

EXHIBIT L

GEOTECHNICAL INVESTIGATION

FOR

SAN BERNARDINO COUNTY

**PACIFIC VILLAGE PLATINUM CAMPUS, PACIFIC VILLAGE
SUBSTANCE USE DISORDER PROGRAM, AND
CDH PACIFIC VILLAGE CAMPUS EXPANSION
DESIGN-BUILD PROJECT**

**PROJECT NUMBER 10.10.1533, 10.10.1380, AND
10.10.1671**



**SAN BERNARDINO
COUNTY**



UES™

Preliminary Geotechnical Investigation Report

**PACIFIC VILLAGE PLATINUM CAMPUS
2626 Pacific Street,
Highland, California 92346**

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April 22, 2024

Project No. 4930.2400003



April 22, 2024

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Reference: Geotechnical Investigation Report
Pacific Village Platinum Campus
2626 Pacific Street,
Highland, California 92346
Project No: 4930.2400003

UES is pleased to submit this Preliminary Geotechnical Engineering Report for the referenced project. This report includes the results from the field exploration and laboratory testing program, along with recommendations for use in the preparation of the appropriate design and construction documents for this project.

UES appreciates the opportunity to provide this Preliminary Geotechnical Investigation Report and looks forward to continuing participation during the design and construction phases of this project. UES also has great interest in providing construction services, including materials testing and inspection services during the construction of this project, and will be glad to meet with you to further discuss how we can be of assistance as the project advances.

If there are questions pertaining to this report, or if UES may be of further service, please contact us at your convenience.

Respectfully,

Oswaldo Garcia
Staff Geologist

Hans F. Tolksdorf, PE, GE
Principal Geotechnical Engineer

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1.0 INTRODUCTION

We have completed a preliminary geotechnical investigation for the proposed development upgrade and renovation of the Pacific Village Platinum Campus. The purpose of this study have been to explore the existing subsurface conditions at the site and provide geotechnical engineering conclusions and recommendations for use in design and construction of the proposed project. This report presents the results of our study.

1.1 AUTHORIZATION

Construction Testing & Engineering, South, Inc. dba UES, Consultant, has completed a field exploration and geotechnical evaluation for the Pacific Village Platinum Campus project. Mr. Chris Aeria, representing LPA Design Studios, authorized UES services on January 11, 2024, by signing UES Proposal No. 4930.0124.00002.

1.2 PROPOSED DEVELOPMENT

We understand the project will consist of the design and construction of new housing units and improvements of the existing facility. Review of preliminary structural drawings prepared by LPA Design Studios indicates construction several live in units, and the Substance Use Disorder Facility all single story structures. We anticipate the improvements will develop relatively light to moderate structural loads based on this type of construction.

We understand associated improvements may consist of new asphalt concrete parking areas, exterior concrete flatwork, and underground utilities. A grading plan was not available when this report was prepared. However, based on existing site topography and our understanding of the proposed construction, we anticipate minor cuts and fills will be required to establish final subgrade levels across the site.

2.0 SITE INFORMATION

2.1 SITE DESCRIPTION

The building sites are located at 2626 Pacific Street Highland, California. The new building sites are located in the northern portion of the existing facility and the eastern adjacent lot. The proposed construction and renovations are located, at latitude 34.12956, longitude -117.22954, bounded by East 17th street to north, Highland creek to the east, Pacific Street to the south, and Valaria Drive to the west.

The topography of the site is relatively flat gently draining to the south-southwest. The average surface elevation within the planned building area is approximately 1,195 feet relative to the North American Vertical Datum of 1988 (NAVD88) based on review of the United States Geological Survey (USGS) 7.5 Minute Topographic Map of the Harrison Mountain Quadrangle, California – San Bernardino County, dated 2021.

2.2 SITE HISTORY

We reviewed available historical aerial photographs of the site. The surrounding areas have been utilized as residential homes and a public park. Based on our review of historic aerials back to 1938, the area of new development on site has remained relatively undisturbed vacant land. There is no evidence in the aerial images of significant grading or dumping at the site.

3.0 FIELD EXPLORATION & LABORATORY PROGRAM

3.1 FIELD ACTIVITIES

Eight (8) exploratory borings (B1 to B8) were performed on March 13, 2024 and four cone penetration tests (CP-1 to CP-4) were performed on March 25, 2024, at the approximate locations shown on the attached Exploration Map presented in Figure 2. At the completion of our field explorations, the borings were backfilled with native soils and the cone penetration soundings were backfilled with native soil and bentonite chips.

The explorations were performed to investigate and obtain samples of the subsurface soils. The borings were excavated using a truck mounted eight-inch diameter, hollow-stem auger drill rig to the refusal depth of approximately 40 feet below ground surface (bgs). The cone penetration soundings were made using MARL Technologies 30-ton (4-axle) CPT rig equipped with 15-centimeter (cm²) cone to the refusal depth of 74 feet below ground surface.

3.2 SUBSURFACE CONDITIONS

The soil conditions at the borings and cone penetration sounding locations generally consist of about 17 feet of silty sands overlying poorly graded sand, to the maximum depth of approximately 74 feet below existing site grades. The moisture content was moist and laboratory moisture ranged from 1.2 percent to 15.7 percent. Course grained soils had densities ranging from loose to dense and laboratory dry unit weight ranged from 95.7 pounds per cubic foot (pcf) to 119.4 pcf.

For specific information regarding the soil conditions at each boring location, please refer to the Logs of Soil Borings, included in Appendix A.

3.3 LABORATORY TESTING

Laboratory tests were conducted on representative soil samples to evaluate their physical properties and engineering characteristics. Specific laboratory tests included:

- Maximum dry unit weight and optimum moisture content,
- In-place moisture and unit weight,
- Direct shear (remolded to 90% relative compaction),
- R-value,
- No. 200 sieve wash,
- Grain size distribution/sieve analysis,
- Corrosion testing (pH, resistivity, chloride, and sulfate) and
- Hydrometer

The laboratory testing was conducted to determine the soil classification, physical properties and corrosivity of the on-site soils. Test method descriptions and laboratory results are presented in Appendix B and also indicated in Appendix A.

4.0 GEOLOGY

4.1 SITE GEOLOGIC CONDITIONS

Based on our investigation and review of *Geologic Map of the Harrison Mountain/North ½ of Redlands Quadrangles, San Bernardino And Riverside County, California* prepared by T.W. Dibble and J.A Minch (2004) the near surface material consists of Quaternary alluvium (Qa), described as alluvial sand and clay of valley areas. Below is a brief description of the materials encountered during the investigation. More detailed descriptions of the soils encountered are provided in the Exploration Logs in Appendix A.

4.1.1 Quaternary Alluvium

In the upper 17 to 25 feet in our borings, we encountered silty sands overlaying poorly graded sands. The silty sand was found to be loose to medium dense and the underlying poorly graded sands ranged from medium dense to dense.

4.2 GROUNDWATER

Groundwater was not encountered at the time of drilling to the explored depth of 74 feet bgs. To supplement the depth to groundwater measured in the field, we reviewed available groundwater data published by the California Department of Water Resources (DWR) from nearby wells. Based on the review of data from DWR, the historic high groundwater depth in the vicinity of the site was recorded to be approximately 60.9 feet bgs measured on February 17, 1942, from a well (identification no. 341283N1172229W001) located approximately 0.40 miles east of the project site. Groundwater will fluctuate during periods of high precipitation. Groundwater is not expected to impact the proposed development, although grading or construction could be adversely affected if performed during or following periods of wet weather.

5.0 GEOLOGIC HAZARDS

5.1 LIQUEFACTION POTENTIAL

Liquefaction occurs when saturated cohesionless soils lose their physical strength during earthquake-induced shaking and behave as a liquid. This is due to loss of point-to-point grain contact and transfer of normal stress to the pore water. Liquefaction potential varies with groundwater level, soil type, material gradation, relative density, and the intensity and duration of ground shaking. Based on historic high groundwater level deeper than 50 feet bgs, the potential for liquefaction is considered very low.

5.2 FLOOD HAZARDS

Based on Federal Emergency Management Agency flood map (FEMA, 2008), the site is located within an area of "0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile, Zone X."

5.3 SOIL EXPANSION POTENTIAL

Due to the granular and non-plastic characteristics of the site soil they are anticipated to have very low expansion potential.

5.4 SEISMIC DESIGN PARAMETERS

The 2022 California Building Code (CBC) references the American Society of Civil Engineers (ASCE) Standard 7-16 for seismic design. Based on the data collected from the borings the site can be designated as Site Class D in determining seismic design forces for this project.

The seismic design parameters provided in the table below were based on the latitude and longitude for the central portion of the site using the web interface developed by the Structural Engineers Association of California (SEAOC) and California Department of Health Care Access and Information (HCAi). Since S_1 is greater than 0.2 g, the coefficient values F_v , S_{M1} , and S_{D1} presented in the table below are valid for this project, provided the requirements in Exception Note No. 2 of Section 11.4.8 of ASCE 7-16 supplement 3 apply.

Table 5: ASCE 7-16 Seismic Design Parameters

Lat./Long. 34.12956, -117.22954	ASCE 7-16 Reference	2022 CBC Reference	Factor / Coefficient	2022 CBC Value
0.2-second Period MCE_R	Figure 22-1	Figure: 1613.2.1(1)	S_S	2.553 g
1.0 second Period MCE_R	Figure 22-2	Figure: 1613.2.1(2)	S_1	0.972 g
Soil Class	Table 20.3-1	Section: 1613.2.2	Site Class	D
Site Coefficient	Table 11.4-1	Table: 1613.2.3(1)	F_a	1
Site Coefficient	Table 11.4-2	Table: 1613.2.3(2)	F_v	1.7
Adjusted MCE_R Spectral Response Parameters	Equation 11.4-1	Equation: 16-36	S_{M5}	2.553 g
	Equation 11.4-2	Equation: 16-37	S_{M1}	2.479 g
Design Spectral Acceleration Parameters	Equation 11.4-3	Equation: 16-38	S_{D5}	1.702 g
	Equation 11.4-4	Equation: 16-39	S_{D1}	1.653g
Seismic Design Category	Table 11.6-1	Table: 1613.2.5(1)	Risk Category I to III	D
	Table 11.6-2	Table: 1613.2.5(2)	Risk Category I to III	D

Notes: MCE_R = Risk-Targeted Maximum Considered Earthquake; g = acceleration due to gravity

6.0 CORROSION

Two soil samples were tested to determine minimum resistivity, pH, chloride, and sulfate concentrations to help evaluate the potential for corrosive attack upon reinforced concrete and buried metal. The results of the corrosivity tests are summarized below in the table below. Copies of the corrosion potential test results performed by HDR are presented in Appendix B.

Table 1: Soil Corrosivity Testing Results

Analyte	Test Method	Sample Identification	
		B3 (0'-5')	B7 (0'-5')
pH	CA DOT 643	7.1	7.2
Minimum Resistivity	CA DOT 643	3,920 Ω-cm	6,000 Ω-cm
Chloride	CA DOT 422	9.0 mg/kg	6.0mg/kg
Sulfate	CA DOT 417	65 mg/kg	12 mg/kg

Notes: Ω-cm = Ohm-centimeters; ppm = Parts per million

Based on the test results, on-site soils are considered corrosive to ferrous metals (Roberge, 2000). Buried ferrous metal may be encased or wrapped to be isolated from on-site soils. Plastic pipes may be considered as an alternative to metal pipelines. Additional corrosion testing may be performed after rough grading to verify corrosion potential of the near surface soil. If needed, a qualified corrosion engineer may be retained to provide more specific recommendations of cathodic protection, barrier coatings, or other means of corrosion protection.

Test results for soluble sulfate indicate the on-site soil is considered to be class "S0" to sulfate exposure. Exposure class S0 is assigned for conditions where the water-soluble sulfate concentration in contact with concrete is low. Concrete mix design should minimally incorporate the requirements for sulfate and chloride exposure as indicated ACI 318 (ACI, 2019). Recommendations may be verified after rough grading.

The information provided for corrosion potential is based on our interpretation of tabulated corrosion determinations. We provide these results in consideration for the corrosion of concrete and ferrous metal in contact with the near surface, on-site soil. A qualified corrosion consultant should be retained if specific recommendations are needed for corrosion potential and protection measures.

7.0 PERCOLATION TEST RESULTS AND CALCULATED INFILTRATION RATES

Testing was performed in accordance with published guidelines in the "Technical Guidance Document for Water Quality Management Plans" County of San Bernardino, prepared by CDM Smith, Inc., dated June 7, 2013 and approved for use, effective September 19, 2013.

Percolation testing was performed at four boring locations. Test borings were drilled to depths of five feet and ten feet below existing grade using an eight-inch diameter auger. The percolation rates that were obtained during field testing were converted to infiltration rates utilizing the "Porchet Method". The following table presents a summary of the test results for each location.

Table 2: Infiltration Testing Results

Boring Number	Depth Below Existing Ground surface (ft)	Soil Description	*Infiltration Rate (inches per hour)
P1	10	Silty Sand (SM)	.09
P2	5	Silty Sand (SM)	Not recorded
P3	10	Silty Sand (SM)	.07
P4	5	Silty Sand (SM)	.27

*No factor of safety has been applied to this rate.

