APPENDIX E: GEOTECHNICAL INVESTIGATION REPORT

E.1 Langan Engineering and Environmental Services, Inc.,
Revised Geotechnical Investigation Report
for Proposed Mixed-Use Multi-Family Development,
400 South San Vicente Boulevard,
Los Angeles, California 90048,
October 12, 2022

E.2 Langan Engineering and Environmental Services, Inc.,
Addendum 1 – Response to LADBS Grading Division Review Comment
Proposed Mixed-Use Multi-Family Development
400 South San Vicente Boulevard,
Los Angeles, California
February 6, 2023

E.3 City of Los Angeles Department of Building and Safety,
Geology and Soils Report Approval Letter,
March 30, 2023

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REVISED GEOTECHNICAL INVESTIGATION REPORT

for

Proposed Mixed-Use Multi-Family Development
400 South San Vicente Boulevard
Los Angeles, California 90048

Prepared For:

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LANGAN

October 12, 2022
Langan Project No.: 700109901

October 12, 2022

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Revised Geotechnical Investigation Report
Proposed Mixed-Use Multi-Family Development
400 South San Vicente Boulevard
Los Angeles, California 90048
Langan Project No. 700109901

Dear Mr. Abraham:

Langan Engineering & Environmental Services, Inc. is pleased to submit this revised geotechnical engineering report for the proposed mixed-use multi-family development planned at 400 South San Vicente Boulevard in Los Angeles, California.

This report was prepared in general accordance with our revised proposal dated December 22, 2021.

♦ ♦ ♦

We sincerely appreciate the opportunity to be of service to you on this project. Please contact us if you have questions regarding this report.

Sincerely,
Langan Engineering & Environmental Services, Inc.

Christopher J. Zadoorian, G.E.
Senior Associate

CC:SHW:CJZ:
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1.0 INTRODUCTION

Langan Engineering and Environmental Services, Inc. has completed a revised geotechnical investigation for the proposed mixed-use multi-family development to be constructed at 400 South San Vicente Boulevard in Los Angeles, California, as shown on Figure 1.

The site is located along the east side of San Vicente Boulevard south of Fourth Street and is currently developed with one- to two-story commercial buildings and asphalt concrete (AC) and Portland cement concrete (PCC) paved parking lots as shown on Figure 2.

The site is bound on the north by West 4th Street, on the south by an existing commercial development that includes a two-level building (434 San Vicente Boulevard) that is established at-grade and associated parking, on the east by an existing alleyway and on the west by South San Vicente Boulevard. Existing residential homes are located to the east of the alley.

Based on our review of data available from Google Earth©, the ground surface level at the site slopes down from east to west and ranges from approximately Elevation 153 to 149.

The site is located within a State of California-designated liquefaction hazard zone and a City of Los Angeles-designated methane zone. The site is not located within other State- or City-designated geologic hazard zones.

Scott Rynders of Rynders Corporation provided us with conceptual architectural plans dated August 30, 2022 prepared by Steinberg Hart for the proposed development. Based on our review of the plans, the proposed development will include an eight-story above-grade mixed-used (commercial and residential) building over three subterranean parking levels.

The lowest basement level will be established approximately 33 feet below the existing ground surface level corresponding to approximately Elevation 117.

Mr. Rynders also furnished us with a geotechnical report dated August 30, 2019 prepared by Partner Engineering and Science, Incorporated (PESI). We've reviewed the data presented in the prior geotechnical report and generally concur with the findings presented therein. As such, we assume the professional responsibility for the use and interpretation of the data.

Mr. Rynders also furnished us with an environmental (Phase II) report dated August 15, 2019 also prepared by PESI, an environmental (Phase II) report dated July 16, 2008 prepared by JMK Environmental Solutions, and an environmental site assessment report (Phase I and limited Phase II) dated February 14, 2022 prepared Leighton and Associates, Inc.

We also located a publicly-available environmental document dated January 27, 2020 prepared by Environmental Managers & Auditors, Incorporated (EMAI) that summarized groundwater monitoring activities.

Based on our review of the prior environmental data, soil and groundwater impacted with chlorinated volatile organic compounds (VOCs) associated with an on-site dry-cleaning facility. The concentrations of the VOCs present were reportedly below regulatory action levels and as a result, the Los Angeles County Fire Department indicated that no further actions (NFA) were required in a letter dated January 22, 2021.

Our investigation is summarized herein following by our conclusions and recommendations for the proposed development.

2.0 SUBSURFACE EXPLORATIONS AND CONDITIONS

2.1 Current Geotechnical Explorations

As part of our current investigation, we drilled four borings (B-5 through B-8) to depths ranging from 51.5 to 76.5 feet below the existing ground surface (bgs) level. The borings were drilled using truck-mounted mud-rotary drilling equipment at the approximate locations shown on Figure 2.

We collected surficial and basement grade bulk bag samples, and relatively undisturbed split spoon samples at regular intervals while performing standard penetration tests (SPT), and maintained a log of the subsurface conditions encountered in the borings.

The samples collected from the borings were transported to our office for further review, classification, and assignment of geotechnical laboratory testing.

Upon completion of drilling, borings B-5 through B-8 were backfilled with grout in accordance with Los Angeles County permit requirements and the drill cuttings were placed in 55-gallon drums pending the results of chemical testing for subsequent off-site disposal by a licensed materials hauler.

2.2 Prior Geotechnical Explorations

The prior geotechnical investigation performed by PESI included two borings (B-1 and B-2) that were drilled to depths of 41.5 and 66.5 feet bgs, respectively. The borings were drilled using truck-mounted hollow-stem auger drilling equipment at the approximate locations shown on Figure 2.

They also drilled a total of four borings (B-1 through B-4), also shown on Figure 2, as part of their environmental investigation programs.

2.3 Prior Environmental Explorations

The prior environmental investigation performed by PESI included four borings (B-1 through B-4) drilled to depths ranging from 10 to 25 feet bgs at the approximate locations shown on Figure 2. Prior PESI environmental borings B-1 and B-2 were drilled in the existing parking lot using truck-mounted direct-push drilling equipment and prior PESI environmental borings B-3 and B-4 were drilled inside the existing one-story building located at 430 San Vicente Boulevard using limited-access direct-push drilling equipment.

In addition to the above prior environmental explorations, four groundwater wells (MW-1 through MW-4) were installed at the site; specific details of the well installation were not available however, groundwater level measurement data from these wells was available from the prior EMAI reports.

Additionally, we were able to access MW-1 through MW-4 to collect current groundwater level data.

Leighton and Associates also conducted a prior environmental investigation in 2022 that included twelve borings (B-1 through B-12) drilled to depths ranging from approximately 10 to 25 feet bgs the approximate locations are shown on Figure 2. The borings were advanced using two methods: a limited-access direct push drilling equipment and hand auger drilling equipment.

2.4 Subsurface Conditions

The summary of subsurface conditions presented herein is based on the data collected from our current and the prior investigations, noting that the data from our current explorations was relied on as the primary source of data.

Asphalt concrete pavement (AC), four to eight inches in thickness, was encountered in the current and prior borings, B-1 through B-7 typically underlain by base materials approximately six inches thick. Portland cement concrete (PCC), 5 inches thick, with welded-wire mesh reinforcement was encountered in Boring B-8.

In prior PESI geotechnical boring B-1, two inches of AC pavement was encountered overlying four inches of PCC pavement overlying six inches of base materials and two inches of AC pavement.

Prior PESI environmental borings B-3 and B-4, drilled inside the existing one-story building located 430 San Vicente, encountered PCC pavement (thickness not specified in the prior boring logs).

Fill soils ranging from approximately two feet to seven feet in thickness were encountered beneath the upper reported pavement and floor slab sections in each boring with the exception of PESI geotechnical boring B-1 where native clayey soils were encountered beneath the pavement section. The fill typically consisted of moist to very moist, stiff to very stiff clay with varying amounts of sand, silt and gravel.

The upper fill soils were underlain by fine-grained recent (geologically young) alluvial soils consisting of very stiff clay and sandy clay and soft sandy silt to depths ranging from approximately 14 to 19 feet bgs.

The upper recent alluvium was underlain by older predominantly fine-grained alluvial soils (San Pedro Formation) consisting of stiff to very stiff silt and clay with varying amounts of sand to depths of approximately 33 to 36 feet bgs. This layer of older alluvium was typically marked by the presence of coarser grained deposits, trace shell fragments and/or caliche.

The upper fine-grained older alluvium was typically underlain by very dense layer of coarse sand and/or gravel up to approximately ten feet in thickness that was in turn underlain by predominantly stiff to very stiff clay deposits to the maximum depths explored.

Generalized depictions of the subsurface conditions at the site are presented in Figure 3 through Figure 5.

Logs of our current borings are presented in Appendix A and logs of the prior borings are presented in Appendix B.

2.5 Groundwater

2.5.1 Current and Prior Exploration Borings

To collect reliable groundwater level measurements in geotechnical exploration borings, it's necessary to allow the borehole to remain open for a sufficient amount of time (typically on the order of 24 to 48 hours or more). This time frame will allow the groundwater level to stabilize within the borehole.

However, it's typically not practical to allow boreholes to remain open for the necessary duration and as a result, the groundwater level in geotechnical exploration borings is typically recorded a short time after completion of drilling.

Groundwater was encountered in our current borings at depths ranging from approximately 14 to 21.5 feet bgs at the time of drilling. Groundwater levels were reported in the prior PESI geotechnical and environmental borings at depths of 20 to 32 feet bgs at the time of drilling. Leighton and Associates encountered groundwater levels at depths ranging from approximately 10 to 12 ft bgs at the time of drilling.

2.5.2 Groundwater Monitoring Wells

To supplement the groundwater level data from the current and prior exploration borings, we accessed the existing groundwater monitoring wells to measure the groundwater levels at the time of our field exploration program.

The groundwater levels measured within the existing monitoring wells ranged from approximately 13.5 to 14.5 feet bgs.

2.5.3 Quarterly Monitoring Reports

Data available from publically-available quarterly monitoring reports prepared in January and October 2020 by EMAI indicate the groundwater level at the site typically ranges from approximately 14 to 17 feet bgs.

2.5.4 Historical High Groundwater Level

Based on our review of the California's Geologic Survey (CGS) Seismic Hazard Zone Report of the Beverly Hills and Hollywood 7.5-Minute Quadrangles, Los Angeles County, California, Seismic Hazard Zone Reports 023 and 026 respectively, (California Division of Mines and Geology, 1998), the historical high groundwater level (HHGWL) at the site is on the order of approximately 10 feet bgs as shown on Figure 6.

3.0 GEOTECHNICAL LABORATORY TESTING

3.1 Current Investigation

We performed the following geotechnical laboratory tests on samples collected during our investigation:

- In-situ moisture content and in-place dry-density
- Maximum dry density and optimum moisture content
- Direct Shear
- Consolidation
- Corrosion Potential
- Atterberg Limits
- Percent Passing # 200 Sieve

The results of the geotechnical laboratory testing from our current investigation are presented in Appendix A.

3.2 Prior Geotechnical Investigation

The prior PESI investigation included the following geotechnical laboratory testing:

- Direct Shear
- Consolidation
- Atterberg Limits

The results of the prior geotechnical laboratory testing are presented in Appendix B.

4.0 GEOLOGIC AND SEISMIC HAZARDS EVALUATION

4.1 Regional and Local Geologic Setting

The site is located near the northwestern end of the Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of mountain

ranges separated by northwest trending valleys that are subparallel to faults that branch from the San Andreas Fault.

More specifically, the site is within the Central Block of the Los Angeles Basin, an extensive sediment-filled depression bound by the San Gabriel Mountains on the north, Santa Monica Mountains and the Pacific Ocean on the west, the Palos Verdes Peninsula on the southwest, the Santa Ana Mountains on the southeast, and the Puente, San Jose, and Chino Hills on the east. The basin's structural history includes extension and strike-slip faulting, followed by oblique contraction via thrusting and strike-slip faulting (Yerkes et al, 1965).

Locally, geologic units are described as late Pleistocene-age Young Alluvium (Qya_2) that overlies middle Pleistocene San Pedro Formation (Qsp) alluvial deposits (Campbell et al., 2014). Young alluvium is regionally described as "unconsolidated, generally friable, stream-deposited silt, sand, and gravel." The underlying San Pedro Formation is described as unconsolidated sand with local gravelly sand, silty sand, and silt interbeds" with common shallow invertebrate fossils.

Figure 7 shows the site location plotted on a regional geologic map that depicts the surficial geologic deposits and nearby geologic units.

4.2 Geologic and Seismic Hazards Evaluation

We evaluated the geologic and seismic hazards at the site in general accordance with CGS Special Publication 117A, "*Guidelines for Evaluating and Mitigating Seismic Hazards in California.*" The results of our evaluation is summarized below.

4.3 Regional Faulting

We reviewed the CGS 2010 Fault Activity Map (FAM) of California and the USGS Quaternary Fault and Fold Database (QFFD), to identify mapped faults within 100 kilometers of the site. The FAM and QFFD show that the closest mapped faults to the site are the Hollywood fault, approximately 2.2 kilometers (1.4 miles) to the north, and the West Beverly Hills lineament of the Newport-Inglewood fault zone, approximately 3.2 kilometers (2.0 miles) to the southwest. Figures 8A and 8B show the site location relative to the nearby seismic sources.

4.4 Regional Seismicity

A search of the USGS ANSS Comprehensive Earthquake Catalog (ComCat) using a web-based Earthquake Archive Search and URL builder tool, found that as of November 8, 2021, 53 earthquakes with magnitude 5.0 or greater have occurred within a 100-km radius of the site since 1800.

The site location relative to historic earthquakes is also shown on Figures 8A and 8B.

4.5 Ground Surface Rupture Potential

The site is not located within an Alquist-Priolo Fault Zone or a Preliminary Fault Rupture Study Area based on a review of State of California and City of Los Angeles fault maps.

Thus, the potential for ground surface rupture is considered very low.

4.6 Liquefaction Potential

Liquefaction generally occurs in saturated, loose to medium dense, granular soil and in saturated, soft to moderately firm silt as a result of strong ground shaking. As the density and/or particle size of the soil increases and as the confinement (overburden pressure) increases, the potential for liquefaction decreases. Typically, potentially saturated, loose to medium dense granular soils and/or very soft to firm fine-grained soils are considered subject to liquefaction as a result of strong ground shaking.

The site is located within a City- and State-designated liquefaction hazard zone as shown on Figure 9 due to the presence of recent geologic deposits, shallow groundwater, and a potential for strong ground shaking.

We performed a liquefaction analysis using the methods presented in the 1996 National Center for Earthquake Engineering Research (NCEER) and subsequent updates in conjunction with methods presented by Boulanger and Idriss, 2006, for evaluating the liquefaction potential for fine-grained (silt and clay) soils.

The primary seismic input in liquefaction analysis includes the peak ground acceleration modified for site conditions (PGA_M) and the predominant earthquake magnitude, M_W. We determined the PGA_M to be 0.985g and the predominant earthquake magnitude M_W to be 6.77 based on the unified hazard web application provided by the United States Geological Survey (USGS) accessible at https://earthquake.usgs.gov/hazards/interactive/.

We utilized the HHGWL of approximately ten feet bgs in conjunction with the field blow count data and the geotechnical laboratory test data in our analysis.

Based on the current development concept, we anticipate that the bottom of foundation will be established approximately three feet below the lowest finish floor level or approximately 36 feet bgs corresponding to approximately Elevation 114.

The results of our liquefaction analysis indicate the soils below the planned foundation levels are not subject to liquefaction. The results of our analysis are presented in Appendix C.

4.7 Lateral Spreading Potential

Lateral spreading is seismically-induced slope instability phenomenon wherein slope failure can occur as a result of liquefaction.

The ground surface level at the site is generally flat so that open or unsupported slopes are not present.

Thus, the potential for lateral spreading is considered negligible.

4.8 Seismic (aka 'Dry') Settlement

Seismically-induced (aka 'dry') settlement may occur in loose granular soils due to strong ground shaking.

The soils encountered in the exploration borings consist of generally stiff and hard fine-grained deposits and/or medium dense to very dense granular deposits.

Based on our analysis, the in-place soils present above the current and historic high groundwater are not subject to appreciable seismic dry settlement.

4.9 Earthquake-Induced Landslides

The site is not located in a zone of required investigation for Earthquake-Induced Landslides per CGS Earthquake Fault Zones and Seismic Hazard Zones, Hollywood Quadrangle map as shown on Figure 9. Additionally, the site is not located in a Landslide Hazard Zone in the City of Los Angeles' ZIMAS online tool.

The site is generally flat and there are no sloped boundary conditions. Thus, the potential for earthquake-induced landsliding is considered negligible.

4.10 Flood Mapping

Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06037C1585F, the site is located within an area determined to be within the 0.2 percent annual chance floodplain.

4.11 Tsunamis, Seiche, and Dam Inundation

Based on information and maps available from the CGS and the City of Los Angeles, the site is not located within a Tsunami inundation hazard zone. Based on review of adjacent water bodies, the site is not subject to inundation from seiche. Based on a review of the Dam Breach Inundation Map Web Publisher hosted by the California Division of Safety of Dams (DSOD) the site is partially located within dam inundation boundaries from the Lower Franklin and Greystone Reservoirs. Both inundation boundaries run partially along the western site property line on San Vicente Blvd. and along the northern site boundary on West 4th street.

4.12 Subsidence

Land subsidence may be induced from withdrawal of oil, gas, or water from wells. Based on a search of the CalGEM (formerly known as Division of Oil, Gas, and Geothermal Resources [DOGGR]) GIS Well Finder online tool, and the USGS Areas of Land Subsidence tool, the site is located in the Salt Lake oil/gas field. Approximately 45 active oil and gas wells are located approximately ¼ mile north of the site. According to our review of the available information from CalGEM, the likelihood of land subsidence caused by oil or gas withdrawal from oil wells is low to moderate. The site is not located within a USGS area of land subsidence.

4.13 Expansive Soils

Expansive soils swell and shrink when the moisture content in the soil changes as a result of cyclic wet/dry weather cycles, installation of irrigation systems, change in landscape plantings, or changes in grading.

Swelling and shrinking soils can result in differential movement of structures including floor slabs and foundations, and site work including hardscape, utilities, and sidewalks.

The soils present at the planned foundation levels consist primarily of medium plasticity clays and may be subject to expansion with changes in moisture content.

Mitigation measures may be required to address the potential for expansion.

4.14 Methane Zone

Per the City of Los Angeles ZIMAS on-line tool, the site is located within a City of Los Angeles-designated "Methane Zone". As a result, a soil-gas study and methane mitigation measures will each be required as part of the proposed development in accordance with City of Los Angeles Ordinance 175790.

5.0 CONCLUSIONS

5.1 General

The site is generally free from geologic or seismic hazards that would preclude the proposed development and the proposed development is considered feasible from a geotechnical perspective.

The site is subject to strong ground shaking that would result from an earthquake occurring on a nearby or distant fault source; however, this hazard is common in Southern California and can be mitigated by following the seismic design requirements of the 2019 California Building Code (CBC).

5.2 Foundations

The native soils encountered at the planned foundation levels consist of stiff to very stiff clay.

These soils are suitable to support the proposed development on a mat foundation provided the recommendations presented herein are followed.

It should be noted, however, that due to the presence of relatively shallow groundwater, we anticipate that some degree of mitigation of the exposed mass excavation bottom will be required to establish a firm working surface for support of the mat foundation.

Recommendations for mitigation are presented herein.

5.3 Floor Slab Support

Considering the proposed building will be supported on a mat foundation, the mat foundation may also serve as the building lowest finish floor slab. In this case, the requirements for support of the mat foundation would be followed and the native soils are suitable for floor slab support, again noting that some degree of mitigation may be required for the exposed native clayey soils.

If a topping slab is planned above the mat foundation, the topping slab may be supported on properly compacted non-expansive fill soils.

5.4 Shoring, Excavation and Permanent Walls Below-Grade

Temporary shoring will be required to support the planned excavation. Soldier pile, tie-back and timber lagging shoring is a common method used in Los Angeles, though other methods including sheet piles may be utilized.

Temporary shoring design will need to include provisions to support the existing building located south of the site at 432 San Vicente Boulevard.

5.5 Groundwater

Groundwater has been measured as shallow as 12 feet below is present at the site and based on our most recent measurements may be encountered at a depth of approximately 13.5 feet bgs, corresponding to approximately Elevation 137.5.

The building walls below grade and mat foundation will be subject to hydrostatic pressure and design recommendations to mitigate these conditions are presented herein.

Temporary construction dewatering will be required to perform the planned excavation. The temporary construction watering should be performed throughout the excavation phase until such time that the gravity loading of the building exceeds the hydrostatic uplift on the mat foundation and the groundwater level within the site should be lowered at least three feet below the planned bottom of excavation.

Given the clayey nature of the upper soils, we do not anticipate the dewatering will result in appreciable subsidence beyond the site limits however, the potential for subsidence due to temporary dewatering should be evaluated when the construction dewatering plans are available.

A National Pollutant Discharge Elimination (NPDES) is required if groundwater discharge to the storm drain system is planned. Other discharge alternatives are potentially available including discharge into the City of Los Angeles sanitary sewer system and/or utilizing vacuum trucks to remove groundwater pumped from the site. Collection of groundwater samples and associated environmental reporting will also be required as part of permitting.

5.6 Excavation Bottom Preparation

The soils present at the planned excavation bottom consist of moderately plastic stiff to very stiff saturated clay.

We anticipate that the exposed excavation bottom will be relatively soft and wet and as a result, some degree of mitigation will be required to establish a firm working surface.

One method of mitigation would be to over-excavate one to two feet of soils at the excavation bottom and replace these soils with crushed rock.

This solution will also mitigate the potential for expansive soils to be present at mat foundation bottom.

Noting that a methane mitigation system (that will also serve as a waterproofing system) will be required, the crushed rock will also serve as a solid substrate for the methane barrier application.

A mud-slab could also be placed on the crushed rock.

5.7 Corrosion Considerations

The results of corrosion testing are summarized in Table 1.

Table 1 – Corrosion Test Results

Boring (Depth)	Soil Type	Resistivity (ohm-cm)	pH	Sulfate (% by Weight)	Chloride (% by Weight)
B-7 (1 to 10 feet)	Clay	960	7.7	0.0613	0.0096

The results of the sulfate testing indicates that the on-site soils be classified as exposure category S_0 for sulfates and exposure category C_1 for chlorides in accordance with American Concrete Institute (ACI) Table 19.3.1.1.

The sulfate concentrations indicate a low potential for sulfate attack on PCC and that the on-site soils are extremely corrosive to ferrous metals.

It would be prudent to engage a corrosion consultant to evaluate the need for mitigation measures for buried metallic piping.

6.0 RECOMMENDATIONS

6.1 Mat Foundation

6.1.1 Allowable Bearing Pressure

Assuming that a permanent dewatering system is not planned, the proposed building may be supported on a mat foundation established in the stiff to very stiff native soils present at the current planned foundation levels. The mat foundation may be designed assuming an allowable bearing pressure equal to 4,500 pounds per square foot (psf). Noting that the planned excavation will result in a pressure release of approximately 1,800 psf, the net applied bearing pressure will be on the order of 2,700 psf.

The recommended bearing pressure may be increased by one-third when considering short term wind and seismic loading conditions.

We estimate the total settlement for foundations designed as recommended herein will be on the order of 1 inch or less and the differential settlement across the mat foundation will be on the order of ¼ inch or less.

6.1.2 Subgrade Modulus of Reaction

For foundation deformation analysis, a subgrade modulus of reaction equal to 125 pounds per cubic inch (pci) may be used.

6.1.3 Passive Resistance and Coefficient of Friction

Assuming that a permanent dewatering system is not planned, lateral loading may be resisted by passive pressure of the soils acting against the sides of the footings and friction along the bottom of the footing.

An ultimate passive resistance equal to 600 psf/ft of embedment up to a maximum value of 6,000 psf and an ultimate coefficient of friction equal to 0.6 may be used. The ultimate passive pressure and the ultimate coefficient of friction may be combined noting that the ultimate passive resistance should be reduced in this case by 50 percent in consideration of the deformation required to mobilize the full passive resistance.

Allowable passive resistance and frictional resistance may be obtained by dividing the ultimate values by 1.5. Allowable passive resistance and frictional resistance values may be used in combination without reduction.

If the methane barrier is placed directly beneath the mat foundation, the ultimate and allowable coefficient of friction values should be reduced by a factor of 0.6 so that ultimate coefficient of friction equal to 0.36 and an allowable coefficient of friction equal to 0.25 should be used.

6.1.4 Uplift Pressure

The mat foundation should be designed for an uplift pressure computed from the bottom of the mat foundation with respect to the HHGWL. For instance, if the bottom of the mat foundation is established at a depth of 36 feet bgs, the resulting hydrostatic uplift pressure at the bottom of the mat foundation can be computed as follows:

$$P_{\text{uplift at bottom of mat}} = (\text{Bottom of Mat Foundation Depth} - \text{HHGWL}) \times 62.4 \text{ psf}$$

$$P_{\text{uplift at bottom of mat}} = (36 - 10) \times 62.4 \text{ psf} = 1{,}622 \text{ psf}$$

If the building weight is not sufficient to resist the hydrostatic pressure with an adequate factor of safety, additional downward resistance will be required.

Additional downward resistance could be obtained using sacrificial concrete via a thickened mat foundation or alternatively, using cast-in-drilled hole (CIDH) shafts to supplement building weight and mat foundation.

6.2 Permanent Walls Below Grade

6.2.1 Design Lateral Earth Pressures

Assuming that a permanent dewatering system is not planned, the building walls below grade will be subject to hydrostatic pressure below the current groundwater level and potentially below the HHGWL of ten feet bgs.

For static conditions, the below-grade building walls should be designed to resist a trapezoidal-shaped at-rest lateral earth pressure distribution equal to 33H psf above the HHGWL and 17H psf below the HHGWL as shown on Figure 10.

For seismic loading conditions, drained below-grade building walls should be designed to resist a triangular-shaped active lateral earth pressure distribution equal to 26H psf in conjunction and a triangular-shaped seismic lateral earth pressure distribution equal to 15H psf above the HHGWL and

a triangular-shaped active lateral earth pressure distribution equal to 13H psf in conjunction and a triangular-shaped seismic lateral earth pressure distribution equal to 7H psf below the HHGWL and as shown on Figure 11.

The load combination (active and seismic earth pressure) and the shape of the seismic pressure distribution are each based on *Seismic Earth Pressures on Cantilevered Retaining Structures* (Atik and Sitar, 2010) and *Seismic Earth Pressures: Fact or Fiction* (Lew, Sitar, and Atik, 2010).

The upper 10 feet of the below-grade building walls should also be designed to resist a uniform lateral pressure of 100 psf to account for normal traffic loading as shown on Figures 10 and 11. The recommended value is based on a vertical applied traffic loading equal to 300 psf.

Although not currently planned, if the surface at the top of the wall is sloped, the recommended lateral earth pressures should be increased as indicated in Table 2.

Table 2 – Lateral Earth Pressures Increases

Slope Inclination at Top of Wall (H:V)	Increase in Lateral Earth Pressure (percent)
1:1	200
1.5:1	165
2:1	150

6.2.2 Surcharge Loading from Surrounding Structures

The planned excavation will extend below the existing commercial located at 432 San Vicente Boulevard.

Foundation details and loading information for the existing structures was not available at the time we prepared this report. For the purposes of this report, we assume that the adjacent structure is established near surface grades on spread and continuous footings and the applied bearing pressures in each case do not exceed 1,500 psf.

Based on these assumptions, we recommend a uniform lateral surcharge pressure equal to 750 psf for the existing commercial building be applied to the lateral earth pressures recommended above for the upper 10 feet of the building wall below grade.

The preliminary values presented below should be re-evaluated when foundation information for the adjacent structure is available.

6.2.3 Wall Back-Drainage

Noting that the building walls below grade will be designed assuming the HHGWL, wall back-drainage is required for the portion of the wall above the HHGWL and any water collected in that drainage system will ultimately discharge within the native soils.

Typically, a pre-fabricated geo-composite drainage board is fixed to the shoring wall and the below-grade building wall is constructed by the placement of shotcrete directly against the drainage board.

In conjunction with wall back-drainage provisions, the City of Los Angeles Department of Building and Safety (LADBS) requires the installation of 'rock-pockets' at eight-feet centers at the base of the wall-below grade. The rock pockets' consist of one cubic foot of crushed rock spaced at 8-foot center-to-center spacing around the perimeter of the building walls below-grade to promote drainage.

In this case, however, noting that the walls-below grade will be designed to resist hydrostatic pressure below the HHGWL, any water collected above the HHGWL will be 'discharged' into the soils

and by definition will not accumulate above the HHGWL. Therefore, there is no need to include rock-pockets.

6.3 Temporary Excavations and Vertical Cuts

Temporary vertical cuts are feasible in the on-site clayey soils. Temporary vertical cuts should not exceed 4 feet in height.

Temporary, unsurcharged slopes may be excavated into the on-site clayey and silty soils and these slopes should not exceed a 1H:1V gradient and should not exceed 20 feet in height.

Temporary vertical cuts and temporary construction slopes should be protected from erosion by directing surface water away from the top of the slope, by placing sand-bags at the top of the slopes and vertical cuts, and/or covering the slopes with plastic sheeting during rain events.

6.4 Temporary Shoring

6.4.1 Design Lateral Earth Pressures

Typically, cantilevered shoring is feasible for retained heights of approximately 15 feet or less, and braced shoring typically becomes economical for retained heights exceeding 15 feet. Cantilevered shoring should be designed to resist a triangular lateral earth pressure distribution where the maximum value is 26H psf noting that the shoring will be installed after construction dewatering is performed.

Internally braced shoring should be designed to resist a trapezoidal earth pressure distribution where the maximum value is equal to 33H psf.

In addition to the lateral earth pressures from the weight of the retained soil, surcharge loading from the adjacent building located at 432 San Vicente should be included as recommended in Section 6.2.2 should also be applied to temporary shoring along the portion of the south shoring line within the limits of the existing building.

For cantilevered and braced shoring design, where the surface at the top of the shoring is sloped, the recommended lateral earth pressures should be increased as indicated in Table 2.

The design of temporary shoring walls should consider the location of construction cranes and other potentially heavy equipment or loads that may act against the shoring system.

An alternative to designing the south below-grade building wall to support surcharge loading due to the existing foundation is to provide direct support to the existing foundation using solider piles (aka underpinning).

6.4.2 Soldier Pile Design and Installation

For the design of soldier piles spaced at least two diameters on-centers, the allowable lateral bearing value (passive value) of the native soil below the level of excavation may be assumed to be 600 psf per foot of depth, up to a maximum of 6,000 psf of depth. To develop the full lateral value, provisions should be taken to ensure firm contact between the soldier piles and the undisturbed soil.

If the embedded portion of the solider pile shafts are filled with lean-mix concrete with a minimum compressive strength of 2,000 psi, the effective width of the soldier pile shaft for use in developing passive resistance may be assumed to be twice the diameter of the soldier pile shaft. If the embedded portion of the soldier pile shaft is filled with other material (such as low-strength sand-cement slurry, for instance), the effective width of the solider pile should be limited to be the diagonal dimension of the solider beam.

The portion of the soldier piles below the bottom of the excavation may also be relied on to support downward loading. For soldier piles that are drilled and filled with structural concrete below the bottom of the excavation, the frictional resistance between the concrete and surrounding soil may be taken as 600 psf. For solider piles that are vibrated into place, the frictional resistance may be taken as 800 psf.

Drilling for solider pile installation will likely encounter perched groundwater. Provisions to mitigate the potential for caving due to perched groundwater, including but not limited to the installation of steel casing and/or the use of drilling mud, should be implemented as needed by the shoring contractor.

Noting that we were able to advance our exploratory borings to a maximum depth of approximately 76 feet using conventional mud rotary exploration drilling equipment, we anticipate solider piles can also be installed in the native soils using conventional drilling equipment in good working condition.

6.4.3 Timber Lagging Design

Continuous lagging will be required between the solider piles. The soldier piles should be designed for the full anticipated lateral earth pressure; however, the pressure on the lagging will be less due to arching in the soil. For clear spans of up to six feet, we recommend the lagging be designed for a triangular pressure distribution where the maximum pressure is 400 psf at the mid-point between solider piles and zero at the solider piles.

6.4.4 Tiebacks

The capacities of anchors should be determined by testing the initial anchors as outlined below. We anticipate that gravity-filled anchors will achieve an allowable bond strength of 1 kips to 2 kips per lineal foot of anchor in the on-site terrace deposits, depending on the method of construction. A variety of methods are available for construction of anchors. If post-grouted anchors are used, we estimate the anchors will develop resistance on the order of three times the estimated value. We recommend that the shoring designer and contractor be responsible for selecting the appropriate bond length and installation methods to achieve the required capacity. Tiebacks should extend a minimum of 15 feet beyond the active wedge. The active wedge is considered 30 degrees from the horizontal. Only the frictional resistance developed beyond the active wedge would be effective in resisting lateral loads. If the anchors are spaced at least 6 feet on-center, reduction in the capacity of the anchors do not need to be considered due to group action.

The anchors are commonly installed at angles of 15 to 40 degrees below the horizontal: however, in many cases it is necessary to use steeper inclinations where adjacent private property is present. Caving of the anchor holes should be anticipated and provisions made to minimize such caving. The anchors should be filled with concrete placed by pumping from the tip out, and the concrete should extend from the tip of the anchor to the active wedge. To minimize chances of caving, we suggest that the portion of the anchor shaft within the active wedge be backfilled with sand before testing the anchor. The portion of the shaft should be filled tightly and flush with the face of the excavation. The sand backfill may contain a small amount of cement to allow the sand to be placed by pumping. For 8-inch-diameter or less post-grouted anchors, the anchor may be filled with concrete to the surface of the shoring.

Our representative should select a representative number of the initial anchors for 24-hour, 200 percent tests and 200 percent quick tests. The purpose of the 200 percent test is to verify the friction value assumed in design. The anchors should be tested to develop twice the assumed friction value. Where satisfactory tests are not achieved on the initial anchors, the anchor diameter and/or length should be increased until satisfactory test results are obtained.

For post-grouted anchors where concrete is used to backfill the anchor along its entire length, the test load should be computed as required to develop the appropriate friction along the entire bonded length of the anchor. We estimate that the influence of the post-grouting and the adjacent soil within the bonded length of the anchors will be less than 5 feet from the anchor.

Total deflection during the 24-hour, 200 percent test should not exceed 12 inches during loading. Anchor deflection should not exceed 0.75 inch during the 24-hour period. Measured after the 200 percent test load is applied. If the anchor movement after the 200 percent load has been applied for six hours is less than 0.5 inch and the movement over the previous four hours has been less than 0.1 inch, the test may be terminated.

For the quick 200 percent tests, the 200 percent test load should be maintained for 30 minutes. The total deflection of the anchor during the quick 200 percent tests should not exceed 12 inches. Anchor deflection after the 200 percent test load has been applied should not exceed 0.75 inch during the 30 minute period. Where satisfactory tests are not achieved on the initial anchors, the anchor diameter and/or length should be increased until satisfactory test results are obtained.

All the production anchors should be pre-tested to at least 150 percent of the design load. Total deflection during the tests should not exceed 12 inches. The rate of creep under the 150 percent test should not exceed 0.1 inch over a 15-minute period for the anchor to be approved for the design loading.

After satisfactory test, each production anchor should be locked off at the design load. The locked-off load should be verified by rechecking the load in the anchor. If the locked-off load varies by more than 10 percent from the design load, the load should be until the anchor is locked off within 10 percent of the design load. Installation of the anchors and testing of the completed anchors should be observed by a representative of our firm.

6.4.5 Raker Bracing

As an alternative to tiebacks, Raker bracing may be used to internally brace the soldier piles. If used, Raker bracing could be supported laterally by temporary concrete footings (aka deadmen) or by the permanent interior footings. For design of such temporary footings placed with the bearing surface normal to the Rakers inclined at 45 to 60 degrees with the vertical, a bearing value of 6,000 psf may be used for footings on the dense or stiff native soil provided the shallowest point of the footing is at least 1 foot below the lowest adjacent grade. To reduce movement of the shoring, the Rakers should be tightly wedged against the footings and/or shoring system. Please note that dewatering is required as discussed in Section 6.8 and should lowered at least three feet below the lowest Raker footing.

6.4.6 Monitoring and Existing Condition Survey

Some means of monitoring the performance of the shoring system is recommended. The monitoring should consist of periodic surveying of the lateral and vertical deflections of top of each soldier pile. When design of the shoring system is finalized, we can discuss appropriate monitoring methods with the design consultants and shoring contractor.

It is difficult to accurately predict the amount of deflection of a shoring system and it should be understood that the shoring system is designed to deflect at the top. We recommend the shoring system be designed to limit deflection at the top to be 1 inch or less. If greater deflection occurs during construction, additional vertical support or lateral bracing may be required.

Additionally, we recommend an existing condition survey be performed to document the condition of the adjacent residence and detached garage. The survey should include photographs and

placement of monitoring devices (crack monitors, for instance) if appropriate and should be performed prior to the start of the shoring installation.

Vibration monitoring during shoring installation should also be performed when working in proximity to the existing adjacent structures.

6.5 Floor Slab Support

Considering the proposed building will be supported on a mat foundation, the mat foundation may also serve as the building lowest finish floor slab.

In this case, the requirements for support of the mat foundation would be followed and stiff to very stiff clayey soils present at the planned excavation bottom are considered suitable for floor slab (aka top of mat foundation) support, noting that some degree of mitigation will be required for the native clayey soils to establish a firm excavation bottom.

Mitigation measures include over-excavation of one to two feet of native clayey soils and placement of one-inch minus crushed rock.

Noting that a methane barrier will be required, and that barrier will also serve as a waterproofing membrane, there is no need to include a capillary break section to mitigate the potential for moisture transmission through the floor slab that could adversely impact finish flooring, if planned.

If a topping slab is planned above the mat foundation, the topping slab may be supported on properly compacted non-expansive fill soils. In this case, a capillary break section may be required.

The capillary break section should consist of six inches of crushed rock underlying a 15-mil HDPE membrane. The crushed rock recommended for excavation bottom stabilization may be used as part of the capillary break system.

Careful observation of the exposed excavation bottom should also be performed by our representative to identify areas that may require additional mitigation, if present.

6.6 Seismic Design

The soils underlying the site may be characterized in accordance with Chapter 20 of ASCE-7-16 as Site Class S_D.

Los Angeles Building Code-prescribed seismic design parameters are presented in Table 3.

Table 3 –Seismic Design Parameters

Criteria	Mapped Value
MCE_R Ground Motion at Short Periods, S_s	2.088g
MCE_R Ground Motion at 1 Second Period, S_1	0.746g
Site Class	D
Site Amplification Factor at 0.2 second, F_a	1.0
Site Amplification Factor at 1.0 second, F_v	2.5*
Site-Modified Spectral Acceleration Value at Short Periods, S_{MS}	2.088g
Site-Modified Spectral Acceleration Value at 1 Second Period, S_{M1}	1.865g*
Design Spectral Response Acceleration at short periods, S_{DS}	1.392g
Design Spectral Response Acceleration at 1 second period, S_{D1}	1.243g*
MCE_G Peak Ground Acceleration, PGA_M	0.985g

The recommended mapped values of F_v, S_{M1}, and S_{D1} above have been increased by 150 percent in accordance with the exception of Section 11.4.8.1 of Supplement No. 3 to ASCE 7-16. If the structural engineer elects not to use this exception in the seismic design approach, we should be notified so that we may develop site-specific response spectra and seismic design criteria in accordance with Chapter 21 of ASCE 7-16.

6.7 Pavement Design Recommendations

6.7.1 General

To provide uniform support for pavement sections, the upper 12 inches of existing soil should be removed and replaced as properly compacted fill. Based on the results of our geotechnical laboratory testing, we used an R-value of 15 in the design of AC and PCC pavement sections

The bottom of the removal excavation should be carefully evaluated by our field representative during construction to assure the removal of any unsuitable soils.

6.7.1 Asphalt-Concrete Pavement Design

Table 4 presents recommended AC Pavement design sections assuming an R-value of 15 for properly compacted fill.

Table 4 – AC Pavement Design Recommendations

Traffic Use	TI	AC (inches)	Class II Base (inches)
Parking Areas	4.5	3.0	5.0
Automobile Drive Lanes	5.0	3.5	6.0
Truck and Trailer Drive Lanes	6.0	4.0	8.0
Delivery Access and Loading Docks	7.0	5.0	10.0

We can determine the recommended pavement and base thickness for other TIs if required. Careful inspection is recommended to confirm that the recommended thickness or greater is achieved and there proper construction procedures are followed.

The base should be compacted to at least 95 percent relative compaction.

6.7.2 Portland Cement Concrete Pavement Design

Table 5 summarizes our Portland cement concrete (PCC) pavement recommendations for assumed TIs of 6 and 7 based on minimum compressive strength of 3,500 psi for the PCC.

Table 5. PCC Pavement Design Recommendations

Traffic Use	TI	PCC (inches)	Class II Base (Inches)
Truck and Trailer Drive Lanes	6.0	6.5	4.0
Delivery Access and Loading Docks	7.0	7.0	4.0

We recommend PCC pavement be reinforced with Number 3 bars spaced 18 inches on-center in each direction.

Dowels are recommended at joints to reduce any possible offsets. Careful inspection is recommended to check that the recommended thickness or greater is achieved and that proper construction procedures are followed.

The base should be compacted to at least 95 percent relative compaction.

6.8 Groundwater Considerations

Groundwater has been measured as shallow as 12 feet below is present at the site and based on our most recent measurements may be encountered at a depth of approximately 12 feet bgs, corresponding to approximately Elevation 139.

The building walls below grade and mat foundation will be subject to hydrostatic pressure and design recommendations to mitigate these conditions are presented herein.

Temporary construction dewatering will be required to perform the planned excavation. The temporary construction watering should be performed throughout the excavation phase until such time that the gravity loading of the building exceeds the hydrostatic uplift on the mat foundation and the groundwater level within the site should be lowered at least three feet below the lowest Raker footing.

