# 11.4 Geotechnical Investigation/ Paleontological Resources Assessment

# GEOTECHNICAL INVESTIGATION
# PROPOSED INDUSTRIAL DEVELPOMENT

SCE Beaumont Avenue
(Highway 79) and Laird Street
Riverside County (Beaumont Area), California
for
Orbis Real Estate Partners




SOUTHERN
CALIFORNIA
GEOTECHNICAL
*A California Corporation*

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A California Corporation

September 25, 2024
(Revised January 15, 2026)

Orbis Real Estate Partners
1501 Quail Street, Suite 250
Newport Beach, California 92660

Attention: Mr. Grant Ross
Partner

Project No.: **24G141-1R**

Subject: **Geotechnical Investigation**
Proposed Industrial Development
SEC Beaumont Avenue (Highway 79) and Laird Road
Riverside County (Beaumont Area), California

Mr. Ross:

In accordance with your request, we have conducted a geotechnical investigation at the subject site. We are pleased to present this report summarizing the conclusions and recommendations developed from our investigation.

We sincerely appreciate the opportunity to be of service on this project. We look forward to providing additional consulting services during the course of the project. If we may be of further assistance in any manner, please contact our office.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

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# 1.0 EXECUTIVE SUMMARY

Presented below is a brief summary of the conclusions and recommendations of this investigation. Since this summary is not all inclusive, it should be read in complete context with the entire report.

**Geotechnical Design Considerations**

- The subsurface materials encountered at the boring locations generally consist of native alluvium (younger and older), colluvium, and weathered bedrock. Younger native alluvial soils were encountered at many of the boring and trench locations, especially in the topographically lower areas of the site, extending from the ground surface to depths of 1½ to 9½± feet below existing site grades, at the boring and trench locations. Borings and trenches performed by others for previous studies encountered younger alluvium extending to depths of 14 to 17± feet in the southern portion of the overall site. Older alluvial soils were encountered at most of the boring and trench locations, either below the younger alluvial soils or at the ground surface.
- The proposed industrial building areas will require cuts of up to 70± feet and fills of up to 80± feet to achieve the new building pad elevations. The overall development of the site will require cuts of up to 114± feet and fills of up to 107± feet to achieve the proposed site grades.
- The younger alluvial soils generally possess low relative densities, relatively low strengths, and occasional porosity. The results of laboratory testing indicate that the younger alluvium is compressible when loaded and moderately to severely collapsible when inundated with water.
- The older alluvium and weathered bedrock materials possess relatively high strengths and high relative densities, and more favorable consolidation characteristics. These materials are generally considered to be suitable for the support of new fill soils and site improvements.
- Remedial grading is considered warranted to remove the younger alluvium and colluvium from the proposed development area in their entirety. These soils may be reused on-site as compacted structural fill.

**Site Preparation**

- Initial site preparation should include stripping of any surficial vegetation. The surficial vegetation, trees, and any organic top soils should be properly disposed of off-site.
- Remedial grading will be necessary in the proposed development area to remove the younger alluvium and colluvial soils in their entirety. Where encountered, these materials generally extend to depths of 1½ to 17± feet at the borings and trench locations.
- Overexcavation within the proposed building pad areas should extend to a depth of at least 5 feet below the proposed building pad grade, at least 5 feet below the existing site grades, and to a depth of at least 3 feet below foundation bearing grades in order to eliminate cut/fill and bedrock/fill transitions in the building pad areas and flatten the inclination of the fill/native contact below the building pad areas. Additional recommendations regarding remedial grading in cut/fill transition areas and minimum depths of remedial grading are provided in Section 6.3 of this report.

- Fill soils should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. **Fill soils placed at depths greater than 20 feet below the proposed building pad grades or site grades should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density.**
- The new pavement and flatwork subgrade soils are recommended to be scarified to a depth of 12± inches, moisture conditioned and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density.

**Building Foundations**
- Conventional shallow foundations, supported in newly placed compacted fill.
- 3,000 lbs/ft$^2$ maximum allowable soil bearing pressure.
- Reinforcement consisting of at least four (4) No. 5 rebars (2 top and 2 bottom) in strip footings. Additional reinforcement may be necessary for structural considerations.

**Building Floor Slabs**
- Conventional Slab-on-Grade, 6 inches thick.
- Modulus of Subgrade Reaction: k = 125 psi/in.
- Minimum reinforcement consisting of at least No. 3 bars at 18 inches on center, in both directions, due to the presence of low to medium expansive soils and the expected variable fill depths below the structures. The actual floor slab reinforcement should be determined by the structural engineer. Additional reinforcement may be necessary for structural considerations.

**Pavement Design Recommendations**

| **ASPHALT PAVEMENTS (R=25)** | | | | | |
|---|---|---|---|---|---|
| **Materials** | **Thickness (inches)** | | | | |
| | Auto Parking and Auto Drive Lanes (TI = 4.0 to 5.0) | Truck Traffic | | | |
| | | TI = 6.0 | TI = 7.0 | TI = 8.0 | TI = 9.0 |
| Asphalt Concrete | 3 | 3½ | 4 | 5 | 5½ |
| Aggregate Base | 7 | 9 | 11 | 12 | 15 |
| Compacted Subgrade | 12 | 12 | 12 | 12 | 12 |

| **PORTLAND CEMENT CONCRETE PAVEMENTS (R=25)** | | | | |
|---|---|---|---|---|
| **Materials** | **Thickness (inches)** | | | |
| | Autos and Light Truck Traffic (TI = 6.0 or less) | Truck Traffic | | |
| | | TI = 7.0 | TI = 8.0 | TI = 9.0 |
| PCC | 5 | 5½ | 7 | 8½ |
| Compacted Subgrade (95% minimum compaction) | 12 | 12 | 12 | 12 |

# 2.0 SCOPE OF SERVICES

The scope of services performed for this project was in accordance with our Proposal No. 24P227, dated June 14, 2024. The scope of services included a visual site reconnaissance, subsurface exploration, field and laboratory testing, and geotechnical engineering analysis to provide criteria for preparing the design of the building foundations, building floor slabs, and parking lot pavements along with site preparation recommendations and construction considerations for the proposed development. The evaluation of the environmental aspects of this site was beyond the scope of services for this geotechnical investigation.

# 3.0 SITE AND PROJECT DESCRIPTION

## 3.1 Site Conditions

The subject site is located at the southeast corner of Beaumont Avenue (Highway 79) and Laird Road in an unincorporated portion of Riverside County, near Beaumont, California. Based on discussions with the client and discussions with personnel of the city of Beaumont, we understand that the city is in the process of annexing the subject property. The site is bounded to the north by vacant lots and a single-family residence, to the west by Beaumont Avenue (Highway 79), to the south by vacant lots and an overhead electrical line corridor (Edison power lines), and to the east by Childhelp Merv Griffin Village and vacant lots. The general location of the site is illustrated on the Site Location Map, included as Plate 1 of this report.

The site consists of several contiguous parcels which total 360± acres. The site is currently vacant and undeveloped. The site is characterized by several topographic features including erosional canyons in the east and west portions of the site, valleys, a southwest-draining drainage course in the northern-central portion of the site, and hills, especially in the east, west and counter portions of the site. The ground surface cover throughout most of the site generally consists of moderate to dense native grass, shrub, and weed growth with some areas of exposed soil, but some areas along the north and east property lines (north and east of Buildings 1 and 2) appear to have been recently disced or mowed. Several medium- to large-sized trees are located throughout the site. Numerous unpaved trails/roads transect the subject site.

Detailed topographic information was provided on the conceptual grading plan prepared by Michael Baker International (MBI), the project civil engineer. Based on the topographic plan, the site consists of hilly and rolling topography with a canyon located in the southeastern area of the site. The topographic high is 2735± feet mean sea level (MSL) in the northeastern area of the site and the topographic low is 2390± feet MSL in the southwestern corner of the site. There is about 345± feet of elevation differential across the site.

## 3.2 Proposed Development

Based on a conceptual grading plan, prepared by MBI, the site will be developed with the following:

| Building | Building Type | Building Location | Building Size (ft²) |
|---|---|---|---|
| 1 | Concrete Tilt-Up | North | 636,937 |
| 2 | Concrete Tilt-Up | North-Central | 1,386,044 |
| 3 | Concrete Tilt-Up | South-Central | 1,488,920 |
| 4 | Concrete Tilt-Up | South | 1,666,305 |

Dock-high doors will be constructed on the north and south sides of each of the buildings except for Building 1 which will only have dock-high doors along the north side of the building. The buildings are expected to be surrounded by asphaltic concrete or Portland Cement concrete

pavements in the parking and drive lanes, Portland cement concrete pavements in the truck court areas, and limited areas of landscape planters.

Detailed structural information was not available at the time of this report. It is assumed that the new buildings will be single-story structures of tilt-up concrete construction, typically supported on conventional shallow foundations with concrete slab-on-grade floors. Based on the assumed construction, maximum column and wall loads are expected to be on the order of 100 kips and 4 to 7 kips per linear foot, respectively.

No significant amounts of below-grade construction, such as crawl spaces or basements, are expected to be included in the proposed development. The proposed building pad elevations for both Buildings 1 and 2 is 2640 feet, msl, and the building pad elevation for both Buildings 3 and 4 is 2560 feet, msl. Within the proposed building areas, cuts of up to 70± feet are expected to be necessary to achieve the proposed building pad grades, and fills on the order of 80± feet are expected to achieve the proposed building pad grades. Based on the cut-fill plan and conceptual grading plan, maximum cuts of up to up to 114± feet and fills up to 107± feet are expected to be necessary to achieve the proposed site grades.

## 3.3 Previous Studies

SCG was provided a fault evaluation report for the subject site. This report is referenced below:

> Report of Geologic and Geotechnical Services, Fault Evaluation, Proposed Industrial/Distribution Development, Southeast of Beaumont (Hwy 79) and S. California Avenue, South of Beaumont, Riverside County, California, prepared by GPI Geotechnical Professionals, Inc., (GPI), prepared for Orbis Real Estate Partners, GPI Project No. 3114.I, dated May 6, 2022.

This report presented the results of a fault evaluation study performed by Petra Geosciences, Inc. (Petra) under subcontract to GPI. GPI states that there are two fault lines (Faults A and B) associated with the Beaumont Plains Fault Zone that transect the subject site. These faults are well defined on the property and correlate to lineaments observed in aerial photographs, and observed in fault trenches by Pacific Soils, Inc. (Pacific) during a previous investigation. GPI also states that the County of Riverside approved the project for a feasibility level study based on the geologic and geotechnical investigation performed. GPI indicates that it is the opinion of GPI and Petra that the potential of the presence of active faulting along the two mapped faults is considered very low and that further subsurface (trenching) fault investigations of the property are not warranted.

SCG was also provided with a geotechnical report for the subject site. This report is referenced below:

> Preliminary Geotechnical Investigation, Proposed Industrial/Distribution Development, Southeast of Beaumont Avenue (Hwy 79) and S. California Avenue, South of Beaumont, Riverside County, California, prepared by GPI, prepared for Orbis Real Estate Partners, GPI Project No. 3114.I, dated September 14, 2022.

GPI was provided with two previous geotechnical investigations for the subject site. The previous studies reviewed by GPI include a geotechnical report prepared by Pacific, as well as a geotechnical report prepared by EGL. The report by GPI included the boring and trench logs and and laboratory test data prepared by Pacific and EGL in the Appendices of their report. As part of their investigation, GPI advanced ten (10) borings to depths of 26 to 31½± feet and ten (10) test pits to depths of 5½ to 11½± feet below the existing site grades. In addition, GPI performed ten (10) seismic refraction lines ranging from 150 to 375± feet in length. GPI reported the following subsurface conditions: Topsoil was encountered at the ground surface, extending to depths of 2 to 6± feet below the ground surface. The topsoil consisted of loose silty sands, sandy silts, clayey sands, and soft sandy clays. Alluvium and colluvium was encountered in the canyon bottoms within the drainage courses between existing ridgelines. The alluvium and colluvium consisted of loose to moderately dense silty sands and soft to stiff sandy silts extending to depths of 3 to 10± feet. Boring and trench logs prepared by Pacific were included with the GPI report, indicating younger alluvium depths of up 14 to 17± feet near the southern property line. GPI reported that prior explorations in these materials encountered some gravel and occasional cobbles. Older alluvium was encountered below the topsoil in some of the exploration locations extending to depths of approximately 5 to 20± feet. The older alluvium generally consisted of medium dense to dense silty sands, clayey sands, and stiff, sandy clays. The San Timoteo Formation was generally encountered, immediately below the thin topsoil layer, below the younger alluvium and older alluvium deposits, or at the ground surface. The bedrock consisted of weakly to moderately cemented interbedded sandstone, siltstone, and claystone.

SCG performed a fault study at the subject site. This report is referenced below:

> Fault Study, Proposed Industrial Development, SEC Beaumont Avenue (Highway 79) and Laird Road, Riverside County (Beaumont Area), California, prepared by Southern California Geotechnical, Inc. (SCG), prepared for Orbis Real Estate Partners, SCG Project No. 24G141-2, dated April 24, 2025.

As part of this investigation, SCG excavated two (2) trenches (identified as FT-1 and FT-2) to depths of 6½ to 20± feet. The trenches were 1,180± and 1,300± feet in length, respectively. The trenches were excavated in an orientation that was roughly perpendicular to the projection of the Beaumont Plain Fault. The fault trenches were logged by a Certified Engineering Geologist (CEG). SCG did not encounter any groundwater during the investigation and did not observe any significant groundwater elevation change across the site which could indicate the possibility of faulting. SCG reported that the fractures and historic liquefaction features associated with on-site faulting were observed within the older San Timoteo Formation bedrock unit. However, these features did not extend into the overlying older alluvium. SCG concluded that the significant seismic events that caused the fractures and liquefaction features occurred prior to the deposition of the older alluvium. All of the faults encountered within Fault Trench Nos. FT-1 and FT-2 observed to terminate within the older alluvium, paleosol, or San Timoteo Formation bedrock. Therefore, SCG indicated that none of the observed faults were considered to be active. SCG concluded that based on the results of the fault investigation, there was positive evidence that neither active not potentially active faults are present within the area of the proposed development. SCG recommended that the development proceed without any structural setbacks.

# 4.0 SUBSURFACE EXPLORATION

## 4.1 Scope of Exploration/Sampling Methods

The subsurface exploration for this geotechnical investigation consisted of ten (10) hollow-stem auger borings (identified as Boring Nos. HSA-1 to HSA-10), ranging in depth from 20 to 65± feet below existing site grades. Eight (8) bucket auger borings were also advanced to depths ranging from 46 to 91± feet below existing site grades in addition to the hollow-stem auger borings. Eight (8) geotechnical test trenches (identified as Trench Nos. T-1 to T-8) were also excavated, ranging in depth from 10 to 15± feet below existing site grades. These borings and trenches were performed in addition to the previous borings and test trenches performed at this site for the previous studies. The borings and trenches were logged by a member of our staff.

Hollow Stem Auger Borings

The borings were advanced with hollow-stem augers by a conventional truck-mounted drilling rig. Representative bulk and relatively undisturbed soil samples were taken during drilling. Relatively undisturbed soil samples were taken with a split barrel "California Sampler" containing a series of one inch long, 2.416± inch diameter brass rings. This sampling method is described in ASTM Test Method D-3550. Samples were also taken using a 1.4± inch inside diameter split spoon sampler, in general accordance with ASTM D-1586. Both of these samplers are driven into the ground with successive blows of a 140-pound weight falling 30 inches. The blow counts obtained during driving are recorded for further analysis. Bulk samples were collected in plastic bags to retain their original moisture content. The relatively undisturbed ring samples were placed in molded plastic sleeves that were then sealed and transported to our laboratory.

Bucket Auger Borings

The large diameter borings were advanced using a bucket auger drilling rig. Samples were taken at various depths using a modified California Sampler. The sampler was driven using the drill rig's Kelly bar. The weight of the Kelly bar varied with depth and was recorded for various lengths on the Boring Logs. Following the completion of drilling, the boring was downhole logged by a member of our staff. The Boring Logs, which illustrate the conditions encountered at the boring locations, as well as the results of some of the laboratory testing, are included in Appendix B of this report.

Trenches

The geotechnical test trenches were performed utilizing a track-mounted excavator and a backhoe loader equipped with rubber tires. Trench Nos. T-1, T-6, T-6, and T-8 were performed using the excavator, and the remaining trenches were performed using the backhoe. Bulk samples were collected from each of the trenches and placed in plastic bags to retain their original moisture content. The Trench Logs, which illustrate the conditions encountered at the trench locations, as well as results of some of the laboratory testing, are included in Appendix B of this report. The approximate boring and trench locations are indicated on the Geotechnical Map, included as Plate 2 in Appendix A of this report.

## 4.2 Geotechnical Conditions

Younger Alluvium

Younger native alluvium was encountered at the ground surface at four (4) of the trench and three (3) of the boring locations, extending to depths of 1½ to 9½± feet below the existing ground surface. The younger native alluvium generally consists of loose to dense sandy clays, silty sands to sandy silts. The younger alluvial soils encountered at Trench No. T-1 possess a loose relative density and a somewhat disturbed appearance. These soils were classified as disturbed alluvium and extended to a depth of 1½± feet below the ground surface.

Colluvium

Native colluvium was encountered at Bucket Auger No. BA-4, extending to a depth of 6½± feet below ground surface. The colluvium consisted of medium dense to very dense sandy silts and fine to coarse-grained gravelly sand. The colluvial soils possess little clay content, iron oxide staining, calcareous veining and nodules, and abundant cobble content.

Older Alluvium

Older alluvium was encountered at the ground surface or beneath the younger alluvial soils at most of the boring and trench locations extending to depths of 1½ to at least 20± feet below ground surface. The older alluvium generally consists of medium dense to very dense sandy silts, silty sands, occasional clayey sands, and stiff to hard silty clays and fine to medium sandy clays. The older alluvial soils are generally red brown or brown in color and possess moderate to high densities with occasional cementation. Various levels of iron oxide staining, and occasional calcareous veining were observed in the older alluvial soils.

San Timoteo Formation (Tst) Bedrock

San Timoteo Formation bedrock (map symbol Tst) was encountered beneath the younger and/or older alluvium at most of the boring and trench locations and at the ground surface at ten (10) of the boring and trench locations, extending to at least the maximum explored depth of 91± feet below existing site grades. The bedrock generally consists of dense to very dense fine and fine to medium grained sandstone, silty sandstone, sandy siltstone, clayey sandstone, and very stiff to hard sandy claystone, clayey siltstones, and silty claystone. Occasional layers of dense gravelly sandstone was encountered at depths between 8½ to 24± feet below existing site grades. The bedrock materials possess variable levels of cementation, sand, silt, gravel, clay, calcareous veining, iron oxide staining, and manganese staining. The bedrock is generally weathered, friable, and weakly to strongly cemented. Occasional layers of caliche and mica cross-bedding were observed in the bedrock at various depths within most of the bucket auger borings. A fault was identified in Bucket Auger Boring BA-7 at a depth of approximately 16± feet. A displacement of approximately 1± inch was observed at the location of the fault within the bedrock stratum at this depth.

Groundwater

Groundwater was not encountered at any of the boring locations during drilling. Based on the lack of any water within the borings, and the moisture contents of the recovered soil samples,

the static groundwater table is considered to have existed at a depth in excess of 91± feet below existing site grades at the time of the subsurface investigation.

As part of our research, we reviewed available groundwater data to determine recent groundwater level for the site. The primary reference used to determine the groundwater depths in this area is the California Department of Water Resources website, http://www.water.ca.gov/waterdatalibrary/. The nearest monitoring well in this database is located 1.18± miles north of the site. Water level readings within this monitoring well indicates a recent high groundwater level of 106± feet below the ground surface in August 2015.

## 4.3 Geologic Conditions

Regional geologic conditions were obtained from the Geologic Map of the Yucaipa Quadrangle 7.5' Quadrangle, Riverside County, California, by Thomas W. Dibblee, Jr., 2004 (Plate 3). The northern one-third of the site is mapped as older alluvium (Map Symbol Qoa). This unit is described as dissected, light reddish, crudely bedded alluvial fan sand and gravel deposits. The central and southeastern areas of the site are mapped as being underlain by the San Timoteo Formation (Map Symbol Tst) bedrock. This bedrock unit is described as light gray, friable, arkosic sandstone; includes some interbedded pebble-cobble conglomerate and greenish to reddish claystone. The southwestern portion of the site is mapped as quartz diorite (tonalite) bedrock (Map Symbol qdi). This bedrock unit is described as medium grained holocrystalline plutonic rocks of the San Jacinto Mountains, part of the atholithic pluton of the Peninsular Ranges. This granitic rock unit consists mostly of quartz diorite but may range into granodiorite. It should be noted that surficial sediments (Map symbol Qa) are mapped several hundred feet west of the site. The younger alluvium (Qa) is described as dissected alluvial sand and gravel of plutonic and gneissic detritus

Based on the materials encountered at the exploration locations, the site is generally underlain by younger alluvium and/or older alluvium in the near surface. San Timoteo Formation bedrock generally was encountered at the ground surface and underlying the alluvium at most of the exploration locations. Pacific Soils, Inc. encountered quartz diorite bedrock in the southwestern area of the site during their previous investigation. It is our opinion that the materials encountered throughout the site are consistent with the mapped geologic units shown on Plate 3.

## 4.4 Seismic Refraction Survey

A seismic refraction survey was performed at the subject site. The purpose of the seismic refraction survey was to define the excavation characteristics of the bedrock materials that underlie the subject site.

A brief summary of the methodology, field procedures, and the results of the seismic refraction survey are presented below. The complete results of the seismic refraction survey are presented in Appendix F of this report.

Methodology

The seismic refraction method consists of measuring (at known points along the surface of the ground) the travel times of compressional waves generated by an impulsive energy source and can be used to estimate the layering, structure, and seismic acoustic velocities of subsurface horizons. Seismic waves travel down and through the soils and rocks, and when the wave encounters a contact between two earth materials having different velocities, some of the wave's energy travels along the contact at the velocity of the lower layer. The fundamental assumption is that each successively deeper layer has a velocity greater than the layer immediately above it. As the wave travels along the contact, some of the wave's energy is refracted toward the surface where it is detected by a series of motion-sensitive transducers (geophones). The arrival time of the seismic wave at the geophone locations can be related to the relative seismic velocities of the subsurface layers in feet per second (fps), which can then be used to aid in interpreting both the depth and type of materials encountered.

Field Procedures

Eight (8) 200- to 300-foot-long seismic refraction survey lines (Seismic Lines SL-1 though SL-8) were performed as shown on the Geotechnical Map, enclosed as Plate 2 of this report. These lines were generally placed near areas of proposed cuts with expected underlying bedrock. A 16-pound sledge-hammer was used as an energy source to produce the seismic waves and twenty-four, 14-Hz geophones (used to aid in filtering background noise from nearby vehicular traffic) spaced at eight- to twelve-foot intervals were employed to detect both the direct and refracted waves. The seismic wave arrivals were digitally recorded in SEG-2 format on a Geometries StrataVisor™ NZXP model signal enhancement refraction seismograph. Seven shot points were utilized along the spread using forward, reverse, and several intermediate locations in order to obtain high resolution survey data for velocity analysis and depth modeling purposes. The data was acquired using a sampling rate of 0.0625 milliseconds having a record length of 0.08 seconds with no acquisition filters.

During acquisition, the seismograph provides both a hard copy and screen display of the seismic wave arrivals, of which are digitally recorded on the in-board seismograph computer. The data on the paper record and/or display screen were used to analyze the arrival time of the primary seismic "P"-waves at each geophone station, in the form of a wiggle trace, for quality control purposes in the field. Each geophone and seismic shot location was surveyed using a hand-level and ruler for topographic correction, with "0" being the lowest point along each survey line, for reference.

Results and Conclusions

The field data obtained during the seismic refraction survey was processed and analyzed using two specialized computer programs, SIPWin (Seismic Refraction Interpretation Program for Windows), Rayfract, and Refractor. SIPWin provides average characteristics for several layers which are defined within the subsurface profile. Rayfract provides more discrete data that indicates the relative structure of the subsurface materials. Refractor evaluates the subsurface using layer assignments and this technique provides an approach for recognizing and compensating for hidden layers. In all of the cases, the results of the geophysical interpretation provide shear wave velocities can be evaluated using rippability charts published by Caterpillar and other grading equipment manufacturers. Typically, the Caterpillar rippability chart for a D-9

Single Shank Ripper is utilized when evaluating the excavation characteristics of bedrock. This table is presented below:

| Sedimentary Rock Velocity (feet/second±) | Rippability |
|---|---|
| <7,300 | Rippable |
| 7,300 – 9,500 | Moderately Rippable |
| >9,500 | Non-Rippable |

However, it should be noted that different excavating equipment, such as a track-mounted excavator or other trench excavating equipment, may not correlate well with these velocity ranges. We have also provided the Caltrans Rippability Chart as presented below for comparison. These values are published Caltrans studies (Stephens, 1978) that are based on their experience and are more conservative than the Caterpillar's rippability charts. It should be noted that the type of bedrock (granitic, metamorphic, or sedimentary) was not indicated. This table is presented below:

| Bedock Velocity (feet/second±) | Rippability |
|---|---|
| <3,500 | Easily Ripped |
| 3,500 – 5,000 | Moderately Difficult |
| 5,000 – 6,600 | Difficult Ripping / Light Blasting |
| >6,600 | Blasting Required |

Using the layer velocity model, the geophysical survey identified three major subsurface layers with respect to seismic velocities. These layers are depicted graphically in Appendix A of the Seismic Refraction Survey, which has been included in Appendix F of this report.

Velocity Layer V-1, ranges from 1,295 to 1,439 feet/second, and is considered to represent topsoil, colluvium, alluvium, and/or very highly-weathered sedimentary bedrock. This layer is considered to be rippable with conventional equipment.

Velocity Layer V-2, ranges from 2,063 to 3,314 feet/second and is considered to represent the non- to slightly-consolidated older alluvial deposits or very highly-weathered sedimentary bedrock. This layer is considered to still be within the threshold for conventional ripping. Trenching within this velocity layer using excavator equipment may require some breaking and/or light blasting.

Velocity Layer V-3, ranges from 3,635 to 4,645 feet/second, and is considered to represent highly-weathered sedimentary bedrock. This layer is considered to still be within the threshold for conventional ripping. Trenching within this velocity layer using excavator equipment may require some breaking and/or light blasting. The approximate depths to each layer are below:

| Seismic Line | Velocity Layer | Upper Limit (feet) | Lower Limit (feet) |
|---|---|---|---|
| S-1 | V-1 | 0 | 3 to 5 |
| | V-2 | 3 to 5 | 7 to 17 |
| | V-3 | 7 to 17 | >40 |
| S-2 | V-1 | 0 | 3 to 6 |
| | V-2 | 3 to 6 | 20 to 25 |
| | V-3 | 20 to 25 | >40 |
| S-3 | V-1 | 0 | 2 to 6 |
| | V-2 | 2 to 6 | >40 |
| S-4 | V-1 | 0 | 3 |
| | V-2 | 3 | >40 |
| S-5 | V-1 | 0 | 4 to 6 |
| | V-2 | 4 to 6 | 40 to 46 |
| | V-3 | 40 to 46 | >75 |
| S-6 | V-1 | 0 | 4 |
| | V-2 | 4 | 36 to 40 |
| | V-3 | 36 to 40 | >55 |
| S-7 | V-1 | 0 | 2 to 4 |
| | V-2 | 2 to 4 | 23 to 35 |
| | V-3 | 23 to 35 | >55 |
| | V-1 | 0 | 2 to 5 |
| S-8 | V-2 | 2 to 5 | 18 to 20 |
| | V-3 | 18 to 20 | >55 |

Conclusions and Recommendations

Based on the results of the layer model of the geophysical survey, the sedimentary bedrock, which is represented by Velocity Layers V-2 and V-3, are considered rippable based on the Caterpillar rippability chart and moderately difficult on the Caltrans rippabilty chartd. Based on our experience with similar projects and our understanding of conventional grading equipment, SCG considers that the grading contractor will encounter rippable materials during grading activities. However, the grading contractor may require some breaking or light blasting in limited areas during trenching and/or the placement of infrastructure if using track-mounted excavator equipment to obtain the desired grade. It is recommended that the full text of the seismic refraction survey be reviewed for more complete information.

# 5.0 LABORATORY TESTING

The soil samples recovered from the subsurface exploration were returned to our laboratory for further testing to determine selected physical and engineering properties of the soils. The tests are briefly discussed below. It should be noted that the test results are specific to the actual samples tested, and variations could be expected at other locations and depths. Test results from the previous study are denoted using the project number (18G180-1). Some of the laboratory test results from the previous studies discussed in Section 3.3 of this report are also included in Appendix G, where noted below.

Classification

All recovered soil samples were classified using the Unified Soil Classification System (USCS), in accordance with ASTM D-2488. The field identifications were then supplemented with additional visual classifications and/or by laboratory testing. The USCS classifications are shown on the Boring Logs and are periodically referenced throughout this report.

Density and Moisture Content

The density has been determined for selected relatively undisturbed ring samples. These densities were determined in general accordance with the method presented in ASTM D-2937. The results are recorded as dry unit weight in pounds per cubic foot. The moisture contents are determined in accordance with ASTM D-2216, and are expressed as a percentage of the dry weight. These test results are presented on the Boring and Trench Logs.

Consolidation

Selected soil samples were tested to determine their consolidation potential, in accordance with ASTM D-2435. The testing apparatus is designed to accept either natural or remolded samples in a one-inch high ring, approximately 2.416 inches in diameter. Each sample is then loaded incrementally in a geometric progression and the resulting deflection is recorded at selected time intervals. Porous stones are in contact with the top and bottom of the sample to permit the addition or release of pore water. The samples are typically inundated with water at an intermediate load to determine their potential for collapse or heave. The results of the consolidation testing are plotted on Plates C-1 through C-14 in Appendix C of this report. Additional consolidation test results performed during the referenced previous studies are included in Appendix G.

Expansion Index

The expansion potential of the on-site soils was determined in general accordance with ASTM D-4829. The testing apparatus is designed to accept a 4-inch diameter, 1-in high, remolded sample. The sample is initially remolded to 50± 1 percent saturation and then loaded with a surcharge equivalent to 144 pounds per square foot. The sample is then inundated with water and allowed to swell against the surcharge. The resultant swell or consolidation is recorded after a 24-hour period. The results of the EI testing are as follows:

| Sample Identification | Expansion Index | Expansive Potential |
|---|---|---|
| B-01 @ 6 feet (Pacific Soils) | 0 | Very Low |
| B-03 @ 0 to 5 feet (Pacific Soils) | 32 | Low |
| B-07 @ 0 to 5 feet (Pacific Soils) | 0 | Very Low |
| B-10 @ 0 to 5 feet (Pacific Soils) | 16 | Very Low |
| B-13 @ 0 to 5 feet (Pacific Soils) | 2 | Very Low |
| B-17 @ 0 to 5 feet (Pacific Soils) | 1 | Very Low |
| B-20 @ 0 to 5 feet (Pacific Soils) | 35 | Low |
| B-22 @ 20 feet (Pacific Soils) | 51 | Medium |
| B-24 @ 10 feet (Pacific Soils) | 60 | Medium |
| B-25 @ 10 feet (Pacific Soils) | 53 | Medium |
| B-26 @ 10 feet (Pacific Soils) | 34 | Low |
| B-108 @ 0 to 5 feet (GPI) | 45 | Low |
| TP-106 @ 4 to 5 feet (GPI) | 42 | Low |
| HSA-2 @ 1 to 5 feet | 28 | Low |
| HSA-4 @ 1 to 5 feet | 9 | Very Low |
| T-7 @ 2 to 5 feet | 14 | Very Low |

Maximum Dry Density and Optimum Moisture Content

A representative bulk sample was tested for its maximum dry density and optimum moisture content. The results have been obtained using the Modified Proctor procedure, per ASTM D-1557 and are presented on Plate C-15 in Appendix C of this report. This test is generally used to compare the in-situ densities of undisturbed field samples, and for later compaction testing. Additional testing of other soil types or soil mixes may be necessary at a later date. The results of previous testing performed during the referenced previous studies are included in Appendix G of this report.

Direct Shear

Direct shear testing was performed during the previous studies performed by GPI and Pacific Soils. A total of eleven (11) direct shear tests were performed, four (4) by GPI and seven (7) by Pacific Soils, on various soil and bedrock materials from the site. The referenced reports indicate that the tests were performed in accordance with ASTM D-3080. The results of the direct shear tests are presented in Appendix G of this report.

Soluble Sulfates

Representative samples of the near-surface soil were submitted to a subcontracted analytical laboratory for determination of soluble sulfate content. Soluble sulfates are naturally present in soils, and if the concentration is high enough, can result in degradation of concrete which comes

into contact with these soils. The results of the soluble sulfate testing are presented below, and are discussed further in a subsequent section of this report.

| Sample Identification | Soluble Sulfates (%) | Sulfate Classification |
|---|---|---|
| TP-2 @ 8 to 9 feet (GPI) | 0.0020 | Not Applicable (S0) |
| TP-6 @ 4 to 5 feet (GPI) | 0.0022 | Not Applicable (S0) |
| TP-6 @ 3 to 4 feet (GPI) | 0.0022 | Not Applicable (S0) |
| B-22 @ 20 feet (Pacific Soils) | 0.0085 | Not Applicable (S0) |
| B-25 @ 10 feet (Pacific Soils) | 0.0006 | Not Applicable (S0) |
| HSA-1 @ 1 to 5 feet | 0.0207 | Not Applicable (S0) |
| HSA-2 @ 1 to 5 feet | 0.0039 | Not Applicable (S0) |
| HSA-2 @ 19 to 20 feet | 0.0041 | Not Applicable (S0) |
| HSA-4 @ 1 to 5 feet | 0.0043 | Not Applicable (S0) |
| HSA-6 @ 1 to 5 feet | 0.0017 | Not Applicable (S0) |
| HSA-8 @ 11 to 16 feet | 0.0093 | Not Applicable (S0) |
| HSA-9 @ 16 to 20 feet | 0.0087 | Not Applicable (S0) |
| HSA-10 @ 1 to 5 feet | 0.0053 | Not Applicable (S0) |

Corrosivity Testing

Representative bulk samples of the near-surface soils were submitted to a subcontracted corrosion engineering laboratory to determine if the near-surface soils possess corrosive characteristics with respect to common construction materials. The corrosivity testing included a determination of the electrical resistivity, pH, and chloride and nitrate concentrations of the soils, as well as other tests. The results of some of these tests are presented below and are discussed further in a subsequent section of this report.

| Sample Identification | Saturated Resistivity (ohm-cm) | pH | Chlorides (mg/kg) | Nitrates (mg/kg) | Sulfides (mg/kg) | Redox Potential (mV) |
|---|---|---|---|---|---|---|
| HSA-1 @ 1 to 5 feet | 2,077 | 7.5 | 44.1 | 6.0 | ND | 152 |
| HSA-2 @ 1 to 5 feet | 3,015 | 7.6 | 22.7 | 2.0 | 4.0 | 147 |
| HSA-2 @ 19 to 20 feet | 2,278 | 7.6 | 23.5 | 7.5 | 0.3 | 156 |
| HSA-4 @ 1 to 5 feet | 5,293 | 7.4 | 25.5 | 0.1 | 2.6 | 141 |
| HSA-6 @ 1 to 5 feet | 3,752 | 6.7 | 8.7 | 2.69 | 0.7 | 129 |
| HSA-8 @ 11 to 16 feet | 1,206 | 7.4 | 44.3 | 3.8 | ND | 163 |
| HSA-9 @ 16 to 20 feet | 1,072 | 6.8 | 127.6 | 5.3 | ND | 175 |
| HSA-10 @ 1 to 5 feet | 4,087 | 7.3 | 22.8 | 4.1 | 0.4 | 149 |

Corrosivity testing results reported by GPI are presented below, and are discussed further in a subsequent section of this report:

| Sample Identification | Saturated Resistivity (ohm-cm) | pH | Chlorides (mg/kg) | Nitrates (mg/kg) |
|---|---|---|---|---|
| TP-2 @ 8 to 9 feet (GPI) | 5,600 | 5.4 | 1.5 | 2.4 |
| TP-6 @ 4 to 5 feet (GPI) | 2,240 | 6.9 | 1.7 | 2.2 |
| TP-6 @ 3 to 4 feet (GPI) | 4,440 | 7.7 | 1.5 | 1.9 |
| B-22 @ 20 feet (Pacific Soils) | 670 | 9.5 | 5.4 | Not Tested |
| B-25 @ 10 feet (Pacific Soils) | 13,000 | 8.6 | ND | Not Tested |

# 6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our review, field exploration, laboratory testing and geotechnical analysis, the proposed development is considered feasible from a geotechnical standpoint. The recommendations contained in this report should be taken into the design, construction, and grading considerations.

The recommendations are contingent upon all grading and foundation construction activities being monitored by the geotechnical engineer of record. The recommendations are provided with the assumption that an adequate program of client consultation, construction monitoring, and testing will be performed during the final design and construction phases to verify compliance with these recommendations. Maintaining Southern California Geotechnical, Inc., (SCG) as the geotechnical consultant from the beginning to the end of the project will provide continuity of services. The geotechnical engineering firm providing testing and observation services shall assume the responsibility of Geotechnical Engineer of Record.

The Grading Guide Specifications, included as Appendix D, should be considered part of this report, and should be incorporated into the project specifications. The contractor and/or owner of the development should bring to the attention of the geotechnical engineer any conditions that differ from those stated in this report, or which may be detrimental for the development.

## 6.1 Seismic Design Considerations

The subject site is located in an area which is subject to strong ground motions due to earthquakes. The performance of a site-specific seismic hazards analysis was beyond the scope of this investigation. However, numerous faults capable of producing significant ground motions are located near the subject site. Due to economic considerations, it is not generally considered reasonable to design a structure that is not susceptible to earthquake damage. Therefore, significant damage to structures may be unavoidable during large earthquakes. The proposed structures should, however, be designed to resist structural collapse and thereby provide reasonable protection from serious injury, catastrophic property damage and loss of life.

Faulting, Seismicity, and Geologic Hazards

Research of available maps indicates that the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. The Riverside County RCIT GIS website indicates that two Riverside County fault zones traverse the site in the northwest/southeast direction. These fault zones are identified as the Beaumont Plain Fault Zones. The locations of these fault zones are identified on the Geotechnical Map, enclosed as Plate 2 in Appendix A of this report.

A recent fault study, discussed in Section 3.3 of this report, was performed by SCG. SCG excavated two (2) trenches, 1,180± to 1,300± feet in length to depths of 6½ to 20± feet within the Beaumont Plain Fault Zone. The trenches were excavated in an orientation that was roughly perpendicular to the projection of the Beaumont Plain Fault. All of the faults encountered within Fault Trench Nos. FT-1 and FT-2 were observed to terminate within the older alluvium, paleosol, or San Timoteo Formation bedrock. SCG concluded that based on the results of the fault

investigation, there was positive evidence that neither active nor potentially active faults are present at the proposed development. SCG recommended that the development proceed without any structural setbacks.

Based on the remedial grading recommendations provided in a subsequent section of this report, the loose and potentially compressible and collapsible younger alluvial soil will be removed and replaced as compacted structural fill. Therefore, the potential for other geologic hazards such as seismically induced settlement, lateral spreading, and subsidence affecting the site is considered low.

Seismic Design Parameters

Based on standards in place at the time of this report, the proposed development is expected to be designed in accordance with the requirements of the 2022 edition of the California Building Code (CBC), which was adopted on January 1, 2023. The 2022 California Building Code (CBC) provides procedures for earthquake resistant structural design that include considerations for on-site soil conditions, occupancy, and the configuration of the structure including the structural system and height. The seismic design parameters presented below are based on the soil profile and the proximity of known faults with respect to the subject site.

The 2022 CBC Seismic Design Parameters have been generated using the SEAOC/OSHPD Seismic Design Maps Tool, a web-based software application available at the website www.seismicmaps.org. This software application calculates seismic design parameters in accordance with several building code reference documents, including ASCE 7-16, upon which the 2022 CBC is based. The application utilizes a database of risk-targeted maximum considered earthquake ($MCE_R$) site accelerations at 0.01-degree intervals for each of the code documents. The table below was created using data obtained from the application. The output generated from this program is included as Plate E-1 in Appendix E of this report.

**2022 CBC SEISMIC DESIGN PARAMETERS**

| Parameter | | Value |
|---|---|---|
| Mapped Spectral Acceleration at 0.2 sec Period | $S_S$ | 1.609 |
| Mapped Spectral Acceleration at 1.0 sec Period | $S_1$ | 0.622 |
| Site Class | --- | C |
| Site Modified Spectral Acceleration at 0.2 sec Period | $S_{MS}$ | 1.931 |
| Site Modified Spectral Acceleration at 1.0 sec Period | $S_{M1}$ | 0.871 |
| Design Spectral Acceleration at 0.2 sec Period | $S_{DS}$ | 1.288 |
| Design Spectral Acceleration at 1.0 sec Period | $S_{D1}$ | 0.581 |

Liquefaction

Liquefaction is the loss of strength in generally cohesionless, saturated soils when the pore-water pressure induced in the soil by a seismic event becomes equal to or exceeds the overburden pressure. The primary factors which influence the potential for liquefaction include groundwater table elevation, soil type and plasticity characteristics, relative density of the soil, initial confining

pressure, and intensity and duration of ground shaking. The depth within which the occurrence of liquefaction may impact surface improvements is generally identified as the upper 50 feet below the existing ground surface. Liquefaction potential is greater in saturated, loose, poorly graded fine sands with a mean ($d_{50}$) grain size in the range of 0.075 to 0.2 mm (Seed and Idriss, 1971). Non-sensitive clayey (cohesive) soils which possess a plasticity index of at least 18 (Bray and Sancio, 2006) are generally not considered to be susceptible to liquefaction, nor are those soils which are above the historic static groundwater table.

The Riverside County GIS website indicates that a small area in the western portion of the site, is located within a zone of moderate liquefaction susceptibility. However, the soil and bedrock conditions encountered at most of the boring and trench locations are not considered to be conducive to liquefaction. The conditions at the borings and trenches generally consist of surficial younger alluvial sediments underlain by medium dense to very dense older alluvium and dense to very dense weathered bedrock. Some of the younger alluvial soils encountered near the ground surface consist of loose to medium dense silty sands, sands, and sandy silts and in their present condition, may be susceptible to liquefaction. However, the remedial grading recommendations presented in a subsequent section of this report indicate that the younger alluvium should be removed in its entirety and replaced as compacted structural fill prior to construction. Therefore, any existing younger alluvium which may be presently susceptible to liquefaction will be recompacted as a part of the recommended remedial grading. Additionally, the groundwater table at this site is considered to be present at a depth greater than 50± feet below the existing site grades. Based on the lack of a static groundwater table and the recommendation to remove and recompact the near-surface younger alluvial sediments, liquefaction is not considered to be a design concern for this project.

## 6.2 Geotechnical Design Considerations

General

Extensive grading will be required at this site in order to facilitate the proposed development. The cut-fill map and conceptual grading plan indicate that fills of up to 80± feet and cuts of up to 70± feet will be necessary within the proposed building areas to achieve the proposed building pad grades. Some areas of deeper cuts and fills will be necessary outside of the building pads, especially near the western property line and near the northeast corner of the site.

The younger alluvial soils and colluvium encountered at the boring locations generally possess relatively low strengths and low relative densities. Some of these materials were observed to be porous. Based on the results of laboratory testing, some of these soils are subject to large magnitudes of settlement consolidation settlement upon loading and significant collapse when inundated with water. Based on these considerations, the younger alluvium and colluvium, in its present condition, is not considered suitable for the support of new fill soils or any new improvements. **Therefore, remedial grading will be necessary in order to remove the younger alluvial soils (as well as any colluvial soils) from the proposed development area. These soils may be reused on site as compacted structural fill.** Based on conditions encountered at the boring locations, the overexcavations will generally extend to depths of 1½ to 9½± feet to remove the younger native alluvial soils. However, previous exploration performed by Pacific Soils, Inc. indicates that the younger alluvial soils may be as deep as 14 to 17± feet near the southern property line, as well as in and near the southern portion of Building 4. The

underlying older alluvium and bedrock materials possess greater strengths and relative densities and are generally considered to be suitable to support new structural fill and improvements.

Settlement

The recommended remedial grading will remove all of the unsuitable, compressible/collapsible, younger alluvial soils and colluvium from the proposed building pad areas and replace these materials as compacted fill soils. The underlying moderate to high strength older alluvium and bedrock which will remain in-place, possess more favorable consolidation characteristics and lack a significant potential for hydrocollapse. Provided that the recommended remedial grading is completed, the post-construction static settlements of the proposed structure are expected to be within tolerable limits.

Deep Fill Areas

Based on the conceptual grading plan, the proposed grading will include fills of up to 80± feet within the building pad areas. Remedial grading in the southwest draining canyon areas will likely create deeper fills to remove the unsuitable younger alluvium and colluvium. In order to reduce the settlement potential of the newly placed fill soils to acceptable levels and avoid excessive differential settlements, fill soils placed at depths greater than 20 feet below proposed pad grade within the building pads should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density.

Settlement of Deep Fill Soils

Subsequent to the proposed grading, the proposed building pad areas will be underlain by engineered fill soils extending to depths on the order of 85± feet. The primary settlement associated with these fill soils is expected to occur relatively quickly. Minor amounts of additional settlement may occur due to secondary consolidation effects. The extent of secondary consolidation is difficult to assess precisely, and will be reduced by the proposed mitigation measures recommended herein, but may be in the range of 0.1 to 0.3 percent of the fill thickness. Based on the differential fill thickness that will exist across the building footprints, the structural design will need to consider the distortions that could be caused by the secondary consolidation of the fill soils. Provided that the grading and foundation design recommendations presented in this report are implemented, these settlements are expected to be within the structural tolerances of the proposed buildings.

This report includes optional recommendations to install settlement monuments within the deep fill areas in the proposed building pads, if deemed necessary at the time of remedial grading. Settlement monuments can be used to verify that primary consolidation of the remaining older alluvial soils is complete, prior to initiating construction of the new buildings.

Cut/Fill Transitions

The conceptual grading plan indicates that several cut/fill and bedrock/fill transitions will be created within the proposed building pad areas by the proposed grading. The differing support conditions of the native older alluvial soils and bedrock versus the newly compacted fill soils may result in excessive differential settlements if not mitigated. Remedial grading will be required to

eliminate the cut/fill transitions which will occur at building pad and foundation bearing grades as well as to reduce the inclinations of the underlying cut/fill contacts.

Expansion

The near-surface on-site soils have been determined to possess very low to medium expansion potentials (EI = 0 to 60). Based on the presence of expansive soils, adequate moisture conditioning of the subgrade soils and fill soils will be necessary during grading, and special care must be taken to maintaining moisture content of these soils at 2 to 4 percent above the Modified Proctor optimum. This will require the contractor to frequently moisture condition these soils throughout the grading process, unless grading occurs during a period of relatively wet weather.

Slope Stability

The conceptual grading plan indicates that new cut and fill slopes will be constructed at inclinations of 2h:1v or flatter in order to facilitate the new site grades surrounding the graded building pad areas. The results of our preliminary slop stability analyses indicate that newly constructed fill slopes, composed of properly compacted engineered fill, at inclinations of 2h:1v or flatter, will possess adequate gross and surficial stability.

Based on the variability of the composition of the near surface soils, cut slopes excavated within the existing alluvial soils may be subject to surficial especially in instability in granular soils and sandstone materials due to the lack of cohesion. Therefore, stability fills will likely be required within some of the cut slope areas. However, most of the soils encountered at the site possess significant silt and clay content and may possess adequate cohesion to remain stable. The need for stability fills should be determined by SCG as part of the future detailed grading plan review.

Soluble Sulfates

The result of the soluble sulfate testing indicates that the selected samples of the on-site soils possess concentrations of sulfates that correspond to Class S0 with respect to the American Concrete Institute (ACI) Publication 318-05 Building Code Requirements for Structural Concrete and Commentary, Section 4.3. Therefore, specialized concrete mix designs are not considered to be necessary, with regard to sulfate protection purposes. It is, however, recommended that additional soluble sulfate testing be conducted at the completion of rough grading to verify the soluble sulfate concentrations of the soils which are present at pad grade within the building areas.

Corrosion Potential

The results of laboratory testing indicate that the tested samples of the on-site soils possess saturated resistivity values of 670 to 13,000 ohm-cm, and pH values of 5.4 to 9.5. The tested soils possess redox potentials ranging between 129 and 175 mV, and sulfide concentrations ranging between 0 and 4.0 mg/kg. These test results have been evaluated in accordance with guidelines published by the Ductile Iron Pipe Research Association (DIPRA). The DIPRA guidelines consist of a point system by which characteristics of the soils are used to quantify the corrosivity characteristics of the site. **Based on these factors, and utilizing the DIPRA procedure, some of the on-site soils are considered to be corrosive to ductile iron pipe.**

Relatively low concentrations (0 to 127.6 mg/kg) of chlorides were detected in the samples submitted for corrosivity testing. In general, soils possessing chloride concentrations in excess of 500 parts per million (ppm) are considered to be corrosive with respect to steel reinforcement within reinforced concrete. Based on the lack of any significant chlorides in the tested samples, the site is considered to have a C1 chloride exposure in accordance with the American Concrete Institute (ACI) Publication 318 Building Code Requirements for Structural Concrete and Commentary. Therefore, a specialized concrete mix design for reinforced concrete for protection against chloride exposure is not considered warranted.

Nitrates present in soil can be corrosive to copper tubing at concentrations greater than 50 mg/kg. The tested samples possess nitrate concentrations ranging from 0.1 to 2.69 mg/kg. Based on this test result, the on-site soils are not considered to be corrosive to copper pipe.

**It should be noted that SCG does not practice in the area of corrosion engineering. Therefore, the client may also wish to contact a corrosion engineer to provide a more thorough evaluation of these conditions.**

Shrinkage/Subsidence

Removal and recompaction of the younger alluvial soils and colluvium is estimated to result in an average shrinkage of 10 to 20 percent. This assumes average compaction of 92 percent within the new engineered fill soils. Removal and recompaction of the existing older alluvial soils is estimated to result in an average shrinkage of 0 to 12 percent. Engineered fills placed more than 20 feet below finished grade (where 95 percent relative compaction is recommended) are expected to shrink about 14 to 26 percent. Removal and recompaction of the weathered bedrock materials is expected to result in bulking of 0 to 5 percent. It should be noted that these shrinkage and bulking estimates are based on dry density testing performed on small-diameter samples taken at the boring locations. If a more accurate and precise shrinkage estimate is desired, SCG can perform a shrinkage study involving several excavated test pits where in-place densities are determined using in-situ testing methods instead of laboratory density testing on small-diameter samples. Please contact SCG for details and a cost estimate regarding a shrinkage study, if desired.

Minor ground subsidence is expected to occur in the older alluvium and weathered bedrock located below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be 0.1 feet.

These estimates are based on previous experience with nearby projects and the subsurface conditions encountered at the boring and trench locations. The actual amount of subsidence is expected to be variable and will be dependent on the type of machinery used, repetitions of use, and dynamic effects, all of which are difficult to assess precisely.

Foundation and Grading Plan Review

It is recommended that we be provided with copies of all future foundation and grading plans, when they become available, for review with regard to the conclusions, recommendations, and assumptions contained within this report.

## 6.3 Site Grading Recommendations

The grading recommendations presented below are based on the subsurface conditions encountered at the boring and trench locations, and our understanding of the proposed development. We recommend that all grading activities be completed in accordance with the Grading Guide Specifications included as Appendix D of this report, unless superseded by site-specific recommendations presented below.

Site Stripping

Initial site stripping should include removal of any surficial vegetation and topsoil. This should include any weeds, grasses, shrubs, and trees. Removal of trees should also include any associated root masses. These materials should be disposed of off-site. The actual extent of site stripping should be determined in the field by the geotechnical engineer, based on the organic content and stability of the materials encountered.

Treatment of Existing Soils

Remedial grading should be performed within the proposed development area in order to remove all of the existing undocumented fill soils and unsuitable younger native alluvial soils and colluvium. These recommended overexcavations generally range from depths of 1½ to 9½± feet below existing grade, but may be as deep as 14 to 17± feet in areas in and near the southern portion of Building 4.

Additional remedial grading is also recommended to mitigate the native/fill transitions that will be created by the proposed grading. The existing soils and bedrock materials present in the proposed building pad areas are recommended to be overexcavated to a depth of at least 5 feet below the proposed building pad grade and 5 feet below existing grade.

Within the influence zones of the new foundations, the overexcavation should extend to a depth of at least 3 feet below proposed foundation bearing grades. The overexcavation area should extend at least 5 feet beyond the building and foundation perimeters, and to an extent equal to the depth of fill below the new foundations. Based on the proposed site grading, the lateral extents of overexcavation will generally be much greater than the 5-foot minimum. If the proposed structure incorporates any exterior columns (such as for a canopy or overhang) the area of overexcavation should also encompass these areas.

To mitigate the relatively steep inclination of the underlying cut/fill contact in the areas of the southwest draining canyons, benching of the sidewalls and the overexcavation bottom will be required during fill placement. The horizontal extent of the benching should be sufficient to reduce the effective inclination of the native fill contact to 4h:1v or flatter. This additional benching is not required outside the areas of the proposed building pads.

The expected depths of necessary overexcavation to remove artificial fill and younger native alluvial soils are indicated on the Geotechnical Map (Plate 2 in Appendix A of this report), next to the boring or trench symbols where younger alluvial or colluvial soils were encountered. As discussed above, additional overexcavation (beyond the depths indicated on Plate 2) is recommended throughout the building pad areas in order to eliminate cut-fill transitions, and to

flatten the inclination of the fill native contact below the building pad areas. Therefore, overexcavation will likely extend to depths greater than the minimum necessary depth to remove younger alluvial soils in some areas, depending on the planned depths of cut and fill.

Following the completion of the overexcavation, the subgrade should be evaluated by the geotechnical engineer to verify its suitability to serve as the structural fill subgrade. Some localized areas of deeper excavation may be required if loose, porous, or low-density materials are encountered at the base of the overexcavation. Materials suitable to serve as the structural fill subgrade within the building areas should consist of moderate strength alluvial soils or bedrock materials which possess an in-situ density equal to at least 85 percent of the ASTM D-1557 maximum dry density. These materials should be moisture conditioned to 2 to 4 percent above optimum moisture content prior to placement of any new fill soils. The previously excavated soils may then be replaced as compacted structural fill.

Deep Fill Areas

In order to reduce the settlement potential of the newly placed fill soils to acceptable levels and avoid excessive differential settlements, fill soils placed at depths greater than 20 feet below proposed building pad grades or finished site grades should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density.

Treatment of Existing Soils: Cut and Fill Slopes

New cut and fill slopes will be constructed in the southwest portion of the site, as well as along the west property line. All slopes should be constructed at an inclination of 2h:1v or flatter. A keyway should be excavated at the toe of new fill slopes which are not located in fill areas. The keyway should be at least 15 feet wide and 3 feet deep. The recommended width of the keyway is based on 1.5 times the width of typical grading equipment. If smaller equipment is utilized, a smaller keyway may be suitable, at the discretion of the geotechnical engineer. The base of the keyway should slope at least 1 foot downward into the slope. Following completion of the keyway cut, the subgrade soils should be evaluated by the geotechnical engineer to verify that the keyway is founded into competent materials. The resulting subgrade soils should then be scarified to a depth of 10 to 12 inches, moisture conditioned to 2 to 4 percent above optimum moisture content and recompacted. During construction of the new fill slopes, any existing slopes should be benched in accordance with the detail presented on Plate D-4 in Appendix D of this report. Benches less than 4 feet in height may be used at the discretion of the geotechnical engineer.

Stability fills for cut slopes will provide a more uniform appearance and allow landscaping on the slope. Should a stability fill for cut slope be necessary, the recommendations for the stability fill will be the same as the recommendations for the fill slopes, mentioned above.

Treatment of Existing Soils: Retaining Walls and Site Walls

The existing soils within the areas of any proposed retaining walls and site walls should be overexcavated to a depth of 5 feet below foundation bearing grade and replaced as compacted structural fill as discussed above for the proposed building pads. Any unsuitable younger alluvium or colluvium within any of these foundation areas should be removed in their entirety. Retaining wall footings may also be supported directly within bedrock materials, with no overexcavation required. The overexcavation areas should extend at least 5 feet beyond the foundation

perimeters, and to an extent equal to the depth of fill below the new foundations. Any erection pads for tilt-up concrete walls are considered to be part of the foundation system. The overexcavation subgrade soils should be evaluated by the geotechnical engineer prior to scarifying, moisture conditioning to within 2 to 4 percent above the optimum moisture content, and recompacting the upper 12 inches of exposed subgrade soils. The previously excavated soils may then be replaced as compacted structural fill.

If a retaining wall foundation is entirely underlain by bedrock, then no overexcavation is considered necessary. However, the subgrade materials should be scarified, moisture conditioned, and recompacted as described above.

If the full lateral extent of the recommended remedial grading cannot be completed for the proposed retaining walls and site walls located along property lines, the foundations for those walls should be designed using a reduced allowable bearing pressure. Furthermore, the contractor should take necessary precautions to protect the adjacent streets during rough grading. The geotechnical engineer of record should be contacted if additional recommendations, such as shoring design recommendations, are required.

Treatment of Existing Soils: Flatwork, Parking and Drive Areas

Based on economic considerations, overexcavation of the existing near-surface existing soils in the new flatwork, parking and drive areas is not considered warranted, with the exception of areas where lower strength or unstable soils are identified by the geotechnical engineer during grading. Subgrade preparation in the new flatwork, parking and drive areas should initially consist of removal of all soils disturbed during stripping operations.

The geotechnical engineer should then evaluate the subgrade to identify any areas of additional unsuitable soils. Any such materials should be removed to a level of firm and unyielding soil. The exposed subgrade soils should then be scarified to a depth of 12± inches, moisture conditioned to 2 to 4 percent above the optimum moisture content, and recompacted to at least 90 percent of the ASTM D-1557 maximum dry density. Based on the presence of variable strength surficial soils throughout the site, it is expected that some isolated areas of additional overexcavation may be required to remove zones of lower strength, unsuitable soils.

The grading recommendations presented above for the proposed flatwork, parking and drive areas assume that the owner and/or developer can tolerate minor amounts of settlement within these areas. The grading recommendations presented above do not mitigate the extent of compressible/collapsible native alluvium and colluvium in the flatwork, parking and drive areas. As such, some settlement and associated pavement distress could occur. Typically, repair of such distressed areas involves significantly lower costs than completely mitigating these soils at the time of construction. If the owner cannot tolerate the risk of such settlements, the flatwork, parking and drive areas should be overexcavated to a depth of 2 feet below proposed pavement subgrade elevation, with the resulting soils replaced as compacted structural fill.

Fill Placement

- Fill soils should be placed in thin (6± inches), near-horizontal lifts, moisture conditioned to 2 to 4 percent of the optimum moisture content, and compacted.

- On-site soils may be used for fill provided they are cleaned of any debris to the satisfaction of the geotechnical engineer. Bedrock materials may be reused as fill.
- All grading and fill placement activities should be completed in accordance with the requirements of the current CBC and the grading code of the city of Beaumont and/or the county of Riverside.
- All fill soils should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density, unless noted otherwise. **Fill soils placed at depths greater than 20 feet below proposed building pad and site grades should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density.** Fill soils should be well mixed.
- Compaction tests should be performed periodically by the geotechnical engineer as random verification of compaction and moisture content. These tests are intended to aid the contractor. Since the tests are taken at discrete locations and depths, they may not be indicative of the entire fill and therefore should not relieve the contractor of his responsibility to meet the job specifications.

Imported Structural Fill

All imported structural fill should consist of very low to low-expansive (EI < 20), well graded soils possessing at least 10 percent fines (that portion of the sample passing the No. 200 sieve). Additional specifications for structural fill are presented in the Grading Guide Specifications, included as Appendix D.

Utility Trench Backfill

In general, all utility trench backfill should be compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Compacted trench backfill should conform to the requirements of the local grading code, and more restrictive requirements may be indicated by the city of Beaumont and/or the county of Riverside. All utility trench backfills should be witnessed by the geotechnical engineer. The trench backfill soils should be compaction tested where possible; probed and visually evaluated elsewhere.

Utility trenches which parallel a footing, and extending below a 1h:1v plane projected from the outside edge of the footing should be backfilled with structural fill soils, compacted to at least 90 percent of the ASTM D-1557 standard. Pea gravel backfill should not be used for these trenches. Any soils used to backfill voids around subsurface utility structures, such as manholes or vaults, should be placed as compacted structural fill. If it is not practical to place compacted fill in these areas, then such void spaces may be backfilled with lean concrete slurry. Uncompacted pea gravel or sand is not recommended for backfilling these voids since these materials have a potential to settle and thereby cause distress of pavements placed around these subterranean structures.

## 6.4 Construction Considerations

Excavation Considerations

The near-surface soils vary greatly in composition in different areas and depths throughout the site. Some of these materials will be subject to caving within shallow excavations. Where caving occurs within shallow excavations, flattened excavation slopes may be sufficient to provide excavation stability. On a preliminary basis, temporary excavation slopes should be made no

steeper than 1½h:1v. Deeper excavations may require some form of external stabilization such as shoring or bracing. Maintaining adequate moisture content within the near-surface soils will improve excavation stability. All excavation activities on this site should be conducted in accordance with Cal-OSHA regulations.

Dense to very dense older alluvium and weathered bedrock were encountered in the exploratory borings at relatively shallow depths. Based on the results of the seismic refraction survey, discussed in Section 4.4 of this report and included in Appendix F, the onsite soils and bedrock materials are generally considered to rippable with heavy grading equipment. However, if areas of less weathered bedrock are encountered, use of specialized excavation equipment may be necessary in localized areas.

Groundwater

Groundwater was not encountered during the drilling of any of the borings, which were advanced to depths as great as 91± feet below the existing site grades, nor during any of the borings and trenching activities for the previous studies. Therefore, groundwater is not expected to impact the grading or foundation construction activities.

Slopes

Cut slopes within the native alluvium and manufactured fill slopes will be prone to erosion. The natural slopes and any manufactured slopes that will be created on site should be planted immediately after construction is completed, to achieve well-established and deep-rooted vegetation. The slopes should be planted with shrubs that will develop root systems to depths of 5 feet or more, such as ground acacia. Intervening areas should be planted with lightweight surface plantings with shallower root systems. Wherever possible, the selected plantings should be lightweight and drought tolerant. Due to its high weight, the use of iceplant is not recommended. It is recommended that a landscape architect be consulted to determine the actual planting materials.

All reasonable precautions should be taken to minimize deep soil moisture penetration within the slope soils. The volume of slope irrigation should be the minimum that is required to maintain plant growth. All surface water runoff from the slopes should be diverted away from the top of the proposed retaining walls. The condition of the slope must be continually maintained to reduce the potential for surficial failures. This includes maintenance of the drainage pathways, any diversion structures, maintenance of the vegetation, and repair of rodent damage.

Subdrains

Subdrains will likely be required at the site, particularly in the canyon/drainage areas where deeper removals will be required. Specific subdrain recommendations can be provided based on a review of the final development plans, and based on conditions encountered during grading.

Settlement Monitoring

Based upon our understanding of proposed grading, fills of up to 80± feet deep will be required in the proposed building pad areas. Engineered fills deeper than 20 feet should incorporate a minimum relative compaction of 95 percent, and a moisture content of at least two percent above

the optimum moisture content. A settlement monitoring program should be implemented, consisting of the surveying of surface monuments to monitor settlement of older alluvial soils left in-place and/or proposed fills deeper than 30 feet (design plus remedial grading). Survey monument readings for both deep fill areas and for fill over natural ground should be conducted following the completion of fill placement. Survey monument locations should be selected by the geotechnical consultant. Survey readings should be taken weekly for the first month and on a monthly basis thereafter until vertical movement of the fill mass achieve 90 percent of primary compression, begin secondary compression or the estimated remaining settlement is less than one inch. Construction of the proposed structures should not commence until approved by the geotechnical consultant based on the results of the settlement monitoring. The survey bench marks used for the monitoring should be confirmed with the geotechnical consultant prior to initial readings being performed.

## 6.5 Foundation Design and Construction

Based on the preceding grading recommendations, it is assumed that the new building pads will be underlain by newly placed structural fill soils, extending to a depth of at least 3 feet below foundation bearing grade, which are underlain by older native alluvial soils or bedrock. Based on this subsurface profile, the proposed structures may be supported on shallow foundations.

Shallow Foundation Design Parameters

New square and rectangular footings may be designed as follows:

- Maximum, net allowable soil bearing pressure: 3,000 lbs/ft$^2$.
- Minimum wall/column footing width: 14 inches/24 inches.
- Minimum longitudinal steel reinforcement within strip footings: Four (4) No. 5 rebars (2 top and 2 bottom), due to the differential fill depths and the presence of l expansive soils.
- Minimum foundation embedment: 12 inches into newly placed structural fill soils, and at least 24 inches below adjacent exterior grade.
- It is recommended that the perimeter building foundations be continuous across all exterior doorways. Any flatwork adjacent to the exterior doors should be doweled into the perimeter foundations in a manner determined by the structural engineer.

The allowable bearing pressure presented above may be increased by one-third when considering short duration wind or seismic loads. The minimum steel reinforcement recommended above is based on geotechnical considerations; additional reinforcement may be necessary for structural considerations. The actual design of the foundations should be determined by the structural engineer.

Foundation Construction

The foundation subgrade soils should be evaluated at the time of overexcavation, as discussed in Section 6.3 of this report. It is further recommended that the foundation subgrade soils be

evaluated by the geotechnical engineer immediately prior to steel or concrete placement. Soils suitable for direct foundation support should consist of newly placed structural fill, compacted to at least 90 percent of the ASTM D-1557 maximum dry density. Any unsuitable materials should be removed to a depth of suitable bearing compacted structural fill or suitable native alluvium (where reduced bearing pressures are utilized), with the resulting excavations backfilled with compacted fill soils. As an alternative, lean concrete slurry (500 to 1,500 psi) may be used to backfill such isolated overexcavations.

The foundation subgrade soils should also be properly moisture conditioned to 2 to 4 percent above the Modified Proctor optimum, to a depth of at least 12 inches below bearing grade. Since it is typically not feasible to increase the moisture content of the floor slab and foundation subgrade soils once rough grading has been completed, care should be taken to maintain the moisture content of the building pad subgrade soils throughout the construction process.

Estimated Foundation Settlements

Post-construction total and differential settlements of shallow foundations designed and constructed in accordance with the previously presented recommendations are estimated to be less than 1.0 and 0.5 inches, respectively. Differential movements are expected to occur over a 60-foot span, thereby resulting in an angular distortion of less than 0.002 inches per inch (1/500 deflection ratio). These estimates do not include consolidation of the fill mass. As discussed in Section 6.2 of this report, secondary settlement of engineered fills may be within the range of 0.1 to 0.3 percent of the fill thickness.

Lateral Load Resistance

Lateral load resistance will be developed by a combination of friction acting at the base of foundations and slabs and the passive earth pressure developed by footings below grade. The following friction and passive pressure may be used to resist lateral forces:

- Passive Earth Pressure: 300 lbs/ft$^3$
- Friction Coefficient: 0.30

These are allowable values, and include a factor of safety. When combining friction and passive resistance, the passive pressure component should be reduced by one-third. These values assume that footings will be poured directly against compacted structural fill. The maximum allowable passive pressure is 2,500 lbs/ft$^2$.

## 6.6 Floor Slab Design and Construction

Subgrades which will support new floor slabs should be prepared in accordance with the recommendations contained in the ***Site Grading Recommendations*** section of this report. Based on the anticipated grading which will occur at this site, the floor of the proposed structures may be constructed as a conventional slabs-on-grade supported on newly placed structural fill, which is underlain by moderate strength alluvium. Based on geotechnical considerations, the floor slab may be designed as follows:

- Minimum slab thickness: 6 inches.

- Modulus of Subgrade Reaction: k = 125 psi/in.

- Minimum slab reinforcement: Reinforcement of the floor slabs should consist of No. 3 bars at 18-inches on center in both directions due to the presence of low to medium expansive soils and the expected variable fill depths below the structures. The actual floor slab reinforcement should be determined by the structural engineer, based upon the imposed loading.

- Slab underlayment: If moisture sensitive floor coverings will be used then minimum slab underlayment should consist of a moisture vapor barrier constructed below the entire slab areas where such moisture sensitive floor coverings are expected. The moisture vapor barrier should meet or exceed the Class A rating as defined by ASTM E 1745-97 and have a permeance rating less than 0.01 perms as described in ASTM E 96-95 and ASTM E 154-88. A polyolefin material such as 15 mil Stego® Wrap Vapor Barrier or equivalent will meet these specifications. The moisture vapor barrier should be properly constructed in accordance with all applicable manufacturer specifications. Given that a rock free subgrade is anticipated and that a capillary break is not required, sand below the barrier is not required. The need for sand and/or the amount of sand above the moisture vapor barrier should be specified by the structural engineer or concrete contractor. The selection of sand above the barrier is not a geotechnical engineering issue and hence outside our purview. Where moisture sensitive floor coverings are not anticipated, the vapor barrier may be eliminated.

- Moisture condition the floor slab subgrade soils to 2 to 4 percent above the Modified Proctor optimum moisture content, to a depth of 12 inches. The moisture content of the floor slab subgrade soils should be verified by the geotechnical engineer within 24 hours prior to concrete placement.

- Proper concrete curing techniques should be utilized to reduce the potential for slab curling or the formation of excessive shrinkage cracks.

- The floor slabs should be structurally connected to the foundations as detailed by the structural engineer.

The actual design of the floor slab should be completed by the structural engineer to verify adequate thickness and reinforcement.

## 6.7 Retaining Wall Design and Construction

Although not indicated on the grading plan, some small (less than 6 feet in height) retaining walls may be required to facilitate the new site grades and in loading docks. Retaining walls are also expected within the truck dock areas of the proposed buildings. The parameters recommended for use in the design of these walls are presented below.

Retaining Wall Design Parameters

Based on the soil conditions encountered at the trench and boring locations, the following parameters may be used in the design of new retaining walls for this site. We have provided parameters assuming the use of on-site soils for retaining wall backfill. These near-surface soils generally consist of silty sands, clayey sands, well-graded sands, and sandy clays underlain by sandstone and siltstone bedrock materials. We do not recommend that the onsite sandy clays be used to backfill retaining walls because these soils possess a low expansion potential and may possess lower strengths than the silty sands, sands, and clayey sands. The on-site sands, silty sands, and clayey sands are expected to possess friction angles of at least 30 degrees when compacted to 90 percent of the ASTM-1557 maximum dry density, based on the results of direct shear testing.

If desired, SCG could provide design parameters for an alternative select backfill material behind the retaining walls. The use of select backfill material could result in lower lateral earth pressures. In order to use the design parameters for the imported select fill, this material must be placed within the entire active failure wedge. This wedge is defined as extending from the heel of the retaining wall upwards at an angle of approximately 60° from horizontal. If select backfill material behind the retaining wall is desired, SCG should be contacted for supplementary recommendations.

**RETAINING WALL DESIGN PARAMETERS**

| **Design Parameter** | | **Soil Type** |
|---|---|---|
| | | On-Site Silty Sands and Clayey Sands |
| Internal Friction Angle ($\phi$) | | 30° |
| Unit Weight | | 130 lbs/ft$^3$ |
| Equivalent Fluid Pressure: | Active Condition (level backfill) | 44 lbs/ft$^3$ |
| | Active Condition (2h:1v backfill) | 70 lbs/ft$^3$ |
| | At-Rest Condition (level backfill) | 65 lbs/ft$^3$ |

The walls should be designed using a soil-footing coefficient of friction of 0.30 and an equivalent passive pressure of 300 lbs/ft$^3$. The structural engineer should incorporate appropriate factors of safety in the design of the retaining walls.

The active earth pressure may be used for the design of retaining walls that do not directly support structures or support soils that in turn support structures and which will be allowed to deflect. The at-rest earth pressure should be used for walls that will not be allowed to deflect such as those which will support foundation bearing soils, or which will support foundation loads directly.

Where the soils on the toe side of the retaining wall are not covered by a "hard" surface such as a structure or pavement, the upper 1 foot of soil should be neglected when calculating passive

resistance due to the potential for the material to become disturbed or degraded during the life of the structure.

Seismic Lateral Earth Pressures

In addition to the lateral earth pressures presented in the previous section, retaining walls which are more than 6 feet in height should be designed for a seismic lateral earth pressure, in accordance with the 2022 CBC. If any such walls are proposed, our office should be contacted for supplementary design recommendations.

Retaining Wall Foundation Design

The retaining wall foundations should be underlain by at least 5 feet of newly placed structural fill. Foundations to support new retaining walls should be designed in accordance with the general Foundation Design Parameters presented in a previous section of this report.

Backfill Material

On-site sands and silty sands may be used to backfill the retaining walls. However, all backfill material placed within 3 feet of the back wall face should have a particle size no greater than 3 inches. The retaining wall backfill materials should be well graded.

It is recommended that a minimum 1-foot thick layer of free-draining granular material (less than 5 percent passing the No. 200 sieve) be placed against the face of the retaining walls. This material should extend from the top of the retaining wall footing to within 1 foot of the ground surface on the back side of the retaining wall. This material should be approved by the geotechnical engineer. In lieu of the 1-foot thick layer of free-draining material, a properly installed prefabricated drainage composite such as the MiraDRAIN 6000XL (or approved equivalent), which is specifically designed for use behind retaining walls, may be used. If the layer of free-draining material is not covered by an impermeable surface, such as a structure or pavement, a 12-inch thick layer of a low permeability soil should be placed over the backfill to reduce surface water migration to the underlying soils. The layer of free draining granular material should be separated from the backfill soils by a suitable geotextile, approved by the geotechnical engineer.

All retaining wall backfill should be placed and compacted under engineering controlled conditions in the necessary layer thicknesses to ensure an in-place density between 90 and 93 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D1557-91). Care should be taken to avoid over-compaction of the soils behind the retaining walls, and the use of heavy compaction equipment should be avoided.

Subsurface Drainage

As previously indicated, the retaining wall design parameters are based upon drained backfill conditions. Consequently, some form of permanent drainage system will be necessary in conjunction with the appropriate backfill material. Subsurface drainage may consist of either:

- A weep hole drainage system typically consisting of a series of 2-inch diameter holes in the wall situated slightly above the ground surface elevation on the exposed side of the

wall and at an approximate 20-foot on-center spacing. The weep holes should include a 2 cubic foot pocket of open graded gravel, surrounded by an approved geotextile fabric, at each weep hole location.

- A 4-inch diameter perforated pipe surrounded by 2 cubic feet of gravel per linear foot of drain placed behind the wall, above the retaining wall footing. The gravel layer should be wrapped in a suitable geotextile fabric to reduce the potential for migration of fines. The footing drain should be extended to daylight or tied into a storm drainage system.

## 6.8 Pavement Design Parameters

Site preparation in the pavement area should be completed as previously recommended in the ***Site Grading Recommendations*** section of this report. The subsequent pavement recommendations assume proper drainage and construction monitoring, and are based on either PCA or CALTRANS design parameters for a twenty (20) year design period. However, these designs also assume a routine pavement maintenance program to obtain the anticipated 20-year pavement service life.

Pavement Subgrades

It is anticipated that the new pavements will be primarily supported on a layer of compacted structural fill, consisting of scarified, thoroughly moisture conditioned and recompacted existing soils. The near-surface soils generally consist of silty sands, clayey sands, and sandy clays. Based on their classification, these materials are expected to possess fair pavement support characteristics with R-values ranging between 20 and 35. Based on their classifications, and the extensive grading that will be performed at this site, the on-site soils that will be present at the pavement subgrade are assumed to possesses an R-value of at least 25. Any fill material imported to the site should have support characteristics equal to or greater than that of the on-site soils and be placed and compacted under engineering-controlled conditions. It is recommended that R-value testing be performed after completion of rough grading. Depending upon the results of the R-value testing, it may be feasible to use thinner pavement sections in some areas of the site.

Asphaltic Concrete

Presented below are the recommended thicknesses for new flexible pavement structures consisting of asphaltic concrete over a granular base. The pavement designs are based on the traffic indices (TI's) indicated. The client and/or civil engineer should verify that these TI's are representative of the anticipated traffic volumes. If the client and/or civil engineer determine that the expected traffic volume will exceed the applicable traffic index, we should be contacted for supplementary recommendations. The design traffic indices equate to the following approximate daily traffic volumes over a 20-year design life, assuming six operational traffic days per week.

| Traffic Index | No. of Heavy Trucks per Day |
|---|---|
| 4.0 | 0 |
| 5.0 | 1 |
| 6.0 | 3 |
| 7.0 | 11 |
| 8.0 | 35 |

| | |
|---|---|
| 9.0 | 93 |

For the purpose of the traffic volumes indicated above, a truck is defined as a 5-axle tractor trailer unit with one 8-kip axle and two 32-kip tandem axles. All of the traffic indices allow for 1,000 automobiles per day.

| **ASPHALT PAVEMENTS (R=25)** | | | | | |
|---|---|---|---|---|---|
| **Materials** | **Thickness (inches)** | | | | |
| | Auto Parking and Auto Drive Lanes (TI = 4.0 to 5.0) | Truck Traffic | | | |
| | | TI = 6.0 | TI = 7.0 | TI = 8.0 | TI = 9.0 |
| Asphalt Concrete | 3 | 3½ | 4 | 5 | 5½ |
| Aggregate Base | 7 | 9 | 11 | 12 | 15 |
| Compacted Subgrade | 12 | 12 | 12 | 12 | 12 |

The aggregate base course should be compacted to at least 95 percent of the ASTM D-1557 maximum dry density. The asphaltic concrete should be compacted to at least 95 percent of the Marshall maximum density, as determined by ASTM D-2726. The aggregate base course may consist of crushed aggregate base (CAB) or crushed miscellaneous base (CMB), which is a recycled gravel, asphalt and concrete material. The gradation, R-Value, Sand Equivalent, and Percentage Wear of the CAB or CMB should comply with appropriate specifications contained in the current edition of the "Greenbook" Standard Specifications for Public Works Construction.

Portland Cement Concrete

The preparation of the subgrade soils within concrete pavement areas should be performed as previously described for proposed asphalt pavement areas. The minimum recommended thicknesses for the Portland Cement Concrete pavement sections are as follows:

| **PORTLAND CEMENT CONCRETE PAVEMENTS (R=25)** | | | | |
|---|---|---|---|---|
| **Materials** | **Thickness (inches)** | | | |
| | Autos and Light Truck Traffic (TI = 6.0 or less) | Truck Traffic | | |
| | | TI = 7.0 | TI = 8.0 | TI = 9.0 |
| PCC | 5 | 5½ | 7 | 8½ |
| Compacted Subgrade (95% minimum compaction) | 12 | 12 | 12 | 12 |

The concrete should have a 28-day compressive strength of at least 3,000 psi. Any reinforcement within the PCC pavements should be determined by the project structural engineer. The maximum joint spacing within all of the PCC pavements is recommended to be equal to or less than 30 times the pavement thickness.

