Appendix IS-3

Geotechnical Reports

Appendix IS-3.1

Geotechnical Investigation

GEOTECHNICAL EXPLORATION REPORT
PROPOSED INDUSTRIAL DEVELOPMENT
9000 AIRPORT BOULEVARD
CITY OF LOS ANGELES, CALIFORNIA

Prepared For

REXFORD INDUSTRIAL REALTY & MANAGEMENT, INC.
11620 WILSHIRE BOULEVARD, SUITE 610
LOS ANGELES, CALIFORNIA 90025

Prepared By

LEIGHTON CONSULTING, INC.
2600 MICHELSON DRIVE, SUITE 400
IRVINE, CALIFORNIA 92612

Project Number 13837.001

February 22, 2024

Leighton Consulting, Inc.

February 22, 2024

Project No. 13837.001

Rexford Industrial Realty & Management, Inc.
11620 Wilshire Boulevard, Suite 610
Los Angeles, California 90025

Attention: Mr. Brian Garcia

Subject: Geotechnical Exploration Report
Proposed Industrial Development
9000 Airport Boulevard
City of Los Angeles, California

Per your request and authorization, Leighton Consulting, Inc. (Leighton) has prepared this geotechnical exploration report for the subject project. We understand two development concepts are being considered for the project site: a single new industrial building concept or an alternate with three (3) new industrial buildings. The proposed one-story industrial buildings will be constructed at-grade and will include dock-high truck loading, surface parking, and Los Angeles Fire Department access around the buildings. Ancillary improvements likely consist of utility infrastructure, pavement, flatwork, and landscaping.

The purpose of our geotechnical exploration was to evaluate subsurface conditions at the site, identify potential geologic and seismic hazards that may affect the project, and provide geotechnical recommendations for design and construction of the proposed improvements as currently planned.

The project is considered feasible from a geotechnical standpoint. The results of our exploration and conclusions and recommendations are presented in this report.

We appreciate the opportunity to be of service to you on this project. If you have any questions or if we can be of further service, please contact us at ***(866) LEIGHTON***; or specifically at the phone extensions or e-mail addresses listed below.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Jeffrey M. Pflueger, PG, CEG 2499
Associate Geologist
Extension 4257, jpflueger@leightongroup.com

Carl C. Kim, PE, GE 2620
Senior Principal Engineer
Extension: 4262, ckim@leightongroup.com

ECB/JW/JMP/CCK/lr

Distribution: (1) Addressee

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1.0 INTRODUCTION

1.1 Site Description and Proposed Development

The project site is located at 9000 South Airport Boulevard in the city of Los Angeles, California. The site location (latitude 33.9544°, longitude -118.3843°) and immediate vicinity are shown on Figure 1, *Site Location Map.*

The project site is irregular in shape and covers approximately 18 acres. The site is bordered by Airport Boulevard to the west, Interceptor Street to the north and northeast, existing residential and industrial properties to the east, and West Arbor Vitae Street to the south. Access to the site is via two driveways along Airport Boulevard on the west and two driveways along West Arbor Vitae Street on the south. The site is currently occupied by an existing and active rental car facility (Hertz) with several industrial buildings throughout the site, solar canopies, and asphalt concrete (AC) and Portland cement concrete paved parking and access throughout the site.

The project site is relatively flat with surface drainage generally directed to the south. Review of the United States Geological Survey (USGS) 7.5-Minute Venice Quadrangle (USGS, 1982) indicates the site is at approximately Elevation (El.) +100 to +110 feet mean sea level (msl).

Based on review of historic aerial photographs (NETR, 2023), the project site appears to have been vacant undeveloped land in 1952. Between approximately 1952 and 1963, the site was developed as Airport Junior High School and contained several buildings located in the northern portion of the site and an athletic field in the southern portion of the site. By approximately 1980, the previous school improvements and buildings were removed and the existing site development was under construction. By approximately 1985, most of the existing structures and site improvements were constructed, including a structure located in the northwestern portion of the site that was removed between approximately 2000 and 2003. In addition, covered parking was constructed in the southern portion of the property between approximately 1992 and 1993, and was improved to include solar panels between approximately 2010 and 2012.

Based on review of the *Preliminary Site Plan – Option 1* (Sheet A1-1) for the project, dated September 22, 2023, we understand one option for the proposed development of the site consists of one (1) new one-story industrial building constructed at-grade with a total building area of 435,390 square feet. The proposed building is planned to include dock-high truck loading on the western side of the building, surface parking in the northern and southern portions of the site, truck trailer parking in the western portion of the site, and Los Angeles Fire Department access around the entire building. The proposed development Option 1 is shown on Figure 2A, *Exploration Location Map*.

Based on review of the *Preliminary Site Plan – Option 2* (Sheet A1-1) for the project dated February 8, 2024, we understand a second option for the proposed development of the site consists of three (3) new one-story industrial buildings constructed at-grade with total building areas of 117,930 square feet (Building 1), 139,093 square feet (Building 2), and 138,043 square feet (Building 3). The proposed buildings are planned to include dock-high truck loading facing the central portion of the site with associated surface parking, and Los Angeles Fire Department access throughout the site. The proposed development Option 2 is shown on Figure 2B, *Exploration Location Map*.

Ancillary improvements will likely consist of utility infrastructure, pavement, flatwork, and landscaping. Preliminary structural loading information was not yet available at the time this memorandum was prepared.

1.2 Purpose and Scope

The purpose of our geotechnical exploration was to evaluate the subsurface conditions at the site relative to the proposed development concept and provide geotechnical recommendations to aid in the design and construction for the project as currently planned. The scope of this geotechnical exploration included the following tasks:

- *Background Review* – We reviewed readily available in-house geotechnical reports, literature, aerial photographs, and maps relevant to the site. We evaluated geological hazards and potential geotechnical issues that may significantly impact the site. The documents reviewed are listed in Section 5.0, *References*.

- *Pre-Field Exploration Activities* – A site visit was performed by a member of our technical staff to mark the proposed exploration locations. Dig Alert (811) was notified to locate and mark existing underground utilities prior to our subsurface exploration.

- *Field Exploration* – Our subsurface exploration was performed on February 28, 2023 which included drilling, logging, and sampling of six (6) hollow-stem auger borings (designated LB-1 through LB-6) to a depth of approximately 31½ feet below the existing ground surface (bgs). Two (2) additional borings (designated LP-1 and LP-2) were drilled to an approximate depth of 10 feet bgs and converted to temporary wells for subsequent percolation testing. Eight (8) cone penetrometer test (CPT) soundings (CPT-1 through CPT-8) were also advanced at the site to depth ranging between approximately 26 and 50 feet bgs. Refusal was encountered in CPT-1 and CPT-5 at depths of 29 feet bgs and 26 feet bgs, respectively, prior to reaching the target depth. The approximate locations of the explorations are shown on Figures 2A and 2B, *Exploration Location Map.* Logs of the borings and CPTs are presented in Appendix A, *Exploration Logs.*

  During drilling of the borings, bulk and drive samples were obtained from the borings for geotechnical laboratory testing. Driven ring samples were collected from the borings using a Modified California ring-lined sampler conducted in accordance with ASTM Test Method D 3550. Standard Penetration Tests (SPTs) were also performed within the borings in accordance with ASTM Test Method D 1586. Samples were collected at 2½-foot to 5-foot intervals throughout the depth of exploration. In both test methods, the sampler is driven below the bottom of the borehole by a 140-pound weight (hammer) free-falling 30 inches. The drilling rig was equipped with an automatic hammer to provide greater consistency in the drop height and striking frequency. The number of blows to drive the sampler the final 12 inches of the 18-inch drive interval is termed the "blowcount" or SPT N-value. The N-values provide a measure of relative density in granular (non-cohesive) soils and comparative consistency in cohesive soils. The number of blows per 6 inches of penetration was recorded on the boring logs, see Appendix A.

  The borings were logged in the field by a geologist from our firm. Each soil sample collected was reviewed and described in accordance with the Unified Soil Classification System (USCS). The samples were sealed and packaged for transportation to our laboratory. After completion of drilling, the borings were backfilled to the ground surface with soils generated during the exploration and patched with cold-mix asphalt concrete to match existing surface conditions. Excess soil cuttings from the borings were placed in 55-gallon drums for offsite disposal after completion of analytical testing.

- *Percolation Testing* – Borings LP-1 and LP-2 (Figures 2A and 2B) were converted to temporary percolation test wells upon completion of drilling and sampling. The test wells consisted of 2-inch slotted (0.020”) PVC well casing surrounded by #3 Monterey Sand placed in the annulus of the well within the test zone. In-situ percolation testing was performed on March 2, 2023, in general accordance with the County of Los Angeles Department of Public Works (LADPW) *Guidelines for Geotechnical Investigation* and Reporting, *Low Impact Development Stormwater Infiltration* (LADPW, 2021). The results of the percolation testing are presented in Appendix B, *Percolation Test Data*. Refer to the discussion of infiltration rate presented in Section 2.4.1, *Infiltration*. Upon completion of the percolation testing, the well casing was removed from each boring and the borings were backfilled with soil cuttings and patched at the surface with cold-mix asphalt concrete to match existing site conditions.

- *Laboratory Testing* – Laboratory tests were performed on selected soil samples obtained from the borings during our field investigation. The laboratory testing program was designed to evaluate the physical and engineering characteristics of the onsite soil. Tests performed during this investigation include:

  - In- situ Moisture Content and Dry Density (ASTM D 2216 and ASTM D 2937);
  - Direct Shear (ASTM D 3080);
  - Consolidation (ASTM D 2435);
  - Maximum Dry Density (ASTM D 1557);
  - Expansion Index (ASTM D 4829);
  - R-value; and
  - Corrosivity Suite – pH, Sulfate, Chloride, and Resistivity (California Test Methods 417, 422, and 532/643).

  Results of the in-situ moisture content and dry density testing are presented on the boring logs in Appendix A. Other laboratory test results are presented in Appendix C, *Laboratory Test Results*

- *Engineering Analysis* – The data obtained from our background review and field exploration were evaluated and analyzed to develop recommendations for the proposed development.

- *Report Preparation* – This report presents our findings, conclusions, and preliminary recommendations for the proposed warehouse development.

2.0 GEOTECHNICAL FINDINGS

2.1 Regional Geologic Setting

The site is located in the Los Angeles Basin in the northwestern portion of the Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges province extends approximately 900 miles southward from the Santa Monica Mountains to the tip of Baja California (Yerkes, et al., 1965) and is characterized by elongated, northwest-trending mountain ridges and sediment-floored valleys. The province includes numerous northwest trending fault zones, most of which either gradually truncate, merge with, or are terminated by faults that form the southern margin of the Transverse Ranges province. These northwest-trending fault zones include the San Jacinto, Whittier-Elsinore, Palos Verdes, and Newport-Inglewood fault zones.

Approximately 65 million years ago (at the end of the Cretaceous Period) a deep, structural trough existed off the current coast of southern California (Yerkes, 1972). Over time, sedimentation would slowly fill the trough with tremendous amounts of sediments. About 7 million years ago, as sedimentation continued, an eastward shift of the boundary between the Pacific and North American plates to its present position would begin shaping the Los Angeles basin from this deep trough. Today the Los Angeles basin refers to the area defined by the Santa Monica, Whittier and Palos Verdes faults, and San Joaquin Hills. Basin depth is limited to the sediments deposited over the basement rock in the last 7 million years (Wright, 1991). The deepest part of the Los Angeles basin contains Tertiary to Quaternary-aged (65 million years and younger) marine and nonmarine sedimentary rocks that are about 24,000 feet thick (Yerkes, et al, 1965; Wright, 1991). During the Pleistocene epoch (the last two million years), the region was flooded as sea level rose in response to the worldwide melting of the Pleistocene glaciers.

2.2 Surficial Geology

More specifically, the site is located approximately 3.4 miles inland from the Pacific Ocean and to the east of the El Segundo Sand Hills, which extend from Baldwin Hills to Palos Verdes Hills. The project area is geologically mapped to be underlain by Quaternary-age (late to middle Pleistocene) old eolian and dune deposits (Qoe) generally consisting of slightly to moderately consolidated wind-blown sand and silty sand (Dibblee, 1981; Roffers and Bedrossian, 2010; Saucedo et al., 2016). The surficial geologic units mapped in the vicinity of the project site are shown on Figure 3, *Regional Geology Map*.