Temporary construction dewatering systems typically consist of perimeter and/or internal well points and/or localized gravel trenches and corresponding pumps.

The dewatering system should be designed by a qualified dewatering contractor and appropriate regulatory permits should be obtained.

6.9 Earthwork Considerations

6.9.1 General

Site preparation for this project will primarily include demolition of existing structures and foundations, removal of existing AC and PCC pavement, and mass excavation to the planned lowest finish floor and foundation levels.

The planned excavation will result in removal of existing fill soils within the limits of the proposed building footprint.

6.9.2 Mass Excavation Bottom Preparation

We anticipate that the exposed excavation bottom will be relatively soft and wet and as a result, some degree of mitigation will be required to establish a firm working surface.

The exposed soils should be over-excavated to a depth of one to two feet below the planned bottom of excavation and replace these soils with one-inch minus crushed rock. The crushed rock should be placed in loose lifts not exceeding eight inches and densified using vibratory equipment.

Proof rolling should also be performed after the placement and densification of the crushed rock to verify the degree of bottom stabilization is sufficient.

Our field technician should observe and document the placement and densification of the crushed rock and also probe the material to confirm densification to establish a firm working surface.

6.9.3 Materials for Fill

As noted previously, one-inch minus crushed rock materials may be placed at the excavation bottom to establish a firm working surface.

For other applications, non-expansive on-site soils are suitable for re-use in the required fills, noting, however, that these soils typically contain relatively high moisture contents and will need to be dried, blended with dry coarse materials and/or treated prior to placement as compacted fill.

All fill soils should be free of organic and other deleterious materials and have a maximum particle size no greater than 3 inches.

Imported fill should be non-expansive. A sample of any proposed import soils should be collected for review and testing by our firm prior to import to the site.

6.9.4 Fill Placement and Compaction

Fill soils shall be moisture conditioned as recommended herein, placed in loose lifts not exceeding 8-inches in thickness and mechanically compacted.

Fine-grained fill soils should be moisture conditioned to 2 to 4 percent above the optimum moisture content and compacted to at least 90 percent of the maximum dry density obtainable per ASTM D-1557. We recommend that relatively light-weight compaction equipment be utilized when working in fine-grained soils.

Granular soils should be moisture conditioned to 0 to 2 percent above the optimum moisture content and compacted to at least 95 percent of the maximum dry density obtained per ASTM D-1557.

Crushed rock for bottom stabilization should be densified using vibratory methods.

6.9.5 Site Drainage

Proper drainage should be maintained at all times. Ponding or trapping of water in localized areas can cause differing moisture levels in the subsurface soil.

Drainage should be directed away from the tops of slopes.

Erosion protection and drainage control measures should be implemented during periods of inclement weather.

7.0 CONSTRUCTION OBSERVATION

Geotechnical testing and observation during construction is considered to be a continuing part of our geotechnical consultation. As required by the City of Los Angeles and in accordance with good practice, our representative should perform geotechnical observation and testing during the following primary activities:

- Drilling and installation of solider piles
- Lagging installation
- Excavation bottom stabilization
- Observation and probing of excavation bottoms
- Placement and compaction of backfill materials
- Installation of wall back-drainage provisions
- Installation of capillary break sections
- Foundation bottom observation and approval
- Placement and compaction of utility trench backfill

We will prepare daily field reports and summary reports at the end of the project that document that geotechnical related construction work was performed in general accordance with the approved geotechnical recommendations.

8.0 LIMITATIONS

The conclusions and recommendations provided in this report are based on subsurface conditions inferred from available boring data, as well as project information provided to date.

This report was prepared for the addressee and their design consultants and contractors for use in the proposed development.

If changes to the proposed development are made, we should be notified to review our conclusions and recommendations

Information on subsurface strata and groundwater levels shown on the logs represent conditions encountered only at the locations indicated and at the time of investigation.

9.0 CLOSING

We sincerely appreciate the opportunity to provide professional services for this project and look forward to working with you on this project.

Please contact us at you convenience to discuss any questions you may have regarding this report.

Sincerely,

Langan Engineering and Environmental Services, Inc.

Claudia Rangel
Staff Engineer

Shaun Wilkins
Senior Engineering Geologist

Christopher J. Zadoorian
Senior Associate

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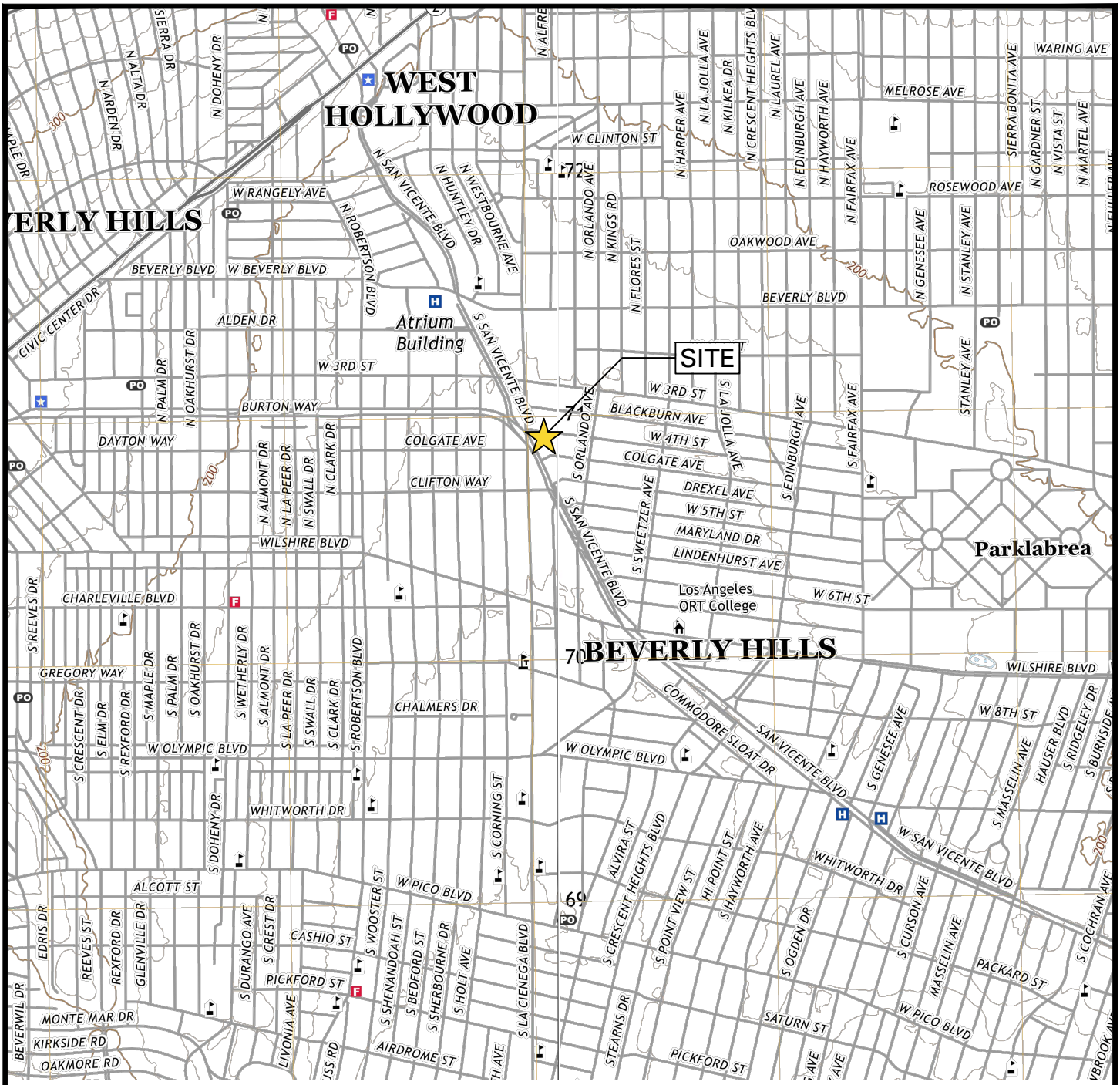
FIGURES



LEGEND:

SITE LOCATION

2000 1000 0 2000

SCALE IN FEET

REFERENCE: USGS 7.5-MINUTE TOPOGRAPHIC MAP OF THE BEVERLY HILLS AND HOLLYWOOD, CA QUADRANGLE (2018).

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Project	Figure Title	Project No.	Figure No.
400 SOUTH SAN VICENTE BOULEVARD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	**SITE LOCATION MAP**	700109901	**1**
		Date October 2022	
		Scale AS SHOWN	
		Drawn By CR	

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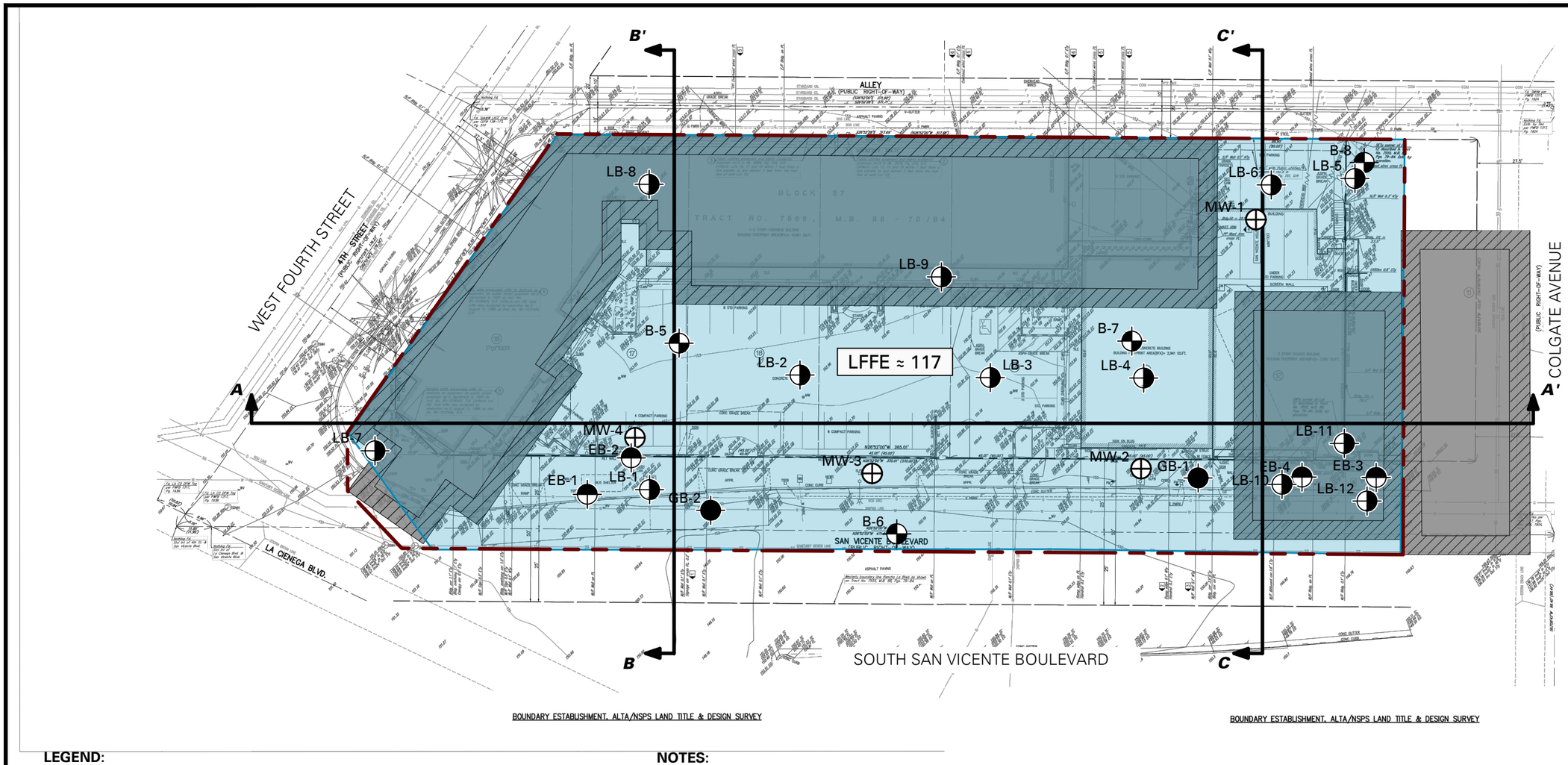
Filename: \\langan.com\data\IRV\data9\700109901\Project Data_Discipline\Geotechnical\CAD\GEOTECHNICAL FIGURES.dwg Date: 12/30/2021 Time: 10:00 User: cconstantino Style Table: Langan.stb Layout: 1-SLM



LEGEND:

- SITE LIMITS
- PROPOSED BUILDING LIMITS
- B-5 — BORING LOCATION
- GB-1 — PRIOR GEOTECHNICAL BORING LOCATION (PARTNER, 2019)
- LB-1 — PRIOR ENVIRONMENTAL BORING LOCATION (LEIGHTON AND ASSOCIATES, 2022)
- EB-1 — PRIOR ENVIRONMENTAL BORING LOCATION (PARTNER, 2019)
- MW-1 — PRIOR MONITORING WELL LOCATION (ENVIRONMENTAL MANAGERS AND AUDITORS INC.,2019)
- EXISTING BUILDING
- LFFE ≈ 117 — LOWEST FINISHED FLOOR ELEVATION

NOTES:

1. BACKGROUND REFERENCED FROM ALTA SURVEY PREPARED BY PSOMAS, DATED JANUARY 12, 2022.
2. PRIOR BORINGS REFERENCED FROM "PHASE I AND LIMITED PHASE II ENVIRONMENTAL SITE ASSESMENT PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT 400 SOUTH SAN VICENTE BOULEVARD, LOS ANGELES CA", PREPARED BY LEIGHTON AND ASSOCIATES, DATED FEBRUARY 14, 2022.
3. PRIOR BORINGS REFERENCED FROM "GEOTECHNICAL FEASIBILITY REPORT - BEVERLY PLAZA", PREPARED BY PARTNERS, DATED AUGUST 30, 2019.
4. PRIOR BORINGS REFERENCED FROM "PHASE II SUBSURFACE INVESTIGATION REPORT - BEVERLY PLAZA," PREPARED BY PARTNERS, DATED AUGUST 15, 2019.

30 15 0 30
SCALE IN FEET

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Project
400 SOUTH SAN VICENTE BOULEVARD
LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Figure Title
SITE PLAN

Project No. 700109901
Date October 2022
Scale AS SHOWN
Drawn By CC
Figure No. **2**

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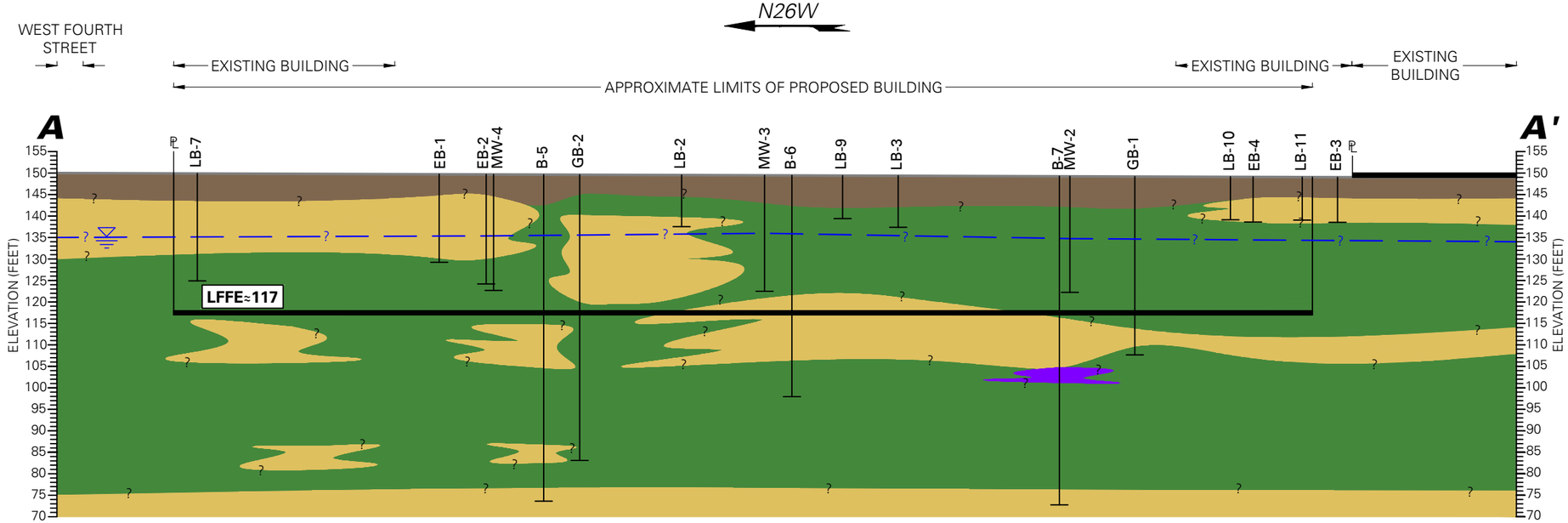
CROSS SECTION A-A'

N26W



LEGEND:

- APPROXIMATE GROUND SURFACE LEVEL
- ARTIFICIAL FILL (af)
- PREDOMINATELY SANDY SOILS
- PREDOMINATELY CLAYEY SOILS
- PREDOMINATELY HIGH PLASTICITY CLAY
- APPROXIMATE GROUNDWATER
- LFFE≈117 — LOWEST FINISHED FLOOR ELEVATION (FEET)

NOTES:

1. CROSS SECTION DISPLAYS GENERALIZED SUBSURFACE CONDITIONS; FOR A DETAILED DESCRIPTION OF CONDITIONS ENCOUNTERED REFER TO BORING LOGS.
2. REFER TO SITE PLAN FOR LOCATION OF CROSS SECTIONS.
3. GROUND SURFACE PROFILE INFERRED FROM GOOGLE EARTH PRO ON JANUARY 10, 2022.

30 15 0 30
SCALE IN FEET

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Project	Figure Title	Project No.	Figure No.
400 SOUTH SAN VICENTE BOULEVARD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	**CROSS SECTION A-A'**	700109901	**3**
		Date: October 2022	
		Scale: AS SHOWN	
		Drawn By: CC	

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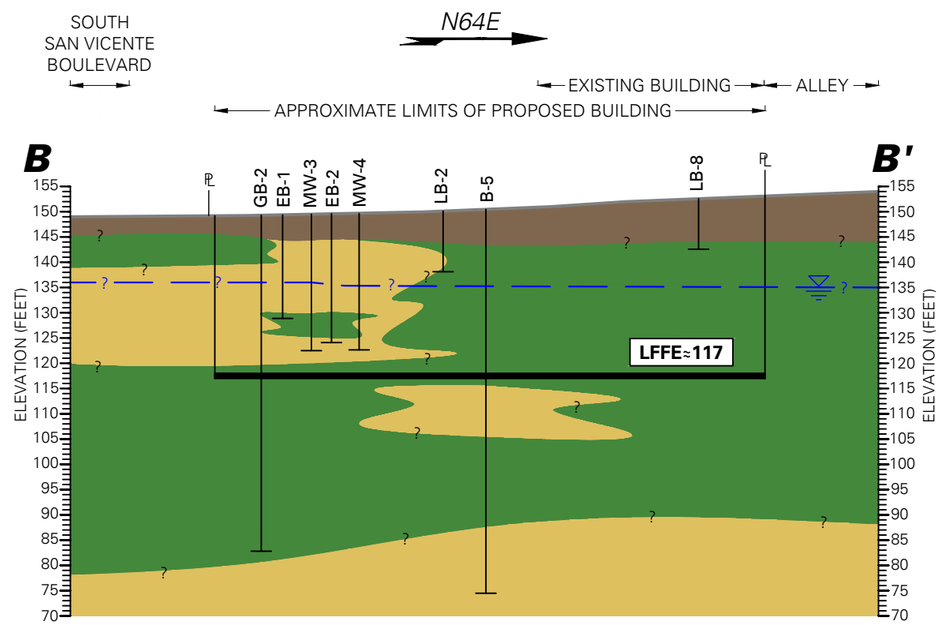
CROSS SECTION B-B'



LEGEND:

- APPROXIMATE GROUND SURFACE LEVEL
- ARTIFICIAL FILL (af)
- PREDOMINATELY SANDY SOILS
- PREDOMINATELY CLAYEY SOILS
- APPROXIMATE GROUNDWATER LEVEL
- LFFE≈117 — LOWEST FINISHED FLOOR ELEVATION (FEET)

NOTES:

1. CROSS SECTION DISPLAYS GENERALIZED SUBSURFACE CONDITIONS; FOR A DETAILED DESCRIPTION OF CONDITIONS ENCOUNTERED REFER TO BORING LOGS.
2. REFER TO SITE PLAN FOR LOCATION OF CROSS SECTIONS.
3. GROUND SURFACE PROFILE INFERRED FROM GOOGLE EARTH PRO ON JANUARY 10, 2022.

30 15 0 30
SCALE IN FEET

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400 SOUTH SAN VICENTE BOULEVARD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	CROSS SECTION B-B'	700109901	4
		Date: October 2022	
		Scale: AS SHOWN	
		Drawn By: CC	

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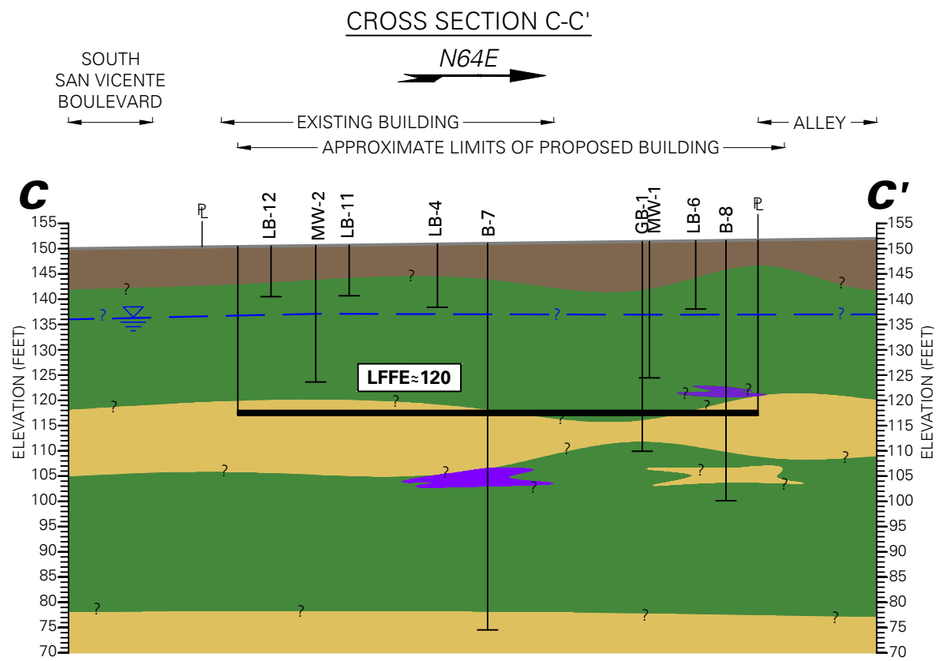

LEGEND:

- APPROXIMATE GROUND SURFACE LEVEL
- ARTIFICIAL FILL (af)
- PREDOMINATELY SANDY SOILS
- PREDOMINATELY CLAYEY SOILS
- PREDOMINATELY HIGH PLASTICITY CLAY
- APPROXIMATE GROUNDWATER LEVEL
- LFFE≈117 — LOWEST FINISHED FLOOR ELEVATION (FEET)

NOTES:

1. CROSS SECTION DISPLAYS GENERALIZED SUBSURFACE CONDITIONS; FOR A DETAILED DESCRIPTION OF CONDITIONS ENCOUNTERED REFER TO BORING LOGS.
2. REFER TO SITE PLAN FOR LOCATION OF CROSS SECTIONS.
3. GROUND SURFACE PROFILE INFERRED FROM GOOGLE EARTH PRO ON JANUARY 10, 2022.

30 15 0 30
SCALE IN FEET

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Project	Figure Title	Project No.	Figure No.
400 SOUTH SAN VICENTE BOULEVARD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	CROSS SECTION C-C'	700109901	5
		Date October 2022	
		Scale AS SHOWN	
		Drawn By CC	

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Filename: \\langan.com\data\IRV\data9\700109901\Project Data_Discipline\Geotechnical\CAD\GEOTECHNICAL FIGURES - copy.dwg Date: 9/12/2022 Time: 15:49 User: crangel Style Table: Langan.stb Layout: 5-XSC

LEGEND:

● BOREHOLE SITE

30 DEPTH TO GROUNDWATER IN FEET

2000 1000 0 2000

SCALE IN FEET

REFERENCE: CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF MINES AND GEOLOGY - SEISMIC HAZARD ZONE REPORT FOR THE BEVERLY HILLS AND HOLLYWOOD 7.5-MINUTE QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA, PLATE 1.2 (SHZR 023 AND 026), (1998).

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Project

400 SOUTH SAN VICENTE BOULEVARD

LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Figure Title

HISTORICAL HIGH GROUNDWATER MAP

Project No.	700109901
Date	October 2022
Scale	AS SHOWN
Drawn By	CR
Figure No.	6

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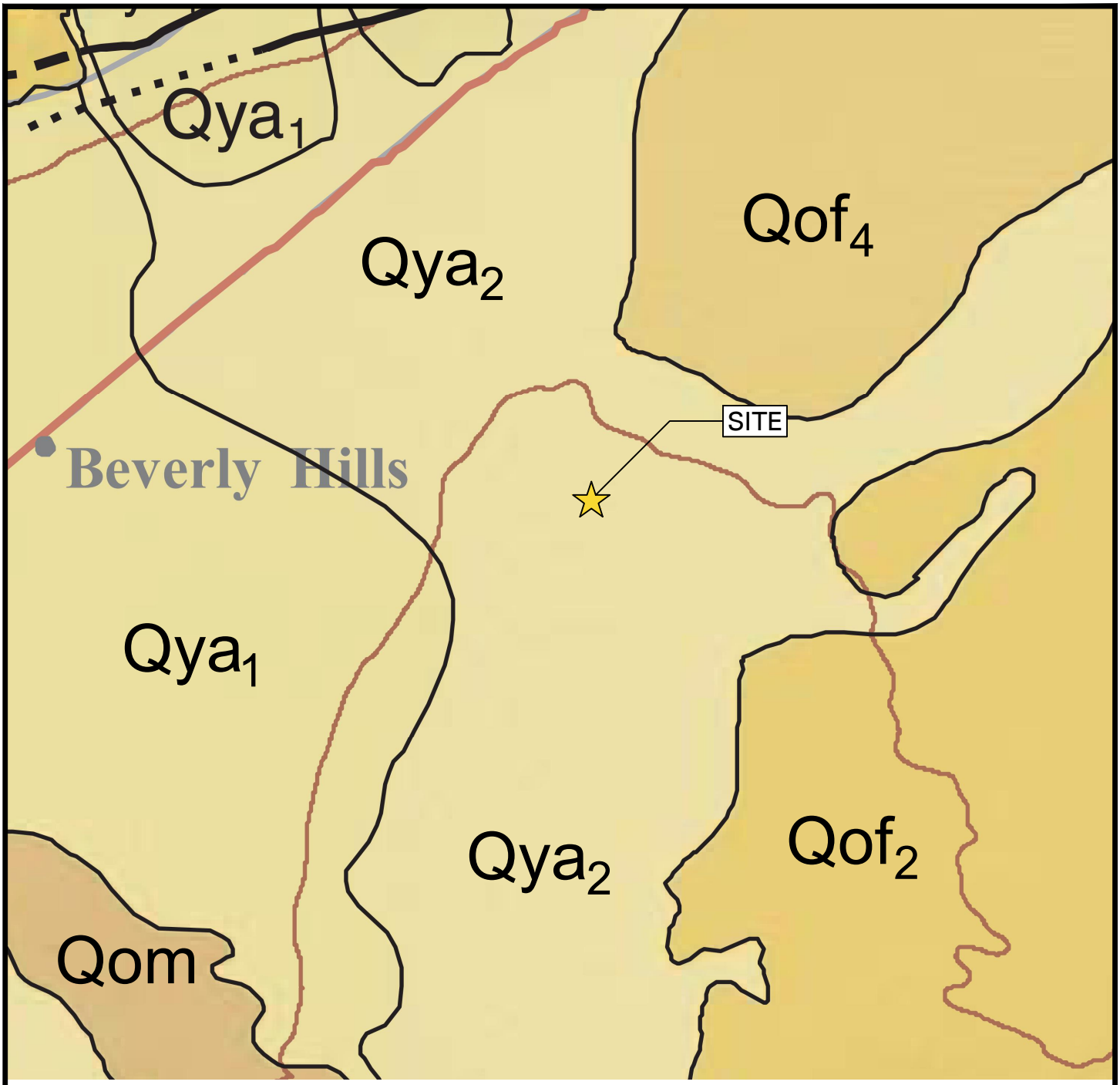

LEGEND:

Qya YOUNG ALLUVIUM

Qof OLD ALLUVIAL FAN DEPOSITS

Qom OLD SHALLOW MARINE DEPOSITS ON WAVE-CUT SURFACE

2000 1000 0 2000

SCALE IN FEET

REFERENCE: PRELIMINARY GEOLOGIC MAP OF THE LOS ANGELES 30' X 60' QUADRANGLE, CALIFORNIA, VERSION 2.1 (CAMPBELL, 2014).

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Project	Figure Title	Project No.	Figure No.
400 SOUTH SAN VICENTE BOULEVARD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	**REGIONAL GEOLOGIC MAP**	700109901	**7**
		Date October 2022	
		Scale AS SHOWN	
		Drawn By CC	

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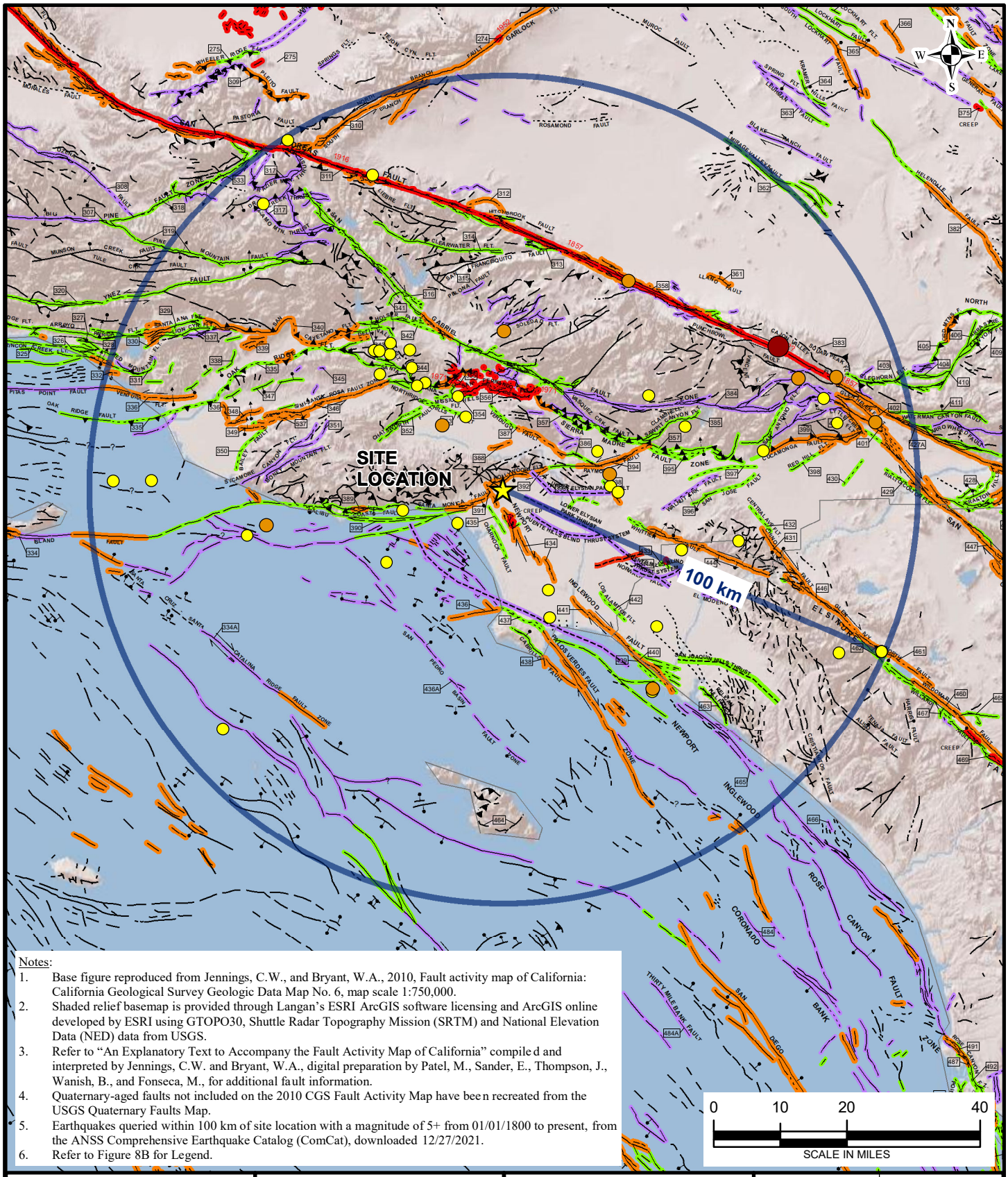
Filename: \\langan.com\data\IRV\data9\700109901\Project Data_Discipline\Geotechnical\CAD\GEOTECHNICAL FIGURES.dwg Date: 12/30/2021 Time: 09:59 User: cconstantino Style Table: Langan.stb Layout: 6-RGM



Notes:

1. Base figure reproduced from Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California: California Geological Survey Geologic Data Map No. 6, map scale 1:750,000.
2. Shaded relief basemap is provided through Langan's ESRI ArcGIS software licensing and ArcGIS online developed by ESRI using GTOPO30, Shuttle Radar Topography Mission (SRTM) and National Elevation Data (NED) data from USGS.
3. Refer to "An Explanatory Text to Accompany the Fault Activity Map of California" compiled and interpreted by Jennings, C.W. and Bryant, W.A., digital preparation by Patel, M., Sander, E., Thompson, J., Wanish, B., and Fonseca, M., for additional fault information.
4. Quaternary-aged faults not included on the 2010 CGS Fault Activity Map have been recreated from the USGS Quaternary Faults Map.
5. Earthquakes queried within 100 km of site location with a magnitude of 5+ from 01/01/1800 to present, from the ANSS Comprehensive Earthquake Catalog (ComCat), downloaded 12/27/2021.
6. Refer to Figure 8B for Legend.

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Project	Figure Title	Project No.	Figure
400 S SAN VICENTE BLVD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	QUATERNARY FAULT ACTIVITY AND EARTHQUAKE EPICENTER MAP	700109901 Date: October 2022 Scale: 1 inch = 20 miles Drawn By: TO	8A

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Path: \\langan.com\data\IRV\data9\700109901\Project Data\ArcGIS\MXD\Geotech_Figures\Fault Map - 700109901.mxd Date: 12/27/2021 User: Toulie Time: 2:59:12 PM

LEGEND:

Fault Age

The age classifications are based on geologic evidence to determine the youngest faulted unit and the oldest unfaulted unit along each fault or fault section

- Historic
- Holocene
- Late Quaternary
- Quaternary

Earthquake Epicenter

- Magnitude 5.0 to 5.9
- Magnitude 6.0 to 6.9
- Magnitude 7.0 to 7.4
- Magnitude 7.5 to 8.0

Pre-Quaternary Faults

- fault, certain
- fault, approx. located
- fault, concealed
- thrust fault, certain
- thrust fault, approx. located
- thrust fault, approx. located, queried
- fault, certain
- fault, concealed
- fault, approx. located

Quaternary Faults

- fault, certain
- fault, approx. located
- fault, approx. located, queried
- fault, inferred, queried
- fault, concealed
- fault, concealed, queried
- thrust fault, certain
- thrust fault, approx. located
- thrust fault, concealed
- dextral fault, certain
- dextral fault, approx. located
- dextral fault, concealed
- sinistral fault, certain
- sinistral fault, approx. located
- sinistral fault, concealed
- thrust fault, certain (2)
- thrust fault, approx. located (2)
- thrust fault, concealed (2)
- fault, solid
- fault, dashed
- fault, dotted
- dextral fault, solid
- fault, dotted, queried
- fault, dotted, queried (2)
- fault, solid, dip
- fault, dashed, dip
- fault, dotted, dip
- reverse fault, solid
- reverse fault, dashed
- reverse fault, dotted

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Project	Figure Title	Project No.	Figure
400 S SAN VICENTE BLVD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	QUATERNARY FAULT ACTIVITY AND EARTHQUAKE EPICENTER MAP	700109901 Date: October 2022 Scale: NOT TO SCALE Drawn By: TO	8B

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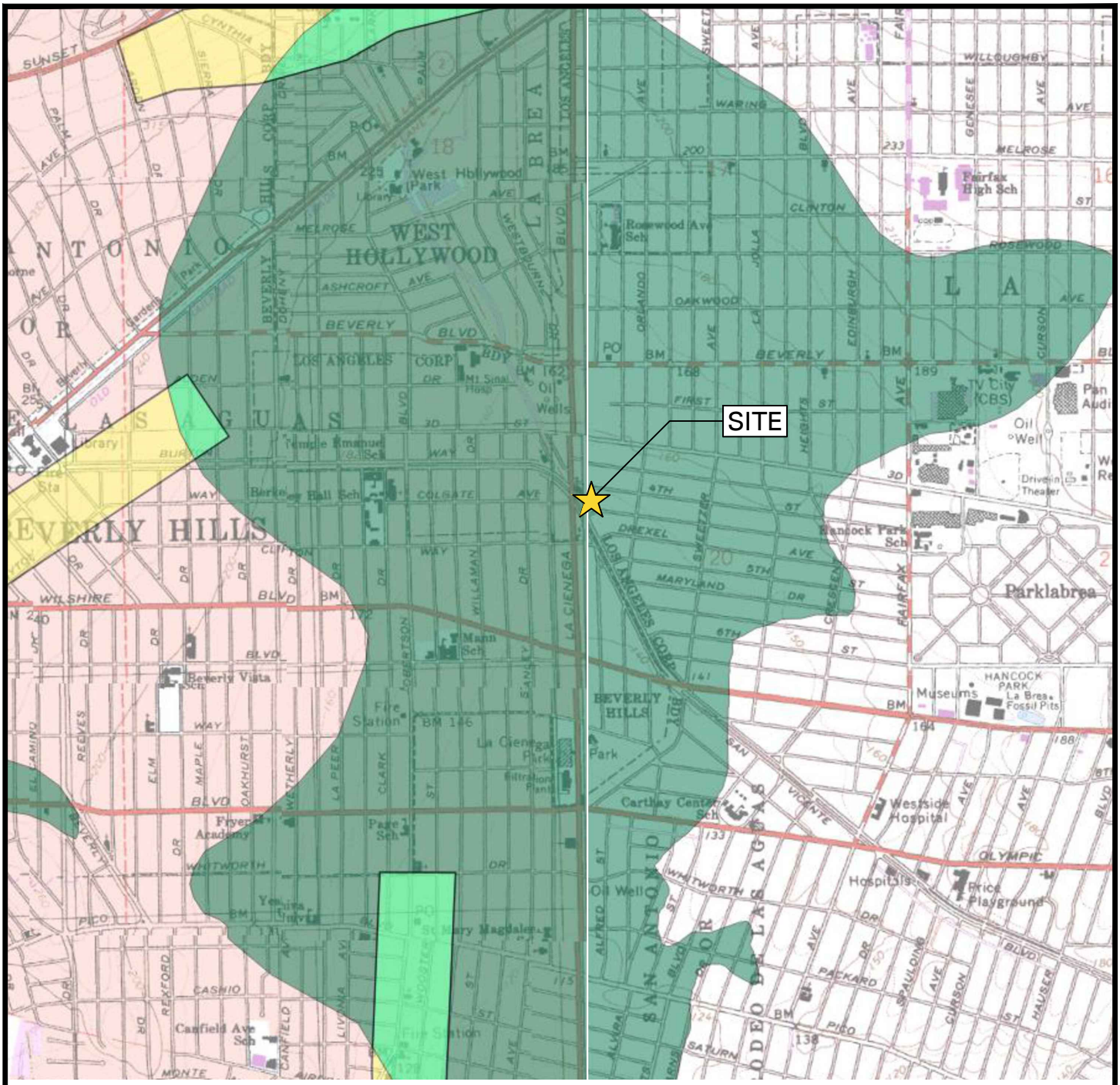
Path: \\langan.com\data\IRV\data9\700109901\Project Data\ArcGIS\MXD\Geotech_Figures\Fault Map Legend - 700109901.mxd Date: 12/27/2021 User: Toulie Time: 2:33:26 PM



LEGEND:

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

1906 C

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

N

2000 1000 0 2000
SCALE IN FEET

REFERENCE: CGS EARTHQUAKE ZONES OF REQUIRED INVESTIGATION FOR THE HOLLYWOOD (2014) AND BEVERLY HILLS (2018), CALIFORNIA 7.5-MINUTE QUADRANGLES.