Infiltration rates can be affected by siltation, debris, degree of saturation, subsurface inconsistencies, and compaction from grading. An appropriate factor of safety should be applied per referenced guidelines to produce design infiltration rates.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 GEOTECHNICAL DISCUSSION

Based on our investigation, the proposed construction on the site is feasible from a geotechnical standpoint, provided the recommendations in this report are incorporated into the design and construction. Recommendations are included in the subsequent sections of this report. Additional recommendations could be required based on the actual conditions encountered during grading. We should review any changes to the plans when they are available to ensure our recommendations still apply or to provide additional recommendations if needed.

8.2 SITE PREPARATION

Prior to commencement of grading operations, all vegetation, organic topsoil, and other deleterious materials should be cleared and disposed of off-site. The on-site soils encountered in our borings are considered suitable for use in engineered fill construction, provided these materials do not contain rubble, rubbish, significant organic concentrations, and are at a workable moisture content appropriate for compaction. All earthwork and grading operations should be performed under the observation and testing of the geotechnical consultant of record.

8.3 EARTHWORK

8.3.1 Subgrade Preparation

Following site preparation activities, areas designated to receive fill, at-grade areas, or those achieved by excavation should be scarified to a depth of at least eight inches, moisture conditioned to at least the optimum moisture content and compacted to not less than 90 percent of the maximum dry density as determined by ASTM D1557.

8.3.2 Remedial Grading and Over-Excavation

In order to provide uniform structural support and reduce potential differential settlement due to the presence of loose material, remedial grading will be required. The proposed building pads and clubhouse addition should be over-excavated to a depth of five feet below existing grade or two feet

below footings whichever is greater. The excavations should extend laterally at least five feet beyond the foundation limits.

For proposed new roads and parking areas the subgrade soils should be over-excavated to a depth of two feet below existing grade. The excavations should extend laterally at least two feet beyond the foundation limits.

The soils exposed at the bottom of the over-excavation should be documented by a geotechnical representative of this office to determine their suitability. If unsuitable materials are encountered at the bottom of the excavation, they should be removed to the depth of competent natural material. Groundwater, if encountered, should be removed from the excavations prior to placing fill. Backfill for the building pad should be placed and compacted as outlined herein for engineered fill.

8.3.3 Engineered Fill Construction

On-site soils are considered suitable for use in engineered fill construction, if they do not contain significant concentrations of organic materials, rubble debris, or particles greater than three inches in maximum dimension. Imported fill materials, if required, should be granular, compactable materials with a Plasticity Index of 15 or less when tested in accordance with ASTM D4318; an Expansion Index of 20 or less when tested in accordance with ASTM D4829; an organic content less than four percent; do not contain particles greater than three inches in maximum dimension, and be within a compactable moisture content.

Engineered fill should be placed in lifts not exceeding six inches in compacted thickness with each lift being uniformly moisture conditioned to at least the optimum moisture content and compacted to not less than 90 percent of the maximum dry density per ASTM D1557.

All earthwork operations should be accomplished in accordance with the recommendations contained within this report. We recommend the Geotechnical Engineer's representative be present on a regular basis during all earthwork operations to observe and test the engineered fill and to verify compliance with the recommendations of this report and the project plans and specifications.

8.4 EXCAVATIONS

8.4.1 Excavation Conditions

Near-surface soils at the site should be readily excavatable with conventional earthmoving and trenching equipment. Subsurface remnants from existing and/or previous development of the site may be encountered and can be slow to excavate with a standard, rubber-tired backhoe; however, experience has shown that excavators can remove these materials with moderate effort.

Based on our borings and CPTs, excavations associated with building foundations, shallow trenches for utilities, and other excavations less than four feet deep associated with the proposed construction, should stand vertically for short periods of time required for construction, unless cohesionless, saturated or disturbed soils are encountered. These unstable conditions may result in caving or sloughing; therefore, the contractor should be prepared to brace or shore the excavations, if necessary.

Excavations deeper than four feet that will be entered by workers should be sloped, braced or shored in accordance with current California OSHA and Cal/OSHA regulations. The contractor must provide an adequately constructed and braced shoring system in accordance with federal, state, and local safety regulations for individuals working in an excavation that may expose them to the danger of moving ground.

Temporarily sloped excavations should be constructed no steeper than a one horizontal to one vertical (1H:1V) inclination. Temporary slopes likely will stand at this inclination for the short-term duration of construction, provided significant pockets of loose and/or saturated granular soils are not encountered. Flatter slopes would be required if these conditions are encountered.

Excavated materials should not be stockpiled directly adjacent to an open excavation to prevent surcharge loading of the excavation sidewalls. Excessive truck and equipment traffic should be avoided near excavations. If material is stored or heavy equipment is stationed and/or operated near an excavation, a shoring system must be designed to resist the additional pressure due to the superimposed loads.

8.4.2 Utility Trench Backfill

Utility trench backfill should be mechanically compacted as engineered fill in accordance with the following recommendations. Bedding and initial backfill around and over the pipe should conform to the pipe manufacturers recommendations for the pipe materials selected and applicable sections of the governing agency standards.

Utility trench backfill should be placed in thin lifts, thoroughly moisture conditioned to at least the optimum moisture content and compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557. The lift thickness will depend on the type of compaction equipment used to backfill utility trenches.

Backfill for the upper 12 inches of trenches must match the adjacent materials.

We recommend that all underground utility trenches aligned nearly parallel with new foundations be at least three feet from the outer edge of foundations, wherever possible. Trenches should not encroach into the zone extending outward at a one horizontal to one vertical (1H:1V) inclination below the bottom of foundations. The intent of these recommendations is to prevent loss of both lateral and vertical support of foundations, resulting in possible settlement.

8.5 SHALLOW FOUNDATIONS

Foundations for the proposed structures should be designed in accordance with structural considerations and the following minimum geotechnical recommendations. Foundations are expected to be supported by compacted engineer fill material. These recommendations assume that the foundation soils will have low potential for expansion.

It is our opinion that the use of isolated and continuous footings will be geotechnically suitable for this project. Foundation dimensions should be based on an allowable bearing pressure of 2,500 pounds per square foot (psf) for minimum footing dimensions of 18 inches in width and 18 inches in depth. The values may be increased by 200 psf for each additional foot of width or depth to a maximum value of

5,000 psf. The allowable bearing value may be increased by one-third for short-duration loading which includes the effects of wind or seismic forces.

Lateral loads may be resisted by friction between the footing bottoms and the supporting soil, and by passive pressure acting against the face of footings. If frictional resistance is used, we recommend an allowable coefficient of friction of 0.40 for concrete cast directly onto properly compacted fill materials. For passive resistance, a lateral pressure of 250 psf per foot of embedment, up to a maximum value of 1,500 psf. The upper foot of embedment should be neglected for passive resistance. The total allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance.

8.6 CONCRETE AND PAVEMENT DESIGN

8.6.1 Concrete Slab-On-Grade

Concrete slabs-on-grade should be designed for the anticipated design loads. Lightly loaded concrete slabs should measure a minimum of 4 inches thick and be reinforced with a minimum of number 3 reinforcing bars placed 18-inches on-center, each way and supported at mid-slab height. An uncorrected modulus of subgrade reaction of 200 pci may be used for elastic design. Concrete slabs subjected to heavier loads may require thicker slab sections and/or increased reinforcement as per the project structural engineer. The correct placement of the reinforcement in the slab is vital for satisfactory performance under normal conditions.

In areas to receive moisture-sensitive floor coverings or used to store moisture-sensitive materials, a polyethylene (Stego or Visqueen) moisture vapor retarder (15-mil or thicker) should be placed beneath the slab. A 4-inch layer of 3/4-inch crushed stone or gravel should underlie the moisture vapor retarder. To protect the membrane during steel and concrete placement, a two-inch layer of sand may be placed over the moisture vapor retarder. Standard practice includes the gravel/crushed rock and vapor retarder. However, the gravel/crushed rock and plastic membrane offer only a limited, first line of defense against soil-related moisture, they do not moisture-proof the slab.

It is recommended that a water-cement ratio of 0.5 or less be used for concrete, and that the slab be moist-cured for at least five days in accordance with methods recommended by the American Concrete Institute. On-site quality control should be used to confirm the design conditions.

8.6.2 Exterior Concrete Flatwork

The upper 12 inches of final soil subgrade for exterior concrete flatwork areas should consist of approved, imported, compactable, very low-expansive (Expansion Index ≤ 20) granular soils compacted in accordance with the Engineered Fill recommendations included in this report. Exterior flatwork subgrade soils should be maintained in a moist condition and protected from disturbance. For added strength, exterior flatwork may be underlain by 4 inches of Class 2 aggregate base compacted to at least 95 percent relative compaction. The aggregate base can be included in the twelve (12) inches of very-low expansive granular soils.

Proper moisture conditioning of the subgrade soils is important to the performance of exterior flatwork. Expansion joints should be provided to allow for minor vertical movement of the flatwork. Exterior flatwork should be constructed independent of the perimeter building foundation and isolated column foundations by the placement of a layer of felt material between the flatwork and the foundation.

Consideration should be given to thickening the edges of the slabs at least twice the slab thickness where wheel traffic is expected over the slabs. The slab designer should determine the final thickness, strength, and joint spacing of exterior slab-on-grade concrete. The slab designer should also determine if slab reinforcement for crack control is required and determine final slab reinforcing requirements.

Our recommendations are intended to reduce the effects of variable soil subgrade conditions in exterior concrete flatwork areas. However, some seasonal movement of exterior flatwork should be anticipated where flatwork is adjacent to landscape areas. Areas adjacent to the new exterior flatwork should be landscaped to maintain uniform soil moisture conditions adjacent to and beneath the flatwork.

8.6.3 Flexible Pavement Design

Pavement sections were evaluated using a design ‘R’ value of 49 based on test results of near surface soil within proposed pavement areas. The pavement section recommendations are based on the assumption that the subgrade soil (the upper 12-inches minimum) and base course will be compacted to a minimum of 95 percent of the maximum dry density (per ASTM D 1557).

Recommended pavement sections are presented below in the table below.

Table 4: Pavement Section Design

Location	Traffic Index	Full Depth Asphalt Concrete (inches)	Multiple Layered	
			Asphalt Concrete (inches)	Aggregate Base (Inches)
Parking Stalls	4.5	5.0	3.0	4.0
Drive Aisles	5.5	6.0	4.0	6.0

The performance of pavements is critically dependent upon uniform and adequate compaction of the soil subgrade, as well as all engineered fill and utility trench backfill within the limits of the pavements. We recommend that pavement subgrade preparation (i.e., scarification, moisture conditioning and compaction) be performed after underground utility construction is completed and just prior to aggregate base placement. The upper 12 inches of pavement subgrade soils should be compacted to at least 95 percent relative compaction at the optimum moisture content. All aggregate base should be compacted to at least 95 percent of the ASTM D1557 maximum dry density.

Pavement subgrades must be stable and unyielding under heavy wheel loads of construction equipment. A proof-roll test using a fully loaded water truck should be performed prior to placement of aggregate base to help identify areas that are unstable, as observed by our representative. Areas that are found to be unstable should be excavated to firm, undisturbed materials and restored to grade with compacted aggregate base.

8.6.4 Rigid Pavement Design

In the summer heat, high axle loads coupled with shear stresses induced by sharply turning tire movements can lead to failure in asphalt concrete pavements. Therefore, we recommend that consideration be given to using the Portland cement concrete (PCC) pavements in areas subjected to concentrated heavy wheel loading, such as truck turning areas and in front of trash enclosures. For preliminary design of concrete pavement, it is recommended that a concrete pavement section consisting of 6 inches of concrete underlain by at least 6 inches of either class 2 or crushed miscellaneous base compacted to 95 percent relative compaction per ASTM D1557. Subgrade soil should be compacted to at least 90 percent of the laboratory maximum dry density in accordance with ASTM D1557.

We suggest the concrete slabs be constructed with thickened edges in accordance with ACI design standards. Reinforcing for crack control, should consist of No. 4 reinforcing bars placed on maximum 24-inch centers each way throughout the slab. Reinforcement must be located at mid-slab depth to be effective. Joint spacing and details should conform with the current PCA or ACI guidelines. Portland cement concrete should achieve a minimum compressive strength of 4,500 psi at 28 days.

8.7 DRAINAGE CONSIDERATIONS

Final site grading should be accomplished to provide positive drainage of surface water away from buildings and prevent ponding of water adjacent to foundations or slabs. Subgrades adjacent to buildings should be sloped away from foundations at a minimum five percent gradient for at least 10 feet, where possible.

We recommend connecting all roof drains to solid pipes which are connected to available drainage features to convey water away from the structures, or discharging the drains onto paved, or hard surfaces that slope away from the foundations. Discharging or ponding of surface water should not be allowed adjacent to buildings, exterior flatwork or onto slope surfaces. Landscape berms, if planned, should not be constructed in such a manner as to promote drainage toward buildings.

8.8 PLAN REVIEW

We recommend that our firm be retained to review the final plans and specifications to determine if the intent of our recommendations has been implemented in those documents. We would be pleased to submit a proposal to provide these services upon request.