2.3 Subsurface Soil Conditions

Based on our subsurface explorations, the site is underlain by a layer of undocumented artificial fill materials (Afu) overlying Quaternary-aged (late to middle Pleistocene) old eolian and dune deposits (Qoe). The artificial fill encountered in our borings at the explored locations varies in thickness across the site up to approximately 7½ feet, likely associated with existing and previous site improvements. As encountered in our borings, the fill soils consist primarily of clayey sand and silty clayey sands. Localized thicker accumulations of the fill materials should be anticipated between explored locations during future earthwork construction, in particular beneath the existing and former building locations. Since there is no documentation for the placement, compaction and testing of the existing fill onsite, the artificial fill is considered undocumented and unsuitable for structural support in its current condition.

Below the artificial fill materials, Quaternary-aged (late to middle Pleistocene) old eolian and dune deposits (Qoe) were encountered in the explorations performed at the site to the maximum depth explored of approximately 50 feet bgs. The older alluvial sediments encountered generally consist of yellow-brown to reddish-brown, slightly moist to moist, medium dense to very dense sand, silty sand, and clayey sand with few interlayers of yellow-brown to orange-brown, moist, stiff to hard sandy clay and clay.

Detailed descriptions of the subsurface soils encountered in the borings are presented on the logs included in Appendix A. Some of the engineering properties of these soils are described in the following sections. The locations of the borings are shown on Figures 2A and 2B. *Exploration Location Map.*

2.3.1 Expansive Soil Characteristics

Expansive soils contain significant amounts of clay particles that swell considerably when wetted and which shrink when dried. Foundations constructed on these soils are subject to uplifting forces caused by the swelling. Without proper mitigation measures, heaving and cracking of both building foundations and slabs-on-grade could result.

Three (3) near-surface bulk soil samples obtained during our subsurface exploration were tested for expansion potential. The test results indicate Expansion Index (EI) values of 1, 14, and 18 (“very low” potential for expansion). The Expansion Index laboratory test results are included in Appendix C of this report.

Expansive soils will likely not impact the proposed construction. Variance in expansion potential of onsite soil is anticipated; therefore, additional testing is recommended upon completion of site grading and excavation to confirm the expansion potential presented in this report. For purposes of this report and based upon visual characterization of alluvial materials at approximate foundation depth, very low expansion potential of site materials may be considered to support design and verified upon completion of earthwork grading.

2.3.2 Soil Corrosivity

Three (3) near-surface bulk soil samples of the onsite soils recovered as a part of our subsurface exploration was tested for corrosivity to assess corrosion potential to buried concrete. The chemical analysis test results for the onsite soil from our geotechnical exploration are included in Appendix C of this report.

The test results indicate soluble sulfate concentrations ranging between 115 and 272 parts per million (ppm), a chloride content of 100 ppm, pH values ranging between 7.73 and 8.11, and minimum resistivity values ranging between 1,670 and 2,930 ohm-cm.

The results of the resistivity tests indicate the underlying soil is moderately to severely corrosive to buried ferrous metals per ASTM STP 1013. Based on the measured water-soluble sulfate contents from the soil samples, concrete in contact with the soil is expected to have negligible to moderate exposure to sulfate attack per ACI 318 (ACI, 2014). The samples tested for water-soluble chloride content indicate a low potential for corrosion of steel in concrete due to the chloride content of the soil.

2.3.3 Soil Compressibility and Collapse

Six (6) samples of the onsite soils recovered from the borings were subjected to consolidation testing to evaluate the compressibility of these materials under assumed loads representative of anticipated structural bearing stresses. The results of testing indicate these soils exhibit a low to moderate compressibility potential. In addition, the results of the testing indicate negligible swell or collapse potential when inundated with water. The results of testing performed as a part of this study are presented in Appendix C.

2.3.4 Shear Strength

Evaluation of the shear strength characteristics of the soils included laboratory direct shear testing of six (6) samples of the onsite soils recovered from the borings. The results of testing are included in Appendix C as well as summary graphs that provide values of angle of internal friction (ø) and cohesion (c) for use in geotechnical analysis.

2.3.5 Excavation Characteristics

Based on our subsurface explorations performed at the site and our experience from grading jobs in the vicinity of the site, we anticipate the onsite artificial fill and alluvial materials can generally be excavated using conventional excavation equipment in good operating condition.

2.4 Groundwater Conditions

Groundwater was not encountered in any of the explorations performed at the site to the maximum depth explored of 50 feet bgs. Based on review of available information from the California Geological Survey (CGS, 1998), the historically shallowest groundwater depth at the site is reported to be greater than 40 feet bgs.

Based on these findings, groundwater is not expected to pose a constraint during or after construction. Fluctuations of the groundwater level, localized zones of perched water, and an increase in soil moisture, should be anticipated during and following the rainy seasons or periods of locally intense rainfall or storm water runoff, or from stormwater infiltration.

2.4.1 Infiltration

Field percolation testing was performed within temporary percolation wells installed in borings LP-1 and LP-2 located in the western portion of the site for a test zone at a depth approximately 5 to 10 feet bgs to evaluate the infiltration characteristics of subsurface soils. The percolation tests were conducted in general accordance with the County of Los Angeles Department of Public Works (LADPW) *Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration*

(LADPW, 2021). Results of the percolation testing are presented in Appendix B, *Percolation Test Data*. The test locations and zones tested are shown on Figures 2A and 2B, *Exploration Location Map*.

A boring percolation test is useful for field measurements of the infiltration rate of soils and is suited for testing when the design depth of the infiltration device is deeper than current existing grades, especially in areas where it is difficult to dig test pits, or where the depths of these test pits would be considerably deep. At the subject site, testing consisted of advancing the borings to general depths anticipated for the invert of typical near-surface infiltration devices.

A falling-head test method was employed for testing, in which the volume of discharge was calculated by adding the total volume of water that dropped within the PVC pipe and within the annulus and incorporating a porosity reduction factor to account for the porosity of the annulus material. The flow area was based on the average water height within the slotted pipe section of the test well. The infiltration rate was calculated by dividing the rate of discharge by the infiltration surface area, or flow area.

Per County of Los Angeles Guidelines (LADPW, 2021), the design infiltration rate incorporates a reduction factor for the test procedure, site variability, number of tests, thoroughness of subsurface investigation and long-term siltation, plugging and maintenance. As such, we have applied an appropriate reduction factor to the small-scale infiltration rates measured at test wells LP-1 and LP-2 for use in design of the system(s) according to County of Los Angeles Guidelines (LADPW, 2021). In addition, based on the variability of the results and the unknown location and depth of the planned stormwater infiltration device(s), additional testing may be required.

Detailed results of the field testing data, measured infiltration rate and design infiltration rate for the tests performed are presented in Appendix B, *Percolation Test Data*. The test results are summarized in the table below:

Table 1 – Infiltration Rate

Test Well Designation	Approximate Depth of Test Zone (feet bgs)	Measured Infiltration Rate (inch per hour)	Design Infiltration Rate (inch per hour)
LP-1	5 to 10	0.03	0.01
LP-2	5 to 10	0.01	0.00

Based on the results of our field percolation testing that was performed at the site, the measured (unfactored) infiltration rates for the two (2) tests performed were 0.03 inch per hour (LP-1) and 0.01 inches per hour (LP-2), respectively.

Per County of Los Angeles *Guidelines for Geotechnical Investigation and Reporting – Low Impact Development Stormwater Infiltration* (LADPW, 2021), the minimum possible reduction factor for the boring percolation test procedure is 3. As such, a reduction of the measured small-scale infiltration rate measured at test wells LP-1 and LP-2 using a minimum factor of safety of 3 should be used for design of the system(s). According to the County of Los Angeles Guidelines, the design infiltration rate at tested locations and depths do **not** meet the minimum feasibility criteria of 0.3 inch per hour. Therefore, based on the results of the testing presented above, stormwater infiltration is not feasible at the project site.

2.5 Surface Fault Rupture

Our review of available literature indicates that no known active faults have been mapped across the site, and the site is **not** located within a currently established *Alquist-Priolo Earthquake Fault Zone* (CGS, 2018; Bryant and Hart, 2007). Therefore, a surface fault rupture hazard evaluation is not mandated for this site and the potential for surface fault rupture at the site is expected to be low.

The location of the closest active faults to the site was evaluated using the United States Geological Survey (USGS) Earthquake Hazards Program National Seismic Hazard Maps (USGS, 2008). The closest active faults to the site with the potential for surface fault rupture are the Newport-Inglewood fault, Palos Verdes fault and Santa Monica fault, located approximately 1.8 miles, 6.8 miles, and 7.3 miles from the site, respectively. The San Andreas fault, which is the largest active fault in California, is approximately 43 miles northeast of the site on the north side of the San Gabriel Mountains. Major regional faults with surface expression in proximity to the site are shown on Figure 4, *Regional Fault and Historic Seismicity Map*.

2.6 Strong Ground Shaking

The principal seismic hazard to the site is ground shaking resulting from an earthquake occurring along any of several major active and potentially active faults in southern California (Figure 4). The intensity of ground shaking at a given location depends primarily upon the earthquake magnitude, the distance from the source, and the site response characteristics.

Accordingly, design of the project should be performed in accordance with all applicable current codes and standards utilizing the appropriate seismic design parameters to reduce seismic risk as defined by California Geological Survey (CGS) Chapter 2 of Special Publication 117A (CGS, 2008). The 2022 edition of the California Building Code (CBC) is the current edition of the code. Through compliance with these regulatory requirements and the utilization of appropriate seismic design parameters selected by the design professionals, potential effects relating to seismic shaking can be reduced.

The following code-based seismic parameters should be considered for design under the 2022 CBC:

Table 2 – 2022 CBC Based Ground Motion Parameters (Mapped Values)

Categorization/Coefficient	Code-Based
Site Latitude	33.9544°
Site Longitude	-118.3843°
Site Class	D
Mapped Spectral Response Acceleration at Short Period (0.2 sec), S_S	1.857 g
Mapped Spectral Response Acceleration at Long Period (1 sec), S_1	0.652 g
Short Period (0.2 sec) Site Coefficient, F_a	1
Long Period (1 sec) Site Coefficient, F_v	1.7[1]
Adjusted Spectral Response Acceleration at Short Period (0.2 sec), S_{MS}	1.857 g
Adjusted Spectral Response Acceleration at Long Period (1 sec), S_{M1}	1.109[1]
Design Spectral Response Acceleration at Short Period (0.2 sec), S_{DS}	1.238 g
Design Spectral Response Acceleration at Long Period (1 sec), S_{D1}	0.739[1]
Site-adjusted geometric mean Peak Ground Acceleration, PGA_M	0.876 g

[1]See Section 11.4.8 of ASCE 7-16. A site-specific ground motion hazard analysis in accordance with Section 21.2 of ASCE 7-16 is required for this site. Per Supplement 3 to ASCE 7-16, a site-specific ground motion hazard analysis is not required where the value of the parameters S_{M1} and S_{D1} in the table are increased by 50%.

2.7 Liquefaction Potential

The term liquefaction is generally referenced to loss of strength and stiffness in soils due to build-up of pore water pressure when subject to cyclic or monotonic loading. Both sandy and clayey soils are susceptible to loss of strength and stiffness. Because of the difference in strength characteristic and methods for evaluating strength loss potential for granular and clayey soils, the term liquefaction is used for granular soils while cyclic softening is used for fine-grained soils (i.e., clays and plastic silts).

In general, adverse effects of liquefaction or cyclic softening include excessive ground settlement, loss of bearing support for structural foundations, and seismically-induced lateral ground deformations such as lateral spreading. Depending upon the relative thickness of the liquefied strata with respect to overlying non-liquefiable soils, other potentially adverse effects such as ground oscillation and ground fissuring may occur.

As shown on Figure 5, *Seismic Hazard Zones* map for the Venice Quadrangle (CGS, 1999), the site is **not** located within a liquefaction hazard zone as delineated by the State of California (Figure 5, *Seismic Hazard Map*). In addition, the historically shallowest groundwater depth at the site is reported to be greater than 40 feet bgs and the native soil that exist at the site consist of Quaternary-aged (late to middle Pleistocene) older alluvial deposits (Saucedo et al., 2016). These materials are generally not considered susceptible to liquefaction. Therefore, based on this information, the potential for liquefaction at the site is considered low.

2.8 Seismically-Induced Settlement

Seismically-induced settlement consists of dynamic settlement of unsaturated soil (above groundwater) and liquefaction-induced settlement (below groundwater). These settlements occur primarily within low density sandy soil due to reduction in volume during and shortly after an earthquake event.

Based on our evaluation of the alluvial site soils, the total seismically-induced settlement is estimated to be less than ½ inch. The differential settlement can be taken as half the total settlement over a horizontal distance of 30 feet.