# 7.0 GENERAL COMMENTS

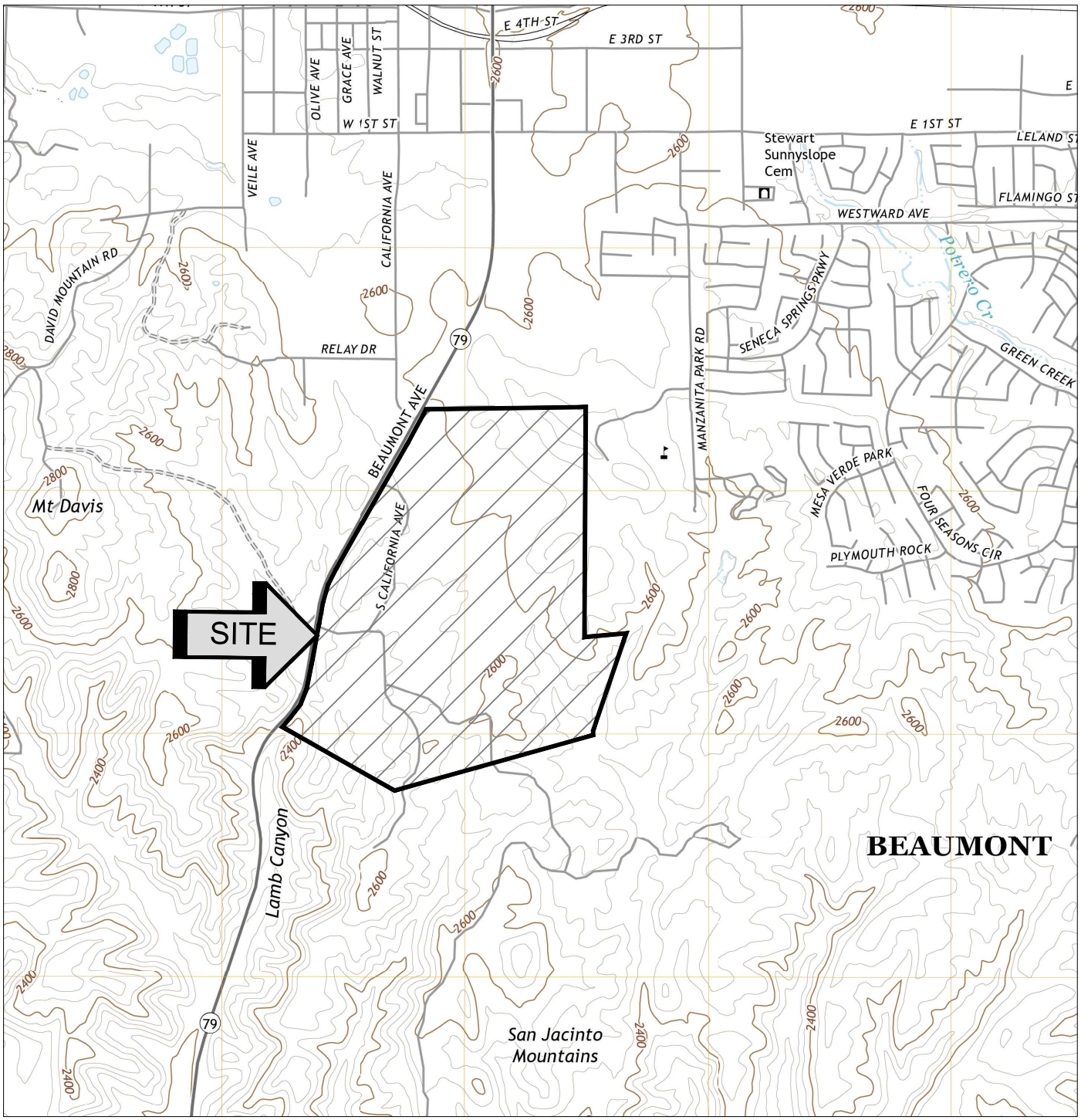
This report has been prepared as an instrument of service for use by the client, in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. This report may be provided to the contractor(s) and other design consultants to disclose information relative to the project. However, this report is not intended to be utilized as a specification in and of itself, without appropriate interpretation by the project architect, civil engineer, and/or structural engineer. The reproduction and distribution of this report must be authorized by the client and Southern California Geotechnical, Inc. Furthermore, any reliance on this report by an unauthorized third party is at such party's sole risk, and we accept no responsibility for damage or loss which may occur. The client(s)' reliance upon this report is subject to the Engineering Services Agreement, incorporated into our proposal for this project.

The analysis of this site was based on a subsurface profile interpolated from limited discrete soil samples. While the materials encountered in the project area are considered to be representative of the total area, some variations should be expected between boring locations and sample depths. If the conditions encountered during construction vary significantly from those detailed herein, we should be contacted immediately to determine if the conditions alter the recommendations contained herein.

This report has been based on assumed or provided characteristics of the proposed development. It is recommended that the owner, client, architect, structural engineer, and civil engineer carefully review these assumptions to ensure that they are consistent with the characteristics of the proposed development. If discrepancies exist, they should be brought to our attention to verify that they do not affect the conclusions and recommendations contained herein. We also recommend that the project plans and specifications be submitted to our office for review to verify that our recommendations have been correctly interpreted.

The analysis, conclusions, and recommendations contained within this report have been promulgated in accordance with generally accepted professional geotechnical engineering practice. No other warranty is implied or expressed.

# APPENDIX A




SOURCE: USGS TOPOGRAPHIC MAP OF THE BEAUMONT QUADRANGLE, SAN BERNARDINO COUNTY, CALIFORNIA, 2021.

**SITE LOCATION MAP**

PROPOSED INDUSTRIAL DEVELOPMENT

BEAUMONT, CALIFORNIA

| | |
|---|---|
| SCALE: 1" = 2000' | |
| DRAWN: MK<br>CHKD: RGT | |
| SCG PROJECT<br>24G141-1 | |
| **PLATE 1** | |

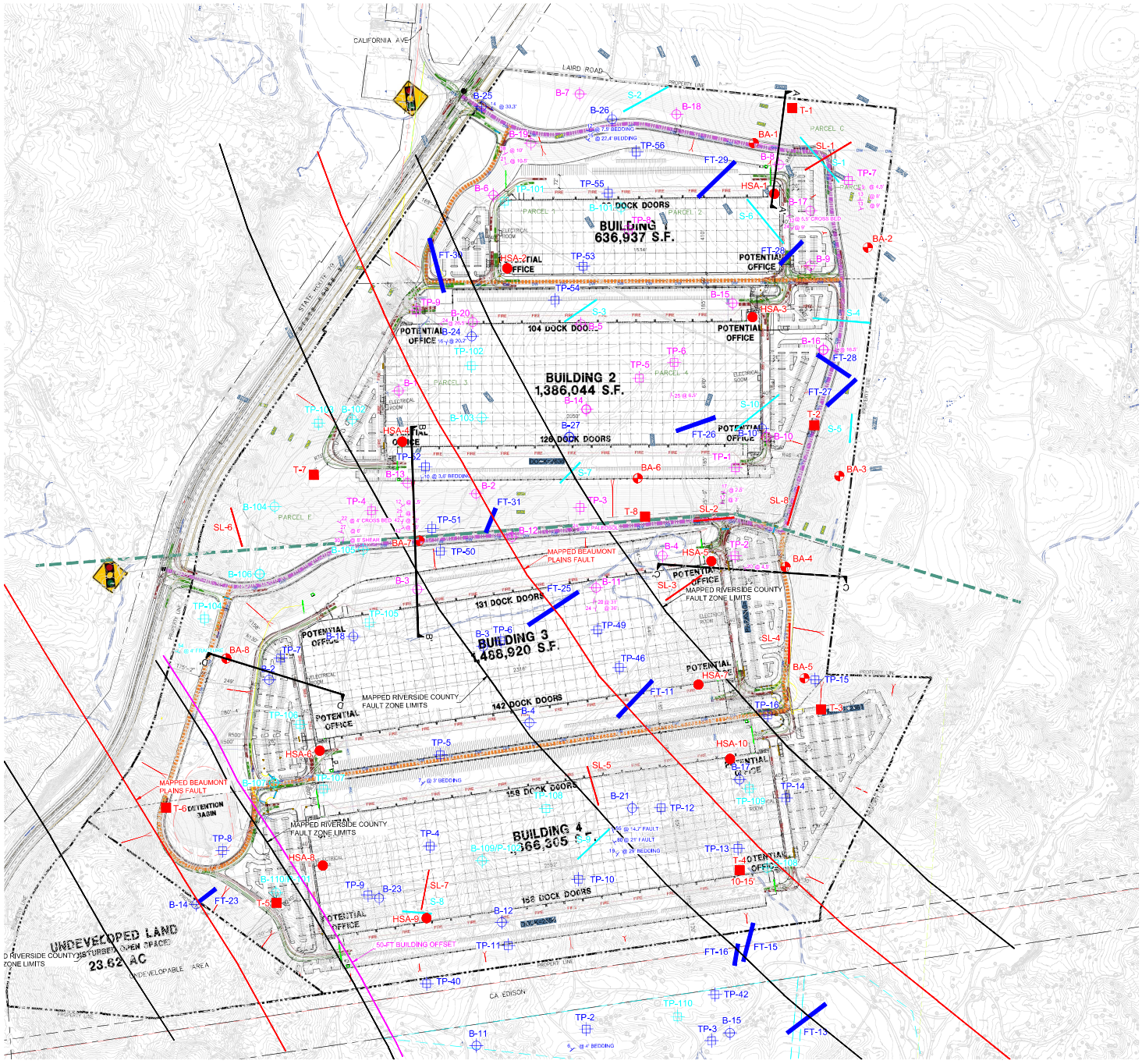
SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL

## GEOTECHNICAL LEGEND

- HSA-1 — APPROXIMATE HOLLOW STEM BORING LOCATION
- BA-1 — APPROXIMATE BUCKET AUGER BORING LOCATION
- T-1 — APPROXIMATE TRENCH LOCATION
- APPROXIMATE CROSS SECTION LOCATION
- 5 — STRIKE AND DIP OF BEDDING
- 5 — STRIKE AND DIP OF JOINT
- SL-1 — APPROXIMATE SEISMIC LINE LOCATION
- B-101 — APPROXIMATE HOLLOW STEM BORING LOCATION (GPI PROJECT NO. 3114.I)
- TP-101 — APPROXIMATE TRENCH LOCATION (GPI PROJECT NO. 3114.I)
- S-1 — APPROXIMATE SEISMIC LINE LOCATION (GPI PROJECT NO. 3114.I)
- B-1 — APPROXIMATE BUCKET AUGER BORING LOCATION (PACIFIC SOILS ENGINEERING, 2005)
- TP-1 — APPROXIMATE TRENCH LOCATION (PACIFIC SOILS ENGINEERING, 2005)
- FT-1 — APPROXIMATE FAULT TRENCH LOCATION (PACIFIC SOILS ENGINEERING, 2005)
- B-1 — APPROXIMATE BUCKET AUGER BORING LOCATION (EGL, 2004)
- TP-1 — APPROXIMATE TRENCH LOCATION (EGL, 2004)

NOTE: CONCEPTUAL GRADING PLAN PREPARED BY MICHAEL BAKER INTERNATIONAL, INC.





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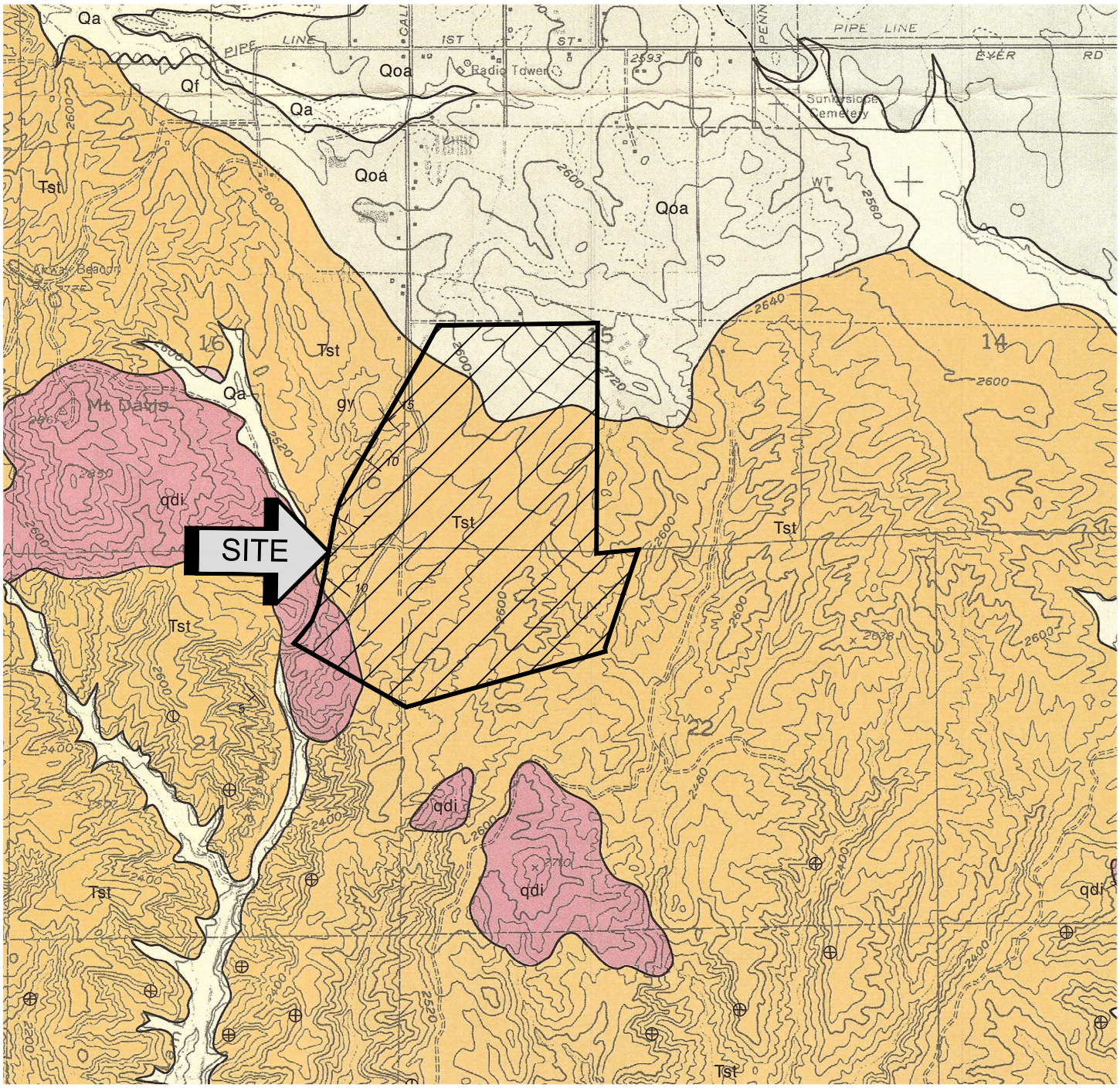

NORTH

SCALE: 1" = 250'
DRAWN: MK
CHKD: DWN
SCG PROJECT
24G141-1R

# PLATE 2

## GEOTECHNICAL MAP

PROPOSED INDUSTRIAL DEVELOPMENT
BEAUMONT, CALIFORNIA




**SURFICIAL SEDIMENTS**

*Unindurated, undissected*

**Qg** *Alluvial gravel and sand of stream channels*

**Qa** *Alluvial sand, gravel and clay of flat flood plains of stream channels*

Qoa | Qf | Qof

**OLDER SURFICIAL SEDIMENTS**

*Weakly indurated alluvial fan deposits dissected or partially so*

**Qf** *Alluvial fan of San Gorgonio Pass, sand and gravel of plutonic and gneissic detritus derived from rising San Bernadino mountains to the north, dissected at lower south margins, in part blends into unit* **Qoa** *to the west*

**Qoa** *Dissected alluvial fan sand and gravel, light reddish, crudely bedded*

Tst

**SAN TIMOTEO FORMATION**

*(San Timoteo Beds of Frazier, 1921) Stream laid alluvial sediments of detritus derived from basement rocks of San Bernadino Mountains but deposited on uneven surface of basement rocks of Peninsular Ranges; thin in this quadrangle and probably is main part of this formation exposed in El Casco quadrangle where it thickens westward; weakly indurated; age, Pliocene (?)*

**Tst** *Sandstone, light gray, friable, arkosic; includes some interbedded pebble-cobble conglomerate and greenish to reddish claystone*

qdi

**PLUTONIC ROCKS**

*Medium grained holocrystalline plutonic rocks of San Jacinto Mountains, part of batholithic pluton of Peninsular Ranges intrusive into or recrystallized from enormously thick metasedimentary petrolith at great depth in Cretaceous time*

**qdi** *Granitic rock, mostly quartz diorite (tonalite) but may range into granodiorite, composed about 1/3 quartz, 2/3 feldspar with greater amounts of sodic plagioclase than potassic feldspar, and small amounts of biotite, rock light gray, massive to faintly gneissoid from sub-parallel orientation of biotite flakes, locally contains scattered small discoid inclusions (enoliths) parallel to gneissoid structure of rock; rock moderately hard, coherent*

# GEOLOGIC MAP

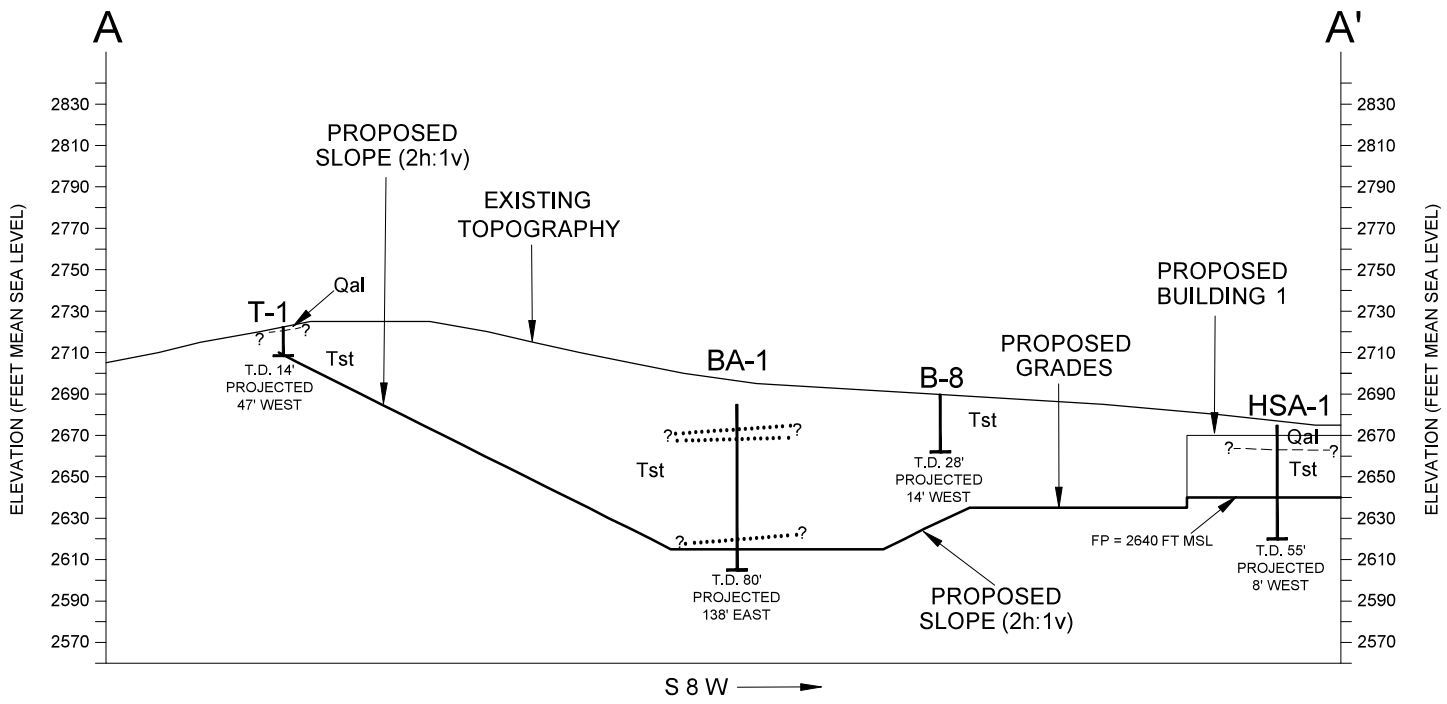
## PROPOSED INDUSTRIAL DEVELOPMENT

## BEAUMONT, CALIFORNIA

| | |
|---|---|
| SCALE: 1" = 2000' | |
| DRAWN: MK<br>CHKD: DN | |
| SCG PROJECT<br>24G141-1 | |
| **PLATE 3** | |

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL




GEOTECHNICAL LEGEND:

– – – – CONTACT - QUERIED WHERE UNCERTAIN

····· BEDDING - QUERIED WHERE UNCERTAIN

GEOLOGIC UNITS:

Qal - YOUNGER ALLUVIUM

Tst - SAN TIMOTEO FORMATION

**CROSS-SECTION A-A'**

PROPOSED INDUSTRIAL BUILDING

BEAUMONT, CALIFORNIA

SCALE: 1" = 60'

DRAWN: JAH

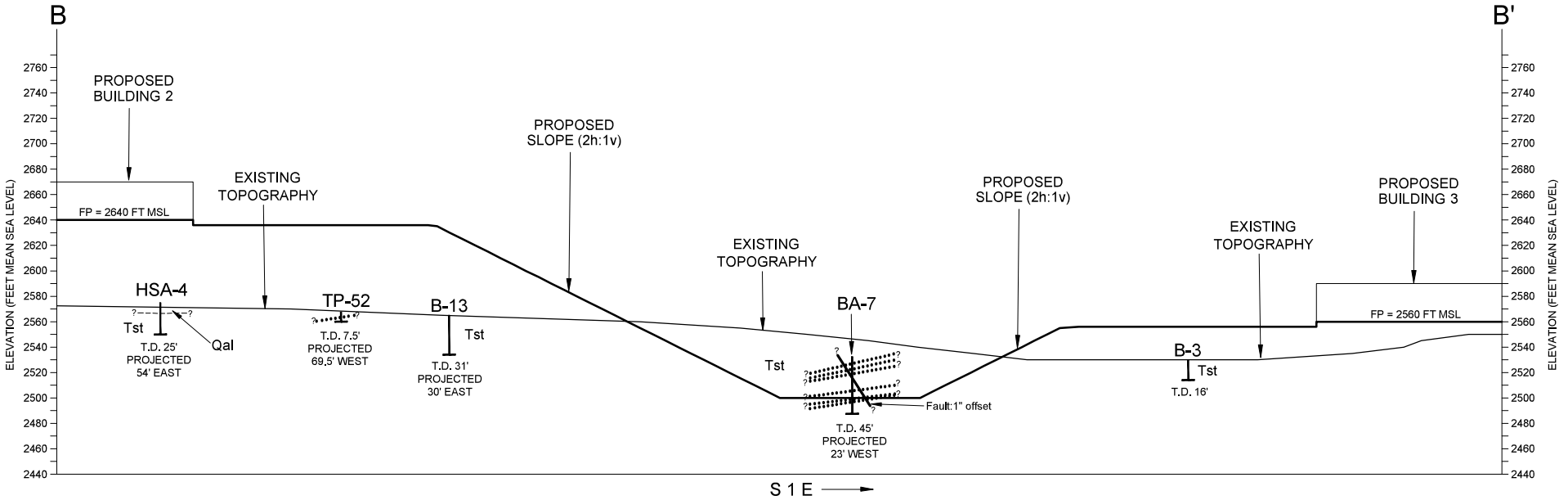
CHKD: DN

SCG PROJECT 24G141-1

PLATE 4a

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL




## GEOTECHNICAL LEGEND:

– – – – CONTACT - QUERIED WHERE UNCERTAIN

····· BEDDING - QUERIED WHERE UNCERTAIN

## GEOLOGIC UNITS:

Qal - YOUNGER ALLUVIUM

Tst - SAN TIMOTEO FORMATION

**CROSS-SECTION B-B'**

PROPOSED INDUSTRIAL DEVELOPMENT

BEAUMONT, CALIFORNIA

SCALE: 1" = 80'

DRAWN: JAH

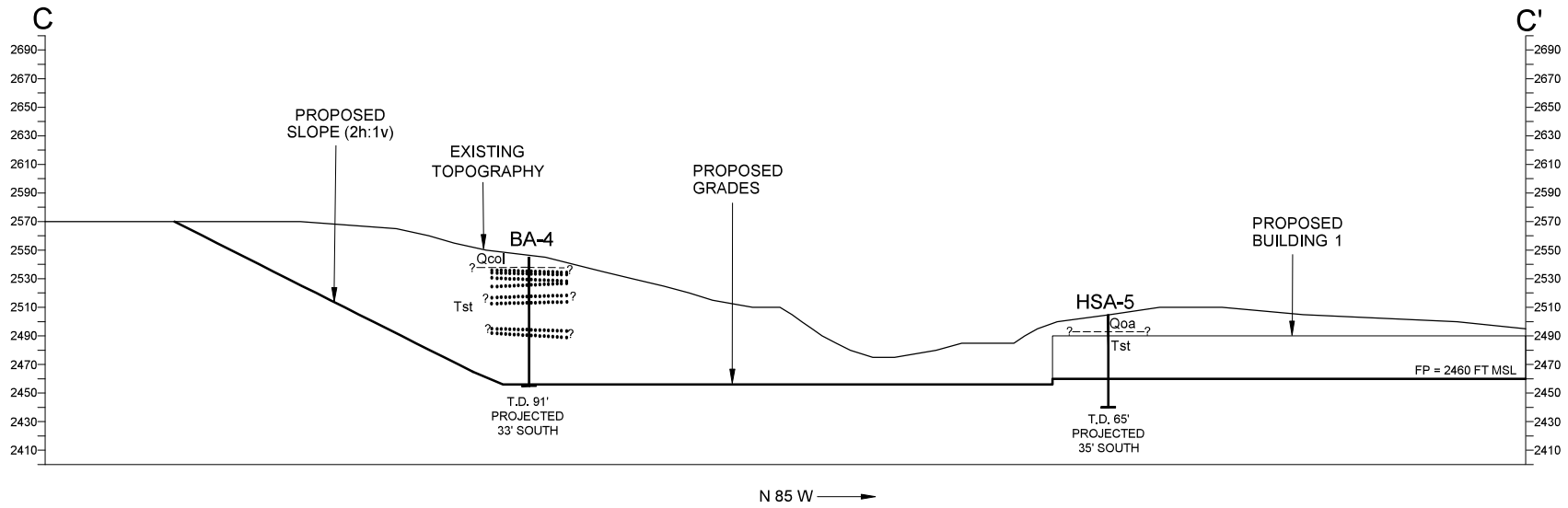
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SCG PROJECT 24G141-1

**PLATE 4b**

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL




## GEOTECHNICAL LEGEND:

- – – – – CONTACT - QUERIED WHERE UNCERTAIN
- ····· BEDDING - QUERIED WHERE UNCERTAIN

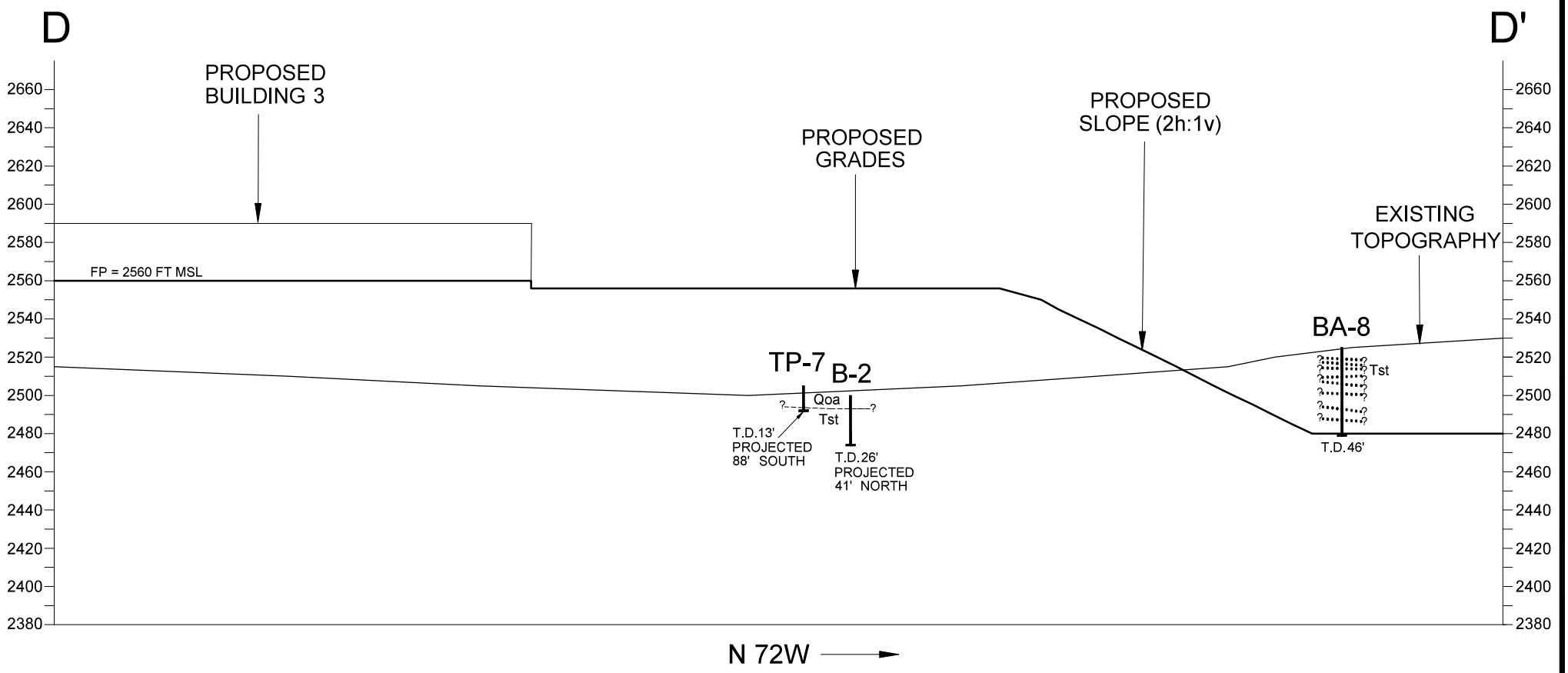
## GEOLOGIC UNITS:

- Qcol - COLLUVIUM
- Qoa - OLDER ALLUVIUM
- Tst - SAN TIMOTEO FORMATION

**CROSS-SECTION C-C'**
PROPOSED INDUSTRIAL DEVELOPMENT
BEAUMONT, CALIFORNIA

SCALE: 1" = 80'
DRAWN: MK
CHKD: DN
SCG PROJECT 24G141-1
**PLATE 4c**

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL




GEOTECHNICAL LEGEND:

– – – – CONTACT - QUERIED WHERE UNCERTAIN

····· BEDDING - QUERIED WHERE UNCERTAIN

GEOLOGIC UNITS:

Qoa - OLDER ALLUVIUM

Tst - SAN TIMOTEO FORMATION

**CROSS-SECTION D-D'**

PROPOSED INDUSTRIAL DEVELOPMENT

BEAUMONT, CALIFORNIA

SCALE: 1" = 50'

DRAWN: RB
CHKD: DN

SCG PROJECT 24G141-1

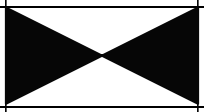
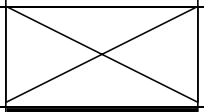
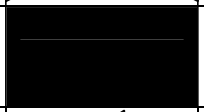
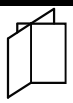
PLATE 4d

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL

# APPENDIX B

# BORING LOG LEGEND

| SAMPLE TYPE | GRAPHICAL SYMBOL | SAMPLE DESCRIPTION |
|---|---|---|
| **AUGER** |  | SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED) |
| **CORE** |  | ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK. |
| **GRAB** |  | SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED) |
| **CS** |  | CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED) |
| **NSR** |  | NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL. |
| **SPT** |  | STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED) |
| **SH** |  | SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED) |
| **VANE** |  | VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED. |

**COLUMN DESCRIPTIONS**

**DEPTH:** Distance in feet below the ground surface.

**SAMPLE**: Sample Type as depicted above.

**BLOW COUNT**: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

**POCKET PEN.**: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

**GRAPHIC LOG**: Graphic Soil Symbol as depicted on the following page.

**DRY DENSITY**: Dry density of an undisturbed or relatively undisturbed sample in $lbs/ft^3$.

**MOISTURE CONTENT**: Moisture content of a soil sample, expressed as a percentage of the dry weight.

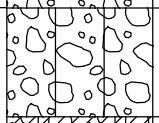
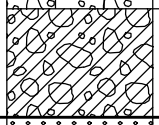
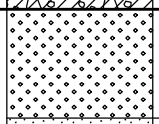
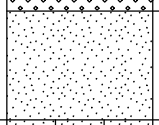
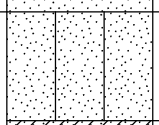
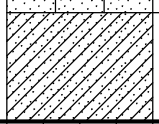
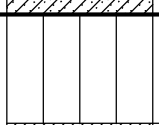
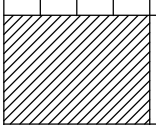
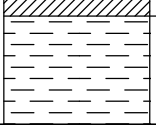
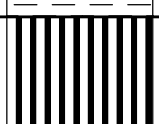
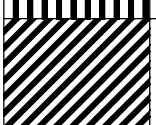
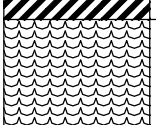
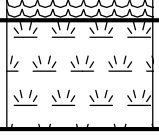
**LIQUID LIMIT**: The moisture content above which a soil behaves as a liquid.

**PLASTIC LIMIT**: The moisture content above which a soil behaves as a plastic.

**PASSING #200 SIEVE**: The percentage of the sample finer than the #200 standard sieve.

**UNCONFINED SHEAR**: The shear strength of a cohesive soil sample, as measured in the unconfined state.

# SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS | | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| | | | GRAPH | LETTER | |
| COARSE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS<br>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | CLEAN GRAVELS<br>(LITTLE OR NO FINES) |  | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | |  | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) |  | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | |  | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| | SAND AND SANDY SOILS<br>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | CLEAN SANDS<br>(LITTLE OR NO FINES) |  | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | |  | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | | SANDS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) |  | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | |  | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 |  | ML | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | |  | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | |  | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 |  | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS |
| | | |  | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | |  | OH | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| HIGHLY ORGANIC SOILS | | |  | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-1

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/18/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 35 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | DESCRIPTION | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | SURFACE ELEVATION: 2677.5 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| 0 | | | | | OLDER ALLUVIUM (Qoa): Dark Brown fine Sandy Clay, little Silt, trace medium Sand, little to some Calcareous veining and nodules, stiff to hard-very moist | | | | | | | |
| 5 | | 12 | 2.5 | | | | 23 | | | | | |
| 10 | | 32 | 4.0 | | @ 8½ feet, Light Gray Brown | | 21 | | | | | |
| 15 | | 65/11" | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandstone, little Clay, trace medium Sand, trace Calcareous veining and nodules, very dense-very moist | | 19 | | | | | |
| 20 | | 59/9" | | | | | 19 | | | | | |
| 25 | | 65/7" | 4.5 | | SAN TIMOTEO FORMATION (Tst): Dark Brown fine-grained Sandy Claystone, trace Calcareous veining and nodules, trace to little Manganese staining, hard-very moist | | 28 | | | | | |
| 30 | | 50/5" | 4.0 | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandstone, trace medium to coarse Sand, trace fine Gravel, highly weathered, weakly cemented, very dense-moist | | 14 | | | | | |
| | | 57/11" | | | @ 33½ feet, little coarse Sand | | 14 | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

TEST BORING LOG

PLATE B-1a

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-1

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/18/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 35 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandstone, trace medium to coarse Sand, trace fine Gravel, highly weathered, weakly cemented, very dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine to coarse-grained Sandstone, trace to little Silt, little fine Gravel, highly weathered, very dense-damp to moist | | | | | | | |
| | | 87/11" | | | | | 7 | | | | | |
| 40 | | | | | | | | | | | | |
| | | 50/5" | | | | | 9 | | | | | |
| 45 | | | | | | | | | | | | |
| | | 50/2" | | | | | 5 | | | | | @ 46 to 55 feet, Disturbed Samples |
| | | 50/1" | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Claystone, little Silt, trace medium Sand, trace to little fine to coarse Gravel, little Calcareous veining and nodules, trace Iron Oxide staining, hard-damp | | 18 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Dark Brown fine to medium-grained Sandy Claystone, little Silt, trace fine Gravel, hard-moist to very moist | | | | | | | |
| 50 | | 50/1" | | | | | 7 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine to medium-grained Sandstone, little Silt, little fine Gravel, dense-damp to moist | | | | | | | |
| | | 50/1" | | | | | 10 | | | | | |
| | | 50/1" | | | | | 4 | | | | | |
| 55 | | | | | Boring Terminated at 55 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-1b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-2

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/18/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 15 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2580.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 47 | 4.0 | | OLDER ALLUVIUM (Qoa): Dark Brown Silty Clay, little fine Sand, trace medium to coarse Sand, weakly cemented, hard-moist | 113 | 11 | | | | | EI = 28 @ 1 to 5 feet |
| | | 53 | 4.0 | | | 119 | 13 | | | | | |
| 5 | | 30 | 4.0 | | Dark Red Brown fine to medium Sandy Clay, little coarse Sand, weakly cemented, very stiff to hard-moist | 113 | 10 | | | | | |
| | | 71/11" | 4.5 | | @ 7½ feet, little Silt, little fine Gravel | 112 | 13 | | | | | |
| 10 | | 86/9" | 4.5 | | | 118 | 12 | | | | | |
| 15 | | 80/9" | 4.5 | | @ 14 feet, trace to little coarse Sand | 123 | 11 | | | | | |
| 20 | | 77/8" | 4.5 | | | 114 | 11 | | | | | |
| | | | | | Boring Terminated at 20 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG** **PLATE B-2**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-3

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/18/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 15 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | DESCRIPTION | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | SURFACE ELEVATION: 2623.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 19 | | | YOUNGER ALLUVIUM (Qal): Dark Brown Silty fine to medium Sand, trace coarse Sand, trace fine Gravel, trace to little fine root fibers, medium dense-damp | | 6 | | | | | Disturbed Sample |
| | | 18 | 4.5 | | OLDER ALLUVIUM (Qoa): Brown fine to medium Sandy Clay, little Silt, trace fine Gravel, trace Calcareous veining and nodules, stiff to very stiff-damp<br>@ 3 feet, trace to little Clay | 94 | 8 | | | | | |
| 5 | | 30 | 3.5 | | Dark Brown fine Sandy Clay, little Silt, trace medium to coarse Sand, trace fine to coarse Gravel, stiff to very stiff-damp | 91 | 9 | | | | | |
| | | 19 | 3.0 | | @ 7 feet, little Calcareous veining and nodules | 117 | 10 | | | | | |
| | | 43 | 4.0 | | | 120 | 8 | | | | | |
| 10 | | | | | | | | | | | | |
| | | 42 | 4.5 | | SAN TIMOTEO FORMATION (Tst): Light Brown to Brown fine-grained Sandy Claystone, little Silt, trace Iron Oxide staining, little Calcareous veining and nodules, highly decomposed, highly weathered, trace Manganese staining, very stiff to hard-moist to very moist | | 19 | | | | | |
| 15 | | | | | | | | | | | | |
| | | 27 | 4.5 | | @ 18½ feet, Brown to Dark Brown | | 12 | | | | | |
| 20 | | | | | Boring Terminated at 20 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-3**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-4

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/18/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 18 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2575.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 39 | 3.5 | | OLDER ALLUVIUM (Qoa): Red Brown Clayey fine Sand to fine Sandy Clay, trace to little medium Sand, slightly cemented, stiff to very stiff-damp | 111 | 7 | | | | | EI = 9 @ 1 to 5 feet |
| | | 44 | 3.5 | | | 110 | 6 | | | | | |
| 5 | | 36 | 4.0 | | | 109 | 7 | | | | | |
| | | 40 | | | Red Brown Silty fine Sand, trace medium Sand, medium dense-damp | 108 | 7 | | | | | |
| 10 | | 80/9" | | | SAN TIMOTEO FORMATION (Tst): Yellow Brown fine-grained Clayey Sandstone, little Silt, little Iron Oxide staining, weakly cemented, very dense-damp to moist | 100 | 10 | | | | | |
| 15 | | 62 | 4.5 | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Claystone, little Silt, trace Manganese staining, little Iron Oxide staining, hard-damp to moist | 114 | 16 | | | | | |
| 20 | | 57 | 4.5 | | | 114 | 9 | | | | | |
| 25 | | 54 | 4.5 | | | 106 | 14 | | | | | |
| | | | | | Boring Terminated at 25 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

TEST BORING LOG

PLATE B-4

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. HSA-5**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/19/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 48 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | DESCRIPTION | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | SURFACE ELEVATION: 2610.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | OLDER ALLUVIUM (Qoa): Light Brown Silty fine Sand, trace Clay, trace medium Sand, trace Calcareous veining, dense-damp to moist | | | | | | | |
| 5 | | 45 | | | | | 10 | | | | | |
| | | 50/5" | | | @ 8½ feet, Light Gray Brown, little Clay, little Calcareous veining, very dense | | 13 | | | | | |
| 10 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey fine-grained Sandstone, trace medium to coarse Sand, little Calcareous veining, very dense-very moist | | | | | | | |
| | | 90/9" | | | | | 25 | | | | | |
| 15 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine to medium-grained Sandstone, trace coarse Sand, trace fine Gravel, very dense-moist | | | | | | | |
| | | 50/5" | | | | | 16 | | | | | |
| 20 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Red Brown fine-grained Sandy Claystone, highly weathered, hard-very moist | | | | | | | |
| | | 86/9" | 3.5 | | | | 21 | | | | | |
| 25 | | | | | | | | | | | | |
| | | 50/5" | 4.5 | | @ 28½ feet, Gray Brown, trace Manganese staining | | 19 | | | | | |
| 30 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Red Brown fine-grained Sandy Claystone, little Silt, trace medium Sand, trace Manganese staining, hard-moist to very moist | | | | | | | |
| | | 86/11" | 2.5 | | | | 25 | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-5a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-5

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/19/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 48 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Red Brown fine-grained Sandy Claystone, little Silt, trace medium Sand, trace Manganese staining, hard-moist to very moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey fine-grained Sandstone, little Silt, highly weathered, very dense-moist | | | | | | | |
| | | 72/9" | | | | | 16 | | | | | |
| 40 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandstone, little Silt, trace Iron Oxide, very dense-damp to moist | | | | | | | |
| | | 62 | | | | | 11 | | | | | |
| 45 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandy Claystone, little Silt, hard-very moist | | | | | | | |
| | | 63 | | | | | 27 | | | | | |
| | | | 4.0 | | @ 49 feet, Gray Brown, little Calcareous veining and nodules | | 17 | | | | | |
| 50 | | | | | | | | | | | | |
| | | 54 | 2.5 | | | | 20 | | | | | |
| 55 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey fine-grained Sandstone, little Silt, very dense-very moist | | | | | | | |
| | | 50/4" | | | | 102 | 21 | | | | | |
| | | 50/3" | | | @ 58 feet, trace to little fine to coarse Gravel, little Calcareous veining and nodules | 110 | 14 | | | | | |
| 60 | | 50/5" | | | | 108 | 14 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandstone, very dense-damp to moist | | | | | | | |
| | | 50/5" | | | | 91 | 7 | | | | | |
| | | 50/3" | | | @ 64 feet, trace to little Silt | | 9 | | | | | @ 64 feet, Disturbed Sample |
| 65 | | | | | | | | | | | | |
| | | | | | Boring Terminated at 65 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-5b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-6

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/18/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 16 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2512.5 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 16 | | | YOUNGER ALLUVIUM (Qal): Dark Brown Clayey fine Sand to fine Sandy Clay, little Silt, trace medium Sand, little fine root fibers, loose to medium dense/medium stiff to stiff-damp to moist | 108 | 9 | | | | | |
| | | 8 | | | | | 14 | | | | | @ 3 feet, Disturbed Sample |
| 5 | | 8 | 4.5 | | | 104 | 15 | | | | | |
| | | 16 | 4.5 | | OLDER ALLUVIUM (Qoa): Dark Brown fine to medium Sandy Clay, little Silt, stiff-moist | 106 | 15 | | | | | |
| | | 16 | 4.5 | | @ 9 feet, trace Calcareous veining and nodules, slightly porous | 113 | 15 | | | | | |
| 10 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Claystone, little Silt, hard-damp | | | | | | | |
| | | 74/8" | | | @ 14 feet, little Iron Oxide staining | 118 | 8 | | | | | |
| 15 | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to medium-grained Sandstone, trace coarse Sand, trace Iron Oxide staining, very dense-damp to moist | | | | | | | |
| | | 50/3" | | | @ 19 feet, trace to little Clay | 111 | 12 | | | | | |
| 20 | | | | | Boring Terminated at 20 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-6**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-7

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/19/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 13 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2545.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 11 | | | YOUNGER ALLUVIUM (Qal): Light Gray Brown Silty fine to medium Sand, trace coarse Sand, little fine root fibers, loose to medium dense-damp | 96 | 4 | | | | | |
| | | 16 | | | | 95 | 6 | | | | | |
| 5 | | 77/9" | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Sandstone, highly weathered, very dense-damp | 109 | 5 | | | | | |
| | | 50/1" | | | | | | | | | | @ 7 feet, No Sample Recovery |
| | | 50/5" | | | SAN TIMOTEO FORMATION (Tst): Light Gray Gravelly fine-grained Sandstone, very dense-damp | | 4 | | | | | @ 9 feet, Disturbed Sample |
| 10 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace Silt, trace medium Sand, very dense-damp | | | | | | | |
| | | 50/5" | | | | | 5 | | | | | @ 14 feet, Disturbed Sample |
| 15 | | | | | | | | | | | | |
| | | 50/4" | | | | | 5 | | | | | @ 19 feet, Disturbed Sample |
| 20 | | | | | Boring Terminated at 20 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG** **PLATE B-7**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. HSA-8**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/19/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 29 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | DESCRIPTION | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | SURFACE ELEVATION: 2522.5 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to medium-grained Sandstone, little Silt, trace to little fine Gravel, little coarse Sand, highly weathered, medium dense-damp to moist | | | | | | | |
| 5 | | 27 | | | | | 8 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandstone, trace to little Silt, little Clay, highly weathered, very dense-damp to moist | | | | | | | |
| | | 74/11" | | | | | 19 | | | | | |
| 10 | | 80/1" | | | @ 11 feet, trace Iron Oxide staining | | 10 | | | | | |
| | | 50/5" | | | @ 13 feet, Light Gray | | 9 | | | | | @ 13 feet, Disturbed Sample |
| 15 | | 50/5" | | | | 104 | 12 | | | | | |
| | | 50/5" | | | @ 17 feet, trace medium to coarse Sand | 102 | 11 | | | | | |
| | | 50/3" | | | @ 19 feet, very moist | | 22 | | | | | @ 19 feet, Disturbed Sample |
| 20 | | | 4.0 | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Claystone, hard-very moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandstone, little Silt, very dense-very moist | | | | | | | |
| | | 50/5" | | | | | 17 | | | | | |
| 25 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Claystone, little Silt, hard-very moist | | | | | | | |
| | | 50/3" | 4.5 | | | | 16 | | | | | |
| 30 | | | | | | | | | | | | |
| | | 50/1" | 3.5 | | | | 19 | | | | | |
| | | | | | Boring Terminated at 35 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-8**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-9

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/19/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 19 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | SURFACE ELEVATION: 2595.0 feet MSL | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, little Silt, little medium Sand, highly weathered, very dense-damp to very moist | | | | | | | |
| | | 67/8" | | | | | 6 | | | | | |
| 5 | | | | | | | | | | | | |
| | | 65 | | | @ 8½ feet, trace Clay, trace Calcareous veining and nodules | | 10 | | | | | |
| 10 | | | | | | | | | | | | |
| | | 69/7" | | | @ 13½ feet, little Silt | | 11 | | | | | |
| 15 | | | | | | | | | | | | |
| | | 72/7" | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to medium-grained Sandstone, highly weathered, very dense-damp | | 6 | | | | | @ 16 feet, Disturbed Sample |
| | | 50/5" | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Claystone, hard-moist to very moist | 100 | 22 | | | | | |
| 20 | | 50/5" | | | @ 20 feet, trace fine to coarse Gravel | 101 | 13 | | | | | |
| | | 50/5" | | | | 98 | 15 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, very dense-moist | | | | | | | |
| | | 50/3" | | | @ 24 feet, little Silt | | 9 | | | | | @ 24 feet, Disturbed Sample |
| 25 | | | | | | | | | | | | |
| | | | | | Boring Terminated at 25 feet | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-9**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. HSA-10

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 7/19/24
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: 15 feet
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2527.5 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 6 | | | YOUNGER ALLUVIUM (Qal): Dark Brown Silty fine Sand to fine Sandy Silt, little medium Sand, trace fine root fibers, loose-damp to moist | 89 | 10 | | | | | |
| | | 13 | | | @ 3 feet, Brown, trace Clay, trace Calcareous veining and nodules | 100 | 7 | | | | | |
| 5 | | 50/5" | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine to medium-grained Sandstone, little Clay, highly weathered, dense to very dense-damp to very moist | 108 | 6 | | | | | |
| | | 60 | | | | 103 | 8 | | | | | |
| 10 | | 69/9" | | | | | 7 | | | | | @ 9 feet, Disturbed Sample |
| 15 | | 50/5" | | | @ 14 feet, little coarse Sand | 108 | 13 | | | | | |
| 20 | | 50/1" | | | @ 19 feet, trace to little Silt | | 15 | | | | | @ 19 feet, Disturbed Sample |
| | | | | | Refusal at 20 feet due to very dense bedrock | | | | | | | |

TBL 24G141-1.GPJ SOCALGEO.GDT 9/25/24

## TEST BORING LOG

## PLATE B-10

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-1

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/20/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2687.5 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine-grained Sandstone, little calcareous nodules, trace fine root fibers, dense-damp | | | | | | | |
| 5 | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandy Siltstone, trace to little, Iron oxide staining, trace Calcareous nodules, little Manganese, weakly cemented, gradational contact, dense-damp<br>@ 8', little Clay, little to some Calcareous nodules | | | | | | | |
| 10 | | 6 | | | SAN TIMOTEO FORMATION (Tst): Interbedded Light Brown Silty fine-grained Sandstone and fine-gained Sandstone, trace medium Sand, trace Calcareous nodules, trace Iron oxide staining, friable, highly weathered, weakly cemented, gradational contact, dense-moist<br>@ 9'3"-9'8", little fine to coarse Gravel | | 8 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Gravelly fine to coarse-grained Sandstone, trace medium Sand, weakly cemented, dense-damp<br>Bedding: S 10 W, 3N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine-grained Sandstone, trace medium Sand, weakly cemented, dense-damp<br>Bedding: N 45 W, 5N | | | | | | | |
| 15 | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Silty fine-grained Sandstone, fine to medium-grained Sandstone, and Clayey Siltstone, trace Calcareous nodules, moderately cemented, gradational contact, dense/hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Light Gray fine-grained Sandstone and Gravelly fine to coarse-grained Sandstone, trace Iron oxide staining, weakly cemented, dense-moist<br>Bedding: N 53 W, 2N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Clayey Siltstone, trace fine to coarse Gravel, trace Calcareous nodules, moderately cemented, gradational contact, hard-moist | | | | | | | |
| 20 | | 7 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandstone, weakly cemented, gradational contact, dense-damp<br>@ 19'6" 5-inch Red Brown fine-grained Sandy Siltstone lens | | 20 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine-grained Sandstone, weakly to moderately cemented, gradational contact, dense-moist<br>@ 20'3"-20'6", little Calcareous veining/nodules | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Clayey Siltstone, trace fine to coarse Gravel, trace Calcareous nodules, trace Iron oxide staining, moderately cemented, gradational contact, hard-very moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandy Siltstone to Silty fine-grained Sandstone, weakly to moderately cemented, gradational contact, dense-moist | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-11a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-1**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/20/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | @ 23'9", 3-inch fine to coarse-grained Sandstone lens<br>SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, trace fine to coarse Gravel, trace Calcareous nodules, moderately cemented, gradational contact, hard-moist<br>@ 25'7"-25'11", some Calcareous veining<br>@ 27'-27'5", little fine to coarse Gravel | | | | | | | |
| | | | | | @ 27'7", 2-inch Silty fine-grained Sandstone lens<br>SAN TIMOTEO FORMATION (Tst): Dark Brown Interfingered Silty Claystone and Gravelly fine to coarse-grained Sandstone, very dense-damp to moist<br>@ 29'3", some Calcareous nodules | | | | | | | |
| 30 | | 14 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, extensive Calcareous nodules, strongly cemented, gradational contact, very dense-moist | | 12 | | | | | Kelly Bar Weight @ 29-58' = 3921 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandy Claystone, extensive Calcareous nodules, trace Iron oxide staining, moderately cemented, gradational contact, hard-moist | | | | | | | |
| 35 | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandy Siltstone to Silty fine-grained Sandstone, trace Clay, trace fine Gravel, trace Iron oxide staining, trace Calcareous nodules, moderately cemented, gradational contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown to Gray Interfingered Gravelly fine to medium-grained Sandstone and fine-grained Sandstone, weakly cemented, channelized contact, dense-damp | | | | | | | |
| 40 | | 14 | | | SAN TIMOTEO FORMATION (Tst): Light Brown Clayey Siltstone, trace fine to coarse Gravel, moderately cemented, gradational contact, very stiff-moist<br>@ 39'7"-39'11", little Calcareous veining, trace Iron oxide staining<br>@ 40'-43', little Calcareous veining | | 14 | | | | | |
| 45 | | | | | SAN TIMOTEO FORMATION (Tst): White fine-grained Sandstone, strongly cemented, gradational contact, very dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, trace Calcareous nodules, trace Iron oxide staining, moderately cemented, very stiff-moist<br>@ 47', 3-inch Silty fine-grained Sandstone lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace Iron oxide staining, trace Calcareous nodules, moderately cemented, gradational contact, very dense-moist | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-11b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-1**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/20/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 9 | | | | | 11 | | | | | |
| | | | | | @ 53'2"-53'5", little Calcareous veining | | | | | | | |
| 55 | | | | | @57'5", 1-inch fine-grained Sandy Siltstone lens | | | | | | | Kelly Bar Weight @ 58-81' = 2531 lbs |
| 60 | | 11 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, trace Iron oxide staining, weakly cemented, gradational contact, very dense-moist to very moist | | 19 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, weakly cemented, gradational contact, dense-moist | | | | | | | |
| 65 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, weakly cemented, dense-moist<br>Bedding: S 50 W, 7N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine-grained Sandstone, weakly cemented, gradational contact, very dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty Claystone, trace Iron oxide staining, trace Calcareous nodules, gradational contact, very stiff-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Claystone, trace medium to coarse Sand, some Calcareous nodules, moderately cemented, gradational contact, very stiff-moist | | | | | | | |
| 70 | | 26 | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine to medium-grained Sandstone, trace coarse Sand, trace Calcareous nodules, moderately cemented, gradational contact, dense-moist<br>@ 69', trace Iron oxide staining<br>@ 69'7", trace fine to coarse Gravel | | 10 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey fine to medium-grained Sandstone, trace fine Gravel, moderately cemented, gradational contact, very dense-moist<br>@ 72'5", some fine to coarse Gravel | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Gravelly fine to coarse-grained Sandstone, weakly to moderately cemented, | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-11c**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-1**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/20/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandy Siltstone, trace to little medium to coarse Sand, weakly cemented, dense-damp | | | | | | | |
| 80 | | 28 | | | | | 6 | | | | | |
| | | | | | Boring Terminated at 81 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-11d**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-2**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/19/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2687.5 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, little Calcareous veining and nodules, moderately cemented, undulating contact, dense-moist | | | | | | | |
| 5 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine to coarse-grained Sandy Siltstone, trace to little Clay, little fine to coarse Gravel, coarsening downwards, some fine to coarse Gravel, little Calcareous veining and nodules, weakly cemented, dense-damp<br>Bedding: S 30 W, 11N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, little Calcareous veining and nodules, little Manganese staining, trace to little fine Gravel, moderately cemented, gradational contact, dense-very moist | | | | | | | |
| 10 | | 4 | | | | | 18 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, trace medium to coarse Sand, trace fine Gravel, little Manganese staining, strongly cemented, undulating contact, hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandy Siltstone, little Clay, little Calcareous veining and nodules, trace to little fine to coarse Gravel, gradational contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, little Calcareous veining and nodules, little Manganese staining, little fine to coarse Gravel, gradational contact, strongly cemented, hard-moist<br>Bedding: S 83 W, 3N | | | | | | | |
| 15 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace Calcareous veining and nodules, trace fine to coarse Gravel, weakly cemented, medium dense-moist<br>Bedding: S 50 E, 6S<br>@ 16'4", Interbedded Brown Silty Claystone lenses | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, little Calcareous veining and nodules, little Manganese staining, strongly cemented, gradational contact, hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandy Siltstone, little Clay, trace to little medium to coarse Sand, little fine to coarse Gravel, abundant Calcareous veining and nodules, trace to little Manganese staining, moderately cemented, dense-moist<br>Bedding: S 80 W, 7N<br>@ 20'3", little Iron Oxide staining | | | | | | | |
| 20 | | 4 | | | | | 16 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, little Manganese staining, abundant Calcareous veining and nodules, strongly cemented, gradational contact, hard-moist | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-12a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-2**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/19/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, little Manganese staining, abundant Calcareous veining and nodules, strongly cemented, gradational contact, hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, trace Calcareous veining and nodules, little Manganese staining, strongly cemented, gradational contact, dense to very dense-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone to Silty Claystone, trace fine Sand, trace to little Calcareous veining and nodules, strongly cemented, hard-moist<br>Bedding: S 35 W, 11N | | | | | | | |
| 30 | | 13 | | | | | 12 | | | | | Kelly Bar Weight @ 29-58' = 3921 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, trace to little medium to coarse Sand, trace fine to coarse Gravel, little fine to coarse Gravel, little Iron Oxide staining, trace Manganese staining, weakly cemented, gradational contact, dense-moist<br>@ 31'1", 7-inch Gray Brown fine-grained Sandy Siltstone lens; Bedding: N 58 W, 5N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, occasional Silty Claystone lenses, little Iron Oxide staining, little fine to coarse Gravel, moderately cemented, gradational contact, dense-damp to moist | | | | | | | |
| 35 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Siltstone, trace fine Sand, trace Iron Oxide staining, strongly cemented, very stiff-damp to moist<br>Bedding: N 50 W, 12N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to medium-grained Sandstone, coarsening downwards, weakly cemented, dense-damp<br>Bedding: S 60 W, 12N<br>@ 35'2" to 35'9", Gray Brown fine-grained Sandy Siltstone lenses, little Iron Oxide staining | | | | | | | |
| 40 | | 11 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, trace to little Clay, little Iron Oxide staining, strongly cemented, dense-moist<br>N 10 E, 5S | | 8 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, little fine to coarse Gravel, coarsening downward, weakly cemented, dense-damp<br>@ 41', Bedding: N 65 W, 14N | | | | | | | |
| 45 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, little medium to coarse Sand, trace fine to coarse Gravel, trace Iron Oxide staining, strongly cemented, horizontal contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, weakly cemented, dense-damp<br>Bedding: S 78 W, 12N<br>@ 48'6" to 49'11", Caliche lens | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-12b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-2**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/19/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 7 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, moderately cemented, very stiff to hard-very moist<br>Bedding: N 75 E, 10N | | 20 | | | | | |
| | | | | | @ 52'7" to 53'9", Light Gray Brown Silty fine-grained Sandstone lenses, trace to little Calcareous nodules | | | | | | | |
| 55 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty Claystone, trace Iron Oxide staining, trace Calcareous nodules, strongly cemented, undulating contact, hard-moist | | | | | | | |
| | | | | | @ 57'4", 3 to 4-inch Caliche lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, little Clay, strongly cemented, gradational contact, dense-damp to moist | | | | | | | Kelly Bar Weight @ 58-81' = 2531 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, little Silt, strongly cemented, gradational contact, dense-moist | | | | | | | |
| 60 | | 16 | | | | | 12 | | | | | |
| | | | | | @ 61', trace fine to coarse Gravel | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine to coarse-grained Sandstone, little Silt, trace to little fine Gravel, coarsening downward, gradational contact, dense-damp to moist | | | | | | | |
| 65 | | | | | @ 65'5", little coarse Gravel | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, trace to little fine Sand, trace Iron Oxide staining, abundant Calcareous veining and nodules, strongly cemented, gradational contact, hard-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandy Siltstone, little Clay, little Iron Oxide staining, little Calcareous veining and nodules, strongly cemented, dense to very dense-moist | | | | | | | |
| 70 | | 26 | | | @ 70', abundant Calcareous veining and nodules | | 11 | | | | | |
| | | | | | Bedding: N 26 W, 5N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Gravelly fine to coarse-grained Sandstone, coarsening downwards, weakly cemented, dense-damp to moist | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-12c**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-2**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/19/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| 80 | | 19 | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Gravelly fine to coarse-grained Sandstone, coarsening downwards, weakly cemented, dense-damp to moist | | 15 | | | | | |
| | | | | | Boring Terminated at 81 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-12d**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-3**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/16/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2665.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, trace Iron Oxide staining, trace Calcareous veining, trace fine root fibers, moderately cemented, gradational contact, dense-damp | | | | | | | |
| 5 | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, little medium Sand, trace coarse Sand, abundant Calcareous veining, moderately cemented, gradational contact, dense-damp<br>Bedding: N 68 W, 3N<br>@ 5', 2-inch Caliche lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, trace to little Iron Oxide staining, little Calcareous veining and nodules, moderately to strongly cemented, dense-damp<br>@ 7'1", 6-inch fine-grained Sandstone lens; Bedding: N 45 W, 4N<br>@ 7'8", 6-inch Clayey Siltstone lens | | | | | | | |
| 10 | | 8 | | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandy Siltstone, trace to little Manganese staining, trace Calcareous veining and nodules, moderately cemented, gradational contact, dense-moist | | 17 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray Brown fine-grained Sandstone and Silty Claystone, trace Calcareous veining and nodules, weakly to moderately cemented, dense/very stiff-moist<br>Bedding: S 40 W, 10N<br>@ 12' to 14'6", Caliche lens | | | | | | | |
| 15 | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray Brown Silty fine-grained Sandstone and Clayey Siltstone, little Calcareous veining and nodules, trace Manganese staining, moderately to strongly cemented, dense/hard-damp to moist<br>@ 17'9", Bedding: S 70 W, 10N | | | | | | | |
| 20 | | 7 | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, trace medium to coarse Sand, trace fine to coarse Gravel, trace Iron Oxide staining, weakly cemented, dense-moist<br>Bedding: N 80 W, 5N | | 19 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, little fine Sand, little Iron Oxide staining, moderately cemented, gradational contact, hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Iron Oxide staining, moderately cemented, gradational contact, dense-damp<br>@ 22'1", 3-inch Silty Claystone lens<br>@ 22'4", 4-inch fine to medium-grained Sandstone lens; Bedding: S 65 W, 3N | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-13a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-3**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/16/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | @22'8", little Clay, trace Manganese staining, trace Calcareous veining and nodules | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, coarsening downwards, little Iron Oxide staining, weakly to moderately cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | @ 27' to 27'5", Gray Brown Clayey Siltstone lens | | | | | | | |
| 30 | | 13 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace Calcareous veining, trace Iron Oxide staining, weakly cemented, gradational contact, dense-moist | | 10 | | | | | Kelly Bar Weight @ 29-58' = 3921 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, strongly cemented, hard-moist | | | | | | | |
| | | | | | @ 32'4", trace Manganese staining | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, coarsening downwards, little Iron Oxide staining, weakly to moderately cemented, gradational contact, dense-damp | | | | | | | |
| 35 | | | | | @ 33'6" to 33'8", Gray Brown fine-grained Sandy Siltstone lens | | | | | | | |
| | | | | | @ 37'7" to 37'9", fine to coarse Gravel lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandy Siltstone, trace Clay, trace Manganese staining, little Iron Oxide staining, strongly cemented, gradational contact, dense-moist | | | | | | | |
| 40 | | 15 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandstone, coarsening downwards, trace Silt, little Iron Oxide staining, trace Manganese staining, weakly cemented, gradational contact, dense-moist | | 9 | | | | | |
| | | | | | @ 40'6", 0.5-inch Silty Claystone lens | | | | | | | |
| | | | | | @ 44', little fine to coarse Gravel | | | | | | | |
| 45 | | | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, little Manganese staining, moderately cemented, hard-moist | | | | | | | |
| | | | | | Bedding: S 35 E, 6S | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown Conglomerate, | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-13b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-3

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/16/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 9 | | | abundant Calcareous nodules, strongly cemented, gradational contact, hard-moist | | 16 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, little Iron Oxide staining, trace to little Calcareous veining and nodules, trace fine Gravel, moderately cemented, gradational contact, very stiff-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Red Brown Silty Claystone, trace to little Calcareous nodules, well cemented, gradational contact, hard-moist | | | | | | | |
| 55 | | | | | SAN TIMOTEO FORMATION (Tst): Dark Brown Conglomerate, abundant Calcareous nodules, strongly cemented, gradational contact, hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, trace Clay, trace to little Manganese staining, trace to little Iron Oxide staining, moderately cemented, gradational contact, dense-moist | | | | | | | Kelly Bar Weight @ 58-71' = 2531 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, coarsening downwards, little Iron Oxide staining, little Manganese staining, weakly cemented, gradational contact, dense-moist | | | | | | | |
| 60 | | 28 | | | | | 10 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Iron Oxide staining, moderately cemented, gradational contact, dense to very dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, little Iron Oxide staining, moderately cemented, gradational contact, dense-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty Claystone, trace fine Sand, trace Calcareous nodules, trace Manganese staining, little Iron Oxide staining, strongly cemented, hard-moist Bedding: N 67 W, 2N | | | | | | | |
| 65 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, little Clay, little Iron Oxide staining, moderately cemented, dense to very dense-damp to moist | | | | | | | |
| 70 | | 17 | | | | | 14 | | | | | |
| | | | | | Boring Terminated at 71 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

TEST BORING LOG

PLATE B-13c

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-4**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/15/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2647.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | COLLUVIUM (Qcol): Gray Brown fine-grained Sandy Silt, little Calcareous nodules, little Iron Oxide staining, trace to little fine root fibers, strongly cemented, medium dense-damp | | | | | | | |
| | | | | | COLLUVIUM (Qcol): Gray Brown fine to coarse-grained Gravelly Sand, little Clay, abundant Cobbles, little Calcareous veining, trace fine root fibers, weakly cemented, medium dense-damp | | | | | | | |
| 5 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Siltstone, trace to little Clay, trace to little fine Sand, moderately to strongly cemented, gradational contact, dense-very moist | | | | | | | |
| | | | | | @ 9'3", 2-inch Silty fine-grained Sandstone lens; Bedding: S 70 W, 4N<br>@ 9'4" to 9'6", trace fine Gravel<br>@ 10'5" to 10'9", fine Sandy Siltstone lens, little Clay, trace fine to coarse Gravel | | | | | | | |
| 10 | | 4 | | | | 125 | 27 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Silty fine-grained Sandstone, trace Clay, trace medium to coarse Sand, trace fine Gravel, abundant Caliche, weakly to moderately cemented, dense-moist<br>@ 11'2", Bedding: S 85 W, 7N<br>@ 13' to 13'10", abundant Caliche | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, moderately cemented, dense-moist<br>Bedding: S 65 W, 5N<br>@ 14'6", trace Manganese staining, trace Iron Oxide staining | | | | | | | |
| 15 | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, little Silt, trace medium to coarse Sand, trace fine Gravel, little Iron Oxide staining, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine to medium-grained Sandstone, trace Silt, little coarse Sand, coarsening downwards, weakly cemented, dense-damp<br>Bedding: N 72 E, 7S<br>@ 17'6" to 18'2", little Iron Oxide staining, trace fine to coarse Gravel | | | | | | | |
| 20 | | 11 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace fine Gravel, trace Iron Oxide staining, trace Calcareous veining, thinly interbedded fine Sand layers, weakly to moderately cemented, gradational contact, dense-damp to moist | | 9 | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-14a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-4**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/15/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace fine Gravel, trace Iron Oxide staining, trace Calcareous veining, thinly interbedded fine Sand layers, weakly to moderately cemented, gradational contact, dense-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace medium to coarse Sand, little Iron Oxide staining, weakly cemented, medium dense-damp<br>Bedding: N 63 W, 5N | | | | | | | |
| 30 | | 16 | | | | | 6 | | | | | Kelly Bar Weight @ 29-58' = 2531 lbs |
| | | | | | @ 30'6", Light Gray fine-grained Sandstone lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace medium Sand, moderately cemented, gradational contact, dense-moist<br>@ 30'10", Light Gray fine Sand lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace Silt, weakly cemented, dense-damp<br>Bedding: N 70 W, 4N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Siltstone, trace Clay, trace fine Sand, moderately cemented, gradational contact, dense-moist<br>@ 32'4", trace Calcareous veining and nodules | | | | | | | |
| 35 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace Clay, trace Iron Oxide staining, trace to little Calcareous veining and nodules, moderately cemented, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, trace medium to coarse Sand, trace fine Gravel, trace to little Iron Oxide staining, moderately cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray Brown Silty fine-grained Sandstone and fine-grained Sandy Siltstone, little medium to coarse Sand, trace fine Gravel, trace to little Iron Oxide staining, moderately cemented, gradational contact, dense-moist<br>@ 40', little Calcareous veining and nodules, little fine Gravel<br>@ 40'10" to 41'1", fine Gravel lens | | | | | | | |
| 40 | | 16 | | | | | 8 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine to coarse-grained Sandstone, little fine Gravel, little Iron Oxide staining, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace to little Iron Oxide staining, weakly cemented, gradational contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to medium-grained Sandstone, little Iron Oxide staining, coarsening downwards, moderately cemented, gradational contact, dense-damp<br>@ 44'1" to 44'4", Light Gray, little fine Gravel<br>@ 44'4" to 44'7", Silty fine-grained Sandstone lens | | | | | | | |
| 45 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace medium Sand, little Iron Oxide staining, moderately cemented, gradational contact, dense-moist<br>@ 46'1" to 46'7", Light Gray Brown fine Sand lens<br>@ 47'5", trace fine to coarse Gravel | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-14b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-4**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/15/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 12 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, moderately cemented, dense-moist<br>Bedding: S 70 W, 4N | | 14 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, little Iron Oxide staining, moderately cemented, gradational contact, dense-damp<br>@ 51'4", trace coarse Gravel | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, little Iron Oxide staining, trace Manganese staining, moderately cemented, gradational contact, dense-moist<br>@ 52'6" to 52'8", Calcareous veining and nodules lenses | | | | | | | |
| 55 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, strongly cemented, dense-moist<br>Bedding: S 45 W, 4N<br>@ 53'9", Light Gray Brown fine-grained Sandstone lens, trace Clay, little Silt<br>@ 54' to 54'3", Calcareous veining and nodules lenses | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty Claystone, trace Manganese staining, little Iron Oxide staining, strongly cemented, gradational contact, hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, trace Iron Oxide staining, strongly cemented, gradational contact, very dense-moist<br>@ 56'2" to 56'8", Calcareous veining and nodules lenses | | | | | | | Kelly Bar Weight @ 58-86' = 2531 lbs |
| 60 | | 21 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, trace to little Clay, trace Iron Oxide staining, strongly cemented, gradational contact, very dense-moist | | 17 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace coarse Gravel, trace Iron Oxide staining, moderately cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, strongly cemented, gradational contact, very dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, trace fine Gravel, trace Manganese staining, moderately cemented, gradational contact, dense-damp | | | | | | | |
| 65 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Silstone, strongly cemented, gradational contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Light Gray fine to coarse-grained Sandstone and Silty fine-grained Sandstone, little fine to coarse Gravel, trace to little Calcareous veining and nodules, little Iron Oxide staining, moderately cemented, undulating contact, dense-damp to moist<br>@ 65', mica striations | | | | | | | |
| 70 | | 44 | | | | | 2 | | | | | @ 70 feet, Disturbed Sample |
| | | | | | @ 71'2"s to 71'4", undulating fine to coarse Gravel lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, trace Manganese staining, strongly cemented, hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray Brown fine-grained Sandstone and fine-grained Sandy Siltstone, strongly cemented, very dense-moist<br>@ 72'11", little medium to coarse Sand, trace fine to coarse Gravel | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-14c**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-4

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/15/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, little fine to coarse Gravel, weakly cemented, gradational contact, dense-damp @ 76', trace Manganese staining | | | | | | | |
| 80 | | 26 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Clay, strongly cemented, very dense-moist @ 81'3", little fine to coarse Gravel | | 12 | | | | | |
| 85 | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Light Gray Brown fine-grained Sandstone and fine-grained Sandy Siltstone, little Iron Oxide staining, moderately cemented, dense-moist | | | | | | | Kelly Bar Weight @ 86-91' = 1407 lbs |
| 90 | | 42 | | | | | 13 | | | | | |
| | | | | | Boring Terminated at 91 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-14d**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-5

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/14/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2643.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray to White fine-grained Sandstone, trace medium Sand, extensive Calcareous veining and nodules, little fine root fibers, strongly cemented, gradational contact, very dense-dry | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace medium to coarse Sand, little to some Calcareous veining and nodules, strongly cemented, gradational contact, very dense-dry | | | | | | | |
| 5 | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandstone, trace medium Sand, little Iron Oxide staining, little Calcareous veining and nodules, moderately cemented, gradational contact, very dense-damp<br><br>@ 7'8", trace fine to coarse Gravel | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, little Iron Oxide staining, little Calcareous veining and nodules, moderately cemented, gradational contact, dense-damp | | | | | | | |
| 10 | | 7 | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, little Iron Oxide staining, trace fine root fibers, weakly cemented, dense-damp to moist<br>Bedding: S 40 W, 5N<br>@ 9'9" to 10'1", little medium to coarse Sand | | 8 | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, trace Iron Oxide staining, trace Calcareous veining and nodules, moderately cemented, gradational contact, dense-damp to moist | | | | | | | |
| | | | | | Gray Brown fine-grained Sandy Siltstone, trace Iron Oxide staining, trace Calcareous nodules, moderately cemented, gradational contact, dense-damp | | | | | | | |
| 15 | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, trace Calcareous veining, trace Iron Oxide staining, moderately cemented, gradational contact, dense-damp<br>@ 13'9" to 13'11", Gray Brown fine-grained Sandy Siltstone lens, strongly cemented<br>@ 16'2" to 16'5", Gray Brown fine-grained Sandy Siltstone lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, trace to little Clay, little Manganese nodules, little Iron Oxide staining, moderately cemented, gradational contact, very dense-moist<br>@ 17'8", 1-inch Calcareous veining lens | | | | | | | |
| 20 | | 8 | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace to little Silt, trace Iron Oxide staining, weakly to moderately cemented, gradational contact, dense-damp | | 12 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, weakly to moderately cemented, gradational contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, trace Clay, trace Iron Oxide staining, little Manganese staining, moderately cemented, gradational contact, very dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, trace Silty Clay nodules, trace Calcareous nodules, moderately cemented, gradational contact, dense-moist | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-15a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-5

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/14/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | @ 22'4" to 22'7", Light Gray fine-grained Sandstone lens<br>@ 22'7" to 22'9", horizontal Calcareous lenses | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, trace Calcareous nodules, moderately cemented, gradational contact, very dense-moist<br>@ 23'6", trace fine to coarse Gravel<br>@ 25'5", trace to little Clay, strongly cemented | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Silty fine-grained Sandstone, trace medium to coarse Sand, trace fine Gravel, trace Iron Oxide staining, weakly to moderately cemented, gradational contact, dense-moist | | | | | | | |
| 30 | | 18 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, trace medium Sand, trace Iron Oxide staining, moderately cemented, gradational contact, very dense-damp to moist | | 9 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace medium Sand, trace Iron Oxide staining, weakly to moderately cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, trace fine to coarse Gravel, trace Iron Oxide staining, weakly to moderately cemented, gradational contact, dense-moist<br>@ 33'6", trace Calcareous nodules | | | | | | | |
| 35 | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, weakly cemented, gradational contact, dense-damp<br>@ 35'5" to 35'7", fine to coarse-grained Gravel lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray to Gray Brown interbedded fine-grained Sandstone and Silty fine-grained Sandstone, trace Iron Oxide staining, trace fine to coarse Gravel, weakly to moderately cemented, gradational contact, dense-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, weakly to moderately cemented, dense-moist<br>Bedding: S 55 W, 3N | | | | | | | |
| 40 | | 12 | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, weakly cemented, gradational contact, dense-damp<br>@ 38'5", little Iron Oxide staining<br>@ 39'10" to 41', trace to little Silt | | 6 | | | | | Kelly Bar Weight @ 29-58' = 2531 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to medium-grained Sandstone, little Iron Oxide staining, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, little to some Iron Oxide staining, weakly cemented, undulating contact, dense-damp<br>Bedding: N 80 W, 3N | | | | | | | |
| 45 | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray Brown Silty fine-grained Sandstone and fine-grained Sandy Siltstone, weakly cemented, gradational contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, moderately to strongly cemented, gradational contact, very dense-moist<br>@ 46'2" to 46'4", Light Gray fine-grained Sandstone lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, weakly cemented, dense-damp<br>Bedding: S 85 E, 7S | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

TEST BORING LOG

PLATE B-15b

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-5

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/14/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Michelle Krizek

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 13 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, weakly to moderately cemented, gradational contact, dense-moist | | 17 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to medium-grained Sandstone, little Iron Oxide staining, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone to fine-grained Sandy Siltstone, moderately cemented, gradational contact, dense-moist | | | | | | | |
| 55 | | | | | | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, trace fine Gravel, weakly cemented, dense-damp | | | | | | | |
| | | | | | @ 58'2" to 58'4", Gray Brown Silty fine-grained Sandstone lens, moderately cemented; Bedding: N 63 W, 5N | | | | | | | |
| 60 | | 17 | | | | | 6 | | | | | |
| 65 | | 23 | | | | | 11 | | | | | Kelly Bar Weight @ 58-66' = 2531 lbs |
| | | | | | Boring Terminated at 66 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-15c**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-6

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/13/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2593.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | OLDER ALLUVIUM (Qoa): Brown Silty fine Sand, little Clay, trace medium Sand, trace fine root fibers, trace roots, dense-damp | | | | | | | |
| 5 | | | | | @ 5'5", trace Iron oxide staining, trace to little Calcareous nodules | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey Siltstone, little fine Sand, little Calcareous nodules, gradational contact, very stiff-moist | | | | | | | |
| 10 | | 4 | | | SAN TIMOTEO FORMATION (Tst): Brown Clayey fine-grained Sandstone to fine-grained Sandy Claystone, trace coarse Sand, trace to little Calcareous nodules, weakly cemented, gradational contact, dense/very stiff-damp to moist | | 9 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine to medium-grained Sandstone, trace coarse Sand, trace fine Gravel, little Calcareous veining, weakly cemented, gradational contact, dense-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine-grained Sandstone, trace coarse Sand, little Iron oxide staining, weakly cemented, dense-damp<br>@ 13'2", Kortovina<br>@ 14', 1-inch Orange Brown fine to coarse-grained Sandstone lens; Bedding: S 60 W, 4N<br>@ 14'1", trace Calcareous nodules | | | | | | | |
| 15 | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine to coarse-grained Sandstone, trace Silt, trace fine to coarse Gravel, trace Calcareous nodules, weakly cemented, undulating contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine-grained Sandstone, trace medium Sand, trace Calcareous nodules, trace Iron oxide staining, gradational contact, dense-damp | | | | | | | |
| 20 | | 8 | | | SAN TIMOTEO FORMATION (Tst): Light Gray to Gray Brown fine-grained Sandstone, trace Calcareous nodules, weakly cemented, gradational contact, dense-damp<br>@ 18'7", Light Gray, trace to little Silt<br>@ 21', 2-inch fine to medium-grained Sandstone lens | | 6 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Silty fine-grained Sandstone, weakly cemented, dense-damp<br>Bedding: S 83 W, 5N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandy Siltstone, trace Iron oxide staining, trace Calcareous nodules, moderately cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace Iron oxide staining, weakly cemented, | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-16a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-6**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/13/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | dense-damp<br>@ 23'8", 3-inch Siltstone lens | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Interbedded fine-grained Sandstone, fine to coarse-grained Sandstone, and fine-grained Sandy Siltstone, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown Interbedded fine-grained Sandy Siltstone and Silty fine-grained Sandstone, little to some Iron oxide staining, moderately cemented, gradational contact, very dense-damp | | | | | | | |
| 30 | | 10 | | | @ 30', some Iron oxide staining, trace Calcareous nodules | | 2 | | | | | Kelly Bar Weight @ 29-58' = 3921 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Red Brown Clayey Siltstone, extensive Iron oxide staining, weakly cemented, gradational contact, very stiff-damp | | | | | | | |
| 35 | | | | | SAN TIMOTEO FORMATION (Tst): Brown to Light Brown fine-grained Sandy Siltstone, moderately cemented, gradational contact, very dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray Brown to Light Brown fine-grained Sandstone and Silty fine-grained Sandstone, weakly cemented, gradational contact, medium dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown to Brown fine-grained Sandy Siltstone, moderately cemented, undulating contact, stiff to very stiff-moist | | | | | | | |
| 40 | | 16 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, trace fine Sand, extensive Calcareous nodules, strongly cemented, gradational contact, hard-moist | | 11 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown to Gray Brown fine-grained Sandy Siltstone, little Clay, trace medium Sand, little to some Calcareous nodules, moderately cemented, stiff-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Brown to Brown Silty fine-grained Sandstone, trace fine to coarse Gravel, moderately cemented, gradational contact, dense-moist | | | | | | | |
| 45 | | | | | SAN TIMOTEO FORMATION (Tst): Brown fine-grained Sandy Siltstone, little Clay, little fine to coarse Gravel, little to some Calcareous nodules, trace Iron Oxide staining, moderately cemented,very stiff-moist<br>@ 44'5" to 46'11", little fine to coarse Gravel | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Brown to Red Brown Clayey Siltstone, little fine Sand, weakly cemented, gradational, undulating contact, very stiff-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray fine to coarse-grained Sandy Siltstone, trace coarse Sand, little Calcareous nodules, trace to little Iron Oxide staining, moderately to highly cemented, undulating contact, stiff-moist | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-16b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-6**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/13/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 16 | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, trace medium Sand, trace fine to coarse Gravel, trace Iron Oxide staining, weakly cemented, gradational contact, dense-moist | | 14 | | | | | |
| | | | | | @ 51', trace Calcareous nodules, trace Iron Oxide staining | | | | | | | |
| 55 | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray to Light Gray fine-grained Sandstone and Gravelly fine to coarse-grained Sandstone, weakly to moderately cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace medium Sand, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, trace Silt, trace fine Gravel, trace to little Iron Oxide staining, weakly cemented, medium dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, trace medium Sand, trace Calcareous veining and nodules, trace Iron Oxide staining, weakly cemented, gradational contact, dense-moist | | | | | | | Kelly Bar Weight @ 58-66' = 2531 lbs |
| 60 | | 18 | | | SAN TIMOTEO FORMATION (Tst): Gray Interbedded Silty fine-grained Sandstone and fine-grained Sandstone, trace Iron Oxide staining, weakly to moderately cemented, dense-moist | | 13 | | | | | |
| 65 | | 25 | | | | | 15 | | | | | |
| | | | | | Boring Terminated at 66 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-16c**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# BORING NO. BA-7