9.0 GEOTECHNICAL RISK AND LIMITATIONS

Our recommendations are based upon the information provided regarding the proposed construction, combined with our analysis of site conditions revealed by the field exploration and laboratory testing programs. We have used prudent engineering and geologic judgment based upon the information provided and the data generated from our investigation. This report has been prepared in substantial compliance with generally accepted geotechnical engineering practices that exist in the area of the project at the time the report was prepared. No warranty, either express or implied, is provided.

If the proposed construction is modified or relocated or, if it is found during construction that subsurface conditions differ from those we encountered at our boring and/or CPT locations, we should be afforded

the opportunity to review the new information or changed conditions to determine if our conclusions and recommendations must be modified.

We emphasize that this report is applicable only to the proposed construction and the investigated site. This report should not be utilized for construction on any other site. This report is considered valid for the proposed construction for a period of two years following the date of this report. If construction has not started within two years, we must re-evaluate the recommendations of this report and update the report, if necessary.

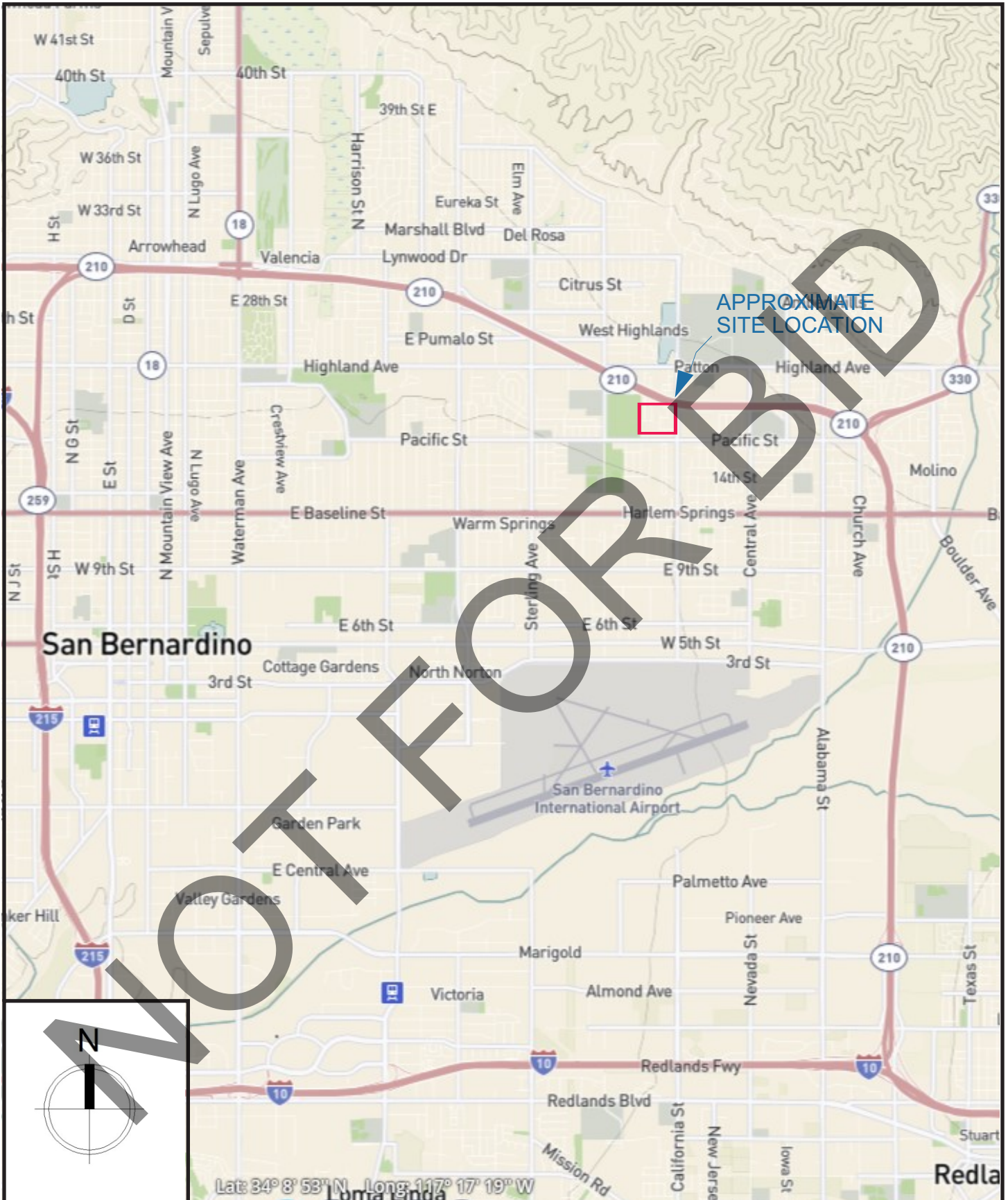
NOT FOR BID

10.0 REFERENCES

- American Society for Civil Engineers, 2017, "Minimum Design Loads for Buildings and Other Structures," ASCE/SEI 7-16.
- American Concrete Institute, 2019, Building Code Requirements for Structural Concrete (ACI 318-19) and Commentary.
- Dibble, T.W. and Minch, J.A., 2004, Geologic Map of the Harrison Mountain/north ½ of Redlands Quadrangles, San Bernardino and Riverside County, California, Scale 1:24,000.
- California Geological Survey, 2018 (Revised), Special Publication 42, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California.
- California Geological Survey, online, Fault Activity Map of California, <https://maps.conservation.ca.gov/cgs/fam>.
- California Geological Survey, online, Information Warehouse: Regulatory Maps, <https://maps.conservation.ca.gov/cgs/informationwarehouse/>.
- California Department of Water Resources (DWR), online, California Dam Breach Inundation Maps, <https://fmds.water.ca.gov/maps/damim/>.
- Federal Emergency Management Agency (FEMA), 2008. Flood Insurance Rate Map, San Bernardino County, California, Map Number 06071C7963H, August 28, 2008.
- Roberge P.R., 2000, Handbook of Corrosion Engineering, New York: McGraw-Hill.
- Unified Facilities Criteria (UFC), 2016. UFC 3-250-01, Pavement Design for Roads and Parking Areas, dated 14 November.
- U.S. Geological Survey (USGS), online. Quaternary Fault and Fold Database of the United States, <https://earthquake.usgs.gov/cfusion/qfault/index.cfm>.

FIGURES


NOT FOR BID

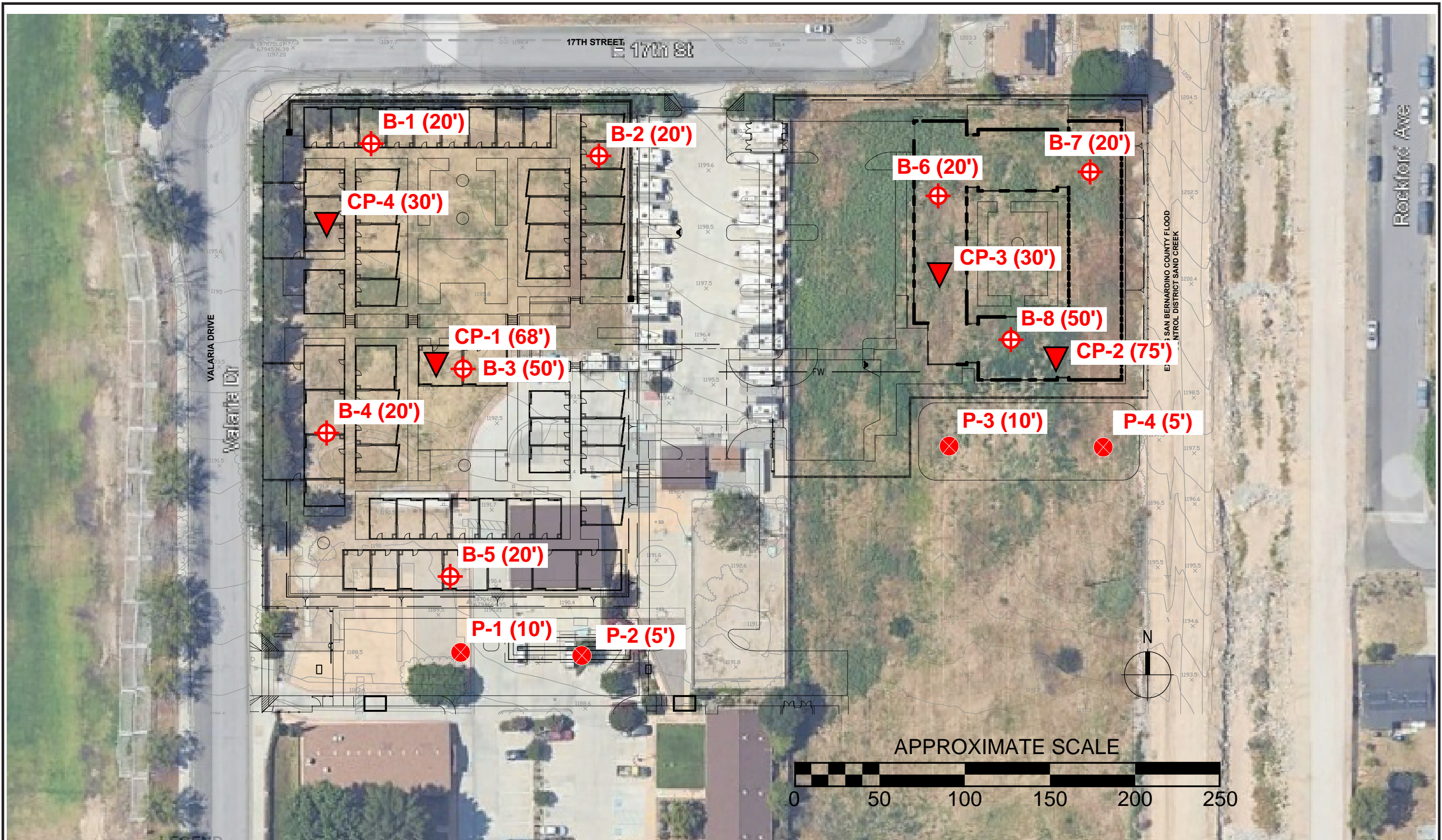


Project: 4930.2400003.0000	
Scale: NTS	Date: APR 2024
Base Map: https://ngmdb.usgs.gov/topoview/viewer/#13/34.1073/-117.2608	
Thematic info: UES	

SITE LOCATION MAP
 PACIFIC VILLAGE
 PLATINUM CAMPUS
 2626 PACIFIC STREET
 HIGHLAND, CALIFORNIA

Figure 1





LEGEND

- ⊕ B-1 APPROXIMATE BORING LOCATION
- ⊗ P-2 APPROXIMATE PERCOLATION LOCATION
- ▼ CP-1 APPROXIMATE CPT LOCATION

UES Universal Engineering Sciences
 Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

EXPLORATION MAP
 PACIFIC VILLAGE PLATINUM CAMPUS
 2626 PACIFIC ST
 HIGHLAND, CALIFORNIA

CTE JOB NO. 4930.240001.0000
 DATE: MAR 2024 FIGURE: 2

APPENDIX A

NOT FOR BID

MAJOR DIVISIONS		USCS	TYPICAL NAMES	
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW GP	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 15% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
		SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW SP
	SANDS WITH OVER 15% FINES		SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
	FINE GRAINED SOILS More than Half < #200 sieve		SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	ML
		CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS		Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	

	Modified California	RV	R-Value
	California Sampler (3" OD)	SA	Sieve Analysis
	Bulk	SW	Swell Test
	Standard Penetration Test (SPT)	TC	Cyclic Triaxial
	Sample Attempt with No Recovery	TX	Unconsolidated Undrained Triaxial
	Shelly Tube	TV	Torvane Shear
	Continuous Push	UC	Unconfined Compression
CA	Chemical Analysis Consolidation	(1.2)	(Shear Strength, ksf)
RS	Remolded Shear	WA	Wash Analysis
CP	Compaction	(20)	(with % Passing No. 200 Sieve)
DS	Direct Shear		Water Level at Time of Drilling
PM	Permeability		Water Level after Drilling (with date measured)
PP	Pocket Penetrometer		

SOIL CLASSIFICATION CHART AND LOG KEY





Pacific Village

Soil Boring: B-1

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/13/2024
 Project Number: 4930.2400003 Hammer Weight: 140lb/30" Date Completed: 03/13/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1200'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab Results		
						Moisture Content (%)	Dry Density (PCF)	
5		6 8 8		SM	Silty SAND , medium dense, brown, moist, fine to medium grained - becomes Strong Brown	8	119.4	
10		4 6 6						
15		8 12 14					3.5	106.9
20		7 10 12						
Boring terminated at 21.5 feet below ground surface. No ground water encountered (N.E) at the time of drilling.						21.5		



Pacific Village

Soil Boring: B-2

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/14/2024
 Project Number: 4930.2400003 Hammer Weight: 140/30" Date Completed: 03/14/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1197'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab Results		
						Moisture Content (%)	Dry Density (PCF)	Percent Passing #200 Sieve
5		4 2 2		SM	Silty SAND , loose, brown, moist, fine to medium grained			32
10		3 3 9				9.4	95.7	
15		6 6 10			-becomes medium dense, Strong Brown			
20		7 11 14				7.1	103.4	
21.5								

Boring terminated at 21.5 feet below ground surface. Not ground water encountered at the time of drilling. (N.E.)