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Project
400 SOUTH SAN VICENTE BOULEVARD
LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Figure Title
SEISMIC HAZARD ZONES MAP

Project No.	Figure No.
700109901	9
Date: October 2022	
Scale: AS SHOWN	
Drawn By: CC	

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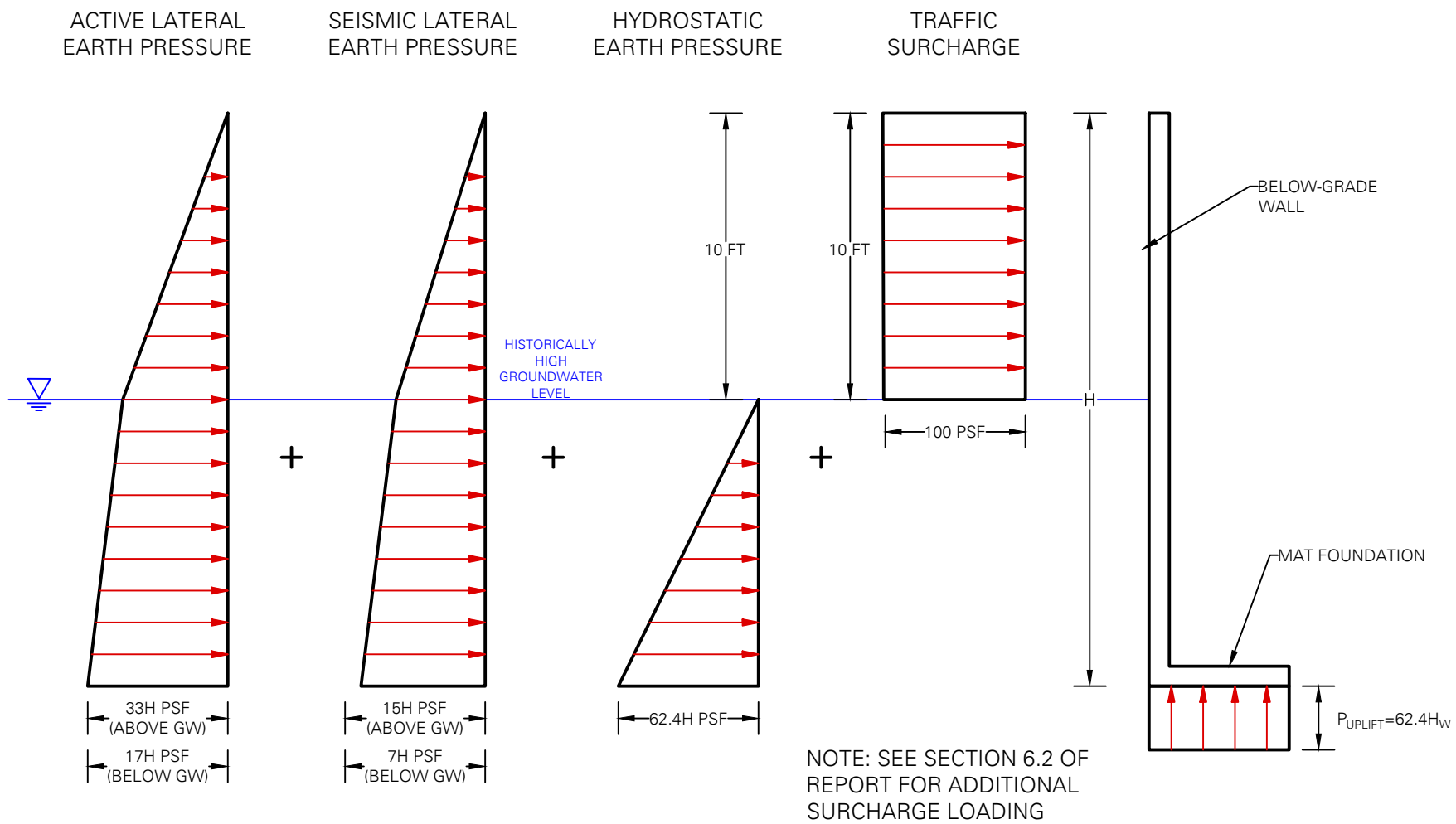
Filename: \\langan.com\data\IRV\data9\700109901\Project Data_Discipline\Geotechnical\CAD\GEOTECHNICAL FIGURES.dwg Date: 12/30/2021 Time: 10:01 User: cconstantino Style Table: Langan.stb Layout: 8-SHZM



NOTE: SEE SECTION 6.2 OF REPORT FOR ADDITIONAL SURCHARGE LOADING

NOT TO SCALE

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Project

400 SOUTH SAN VICENTE BOULEVARD

LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Figure Title

ACTIVE LATERAL EARTH PRESSURE

Project No.	700109901
Date	October 2022
Scale	NOT TO SCALE
Drawn By	CR
Figure No.	10

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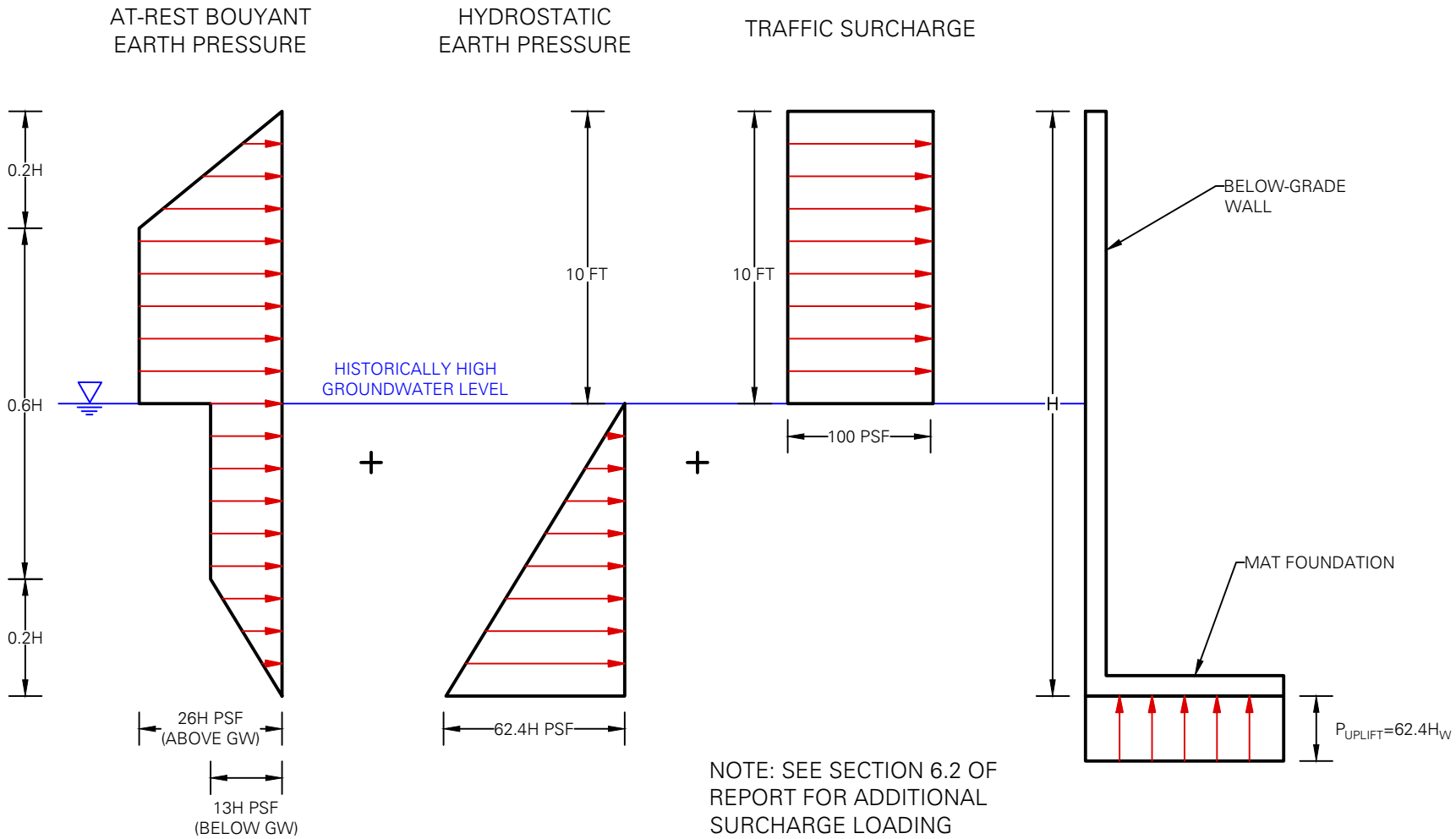

NOTE: SEE SECTION 6.2 OF REPORT FOR ADDITIONAL SURCHARGE LOADING

NOT TO SCALE

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Project	Figure Title	Project No.	Figure No.
400 SOUTH SAN VICENTE BOULEVARD LOS ANGELES LOS ANGELES COUNTY CALIFORNIA	**BOUYANT LATERAL EARTH PRESSURE**	700109901	**11**
		Date: October 2022	
		Scale: NOT TO SCALE	
		Drawn By: CR	

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APPENDIX A

Current Subsurface Explorations and Geotechnical Laboratory Testing

APPENDIX A

SUBSURFACE EXPLORATIONS

We explored the subsurface conditions at the site by drilling three borings (B-5 through B-7) to depths ranging between 51.5 and 76.5 feet BGS at the locations shown on Figure 2. SoCal Drilling, Inc. using truck-mounted mud rotary drilling equipment drilled the borings on January 6 and 7, 2022.

The locations of the explorations were determined in the field by observing nearby landmarks/structures, which were based on site maps prepared by us. This information should be considered accurate only to the degree implied by the methods used.

Our field representative observed and logged the explorations. We obtained representative samples of the various soil encountered in the explorations. Classifications and sampling intervals are presented on the exploration logs included in this appendix.

SOIL SAMPLING

Samples were collected from the borings using modified California split-spoon samplers in general accordance with ASTM D3550 and we performed Standard Penetration Tests (SPTs) in general accordance with ASTM D1586.

The modified California samplers and SPTs were driven using a 140-pound hammer free falling 30 inches. The samplers were driven a total distance of 18 inches or to refusal. The number of blow counts required to drive the sampler for each 6 inch segment was recorded (or less if refusal is met) on the exploration logs. Sampling methods and intervals are shown on the exploration logs.

The samples collected from the borings were transported to our office for further review and for assignment of geotechnical laboratory testing.

SOIL CLASSIFICATION

The soil samples were described in accordance with the classification legend that is included in this appendix prior to the exploration logs. The exploration logs indicate the depths at which the soils or their characteristics change, although the change actually may be gradual. If the change occurred between sample locations, the depth was interpreted. Changes between geologic units or soil types on the boring logs are represented with a solid line if observed directly in the samples, and with a dashed line if inferred between sample depths. Classifications are shown on the exploration logs.

LABORATORY TESTING

Moisture Content and In-place Dry Density

The natural moisture content of select soil samples were performed in general accordance with ASTM D2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage.

Select soil samples were tested to determine the in situ dry density. The tests were performed in general accordance with ASTM D2937. The dry density is defined as the ratio of the dry weight of the soil sample to the volume of that sample. The dry density typically is expressed in units of pounds per cubic foot (pcf).

The test results are presented in this appendix.

Maximum Dry-Density and Optimum Moisture Content

Maximum dry-density and optimum moisture content testing was performed in general accordance with ASTM D 1557 on one bulk samples obtained from the explorations. The tests determines the optimal moisture content at which sample achieves its maximum dry density. The test results are presented in this appendix.

Atterberg Limits

Atterberg Limit tests were completed on select samples obtained from the explorations. The tests were conducted in general accordance with ASTM D 4318. The test measures the liquid limit, plastic limit, and plasticity index of soils.

The test results are presented in this appendix.

Grain Size Analysis

Grain Size analysis was completed on select samples obtained from the explorations. The tests were conducted in general accordance with ASTM D 1140. The test measures the amount of material finer than 75µm (No. 200) sieve in soils.

The test results are presented in this appendix.

Corrosion Testing

Chemical and electrical analyses were performed on selected bulk samples of onsite soils to determine their soluble sulfate content, chloride content, pH (acidity) and minimum electrical resistivity. These tests were performed in accordance with the latest versions of California Test Method Nos. CTM 417 (sulfate), CTM 422 (chloride), and CTM 643 (pH and resistivity) respectively.

The results of these tests are included in this appendix.

Consolidation Testing

One-dimensional consolidation testing was performed in general accordance with ASTM D2435 on relatively undisturbed soil samples. The test measures the volume change of a soil sample under predetermined loads.

The test results are presented in this appendix.

Strength Testing

Direct shear tests were completed on select samples obtained from the explorations. The tests were performed in general accordance with ASTM D3080. The test determines the effects upon shear resistance and displacement, and strength properties such as Mohr strength envelopes.

The test results are presented in this appendix.

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Log of Boring **B-5** Sheet 1 of 4

Project: 400 South San Vicente Boulevard	Project No.: 700109901
Location: 400 South San Vicente Boulevard	Elevation and Datum: Approx. 151 (feet, MSL)
Drilling Company: SoCal Drilling	Date Started: 1/6/22 / Date Finished: 1/6/22
Drilling Equipment: Mayhew 1000	Completion Depth: 76 ft / Rock Depth: -
Size and Type of Bit: 4.75" Mud Rotary	Number of Samples: Disturbed 10, Undisturbed 9, Core -
Casing Diameter (in): - / Casing Depth (ft): -	Water Level (ft.): First ▽ 21.5, Completion ▼ -, 24 HR. ▼ -
Casing Hammer: - / Weight (lbs): - / Drop (in): -	Drilling Foreman:
Sampler: Bulk; 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod	Field Engineer: A. Nieblas
Sampler Hammer: Automatic / Weight (lbs): 140 / Drop (in): 30	

Elev. (ft)	Sample Description	Depth Scale	Sample Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+151.0	AC = 4-inches thick, Base = 6-inches thick.	0						Bulk sample collected from 0-10 feet bgs.
+150.2	**Artificial Fill (af)** CLAY with Sand (CL), dark brown and brown mottled, very stiff, moist to very moist, fine sand.	1						
		2						
		3						
		4						
		5	S-1	CR	15	5 10 11		WC = 30.7% DD = 93.0 pcf
		6						
+144.0	**Quaternary Young Alluvium (Qya)** Sandy CLAY (CL), brown, very stiff, moist, some coarse sand.	7						
		8						
		9						
		10	S-2	CR	18	5 11 17		
		11						
		12						
	Stiff, very moist.	13	S-3	SPT	18	4 4 5		LL = 42, PL = 25, PI = 17 %Pass #200 = 67
+137.0	Sandy SILT (ML), gray and grayish brown, very stiff, very moist, fine to medium sand, trace bivalve shells.	14						
		15	S-4	CR	18	9 9 7		WC = 23.0% DD = 103.4 pcf
		16						
+134.0	SILT with Sand (ML), orangish brown, very stiff, very moist, trace fine sand.	17						
		18	S-5A/S-5B	SPT	15	5 7 9		
+132.5	SILT (ML), bluish gray, very stiff, very moist, abundant rootlets.	19						
+131.0		20						

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Log of Boring **B-5** Sheet 2 of 4

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

Elev. (ft)	Sample Description	Sample Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+131.0	Sandy CLAY (CL), grayish brown and light grayish brown mottled, stiff, moist, fine to coarse sand, few fine gravel.	S-6	CR	14	4 6 9		WC = 22.3% DD = 108.3 pcf LL = 35, PL = 20, PI = 15 %Pass #200 = 57 Groundwater encountered at 21.5 feet.
+128.0	Sandy CLAY (CL), grayish brown, stiff to very stiff, very moist, fine to coarse sand.	S-7	SPT	13	5 7 9		LL = 29, PL = 21, PI = 8
	Gray and light gray mottled, very stiff.	S-8	CR	12	6 12 17		WC = 27.6% DD = 97.6 pcf Direct shear test. Consolidation test.
+116.0	**Quaternary San Pedro Formation (Qsp)** Clayey SAND (SC), grayish brown, very dense, wet, fine to coarse sand, fine gravel, lean clay.	S-9	SPT	12	9 33 34		
+113.0	Gravelly SAND (SP), gray, very dense, wet, medium to coarse sand, fine to medium gravel.	S-10	CR	10.5	39 50/4.5"		WC = 12.5% DD = 124.4 pcf
+106.0							

Depth Scale: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45

\\LANGAN.COM\DATA\IRV\DATA9\700109901\PROJECT DATA_DISCIPLINE\GEOTECHNICAL\GINTLOGS\700109901 - GINT.GPJ ... 2/14/2022 3:22:44 PM ... Report: Log - LANGAN

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Log of Boring **B-5** Sheet 3 of 4

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

Elev. (ft)	Sample Description	Sample Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+106.0	CLAY (CL), bluish gray, very stiff, very moist, coarse sand, fine gravel.	S-11	SPT	18	10 11 11		LL = 43, PL = 26, PI = 17
	Light greenish gray and bluish gray mottled, hard, very friable, very old caliche.	S-12	CR	18	13 26 20		WC = 28.7% DD = 98.8 pcf
+98.0	Sandy CLAY (CL), bluish gray with light bluish gray and gray mottled, hard, very moist.	S-13	SPT	14	11 21 25		
+94.0	CLAY with Sand (CL), bluish gray, hard, very moist, fine to coarse sand.	S-14	CR	18	11 21 23		WC = 24.7% DD = 104.7 pcf
+88.0	Clayey SAND (SC), bluish gray, very dense, very moist, very fine sand.	S-15	SPT	12	23 31 34		
+84.0	Clayey SAND (SC) / Sandy CLAY with Gravel (CL), very dense to hard, very moist, very fine sand.						

Depth Scale: 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70

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Log of Boring **B-5** Sheet 4 of 4

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

Elev. (ft)	Sample Description	Sample Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+81.0		S-16	CR	10	32 50/5"		
+78.0	Clayey SAND (SC), bluish gray, very dense, moist, very fine sand.						
		S-17	SPT	11	29 50/5"		
+75.0	Total Depth = 76 feet Groundwater encountered at 21.5 feet. Borehole backfilled per LA County guidelines with bentonite grout mixture.						

Depth Scale: 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95

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Log of Boring **B-6** Sheet 1 of 3

Project: 400 South San Vicente Boulevard	Project No.: 700109901
Location: 400 South San Vicente Boulevard	Elevation and Datum: Approx. 149 (feet, MSL)
Drilling Company: SoCal Drilling	Date Started: 1/6/22 — Date Finished: 1/7/22
Drilling Equipment: Mayhew 1000	Completion Depth: 51.5 ft — Rock Depth: -
Size and Type of Bit: 4.75" Mud Rotary	Number of Samples: Disturbed 6, Undisturbed 7, Core -
Casing Diameter (in): - — Casing Depth (ft): -	Water Level (ft.): First ▽ 15.5, Completion ▼ -, 24 HR. ▼ -
Casing Hammer: - — Weight (lbs): - — Drop (in): -	Drilling Foreman:
Sampler: 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod	Field Engineer: A. Nieblas
Sampler Hammer: Automatic — Weight (lbs): 140 — Drop (in): 30	

Elev. (ft)	Sample Description	Depth Scale	Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+149.0	AC = 4-inches thick, Base = 6-inches thick.	0						
+148.0	**Artificial Fill (af)** CLAY (CL), brown and light brown mottled, very stiff to hard, very moist, few medium sand.	1						
		2						
		3						
		4						
		5	S-1	CR	18	7 15 17		
		6						
+142.0	**Quaternary Young Alluvium (Qya)** CLAY with Some Sand (CL), brown and light brown mottled, stiff, moist, caliche.	7						
		8						
		9						
		10	S-2	CR	18	2 5 5		WC = 39.4% DD = 85.8 pcf
+138.0	Sandy SILT (ML), brown to orangish brown, soft, very moist, very fine sand.	11						
		12						
		13	S-3	SPT	18	1 1 2		
+135.0	Sandy CLAY (CL), grayish brown with light grayish brown mottled, very stiff, very moist, few fine gravel, some iron oxide staining, very old caliche/rootlets.	14						
		15 ▽	S-4	CR	0	5 7 11		No sample recovery. Groundwater encountered at 15.5 feet.
		16						
		17						
		18	S-5	SPT	18	10 12 12		LL = 37, PL = 22, PI = 15
		19						
+129.0		20						

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Log of Boring **B-6** Sheet 2 of 3

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 149 (feet, MSL)

Elev. (ft)	Sample Description	Sample Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+129.0	Sandy CLAY (CL), orangish brown, very stiff, very moist, fine to coarse sand, moderate plasticity.	S-6	CR	18	6 11 13		WC = 22.2% DD = 103.6 pcf LL = 49, PL = 27, PI = 22 Direct shear test. Consolidation test.
	Grayish brown mottled, moist, very fine to medium sand.	S-7	SPT	18	4 7 10		LL = 36, PL = 24, PI = 12 %Pass #200 = 74
+121.0	Clayey SAND (SC), gray to grayish brown, very dense, wet.	S-8	CR	18	22 50 50		WC = 12.7% DD = 124.7 pcf
+116.0	**Quaternary San Pedro Formation (Qsp)** SAND with Gravel and Clay (SW-SC), brown, very dense, wet, well graded sand.	S-9	SPT	9	22 32 23		
+112.0	SAND with Some Gravel (SP), grayish brown, very dense, moist, well graded sand.	S-10	CR	11	28 50/5"		WC = 9.6% DD = 129.6 pcf
+106.0	CLAY with Sand (CL), bluish gray, hard, very moist.						

Depth Scale: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45

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Log of Boring **B-6** Sheet 3 of 3

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 149 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+104.0		45	S-11	SPT	10	15 18 21		
			46						
			47						
	+101.0	Sandy CLAY (CL), greenish gray and bluish gray, very stiff, very moist, fine to medium sand, thin Clayey Sand (SC) lenses.	48						
			49						
			50	S-12	CR	18	11 15 17		WC = 25.3% DD = 103.5 pcf LL = 35, PL = 19, PI = 16
			51						
	+97.5	Total Depth = 51.5 feet Groundwater encountered at 15.5 feet. Borehole backfilled per LA County guidelines with bentonite grout mixture.	52						
			53						
			54						
			55						
			56						
			57						
			58						
			59						
			60						
			61						
			62						
			63						
			64						
			65						
			66						
			67						
			68						
			69						
			70						

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Log of Boring **B-7** Sheet 1 of 4

Project: 400 South San Vicente Boulevard	Project No.: 700109901
Location: 400 South San Vicente Boulevard	Elevation and Datum: Approx. 151 (feet, MSL)
Drilling Company: SoCal Drilling	Date Started: 1/7/22 / Date Finished: 1/7/22
Drilling Equipment: Mayhew 1000	Completion Depth: 76.5 ft / Rock Depth: -
Size and Type of Bit: 4.75" Mud Rotary	Number of Samples: Disturbed 9, Undisturbed 9, Core -
Casing Diameter (in): - / Casing Depth (ft): -	Water Level (ft.): First ▽ 14, Completion ▼ -, 24 HR. ▼ -
Casing Hammer: - / Weight (lbs): - / Drop (in): -	Drilling Foreman:
Sampler: Bulk; 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod	Field Engineer: A. Nieblas
Sampler Hammer: Automatic / Weight (lbs): 140 / Drop (in): 30	

Elev. (ft)	Sample Description	Depth Scale	Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+151.0	AC = 8-inches thick, Base = 6-inches thick.	0						Bulk sample collected from 0-10 feet bgs. Compaction test. Corrosivity and Chemical tests.
+149.8	**Artificial Fill (af)** Sandy CLAY (CL), dark brown and brown mottled, hard, moist.	1, 2, 3, 4						
		5, 6	S-1	CR	18	9 18 22		WC = 16.5% DD = 112.0 pcf Direct shear test.
+144.0	**Quaternary Young Alluvium (Qya)** CLAY (CL) to SILT (ML), orangish brown and light brown mottled, stiff, moist.	7, 8, 9						
		10, 11	S-2	SPT	9	5 6 6		
+139.0	CLAY with Sand (CL), brown and light brown mottled, stiff, very moist, caliche.	12						
		13	S-3	CR	12	4 5 5		WC = 29.7% DD = 93.6 pcf
		14 ▽						Groundwater encountered at 14 feet.
	Orangish brown, moist to very moist, no caliche.	15, 16	S-4	SPT	18	2 5 5		LL = 40, PL = 22, PI = 18
+134.0	SILT (ML), brown, hard, moist, medium sand, manganese oxide staining.	17						
		18	S-5	CR	18	10 18 22		WC = 51.5% DD = 90.4 pcf
+132.5	Sandy CLAY (CL), gray brown, hard, moist, fine to coarse sand, some iron oxide staining.	19						
+131.0		20						

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Log of Boring **B-7** Sheet 2 of 4

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

Elev. (ft)	Sample Description	Sample Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+131.0	CLAY (CL), brown, stiff, moist, scattered caliche.	S-6	SPT	15	4 6 6		WC = 19.7% LL = 38, PL = 20, PI = 18
+128.0	CLAY with Sand (CL), brown, very stiff, moist, fine to medium sand, few caliche stringers.	S-7	CR	18	7 12 13		WC = 25.9% DD = 100.2 pcf LL = 43, PL = 23, PI = 20 Consolidation test.
+123.0	CLAY (CL), brown, stiff, moist.	S-8	SPT	18	4 5 5		LL = 49, PL = 23, PI = 26
+118.0	Clayey SAND (SC), brown, very dense, moist, iron oxide staining.	S-9	CR	18	17 33 38		WC = 17.2% DD = 113.9 pcf Direct shear test.
+115.0	**Quaternary San Pedro Formation (Qsp)** SAND (SP/SW), gray, very dense, moist to wet, coarse sand.						
+113.0	SAND with Gravel (SW), gray, very dense, wet, medium to coarse sand, fine gravel.	S-10	CR	11	37 50/5"		WC = 13.0% DD = 125.4 pcf
+107.0	CLAY with Sand (CH), light bluish gray, stiff, moist to very moist, caliche.						

Depth Scale: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45

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Log of Boring **B-7** Sheet 3 of 4

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+106.0		45						LL = 78, PL = 34, PI = 44
		46	S-11	SPT	18	4 6 6		
		47						
+103.0	Sandy CLAY (CL), light greenish gray and bluish gray, hard, moist.	48						
		49						
		50	S-12	CR	18	17 31 32		WC = 24.6% DD = 106.2 pcf
		51						
		52						
		53						
		54						
	Bluish gray, very moist, fine to coarse sand, quartzofeldspathic composition.	55	S-13	SPT	18	12 18 20		
		56						
		57						
+93.0	CLAY (CL), bluish gray, hard, very moist.	58						
		59						
		60	S-14	CR	18	17 38 45		WC = 30.9% DD = 92.9 pcf
		61						
		62						
		63						
		64						
		65	S-15	SPT	18	17 25 29		
		66						
		67						
+83.0	SILT (ML), bluish gray, hard, moist.	68						
		69						
		70						

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Log of Boring **B-7** Sheet 4 of 4

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+81.0		70						
			71	S-16	CR	17	21 36 50/5"		
			72						
	+78.0	Clayey SAND (SC), bluish gray, very dense, very moist.	73						
			74						
			75	S-17	SPT	11	38 50/5"		
			76						
	+74.5	Total Depth = 76.5 feet Groundwater encountered at 14 feet. Borehole backfilled per LA County guidelines with bentonite grout mixture.	77						
			78						
			79						
			80						
			81						
			82						
			83						
			84						
			85						
			86						
			87						
			88						
			89						
			90						
			91						
			92						
			93						
			94						
			95						

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Log of Boring **B-8** Sheet 1 of 3

Project: 400 South San Vicente Boulevard	Project No.: 700109901
Location: 400 South San Vicente Boulevard	Elevation and Datum: Approx. 151 (feet, MSL)
Drilling Company: 2R Drilling	Date Started: 2/3/22 / Date Finished: 2/3/22
Drilling Equipment: CME-75 Short Tower Track Rig	Completion Depth: 51.5 ft / Rock Depth: -
Size and Type of Bit: 8-inch O.D. Hollow Stem Auger	Number of Samples: Disturbed 7, Undisturbed 5, Core -
Casing Diameter (in): - / Casing Depth (ft): -	Water Level (ft.): First ▽ 20, Completion ▼ -, 24 HR. ▼ -
Casing Hammer: - / Weight (lbs): - / Drop (in): -	Drilling Foreman:
Sampler: 2-inch O.D. SPT Split-Barrel, 2.5-inch I.D. Cal Mod	Field Engineer: A. Nieblas
Sampler Hammer: Automatic / Weight (lbs): 140 / Drop (in): 30	

Elev. (ft)	Sample Description	Depth Scale	Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+151.0		0						
+150.7	PCC = 4-inches thick. Welded wire mesh.							
	Artificial Fill (af) Sandy CLAY (CL), dark brown, moist.	1, 2, 3, 4						
+146.0	**Quaternary Young Alluvium (Qya)** SILT with Sand (ML), olive brown, stiff, slightly moist to moist.	5, 6	S-1	SPT	18	4 5 9		
		7						
+143.0	Sandy CLAY (CL), olive brown, stiff, moist, fine to very coarse sand, scattered caliche.	8, 9, 10, 11	S-2	CR	18	4 6 9		
		12						
+138.0	CLAY (CL), brown, medium stiff, very moist.	13, 14, 15, 16	S-3	SPT	18	2 3 3		
		17, 18, 19, 20						

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Log of Boring **B-8** Sheet 2 of 3

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

Elev. (ft)	Sample Description	Depth Scale	Sample Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+131.0	Medium plasticity.	20, 21	S-4	CR	18	3, 5, 8		Groundwater encountered at 20 feet.
+128.0	CLAY with some Sand (CL), brown, stiff, very moist, some caliche.	22, 23, 24						
+125.0	CLAY with Sand (CL), gray with light gray mottled, stiff, very moist.	25, 26	S-5	SPT	18	2, 4, 5		
		27						Bulk sample collected from 27-30 feet.
		28	S-6	CR	18	5, 7, 10		
+122.0	CLAY (CL), bluish gray, stiff, very moist.	29, 30						
+120.3	Clayey SAND (SC) and SAND (SP), bluish gray, medium dense, very moist, medium to coarse sand.	31	S-7a/S-7b	SPT	18	3, 5, 7		
		32, 33, 34						
	Quaternary San Pedro Formation (Qsp) Grayish brown, very dense, wet.	35, 36	S-8	CR	18	17, 27, 55		
+114.0	SAND (SP), brown, medium dense, wet, fine to very coarse sand.	37, 38, 39						
		40, 41	S-9	SPT	12	17, 14, 14		
		42						
+108.0	CLAY (CL), olive brown, dense, very moist.	43, 44, 45						

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Log of Boring **B-8** Sheet 3 of 3

Project	Project No.
400 South San Vicente Boulevard	700109901
Location	**Elevation and Datum**
400 South San Vicente Boulevard	Approx. 151 (feet, MSL)

Elev. (ft)	Sample Description	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	Water Content	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+106.0							
+105.7	SAND with Gravel (SP), brown, dense, wet.	S-10	CR	15	16 17 26		Split sample
+105.0	CLAY (CL), olive brown, dense, very moist.						
+103.0	Clayey SAND (SC) to Sandy CLAY (CL), light greenish gray to bluish gray, dense to hard, very moist to wet.						
		S-11	SPT	18	10 18 20		
+99.5	Total Depth = 51.5 feet Groundwater encountered at 20 feet. Borehole backfilled per LA County guidelines with bentonite grout mixture.						

Depth Scale: 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70

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MOISTURE DENSITY TESTS

PROJECT Langan # 700109901 **JOB NO.** 2012-0057 **BY** LD **DATE** 01/20/22

Sample No.	B-5 / S-1	B-5 / S-4	B-5 / S-6	B-5 / S-10	B-5 / S-12	B-5 / S-14	B-6 / S-2	B-6 / S-8
Depth (ft)	5.0	15.0	20.0	40.0	50.0	60.0	10.0	30.0
Testing								
Soil Type	Brown, Silty Clay	Brown, Silty Clay	Brown, Silty Clay	Brown, Silty Sand w. Gravel	Brown, Silty Clay	Brown, Silty Clay	Brown, Silty Clay	Brown, Sandy Clay
Wet+Tare	955.4	988.4	612.1	1065.0	1185.9	1008.8	943.7	1068.6
No. Ring	5	5	3	5	6	5	5	5
Wet Weight	140.0	113.5	149.9	136.0	143.5	141.4	130.8	165.2
Dry Weight	107.1	92.3	122.6	120.9	111.5	113.4	93.8	146.6
Wet density	121.6	127.1	132.5	139.9	127.1	130.6	119.7	140.5
% Water	30.7	23.0	22.3	12.5	28.7	24.7	39.4	12.7
Dry Density	93.0	103.4	108.3	124.4	98.8	104.7	85.8	124.7
O.B.Press(psf)								

Sample No.	B-6 / S-10	B-6 / S-12	B-7 / S-3	B-7 / S-5	B-7 / S-6	B-7 / S-10	B-7 / S-12	B-7 / S-14
Depth (ft)	40.0	50.0	12.5	17.5	20.0	40.0	50.0	60.0
Testing								
Soil Type	Brown, Silty Sand w. Gravel	Brown, Silty Clay	Brown, Silty Clay	Brown, Silty Sand w. Gravel	Brown, Silty Clay	Brown, Silty Sand w. Gravel	Brown, Silty Clay	Brown, Silty Clay
Wet+Tare	1077.8	602.3	954.0	1044.5		1290.9	1223.0	955.0
No. Ring	5	3	5	5		6	6	5
Wet Weight	143.9	157.9	133.5	168.3	165.1	169.2	165.1	131.0
Dry Weight	131.3	126.0	102.9	111.4	137.9	149.7	132.5	100.1
Wet density	142.1	129.7	121.4	136.5		141.7	132.3	121.6
% Water	9.6	25.3	29.7	51.1	19.7	13.0	24.6	30.9
Dry Density	129.6	103.5	93.6	90.4		125.4	106.2	92.9
O.B.Press(psf)								

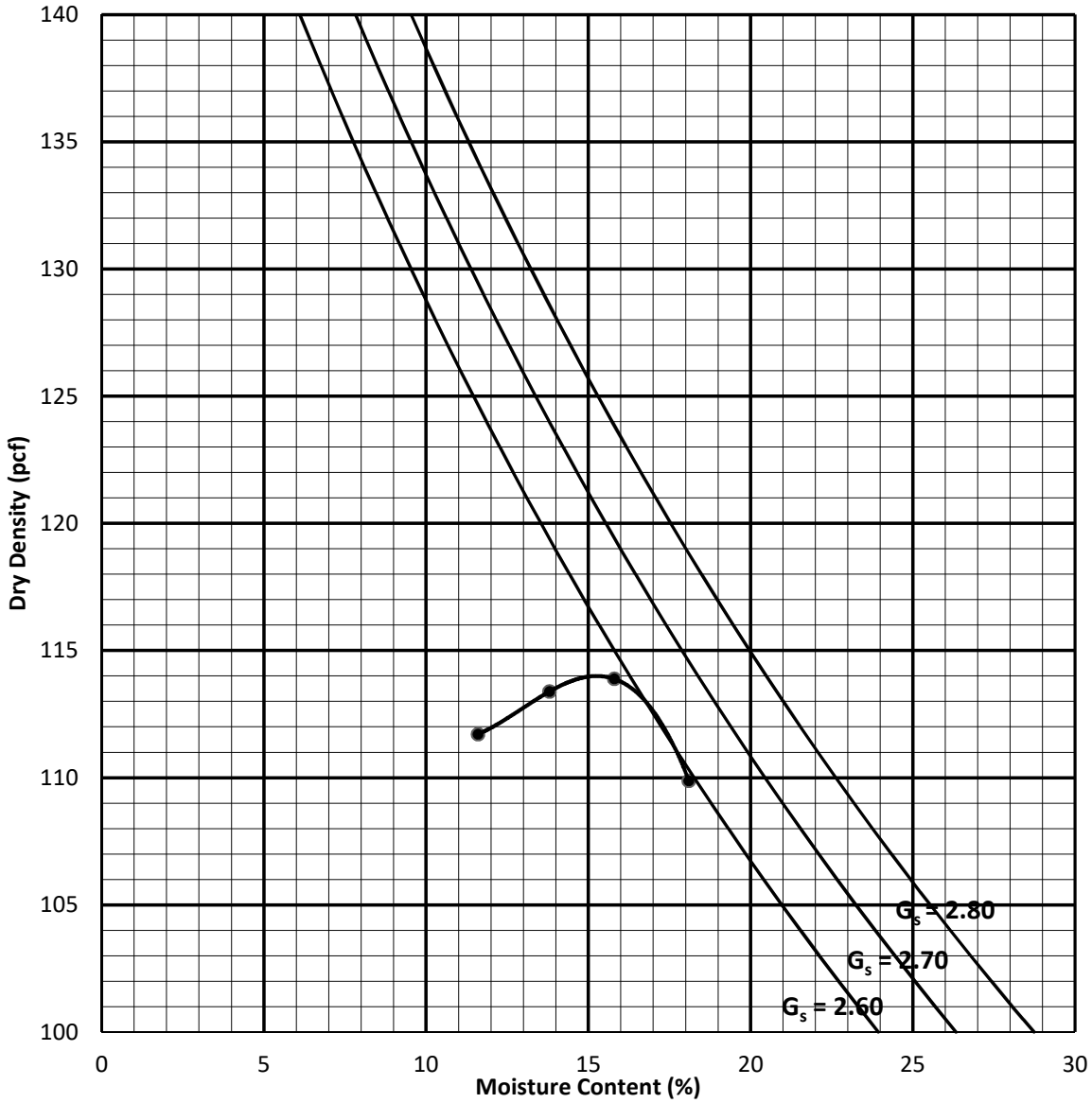
Geo-Logic ASSOCIATES

COMPACTION TEST REPORT

Project: Langan # 700109901 **GLA No.** 2012-0057
Sample: B-7 / Bulk **Date:** 1/20/2022
Description: Brown, Silty Clay **By:** LD

ASTM D1557	Method B	Volume (cf): 0.03333		# Blows: 25	# Layers: 5
Specimen		**A**	**B**	**C**	**D**
Wet Weight (grs)		1951	1994	1962	1885
Wet Density (pcf)		129.0	131.9	129.8	124.7
Moisture Content (%)		13.8	15.8	18.1	11.6
Dry Density (pcf)		113.4	113.9	109.9	111.7

Max. Dry Density : 114.0 pcf
Opt. Water Content: 15.0 %



Geo-Logic ASSOCIATES

SAMPLE NO.:		B-7 / Bulk														
Depth:		1' - 10'														
DIRECT SHEAR TEST (type)																
Initial Moisture Content %																
Dry Density (pcf)																
Normal Stress (psf)																
Peak Shear Stress (psf)																
Ultimate Shear Stress (psf)																
Cohesion (psf)																
Internal Friction Angle (degrees)																
EXPANSION TEST UBC STD 18-2																
Initial Dry Density (pcf)																
Initial Moisture Content %																
Final Moisture Content %																
Pressure (psf)																
Expansion Index	Swell %															
CORROSIVITY TEST																
Resistivity (CTM 643) (ohm-cm)		960														
pH (ASTM D1293)		7.7														
CHEMICAL TESTS																
Soluble Sulfate (CTM 417) (%)		0.0613														
Chloride Content (CTM 422) (%)		0.0096														
Wash #200 Sieve (ASTM-1140) %																
Sand Equivalent (ASTM D2419)																

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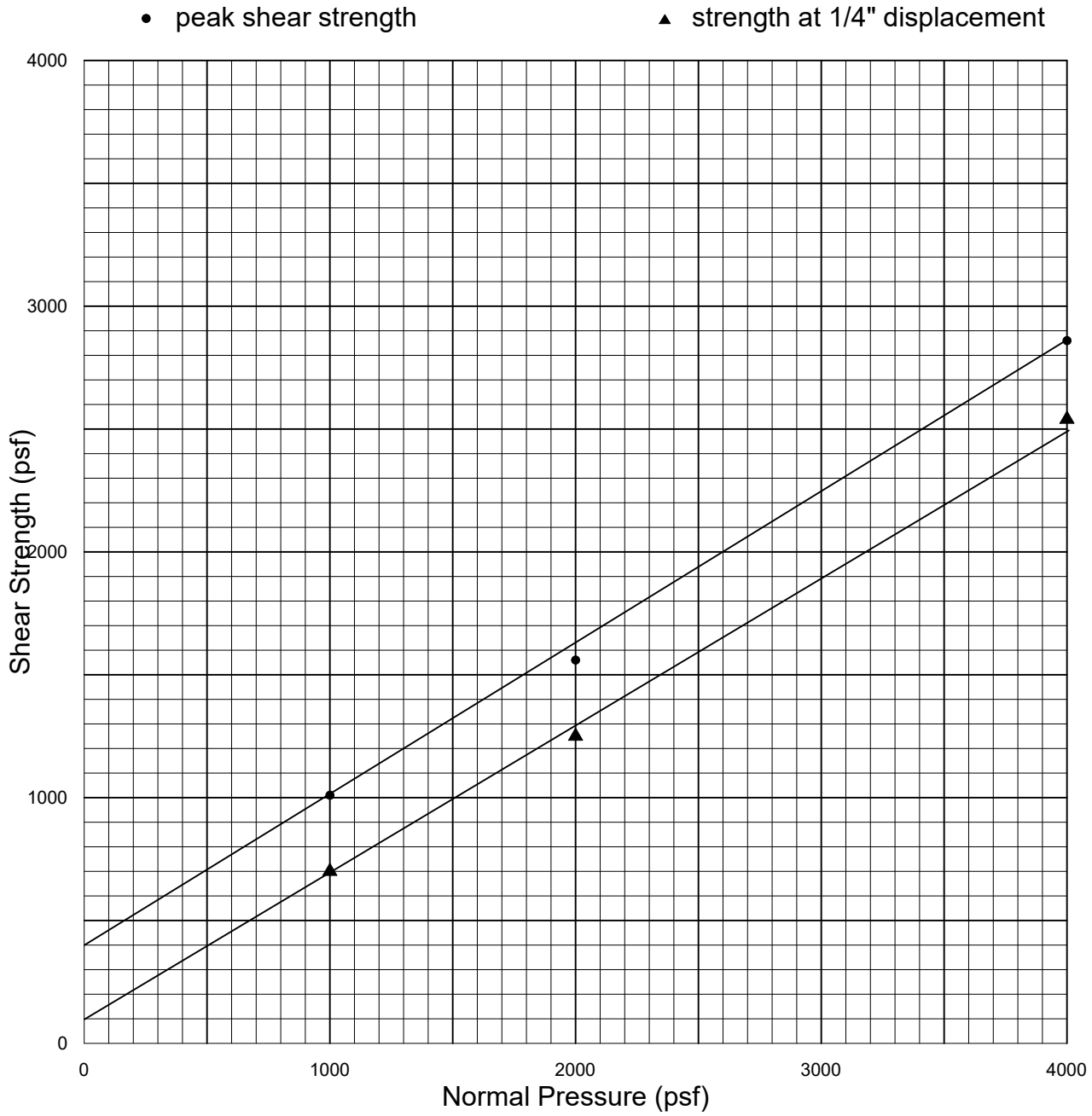
DIRECT SHEAR TEST - ASTM D-3080



Strain Rate: 0.0042 in. / min.