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/12/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2545.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little fine root fibers, little Manganese staining, moderately cemented, weathered, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray to Gray Brown Silty fine-grained Sandstone and fine-grained Sandstone, little Iron Oxide staining, little Calcareous nodules, weakly cemented, dense-moist<br>@ 3'1", Bedding: N 89 W, 13N<br>@ 4'2", Bedding: N 70 W, 12N | | | | | | | |
| 5 | | 5 | | | | | 7 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Iron Oxide staining, little Calcareous nodules, little Manganese staining, stiff-moist<br>Bedding: N 87 W, 13N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Gray Brown to Gray Silty fine-grained Sandstone and fine-grained Sandstone, little Iron Oxide staining, trace Calcareous nodules, gradational contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, trace Iron Oxide staining, weakly cemented, gradational contact, dense-damp<br>@ 8'6", occasional Kortivina | | | | | | | |
| 10 | | 5 | | | | | 15 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Brown to Gray Brown fine-grained Sandy Siltstone and Silty fine-grained Sandstone, little Iron Oxide staining, weakly to moderately cemented, dense-moist<br>@ 10', Bedding: N 80 W, 12N<br>@ 11'2", Bedding: N 69 W, 9N<br>@ 11'2", little Clay, trace Calcareous veining and nodules | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, little Manganese staining, weakly cemented, gradational contact, dense-damp | | | | | | | |
| 15 | | 9 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, little Calcareous veining and nodules, weakly cemented, dense-moist<br>Bedding: N 56 W, 12N | | 7 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, weakly cemented, dense-damp<br>@ 13'4", Fault: S 85 E, 57S, 1" offset<br>@ 15'2", 1-inch lens of Silty fine-grained Sandstone | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, little Calcareous veining and nodules, trace Iron Oxide staining, weakly cemented, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, little fine Sand, some Iron Oxide staining, trace Calcareous veining and nodules, moderately to strongly cemented, hard-moist to very moist<br>Bedding: N 40 W, 12N<br>@ 17', strongly cemented<br><br>@ 22', some Calcareous veining and nodules | | | | | | | |
| 20 | | 5 | | | | | 22 | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-17a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-7**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/12/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 5 | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Clayey Siltstone, little fine Sand, some Iron Oxide staining, trace Calcareous veining and nodules, moderately to strongly cemented, hard-moist to very moist | | 21 | | | | | |
| | | | | | Bedding: N 40 W, 12N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, occasional Clay lens, trace Iron Oxide staining, weakly cemented, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, weakly cemented, gradational contact, dense-damp | | | | | | | |
| 30 | | 9 | | | | | 16 | | | | | Kelly Bar Weight @ 29-46' = 3921 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown to Gray Silty Claystone, little Iron Oxide staining, little Calcareous veining and nodules, moderately cemented, hard-moist | | | | | | | |
| | | | | | Bedding: N 47 W, 10N | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little Manganese staining, little Iron Oxide staining, little Calcareous veining and nodules, moderately cemented, very stiff-moist | | | | | | | |
| 35 | | 14 | | | Bedding: N 42 W, 14N | | 12 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Silty fine-grained Sandstone, little Iron Oxide staining, weakly cemented, medium dense-damp to moist | | | | | | | |
| 40 | | 15 | | | | | 11 | | | | | |
| 45 | | 13 | | | | | 11 | | | | | |
| | | | | | Boring Terminated at 46 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-17b**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-8**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/12/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION<br>SURFACE ELEVATION: 2525.0 feet MSL | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | | | | Casing | | | | | | | Kelly Bar Weight @ 0-29' = 5952 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Interbedded Dark Gray Clayey Siltstone and Light Gray Siltstone, abundant Calcareous veining and nodules, little Iron Oxide staining, trace fine root fibers, abundant Kortivina, highly weathered, very stiff to hard-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Silty fine-grained Sandstone, highly weathered, friable, dense-moist | | | | | | | |
| 5 | | 19 | | | | | 10 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown fine to coarse-grained Sandstone, trace Silt, trace medium to coarse Gravel, highly weathered, dense-damp to moist<br>Bedding: S 75 W, 6N<br>@ 6'2" to 6'8", Dark Gray Clayey Siltstone lens, trace fine Sand | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION: Dark Gray Clayey Siltstone, trace fine Sand, trace Iron Oxide staining, highly weathered, friable, very stiff-moist<br>Bedding: S 80 W, 7N | | | | | | | |
| 10 | | 14 | | | SAN TIMOTEO FORMATION (Tst): Interbedded Light Gray fine-grained Sandstone and fine to coarse-grained Sandstone, trace Silt, highly weathered, dense-damp<br>@ 9'7", Bedding: S 50 E, 10S<br>@ 11', Bedding: S 85 W, 5N | | 4 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Dark Gray fine-grained Sandy Siltstone, interbedded with fine to coarse-grained Sandstone, little fine to coarse Gravel, highly weathered, friable, weakly cemented, medium dense-damp to moist | | | | | | | |
| 15 | | 11 | | | SAN TIMOTEO FORMATION (Tst): Gray fine to medium-grained Sandstone, trace to little coarse Sand, dense-damp<br>Bedding: S 80 E, 16S | | 4 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray fine to coarse-grained Sandstone, trace to little fine to coarse Gravel, friable, gradational contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown Silty fine-grained Sandstone, friable, highly weathered, dense-damp<br>Bedding: S 80 W, 12N | | | | | | | |
| 20 | | 14 | | | | | 4 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray fine-grained Sandy Siltstone, highly weathered, friable, weakly cemented, undulating contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Dark Gray Siltstone, trace | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-18a**

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

**BORING NO. BA-8**

JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California

DRILLING DATE: 8/12/24
DRILLING METHOD: Bucket Auger
LOGGED BY: Aidan Salazar

WATER DEPTH: Dry
CAVE DEPTH: ---
READING TAKEN: At Completion

| FIELD RESULTS | | | | | | LABORATORY RESULTS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH (FEET) | SAMPLE | BLOW COUNT | POCKET PEN. (TSF) | GRAPHIC LOG | DESCRIPTION (Continued) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | LIQUID LIMIT | PLASTIC LIMIT | PASSING #200 SIEVE (%) | ORGANIC CONTENT (%) | COMMENTS |
| | | 11 | | | Clay, friable, undulating contact, dense-moist<br>Bedding: S 85 W, 7N<br>@ 24'11", 1-inch Calcareous veining and nodule layer | | 9 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, trace Silt, highly weathered, friable, undulating contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Dark Gray Siltstone, trace Clay, highly weathered, friable, undulating contact, dense-moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, highly weathered, friable, gradational contact, dense-damp | | | | | | | |
| 30 | | 11 | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine to coarse-grained Sandstone, undulating contact, highly weathered, dense-damp | | 19 | | | | | Kelly Bar Weight @ 29-46' = 3921 lbs |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Silty fine to medium-grained Sandstone, highly weathered, friable, undulating contact, dense-damp | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Dark Gray Siltstone, trace Clay, trace fine Sand, dense-moist<br>Bedding: S 75 W, 12N | | | | | | | |
| 35 | | 13 | | | | | 7 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Silty fine-grained Sandstone, highly weathered, gradational contact, dense-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray fine to coarse-grained Sandstone, trace fine to coarse Gravel, highly weathered, friable, dense-damp to moist<br>Bedding: N 70 W, 6N | | | | | | | |
| 40 | | 9 | | | SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, highly weathered, gradational contact, dense-damp to moist | | 17 | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray fine to coarse-grained Sandstone, highly weathered, gradational contact, dense-damp to moist | | | | | | | |
| | | | | | SAN TIMOTEO FORMATION (Tst): Gray Silty fine-grained Sandstone, highly weathered, gradational contact, dense-moist | | | | | | | |
| 45 | | 28 | | | | | 15 | | | | | |
| | | | | | Boring Terminated at 46 feet | | | | | | | |

TBL 24G141-1 BUCKET AUGERS.GPJ SOCALGEO.GDT 9/25/24

**TEST BORING LOG**

**PLATE B-18b**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-1**

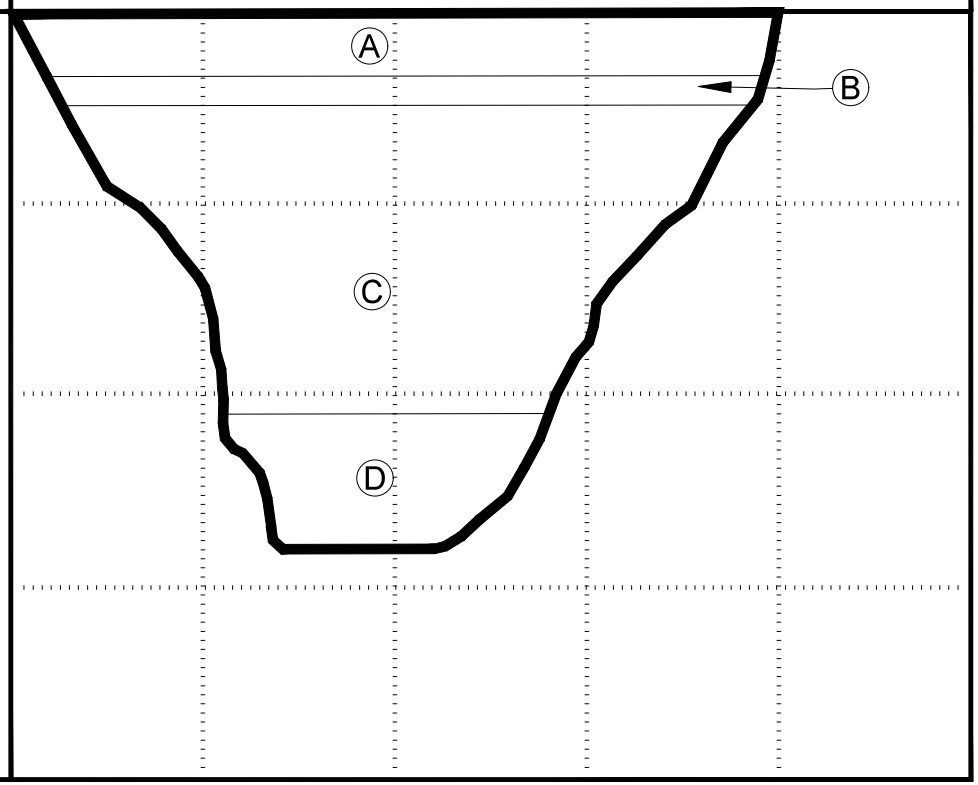
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/19/2024

EQUIPMENT USED: Excavator
LOGGED BY: Jamie Hayward
ORIENTATION: N 67 E
ELEVATION: 2720 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| | b | | 12 | A: DISTURBED ALLUVIUM (Dist. Qal): Gray Brown Silty fine Sand, some fine root fibers, loose-moist |
| | b | | 12 | B: SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, some Calcareous veining, weakly cemented, dense-moist |
| | b | | 17 | C: Tst: Gray Brown to Brown Silty fine-grained Sandstone, little Calcareous veining, weakly cemented, dense-very moist |
| 5 | b | | 13 | @ 6 to 10.5 feet, Brown, moist |
| 10 | b | | 9 | D: Tst: Red Brown fine-grained Sandy Siltstone, moderately cemented, dense to very dense-moist |
| 15 | | | | Refusal @ 14 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2706 feet msl |

GRAPHIC REPRESENTATION




KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-19**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-2**

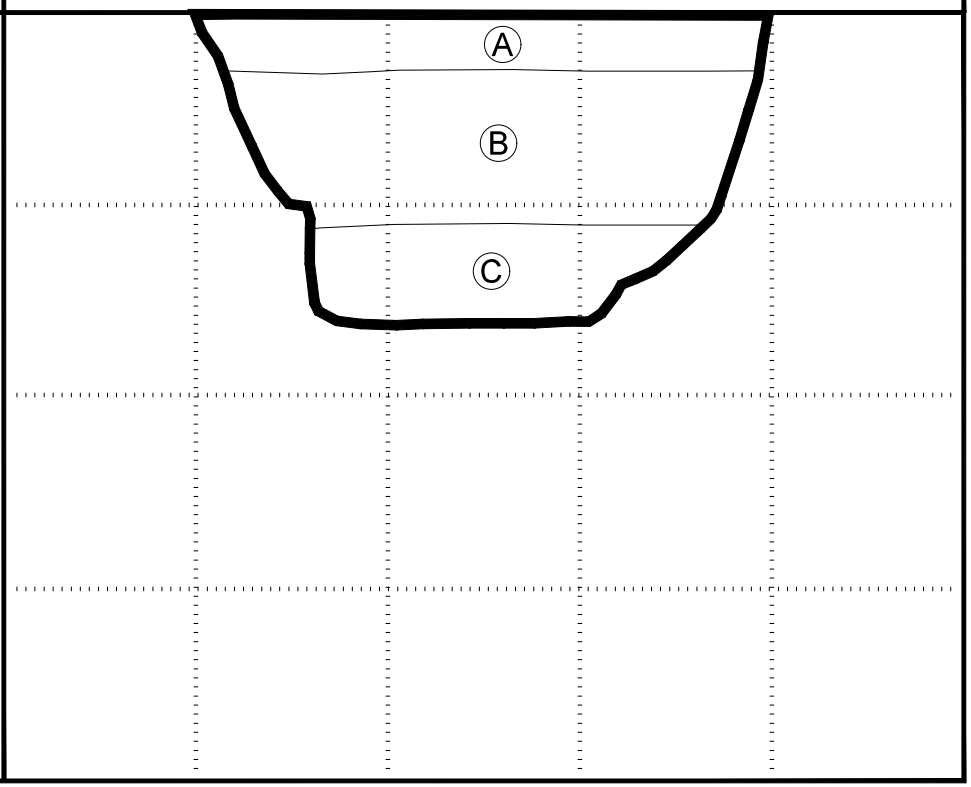
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/19/2024

EQUIPMENT USED: Backhoe
LOGGED BY: Jamie Hayward
ORIENTATION: N 66 E
ELEVATION: 2695 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| 5 | b | | 21 | A: OLDER ALLUVIUM (Qoa): Brown fine Sandy Clay, little medium to coarse Sand, trace fine to coarse Gravel, little fine root fibers, strongly cemented, blocky texture, medium dense-very moist |
| | b | | 12 | B: SAN TIMOTEO FORMATION (Tst): Light Gray Brown to Light Gray Silty fine-grained Sandstone, little roots, some Calcareous nodules, strongly cemented, blocky texture, very dense-dry |
| | b | | 19 | C: Tst: Brown Silty fine-grained Sandstone, laminated, strongly cemented, blocky texture, very dense-very moist |
| 10 | | | | Refusal @ 8 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2687 feet msl |
| 15 | | | | |

GRAPHIC REPRESENTATION




KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-20**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-3**

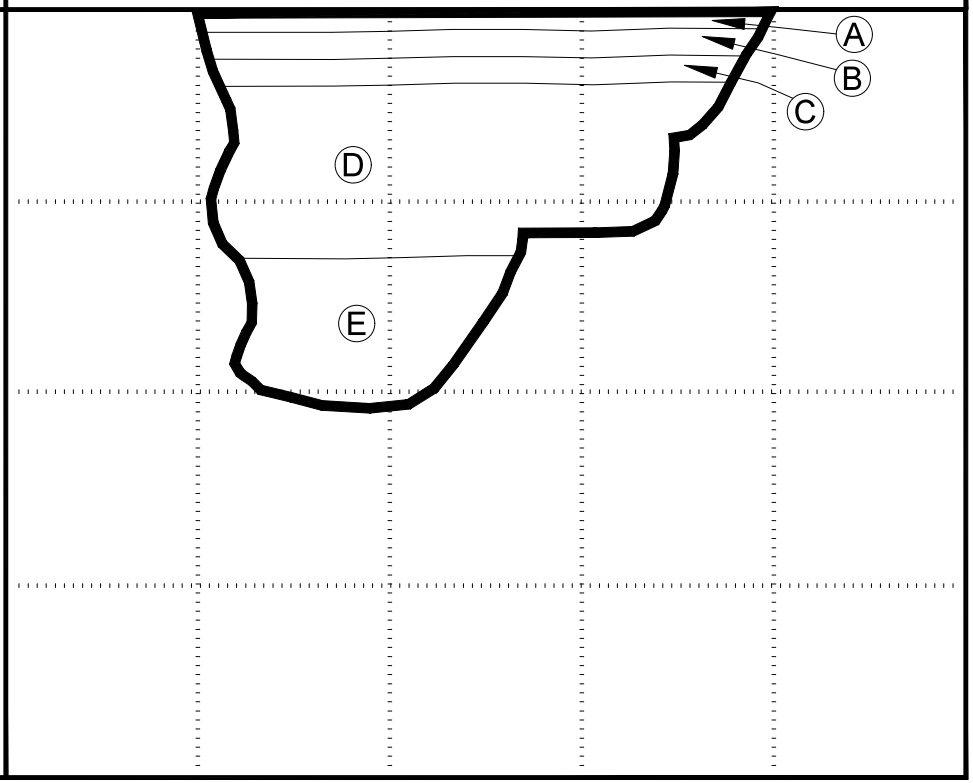
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/18/2024

EQUIPMENT USED: Backhoe
LOGGED BY: Jamie Hayward
ORIENTATION: S 75 E
ELEVATION: 2615 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| | b | | 2 | A: YOUNGER ALLUVIUM (Qal): Brown Silty fine to medium Sand, some fine root fibers, some roots, loose-dry |
| | b | | 9 | |
| | b | | 3 | B: Qal: Light Gray fine Sand, trace medium to coarse Sand, little fine root fibers, some roots, medium dense-moist |
| | b | | 17 | C: SAN TIMOTEO FORMATION (Tst): Gray Brown fine-grained Sandy Siltstone, little fine root fibers, blocky structure, strongly cemented, medium dense to dense-damp |
| 5 | b | | 9 | D: Tst: Light Brown fine-grained Sandstone, little Silt, little Calcareous veining, little Iron oxide staining, moderately cemented, very dense-very moist |
| | b | | 5 | @ 5 to 6.5 feet, Gray Brown, strongly cemented |
| | | | | E: Tst: Gray Brown Silty fine-grained Sandstone, laminated, strongly cemented, very dense-damp |
| 10 | | | | Refusal @ 10.5 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2604.5 feet msl |
| 15 | | | | |

## GRAPHIC REPRESENTATION




KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-21**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-4**

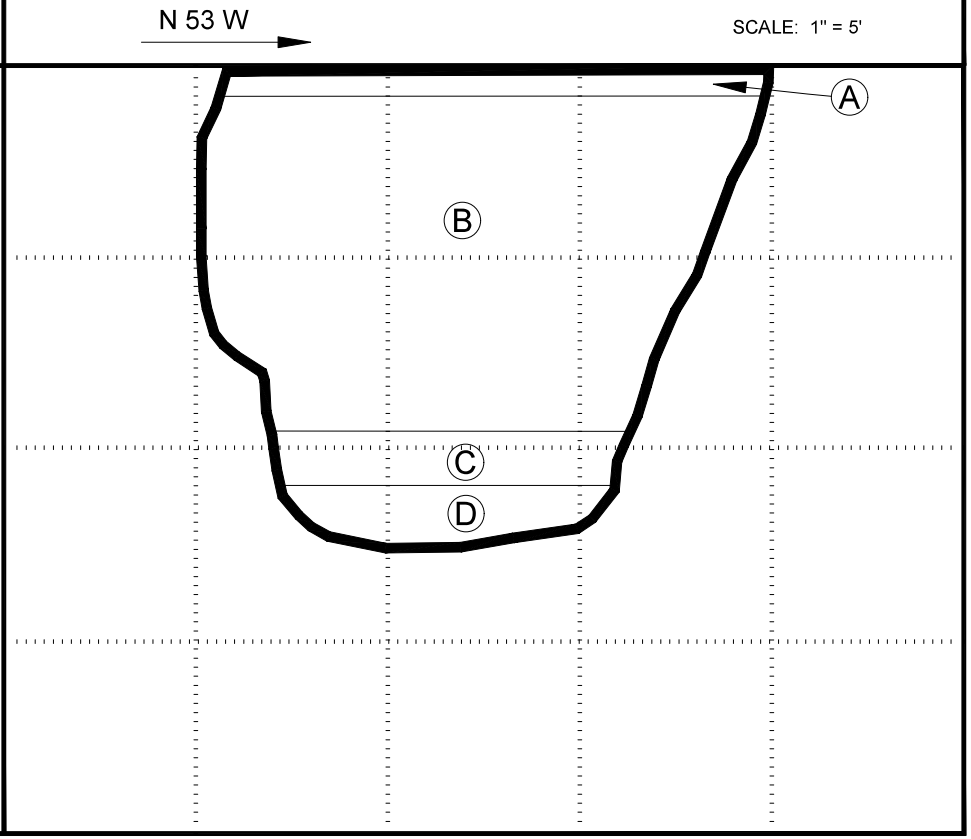
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/18/2024

EQUIPMENT USED: Backhoe
LOGGED BY: Jamie Hayward
ORIENTATION: N 53 W
ELEVATION: 2520 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| | b | | 5 | A: YOUNGER ALLUVIUM (Qal): Gray Brown Silty fine Sand, slightly porous, little fine root fibers, little roots, medium dense-damp |
| | b | | 7 | B: Qal: Light Gray Brown Silty fine Sand and fine Sandy Silt, trace medium Sand, porous, trace fine root fibers, medium dense-damp |
| 5 | | | | |
| | b | | 7 | C: OLDER ALLUVIUM (Qoa): Light Red Brown fine Sandy Silt, little Calcareous veining, medium dense-damp |
| 10 | | | | D: SAN TIMOTEO FORMATION (Tst): Light Gray fine-grained Sandstone, little Silt, moderately cemented, dense-moist |
| | b | | 11 | |
| | | | | Refusal @ 12.7 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2507.3 feet msl |
| 15 | | | | |

## GRAPHIC REPRESENTATION




KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-22**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-5**

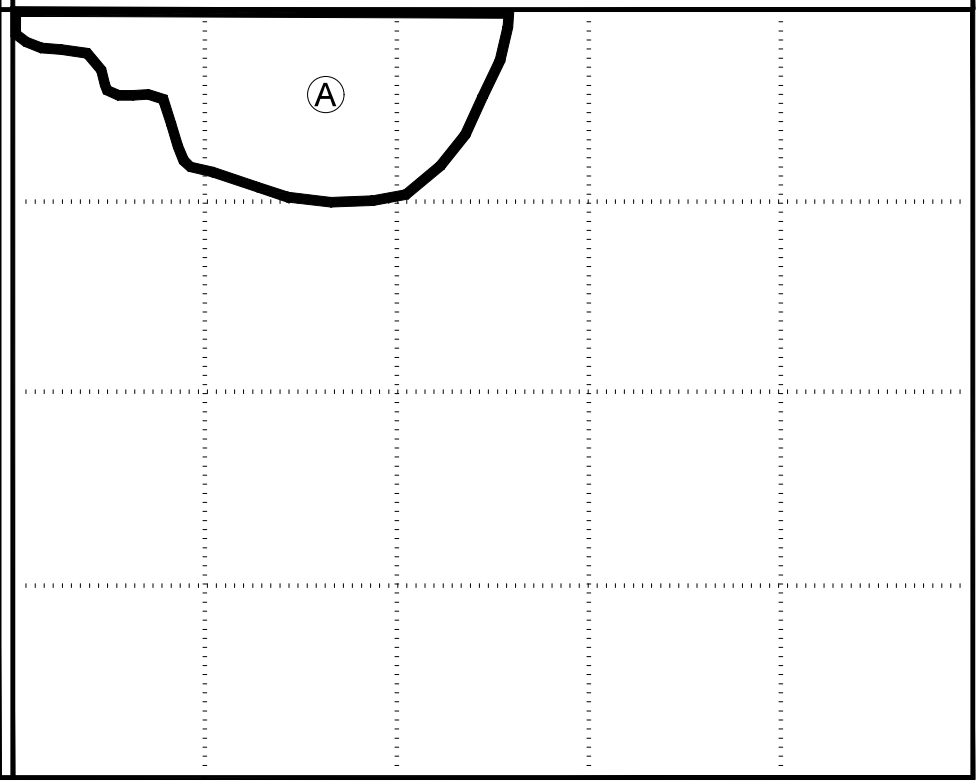
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/18/2024

EQUIPMENT USED: Backhoe
LOGGED BY: Caleb Brackett
ORIENTATION: S 56 E
ELEVATION: 2500 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| | b | | 6 | A: SAN TIMOTEO FORMATION (Tst): Light Gray Brown fine-grained Sandstone, trace Calcareous veining/nodules, strongly cemented, dense-damp<br>@ 0-1', little fine root fibers |
| 5 | b | | 17 | Refusal @ 5 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2495 feet msl |
| 10 | | | | |
| 15 | | | | |

GRAPHIC REPRESENTATION




KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-23**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-6**

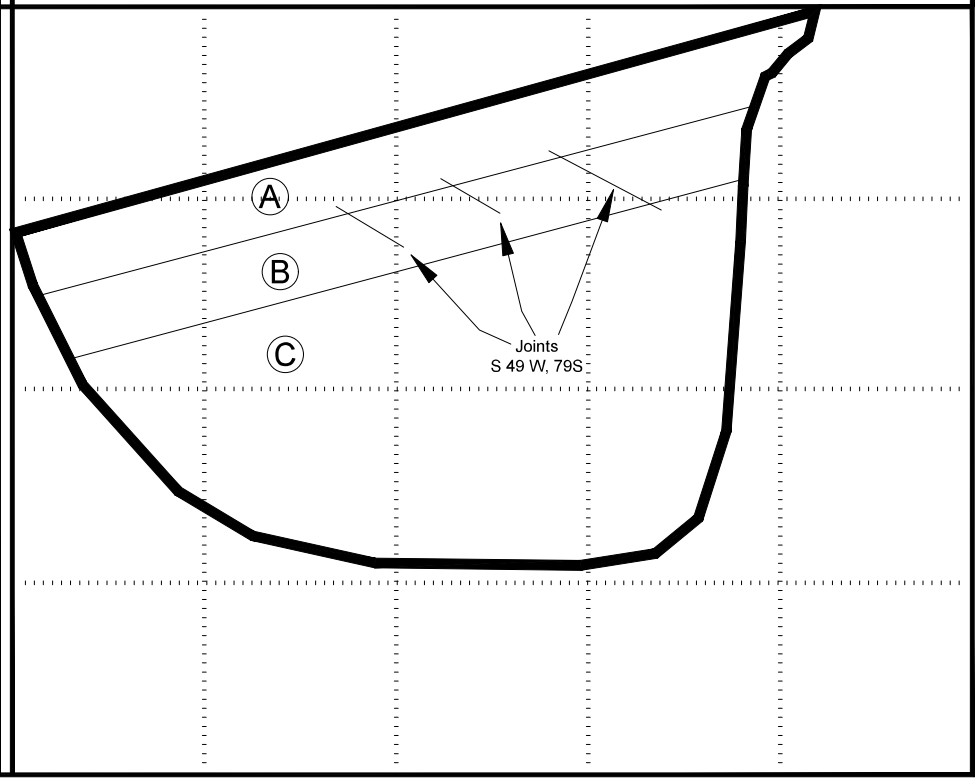
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/19/2024

EQUIPMENT USED: Excavator
LOGGED BY: Jamie Hayward
ORIENTATION: S 12 W
ELEVATION: 2485 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| | | | | A: SAN TIMOTEO FORMATION (Tst): Gray Brown Interbedded Silty fine-grained Sandstone to fine-grained Sandy Siltstone, little Iron oxide staining, weakly cemented, dense-damp |
| | b | | 7 | Bedding: N 72 W, 14N |
| | b | | 4 | B: Tst: Light Brown fine-grained Sandstone, little Iron oxide staining, weakly cemented, dense-damp |
| | b | | 17 | Bedding: N 78 W, 11N |
| 5 | | | | C: Tst: Gray Brown fine-grained Sandy Siltstone, moderately to strongly cemented, laminated, very dense-very moist |
| 10 | | | | |
| 15 | | | | Refusal @ 14.5 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2470.5 feet msl |

GRAPHIC REPRESENTATION




KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-24**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-7**

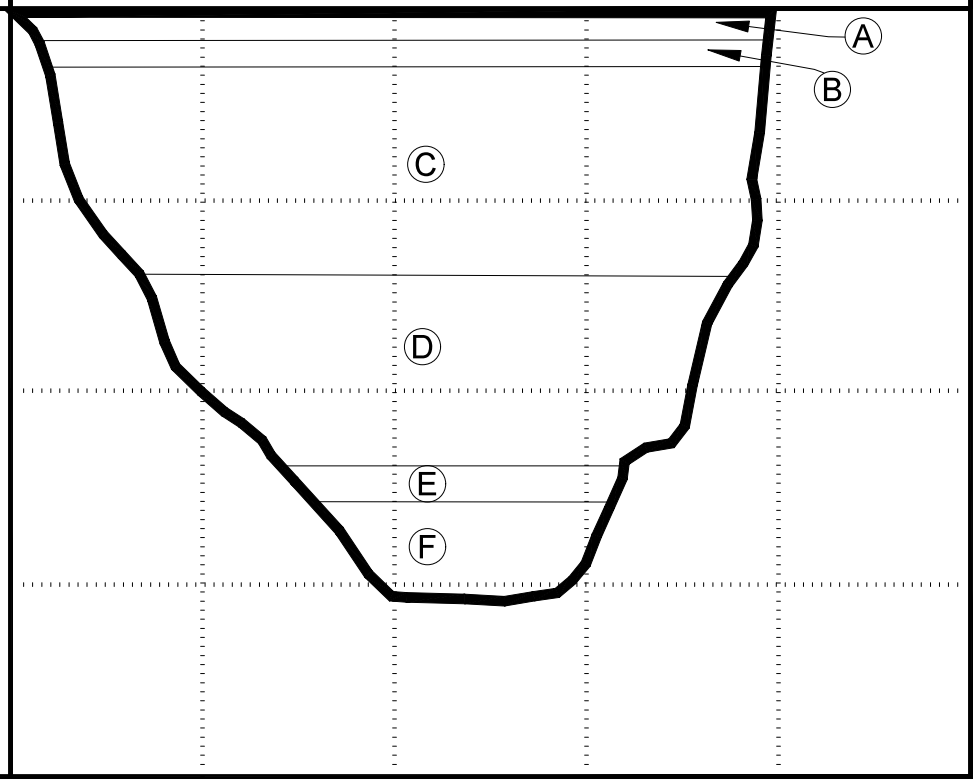
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/19/2024

EQUIPMENT USED: Excavator
LOGGED BY: Jamie Hayward
ORIENTATION: S 31 W
ELEVATION: 2575 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| | b | | 9 | A: OLDER ALLUVIUM (Qoa): Brown fine Sandy Clay to Clayey fine Sand, little fine root fibers, loose-moist |
| | b | | 8 | |
| | b | | 8 | B: Qoa: Light Brown Clayey fine Sand, trace fine root fibers, trace Iron oxide staining, weakly cemented, medium dense-moist |
| | | | | C: SAN TIMOTEO FORMATION (Tst): Light Brown fine-grained Sandstone, trace fine root fibers, weakly cemented, very dense-moist |
| 5 | | | | |
| | b | | 16 | D: Tst: Light Brown Silty fine-grained Sandstone, laminated, very dense-very moist |
| 10 | | | | |
| | b | | 11 | E: Tst: Light Brown fine-grained Sandstone, very dense-moist |
| | b | | 11 | F: Tst: Light Gray Brown Clayey fine-grained Sandstone, little Iron oxide staining, moderately cemented, very dense-moist |
| 15 | | | | Refusal @ 15.5 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2559.5 feet msl |

GRAPHIC REPRESENTATION




KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-25**

# SOUTHERN CALIFORNIA GEOTECHNICAL

**TRENCH NO. T-8**

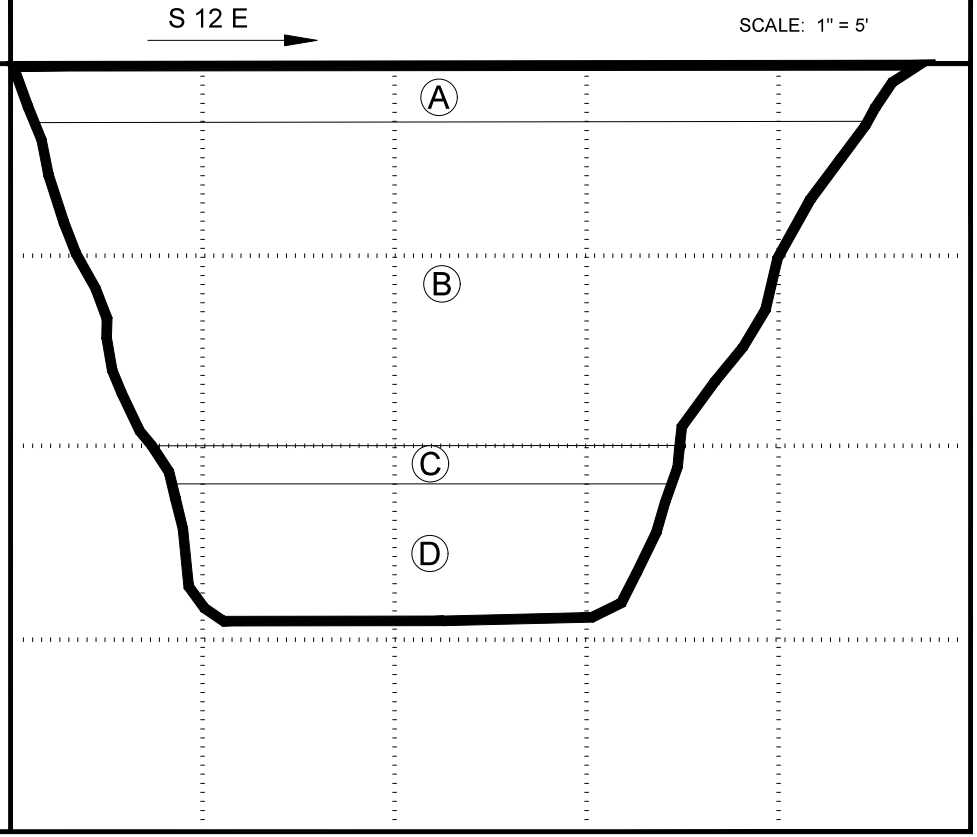
JOB NO.: 24G141-1
PROJECT: Proposed Industrial Development
LOCATION: Beaumont, California
DATE: 7/19/2024

EQUIPMENT USED: Excavator
LOGGED BY: Jamie Hayward
ORIENTATION: S 12 E
ELEVATION: 2595 FEET MSL

WATER DEPTH: Dry
SEEPAGE DEPTH: Dry
READINGS TAKEN: At Completion

| DEPTH | SAMPLE | DRY DENSITY (PCF) | MOISTURE (%) | EARTH MATERIALS DESCRIPTION |
|---|---|---|---|---|
| | b | | 6 | A: YOUNGER ALLUVIUM (Qal): Gray Brown fine-coarse Sandy Silt, highly porous, little fine root fibers, loose-damp |
| | | | | B: OLDER ALLUVIUM (Qoa): Light Brown Clayey fine to medium Sand, trace fine Gravel, trace fine root fibers, medium dense-moist |
| | b | | 8 | |
| 5 | | | | |
| 10 | b | | 14 | C: Qoa: Brown fine Sandy Silt, little Clay, little fine root fibers, slightly porous, medium dense-very moist |
| | b | | 15 | D: SAN TIMOTEO FORMATION (Tst): Gray Brown Silty fine-grained Sandstone, moderately to strongly cemented, very dense-very moist |
| 15 | | | | Refusal @ 14.5 feet due to very dense bedrock<br>Bottom of Trench Elevation: 2580.5 feet msl |

GRAPHIC REPRESENTATION



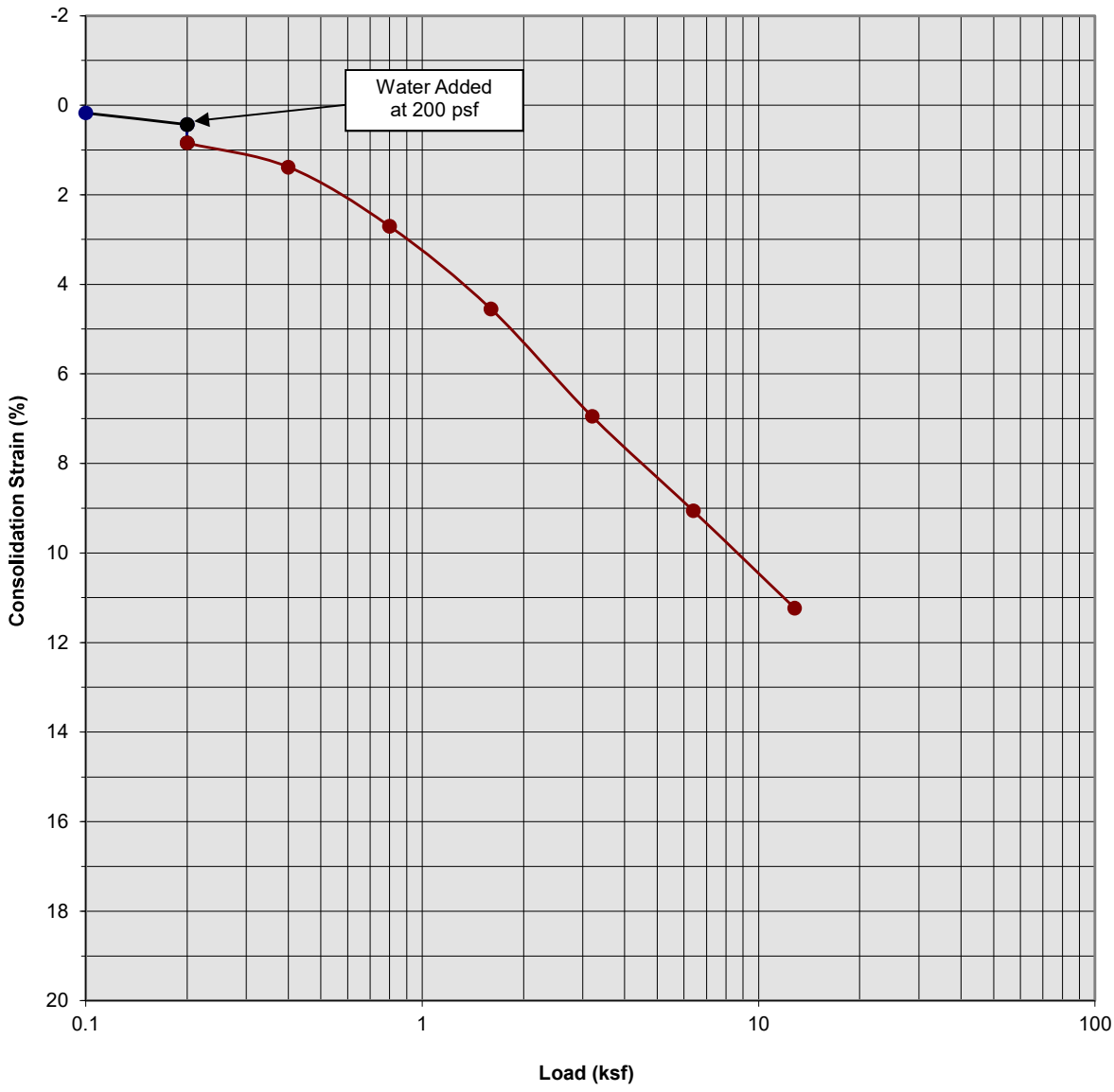

KEY TO SAMPLE TYPES:
B - BULK SAMPLE (DISTURBED)
R - RING SAMPLE 2-1/2" DIAMETER (RELATIVELY UNDISTURBED)

**TRENCH LOG**

**PLATE B-26**

# APPENDIX C

## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Brown Silty Clay, little fine Sand

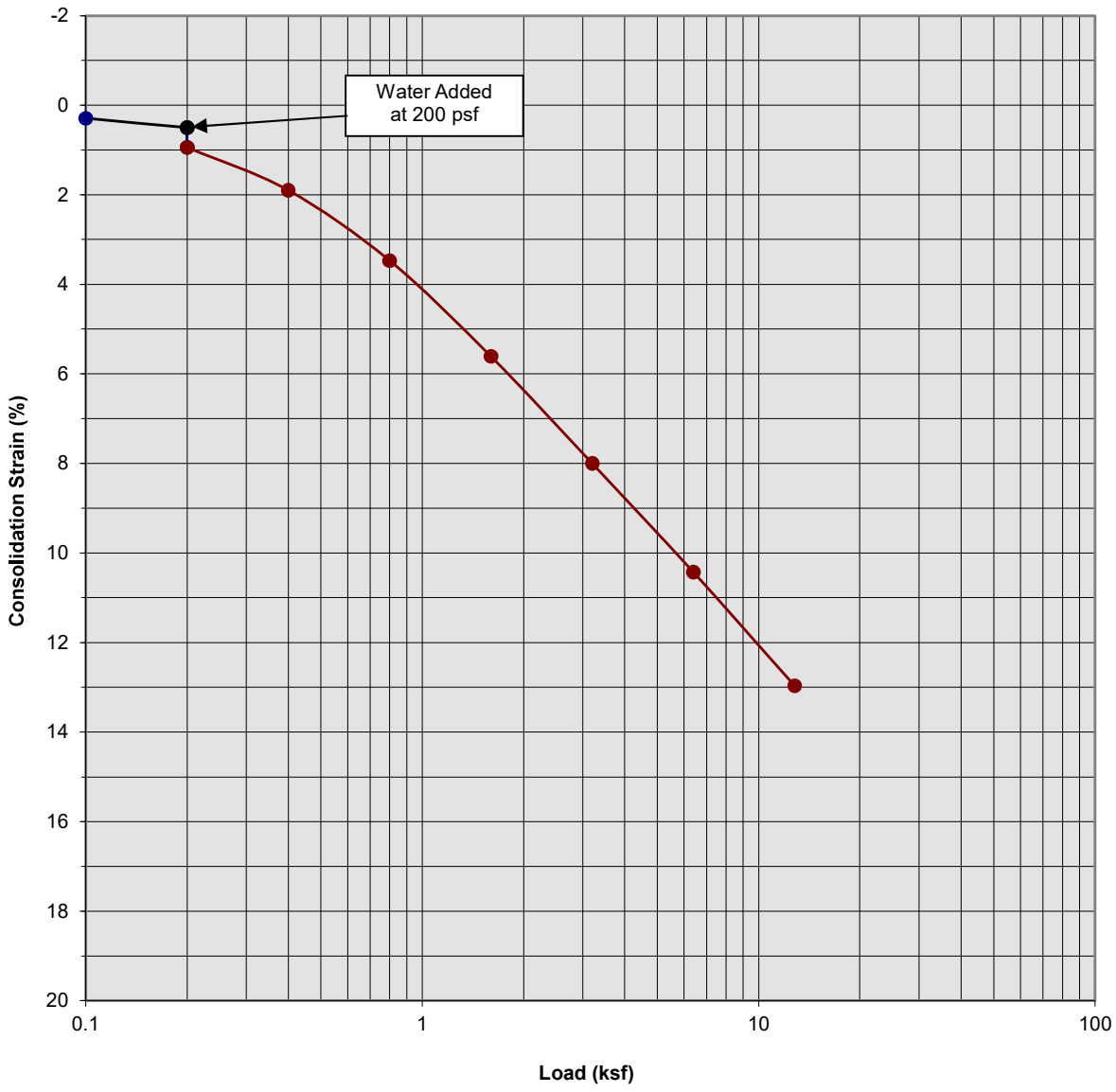
| | | | |
|---|---|---|---|
| Boring Number: | HSA-2 | Initial Moisture Content (%) | 12 |
| Sample Number: | --- | Final Moisture Content (%) | 13 |
| Depth (ft) | 3 to 4 | Initial Dry Density (pcf) | 119.2 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 135.5 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 0.41 |

Proposed Industrial Development
Beaumont, California
Project No. 24G141-1

**PLATE C- 1**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Red Brown fine to medium Sandy Clay

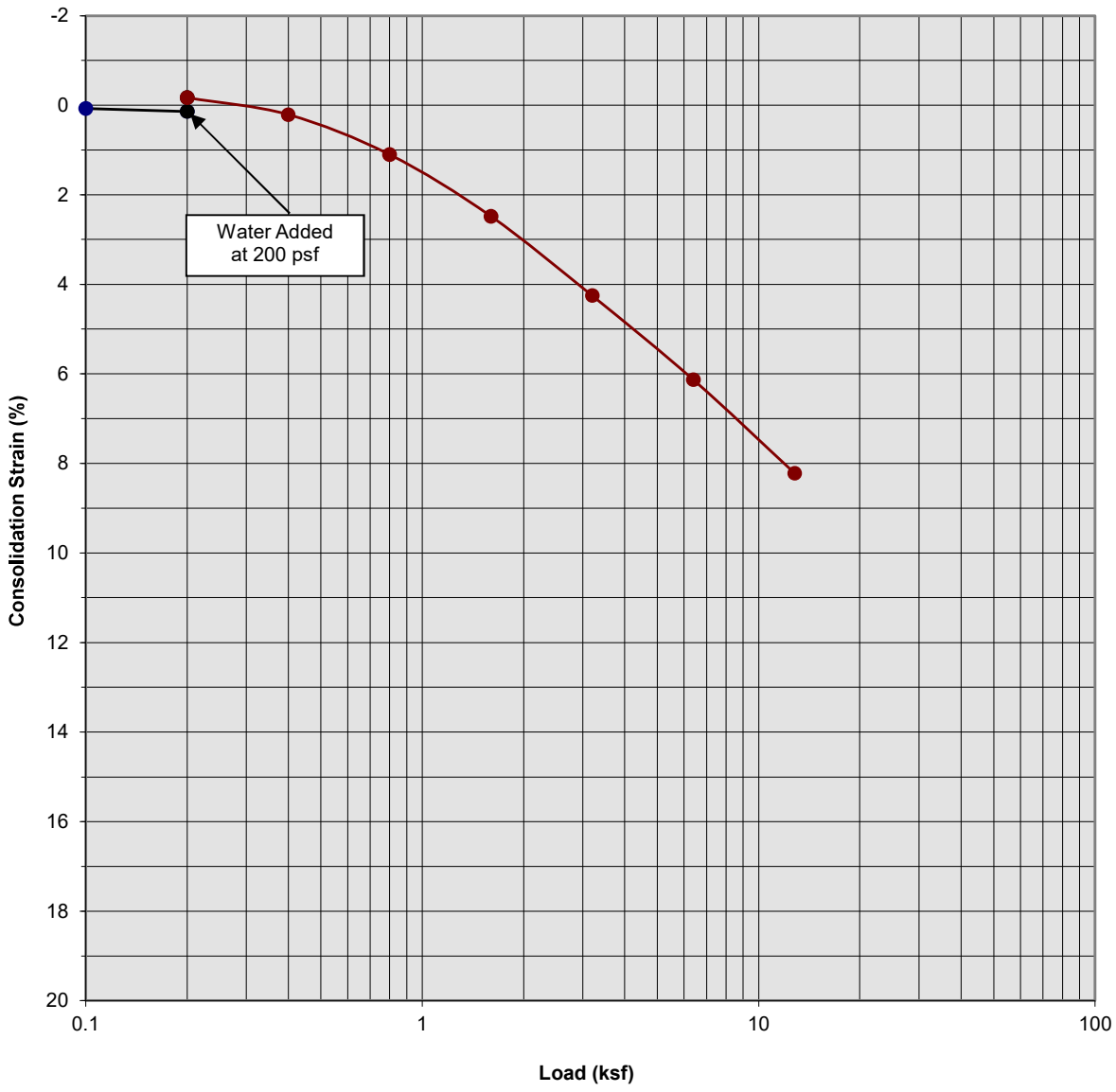
| | | | |
|---|---|---|---|
| Boring Number: | HSA-2 | Initial Moisture Content (%) | 9 |
| Sample Number: | --- | Final Moisture Content (%) | 14 |
| Depth (ft) | 5 to 6 | Initial Dry Density (pcf) | 113.1 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 129.9 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 0.44 |

Proposed Industrial Development
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Project No. 24G141-1

**PLATE C- 2**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Red Brown fine to medium Sandy Clay

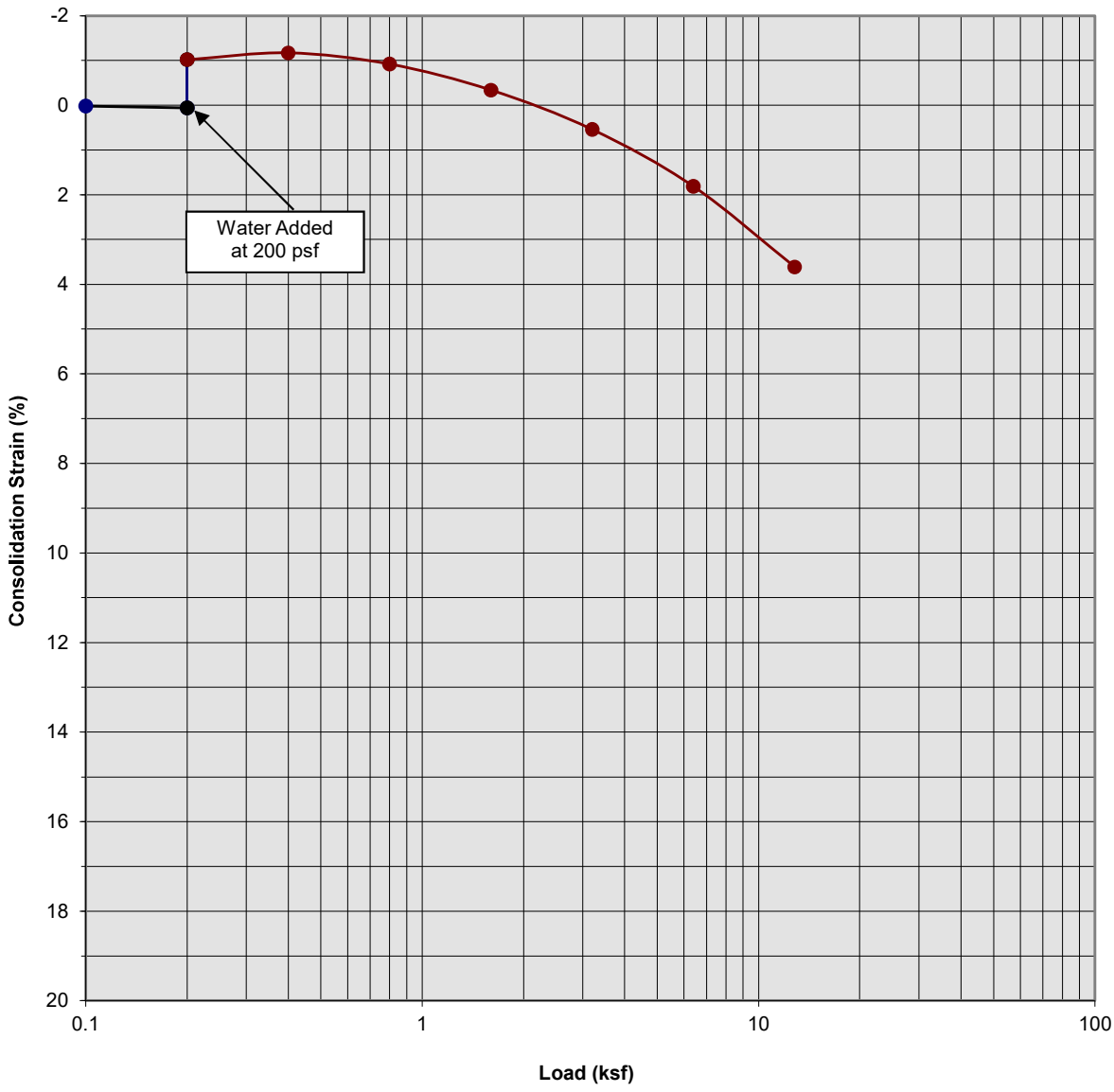
| | | | |
|---|---|---|---|
| Boring Number: | HSA-2 | Initial Moisture Content (%) | 12 |
| Sample Number: | --- | Final Moisture Content (%) | 13 |
| Depth (ft) | 7 to 8 | Initial Dry Density (pcf) | 112.5 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 127.1 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | -0.31 |

Proposed Industrial Development
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Project No. 24G141-1

**PLATE C- 3**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Red Brown fine to medium Sandy Clay

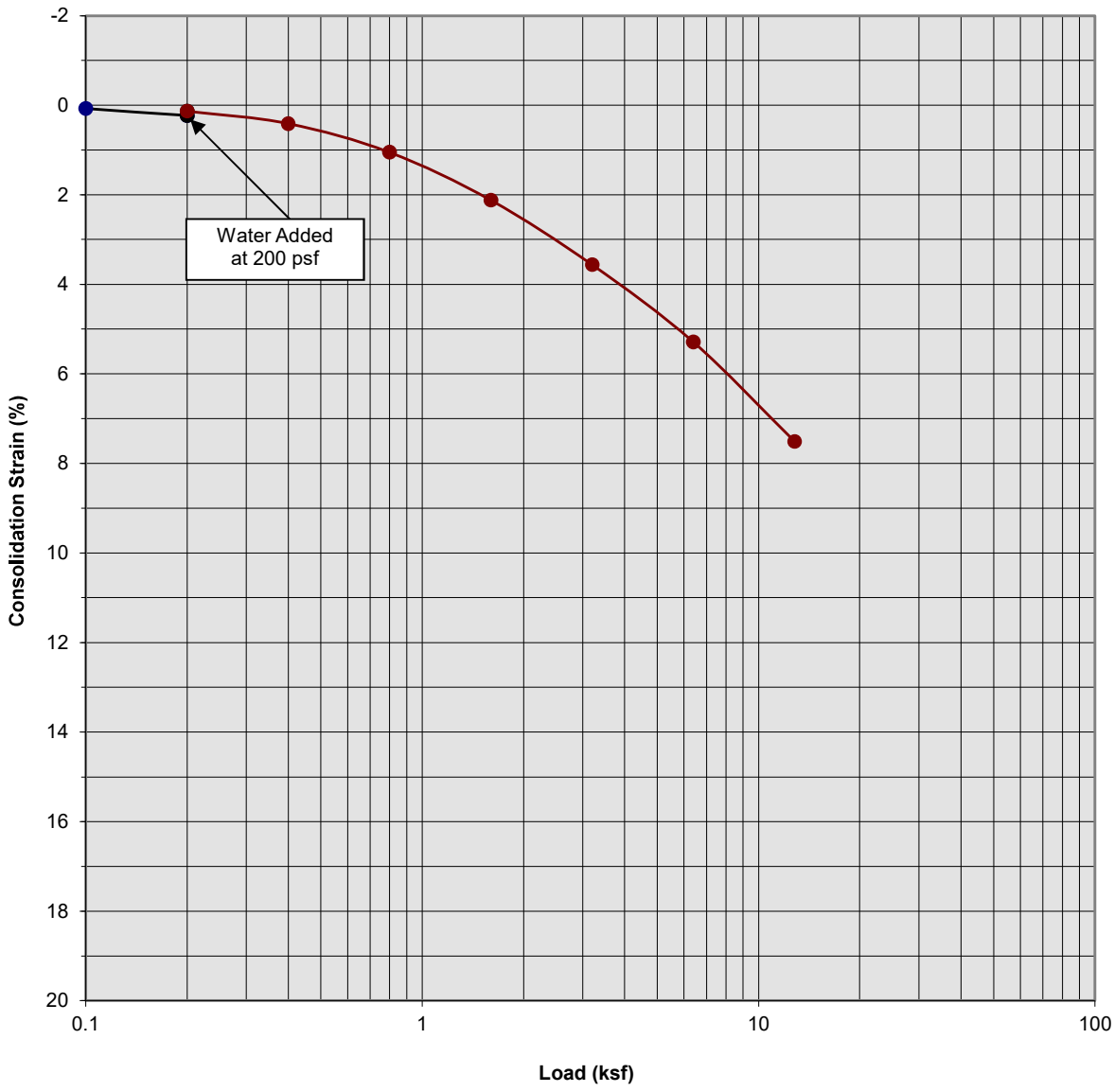
| | | | |
|---|---|---|---|
| Boring Number: | HSA-2 | Initial Moisture Content (%) | 11 |
| Sample Number: | --- | Final Moisture Content (%) | 15 |
| Depth (ft) | 9 to 10 | Initial Dry Density (pcf) | 118.1 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 123.3 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | -1.08 |

Proposed Industrial Development
Beaumont, California
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**PLATE C- 4**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Brown fine Sandy Clay, little Silt

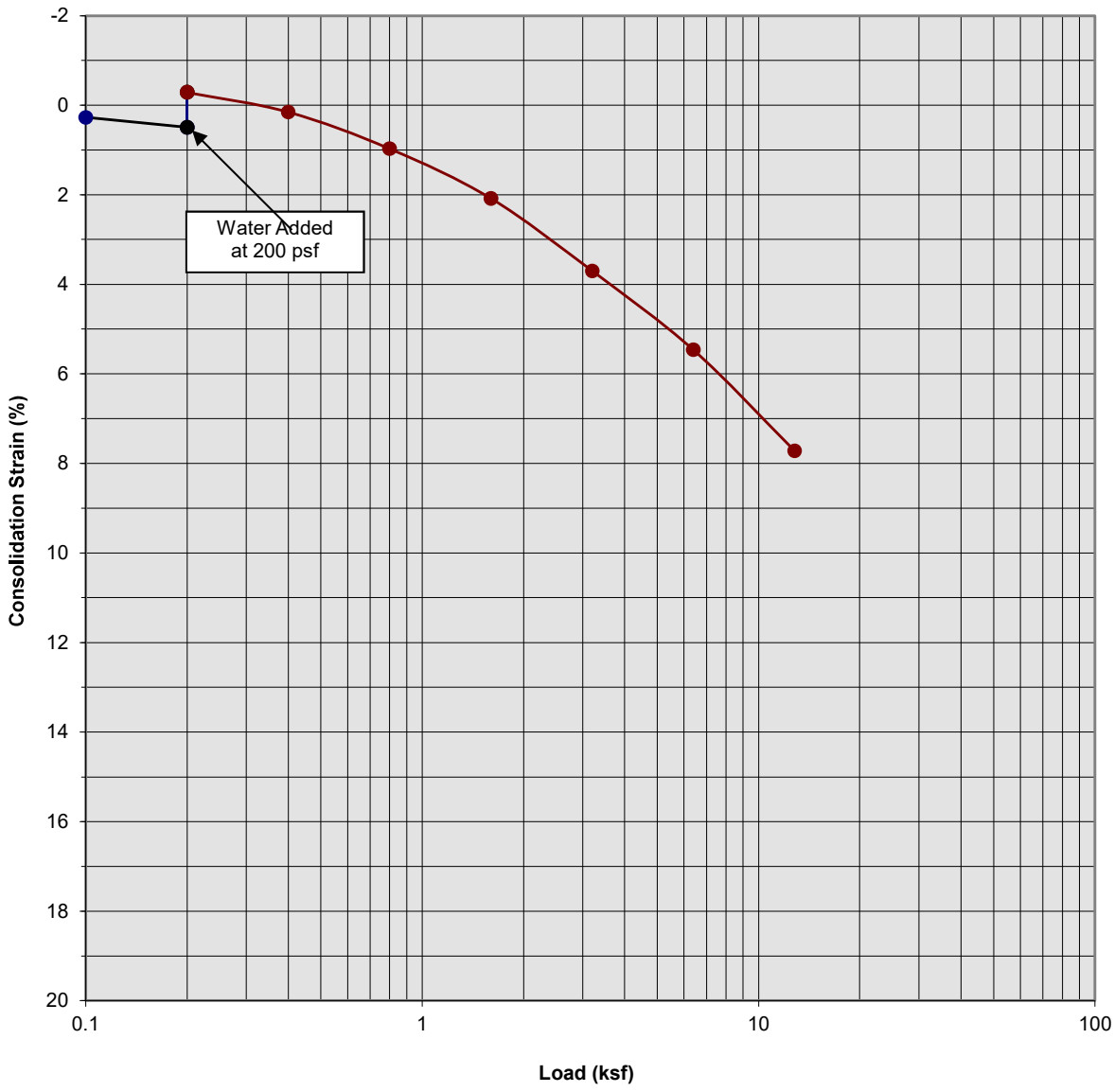
| | | | |
|---|---|---|---|
| Boring Number: | HSA-3 | Initial Moisture Content (%) | 10 |
| Sample Number: | --- | Final Moisture Content (%) | 16 |
| Depth (ft) | 7 to 8 | Initial Dry Density (pcf) | 116.5 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 125.0 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | -0.10 |

Proposed Industrial Development
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**PLATE C- 5**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Brown fine Sandy Clay, little Silt

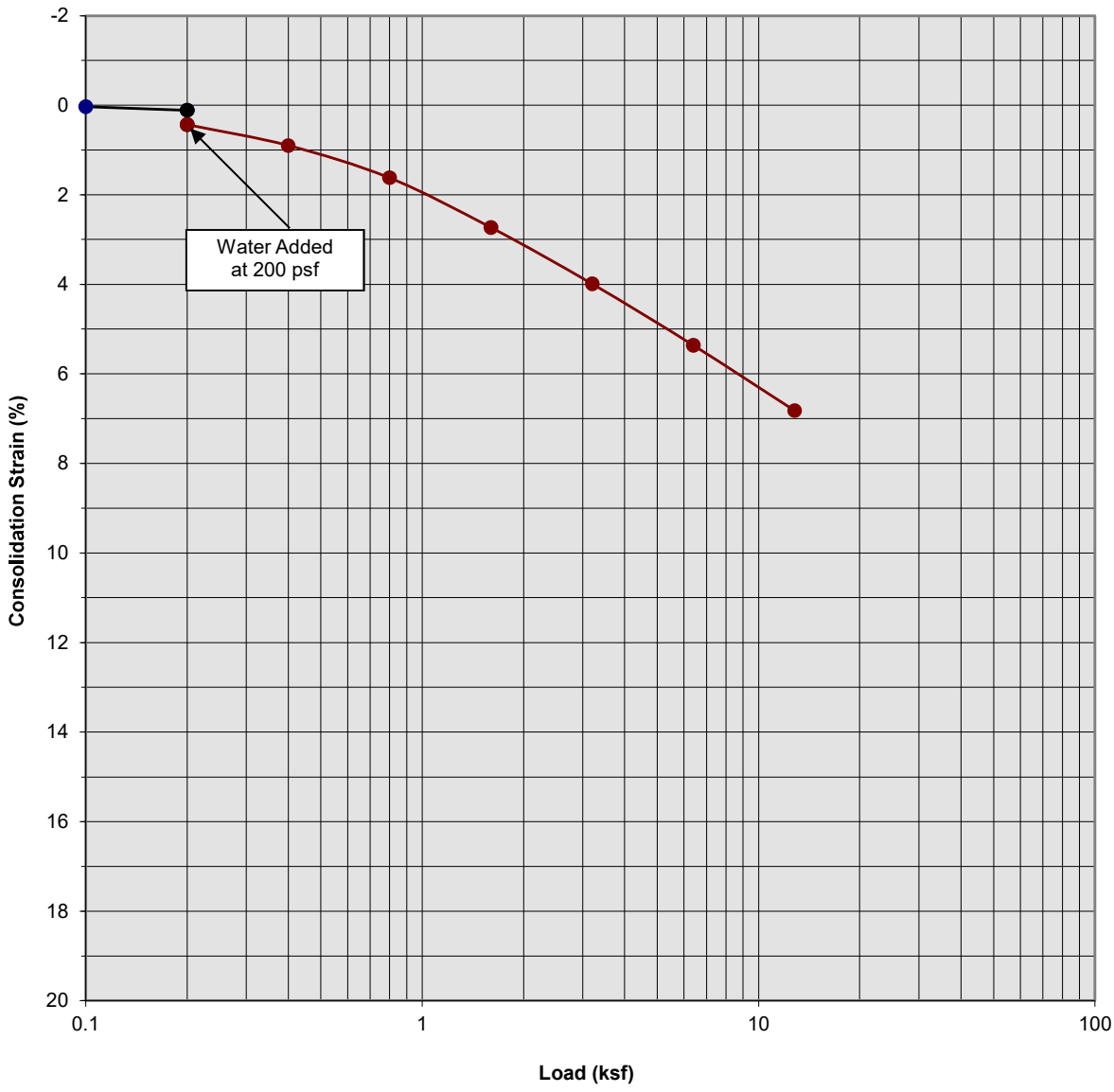
| | | | |
|---|---|---|---|
| Boring Number: | HSA-3 | Initial Moisture Content (%) | 8 |
| Sample Number: | --- | Final Moisture Content (%) | 17 |
| Depth (ft) | 9 to 10 | Initial Dry Density (pcf) | 119.7 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 127.1 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | -0.78 |

Proposed Industrial Development
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Project No. 24G141-1

**PLATE C- 6**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Red Brown Clayey Sand to Sandy Clay

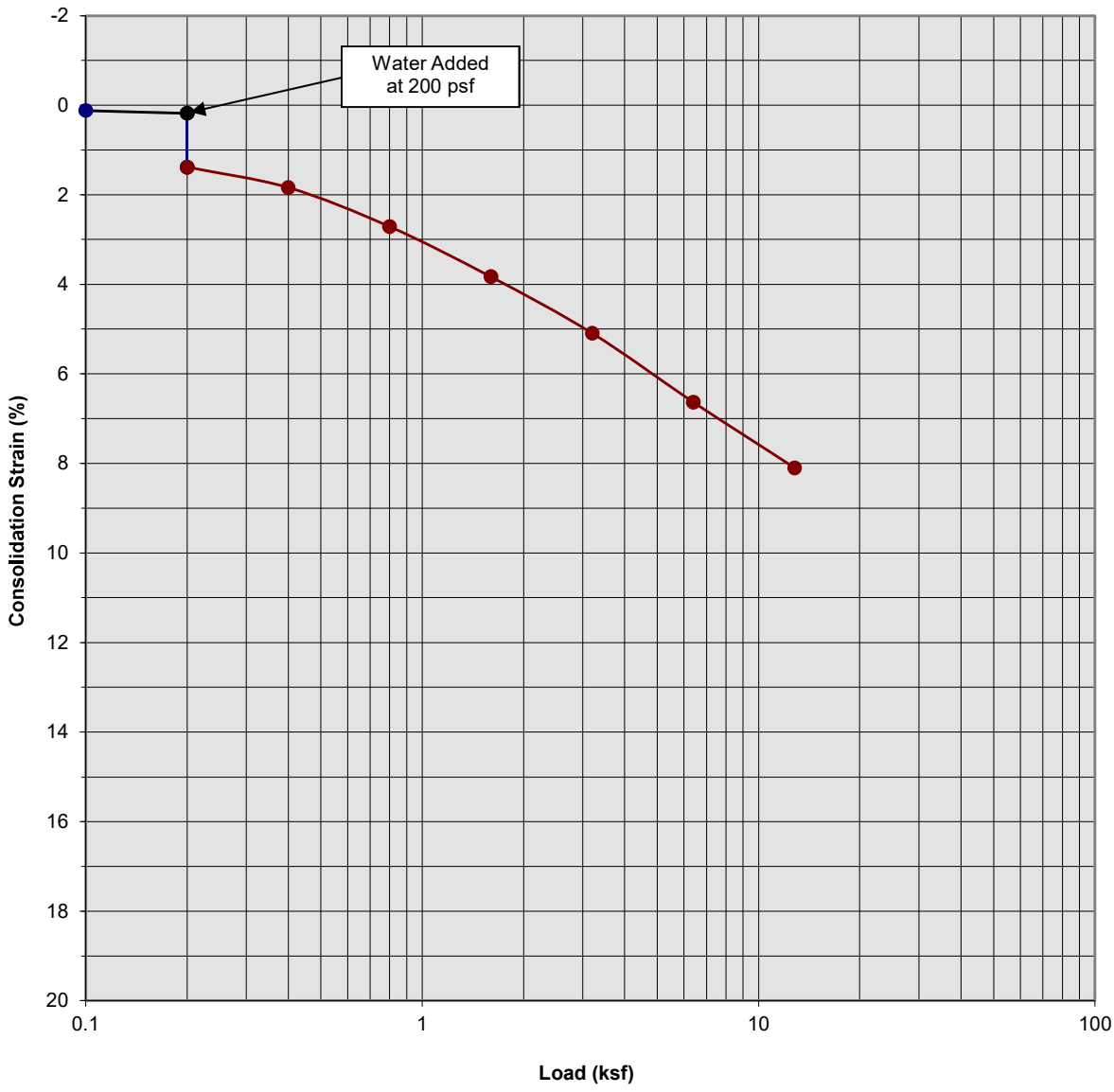
| | | | |
|---|---|---|---|
| Boring Number: | HSA-4 | Initial Moisture Content (%) | 6 |
| Sample Number: | --- | Final Moisture Content (%) | 14 |
| Depth (ft) | 3 to 4 | Initial Dry Density (pcf) | 110.5 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 117.3 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 0.32 |

Proposed Industrial Development
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**PLATE C- 7**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Red Brown Clayey Sand to Sandy Clay

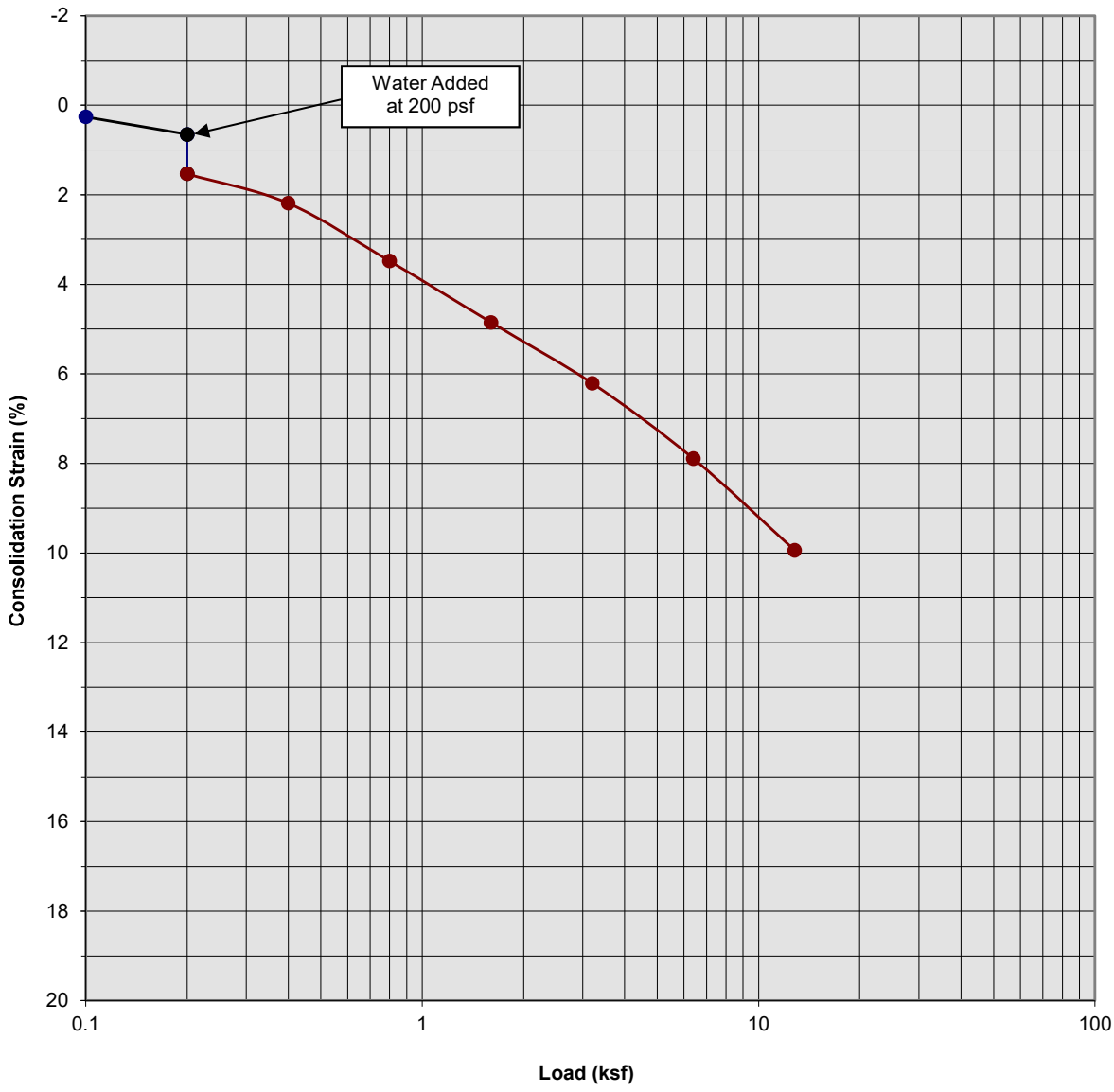
| | | | |
|---|---|---|---|
| Boring Number: | HSA-4 | Initial Moisture Content (%) | 7 |
| Sample Number: | --- | Final Moisture Content (%) | 15 |
| Depth (ft) | 5 to 6 | Initial Dry Density (pcf) | 109.2 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 120.1 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 1.20 |

Proposed Industrial Development
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**PLATE C- 8**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Red Brown Silty fine Sand

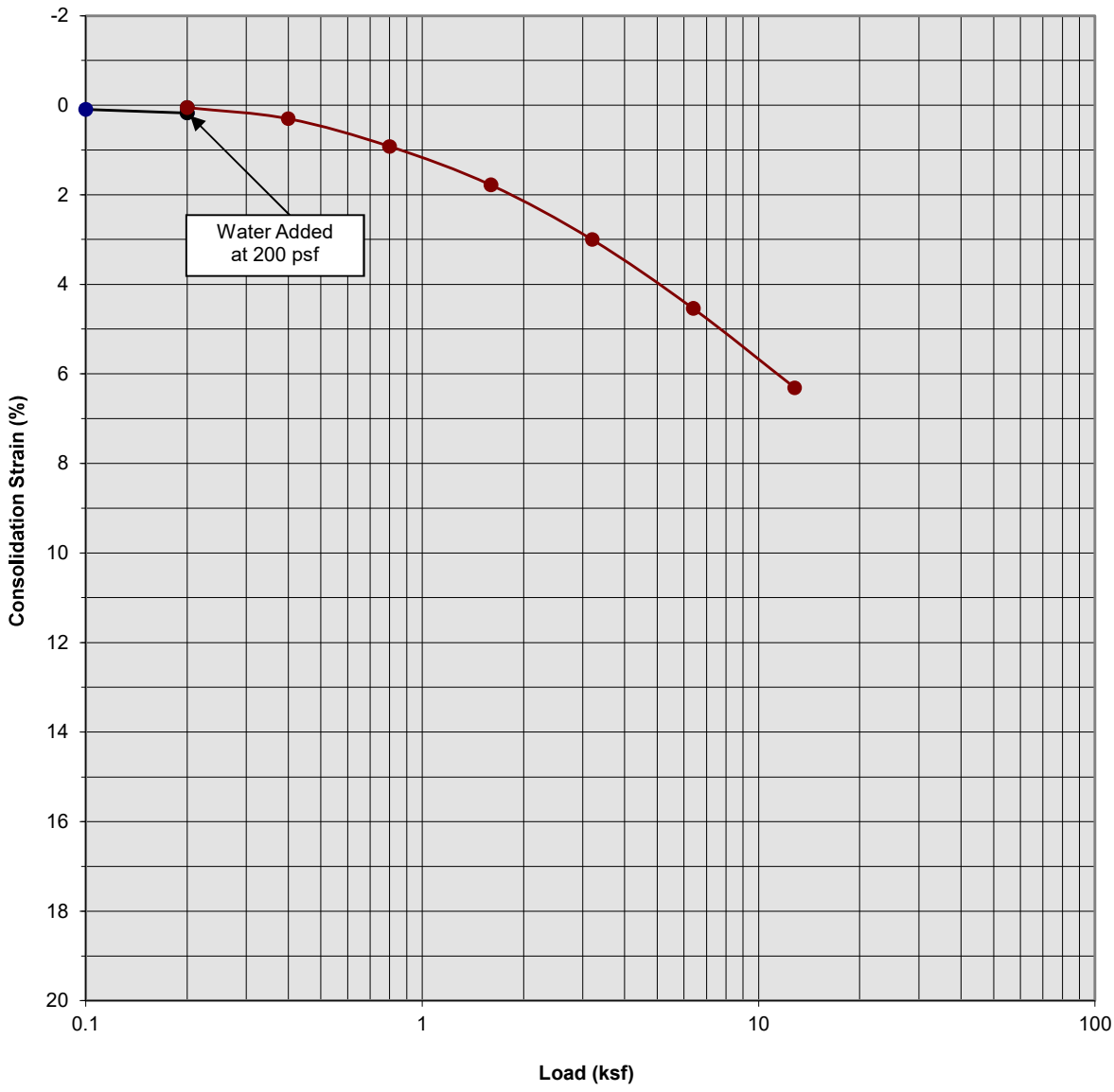
| | | | |
|---|---|---|---|
| Boring Number: | HSA-4 | Initial Moisture Content (%) | 7 |
| Sample Number: | --- | Final Moisture Content (%) | 16 |
| Depth (ft) | 7 to 8 | Initial Dry Density (pcf) | 108.6 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 118.9 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 0.88 |

Proposed Industrial Development
Beaumont, California
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**PLATE C- 9**

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## Consolidation/Collapse Test Results




Classification: Tst: Yellow Brown fine grained Sandy Claystone

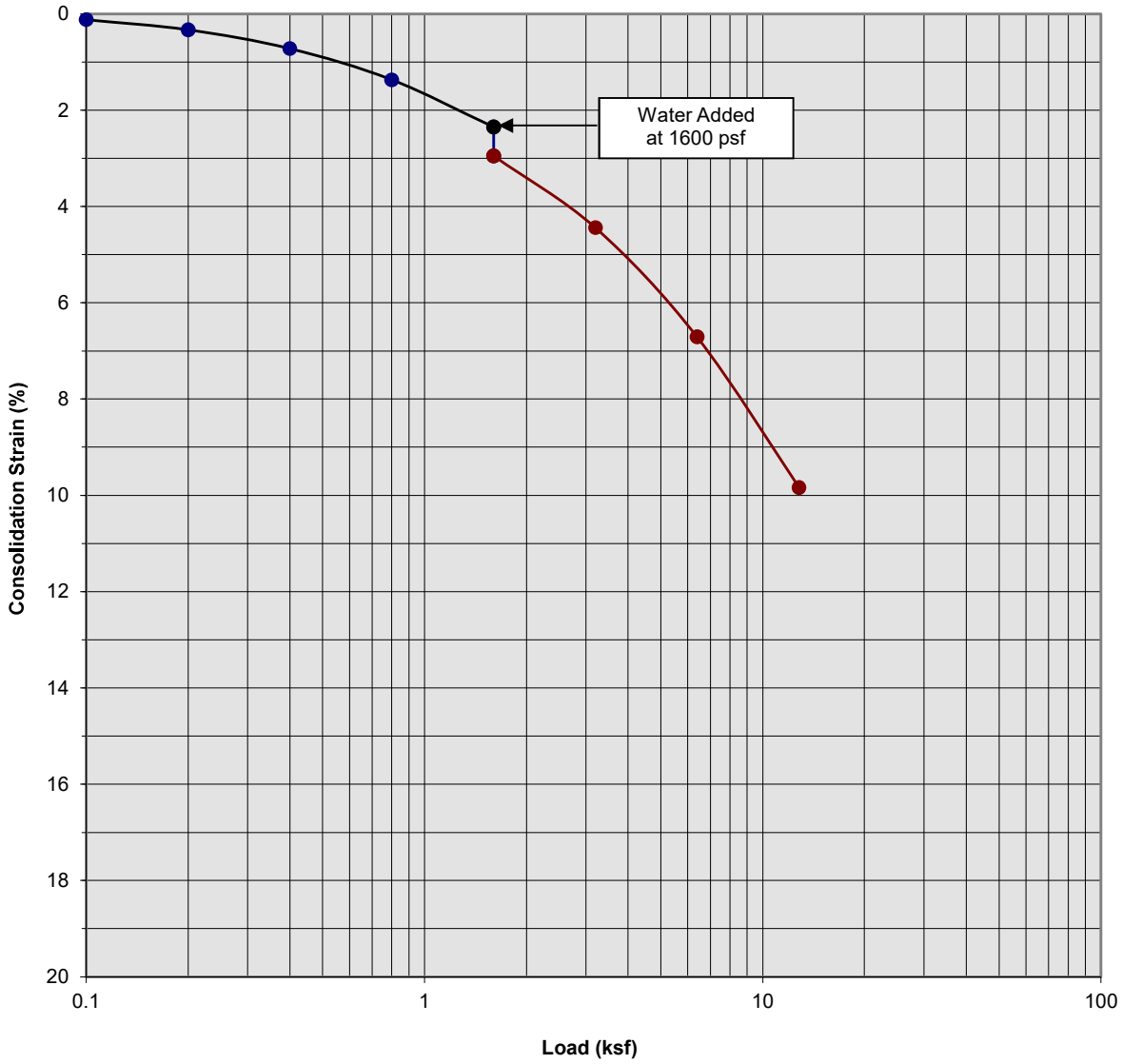
| | | | |
|---|---|---|---|
| Boring Number: | HSA-4 | Initial Moisture Content (%) | 10 |
| Sample Number: | --- | Final Moisture Content (%) | 23 |
| Depth (ft) | 9 to 10 | Initial Dry Density (pcf) | 100.6 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 104.1 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | -0.12 |