Pacific Village

Soil Boring: B-3

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/13/2024
 Project Number: 4930.2400003 Hammer Weight: 140lb/30" Date Completed: 03/13/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1194'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab...	
						Moisture Content (%)	Dry Density (PCF)
5		5 4 2		SM	Silty SAND , loose, brown, moist, fine to medium grained	10.8	99.7
5		2 3 3		SM		13	104.1
10		8 10 13			-becomes medium dense, Strong brown	1.7	104.5
10		5 8 12				1.9	106.3
15		5 6 8				8.7	107.6
15		5 6 7				7.3	116
20		12 12 14		SP-SM	Poorly Graded Sand with Silt , medium dense, strong brown, moist, fine to medium grained	15.7	121
				SP	Poorly Graded SAND , dense, strong brown, moist, medium to coarse grained		



Pacific Village

Soil Boring: B-3

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/13/2024
 Project Number: 4930.2400003 Hammer Weight: 140lb/30" Date Completed: 03/13/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1194'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab...	
						Moisture Content (%)	Dry Density (PCF)
7	▲	7 14 22	[Stippled pattern]	SP	Poorly Graded SAND, dense, strong brown, moist, medium to coarse grained		
11	▲	11 12 16					
12	▲	12 14 20					
13	▲	13 13 18					
Boring terminated 41.5 feet below ground surface. No ground water encountered at the time of drilling. (N.E.)						41.5	



Pacific Village

Soil Boring: B-4

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/14/2024
 Project Number: 4930.2400003 Hammer Weight: 140/30" Date Completed: 03/14/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1197'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Graphic Log	USCS	Visual Classification	Lab Results		
					Moisture Content (%)	Dry Density (PCF)	Percent Passing #200 Sieve
5			SM	Silty SAND , medium dense, brown, moist, fine to medium grained -becomes Strong Brown			21.4
10					7.8	105.3	
20					1.7	96.9	
21.5							

Boring terminated at 21.5 feet below ground surface. No ground water encountered at the time of drilling. (N.E.)



Pacific Village

Soil Boring: B-5

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/13/2024
 Project Number: 4930.2400003 Hammer Weight: 140lb/30" Date Completed: 03/13/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1195'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab Results		
						Moisture Content (%)	Dry Density (PCF)	Percent Passing #200 Sieve
5		10 12 6		SM	Silty SAND , medium dense, brown, moist, fine to medium grained	10.7	110	
10		2 2 3			-becomes loose			22
15		4 8 9			-becomes strong brown	6.0	108.4	
20		7 9 13		SP	Poorly Graded SAND , medium dense, strong brown, moist, medium to coarse grained			
Boring terminated at 21.5 feet below ground surface. No ground water encountered at the time of drilling. (N.E.)						21.5		

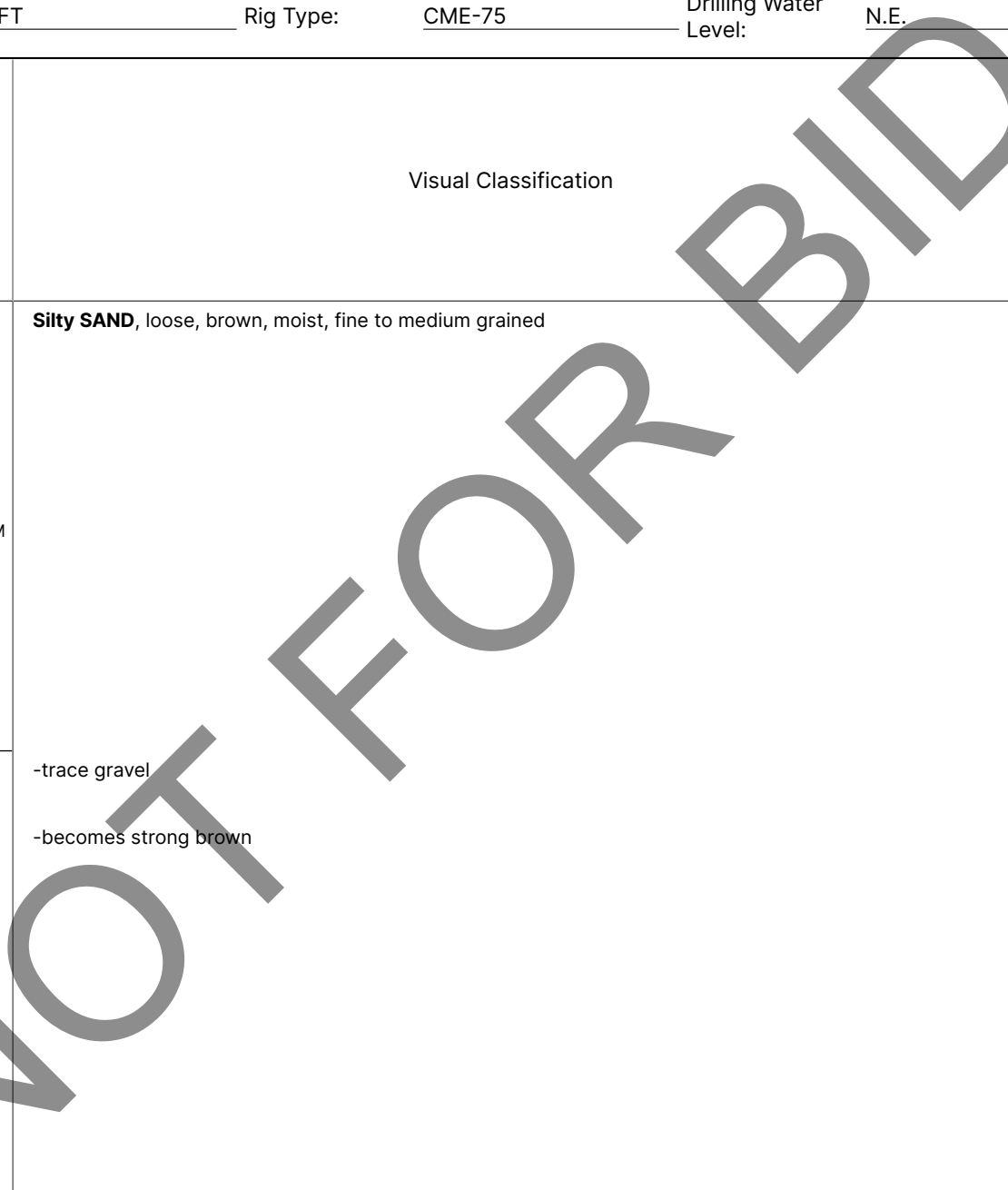


Pacific Village

Soil Boring: B-6

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/13/2024
 Project Number: 4930.2400003 Hammer Weight: 140lb/30" Date Completed: 03/13/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1201'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab Results		
						Moisture Content (%)	Dry Density (PCF)	Percent Passing #200 Sieve
5		5 3 3		SM	Silty SAND , loose, brown, moist, fine to medium grained	12	106.9	33
10		7 10 10			-trace gravel -becomes strong brown			
15		9 11 11				4.2	110.2	
20		3 5 8						
Boring terminated at 21.5 feet below ground surface. No groundwater encountered at the time of drilling. (N.E)						21.5		





Pacific Village
Soil Boring: B-7

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/14/2024
 Project Number: 4930.2400003 Hammer Weight: 140/30" Date Completed: 03/14/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: 1202'
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab Results			
						Moisture Content (%)	Dry Density (PCF)	Percent Passing #200 Sieve	
5		4 2 2		SM	Silty SAND , loose, brown, moist, fine to medium grained			29.6	
10		6 8 13		SM		10.0	108.8		
15		7 9 10		SM	becomes strong brown				
20		11 11 13		SP	Poorly Graded SAND , strong brown, medium to coarse grained				
Boring terminated at 21.5 feet below ground surface. No ground water encountered at the time of drilling. (N.E.)						21.5	1.2	107.8	5.1



Pacific Village

Soil Boring: B-8

Client Name: LPA Designs Drilling Firm: Jet Drilling Date Started: 03/13/2024
 Project Number: 4930.2400003 Hammer Weight: 140lb/30" Date Completed: 03/13/2024
 Logged By: OG Hammer Type: Autohammer Surface Elevation: N/A
 Checked By: HFT Rig Type: CME-75 Drilling Water Level: N.E.

Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab...	
						Moisture Content (%)	Dry Density (PCF)
5.0 - 5.5	[Sample Graphic]	6 4 2	[Graphic Log]	SM	Silty SAND, loose, brown, moist, fine to medium grained	7.0	111
5.5 - 6.0	[Sample Graphic]	2 2 3	[Graphic Log]	SM		8.9	104.1
6.0 - 6.5	[Sample Graphic]	7 9 12	[Graphic Log]	SM		2.2	100.3
6.5 - 7.0	[Sample Graphic]	7 8 8	[Graphic Log]	SM	-becomes strong brown	2.7	105.4
7.0 - 7.5	[Sample Graphic]	7 7 8	[Graphic Log]	SP-SM	Poorly Graded SAND, medium dense, moist, fine to coarse grained	2.1	107.2
7.5 - 8.0	[Sample Graphic]	9 10 13	[Graphic Log]	SM		3.4	112.3
8.0 - 8.5	[Sample Graphic]		[Graphic Log]				
8.5 - 9.0	[Sample Graphic]		[Graphic Log]				
9.0 - 9.5	[Sample Graphic]		[Graphic Log]				
9.5 - 10.0	[Sample Graphic]		[Graphic Log]				
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10.5 - 11.0	[Sample Graphic]		[Graphic Log]				
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12.0 - 12.5	[Sample Graphic]		[Graphic Log]				
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87.5 - 88.0	[Sample Graphic]		[Graphic Log]				
88.0 - 88.5	[Sample Graphic]		[Graphic Log]				
88.5 - 89.0	[Sample Graphic]		[Graphic Log]				
89.0 - 89.5	[Sample Graphic]		[Graphic Log]				
89.5 - 90.0	[Sample Graphic]		[Graphic Log]				
90.0 - 90.5	[Sample Graphic]		[Graphic Log]				
90.5 - 91.0	[Sample Graphic]		[Graphic Log]				
91.0 - 91.5	[Sample Graphic]		[Graphic Log]				
91.5 - 92.0	[Sample Graphic]		[Graphic Log]				
92.0 - 92.5	[Sample Graphic]		[Graphic Log]				
92.5 - 93.0	[Sample Graphic]		[Graphic Log]				
93.0 - 93.5	[Sample Graphic]		[Graphic Log]				
93.5 - 94.0	[Sample Graphic]		[Graphic Log]				
94.0 - 94.5	[Sample Graphic]		[Graphic Log]				
94.5 - 95.0	[Sample Graphic]		[Graphic Log]				
95.0 - 95.5	[Sample Graphic]		[Graphic Log]				
95.5 - 96.0	[Sample Graphic]		[Graphic Log]				
96.0 - 96.5	[Sample Graphic]		[Graphic Log]				