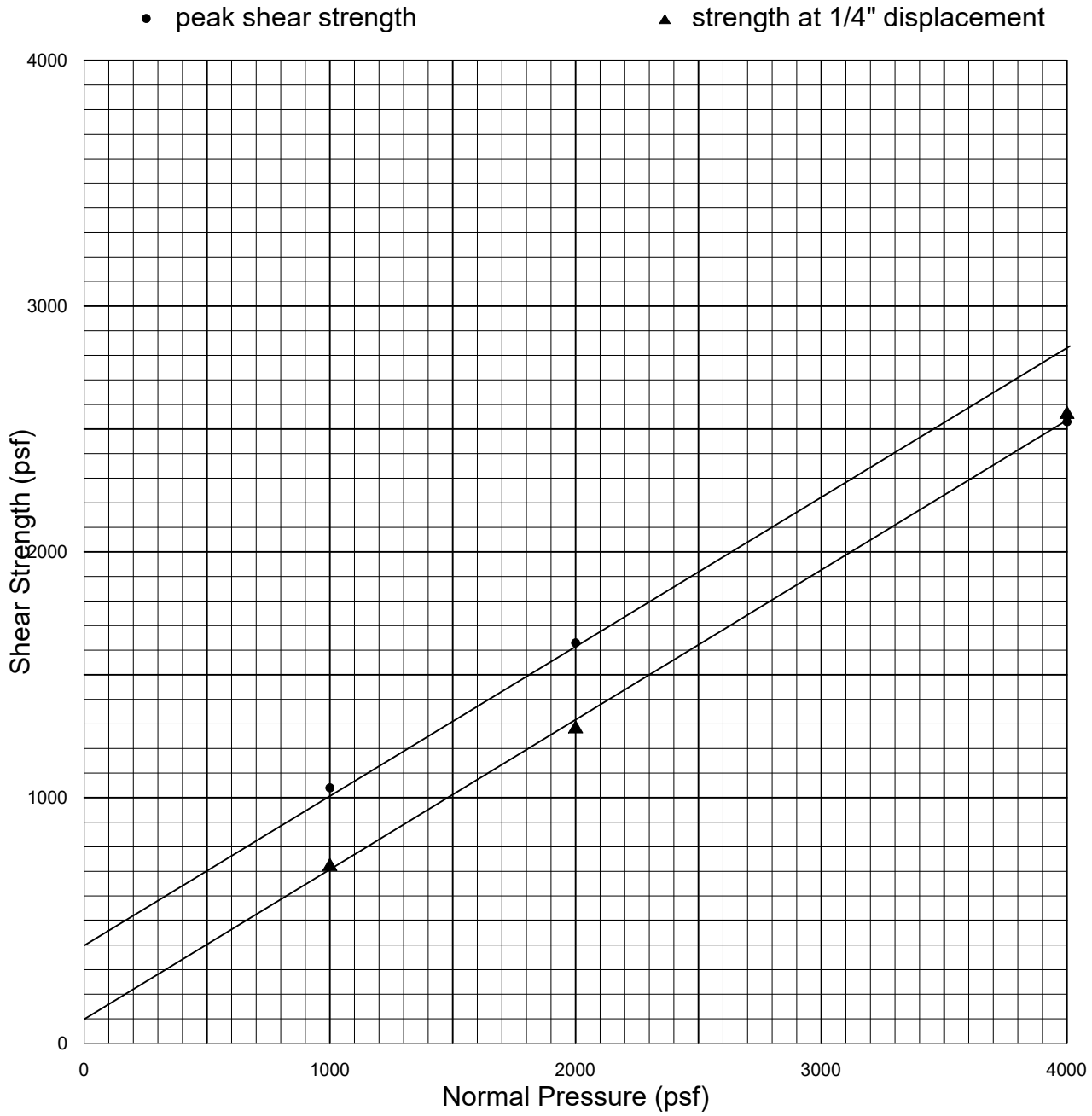
Sample	Type	Description	Dry Density (pcf)	Initial W.C. (%)	Final W.C. (%)
B-5 / S-8	Undisturbed & Saturated	Silty Clay	97.6	27.6	30.4

Normal Pressure (psf)	Peak Shear Strength (psf)	Ultimate Shear Strength (psf)
1000	1010 @ 0.0600"	700
2000	1560 @ 0.1100"	1250
4000	2860 @ 0.1400"	2540
	C = 400 psf	C = 100 psf
	ϕ = 31.5 deg.	ϕ = 31 deg.

Date: 1-19-2022

GeoLogic Associates

DIRECT SHEAR TEST - ASTM D-3080



Strain Rate: 0.0042 in. / min.

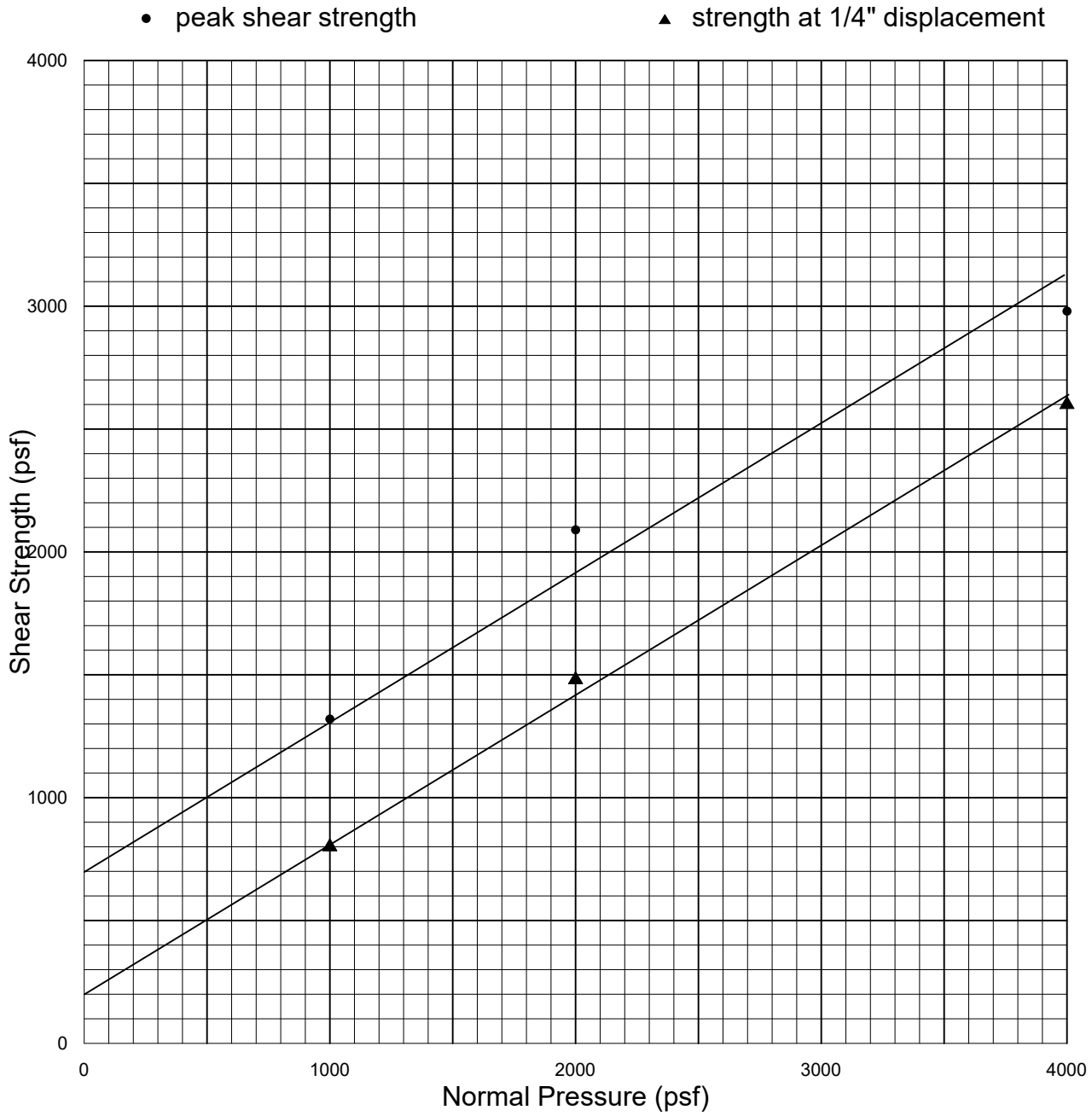
Sample	Type	Description	Dry Density (pcf)	Initial W.C. (%)	Final W.C. (%)
B-6 / S-6	Undisturbed & Saturated	Silty Clay	103.6	22.2	24.7

Normal Pressure (psf)	Peak Shear Strength (psf)	Ultimate Shear Strength (psf)
1000	1040 @ 0.1000"	720
2000	1630 @ 0.0900"	1280
4000	2530 @ 0.1450"	2560
	C = 400 psf	C = 100 psf
	ϕ = 31 deg.	ϕ = 31 deg.

Date: 1-19-2022

GeoLogic Associates

DIRECT SHEAR TEST - ASTM D-3080

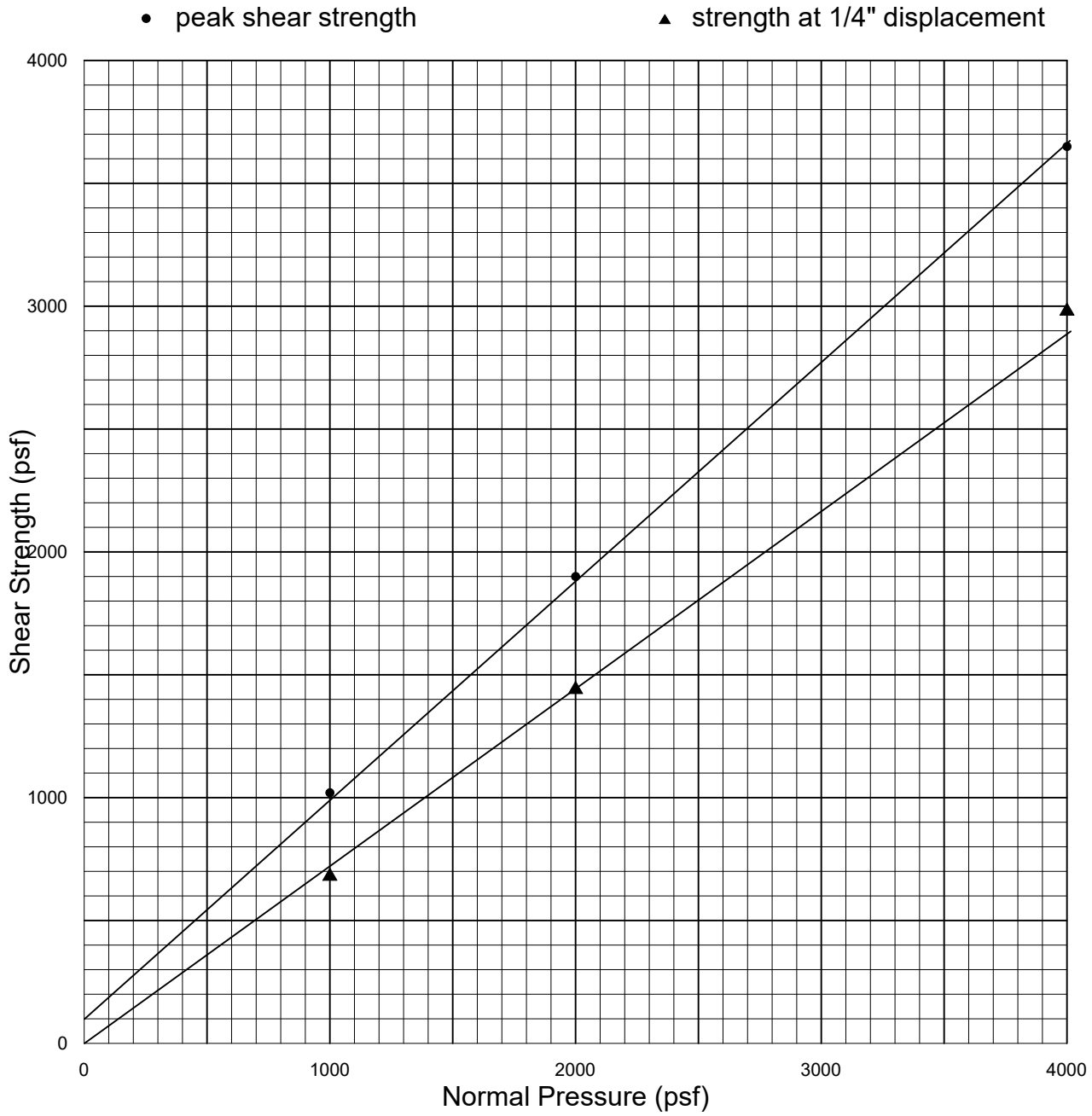


Strain Rate: 0.0042 in. / min.

Sample	Type	Description	Dry Density (pcf)	Initial W.C. (%)	Final W.C. (%)
B-7 / S-1	Undisturbed & Saturated	Silty Clay	112.0	16.5	23.3

Normal Pressure (psf)	Peak Shear Strength (psf)	Ultimate Shear Strength (psf)
1000	1320 @ 0.0450"	800
2000	2090 @ 0.0950"	1480
4000	2980 @ 0.0950"	2600
	C = 700 psf	C = 200 psf
	ϕ = 31 deg.	ϕ = 31 deg.

DIRECT SHEAR TEST - ASTM D-3080



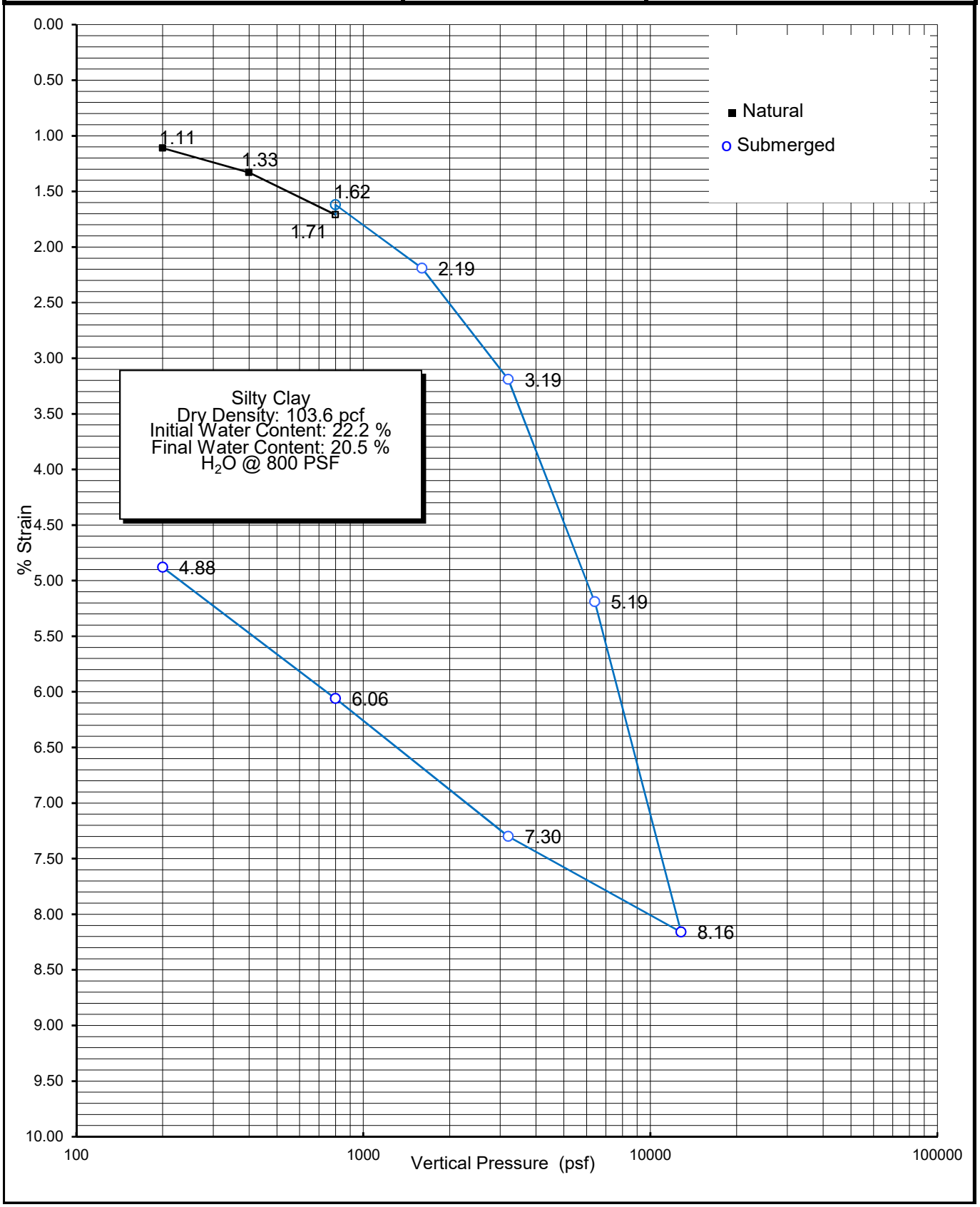
Strain Rate: 0.0084 in. / min.

Sample	Type	Description	Dry Density (pcf)	Initial W.C. (%)	Final W.C. (%)
B-7 / S-9	Undisturbed & Saturated	Silty Sand	113.9	17.2	22.2

Normal Pressure (psf)	Peak Shear Strength (psf)	Ultimate Shear Strength (psf)
1000	1020 @ 0.0750"	680
2000	1900 @ 0.1205"	1440
4000	3950 @ 0.1500"	2980
	C = 100 psf	C = 0 psf
	ϕ = 41.5 deg.	ϕ = 35.5 deg.

CONSOLIDATION TEST - ASTM D2435

Boring / Sample No.	B-6 / S-6	Depth:	20'	Date	01-13-22



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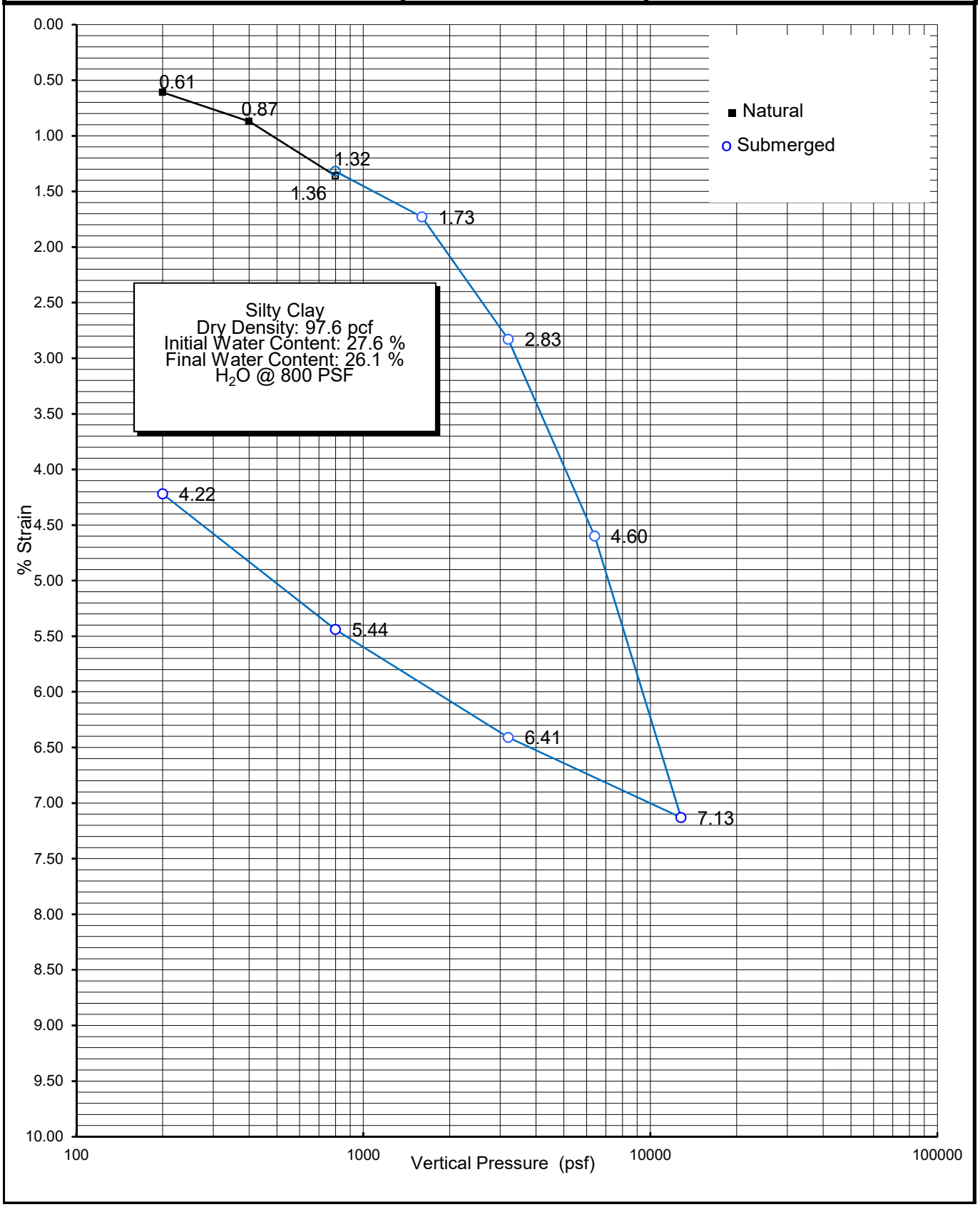
CONSOLIDATION TEST - ASTM D2435

Boring / Sample No.	B-5 / S-8	Depth:	30'	Date	01-13-22



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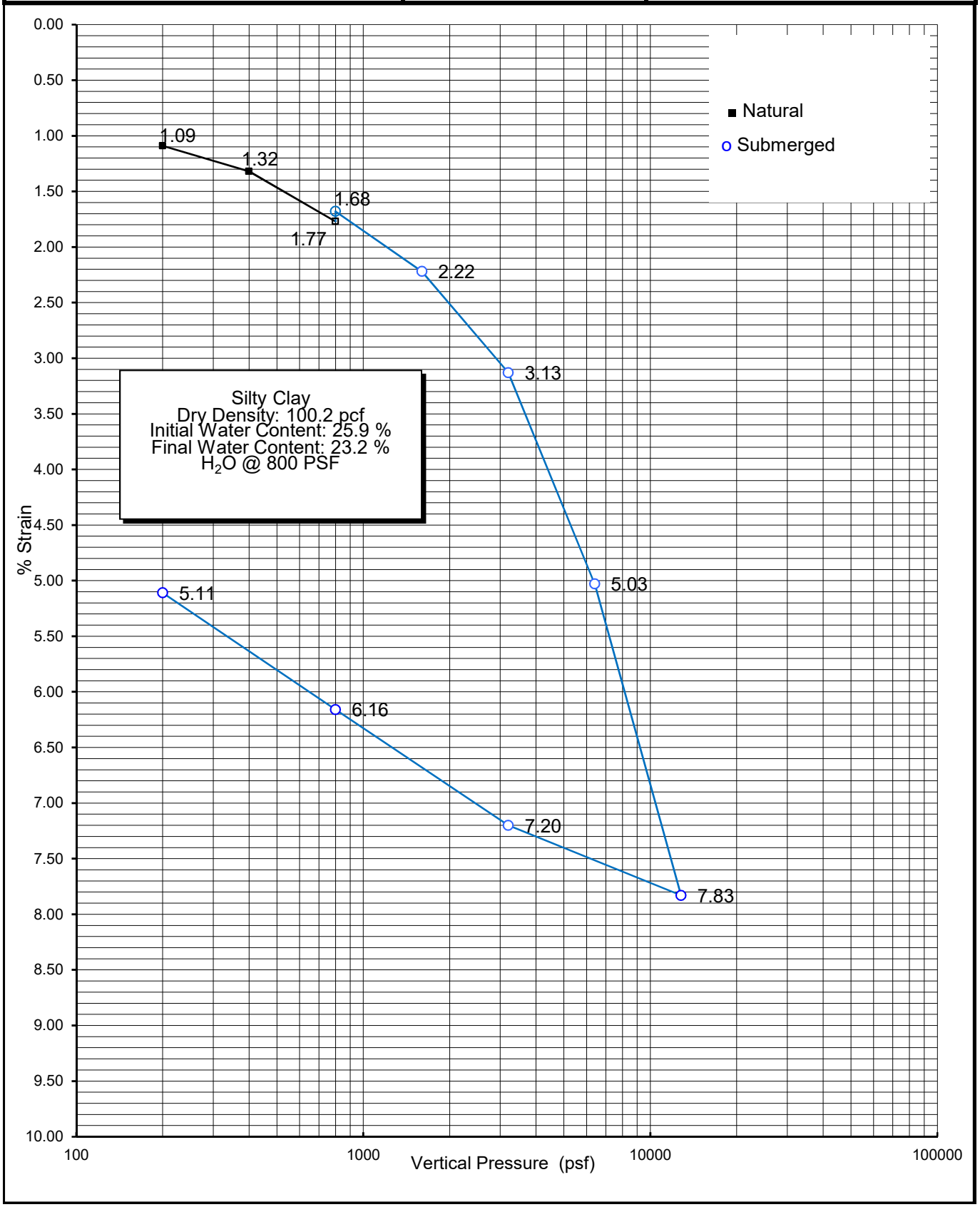
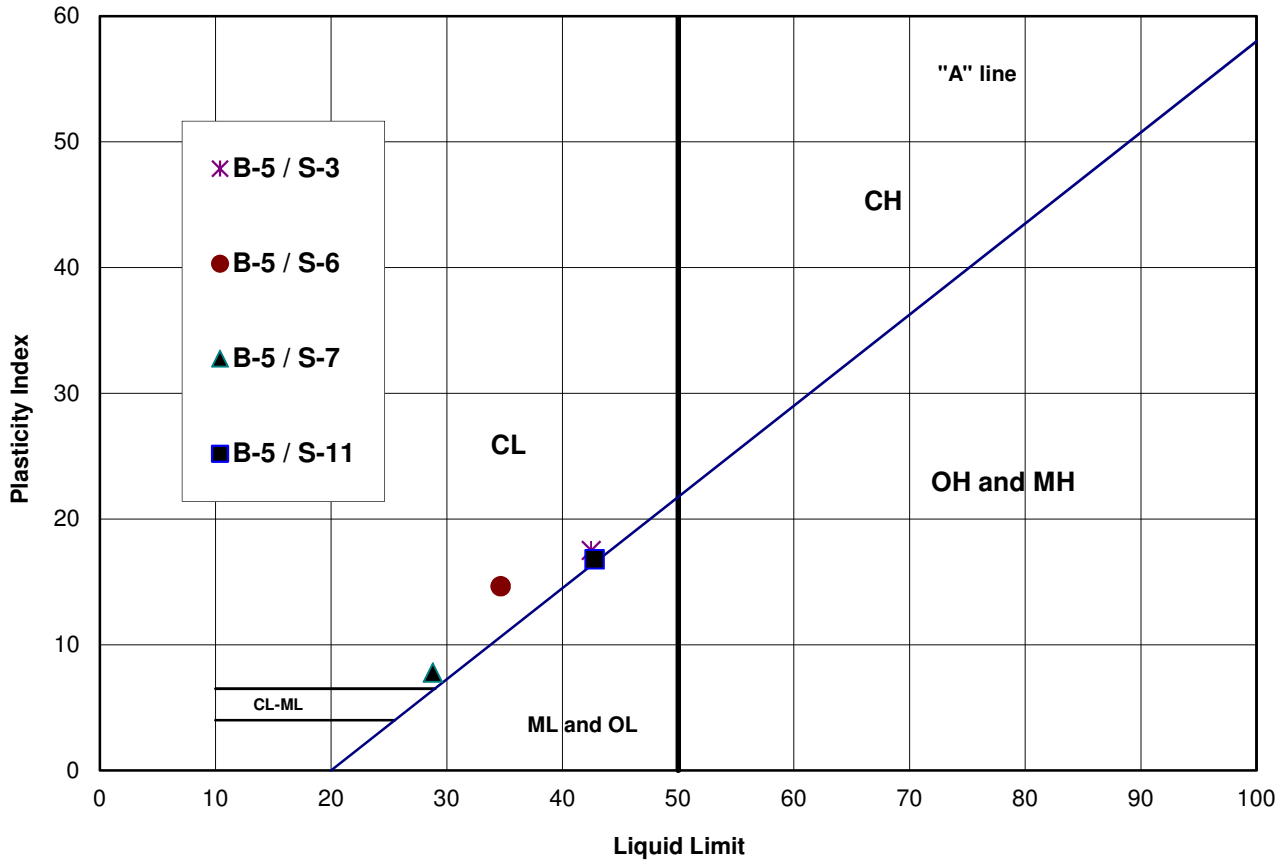
CONSOLIDATION TEST - ASTM D2435

Boring / Sample No.	B-7 / S-7	Depth:	25'	Date	01-13-22



Geo-Logic ASSOCIATES

PLASTICITY INDEX _ ASTM D4318



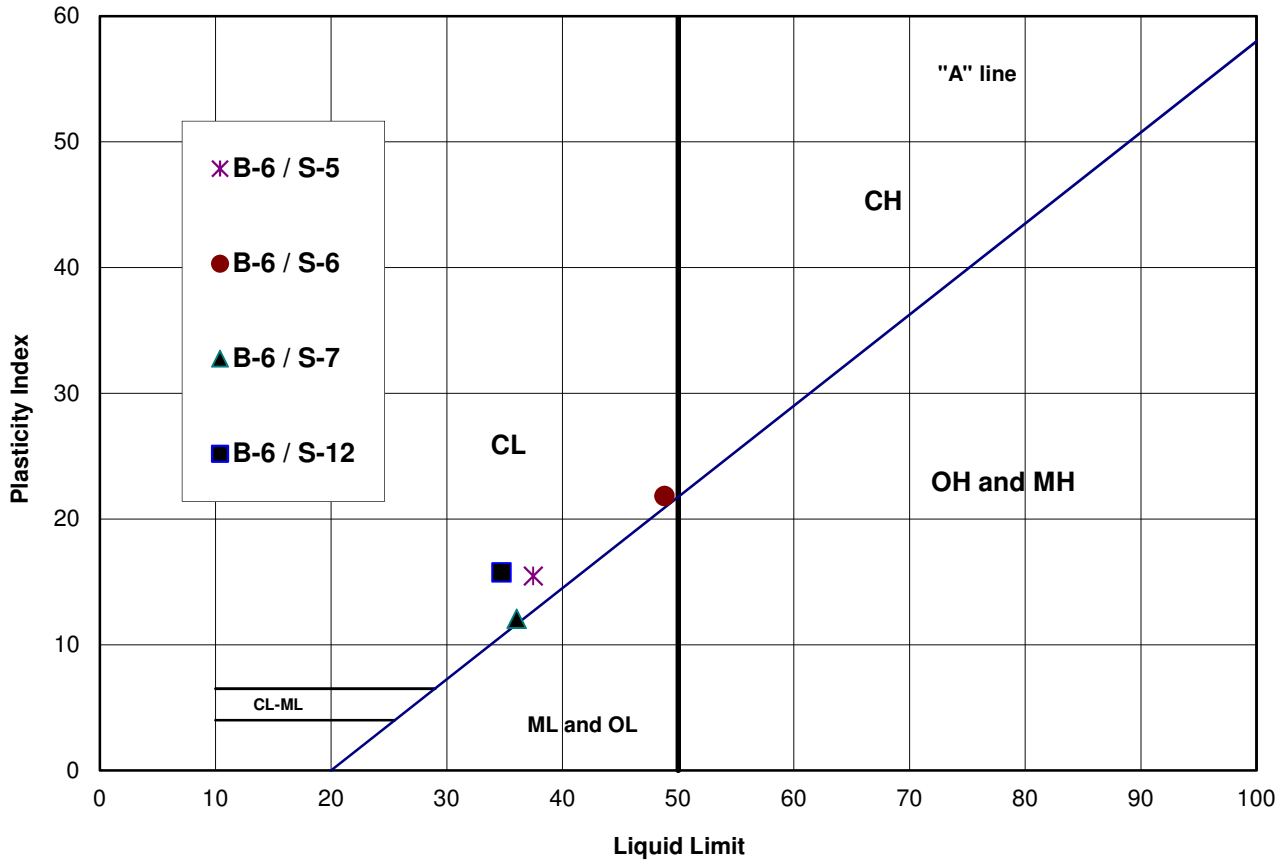
Sample	Depth	LL	PL	PI	USCS	Material Description
B-5 / S-3	12.5'	42	25	17	CL	
B-5 / S-6	20'	35	20	15	CL	
B-5 / S-7	25'	29	21	8	CL	
B-5 / S-11	45'	43	26	17	CL	

Job Name: Langan # 700109901 Date: 1/17/22

Job No.: 2012-0057

Geo-Logic ASSOCIATES

PLASTICITY INDEX _ ASTM D4318



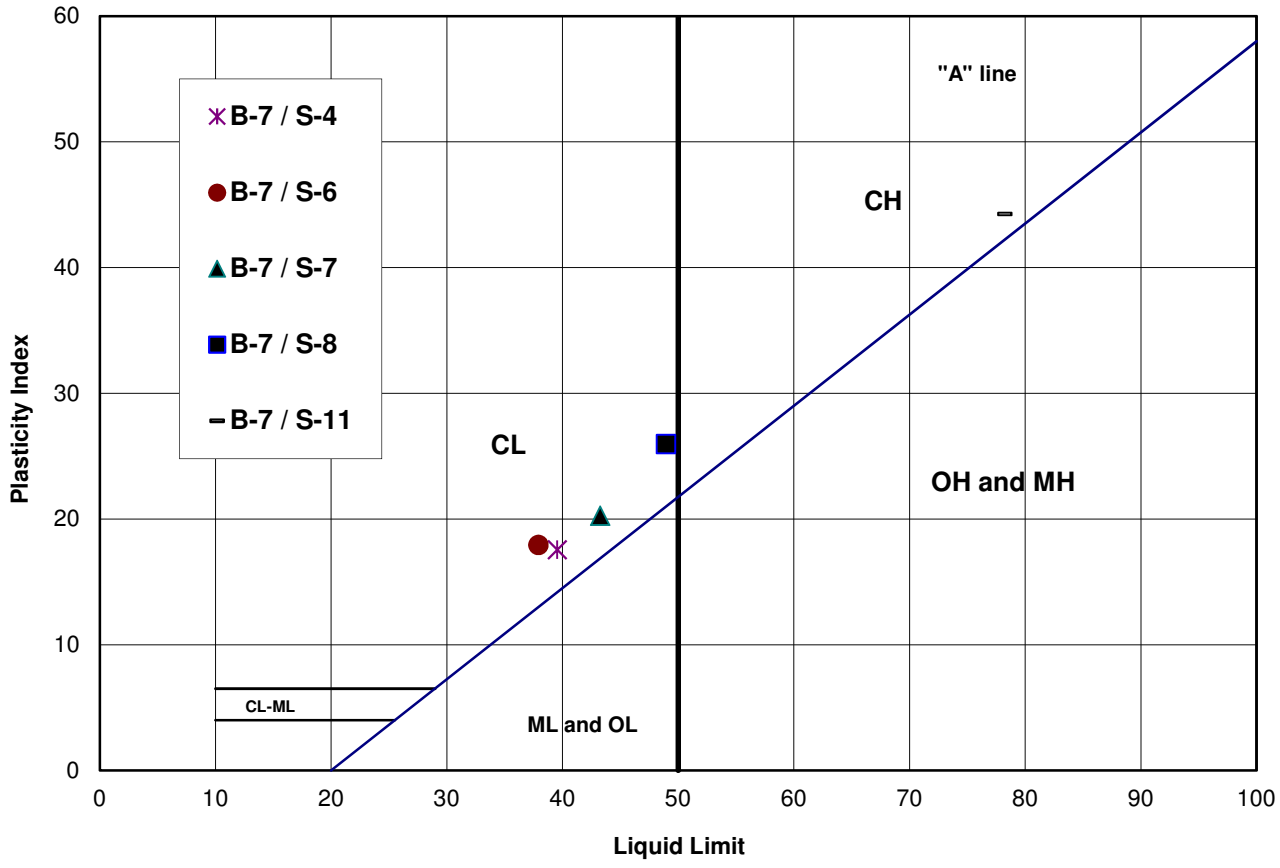
Sample	Depth	LL	PL	PI	USCS	Material Description
B-6 / S-5	17.5'	37	22	15	CL	
B-6 / S-6	20'	49	27	22	CL	
B-6 / S-7	25'	36	24	12	CL	
B-6 / S-12	50'	35	19	16	CL	

Job Name: Langan # 700109901 Date: 1/17/22

Job No.: 2012-0057

Geo-Logic ASSOCIATES

PLASTICITY INDEX _ ASTM D4318



Sample	Depth	LL	PL	PI	USCS	Material Description
B-7 / S-4	15'	40	22	18	CL	
B-7 / S-6	20'	38	20	18	CL	
B-7 / S-7	25'	43	23	20	CL	
B-7 / S-8	30'	49	23	26	CL	
B-7 / S-11	45'	78	34	44	CH	

Job Name: Langan # 700109901 Date: 1/17/22

Job No.: 2012-0057

Geo-Logic ASSOCIATES

WASH #200 SIEVE - ASTM D 1140-92

Job Name	Langan # 700109901	Date	1-17-22
Job No.	2012-0057	By	LD

Sample	B-5 / S-3	**Sample**	B-5 / S-6	**Sample**	B-6 / S-7
Soil Type		Soil Type		Soil Type	
% water		% water		% water	
Wet weight		Wet weight		Wet weight	
Dry weight	142.8	Dry weight	95.1	Dry weight	97.2
+ 200 sieve	47.2	+ 200 sieve	41.3	+ 200 sieve	25.5
% Retained	33.1	% Retained	43.4	% Retained	26.2
%Pass. #200	**67**	**%Pass. #200**	**57**	**%Pass. #200**	**74**

Sample		**Sample**		**Sample**	
Soil Type		Soil Type		Soil Type	
% water		% water		% water	
Wet weight		Wet weight		Wet weight	
Dry weight		Dry weight		Dry weight	
+ 200 sieve		+ 200 sieve		+ 200 sieve	
% Retained		% Retained		% Retained	
%Pass. #200		**%Pass. #200**		**%Pass. #200**	

Sample		**Sample**		**Sample**	
Soil Type		Soil Type		Soil Type	
% water		% water		% water	
Wet weight		Wet weight		Wet weight	
Dry weight		Dry weight		Dry weight	
+ 200 sieve		+ 200 sieve		+ 200 sieve	
% Retained		% Retained		% Retained	
%Pass. #200		**%Pass. #200**		**%Pass. #200**	

Sample		**Sample**		**Sample**	
Soil Type		Soil Type		Soil Type	
% water		% water		% water	
Wet weight		Wet weight		Wet weight	
Dry weight		Dry weight		Dry weight	
+ 200 sieve		+ 200 sieve		+ 200 sieve	
% Retained		% Retained		% Retained	
%Pass. #200		**%Pass. #200**		**%Pass. #200**	

Geo-Logic ASSOCIATES

APPENDIX B
Prior Subsurface Explorations and Geotechnical Laboratory Testing

APPENDIX A

Boring Logs

PARTNER

BORING LOG KEY - EXPLANATION OF TERMS

SURFACE COVER: General discription with thickness to the inch, ex. Topsoil, Concrete, Asphalt, etc,

FILL: General description with thickness to the 0.5 feet. Ex. Roots, Debris, Processed Materials (Pea Gravel, etc.)