Proposed Industrial Development
Beaumont, California
Project No. 24G141-1

**PLATE C- 10**

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## Consolidation/Collapse Test Results




Classification: YOUNGER ALLUVIUM: Dark Brown Clayey Sand to Sandy Clay

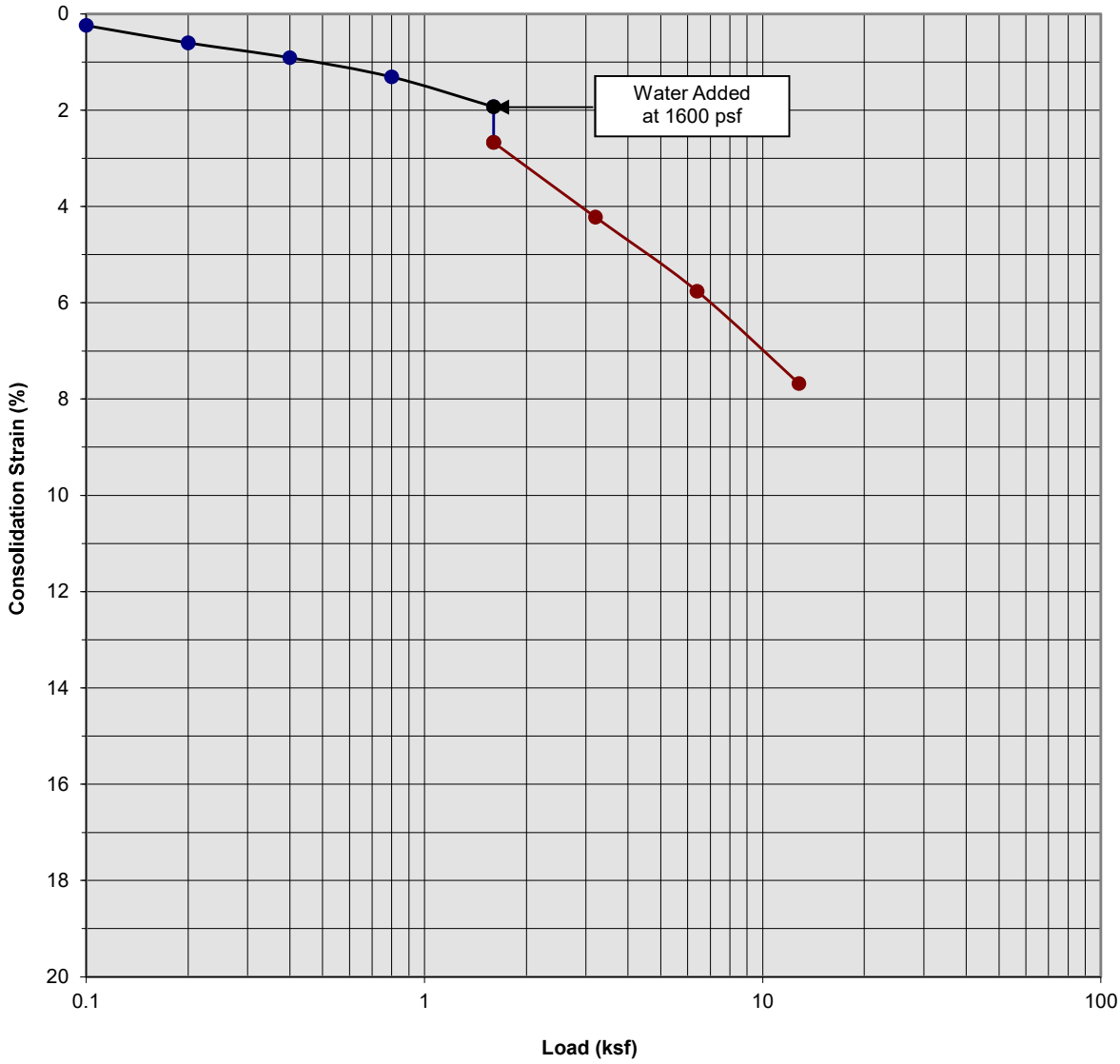
| | | | |
|---|---|---|---|
| Boring Number: | HSA-6 | Initial Moisture Content (%) | 15 |
| Sample Number: | --- | Final Moisture Content (%) | 18 |
| Depth (ft) | 5 to 6 | Initial Dry Density (pcf) | 104.4 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 115.4 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 0.60 |

Proposed Industrial Development
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Project No. 24G141-1

**PLATE C- 11**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Brown fine to medium Sandy Clay

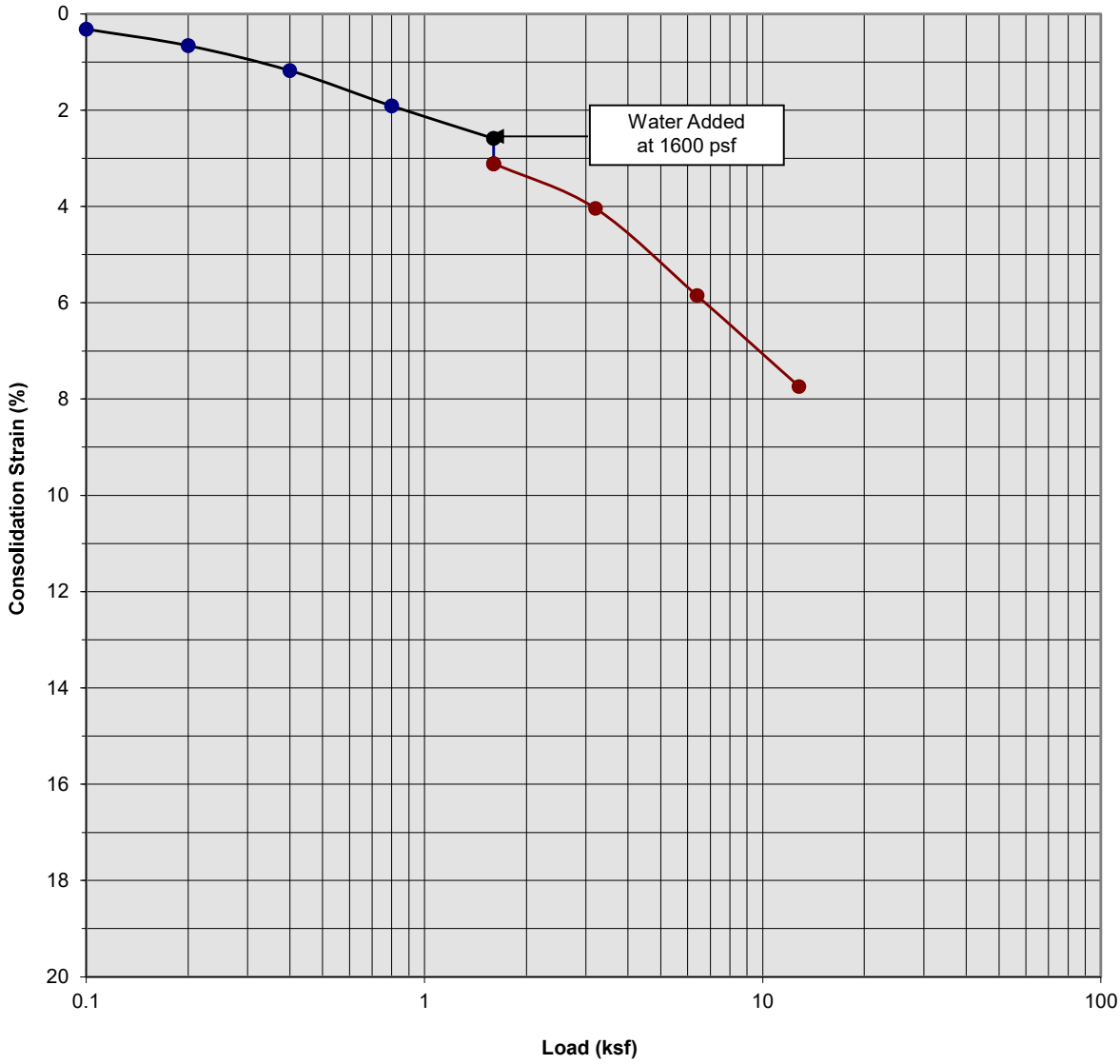
| | | | |
|---|---|---|---|
| Boring Number: | HSA-6 | Initial Moisture Content (%) | 15 |
| Sample Number: | --- | Final Moisture Content (%) | 19 |
| Depth (ft) | 7 to 8 | Initial Dry Density (pcf) | 105.5 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 113.6 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 0.74 |

Proposed Industrial Development
Beaumont, California
Project No. 24G141-1

**PLATE C- 12**

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## Consolidation/Collapse Test Results




Classification: OLDER ALLUVIUM: Dark Brown fine to medium Sandy Clay

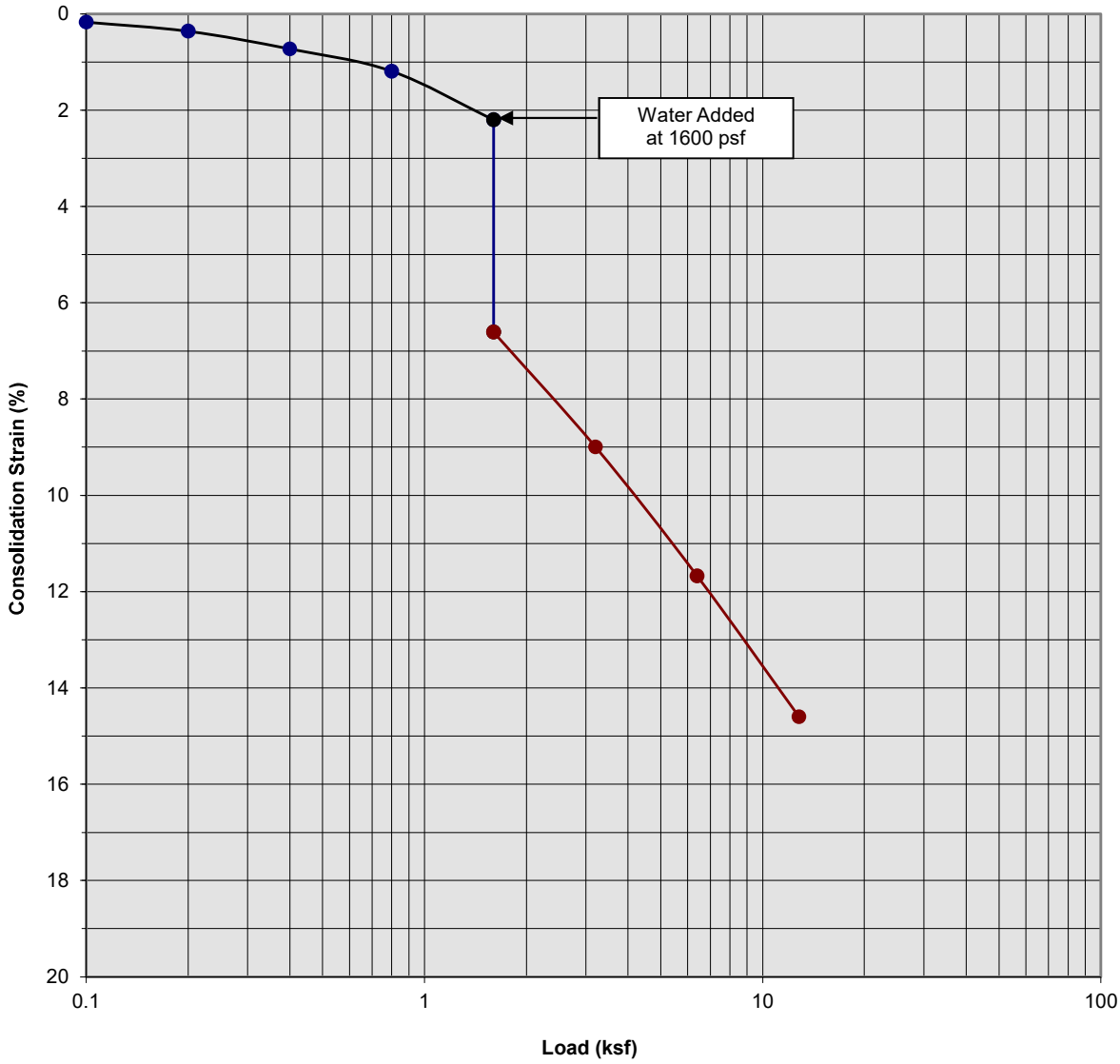
| | | | |
|---|---|---|---|
| Boring Number: | HSA-6 | Initial Moisture Content (%) | 14 |
| Sample Number: | --- | Final Moisture Content (%) | 16 |
| Depth (ft) | 9 to 10 | Initial Dry Density (pcf) | 113.8 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 123.0 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 0.52 |

Proposed Industrial Development
Beaumont, California
Project No. 24G141-1

**PLATE C- 13**

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## Consolidation/Collapse Test Results




Classification: YOUNGER ALLUVIUM: Light Gray Brown Silty fine to medium Sand

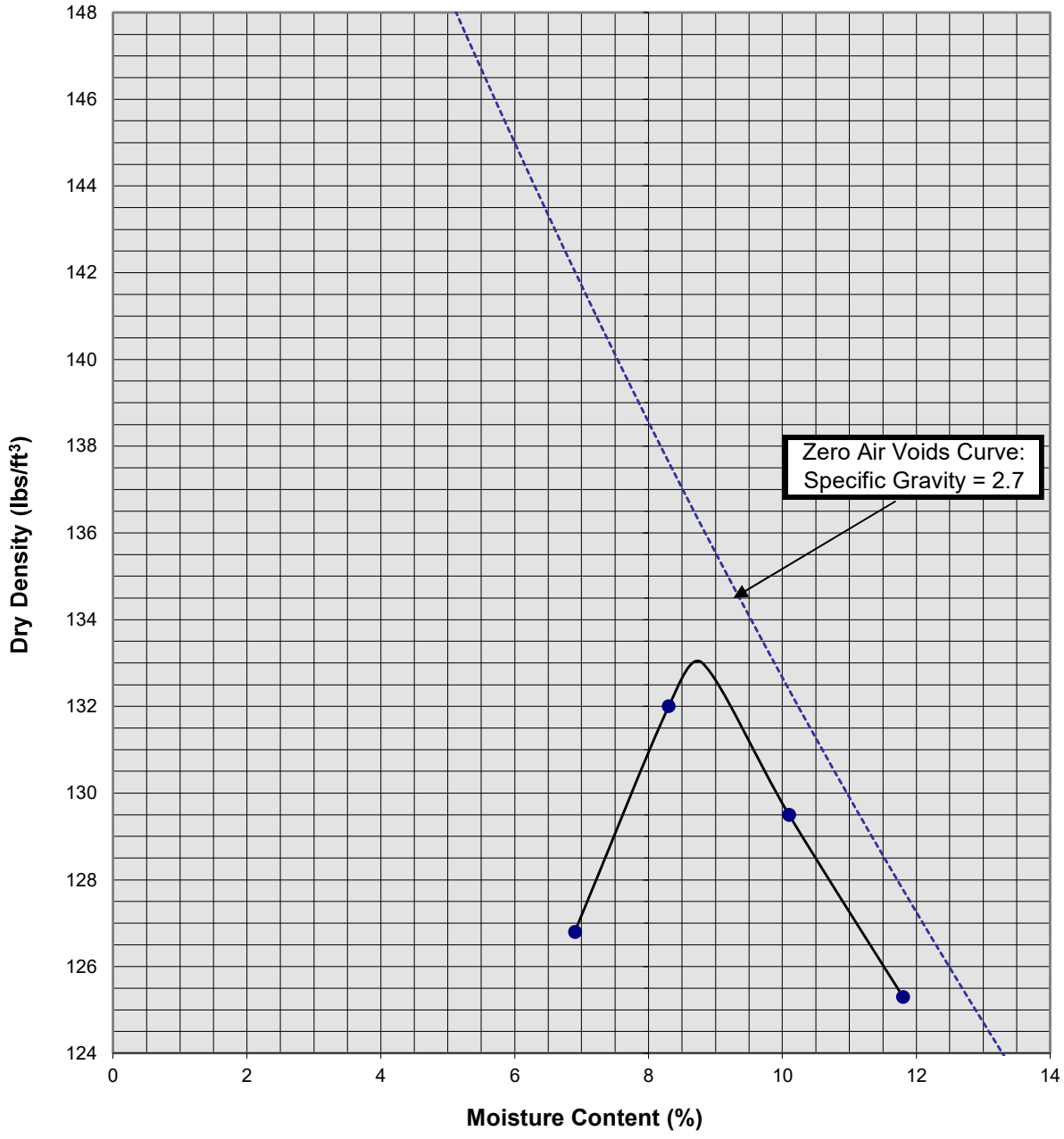
| | | | |
|---|---|---|---|
| Boring Number: | HSA-7 | Initial Moisture Content (%) | 4 |
| Sample Number: | --- | Final Moisture Content (%) | 17 |
| Depth (ft) | 1 to 2 | Initial Dry Density (pcf) | 95.3 |
| Specimen Diameter (in) | 2.4 | Final Dry Density (pcf) | 111.3 |
| Specimen Thickness (in) | 1.0 | Percent Collapse (%) | 4.41 |

Proposed Industrial Development
Beaumont, California
Project No. 24G141-1

**PLATE C- 14**

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## Moisture/Density Relationship
## ASTM D-1557




| Soil ID Number | HSA-4 @ 1-5' |
|---|---|
| Optimum Moisture (%) | 8.5 |
| Maximum Dry Density (pcf) | 133 |
| Soil Classification | Red Brown Clayey fine Sand, little medium Sand |

Proposed Industrial Development
Beaumont, California
Project No. 24G141-1

**PLATE C-15**

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

# APPENDIX D

# GRADING GUIDE SPECIFICATIONS

These grading guide specifications are intended to provide typical procedures for grading operations. They are intended to supplement the recommendations contained in the geotechnical investigation report for this project. Should the recommendations in the geotechnical investigation report conflict with the grading guide specifications, the more site specific recommendations in the geotechnical investigation report will govern.

## General

- The Earthwork Contractor is responsible for the satisfactory completion of all earthwork in accordance with the plans and geotechnical reports, and in accordance with city, county, and applicable building codes.

- The Geotechnical Engineer is the representative of the Owner/Builder for the purpose of implementing the report recommendations and guidelines. These duties are not intended to relieve the Earthwork Contractor of any responsibility to perform in a workman-like manner, nor is the Geotechnical Engineer to direct the grading equipment or personnel employed by the Contractor.

- The Earthwork Contractor is required to notify the Geotechnical Engineer of the anticipated work and schedule so that testing and inspections can be provided. If necessary, work may be stopped and redone if personnel have not been scheduled in advance.

- The Earthwork Contractor is required to have suitable and sufficient equipment on the job-site to process, moisture condition, mix and compact the amount of fill being placed to the approved compaction. In addition, suitable support equipment should be available to conform with recommendations and guidelines in this report.

- Canyon cleanouts, overexcavation areas, processed ground to receive fill, key excavations, subdrains and benches should be observed by the Geotechnical Engineer prior to placement of any fill. It is the Earthwork Contractor's responsibility to notify the Geotechnical Engineer of areas that are ready for inspection.

- Excavation, filling, and subgrade preparation should be performed in a manner and sequence that will provide drainage at all times and proper control of erosion. Precipitation, springs, and seepage water encountered shall be pumped or drained to provide a suitable working surface. The Geotechnical Engineer must be informed of springs or water seepage encountered during grading or foundation construction for possible revision to the recommended construction procedures and/or installation of subdrains.

## Site Preparation

- The Earthwork Contractor is responsible for all clearing, grubbing, stripping and site preparation for the project in accordance with the recommendations of the Geotechnical Engineer.

- If any materials or areas are encountered by the Earthwork Contractor which are suspected of having toxic or environmentally sensitive contamination, the Geotechnical Engineer and Owner/Builder should be notified immediately.

- Major vegetation should be stripped and disposed of off-site. This includes trees, brush, heavy grasses and any materials considered unsuitable by the Geotechnical Engineer.

- Underground structures such as basements, cesspools or septic disposal systems, mining shafts, tunnels, wells and pipelines should be removed under the inspection of the Geotechnical Engineer and recommendations provided by the Geotechnical Engineer and/or city, county or state agencies. If such structures are known or found, the Geotechnical Engineer should be notified as soon as possible so that recommendations can be formulated.

- Any topsoil, slopewash, colluvium, alluvium and rock materials which are considered unsuitable by the Geotechnical Engineer should be removed prior to fill placement.

- Remaining voids created during site clearing caused by removal of trees, foundations basements, irrigation facilities, etc., should be excavated and filled with compacted fill.

- Subsequent to clearing and removals, areas to receive fill should be scarified to a depth of 10 to 12 inches, moisture conditioned and compacted

- The moisture condition of the processed ground should be at or slightly above the optimum moisture content as determined by the Geotechnical Engineer. Depending upon field conditions, this may require air drying or watering together with mixing and/or discing.

Compacted Fills

- Soil materials imported to or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable in the opinion of the Geotechnical Engineer. Unless otherwise approved by the Geotechnical Engineer, all fill materials shall be free of deleterious, organic, or frozen matter, shall contain no chemicals that may result in the material being classified as "contaminated," and shall be very low to non-expansive with a maximum expansion index (EI) of 20. The top 12 inches of the compacted fill should have a maximum particle size of 3 inches, and all underlying compacted fill material a maximum 6-inch particle size, except as noted below.

- All soils should be evaluated and tested by the Geotechnical Engineer. Materials with high expansion potential, low strength, poor gradation or containing organic materials may require removal from the site or selective placement and/or mixing to the satisfaction of the Geotechnical Engineer.

- Rock fragments or rocks less than 6 inches in their largest dimensions, or as otherwise determined by the Geotechnical Engineer, may be used in compacted fill, provided the distribution and placement is satisfactory in the opinion of the Geotechnical Engineer.

- Rock fragments or rocks greater than 12 inches should be taken off-site or placed in accordance with recommendations and in areas designated as suitable by the Geotechnical Engineer. These materials should be placed in accordance with Plate D-8 of these Grading Guide Specifications and in accordance with the following recommendations:

    - Rocks 12 inches or more in diameter should be placed in rows at least 15 feet apart, 15 feet from the edge of the fill, and 10 feet or more below subgrade. Spaces should be left between each rock fragment to provide for placement and compaction of soil around the fragments.

    - Fill materials consisting of soil meeting the minimum moisture content requirements and free of oversize material should be placed between and over the rows of rock or

concrete. Ample water and compactive effort should be applied to the fill materials as they are placed in order that all of the voids between each of the fragments are filled and compacted to the specified density.

- Subsequent rows of rocks should be placed such that they are not directly above a row placed in the previous lift of fill. A minimum 5-foot offset between rows is recommended.

- To facilitate future trenching, oversized material should not be placed within the range of foundation excavations, future utilities or other underground construction unless specifically approved by the soil engineer and the developer/owner representative.

- Fill materials approved by the Geotechnical Engineer should be placed in areas previously prepared to receive fill and in evenly placed, near horizontal layers at about 6 to 8 inches in loose thickness, or as otherwise determined by the Geotechnical Engineer for the project.

- Each layer should be moisture conditioned to optimum moisture content, or slightly above, as directed by the Geotechnical Engineer. After proper mixing and/or drying, to evenly distribute the moisture, the layers should be compacted to at least 90 percent of the maximum dry density in compliance with ASTM D-1557-78 unless otherwise indicated.

- Density and moisture content testing should be performed by the Geotechnical Engineer at random intervals and locations as determined by the Geotechnical Engineer. These tests are intended as an aid to the Earthwork Contractor, so he can evaluate his workmanship, equipment effectiveness and site conditions. The Earthwork Contractor is responsible for compaction as required by the Geotechnical Report(s) and governmental agencies.

- Fill areas unused for a period of time may require moisture conditioning, processing and recompaction prior to the start of additional filling. The Earthwork Contractor should notify the Geotechnical Engineer of his intent so that an evaluation can be made.

- Fill placed on ground sloping at a 5-to-1 inclination (horizontal-to-vertical) or steeper should be benched into bedrock or other suitable materials, as directed by the Geotechnical Engineer. Typical details of benching are illustrated on Plates D-2, D-4, and D-5.

- Cut/fill transition lots should have the cut portion overexcavated to a depth of at least 3 feet and rebuilt with fill (see Plate D-1), as determined by the Geotechnical Engineer.

- All cut lots should be inspected by the Geotechnical Engineer for fracturing and other bedrock conditions. If necessary, the pads should be overexcavated to a depth of 3 feet and rebuilt with a uniform, more cohesive soil type to impede moisture penetration.

- Cut portions of pad areas above buttresses or stabilizations should be overexcavated to a depth of 3 feet and rebuilt with uniform, more cohesive compacted fill to impede moisture penetration.

- Non-structural fill adjacent to structural fill should typically be placed in unison to provide lateral support. Backfill along walls must be placed and compacted with care to ensure that excessive unbalanced lateral pressures do not develop. The type of fill material placed adjacent to below grade walls must be properly tested and approved by the Geotechnical Engineer with consideration of the lateral earth pressure used in the design.

Foundations

- The foundation influence zone is defined as extending one foot horizontally from the outside edge of a footing, and proceeding downward at a ½ horizontal to 1 vertical (0.5:1) inclination.

- Where overexcavation beneath a footing subgrade is necessary, it should be conducted so as to encompass the entire foundation influence zone, as described above.

- Compacted fill adjacent to exterior footings should extend at least 12 inches above foundation bearing grade. Compacted fill within the interior of structures should extend to the floor subgrade elevation.

Fill Slopes

- The placement and compaction of fill described above applies to all fill slopes. Slope compaction should be accomplished by overfilling the slope, adequately compacting the fill in even layers, including the overfilled zone and cutting the slope back to expose the compacted core

- Slope compaction may also be achieved by backrolling the slope adequately every 2 to 4 vertical feet during the filling process as well as requiring the earth moving and compaction equipment to work close to the top of the slope. Upon completion of slope construction, the slope face should be compacted with a sheepsfoot connected to a sideboom and then grid rolled. This method of slope compaction should only be used if approved by the Geotechnical Engineer.

- Sandy soils lacking in adequate cohesion may be unstable for a finished slope condition and therefore should not be placed within 15 horizontal feet of the slope face.

- All fill slopes should be keyed into bedrock or other suitable material. Fill keys should be at least 15 feet wide and inclined at 2 percent into the slope. For slopes higher than 30 feet, the fill key width should be equal to one-half the height of the slope (see Plate D-5).

- All fill keys should be cleared of loose slough material prior to geotechnical inspection and should be approved by the Geotechnical Engineer and governmental agencies prior to filling.

- The cut portion of fill over cut slopes should be made first and inspected by the Geotechnical Engineer for possible stabilization requirements. The fill portion should be adequately keyed through all surficial soils and into bedrock or suitable material. Soils should be removed from the transition zone between the cut and fill portions (see Plate D-2).

Cut Slopes

- All cut slopes should be inspected by the Geotechnical Engineer to determine the need for stabilization. The Earthwork Contractor should notify the Geotechnical Engineer when slope cutting is in progress at intervals of 10 vertical feet. Failure to notify may result in a delay in recommendations.

- Cut slopes exposing loose, cohesionless sands should be reported to the Geotechnical Engineer for possible stabilization recommendations.

- All stabilization excavations should be cleared of loose slough material prior to geotechnical inspection. Stakes should be provided by the Civil Engineer to verify the location and dimensions of the key. A typical stabilization fill detail is shown on Plate D-5.

- Stabilization key excavations should be provided with subdrains. Typical subdrain details are shown on Plates D-6.

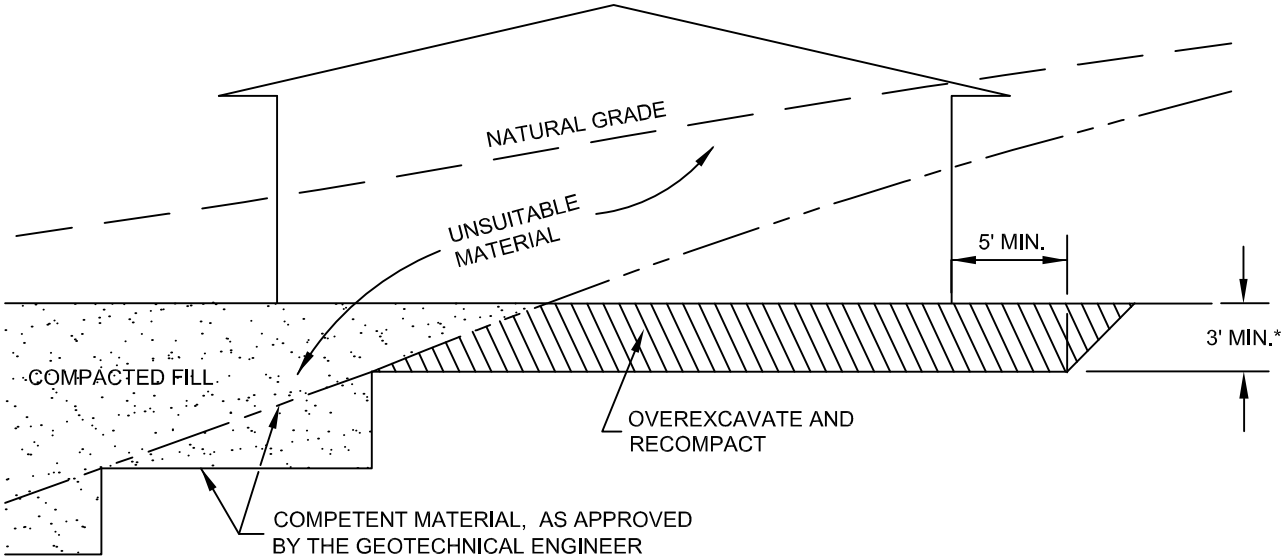
Subdrains

- Subdrains may be required in canyons and swales where fill placement is proposed. Typical subdrain details for canyons are shown on Plate D-3. Subdrains should be installed after approval of removals and before filling, as determined by the Soils Engineer.

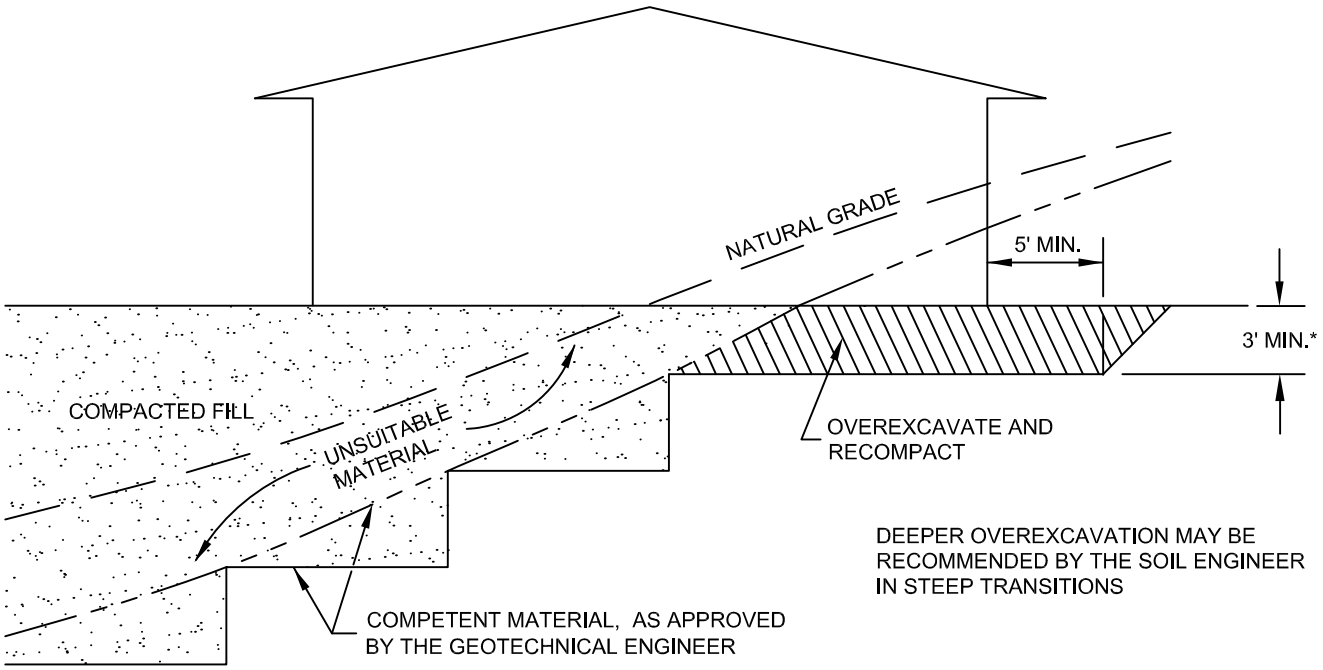
- Plastic pipe may be used for subdrains provided it is Schedule 40 or SDR 35 or equivalent. Pipe should be protected against breakage, typically by placement in a square-cut (backhoe) trench or as recommended by the manufacturer.

- Filter material for subdrains should conform to CALTRANS Specification 68-1.025 or as approved by the Geotechnical Engineer for the specific site conditions. Clean ¾-inch crushed rock may be used provided it is wrapped in an acceptable filter cloth and approved by the Geotechnical Engineer. Pipe diameters should be 6 inches for runs up to 500 feet and 8 inches for the downstream continuations of longer runs. Four-inch diameter pipe may be used in buttress and stabilization fills.

## CUT LOT




## CUT/FILL LOT (TRANSITION)




*SEE TEXT OF REPORT FOR SPECIFIC RECOMMENDATION. ACTUAL DEPTH OF OVEREXCAVATION MAY BE GREATER.

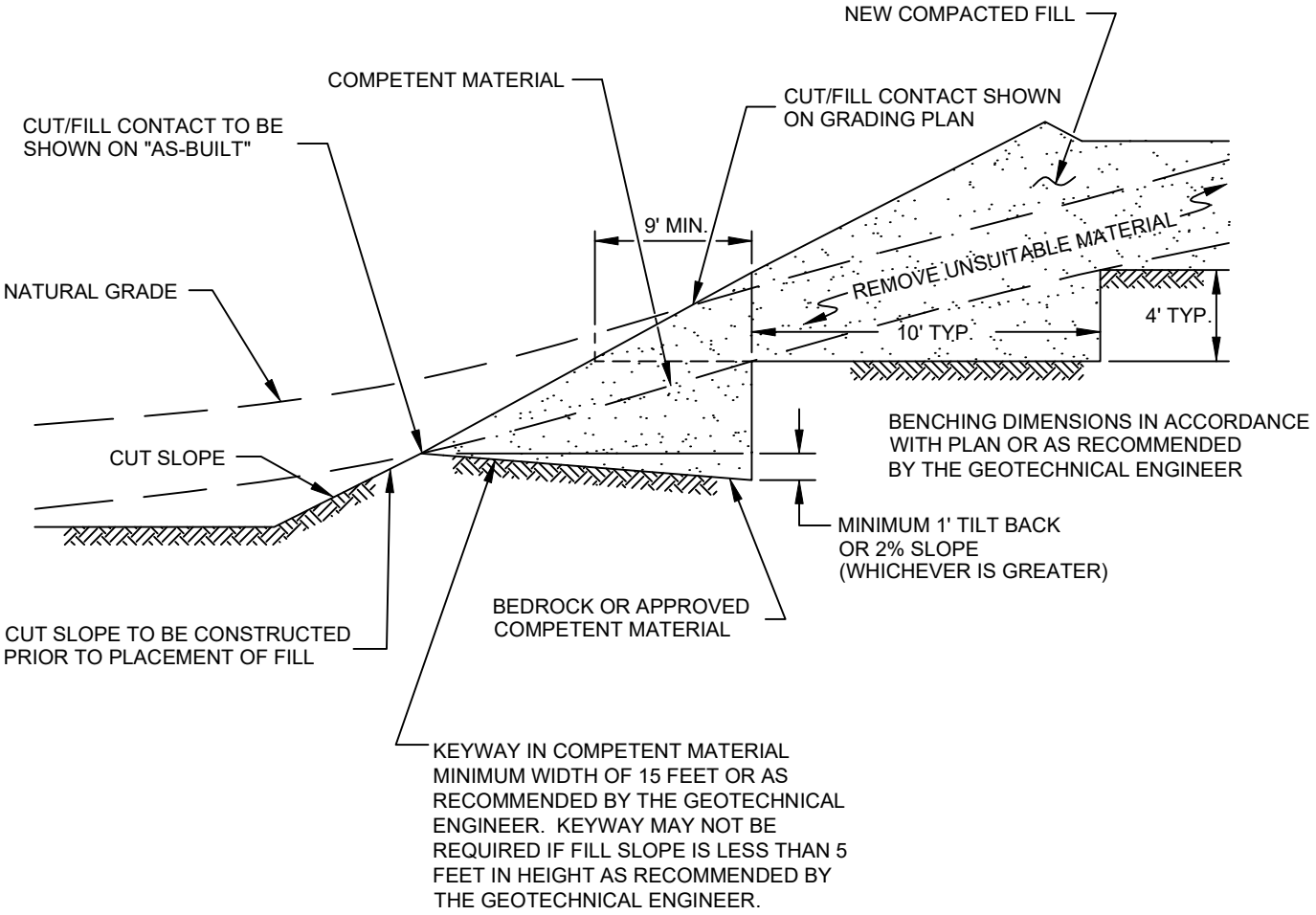
**TRANSITION LOT DETAIL**

GRADING GUIDE SPECIFICATIONS

| | |
|---|---|
| NOT TO SCALE | |
| DRAWN: JAS<br>CHKD: GKM | |
| | |
| **PLATE D-1** | |

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**FILL ABOVE CUT SLOPE DETAIL**

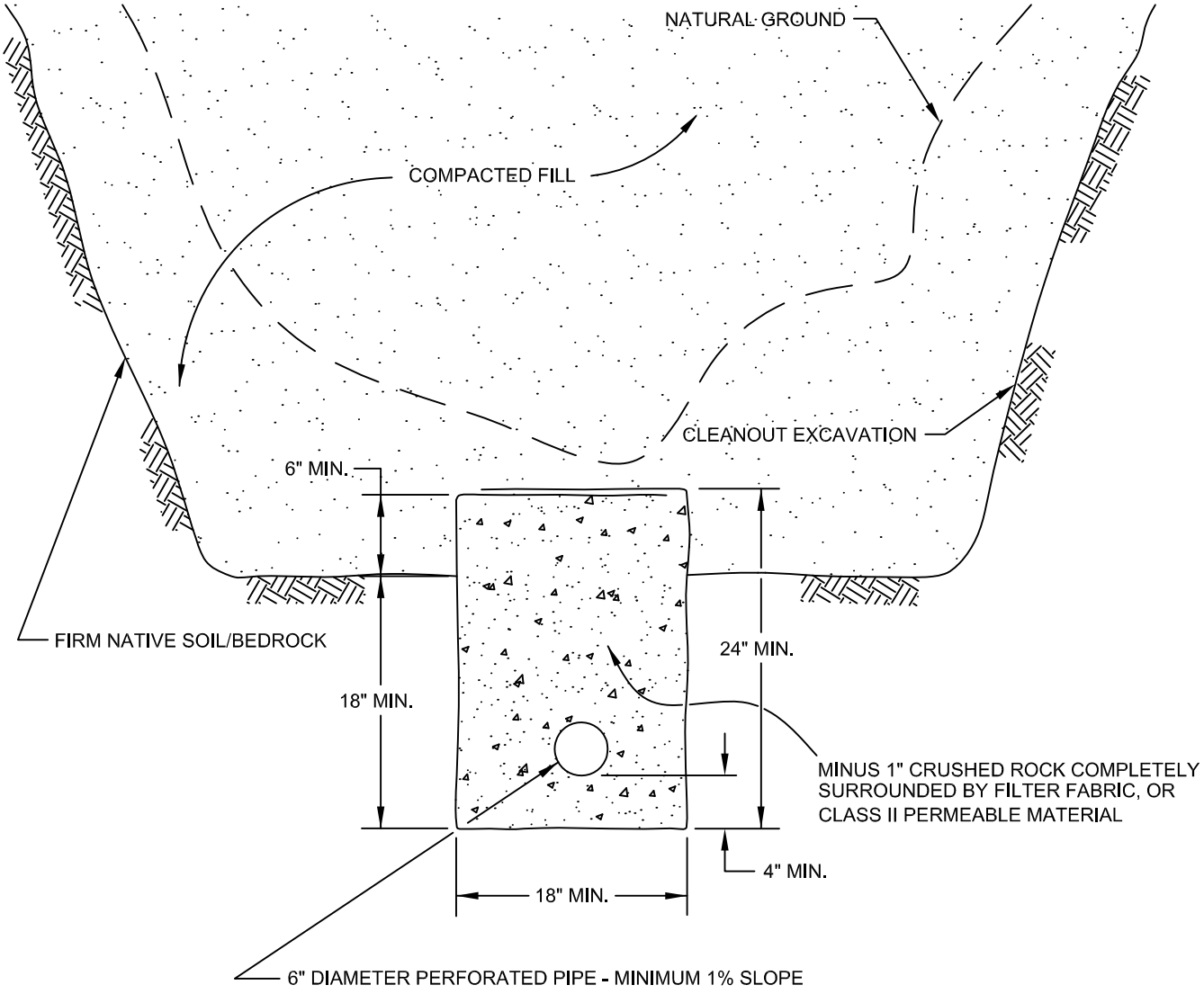
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

**PLATE D-2**

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| PIPE MATERIAL | DEPTH OF FILL OVER SUBDRAIN |
|---|---|
| ADS (CORRUGATED POLETHYLENE) | 8 |
| TRANSITE UNDERDRAIN | 20 |
| PVC OR ABS: SDR 35 | 35 |
| SDR 21 | 100 |

**SCHEMATIC ONLY**
**NOT TO SCALE**

**CANYON SUBDRAIN DETAIL**

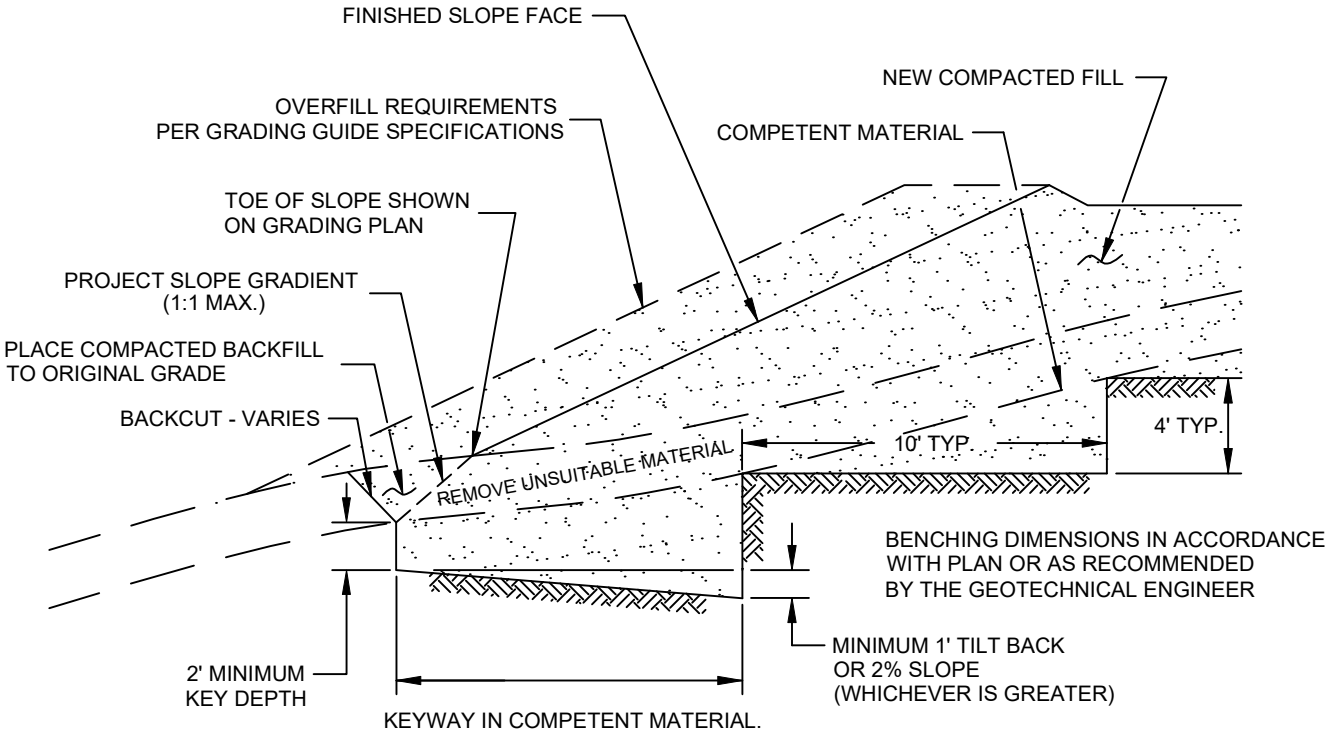
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

**PLATE D-3**

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NOTE:
BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

**FILL ABOVE NATURAL SLOPE DETAIL**

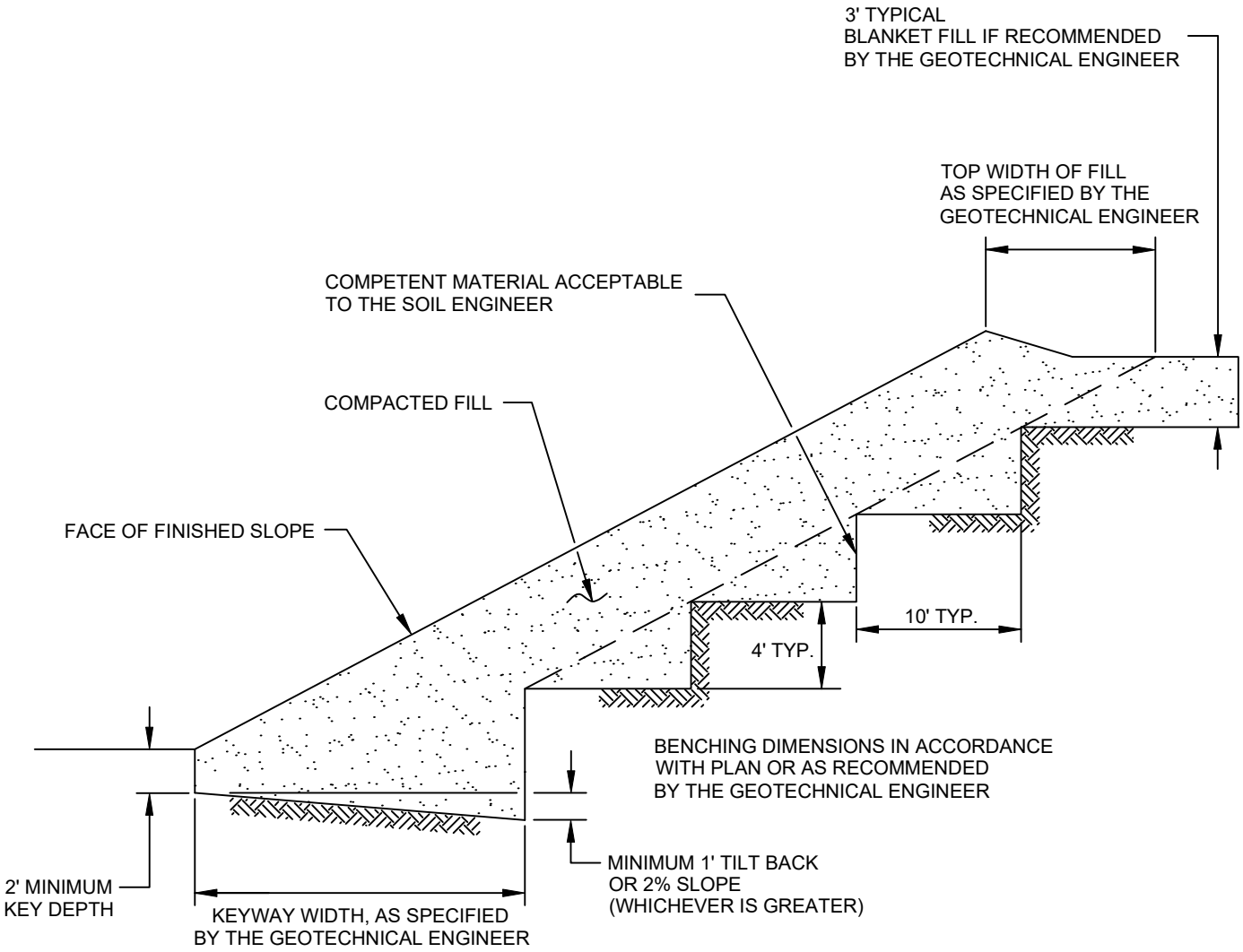
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

**PLATE D-4**

SoCalGeo
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**STABILIZATION FILL DETAIL**

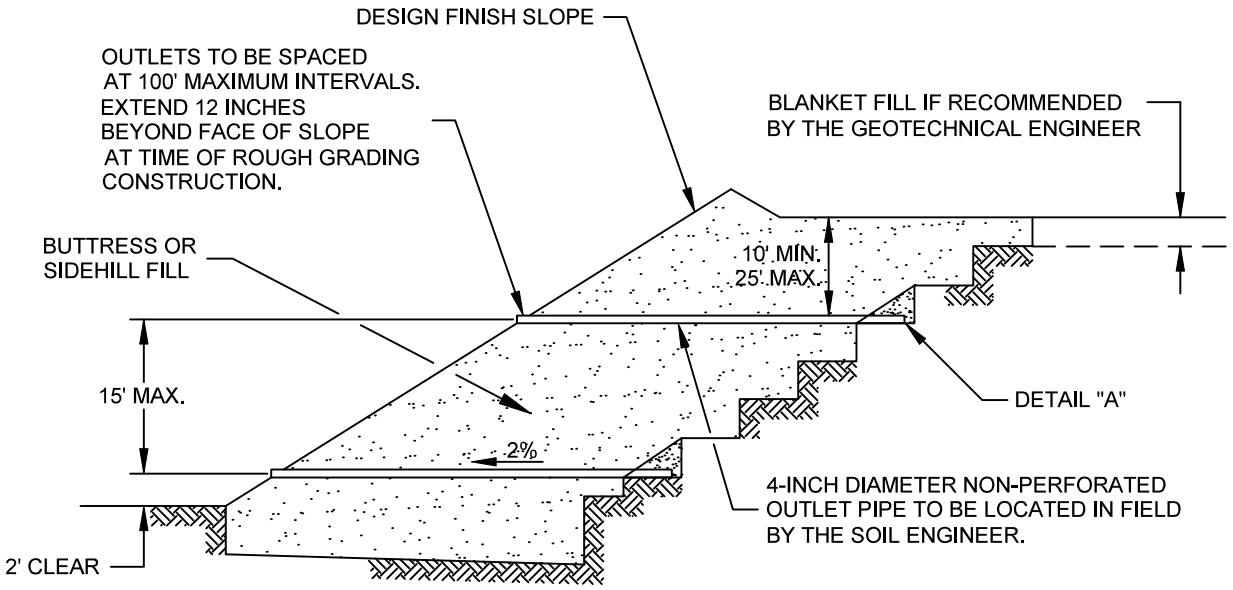
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

**PLATE D-5**

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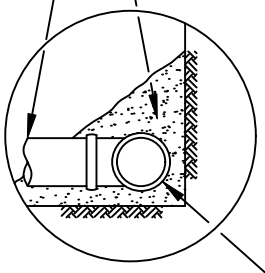

"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

| SIEVE SIZE | PERCENTAGE PASSING |
|---|---|
| 1" | 100 |
| 3/4" | 90-100 |
| 3/8" | 40-100 |
| NO. 4 | 25-40 |
| NO. 8 | 18-33 |
| NO. 30 | 5-15 |
| NO. 50 | 0-7 |
| NO. 200 | 0-3 |

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

| SIEVE SIZE | MAXIMUM PERCENTAGE PASSING |
|---|---|
| 1 1/2" | 100 |
| NO. 4 | 50 |
| NO. 200 | 8 |

SAND EQUIVALENT = MINIMUM OF 50




DETAIL "A"

NOTES:
1. TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON-SITE SOIL.

**SLOPE FILL SUBDRAINS**

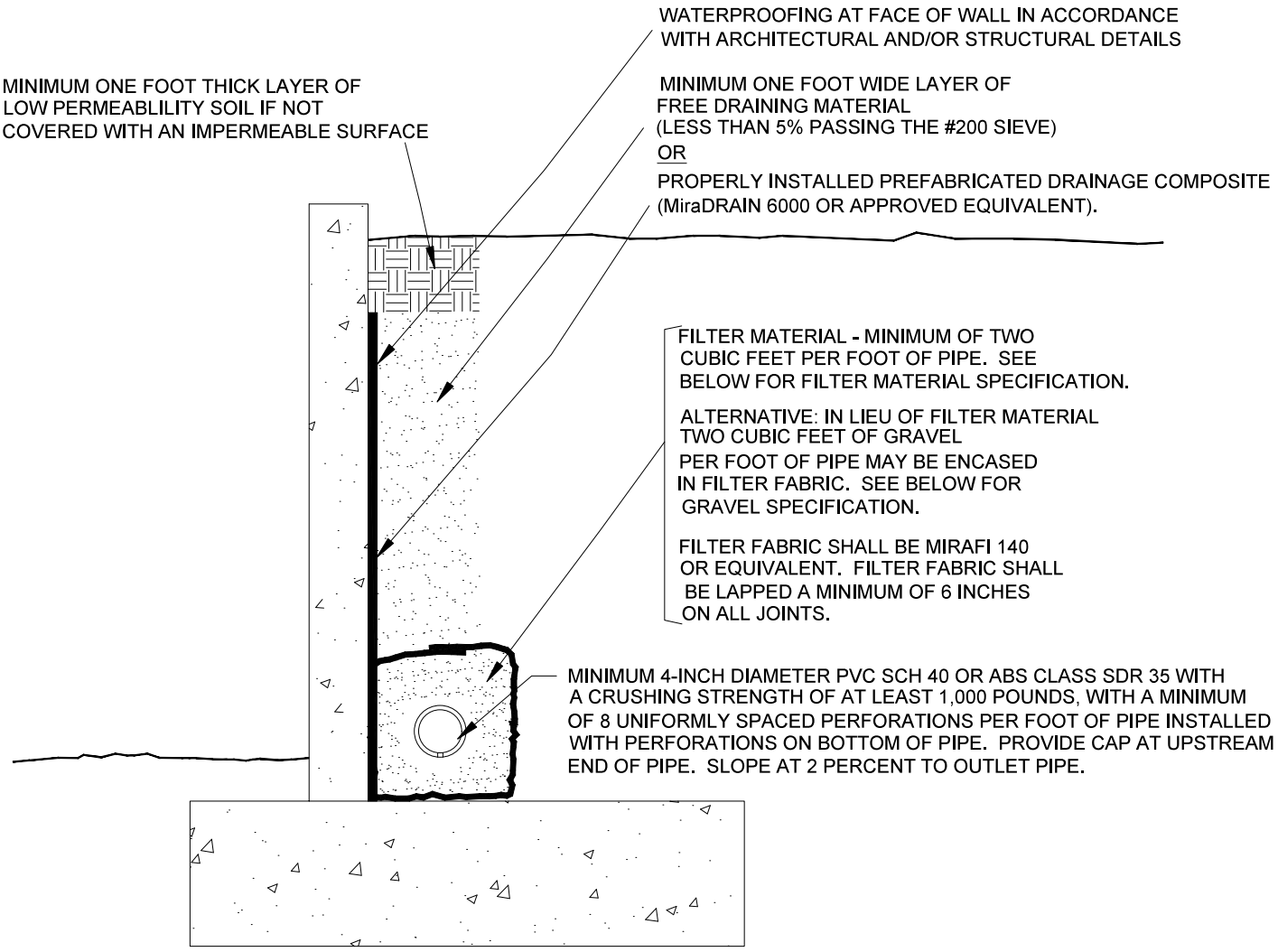
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: JAS
CHKD: GKM

PLATE D-6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL




"FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO EMA STD. PLAN 323)

| SIEVE SIZE | PERCENTAGE PASSING |
|---|---|
| 1" | 100 |
| 3/4" | 90-100 |
| 3/8" | 40-100 |
| NO. 4 | 25-40 |
| NO. 8 | 18-33 |
| NO. 30 | 5-15 |
| NO. 50 | 0-7 |
| NO. 200 | 0-3 |

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

| SIEVE SIZE | MAXIMUM PERCENTAGE PASSING |
|---|---|
| 1 1/2" | 100 |
| NO. 4 | 50 |
| NO. 200 | 8 |

SAND EQUIVALENT = MINIMUM OF 50

**RETAINING WALL BACKDRAINS**

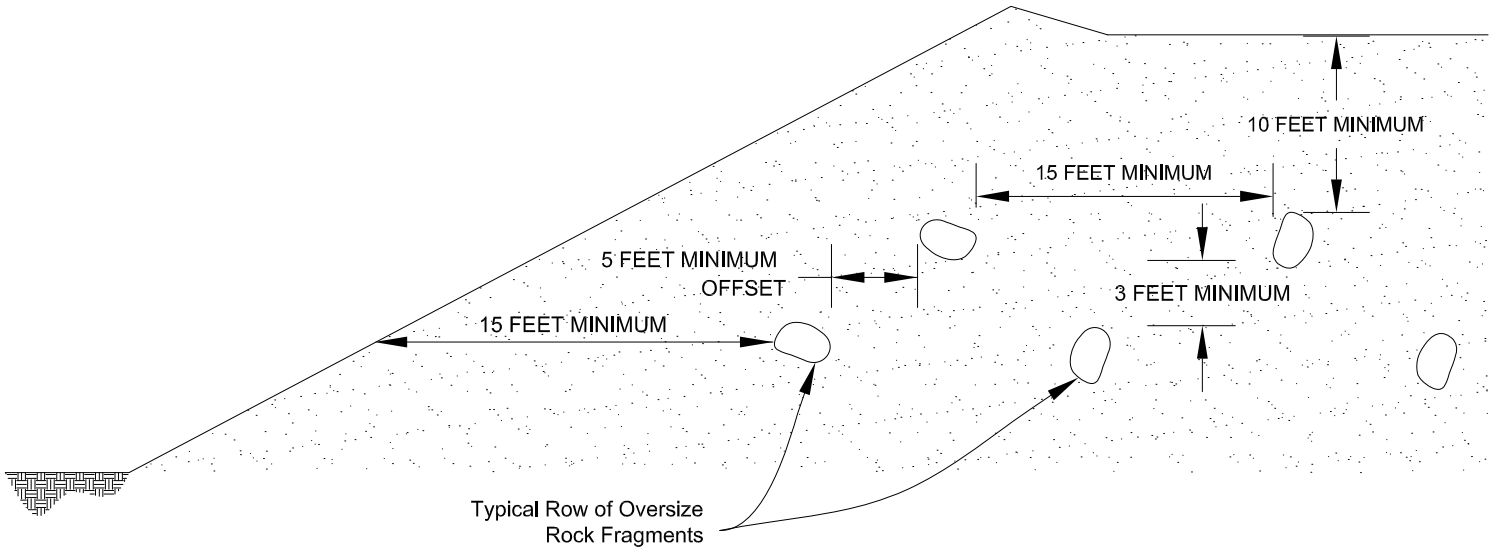
GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

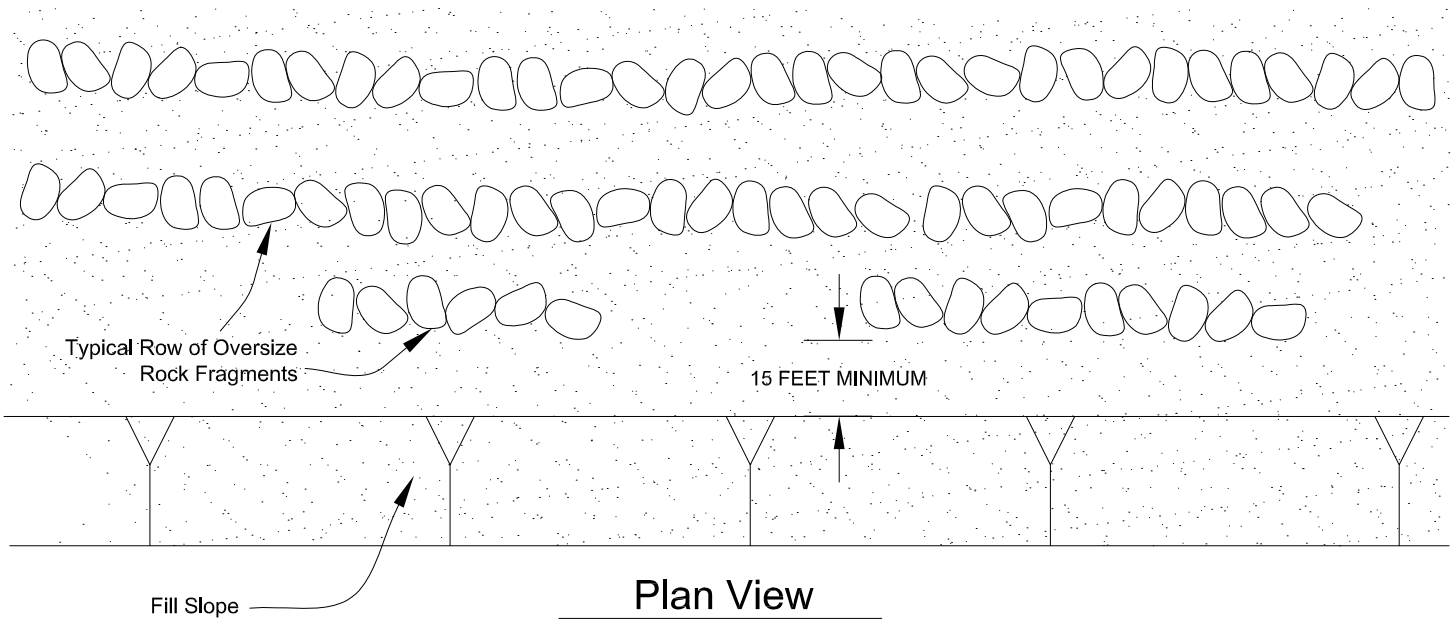
DRAWN: JAS
CHKD: GKM

**PLATE D-7**

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL




Section View




Plan View

**PLACEMENT OF OVERSIZED MATERIAL**

GRADING GUIDE SPECIFICATIONS

NOT TO SCALE

DRAWN: PM
CHKD: GKM

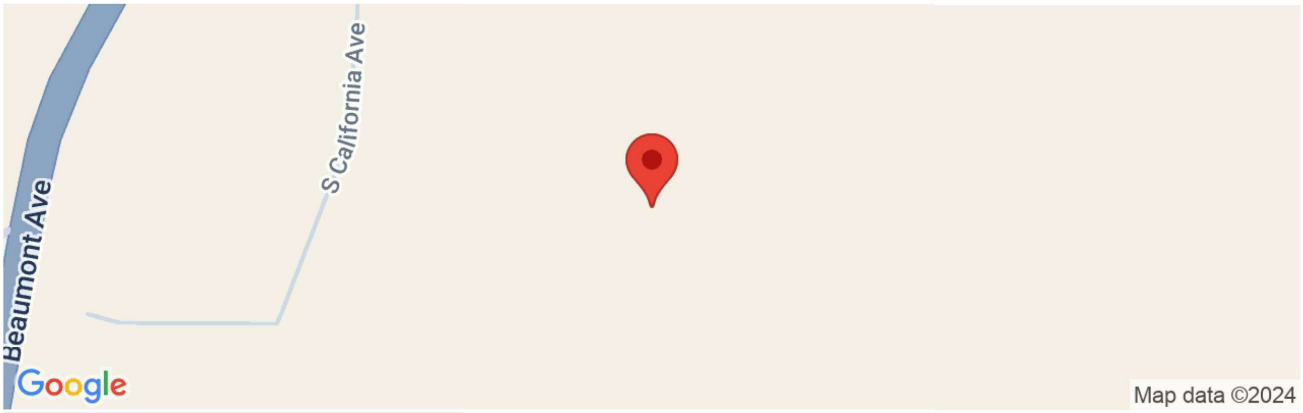
**PLATE D-8**

SoCalGeo

SOUTHERN CALIFORNIA GEOTECHNICAL

# APPENDIX E

**Latitude, Longitude: 33.903968, -116.978341**




| | |
|---|---|
| **Date** | 9/19/2024, 3:58:09 PM |
| **Design Code Reference Document** | ASCE7-16 |
| **Risk Category** | II |
| **Site Class** | C - Very Dense Soil and Soft Rock |

| Type | Value | Description |
|---|---|---|
| $S_S$ | 1.609 | $MCE_R$ ground motion. (for 0.2 second period) |
| $S_1$ | 0.622 | $MCE_R$ ground motion. (for 1.0s period) |
| $S_{MS}$ | 1.931 | Site-modified spectral acceleration value |
| $S_{M1}$ | 0.871 | Site-modified spectral acceleration value |
| $S_{DS}$ | 1.288 | Numeric seismic design value at 0.2 second SA |
| $S_{D1}$ | 0.581 | Numeric seismic design value at 1.0 second SA |

| Type | Value | Description |
|---|---|---|
| SDC | D | Seismic design category |
| $F_a$ | 1.2 | Site amplification factor at 0.2 second |
| $F_v$ | 1.4 | Site amplification factor at 1.0 second |
| PGA | 0.68 | $MCE_G$ peak ground acceleration |
| $F_{PGA}$ | 1.2 | Site amplification factor at PGA |
| $PGA_M$ | 0.816 | Site modified peak ground acceleration |
| $T_L$ | 8 | Long-period transition period in seconds |
| SsRT | 2.048 | Probabilistic risk-targeted ground motion. (0.2 second) |
| SsUH | 2.23 | Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration |
| SsD | 1.609 | Factored deterministic acceleration value. (0.2 second) |
| S1RT | 0.793 | Probabilistic risk-targeted ground motion. (1.0 second) |
| S1UH | 0.889 | Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration. |
| S1D | 0.622 | Factored deterministic acceleration value. (1.0 second) |
| PGAd | 0.68 | Factored deterministic acceleration value. (Peak Ground Acceleration) |
| $PGA_{UH}$ | 0.884 | Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration |
| $C_{RS}$ | 0.918 | Mapped value of the risk coefficient at short periods |
| $C_{R1}$ | 0.892 | Mapped value of the risk coefficient at a period of 1 s |
| $C_V$ | 1.222 | Vertical coefficient |

SOURCE: SEAOC/OSHPD Seismic Design Maps Tool
<https://seismicmaps.org/>

**SEISMIC DESIGN PARAMETERS - 2022 CBC**
PROPOSED INDUSTRIAL DEVELOPMENT
BEAUMONT, CALIFORNIA

DRAWN: MK
CHKD:RGT
SCG PROJECT
24G141-1
**PLATE E-1**

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL

# APPENDIX F

TERRA GEOSCIENCES

# SEISMIC REFRACTION SURVEY

## PROPOSED INDUSTRIAL DEVELOPMENT PROJECT

## SEC OF HIGHWAY 79 (BEAUMONT AVENUE) AND LAIRD AVENUE

## BEAUMONT, RIVERSIDE COUNTY, CALIFORNIA

Project No. 223858-2

August 20, 2024

***Prepared for:***

Southern California Geotechnical, Inc.
22885 E. Savi Ranch Parkway, Suite E
Yorba Linda, CA 92887

*Consulting Engineering Geology & Geophysics*

*P.O. Box 1090, Loma Linda, CA 92354 • 909 796-4667*

Southern California Geotechnical, Inc.
22885 E. Savi Ranch Parkway, Suite E
Yorba Linda, CA 92887

August 20, 2024
Project No. 223858-2

Attention: Mr. Daryl R. Kas, Project Geologist I

Regarding: Seismic Refraction Survey
Proposed Industrial Development Project
SEC Highway 79 (Beaumont Avenue) and Laird Road
Beaumont, Riverside County, California
SCG Project No. 24G141-1

## EXECUTIVE SUMMARY

As requested, this firm has performed a geophysical survey using the seismic refraction method for the above-referenced site. The purpose of this investigation was to assess the general seismic velocity characteristics of the underlying earth materials and to evaluate whether high velocity bedrock materials (non-rippable) may be present. Additionally, the structure and seismic velocity distribution of the subsurface earth materials was also assessed. This report will describe in further detail the procedures used and the results of our findings, along with presentation of representative seismic models for the survey traverse.

For this study, eight survey traverses (Seismic Lines SL-1 through SL-8) were performed across the subject site, as selected by your office. The traverses were located in the field by use of Google™ Earth imagery (2024) and GPS coordinates. The approximate locations of our seismic traverses are presented on a captured Google™ Earth (2024) image, as presented on Plate 1, with a Seismic Line Location Map presented on Plate 2, using a partial modified copy of the provided Beaumont Development CF Map, dated May 6, 2024.

This opportunity to be of service is sincerely appreciated. If you should have questions regarding this report or do not understand the limitations of this study or the data and results that are presented, please do not hesitate to contact our office.

Respectfully submitted,
**TERRA GEOSCIENCES**



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Principal Geophysicist
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## INTRODUCTION

The subject property is located southeast of the intersection of Highway 79 (Beaumont Avenue) and Laird Road, within the Beaumont area of Riverside County, California. Geomorphically, the site is situated within some low-lying hills along the eastern-most fringe of the San Timoteo Badlands, of which consists of a thick section of Pliocene and Pleistocene continental sedimentary rocks that were deposited as outwash from the San Gabriel and San Bernardino Mountains. This formation generally consists of a wide variety of sedimentary constituents, most widely characterized by poorly cemented to moderately indurated and semi-consolidated, pebbly to cobbly sandstone, conglomerate, and fanglomerate, with interbeds of siltstone.

Local geologic mapping by Dibblee (2003) indicates the subject property to be underlain by Tertiary age alluvial sediments of the San Timoteo Formation and Pleistocene age older surficial sediments. Dibblee describes the San Timoteo Formation as being comprised generally of weakly-indurated sandstone that is friable with interbedded pebble-cobble conglomerate and greenish to reddish claystone. The older surficial sediments are generally described as being comprised of crudely-bedded alluvial fan sand and gravel. Within the southwestern-most portion of the site, medium-grained Cretaceous age granitic rocks are locally shown to be present.

## SEISMIC REFRACTION SURVEY

### *Methodology*

The seismic refraction method consists of measuring (at known points along the surface of the ground) the travel times of compressional waves generated by an impulsive energy source and can be used to estimate the layering, structure, and seismic acoustic velocities of subsurface horizons. Seismic waves travel down and through the soils and rocks, and when the wave encounters a contact between two earth materials having different velocities, some of the wave's energy travels along the contact at the velocity of the lower layer. The fundamental assumption is that each successively deeper layer has a velocity greater than the layer immediately above it. As the wave travels along the contact, some of the wave's energy is refracted toward the surface where it is detected by a series of motion-sensitive transducers (geophones). The arrival time of the seismic wave at the geophone locations can be related to the relative seismic velocities of the subsurface layers in feet per second (fps), which can then be used to aid in interpreting both the depth and type of materials encountered.

### *Field Procedures*

Eight seismic refraction survey lines (Seismic Lines SL-1 through SL-8) have been performed along representative areas across the subject property as selected by you. The traverses were located in the field by use of Google™ Earth imagery (2024) and GPS coordinates, and are delineated on the Google™ Earth Imagery Map and the

Seismic Line Location Map, as presented on Plates 1 and 2, respectively. Each seismic line consisted of a total of twenty-four 14-Hertz geophones, spaced at regular 8- to 12-foot intervals (total lengths of 200 to 300 feet), in order to detect both the direct and refracted waves. A 16-pound sledge-hammer was used as the energy source to produce the seismic waves.

Seven shot points were utilized along each survey line spread using forward, reverse, and several intermediate locations in order to obtain high resolution survey data for velocity analysis and depth modeling purposes. Multiple hammer impacts were utilized at each shot point location in order to increase the signal to noise ratio, which enhanced the primary seismic "P"-waves. The seismic wave arrivals were digitally recorded in SEG-2 format on a Geometrics Geode model signal enhancement refraction seismograph. The data was acquired using a sampling rate of 0.0625 milliseconds having a record length of 0.10 to 0.20 seconds. No acquisition filters were used during data collection.

During acquisition, the seismograph displays the seismic wave arrivals on the computer screen which were used to analyze the arrival time of the primary seismic "P"-waves at each geophone station, in the form of a wiggle trace for quality control purposes in the field. If the records appear "noisy", then the shots are repeated until satisfactory data is recorded. Each geophone and seismic shot location was surveyed using a hand level and ruler for topographic correction, with "0" being the lowest point along each survey line, for reference.

## ***Data Processing***

The recorded seismic data was subsequently transferred to our office computer for processing and analyzing purposes, using the computer programs **SIPwin** (**S**eismic Refraction **I**nterpretation **P**rogram for **Win**dows) developed by Rimrock Geophysics, Inc. (2004); **Refractor** (Geogiga, 2001-2023); and **Rayfract™** (Intelligent Resources, Inc., 1996-2024). All of the computer programs perform their individual analyses using exactly the same input data, which includes the first-arrival times of the "P"-waves and the survey line geometry.

- **SIPwin** is a ray-trace modeling program that evaluates the subsurface using layer assignments based on time-distance curves and is better suited for layered media, using the "Seismic Refraction Modeling by Computer" method (Scott, 1973). The first step in the modeling procedure is to compute layer velocities by least-squares techniques. Then the program uses the delay-time method to estimate depths to the top of layer-2. A forward modeling routine traces rays from the shot points to each geophone that received a first-arrival ray refracted along the top of layer-2. The travel time of each such ray is compared with the travel time recorded in the field by the seismic system. The program then adjusts the layer-2 depths so as to minimize discrepancies between the computed ray-trace travel times and the first arrival times picked from the seismic waveform record.

The process of ray tracing and model adjustment is repeated a total of six times to improve the accuracy of depths to the top of layer-2. This first-arrival picks were then used to generate the Layer Velocity Models using the **SIPwin** computer program, which presents the subsurface velocities as individual layers and are presented within Appendix A for reference. In addition, the associated Time-Distance Plot for each survey line, which shows the individual data picks of the first "P-wave" arrival times, also appears in Appendix A.

- **Refractor** is seismic refraction software that also evaluates the subsurface using layer assignments utilizing interactive and interchangeable analytical methods that include the Delay-Time method, the Plus-Minus method, and the Generalized Reciprocal Method (GRM). These methods are used for defining irregular non-planar refractors and are briefly described below.

  - The Delay-Time method will measure the delay time depth to a refractor beneath each geophone rather than at shot points. Delay-time is the time spent by a wave to travel up or down through the layer (slant path) compared to the time the wave would spend if traveling along the projection of the slant path on the refractor.

  - The Plus-Minus time analysis method includes a Plus time analysis for depth analysis and a Minus time analysis for velocity determination. The basis of the Plus-Minus time analysis method lies in the traveltime reciprocity, i.e., the traveltime of a seismic wave from source to receiver is equal to the traveltime in the opposite direction if source and receiver are interchanged. It can be used to calculate the depth and velocity variations of an undulating layer boundary for slope angles less than ~10°.

  - The GRM method is a technique for delineating undulating refractors at any depth from in-line seismic refraction data consisting of forward and reverse travel-times and is capable of resolving dips of up to 20% and does not over-smooth or average the subsurface refracting layers. In addition, the technique provides an approach for recognizing and compensating for hidden layer conditions.

**Rayfract™** is seismic refraction tomography software that models subsurface refraction, transmission, and diffraction of acoustic waves which generally indicates the relative structure and velocity distribution of the subsurface using first break energy propagation modeling. An initial 1D gradient model is created using the DeltatV method (Gebrande and Miller, 1985) which gives a good initial fit between modeled and picked first breaks. The DeltatV method is a turning-ray inversion method which delivers continuous depth vs. velocity profiles for all profile stations. These profiles consist of horizontal inline offset, depth, and velocity triples. The method handles real-life geological conditions such as velocity gradients, linear increasing of velocity with depth, velocity inversions, pinched-out layers and

outcrops, and faults and local velocity anomalies. This initial model is then refined automatically with a true 2D WET (Wavepath Eikonal Traveltime) tomographic inversion (Schuster and Quintus-Bosz, 1993).

WET tomography models multiple signal propagation wave-paths contributing to one first break, whereas conventional ray tracing tomography is limited to the modeling of just one ray per first break. This computer program performs the analysis by using the same first-arrival P-wave times and survey line geometry that were generated during the layer velocity model analyses. The associated Refraction Tomographic Models, which display the subsurface earth material velocity structure, is represented by the velocity contours (isolines displayed in feet/second), supplemented with the color-coded velocity shading for visual reference, and are presented within Appendix B.

The combined use of these computer programs provided a more thorough and comprehensive analysis of the subsurface structure and velocity characteristics. Each computer program has a specific purpose based on the objective of the analysis being performed. **SIPwin** and **Refractor** were primarily used for detecting generalized subsurface velocity layers providing "weighted average velocities." The processed seismic data of these two programs were compared and averaged to provide a final composite layer velocity model which provided a more thorough representation of the subsurface. **Rayfract™** provided tomographic velocity and structural imaging that is very conducive to detecting strong lateral velocity characteristics such as imaging corestones, dikes, and other subsurface structural characteristics.

## SUMMARY OF GEOPHYSICAL INTERPRETATION

The first computer method described below used for data analysis is the traditional layer method (**SIPwin** and **Refractor**). Using this method, it should be understood that the data obtained represents an average of seismic velocities within any given layer. For example, high seismic velocity concretions or other local lithologic inconsistencies, may be isolated within a low velocity matrix, thus yielding an average medium velocity for that layer. Therefore, in any given layer, a range of velocities could be anticipated, which can also result in a wide range of excavation characteristics. In general, the site where locally surveyed, was noted to be characterized by three major subsurface layers (Layers V1 through V3) with respect to seismic velocities. The following velocity layer summaries have been prepared using the **SIPwin** and **Refractor** analysis, with the representative Layer Velocity Models presented within Appendix A along with their respective Time-Distance Plots.

- ***Velocity Layer V1***: The upper layer (V1) yielded a seismic velocity range of 1,295 to 1,439 fps, which is typical for near-surface unconsolidated surficial earth materials. These materials are most likely comprised of topsoil, colluvium, alluvial materials, and/or completely-weathered and fractured sedimentary bedrock.

- ***Velocity Layer V2***: The second layer (V2) yielded a seismic velocity range of 2,063 to 3,314 fps, which is representative of non- to slightly consolidated older alluvial materials and/or very highly-weathered or non-lithified bedrock sedimentary bedrock materials, such as surficially exposed across the site within the mapped San Timoteo Formation.

- ***Velocity Layer V3***: The third layer (V3) most likely indicates the presence of highly-weathered sedimentary bedrock of the San Timoteo Formation, having a seismic velocity range of 3,635 to 4,645 fps. These relatively higher velocities signify the decreasing effect of weathering as a function of depth.

Table 1 below summarizes the results of the survey lines with respect to the "weighted average" seismic velocities for each layer, as indicated on the Layer Velocity Models, presented within Appendix A.

TABLE 1- VELOCITY SUMMARY OF SEISMIC SURVEY LINES

| Seismic Line | V1 Layer (fps) | V2 Layer (fps) | V3 Layer (fps) |
|---|---|---|---|
| **SL-1** | **1,295** | **2,928** | **3,682** |
| **SL-2** | **1,439** | **2,063** | **3,635** |
| **SL-3** | **1,394** | **2,473** | **------** |
| **SL-4** | **1,362** | **3,314** | **------** |
| **SL-5** | **1,306** | **2,349** | **3,905** |
| **SL-6** | **1,325** | **2,713** | **4,645** |
| **SL-7** | **1,416** | **2,862** | **3,798** |
| **SL-8** | **1,407** | **2,460** | **3,636** |

**Note**: "**------**" indicates velocity layer not modeled or encountered.

Using **Rayfract™**, tomographic models were also prepared for comparative purposes to better illustrate the general structure and velocity distribution of the subsurface, using velocity contour isolines, as presented within Appendix B. Although no discrete velocity layers or boundaries are created, these models generally resemble the corresponding overall average layer velocities as presented within Appendix A. In general, the seismic velocity of the subsurface earth materials gradually increases with depth, with minor lateral velocity differentials suggesting the local presence of weathering differentials, concretions, and/or possible bedding structures. The colors representing the velocity gradients have been standardized on all of the models for comparative purposes.