2.9 Lateral Spreading

Liquefaction may also cause lateral spreading. For lateral spreading to occur, the liquefiable zone must be continuous, unconstrained laterally, and free to move along gently sloping ground toward an unconfined area. Since liquefaction is not considered a hazard at the site and the site is relatively constrained laterally, earthquake-induced lateral spreading is also not considered a hazard at the site.

2.10 Earthquake-Induced Landsliding

As shown on the *Seismic Hazard Zones* map for Torrance Quadrangle (CGS, 1999), the site is **not** mapped within a seismically-induced landslide hazard zone identified by the State of California (Figure 5, *Seismic Hazard Map*). In addition, due to project site being relatively flat, it is our opinion that the potential for seismically-induced landslide hazard at the site is negligible.

2.11 Flooding

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map (FEMA, 2008), the project site is located within a flood hazard area identified as "Zone X", which is defined as an area of minimal flood hazard. Regionally, storm runoff flow is generally directed to the south. As shown on Figure 6, *Flood Hazard Zone Map*, the site is **not** located within a 100-year or 500-year flood hazard zone.

Earthquake-induced flooding can be caused by failure of dams or other water-retaining structures as a result of earthquakes. As shown on Figure 7, *Dam Inundation Map*, the site is **not** mapped within an inundation zone. Therefore, the risk of seismically-induced flooding due to dam failure is considered low.

2.12 Seiches and Tsunamis

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are waves generated in large bodies of water by fault displacement or major ground movement. Based on the absence of an enclosed water body near the site and the inland location of the site, seiche and tsunami risks at the site are considered negligible.

2.13 Methane

Based on review of State of California Geologic Energy Management Division (CalGEM) records, the project site is **not** located within a documented oil field and there are no documented oil wells onsite (CalGEM, 2023). The nearest documented oil field to the site is the Potrero oil field (abandoned), located approximately 5,900 feet northeast of the site, and the nearest documented oil well to the site (Cleveland Oil Company, Well No. 1) is located approximately 2,700 feet southwest of the site (Union Oil Company of California, Union-Standard-Westchester E.H. Lease, Well No. 1) and is reported as plugged (CalGEM, 2023). In addition, the project site is not located within a methane zone or methane buffer zone as mapped by the City of Los Angeles (City of Los Angeles, 2004). Based on these findings, methane is not considered a hazard at the site.

2.14 Regional Subsidence

Regional ground subsidence generally occurs due to rapid and intensive removal of subterranean fluids, typically water or oil. It is generally attributed to the consolidation of sediments as the fluid in the sediment is removed. The total load of the soils in partially or fully saturated deposits is born by their granular structure and the fluid. When the fluid is removed, the load is born by the sediment alone and it settles. No reports on regional subsidence due to fluid removal have documented subsidence in the site vicinity, and the project would not involve the removal of water or oil at the site, making the potential for ground subsidence related to fluid removal not a geologic hazard.

3.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

Based on the results of this study, we conclude that the proposed development for the subject site is feasible from a geotechnical standpoint, provided that the recommendations presented in this report are properly incorporated in design and construction.

Based on our review of available site-specific geotechnical data and our professional experience, the earth materials on the site are suitable for support of the proposed industrial building, provided they are subjected to a phase of remedial rough grading. The purpose of the grading would be to establish conditions suitable for the use of a conventional shallow foundations (spread footings).

The proposed structure may be supported on shallow spread-type foundations established in engineered fill or undisturbed natural soils. The floor slab may be supported directly on grade. There may be existing underground utilities that will also be impacted. Information on these utilities should be provided to Leighton for evaluation.

All existing undocumented fill at the site is recommended to be removed from the proposed building/structure footprint areas prior to placement of engineered fill. Based on our explorations performed at the site, the existing undocumented artificial fill soils encountered at the site recommended to be removed and replaced as engineered fill are generally on the order of approximately 3 to 7½ feet in thickness. Localized areas in the unexplored portions of the site should be anticipated to require deeper removals.

The recommendations below are based upon the exhibited geotechnical engineering properties of the soils and their anticipated response both during and after construction. Additional exploration and/or evaluation may be required in the future once more detailed development plans become available. The recommendations are also based upon proper field observation and testing during construction. The project geotechnical engineer should be notified of suspected variances in field conditions to determine the effect upon the recommendations subsequently presented. These recommendations are considered minimal and may be superseded by more restrictive requirements of the civil and structural engineers, the City of Los Angeles, and other governing agencies.

Leighton should review the grading and foundation plans and project specifications as they become available to verify that the recommendations presented in this report have been incorporated into the plans for this project.

3.1 Site Grading

Earthwork for the project is expected to consist of removal of unsuitable soil materials, excavation, and placement of compacted fill. We recommend that earthwork on the site be performed in accordance with the recommendations presented in this report and the project specifications as prepared by others. The *Earthwork and Grading Guide Specifications* included in Appendix D may be used for guidance in developing the project specifications. If conflict arises, the recommendations in Appendix D shall be superseded by the project specifications, recommendations contained in this report and/or the City of Los Angeles requirements, whichever is more stringent. All site grading should be performed in accordance with the applicable local codes and in accordance with the project specifications that are prepared by the appropriate design professional.

3.1.1 Site Preparation

Prior to construction, the site should be cleared of any vegetation, trash, and/or debris within the area of proposed grading. These materials should be removed from the site. Any underground obstructions onsite should be removed. Efforts should be made to locate any existing utility lines to be removed or rerouted where interfering with the proposed construction. Any resulting cavities should be properly backfilled and compacted. After the site is cleared, the soils should be carefully observed for the removal of all unsuitable deposits. All undocumented fill or man-made debris, unsuitable native soils and former foundation remnants should be excavated and removed from the proposed building/structure footprint areas prior to placement of engineered fill.

3.1.2 Removals and Overexcavations

To provide uniform foundation support and reduce the potential for excessive static settlement, all existing undocumented fill and any unsuitable soil, as deemed by the geotechnical engineer, should be removed to expose suitable native soils and replaced as engineered fill below the proposed building and other structural improvements. Based on our field exploration, we estimate removals of existing undocumented fill could range between approximately 3 to 7½ feet below existing grades across the site. Localized areas may require deeper removals as determined during grading by a representative of the geotechnical engineer depending on observed subsurface conditions. Unexplored portions of the site including areas beneath existing buildings and in areas of existing utilities, and areas disturbed during demolition of existing buildings and improvements may also require deeper removals. The lateral extent of removals or overexcavation beyond foundations should be equal to the depth of removals below the proposed foundation elements.

The depth of overexcavation in non-structural areas planned for new pavement construction is recommended to be 2 feet below the current grade or planned subgrade elevation to develop a suitable bearing subgrade for pavement support. Deeper overexcavations in localized areas may be recommended during grading by a representative of the geotechnical engineer depending on observed subsurface conditions. Preparation limited to 2 feet of overexcavation below subgrade may result in the need for increased pavement maintenance and periodic repairs where existing undocumented fill is left in place below the recommended overexcavation depth of 2 feet. Alternatively, removals can be performed such that all undocumented fill is removed to expose suitable natural soils (alluvium) and replaced as engineered fill.

3.1.3 Excavation Bottom Preparation

All excavation or removal bottoms should be observed by a representative of the geotechnical engineer prior to placement of fill or other improvements to determine that geotechnically suitable soil is exposed. Excavation bottoms observed to be suitable for fill placement or other improvements should be scarified to a depth of at least 8 inches, moisture-conditioned as necessary to achieve a moisture content within 2 percentage points of the optimum moisture content, and then compacted to a minimum of 90 percent of the laboratory derived maximum density as determined by ASTM Test Method D 1557 (Modified Proctor).

Clayey natural soils with high moisture content were encountered below fill soils in some areas. If the subgrade soils are wet and soft, stabilizing the subgrade soils using crushed rock or crushed rock with geogrid to provide a competent base for construction activities and the compaction of the required fill may be necessary. It is necessary for the geotechnical consultant to evaluate the subgrade conditions during grading in order to provide specific subgrade stabilization methods and recommendations prior to placement of engineered fill.

3.1.4 Fill Materials

On-site soil that is free of construction debris, organics, cobbles, boulders, rubble, or rock larger than 6 inches in largest dimension is suitable to be used as fill for support of structures. Any imported fill soil should be approved by the geotechnical engineer prior to import or use onsite.

3.1.5 Fill Placement and Compaction

Fill soils should be placed in thin, loose lifts, moisture-conditioned to within 2 percentage points of optimum moisture content and compacted using appropriate equipment and methods to achieve a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D 1557. Aggregate base should be compacted to a minimum of 95 percent relative compaction.

When grading is interrupted by heavy rains, fill operations should not be resumed until the moisture content and the dry density of the placed fill are satisfactory.

3.1.6 Shrinkage

The change in volume of excavated and recompacted soil varies according to soil type and location. This volume change is represented as a percentage increase (bulking) or decrease (shrinkage) in volume of fill after removal and recompaction. Field and laboratory data used in our calculations included laboratory-measured maximum dry density for the general soil type encountered at the subject site, the measured in-place densities of near surface soils encountered and our experience.

Based upon the results of the in-place density and the moisture-density relationship exhibited by representative bulk samples of the near surface soils, recompaction of the soils is anticipated to result in volume shrinkage in the range of 10 to 15 percent. The estimated shrinkage does not include material losses due to removal of organic material or other unsuitable bearing materials (debris, rubble, oversize material greater than 6-inches) and the actual shrinkage that occurs during grading may vary throughout the site.

3.1.7 Reuse of Concrete and Asphalt Rubble

If encountered during site clearing and/or during preparation activities, construction rubble (i.e., Portland cement concrete and asphalt concrete) may be incorporated in the proposed development. For use as structural fill, the processed material should be crushed to develop a relatively well-graded mixture with a maximum particle size of 3-inch nominal diameter. Concrete rubble should be free of rebar and processed asphalt pavement rubble may be used if mixed with the existing base course (where present). Crushed material may be used as structural fill if uniformly mixed with onsite soils in proportion of 1 part crushed material to 3 parts soil. For use as pavement base course, crushed material should satisfy gradation requirements of Section 200-2.4 of the *Standard Specifications for Public Works Construction* (Greenbook). Such materials must be free of and segregated from any hazardous materials and/or organic material of any kind.

3.2 Foundation Design

Conventional spread footings established in engineered fill or undisturbed natural soils may be used to support the proposed building. Footings should be embedded a minimum 18 inches below the lowest adjacent grade. An allowable soil bearing pressure of 3,000 pounds per square foot (psf) may be used for footings with a minimum width of 12 inches for continuous footings and 18 inches for isolated footings.

A one-third increase in the bearing value for short duration loading, such as wind or seismic forces may be used. The ultimate bearing capacity can be taken as 9,000 psf, which does not incorporate a factor of safety. A resistance factor of 0.45 should be used for initial bearing capacity evaluation with factored loads.

The recommended bearing values are net values, and the weight of concrete in the mat foundation can be taken as 50 pounds per cubic foot (pcf); the weight of soil backfill can be neglected when determining the downward loads.

The allowable bearing capacity for shallow footings is based on a total static settlement of ½ inch. Differential settlement can be taken as half the total settlement over a horizontal distance of 30 feet.

For static loading, 50 pounds per cubic inch (pci) may be assumed as the modulus of subgrade reaction (*k*). For seismic loading, a *k* value of 150 pci may be assumed.

Since settlement is a function of footing size and contact bearing pressure, differential settlement can be expected between adjacent columns or walls where a large differential loading condition exists. Once developed by the structural engineer, we should review total dead and sustained live loads for each column including plan location and span distance, to evaluate if differential settlements between dissimilarly loaded columns will be tolerable. Excessive differential settlement can be mitigated with the use of reduced bearing pressures, deeper footing embedment, possibly changing overexcavation schemes and using imported base material under spread footings, or possibly other methods.

Resistance to lateral loads will be provided by a combination of friction between the soil and structure interface and passive pressure acting against the vertical portion of the footings. For calculating lateral resistance, a passive pressure of 250 psf per foot of depth to a maximum of 2,500 psf and a frictional coefficient of 0.3 may be used. Note that the passive and frictional coefficients do not include a factor of safety. The frictional resistance and the passive resistance of the soils can be combined without reduction in determining the total lateral resistance.

3.3 Slabs-on-Grade

Unloaded concrete slabs may be designed using a modulus of subgrade reaction of 100 pci provided the subgrade is prepared as described in Section 3.1. From a geotechnical standpoint, we recommend slab-on-grade be a minimum 5 inches thick with No. 3 rebar placed at the center of the slab at 24 inches on center in each direction. The structural engineer should design the actual thickness and reinforcement based on anticipated loading conditions. Where moisture-sensitive floor coverings or equipment is planned, the slabs should be protected by a minimum 10-mil-thick vapor barrier between the slab and subgrade. A coefficient of friction of 0.35 can be used between the floor slab and the vapor barrier.