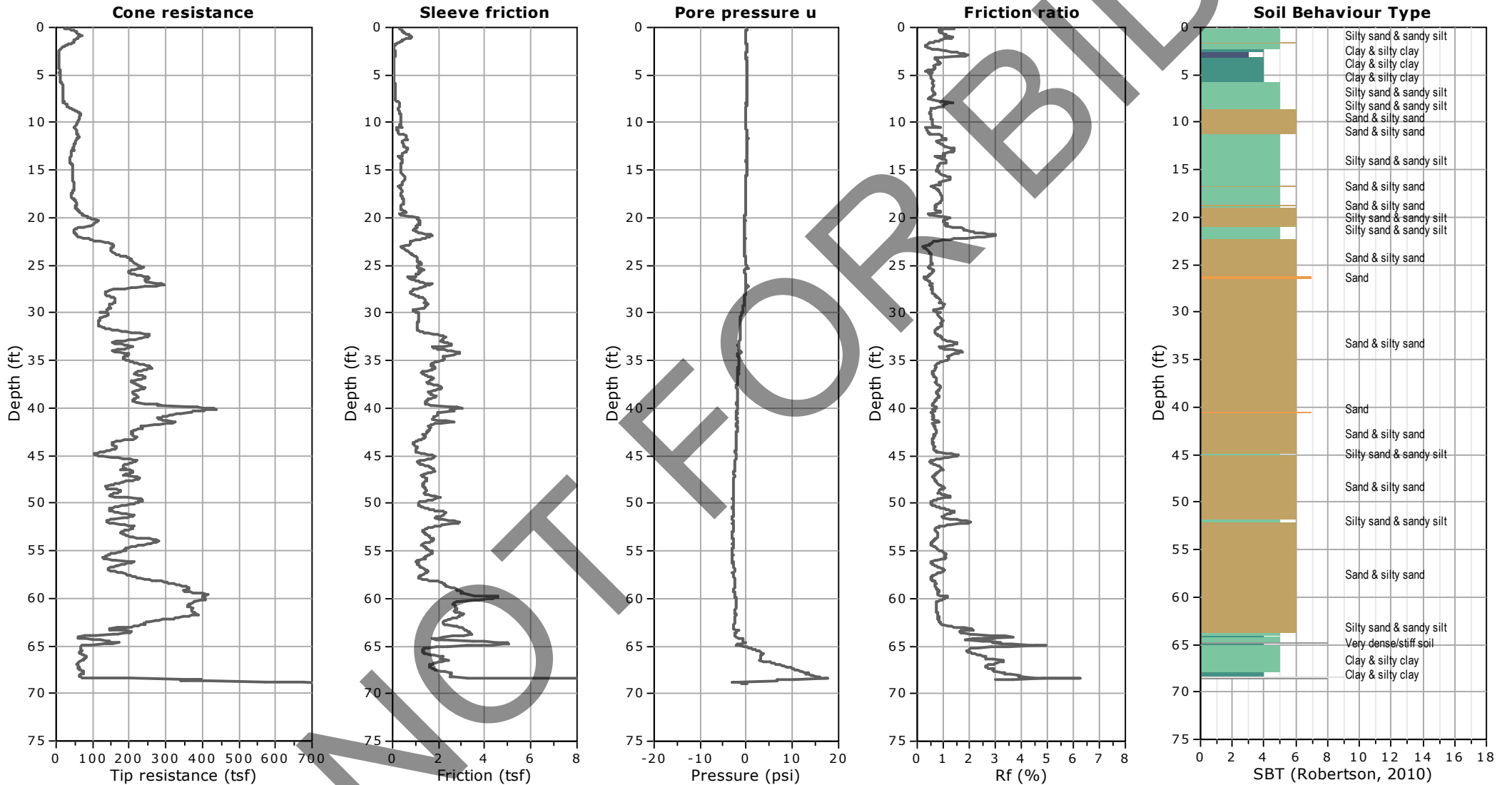
Pacific Village

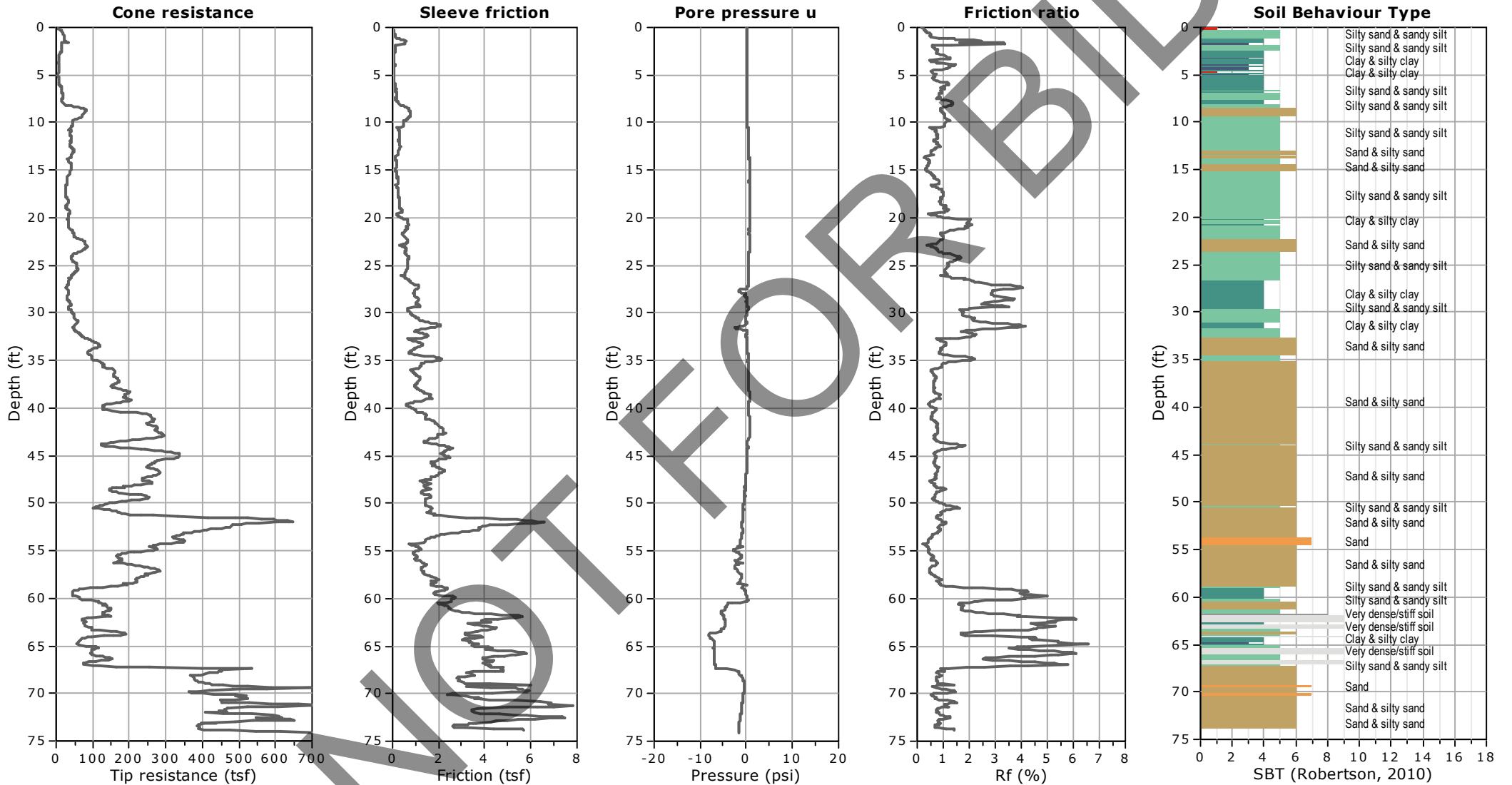
Soil Boring: B-8

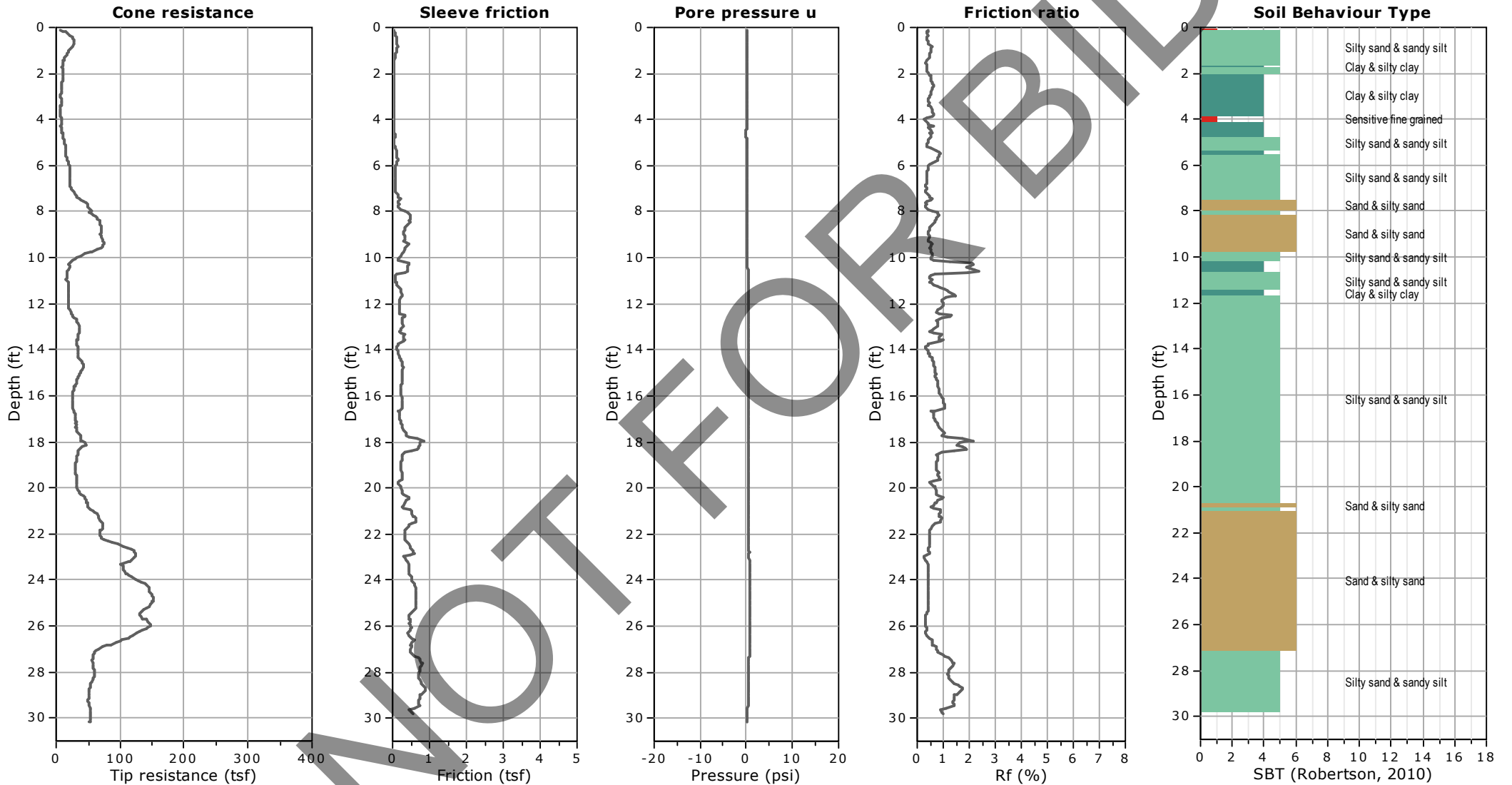
Client Name: <u>LPA Designs</u>	Drilling Firm: <u>Jet Drilling</u>	Date Started: <u>03/13/2024</u>
Project Number: <u>4930.2400003</u>	Hammer Weight: <u>140lb/30"</u>	Date Completed: <u>03/13/2024</u>
Logged By: <u>OG</u>	Hammer Type: <u>Autohammer</u>	Surface Elevation: <u>N/A</u>
Checked By: <u>HFT</u>	Rig Type: <u>CME-75</u>	Drilling Water Level: <u>N.E.</u>

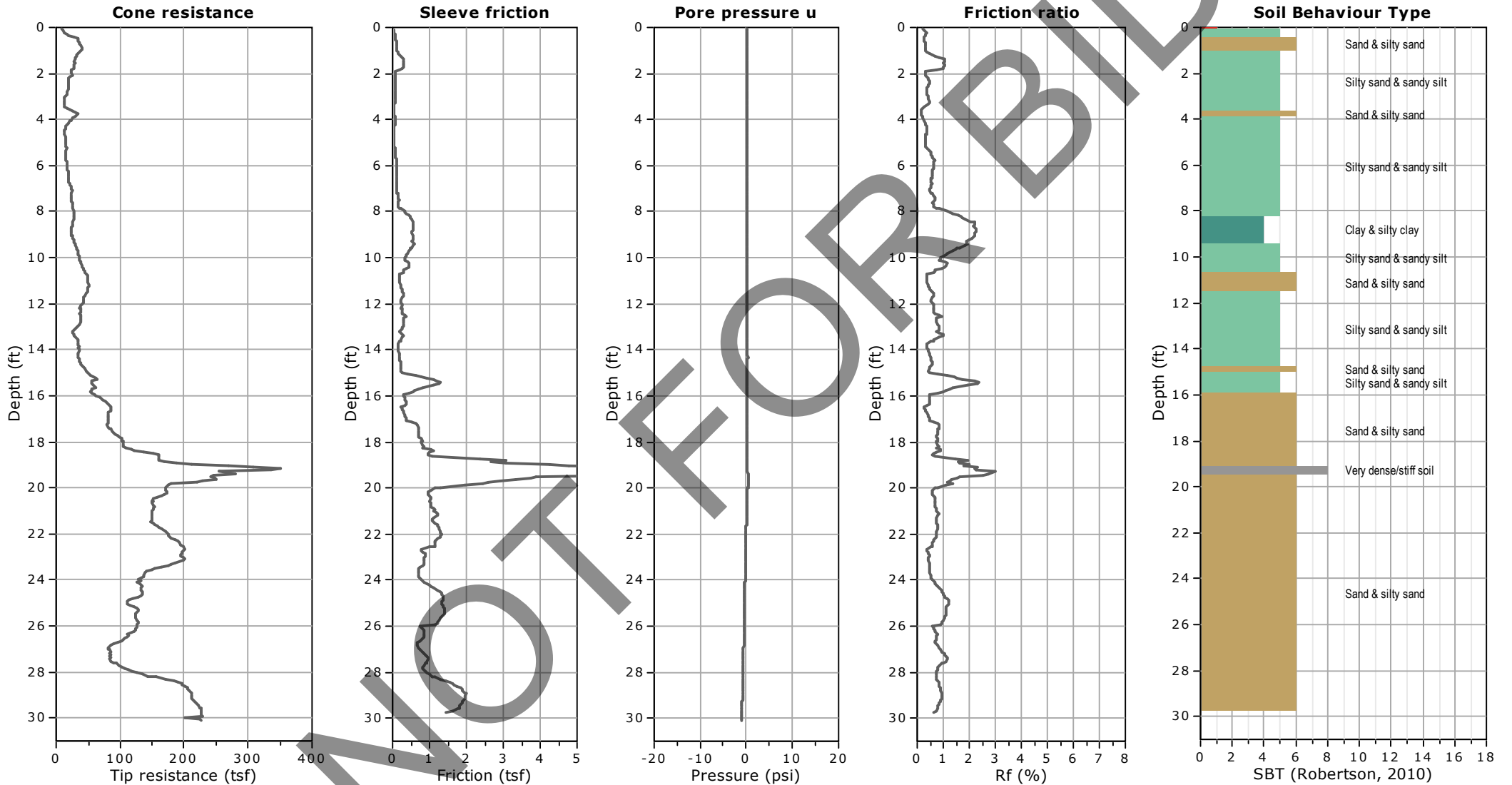
Depth (ft)	Sample Graphic	Blow Counts	Graphic Log	USCS	Visual Classification	Lab...	
						Moisture Content (%)	Dry Density (PCF)
0 - 4		4 4 7		SM	Silty SAND, medium dense, brown, moist, fine to medium grained		
30 - 31		6 6 11					
35 - 36		11 12 14					
40 - 41.5						41.5	

Boring terminated at 41.5 feet below ground surface. No groundwater encountered at the time of drilling. (N.E.)