## GENERALIZED BEDROCK RIPPABILITY CHARACTERISTICS

A summary of the generalized rippability characteristics of bedrock based on a compilation of rippability performance charts prepared by Caterpillar, Inc. (2022; see Figure 1, Page 7), Caltrans (Stephens, 1978), and Santi (2006), has been provided to aid in evaluating potential excavation difficulties with respect to the seismic velocities obtained along the local areas surveyed. These seismic velocity ranges and rippability potentials have been tabulated below for reference.

TABLE 2- CATERPILLAR RIPPABILITY CHART (D9 Ripper)

| Sedimentary Rock Velocity | Rippability |
|---|---|
| < 7,300 | Rippable |
| 7,300 – 9,500 | Moderately Rippable |
| > 9,500 | Non-Rippable |

Additionally, we have provided the Caltrans Rippability Chart as presented below within Table 3 for comparison. These values are from published Caltrans studies (Stephens, 1978) that are based on their experience and which appear to be more conservative than Caterpillar's rippability charts. It should be noted that the type of bedrock was not indicated.

TABLE 3- STANDARD CALTRANS RIPPABILITY CHART

| Velocity (feet/sec ±) | Rippability |
|---|---|
| < 3,500 | Easily Ripped |
| 3,500 – 5,000 | Moderately Difficult |
| 5,000 – 6,600 | Difficult Ripping / Light Blasting |
| > 6,600 | Blasting Required |

Table 4 is partially modified from the “Engineering Behavior from Weathering Grade” as presented by Santi (2006), which also provides velocity ranges with respect to rippability potentials, along with other rock engineering properties that may be pertinent.

TABLE 4- SUMMARY OF ROCK ENGINEERING PROPERTIES

| ENGINEERING PROPERTY: | Slightly Weathered | Moderately Weathered | Highly Weathered | Completely Weathered |
|---|---|---|---|---|
| **Excavatability** | Blasting necessary | Blasting to rippable | Generally rippable | Rippable |
| **Slope Stability** | ½ :1 to 1:1 (H:V) | 1:1 (H:V) | 1:1 to 1.5:1 (H:V) | 1.5:1 to 2:1 (H:V) |
| **Schmidt Hammer Value** | 51 – 56 | 37 – 48 | 12 – 21 | 5 – 20 |
| **Seismic Velocity (fps)** | 8,200 – 13,125 | 5,000 – 10,000 | 3,300 – 6,600 | 1,650 – 3,300 |

The Caterpillar D9R Ripper Performance Chart (Caterpillar, 2022) has been provided on Figure 1 below for reference.

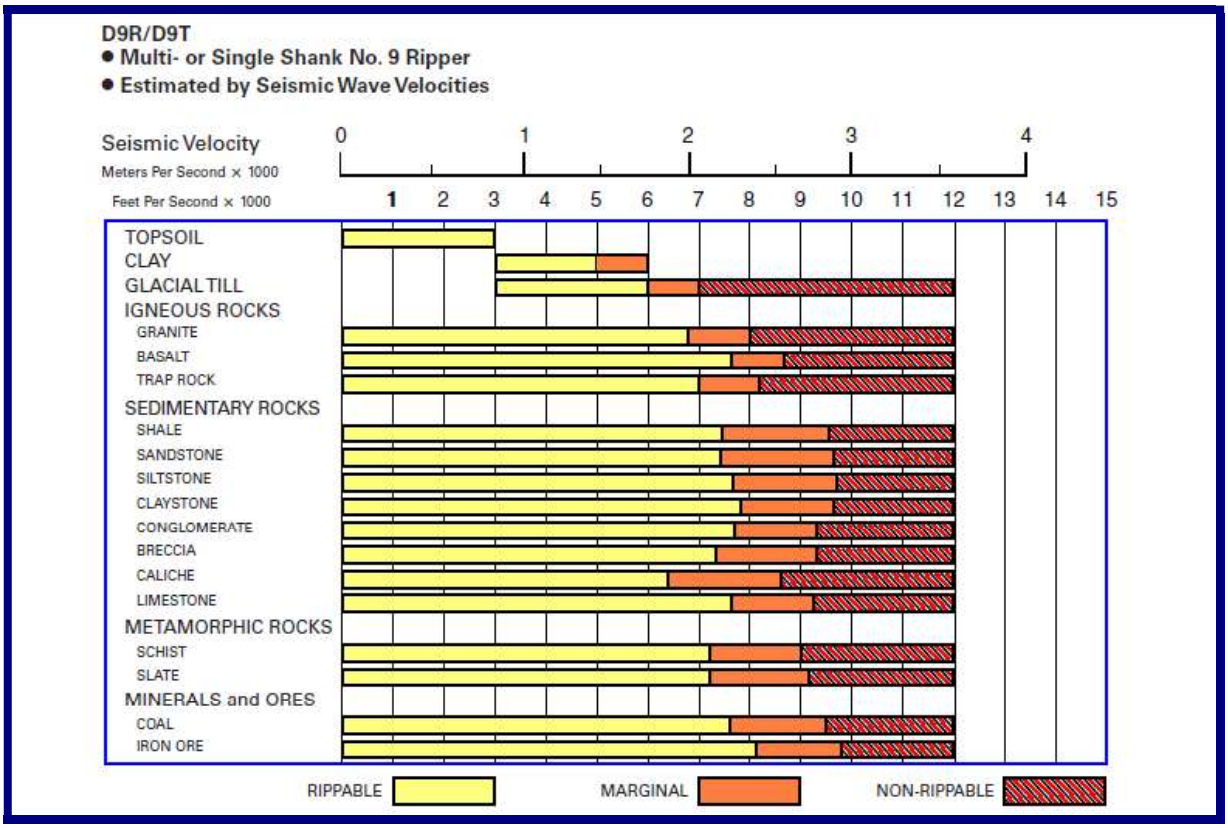



**FIGURE 1- Caterpillar D9R Ripper Performance Chart (2022).**

For purposes of the discussion in this report with respect to the expected bedrock rippability characteristics, we are assuming that a D9R/D9T dozer will be used as a minimum, such as illustrated above. Smaller excavating equipment will most likely result in slower production rates and possible refusal within relatively lower velocity bedrock materials.

## GEOLOGIC & EARTHWORK CONSIDERATIONS

To evaluate whether a particular bedrock material can be ripped or excavated, this geophysical survey should be used in conjunction with the geologic and/or geotechnical report and/or information gathered for the subject project which may describe the physical properties of the bedrock. The physical characteristics of bedrock materials that favor ripping generally include the presence of bedding planes, fractures, faults, and other structural discontinuities, weathering effects, brittleness or crystalline structure, stratification or lamination, large grain size, moisture permeated clay, and low compressive strength. If the bedrock is foliated and/or fractured at depth, this structure could aid in excavation production.

Unfavorable bedrock conditions can include such characteristics as massive and homogeneous formations, non-crystalline structure, absence of planes of weakness, fine-grained materials, and formations of clay origin where moisture makes the material plastic. Use of these physical bedrock conditions along with the subsurface velocity characteristics as presented within this report should aid in properly evaluating the type of equipment that will be necessary and the production levels that can be anticipated for this project.

A summary of excavation considerations is included within Appendix C in order to provide you and your grading contractor with a better understanding of the complexities of excavation in bedrock materials, so that proper planning and excavation techniques can be employed.

## SUMMARY OF FINDINGS AND CONCLUSIONS

The raw field data was considered to be of good quality with moderate amounts of ambient “noise” that was introduced during our survey, from sources such as vehicle traffic along Highway 79 to the west (dominant source), apparent high-frequency radio/microwave interference from nearby communication towers, and distant trains to the north. Analysis of the data and picking of the primary “P”-wave arrivals was therefore performed with some difficulty, with minor interpolation of some data points being necessary. Based on the results of our comparative seismic analyses of the computer programs **SIPwin**, **Refractor**, and **Rayfract™**, the seismic refraction survey line models appear to generally coincide with one another, with some minor variances due to the methods that these programs process, integrate, and display the input data.

The anticipated excavation potentials of the velocity layers encountered locally during our survey are as follows:

- **Velocity Layer V1**:

  No excavating difficulties are expected to be encountered within the uppermost, low-velocity V1 layer (average weighted velocity of 1,295 to 1,439 fps) and should excavate with conventional ripping. This surficial velocity layer is expected to be comprised of topsoil, colluvium, alluvium, and/or completely-weathered and fractured sedimentary bedrock materials.

- **Velocity Layer V2**:

  The second V2 layer (average weighted velocity of 2,063 to 3,314 fps) is believed to consist of non- to slightly-consolidated older alluvium and/or very highly-weathered sedimentary bedrock. Using the rock classifications as presented within Tables 2 through 4 and Figure 1, seismic wave velocities of less than 6,600 to 7,300± fps are generally noted to be within the threshold for conventional ripping, therefore excavation within this velocity layer should not encounter extreme difficulty. Trenching and/or placement of infrastructure within this velocity layer using excavator equipment may require some breaking and/or light blasting to obtain desired grade.

- **Velocity Layer V3**:

  The third V3 layer is believed to consist of highly-weathered sedimentary bedrock. Moderate excavation difficulties within this velocity layer (average weighted velocity range of 3,635 to 4,645 fps) are anticipated. Using the rock classifications as presented within Tables 2 through 4 and Figure 1, seismic wave velocities of less than 6,600 to 7,300± fps is generally noted to be within the threshold for conventional ripping, therefore excavation within this velocity layer should not encounter extremely hard difficulty. Trenching and/or placement of infrastructure within this velocity layer using excavator equipment may require some breaking and/or light blasting to obtain desired grade.

The ray sampling coverage of the subsurface seismic waves that were acquired during the data processing of the tomographic models using **Rayfract™**, appeared to be of good quality which was verified by having a Root Mean Square Error (RMS) of 0.6 to 2.6 percent (see lower right-hand corner of each model). The RMS error (misfit between picked and modeled first break times) is automatically calculated during the processing routine, with a value of less than 5.0% being preferred, of which all the models obtained.

Based on the tomographic modeling and typical excavation characteristics observed within bedrock materials of the southern California region, anticipation of gradual increasing hardness with depth should be anticipated during grading. Additionally, some lateral velocity variations may be encountered.

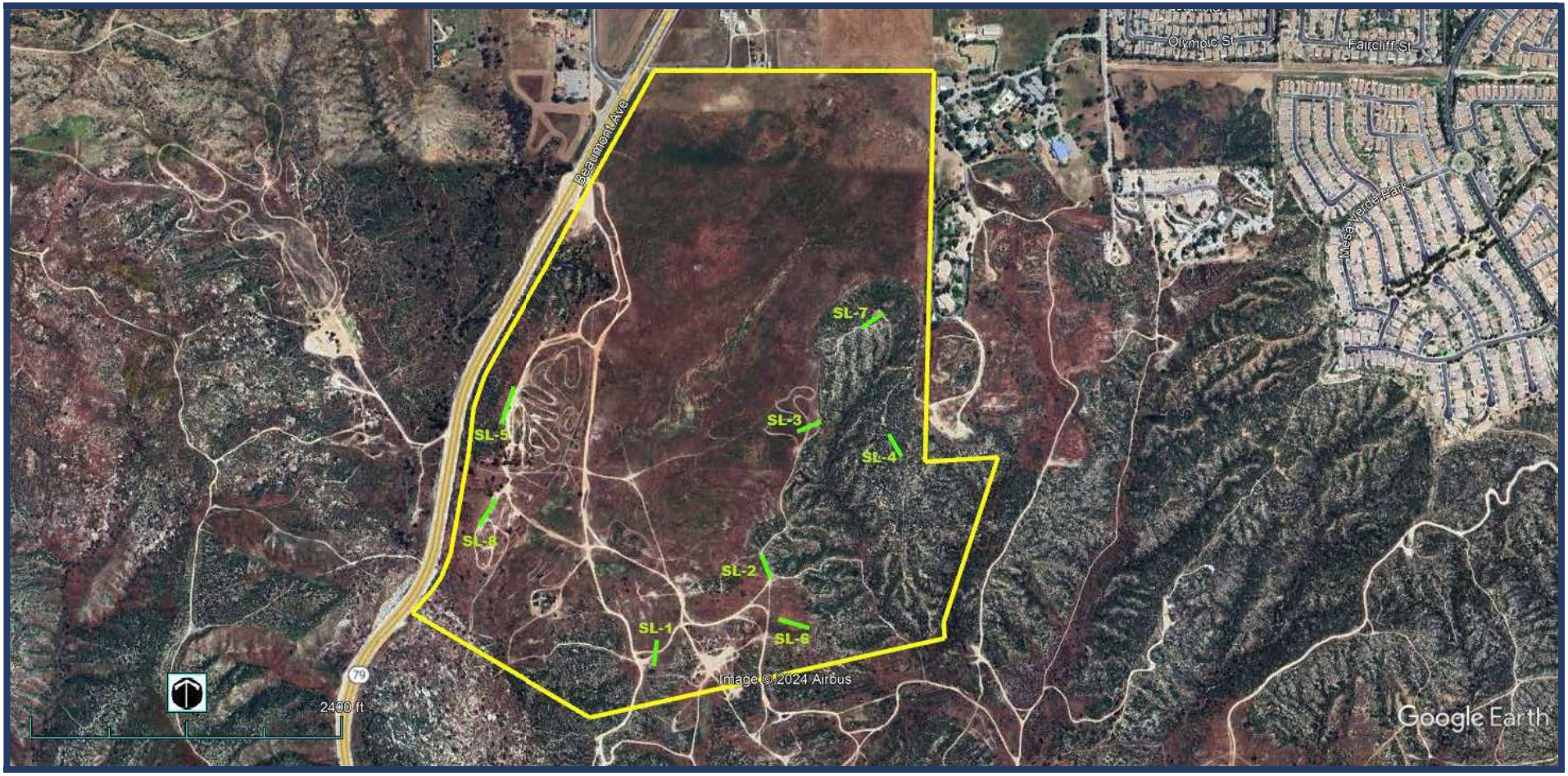
## CLOSURE

The field geophysical survey was performed during July and August 2024 by the undersigned using "state of the art" geophysical equipment and techniques along the selected traverse locations scattered across the site. The seismic data was further evaluated using recently developed computerized tomographic inversion techniques to provide a more thorough analysis and understanding of the subsurface velocity and structural conditions. It should be noted that our data presented within this report was obtained along eight specific locations therefore other areas in the local may contain different velocity layers and depths not encountered during our field survey. Additional survey traverses may be necessary to further evaluate the excavation characteristics across other portions of the site where cut grading will be proposed, if warranted.

It is important to understand that the fundamental limitation for seismic refraction surveys is known as nonuniqueness, wherein a specific seismic refraction data set does not provide sufficient information to determine a single “true” earth model. Therefore, the interpretation of any seismic data set uses “best-fit” approximations along with the geologic models that appear to be most reasonable for the local area being surveyed. Client should also understand that when using the theoretical geophysical principles and techniques discussed in this report, sources of error are possible in both the data obtained and, in the interpretation, therefore, the results of this survey may not represent actual subsurface conditions. These are all factors beyond **Terra Geosciences** control and no guarantees as to the results of this survey can be made. We make no warranty, either expressed or implied. Estimates of layer velocity boundaries as presented in this report are generally considered to be within 10± percent of the total depth of the contact.

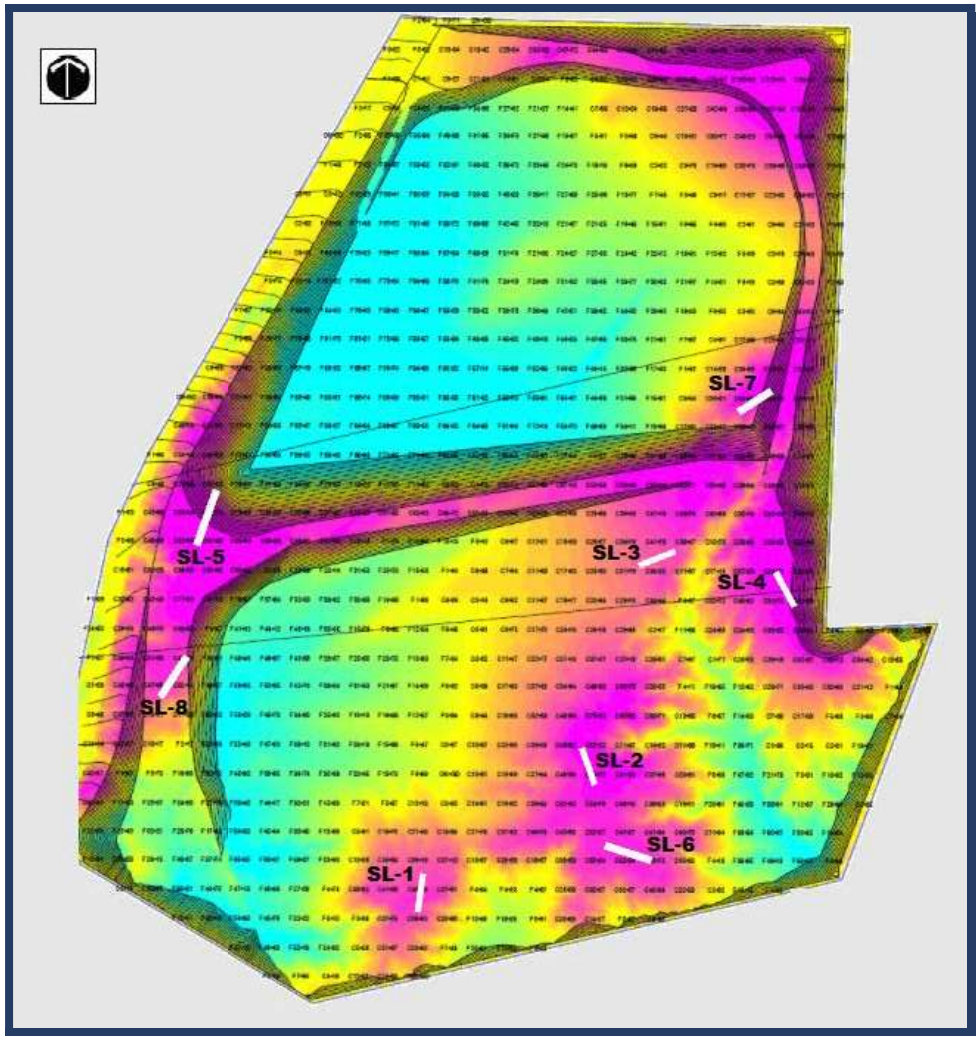
In summary, the results of this seismic refraction survey are to be considered as an aid to assessing the rippability and excavation potentials of the bedrock locally. This information should be carefully reviewed by the grading contractor and representative “test” excavations with the proposed type of excavation equipment for the proposed construction should be considered, so that they may be correlated with the data presented within this report.

# GOOGLE™ EARTH IMAGERY MAP




**Base Map: Google™ Earth (2024); Seismic traverses SL-1 through SL-8 indicated as green lines, approximate site boundaries outlined in yellow.**

# SEISMIC LINE LOCATION MAP




**BASE MAP: Partial modified copy of the provided Beaumont Conceptual CF Map, Seismic traverses SL-1 through S-L8 indicated as white lines.**