Minor cracking of concrete after curing due to drying and shrinkage is normal and should be expected; however, concrete is often aggravated by a high water/cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low-slump concrete or low water/cement ratios can reduce the potential for shrinkage cracking. Additionally, our experience indicates that the use of reinforcement in slabs and foundations can generally reduce the potential but not eliminate for concrete cracking.

To reduce the potential for excessive cracking, concrete slabs-on-grade should be provided with construction or weakened plane joints at frequent intervals. Joints should be laid out to form approximately square panels.

3.4 Cement Type and Corrosion Protection

Based on the results of laboratory testing, concrete structures in contact with the onsite soil are expected to have negligible to moderate exposure to water-soluble sulfates in the soil. Common Type II cement may be used for concrete construction onsite and the concrete should be designed in accordance with CBC 2022 requirements. However, concrete exposed to recycled water should be designed using Type V cement.

Based on our laboratory testing, the onsite soil is considered moderately to severely corrosive to ferrous metals. Ferrous pipe should be avoided by using high-density polyethylene (HDPE) or other non-ferrous pipe when possible. Ferrous pipe, if used, should be protected by polyethylene bags, tap or coatings, di-electric fittings or other means to separate the pipe from onsite soils.

3.5 Retaining Walls

Recommended lateral earth pressures are provided as equivalent fluid unit weights, in psf/ft. or pcf. These values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design.

On-site soils are likely suitable to be used as retaining wall backfill due to its very low expansion potential. However, field and laboratory verification are recommended before use. Site soils can be variable in composition, clast size and expansive characteristics. Should site soil for reuse behind retaining walls should be tested to ensure Expansion potential is less than 20 (EI<20). Recommended lateral earth pressures for retaining walls backfilled with sandy soils with drained conditions as shown on Figure 8, *Retaining Wall Backfill and Subdrain Detail* are as follows:

Table 3 – Retaining Wall Design Earth Pressures

Retaining Wall Condition (Level Backfill)	Equivalent Fluid Pressure (pounds-per-cubic-foot)*
Active (cantilever)	40
At-Rest (braced)	60
Passive Resistance (compacted fill)	250
Seismic Increment (add to active pressure)	30

*Only for level and drained properly compacted backfill

Walls that are free to rotate or deflect may be designed using active earth pressure. For basement walls or walls that are fixed against rotation, the at-rest pressure should be used. For seismic condition, the pressure should be distributed as an inverted triangular distribution and the dynamic thrust should be applied at a height of 0.6H above the base of the wall.

3.5.1 Sliding and Overturning

Total depth of retained earth for design of walls and for uplift resistance, should be measured as the vertical height of the stem below the ground surface at the wall face for stem design, or measured at the heel of the footing for overturning and sliding. A soil unit weight of 120 pcf may be assumed for calculating the actual weight of the soil over the wall footing, if drained, or 60 pcf if submerged, for properly compacted backfill.

3.5.2 Drainage

Adequate drainage may be provided by a subdrain system positioned behind the walls (Figure 8). Typically, this system consists of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with pervious backfill material described in Section 300-3.6 of the *Standard Specifications for Public Works Construction* (Greenbook), 2021 Edition. This pervious backfill should extend at least 2 feet out from the wall and to within 2 feet of the outside finished grade. This pervious backfill and pipe should be wrapped in filter fabric, such as Mirafi 140N or equivalent, placed as described in Section 300-8.1 of the *Standard Specifications for Public Works Construction* (Greenbook), 2021 Edition. The subdrain outlet should be connected to a free-draining outlet or sump.

Miradrain, Geotech Drainage Panels, or Enkadrain drainage geocomposites, or similar, may be used for wall drainage as an alternative to the Class 2 Permeable Material or drain rock backfill, particularly where horizontal space is limited adjacent to shoring (where walls are cast against shoring). These drainage panels should be connected to the perforated drainpipe at the base of the wall.

3.6 Paving

To provide support for paving, the subgrade soils should be prepared as recommended in the Section 3.1. Compaction of the subgrade, including trench backfills, to at least 90 percent of the maximum dry density as determined by ASTM Test Method D 1557, and achieving a firm, hard, and unyielding surface will be important for paving support. The preparation of the paving area subgrade should be performed immediately prior to placement of the base course.

Adequate drainage (both surface and subsurface) should be provided such that the subgrade soils and aggregate base materials are not allowed to become wet. Landscape areas must be separated from pavements with concrete curbs and/or edge drains. Excessive over-irrigation will have an adverse impact on adjacent pavements. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from paving, will result in premature pavement failure.

3.6.1 Asphalt Concrete

The required paving and base thicknesses will depend on the expected wheel loads and volume of traffic (Traffic Index or TI). Assuming that the paving subgrade will consist of engineered fill with an R-value greater than 20, which will need to be verified after the completion of site grading, the minimum recommended paving thicknesses are presented in the following table. Results of R-value testing on near surface samples of existing onsite soils indicate values of 14, 25 and 50.

Table 4 – Asphalt Concrete Pavement Sections

Traffic Index	Asphalt Concrete (inches)	Base Course (inches)
5	3	7½
6	4	8½
7	4	12
8	5	13½
9	6	15

The asphalt paving sections were determined using the Caltrans design method. We can determine the recommended paving and base course thicknesses for other Traffic Indices if required. Careful inspection is recommended to verify that the recommended thicknesses or greater are achieved, and that proper construction procedures are followed.

3.6.2 Portland Cement Concrete Paving

We have assumed that such a subgrade will have an R-value of at least 20, which will need to be verified after the completion of site grading.

Portland cement concrete (PCC) paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for a range of Traffic Indices are presented in the following table. We have assumed that the Portland cement concrete will have a compressive strength of at least 4,000 pounds per square inch.

Table 5 – PCC Pavement Sections

Traffic Index	PCC (inches)	Base Course (inches)
5	7	4
6	7	4
7	7½	4
8	8	4
9	9	4

The paving should be provided with control joints or expansion joints at regular intervals no more than 15 feet in each direction. Load transfer devices, such as dowels or keys, are recommended at joints in the paving to reduce possible offsets. The paving sections in the above table have been developed based on the strength of unreinforced concrete. Steel reinforcing may be added to the paving to reduce cracking and to prolong the life of the paving.

3.6.3 Base Course

The base course for both asphalt concrete and Portland cement concrete paving should meet the specifications for Class 2 Aggregate Base as defined in Section 26 of the latest edition of the State of California, Department of Transportation, Standard Specifications. Alternatively, the base course could meet the specifications for untreated base as defined in Section 200-2 of the latest edition of the *Standard Specifications for Public Works Construction* (Greenbook). The base course should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM Test Method D 1557.

3.7 Temporary Excavations

All temporary excavations, including utility trenches, retaining wall excavations, and foundation excavations should be performed in accordance with project plans, specifications, and all OSHA requirements. Excavations 4 feet or deeper should be laid back or shored in accordance with OSHA requirements before personnel are allowed to enter.

No surcharge loads should be permitted within a horizontal distance equal to the height of cut or 5 feet, whichever is greater from the top of the cut, unless the cut is shored appropriately. Excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any adjacent existing site foundation should be properly shored to maintain support of the adjacent structure.

Temporary excavations should be treated in accordance with the State of California version of OSHA excavation regulations, Construction Safety Orders for Excavation General Requirements, Article 6, Section 1541, effective October 1, 1995. The sides of excavations should be shored or sloped in accordance with OSHA regulations. OSHA allows the sides of unbraced excavations, up to a maximum height of 20 feet, to be cut to a ¾H:1V (horizontal:vertical) slope for Type A soils, 1H:1V for Type B soils, and 1½H:1V for Type C soils.

During construction, the soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor shall be responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and the geotechnical engineer should be maintained to facilitate construction while providing safe excavations.

3.8 Trench Backfill

Utility trenches should be backfilled with compacted fill in accordance with Sections 306-1 and 306-6 of the *Standard Specifications for Public Works Construction*, (Greenbook), 2021 Edition. Utility trenches can be backfilled with onsite sandy material free of rubble, debris, organic and oversized material up to (≤) 3-inches in largest dimension. Prior to backfilling trenches, pipes should be bedded in and covered with either:

(1) **Sand:** A uniform, sand material that has a Sand Equivalent (SE) greater-than-or-equal-to (≥) 30, passing the No. 4 U.S. Standard Sieve (or as specified by the pipe manufacturer), water densified in place, or

(2) **CLSM:** Controlled Low Strength Material (CLSM) conforming to Section 201-6 of the *Standard Specifications for Public Works Construction,* (Greenbook), 2021 Edition. CLSM should not be jetted.

Pipe bedding should extend at least 4 inches below the pipeline invert and at least 12 inches over the top of the pipeline. Native and clean fill soils can be used as backfill over the pipe bedding zone, and should be placed in thin lifts, moisture conditioned above optimum, and mechanically compacted to at least 90 percent relative compaction, relative to the ASTM D 1557 laboratory maximum density.

3.9 Drainage and Landscaping

Building walls below grade should be waterproofed or at least damp proofed, depending upon the degree of moisture protection desired. Surface drainage should be designed to direct water away from foundations and toward approved drainage devices. Irrigation of landscaping should be controlled to maintain, as much as possible, consistent moisture content sufficient to provide healthy plant growth without overwatering.

3.10 Additional Geotechnical Services

Leighton should review the grading plans, foundation plans, and specifications when they are available to verify that the recommendations presented in this report have been properly interpreted and incorporated.

Geotechnical observation and testing should be provided during the following activities:

- Grading and excavation of the site;
- Subgrade Preparation;
- Compaction of all fill materials;
- Utility trench backfilling and compaction;
- Footing excavation and slab-on-grade preparation;

- Pavement subgrade and base preparation;
- Placement of asphalt concrete and/or concrete; and
- When any unusual conditions are encountered.

4.0 LIMITATIONS

This geotechnical exploration does not address the potential for encountering hazardous soil at this site. In addition, this report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is, by necessity, incomplete. Please also refer GBA's *Important Information About Your Geotechnical Report* (included at the rear of the text), presenting additional information and limitations regarding geotechnical engineering studies and reports. The nature of many sites is such that differing soil or geologic conditions can be present within small distances and under varying climatic conditions. Changes in subsurface conditions can and do occur over time. Therefore, the findings, conclusions, and recommendations presented in this report are only valid if Leighton Consulting, Inc. has the opportunity to observe subsurface conditions during grading and construction, to confirm that our data are representative for the site. Leighton Consulting, Inc. should also review the construction plans and project specifications, when available, to comment on the geotechnical aspects.

This report was prepared using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing at this time in Los Angeles County. We do not make any warranty, either expressed or implied.

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:
- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:
- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept* *responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