NATIVE GEOLOGIC MATERIAL: Deposit type, 1.Color, 2.moisture, 3.density, 4.SOIL TYPE, other notes - Thickness to 0.5 feet

1. Color - Generalized

Light Brown (usually indicates dry soil, rock, caliche)
Brown (usually indicates moist soil)
Dark Brown (moist to wet soil, organics, clays)
Reddish (or other bright colors) Brown (moist, indicates some soil development/or residual soil)
Greyish Brown (Marine, sub groundwater - not the same as light brown above)
Mottled (brown and gray, indicates groundwater fluctuations)

2. Moisture

dry - only use for wind-blown silts in the desert
damp - soil with little moisture content
moist - near optimum, has some cohesion and stickyness
wet - beyond the plastic limit for clayey soils, and feels wet to the touch for non clays
saturated - Soil below the groundwater table, sampler is wet on outside

3. Density (based on blow counts or hand evaluation)

SPT	Ring	Granular	Cohesive		
0-5	0-7	very loose	very soft	Unsuitable	Thumb penetrates through
5-10	7-14	loose	soft	<1,500psf	Thumb penetrates part way
10-20	14-28	medium dense	firm	<3,000psf	Thumb dents only
20-75	28-100	dense	stiff	>3,000psf	Thumbnail dents
75+	100+	very dense	hard	Hard Dig	Thumbnail does not dent

4. Classification

Determine percent Gravel (bigger than 3/8")
Determine percent fines (silt and clay feel soft, with no grit)
Determine percent sand (between silt and clay, feels gritty)
Determine if clayey (make soil moist, if it easily roll into a snake it is clayey)

Sands and gravels (more gravel starts with G, more sand starts with S)

GP	SP	Mostly sand and gravel, with less than 5 % fines	sandy GRAVEL	SAND
GP-GM	SP-SM	Mostly sand and gravel 7-12% fines, non-clayey	sandy GRAVEL with silt	SAND with Silt
GP-GC	SP-SC	Mostly sand and gravel 7-12% fines, clayey	sandy GRAVEL with clay	SAND with clay
GC	SC	Mostly sand and gravel >12% fines clayey	clayey GRAVEL	clayey SAND
GM	SM	Mostly sand and gravel >12% fines non-clayey	silty GRAVEL	silty SAND

Cohesive Soil (generaly forms long chunks (more than 2 inches) in sampler

ML	Soft, non clayey	SILT with sand
MH	Very rare, holds a lot of water, and is pliable with very low strength	high plasticity SILT
CL	If sandy can be hard when dry, will be stiff/plastic when wet	CLAY with sand/silt
CH	Hard and resiliant when dry, very strong/sticky when wet (may have sand in it)	FAT CLAY

H = Liquid limit over 50%, L - LL under 50%
C = Clay
M = Silt

Samplers

S = Standard split spoon (SPT)
R = Modified ring
Bulk = Excavation spoils
ST = Shelby tube
C = Rock core

Boring Number:	B1	Boring Log Page 1 of 2	
Location:	SE corner of Parking lot	Date Started:	8/9/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/9/2019
	Los Angeles, California 90048	Depth to Groundwater:	20'
Project Number:	19-250627.3	Field Technician:	J. Pruiet
Drill Rig Type:	CME 95	**Partner Engineering and Science**	
Sampling Equipment:	SPT and Rings	**2154 Torrance Boulevard**	
Borehole Diameter:	8"	**Torrance, CA 90501**	

Depth	Sample	N-Value	USCS	Description
0				**SURFACE COVER**: Asphalt (~ 2") / Concrete debris- Aggregate fill (~ 4")
1				Base (~ 6") / Asphalt (~ 2")
2				
3				
4				
5	S	21	CL	**NATIVE**: Brown, damp, dense , CLAY with silt and gravel
6				
7				
8				
9				
10	R	20	ML	Brown, damp , medium dense, SILT with sand
11				
12				
13				
14				
15	S	12		
16				
17				
18				
19				
20	R	18	CL	Brown, damp, firm, CLAY with trace sand
21				
22				
23				
24				
25	S	17		Silty
26				
27				
28				
29				
				Continued on next page ..

Boring Number:	B1	Boring Log Page 2 of 2	
Location:	SE corner of Parking lot	Date Started:	8/9/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/9/2019
	Los Angeles, California 90048	Depth to Groundwater:	20'
Project Number:	19-250627.3	Field Technician:	J. Pruiet
Drill Rig Type:	CME 95	**Partner Engineering and Science**	
Sampling Equipment:	SPT and Rings	**2154 Torrance Boulevard**	
Borehole Diameter:	8"	**Torrance, CA 90501**	

Depth	Sample	N-Value	USCS	Description
30	R	17	ML	Brown, damp, firm, SILT with coarse sand
31				
32				
33				
34				
35	S	58		
36			SP-SM	(36'-36.5') Brown, damp, dense, silty SAND
37				
38				
39				
40	R	22	ML	Brown, damp, stiff, SILT with sand
41				Boring terminated at 41.5'
42				Backfilled with grout upon completion, drill cuttings drummed
43				Groundwater encountered at 20'
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				

Boring Number:	B2	Boring Log Page 1 of 3	
Location:	NE corner of Parking lot	Date Started:	8/9/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/9/2019
	Los Angeles, California 90048	Depth to Groundwater:	32'
Project Number:	19-250627.3	Field Technician:	J. Pruiet
Drill Rig Type:	CME 95	**Partner Engineering and Science**	
Sampling Equipment:	SPT and Rings	**2154 Torrance Boulevard**	
Borehole Diameter:	8"	**Torrance, CA 90501**	

Depth	Sample	N-Value	USCS	Description
0				**SURFACE COVER**: Asphalt (4") / Base (6")
1				
2	R	17	CL	**FILL:** Brown, damp, firm, CLAY with silt and gravel
3				
4				
5	S	10	CL	**NATIVE:** Light brown, damp, firm, CLAY with sand
6				
7	R	20		Brown to black,with trace sand
8				
9				
10	S	16	SP-SM	Brown, damp, medium dense, silty SAND
11				
12				
13				
14				
15	R	16		
16				
17				
18				
19				
20	S	19		Gray to brown, petroleum odor detected
21				
22				
23				
24				
25	R	18		
26				
27				
28				
29				
				Continued on next page ..

Boring Number:	B2	Boring Log Page 2 of 3	
Location:	NE corner of Parking lot	Date Started:	8/9/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/9/2019
	Los Angeles, California 90048	Depth to Groundwater:	32'
Project Number:	19-250627.3	Field Technician:	J. Pruiet
Drill Rig Type:	CME 95	**Partner Engineering and Science**	
Sampling Equipment:	SPT and Rings	**2154 Torrance Boulevard**	
Borehole Diameter:	8"	**Torrance, CA 90501**	

Depth	Sample	N-Value	USCS	Description
30	S	24	CL	Blue gray, damp, stiff, CLAY with trace sand
31				
32			∇	**Groundwater encountered (32')**
33				
34				
35	R	66	CL	Gray - brown, staurated, stiff, CLAY with trace sand
36				
37				
38				
39				
40	S	19	SP-SM	Brown- tan, saturated, medium dense, silty SAND
41			ML	Brown- tan, saturated, medium dense, SILT with sand
42				
43				
44				
45	R	48	CL	Blue-gray, moist, stiff, CLAY
46				
47				
48				
49				
50	S	35		Damp, with trace sand and gravel
51				
52				
53				
54				
55	R	35		
56			∇	**Perched Groundwater encountered (55')**
57				
58				
59				

Boring Number:	B2	Boring Log Page 3 of 3	
Location:	NE corner of Parking lot	Date Started:	8/9/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/9/2019
	Los Angeles, California 90048	Depth to Groundwater:	32'
Project Number:	19-250627.3	Field Technician:	J. Pruiet
Drill Rig Type:	CME 95	**Partner Engineering and Science**	
Sampling Equipment:	SPT and Rings	**2154 Torrance Boulevard**	
Borehole Diameter:	8"	**Torrance, CA 90501**	

Depth	Sample	N-Value	USCS	Description
60	S	30	CL	Blue- gray, damp, stiff, CLAY with trace sand
61				
62				
63				
64				
65	R	26		
66				Boring terminated at 66.5' due to auger refusal
67				Backfilled with grout upon completion, drill cuttings drummed
68				Groundwater encountered at 32'
69				
70				
71				
72				
73				
74				
75				
76				
77				
78				
79				
80				
81				
82				
83				
84				
85				
86				
87				
88				
89				

APPENDIX B

Lab Data

PARTNER

HAMILTON
& Associates

1641 Border Avenue • Torrance, CA 90501 T 310.618.2190 888.618.2190 F 310.618.2191 W hamilton-associates.net

August 29, 2019
H&A Project No. 19-2648
Partner Project No. 19-250627.3

Partner Engineering and Science, Inc.
4518 N.12 Street Suite 201
Phoenix AZ, 85016

Attention: Mr. Matthew Marcus, Technical Director- Geotechnical Engineering

Subject: Laboratory Testing of Soil Samples, Partner (San Vicente)
400 South San Vicente, Los Angeles, California 90048

Dear Mr. Marcus:

We have completed the laboratory tests on the samples provided for the subject project. Enclosed is a summary of laboratory test results.

We thank you for the opportunity to provide laboratory testing services. If there are any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
HAMILTON & ASSOCIATES, INC.

Rosa E. Murrieta
Laboratory Supervisor | Staff Geologist

David T. Hamilton, PE, GE
President

Distribution: (1) Matthew Marcus
mmarcus@partneresi.com
(2) Brett Bova
bbova@partneresi.com

MOISTURE CONTENT AND DENSITY TESTS

Relatively undisturbed soil retained within the rings of the Modified California barrel sampler was tested in the laboratory to determine in-place dry density and moisture content. Test results are presented in Table 1.

NO. 200 SIEVE (WASH)

No. 200 Sieves (Wash) were performed on selected samples to determine the fines content. The results of these tests are shown on Table 1.

CONSOLIDATION TESTS

Consolidation (ASTM D-2435) tests were performed on selected relatively undisturbed samples or remolded samples to determine the settlement characteristics of various soil samples, respectively. The results of this test are shown graphically on the appended 'C' Plates.

DIRECT SHEAR TESTS

Direct shear (ASTM D3080) tests were performed on selected relatively undisturbed samples to determine the shear strength parameters of various soil samples, respectively. The results of these tests are shown graphically on the appended "D" Plates.

ATTERBERG LIMITS

Atterberg Limits (ASTM D-4318) tests were performed on selected samples to determine the liquid limit, plastic limit, and the plasticity index of soils. The results of these tests are shown on the appended "E" Plates.

HAMILTON
& Associates

TABLE 1: LABORATORY RESULTS

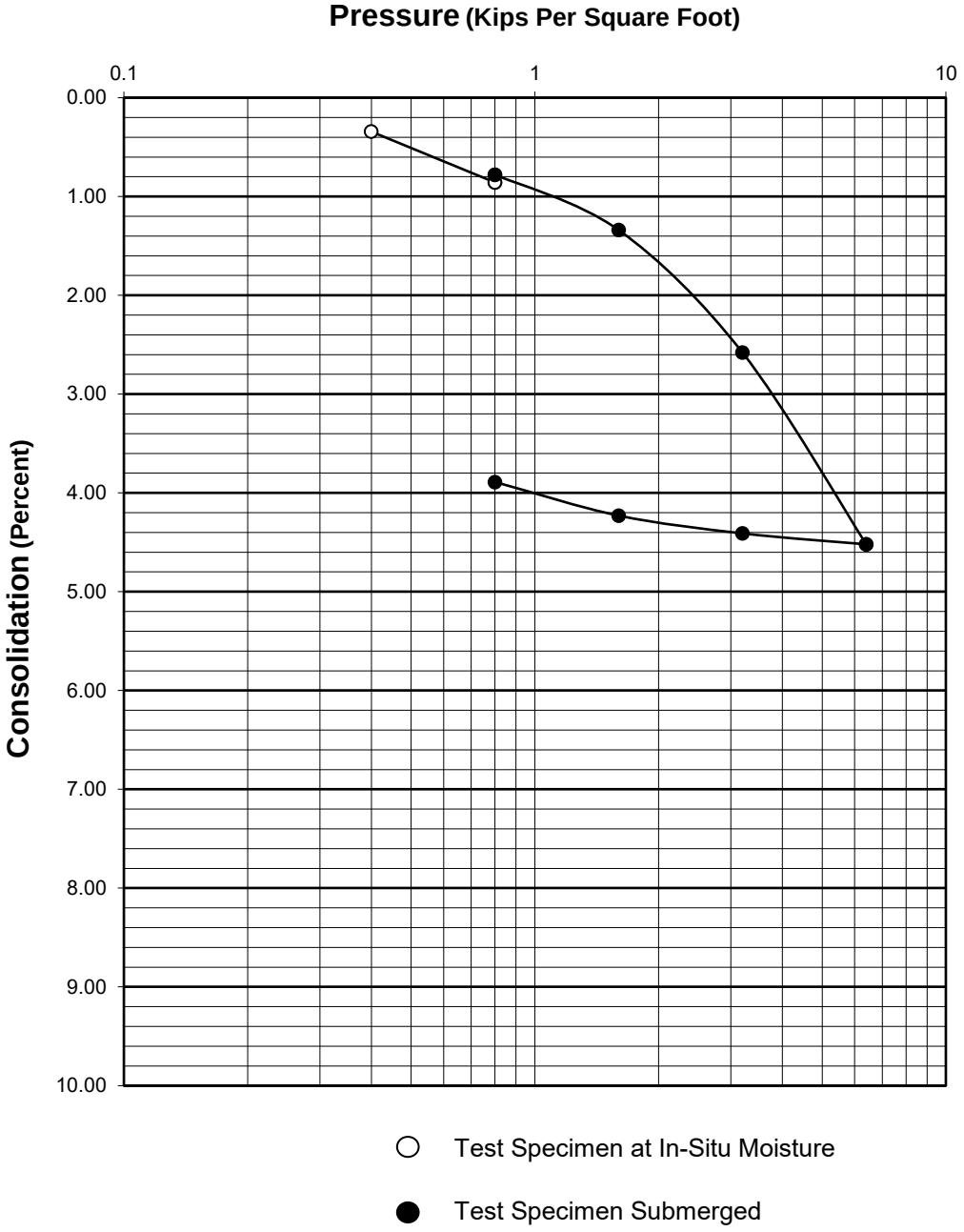
JOB TITLE: Partner (San Vicente)
H&A PROJECT NO. 19-2648
SCHEDULED BY: YK
DATE RECEIVED: **8.12.19**
DATE ASSIGNED: **8.12.19**
SHEET: 1 of 1

Test Pit/ Boring No.	Depth (ft)	Sampler/No. Rings	Field Dry Density (pcf)	Field Moisture (%)	Atterberg	Consolidation	Corrosivity Suite	Direct Shear	Expansion Index	Fines Fraction (%) (Minus No. 200)	Hydraulic Conductivity	Maximum Density/ Optimum Moisture	No. 200 Wash / Grain Size Analysis (Particle Size)	Particle Size w/ Hydrometer	R-Value	Reshear (4/7 passes)	Specific Gravity	Sulfate	Triaxial (UU)	Triaxial (CU)	Unconfined Compression	Other	Other	Remarks
B-1	5	SPT			X					61.1														
	10	R	98.6	24.8				X																
	20	R	103.8	4.0				X																
	25	SPT			X					68.1														
	30	R	92.0	26.7		X																		
B-2	25	R	103.3	22.6		X																		
	30	SPT			X					70.3														
	50	SPT			X					49.3														
	60	SPT			X					71.5														

SPECIAL INSTRUCTIONS:

CONSOLIDATION TEST RESULTS

B-2 at 25 feet

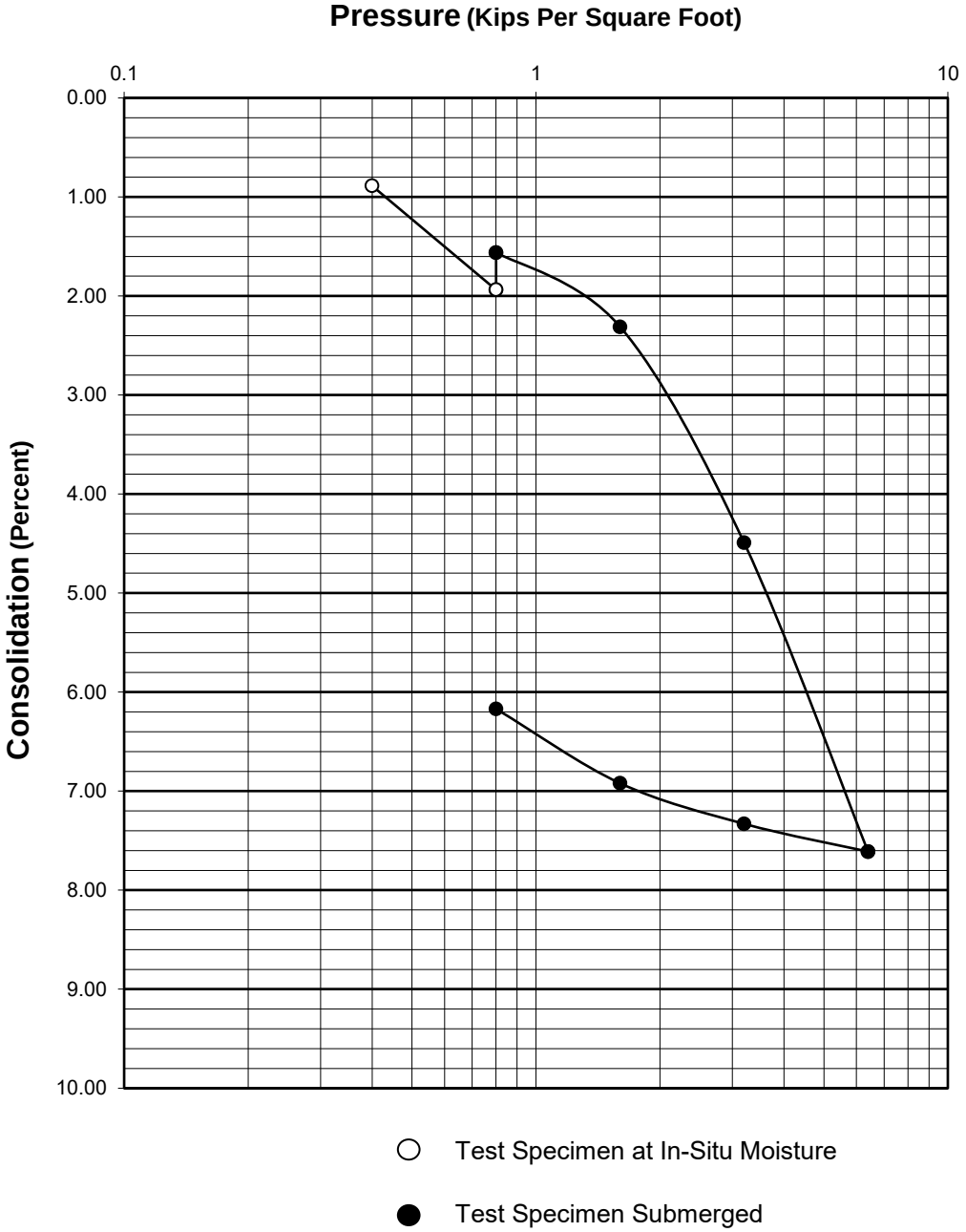


Geotechnical Engineering Investigation 400 South San Vicente Boulevard Los Angeles, California	Project No.	19-2648
	Plate	C-1

HAMILTON & ASSOCIATES, INC.

CONSOLIDATION TEST RESULTS

B-1 at 30 feet

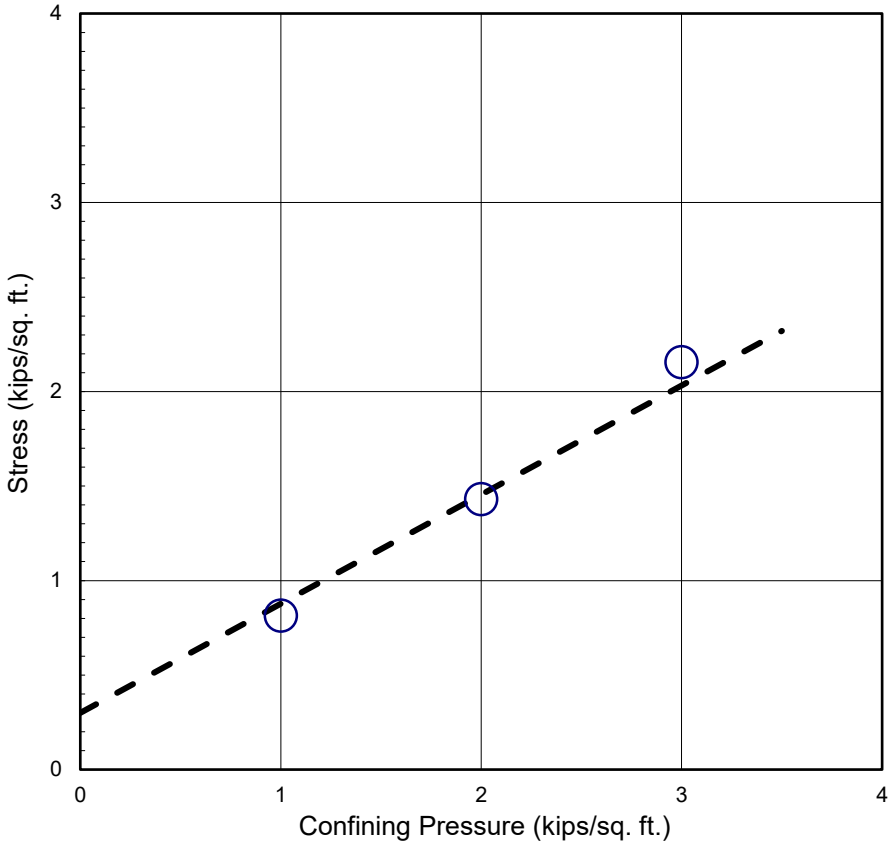


Geotechnical Engineering Investigation 400 South San Vicente Boulevard Los Angeles, California	Project No.	19-2648
	Plate	C-2

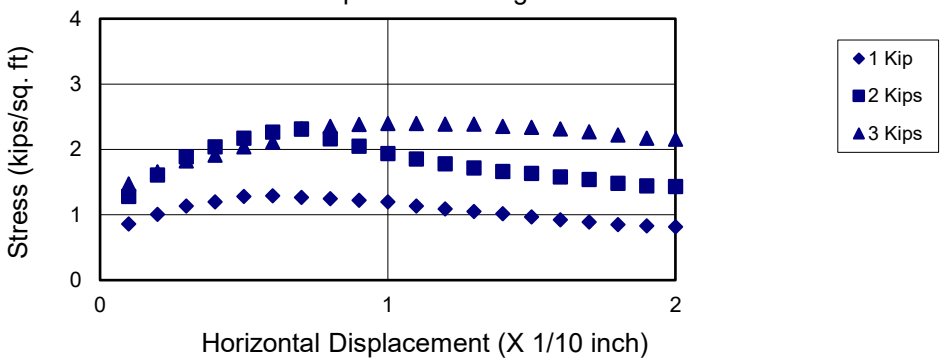
HAMILTON & ASSOCIATES, INC.

SHEAR TEST RESULTS

B-1 at 10 feet



Stress - Displacement Diagram

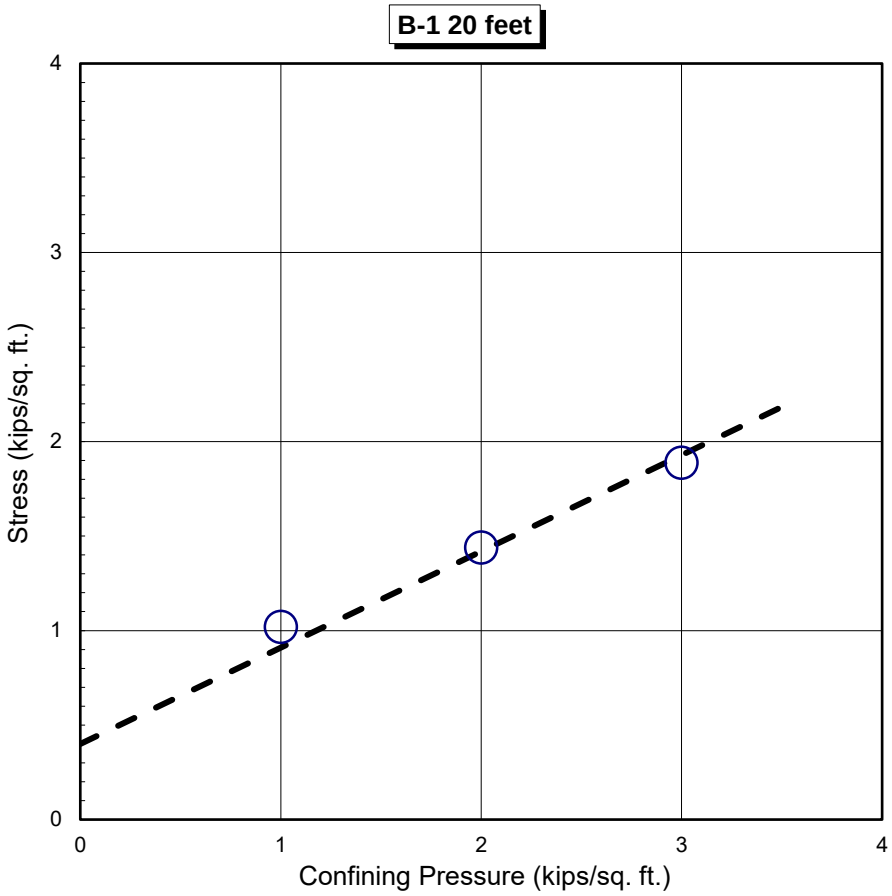


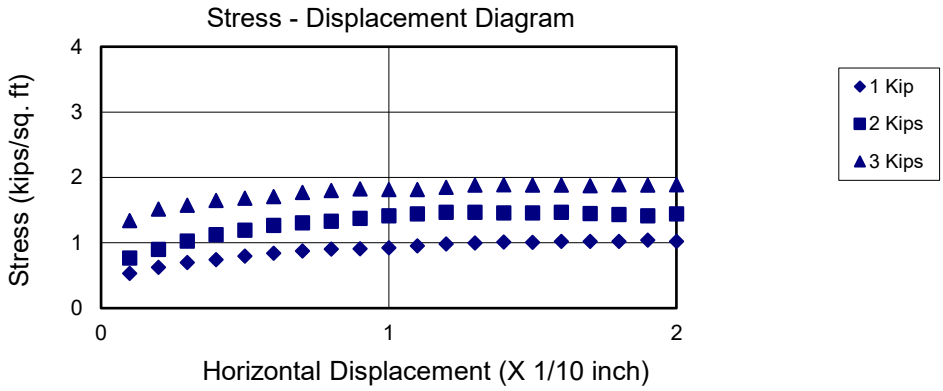
Sandy clay samples were submerged for at least 24 hours.
The samples had a density of 98.6 lbs./cu.ft. and a moisture content of 24.8 %
Cohesion = 300 psf
Friction Angle = 30 degrees
Based on Ultimate Strength

Geotechnical Engineering Investigation 400 South San Vicente Boulevard Los Angeles, California	Project No. 19-2648 Plate D-1

HAMILTON & ASSOCIATES

SHEAR TEST RESULTS





Sandy Clay samples were submerged for at least 24 hours.
The samples had a density of 103.8 lbs./cu.ft. and a moisture content of 25.6 %
Cohesion = 400 psf
Friction Angle = 27 degrees
Based on Ultimate Strength

Geotechnical Engineering Investigation 400 South San Vicente Boulevard Los Angeles, California	Project No. 19-2648 Plate D-2

HAMILTON & ASSOCIATES

HAMILTON & Associates

ATTERBERG LIMITS
ASTM D4318

Project Name: Partner (San Vicente)
Project No. : 19-2648
Boring No. : B-1
Sample No. : N/A

Tested By: RM
Checked By: RM
Depth (ft.): 5
Date: 8.26.19

Visual Sample Description: Brown sandy lean clay

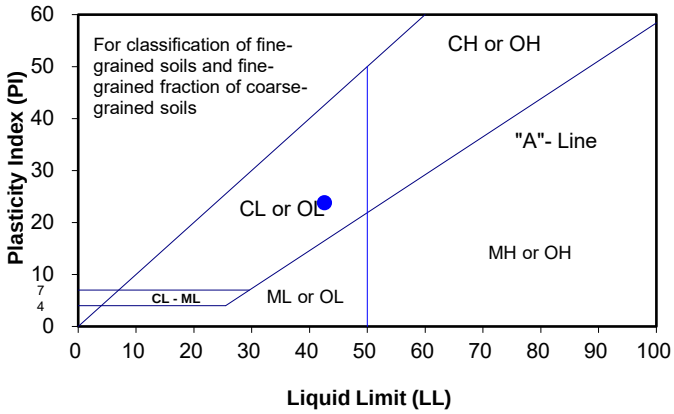
	PLASTIC LIMIT		LIQUID LIMIT			
	1	2	1	2	3	4
Number of Blows [N]:			25	20	15	
Tare No.:	3	1	2	2	1	
Wt. of Tare (gm):	79.90	80.10	80.05	80.05	80.10	
Wet Wt. of Soil + Tare (gm):	85.00	84.50	106.00	107.30	105.90	
Dry Wt. of Soil + Tare (gm):	84.20	83.80	98.20	99.00	97.90	
Moisture Content (%) [Wn]:	18.60	18.92	42.98	43.80	44.94	

Liquid Limit	**43**
Plastic Limit	**19**
Plasticity Index	**24**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 16.51208

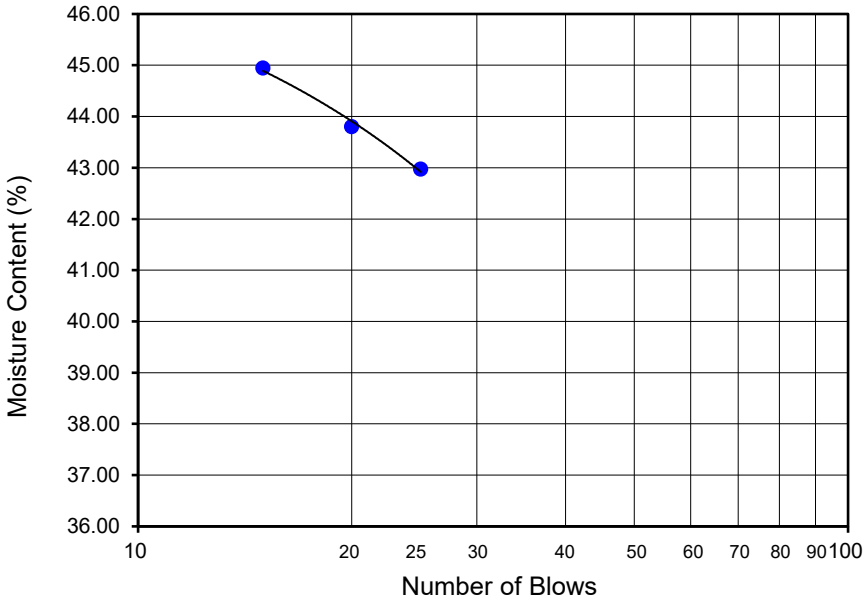
One - Point Liquid Limit Calculation

LL =Wn(N/25)$^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



HAMILTON & Associates

ATTERBERG LIMITS
ASTM D4318

Project Name: Partner (San Vicente)
Project No. : 19-2648
Boring No. : B-1
Sample No. : N/A

Tested By: RM
Checked By: RM
Depth (ft.): 25
Date: 8.26.19

Visual Sample Description: Brown sandy lean clay

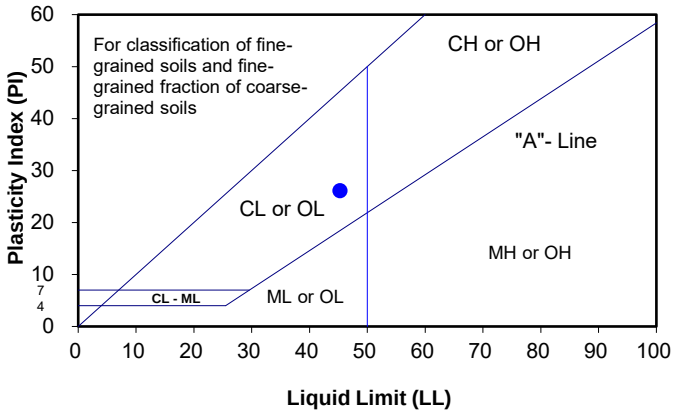
	PLASTIC LIMIT		LIQUID LIMIT			
	1	2	1	2	3	4
Number of Blows [N]:			25	20	17	
Tare No.:	3	1	1	2	1	
Wt. of Tare (gm):	79.90	80.10	80.10	80.05	80.10	
Wet Wt. of Soil + Tare (gm):	84.80	84.85	106.65	108.05	106.30	
Dry Wt. of Soil + Tare (gm):	84.00	84.10	98.40	99.10	97.90	
Moisture Content (%) [Wn]:	19.51	18.75	45.08	46.98	47.19	

Liquid Limit	**45**
Plastic Limit	**19**
Plasticity Index	**26**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 18.45719

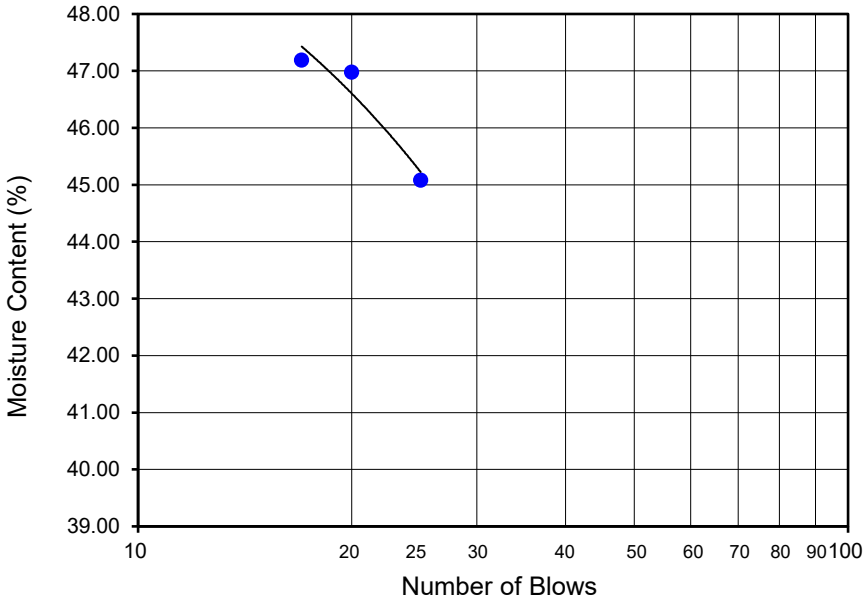
One - Point Liquid Limit Calculation

LL =Wn(N/25)$^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [x] Dry Preparation
  Multipoint - Dry
- [x] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



HAMILTON & Associates

ATTERBERG LIMITS
ASTM D4318

Project Name: Partner (San Vicente)
Project No. : 19-2648
Boring No. : B-2
Sample No. : N/A

Tested By: RM
Checked By: RM
Depth (ft.): 30
Date: 8.28.19

Visual Sample Description: Gray/blue sandy lean clay

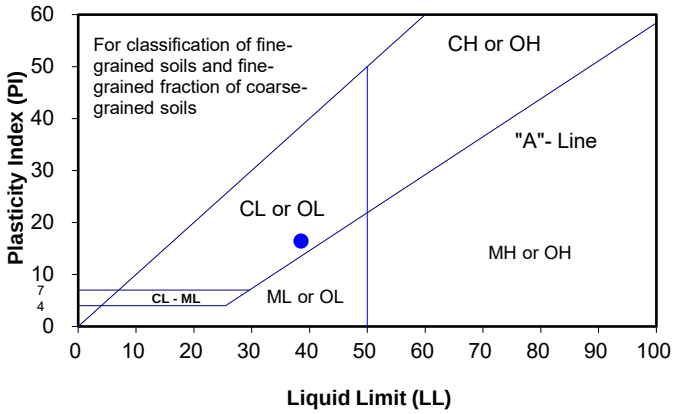
	PLASTIC LIMIT		LIQUID LIMIT			
	1	2	1	2	3	4
Number of Blows [N]:			27	20	15	
Tare No.:	2	1	1	1	1	
Wt. of Tare (gm):	80.10	80.00	80.00	80.00	80.00	
Wet Wt. of Soil + Tare (gm):	81.20	85.00	104.50	106.70	108.30	
Dry Wt. of Soil + Tare (gm):	81.00	84.10	97.60	99.15	100.20	
Moisture Content (%) [Wn]:	22.22	21.95	39.20	39.43	40.10	

Liquid Limit	**39**
Plastic Limit	**22**
Plasticity Index	**16**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 13.5396

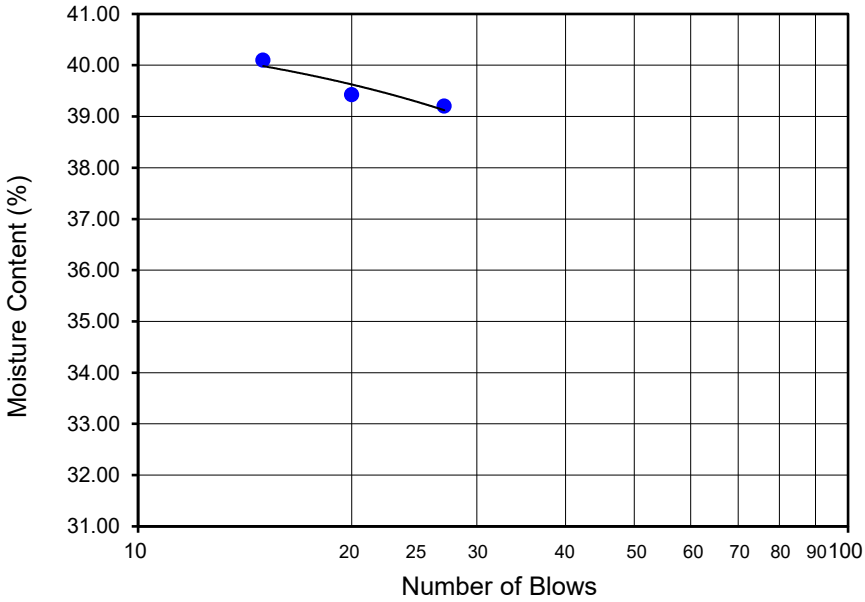
One - Point Liquid Limit Calculation

LL =Wn(N/25)$^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [x] Dry Preparation
  Multipoint - Dry
- [x] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



HAMILTON & Associates

ATTERBERG LIMITS
ASTM D4318

Project Name:	Partner (San Vicente)	**Tested By:**	RM
Project No. :	19-2648	**Checked By:**	RM
Boring No. :	B-2	**Depth (ft.):**	50
Sample No. :	N/A	**Date:**	8.26.19

Visual Sample Description: Gray/blue sandy lean clay

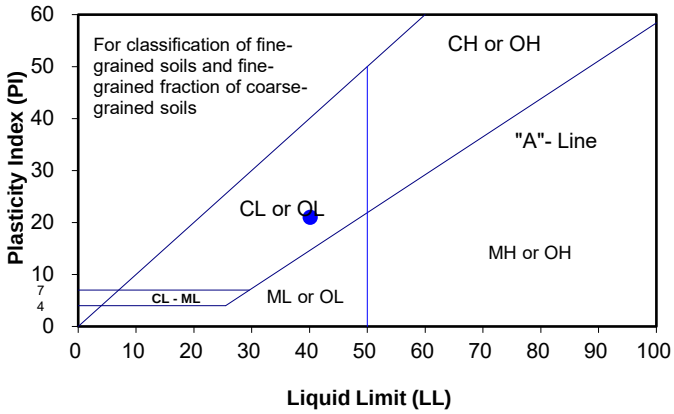
	PLASTIC LIMIT		LIQUID LIMIT			
	1	2	1	2	3	4
Number of Blows [N]:			25	21	15	
Tare No.:	3	2	1	2	2	
Wt. of Tare (gm):	79.90	80.10	80.11	80.10	80.10	
Wet Wt. of Soil + Tare (gm):	81.20	84.90	105.00	107.00	109.00	
Dry Wt. of Soil + Tare (gm):	81.00	84.10	98.00	99.10	100.30	
Moisture Content (%) [Wn]:	18.18	20.00	39.13	41.58	43.07	

Liquid Limit	**40**
Plastic Limit	**19**
Plasticity Index	**21**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 14.67951

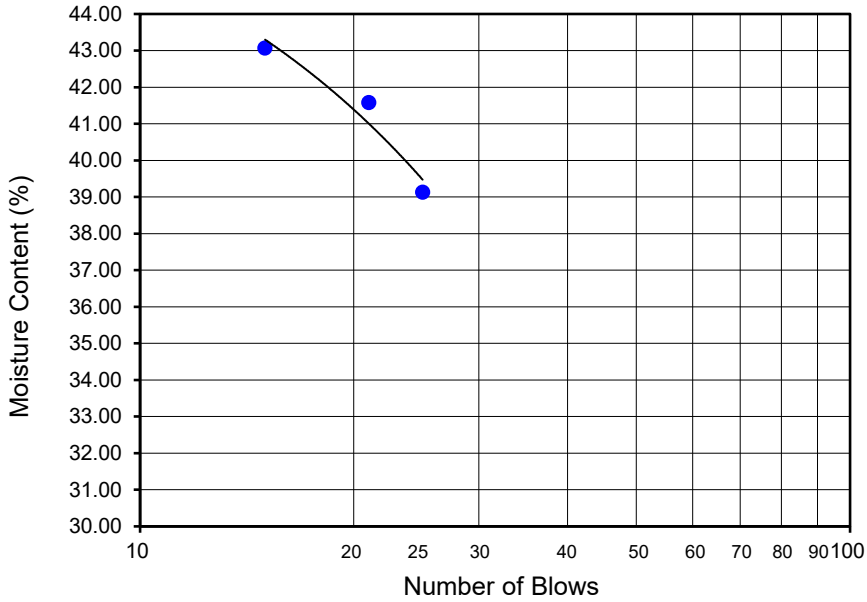
One - Point Liquid Limit Calculation

LL =Wn(N/25)$^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [x] Dry Preparation
  Multipoint - Dry
- [x] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



HAMILTON & Associates

ATTERBERG LIMITS
ASTM D4318

Project Name: Partner (San Vicente)
Project No. : 19-2648
Boring No. : B-2
Sample No. : N/A

Tested By: RM
Checked By: RM
Depth (ft.): 60
Date: 8.26.19

Visual Sample Description: Gray/blue sandy lean clay

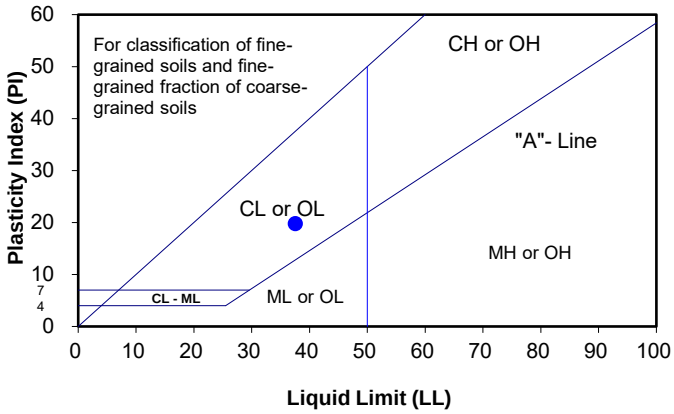
	PLASTIC LIMIT		LIQUID LIMIT			
	1	2	1	2	3	4
Number of Blows [N]:			25	20	15	
Tare No.:	4	2	1	2	3	
Wt. of Tare (gm):	79.90	80.10	80.00	80.10	80.11	
Wet Wt. of Soil + Tare (gm):	81.30	84.85	104.64	106.43	109.00	
Dry Wt. of Soil + Tare (gm):	81.10	84.10	97.80	99.10	100.90	
Moisture Content (%) [Wn]:	16.67	18.75	38.43	38.58	38.96	

Liquid Limit	**38**
Plastic Limit	**18**
Plasticity Index	**20**
USCS Classification	**CL**

PI at "A" - Line = 0.73(LL-20) = 12.8003

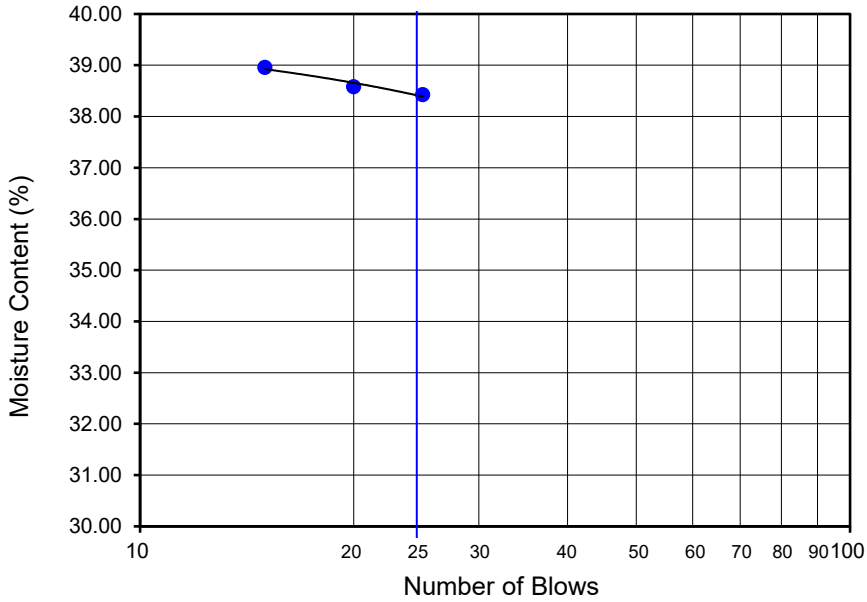
One - Point Liquid Limit Calculation

LL =Wn(N/25)$^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [x] Dry Preparation
  Multipoint - Dry
- [x] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



APPENDIX A: BORING LOGS

PARTNER

Boring Number:	B1		Page 1 of 1
Location:	Within backfilled excavation	Date Started:	8/6/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/6/2019
	Los Angeles, California 90048	Depth to Groundwater:	20 feet
Project Number:	19-250627.2	Field Technician:	H. Gutierrez
Drill Rig Type:		**Partner Engineering and Science**	
Sampling Equipment:	Acetate liners, plastic syringes, VOAs	2154 Torrance Boulevard, Suite 200	
Borehole Diameter:	2.0"	Torrance, California 90501	

Depth	Sample	PID	USCS	Description	Notes
1					Asphalt at surface
2	B1-2	0.0	ML	Clayey Silt with Sand: brown, loose, damp	
3					
4					
5	B1-5	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	oxidation
6					
7					
8					
9					
10	B1-10	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	
11					
12					
13					
14					
15	B1-15	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	
16					
17					
18					
19					
20	B1-20	0.0	ML	Clayey Silt: brown, medium soft, damp	Groundwater encountered
21					Boring terminated, backfilled with hydrated bentonite, and capped with asphalt upon completion.
22					
23					
24					
25					

Boring Number:	B2		Page 1 of 1
Location:	East of backfilled excavation	Date Started:	8/6/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/6/2019
	Los Angeles, California 90048	Depth to Groundwater:	20 feet
Project Number:	19-250627.2	Field Technician:	H. Gutierrez
Drill Rig Type:		**Partner Engineering and Science**	
Sampling Equipment:	Acetate liners, plastic syringes, VOAs	2154 Torrance Boulevard, Suite 200	
Borehole Diameter:	2.0"	Torrance, California 90501	

Depth	Sample	PID	USCS	Description	Notes
1					Asphalt at surface
2	B2-2	0.0	ML	Clayey Silt with Sand: brown, loose, damp	
3					
4					
5	B2-5	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	oxidation
6					
7					
8					
9					
10	B2-10	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	
11					
12					
13					
14					
15	B2-15	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	
16					
17					
18					
19					
20	B2-20	0.0	ML	Clayey Silt: brown, medium soft, damp	Groundwater encountered
21					
22					
23					
24					
25	B2-25		ML	Clayey Silt: brown, medium soft, damp	Boring terminated, backfilled with hydrated bentonite, and capped with asphalt upon completion.