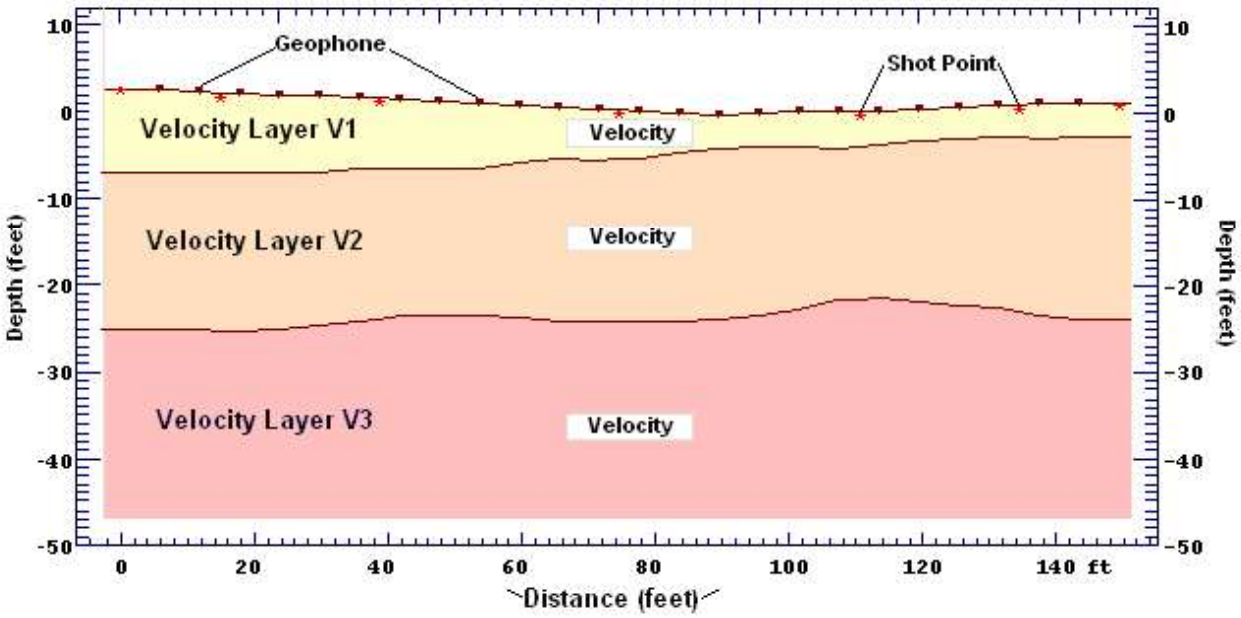
# APPENDIX A

## LAYER VELOCITY MODELS

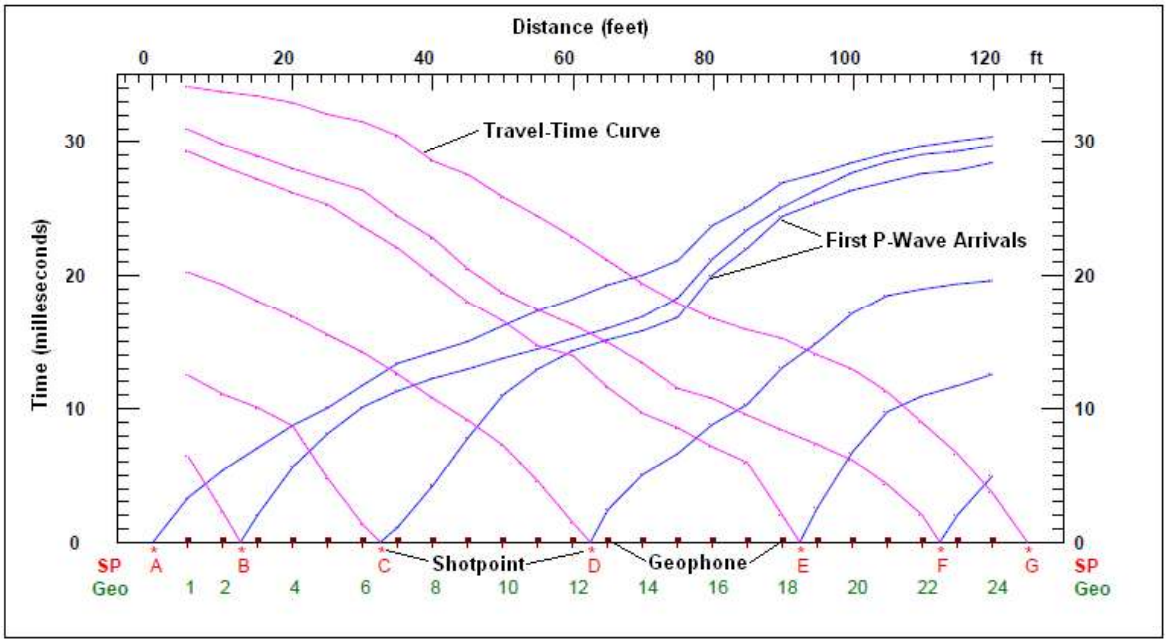


# LAYER VELOCITY MODEL LEGEND

## LAYER VELOCITY MODEL



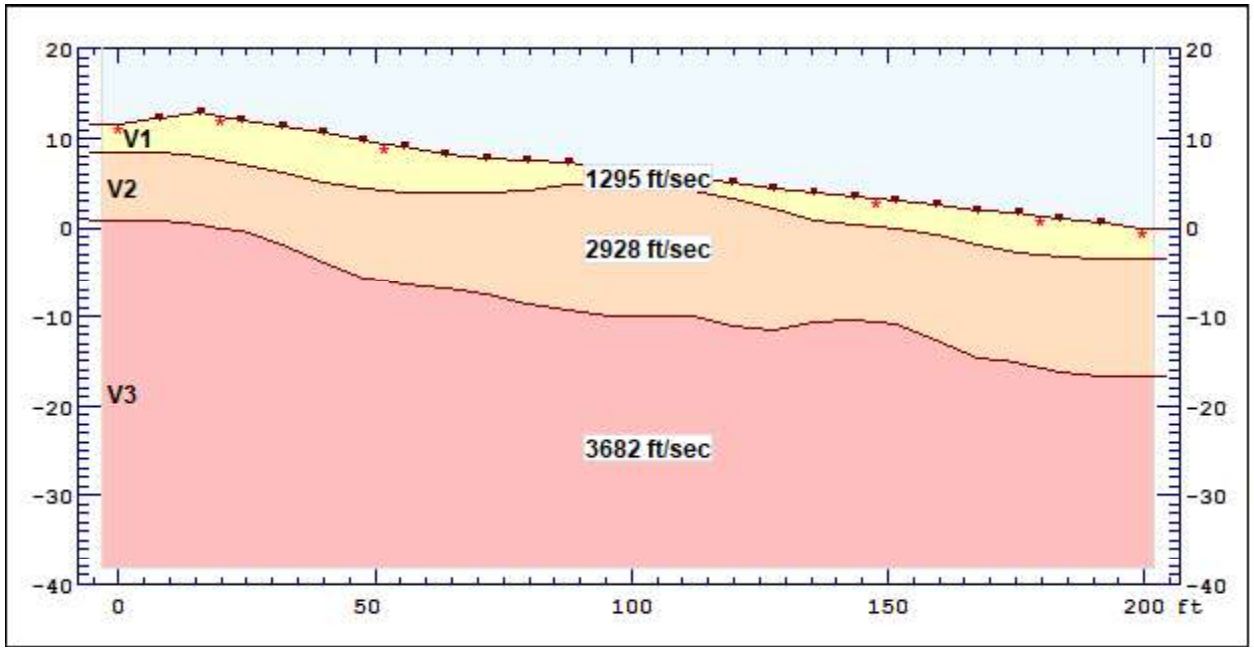

## TIME-DISTANCE PLOT



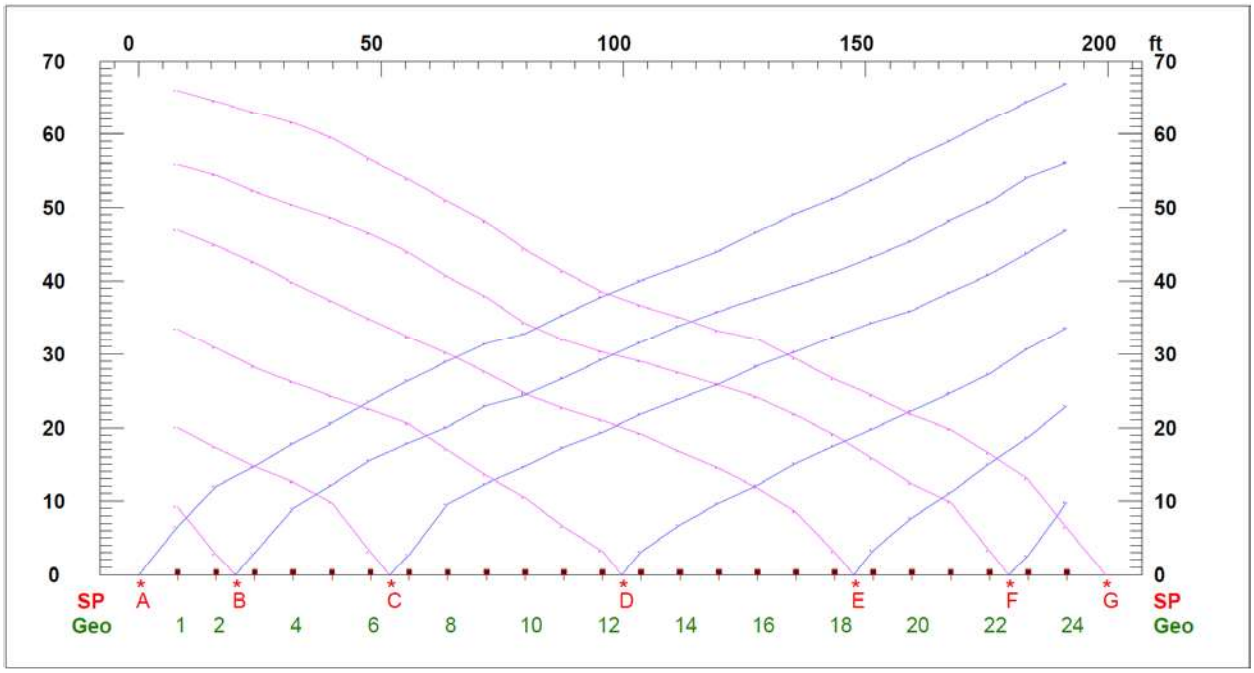
# SEISMIC LINE SL-1

## North 7° East >

### LAYER VELOCITY MODEL



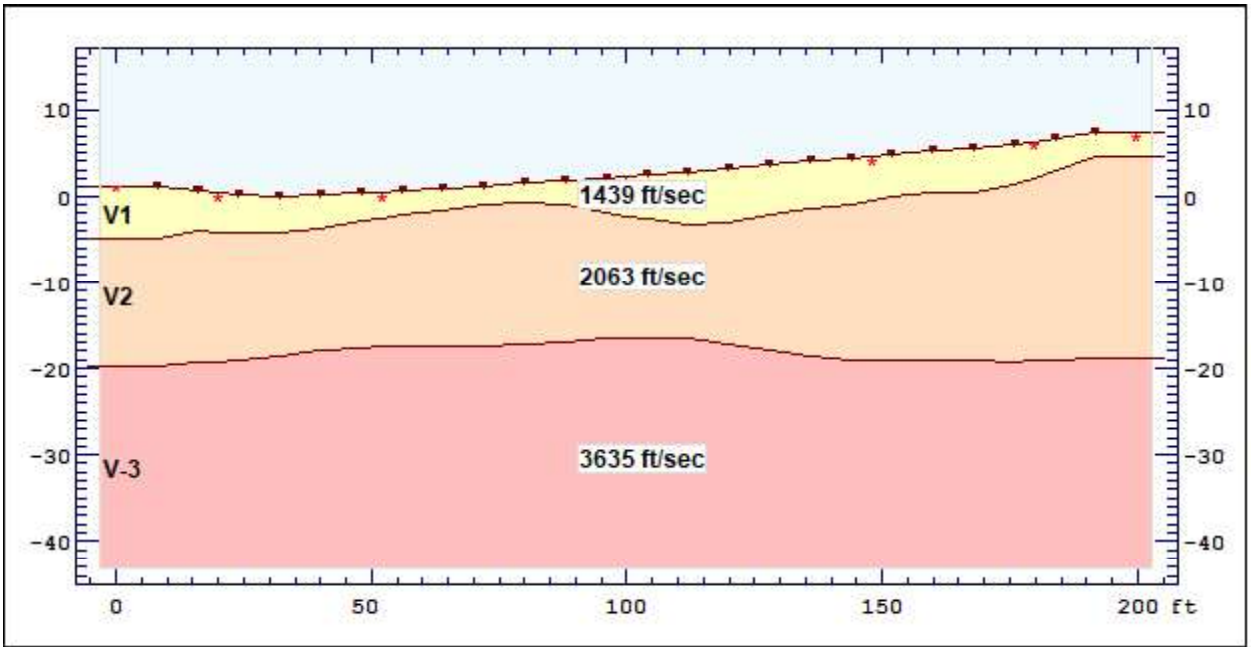

### TIME-DISTANCE PLOT



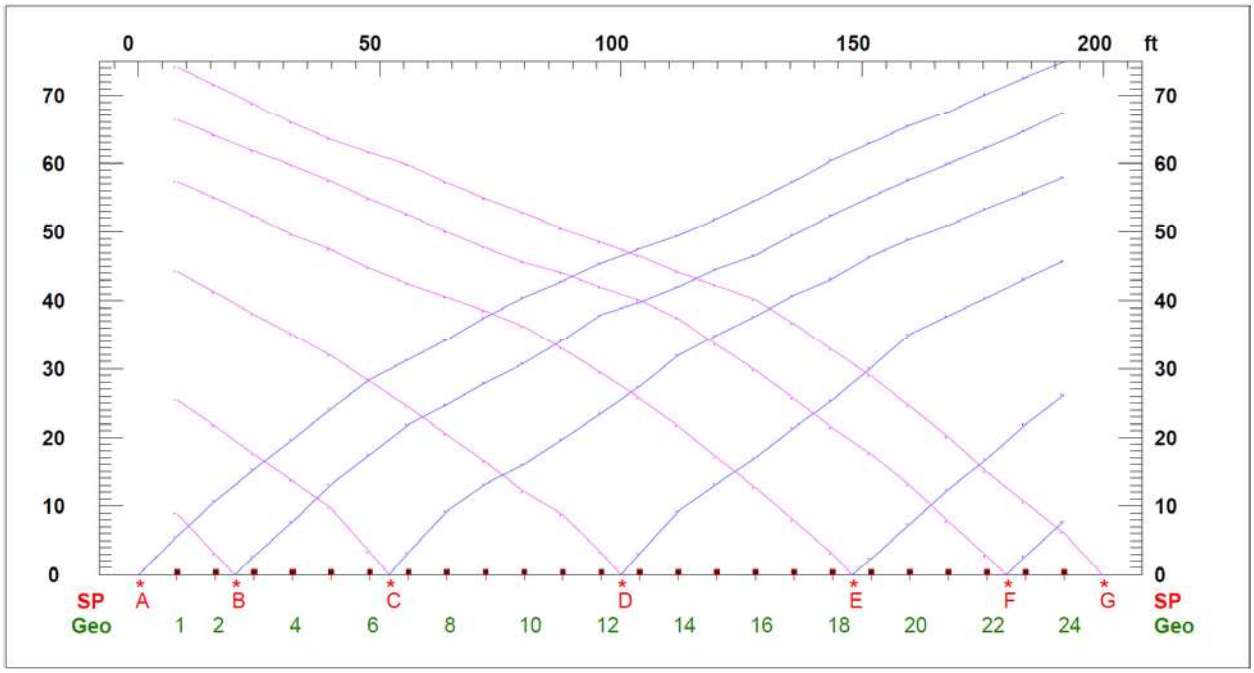
# SEISMIC LINE SL-2

## North 21° West >

### LAYER VELOCITY MODEL



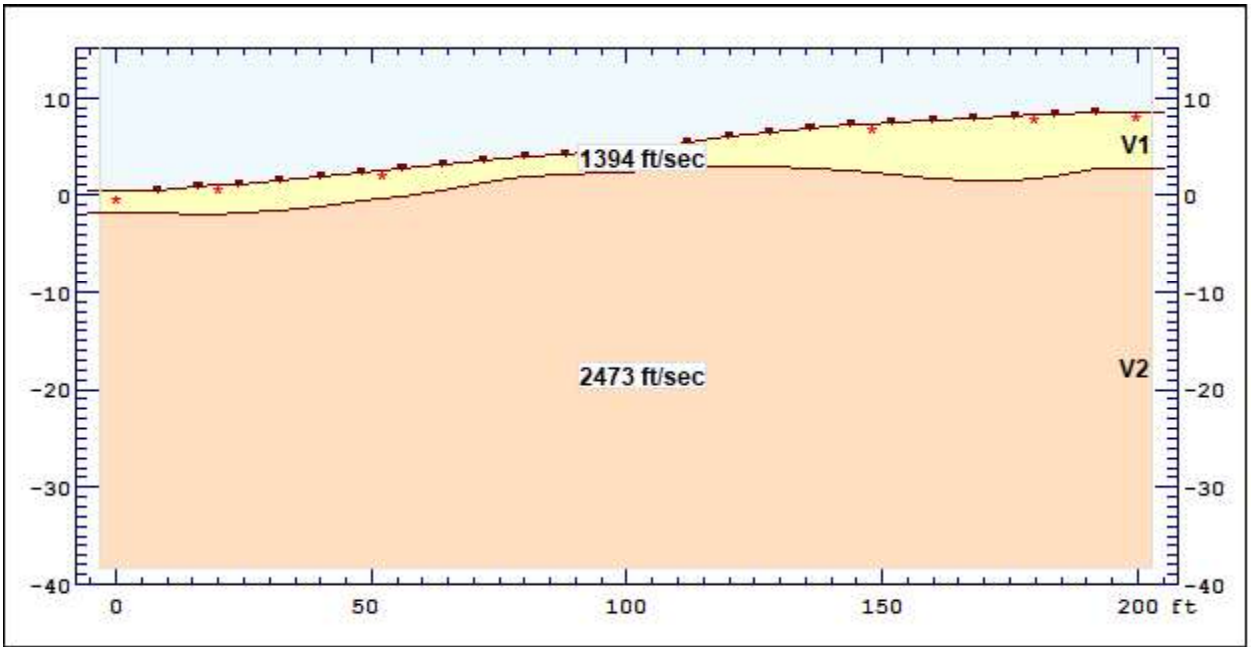

### TIME-DISTANCE PLOT



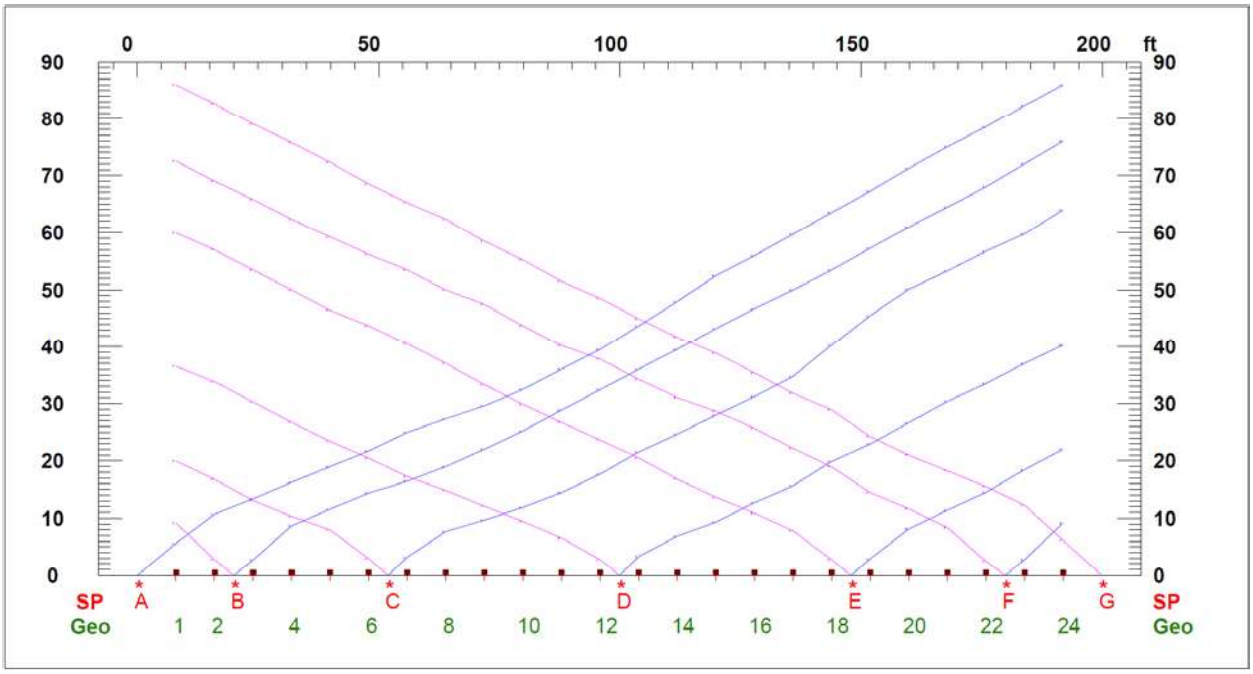
# SEISMIC LINE SL-3

## North 67° East >

### LAYER VELOCITY MODEL



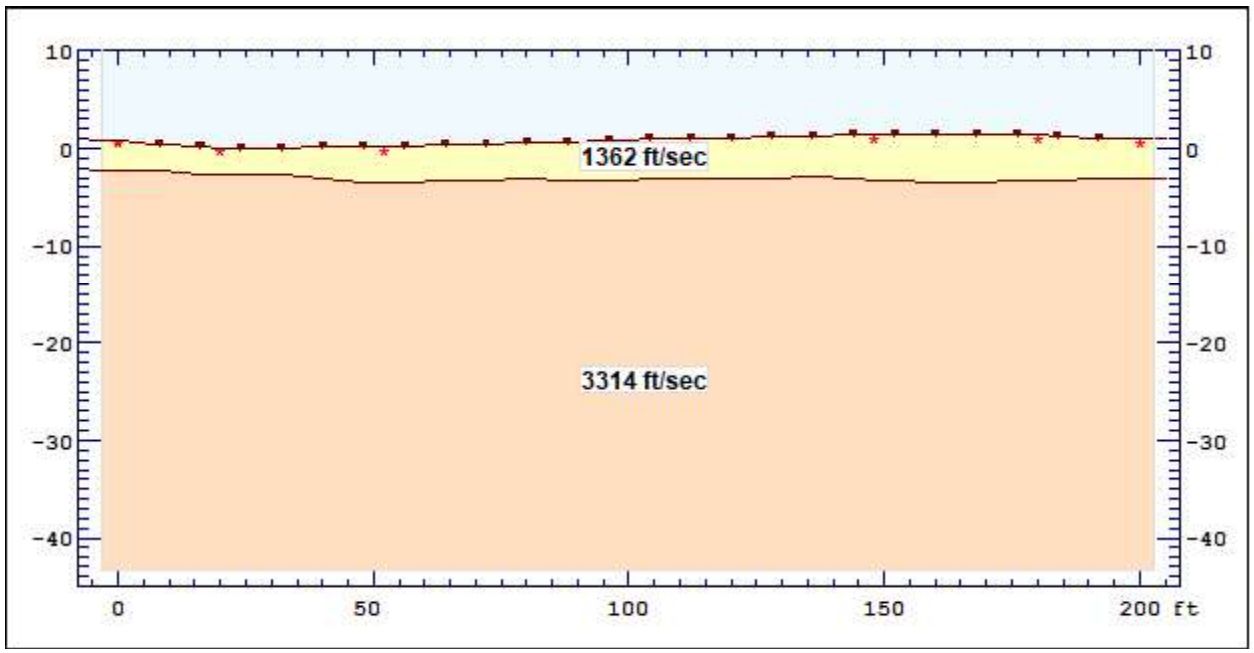

### TIME-DISTANCE PLOT



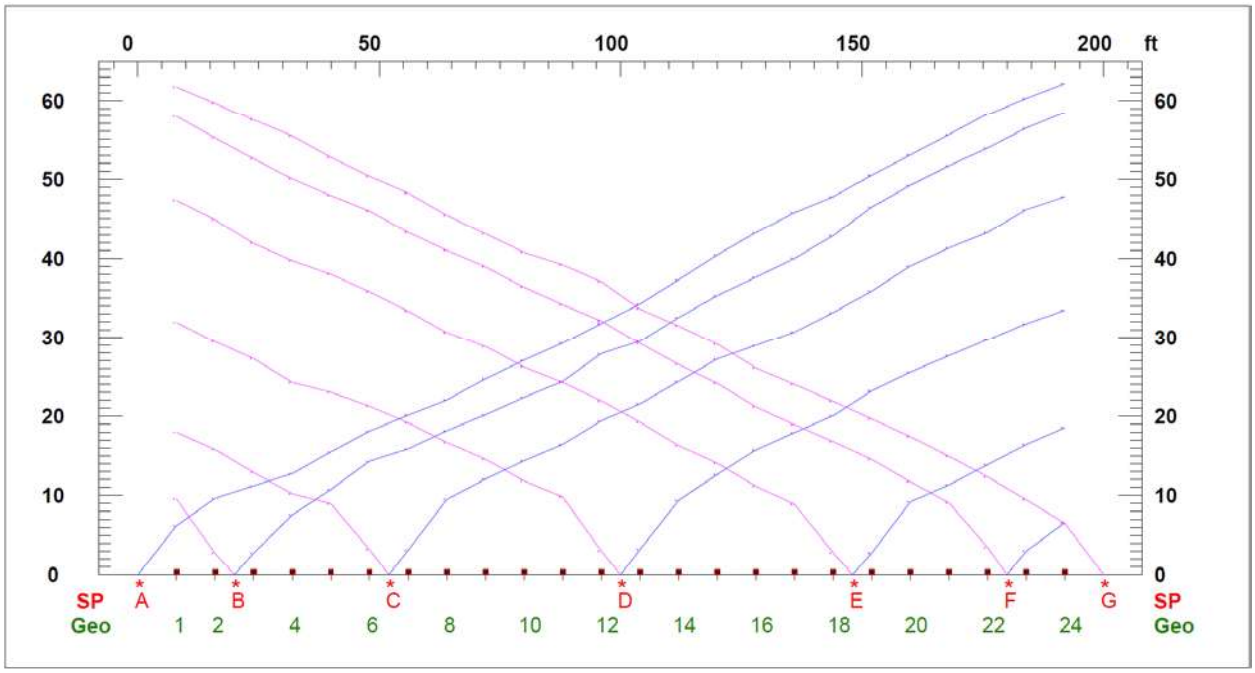
# SEISMIC LINE SL-4

## North 30° West >

### LAYER VELOCITY MODEL



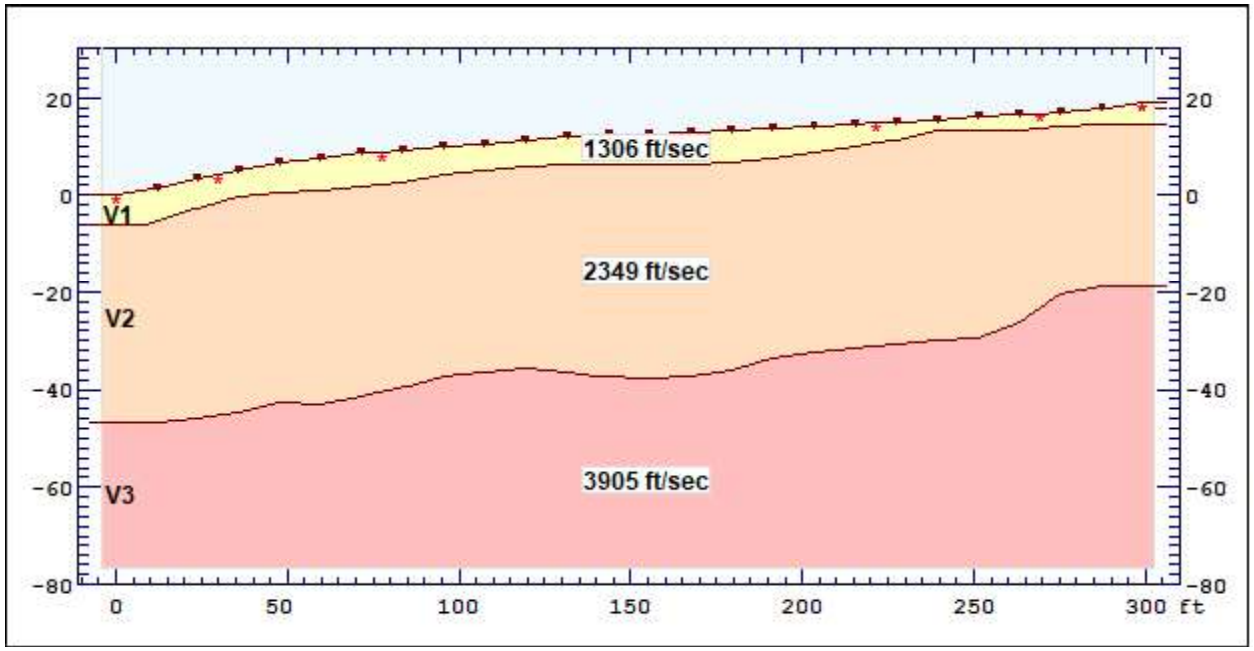

### TIME-DISTANCE PLOT



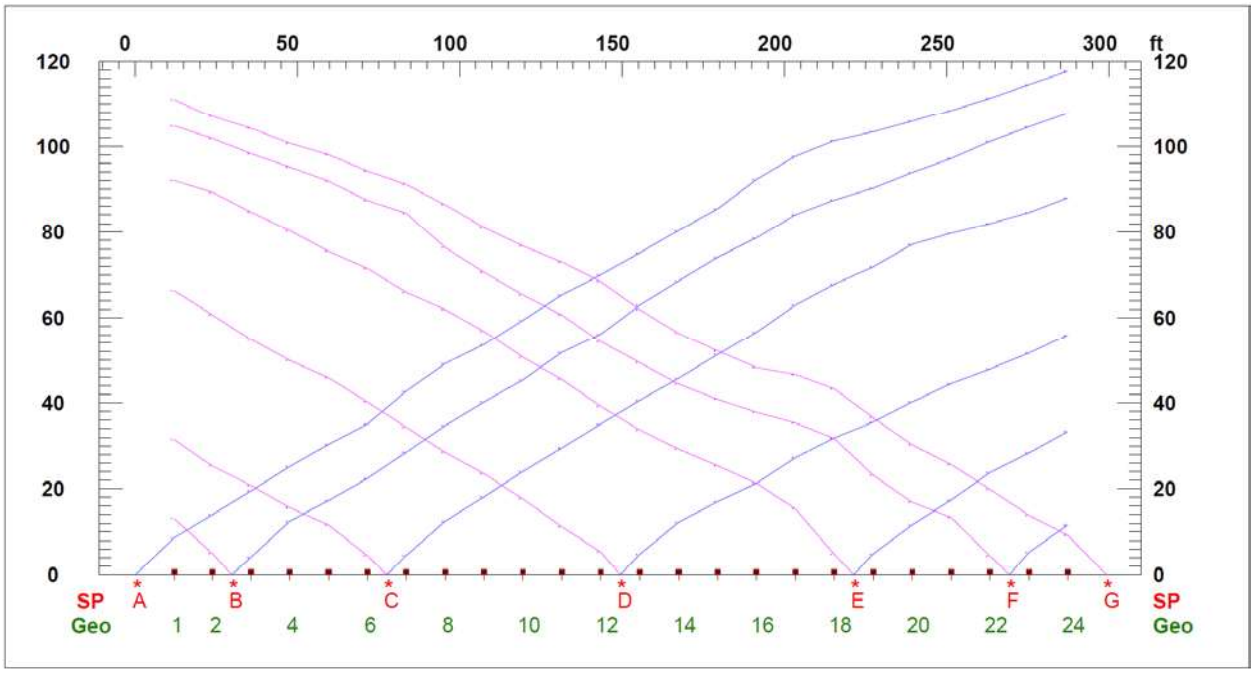
# SEISMIC LINE SL-5

## North 19° East >

### LAYER VELOCITY MODEL



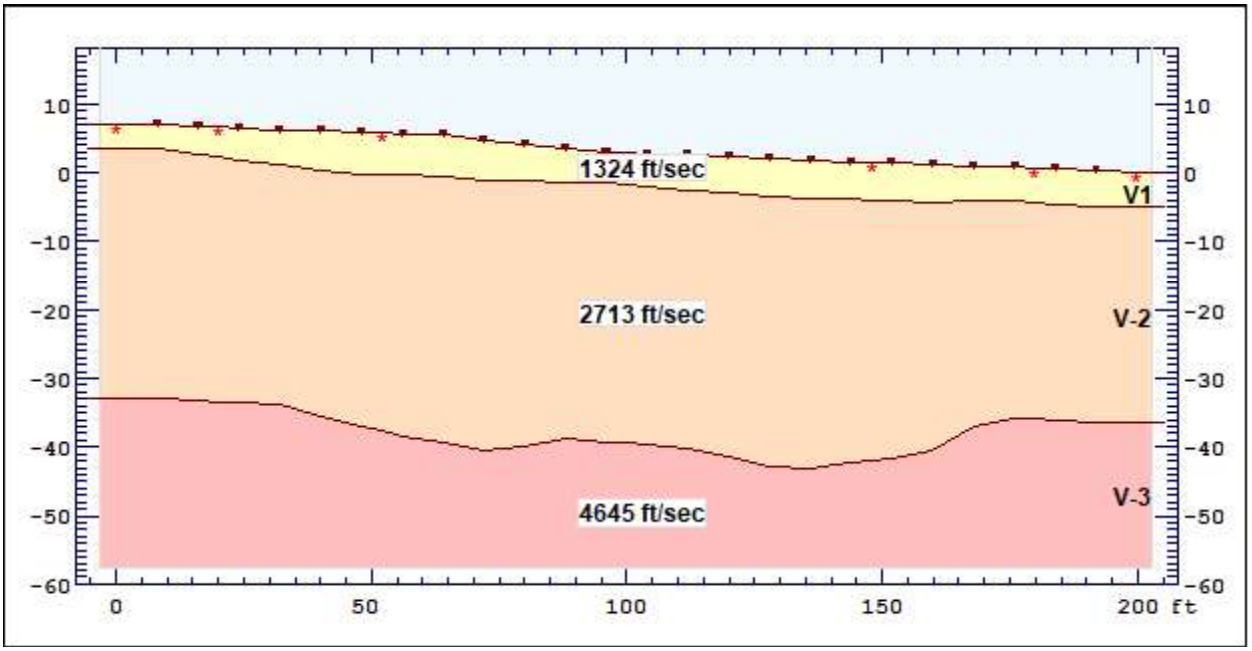

### TIME-DISTANCE PLOT



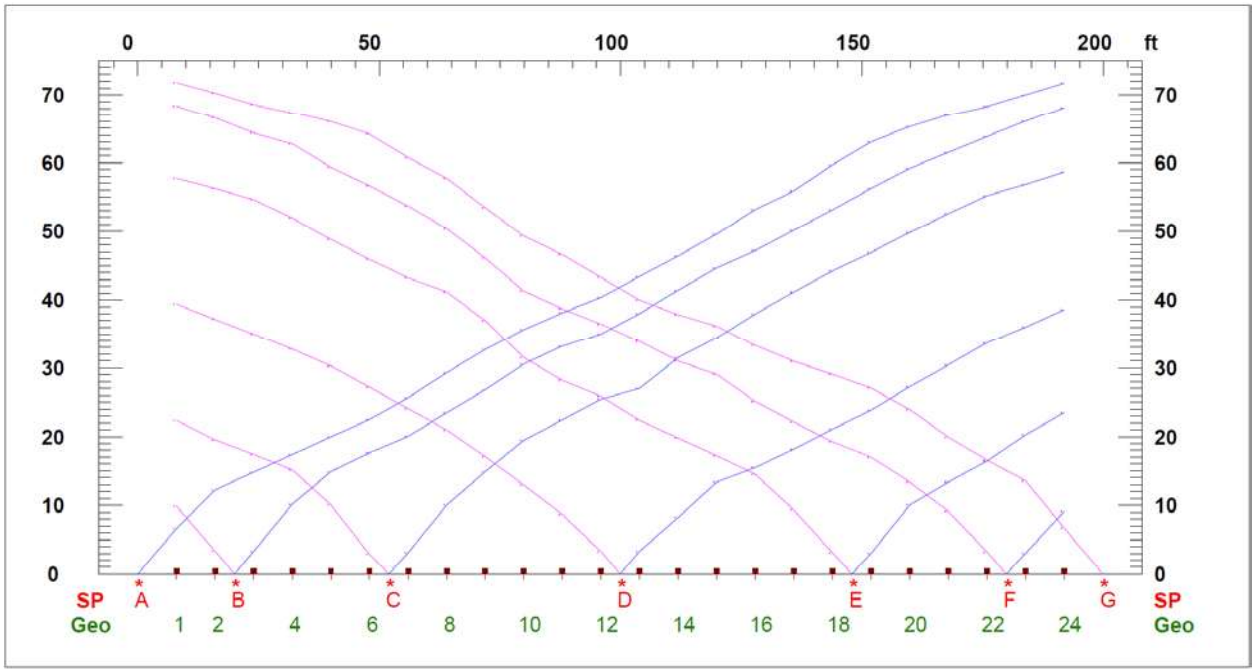
# SEISMIC LINE SL-6

## South 73° East >

### LAYER VELOCITY MODEL



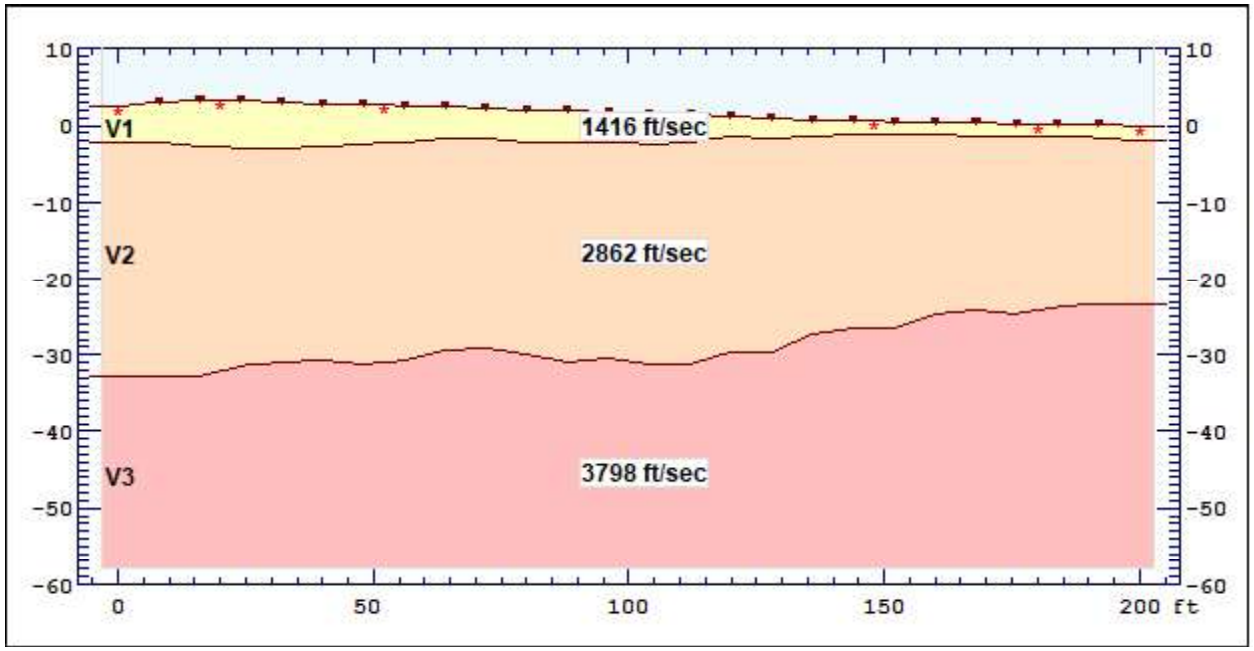

### TIME-DISTANCE PLOT



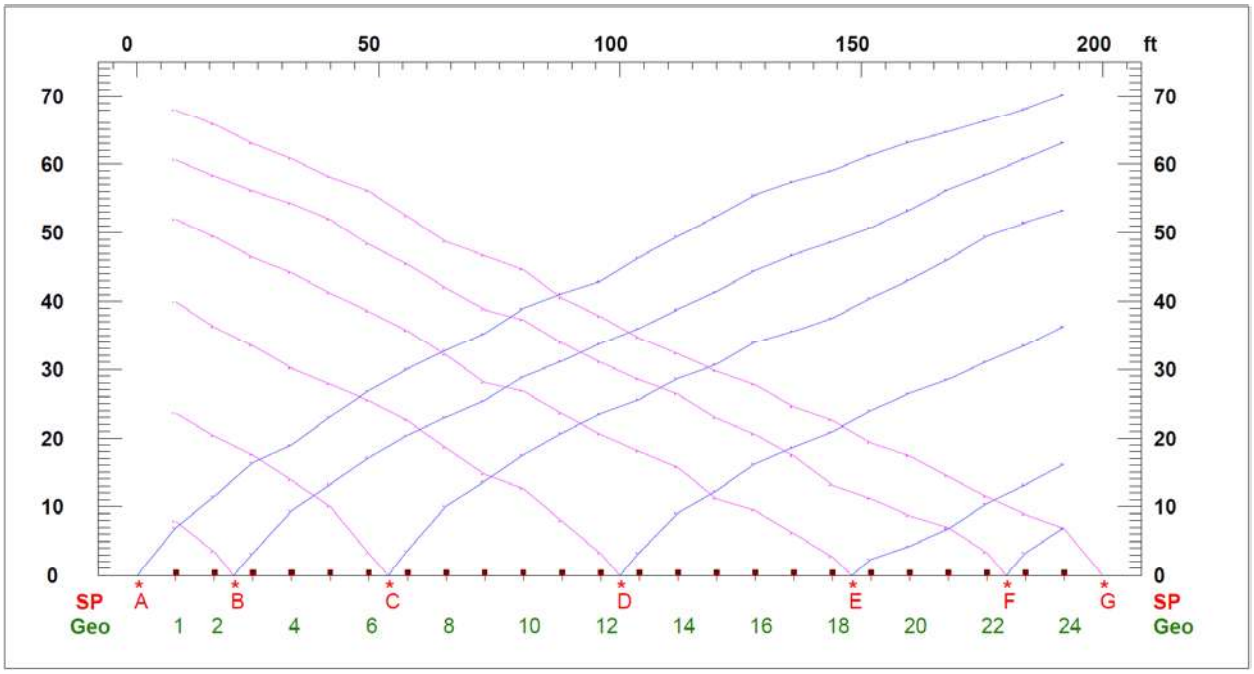
# SEISMIC LINE SL-7

## North 56° East >

### LAYER VELOCITY MODEL



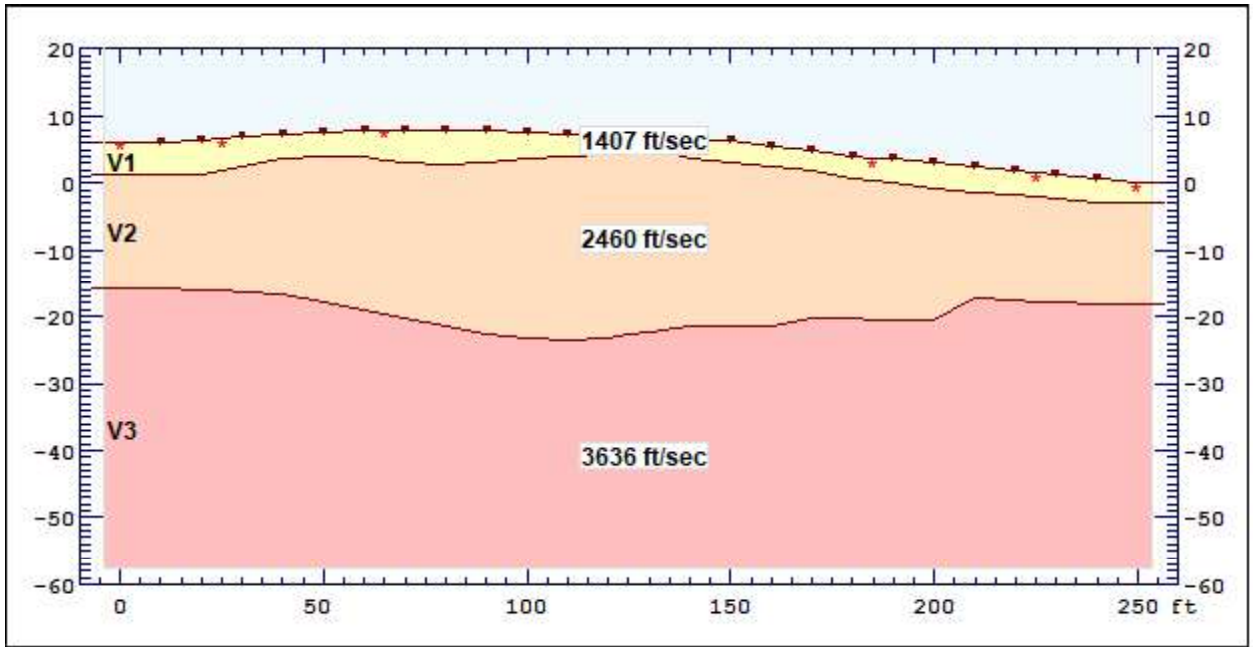

### TIME-DISTANCE PLOT



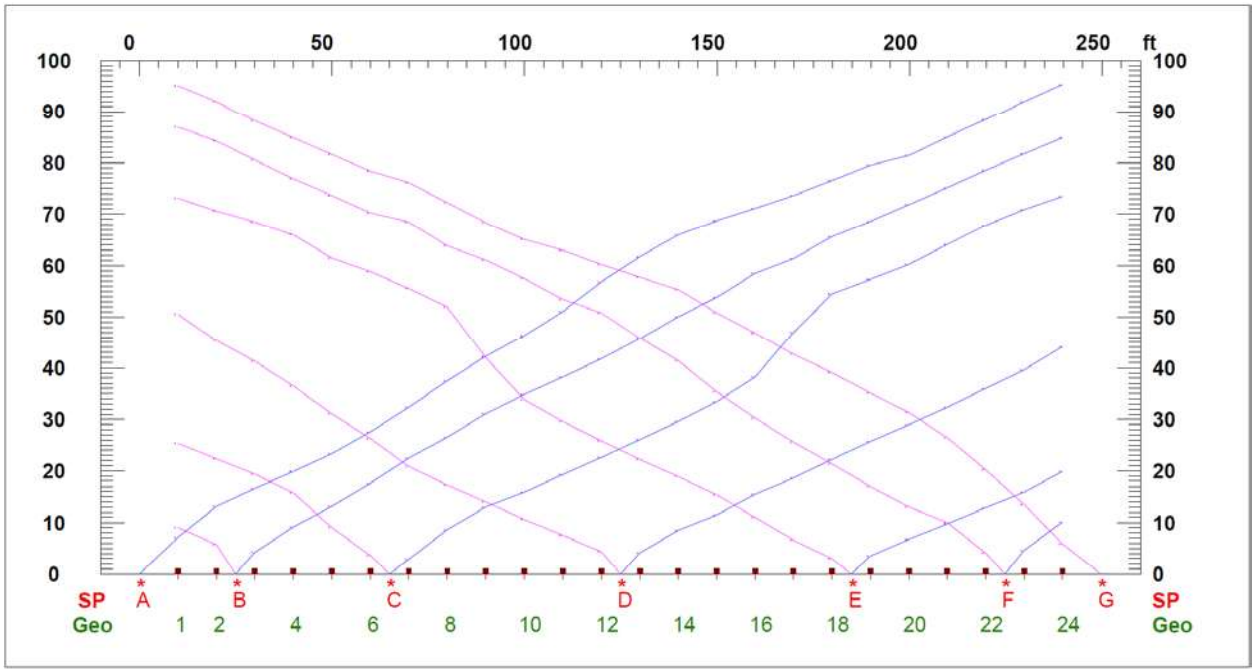
# SEISMIC LINE SL-8

## North 33° East >

### LAYER VELOCITY MODEL




### TIME-DISTANCE PLOT



# APPENDIX B

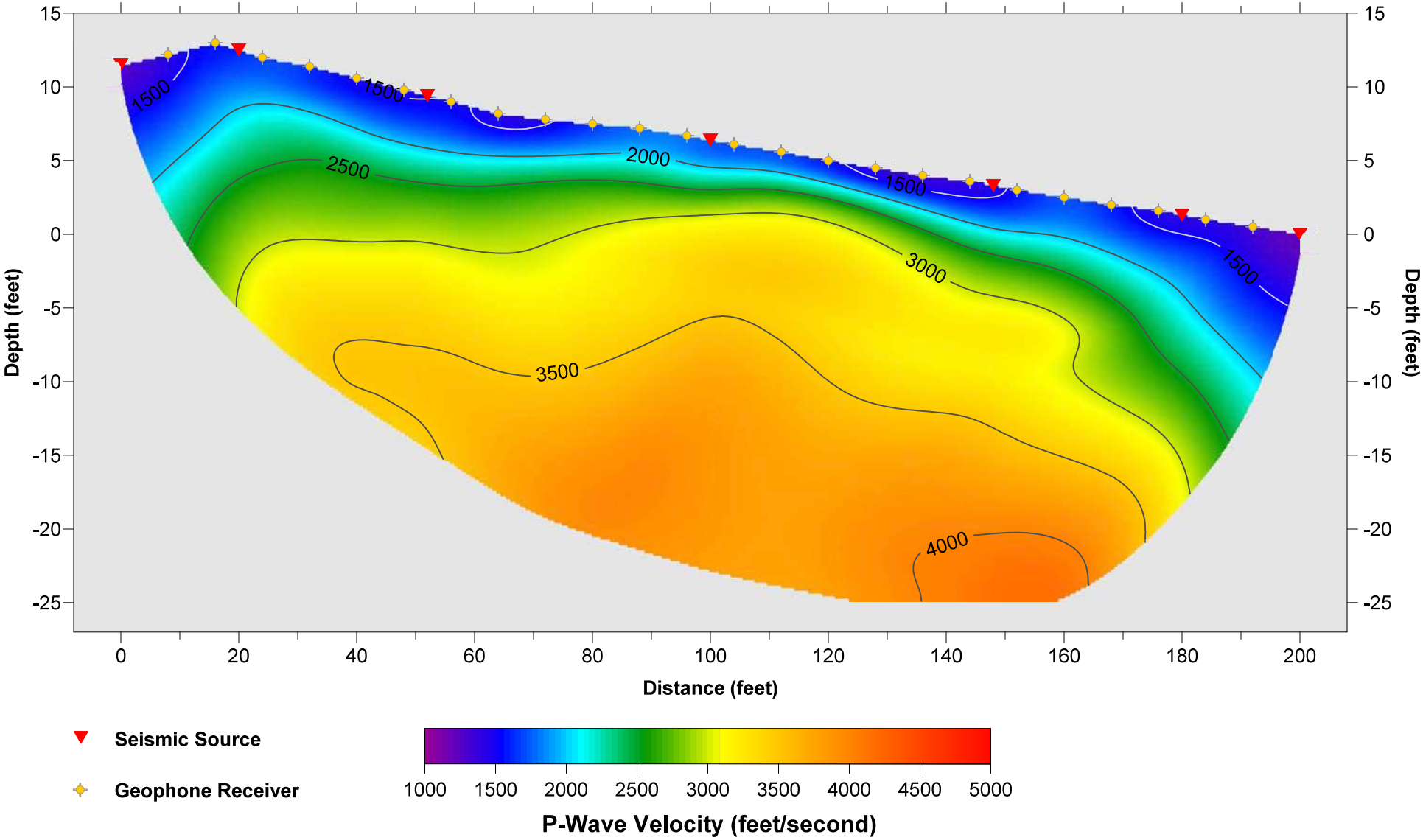
## REFRACTION TOMOGRAPHIC MODELS



# SEISMIC LINE SL-1

## North 7° East →

### REFRACTION TOMOGRAPHIC MODEL

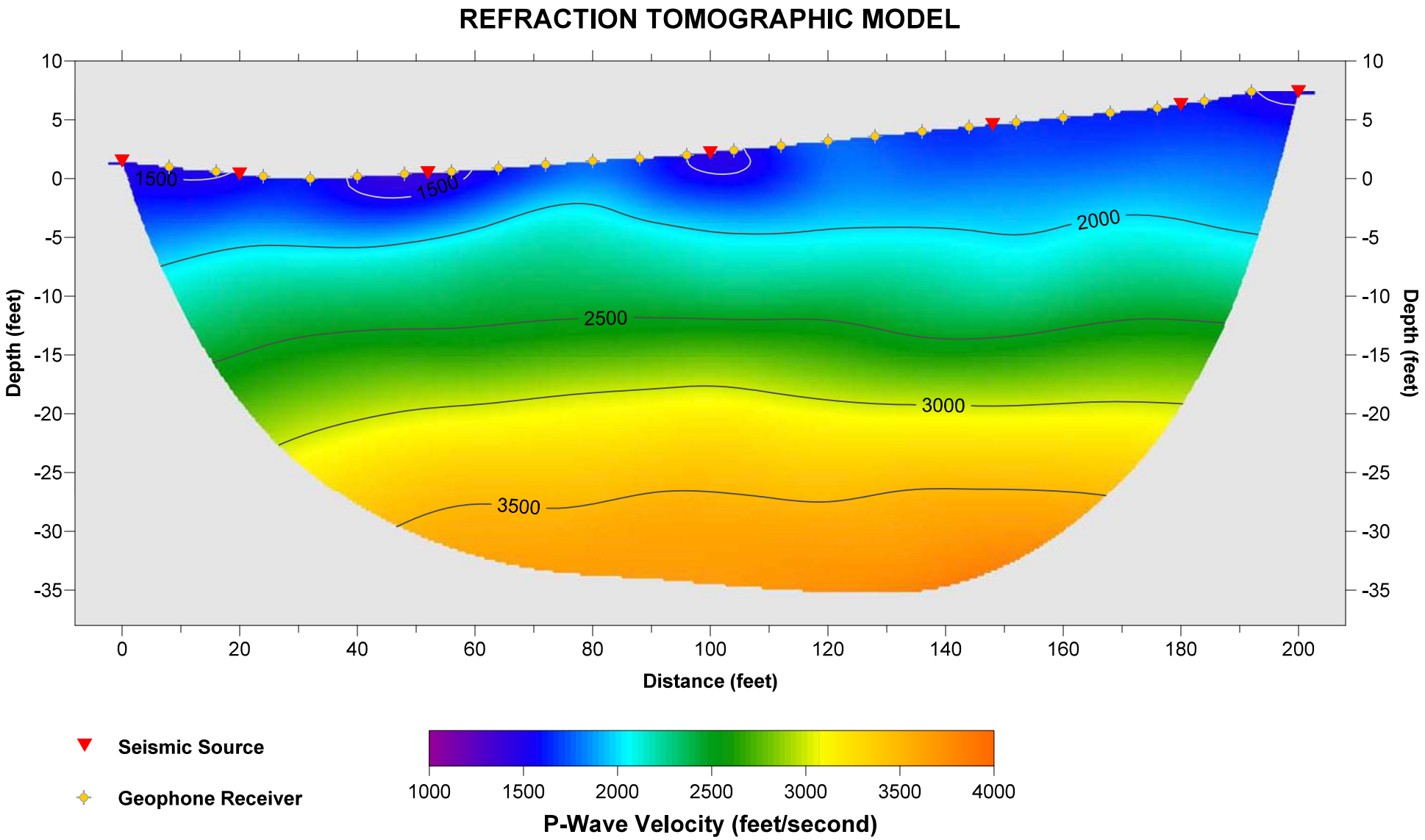



SCALE: Vertical Exaggeration 2.5X

RMS error 2.0%, Rayfract Version 4.06

# SEISMIC LINE SL-2

## North 21° West →

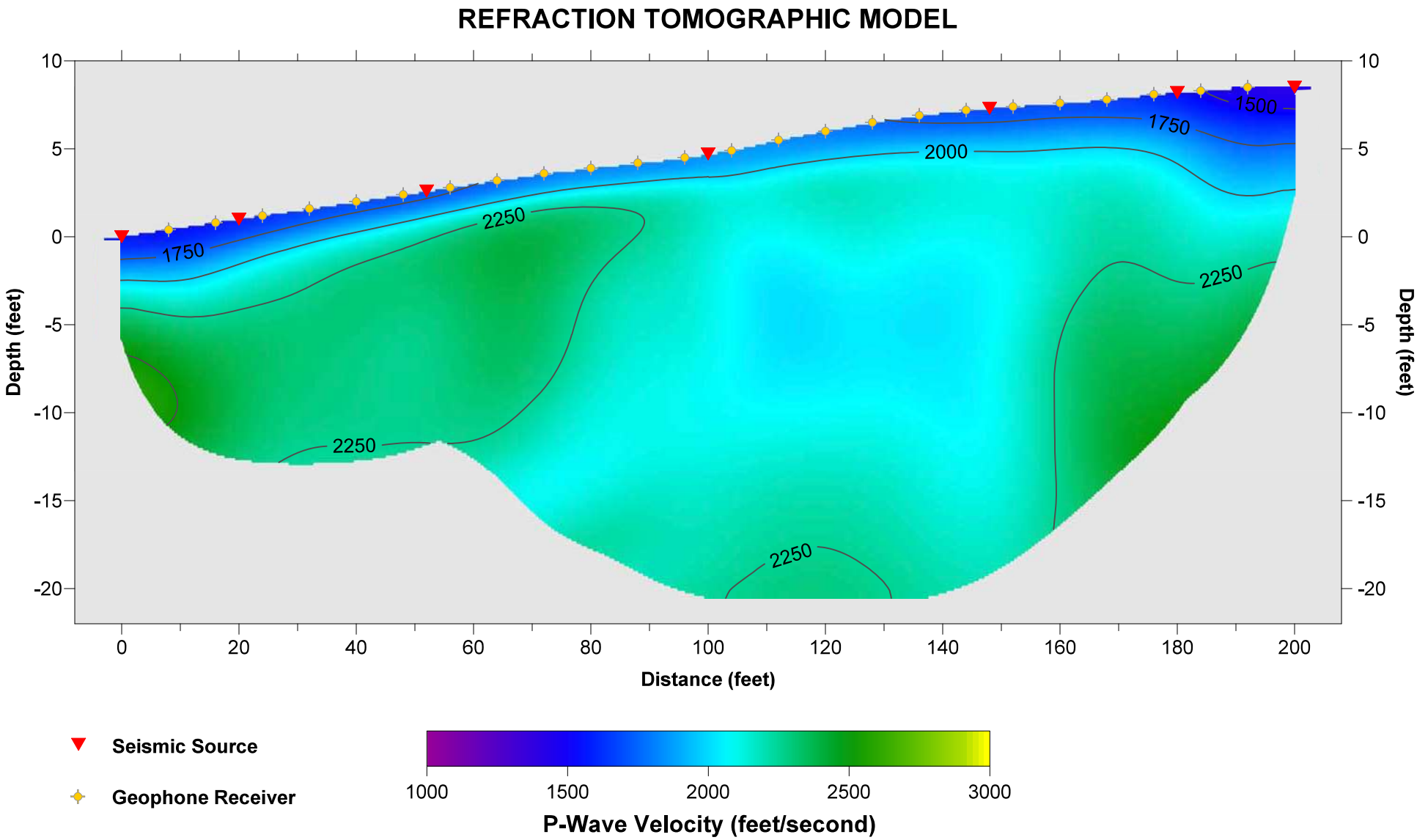



SCALE: Vertical Exaggeration 2X

RMS error 0.6%, Rayfract Version 4.06

# SEISMIC LINE SL-3

## North 67° East →

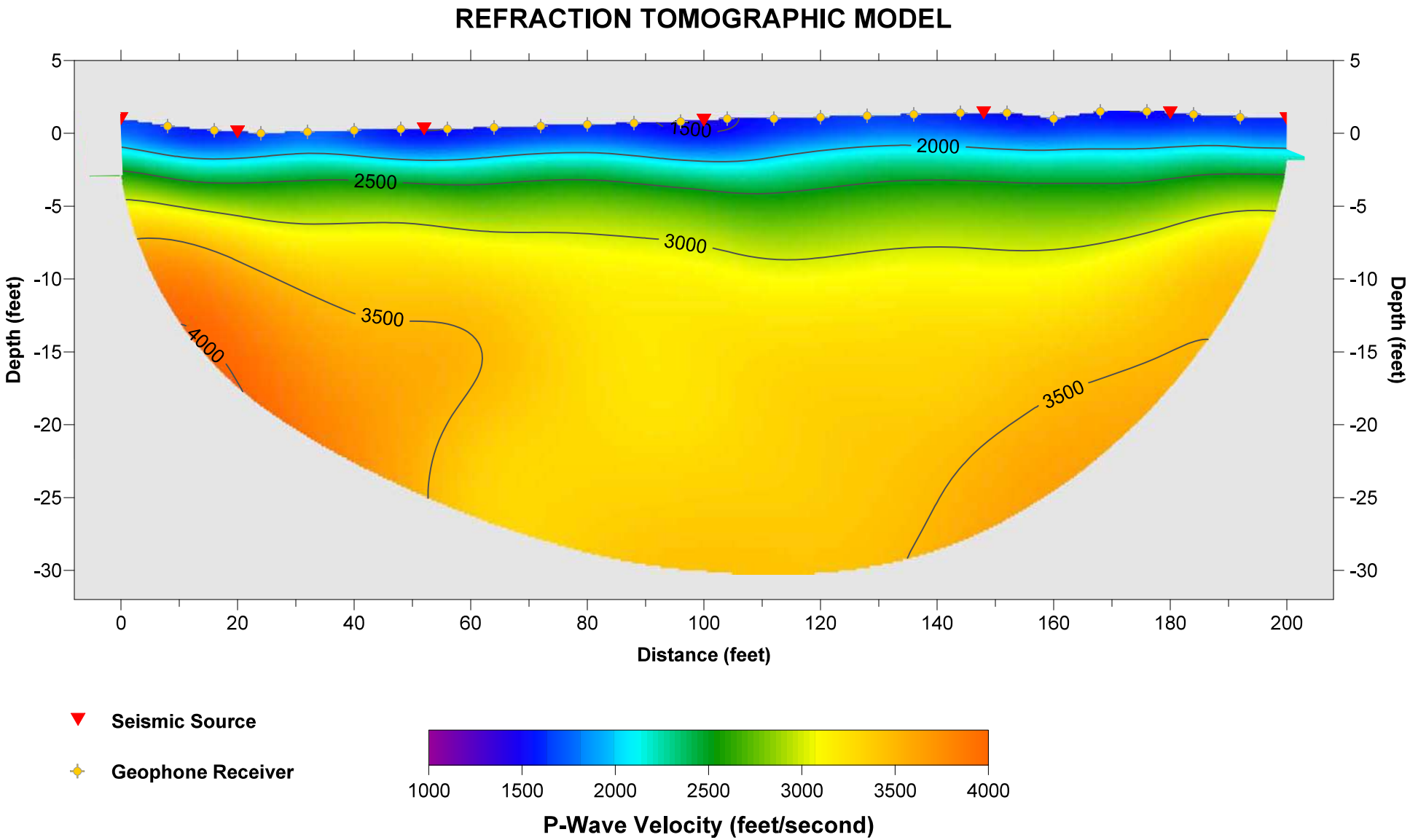



SCALE: Vertical Exaggeration 3X

RMS error 2.1%, Rayfract Version 4.06

# SEISMIC LINE SL-4

## North 30° West →

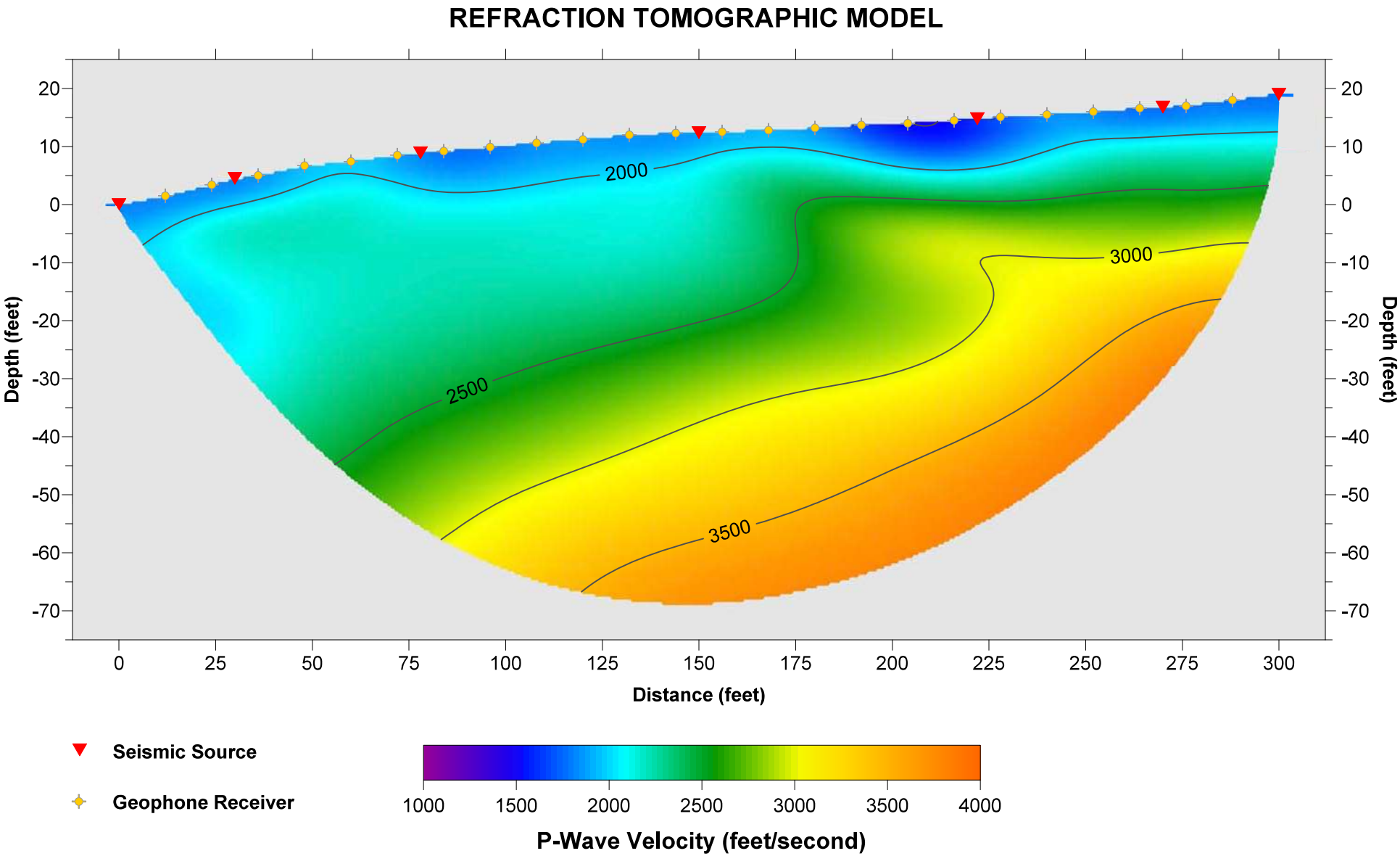



SCALE: Vertical Exaggeration 2.5X

RMS error 1.4%, Rayfract Version 4.06

# SEISMIC LINE SL-5

## North 19° East →

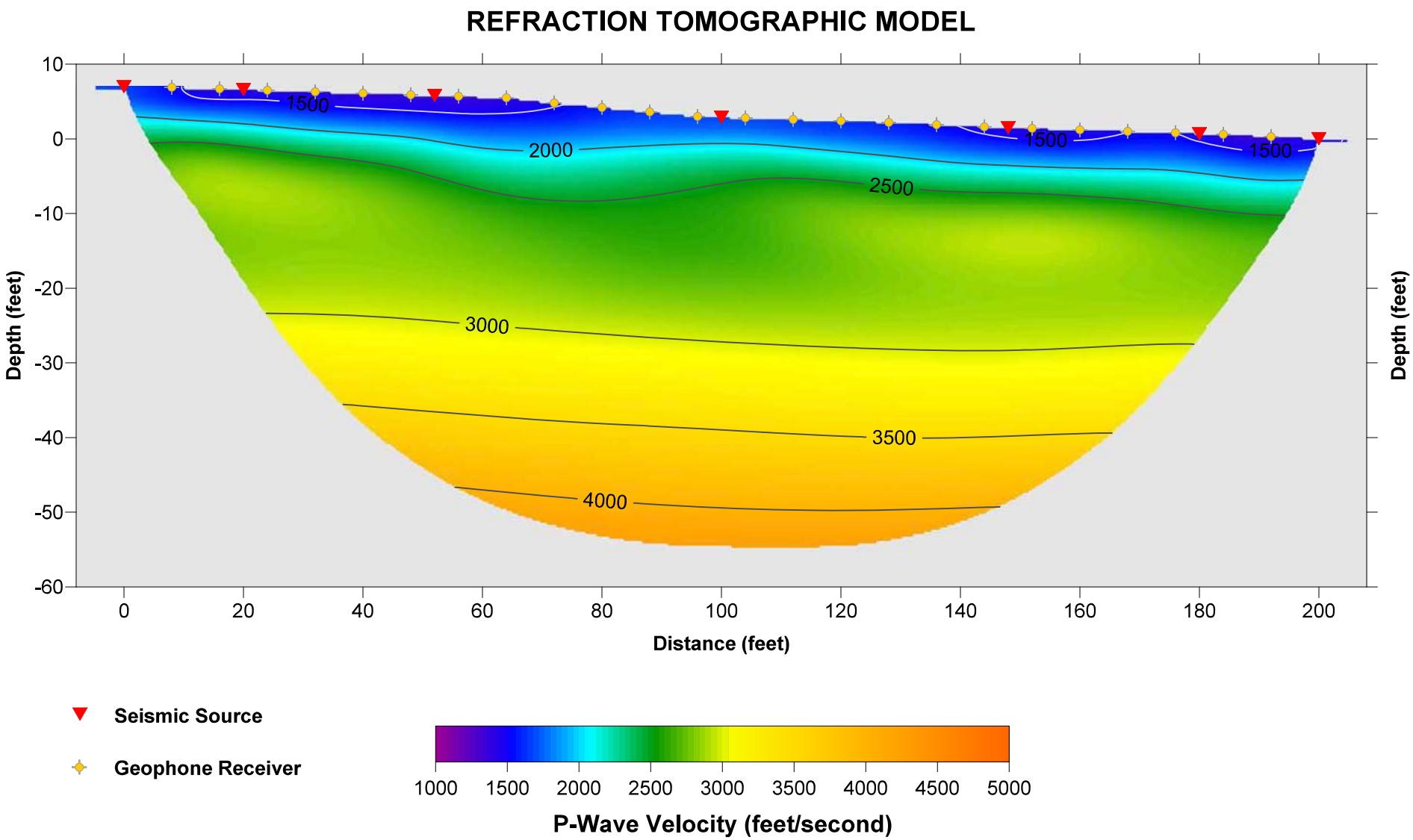



SCALE: Vertical Exaggeration 1.5X

RMS error 1.2%, Rayfract Version 4.06

# SEISMIC LINE SL-6

## South 73° East →

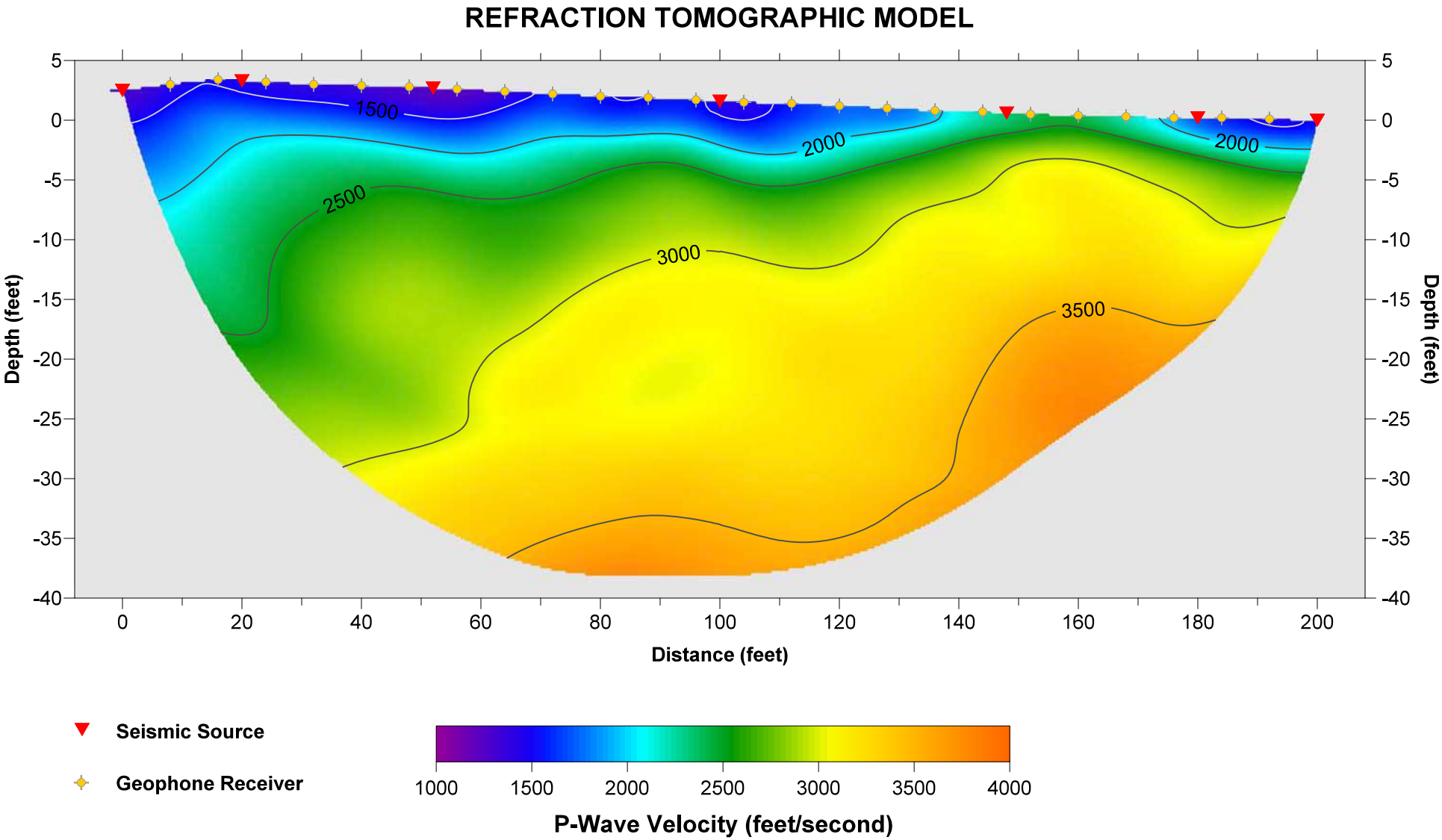



SCALE: Vertical Exaggeration 1.25X

RMS error 1.2%, Rayfract Version 4.06

# SEISMIC LINE SL-7

## North 56° East →

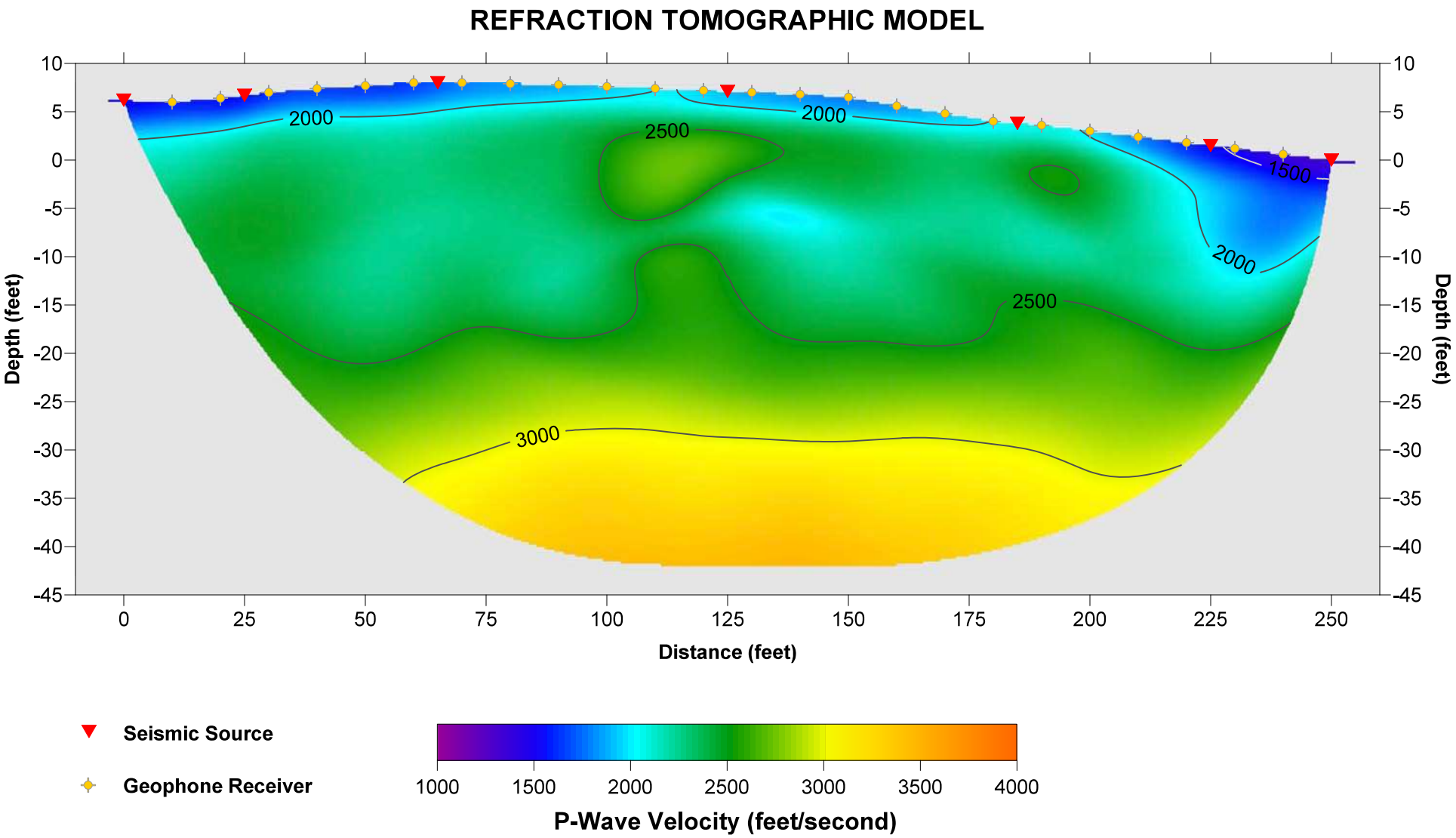



SCALE: Vertical Exaggeration 2X

RMS error 1.4%, Rayfract Version 4.06

# SEISMIC LINE SL-8

## North 33° East →




SCALE: Vertical Exaggeration 2X

RMS error 2.6%, Rayfract Version 4.06

# APPENDIX C

## EXCAVATION CONSIDERATIONS

# EXCAVATION CONSIDERATIONS

These excavation considerations have been included to provide the client with a brief overall summary of the general complexity of hard bedrock excavation. It is considered the client's responsibility to ensure that the grading contractor they select is both properly licensed and qualified, with experience in hard-bedrock ripping processes. To evaluate whether a particular bedrock material can be ripped, this geophysical survey should be used in conjunction with the geologic or geotechnical report prepared for the project which describes the physical properties of the bedrock. The physical characteristics of bedrock materials that favor ripping generally include the presence of fractures, faults and other structural discontinuities, weathering effects, brittleness or crystalline structure, stratification of lamination, large grain size, moisture permeated clay, and low compressive strength. Unfavorable conditions can include such characteristics as massive and homogeneous formations, non-crystalline structure, absence of planes of weakness, fine-grained materials, and formations of clay origin where moisture makes the material plastic.

When assessing the potential rippability of the underlying bedrock of a given site, the above geologic characteristics along with the estimated seismic velocities can then be used to evaluate what type of equipment may be appropriate for the proposed grading. When selecting the proper ripping equipment there are three primary factors to consider, which are:

- ***Down Pressure available at the tip, which determines the ripper penetration that can be attained and maintained,***
- ***Tractor flywheel horsepower, which determines whether the tractor can advance the tip, and,***
- ***Tractor gross-weight, which determines whether the tractor will have sufficient traction to use the horsepower.***

In addition to selecting the appropriate tractor, selection of the proper ripper design is also important. There are basically three designs, being radial, parallelogram, and adjustable parallelogram, of which the contractor should be aware of when selecting the appropriate design to be used for the project. The penetration depth will depend upon the down-pressure and penetration angle, as well as the length of the shank tips (short, intermediate, and long).

Also, important in the excavation process is the ripping technique used as well as the skill of the individual tractor operator. These techniques include the use of one or more ripping teeth, up- and down-hill ripping, and the direction of ripping with respect to the geologic structure of the bedrock locally. The use of two tractors (one to push the first tractor-ripper) can extend the range of materials that can be ripped. The second tractor can also be used to supply additional down-pressure on the ripper. Consideration of light blasting can also facilitate the ripper penetration and reduce the cost of moving highly consolidated rock formations.

All of the combined factors above should be considered by both the client and the grading contractor, to ensure that the proper selection of equipment and ripping techniques are used for the proposed grading.

# APPENDIX D

## REFERENCES

# REFERENCES


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# APPENDIX G

# APPENDIX C

# LABORATORY TESTS

## INTRODUCTION

Representative undisturbed soil samples and bulk samples were carefully packaged in the field and sealed to prevent moisture loss. The samples were then transported to our Cypress laboratory for examination and testing assignments. Laboratory tests were performed on selected representative samples as an aid in classifying the soils and bedrock materials and to evaluate the physical properties of the soils and bedrock materials affecting foundation design and construction procedures. Detailed descriptions of the laboratory tests are presented below under the appropriate test headings. Test results are presented in the figures that follow.

## MOISTURE CONTENT AND DRY DENSITY

Moisture content and dry density were determined from select ring samples. The samples were first trimmed to obtain volume and wet weight and then were dried in accordance with ASTM D2216. After drying, the weight of each sample was measured, and moisture content and dry density were calculated. Moisture content and dry density values are presented on the Logs of Borings and Test Pits in Appendices A and B.

## GRAIN SIZE DISTRIBUTION

Selected samples were dried, weighed, soaked in water until individual particles were separated, and then washed on the No. 200 sieve. That portion of the material retained on the No. 200 sieve was oven-dried and weighed to determine the percentage of the material passing the No. 200 sieve. Afterwards, the retained material was run through a standard set of sieves in accordance with ASTM D422 for select samples. The percentage passing the No. 200 sieve for each sample are tabulated below. The grain size distribution obtained from the full sieve analysis of six samples are presented in Figures C-1 and C-2.

| BORING NO. | DEPTH (ft) | SOIL DESCRIPTION | PERCENT PASSING No. 200 SIEVE |
|---|---|---|---|
| B-102 | 7 | Silty Sandstone | 31 |
| B-102 | 20 | Sandy Siltstone | 57 |
| B-103 | 0-5 | Sandy Silt (ML) | 54 |
| B-103 | 21 | Silty Sandstone | 42 |
| B-105 | 3 | Silty Sand | 35 |
| B-106 | 15 | Silty Sandstone | 42 |
| B-106 | 20 | Silty Sandstone | 24 |
| B-108 | 0-5 | Sandy Silt (ML) | 51 |
| B-109 | 15 | Silty Sandstone | 35 |
| B-110 | 5 | Sandstone | 12 |
| B-110 | 17.5 | Siltstone | 71 |
| B-110 | 20 | Silty Sandstone | 30 |
| TP-102 | 8 | Sandy Clay (CL) | 67 |
| TP-103 | 4 | Sandstone | 10 |
| TP-104 | 4 | Silty Sandstone | 19 |
| TP-106 | 4 | Sandy Clay (CL) | 51 |

| BORING NO. | DEPTH (ft) | SOIL DESCRIPTION | PERCENT PASSING No. 200 SIEVE |
|---|---|---|---|
| TP-109 | 3 | Silty Sand (SM) | 24 |
| TP-110 | 9 | Silty Sand (SM) | 12 |

## ATTERBERG LIMITS

The liquid and plastic limits were determined for select cohesive soil samples in accordance with ASTM D4318. The results of the Atterberg Limits tests are presented in Figure C-3.

## DIRECT SHEAR

Direct shear tests were performed on undisturbed and remolded bulk samples in accordance with ASTM D3080. The bulk samples were remolded to approximately 90 percent of maximum density (ASTM D1557). The samples were placed in the shear machine, and a normal load comparable to the in-situ overburden stress was applied. The samples were inundated, allowed to consolidate, and then were sheared to failure. The tests were repeated on additional test specimens under increased normal loads. Shear stress and sample deformation were monitored throughout the test. The results of the direct shear tests are presented in Figures C-4 to C-7.

## CONSOLIDATION

One-dimensional consolidation test was performed on undisturbed samples in accordance with ASTM D2435. After trimming the ends, the sample was placed in the consolidometer and loaded to up to 0.4 ksf. Thereafter, the sample was incrementally loaded to a maximum load of up to 25.6 ksf. The samples were inundated at 3.2 ksf. Sample deformation was measured to 0.0001 inch. Rebound behavior was investigated by unloading the sample back to 0.4 ksf. The results of the consolidation tests, in the form of percent consolidation versus log pressure, are presented in Figures C-8 to C-11.

## HYDROCONSOLIDATION

One-dimensional consolidation testing was performed on an undisturbed sample in accordance with ASTM D5333. After trimming the ends, the sample was placed in the consolidometer and loaded to 0.4ksf. Thereafter, the samples were incrementally loaded to a maximum load of 3.2 ksf at the in-situ moisture content and then saturated. Sample deformation was measured to 0.0001 inch. The amount of collapse is shown below as percent compression of the sample.

| BORING NO. | DEPTH (ft) | SOIL DESCRIPTION | TOTAL COLLAPSE (%) |
|---|---|---|---|
| B-109 | 27.5 | Sandstone | 0.4 |

## COMPACTION TEST

Maximum dry density/optimum moisture tests were performed in accordance with ASTM D1557 on representative bulk samples of the site soils. The test results are as follows:

| BORING NO. | DEPTH (ft) | SOIL DESCRIPTION | MAXIMUM DRY DENSITY (pcf) | OPTIMUM MOISTURE (%) |
|---|---|---|---|---|
| B-103 | 0-5 | Silty Sand (SM) | 128 | 9.5 |
| B-108 | 0-5 | Sandy Silt (ML) | 122 | 12 |

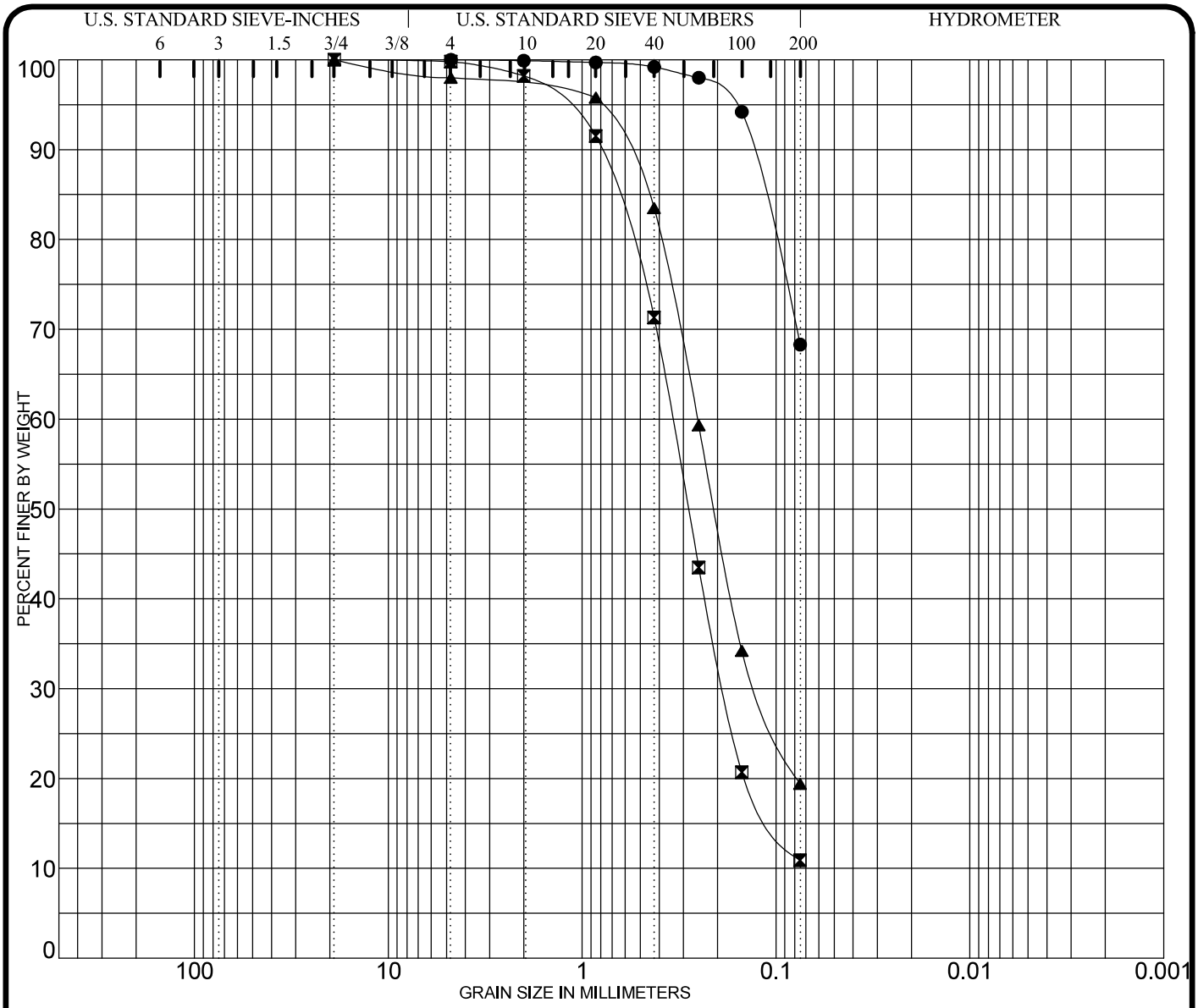
## EXPANSION INDEX TEST

Expansion index tests were performed on representative bulk samples. The tests were performed in accordance with ASTM D4829 to assess the expansion potential of the on-site soils. The results of the test are summarized below.

| BORING NO. | DEPTH (ft) | SOIL DESCRIPTION | EXPANSION INDEX, EI | EXPANSION POTENTIAL |
|---|---|---|---|---|
| B-108 | 0-5 | Sandy Silt (ML) | 45 | Low |
| TP-106 | 4-5 | Sandy Clay (CL) | 42 | Low |

## CORROSIVITY

Soil corrosivity testing was performed by HDR on sample provided by GPI. The test results are summarized in Table 1 of this Appendix.




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Sample Location | | Classification | MC% | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|---|
| ● | TP-102 | 8.0 | SANDY CLAY (CL) | | | | | | |
| ⊠ | TP-103 | 4.0 | SANDSTONE | | | | | 1.42 | 4.9 |
| ▲ | TP-104 | 4.0 | SILTY SANDSTONE | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

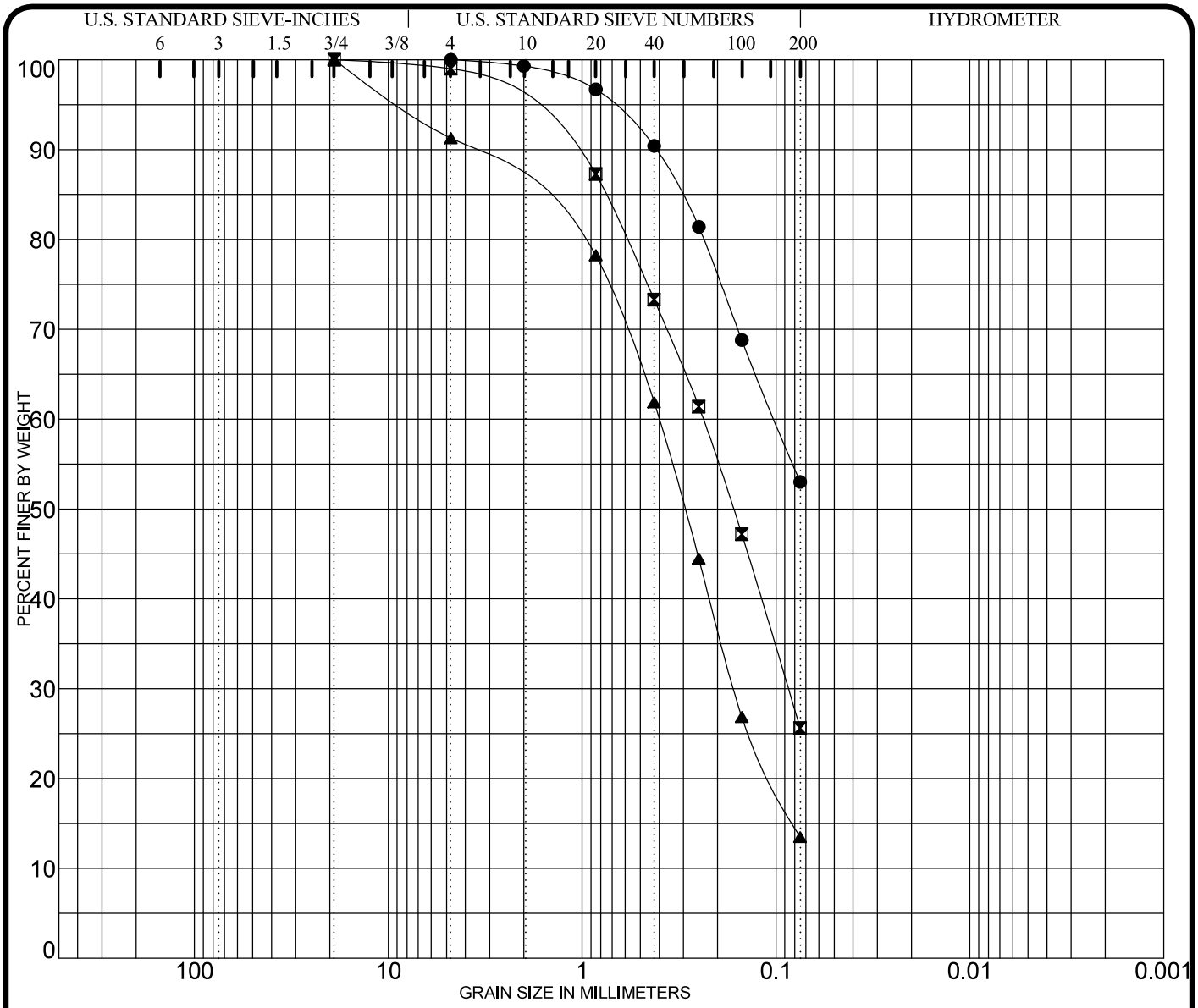
| | Sample Location | | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | TP-102 | 8.0 | 4.75 | | | | 0.0 | 31.7 | 68.3 | |
| ⊠ | TP-103 | 4.0 | 19.00 | 0.34 | 0.185 | | 0.2 | 88.9 | 10.9 | |
| ▲ | TP-104 | 4.0 | 19.00 | 0.25 | 0.123 | | 2.0 | 78.6 | 19.4 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

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# GRAIN SIZE DISTRIBUTION

FIGURE C-1




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Sample Location | | Classification | MC% | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|---|
| ● | TP-106 | 4.0 | SANDY CLAY (CL) | | | | | | |
| ⊠ | TP-109 | 3.0 | SILTY SAND (SM) | | | | | | |
| ▲ | TP-110 | 9.0 | SILTY SAND (SM) | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

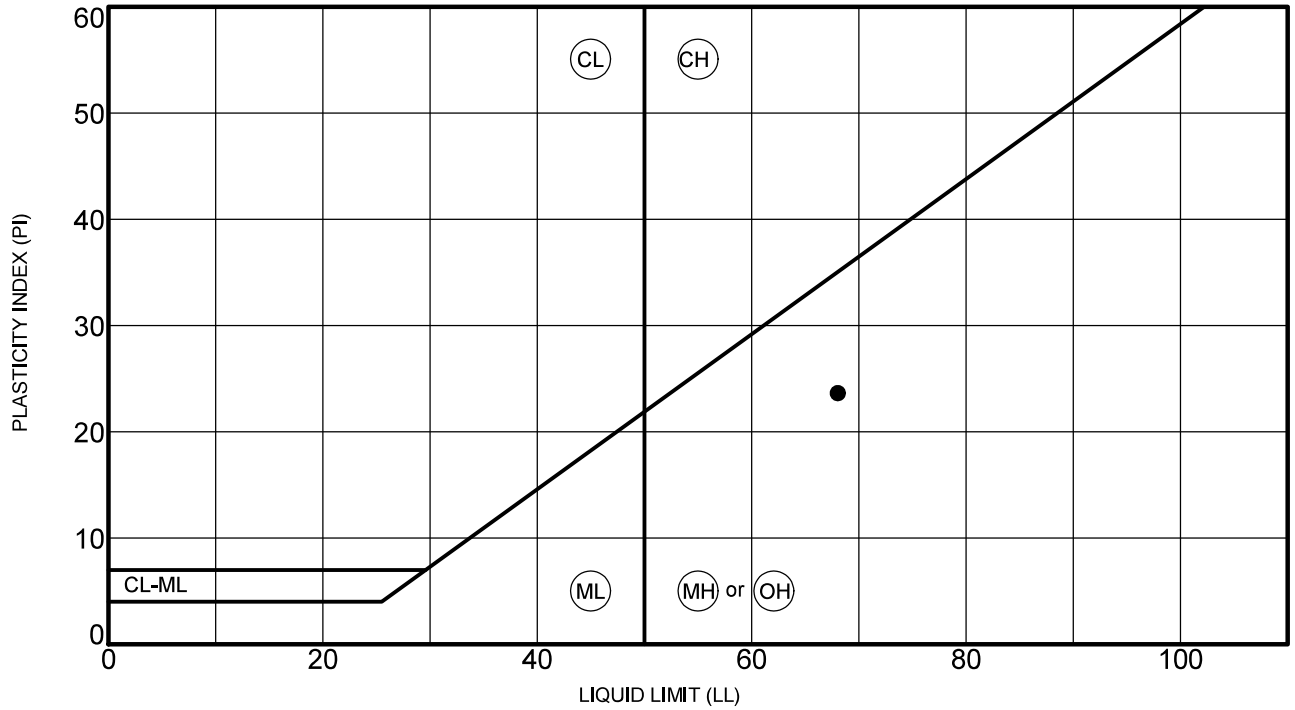
| | Sample Location | | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | TP-106 | 4.0 | 4.75 | 0.10 | | | 0.0 | 47.0 | 53.0 | |
| ⊠ | TP-109 | 3.0 | 19.00 | 0.24 | 0.086 | | 1.0 | 73.4 | 25.6 | |
| ▲ | TP-110 | 9.0 | 19.00 | 0.40 | 0.164 | | 8.7 | 77.8 | 13.5 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

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## GRAIN SIZE DISTRIBUTION

FIGURE C-2



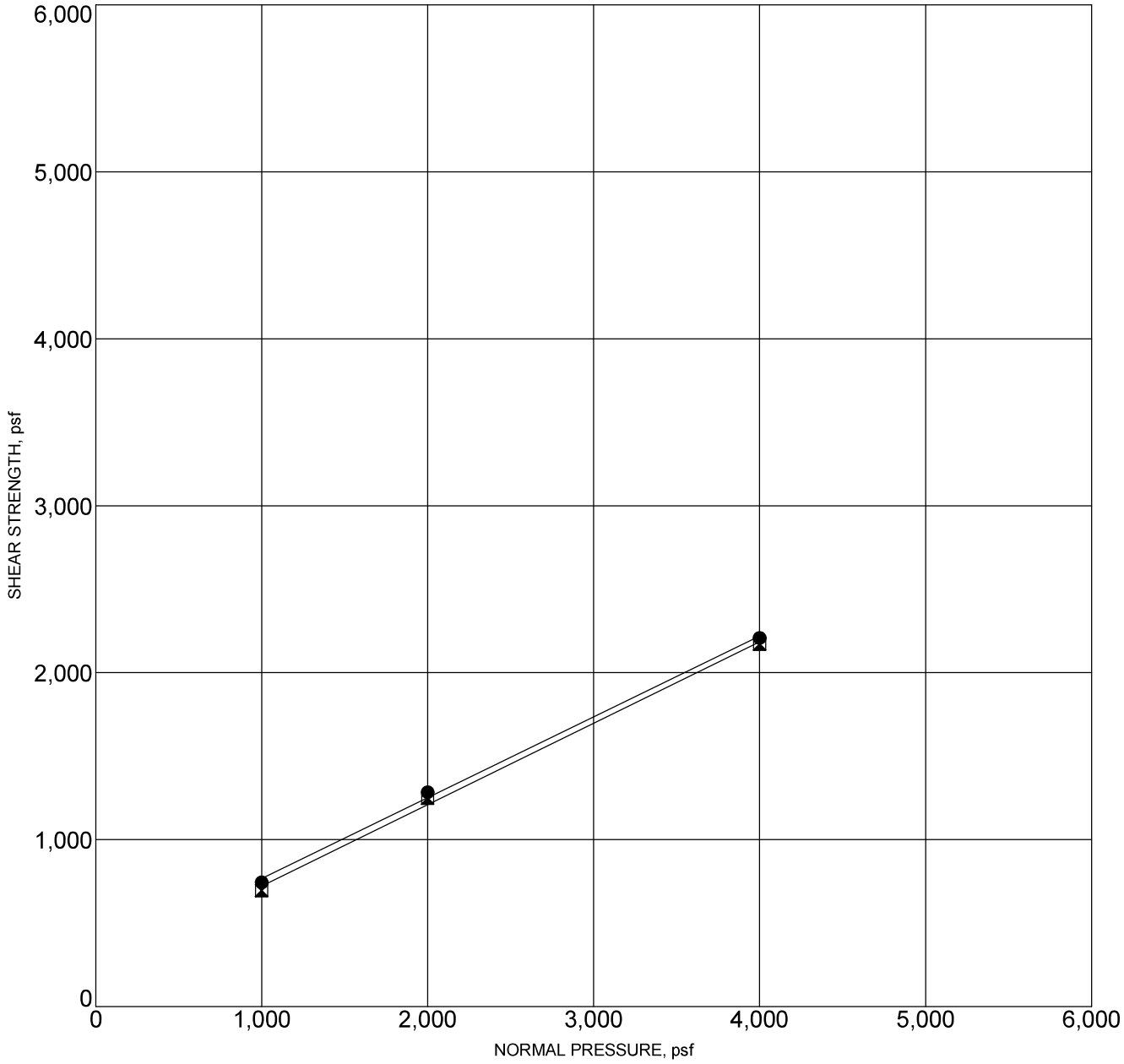

| | SAMPLE LOCATION | | LL | PL | PI | Fines, % | Classification |
|---|---|---|---|---|---|---|---|
| ● | B-104 | 10.0 | 68 | 44 | 24 | | SANDY SILTSTONE |

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## ATTERBERG LIMITS TEST RESULTS

FIGURE C-3




● **PEAK STRENGTH**
*Friction Angle= 26 degrees*
*Cohesion= 282 psf*

⧓ **ULTIMATE STRENGTH**
*Friction Angle= 26 degrees*
*Cohesion= 234 psf*

*Note: Samples remolded to 90% of maximum dry density*

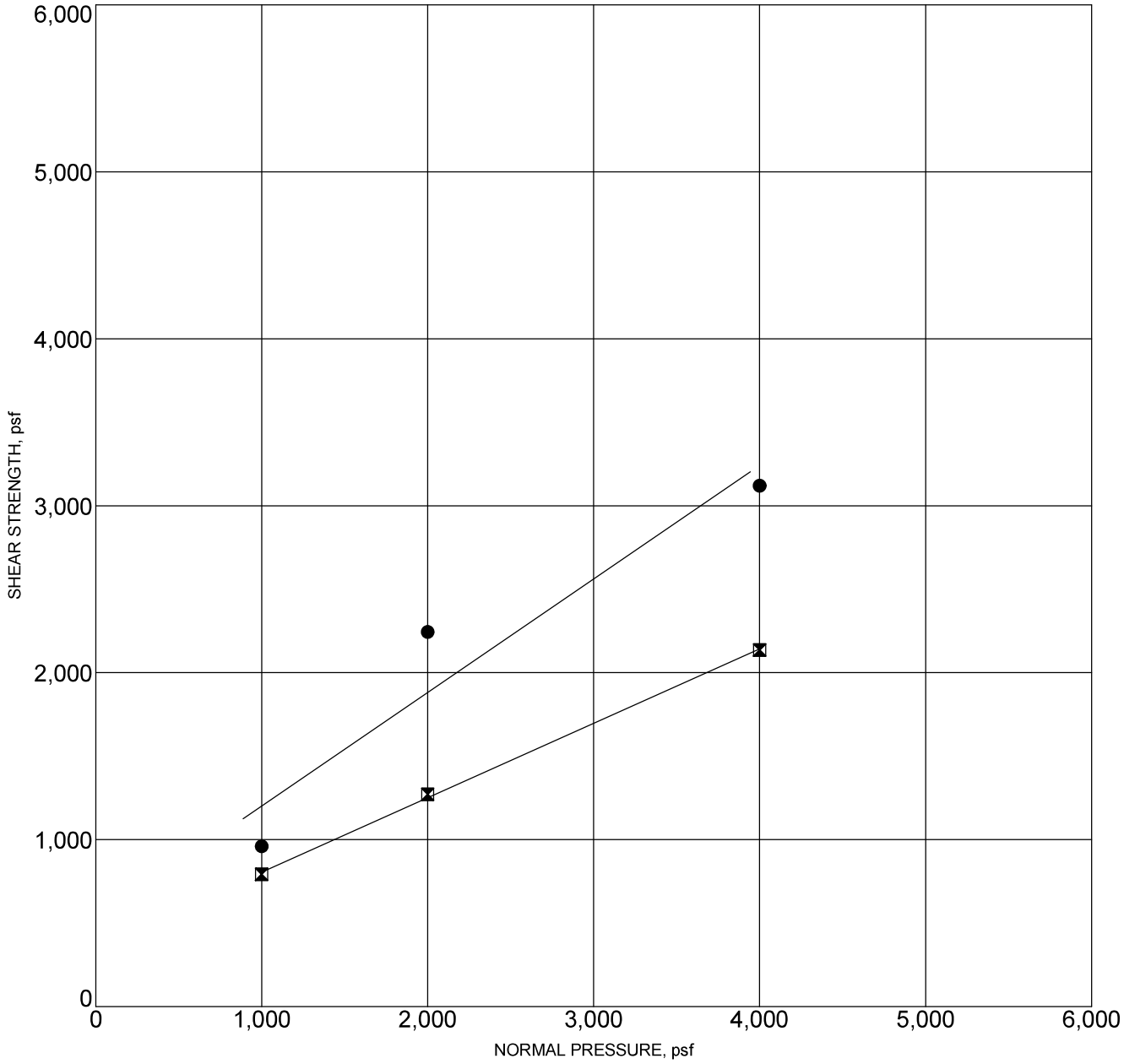
| Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|
| B-103 | 0-5 | SANDY SILT (ML) | 115 | 9.5 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

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## DIRECT SHEAR TEST RESULTS

FIGURE C-4




● **PEAK STRENGTH**
*Friction Angle= 34 degrees*
*Cohesion= 522 psf*

⧓ **ULTIMATE STRENGTH**
*Friction Angle= 24 degrees*
*Cohesion= 360 psf*

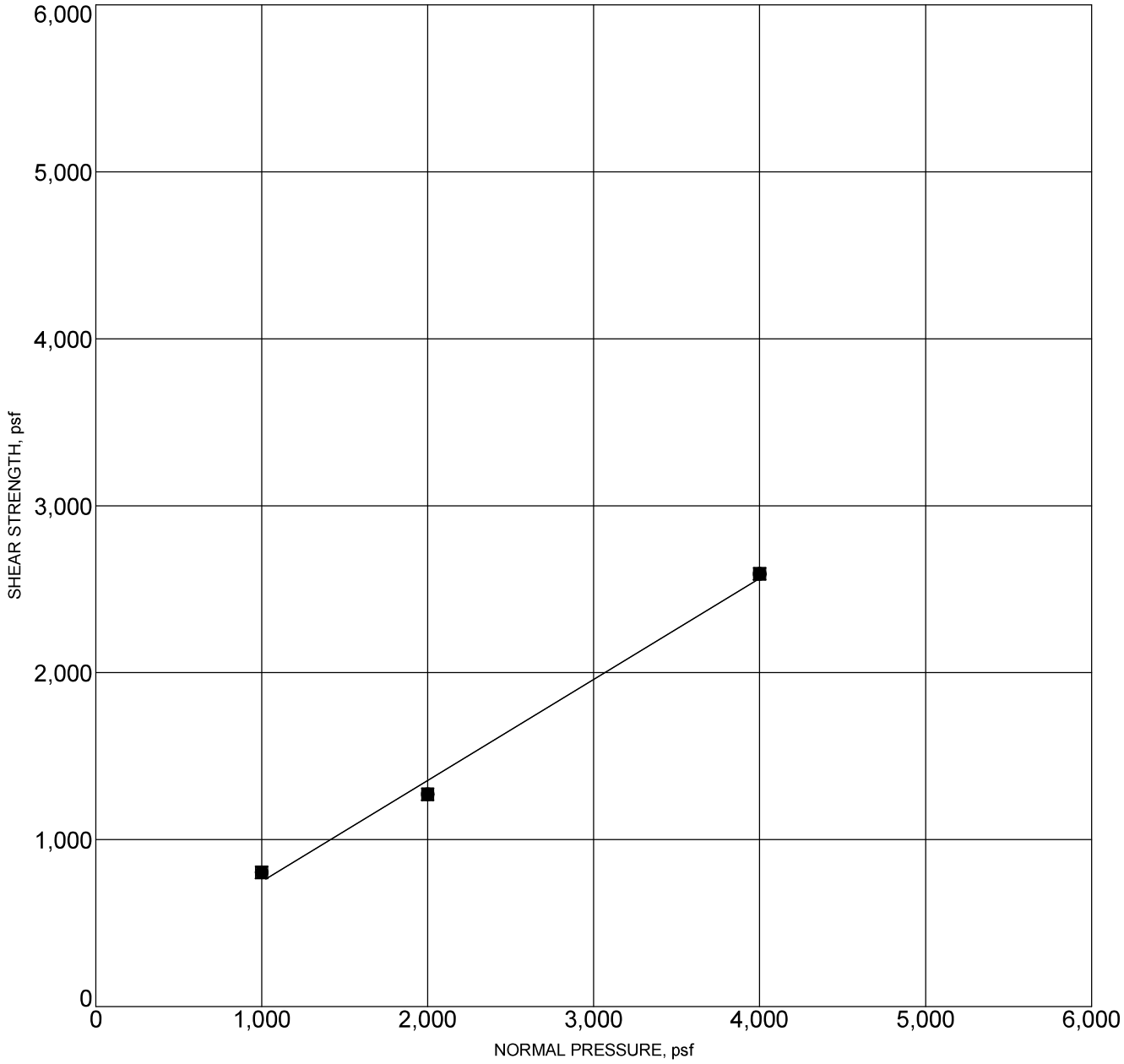
| Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|
| B-104 | 7.0 | SANDY SILTSTONE | 97 | 22.8 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

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## DIRECT SHEAR TEST RESULTS

FIGURE C-5




● **PEAK STRENGTH**
*Friction Angle= 31 degrees*
*Cohesion= 144 psf*

⧓ **ULTIMATE STRENGTH**
*Friction Angle= 31 degrees*
*Cohesion= 144 psf*

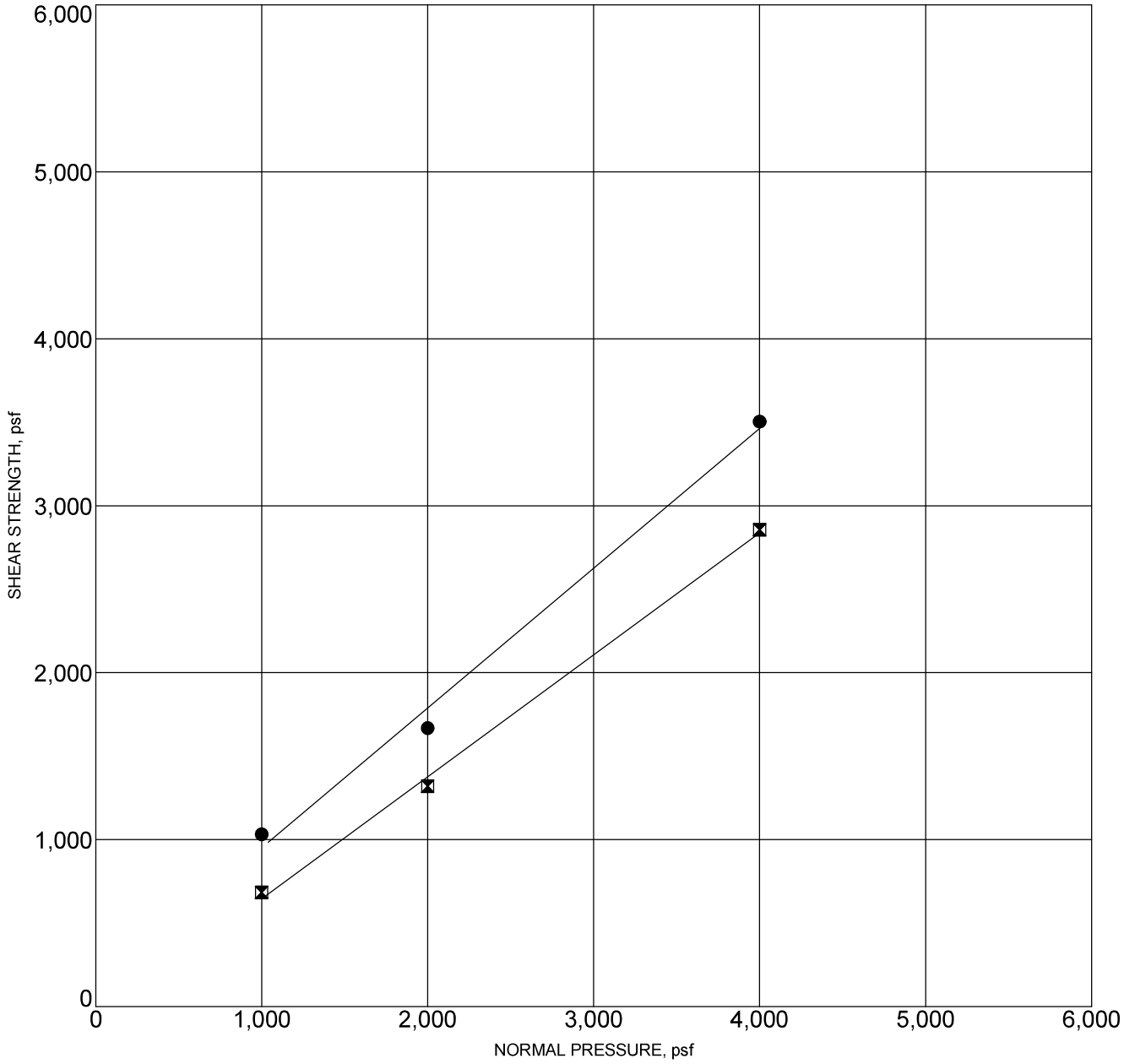
| Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|
| B-105 | 3.0 | SILTY SAND (SM) | 93 | 4.1 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

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# DIRECT SHEAR TEST RESULTS

FIGURE C-6




● **PEAK STRENGTH**
*Friction Angle= 40 degrees*
*Cohesion= 114 psf*

⧓ **ULTIMATE STRENGTH**
*Friction Angle= 35 degrees*
*Cohesion= 0 psf*

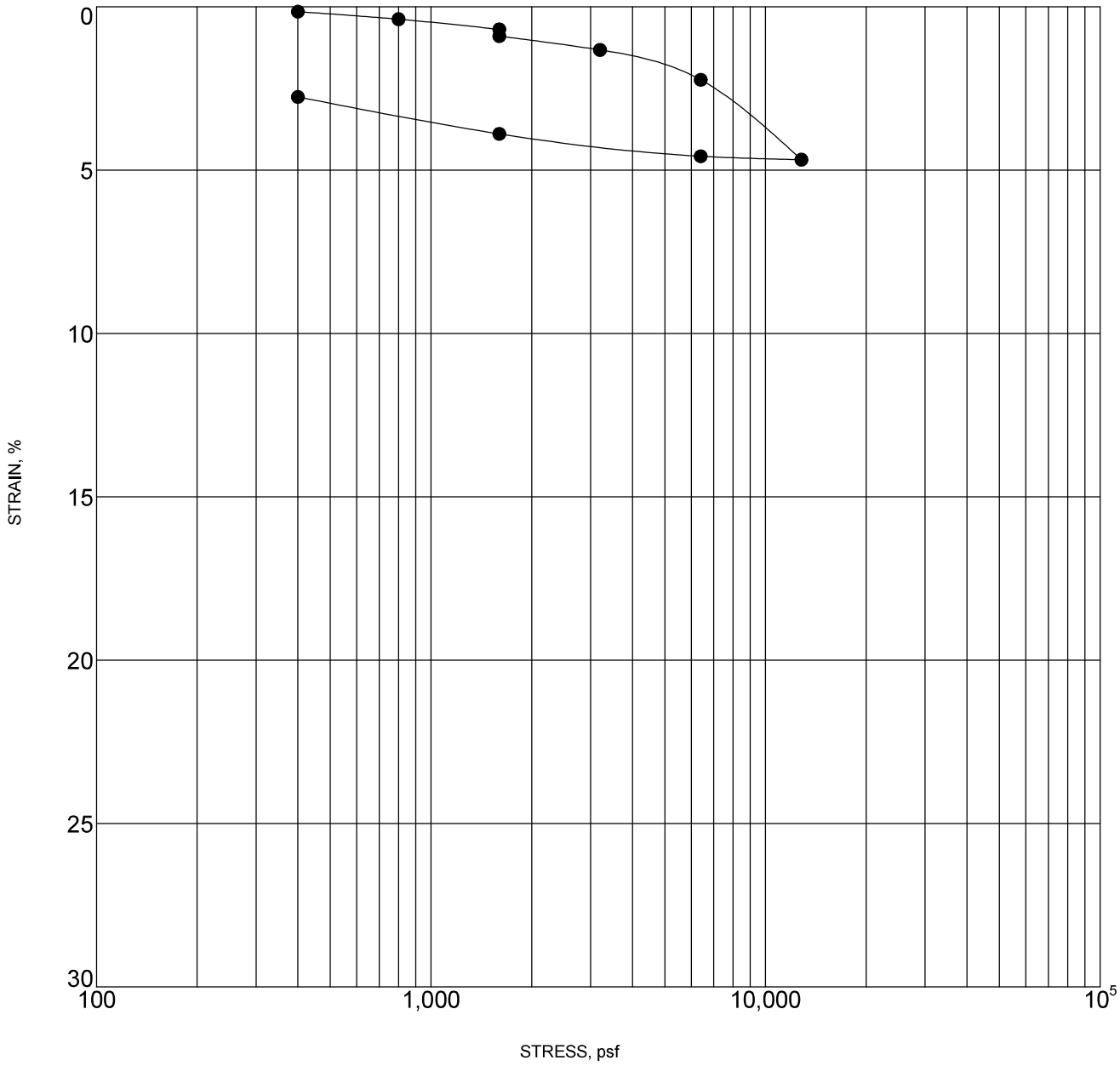
| Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|
| B-106 | 10.0 | SILTY SANDSTONE | 106 | 3.6 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

PROJECT: ORBIS BEAUMONT PROJECT NO.: 3114.I

GPI

## DIRECT SHEAR TEST RESULTS

FIGURE C-7




*Sample inundated at 1600 psf*

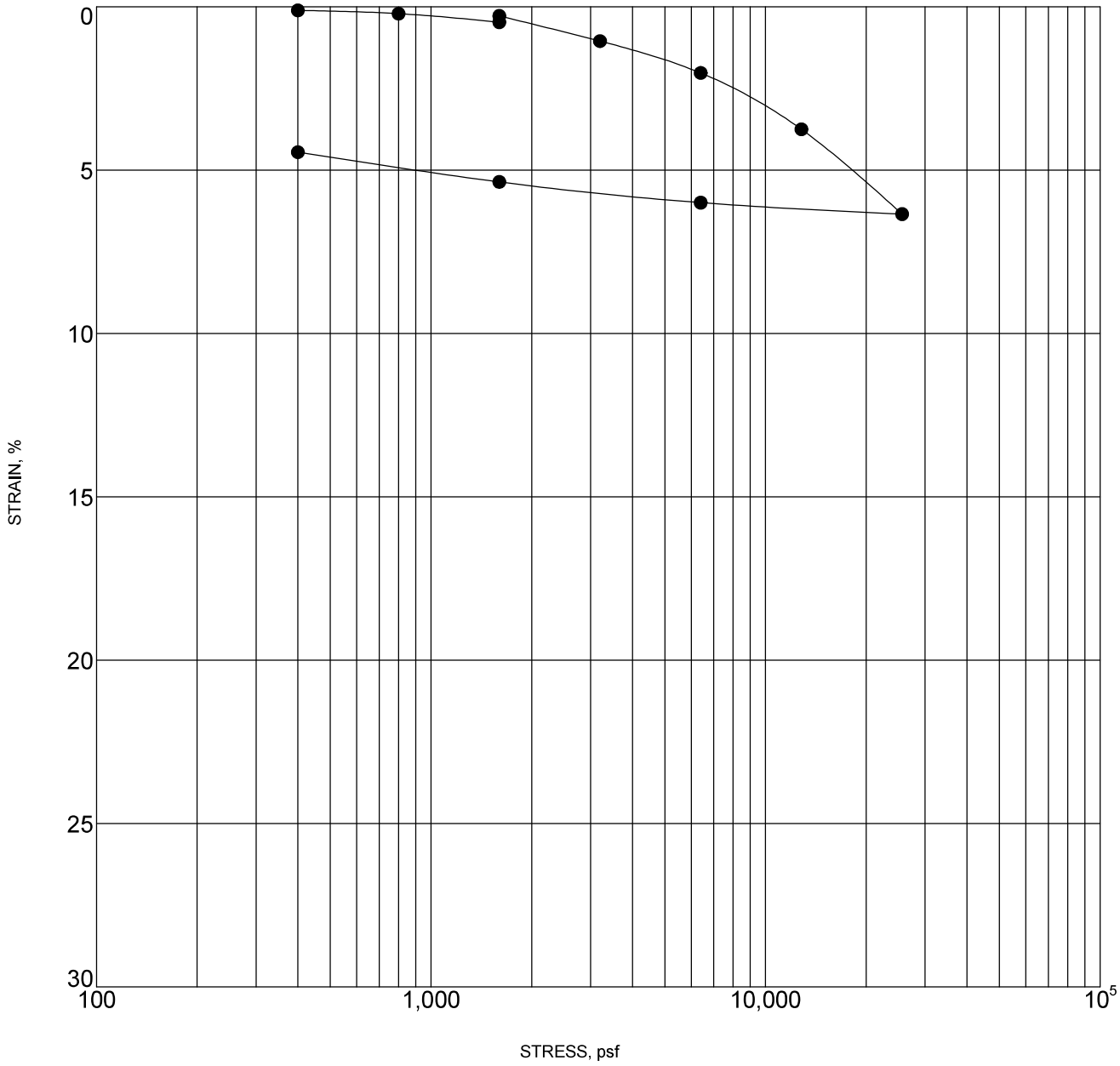
| | Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|---|
| ● | B-101 | 3.0 | CLAYEY SAND (SC) | 106 | 8.6 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

PROJECT: ORBIS BEAUMONT PROJECT NO.: 3114.I

GPI

## CONSOLIDATION TEST RESULTS

FIGURE C-8




*Sample inundated at 1600 psf*

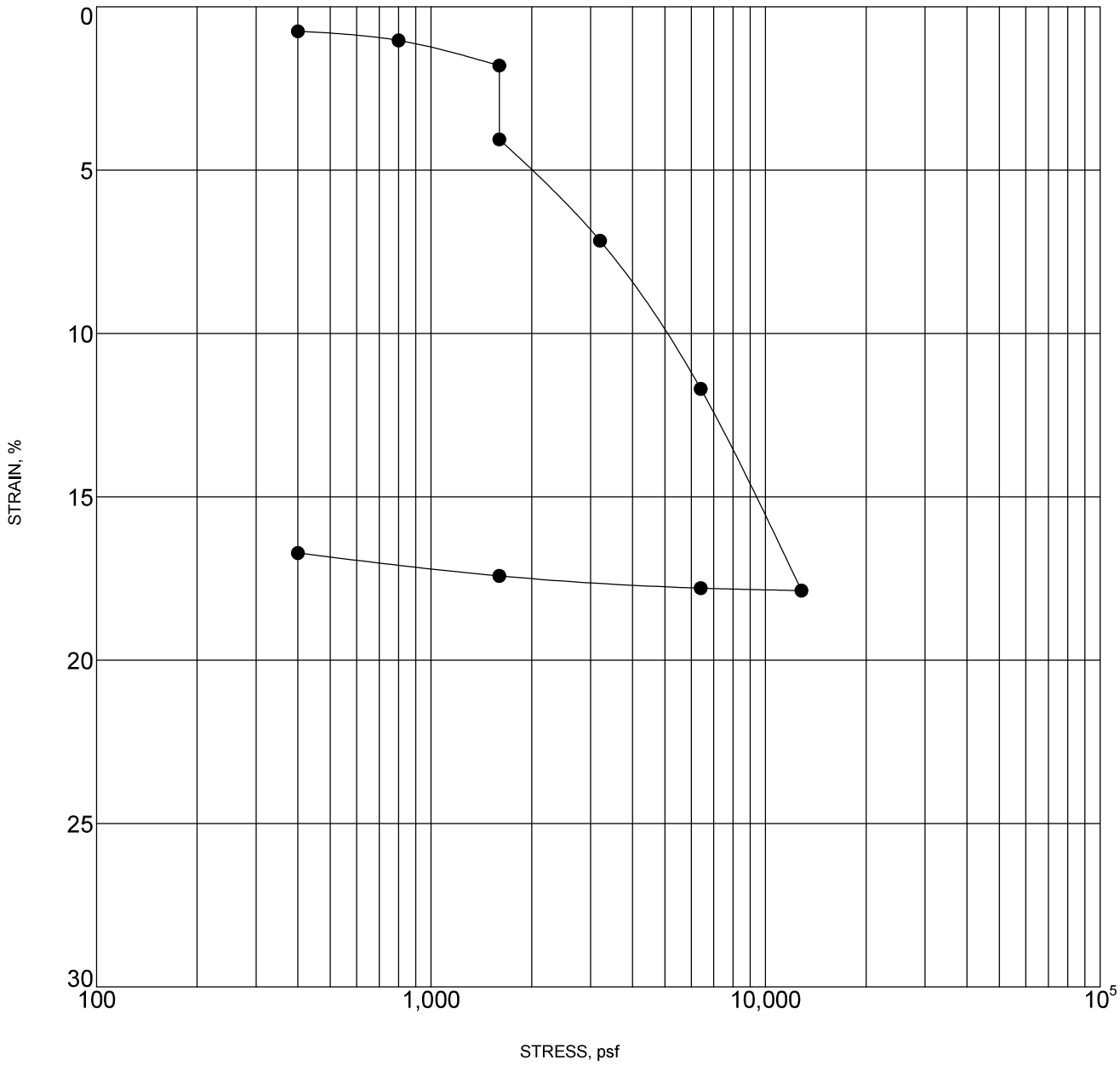
| | Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|---|
| ● | B-102 | 2.0 | SILTY SAND (SM) | 109 | 7.6 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

PROJECT: ORBIS BEAUMONT PROJECT NO.: 3114.I

GPI

## CONSOLIDATION TEST RESULTS

FIGURE C-9




*Sample inundated at 1600 psf*

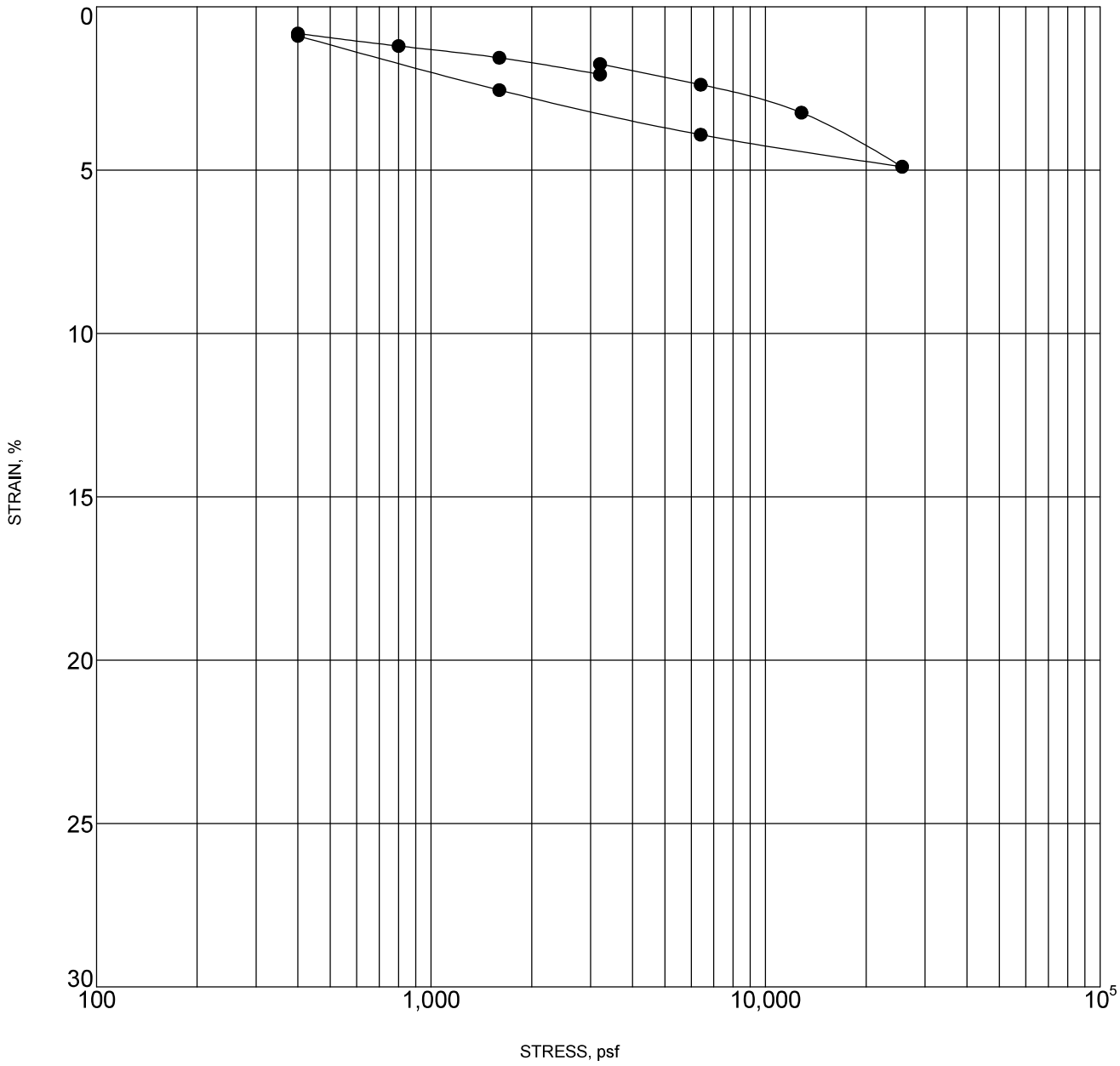
| | Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|---|
| ● | B-108 | 2.0 | SANDY SILT (ML) | 90 | 5.6 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

PROJECT: ORBIS BEAUMONT PROJECT NO.: 3114.I

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## CONSOLIDATION TEST RESULTS

FIGURE C-10




*Sample inundated at 3200 psf*

| | Sample Location | | Classification | DD,pcf | MC,% |
|---|---|---|---|---|---|
| ● | B-110 | 17.5 | SILTSTONE | 104 | 21.4 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

PROJECT: ORBIS BEAUMONT PROJECT NO.: 3114.I

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## CONSOLIDATION TEST RESULTS

FIGURE C-11

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | 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 actual conditions encountered. | |
| | | | | | | Topsoil: **CLAYEY SAND (SC)** dark red-brown, dry, soft to firm, loose, porous, with rootlets | |
| | | | | | | Older Alluvium: **CLAYEY SAND (SC)** red-brown, damp, stiff, porous | 2580 |
| | | | | | 5 | @ 5 feet, moist | |
| | | | | | 10 | | 2575 |
| | | | | | | Total Depth 10 feet<br><br>Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-101

FIGURE B-1

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | | |
| | | | | | | Topsoil:**SANDY CLAY (CL)** dark brown, dry, soft, porous, with organics | |
| | | | | | | Older Alluvium: **SANDY CLAY (CL)** red-brown, damp to moist, stiff | 2570 |
| | | | | | 5 | | |
| | 9.9 | | | B | | | 2565 |
| | | | | | 10 | | |
| | | | | | | Total Depth 11.5 feet<br><br>Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-102

FIGURE B-2

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | 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 actual conditions encountered. | |
| | | | | | | Topsoil: **SILTY SAND (SM)** dark red-brown, dry, loose, hematite cemented, porous | |
| | | | | | | @ 1.9 feet, red-brown | |
| | 4.1 | | | B | 5 | San Timoteo Formation: **SANDSTONE** olive grey, fine to medium grained, damp, weak, friable, slightly cemented, calcareous | 2580 |
| | | | | | | Total Depth 6 feet | |
| | | | | | | Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-103

FIGURE B-3

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | | |
| | | | | | | Topsoil: **SILTY SAND (SM)** brown, dry, loose, fine to medium grained, porous, with fine to coarse subangular gravel sized fragments of San Timoteo, with rootlets | |
| | | | | | | @ 2 feet, approximate attitude of contact N70W, 12ºN | |
| | 3.6 | | | B | 5 | San Timoteo Formation: **SILTY FINE GRAINED SANDSTONE AND SANDY SILTSTONE** light grey to olive grey, calcareous, damp, weak, friable | 2570 |
| | | | | | | @ 4 feet, approximate attitude of irregular evaporate infilled fracture N70W, 54ºN | |
| | | | | | 10 | | 2565 |
| | | | | | | Total Depth 11 feet | |
| | | | | | | Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-104

FIGURE B-4

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | 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 actual conditions encountered. | |
| | | | | | | Younger Alluvium: **SILTY SAND (SM)** grey-brown, fine to medium grained,dry, loose | |
| | | | | | | San Timoteo Formation: **SILTY SANDSTONE** grey, poorly graded, fine to medium grained, damp, loose to medium dense, massive | 2515 |
| | | | | | 5 | | |
| | | | | | | Total Depth 5.5 feet<br><br>Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-105

FIGURE B-5

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | | |
| | | | | | | Younger Alluvium: **SILTY SAND (SM)** dark brown,fine to medium grained, dry, loose, porous, 10-15% sub rounded fine grained gravel | |
| | | | | | | Older Alluvium: **SANDY CLAY (CL)** red-brown,fine to coarse sand, dry to damp, medium dense, slightly cemented, porous | 2505 |
| | 12.9 | | | B | 5 | | |
| | | | | | | **SILTY SAND (SM)** yellow-brown, fine to medium grained, moist, dense | 2500 |
| | | | | | 10 | | |
| | | | | | | Total Depth 10 feet<br><br>Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-106

FIGURE B-6

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | *DESCRIPTION OF SUBSURFACE MATERIALS* | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | 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 actual conditions encountered. | |
| | | | | | | Topsoil: **SANDY CLAY (CL)** dark red-brown, dry, soft to firm, porous, with rootlets | 2520 |
| | | | | | 5 | Older Alluvium: **SANDY CLAY (CL)** red-brown, with sparse coarse grains, damp, stiff, porous | |
| | | | | | | @ 6.75 feet, non-porous | 2515 |
| | | | | | 10 | | |
| | | | | | | Total Depth 12 feet | 2510 |
| | | | | | | Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-107

FIGURE B-7

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | *DESCRIPTION OF SUBSURFACE MATERIALS* | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | Younger Alluvium: **SILTY SAND (SM)** grey-brown, fine to medium grained, dry, loose, porous, 5-10% sub rounded fine gravel | |
| | | | | | 5 | San Timoteo Formation: **SANDSTONE** grey to olive grey, fine to medium grained, friable, damp, weak | 2585 |
| | | | | | | @ 5 feet, near horizontal bedding, damp to moist, weak, friable | |
| | | | | | | Total Depth 6.5 feet | |
| | | | | | | Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-108

FIGURE B-8

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | | 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 actual conditions encountered. | |
| | | | | | 0 | Younger Alluvium: **SILTY SAND (SM)** grey-brown to light grey, fine to medium grained, dry, loose, 5-10% sub rounded fine grained gravel | |
| | 7.0 | | | B | | @ 2.2 feet, damp, porous | |
| | | | | | 5 | | 2520 |
| | | | | | 10 | San Timoteo Formation: **SILTY SANDSTONE** grey-brown to olive grey, fine to medium grained, damp, weak, friable | 2515 |
| | | | | | | Total Depth 10 feet<br>Caving @ 0-4.5'<br>Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-109

FIGURE B-9

| PROBE (IN) | MOISTURE (%) | DRY DENSITY (PCF) | PENETRATION RESISTANCE (BLOWS/FOOT) | SAMPLE TYPE | DEPTH (FEET) | DESCRIPTION OF SUBSURFACE MATERIALS | ELEVATION (FEET) |
|---|---|---|---|---|---|---|---|
| | | | | | 0 | Younger Alluvium: **SILTY SAND (SM)** grey-brown, fine to medium grained, dry, loose, porous, <5% sub rounded fine gravel | |
| | | | | | | @ 2.3 feet, damp, pinhole porosity | 2540 |
| | | | | | 5 | | 2535 |
| | 3.9 | | | B | 10 | | |
| | | | | | | Total Depth 10 feet<br><br>Backfilled with cuttings | |

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 8-8-22
EQUIPMENT USED: BACKHOE
GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3114.I
ORBIS BEAUMONT

## LOG OF TEST PIT TP-110

FIGURE B-10

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-3 | 0.0 – 14.0 | ML | **ALLUVIUM** (Qal): SANDY SILT, fine- to coarse-grained, light brown, slightly moist, soft; some fine to medium gravel, subrounded. |
| | 14.0 – 14.5 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to medium-grained, light medium gray, moist, moderately hard. |
| | | | TOTAL DEPTH 14.5 FT.<br>NO WATER, NO CAVING |
| TP-4 | 0.0 – 0.5 | ML | **TOPSOIL** (No Nap Symbol): SANDY SILT to SILTY SAND, fine- to coarse-grained, light yellow brown, dry, soft. |
| | 0.5 – 6.5 | | **SAN TIMOTEO FORMATION** (QTst): SILTY CLAYSTONE, olive grey, slightly moist, moderately hard; highly weathered; extensive carbonate ($CaCO_3$) deposits; no apparent bedding. @ 3.0 ft. becoming moderately weathered. |
| | | | TOTAL DEPTH 6.5 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-5 | 0.0 – 0.5 | ML | **TOPSOIL** (No Nap Symbol): SANDY SILT, fine- to medium-grained, light yellow brown, dry, dense. |
| | 0.5 – 7.0 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to coarse-grained, light brownish gray, dry, moderately hard; moderately weathered; thin to moderate bedding.<br>Bedding: N42E, 7N<br>@ 3.0 ft. CLAYEY SILTSTONE, olive gray, slightly moist, moderately hard; slightly weathered; thinly bedded.<br><br>TOTAL DEPTH 7.0 FT.<br>NO WATER, NO CAVING |
| TP-6 | 0.0 – 3.0 | ML-SM | **OLDER ALLUVIUM** (Qoal): SANDY SILT to SILTY SAND, fine- to coarse-grained, slightly moist to moist, soft; highly porous; trace fine to medium gravel. |
| | 3.0 – 7.0 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to medium-grained, light yellow brown, slightly moist, moderately hard; highly weathered.<br>@ 4.5 ft. becoming moderately weathered; common iron oxide ($Fe_2O_3$) staining; massive.<br><br>TOTAL DEPTH 7.0 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-7 | 0.0 – 11.0 | ML | **OLDER ALLUVIUM** (Qoal): SANDY SILT, fine- to coarse-grained, medium brown, moist, soft; trace fine to coarse gravel.<br>@ 9.0 ft. SANDY GRAVEL, fine- to coarse-grained, multi-colored, moist, loose; common small cobbles.<br>@ 10.0 ft. SANDY SILT to SILTY SAND, fine- to coarse-grained, light red brown, moist, moderately dense. |
| | 11.0 – 13.0 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to medium-grained, moist, moderately hard; unweathered; massive.<br><br>TOTAL DEPTH 13.0 FT.<br>NO WATER, NO CAVING |
| TP-8 | 0.0 – 6.5 | SM | **OLDER ALLUVIUM** (Qoal): SILTY SAND, fine- to coarse-grained, dark reddish brown, dry to slightly moist, dense; trace fine gravel.<br>@ 2.5 ft. CLAYEY SILTSTONE, light olive gray, slightly moist, moderately hard; moderately weathered; thinly bedded.<br>@ 3.5 ft. becoming slightly weathered.<br>Bedding: N56W, 5N<br><br>TOTAL DEPTH 6.5 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-9 | 0.0 – 12.0 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to coarse-grained, light gray, slightly moist to dry, soft to moderately hard; weathered; moderate bedding; minor cross-bedding.<br>@ 2.0 ft. slightly weathered.<br>@ 10.0 ft. SANDY SILTSTONE, fine-grained, medium gray, moist, moderately hard; massive.<br><br>TOTAL DEPTH 12.0 FT.<br>NO WATER, NO CAVING |
| TP-10 | 0.0 – 1.0 | SM | **TOPSOIL** (No Nap Symbol): SILTY SAND to SANDY SILT, fine- to medium-grained, light brown, dry, loose. |
| | 1.0 – 5.5 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SAND, fine- to medium-grained, light olive gray, dry to slightly moist, moderately hard to hard; massive; highly weathered; high $CaCO_3$.<br>@ 2.5 ft. slightly weathered; massive; difficult digging.<br><br>TOTAL DEPTH 5.5 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-11 | 0.0 14.3 | ML | **ALLUVIUM** (Qal): SANDY SILT, fine- to coarse-grained, light brown gray, slightly moist, soft; massive; trace fine gravel.<br><br>TOTAL DEPTH 14.3 FT.<br>NO WATER, SOME MINOR CAVING |
| TP-12 | 0.0 – 5.5 | | **SAN TIMOTEO FORMATION** (QTst): (SILTY SANDSTONE, fine- to coarse-grained, light gray, dry, moderately hard; moderately weathered.<br>@ 2.5 ft. becoming fine- to medium-grained; slightly weathered; massive; minor $CaCO_3$ deposits.<br><br>TOTAL DEPTH 5.5 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-13 | 0.0 – 5.0 | ML | **ALLUVIUM** (Qal): SANDY SILT, medium- to fine-grained, light brown, dry, soft. @ 2.2 ft. SANDY SILTSTONE, fine-grained, light brownish gray to olive gray, slightly moist; moderately hard; thin bedded. |
| | 5.0 – 7.0 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SAND, light gray, fine- to coarse-grained, moist, moderately hard; massive; cemented layers. |
| | | | TOTAL DEPTH 7.0 FT. NO WATER, NO CAVING |
| TP-14 | 0.0 – 3.0 | SM | **TOPSOIL** (No Map Symbol): SILTY SAND, fine- to coarse-grained, dark reddish orange to red brown, moist, firm, dense; abundant fine gravel and small cobble. |
| | 3.0 –6.5 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SAND, fine- to medium-grained; yellowish gray, moist, moderately hard; massive, cohesion-less. |
| | | | TOTAL DEPTH 6.5 FT. NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-15 | 0.0 – 4.0 | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILTSTONE, fine-grained, medium brown to white, dry, soft to moderately hard; highly weathered, extensive $CaCO_3$ deposits.<br>@ 1.5 ft. fine-grained, light gray to white, dry, moderately hard to hard.<br>@ 4.0 ft. very hard; highly cemented; refusal.<br><br>TOTAL DEPTH 4.0 FT.<br>NO WATER, NO CAVING |
| TP-16 | 0.0 – 6.5 | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILT, fine- to medium-grained, light brown, dry, moderately hard; highly weathered.<br>@ 1.0 ft., fine- to coarse-grained, tan, dry, moderately hard; moderately weathered; gravel lag deposits; fine gravel to small cobbles.<br><br>TOTAL DEPTH 6.5 FT.<br>NO WATER, NO CAVING |