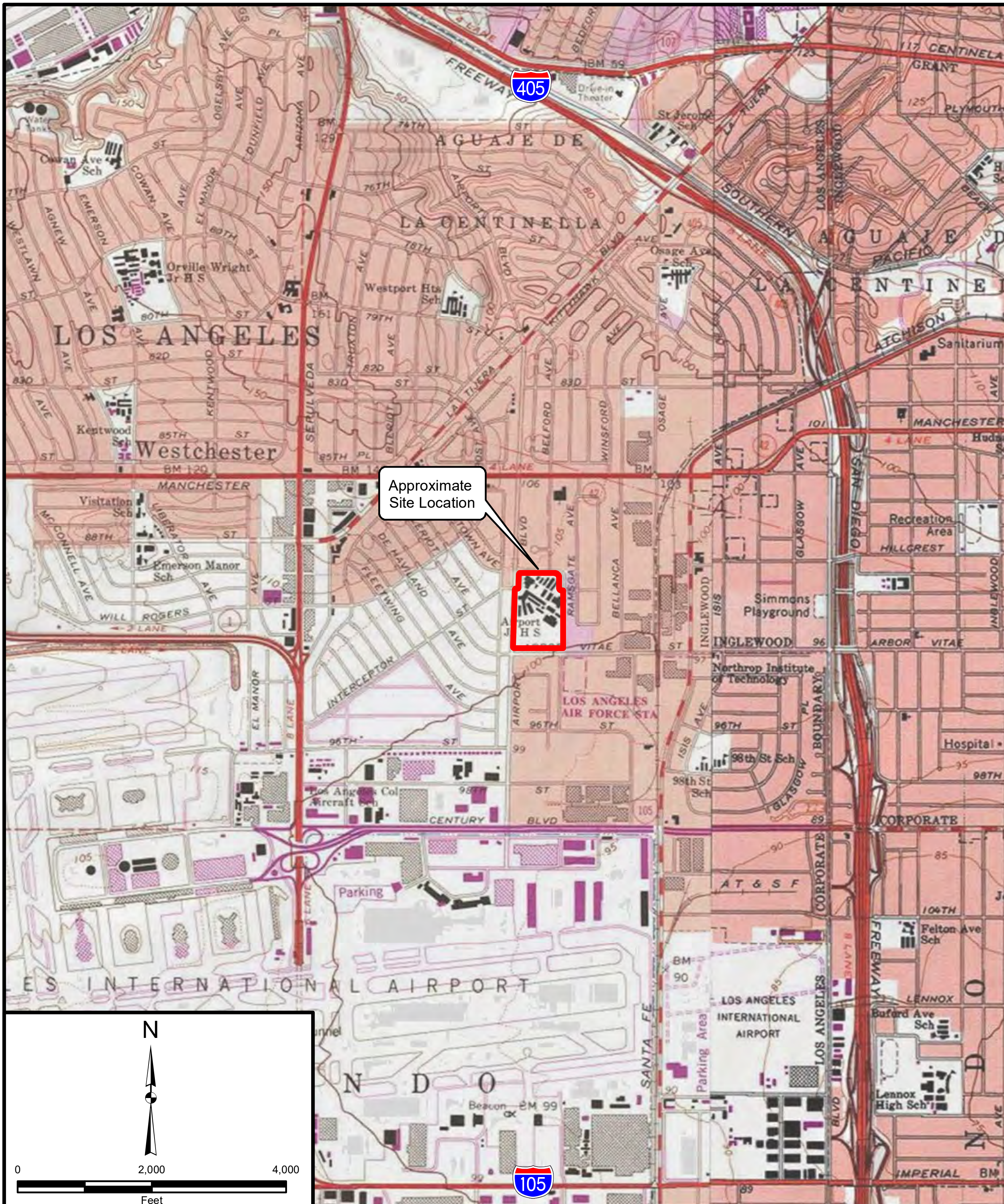
The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org



Project: 13837.001

Eng/Geol: CCK/JMP

Scale: 1 " = 2,000 '

Date: March 2023

Reference: Copyright:© 2013 National Geographic Society, i-cubed

SITE LOCATION MAP

Proposed Industrial Building
9000 Airport Boulevard
City of Los Angeles, California

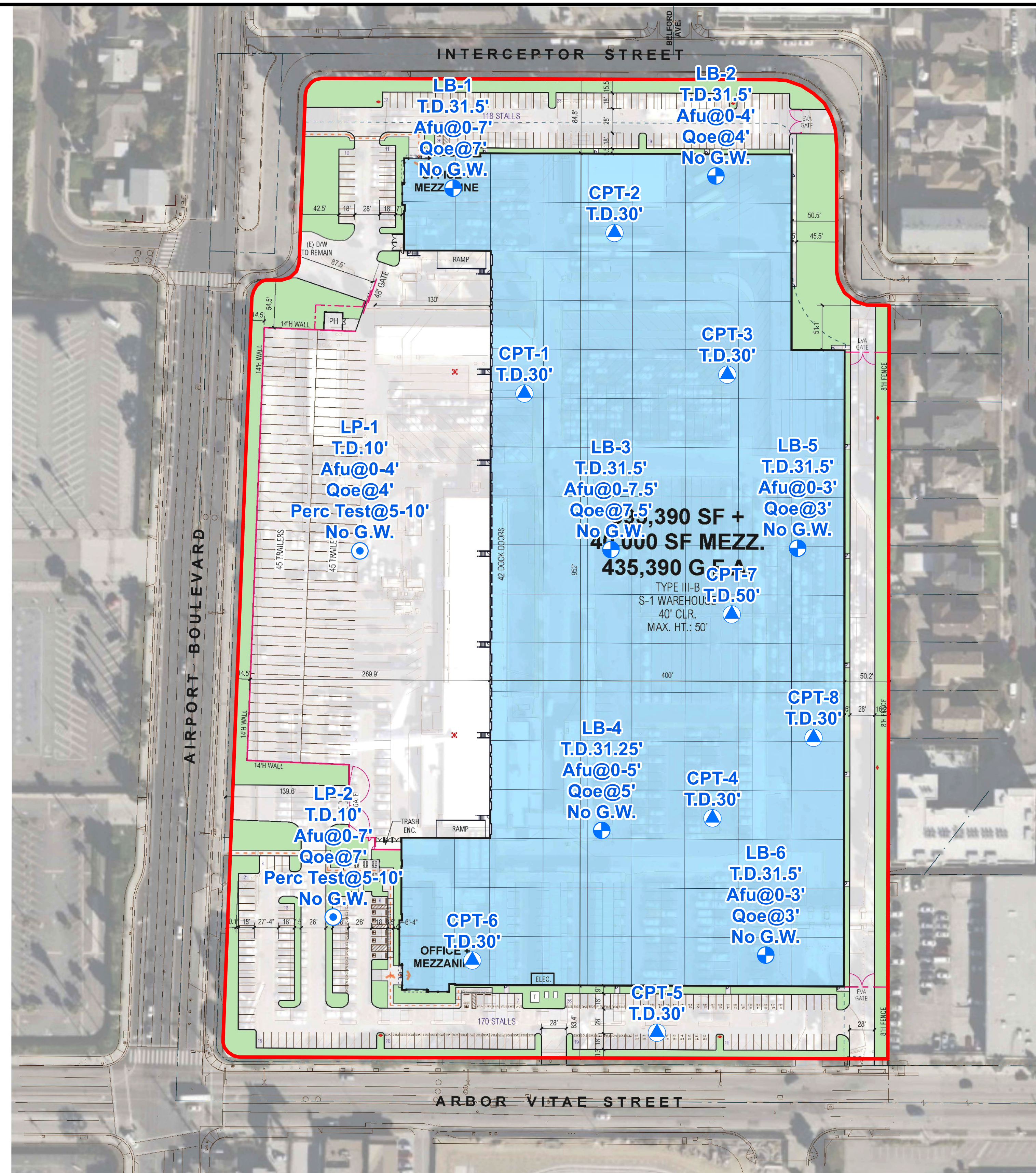
FIGURE 1

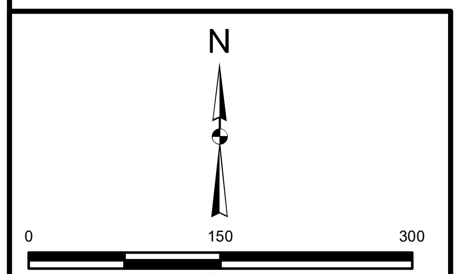
Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F01_SLM_2023-03-03.mxd on 3/2/2023 10:16:02 AM Author: KVM (btran)

LEGEND

LB-6	Approximate location of hollow-stem auger boring showing total depth (T.D.), depth to groundwater (G.W.) and depth to earth units in feet below existing grade
LP-2	Approximate location of percolation test showing total depth (T.D.), depth to groundwater (G.W.), depth to earth units and depth of percolation test in feet below existing grade
CPT-8	Approximate location of cone penetrometer test (CPT) showing total depth (T.D.)
Afu	Artificial Fill, Undocumented
Qoe	Old Eolian Dune Deposits
	Approximate Site Boundary





Project: 13837.001	Eng/Geol: CCK/JMP
Scale: 1 " = 150 '	Date: February 2024

Reference: Preliminary Site Plan - Option 1
Sheet A1-1 by RGA/Rexford Industrial

EXPLORATION LOCATION MAP

Proposed Industrial Building - Option 1
9000 Airport Boulevard
City of Los Angeles, California

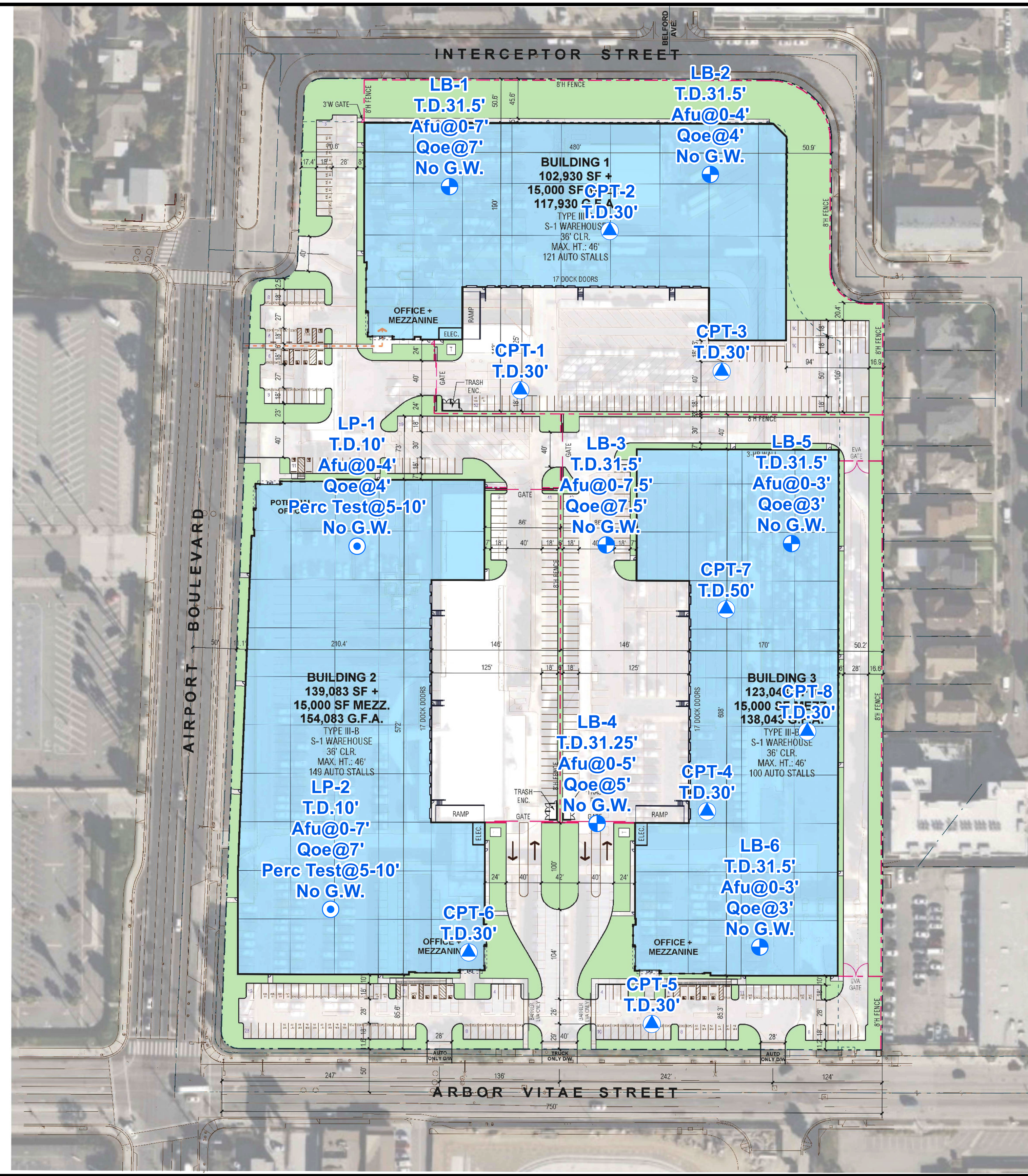
FIGURE 2A

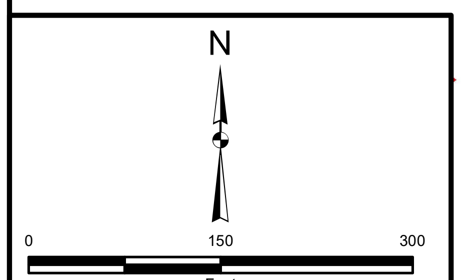
Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F02A_ELM_2024-02-20.mxd on 1/9/2024 5:22:58 PM Author: KVM (btran)

LEGEND

LB-6	Approximate location of hollow-stem auger boring showing total depth (T.D.), depth to groundwater (G.W.) and depth to earth units in feet below existing grade
LP-2	Approximate location of percolation test showing total depth (T.D.), depth to groundwater (G.W.), depth to earth units and depth of percolation test in feet below existing grade
CPT-8	Approximate location of cone penetrometer test (CPT) showing total depth (T.D.)
Afu	Artificial Fill, Undocumented
Qoe	Old Eolian Dune Deposits
(red box)	Approximate Site Boundary