Boring Number:	B3		Page 1 of 1
Location:		Date Started:	8/6/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/6/2019
	Los Angeles, California 90048	Depth to Groundwater:	20 feet
Project Number:	19-250627.2	Field Technician:	H. Gutierrez
Drill Rig Type:		**Partner Engineering and Science**	
Sampling Equipment:	Acetate liners, plastic syringes, VOAs	2154 Torrance Boulevard, Suite 200	
Borehole Diameter:	2.0"	Torrance, California 90501	

Depth	Sample	PID	USCS	Description	Notes
1					Concrete at surface
2	B3-2	0.0	ML	Clayey Silt with Sand: brown, loose, damp	
3					
4					
5	B3-5	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	
6					
7					
8					
9					
10	B3-10	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	Refusal
11					Boring terminated due to refusal, backfilled with hydrated bentonite, and capped with concrete upon completion.
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Boring Number:	B4		Page 1 of 1
Location:		Date Started:	8/6/2019
Site Address:	400 South San Vicente Boulevard	Date Completed:	8/6/2019
	Los Angeles, California 90048	Depth to Groundwater:	20 feet
Project Number:	19-250627.2	Field Technician:	H. Gutierrez
Drill Rig Type:		**Partner Engineering and Science**	
Sampling Equipment:	Acetate liners, plastic syringes, VOAs	2154 Torrance Boulevard, Suite 200	
Borehole Diameter:	2.0"	Torrance, California 90501	

Depth	Sample	PID	USCS	Description	Notes
1					Concrete at surface
2	B4-2	0.0	ML	Clayey Silt with Sand: brown, loose, damp	
3					
4					
5	B4-5	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	
6					
7					
8					
9					
10	B4-10	0.0	SM	Silty Sand: brown, fine to coarse grained, medium-dense, damp	Refusal
11					Boring terminated due to refusal, backfilled with hydrated bentonite, and capped with concrete upon completion.
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

APPENDIX C: LABORATORY ANALYTICAL REPORTS

PARTNER

714-449-9937
562-646-1611
805-399-0060

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**JEL Ref. No.:** **Client Ref. No.:**	ST-14113 19-250627.2
Attn:	Jessica Ryan	**Date Sampled:** **Date Received:**	8/6/2019 8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6,7/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Water

ANALYSES REQUESTED

Soil:

1. EPA 8015M – Extended Range Hydrocarbons
2. EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics
3. EPA 8270C by 3546 – Semivolatile Organics by GC/MS

Water:

1. EPA 8260B by 5030B – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Approval: _____

David Mirakian, M.S.

JONES ENVIRONMENTAL, INC.
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11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	**B1-15**	**B2-15**	**B3-2**	**B3-10**	**B4-2**		
Jones ID:	**ST-14113-04**	**ST-14113-09**	**ST-14113-12**	**ST-14113-14**	**ST-14113-15**	**Reporting Limit**	**Units**
Carbon Chain Range							
C10 - C11	ND	ND	ND	ND	ND	1.0	mg/kg
C12 - C13	ND	ND	ND	ND	ND	1.0	mg/kg
C14 - C15	ND	ND	ND	ND	ND	1.0	mg/kg
C16 - C17	ND	ND	ND	ND	ND	1.0	mg/kg
C18 - C19	ND	ND	ND	ND	ND	1.0	mg/kg
C20 - C23	ND	ND	ND	ND	ND	1.0	mg/kg
C24 - C27	ND	ND	ND	ND	ND	1.0	mg/kg
C28 - C31	ND	ND	ND	ND	ND	1.0	mg/kg
C32 - C35	ND	ND	ND	ND	ND	1.0	mg/kg
C36 - C39	ND	ND	ND	ND	ND	1.0	mg/kg
C40 - C43	ND	ND	ND	ND	ND	1.0	mg/kg
C13 - C22	ND	ND	ND	ND	ND	10.0	mg/kg
C23 - C40	ND	ND	ND	ND	ND	10.0	mg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recovery:						**QC Limits**	
Hexacosane	111%	88%	75%	86%	80%	30 - 120	
Batch:	8015 _080619_01	8015 _080619_01	8015 _080619_01	8015 _080619_01	8015 _080619_01		

ND = Value less than reporting limit

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID: **B4-10**

Jones ID:	**ST-14113-17**	**Reporting Limit**	**Units**
Carbon Chain Range			
C10 - C11	ND	1.0	mg/kg
C12 - C13	ND	1.0	mg/kg
C14 - C15	ND	1.0	mg/kg
C16 - C17	ND	1.0	mg/kg
C18 - C19	ND	1.0	mg/kg
C20 - C23	ND	1.0	mg/kg
C24 - C27	ND	1.0	mg/kg
C28 - C31	ND	1.0	mg/kg
C32 - C35	ND	1.0	mg/kg
C36 - C39	ND	1.0	mg/kg
C40 - C43	ND	1.0	mg/kg
C13 - C22	ND	10.0	mg/kg
C23 - C40	ND	10.0	mg/kg
Dilution Factor	1		

Surrogate Recovery:		**QC Limits**
Hexacosane	88%	30 - 120

Batch: 8015_080619_01

ND = Value less than reporting limit

714-449-9937
562-646-1611
805-399-0060

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SANTA FE SPRINGS, CA 90670
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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8015M - Extended Range Hydrocarbons

Sample ID:	**METHOD BLANK**		
Jones ID:	**MB-080619_01**	**Reporting Limit**	**Units**
Carbon Chain Range			
C10 - C11	ND	1.0	mg/kg
C12 - C13	ND	1.0	mg/kg
C14 - C15	ND	1.0	mg/kg
C16 - C17	ND	1.0	mg/kg
C18 - C19	ND	1.0	mg/kg
C20 - C23	ND	1.0	mg/kg
C24 - C27	ND	1.0	mg/kg
C28 - C31	ND	1.0	mg/kg
C32 - C35	ND	1.0	mg/kg
C36 - C39	ND	1.0	mg/kg
C40 - C43	ND	1.0	mg/kg
C13 - C22	ND	10.0	mg/kg
C23 - C40	ND	10.0	mg/kg
Dilution Factor	1		

Surrogate Recovery:		**QC Limits**
Hexacosane	78%	30 - 120

Batch:	8015_080619_01

ND = Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:** **Client Ref. No.:**	ST-14113 19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

BATCH: 8015 _080619_01 **Prepared:** 8/6/2019 **Analyzed:** 8/6/2019

EPA 8015M - Extended Range Hydrocarbons

	Result	Spike Level	% Recovery	% RPD	% Recovery Limits	Units
LCS:	LCS-080619_01	**SAMPLE SPIKED:**		CLEAN SOIL		
Analyte:						
Diesel	**370**	500	74%		60 - 140	mg/kg
Surrogate Recovery:						
Hexacosane			80%		30 - 120	
LCSD:	LCSD-080619_01	**SAMPLE SPIKED:**		CLEAN SOIL		
Analyte:						
Diesel	**379**	500	76%	2.4%	60 - 140	mg/kg
Surrogate Recoveries:						
Hexacosane			86%		30 - 120	
CCV:	CCV-080619_01					
Analyte:						
Diesel	**998**	1000	100%		80 - 120	mg/kg

LCS = Laboratory Control Sample
LCSD= Laboratory Control Sample Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**B1-15**	**B2-15**	**B3-2**	**B3-10**	**B4-2**		
Jones ID:	**ST-14113-04**	**ST-14113-09**	**ST-14113-12**	**ST-14113-14**	**ST-14113-15**	**Reporting Limit**	**Units**
Analytes:							
Benzene	ND	ND	**11.7**	**2.9**	**12.1**	1.0	µg/kg
Bromobenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Bromodichloromethane	ND	ND	ND	ND	ND	1.0	µg/kg
Bromoform	ND	ND	ND	ND	ND	1.0	µg/kg
n-Butylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
sec-Butylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
tert-Butylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Carbon tetrachloride	ND	ND	ND	ND	ND	1.0	µg/kg
Chlorobenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Chloroform	ND	ND	ND	ND	ND	1.0	µg/kg
2-Chlorotoluene	ND	ND	ND	ND	ND	1.0	µg/kg
4-Chlorotoluene	ND	ND	ND	ND	ND	1.0	µg/kg
Dibromochloromethane	ND	ND	ND	ND	ND	1.0	µg/kg
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	1.0	µg/kg
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	ND	1.0	µg/kg
Dibromomethane	ND	ND	ND	ND	ND	1.0	µg/kg
1,2- Dichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/kg
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/kg
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/kg
1,1-Dichloroethane	ND	ND	ND	ND	ND	1.0	µg/kg
1,2-Dichloroethane	ND	ND	ND	ND	ND	1.0	µg/kg
1,1-Dichloroethene	ND	ND	ND	ND	ND	1.0	µg/kg
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	µg/kg
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	1.0	µg/kg
1,2-Dichloropropane	ND	ND	ND	ND	ND	1.0	µg/kg
1,3-Dichloropropane	ND	ND	ND	ND	ND	1.0	µg/kg
2,2-Dichloropropane	ND	ND	ND	ND	ND	1.0	µg/kg
1,1-Dichloropropene	ND	ND	ND	ND	ND	1.0	µg/kg
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	1.0	µg/kg

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**B1-15**	**B2-15**	**B3-2**	**B3-10**	**B4-2**		
Jones ID:	**ST-14113-04**	**ST-14113-09**	**ST-14113-12**	**ST-14113-14**	**ST-14113-15**	**Reporting Limit**	**Units**
Analytes:							
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	1.0	µg/kg
Ethylbenzene	ND	ND	**2.7**	ND	**2.3**	1.0	µg/kg
Freon 11	ND	ND	ND	ND	ND	5.0	µg/kg
Freon 12	ND	ND	ND	ND	ND	5.0	µg/kg
Freon 113	ND	ND	ND	ND	ND	5.0	µg/kg
Hexachlorobutadiene	ND	ND	ND	ND	ND	1.0	µg/kg
Isopropylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
4-Isopropyltoluene	ND	ND	ND	ND	ND	1.0	µg/kg
Methylene chloride	ND	ND	ND	ND	ND	1.0	µg/kg
Naphthalene	ND	ND	**1.9**	ND	**1.1**	1.0	µg/kg
n-Propylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Styrene	ND	ND	ND	ND	ND	1.0	µg/kg
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	µg/kg
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	1.0	µg/kg
Tetrachloroethene	ND	**1.4**	**160**	**38.8**	**68.9**	1.0	µg/kg
Toluene	ND	ND	**15.1**	ND	**13.2**	1.0	µg/kg
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/kg
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	1.0	µg/kg
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	1.0	µg/kg
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	1.0	µg/kg
Trichloroethene	ND	ND	ND	ND	ND	1.0	µg/kg
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	1.0	µg/kg
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	1.0	µg/kg
Vinyl chloride	ND	ND	ND	ND	ND	1.0	µg/kg
m,p-Xylene	ND	ND	**3.2**	ND	**2.7**	2.0	µg/kg
o-Xylene	ND	ND	ND	ND	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	ND	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	ND	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	ND	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	ND	ND	ND	0.20	mg/kg
Dilution Factor	1	1	1	1	1		
Surrogate Recoveries:						**QC Limits**	
Dibromofluoromethane	114%	113%	115%	109%	114%	60 - 140	
Toluene-d_8	105%	101%	103%	104%	97%	60 - 140	
4-Bromofluorobenzene	103%	96%	94%	99%	94%	60 - 140	
	VOC3-080619-01	VOC3-080619-01	VOC3-080619-01	VOC3-080619-01	VOC3-080619-01		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID: **B4-10**

Jones ID:	**ST-14113-17**	**Reporting Limit**	**Units**
Analytes:			
Benzene	ND	1.0	µg/kg
Bromobenzene	ND	1.0	µg/kg
Bromodichloromethane	ND	1.0	µg/kg
Bromoform	ND	1.0	µg/kg
n-Butylbenzene	ND	1.0	µg/kg
sec-Butylbenzene	ND	1.0	µg/kg
tert-Butylbenzene	ND	1.0	µg/kg
Carbon tetrachloride	ND	1.0	µg/kg
Chlorobenzene	ND	1.0	µg/kg
Chloroform	ND	1.0	µg/kg
2-Chlorotoluene	ND	1.0	µg/kg
4-Chlorotoluene	ND	1.0	µg/kg
Dibromochloromethane	ND	1.0	µg/kg
1,2-Dibromo-3-chloropropane	ND	1.0	µg/kg
1,2-Dibromoethane (EDB)	ND	1.0	µg/kg
Dibromomethane	ND	1.0	µg/kg
1,2- Dichlorobenzene	ND	1.0	µg/kg
1,3-Dichlorobenzene	ND	1.0	µg/kg
1,4-Dichlorobenzene	ND	1.0	µg/kg
1,1-Dichloroethane	ND	1.0	µg/kg
1,2-Dichloroethane	ND	1.0	µg/kg
1,1-Dichloroethene	ND	1.0	µg/kg
cis-1,2-Dichloroethene	ND	1.0	µg/kg
trans-1,2-Dichloroethene	ND	1.0	µg/kg
1,2-Dichloropropane	ND	1.0	µg/kg
1,3-Dichloropropane	ND	1.0	µg/kg
2,2-Dichloropropane	ND	1.0	µg/kg
1,1-Dichloropropene	ND	1.0	µg/kg
cis-1,3-Dichloropropene	ND	1.0	µg/kg

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID: **B4-10**

Jones ID: **ST-14113-17**

Analytes:		**Reporting Limit**	**Units**
trans-1,3-Dichloropropene	ND	1.0	µg/kg
Ethylbenzene	ND	1.0	µg/kg
Freon 11	ND	5.0	µg/kg
Freon 12	ND	5.0	µg/kg
Freon 113	ND	5.0	µg/kg
Hexachlorobutadiene	ND	1.0	µg/kg
Isopropylbenzene	ND	1.0	µg/kg
4-Isopropyltoluene	ND	1.0	µg/kg
Methylene chloride	ND	1.0	µg/kg
Naphthalene	**1.5**	1.0	µg/kg
n-Propylbenzene	ND	1.0	µg/kg
Styrene	ND	1.0	µg/kg
1,1,1,2-Tetrachloroethane	ND	1.0	µg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	µg/kg
Tetrachloroethene	**11.2**	1.0	µg/kg
Toluene	ND	1.0	µg/kg
1,2,3-Trichlorobenzene	ND	1.0	µg/kg
1,2,4-Trichlorobenzene	ND	1.0	µg/kg
1,1,1-Trichloroethane	ND	1.0	µg/kg
1,1,2-Trichloroethane	ND	1.0	µg/kg
Trichloroethene	ND	1.0	µg/kg
1,2,3-Trichloropropane	ND	1.0	µg/kg
1,2,4-Trimethylbenzene	ND	1.0	µg/kg
1,3,5-Trimethylbenzene	ND	1.0	µg/kg
Vinyl chloride	ND	1.0	µg/kg
m,p-Xylene	ND	2.0	µg/kg
o-Xylene	ND	1.0	µg/kg
Methyl-tert-butylether	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	5.0	µg/kg
Di-isopropylether	ND	5.0	µg/kg
tert-amylmethylether	ND	5.0	µg/kg
tert-Butylalcohol	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	0.20	mg/kg

Dilution Factor 1

Surrogate Recoveries:		**QC Limits**
Dibromofluoromethane	109%	60 - 140
Toluene-d_8	99%	60 - 140
4-Bromofluorobenzene	99%	60 - 140

VOC3-
080619-01

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**METHOD BLANK**		
Jones ID:	**080619-V3MB1**	**Reporting Limit**	**Units**
Analytes:			
Benzene	ND	1.0	µg/kg
Bromobenzene	ND	1.0	µg/kg
Bromodichloromethane	ND	1.0	µg/kg
Bromoform	ND	1.0	µg/kg
n-Butylbenzene	ND	1.0	µg/kg
sec-Butylbenzene	ND	1.0	µg/kg
tert-Butylbenzene	ND	1.0	µg/kg
Carbon tetrachloride	ND	1.0	µg/kg
Chlorobenzene	ND	1.0	µg/kg
Chloroform	ND	1.0	µg/kg
2-Chlorotoluene	ND	1.0	µg/kg
4-Chlorotoluene	ND	1.0	µg/kg
Dibromochloromethane	ND	1.0	µg/kg
1,2-Dibromo-3-chloropropane	ND	1.0	µg/kg
1,2-Dibromoethane (EDB)	ND	1.0	µg/kg
Dibromomethane	ND	1.0	µg/kg
1,2- Dichlorobenzene	ND	1.0	µg/kg
1,3-Dichlorobenzene	ND	1.0	µg/kg
1,4-Dichlorobenzene	ND	1.0	µg/kg
1,1-Dichloroethane	ND	1.0	µg/kg
1,2-Dichloroethane	ND	1.0	µg/kg
1,1-Dichloroethene	ND	1.0	µg/kg
cis-1,2-Dichloroethene	ND	1.0	µg/kg
trans-1,2-Dichloroethene	ND	1.0	µg/kg
1,2-Dichloropropane	ND	1.0	µg/kg
1,3-Dichloropropane	ND	1.0	µg/kg
2,2-Dichloropropane	ND	1.0	µg/kg
1,1-Dichloropropene	ND	1.0	µg/kg
cis-1,3-Dichloropropene	ND	1.0	µg/kg

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**METHOD BLANK**		
Jones ID:	**080619-V3MB1**	**Reporting Limit**	**Units**
Analytes:			
trans-1,3-Dichloropropene	ND	1.0	µg/kg
Ethylbenzene	ND	1.0	µg/kg
Freon 11	ND	5.0	µg/kg
Freon 12	ND	5.0	µg/kg
Freon 113	ND	5.0	µg/kg
Hexachlorobutadiene	ND	1.0	µg/kg
Isopropylbenzene	ND	1.0	µg/kg
4-Isopropyltoluene	ND	1.0	µg/kg
Methylene chloride	ND	1.0	µg/kg
Naphthalene	ND	1.0	µg/kg
n-Propylbenzene	ND	1.0	µg/kg
Styrene	ND	1.0	µg/kg
1,1,1,2-Tetrachloroethane	ND	1.0	µg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	µg/kg
Tetrachloroethene	ND	1.0	µg/kg
Toluene	ND	1.0	µg/kg
1,2,3-Trichlorobenzene	ND	1.0	µg/kg
1,2,4-Trichlorobenzene	ND	1.0	µg/kg
1,1,1-Trichloroethane	ND	1.0	µg/kg
1,1,2-Trichloroethane	ND	1.0	µg/kg
Trichloroethene	ND	1.0	µg/kg
1,2,3-Trichloropropane	ND	1.0	µg/kg
1,2,4-Trimethylbenzene	ND	1.0	µg/kg
1,3,5-Trimethylbenzene	ND	1.0	µg/kg
Vinyl chloride	ND	1.0	µg/kg
m,p-Xylene	ND	2.0	µg/kg
o-Xylene	ND	1.0	µg/kg
Methyl-tert-butylether	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	5.0	µg/kg
Di-isopropylether	ND	5.0	µg/kg
tert-amylmethylether	ND	5.0	µg/kg
tert-Butylalcohol	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	0.20	mg/kg
Dilution Factor	1		

Surrogate Recoveries:		**QC Limits**
Dibromofluoromethane	110%	60 - 140
Toluene-d_8	103%	60 - 140
4-Bromofluorobenzene	94%	60 - 140
	VOC3-080619-01	

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC3-080619-01		
Jones ID:	**080619-V3MS1**	**080619-V3MSD1**			**080619-V3CCV1**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Vinyl chloride	126%	128%	1.5%	60 - 140	124%	80 - 120
1,1-Dichloroethene	85%	87%	2.3%	60 - 140	77%	80 - 120
Cis-1,2-Dichloroethene	118%	121%	2.2%	70 - 130	110%	80 - 120
1,1,1-Trichloroethane	120%	126%	4.9%	70 - 130	110%	80 - 120
Benzene	117%	122%	4.0%	70 - 130	109%	80 - 120
Trichloroethene	122%	122%	0.3%	70 - 130	114%	80 - 120
Toluene	105%	115%	8.8%	70 - 130	106%	80 - 120
Tetrachloroethene	120%	115%	4.4%	70 - 130	116%	80 - 120
Chlorobenzene	105%	109%	4.0%	70 - 130	111%	80 - 120
Ethylbenzene	111%	115%	3.4%	70 - 130	116%	80 - 120
1,2,4 Trimethylbenzene	107%	116%	7.8%	70 - 130	117%	80 - 120
Gasoline Range Organics (C4-C12)	110%	117%	6.0%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	114%	112%		60 - 140	99%	60 - 140
Toluene-d_8	103%	101%		60 - 140	102%	60 - 140
4-Bromofluorobenzene	99%	101%		60 - 140	104%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8270C by 3546 – Semivolatile Organics by GC/MS

Sample ID:	**B1-15**	**B2-15**	**B3-2**	**B3-10**	**B4-2**		
Jones ID:	**ST-14113-04**	**ST-14113-09**	**ST-14113-12**	**ST-14113-14**	**ST-14113-15**	**Reporting Limit**	**Units**
Analytes:							
Naphthalene	ND	ND	ND	ND	ND	20	µg/kg
2-Methylnaphthalene	ND	ND	ND	ND	ND	20	µg/kg
1-Methylnaphthalene	ND	ND	ND	ND	ND	20	µg/kg
Acenaphthalene	ND	ND	ND	ND	ND	20	µg/kg
Acenaphthene	ND	ND	ND	ND	ND	20	µg/kg
Fluorene	ND	ND	ND	ND	ND	20	µg/kg
Phenanthrene	ND	ND	ND	ND	ND	20	µg/kg
Anthracene	ND	ND	ND	ND	ND	20	µg/kg
Fluoranthene	ND	ND	ND	ND	ND	20	µg/kg
Pyrene	ND	ND	ND	ND	ND	20	µg/kg
Benz[a]anthracene	ND	ND	ND	ND	ND	20	µg/kg
Chrysene	ND	ND	ND	ND	ND	20	µg/kg
Benzo[b]fluoranthene	ND	ND	ND	ND	ND	20	µg/kg
Benzo[k]fluoranthene	ND	ND	ND	ND	ND	20	µg/kg
Benzo[a]pyrene	ND	ND	ND	ND	ND	100	µg/kg
Indeno[1, 2, 3-cd]pyrene	ND	ND	ND	ND	ND	100	µg/kg
Dibenz[a, h]anthracene	ND	ND	ND	ND	ND	100	µg/kg
Benzo[g, h, i]perylene	ND	ND	ND	ND	ND	100	µg/kg

Surrogate Recoveries:						**QC Limits**
2-Fluorophenol	55%	55%	50%	57%	57%	30 - 120
Phenol-D5	54%	61%	49%	52%	51%	30 - 120
Nitrobenzene-D_5	48%	53%	45%	48%	48%	30 - 120
2-Fluorobiphenyl	53%	57%	50%	52%	53%	30 - 120
p-Terphenyl_D14	67%	70%	64%	66%	69%	30 - 120

Batch:	8270-080619-1	8270-080619-1	8270-080619-1	8270-080619-1	8270-080619-1
Prepared:	8/6/2019	8/6/2019	8/6/2019	8/6/2019	8/6/2019
Analyzed:	8/6/2019	8/6/2019	8/6/2019	8/6/2019	8/6/2019

ND= Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8270C by 3546 – Semivolatile Organics by GC/MS

Sample ID: **B4-10**

Jones ID: **ST-14113-17**

Analytes:		**Reporting Limit**	**Units**
Naphthalene	ND	20	µg/kg
2-Methylnaphthalene	ND	20	µg/kg
1-Methylnaphthalene	ND	20	µg/kg
Acenaphthalene	ND	20	µg/kg
Acenaphthene	ND	20	µg/kg
Fluorene	ND	20	µg/kg
Phenanthrene	ND	20	µg/kg
Anthracene	ND	20	µg/kg
Fluoranthene	ND	20	µg/kg
Pyrene	ND	20	µg/kg
Benz[a]anthracene	ND	20	µg/kg
Chrysene	ND	20	µg/kg
Benzo[b]fluoranthene	ND	20	µg/kg
Benzo[k]fluoranthene	ND	20	µg/kg
Benzo[a]pyrene	ND	100	µg/kg
Indeno[1, 2, 3-cd]pyrene	ND	100	µg/kg
Dibenz[a, h]anthracene	ND	100	µg/kg
Benzo[g, h, i]perylene	ND	100	µg/kg

Surrogate Recoveries:		**QC Limits**
2-Fluorophenol	45%	30 - 120
Phenol-D5	40%	30 - 120
Nitrobenzene-D_5	37%	30 - 120
2-Fluorobiphenyl	41%	30 - 120
p-Terphenyl_D14	63%	30 - 120

Batch:	8270-080619-1
Prepared:	8/6/2019
Analyzed:	8/6/2019

ND= Value less than reporting limit

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8270C by 3546 – Semivolatile Organics by GC/MS

Sample ID: **Method Blank**

Jones ID:	**8270F-080619-MB1**	**Reporting Limit**	**Units**
Analytes:			
Naphthalene	ND	20	µg/kg
2-Methylnaphthalene	ND	20	µg/kg
1-Methylnaphthalene	ND	20	µg/kg
Acenaphthalene	ND	20	µg/kg
Acenaphthene	ND	20	µg/kg
Fluorene	ND	20	µg/kg
Phenanthrene	ND	20	µg/kg
Anthracene	ND	20	µg/kg
Fluoranthene	ND	20	µg/kg
Pyrene	ND	20	µg/kg
Benz[a]anthracene	ND	20	µg/kg
Chrysene	ND	20	µg/kg
Benzo[b]fluoranthene	ND	20	µg/kg
Benzo[k]fluoranthene	ND	20	µg/kg
Benzo[a]pyrene	ND	100	µg/kg
Indeno[1, 2, 3-cd]pyrene	ND	100	µg/kg
Dibenz[a, h]anthracene	ND	100	µg/kg
Benzo[g, h, i]perylene	ND	100	µg/kg

Surrogate Recoveries:		**QC Limits**
2-Fluorophenol	80%	30 - 120
Phenol-D5	75%	30 - 120
Nitrobenzene-D_5	72%	30 - 120
2-Fluorobiphenyl	72%	30 - 120
p-Terphenyl_D14	83%	30 - 120

Batch:	8270-080619-1
Prepared:	8/6/2019
Analyzed:	8/6/2019

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8270C by 3546 – Semivolatile Organics by GC/MS

Sample Spiked:	CLEAN SOIL				ST-14113-09	
Jones ID:	**8270F-080619-LCS1**	**8270F-080619-LCSD1**			**8270F-080619-MS1**	
Parameter	LCS Recovery (%)	LCSD Recovery (%)	**RPD**	**Acceptable RPD limit**	MS Recovery (%)	**% Recovery Limits**
Acenaphthene	91%	78%	15.2%	33%	61%	31 - 137
Pyrene	98%	90%	8.3%	36%	82%	35 - 142
Surrogate Recovery:						
2-Fluorophenol	84%	81%			59%	30 - 120
Phenol-D5	92%	85%			61%	30 - 120
Nitrobenzene-D_5	89%	79%			57%	30 - 120
2-Fluorobiphenyl	88%	79%			60%	30 - 120
p-Terphenyl-D_{14}	85%	84%			70%	30 - 120

Batch: 8270-080619-1

LCS = Laboratory Control Sample
LCSD = Laboratory Control Sample Duplicate
MS = Matrix Spike

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:** **Client Ref. No.:**	ST-14113 19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Soil

EPA 8270C by 3546 – Semivolatile Organics by GC/MS

	Result	Expected	%Deviation	Acceptable Deviation	Pass/Fail
CCV:	**8270F-080619-CCV1**				
Analytes:					
Naphthalene	**4.92**	5.00	**2%**	40%	PASS
2-Methylnaphthalene	**5.19**	5.00	**4%**	20%	PASS
1-Methylnaphthalene	**5.08**	5.00	**2%**	20%	PASS
Acenaphthalene	**5.02**	5.00	**0%**	20%	PASS
Acenaphthene	**4.78**	5.00	**4%**	20%	PASS
Fluorene	**5.03**	5.00	**1%**	20%	PASS
Phenanthrene	**4.78**	5.00	**4%**	20%	PASS
Anthracene	**4.52**	5.00	**10%**	20%	PASS
Fluoranthene	**4.77**	5.00	**5%**	20%	PASS
Pyrene	**4.77**	5.00	**5%**	20%	PASS
Benz[a]anthracene	**4.51**	5.00	**10%**	20%	PASS
Chrysene	**4.52**	5.00	**10%**	20%	PASS
Benzo[b]fluoranthene	**5.27**	5.00	**5%**	20%	PASS
Benzo[k]fluoranthene	**5.15**	5.00	**3%**	20%	PASS
Benzo[a]pyrene	**5.09**	5.00	**2%**	20%	PASS
Indeno[1, 2, 3-cd]pyrene	**4.96**	5.00	**1%**	20%	PASS
Dibenz[a, h]anthracene	**4.96**	5.00	**1%**	20%	PASS
Benzo[g, h, i]perylene	**4.96**	5.00	**1%**	20%	PASS
Benzo[a]Pyrene	**5.09**	5.00	**2%**	20%	PASS

Surrogate Recovery:		**QC Limits**
2-Fluorophenol	99%	30 - 120
Phenol-D5	103%	30 - 120
Nitrobenzene-D_5	107%	30 - 120
2-Fluorobiphenyl	103%	30 - 120
p-Terphenyl-D_{14}	99%	30 - 120

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Water

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**B1-GW20**	**B2-GW20**		
Jones ID:	**ST-14113-18**	**ST-14113-19**	**Reporting Limit**	**Units**
Analytes:				
Benzene	ND	ND	0.5	µg/L
Bromobenzene	ND	ND	0.5	µg/L
Bromodichloromethane	ND	ND	0.5	µg/L
Bromoform	ND	ND	0.5	µg/L
n-Butylbenzene	ND	ND	0.5	µg/L
sec-Butylbenzene	ND	ND	0.5	µg/L
tert-Butylbenzene	ND	ND	0.5	µg/L
Carbon tetrachloride	ND	ND	0.5	µg/L
Chlorobenzene	ND	ND	0.5	µg/L
Chloroform	ND	ND	0.5	µg/L
2-Chlorotoluene	ND	ND	0.5	µg/L
4-Chlorotoluene	ND	ND	0.5	µg/L
Dibromochloromethane	ND	ND	0.5	µg/L
1,2-Dibromo-3-chloropropane	ND	ND	0.5	µg/L
1,2-Dibromoethane (EDB)	ND	ND	0.5	µg/L
Dibromomethane	ND	ND	0.5	µg/L
1,2- Dichlorobenzene	ND	ND	0.5	µg/L
1,3-Dichlorobenzene	ND	ND	0.5	µg/L
1,4-Dichlorobenzene	ND	ND	0.5	µg/L
1,1-Dichloroethane	ND	ND	0.5	µg/L
1,2-Dichloroethane	ND	ND	0.5	µg/L
1,1-Dichloroethene	ND	ND	0.5	µg/L
cis-1,2-Dichloroethene	**77.8**	**47.7**	0.5	µg/L
trans-1,2-Dichloroethene	ND	ND	0.5	µg/L
1,2-Dichloropropane	ND	ND	0.5	µg/L
1,3-Dichloropropane	ND	ND	0.5	µg/L
2,2-Dichloropropane	ND	ND	0.5	µg/L
1,1-Dichloropropene	ND	ND	0.5	µg/L
cis-1,3-Dichloropropene	ND	ND	0.5	µg/L

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**B1-GW20**	**B2-GW20**		
Jones ID:	**ST-14113-18**	**ST-14113-19**	**Reporting Limit**	**Units**
Analytes:				
trans-1,3-Dichloropropene	ND	ND	0.5	µg/L
Ethylbenzene	ND	ND	0.5	µg/L
Freon 11	ND	ND	2.5	µg/L
Freon 12	ND	ND	2.5	µg/L
Freon 113	ND	ND	2.5	µg/L
Hexachlorobutadiene	ND	ND	0.5	µg/L
Isopropylbenzene	ND	ND	0.5	µg/L
4-Isopropyltoluene	ND	ND	0.5	µg/L
Methylene chloride	**22.4**	**31.3**	0.5	µg/L
Naphthalene	ND	ND	0.5	µg/L
n-Propylbenzene	ND	ND	0.5	µg/L
Styrene	ND	ND	0.5	µg/L
1,1,1,2-Tetrachloroethane	ND	ND	0.5	µg/L
1,1,2,2-Tetrachloroethane	ND	ND	0.5	µg/L
Tetrachloroethene	**10.9**	**8.5**	0.5	µg/L
Toluene	**1.3**	ND	0.5	µg/L
1,2,3-Trichlorobenzene	ND	ND	0.5	µg/L
1,2,4-Trichlorobenzene	ND	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	ND	0.5	µg/L
1,1,2-Trichloroethane	ND	ND	0.5	µg/L
Trichloroethene	**10.1**	**3.8**	0.5	µg/L
1,2,3-Trichloropropane	ND	ND	0.5	µg/L
1,2,4-Trimethylbenzene	**0.6**	ND	0.5	µg/L
1,3,5-Trimethylbenzene	ND	ND	0.5	µg/L
Vinyl chloride	ND	ND	0.5	µg/L
m,p-Xylene	**2.0**	ND	1.0	µg/L
o-Xylene	**0.7**	ND	0.5	µg/L
Methyl-tert-butylether	ND	ND	2.5	µg/L
Ethyl-tert-butylether	ND	ND	2.5	µg/L
Di-isopropylether	ND	ND	2.5	µg/L
tert-amylmethylether	ND	ND	2.5	µg/L
tert-Butylalcohol	ND	ND	25.0	µg/L
Gasoline Range Organics (C4-C12)	ND	ND	0.10	mg/L
TIC:				
Ethanol	ND	ND	50.0	µg/L
Dilution Factor	1	1		
Surrogate Recoveries:			**QC Limits**	
Dibromofluoromethane	102%	103%	60 - 140	
Toluene-d_8	106%	105%	60 - 140	
4-Bromofluorobenzene	96%	95%	60 - 140	
	VOC1-080619-01	VOC1-080619-01		

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Water

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**METHOD BLANK**		
Jones ID:	**080619-V1MB1**	**Reporting Limit**	**Units**
Analytes:			
Benzene	ND	0.5	µg/L
Bromobenzene	ND	0.5	µg/L
Bromodichloromethane	ND	0.5	µg/L
Bromoform	ND	0.5	µg/L
n-Butylbenzene	ND	0.5	µg/L
sec-Butylbenzene	ND	0.5	µg/L
tert-Butylbenzene	ND	0.5	µg/L
Carbon tetrachloride	ND	0.5	µg/L
Chlorobenzene	ND	0.5	µg/L
Chloroform	ND	0.5	µg/L
2-Chlorotoluene	ND	0.5	µg/L
4-Chlorotoluene	ND	0.5	µg/L
Dibromochloromethane	ND	0.5	µg/L
1,2-Dibromo-3-chloropropane	ND	0.5	µg/L
1,2-Dibromoethane (EDB)	ND	0.5	µg/L
Dibromomethane	ND	0.5	µg/L
1,2- Dichlorobenzene	ND	0.5	µg/L
1,3-Dichlorobenzene	ND	0.5	µg/L
1,4-Dichlorobenzene	ND	0.5	µg/L
1,1-Dichloroethane	ND	0.5	µg/L
1,2-Dichloroethane	ND	0.5	µg/L
1,1-Dichloroethene	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.5	µg/L
trans-1,2-Dichloroethene	ND	0.5	µg/L
1,2-Dichloropropane	ND	0.5	µg/L
1,3-Dichloropropane	ND	0.5	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
1,1-Dichloropropene	ND	0.5	µg/L
cis-1,3-Dichloropropene	ND	0.5	µg/L

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**METHOD BLANK**		
Jones ID:	**080619-V1MB1**	**Reporting Limit**	**Units**
Analytes:			
trans-1,3-Dichloropropene	ND	0.5	µg/L
Ethylbenzene	ND	0.5	µg/L
Freon 11	ND	2.5	µg/L
Freon 12	ND	2.5	µg/L
Freon 113	ND	2.5	µg/L
Hexachlorobutadiene	ND	0.5	µg/L
Isopropylbenzene	ND	0.5	µg/L
4-Isopropyltoluene	ND	0.5	µg/L
Methylene chloride	ND	0.5	µg/L
Naphthalene	ND	0.5	µg/L
n-Propylbenzene	ND	0.5	µg/L
Styrene	ND	0.5	µg/L
1,1,1,2-Tetrachloroethane	ND	0.5	µg/L
1,1,2,2-Tetrachloroethane	ND	0.5	µg/L
Tetrachloroethene	ND	0.5	µg/L
Toluene	ND	0.5	µg/L
1,2,3-Trichlorobenzene	ND	0.5	µg/L
1,2,4-Trichlorobenzene	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	0.5	µg/L
1,1,2-Trichloroethane	ND	0.5	µg/L
Trichloroethene	ND	0.5	µg/L
1,2,3-Trichloropropane	ND	0.5	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L
1,3,5-Trimethylbenzene	ND	0.5	µg/L
Vinyl chloride	ND	0.5	µg/L
m,p-Xylene	ND	1.0	µg/L
o-Xylene	ND	0.5	µg/L
Methyl-tert-butylether	ND	2.5	µg/L
Ethyl-tert-butylether	ND	2.5	µg/L
Di-isopropylether	ND	2.5	µg/L
tert-amylmethylether	ND	2.5	µg/L
tert-Butylalcohol	ND	25.0	µg/L
Gasoline Range Organics (C4-C12)	ND	0.10	mg/L
TIC:			
Ethanol	ND	50.0	µg/L
Dilution Factor	1		