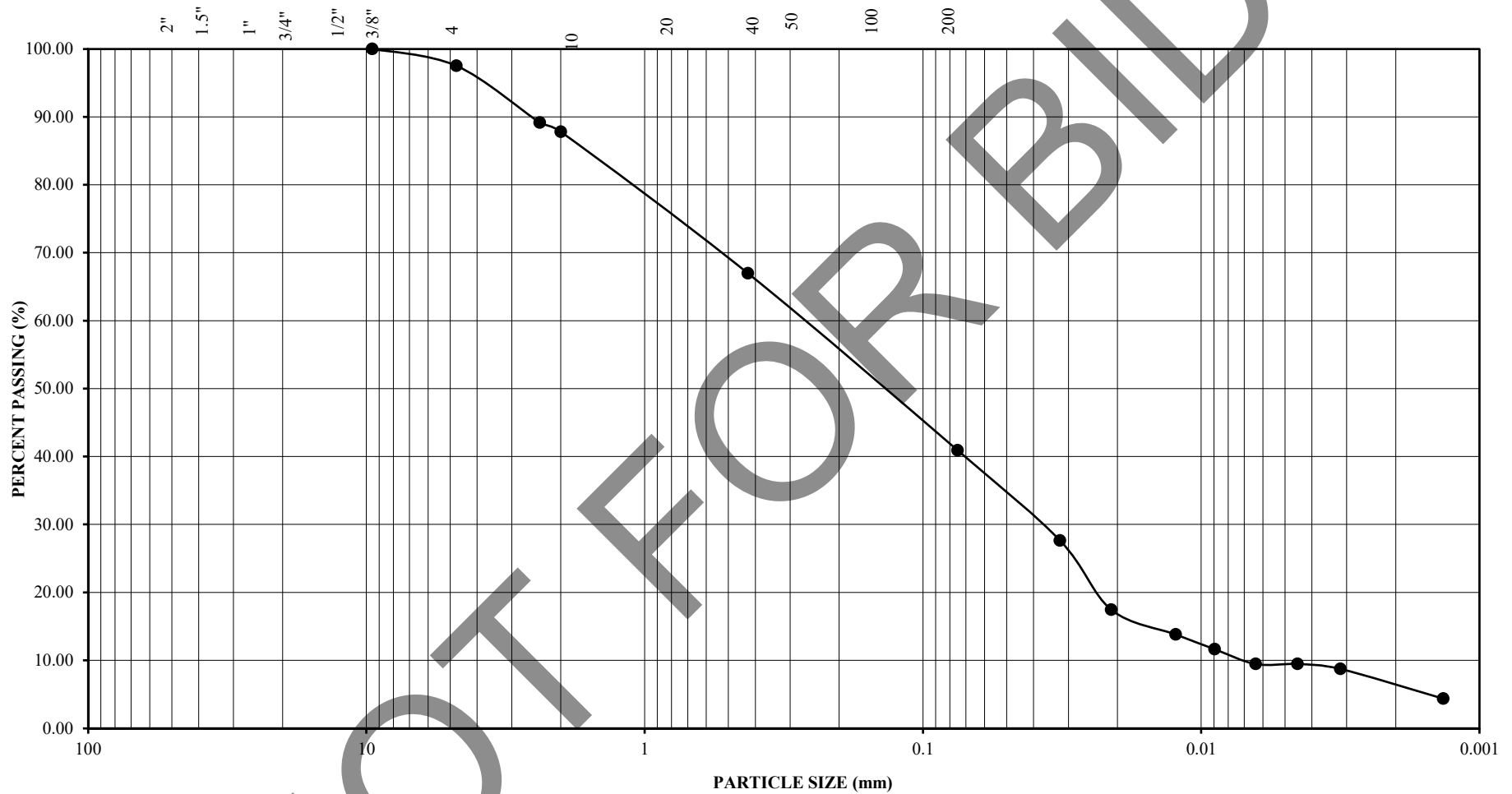




APPENDIX B

NOT FOR BID

U. S. STANDARD SIEVE SIZE



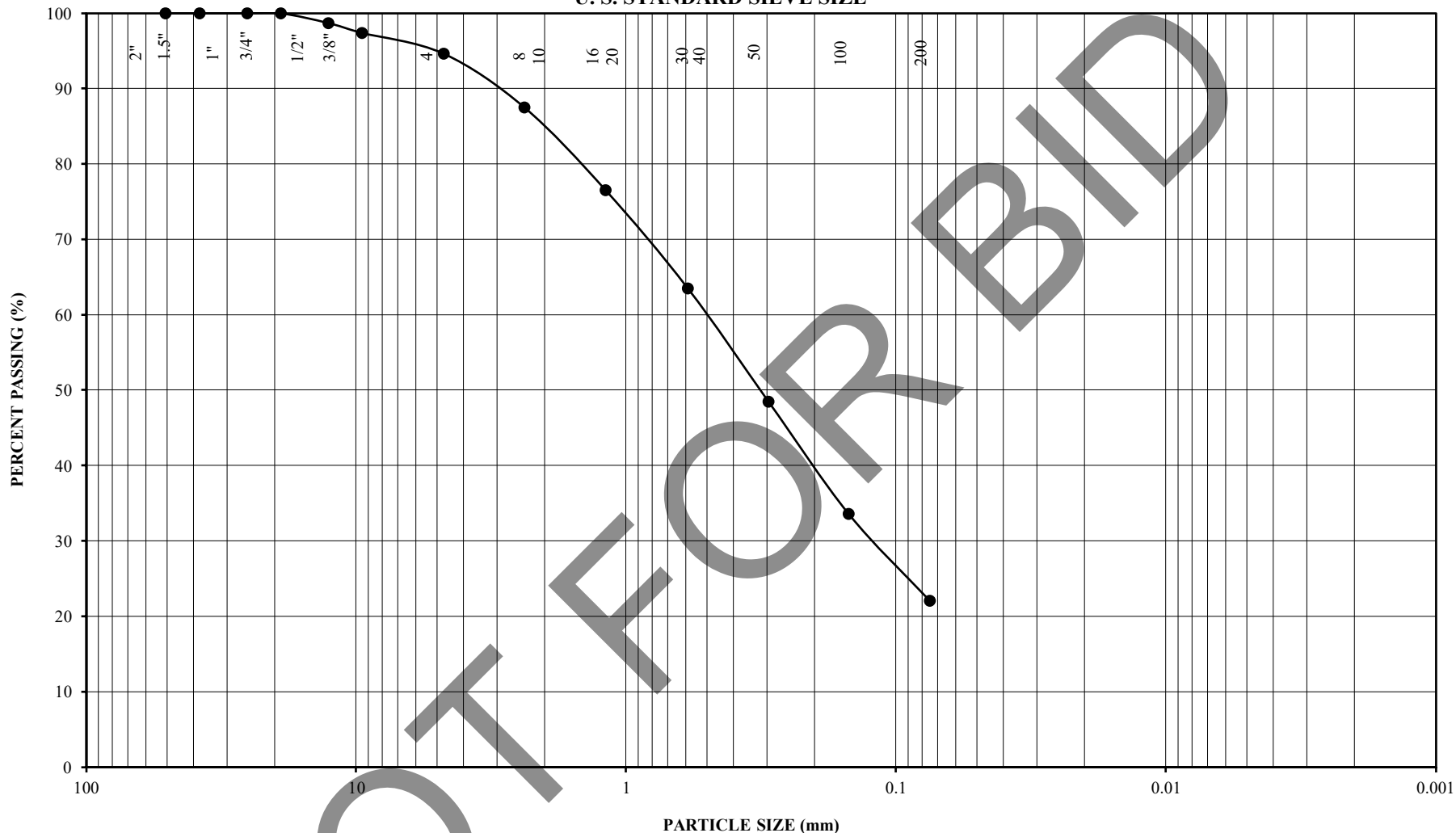
PARTICLE SIZE ANALYSIS (AASHTO T88)



Universal Engineering Sciences
 14538 Meridian Parkway Suite A
 Riverside, CA 92518
 p. 951.571.4081 | teamues.com

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-2	5	●	N/A	N/A	SM
Project:			4930.2400003.0000	Lab No.	9879

U. S. STANDARD SIEVE SIZE

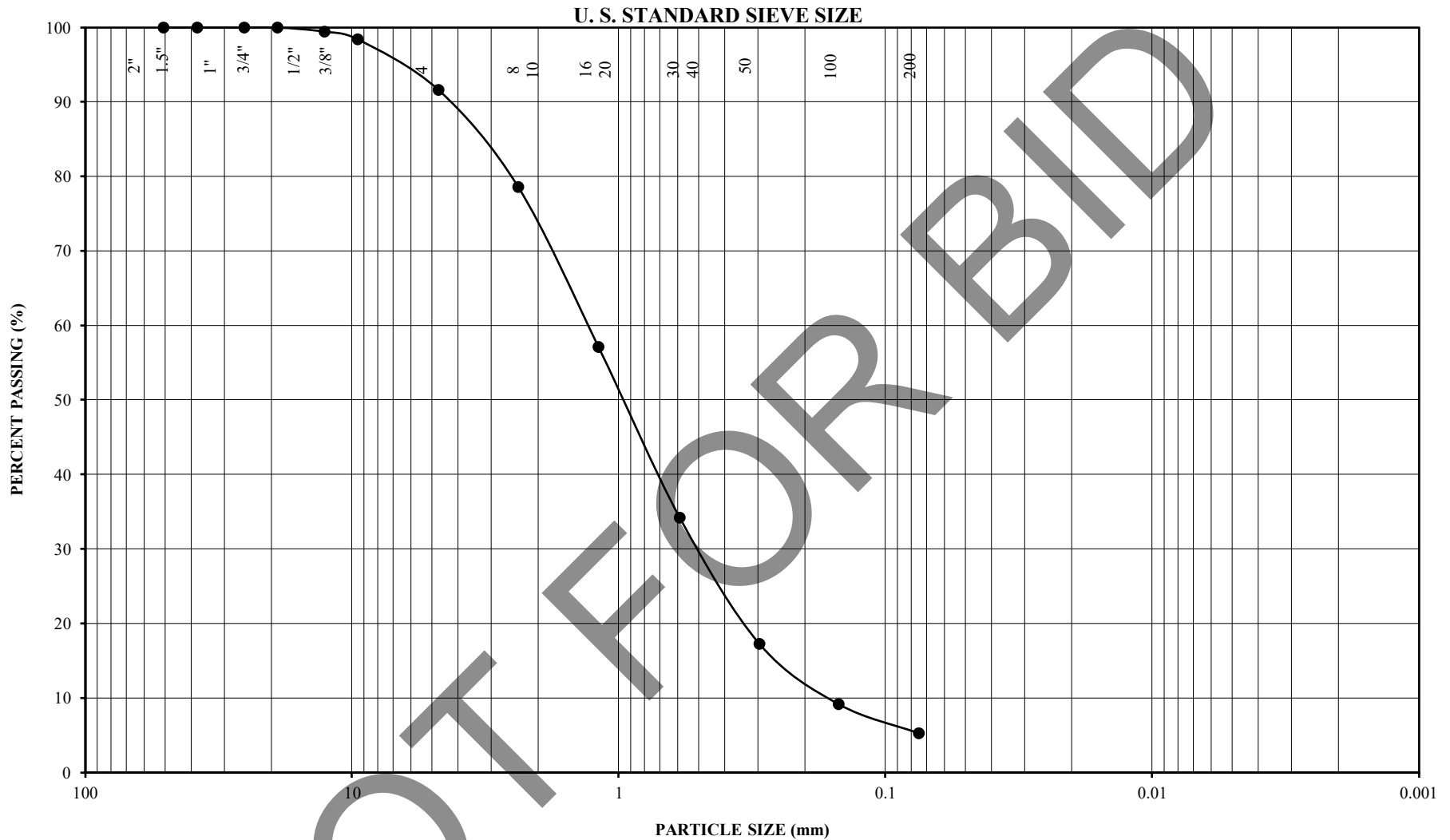


PARTICLE SIZE ANALYSIS



Universal Engineering Sciences
 14538 Meridian Parkway Suite A
 Riverside, CA 92518
 p. 951.571.4081 | teamues.com

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B4	5	●	N/A	N/A	SM
Project:			4930.2400003.0000	LAB NO.:	9879



PARTICLE SIZE ANALYSIS



Universal Engineering Sciences
 14538 Meridian Parkway Suite A
 Riverside, CA 92518
 p. 951.571.4081 | teamues.com

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B7	20	●	N/A	N/A	SP-SM
Project:			4930.2400003.0000	LAB NO.:	9879



**MATERIALS IN AGGREGATE & SOILS FINER THAN NO. 200 SIEVE BY WASHING
ASTM C117**

PROJECT NAME Pacific Villiage Platinum Campus

PROJECT NO. 4930.24

LABORATORY NO. 9879

SAMPLE NO.	B1, 10'	B4, 5'	B5, 10'	B6, 5'
INITIAL DRY WT. (1)	299.3	374.8	294.9	135.3
FINAL DRY WT (2)	235.5	294.7	230.1	89.6
CHANGE (3)	63.8	80.1	64.8	45.7
PERCENT PASSING NO. 200 (3 / 1)	21.30%	21.40%	22%	33%

Tested in accordance with ASTM C117.