Project: 13837.001	Eng/Geol: CCK/JMP
Scale: 1 " = 150 '	Date: February 2024

Reference: Preliminary Site Plan - Option 2
Sheet A1-1 by Rexford Industrial

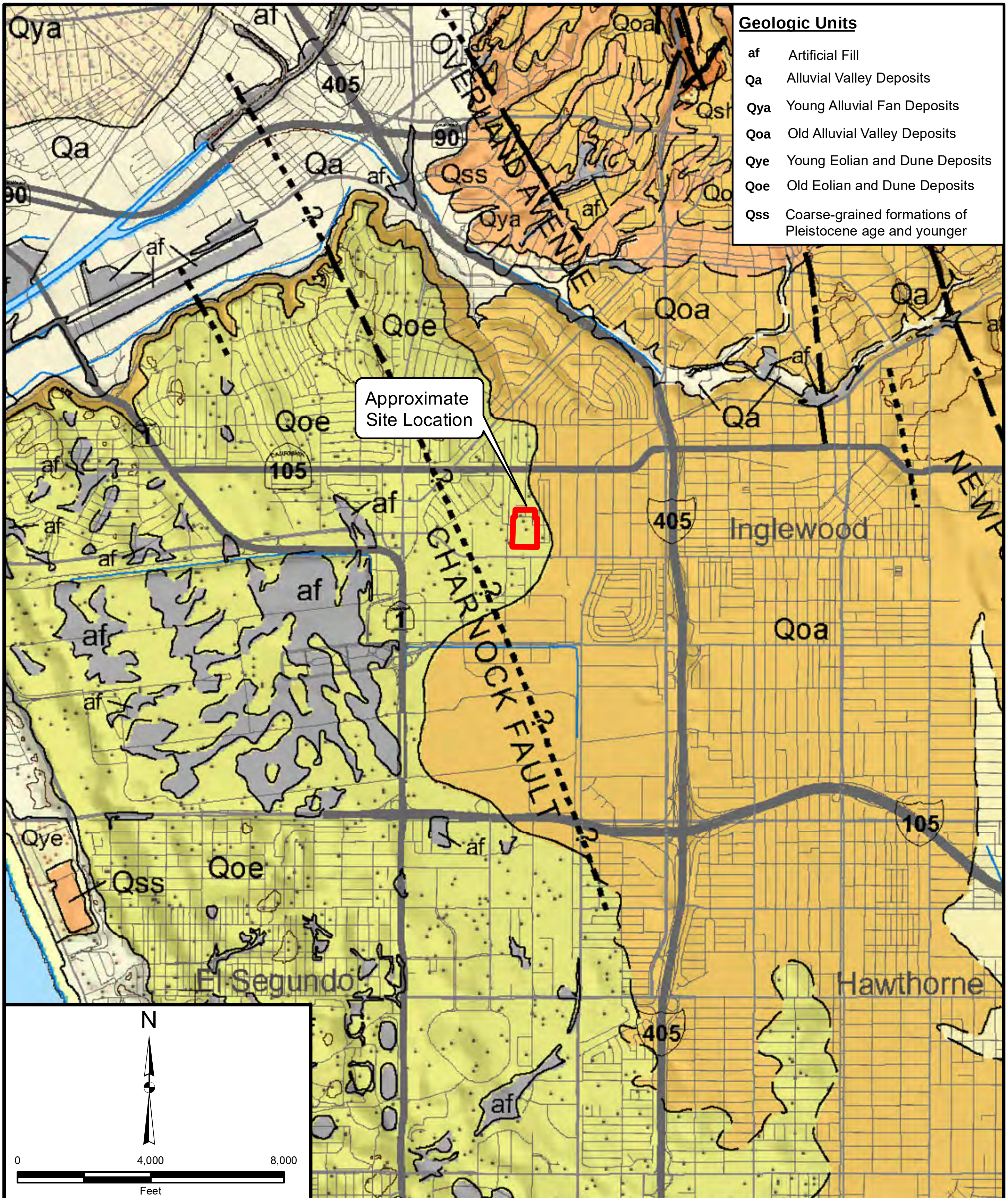
EXPLORATION LOCATION MAP

Proposed Industrial Building - Option 2
9000 Airport Boulevard
City of Los Angeles, California

FIGURE 2B

Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F02B_ELM_2024-02-20.mxd on 1/9/2024 5:36:07 PM Author: KVM (btran)



Project: 13837.001	Eng/Geol: CCK/JMP
Scale: 1 " = 4,000 '	Date: March 2023

Reference:
Geologic Compilation of Quaternary Surficial Deposits in Southern California, Onshore Portion of The Long Beach by Bedrossian, July 2010

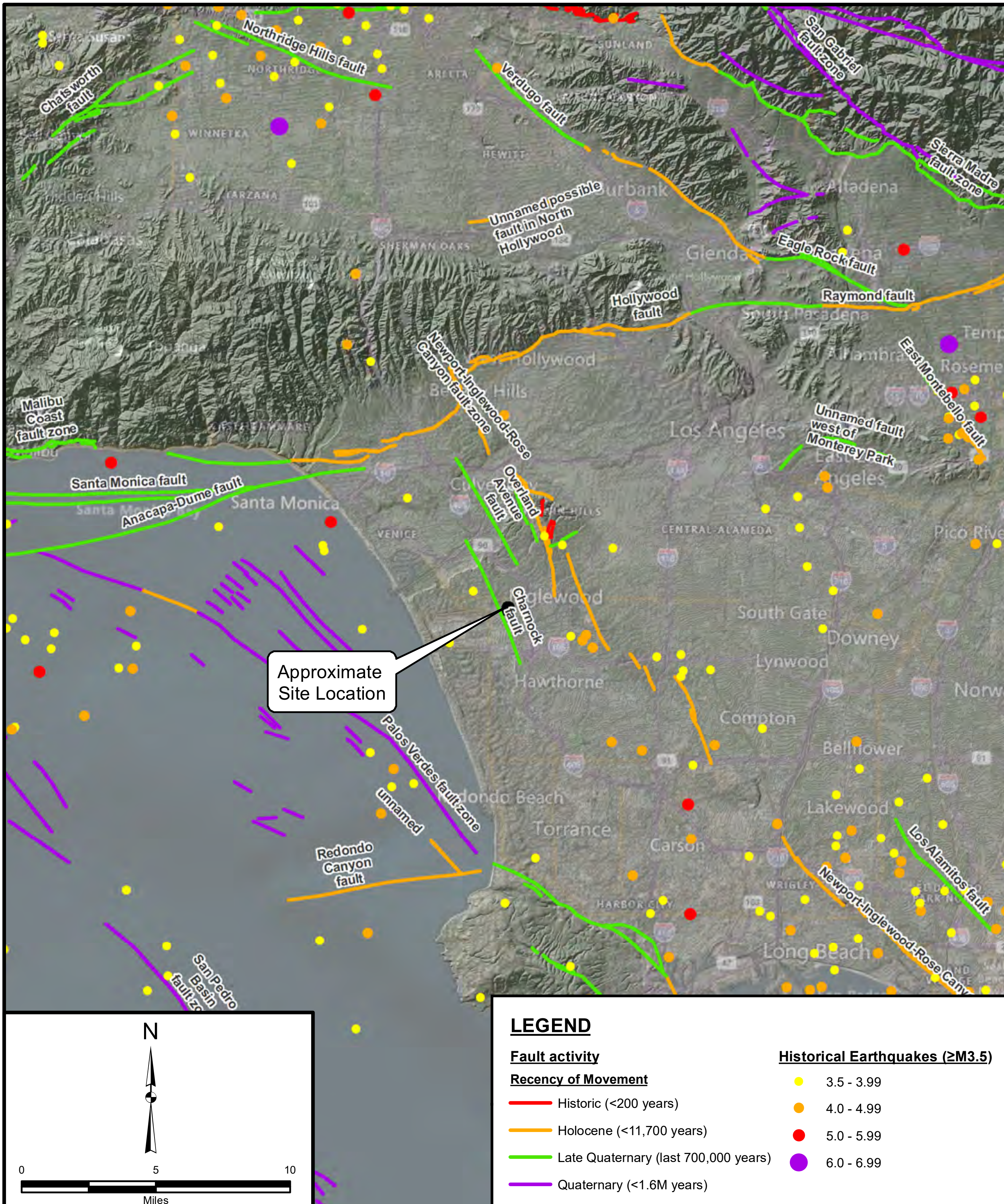
REGIONAL GEOLOGY MAP

Proposed Industrial Building
9000 Airport Boulevard
City of Los Angeles, California

FIGURE 3

Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F03_RGM_2023-03-03.mxd on 3/2/2023 10:48:21 AM Author: KVM (btran)



Project: 13837.001	Eng/Geol: CCK/JMP
Scale: 1 " = 5 miles	Date: March 2023

Basemap Reference: © 2023 Microsoft Corporation Earthstar Geographics SIO © 2022 TomTom
Seismicity Data Reference: maps.conservation.ca.gov

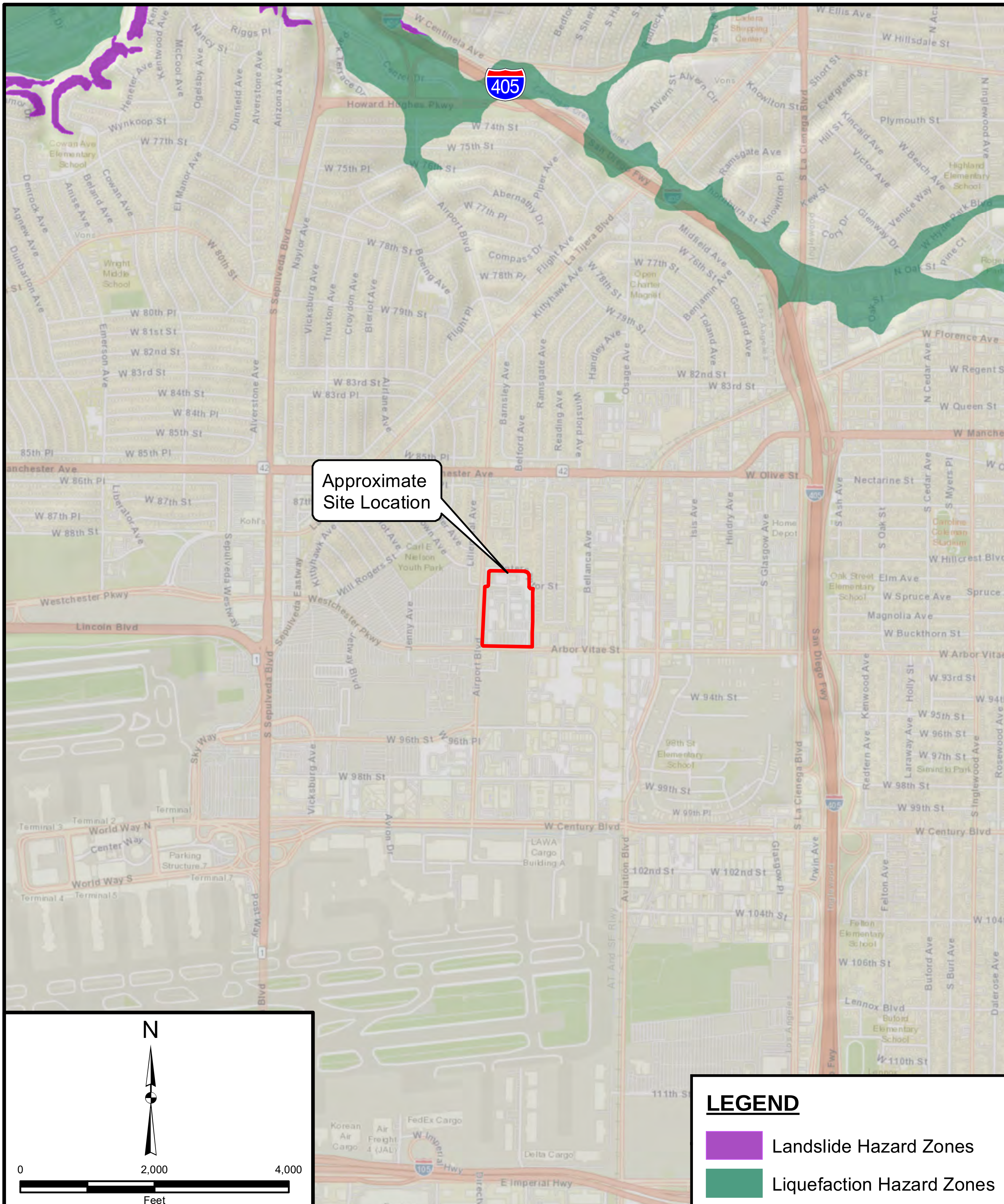
REGIONAL FAULT AND HISTORIC SEISMICITY MAP