Surrogate Recoveries:		**QC Limits**
Dibromofluoromethane	113%	60 - 140
Toluene-d_8	106%	60 - 140
4-Bromofluorobenzene	101%	60 - 140
	VOC1-080619-01	

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/7/2019
Client Address:	1761 E. Garey Ave. Santa Ana, CA	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Jessica Ryan	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/6/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA 90048	**Physical State:**	Water

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN WATER		**GC#:**	VOC1-080619-01		
Jones ID:	**080619-V1MS1**	**080619-V1MSD1**		**080619-V1CCV1**		
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Vinyl chloride	136%	136%	0.1%	60 - 140	101%	80 - 120
1,1-Dichloroethene	118%	116%	1.4%	60 - 140	110%	80 - 120
Cis-1,2-Dichloroethene	122%	116%	5.2%	70 - 130	106%	80 - 120
1,1,1-Trichloroethane	128%	128%	0.1%	70 - 130	116%	80 - 120
Benzene	110%	110%	0.5%	70 - 130	107%	80 - 120
Trichloroethene	119%	119%	0.8%	70 - 130	117%	80 - 120
Toluene	122%	124%	1.7%	70 - 130	117%	80 - 120
Tetrachloroethene	125%	124%	1.5%	70 - 130	117%	80 - 120
Chlorobenzene	122%	123%	0.3%	70 - 130	118%	80 - 120
Ethylbenzene	107%	105%	2.4%	70 - 130	102%	80 - 120
1,2,4 Trimethylbenzene	119%	117%	1.2%	70 - 130	116%	80 - 120
Gasoline Range Organics (C4-C12)	115%	114%	0.5%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	99%	96%		60 - 140	100%	60 - 140
Toluene-d_8	102%	102%		60 - 140	111%	60 - 140
4-Bromofluorobenzene	97%	97%		60 - 140	110%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

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Fax (714) 449-9685
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Chain-of-Custody Record

Client	Partner Engineering and Science
Date	8/6/19
Project Name	San Vicente
Client Project #	19-250627.2
Project Address	400 S. San Vicente Blvd
	Los Angeles, CA. 90048
Email	jryan@partnersi.com
Phone	(219) 221-0366
Report To	Jessica Ryan
Sampler	H. Gutierrez

Turn Around Requested:
- ☐ Immediate Attention
- ☑ Rush 24 Hours
- ☐ Rush 48 Hours
- ☐ Rush 72 Hours
- ☐ Normal

Report Options
EDD _____
EDF* - 10% Surcharge____
*Global ID _____

LAB USE ONLY
Jones Project # CT-14113
Page 1 of 2

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Sample Container / Preservative Abbreviations
- AS - Acetate Sleeve
- SS - Stainless Steel Sleeve
- BS - Brass Sleeve
- G - Glass
- AB - Amber Bottle
- P - Plastic
- SOBI - Sodium Bisulfate
- MeOH - Methanol
- HCl - Hydrochloric Acid
- HNO3 - Nitric Acid
- O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	TPH-c (Diesel 8015/8260) Types total		PAHs 8270		VOCs 8260						Hold	Number of Containers	Notes & Special Instructions
B1-2	8/6	8:20	CT-14113-01		SLEEVE 3VOAs	S													
B1-5		8:34	CT-14113-02																
B1-10		8:40	CT-14113-03																
B1-15		8:48	CT-14113-04				X		X		X								
B1-20		8:50	CT-14113-05																
B2-2		9:18	CT-14113-06																
B2-5		9:22	CT-14113-07																
B2-10		9:29	CT-14113-08																
B2-15		9:36	CT-14113-09				X	/	X		X								
B2-20			CT-14113-10																

Relinquished By (Signature)	Printed Name: Hernan Gutierrez	Received By (Signature)	Printed Name: Stephanie Salas
Company: PES	Date: 8/6 Time: 14:20	Company: Jones Env	Date: 8/6/19 Time: 1420
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name
Company	Date: Time	Company	Date Time

Total Number of Containers

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

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Santa Fe Springs, CA 90670
(714) 449-9937
Fax (714) 449-9685
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Chain-of-Custody Record

Client: Partner ESI
Date: 8/6/19
Project Name: San Vicente
Client Project #: 19-250627.2
Project Address: 400 S. San Vicente Blvd
Los Angeles, CA 90048
Email: jryan@partneresi.com
Phone: (214) 221-0366
Report To: Jessica Ryan
Sampler: Hernan Gutierrez

Turn Around Requested:
- □ Immediate Attention
- ☑ Rush 24 Hours
- □ Rush 48 Hours
- □ Rush 72 Hours
- □ Normal

Report Options
EDD _____
EDF* - 10% Surcharge____
*Global ID _____

LAB USE ONLY
Jones Project # ST-14113
Page 2 of 2

Sample Condition as Recieved:
Chilled □ yes □ no
Sealed □ yes □ no

Sample Container / Preservative Abbreviations
- AS - Acetate Sleeve
- SS - Stainless Steel Sleeve
- BS - Brass Sleeve
- G - Glass
- AB - Amber Bottle
- P - Plastic
- SOBI - Sodium Bisulfate
- MeOH - Methanol
- HCl - Hydrochloric Acid
- HNO3 - Nitric Acid
- O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	TPH-c to C40 (Diesel) 8015/8260		PAHs 8270		VOCs 8260						Hold	Number of Containers	Notes & Special Instructions
B2-25	8/6		ST-14113-11		SLEEVE & 3VOAs	S													
B3-2	↓		ST-14113-12		↓	↓	X		X		X								
B3-5			ST-14113-13																
B3-10			ST-14113-14				X		X		X								
B4-2			ST-14113-15				X		X		X								
B4-5			ST-14113-16																
B4-10			ST-14113-17		↓		X		X		X								
B1-GW20			ST-14113-18		Amber bottle & 3VOAs				X		X								
B2-GW20	↓		ST-14113-19		↓				X		X								
						↓													

Relinquished By (Signature)	Printed Name	Received By (Signature)	Printed Name	Total Number of Containers
[signature]	Hernan Gutierrez	[signature]	Stephanie Salas	
Company: PES	Date: 8/6 Time: 14:20	Company: Jones Env	Date: 8/6/19 Time: 1420	
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name	
Company	Date: Time	Company	Date Time	

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

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WWW.JONESENV.COM

JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/13/2019
Client Address:	2154 Torrance Blvd., Suite 200 Torrance, CA 90501	**JEL Ref. No.:** **Client Ref. No.:**	ST-14113 19-250627.2
Attn:	Hernan Gutierrez	**Date Sampled:** **Date Received:**	8/6/2019 8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/13/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA	**Physical State:**	Soil

ANALYSES REQUESTED

Soil:

1. EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Approval:

David Mirakian, M.S.
Stationary Lab Chemist

JONES ENVIRONMENTAL, INC.

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/13/2019
Client Address:	2154 Torrance Blvd., Suite 200 Torrance, CA 90501	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Hernan Gutierrez	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/13/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**B3-5**	**B4-5**		
Jones ID:	**ST-14113-13**	**ST-14113-16**	**Reporting Limit**	**Units**
Analytes:				
Benzene	**66.7**	**8.2**	1.0	µg/kg
Bromobenzene	ND	ND	1.0	µg/kg
Bromodichloromethane	ND	ND	1.0	µg/kg
Bromoform	ND	ND	1.0	µg/kg
n-Butylbenzene	ND	ND	1.0	µg/kg
sec-Butylbenzene	ND	ND	1.0	µg/kg
tert-Butylbenzene	ND	ND	1.0	µg/kg
Carbon tetrachloride	ND	ND	1.0	µg/kg
Chlorobenzene	ND	ND	1.0	µg/kg
Chloroform	ND	ND	1.0	µg/kg
2-Chlorotoluene	ND	ND	1.0	µg/kg
4-Chlorotoluene	ND	ND	1.0	µg/kg
Dibromochloromethane	ND	ND	1.0	µg/kg
1,2-Dibromo-3-chloropropane	ND	ND	1.0	µg/kg
1,2-Dibromoethane (EDB)	ND	ND	1.0	µg/kg
Dibromomethane	ND	ND	1.0	µg/kg
1,2- Dichlorobenzene	ND	ND	1.0	µg/kg
1,3-Dichlorobenzene	ND	ND	1.0	µg/kg
1,4-Dichlorobenzene	ND	ND	1.0	µg/kg
1,1-Dichloroethane	ND	ND	1.0	µg/kg
1,2-Dichloroethane	ND	ND	1.0	µg/kg
1,1-Dichloroethene	ND	ND	1.0	µg/kg
cis-1,2-Dichloroethene	ND	ND	1.0	µg/kg
trans-1,2-Dichloroethene	ND	ND	1.0	µg/kg
1,2-Dichloropropane	ND	ND	1.0	µg/kg
1,3-Dichloropropane	ND	ND	1.0	µg/kg
2,2-Dichloropropane	ND	ND	1.0	µg/kg
1,1-Dichloropropene	ND	ND	1.0	µg/kg
cis-1,3-Dichloropropene	ND	ND	1.0	µg/kg

JONES ENVIRONMENTAL LABORATORY RESULTS

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**B3-5**	**B4-5**		
Jones ID:	**ST-14113-13**	**ST-14113-16**	**Reporting Limit**	**Units**
Analytes:				
trans-1,3-Dichloropropene	ND	ND	1.0	µg/kg
Ethylbenzene	**13.4**	**1.7**	1.0	µg/kg
Freon 11	ND	ND	5.0	µg/kg
Freon 12	ND	ND	5.0	µg/kg
Freon 113	ND	ND	5.0	µg/kg
Hexachlorobutadiene	ND	ND	1.0	µg/kg
Isopropylbenzene	ND	ND	1.0	µg/kg
4-Isopropyltoluene	ND	ND	1.0	µg/kg
Methylene chloride	ND	ND	1.0	µg/kg
Naphthalene	**3.1**	**1.2**	1.0	µg/kg
n-Propylbenzene	**1.2**	ND	1.0	µg/kg
Styrene	ND	ND	1.0	µg/kg
1,1,1,2-Tetrachloroethane	ND	ND	1.0	µg/kg
1,1,2,2-Tetrachloroethane	ND	ND	1.0	µg/kg
Tetrachloroethene	**573**	**64.7**	1.0	µg/kg
Toluene	**83.6**	**9.9**	1.0	µg/kg
1,2,3-Trichlorobenzene	**1.1**	ND	1.0	µg/kg
1,2,4-Trichlorobenzene	**1.2**	ND	1.0	µg/kg
1,1,1-Trichloroethane	ND	ND	1.0	µg/kg
1,1,2-Trichloroethane	ND	ND	1.0	µg/kg
Trichloroethene	**1.4**	ND	1.0	µg/kg
1,2,3-Trichloropropane	ND	ND	1.0	µg/kg
1,2,4-Trimethylbenzene	**2.5**	ND	1.0	µg/kg
1,3,5-Trimethylbenzene	**1.4**	ND	1.0	µg/kg
Vinyl chloride	ND	ND	1.0	µg/kg
m,p-Xylene	**17.7**	**2.3**	2.0	µg/kg
o-Xylene	**6.6**	ND	1.0	µg/kg
Methyl-tert-butylether	ND	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	ND	5.0	µg/kg
Di-isopropylether	ND	ND	5.0	µg/kg
tert-amylmethylether	ND	ND	5.0	µg/kg
tert-Butylalcohol	ND	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	ND	0.20	mg/kg
Dilution Factor	1	1		

Surrogate Recoveries:			**QC Limits**
Dibromofluoromethane	104%	106%	60 - 140
Toluene-d_8	105%	106%	60 - 140
4-Bromofluorobenzene	99%	101%	60 - 140
	VOC3-081319-01	VOC3-081319-01	

ND= Value less than reporting limit

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/13/2019
Client Address:	2154 Torrance Blvd., Suite 200 Torrance, CA 90501	**Jones Ref. No.:** **Client Ref. No.:**	ST-14113 19-250627.2
Attn:	Hernan Gutierrez	**Date Sampled:** **Date Received:**	8/6/2019 8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/13/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**METHOD BLANK**		
Jones ID:	**081319-V3MB1**	**Reporting Limit**	**Units**
Analytes:			
Benzene	ND	1.0	µg/kg
Bromobenzene	ND	1.0	µg/kg
Bromodichloromethane	ND	1.0	µg/kg
Bromoform	ND	1.0	µg/kg
n-Butylbenzene	ND	1.0	µg/kg
sec-Butylbenzene	ND	1.0	µg/kg
tert-Butylbenzene	ND	1.0	µg/kg
Carbon tetrachloride	ND	1.0	µg/kg
Chlorobenzene	ND	1.0	µg/kg
Chloroform	ND	1.0	µg/kg
2-Chlorotoluene	ND	1.0	µg/kg
4-Chlorotoluene	ND	1.0	µg/kg
Dibromochloromethane	ND	1.0	µg/kg
1,2-Dibromo-3-chloropropane	ND	1.0	µg/kg
1,2-Dibromoethane (EDB)	ND	1.0	µg/kg
Dibromomethane	ND	1.0	µg/kg
1,2- Dichlorobenzene	ND	1.0	µg/kg
1,3-Dichlorobenzene	ND	1.0	µg/kg
1,4-Dichlorobenzene	ND	1.0	µg/kg
1,1-Dichloroethane	ND	1.0	µg/kg
1,2-Dichloroethane	ND	1.0	µg/kg
1,1-Dichloroethene	ND	1.0	µg/kg
cis-1,2-Dichloroethene	ND	1.0	µg/kg
trans-1,2-Dichloroethene	ND	1.0	µg/kg
1,2-Dichloropropane	ND	1.0	µg/kg
1,3-Dichloropropane	ND	1.0	µg/kg
2,2-Dichloropropane	ND	1.0	µg/kg
1,1-Dichloropropene	ND	1.0	µg/kg
cis-1,3-Dichloropropene	ND	1.0	µg/kg

JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample ID:	**METHOD BLANK**		
Jones ID:	**081319-V3MB1**	**Reporting Limit**	**Units**
Analytes:			
trans-1,3-Dichloropropene	ND	1.0	µg/kg
Ethylbenzene	ND	1.0	µg/kg
Freon 11	ND	5.0	µg/kg
Freon 12	ND	5.0	µg/kg
Freon 113	ND	5.0	µg/kg
Hexachlorobutadiene	ND	1.0	µg/kg
Isopropylbenzene	ND	1.0	µg/kg
4-Isopropyltoluene	ND	1.0	µg/kg
Methylene chloride	ND	1.0	µg/kg
Naphthalene	ND	1.0	µg/kg
n-Propylbenzene	ND	1.0	µg/kg
Styrene	ND	1.0	µg/kg
1,1,1,2-Tetrachloroethane	ND	1.0	µg/kg
1,1,2,2-Tetrachloroethane	ND	1.0	µg/kg
Tetrachloroethene	ND	1.0	µg/kg
Toluene	ND	1.0	µg/kg
1,2,3-Trichlorobenzene	ND	1.0	µg/kg
1,2,4-Trichlorobenzene	ND	1.0	µg/kg
1,1,1-Trichloroethane	ND	1.0	µg/kg
1,1,2-Trichloroethane	ND	1.0	µg/kg
Trichloroethene	ND	1.0	µg/kg
1,2,3-Trichloropropane	ND	1.0	µg/kg
1,2,4-Trimethylbenzene	ND	1.0	µg/kg
1,3,5-Trimethylbenzene	ND	1.0	µg/kg
Vinyl chloride	ND	1.0	µg/kg
m,p-Xylene	ND	2.0	µg/kg
o-Xylene	ND	1.0	µg/kg
Methyl-tert-butylether	ND	5.0	µg/kg
Ethyl-tert-butylether	ND	5.0	µg/kg
Di-isopropylether	ND	5.0	µg/kg
tert-amylmethylether	ND	5.0	µg/kg
tert-Butylalcohol	ND	50.0	µg/kg
Gasoline Range Organics (C4-C12)	ND	0.20	mg/kg
Dilution Factor	1		

Surrogate Recoveries:		**QC Limits**
Dibromofluoromethane	99%	60 - 140
Toluene-d_8	103%	60 - 140
4-Bromofluorobenzene	92%	60 - 140
	VOC3-081319-01	

ND= Value less than reporting limit

JONES ENVIRONMENTAL, INC.

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SANTA FE SPRINGS, CA 90670
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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client:	Partner Engineering & Science, Inc.	**Report date:**	8/13/2019
Client Address:	2154 Torrance Blvd., Suite 200 Torrance, CA 90501	**Jones Ref. No.:**	ST-14113
		Client Ref. No.:	19-250627.2
Attn:	Hernan Gutierrez	**Date Sampled:**	8/6/2019
		Date Received:	8/6/2019
Project:	San Vicente	**Date Analyzed:**	8/13/2019
Project Address:	400 S. San Vicente Blvd. Los Angeles, CA	**Physical State:**	Soil

EPA 8260B by 5035 – Volatile Organics by GC/MS + Oxygenates/Gasoline Range Organics

Sample Spiked:	CLEAN SOIL		**GC#:**	VOC3-081319-01		
Jones ID:	**081319-V3MS1**	**081319-V3MSD1**			**081319-V3CCV1**	
Parameter	MS Recovery (%)	MSD Recovery (%)	RPD	Acceptability Range (%)	CCV	Acceptability Range (%)
Vinyl chloride	114%	111%	2.4%	60 - 140	81%	80 - 120
1,1-Dichloroethene	129%	123%	4.3%	60 - 140	131%	80 - 120
Cis-1,2-Dichloroethene	121%	111%	8.2%	70 - 130	83%	80 - 120
1,1,1-Trichloroethane	120%	118%	1.5%	70 - 130	84%	80 - 120
Benzene	118%	116%	2.1%	70 - 130	82%	80 - 120
Trichloroethene	116%	110%	4.8%	70 - 130	84%	80 - 120
Toluene	118%	109%	7.2%	70 - 130	86%	80 - 120
Tetrachloroethene	119%	115%	3.6%	70 - 130	90%	80 - 120
Chlorobenzene	118%	114%	3.1%	70 - 130	91%	80 - 120
Ethylbenzene	111%	103%	6.8%	70 - 130	86%	80 - 120
1,2,4 Trimethylbenzene	105%	104%	1.8%	70 - 130	87%	80 - 120
Gasoline Range Organics (C4-C12)	113%	108%	4.5%	70 - 130		
Surrogate Recovery:						
Dibromofluoromethane	103%	109%		60 - 140	101%	60 - 140
Toluene-d_8	104%	108%		60 - 140	100%	60 - 140
4-Bromofluorobenzene	99%	99%		60 - 140	99%	60 - 140

MS = Matrix Spike
MSD = Matrix Spike Duplicate
CCV = Continuing Calibration Verification
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 20%

JONES ENVIRONMENTAL, INC.

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Santa Fe Springs, CA 90670
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Fax (714) 449-9685
www.jonesenv.com

Chain-of-Custody Record

Client	Portner Engineering and Science
Date	8/6/19
Project Name	San Vicente
Client Project #	19-250627.2
Project Address	400 S. San Vicente Blvd Los Angeles, CA. 90048
Email	jryan@portneresi.com
Phone	(219) 221-0366
Report To	Jessica Ryan
Sampler	H. Gutierrez

Turn Around Requested:
- ☐ Immediate Attention
- ☑ Rush 24 Hours
- ☐ Rush 48 Hours
- ☐ Rush 72 Hours
- ☐ Normal

Report Options
EDD _____
EDF* - 10% Surcharge____
*Global ID _____

LAB USE ONLY
Jones Project # CT-14113
Page 1 of 2

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Sample Container / Preservative Abbreviations
- AS - Acetate Sleeve
- SS - Stainless Steel Sleeve
- BS - Brass Sleeve
- G - Glass
- AB - Amber Bottle
- P - Plastic
- SOBI - Sodium Bisulfate
- MeOH - Methanol
- HCl - Hydrochloric Acid
- HNO3 - Nitric Acid
- O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	TPH-cc Hfiesel 8015/8260 types to ID		PAHs 8270		VOCs 8260						Hold	Number of Containers	Notes & Special Instructions
B1-2	8/6	8:20	CT-14113-01		SLEEVE #3VOAs	S													
B1-5		8:34	CT-14113-02																
B1-10		8:40	CT-14113-03																
B1-15		8:48	CT-14113-04				X		X		X								
B1-20		8:50	CT-14113-05																
B2-2		9:18	CT-14113-06																
B2-5		9:22	CT-14113-07																
B2-10		9:29	CT-14113-08																
B2-15		9:36	CT-14113-09				X	/	X		X								
B2-20			CT-14113-10																

Relinquished By (Signature)	Printed Name: Hernan Gutierrez	Received By (Signature)	Printed Name: Stephanie Salas
Company: PES	Date: 8/6 Time: 14:20	Company: Jones Env	Date: 8/6/19 Time: 1420
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name
Company	Date: Time	Company	Date Time

Total Number of Containers

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

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Chain-of-Custody Record

LAB USE ONLY
Jones Project # ST-14113
Page 2 of 2

Sample Condition as Recieved:
Chilled □ yes □ no
Sealed □ yes □ no

Client: Partner ESI
Date: 8/6/19
Project Name: San Vicente
Client Project #: 19-250627.2
Project Address: 400 S. San Vicente Blvd
Los Angeles, CA 90048
Email: jryan@partneresi.com
Phone: (214) 221-0366
Report To: Jessica Ryan
Sampler: Hernan Gutierrez

Turn Around Requested:
□ Immediate Attention
☑ Rush 24 Hours
□ Rush 48 Hours
□ Rush 72 Hours
□ Normal

Report Options
EDD _____
EDF* - 10% Surcharge____
*Global ID _____

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	TPH-CC T905 TO15SIM T011 8015/8260		PAHs 8270		VOCs 8260						Hold	Number of Containers	Notes & Special Instructions
B2-25	8/6		ST-14113-11		SLEEVE & 3VOAs	S													
B3-2			ST-14113-12				X		X		X								
B3-5			ST-14113-13								X	add 8/13 24hr							
B3-10			ST-14113-14				X		X		X								
B4-2			ST-14113-15				X		X		X								
B4-5			ST-14113-16								X	add 8/13 24h							
B4-10			ST-14113-17				X		X		X								
B1-GW20			ST-14113-18		Amber bottle & 3VOAs				X		X								
B2-GW20			ST-14113-19						X		X								

Relinquished By (Signature)	Printed Name	Received By (Signature)	Printed Name	
	Hernan Gutierrez		Stephanie Salas	Total Number of Containers
Company: PES	Date: 8/6 Time: 14:20	Company: Jones Env	Date: 8/6/19 Time: 1420	
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature)	Printed Name	
Company	Date: Time	Company	Date Time	

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

APPENDIX F

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-1
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/17/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.	LITHOLOGIC DESCRIPTION
							@Surface: 4" Concrete
							@2': Lean to fat CLAY with sand, grayish brown, moist, stiff, no s/o.
			LB-1-2'		2.0		@5': Lean CLAY with trace silt, pale brown, moist, stiff, no s/o.
5			LB-1-5'		0.7		@10': Lean to fat CLAY with trace sand, medium brown, moist, stiff, fine to medium grained, no s/o.
10			LB-1-10'		0.2		
							@11.5': Lean to fat CLAY with trace sand, medium brown, wet, stiff, fine to medium grained, no s/o.
							Total Depth: 12 feet bgs Groundwater encountered: 11.5 feet Probes installed at 5 and 10 feet
15							

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-2
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/17/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.	LITHOLOGIC DESCRIPTION
							@Surface: 4" Concrete
							@2': Lean to fat CLAY with trace sand, dark grayish brown, moist, stiff, fine to medium sand, no s/o.
			LB-2-2'		1.0		
5			LB-2-5'		1.0		@10': Lean to fat CLAY, yellowish brown, moist, stiff, no s/o.
10			LB-2-10'		0.8		
							@11.5': Lean to fat CLAY, yellowish brown, wet, stiff, no s/o.
							Total Depth: 12 feet bgs Groundwater encountered: 11.5 feet Probes installed at 5 and 10 feet
15							

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-3
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/17/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.	LITHOLOGIC DESCRIPTION
							@Surface: 4" Concrete
							@2': Lean to fat CLAY with trace sand, gray, moist, stiff, fine to medium grained, no s/o.
			LB-3-2'		4.3		@5': Lean to fat clay, pale gray, moist, stiff, no s/o.
5			LB-3-5'		0.8		@10': Lean to fat CLAY, grayish olive brown, moist, stiff, no s/o.
10			LB-3-10'		0.1		
							@12': Lean to fat CLAY, grayish olive brown, wet, stiff, no s/o.
							Total Depth: 12.5 feet bgs Groundwater encountered: 12.0 feet Probes installed at 5 and 10 feet
15							

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-4
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/17/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.	LITHOLOGIC DESCRIPTION
							@Surface: 6.5" Asphalt, 4.5" Concrete
							@2': Lean to fat CLAY with trace sand, dark grayish brown, moist, stiff, fine to medium grained, no s/o.
			LB-4-2'		0.0		@5': Lean to fat CLAY, grayish brown, moist, stiff, no s/o.
5			LB-4-5'		0.0		@10': Lean to fat CLAY, yellowish brown, moist, stiff, no s/o.
10			LB-4-10'		0.0		
							@12': Lean to fat CLAY, yellowish brown, wet, stiff, no s/o.
							Total Depth: 12.5 feet bgs Groundwater encountered: 12.0 feet Probes installed at 5 and 10 feet
15							

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-5
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/17/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.	LITHOLOGIC DESCRIPTION
							@Surface: 10" Concrete
							@2': Lean to fat CLAY with trace gravel, brown, moist, stiff, fine to medium grained, no s/o.
			LB-5-2'		3.7		@5': Lean to fat CLAY, grayish brown, moist, stiff, no s/o.
5			LB-5-5'		1.0		@10': Lean to fat CLAY, pale yellowish brown, wet, stiff, no s/o.
10			LB-5-10'		0.1		
15							Total Depth: 13.5 feet bgs Groundwater encountered: 10.0 feet Probes installed at 5 and 10 feet

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-6
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/17/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.		LITHOLOGIC DESCRIPTION
								@Surface: 10" Concrete
								@2': Lean to fat CLAY with trace sand, dark brown, moist, stiff, fine to medium grained, no s/o.
			LB-6-2'		0.3			@5': Lean to fat CLAY, grayish brown, moist, stiff, no s/o.
5			LB-6-5'		0.0			@10': Lean to fat CLAY, pale yellowish brown, moist, stiff, no s/o.
10			LB-6-10'		0.4			
								@11': Lean to fat CLAY, pale yellowish brown, wet, stiff, no s/o.
15								Total Depth: 13.5 feet bgs Groundwater encountered: 11.0 feet Probes installed at 5 and 10 feet

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-7
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/17/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.	LITHOLOGIC DESCRIPTION
							@Surface: Topsoil with organics
							@2': Lean to fat CLAY, pale yellowish brown, moist, stiff, no s/o.
			LB-7-2'	☒	0.0		@5': Lean CLAY with sand, pale olive brown, moist, stiff, fine to medium grained, no s/o.
5			LB-7-5'	☒	0.7		@10': Lean CLAY with sand, yellowish brown, moist, stiff, fine to medium grained, no s/o.
10			LB-7-10'	☒	0.0		
							@11.5': Lean CLAY with sand, yellowish brown, wet, stiff, fine to medium grained, no s/o.
15							
20							@20': Lean to fat CLAY, gray, wet, stiff, no s/o.
25							

SOIL BORING LOG

PROJECT NUMBER 13401.002 **BORING/WELL NUMBER** LB-7

PROJECT NAME Oklahome Rock/SanVincent/EnvPh II **DATE DRILLED** 1/17/2022

Continued from Previous Page

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.		LITHOLOGIC DESCRIPTION
								Total Depth: 25.0 feet bgs Groundwater encountered: 11.5 feet Probes installed at 5 and 10 feet
30								
35								
40								
45								
50								

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-8
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/18/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Hand Auger, Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	8oz Glass Jar, SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.		LITHOLOGIC DESCRIPTION
								@Surface: 4" Concrete Hand Auger to 4.5 feet. @2': Lean to fat CLAY with trace sand, very dark brown, moist, stiff, no s/o.
			LB-8-2'		0.8			@5': Lean to fat CLAY, dark grayish brown, moist, stiff, no s/o.
5			LB-8-5'		0.4			@10': Lean to fat CLAY, olive brown, moist, stiff, no s/o.
10			LB-8-10'		1.7			Refusal at 10 feet. Total Depth: 10.0 feet bgs No groundwater encountered Probes Installed at 5 and 10 feet
15								

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-9
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/18/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Hand Auger	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	8oz Glass Jar	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.		LITHOLOGIC DESCRIPTION
								@Surface: 4" Concrete Hand Auger to 10.0 feet.
								@2': Lean to fat CLAY with trace sand, very dark brown, moist, stiff, no s/o.
			LB-9-2'		1.5			
5			LB-9-5'		2.0			@10': Lean CLAY, pale brown, moist, stiff, no s/o.
10			LB-9-10'		0.4			Refusal at 10 feet. Total Depth: 10.0 feet bgs No groundwater encountered Probes installed at 5 and 10 feet
15								

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-10
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/18/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Hand Auger, Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	8oz Glass Jar, SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.		LITHOLOGIC DESCRIPTION
								@Surface: 4" Concrete Hand Auger to 4.5 feet.
								@2': Lean to fat CLAY with trace sand, dark brown, moist, stiff, fine to medium grained, no s/o.
			LB-10-2'		0.0			@5': Lean to fat CLAY, dark brown, moist, stiff, no s/o.
5			LB-10-5'		0.5			@10': Lean CLAY with sand and trace gravel, brown, moist, stiff, no s/o.
10			LB-10-10'		2.3			Total Depth: 10.0 feet bgs No groundwater encountered due to limitations Probes installed at 5 and 10 feet
15								

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-11
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/18/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Hand Auger, Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	8oz Glass Jar, SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.		LITHOLOGIC DESCRIPTION
								@Surface: 4" Concrete Hand Auger to 4.5 feet.
								@2': Lean to fat CLAY with trace sand, dark brown, moist, stiff, fine to medium grained, no s/o.
			LB-11-2'		5.2			@5': Lean to fat CLAY, very dark brown, moist, stiff, no s/o.
5			LB-11-5'		3.9			@10': Lean CLAY, pale brown, moist, stiff, no s/o.
10			LB-11-10'		1.5			Total Depth: 10.0 feet bgs No groundwater encountered due to limitations Probes installed at 5 and 10 feet
15								

SOIL BORING LOG

PROJECT NUMBER	13401.002	**BORING/WELL NUMBER**	LB-12
PROJECT NAME	Oklahome Rock/SanVincent/EnvPh II	**DATE DRILLED**	1/18/2022
LOCATION	400 South San Vicente Boulevard, Los Angeles, CA	**CASING TYPE/DIAMETER**	N/A / N/A
DRILLING METHOD	Hand Auger, Direct Push	**SCREEN TYPE/SLOT**	N/A / N/A
SAMPLING METHOD	8oz Glass Jar, SPT	**FILTER PACK TYPE**	N/A
GROUND ELEVATION		**GROUT TYPE**	N/A
TOP OF CASING ELEV.	N/A	**DEPTH TO WATER**	ft.
LOGGED BY	YTN	**TOTAL DRILL DEPTH**	10 ft.
REMARKS	Drilling completed by Millenium Environmental, Inc.	**HOLE DIAMETER**	3.25 inch

DEPTH (ft. BGL)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	PID (ppm)	U.S.C.S.		LITHOLOGIC DESCRIPTION
								@Surface: 4" Concrete Hand Auger to 4.5 feet. @2': Lean CLAY, dark brown, moist, stiff, no s/o.
			LB-12-2'		0.5			@5': Lean to fat CLAY with sand and trace gravel, very dark brown, moist, stiff, fine to medium grained, no s/o.
5			LB-12-5'		2.2			@10': Lean CLAY, pale brown, moist, stiff, no s/o.
10			LB-12-10'		1.2			Total Depth: 10.0 feet bgs Groundwater encountered: 20.0' Probes installed at 5 and 10 feet
15								
20								

APPENDIX C
Liquefaction Analysis

PGA[1] (g)	0.985
Depth to GW (BGS)	12.0
HHGW (ft)	10.0
g^2 (ft/sec^2)	32.2
M	6.77
PI Cutoff	16
Boring #	B-5

Project #	700109901		
Client	Oklahoma Rock		
Calcs by	CJZ	Date	1/30/2022
Checked by	-	Date	-

Total Settlement	
Upper 50 feet	2.5
Full Depth of Boring	2.5

Layer #	Depth[3] (ft)			USCS[4]	PI[5] (%)	Blow Counts and Adj. for Fines					γ[9] (pcf)	Current static water pressure (psf)	HHGW static water pressure (psf)	σ_{vo} (psf)[10]	σ'_{vo} (psf)[11]	σ_{vo} (psf)[10]	σ'_{vo} (psf)[11]	r[12]	CSR[13]	$CRR_{7.5}$[14]	MSF[15]	FS[16]	Settlement			Residule Strength (psf)	
	Top	Mid	Bottom			$(N_1)_{60}$[6]	% fines	α[7]	β[7]	$(N_1)_{60cs}$[8]													(%)	Incremental (inches)	Cumulative (inches)	$S_u(liq)/\sigma'_{v0}$	Su(liq)
1	0	0.5	1	CL	0	20	51	5.00	1.20	29.0	120	0	0	60	60	60	60	1.000	0.64054	0.41108	1.358	no gw	-	0.0	2.5	-	-
2	1	1.5	2	CL	0	20	51	5.00	1.20	29.0	120	0	0	180	180	180	180	0.998	0.63927	0.41108	1.358	no gw	-	0.0	2.5	-	-
3	2	2.5	3	CL	0	20	51	5.00	1.20	29.0	120	0	0	300	300	300	300	0.996	0.63778	0.41108	1.358	no gw	-	0.0	2.5	-	-
4	3	3.5	4	CL	0	20	51	5.00	1.20	29.0	120	0	0	420	420	420	420	0.994	0.63626	0.41108	1.358	no gw	-	0.0	2.5	-	-
5	4	4.5	5	CL	0	20	51	5.00	1.20	29.0	120	0	0	540	540	540	540	0.991	0.63475	0.41108	1.358	no gw	-	0.0	2.5	-	-
6	5	5.5	6	CL	0	20	51	5.00	1.20	29.0	120	0	0	660	660	660	660	0.989	0.63326	0.41108	1.358	no gw	-	0.0	2.5	-	-
7	6	6.5	7	CL	0	11.081	51	5	1.2	18.3	120	0	0	780	780	780	780	0.9868	0.63180	0.19518	1.358	no gw	-	0.0	2.5	-	-
8	7	7.5	8	CL	0	27.28	51	5	1.2	37.7	120	0	0	900	900	900	900	0.9846	0.63036	NL	1.358	no gw	-	0.0	2.5	-	-
9	8	8.5	9	CL	0	25.625	51	5	1.2	35.8	120	0	0	1020	1020	1020	1020	0.9824	0.62896	NL	1.358	no gw	-	0.0	2.5	-	-
10	9	9.5	10	CL	0	24.239	51	5	1.2	34.1	120	0	0	1140	1140	1140	1140	0.9802	0.62758	NL	1.358	no gw	-	0.0	2.5	-	-
11	10	10.5	11	CL	17	23.056	67	5	1.2	32.7	120	0	31.2	1260	1260	1260	1260	0.9781	0.62622	NL	1.358	-	-	0.0	2.5	-	-
12	11	11.5	12	CL	17	22.031	67	5	1.2	31.4	120	0	93.6	1380	1380	1380	1380	0.976	0.62486	NL	1.358	-	-	0.0	2.5	-	-
13	12	12.5	13	CL	17	12.672	67	5	1.2	20.2	120	31.2	156	1500	1469	1500	1469	0.9739	0.63676	NL	1.358	-	-	0.0	2.5	-	-
14	13	13.5	14	CL	17	12.43	67	5	1.2	19.9	120	93.6	218.4	1620	1526	1620	1526	0.9718	0.66032	NL	1.358	-	-	0.0	2.5	-	-
15	14	14.5	15	ML	0	13.133	51	5	1.2	20.8	120	156	280.8	1740	1584	1740	1584	0.9696	0.68195	0.22508	1.358	0.4	0.014	0.2	2.5	0.12849625	203.5
16	15	15.5	16	ML	0	13	51	5.00	1.20	20.5	120	218.4	343.2	1860	1642	1860	1642	0.967	0.70183	0.22148	1.358	0.4	0.014	0.2	2.4	0.126752816	208.1
17	16	16.5	17	ML	0	13	51	5.00	1.20	20.2	120	280.8	405.6	1980	1699	1980	1699	0.965	0.72014	0.21811	1.358	0.4	0.014	0.2	2.2	0.125098799	212.6
18	17	17.5	18	ML	0	23	51	5.00	1.20	32.6	120	343.2	468	2100	1757	2100	1757	0.963	0.73700	NL	1.358	-	-	0.0	2.0	-	-
19	18	18.25	18.5	ML	0	23	51	5.00	1.20	32.3	120	390	514.8	2190	1800	2190	1800	0.961	0.74877	NL	1.358	-	-	0.0	2.0	-	-
20	18.5	18.75	19	ML	0	23	51	5.00	1.20	32.1	120	421.2	546	2250	1829	2250	1829	0.960	0.75622	NL	1.358	-	-	0.0	2.0	-	-
21	19	19.5	20	ML	0	22	51	5.00	1.20	31.8	120	468	592.8	2340	1872	2340	1872	0.958	0.76684	NL	1.358	-	-	0.0	2.0	-	-
22	20	20.5	21	CL	15	11	57	5.00	1.20	18.4	120	530.4	655.2	2460	1930	2460	1930	0.956	0.77999	0.19619	1.358	0.3	0.015	0.2	2.0	0.113663285	219.3
23	21	21.5	22	CL	15	11	57	5.00	1.20	18.2	120	592.8	717.6	2580	1987	2580	1987	0.953	0.79205	0.19397	1.358	0.3	0.015	0.2	1.8	0.112441858	223.4
24	22	22.5	23	CL	15	11	57	5.00	1.20	18.0	120	655.2	780	2700	2045	2700	2045	0.950	0.80310	0.19186	1.358	0.3	0.015	0.2	1.7	0.111272411	227.5
25	23	23.5	24	CL	8	21	51	5.00	1.20	30.3	120	717.6	842.4	2820	2102	2820	2102	0.947	0.81316	NL	1.358	-	-	0.0	1.5	-	-
26	24	24.5	25	CL	8	21	51	5.00	1.20	29.9	120	780	904.8	2940	2160	2940	2160	0.944	0.82228	0.46180	1.358	0.8	0.011	0.1	1.5	0.185717814	401.2
27	25	25.5	26	CL	8	20	51	5.00	1.20	29.6	120	842.4	967.2	3060	2218	3060	2218	0.940	0.83048	0.44132	1.358	0.7	0.011	0.1	1.4	0.183682199	407.3
28	26	26.5	27	CL	8	20	51	5.00	1.20	29.3	120	904.8	1029.6	3180	2275	3180	2275	0.936	0.83781	0.42398	1.358	0.7	0.011	0.1	1.2	0.181724384	413.5
29	27	27.5	28	CL	8	21	51	5.00	1.20	30.2	120	967.2	1092	3300	2333	3300	2333	0.932	0.84426	NL	1.358	-	-	0.0	1.1	-	-
30	28	28.5	29	CL	8	20	51	5.00	1.20	29.5	120	1029.6	1154.4	3420	2390	3420	2390	0.928	0.84986	0.43480	1.358	0.7	0.011	0.1	1.1	0.182973571	437.4
31	29	29.5	30	CL	8	20	51	5.00	1.20	29.2	120	1092	1216.8	3540	2448	3540	2448	0.923	0.85462	0.41937	1.358	0.7	0.011	0.1	1.0	0.181163169	443.5
32	30	30.5	31	CL	8	20	51	5.00	1.20	28.9	120	1154.4	1279.2	3660	2506	3660	2506	0.918	0.85855	0.40590	1.358	0.6	0.011	0.1	0.8	0.179415559	449.5
33	31	31.5	32	CL	8	20	20	3.61	1.08	24.9	120	1216.8	1341.6	3780	2563	3780	2563	0.913	0.86166	0.28946	1.358	0.5	0.014	0.2	0.7	0.177727193	455.6
34	32	32.5	33	CL	8	19	51	5.00	1.20	28.4	120	1279.2	1404	3900	2621	3900	2621	0.907	0.86395	0.38343	1.358	0.6	0.011	0.1	0.5	0.176094798	461.5
35	33	33.5	34	CL	8	19	51	5.00	1.20	28.1	120	1341.6	1466.4	4020	2678	4020	2678	0.901	0.86545	0.37392	1.358	0.6	0.011	0.1	0.4	0.174515349	467.4
36	34	34.5	35	CL	8	19	51	5.00	1.20	27.9	120	1404	1528.8	4140	2736	4140	2736	0.894	0.86616	0.36532	1.358	0.6	0.011	0.1	0.3	0.172986043	473.3
37	35	35.5	36	SC	0	80	15	2.50	1.05	86.8	120	1466.4	1591.2	4260	2794	4260	2794	0.887	0.86609	NL	1.358	-	-	0.0	0.1	-	-
38	36	36.5	37	SC	0	80	15	2.50	1.05	86.0	120	1528.8	1653.6	4380	2851	4380	2851	0.880	0.86526	NL	1.358	-	-	0.0	0.1	-	-
39	37	37.5	38	SC	0	79	15	2.50	1.05	85.2	120	1591.2	1716	4500	2909	4500	2909	0.872	0.86369	NL	1.358	-	-	0.0	0.1	-	-
40	38	38.5	39	SP	0	32	0	0.00	1.00	31.6	120	1653.6	1778.4	4620	2966	4620	2966	0.864	0.86141	NL	1.358	-	-	0.0	0.1	-	-
41	39	39.5	40	SP	0	31	0	0.00	1.00	31.3	120	1716	1840.8	4740	3024	4740	3024	0.855	0.85845	NL	1.358	-	-	0.0	0.1	-	-
42	40	40.5	41	SP	0	31	0	0.00	1.00	31.0	120	1778.4	1903.2	4860	3082	4860	3082	0.847	0.85484	NL	1.358	-	-	0.0	0.1	-	-
43	41	41.5	42	SP	0	31	0	0.00	1.00	30.7	120	1840.8	1965.6	4980	3139	4980	3139	0.837	0.85061	NL	1.358	-	-	0.0	0.1	-	-
44	42	42.5	43	SP	0	30	0	0.00	1.00	30.4	120	1903.2	2028	5100	3197	5100	3197	0.828	0.84582	NL	1.358	-	-	0.0	0.1	-	-
45	43	43.5	44	SP	0	30	0	0.00	1.00	30.1	120	1965.6	2090.4	5220	3254	5220	3254	0.818	0.84051	NL	1.358	-	-	0.0	0.1	-	-
46	44	44.5	45	SP	0	30	0	0.00	1.00	29.9	120	2028	2152.8	5340	3312	5340	3312	0.809	0.83472	0.45919	1.358	0.7	0.011	0.1	0.1	0.254067328	841.5
47	45	45.5	46	CL	17	24	51	5.00	1.20	33.9	120	2090.4	2215.2	5460	3370	5460	3370	0.799	0.82851	NL	1.358	-	-	0.0	0.0	-	-
48	46	46.5	47	CL	17	24	51	5.00	1.20	33.6	120	2152.8	2277.6	5580	3427	5580	3427	0.788	0.82194	NL	1.358	-	-	0.0	0.0	-	-
49	47	47.5	48	CL	17	24	51	5.00	1.20	33.4	120	2215.2	2340	5700	3485	5700	3485	0.778	0.81505	NL	1.358	-	-	0.0	0.0	-	-
50	48	48.5	49	CL	17	23	51	5.00	1.20	33.2	120	2277.6	2402.4	5820	3542	5820	3542	0.768	0.80791	NL	1.358	-	-	0.0	0.0	-	-
51	49	49.5	50	CL	0	26	51	5.00	1.20	36.6	120	2340	2464.8	5940	3600	5940	3600	0.758	0.80057	NL	1.358	-	-	0.0	0.0	-	-
52	50	50.5	51	CL	0	26	51	5.00	1.20	36.4	120	2402.4	2527.2	6060	3658	6060	3658	0.748	0.79307	NL	1.358	-	-	0.0	0.0	-	-
53	51	51.5	52	CL	0	26	51	5.00	1.20	36.1	120	2464.8	2589.6	6180	3715	6180	3715	0.738	0.78548	NL	1.358	-	-	0.0	0.0	-	-
54	52	52.5	53	CL	0	48	51	5.00	1.20	62.1	120	2527.2	2652	6300	3773	6300	3773	0.728	0.77784	NL	1.358	-	-	0.0	0.0	-	-
55	53	53.5	54	CL	0	47	51	5.00	1.20	61.6	120	2589.6	2714.4	6420	3830	6420	3830	0.718	0.77018	NL	1.358	-	-	0.0	0.0	-	-
56	54	54.5	55	CL	0	47	51	5.00	1.20	61.2	120	2652	2776.8	6540	3888	6540	3888	0.708	0.76257	NL	1.358	-	-	0.0	0.0	-	-
57	55	55.5	56	CL	0	46	51	5.00	1.20	60.8	120	2714.4	2839.2	6660	3946	6660	3946	0.699	0.75502	NL	1.358	-	-	0.0	0.0	-	-
58	56	56.5	57	CL	0	45	51	5.00	1.20	59.2	120	2776.8	2901.6	6780	4003	6780	4003	0.689	0.74758	NL	1.358	-	-	0.0	0.0	-	-
59	57	57.5	58	CL	0	23	51	5.00	1.20	32.8	120	2839.2	2964	6900	4061	6900	4061	0.680	0.74027	NL	1.358	-	-	0.0	0.0	-	-
60	58	58.5	59	CL	0	23	51	5.00	1.20	32.6	120	2901.6	3026.4	7020	4118	7020	4118	0.672	0.73312	NL	1.358	-	-	0.0	0.0	-	-
61	59	59.5	60	CL	0	23	51	5.00	1.20	32.4	120	2964	3088.8	7140	4176	7140	4176	0.663	0.72614	NL	1.358	-	-	0.0	0.0	-	-
62	60	60.5	61	CL	0	23	51	5.00	1.20	32.1	120	3026.4	3151.2	7260	4234	7260	4234	0.655	0.71936	NL	1.358	-	-	0.0	0.0	-	-
63	61	61.5	62	CL	0	22	51	5.00	1.20	31.9	120	3088.8	3213.6	7380	4291	7380	4291	0.647	0.71278	NL	1.358	-	-	0.0	0.0	-	-
64	62	62.5	63	CL	0	22	51	5.00	1.20	31.7	120	3151.2	3276	7500	4349	7500	4349	0.640	0.70642	NL	1.358	-	-	0.0	0.0	-	-
65	63	63.5	64	SC	0	59	51	5.00	1.20	76.0	120	3213.6	3338.4	7620	4406	7620	4406	0.632	0.70028	NL	1.358	-	-	0.0	0.0	-	-
66	64	64.5	65	SC	0	59	51	5.00	1.20	75.5	120	3276	3400.8	7740	4464	7740	4464	0.625	0.69437	NL	1.358	-	-	0.0	0.0	-	-
67	65	65.5	66	SC	0	58	51	5.00	1.20	74.9	120	3338.4	3463.2	7860	4522	7860	4522	0.619	0.68868	NL	1.358	-	-	0.0	0.0	-	-
68	66	66.5	67	SC	0	58	51	5.00	1.20	74.3	120	3400.8	3525.6	7980	4579	7980	4579	0.612	0.68322	NL	1.358	-	-	0.0	0.0	-	-
69	67	67.5	68	SC	0	24	51	5.00	1.20	34.1	120	3463.2	3588	8100	4637	8100	4637	0.606	0.67798	NL	1.358	-	-	0.0	0.0	-	-
70	68	68.5	69	SC	0	24	51	5.00	1.20	33.9	120	3525.6	3650.4	8220	4694	8220	4694	0.600	0.67297	NL	1.358	-	-	0.0	0.0	-	-
71	69	69.5	70	SC	0	24	51	5.00	1.20	33.6	120	3588	3712.8	8340	4752	8340	4752	0.595	0.66817	NL	1.358	-	-	0.0	0.0	-	-
72	70	70.5	71	SC	0	24	51	5.00	1.20	33.4	120	3650.4	3775.2	8460	4810	8460	4810	0.589	0.66358	NL	1.358	-	-	0.0	0.0	-	-
73	71	71.5	72	SC	0	23	51	5.00	1.20	33.2	120	3712.8	3837.6	8580	4867	8580	4867	0.584	0.65919	NL	1.358	-	-	0.0	0.0	-	-
74	72	72.5	73	SC	0	23	51	5.00	1.20	33.0	120	3775.2	3900	8700	4925	8700	4925	0.579	0.65500	NL	1.358	-	-	0.0	0.0	-	-
75	73	73.5	74	SC	0	43	51	5.00	1.20	56.2	120	3837.6	3962.4	8820	4982	8820	4982	0.574	0.65100	NL	1.358	-	-	0.0	0.0	-	-
76	74	74.5	75	SC	0	42	51	5.00	1.20	55.9	120	3900	4024.8	8940	5040	8940	5040	0.570	0.64717	NL	1.358	-	-	0.0	0.0	-	-
77	75	75.5	76	SC	0	42	51	5.00	1.20	55.5	120	3962.4	4087.2	9060	5098	9060	5098	0.566	0.64352	NL	1.358	-	-	0.0	0.0	-	-

