTIAL	11.52
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TOTAL		120.61

LEGEND

- PROJECT BOUNDARY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
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- EASEMENT LINE
- FUEL MOD
- PROPOSED CENTERLINE
- PROPOSED WATER
- PROPOSED SEWER
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- EXISTING SEWER
- EXISTING WATER
- RETAINING WALL/ RETAINING WALL HEIGHT
- PROPOSED M.S.E. WALL
- TOP OF SLOPE
- TOE OF SLOPE
- FIRE HYDRANT
- LOT NUMBER
- UNIT NUMBER
- PLAN TYPE

NORTH

0 20' 40' 80'

SCALE: 1" = 40'

OWNER/APPLICANT:
TRUMARK HOMES
450 NEWPORT CENTER DRIVE, SUITE 300
NEWPORT BEACH, CA 92660
PH: (949) 999–9800

PREPARED BY:
HUNSAKER & ASSOCIATES IRVINE, INC.
PLANNING • ENGINEERING • SURVEYING
157 Technology Drive • Irvine, CA 92618 • (949) 583-1010

CITY OF POMONA, COUNTY OF LOS ANGELES

TENTATIVE TRACT MAP 72653
CONCEPTUAL GRADING PLAN
ELEPHANT HILL

REVISION	
DATE	DESCRIPTION
.	.

DESIGNED BY: _____
DRAFTED BY: _____
CHECKED BY: _____

DATE: 10/29/2025

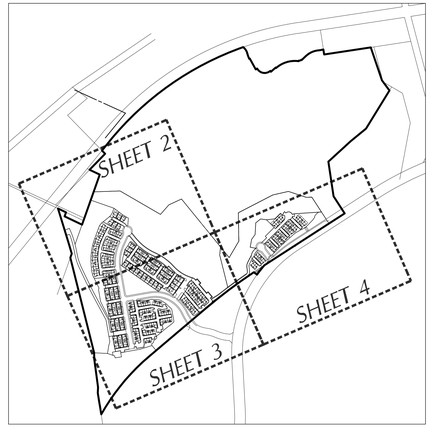
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KEY MAP

LOT SUMMARY

Lot No.	Land Use	Acres
LOTS 1–85	RESIDENTIAL	11.52
LOTS 86–104	PRIVATE STREET	7.70
LOTS 105–106	WATER QUALITY/DEBRIS BASIN	1.11
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LEGEND

- PROJECT BOUNDARY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- PROPOSED CURB
- EASEMENT LINE
- FUEL MOD
- PROPOSED CENTERLINE
- DW PROPOSED WATER
- S PROPOSED SEWER
- SD PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- S EXISTING SEWER
- W EXISTING WATER
- RETAINING WALL/ RETAINING WALL HEIGHT
- PROPOSED M.S.E. WALL
- TOP OF SLOPE
- TOE OF SLOPE
- FIRE HYDRANT
- PROPOSED MWS
- LOT NUMBER
- UNIT NUMBER
- PLAN TYPE



0 20' 40' 80'

SCALE: 1" = 40'

OWNER/APPLICANT:
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450 NEWPORT CENTER DRIVE, SUITE 300
NEWPORT BEACH, CA 92660
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CITY OF POMONA, COUNTY OF LOS ANGELES

TENTATIVE TRACT MAP 72653
CONCEPTUAL GRADING PLAN
ELEPHANT HILL

REVISION	
DATE	DESCRIPTION
.	.

DESIGNED BY: _____
DRAFTED BY: _____
CHECKED BY: _____

DATE: 10/29/2025

CITY FILE NO.:

SHEET 4 OF 4

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