Proposed Industrial Building
9000 Airport Boulevard
City of Los Angeles, California

FIGURE 4

Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F04_RFHSM_2023-03-03.mxd on 3/2/2023 10:46:27 AM Author: KVM (btran)



Project: 13837.001	Eng/Geol: CCK/JMP
Scale: 1 " = 2,000 '	Date: March 2023

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

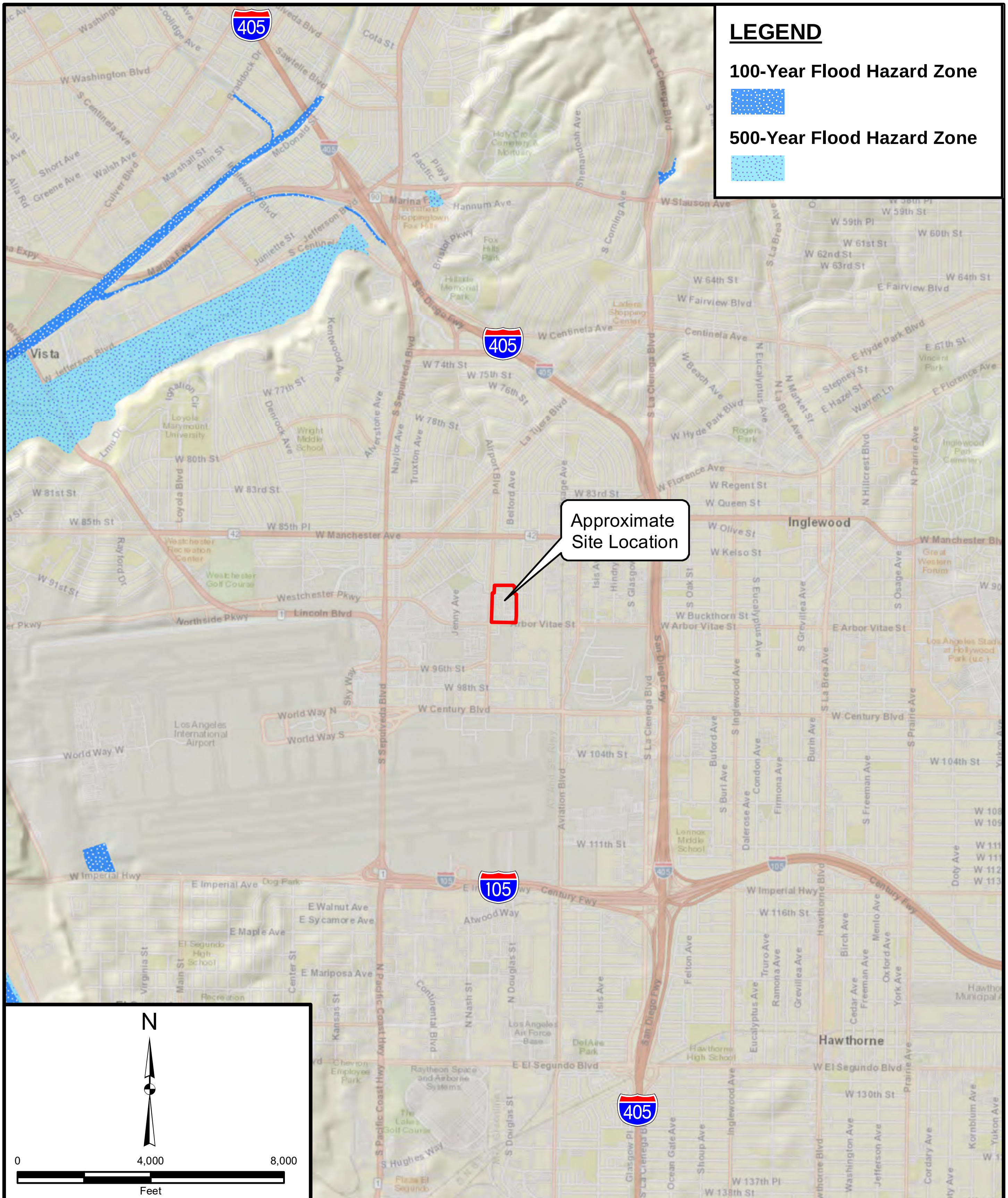
SEISMIC HAZARD MAP

Proposed Industrial Building
9000 Airport Boulevard
City of Los Angeles, California

FIGURE 5

Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F05_SHM_2023-03-03.mxd on 3/2/2023 10:50:13 AM Author: KVM (btran)



Project: 13837.001	Eng/Geol: CCK/JMP
Scale: 1 " = 4,000 '	Date: March 2023

Reference: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
FEMA (http://www.fema.gov/index.shtm), DWR (http://www.dwr.ca.gov)

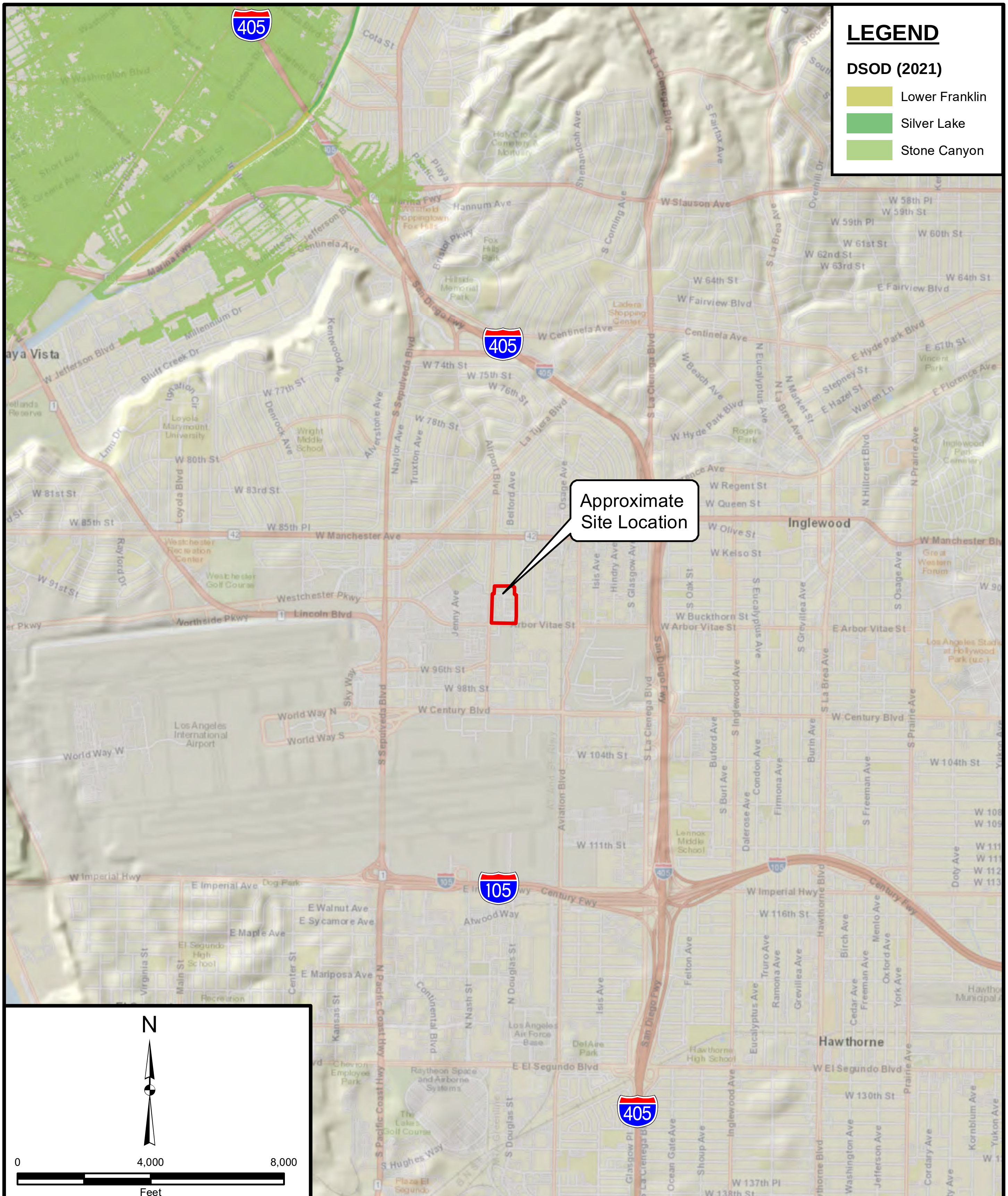
FLOOD HAZARD ZONE MAP

Proposed Industrial Building
9000 Airport Boulevard
City of Los Angeles, California

FIGURE 6

Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F06_FHZM_2023-03-03.mxd on 3/2/2023 10:52:07 AM Author: KVM (btran)



Project: 13837.001	Eng/Geol: CCK/JMP
Scale: 1 " = 4,000 '	Date: March 2023

Base Map: ESRI ArcGIS Online 2023
Reference: Office of Emergency Services (2007),
Dept of Safety of Dams (2021)
National Inventory of Dams, Army Corps of Engrs (2021)

DAM INUNDATION MAP

Proposed Industrial Building
9000 Airport Boulevard
City of Los Angeles, California

FIGURE 7

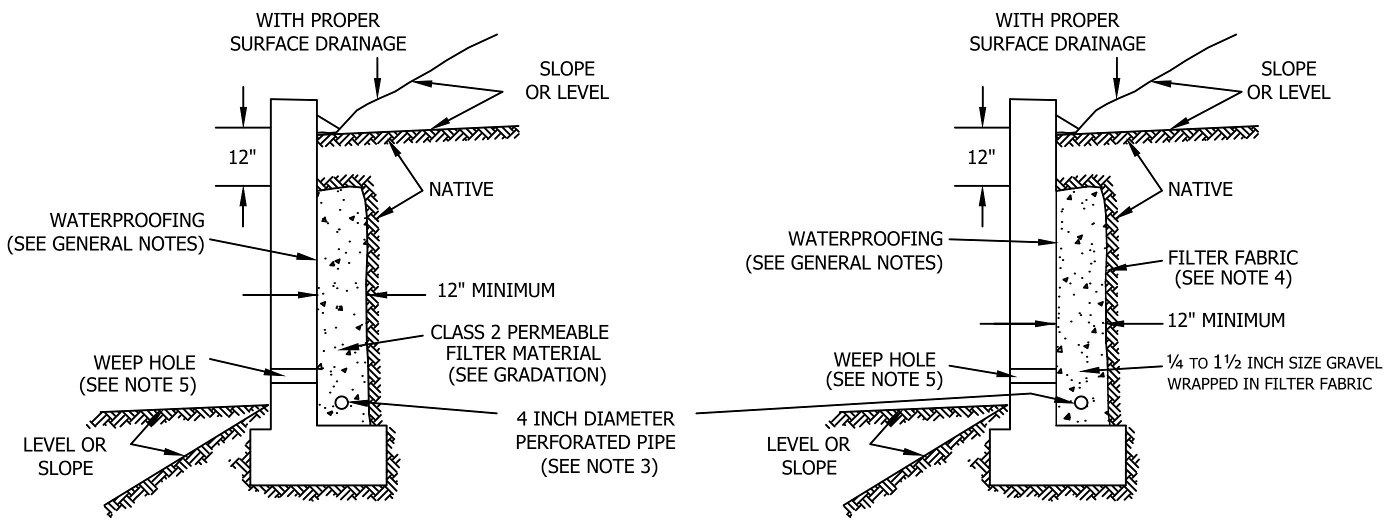
Leighton

Map Saved as J:\Drafting\13837\001\Maps\13837-001_F07_DIM_2023-03-03.mxd on 3/2/2023 10:54:18 AM Author: KVM (btran)

SUBDRAIN OPTIONS AND BACKFILL WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50

OPTION 1: PIPE SURROUNDED WITH CLASS 2 PERMEABLE MATERIAL

OPTION 2: GRAVEL WRAPPED IN FILTER FABRIC



Class 2 Filter Permeable Material Gradation
Per Caltrans Specifications

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

GENERAL NOTES:

* Waterproofing should be provided where moisture nuisance problem through the wall is undesirable.
* Water proofing of the walls is not under purview of the geotechnical engineer
* All drains should have a gradient of 1 percent minimum
*Outlet portion of the subdrain should have a 4-inch diameter solid pipe discharged into a suitable disposal area designed by the project engineer. The subdrain pipe should be accessible for maintenance (rodding)
*Other subdrain backfill options are subject to the review by the geotechnical engineer and modification of design parameters.