## TABLE I continued

## LOG OF TEST PITS

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-33 | 0.0 – 1.5 | SM | **TOPSOIL** (No Map Symbol): SILTY SAND, fine- to coarse-grained, light orangish brown, dry, moderately hard; highly weathered. |
| | 1.5 – 6.0 | | **SAN TIMOTEO FORMATION** (QTst) SANDY SILTSTONE, fine- to medium-grained, light yellowish brown, dry, hard; moderately weathered; moderately bedded.<br><br>TOTAL DEPTH 6.0 FT.<br>NO WATER, NO CAVING |
| TP-34 | 0.0 – 6.5 | SM | **ALLUVIUM** (Qal): SILTY SAND, coarse- to fine-grained, medium brown, slightly moist, soft; moderately weathered; massive.<br><br>TOTAL DEPTH 6.5 FT.<br>NO WATER, NO CAVING |

## TABLE I continued

## LOG OF TEST PITS

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-39 | 0.0 – 9.0 | SM | **SAN TIMOTEO FORMATION** (QTst): SILTY SAND, fine- to medium-grained, mottled light gray brown to brownish orange, dry to slightly moist, dense to very dense.<br><br>TOTAL DEPTH 9.0 FT.<br>NO WATER, NO CAVING |
| TP-40 | 0.0 – 6.5 | | **SAN TIMOTEO FORMATION** (QTst): GRAVELLY SAND, fine- to medium-grained, light yellow brown to multi-colored, slightly moist, moderately hard; moderately weathered; poorly bedded.<br>@ 2.5 ft. SILTY SANDSTONE, fine- to coarse-grained, light yellow brown, slightly moist, moderately hard; slightly weathered; massive.<br><br>TOTAL DEPTH 6.5 FT.<br>NO WATER, NO CAVING |

## TABLE I continued

## LOG OF TEST PITS

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-41 | 0.0 – 8.5 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to coarse-grained, light yellow gray, dry to slightly moist, moderately hard; moderately weathered; poorly bedded; common fine gravel.<br>@ 3.5 ft. becoming SILTY SANDSTONE, fine- to medium-grained; massive.<br><br>TOTAL DEPTH 8.5 FT.<br>NO WATER, NO CAVING |
| TP-42 | 0.0 – 7.5 | | **SAN TIMOTEO FORMATION** (QTst): CLAYEY SILTSTONE, light olive gray, dry to slightly moist, moderately hard; moderately weathered; thinly bedded.<br>@ 3.0 ft. becoming interbedded with SILTY SANDSTONE, fine- to coarse-grained, light gray, slightly moist, moderately hard; slightly weathered; bedding appears horizontal.<br><br>TOTAL DEPTH 7.5 FT.<br>NO WATER, NO CAVING |

## TABLE I continued

## LOG OF TEST PITS

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-45 | 0.0 – 8.0 | | **QUARTZ DIORITE** (qdi): 45% quartz, 45% plagioclase, 10% secondary minerals, dry to slightly moist, moderately hard; highly weathered.<br>@ 7.0 ft. becoming hard to very hard; moderately weathered.<br>@ 8.0 ft. practical refusal.<br><br>TOTAL DEPTH 8.0 FT.<br>NO WATER, NO CAVING, NO OVERSIZE |
| TP-46 | 0.0 – 13.5 | ML | **OLDER ALLUVIUM** (Qoal): SANDY SILT, fine-grained, medium brown, moist, soft.<br>@ 4.5 ft. SILTY SAND to SANDY SILT, fine-grained, light orange brown, moist, firm.<br>@ 7.5 ft. slight porosity.<br>@ 8.0 ft. becoming light yellow brown. |
| | 13.5 – 14.0 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to medium grained, light olive brown, moist, moderately hard.<br><br>TOTAL DEPTH 14.0 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-47 | 0.0 – 9.5 | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILT, fine-grained, light brown, moist, soft.<br>@ 3.3 ft. fine- to medium grained.<br>@ 3.5 ft. SANDY SILTSTONE, fine-grained, light brown olive, moist, moderately hard.<br>@ 4.8 ft. SILTY SANDSTONE, fine- to medium-grained, light brown gray, moist, soft; interbedded red beds.<br>@ 6.3 ft. SANDY SILTSTONE, fine-grained, light brown gray, moist, soft.<br><br>TOTAL DEPTH 9.5 FT.<br>NO WATER, NO CAVING |
| TP-48 | 0.0 – 1.1 | SM | **TOPSOIL** (No Map Symbol): SILTY SAND, fine-grained, medium brown, moist, soft. |
| | 1.1 – 7.3 | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILTSTONE, fine-grained, light brown, mottled yellow brown, moist, soft.<br>@ 6.2 ft. CLAYEY SILTSTONE, fine-grained, light yellow brown, moist, soft.<br><br>TOTAL DEPTH 7.3 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-49 | 0.0 – 3.2 | ML | **TOPSOIL** (No Map Symbol): SANDY SILT, fine-grained, medium reddish brown, moist, soft. |
| | 3.2 – 10.2 | | **OLDER ALLUVIUM** (Qoal): SANDY SILTSTONE, fine-grained, light olive brown, moist, moderately hard.<br>@ 6.2 ft. SANDY SILTSTONE, fine-grained, light brown, moist, soft.<br>@ 10.2 ft. SANDY SILTSTONE, fine-grained, medium brown, moist, moderately hard.<br><br>TOTAL DEPTH 10.2 FT.<br>NO WATER, NO CAVING |
| TP-50 | 0.0 – 8.1 | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILT to SILTY SAND, fine-grained, dark brown, moist, firm; weathered<br>@ 4.0 ft. becoming moderately weathered.<br><br>TOTAL DEPTH 8.1 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-51 | 0.0 – 8.4 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SAND to SANDY SILT, fine-grained, dark brown, moist, firm; weathered.<br>@ 3.2 ft. becoming moderately weathered.<br><br>TOTAL DEPTH 8.4 FT.<br>NO WATER, NO CAVING |
| TP-52 | 0.0 – 2.8 | SM | **TOPSOIL** (No Map Symbol): SILTY SAND to SANDY SILT, fine-grained, dark orange brown, moist, firm. |
| | 2.8 – 7.5 | | **SAN TIMOTEO FORMATION** (QTst): CLAYEY SILTSTONE, fine-grained, light yellowish brown, moist, soft, brittle.<br>@ 3.6 ft. SANDY SILTSTONE, fine-grained, light orange brown, moist, soft; slightly bedded, N20W, 10N.<br>@ 3.8 ft. turning light gray brown; massive.<br><br>TOTAL DEPTH 7.5 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-53 | 0.0 – 2.7 | CL | **TOPSOIL** (No Map Symbol): CLAYEY SILT, medium brown, moist, soft; trace fine gravel; highly porous. |
| | 2.7 – 8.0 | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILTSTONE, fine-grained, brownish olive, moist, moderately hard; weathered; common carbonates. @ 5.5 ft. becoming moderately weathered.<br><br>TOTAL DEPTH 8.0 FT.<br>NO WATER, NO CAVING |
| TP-54 | 0.0 – 2.0 | CL | **TOPSOIL** (No Map Symbol): CLAYEY SILT, medium brown, moist, soft; trace fine to medium gravel; rootlets. |
| | 2.0 – 7.0 | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine- to medium-grained, light gray, moist, moderately hard; weathered. @ 4.0 ft. becoming moderately weathered.<br><br>TOTAL DEPTH 7.0 FT.<br>NO WATER, NO CAVING |

**TABLE I continued**

**LOG OF TEST PITS**

| Test Pit No. | Depth (ft.) | USCS | Description |
|---|---|---|---|
| TP-55 | 0.0 – 6.0 | CL | **OLDER ALLUVIUM** (Qoal): SILTY CLAY, medium brown, moist, firm to firm; highly porous; rootlets.<br>@ 2.5 ft. becoming stiff, slightly porous.<br>@ 3.5 ft. becoming dark red brown; trace fine gravel.<br><br>TOTAL DEPTH 6.0 FT.<br>NO WATER, NO CAVING |
| TP-56 | 0.0 – 7.5 | CL | **OLDER ALLUVIUM** (Qoal): SILTY CLAY, medium brown, moist, soft to firm; highly porous; rootlets.<br>@ 2.5 ft. becoming slightly porous; trace fine to medium gravel.<br>@ 3.5 ft. becoming dark reddish brown; stiff.<br><br>TOTAL DEPTH 7.5 FT.<br>NO WATER, NO CAVING |

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/24/05 | GROUND ELEV. | | BORING DESIG. | B-02 |
| DATE FINISHED | 08/24/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=3548lb |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=2577lb |
| | | | | | 47-73"=1648lb |

| DEPTH (Feet) | SAMPLE TYPE | BLOWS | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| | | | ML | **OLDER ALLUVIUM** (Qoal): SANDY SILT, fine to coarse grained sand, mottled orange, yellowish brown, and light brown, firm, slightly moist. | | | | |
| 5 | R | 1 | | @ 5.0 ft. fine grained sand, mottled yellowish brown and light brown, tan stringers, soft, moist, pinhole porosity. | 14.6 | 103 | 64 | CON, HY |
| | | | | **SAN TIMOTEO FORMATION** (QTst): SILTSTONE, yellowish brown and gray, tan stringers, soft, slightly moist. | | | | |
| 10 | R | 4 for 6" | | @ 10.0 ft. SILTY SANDSTONE, fine to coarse grained, trace gravel, grayish brown, moderately hard, slightly moist. | 4.7 | 118 | 31 | DS, HY |
| 15 | R<br>B | 7 | | @ 15.0 ft. SANDSTONE, fine grained, gray and orangish brown, slightly moist, mica present, moderately hard. | 11.1 | 119 | 76 | |
| 20 | R | 9 | | @ 20.0 ft. fine to coarse grained. | 6.1 | 115 | 36 | |
| 25 | R | 12 | | @ 25.0 ft. SILTY SANDSTONE, fine to medium grained, mottled reddish brown and grayish brown and dark brown, hard, moist, micaceous. | 15.4 | 118 | 100 | |
| | | | | TOTAL DEPTH 26.0 FT<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-2

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/24/05 | GROUND ELEV. | | BORING DESIG. | B-03 |
| DATE FINISHED | 08/24/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=35481b |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=25771b |
| | | | | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SM | **OLDER ALLUVIUM** (Qoal): SILTY SAND, fine to medium grained, dark brown, dense, dry, porous. | | | | |
| | | | | | | @ 3.0 ft. reddish brown, slightly moist, moderately dense, no visible porosity. | | | | |
| 5 | | R | 3 | | | @ 5.0 ft. fine to coarse grained, reddish brown and dark brown, slightly moist, moderately dense. | 12.5 | 117 | 80 | |
| 10 | | R<br>B | 4 | | | @ 10.0 ft. fine grained, orangish brown, moderately dense, slightly moist. | 9.4 | 103 | 42 | CON, HY DSR, MAX, EI, HY; CHEM |
| 15 | | R | 4 | | | | 12.1 | 114 | 71 | |
| 20 | | R | 3 | | | | 9.9 | 114 | 59 | CON, HY |
| 25 | | R | 3 | | | | 14.6 | 106 | 69 | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-3

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-03 |
| DATE STARTED | 08/24/05 | GROUND ELEV. | | LOGGED BY | TC |
| DATE FINISHED | 08/24/05 | GW DEPTH (FT) | | NOTE | 0-24"=3548lb |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=2577lb |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R | 7 | | | | 7.3 | 121 | 52 | |
| 35 | | R | 6 | | SM | @ 35.0 ft. SILTY SAND with GRAVEL, fine to medium grained, brown, moderately dense, moist. | 13.1 | 118 | 88 | |
| | | | | | | **SAN TIMOTEO FORMATION** (QTst): SANDSTONE, mottled white, gray, orangish brown, very hard. | | | | |
| 40 | | | | | | TOTAL DEPTH 43.0 FT - REFUSAL<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-3

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/24/05 | GROUND ELEV. | | BORING DESIG. | B-04 |
| DATE FINISHED | 08/24/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=3548lb |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=2577lb |
| | | | | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ML | **OLDER ALLUVIUM** (Qoal): SANDY SILT, fine to medium grained sand, reddish brown and dark brown, firm, slightly moist, root hairs, porosity. | | | | |
| 5 | | R | 5 | | | | 11.0 | 118 | 72 | |
| | | | | | | @ 7.0 ft. orangish brown, no visible roots or porosity. | | | | |
| 10 | | R | 6 | | | | 9.5 | 110 | 49 | CON, HY |
| 15 | | R | 6 | | | @ 15.0 ft. reddish brown. | 9.1 | 121 | 66 | |
| 20 | | R | 5 | | | | 6.9 | 111 | 37 | |
| 25 | | R | 6 | | | | 8.1 | 110 | 43 | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-4

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/24/05 | GROUND ELEV. | | BORING DESIG. | B-04 |
| DATE FINISHED | 08/24/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=35481b |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=25771b |
| | | | | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R | 5 | | | @ 30.0 ft. light brown. | 13.1 | 113 | 74 | |
| 35 | | R | 7 | | | **SAN TIMOTEO FORMATION** (QTst): SANDSTONE, fine grained, mottled orange and gray, hard, moist. | 10.4 | 114 | 61 | |
| 40 | | R | 7 for 6" | | | | 4.3 | 112 | 24 | |
| | | | | | | TOTAL DEPTH 40.5 FT<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-4

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/25/05 | GROUND ELEV. | | BORING DESIG. | B-10 |
| DATE FINISHED | 08/25/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=35481b |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=25771b |
| | | | | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SM | **ALLUVIUM** (Qoal): SILTY SAND, fine to coarse grained, light brown, very loose, dry. | | | | |
| 5 | | R<br>B | 4 | | | **SAN TIMOTEO FORMATION** (QTst): SILTSTONE, mottled gray, greenish brown, orangish brown, tan and white, hard, slightly moist. | 20.2 | 107 | 98 | MAX, EI, HY, CHEM |
| 10 | | R | 7 | | | @ 10.0 ft. SILTY SANDSTONE, fine to coarse grained, mottled light brown, tan, greenish brown and gray, hard. | 5.8 | 119 | 40 | |
| | | | | | | @ 11.0 ft. SANDSTONE, fine grained, mottled orangish brown, tan, greenish brown and dark brown, hard, slightly moist. | | | | |
| 15 | | R | 5 | | | @ 15.0 ft. SILTSTONE, mottled orangish brown, light brown and greenish brown, hard, slightly moist. | 23.4 | 101 | 97 | |
| | | | | | | TOTAL DEPTH 16.0 FT<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-10

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/25/05 | GROUND ELEV. | | BORING DESIG. | B-11 |
| DATE FINISHED | 08/25/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=35481b |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=25771b |
| | | | | | 47-73"=16481b |

| DEPTH (Feet) | SAMPLE TYPE | BLOWS | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| | | | ML | **ALLUVIUM** (Qal): SANDY SILT, fine grained sand, light brown, dry. | | | | |
| | | | | @ 3.0 ft. fine to medium grained sand, brown, soft, dry. | | | | |
| 5 | R | PUSH | | | 9.6 | 98 | 37 | |
| 10 | R | PUSH | | | 11.4 | 99 | 45 | |
| 15 | R | 4 | | @ 15.0 ft. soft to firm. | 19.0 | 111 | 102 | CON, HY |
| | | | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILTSTONE, fine grained, mottled greenish brown, gray, and orangish brown, hard to very hard, slightly moist. | | | | |
| 20 | R | 8 | | | 16.1 | 110 | 85 | |
| | | | | TOTAL DEPTH 23.0 FT - REFUSAL<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-11

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/25/05 | GROUND ELEV. | | BORING DESIG. | B-12 |
| DATE FINISHED | 08/25/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=35481b |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=25771b |
| | | | | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SM | **ALLUVIUM** (Qal): SILTY SAND, fine grained, brown, slightly moist, loose. | | | | |
| 5 | | R | PUSH | | | | 11.6 | 97 | 43 | |
| 10 | | R | PUSH | | | @ 10.0 ft. slightly moist to moist. | 14.5 | 93 | 49 | DS, HY |
| 15 | | R | 4 | | | @ 15.0 ft. medium dense. | 11.1 | 113 | 63 | |
| | | | | | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine grained, mottled gary and orangish brown, hard, slightly moist. | | | | |
| 20 | | R | 5 | | | @ 20.0 ft. very moist. | 17.7 | 109 | 91 | |
| 25 | | R B | 10 | | | @ 25.0 ft. SANDSTONE, fine to coarse grained, tan and brown, gray, orangish brown, hard, slightly moist. | 5.2 | 115 | 32 | |
| | | | | | | TOTAL DEPTH 27.0 FT<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-12

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-14 |
| DATE STARTED | 08/25/05 | GROUND ELEV. | | LOGGED BY | TC |
| DATE FINISHED | 08/25/05 | GW DEPTH (FT) | | NOTE | 0-24"=3548lb |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=2577lb |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | ML | **ALLUVIUM** (Qal): SANDY SILT, fine grained, brown, soft, dry. | | | | |
| 5 | | R | PUSH | | | | 7.3 | 103 | 32 | |
| 10 | | R | 5 | | | **SAN TIMOTEO FORMATION** (QTst): SANDSTONE, fine grained, gray, moderately hard, slighty moist. | 7.3 | 113 | 42 | |
| 15 | | | | | | @ 15.0 ft. fine grained, mottled light brown, orangish brown, very hard, slightly moist. | | | | |
| | | | | | | TOTAL DEPTH 15.0 FT<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-14

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | | |
| DATE STARTED | 08/26/05 | GROUND ELEV. | | BORING DESIG. | B-15 |
| DATE FINISHED | 08/26/05 | GW DEPTH (FT) | | LOGGED BY | TC |
| DRILLER | Ledezma | DRIVE WT. | See Notes | NOTE | 0-24"=3548lb |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 24-47"=2577lb |
| | | | | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ML | **ALLUVIUM** (Qal): SANDY SILT, fine grained, brown, soft, dry. | | | | |
| 5 | | R | PUSH | | | | 9.4 | 99 | 37 | |
| 10 | | R | 1 | | | | 8.4 | 98 | 33 | |
| 15 | | R<br>B | 6 | | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine grained, gray with orangish brown, hard, slightly moist. | 12.8 | 111 | 69 | |
| 20 | | R | 8 | | | @ 20.0 ft. fine to medium grained, mottled gray, greenish brown, light brown and orangish brown. | 16.4 | 110 | 87 | |
| | | | | | | TOTAL DEPTH 22.0 FT<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-15

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-18 |
| DATE STARTED | 08/26/05 | GROUND ELEV. | | LOGGED BY | TC |
| DATE FINISHED | 08/26/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 18" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | SAMPLE TYPE | BLOWS | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| | | | ML | **ALLUVIUM** (Qal): SANDY SILT, fine to medium grained, brown, soft, moist. | | | | |
| 5 | R | PUSH | | | 7.7 | 103 | 34 | |
| 10 | R | PUSH | | | 13.7 | 112 | 76 | CON, HY |
| 15 | R | 1 | | @ 16.0 ft. becoming light brownish gray. | 12.2 | 102 | 52 | |
| | | | SM | @ 19.0 ft. SILTY SAND, fine to medium grained, gray, medium dense, moist, trace iron oxide stain. | | | | |
| 20 | R/B | 10 | | | 7.5 | 116 | 46 | DS, HY |
| | | | | TOTAL DEPTH 24.0 FT - REFUSAL<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-18

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-21 |
| DATE STARTED | 11/16/05 | GROUND ELEV. | 2615 | LOGGED BY | CNI |
| DATE FINISHED | 11/16/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2615 | | | | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine grained, light brownish gray, dry to slightly moist, soft to moderately hard, thinly bedded, common carbonate deposits. | | | | |
| 5 | 2610 | | | | | @ 5.0 ft. common sand lenses, coarse grained, trace fine GRAVEL. | | | | |
| 10 | 2605 | R | 4/12" | | | | 11.8 | 108 | 58 | |
| | | | | | | @ 13.0 ft. becoming SANDY SILTSTONE, fine grained, light olive brown, moist, moderately hard common random shears. | | | | |
| 15 | 2600 | | | | | @ 14.7 ft. fault: N20W 55NE, gauge: .5" - 1.5"<br>@ 14.8 ft. SILTY SANDSTONE, fine to medium grained, light gray, moist, moderately hard, massive. | | | | |
| 20 | 2595 | R | 3/12" | | | @ 20.0 ft. some CLAYSTONE lenses, discontinuous to 3.5". | 17.4 | 102 | 75 | |
| | | | | | | @ 21.0 ft. fault: N35W 80NE. | | | | |
| 25 | 2590 | | | | | | | | | |
| | 2585 | | | | | @ 29.0 ft. bedding, N30E 19N | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-21

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-21 |
| DATE STARTED | 11/16/05 | GROUND ELEV. | 2615 | LOGGED BY | CNI |
| DATE FINISHED | 11/16/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2585 | R | 4/12" | | | | 20.1 | 106 | 94 | |
| | | | | | | @ 31.5 ft. SILTY CLAYSTONE, olive brown, moist, soft to moderately hard, highly sheared. | | | | |
| | | | | | | @ 33.4 ft. becoming moderately hard, common GRAVEL sized concretions. | | | | |
| 35 | 2580 | | | | | | | | | |
| | | | | | | @ 28.0 ft. becoming sandy. | | | | |
| | | | | | | @ 39.0 ft. SILTY SANDSTONE, fine to medium grained, light brown gray, moist, moderately hard. | | | | |
| 40 | 2575 | R | 4/12" | | | | 20.2 | 108 | 100 | |
| | | | | | | @ 44.0 ft. becoming mixed with CLAYEY SILTSTONE, yellow brown, moist, moderately hard. | | | | |
| 45 | 2570 | | | | | | | | | |
| | | | | | | @ 47.0 ft. becoming highly cemented, hard to very hard. | | | | |
| 50 | 2565 | R | 3/12" | | | | 10.6 | 127 | 93 | DS HY |
| | | | | | | TOTAL DEPTH = 51 FT<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-21

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-23 |
| DATE STARTED | 11/16/05 | GROUND ELEV. | 2597 | LOGGED BY | CNI |
| DATE FINISHED | 11/16/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 2595 | | | | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE, fine to medium grained, light gray, dry, soft to moderately hard, abundant, gravel sized concretions. | | | | |
| | | | | | | @ 3.0 ft. becoming SANDY SILTSTONE, fine grained, light yellow brown, moist, moderately hard to hard. | | | | |
| 5 | | | | | | @ 6.0 ft. grades into SILTY SANDSTONE, fine grained, light gray, moist, moderately hard, massive, occasional cemented beds to 3.0" thick. | | | | |
| | 2590 | | | | | | | | | |
| 10 | | R | 5/12" | | | | 15.0 | 112 | 84 | |
| | 2585 | | | | | @ 13.0 ft. becoming coarse grained with trace fine GRAVEL. | | | | |
| 15 | | | | | | @ 16.0 ft. some clay rip up clasts to 4.0". | | | | |
| | 2580 | | | | | @ 16.5 ft. scoured contact with SILTY SANDSTONE, fine to medium grained, light gray, moist, moderately hard. | | | | |
| | | B | | | | | | | | MAX |
| 20 | | R | 8/12" | | | | 11.8 | 120 | 81 | |
| | 2575 | | | | | | | | | |
| 25 | | | | | | @ 25.0 ft. bedding N80W 15NE. | | | | |
| | 2570 | | | | | | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-23

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-23 |
| DATE STARTED | 11/16/05 | GROUND ELEV. | 2597 | LOGGED BY | CNI |
| DATE FINISHED | 11/16/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R | 8/12" | | | @ 30.5 ft. becoming coarse grained. | 7.0 | 116 | 44 | |
| | 2565 | | | | | @ 32.5 ft. some cross bedding common. | | | | |
| | | | | | | @ 34.0 ft. becomes fine grained, massive. | | | | |
| 35 | | | | | | | | | | |
| | 2560 | | | | | | | | | |
| 40 | | R | 8/12" | | | | 7.7 | 121 | 55 | |
| | | | | | | TOTAL DEPTH = 40.0 FT.<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-23

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-24 |
| DATE STARTED | 11/17/05 | GROUND ELEV. | 2568 | LOGGED BY | CNI |
| DATE FINISHED | 11/17/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ML | **OLDER ALLUVIUM** (Qoal): CLAYEY SILT, medium brown, moist, soft, trace coarse sand. | | | | |
| | | | | | | @ 2.0 ft, becoming dark red brown. | | | | |
| | 2565 | | | | CL | @ 3.0 ft. SILTY CLAY, dark red brown, moist, firm, trace coarse sand, trace fine gravel. | | | | |
| 5 | | R | 2/12" | | | @ 5.0 ft. becoming mottled, light brown to light red brown. | 18.7 | 102 | 80 | CON HY |
| | | | | | SM | @ 5.5 ft. grades into SILTY SAND, fine grained, mottled light brownish gray and light red brown, moist, moderately dense. | | | | |
| | 2560 | | | | | @ 8.0 ft. becomes mixed with SILTSTONE and SANDSTONE clasts to 2.0" slight pinhole porosity. | | | | |
| 10 | | R B | 2/12" | | | **SAN TIMOTEO FORMATION** (Qtst): SANDY SILTSTONE, fine grained, light olive gray, moist, moderately hard, some interbedded CLAYEY SILTSTONE common. | 20.3 | 102 | 87 | MAX EI HY |
| | 2555 | | | | | | | | | |
| 15 | | R | 5/12" | | | @ 15.2 ft. abrupt contact with SILTY SANDSTONE, fine to medium grained, light brownish gray, moist, soft to moderately hard, common micaceous laminations, bedding nearly horizontal. | 13.3 | 103 | 59 | |
| | 2550 | | | | | @ 18.0 ft. becoming cross bedded with coarse sand and fine GRAVEL. | | | | |
| 20 | | R | 7/12" | | | @ 19.6 ft. scoured contact with brownish orange SILTY SANDSTONE.<br>@ 20.2 N10E 16NW.<br>@ 20.5 ft. grades into SILTY SANDSTONE, fine to coarse grained, light yellow brown, moist, moderately hard, common fine to medium-gravel. | 3.2 | 114 | 19 | |
| | 2545 | | | | | @ 24.0 ft. becoming interbedded with SANDY SILTSTONE, fine grained, light yellow brown, moist, moderately hard, bed 6.0" to 3.0' | | | | |
| 25 | | | | | | | | | | |
| | 2540 | | | | | | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-24

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-24 |
| DATE STARTED | 11/17/05 | GROUND ELEV. | 2568 | LOGGED BY | CNI |
| DATE FINISHED | 11/17/05 | GW DEPTH (FT) | | NOTE | 0-24"=3548lb |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=2577lb |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TOTAL DEPTH 30.0 FT.<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-24

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-25 |
| DATE STARTED | 11/17/05 | GROUND ELEV. | 2582 | LOGGED BY | CNI |
| DATE FINISHED | 11/17/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ML | **OLDER ALLUVIUM** (Qoal): SANDY SILT, fine to coarse grained, dark red brown, slightly moist firm; roots/rootlets. | | | | |
| | 2580 | | | | | | | | | |
| 5 | | R | 2/12" | | | | 11.9 | 114 | 70 | CON HY |
| | 2575 | | | | | @ 7.2 ft. soft. | | | | |
| 10 | | R B | 2/12" | | | | 15.5 | 114 | 92 | DSR CON MAX El HY CHEM |
| | 2570 | | | | | @ 14.0 ft. fine to medium grained; no roots. | | | | |
| 15 | | R | 1/12" | | | | 16.3 | 112 | 91 | CON HY |
| | 2565 | | | | SM | @ 17.9 ft. SILTY SAND, fine grained, dark red brown, moist, moderately dense. | | | | |
| 20 | | R B | 2/12" | | | @ 20.0 ft. SILTY SAND, fine grained, mottled yellow brown to red brown, moist, loose, (gradational change beginning) | 14.3 | 114 | 84 | DS MAX HY |
| | 2560 | | | | ML-SM | @ 22.7 ft. SANDY SILT-SILTY SAND, fine to medium grained, orange brown, slightly moist, firm. | | | | |
| 25 | | R | 1/12" | | | | 15.6 | 109 | 80 | |
| | 2555 | | | | | **SAN TIMOTEO FORMATION** (QTst): SILTY SANDSTONE with interbedded clays, fine grained, brownish yellow, slightly moist, moderately hard, small granitic type clast no distinct bedding. | | | | |
| | | | | | | @ 29.1 ft. SILTY SANDSTONE, fine to coarse grained, mottled yellow and gray, slightly moist, moderately hard common fine to | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-25

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-25 |
| DATE STARTED | 11/17/05 | GROUND ELEV. | 2582 | LOGGED BY | CNI |
| DATE FINISHED | 11/17/05 | GW DEPTH (FT) | | NOTE | 0-24"=35481b |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=25771b |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=16481b |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R | 6/12" | | | medium GRAVEL. | 13.9 | 112 | 77 | |
| | 2550 | | | | | @ 30.3 interbedded SILTY SANDSTONE, fine to coarse grained, dark yellowish brown, slightly moist, moderately hard. bedding: N77W 14NE. | | | | |
| 35 | | | | | | TOTAL DEPTH = 35.1 FT.<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-25

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-26 |
| DATE STARTED | 11/17/05 | GROUND ELEV. | 2649 | LOGGED BY | CNI |
| DATE FINISHED | 11/17/05 | GW DEPTH (FT) | | NOTE | 0-24"=3548lb |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=2577lb |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **SAN TIMOTEO FORMATION** (QTst): SANDY SILTSTONE, fine grained, white to gray brown, dry, moderately hard, highly weathered, extensive carbonate deposits, abundant fine to coarse-gravel sized concretions. | | | | |
| | | | | | | @ 3.0 ft. becoming moderately weathered, hard, trace of carbonate deposits. | | | | |
| | 2645 | | | | | | | | | |
| 5 | | | | | | | | | | |
| | | | | | | @ 7.5 ft. bedding N85W 12NE.<br>@ 7.6 ft. abruptly becomes light red brown. | | | | |
| | 2640 | | | | | | | | | |
| 10 | | | | | | @ 9.0 ft. becoming mottled light orange brown and gray grown, micaceous. | | | | |
| | | | | | | @ 10.5 ft. becoming CLAYEY SILTSTONE, light gray to white, moist, moderately hard to very hard, highly cemented in areas. | | | | |
| | 2635 | | | | | | | | | |
| 15 | | | | | | | | | | |
| | | | | | | @ 16.0 ft. grades into SANDY SILTSTONE-SILTY SANDSTONE, fine to medium grained, mottled orange brown to light yellow brown, moist, moderately hard, trace fine to medium GRAVEL, massive. | | | | |
| | 2630 | | | | | | | | | |
| 20 | | R | 6/12" | | | | 12.8 | 121 | 92 | DS HY |
| | | | | | | @ 21.6 ft. some interbedded coarse SAND and fine to medium GRAVEL beds to .5' in thickness.<br>@ 22.4 ft. bedding N58W 15NE. | | | | |
| | 2625 | | | | | | | | | |
| 25 | | | | | | | | | | |
| | | | | | | @ 28.8 fine grained, becoming brownish red to yellow brown. | | | | |
| | 2620 | | | | | | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-26

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-26 |
| DATE STARTED | 11/17/05 | GROUND ELEV. | 2649 | LOGGED BY | CNI |
| DATE FINISHED | 11/17/05 | GW DEPTH (FT) | | NOTE | 0-24"=3548lb |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=2577lb |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R<br>B | 12/12" | | | | 14.7 | 116 | 92 | MAX<br>EI HY |
| | | | | | | @ 32.0 ft. grades into SANDY SILTSTONE, fine grained, brownish red, moist, moderately hard to hard, trace fine gravel, massive. | | | | |
| | 2615 | | | | | TOTAL DEPTH = 33.0<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |
| | | R | 5/12" | | | | 15.7 | 112 | 88 | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-26

# GEOTECHNICAL BORING LOG



| | | | | | |
|---|---|---|---|---|---|
| PROJECT NO. | 700145 | PROJECT NAME | Beaumont Heights | BORING DESIG. | B-27 |
| DATE STARTED | 11/17/05 | GROUND ELEV. | 2577 | LOGGED BY | CNI |
| DATE FINISHED | 11/17/05 | GW DEPTH (FT) | | NOTE | 0-24"=3548lb |
| DRILLER | Ledezma | DRIVE WT. | See Notes | | 24-47"=2577lb |
| TYPE OF DRILL RIG | 30" Bucket Auger | DROP | 12 in. | | 47-73"=1648lb |

| DEPTH (Feet) | ELEV | SAMPLE TYPE | BLOWS | LITHOLOGY | GROUP SYMBOL | GEOTECHNICAL DESCRIPTION | MOISTURE CONT (%) | DRY (pcf) DENSITY | SAT-URATION (%) | OTHER TESTS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ML | **OLDER ALLUVIUM** (Qoal): SANDY SILT, fine grained, mottled dark brown and light brown slightly moist, stiff, trace fine gravel. | | | | |
| | 2575 | | | | | | | | | |
| | | | | | SM | @ 3.8 ft. SILTY SAND, fine to medium grained, brownish red, slightly moist, moderately dense, interbedded gravel bars. | | | | |
| 5 | | | | | ML | @ 5.3 ft. SANDY SILT, fine grained, dark brown, moist, firm. | | | | |
| | 2570 | | | | | @ 8.1 ft. stiff. | | | | |
| 10 | | R | 2/12" | | | @ 10.3 ft. mottled dark brown and red brown. | 13.8 | 110 | 73 | CON HY |
| | 2565 | | | | | **SAN TIMOTEO FORMATION** (QTst): contact CLAYEY SILTSTONE, mottled light brownish gray and light brown. | | | | |
| 15 | | | | | | @ 15.0 ft. interbedded with SANDY SILTSTONE fine grained, light brown, moist, moderately hard to hard. | | | | |
| | 2560 | | | | | | | | | |
| 20 | | R | 10/12" | | | | 6.1 | 111 | 33 | |
| | | | | | | TOTAL DEPTH = 20.0 FT.<br>NO GROUNDWATER ENCOUNTERED<br>NO CAVING OBSERVED | | | | |

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

▼ GROUNDWATER
► SEEPAGE

PACIFIC SOILS ENGINEERING, INC.

PLATE A-27

## AT-14

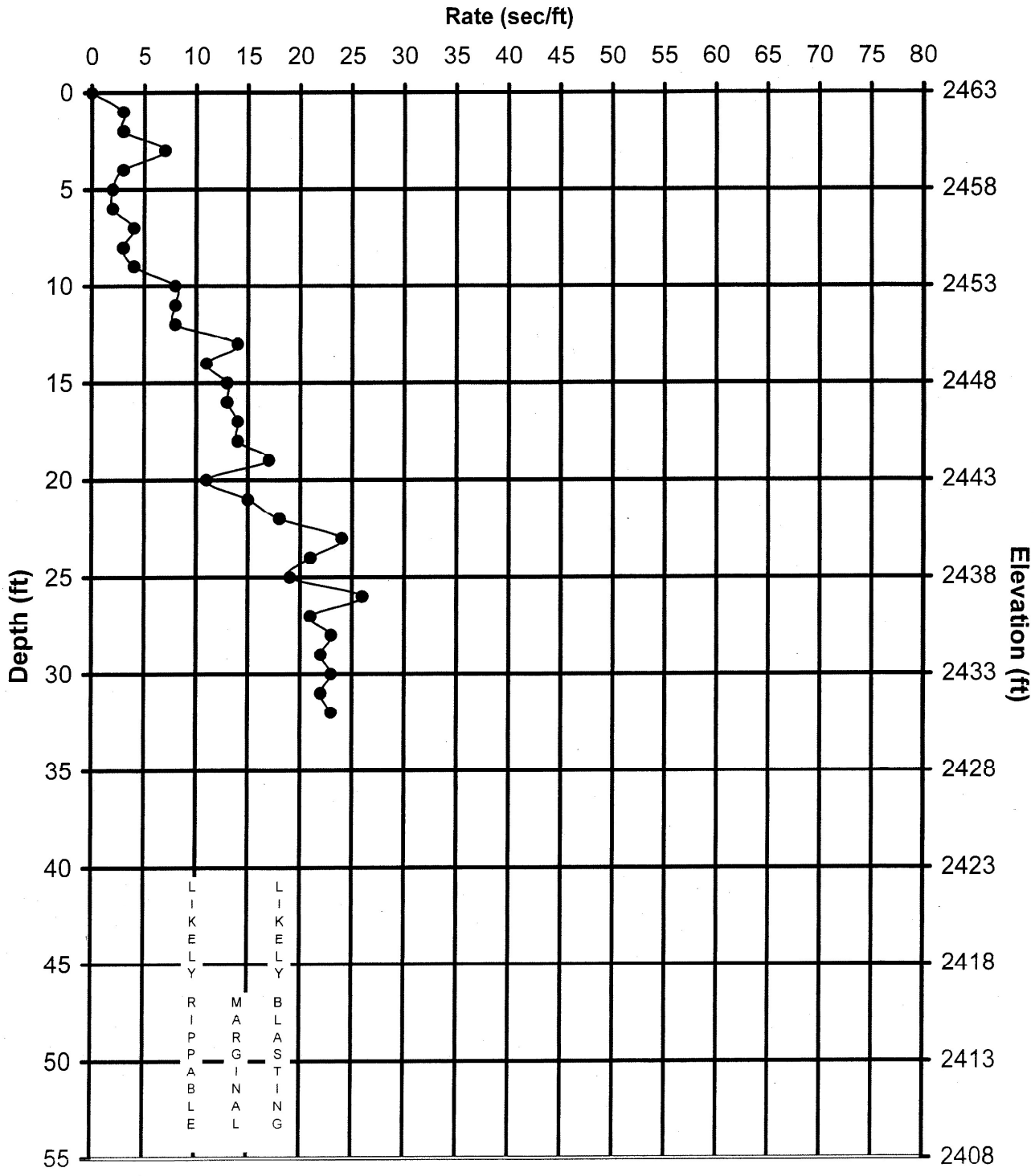



PLATE C - 14

## AT-16

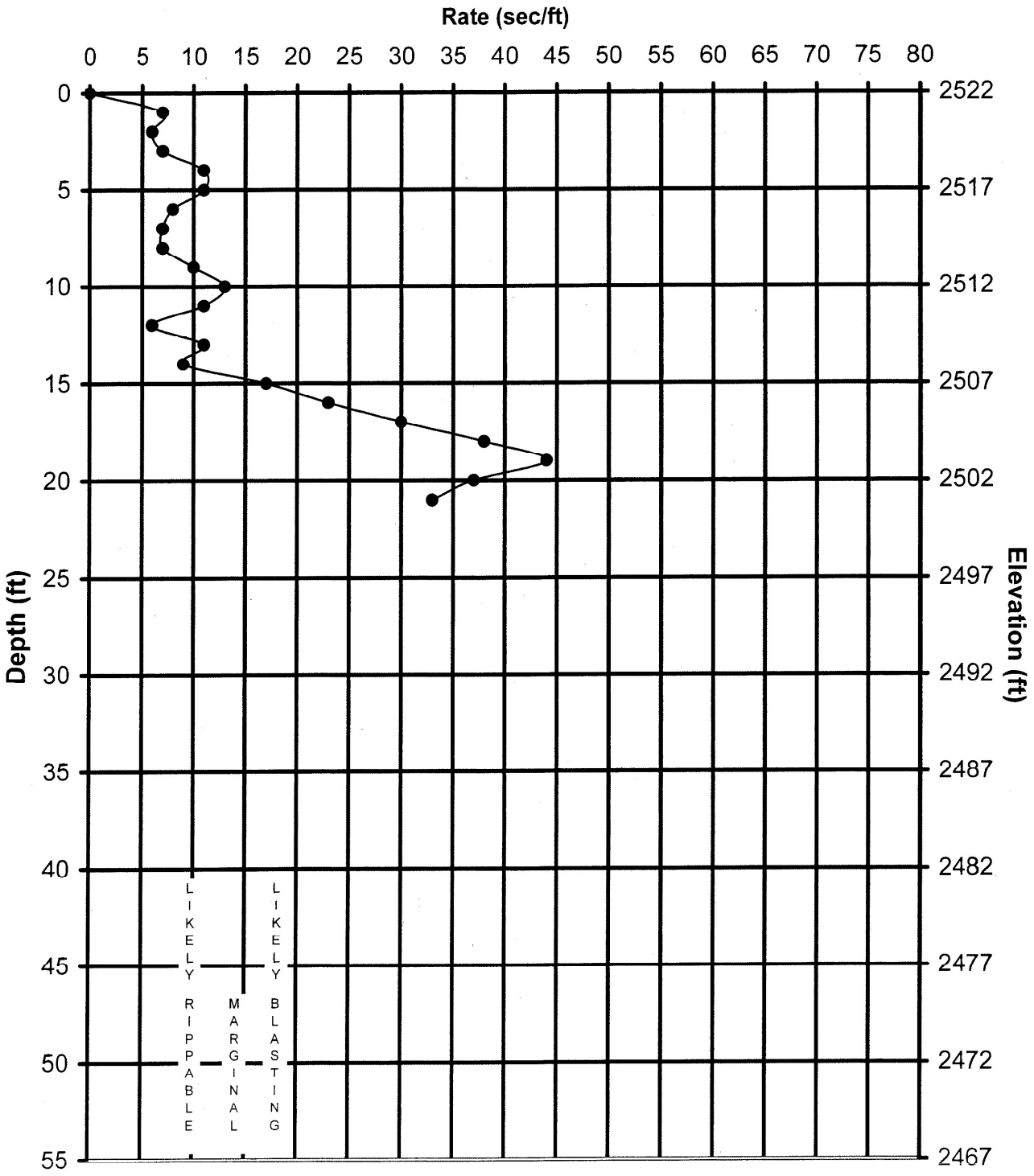



PLATE C-16

## AT-17

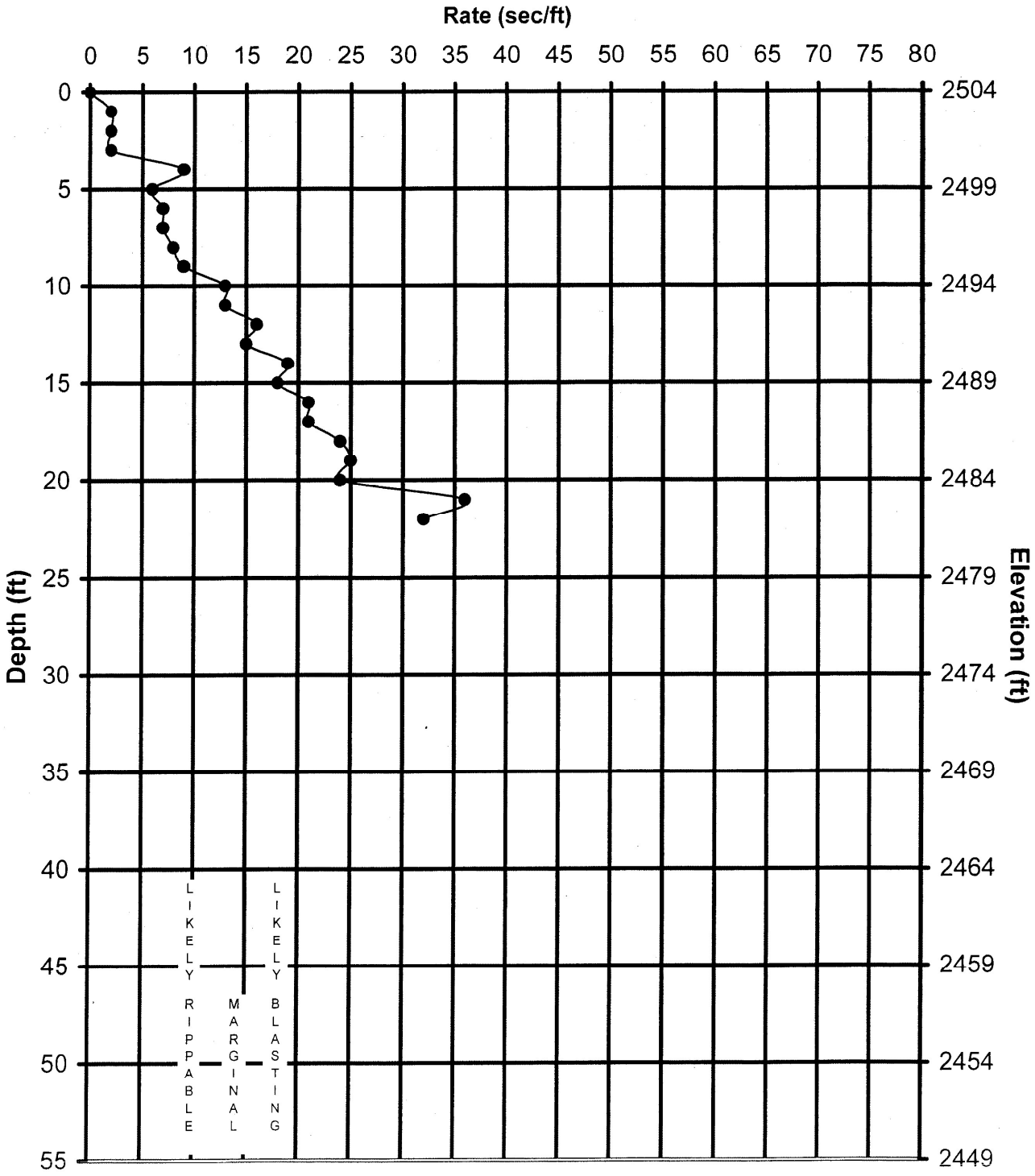



PLATE C-17

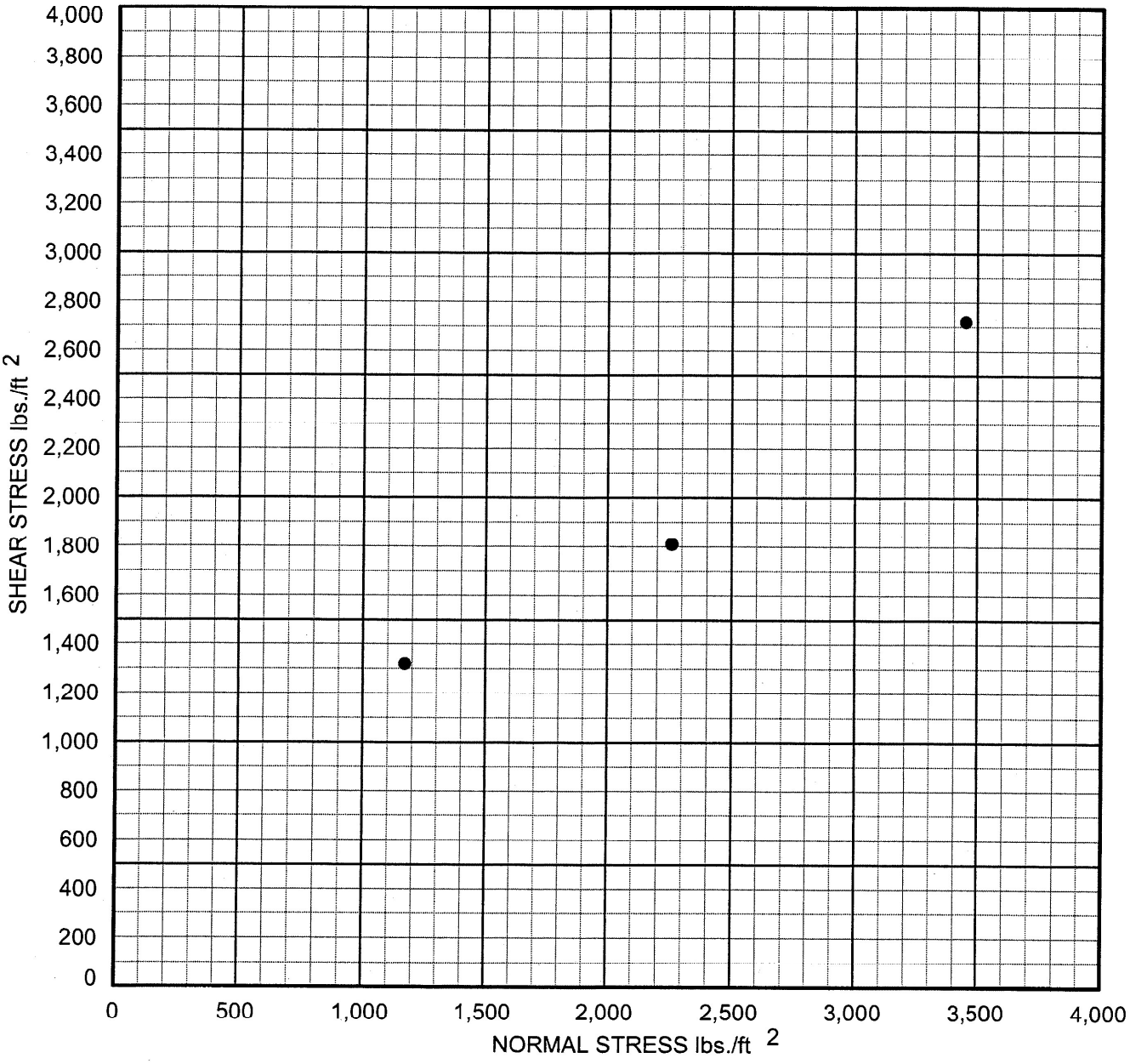
# TABLE II
# SUMMARY OF LABORATORY TEST DATA
# W.O. 700145

| SAMPLE | DEPTH (FEET) | SOIL DESCRIPTION | GROUP SYMBOL | MAXIMUM DENSITY (PCF) | OPTIMUM MOISTURE CONTENT (%) | IN-SITU DRY DENSITY (PCF) | IN-SITU MOISTURE CONTENT (%) | DEGREE OF SATURATION (%) | PLUS NO.4 SIEVE (%) | COARSE SAND (%) | MEDIUM TO FINE SAND (%) | SILT (0.075mm - 0.005mm) (%) | CLAY (minus 0.005mm) (%) | EXPANSION INDEX UBC 18-2 | COHESION (PSF) | FRICTION ANGLE (DEGREES) | OTHER TESTS REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-01 | 6 | Sand w/ Silt | SP-SM | 109.3 | 14.2 | | | | 0 | 6 | 80 | 12 | 2 | 0 | | | |
| B-02 | 5 | Sandy Silt | ML | | | 103.3 | 14.6 | 64 | 0 | 4 | 43 | 38 | 15 | | | | Consolidation |
| B-02 | 10 | Sand w/ Silt | SP-SM | | | 118.4 | 4.7 | 31 | 13 | 9 | 69 | 7 | 2 | | 500 | 31 | |
| B-03 | 10 | Silty Sand | SM | | | 103.4 | 9.4 | 42 | 0 | 0 | 52 | 30 | 18 | | 425 | 33 | Consolidation |
| B-03 | 11 | Silty Sand | SM | 119.7 | 12.5 | | | | | | | | | 32 | | | |
| B-03 | 20 | Silty Sand | SM | | | 114.3 | 9.9 | 59 | 0 | 2 | 54 | 32 | 12 | | | | Consolidation |
| B-04 | 10 | Sandy Silt | ML | | | 109.5 | 9.5 | 49 | 0 | 3 | 44 | 35 | 18 | | | | Consolidation |
| B-06 | 10 | Silty Sand | SM | | | 100.1 | 10.2 | 41 | 0 | 6 | 69 | 15 | 10 | | | | Consolidation |
| B-07 | 10 | Silty Sand | SM | | | 111.4 | 12.3 | 67 | | | | | | | 0 | 33 | |
| B-07 | 11 | Silty Sand | SM | 110.8 | 16.5 | | | | 0 | 6 | 72 | 19 | 3 | 0 | | | |
| B-10 | 5 | Sandy Silt | ML | 111.4 | 17.0 | 107.1 | 20.2 | 98 | 0 | 4 | 41 | 40 | 15 | 16 | | | |
| B-11 | 15 | Sandy Silt | ML | | | 110.8 | 19.0 | 102 | 0 | 0 | 45 | 48 | 7 | | | | Consolidation |
| B-12 | 10 | Silty Sand | SM | | | 93.0 | 14.5 | 49 | 0 | 2 | 53 | 30 | 15 | | 350 | 28 | |
| B-13 | 5 | Silty Sand | SM | 116.8 | 14.5 | 91.1 | 11.7 | 38 | 0 | 1 | 53 | 33 | 13 | 2 | | | |
| B-13 | 10 | Silty Sand | SM | | | 107.3 | 5.4 | 26 | 0 | 5 | 68 | 20 | 7 | | | | Consolidation |
| B-17 | 17 | Silty Sand | SM | 115.3 | 13.2 | | | | 0 | 7 | 76 | 14 | 3 | 1 | 370 | 31 | |
| B-18 | 10 | Sandy Silt | ML | | | 111.8 | 13.7 | 76 | 0 | 0 | 48 | 32 | 20 | | | | Consolidation |
| B-18 | 20 | Silty Sand | SM | | | 115.5 | 7.5 | 46 | 0 | 6 | 78 | 8 | 8 | | 330 | 33 | |
| B-19 | 40 | Silty Sand | SM | | | 112.1 | 4.8 | 27 | 0 | 1 | 84 | 10 | 5 | | 0 | 34 | |
| B-20 | 15 | Sandy Silt | ML | 113.8 | 16.8 | | | | 0 | 15 | 22 | 48 | 15 | 35 | 0 | 34 | |
| B-20 | 20 | Sandy Silt | ML | | | 108.1 | 17.1 | 86 | 0 | 0 | 27 | 65 | 8 | | 300 | 24 | |
| B-20 | 48 | Clayey Silt | ML | 120.1 | 11.7 | | | | | | | | | | | | |

# TABLE II
# SUMMARY OF LABORATORY TEST DATA
# W.O. 700145

| SAMPLE | DEPTH (FEET) | SOIL DESCRIPTION | GROUP SYMBOL | MAXIMUM DENSITY (PCF) | OPTIMUM MOISTURE CONTENT (%) | IN-SITU DRY DENSITY (PCF) | IN-SITU MOISTURE CONTENT (%) | DEGREE OF SATURATION (%) | PLUS NO.4 SIEVE (%) | COARSE SAND (%) | MEDIUM TO FINE SAND (%) | SILT (0.075mm - 0.005mm) (%) | CLAY (minus 0.005mm) (%) | EXPANSION INDEX UBC 18-2 | COHESION (PSF) | FRICTION ANGLE (DEGREES) | OTHER TESTS REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-21 | 50 | Silty Sand | SM | | | 127.0 | 10.6 | 93 | 0 | 1 | 59 | 28 | 12 | | 400 | 31 | |
| B-22 | 20 | Sandy Silt | ML | 112.3 | 16.1 | 111.6 | 18.0 | 99 | 0 | 5 | 32 | 40 | 23 | 51 | 0 | 36 | Chemical |
| B-23 | 18 | Silty Sand | SM | 117.3 | 13.3 | | | | | | | | | | | | |
| B-24 | 5 | Sandy Silt | ML | | | 102.3 | 18.7 | 80 | 0 | 0 | 37 | 48 | 15 | | | | |
| B-24 | 10 | Sandy Silt | ML | 112.2 | 16.2 | 102.0 | 20.3 | 87 | 0 | 0 | 33 | 42 | 25 | 60 | | | |
| B-25 | 5 | Sandy Silt | ML | | | 114.0 | 11.9 | 70 | 0 | 1 | 47 | 27 | 25 | | | | |
| B-25 | 10 | Sandy Silt | ML | 121.8 | 12.4 | 114.3 | 15.5 | 92 | 0 | 1 | 49 | 27 | 23 | 53 | 315 | 28 | Chemical |
| B-25 | 10.5 | Silty Sand | SM | | | | | | 0 | 0 | 52 | 25 | 23 | | | | |
| B-25 | 15 | Silty Sand | SM | | | 112.3 | 16.3 | 91 | 0 | 1 | 52 | 25 | 22 | | | | |
| B-25 | 20 | Silty Sand | SM | 127.2 | 9.2 | 113.8 | 14.3 | 84 | 0 | 0 | 62 | 21 | 17 | | 50 | 35 | |
| B-25 | 20.5 | Silty Sand | SM | | | | | | 0 | 0 | 58 | 22 | 20 | | | | |
| B-26 | 20 | Silty Sand | SM | | | 120.8 | 12.8 | 92 | 0 | 0 | 55 | 32 | 13 | | 240 | 29 | |
| B-26 | 30 | Sandy Silt | ML | 117.8 | 14.4 | 116.0 | 14.7 | 92 | 0 | 4 | 29 | 45 | 22 | 34 | | | |
| B-27 | 10 | Sandy Silt | ML | | | 110.1 | 13.8 | 73 | 0 | 0 | 45 | 32 | 23 | | | | |

# DIRECT SHEAR TEST
Undisturbed




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-02 | 10.0 | 118 | 4.7 | 9 | SP-SM | Sand w/ Silt |

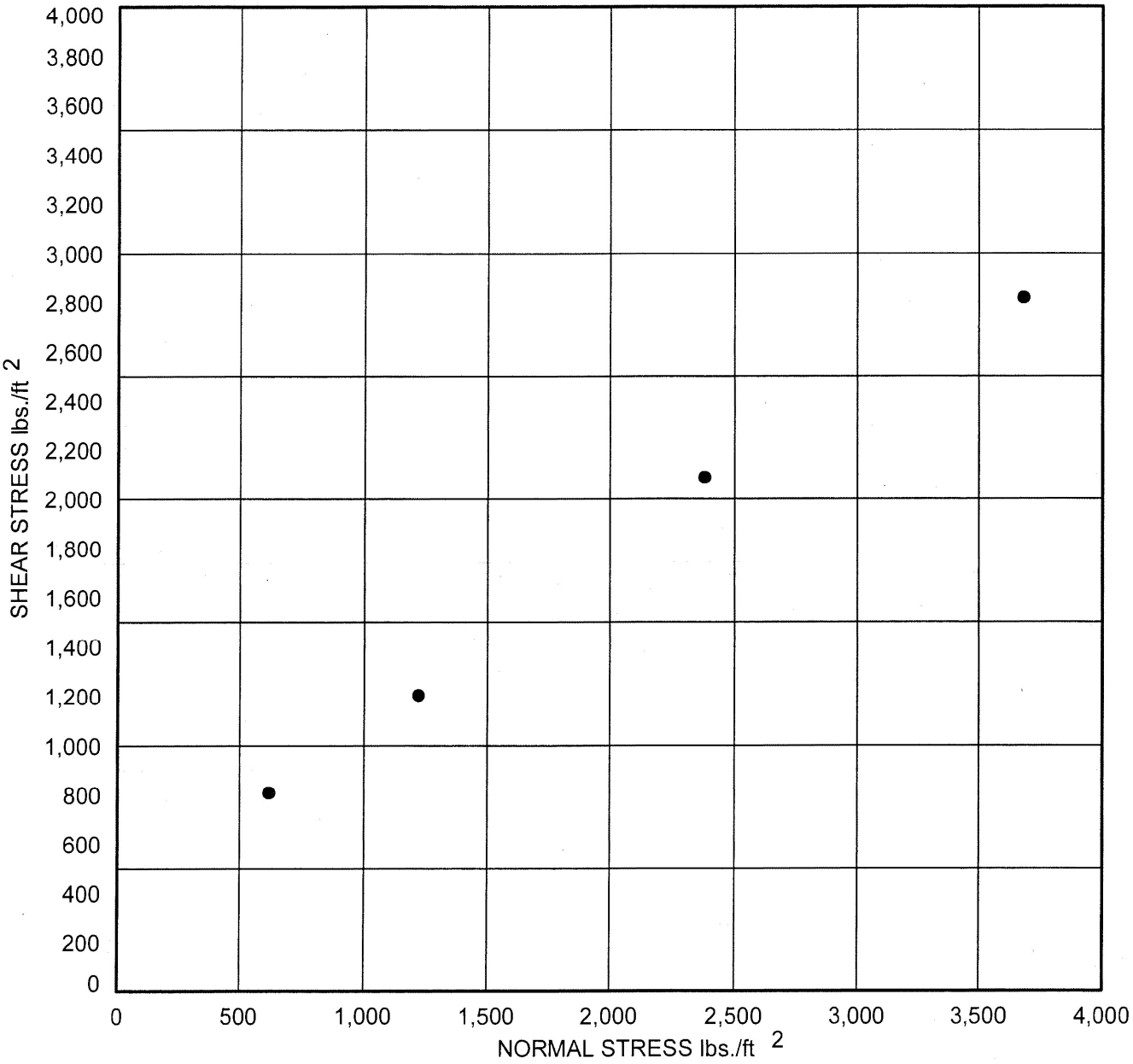
| | |
|---|---|
| COHESION | 500 psf. |
| FRICTION ANGLE | 31 degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-1

# DIRECT SHEAR TEST
## Remolded at 90% Relative Compaction




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-03 | 11.0 | | | 47 | SM | Silty Sand |

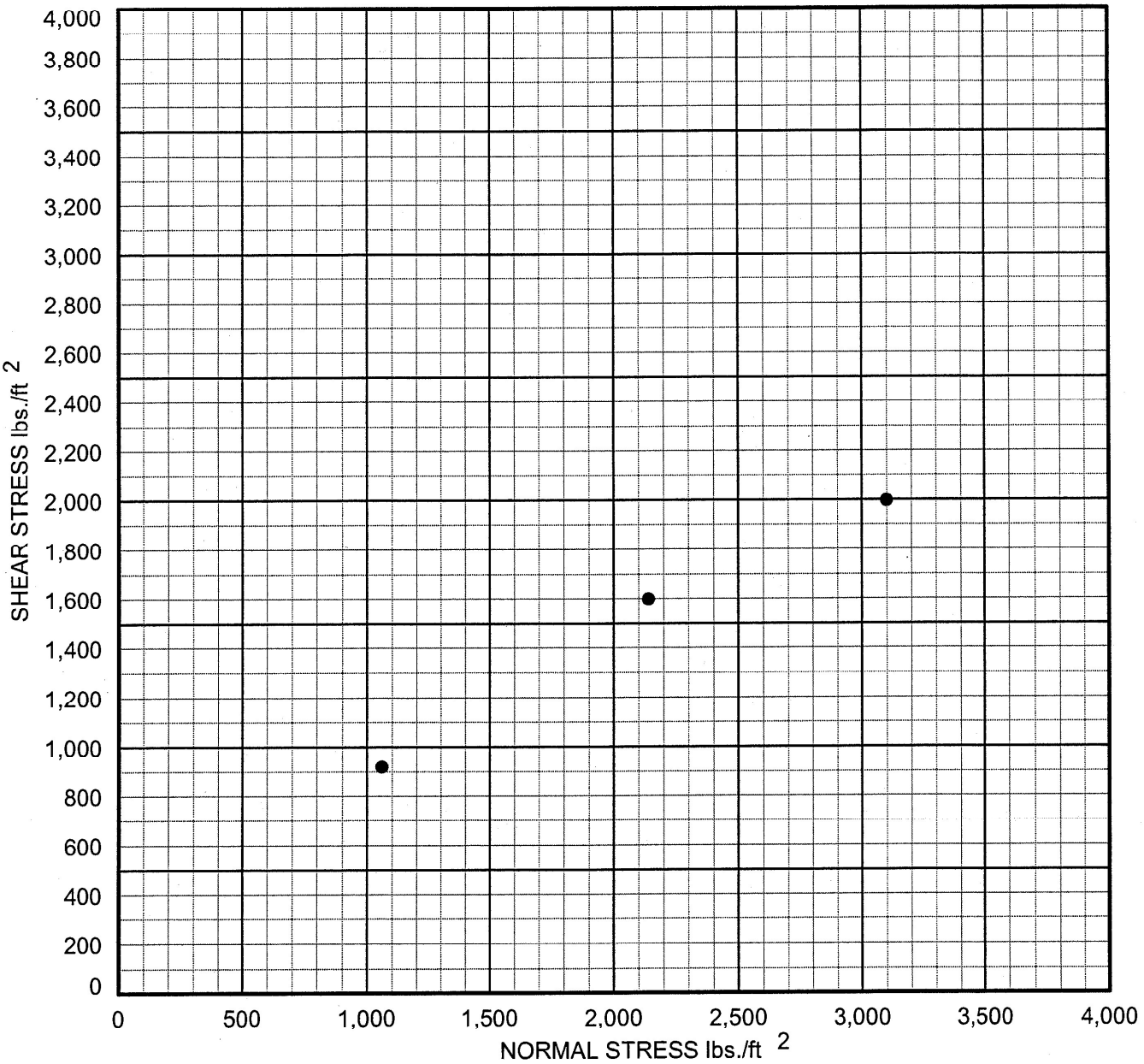
| | | |
|---|---|---|
| COHESION | 425 | psf. |
| FRICTION ANGLE | 33 | degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-2

# DIRECT SHEAR TEST
Undisturbed




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-12 | 10.0 | 93 | 14.5 | 45 | SM | Silty Sand |

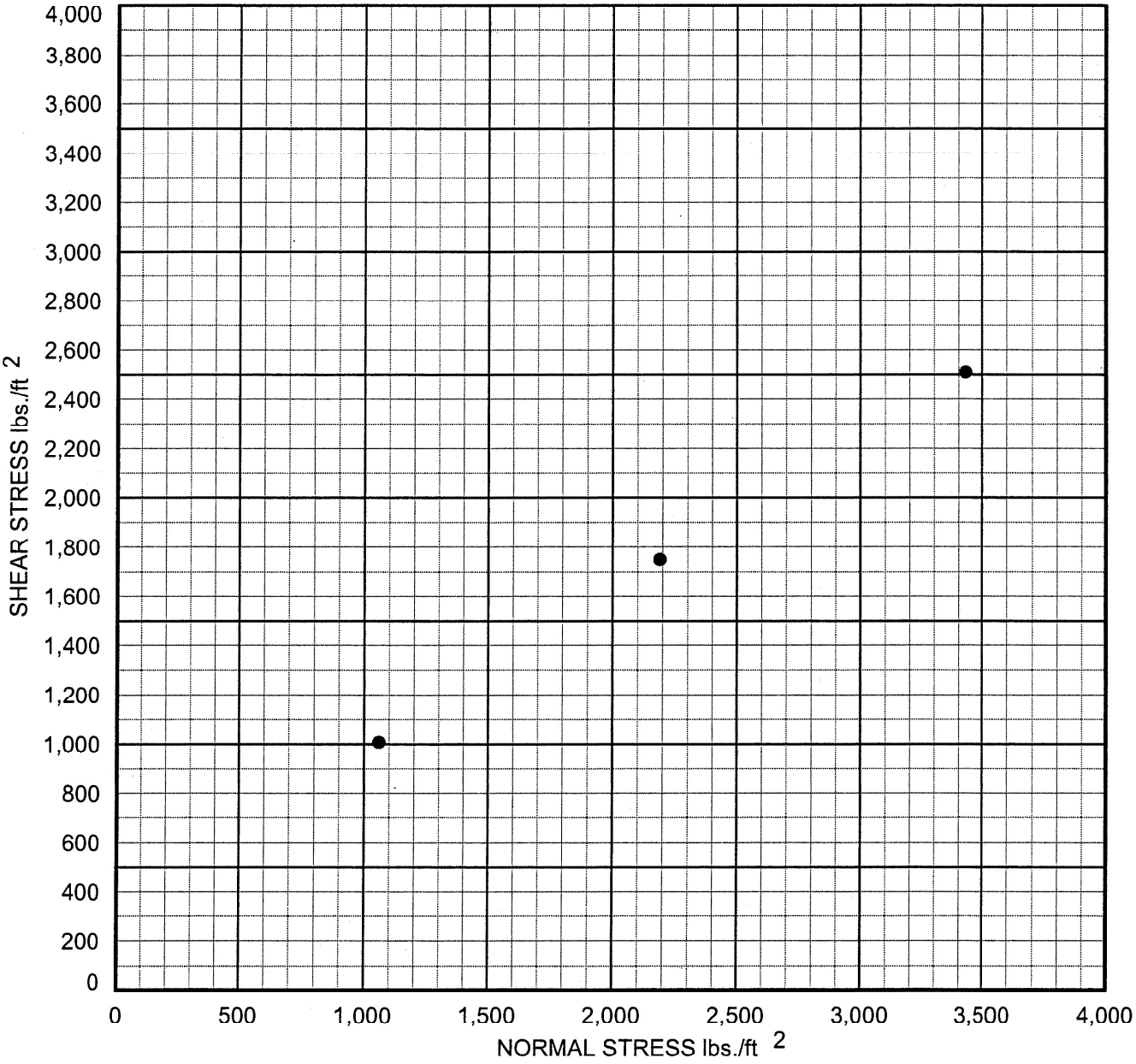
| | | |
|---|---|---|
| COHESION | 350 | psf. |
| FRICTION ANGLE | 28 | degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-4

# DIRECT SHEAR TEST
Undisturbed




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-18 | 20.0 | 116 | 7.5 | 16 | SM | Silty Sand |

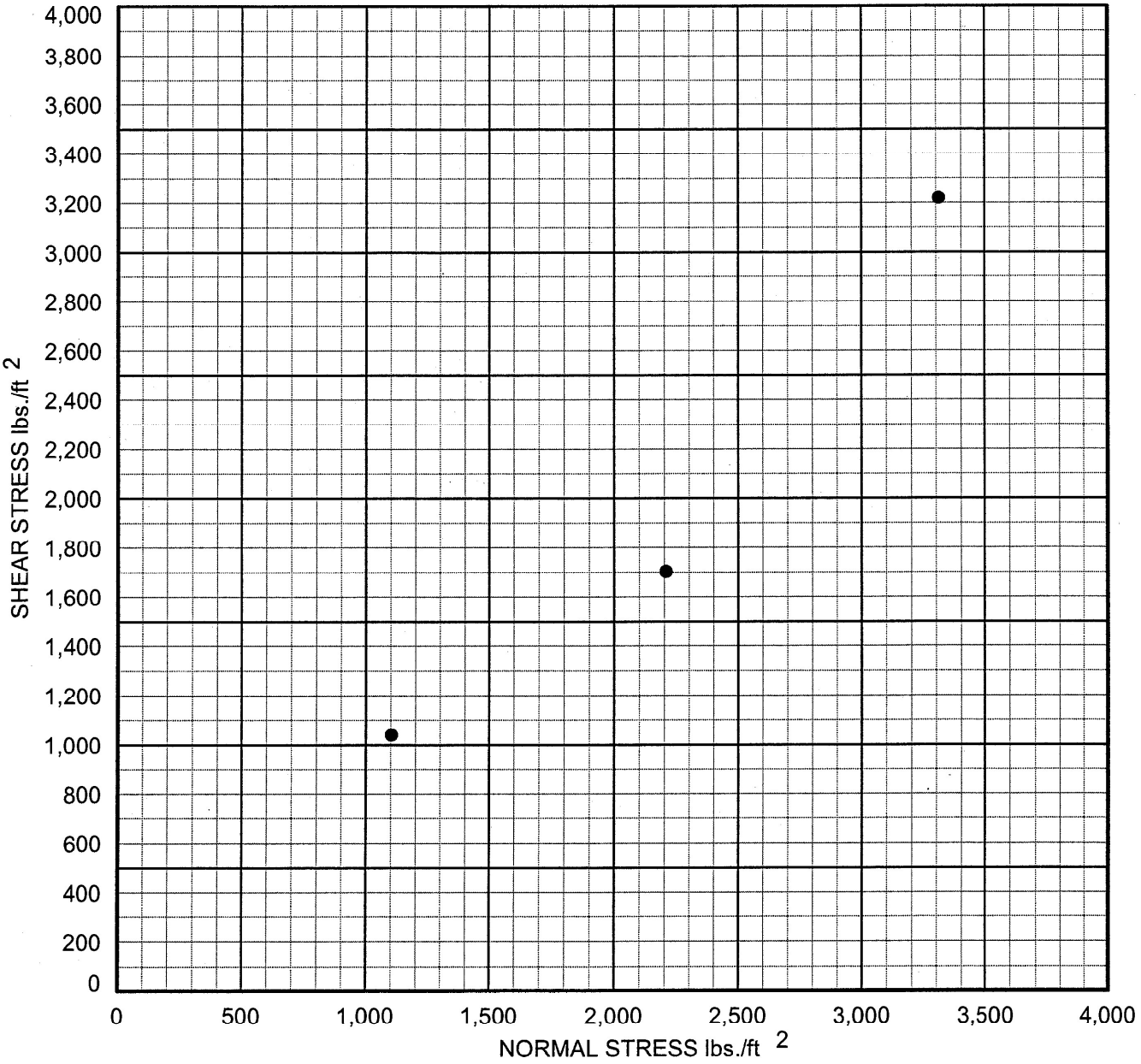
| | |
|---|---|
| COHESION | 330 psf. |
| FRICTION ANGLE | 33 degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-6

# DIRECT SHEAR TEST
Undisturbed




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-21 | 50.0 | 127 | 10.6 | 40 | SM | Silty Sand |

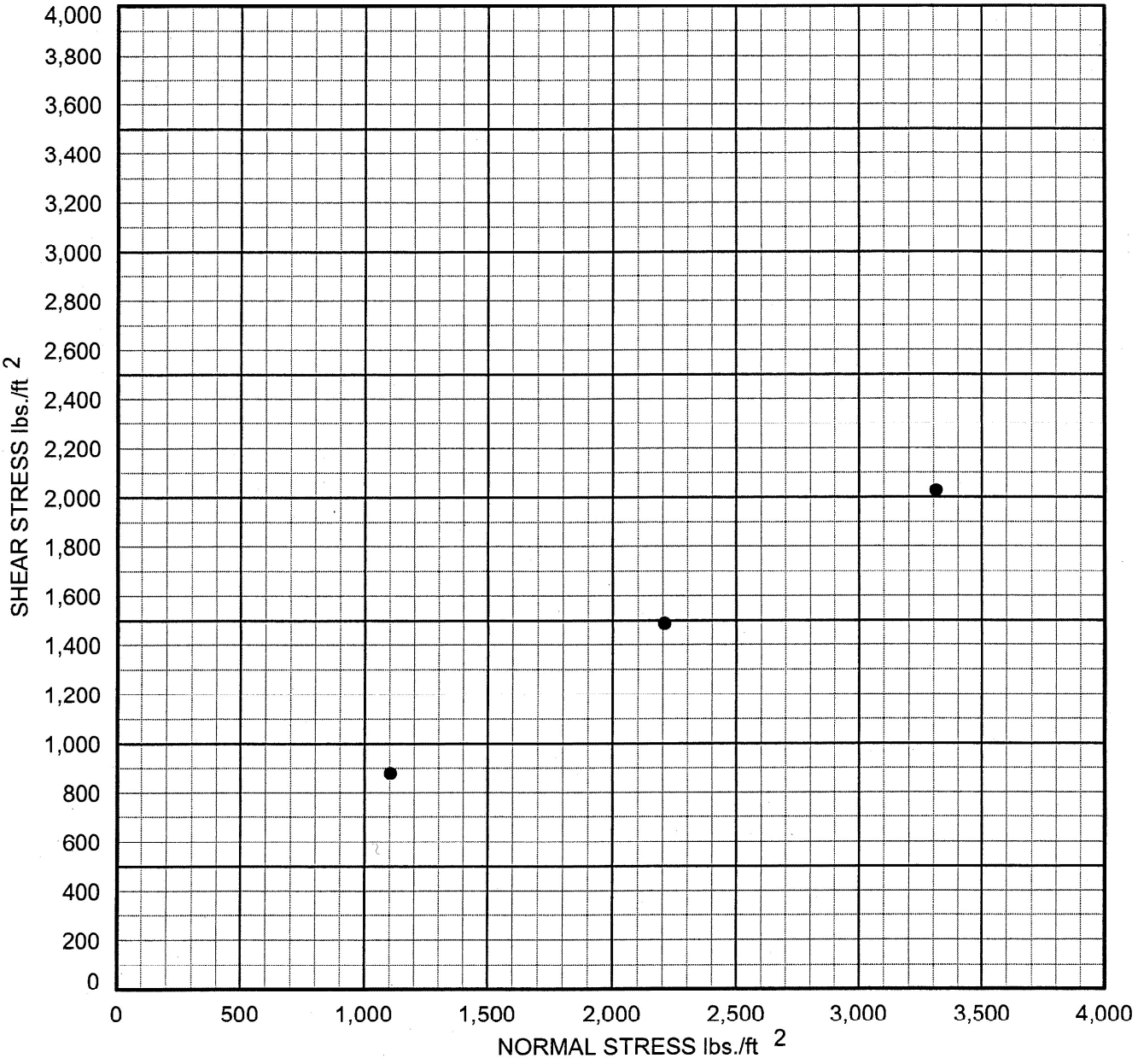
| | | |
|---|---|---|
| COHESION | 400 | psf. |
| FRICTION ANGLE | 31 | degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-10

# DIRECT SHEAR TEST
## Remolded at 90% Relative Compaction




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-25 | 10.0 | 114 | 15.5 | 50 | ML | Sandy Silt |