DATE TESTED: 3/28/2024

TESTED BY: NG

REVIEWED BY: _____



LABORATORY COMPACTION OF SOIL (MODIFIED PROCTOR)

ASTM D 1557

Project Name: Pacific Village Platinum Campus
UES Project No.: 4930.2400003
Lab No.: 9879
Sample ID: B-8
Sample Description: Brown Silty Sand

Sampled By: OG **Date:** 03/13/24
Tested By: AB **Date:** 03/14/24
Reviewed By: SP **Date:** 03/15/24

	-2	0	2	4	
TEST NO.	1	2	3	4	
Wt. Comp. Soil + Mold (lbs)	13.457	13.674	13.842	13.702	
Wt. of Mold (lbs)	9.088	9.088	9.088	9.088	
Net Wt. of Soil (lbs)	4.369	4.586	4.754	4.614	
Wet Wt. of Soil + Cont. (g)	600.8	600.4	600.7	600.6	
Dry Wt. of Soil + Cont. (g)	576.0	563.3	553.8	543.4	
Wt. of Container (g)	12.6	12.6	12.6	12.6	
Moisture Content (%)	4.4	6.7	8.7	10.8	
Wet Density (pcf)	131.2	137.7	142.8	138.6	
Dry Density (pcf)	125.7	129.0	131.4	125.1	

Preparation Method: Dry
 Moist

Mechanical Rammer
Manual Rammer

Hammer Weight:

Drop:

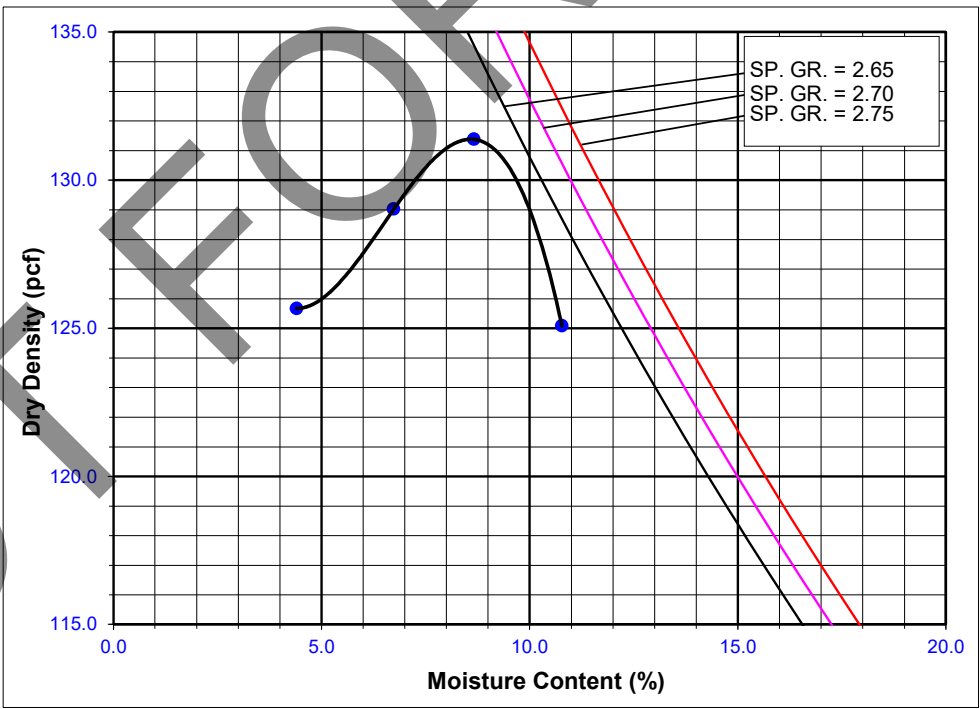
Mold Volume (ft.³):

METHOD USED

Method A
 Soil Passing No. 4 (4.75 mm) Sieve
 Mold : 4 in. (101.6 mm) diameter
 Layers : 5 (Five)
 Blows per layer : 25 (twenty-five)
 May be used if No.4 retained =/< 25%

Method B
 Soil Passing 3/8 in. (9.5 mm) Sieve
 Mold : 4 in. (101.6 mm) diameter
 Layers : 5 (Five)
 Blows per layer : 25 (twenty-five)
 May be used if 3/8" retained =/< 25%

Method C
 Soil Passing 3/4 in. (19.0 mm) Sieve
 Mold : 6 in. (152.4 mm) diameter
 Layers : 5 (Five)
 Blows per layer : 56 (fifty-six)
 May be used if 3/4" retained =/< 30%



OVERSIZE FRACTION	
Total Sample Weight (g):	23050.3
Weight Retained (g)	Percent Retained
	Plus 3/4" 0.0
	Plus 3/8" 0.0
816.1	Plus #4 3.5

Maximum Dry Density (pcf)

Optimum Moisture Content (%)

Rock Correction Applied per ASTM D 4718

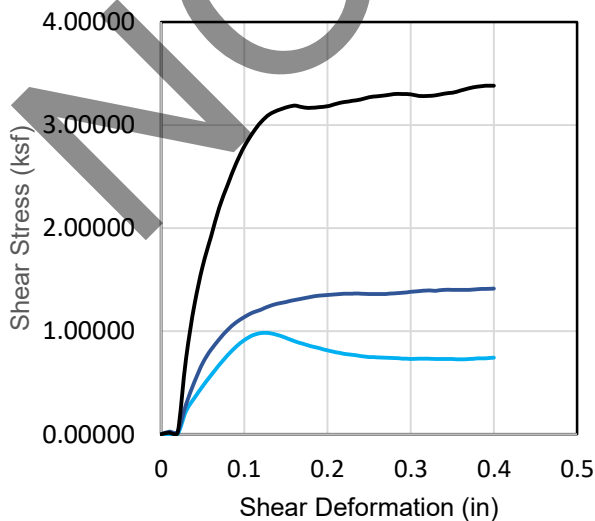
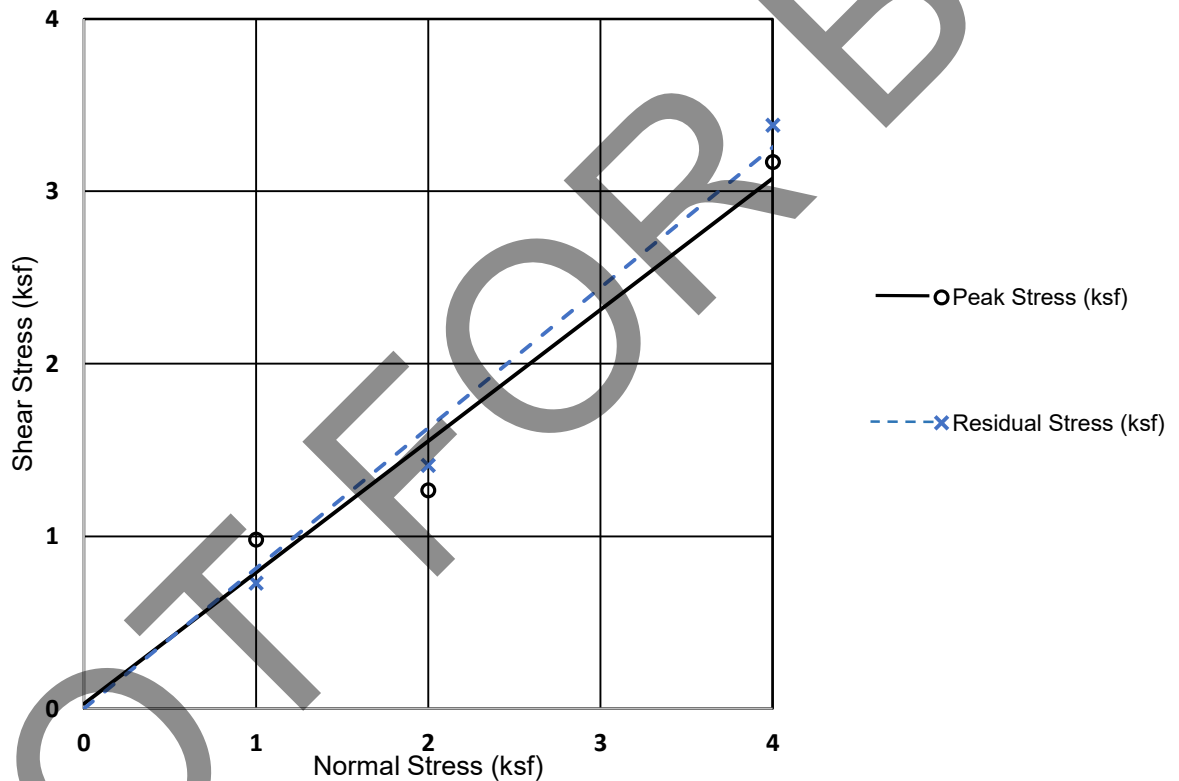
Maximum Dry Density (pcf)

Optimum Moisture Content (%)

Direct Shear Test Results ASTM D3080

Client: LPA Design Studios
Project Name: Pacific Village Platinum Campus
Project No.: 4930.2400003.0000
Boring No.: B-5
Sample No.: Ring _____ Depth (ft): 5ft
Sample Description: Dark Brown Silty Sand

Sampled By: OG **Date:** 3/14/2024
Tested By: SP **Date:** 4/2/2024
Checked By: HT **Date:** 4/12/2024
Test Condition: Saturated
Sample Type: Undisturbed

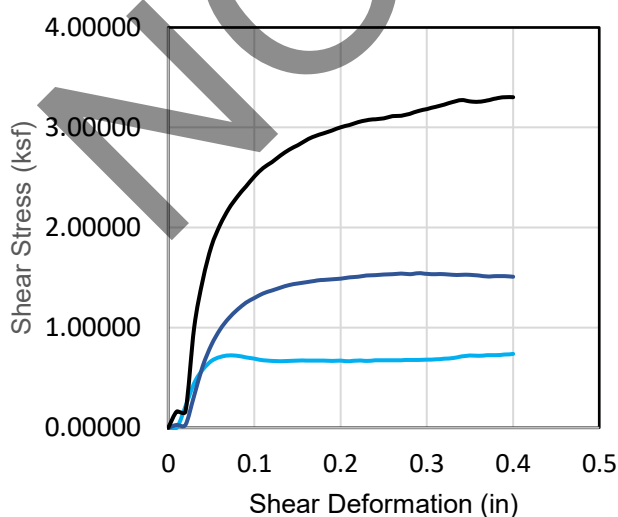
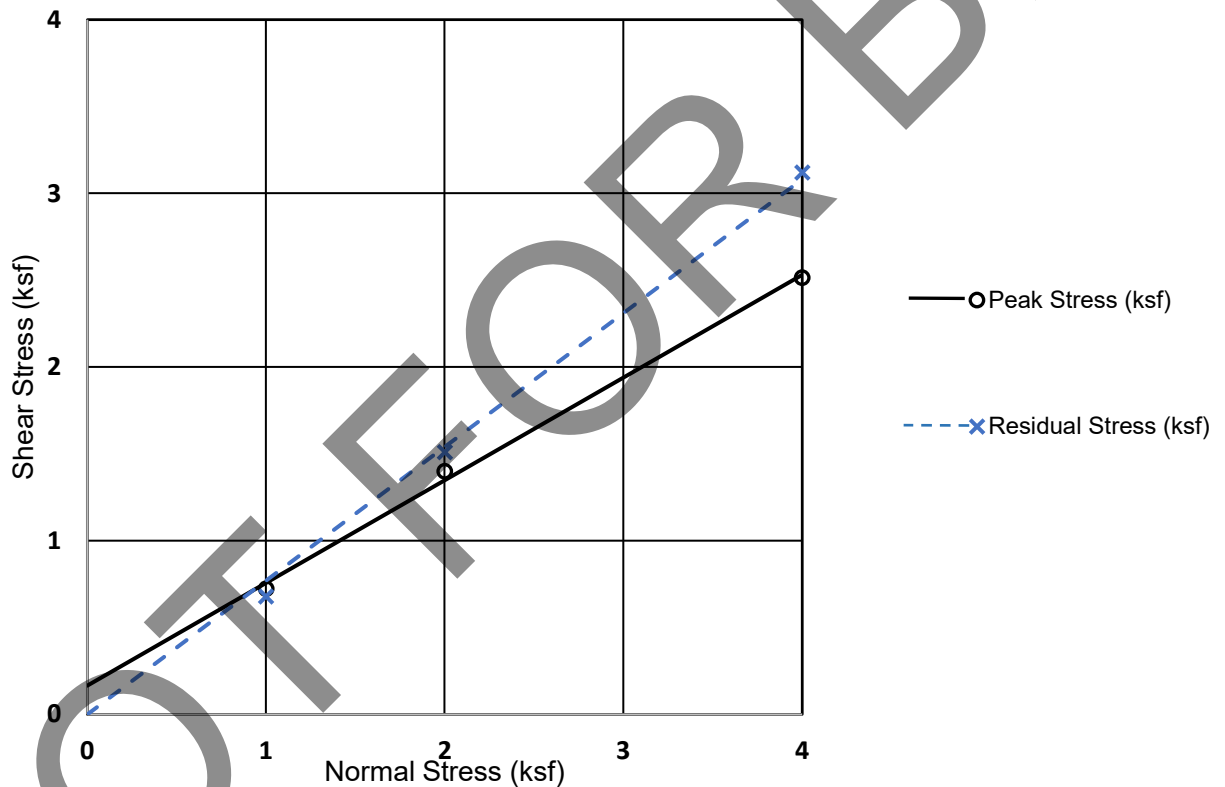