Notes:

1. peak ground acceleration
2. gravitational acceleration in g's
3. define depths to layers (BGS) for top, middle, and bottom
4. unified soil classification system (USCS)
5. plasticity index - used for ML layers only. Populates as "0" if layer is not ML
5. corrected blow counts normalized to 1 ton overburden
6. clean sand equivalent coefficients used to correct
   blow counts for fines content (Youd et al., 2001)
7. clean sand equivalent blow counts calculated by:
   (N1)60cs = a + b(N1)60 (Youd et al., 2001)
8. Unit weight of soil (pcf)
9. overburden stress (psf)
10. effective overburden (psf)
11. stress reduction coefficent (Youd, 2001)
12. cycliic stress ratio:
    CSR = tave/s'v0 = $0.65(a_{max}/g)(s_{v0}/s'_{vo})r_d$
13. cyclic resistance ratio for earthquake magnitude 7.5
    "NL" indicates layer is not liquefyable
14. magnitude scaling factor to adjust CRR7.5 values to
    different earthquake magnitudes
15. factor of safety
    green dot indicates FS ≥ 1.5; yellow dot indicates 1.0 < FS < 1.5;
    red dot indicates FS ≤ 1.0; no gw indicates no groundwater

PGA[1] (g)	0.985
Depth to GW (BGS)	12.0
HHGW (ft)	10.0
g^2 (ft/sec^2)	32.2
M	6.77
PI Cutoff	16
Boring #	B-6

Project #	700109901		
Client	Oklahoma Rock		
Calcs by	CC	Date	1/17/2022
Checked by	-	Date	-

Total Settlement	
Upper 50 feet	2.1
Full Depth of Boring	2.1

Layer #	Depth[3] (ft)			USCS[4]	PI[5] (%)	Blow Counts and Adj. for Fines					γ[9] (pcf)	Current static water pressure (psf)	HHGW static water pressure (psf)	σ_{vo} (psf)[10]	σ'_{vo} (psf)[11]	σ_{vo} (psf)[10]	σ'_{vo} (psf)[11]	r[12]	CSR[13]	$CRR_{7.5}$[14]	MSF[15]	FS[16]	Settlement			Residue Strength (psf)	
	Top	Mid	Bottom			$(N_1)_{60}$[6]	% fines	α[7]	β[7]	$(N_1)_{60cs}$[8]													(%)	Incremental (inches)	Cumulative (inches)	$S_u(liq)/\sigma'_{v0}$	Su(liq)
1	0	0.5	1	CL	0	30	51	5.00	1.20	41.6	120	0	0	60	60	60	60	1.000	0.64054	NL	1.358	no gw	-	0.0	2.1	-	-
2	1	1.5	2	CL	0	30	51	5.00	1.20	41.6	120	0	0	180	180	180	180	0.998	0.63927	NL	1.358	no gw	-	0.0	2.1	-	-
3	2	2.5	3	CL	0	30	51	5.00	1.20	41.6	120	0	0	300	300	300	300	0.996	0.63778	NL	1.358	no gw	-	0.0	2.1	-	-
4	3	3.5	4	CL	0	30	51	5.00	1.20	41.6	120	0	0	420	420	420	420	0.994	0.63626	NL	1.358	no gw	-	0.0	2.1	-	-
5	4	4.5	5	CL	0	30	51	5.00	1.20	41.6	120	0	0	540	540	540	540	0.991	0.63475	NL	1.358	no gw	-	0.0	2.1	-	-
6	5	5.5	6	CL	0	30	51	5.00	1.20	41.6	120	0	0	660	660	660	660	0.989	0.63326	NL	1.358	no gw	-	0.0	2.1	-	-
7	6	6.5	7	CL	0	29.55	51	5	1.2	40.5	120	0	0	780	780	780	780	0.9868	0.63180	NL	1.358	no gw	-	0.0	2.1	-	-
8	7	7.5	8	CL	0	9.7429	51	5	1.2	16.7	120	0	0	900	900	900	900	0.9846	0.63036	0.17753	1.358	no gw	-	0.0	2.1	-	-
9	8	8.5	9	CL	0	9.1519	51	5	1.2	16.0	120	0	0	1020	1020	1020	1020	0.9824	0.62896	0.17008	1.358	no gw	-	0.0	2.1	-	-
10	9	9.5	10	CL	0	8.6568	51	5	1.2	15.4	120	0	0	1140	1140	1140	1140	0.9802	0.62758	0.16398	1.358	no gw	-	0.0	2.1	-	-
11	10	10.5	11	CL	0	8.2343	51	5	1.2	14.9	120	0	31.2	1260	1260	1260	1260	0.9781	0.62622	0.15887	1.358	0.3	0.02	0.2	2.1	0.091757165	115.6
12	11	11.5	12	ML	0	4.3577	51	5	1.2	10.2	120	0	93.6	1380	1380	1380	1380	0.976	0.62486	0.11515	1.358	0.3	0.025	0.3	1.9	0.062683023	86.5
13	12	12.5	13	ML	0	4.224	51	5	1.2	10.1	120	31.2	156	1500	1468.8	1500	1468.8	0.9739	0.63676	0.11373	1.358	0.2	0.025	0.3	1.6	0.061679654	90.6
14	13	13.5	14	ML	0	4.1435	51	5	1.2	10.0	120	93.6	218.4	1620	1526.4	1620	1526.4	0.9718	0.66032	0.11287	1.358	0.2	0.027	0.3	1.3	0.061076177	93.2
15	14	14.5	15	CL	15	14.774	51	5	1.2	22.7	120	156	280.8	1740	1584	1740	1584	0.9696	0.68195	0.25277	1.358	0.5	0.014	0.2	1.0	0.140808281	223.0
16	15	15.5	16	CL	15	15	51	5.00	1.20	22.4	120	218.4	343.2	1860	1641.6	1860	1641.6	0.967	0.70183	0.24805	1.358	0.5	0.014	0.2	0.8	0.138846917	227.9
17	16	16.5	17	CL	15	14	51	5.00	1.20	22.1	120	280.8	405.6	1980	1699.2	1980	1699.2	0.965	0.72014	0.24370	1.358	0.5	0.014	0.2	0.6	0.136986149	232.8
18	17	17.5	18	CL	15	35	51	5.00	1.20	46.4	120	343.2	468	2100	1756.8	2100	1756.8	0.963	0.73700	NL	1.358	-	-	0.0	0.5	-	-
19	18	18.5	19	CL	15	34	51	5.00	1.20	45.8	120	405.6	530.4	2220	1814.4	2220	1814.4	0.961	0.75254	NL	1.358	-	-	0.0	0.5	-	-
20	19	19.5	20	CL	15	33	51	5.00	1.20	45.1	120	468	592.8	2340	1872	2340	1872	0.958	0.76684	NL	1.358	-	-	0.0	0.5	-	-
21	20	20.5	21	CL	22	18	51	5.00	1.20	26.4	120	530.4	655.2	2460	1929.6	2460	1929.6	0.956	0.77999	NL	1.358	-	-	0.0	0.5	-	-
22	21	21.5	22	CL	22	18	51	5.00	1.20	26.1	120	592.8	717.6	2580	1987.2	2580	1987.2	0.953	0.79205	NL	1.358	-	-	0.0	0.5	-	-
23	22	22.5	23	CL	22	17	51	5.00	1.20	25.8	120	655.2	780	2700	2044.8	2700	2044.8	0.950	0.80310	NL	1.358	-	-	0.0	0.5	-	-
24	23	23.5	24	CL	12	22	74	5.00	1.20	31.8	120	717.6	842.4	2820	2102.4	2820	2102.4	0.947	0.81316	NL	1.358	-	-	0.0	0.5	-	-
25	24	24.5	25	CL	12	22	74	5.00	1.20	31.5	120	780	904.8	2940	2160	2940	2160	0.944	0.82228	NL	1.358	-	-	0.0	0.5	-	-
26	25	25.5	26	CL	12	22	74	5.00	1.20	31.1	120	842.4	967.2	3060	2217.6	3060	2217.6	0.940	0.83048	NL	1.358	-	-	0.0	0.5	-	-
27	26	26.5	27	CL	12	21	74	5.00	1.20	30.8	120	904.8	1029.6	3180	2275.2	3180	2275.2	0.936	0.83781	NL	1.358	-	-	0.0	0.5	-	-
28	27	27.5	28	CL	12	22	74	5.00	1.20	31.8	120	967.2	1092	3300	2332.8	3300	2332.8	0.932	0.84426	NL	1.358	-	-	0.0	0.5	-	-
29	28	28.5	29	SC	0	70	15	2.50	1.05	76.2	120	1029.6	1154.4	3420	2390.4	3420	2390.4	0.928	0.84986	NL	1.358	-	-	0.0	0.5	-	-
30	29	29.5	30	SC	0	70	15	2.50	1.05	75.3	120	1092	1216.8	3540	2448	3540	2448	0.923	0.85462	NL	1.358	-	-	0.0	0.5	-	-
31	30	30.5	31	SC	0	69	15	2.50	1.05	74.5	120	1154.4	1279.2	3660	2505.6	3660	2505.6	0.918	0.85855	NL	1.358	-	-	0.0	0.5	-	-
32	31	31.5	32	SC	0	68	15	2.50	1.05	73.7	120	1216.8	1341.6	3780	2563.2	3780	2563.2	0.913	0.86166	NL	1.358	-	-	0.0	0.5	-	-
33	32	32.5	33	SC	0	67	20	3.61	1.08	76.1	120	1279.2	1404	3900	2620.8	3900	2620.8	0.907	0.86395	NL	1.358	-	-	0.0	0.5	-	-
34	33	33.5	34	SW	0	67	0	0.00	1.00	67.5	120	1341.6	1466.4	4020	2678.4	4020	2678.4	0.901	0.86545	NL	1.358	-	-	0.0	0.5	-	-
35	34	34.5	35	SW	0	67	0	0.00	1.00	66.8	120	1404	1528.8	4140	2736	4140	2736	0.894	0.86616	NL	1.358	-	-	0.0	0.5	-	-
36	35	35.5	36	SW	0	66	0	0.00	1.00	66.1	120	1466.4	1591.2	4260	2793.6	4260	2793.6	0.887	0.86609	NL	1.358	-	-	0.0	0.5	-	-
37	36	36.5	37	SW	0	65	0	0.00	1.00	65.4	120	1528.8	1653.6	4380	2851.2	4380	2851.2	0.880	0.86526	NL	1.358	-	-	0.0	0.5	-	-
38	37	37.5	38	SP	0	32	0	0.00	1.00	31.9	120	1591.2	1716	4500	2908.8	4500	2908.8	0.872	0.86369	NL	1.358	-	-	0.0	0.5	-	-
39	38	38.5	39	SP	0	32	0	0.00	1.00	31.6	120	1653.6	1778.4	4620	2966.4	4620	2966.4	0.864	0.86141	NL	1.358	-	-	0.0	0.5	-	-
40	39	39.5	40	SP	0	31	0	0.00	1.00	31.3	120	1716	1840.8	4740	3024	4740	3024	0.855	0.85845	NL	1.358	-	-	0.0	0.5	-	-
41	40	40.5	41	SP	0	31	0	0.00	1.00	31.0	120	1778.4	1903.2	4860	3081.6	4860	3081.6	0.847	0.85484	NL	1.358	-	-	0.0	0.5	-	-
42	41	41.5	42	SP	0	31	0	0.00	1.00	30.7	120	1840.8	1965.6	4980	3139.2	4980	3139.2	0.837	0.85061	NL	1.358	-	-	0.0	0.5	-	-
43	42	42.5	43	SP	0	30	0	0.00	1.00	30.4	120	1903.2	2028	5100	3196.8	5100	3196.8	0.828	0.84582	NL	1.358	-	-	0.0	0.5	-	-
44	43	43.5	44	CL	0	43	51	5.00	1.20	57.1	120	1965.6	2090.4	5220	3254.4	5220	3254.4	0.818	0.84051	NL	1.358	-	-	0.0	0.5	-	-
45	44	44.5	45	CL	0	43	51	5.00	1.20	56.6	120	2028	2152.8	5340	3312	5340	3312	0.809	0.83472	NL	1.358	-	-	0.0	0.5	-	-
46	45	45.5	46	CL	0	43	51	5.00	1.20	56.2	120	2090.4	2215.2	5460	3369.6	5460	3369.6	0.799	0.82851	NL	1.358	-	-	0.0	0.5	-	-
47	46	46.5	47	CL	0	42	51	5.00	1.20	55.8	120	2152.8	2277.6	5580	3427.2	5580	3427.2	0.788	0.82194	NL	1.358	-	-	0.0	0.5	-	-
48	47	47.5	48	CL	0	42	51	5.00	1.20	55.3	120	2215.2	2340	5700	3484.8	5700	3484.8	0.778	0.81505	NL	1.358	-	-	0.0	0.5	-	-
49	48	48.5	49	CL	16	18	51	5.00	1.20	27.2	120	2277.6	2402.4	5820	3542.4	5820	3542.4	0.768	0.80791	0.34363	1.358	0.6	0.011	0.1	0.5	0.168661174	597.5
50	49	49.5	50	CL	16	18	51	5.00	1.20	27.0	120	2340	2464.8	5940	3600	5940	3600	0.758	0.80057	0.33857	1.358	0.6	0.011	0.1	0.3	0.167547412	603.2
51	50	50.5	51	CL	16	18	51	5.00	1.20	26.8	120	2402.4	2527.2	6060	3657.6	6060	3657.6	0.748	0.79307	0.33382	1.358	0.6	0.011	0.1	0.2	0.166460064	608.8
52	51	51.25	51.5	CL	16	18	51	5.00	1.20	26.7	120	2449.2	2574	6150	3700.8	6150	3700.8	0.740	0.78738	0.33043	1.358	0.6	0.011	0.1	0.1	0.165661266	613.1

Notes:

1. peak ground acceleration
2. gravitational acceleration in g's
3. define depths to layers (BGS) for top, middle, and bottom
4. unified soil classification system (USCS)
5. plasticity index - used for ML layers only. Populates as "0" if layer is not ML
5. corrected blow counts normalized to 1 ton overburden
6. clean sand equivalent coefficients used to correct blow counts for fines content (Youd et al., 2001)
7. clean sand equivalent blow counts calculated by: (N1)60cs = a + b(N1)60 (Youd et al., 2001)
8. Unit weight of soil (pcf)
9. overburden stress (psf)
10. effective overburden (psf)
11. stress reduction coefficent (Youd, 2001)
12. cycliic stress ratio:
    $CSR = tave/s'v0 = 0.65(a_{max}/g)(s_{v0}/s'_{v0})r_d$
13. cyclic resistance ratio for earthquake magnitude 7.5
    "NL" indicates layer is not liquefyable
14. magnitude scaling factor to adjust CRR7.5 values to different earthquake magnitudes
15. factor of safety
    green dot indicates FS ≥ 1.5; yellow dot indicates 1.0 < FS < 1.5;
    red dot indicates FS ≤ 1.0; no gw indicates no groundwater

PGA[1] (g)	0.985
Depth to GW (BGS)	12.0
HHGW (ft)	10.0
g^2 (ft/sec^2)	32.2
M	6.77
PI Cutoff	18
Boring #	B-7

Project #	700109901		
Client	Oklahoma Rock		
Calcs by	CC	Date	1/17/2022
Checked by	-	Date	-

Total Settlement	
Upper 50 feet	1.8
Full Depth of Boring	1.8

Layer #	Depth[3] (ft)			USCS[4]	PI[5] (%)	Blow Counts and Adj. for Fines					γ[9] (pcf)	Current static water pressure (psf)	HHGW static water pressure (psf)	σ_{vo} (psf)[10]	σ'_{vo} (psf)[11]	σ_{vo} (psf)[10]	σ'_{vo} (psf)[11]	r[12]	CSR[13]	$CRR_{7.5}$[14]	MSF[15]	FS[16]	Settlement			Residue Strength (psf)	
	Top	Mid	Bottom			$(N_1)_{60}$[6]	% fines	α[7]	β[7]	$(N_1)_{60cs}$[8]													(%)	Incremental (inches)	Cumulative (inches)	$S_u(liq)/\sigma'_{v0}$	Su(liq)
1	0	0.5	1	CL	0	38	51	5.00	1.20	50.7	120	0	0	60	60	60	60	1.000	0.64054	NL	1.358	no gw	-	0.0	1.8	-	-
2	1	1.5	2	CL	0	38	51	5.00	1.20	50.7	120	0	0	180	180	180	180	0.998	0.63927	NL	1.358	no gw	-	0.0	1.8	-	-
3	2	2.5	3	CL	0	38	51	5.00	1.20	50.7	120	0	0	300	300	300	300	0.996	0.63778	NL	1.358	no gw	-	0.0	1.8	-	-
4	3	3.5	4	CL	0	38	51	5.00	1.20	50.7	120	0	0	420	420	420	420	0.994	0.63626	NL	1.358	no gw	-	0.0	1.8	-	-
5	4	4.5	5	CL	0	38	51	5.00	1.20	50.7	120	0	0	540	540	540	540	0.991	0.63475	NL	1.358	no gw	-	0.0	1.8	-	-
6	5	5.5	6	CL	0	38	51	5.00	1.20	50.7	120	0	0	660	660	660	660	0.989	0.63326	NL	1.358	no gw	-	0.0	1.8	-	-
7	6	6.5	7	CL	0	36.937	51	5	1.2	49.3	120	0	0	780	780	780	780	0.9868	0.63180	NL	1.358	no gw	-	0.0	1.8	-	-
8	7	7.5	8	CL	0	21.584	51	5	1.2	30.9	120	0	0	900	900	900	900	0.9846	0.63036	NL	1.358	no gw	-	0.0	1.8	-	-
9	8	8.5	9	CL	0	20.275	51	5	1.2	29.3	120	0	0	1020	1020	1020	1020	0.9824	0.62896	0.42683	1.358	no gw	-	0.0	1.8	-	-
10	9	9.5	10	CL	0	19.178	51	5	1.2	28.0	120	0	0	1140	1140	1140	1140	0.9802	0.62758	0.37004	1.358	no gw	-	0.0	1.8	-	-
11	10	10.5	11	CL	0	18.242	51	5	1.2	26.9	120	0	31.2	1260	1260	1260	1260	0.9781	0.62622	0.33535	1.358	0.7	0.011	0.1	1.8	0.166815872	210.2
12	11	11.5	12	CL	0	17.431	51	5	1.2	25.9	120	0	93.6	1380	1380	1380	1380	0.976	0.62486	0.31124	1.358	0.7	0.011	0.1	1.6	0.160732093	221.8
13	12	12.5	13	CL	18	7.6266	51	5	1.2	14.2	120	31.2	156	1500	1468.8	1500	1468.8	0.9739	0.63676	0.15165	1.358	0.3	0.02	0.2	1.5	0.087199376	128.1
14	13	13.5	14	CL	18	7.4813	51	5	1.2	14.0	120	93.6	218.4	1620	1526.4	1620	1526.4	0.9718	0.66032	0.14995	1.358	0.3	0.02	0.2	1.2	0.086109764	131.4
15	14	14.5	15	CL	18	15.153	51	5	1.2	23.2	120	156	280.8	1740	1584	1740	1584	0.9696	0.68195	0.25984	1.358	0.5	0.014	0.2	1.0	0.143649519	227.5
16	15	15.5	16	CL	18	15	51	5.00	1.20	22.9	120	218.4	343.2	1860	1641.6	1860	1641.6	0.967	0.70183	0.25480	1.358	0.5	0.014	0.2	0.8	0.141637864	232.5
17	16	16.5	17	CL	18	15	51	5.00	1.20	22.6	120	280.8	405.6	1980	1699.2	1980	1699.2	0.965	0.72014	0.25016	1.358	0.5	0.014	0.2	0.7	0.139729384	237.4
18	17	17.25	17.5	ML	0	31	51	5.00	1.20	42.6	120	327.6	452.4	2070	1742.4	2070	1742.4	0.964	0.73292	NL	1.358	-	-	0.0	0.5	-	-
19	17.5	18	18.5	ML	0	31	51	5.00	1.20	42.1	120	374.4	499.2	2160	1785.6	2160	1785.6	0.962	0.74493	NL	1.358	-	-	0.0	0.5	-	-
20	18.5	18.75	19	CL	0	31	51	5.00	1.20	41.7	120	421.2	546	2250	1828.8	2250	1828.8	0.960	0.75622	NL	1.358	-	-	0.0	0.5	-	-
21	19	19.5	20	CL	0	30	51	5.00	1.20	41.2	120	468	592.8	2340	1872	2340	1872	0.958	0.76684	NL	1.358	-	-	0.0	0.5	-	-
22	20	20.5	21	CL	18	16	51	5.00	1.20	24.8	120	530.4	655.2	2460	1929.6	2460	1929.6	0.956	0.77999	0.28741	1.358	0.5	0.014	0.2	0.5	0.153564237	296.3
23	21	21.5	22	CL	18	16	51	5.00	1.20	24.5	120	592.8	717.6	2580	1987.2	2580	1987.2	0.953	0.79205	0.28200	1.358	0.5	0.014	0.2	0.3	0.151760283	301.6
24	22	22.5	23	CL	18	16	51	5.00	1.20	24.2	120	655.2	780	2700	2044.8	2700	2044.8	0.950	0.80310	0.27700	1.358	0.5	0.014	0.2	0.2	0.150033099	306.8
25	23	23.5	24	CL	20	18	51	5.00	1.20	26.4	120	717.6	842.4	2820	2102.4	2820	2102.4	0.947	0.81316	NL	1.358	-	-	0.0	0.0	-	-
26	24	24.5	25	CL	20	18	51	5.00	1.20	26.1	120	780	904.8	2940	2160	2940	2160	0.944	0.82228	NL	1.358	-	-	0.0	0.0	-	-
27	25	25.5	26	CL	20	17	51	5.00	1.20	25.8	120	842.4	967.2	3060	2217.6	3060	2217.6	0.940	0.83048	NL	1.358	-	-	0.0	0.0	-	-
28	26	26.5	27	CL	20	17	51	5.00	1.20	25.5	120	904.8	1029.6	3180	2275.2	3180	2275.2	0.936	0.83781	NL	1.358	-	-	0.0	0.0	-	-
29	27	27.5	28	CL	20	18	51	5.00	1.20	26.4	120	967.2	1092	3300	2332.8	3300	2332.8	0.932	0.84426	NL	1.358	-	-	0.0	0.0	-	-
30	28	28.5	29	CL	26	13	51	5.00	1.20	20.6	120	1029.6	1154.4	3420	2390.4	3420	2390.4	0.928	0.84986	NL	1.358	-	-	0.0	0.0	-	-
31	29	29.5	30	CL	26	13	51	5.00	1.20	20.4	120	1092	1216.8	3540	2448	3540	2448	0.923	0.85462	NL	1.358	-	-	0.0	0.0	-	-
32	30	30.5	31	CL	26	13	51	5.00	1.20	20.2	120	1154.4	1279.2	3660	2505.6	3660	2505.6	0.918	0.85855	NL	1.358	-	-	0.0	0.0	-	-
33	31	31.5	32	CL	26	13	20	3.61	1.08	17.1	120	1216.8	1341.6	3780	2563.2	3780	2563.2	0.913	0.86166	NL	1.358	-	-	0.0	0.0	-	-
34	32	32.5	33	CL	26	12	51	5.00	1.20	19.9	120	1279.2	1404	3900	2620.8	3900	2620.8	0.907	0.86395	NL	1.358	-	-	0.0	0.0	-	-
35	33	33.5	34	SC	0	47	15	2.50	1.05	51.9	120	1341.6	1466.4	4020	2678.4	4020	2678.4	0.901	0.86545	NL	1.358	-	-	0.0	0.0	-	-
36	34	34.5	35	SC	0	47	15	2.50	1.05	51.4	120	1404	1528.8	4140	2736	4140	2736	0.894	0.86616	NL	1.358	-	-	0.0	0.0	-	-
37	35	35.5	36	SC	0	46	15	2.50	1.05	50.9	120	1466.4	1591.2	4260	2793.6	4260	2793.6	0.887	0.86609	NL	1.358	-	-	0.0	0.0	-	-
38	36	36.5	37	SP	0	46	0	0.00	1.00	45.7	120	1528.8	1653.6	4380	2851.2	4380	2851.2	0.880	0.86526	NL	1.358	-	-	0.0	0.0	-	-
39	37	37.5	38	SP	0	45	0	0.00	1.00	45.3	120	1591.2	1716	4500	2908.8	4500	2908.8	0.872	0.86369	NL	1.358	-	-	0.0	0.0	-	-
40	38	38.5	39	SW	0	32	0	0.00	1.00	31.6	120	1653.6	1778.4	4620	2966.4	4620	2966.4	0.864	0.86141	NL	1.358	-	-	0.0	0.0	-	-
41	39	39.5	40	SW	0	31	0	0.00	1.00	31.3	120	1716	1840.8	4740	3024	4740	3024	0.855	0.85845	NL	1.358	-	-	0.0	0.0	-	-
42	40	40.5	41	SW	0	31	0	0.00	1.00	31.0	120	1778.4	1903.2	4860	3081.6	4860	3081.6	0.847	0.85484	NL	1.358	-	-	0.0	0.0	-	-
43	41	41.5	42	SW	0	31	0	0.00	1.00	30.7	120	1840.8	1965.6	4980	3139.2	4980	3139.2	0.837	0.85061	NL	1.358	-	-	0.0	0.0	-	-
44	42	42.5	43	SW	0	30	0	0.00	1.00	30.4	120	1903.2	2028	5100	3196.8	5100	3196.8	0.828	0.84582	NL	1.358	-	-	0.0	0.0	-	-
45	43	43.5	44	SW	0	30	0	0.00	1.00	30.1	120	1965.6	2090.4	5220	3254.4	5220	3254.4	0.818	0.84051	NL	1.358	-	-	0.0	0.0	-	-
46	44	44.5	45	CL	44	13	51	5.00	1.20	20.9	120	2028	2152.8	5340	3312	5340	3312	0.809	0.83472	NL	1.358	-	-	0.0	0.0	-	-
47	45	45.5	46	CL	44	13	51	5.00	1.20	20.7	120	2090.4	2215.2	5460	3369.6	5460	3369.6	0.799	0.82851	NL	1.358	-	-	0.0	0.0	-	-
48	46	46.5	47	CL	44	13	51	5.00	1.20	20.6	120	2152.8	2277.6	5580	3427.2	5580	3427.2	0.788	0.82194	NL	1.358	-	-	0.0	0.0	-	-
49	47	47.5	48	CL	44	13	51	5.00	1.20	20.5	120	2215.2	2340	5700	3484.8	5700	3484.8	0.778	0.81505	NL	1.358	-	-	0.0	0.0	-	-
50	48	48.5	49	CL	0	36	51	5.00	1.20	48.7	120	2277.6	2402.4	5820	3542.4	5820	3542.4	0.768	0.80791	NL	1.358	-	-	0.0	0.0	-	-
51	49	49.5	50	CL	0	36	51	5.00	1.20	48.3	120	2340	2464.8	5940	3600	5940	3600	0.758	0.80057	NL	1.358	-	-	0.0	0.0	-	-
52	50	50.5	51	CL	0	36	51	5.00	1.20	48.0	120	2402.4	2527.2	6060	3657.6	6060	3657.6	0.748	0.79307	NL	1.358	-	-	0.0	0.0	-	-
53	51	51.5	52	CL	0	36	51	5.00	1.20	47.7	120	2464.8	2589.6	6180	3715.2	6180	3715.2	0.738	0.78548	NL	1.358	-	-	0.0	0.0	-	-
54	52	52.5	53	CL	0	35	51	5.00	1.20	47.3	120	2527.2	2652	6300	3772.8	6300	3772.8	0.728	0.77784	NL	1.358	-	-	0.0	0.0	-	-
55	53	53.5	54	CL	0	35	51	5.00	1.20	47.0	120	2589.6	2714.4	6420	3830.4	6420	3830.4	0.718	0.77018	NL	1.358	-	-	0.0	0.0	-	-
56	54	54.5	55	CL	0	39	51	5.00	1.20	51.4	120	2652	2776.8	6540	3888	6540	3888	0.708	0.76257	NL	1.358	-	-	0.0	0.0	-	-
57	55	55.5	56	CL	0	38	51	5.00	1.20	51.1	120	2714.4	2839.2	6660	3945.6	6660	3945.6	0.699	0.75502	NL	1.358	-	-	0.0	0.0	-	-
58	56	56.5	57	CL	0	37	51	5.00	1.20	49.8	120	2776.8	2901.6	6780	4003.2	6780	4003.2	0.689	0.74758	NL	1.358	-	-	0.0	0.0	-	-
59	57	57.5	58	CL	0	37	51	5.00	1.20	49.4	120	2839.2	2964	6900	4060.8	6900	4060.8	0.680	0.74027	NL	1.358	-	-	0.0	0.0	-	-
60	58	58.5	59	CL	0	43	51	5.00	1.20	57.1	120	2901.6	3026.4	7020	4118.4	7020	4118.4	0.672	0.73312	NL	1.358	-	-	0.0	0.0	-	-
61	59	59.5	60	CL	0	43	51	5.00	1.20	56.6	120	2964	3088.8	7140	4176	7140	4176	0.663	0.72614	NL	1.358	-	-	0.0	0.0	-	-
62	60	60.5	61	CL	0	43	51	5.00	1.20	56.2	120	3026.4	3151.2	7260	4233.6	7260	4233.6	0.655	0.71936	NL	1.358	-	-	0.0	0.0	-	-
63	61	61.5	62	CL	0	42	51	5.00	1.20	55.7	120	3088.8	3213.6	7380	4291.2	7380	4291.2	0.647	0.71278	NL	1.358	-	-	0.0	0.0	-	-
64	62	62.5	63	CL	0	42	51	5.00	1.20	55.3	120	3151.2	3276	7500	4348.8	7500	4348.8	0.640	0.70642	NL	1.358	-	-	0.0	0.0	-	-
65	63	63.5	64	CL	0	42	51	5.00	1.20	54.9	120	3213.6	3338.4	7620	4406.4	7620	4406.4	0.632	0.70028	NL	1.358	-	-	0.0	0.0	-	-
66	64	64.5	65	CL	0	50	51	5.00	1.20	64.4	120	3276	3400.8	7740	4464	7740	4464	0.625	0.69437	NL	1.358	-	-	0.0	0.0	-	-
67	65	65.5	66	CL	0	49	51	5.00	1.20	64.0	120	3338.4	3463.2	7860	4521.6	7860	4521.6	0.619	0.68868	NL	1.358	-	-	0.0	0.0	-	-
68	66	66.5	67	CL	0	49	51	5.00	1.20	63.5	120	3400.8	3525.6	7980	4579.2	7980	4579.2	0.612	0.68322	NL	1.358	-	-	0.0	0.0	-	-
69	67	67.5	68	CL	0	48	51	5.00	1.20	63.0	120	3463.2	3588	8100	4636.8	8100	4636.8	0.606	0.67798	NL	1.358	-	-	0.0	0.0	-	-
70	68	68.5	69	ML	0	41	51	5.00	1.20	54.6	120	3525.6	3650.4	8220	4694.4	8220	4694.4	0.600	0.67297	NL	1.358	-	-	0.0	0.0	-	-
71	69	69.5	70	ML	0	41	51	5.00	1.20	54.3	120	3588	3712.8	8340	4752	8340	4752	0.595	0.66817	NL	1.358	-	-	0.0	0.0	-	-
72	70	70.5	71	ML	0	41	51	5.00	1.20	53.9	120	3650.4	3775.2	8460	4809.6	8460	4809.6	0.589	0.66358	NL	1.358	-	-	0.0	0.0	-	-
73	71	71.5	72	ML	0	40	51	5.00	1.20	53.5	120	3712.8	3837.6	8580	4867.2	8580	4867.2	0.584	0.65919	NL	1.358	-	-	0.0	0.0	-	-
74	72	72.5	73	ML	0	40	51	5.00	1.20	53.1	120	3775.2	3900	8700	4924.8	8700	4924.8	0.579	0.65500	NL	1.358	-	-	0.0	0.0	-	-
75	73	73.5	74	SC	0	75	15	2.50	1.05	81.3	120	3837.6	3962.4	8820	4982.4	8820	4982.4	0.574	0.65100	NL	1.358	-	-	0.0	0.0	-	-
76	74	74.5	75	SC	0	75	15	2.50	1.05	80.7	120	3900	4024.8	8940	5040	8940	5040	0.570	0.64717	NL	1.358	-	-	0.0	0.0	-	-
78	75	75.5	76	SC	0	74	15	2.50	1.05	80.1	120	3962.4	4087.2	9060	5097.6	9060	5097.6	0.566	0.64352	NL	1.358	-	-	0.0	0.0	-	-
79	76	76.25	76.5	SC	0	74	15	2.50	1.05	79.7	120	4009.2	4134	9150	5140.8	9150	5140.8	0.562	0.64089	NL	1.358	-	-	0.0	0.0	-	-

Notes:

1. peak ground acceleration
2. gravitational acceleration in g's
3. define depths to layers (BGS) for top, middle, and bottom
4. unified soil classification system (USCS)
5. plasticity index - used for ML layers only. Populates as "0" if layer is not ML
5. corrected blow counts normalized to 1 ton overburden
6. clean sand equivalent coefficients used to correct blow counts for fines content (Youd et al., 2001)
7. clean sand equivalent blow counts calculated by: (N1)60cs = a + b(N1)60 (Youd et al., 2001)
8. Unit weight of soil (pcf)
9. overburden stress (psf)
10. effective overburden (psf)
11. stress reduction coefficent (Youd, 2001)
12. cycliic stress ratio: CSR = tave/s'v0 = $0.65(a_{max}/g)(s_{v0}/s'_{v0})r_d$
13. cyclic resistance ratio for earthquake magnitude 7.5 "NL" indicates layer is not liquefyable
14. magnitude scaling factor to adjust CRR7.5 values to different earthquake magnitudes
15. factor of safety green dot indicates FS ≥ 1.5; yellow dot indicates 1.0 < FS < 1.5; red dot indicates FS ≤ 1.0; no gw indicates no groundwater