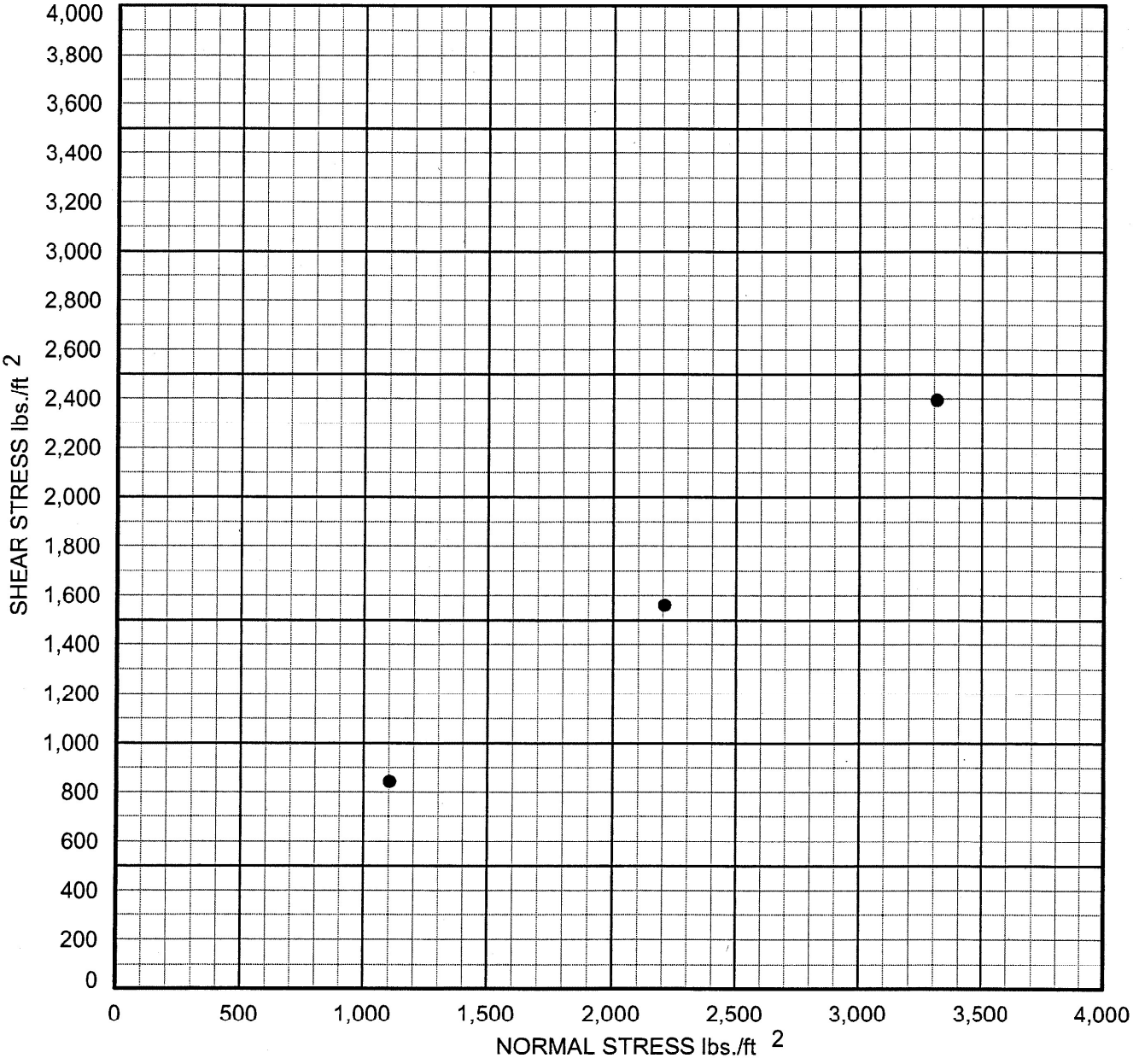
| | |
|---|---|
| COHESION | 315 psf. |
| FRICTION ANGLE | 28 degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-12

# DIRECT SHEAR TEST
Undisturbed




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-25 | 20.0 | 114 | 14.3 | 38 | SM | Silty Sand |

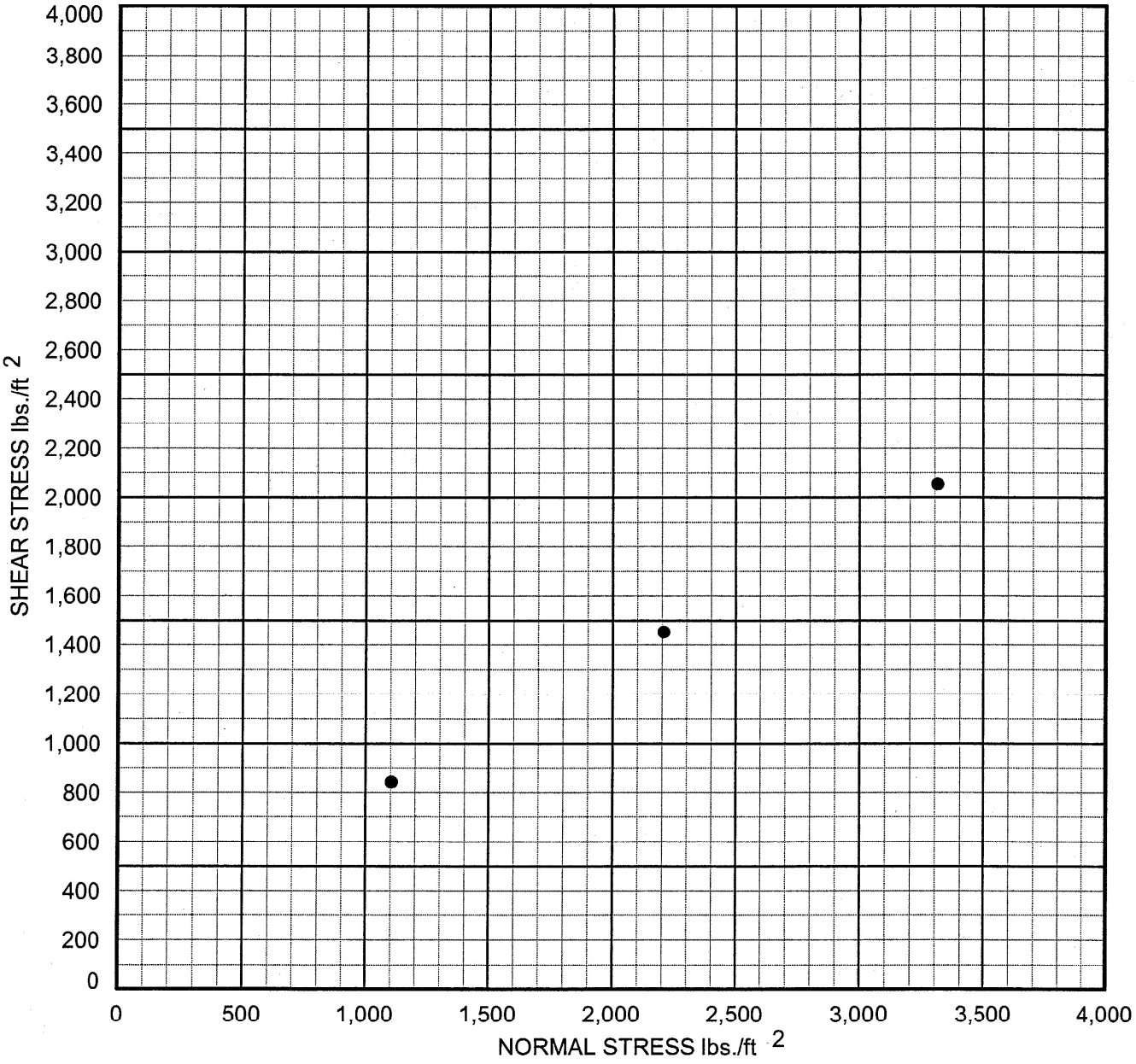
| | |
|---|---|
| COHESION | 50 psf. |
| FRICTION ANGLE | 35 degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-13

# DIRECT SHEAR TEST
Undisturbed




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|
| B-26 | 20.0 | 121 | 12.8 | 45 | SM | Silty Sand |

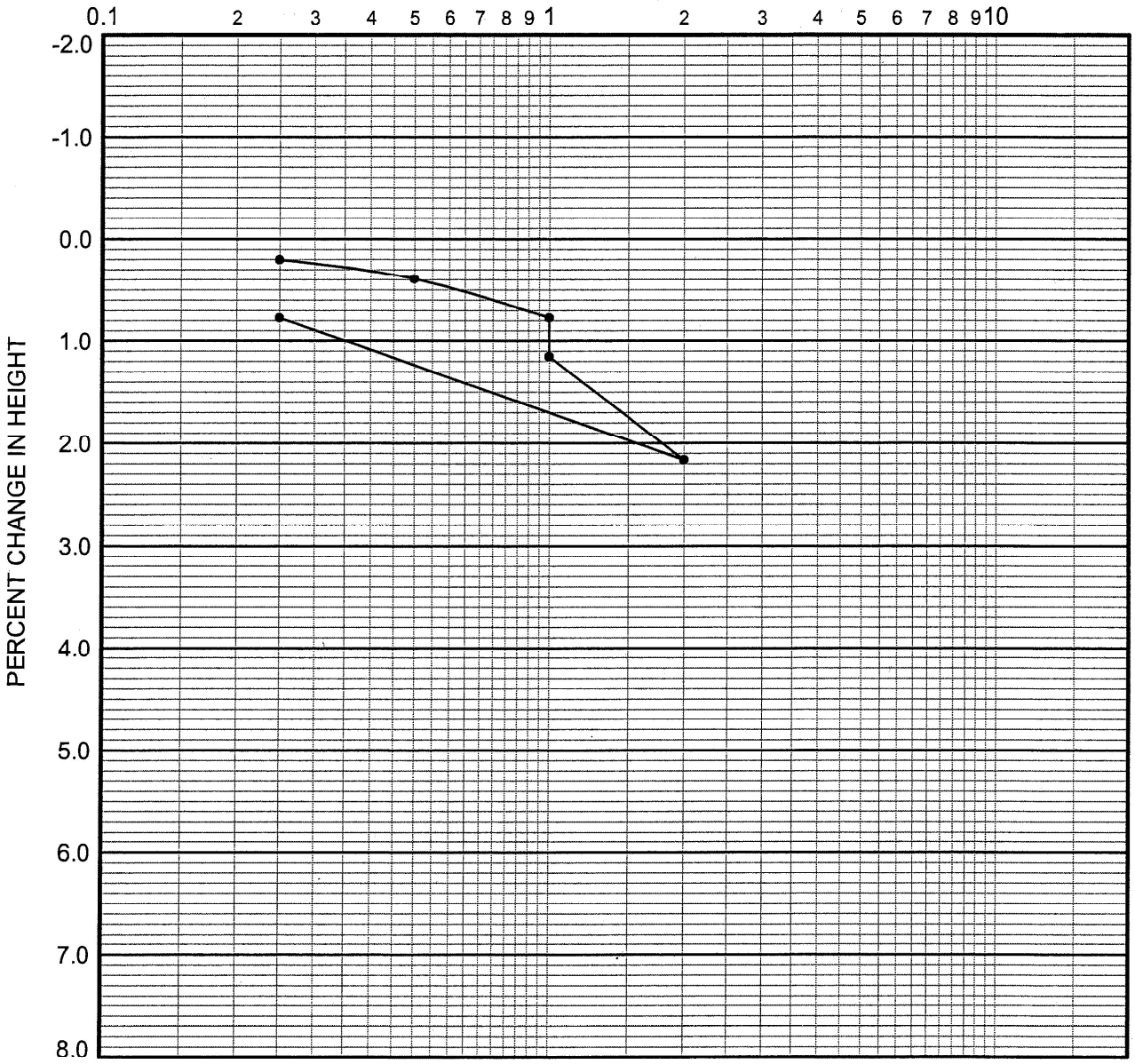
| | | |
|---|---|---|
| COHESION | 240 | psf. |
| FRICTION ANGLE | 29 | degrees |

DIRECT SHEAR TEST

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE B-14

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-02 | 5.0 | 103 | 14.6 | 64 | 53 | ML | Sandy Silt |

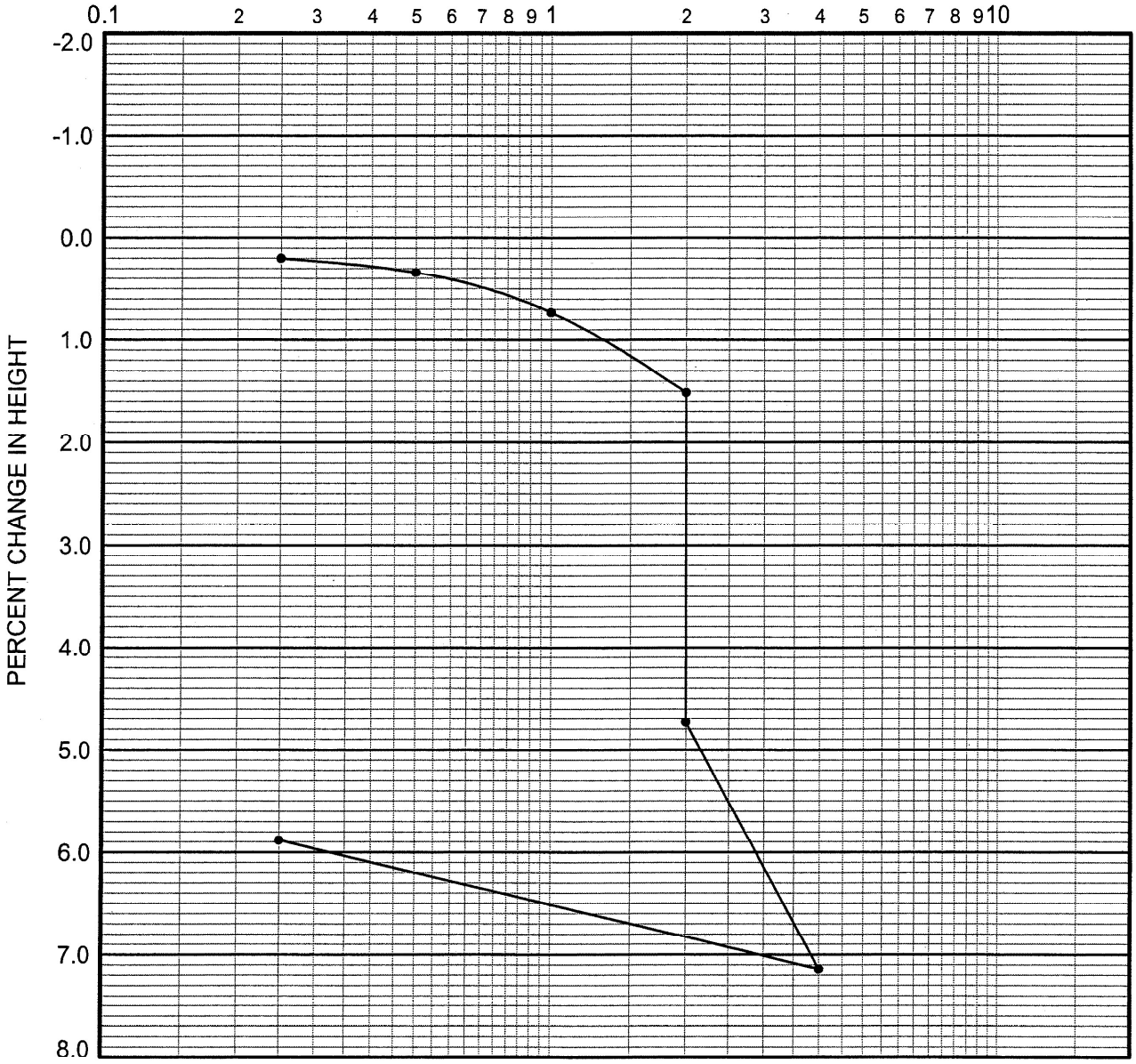
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-1

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-03 | 10.0 | 103 | 9.4 | 42 | 48 | SM | Silty Sand |

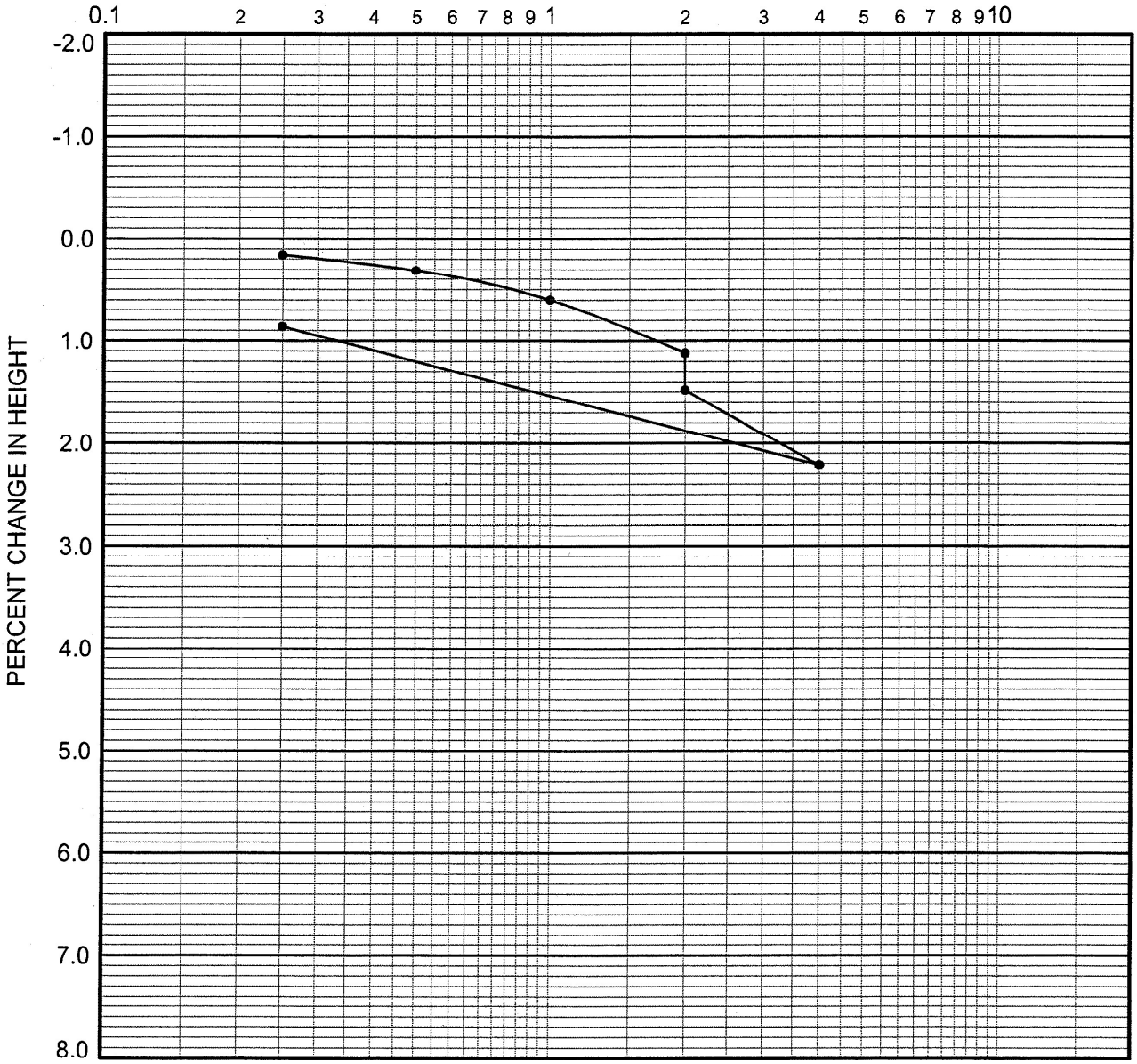
REMARKS: WATER ADDED AT 2.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-2

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-03 | 20.0 | 114 | 9.9 | 59 | 44 | SM | Silty Sand |

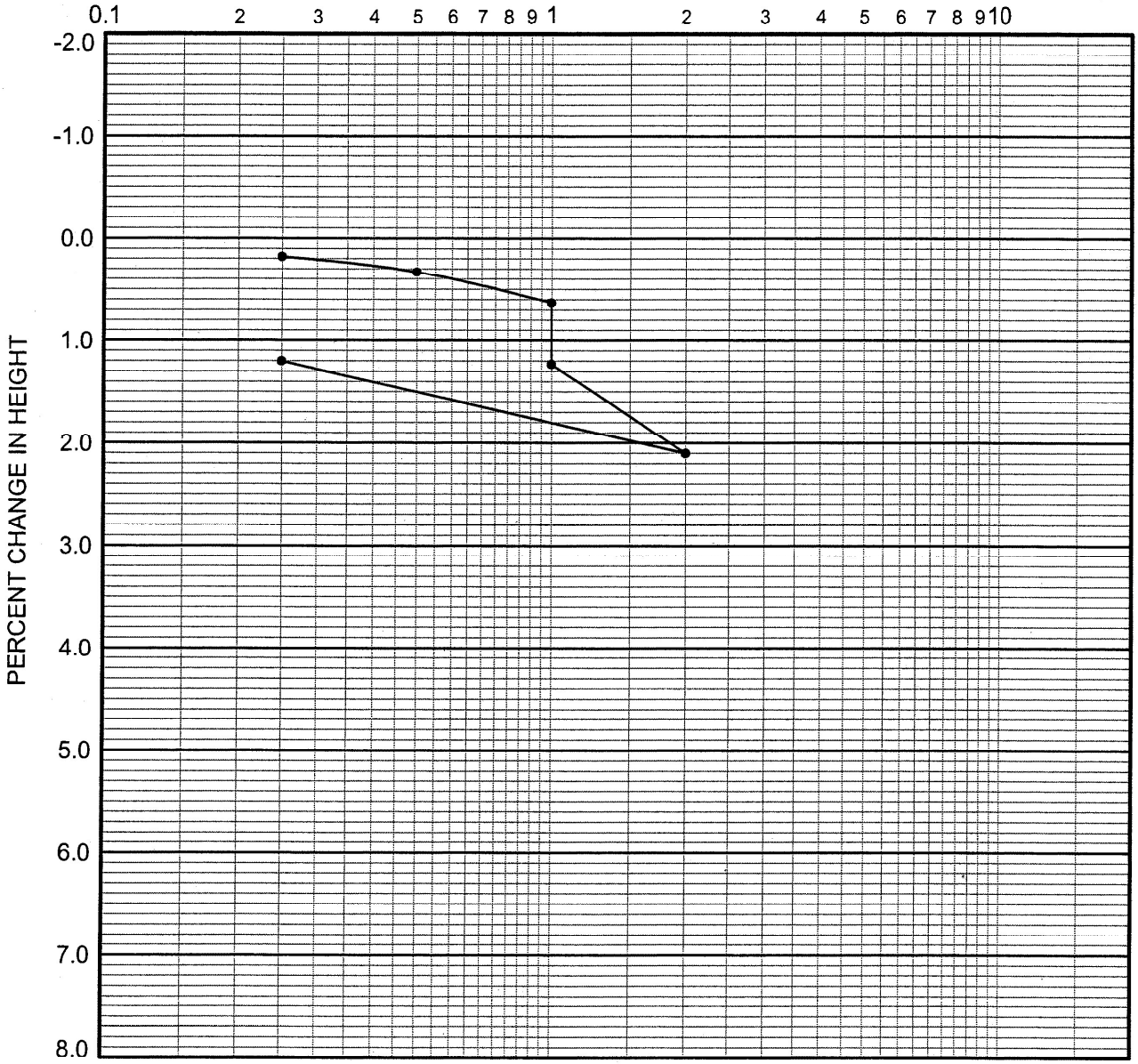
REMARKS: WATER ADDED AT 2.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-3

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-04 | 10.0 | 110 | 9.5 | 49 | 53 | ML | Sandy Silt |

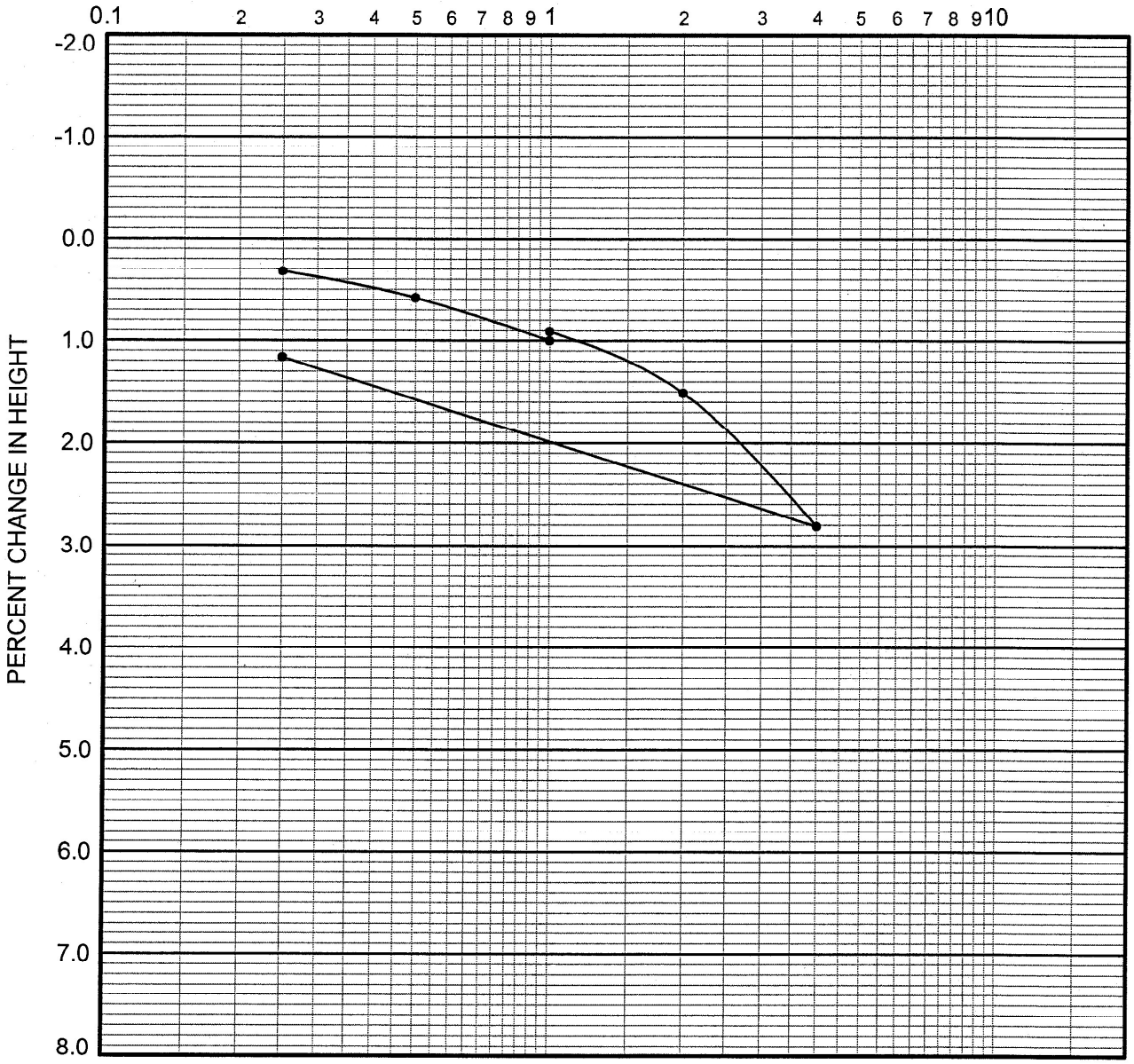
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-4

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-11 | 15.0 | 111 | 19.0 | 102 | 55 | ML | Sandy Silt |

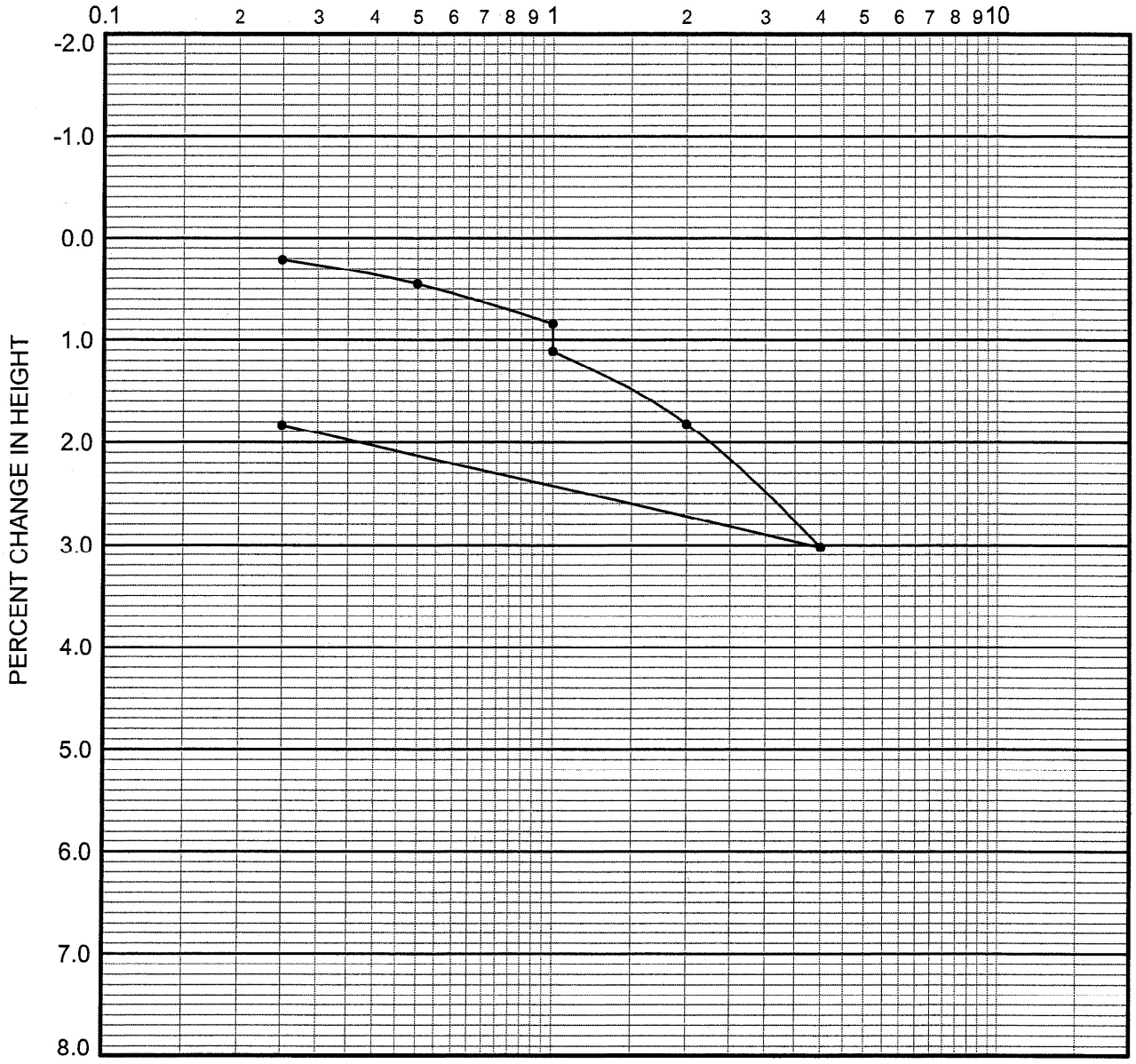
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-6

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-18 | 10.0 | 112 | 13.7 | 76 | 52 | ML | Sandy Silt |

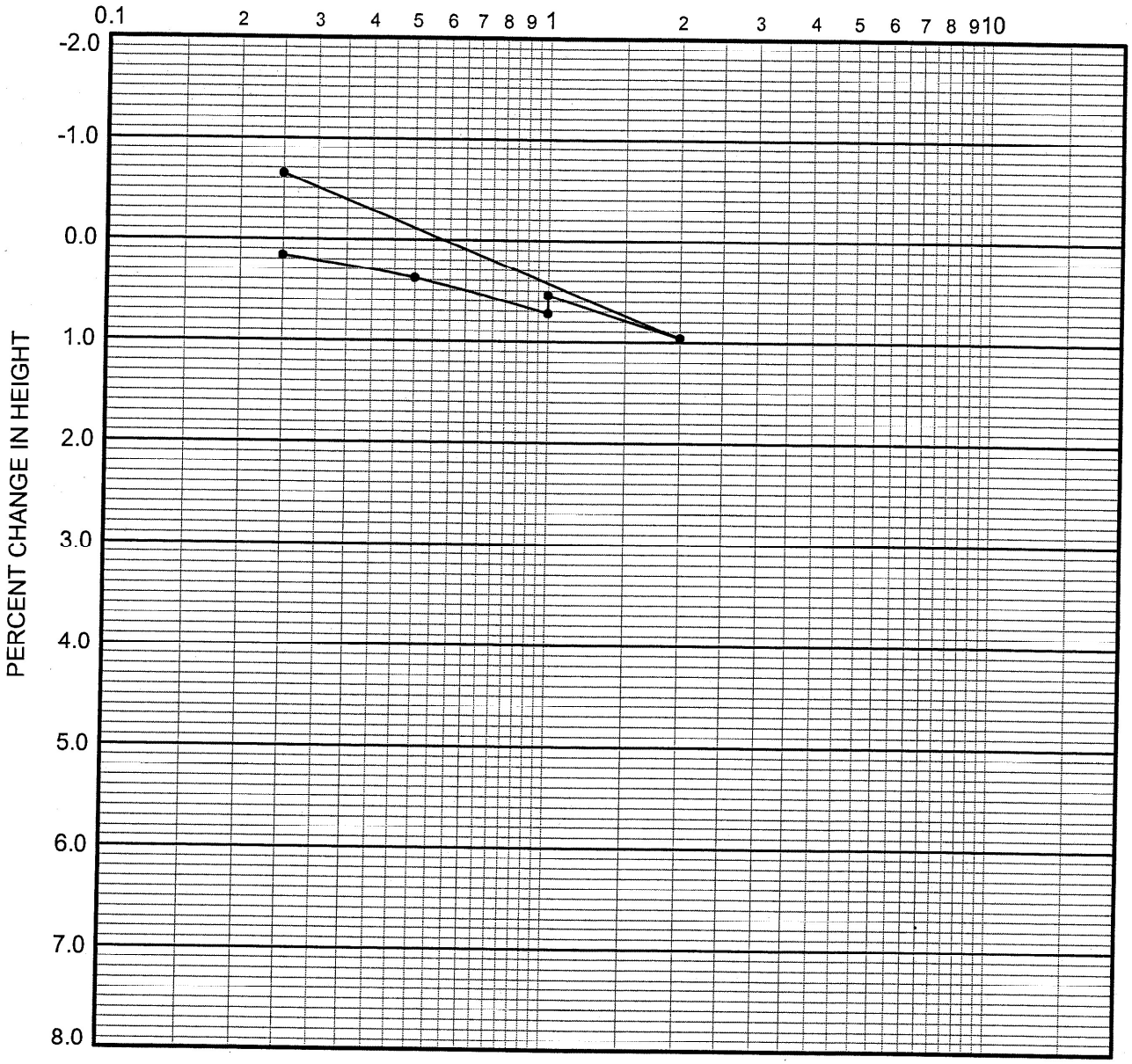
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-8

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-24 | 5.0 | 102 | 18.7 | 80 | 63 | ML | Sandy Silt |

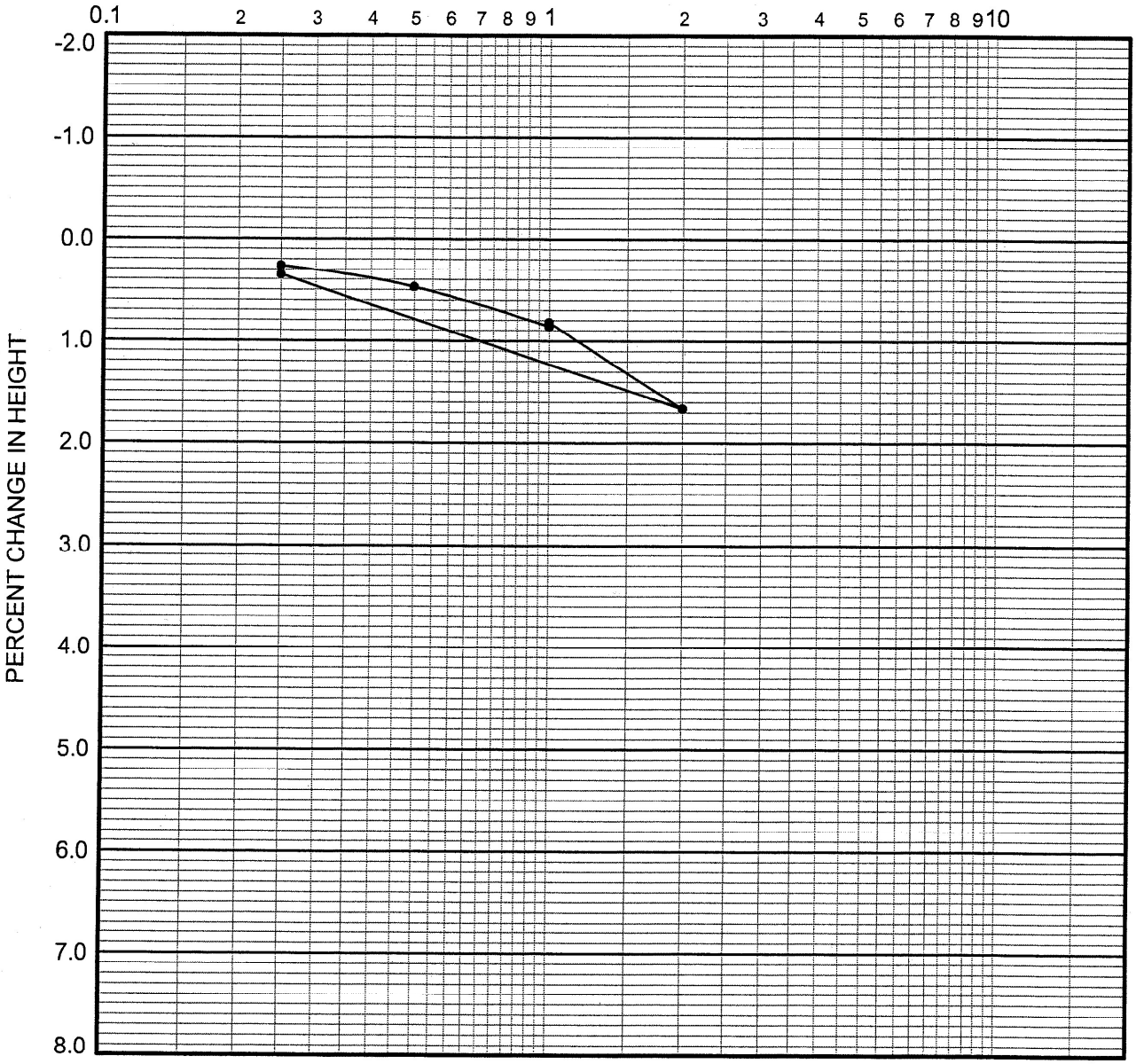
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-9

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-25 | 5.0 | 114 | 11.9 | 70 | 52 | ML | Sandy Silt |

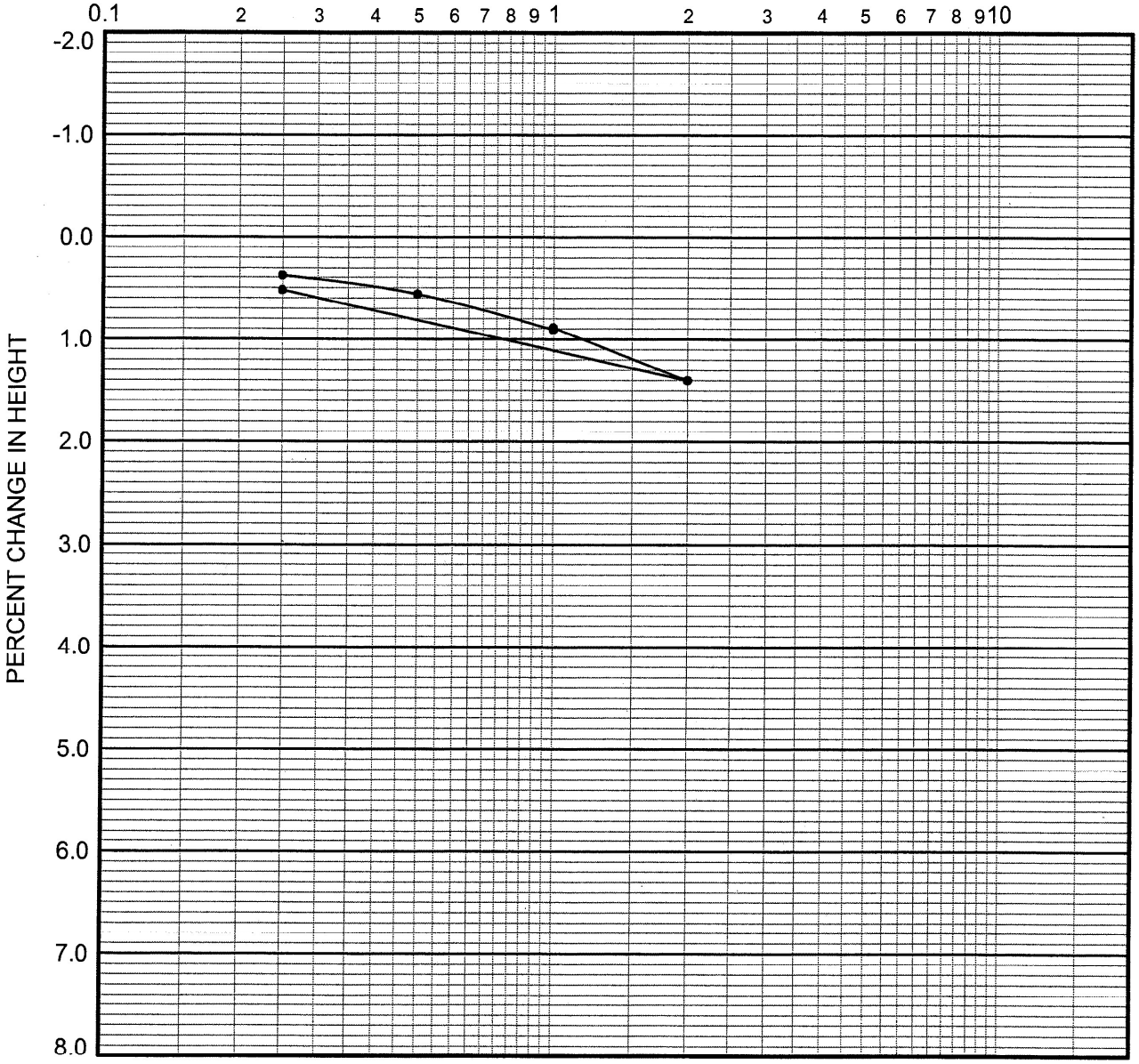
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-10

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-25 | 10.0 | 114 | 15.5 | 92 | 50 | ML | Sandy Silt |

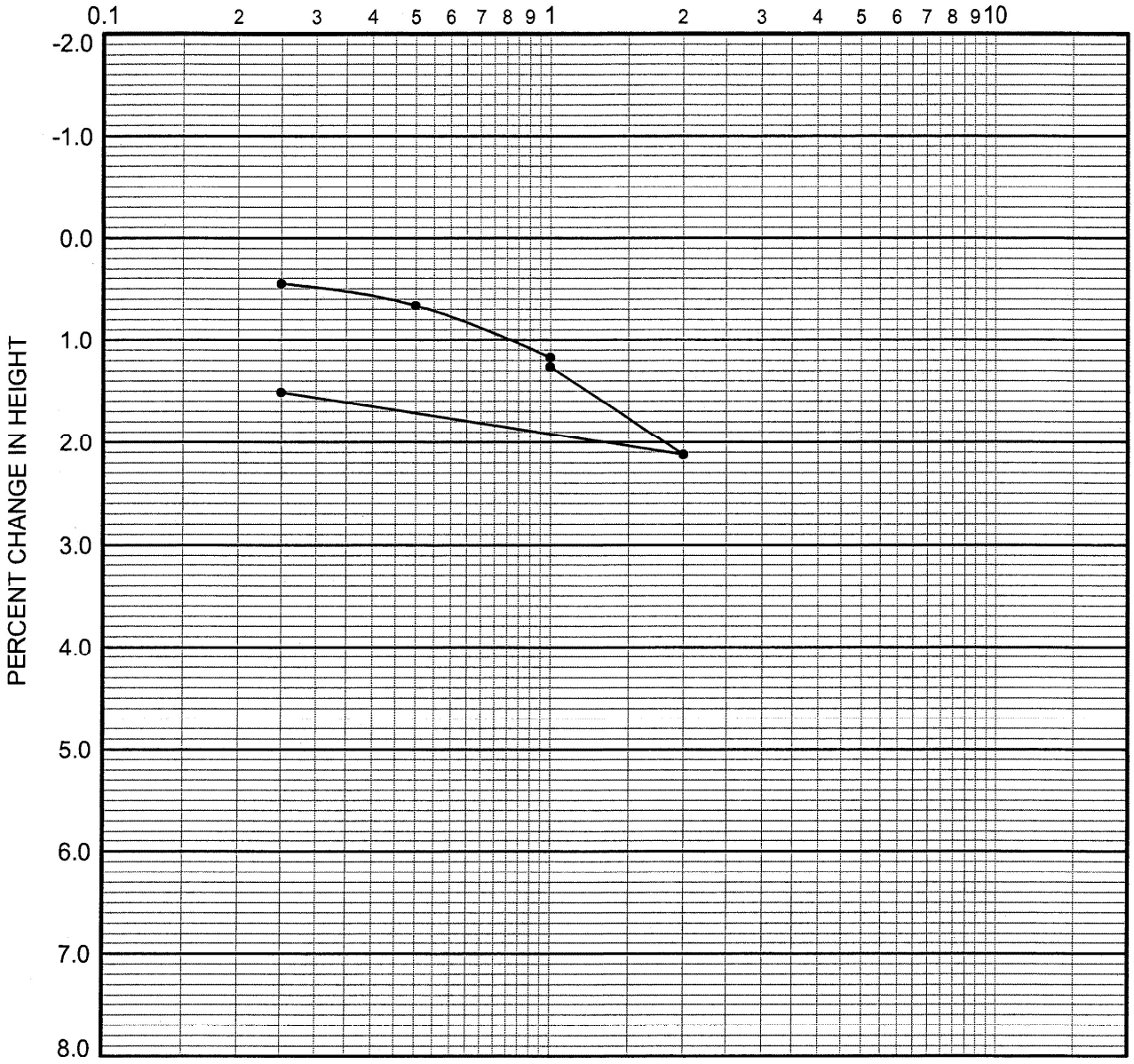
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-11

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-25 | 15.0 | 112 | 16.3 | 91 | 47 | SM | Silty Sand |

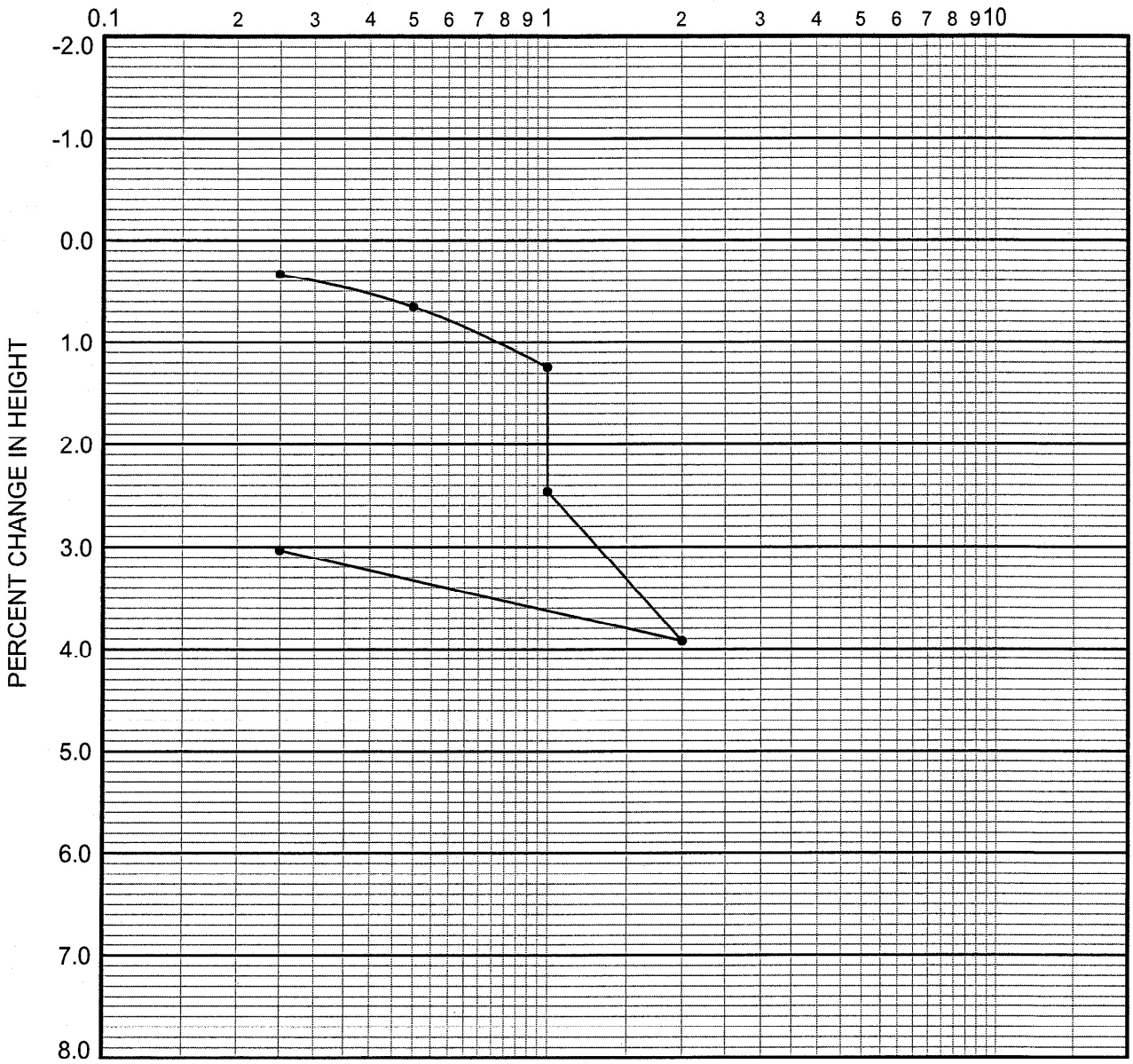
REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-12

COMPRESSIVE STRESS IN TSF




| boring | depth (ft.) | dry density (pcf) | in situ moist. (%) | in situ satur. (%) | -200 sieve (%) | group symbol | typical names |
|---|---|---|---|---|---|---|---|
| B-27 | 10.0 | 110 | 13.8 | 73 | 55 | ML | Sandy Silt |

REMARKS: WATER ADDED AT 1.0 TSF

CONSOLIDATION CURVE

**PACIFIC SOILS ENGINEERING, INC.**

W.O. 700145 PLATE C-13

# PALEONTOLOGICAL RESOURCES IDENTIFICATION

# Beaumont Heights Business Centre Project

City of Beaumont, California, and
Unincorporated Riverside County,
Within the Sphere of Influence of the City of Beaumont, California

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Prepared for
**Beaumont Heights Business, LLC**
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February 2025

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# 1.0 INTRODUCTION

In support of the proposed Beaumont Heights Business Centre Project (project), Michael Baker International staff conducted a fossil locality search at the Western Science Center (WSC), a literature and geologic map review, and a paleontological resources sensitivity analysis. These efforts identified the paleontological sensitivity of the project area and determined whether the project could result in significant impacts to paleontological resources in accordance with the California Environmental Quality Act (CEQA). Methods, results, and recommendations are summarized below; figures are provided in Attachment 1.

## 1.1 PROJECT LOCATION

The project encompasses approximately 629.3 acres (project site) located in the City of Beaumont and the City of Beaumont Sphere of Influence (SOI), unincorporated Riverside County, California (**Figure 1**). Generally, the site is bounded by First Street to the north, an institutional use (Harmony Haven Children and Youth Center), single-family residences, and undeveloped land to the east, undeveloped land to the south, and SR-79 to the west. Additionally, a Southern California Edison (SCE) easement bisects the southern portion of the site. Regional and local access to the site is provided via SR-79 and California Avenue. The project is within Township 3 South, Range 1 West, Sections 9, 10, 15, 16, 21, and 22 on the Beaumont U.S. Geological Survey Quadrangle (**Figures 2 and 3**).

The project site is entirely vacant and undeveloped land with the exception of improved segments of SR-79, California Avenue, and a proposed utility corridor through the Harmony Haven Children Youth Center property.

A small portion of the northern segment of the project site along California Avenue enters the current City limits; the remainder of the project site is located within the City's SOI.

## 1.2 PROJECT DESCRIPTION

The project proposes to develop four industrial buildings and associated improvements within an approximately 385.60-acre portion of the project site (**Attachment 1: Figures 1-3**). An approximately 182.14-acre area to the south of the warehouse development will be used as construction staging/earthwork balance. This part of the project site is proposed to be annexed into the City's jurisdiction, which would require Riverside County Local Agency Formation Commission (LAFCO) approval.

The project proposes to develop four industrial buildings (totaling 5,146,891 square feet) and associated improvements within 385.60-acres. However, the Environmental Impact Report (EIR) prepared for the project conservatively analyzes the project at a maximum buildout of 5,700,000 square feet. Each of the four industrial buildings could be constructed to a maximum height of 50 feet. Landscaping would be installed throughout the site in accordance with City standards. Nighttime parking lot, vehicular access, and building security lighting are proposed on-site.

The location of the four warehouses would be mass-graded in its entirety; subsequently, industrial development would be constructed in four phases, one phase per building. Anticipated grading consists of approximately 9,000,000 cubic yards of cut and approximately 10,000,000 cubic yards of fill material, with a net import of approximately 1,000,000 cubic yards. Construction is anticipated to have a duration

of approximately seven years with each industrial building becoming operational as each phase is completed. The maximum depth of excavation associated with construction activities is anticipated to be 132 feet below the ground surface.

The project would construct on-site utility improvements, including water, wastewater, storm drain, and dry utilities, to accommodate operations of the proposed industrial development. Notably, the proposed project would require the installation of water, wastewater, and electrical facilities within California Avenue to provide new connections from the project site to existing facilities within East 1st Street, north of the site.

An approximately 4.27-acre segment of the project site to the east of the warehouse development (within the Harmony Haven Children and Youth Center) is proposed for water and recycled water utility improvements. The remaining approximately 57.26-acres of the project site involve transportation improvements along SR-79 and utility installation (water, wastewater, electrical) along California Avenue. The southern approximately 182.1 acres are proposed solely for limited temporary construction staging and earthwork balance activities; no permanent development or annexation is proposed in this portion of the site. However, construction staging of equipment and soils would occur in the southern portion of the site. These activities are anticipated to cause significant ground disturbance.

## 1.3 REGULATORY FRAMEWORK

### Paleontological Resources

Paleontological resources are the fossilized remains, imprints, or traces of past life preserved in the geologic record. These resources include bones, teeth, soft tissues, shells, plant material, microscopic organisms, footprints, trackways, and burrows. Fossils record the natural history of life on Earth. Despite the frequency of sedimentary rock in the geologic record and the number of organisms that have lived throughout the planet's history, only a minimal number of remains have been preserved in the fossil record.

Paleontological resources are afforded protection by CEQA environmental legislation. Appendix G (part VII) of the CEQA Guidelines explains significant impacts on paleontological resources. It details that a project would significantly impact paleontological resources if it disturbs or destroys unique paleontological resources or a unique geologic feature. Appendix G further provides an environmental checklist of questions to be addressed to determine a project's environmental impacts under CEQA. One of the questions in this checklist (Section 15023, Appendix G, part VII, question f) is: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" Additionally, Public Resources Code Section 5097.5 specifies that any unauthorized removal of paleontological remains is a misdemeanor. Penalties for this removal or damage of paleontological resources are set forth in California Penal Code Section 622.5.

# 2.0 GEOLOGICAL SETTING

California is divided into 11 geomorphic provinces, each defined by unique geologic and geomorphic characteristics. The project site is in the northeastern Peninsular Ranges geomorphic province, a region of northwest-trending ranges and valleys, subparallel to faults related to the San Andreas Fault (CGS 2002). The project site is situated in a geographic sub-region of the Peninsular Ranges known as the San

Gorgonio Pass. The San Gorgonio Pass is bounded to the north by the San Bernardino Mountains and to the south by the San Jacinto Mountains. The project site and surrounding area are located between the San Jacinto Fault Zone (Claremont Branch) and the inactive Banning Fault. This province is bordered to the north by the Transverse Ranges geomorphic province and to the east by the Colorado Desert province (CGS 2002).

The geology of the area was mapped by Lancaster, Hayhurst, and Bedrossian (2012) at a scale of 1:00,000 and by Dibblee and Minch (2003) at a scale of 1:24,000. The coarser-scale map (Lancaster, Hayhurst, and Bedrossian 2012) indicates that the project site is underlain by Tertiary (Paleogene to early Pleistocene) course-grained sedimentary rocks (Tss) and granitic and igneous rocks of Mesozoic and older ages (gr), while the finer-scale map (Dibblee and Minch 2003) shows the project site consists of Holocene-aged alluvial fan deposits (Qa), older alluvial fan deposits of Pleistocene age (Qoa), Pliocene-aged alluvial sandstones of the San Timoteo Formation (Tst), and Cretaceous-aged plutonic granites and diorites (qdi). Holocene and Pleistocene alluvial deposits consist of weakly consolidated gravels and sands. The Holocene is a period that overlaps with archaeological concern; however, Holocene deposits older than 5,000 years in age and Pleistocene-aged deposits can possibly contain significant fossil resources (SVP 2010). Geotechnical studies (GPI 2022) have identified geologic units mapped within the project site (alluvium, older alluvium, San Timoteo Formation rocks, and plutonic rocks) that can be found at current surface conditions to shallow depths beneath topsoil (2 to 6 feet).

The USDA soil survey map units at the site include San Timoteo loam (41.5%), Badland (24.8%), Ramona sandy loam (18.0%), Cieneba rocky sandy loam (5.2%), San Emigdio fine sandy loam (3.1%), Greenfield sandy loam (2.9%), Ramona very fine sandy loam (2.3%), and San Emigdio loam (2.2%) (NRCS 2024). The San Timoteo series consists of well-drained soils on upland areas derived from shales, sandstones, and weathered granites (USDA 1999a). Badland units are described as moderate to very steep barren areas within semiarid and arid regions, cutting through soft geologic material with intermittent drainage channels (Soil Science Division Staff 2017). Cieneba series soils are located on hills and mountains and consist of shallow, excessively drained soils formed from weathered granites (USDA 2012). The San Emigdio series consists of well-drained soils that formed in sedimentary alluvium and are found on alluvial fans and floodplains (USDA 1999b). Greenfield series soils consist of well-drained alluvium derived from granitic and mixed sources that can be found on alluvial fans and terraces (USDA 2019). The Ramona series consists of sandy loam (USDA 2003).

The project is within the Inland Hills ecoregion, which occurs on moderate to steep slopes, northeast of Lake Perris. The climate is hot and dry compared to the coastal hills to the west with annual precipitation at 10–14 inches. Historically, vegetation included interior or Riversidian sage scrub mixed with areas of grassland and chaparral (Griffith et al. 2016).

# 3.0 RECORDS SEARCH AND LITERATURE SEARCH

## 3.1 Western Science Center

Michael Baker International staff received a fossil locality records search from the WSC on May 13, 2024 (Attachment 2). The records search showed no previously identified fossil localities within the project site or within 3 miles of the project site. However, an unspecified number of fossil localities from similar sedimentary deposits to those mapped within the project site have been recorded nearby. One nearby fossil locality is the El Casco Substation, approximately 7 miles northwest of the project site, which has

resulted in several dozen taxa of plants, invertebrates, and vertebrate fossils from the San Timoteo Formation (LSA 2009).

## 3.2 Online Paleontological Records Searches

Michael Baker International conducted supplemental paleontological records searches within 4 miles of the project site using the following websites:

- University of California Museum of Paleontology Locality Search (UCMP n.d.)
- San Diego Natural History Museum Collection Database (SDNHM n.d.)
- The Paleobiology Database (PBDB n.d.)

While these databases showed no previously identified fossil-bearing localities within the property area, several localities have been reported within 3 miles of the project site from geologic units identified as present within the project site (Table 1). There are additional vertebrate localities within 3 miles of the project site that correspond to geologic units not represented within the project site on the local geologic map (Dibblee and Minch 2003), such as the Lake Mathews Formation, Mt. Eden Formation, Pauba Formation, Temecula Arkose Formation, and an "unnamed sandstone." The records searches were limited to data available online.

**Table 1 – Previously Recorded Paleontological Resources From Online Data**

| Collection Number | Taxa | Formation | Intervals | Depth | Distance to Project Site |
|---|---|---|---|---|---|
| PBDB 19667, 19728-19742, 20155, 20319, 20442, 20522, 20528 | Sloths (Megalonyx sp.), camels (Camelops hesternus), camel family (Camelidae), deer (Odocoileus hemionus, Odocoileus sp.), deer family (Cervidae), horses (Equus mexicanus, Pleippus idahoensis, "Plesippus simplicidens"), rodents (Baiomys mowi, Dipodomys sp., Erethizon cascoensis, Microtus californicus, Mictomys kansasensis, Microtus meadensis, Neotoma fossillis, Neotoma fuscipes, Neotoma sp., Ondatra idahoensis, Ophiomys sp., Peromyscus baumgartneri, Peromyscus complexus, Peromyscus hagermanensis, Peromyscus maximus, Peromyscus truei, Prodipodomys idahoensis, | San Timoteo Formation | Pliocene | Unknown | ~1 mile W |

| Collection Number | Taxa | Formation | Intervals | Depth | Distance to Project Site |
|---|---|---|---|---|---|
| | Sloths (Megalonyx sp.), camels (Camelops hesternus), camel family (Camelidae), deer (Odocoileus hemionus, Odocoileus sp.), deer family (Cervidae), horses (Equus mexicanus, Pleippus idahoensis, "Plesippus simplicidens"), rodents (Baiomys mowi, Dipodomys sp., Erethizon cascoensis, Microtus californicus, Mictomys kansasensis, Microtus meadensis, Neotoma fossillis, Neotoma fuscipes, Neotoma sp., Ondatra idahoensis, Ophiomys sp., Peromyscus baumgartneri, Peromyscus complexus, Peromyscus hagermanensis, Peromyscus maximus, Peromyscus truei, Prodipodomys idahoensis, Prodipodomys riversidensis, Prodipodomys timoteoensis, Prodipodomys sp., Reithrodontomys sp., Reynoldsomys timoteoensis, Sigmodon minor, Thomomys gidleyi, Thomomys sp., Arvicollinae, Perognathinae), shrews (Sorex leahyi, Sorex sp.), rabbits (Hypolagus edensis, Lepus sp., Sylvilagus hibbardi, Sylvilagus sp., Archaeolaginae), rabbit family (Leporidae), bears (Arctodus sp.), weasel family (Mustelidae), dogs (Canis edwardii), tapirs (Tapirus (Helicotapirus) haysii, Tapirus merriami), pronghorns (Antilocapra sp., Capromeryx sp.), mammoths (Mammuthus columbi), gomphothere family (Gomphotheriidae), squirrel family (Tamiini) | | | | |
| UCMP -3248, -3249, -3251, -3253– 3256, -3260, -3262– 3264, RV9601– RV9617, V65406 | Horses (Equus bautistensis, Equus simplicidens, Pliohippus francescana, "Plesippus" idahoensis), deer (Odocoileus sp.), camels (Pliauchenia sp.), deer family (Cervidae), camel family (Camelidae), rodents (Baiomys mowi, Dipodomys sp., Erethizon cascoensis, Mimomys sp., Neotoma fossilis, Perognathus sp., Peromyscus baumgartneri, Peromyscus complexus, Peromyscus hagermanensis, Peromyscus maximus, Prodipodomys idahoensis, Prodipodomys riversidensis, Prodipodomys timoteoensis, Prodipodomys sp., Reynoldsomys timoteoensis, Reithrodontomys sp., Sigmodon minor, Thomomys gidleyi), rabbits (Archaeolagidae sp., Hypolagus edensis, Sylvilagus hibbardi, Sylvilagus sp.), rabbit family (Leporidae), shrews (Microtus sp., Sorex leahyi), mammals (Insectivora), tortoises (Geochelone sp.) | San Timoteo Formation | Pliocene | Unknown | Within Riverside County |
| PBDB (149 localities) | 653 fossil occurrences | Multiple, including Lake Mathews, Mt. Eden, Pauba, and Temecula Arkose Formations, and an "unnamed sandstone" | | | |

## 3.3 Literature Search

The review of the published scientific literature also yielded reported occurrences of fossils throughout the San Timoteo Badlands and the geologic formations underlying the project site. For over a century (since 1916), paleontological investigations have been taking place in the San Timoteo Badlands (Frick 1921, 1933). Numerous vertebrate fossils, including horse, deer, camels, ground sloths, and tortoises,

have been recovered from the San Timoteo Canyon area; additionally, horse, ground sloths, sabre-tooth cats, dogs, cats, bears, deer, antelopes, peccaries, camels, mastodons, rabbits, and fish have been recovered from the Mt. Eden area (Frick 1921). Numerous plant fossils have also been recovered from the Mt. Eden area, such as pines, grasses, manzanitas, buckthorns, and mahogany (Axelrod 1934, 1950). The ages of the areas containing these fossils have been determined using geochronological techniques to 1.5 to 0.5 Ma (San Timoteo Canyon) and 6.0 to 2.5 Ma (Eden Hot Springs) (Albright 1999).

### 3.3 Paleontological Resources Sensitivity Analysis

The WSC paleontological records search did not identify any paleontological resources within the entire project site. However, the WSC paleontological records search, and fossil locality searches of online databases (PBDB, SDNHM, and UCMP), record 199 localities within 3 miles of the project site from rock formations similar to those underlying the project site, with several hundreds of mammal and reptile fossils recorded. Per mitigation impact guidelines set forth by the Society of Vertebrate Paleontology (SVP 2010), the portions of the project site underlain by sedimentary rock formations (older Holocene-aged [over 5,000 years old] alluvium, Pleistocene-aged alluvium and San Timoteo Formation deposits of Pliocene age) have a high potential to disturb paleontological resources within undisturbed bedrock, as determined by the numerous fossils previously recorded from these sedimentary rock units. The igneous rock formation (Cretaceous-aged plutonic granites), found in the southwestern and southern portions of the project site, has no potential to disturb paleontological resources.

## 4.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

The paleontological resources summary and recommendations presented here address the project area. Significant fossils have been recovered from rock formations known or anticipated to underlie the project area. It is therefore recommended that the project be monitored by a paleontological resources monitor and overseen by a qualified paleontologist during excavation into native older Holocene (over 5,000 years old) and Pleistocene-aged alluvial deposits and Pliocene-aged San Timoteo Formation bedrock. Based on the information presented in the geological setting in Section 2.0 of this report, including USDA soil reports, the known geology of the area, and previous geotechnical investigations, paleontological monitoring should be conducted during excavations at and below current surface elevations.

In the event that paleontological resources are encountered during earth-disturbing activities, all construction activities in the immediate area of the find shall be temporarily halted, and a qualified paleontologist shall evaluate the find to determine the appropriate treatment in accordance with Society for Vertebrate Paleontology guidelines for identification, evaluation, disclosure, avoidance, recovery, or curation, as appropriate. Any fossils recovered during mitigation shall be deposited to an accredited and permanent scientific institution, such as the WSC. A qualified paleontologist is a professional with a graduate degree in paleontology, geology, or a related field, with demonstrated experience in the vertebrate, invertebrate, or botanical paleontology of California, as well as at least two years of full-time professional experience or equivalent specialized training in paleontological research (i.e., the identification of fossil deposits, application of paleontological field and laboratory procedures and techniques, and curation of fossil specimens), and at least four months of supervised field and analytic experience in general North American paleontology.

Activities to be monitored include grading, trenching, drilling, and any other ground-disturbing activities that reach native sediments. Monitors will examine sediments exposed by grading activities, take photographs, and may collect sediment samples for microfossil and sedimentary analysis, as safety

conditions permit. Tools used on-site can include brushes, trowels, geology hammers, sieves, GPS units, and tablets for recordation during monitoring, as well as collection materials in instances of fossil discovery.

Boring and drilling of deep holes may also be monitored on a part-time basis. These activities bring subsurface sediments to the surface as loosened spoils. Although the precise depth of discovery can be difficult to ascertain, fossils recovered from boring and drilling activities may still be significant. The qualified paleontologist will determine the monitoring of these activities.

Monitors will complete, at a minimum, a daily written monitoring log. They will also complete other documentation, such as photographic records and other forms, as determined by the qualified paleontologist.

# PREPARER QUALIFICATIONS

**Peter A. Kloess, Ph.D.- Principal Investigator**

Dr. Kloess is a principal investigator and paleontologist with over 20 years of experience in paleontology, with 7 years in paleontology mitigation. His experience includes private and public consultation, field monitoring, excavation, and laboratory research on projects across the western United States, in California. He has consulting experience with a range of projects, including construction, transportation, utility, transmission, monitoring, and surveys, as well as expertise recovering a diversity of fossils from project sites, such as marine invertebrates, microfossils, plants, small mammals, birds, large marine and terrestrial mammals, and dinosaurs. He also has extensive experience in paleontological museum collections and lab settings. He has worked on and co-led scientific excavations of large mammals and dinosaurs in California, Utah, New Mexico, and Montana. Dr. Kloess has served as a lab preparator and assistant curator for paleontology museums in California and Montana, where his duties included manual preparation of specimens, casting, jacketing, public outreach, cataloging, and curation. He meets the Society of Vertebrate Paleontology's standards for paleontological Principal Investigator.

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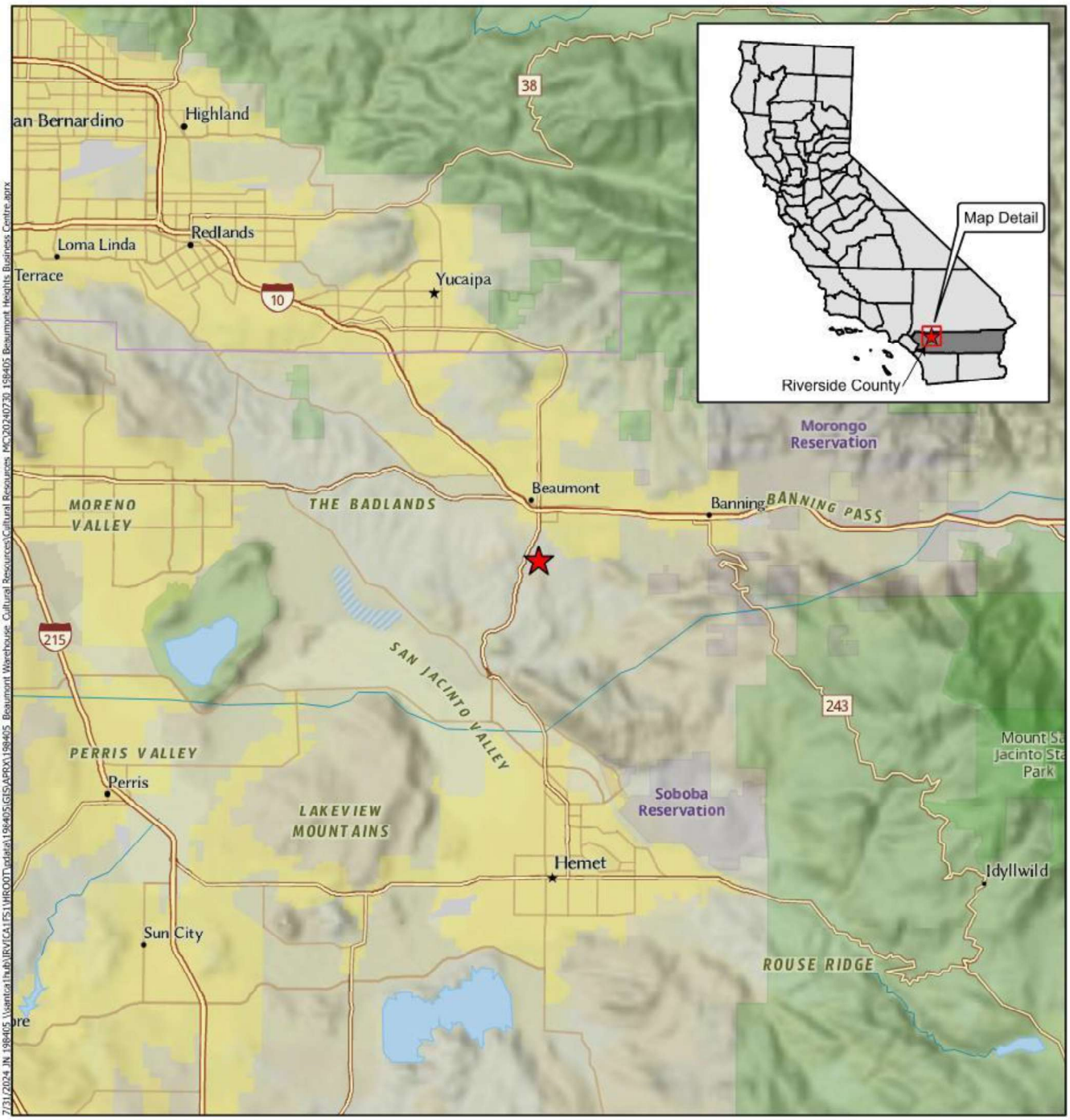
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# Attachment 1 Figures




**Legend**

★ Project Location

BEAUMONT HEIGHTS BUSINESS CENTRE PROJECT
BEAUMONT, CA

Michael Baker INTERNATIONAL

0 2.5 5 Miles

Source: ESRI, USGS, Riverside County

# Regional Vicinity

Figure 1

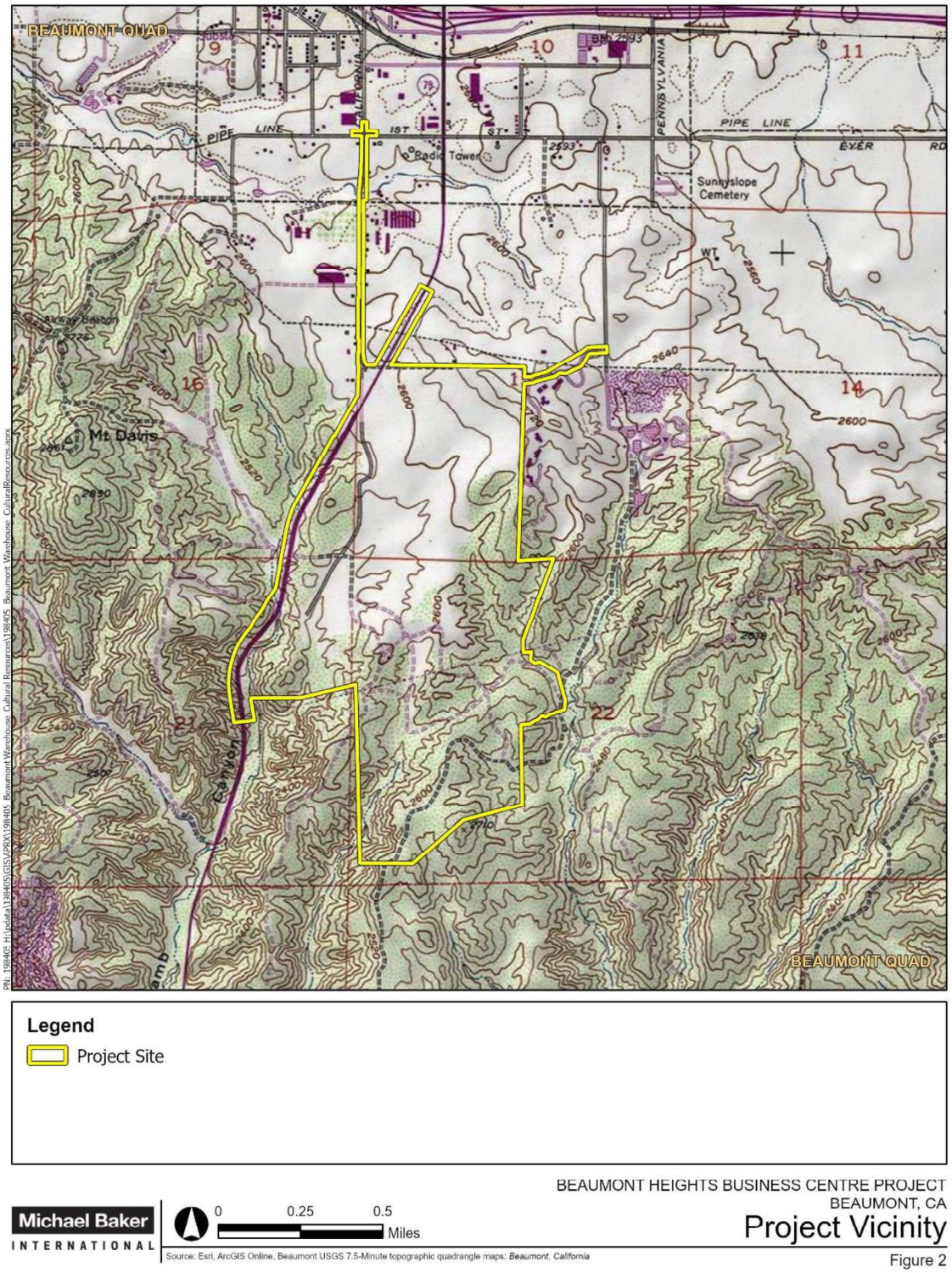



FIGURE 2. PROJECT VICINITY

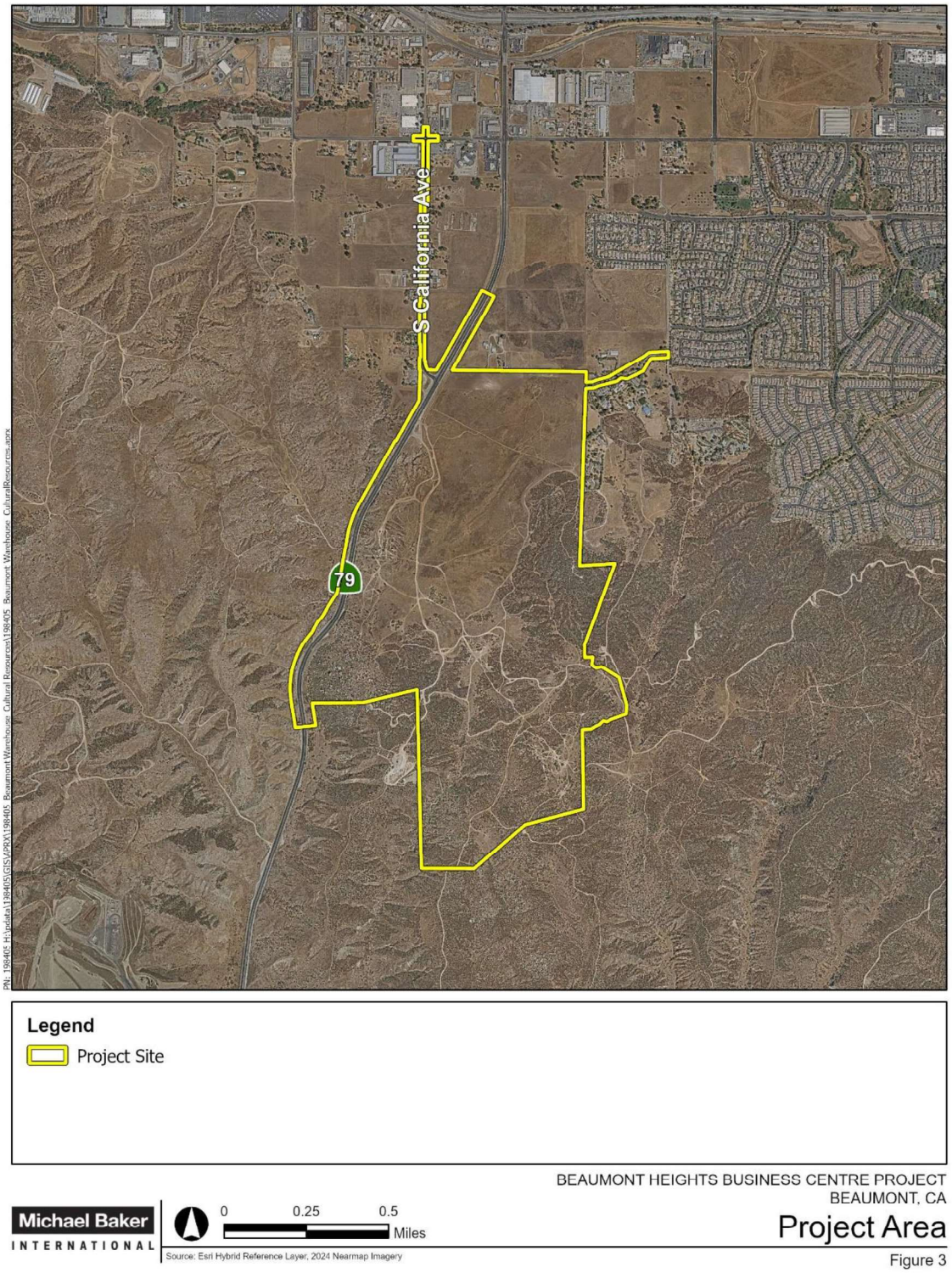



FIGURE 3. PROJECT LOCATION

# Attachment 2 Records Search Results

# WESTERN SCIENCE CENTER

May 13th, 2024

Michael Baker International
Kholood Abdo
3536 Concours, Suite 100
Ontario, CA 91764

Hello,

This letter presents the results of a record search conducted for Beaumont Warehouse Project in the City of Beaumont, Riverside County, CA. The project is located south of Interstate 10 and on either side of Highway 79 on Township 3 South, Range 1 West, Sections 9, 10, 15, 16, 21, and 22 of the *Beaumont, CA* U.S. Geological Survey 7.5' quadrangle.

The geologic units underlying this project are mapped as alluvial sand and gravel from the Pleistocene epoch, and Pliocene-aged sandstone from the fossiliferous San Timoteo Formation, with a portion of Holocene alluvial and Cretaceous quartz diorite (Dibblee and Minch 2003). Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have localities within the project area or within a 3 mile radius, which was chosen to accommodate the size of the project area; however it does have localities in similarly mapped units across Southern California, including the El Casco Substation Project from another portion of the San Timoteo Formation.

Any fossil specimen from the Beaumont Warehouse Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the study area.

If you have any questions, or would like further information about the El Casco Substation Project, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,



Brittney Elizabeth Stoneburg, MSc
Collections Manager