	Peak	Residual
Cohesion, c (psf)	30	0
Friction Angle, ϕ (°)	37	39

Direct Shear Test Results ASTM D3080

Client: LPA Design Studios
Project Name: Pacific Village Platinum Campus
Project No.: 4930.2400003.0000
Boring No.: B-8
Sample No.: Bulk **Depth (ft):** 0-5 ft.
Sample Description: Brown Silty Sand

Sampled By: OG **Date:** 3/14/2024
Tested By: SP **Date:** 3/29/2024
Checked By: HT **Date:** 4/12/2024
Test Condition: Saturated
Sample Type: Remolded 90% RC (ASTM D1557)



	Peak	Residual
Cohesion, c (psf)	170	0
Friction Angle, ϕ (°)	31	36

REPORT OF RESISTANCE 'R' VALUE-EXPANSION PRESSURE

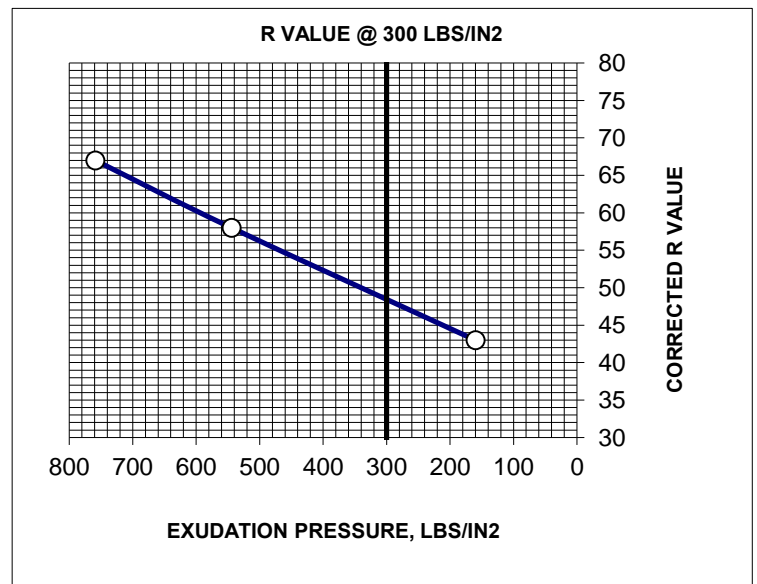
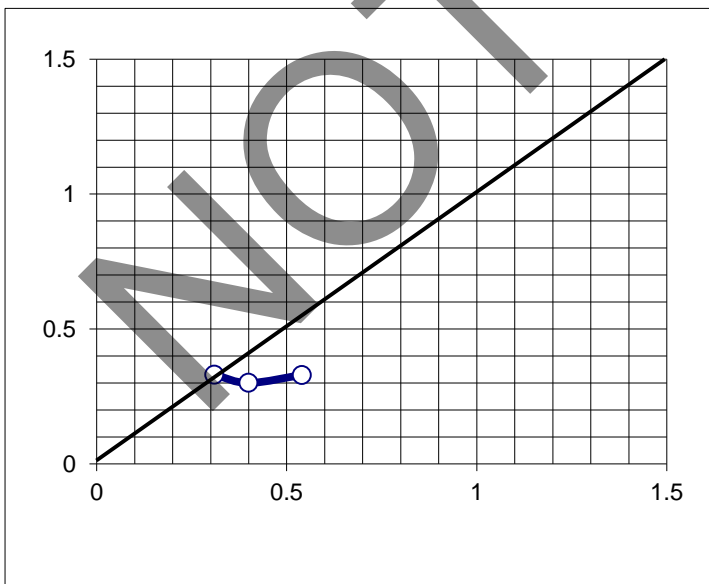
Project Name: Pacific Village Platinum Campus
Project Number.: 4930.2400003.0000
Sample Location: B-2 @ 0-5'
Soil Description: Brown (SC/ML)
Test Procedure: Cal 301

Lab No.: 35664
Sampled By: H.T. **Date:** 3/14/2024
Submitted By: H.T. **Date:** 4/1/2024
Tested By: Larry Sachs **Date:** 4/3/2024
Reviewed By: Erik Campbell **Date:** 4/5/2024

Specimen/ Mold No.	3	1	2
Compactor Air Pressure, ft.lbs.	210	220	230
Initial Moisture, %	3.9	3.9	3.9
Wet Weight / Tare (g)	1200.6	1200.6	1200.6
Dry Weight / Tare (g)	1182.2	1182.2	1182.2
Tare (g)	704.3	704.3	704.3
Water Added, ml	100	90	80
Moisture at Compaction, %	24.8	22.7	20.6
Wt. Of Briquette and Mold, g	3244	3287	3269
Wt. Of Mold, g	2094	2108	2094
Wt. Of Briquette, g	1150	1179	1175
Height of Briquette, in	2.51	2.57	2.56
Dry Density, pcf	111.3	113.4	115.4
Stabilometer PH @ 1000 lbs	49	30	22
Stabilometer PH @ 2000 lbs	116	56	40
Displacement	3.69	3.66	3.60
R' Value	43	58	67
Corrected 'R' Value	43	58	67
Exudation Pressure, lbs	2000	6805	9488
Exudation Pressure, psi	160	544	759
Stabilometer Thickness - ft	0.54	0.40	0.31
Expansion Pressure	0.0010	0.0009	0.0010
Expansion Press, Thick-ft	0.33	0.30	0.33

Exudation 49
Expansion 68
R-value 49

TI	4.5
Expansion	68



Cover Thickness by Expansion Pressure-Feet

Expansion From Graph: **0.31**



 Erik Campbell
 Laboratory Manager



Table 1 - Laboratory Tests on Soil Samples

CTE-UES
Pacific Village Platinum Campus
Your #4930.2400003.0000, HDR Lab #24-0143LAB
3-Apr-24

Sample ID

B-3 @ 0-5' B-7 @ 0-5'

Resistivity		Units	B-3 @ 0-5'	B-7 @ 0-5'
as-received		ohm-cm	560,000	480,000
minimum		ohm-cm	3,920	6,000
pH			7.1	7.2
Electrical Conductivity		mS/cm	0.09	0.04
Chemical Analyses				
Cations				
calcium	Ca ²⁺	mg/kg	44	22
magnesium	Mg ²⁺	mg/kg	5.0	3.0
sodium	Na ¹⁺	mg/kg	39	17
potassium	K ¹⁺	mg/kg	11	9.0
ammonium	NH ₄ ¹⁺	mg/kg	ND	ND
Anions				
carbonate	CO ₃ ²⁻	mg/kg	ND	ND
bicarbonate	HCO ₃ ¹⁻	mg/kg	79	52
fluoride	F ¹⁻	mg/kg	21	20
chloride	Cl ¹⁻	mg/kg	9.0	6.0
sulfate	SO ₄ ²⁻	mg/kg	65	12
nitrate	NO ₃ ¹⁻	mg/kg	11	6.0
phosphate	PO ₄ ³⁻	mg/kg	6.0	7.0
Other Tests				
sulfide	S ²⁻	qual	na	na
Redox		mV	na	na

Minimum resistivity and pH per CTM 643, Chloride per CTM 422, Sulfate per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

APPENDIX C

NOT FOR BID



Percolation Test Data Sheet

Project: 4930.2400003.0000

Date: March 26, 2024

Test Hole No: P1

Hole Depth, D_T (inches): 120

Diameter (inches): 8

Soil Description: Silty Sand (SM)

Tested Infiltration Rate¹
0.09 in/hr

Sandy Soil Criteria Test							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	7:55	8:20	25	30.00	32.00	2.00	No
2	8:30	8:55	25	30.00	31.00	1.00	No

Trial Readings							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:10	9:40	30	30.00	31.00	1.00	30.00
2	9:40	10:10	30	30.00	31.50	1.50	20.00
3	10:10	10:40	30	30.00	32.00	2.00	15.00
4	10:45	11:15	30	30.00	31.00	1.00	30.00
5	11:15	11:45	30	30.00	32.00	2.00	15.00
6	11:45	12:15	30	30.00	31.50	1.50	20.00
7	12:15	12:45	30	30.00	31.50	1.50	20.00
8	12:45	1:15	30	30.00	32.00	2.00	15.00
9	1:15	1:45	30	30.00	32.00	2.00	15.00
10	1:45	2:15	30	30.00	31.50	1.50	20.00
11	2:15	2:45	30	30.00	31.50	1.50	20.00
12	2:45	3:15	30	30.00	32.00	2.00	15.00

Comments: ¹ Tested infiltration rate from Mojave River Watershed Technical Guidance Document for Water Quality Management Plans. No factor of safety is applied to this rate.



Percolation Test Data Sheet

Project: 4930.2400003.0000

Date: March 26, 2024

Test Hole No: P3

Hole Depth, D_T (inches): 120

Diameter (inches): 8

Soil Description: Silty Sand (SM)

Tested Infiltration Rate¹
0.07 in/hr

Sandy Soil Criteria Test							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	8:05	8:30	25	42.00	44.00	2.00	No
2	8:35	9:00	25	42.00	45.00	3.00	No

Trial Readings							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:20	9:50	30	31.00	33.50	2.50	12.00
2	9:50	10:20	30	31.00	33.00	2.00	15.00
3	10:20	10:50	30	31.00	32.50	1.50	20.00
4	10:50	11:20	30	31.00	32.50	1.50	20.00
5	11:20	11:50	30	31.00	33.00	2.00	15.00
6	11:50	12:20	30	31.00	32.50	1.50	20.00
7	12:20	12:50	30	31.00	32.50	1.50	20.00
8	12:50	1:20	30	31.00	33.50	2.50	12.00
9	1:20	1:50	30	31.00	33.00	2.00	15.00
10	1:50	2:20	30	31.00	32.50	1.50	20.00
11	2:20	2:50	30	31.00	32.00	1.00	30.00
12	2:50	3:20	30	31.00	32.50	1.50	20.00

Comments: ¹ Tested infiltration rate from Mojave River Watershed Technical Guidance Document for Water Quality Management Plans. No factor of safety is applied to this rate.



Percolation Test Data Sheet

Project: 4930.2400003.0000

Date: March 26, 2024

Test Hole No: P4

Hole Depth, D_T (inches): 60

Diameter (inches): 8

Soil Description: Silty Sand (SM)

Tested Infiltration Rate¹
0.27 in/hr

Sandy Soil Criteria Test							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	8:15	8:40	25	16.00	18.50	2.50	No
2	8:40	9:15	25	16.00	19.00	3.00	No

Trial Readings							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:25	9:55	30	16.00	19.00	3.00	10.00
2	9:55	10:25	30	16.00	18.00	2.00	15.00
3	10:30	11:00	30	16.00	18.50	2.50	12.00
4	11:00	11:30	30	16.00	19.00	3.00	10.00
5	11:30	12:00	30	16.00	19.00	3.00	10.00
6	12:00	12:30	30	16.00	18.00	2.00	15.00
7	12:30	1:00	30	16.00	18.50	2.50	12.00
8	1:00	1:30	30	16.00	19.00	3.00	10.00
9	1:30	2:00	30	16.00	18.50	2.50	12.00
10	2:00	2:30	30	16.00	18.00	2.00	15.00
11	2:30	3:00	30	16.00	18.50	2.50	12.00
12	3:00	3:30	30	16.00	19.00	3.00	10.00

Comments: ¹ Tested infiltration rate from Mojave River Watershed Technical Guidance Document for Water Quality Management Plans. No factor of safety is applied to this rate.