Notes:
1) Sand should have a sand equivalent of 30 or greater and may be densified by water jetting.
2) 1 Cu. ft. per ft. of 1/4- to 1 1/2-inch size gravel wrapped in filter fabric
3) Pipe type should be ASTM D1527 Acrylonitrile Butadiene Styrene (ABS) SDR35 or ASTM D1785 Polyvinyl Chloride plastic (PVC), Schedule 40, Armco A2000 PVC, or approved equivalent. Pipe should be installed with perforations down. Perforations should be 3/8 inch in diameter placed at the ends of a 120-degree arc in two rows at 3-inch on center (staggered)
4) Filter fabric should be Mirafi 140NC or approved equivalent.
5) Weephole should be 3-inch minimum diameter and provided at 10-foot maximum intervals. If exposure is permitted, weepholes should be located 12 inches above finished grade. If exposure is not permitted such as for a wall adjacent to a sidewalk/curb, a pipe under the sidewalk to be discharged through the curb face or equivalent should be provided. For a basement-type wall, a proper subdrain outlet system should be provided.
6) Retaining wall plans should be reviewed and approved by the geotechnical engineer.
7) Walls over six feet in height are subject to a special review by the geotechnical engineer and modifications to the above requirements.

RETAINING WALL BACKFILL AND SUBDRAIN DETAIL FOR WALLS 6 FEET OR LESS IN HEIGHT

WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50

Leighton

Figure 8

APPENDIX A

EXPLORATION LOGS

GEOTECHNICAL BORING LOG LB-1

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	110'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
110	0								@Surface: 1.5-inch asphalt concrete over 12-inch aggregate base	
				B-1				SM	**Artificial Fill, Undocumented (Afu)** @1.1': Silty SAND with gravel, reddish brown, moist, fine to medium sand, approximately 40% medium subrounded to subangular gravel (field estimate) @3': decreasing gravel percentage with depth	MD,DS, EI,CN, RV,CR
105	5			R-1	7 11 9	117	9		@5': Silty SAND, brown, mottled reddish brown/yellow brown, moist, medium dense, fine to coarse sand, some fine to medium subrounded gravel, medium dense	
				S-2	6 7 12		5	SM	**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @7.5': Silty SAND, reddish brown, moist, medium dense, mostly fine sand, laminated, trace poorly graded gravel	
100	10			R-3	18 22 26	117	8	SC	@10': Clayey SAND, reddish brown, moist, dense, fine to medium grained sand, homogeneous, trace coarse sand, low plasticity	
95	15			S-4	9 15 16		7	SM	@15': Silty SAND, reddish brown, moist, dense, mostly fine grained sand, laminated, uniform	
90	20			R-5	22 50/6"	105	8	SP	@20': Poorly-graded SAND, yellowish brown, moist, very dense, mostly fine sand, FeO specs, uniform, homogeneous	
85	25			S-6	12 15 19		7	SP-SM	@25': Poorly-graded SAND with silt, yellowish brown, moist, dense, mostly fine sand, oxidized specs/blebs, silt laminations	
80	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-1

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	110'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
80	30			R-7	16 31 50/5.5"	104	4	SP	@30': Poorly-graded SAND, yellowish brown, moist, very dense, primarily fine grained sand, oxidized, uniform/ homogeneous, little to no fines	
									Total Depth 31.5' bgs **No Groundwater encountered during drilling** **Boring backfilled to ground surface with spoils and patched with cold-mix asphalt concrete**	
75	35									
70	40									
65	45									
60	50									
55	55									
50	60									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-2

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	106'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
105	0							SC	@Surface: 2-inch asphalt concrete over 8-inch aggregate base **Artificial Fill, Undocumented (Afu)** Clayey SAND, dark brown, mottled yellow brown, fine to coarse grained sand, light to medium plasticity, some fine subrounded gravel, pockets of poorly graded SAND @2': steel pipe encountered; sidestep boring out 5 feet	
100	5			S-1	3 5 8		11	SM	**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @4': Silty SAND, reddish brown, moist, fine grained sand, uniform @5': Silty SAND, reddish brown, saturated (recent rain), medium dense, decreased moisture with depth, fine sand, MnO specs-smeared	
				R-2	15 21 25	116	11	SP-SM	@7.5': Poorly-graded SAND with silt and clay, yellowish brown, slightly moist, dense, fine to medium grained sand, some clay, low plasticity, pocket of grayish white sand, 3-inch thick filling downward sequences	
95	10			S-3	8 14 14		9		@10': medium dense, MnO and FeO specs	
90	15			R-4	9 19 19	122	10	SC	@15': Clayey SAND, olive brown, moist, dense, low plasticity, fine grained sand, abundant Feo specs, pinhole pores, thinly laminated, some poorly-graded sand layers	
85	20			S-5	5 11 12		2	SP	@20': Poorly-graded SAND, yellowish brown, slightly moist, medium dense, primarily fine grained SAND, little to no fines, oxidized laminae, uniform and homogeneous	
80	25			R-6	4 15 25	102	3		@25': medium dense	
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-2

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	106'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
75	30			S-7	7 15 20		4		@30': Poorly-graded SAND, orange brown, dense, highly oxidized, well-sorted/no fines, uniform and homogeneous	
									Total Depth 31.5' bgs **No Groundwater encountered during drilling** **Boring backfilled to ground surface with spoils and patched with cold-mix asphalt concrete**	
70	35									
65	40									
60	45									
55	50									
50	55									
	60									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-3

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	108'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
108	0							@Surface: 2-inch asphalt concrete over 8-inch aggregate base	
							CL	**Artificial Fill, Undocumented (Afu)** Sandy CLAY with gravel, dark gray, mottled yellow smears, very moist, medium plasticity, fine subrounded gravel, fine to medium grained sand, trace coarse sand	
105									
	5		S-1	2 2 3		20		@5': medium stiff, mottled green/black/red/yellow	
100			R-2	2 2 5	100	25	CL	**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @7.5': Lean CLAY, orange brown, very moist, medium stiff, medium to high plasticity, undulatory laminae, MnO specs, trace micas	DS,CN
	10		S-3	2 3 6		12	SP	@10': Poorly-graded SAND, light brown, loose, mostly fine grained SAND, homogeneous	
								@11': sharp contact to Sandy CLAY, orange brown, moist, stiff, low to medium plasticity, micaceous, thinly laminated	
95									
	15		R-4	5 5 9	115	14	SC	@15': Clayey SAND, reddish brown, slightly moist, loose, fine to coarse grained SAND, low to medium plasticity, trace micas, oxidized blebs-smeared	
90									
	20		S-5	5 8 11		4	SP	@20': Poorly-graded SAND, light brown, very moist, medium dense, primarily fine sand, little to no fines, homogeneous/ uniform	
85									
	25		R-6	10 21 35	106	5	SP-SM	@25': Poorly-graded SAND with silt, light brown, very moist, medium dense, primarily fine SAND, little to no fines, homogeneous/ uniform, 2.5-inch thick fining downward sequences to a silty sand	
80									
	30								

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-3

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	108'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			S-7	9 12 10		12		@30': medium dense @31': gradual contact to CLAY, olive brown, very stiff, oxidized smears, medium plasticity, some fine grained sand	
75									**Total Depth 31.5' bgs** **No Groundwater encountered during drilling** **Boring backfilled to ground surface with spoils and patched with cold-mix asphalt concrete**	
	35									
70										
	40									
65										
	45									
60										
	50									
55										
	55									
50										
	60									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-4

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	105'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
105	0								@Surface: 3-inch asphalt concrete over 12-inch aggregate base	
				B-1				SC-SM	**Artificial Fill, Undocumented (Afu)** @1.3': Silty clayey SAND, black/dark gray, moist, slightly odorous, low plasticity, fine sand, some fine subrounded gravel	
100	5			R-1	7 10 16	119	15	CL-ML	**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @5': Silty CLAY, reddish brown, moist, very stiff, low plasticity, manganese oxide specs, pinhole pores, trace micas	
				S-2	4 8 14		16	CL	@7.5': Sandy CLAY, reddish brown, slightly moist, very stiff, low to medium plasticity, fine to medium sand, oxidized	
95	10			R-3	5 13 20	123	13	SC	@10': Clayey SAND, reddish brown, slightly moist, medium density, low to medium plasticity, fine to medium sand, oxidized	
90	15			S-4	6 9 9		10		@15': Clayey SAND, reddish brown, moist, medium density, fine to medium sand, low plasticity, thinly laminated silt layers-undulatory	
85	20			R-5	7 15 30	104	5	SP	@20': Poorly-graded SAND, orange (highly oxidized), moist, medium density, primarily fine grained sand, little to no fines present, uniform, homogenous	
80	25			S-6	8 17 21		4	SP	@25': Poorly-graded SAND, yellowish brown/ orange (highly oxidized), slightly moist, dense, mostly fine sand, 2" layer of medium to coarse grained sand that is coarsening downward, few to no fines present	
75	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LB-4

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	105'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
75	30			R-7	16 40 50/3	105	4	SP/SW	@30': Alternating layers of poorly-graded and well-graded SANDS, moist, very dense, coarsening downward sequences interlayed with oxidized sand layers, few fines present	
									Total Depth 31.25' bgs **No Groundwater encountered during drilling** **Boring backfilled to ground surface with spoils and patched with cold-mix asphalt concrete**	
70	35									
65	40									
60	45									
55	50									
50	55									
45	60									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-5

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	107'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Graphic Log: N S

Elevation Feet	Depth Feet	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
107	0							@Surface: 2.5-inch asphalt concrete over 7-inch aggregate base	
105			B-1				SM	**Artificial Fill, Undocumented (Afu)** @0.8': Silty SAND, dark brown, moist, fine sand	
							CL	**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @3': Sandy CLAY, dark grayish brown, moist, low plasticity, fine to medium grained sand	
	5		R-1	4 5 10	122	8	SM	@5': Silty SAND, reddish brown, moist, loose, fine grained SAND, non plastic	DS,CN
100							CL-ML	@6': Silty CLAY, dark brown, moist, stiff, medium to high plasticity, trace amount of fine sand	
			S-2	4 7 10		16	CL	@7.5': Lean CLAY, reddish brown, slightly moist, very stiff, low plasticity, manganese oxide specs and calcium carbonate veins, trace fine to medium sand and medium subrounded gravel	
	10		R-3	8 20 32	118	14		@10': hard	DS,CN
95									
	15		S-4	2 3 3		14		@15': CLAY with sand, yellowish brown, moist, medium stiff, low to medium plasticity, thin laminae of fine grained sand, trace micas, trace FeO staining	
90									
	20		R-5	4 14 18	104	4	SP-SM	@20': Poorly-graded SAND with silt, light brown, slightly moist, medium dense, mostly fine grained sand, uniform and homogenous	
85									
	25		S-6	5 9 10		4	SP	@25': Poorly-graded SAND, yellow brown, moist, medium dense, fine to medium sand, uniform, trace oxidation	
80									
	30								

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LB-5

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	107'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			R-7	15 32 39	106	4	SP	@30': dense, oxidized veins	
75									**Total Depth 31.5' bgs** **No Groundwater encountered during drilling** **Boring backfilled to ground surface with spoils and patched with cold-mix asphalt concrete**	
	35									
70										
	40									
65										
	45									
60										
	50									
55										
	55									
50										
	60									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-6

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	103'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N–S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								@Surface: 2.5-inch asphalt concrete over 6.5-inch aggregate base	
				B-1				SC-SM	**Artificial Fill, Undocumented (Afu)** @0.7': Clayey SAND, dark brown, moist, low plasticity, mottled black/light brown, fine grained sand	MD,DS, EI,CN, RV,CR
100								SM	**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @3': Silty SAND, reddish brown, very moist-wet (recent rainfall), nonplastic, fine grained sand	
	5			S-1	4 9 13		15	CL	@5': Sandy CLAY, reddish brown, moist, very stiff, manganese oxide specs, medium plasticity, fine grained sand	
95				R-2	6 14 22	94	15		@7.5': highly oxidized	
	10			S-3	6 10 10		10	SC	@10': Clayey SAND, reddish brown, slightly moist, medium density, manganese oxide specs, pinhole porosity, low plasticity, fine grained sand	
90										
	15			R-4	7 12 25	103	5	SP	@15': Poorly-graded SAND, highly oxidized orange, slightly moist, medium density, fine grained sand, homogenous and uniform	
85										
	20			S-5	9 15 21		3		@20': yellow brown, moist, dense	
80										
	25			R-6	13 25 45	105	2		@25': dense, uniform, with trace oxidation, thinly laminated	
75										
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-6

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	103'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	30			S-7	9 21 40		3	SP-SM	@30': Silty poorly-graded SAND, yellow brown, moist, very dense, fine to medium grained sand, with oxidized stripes/streaks	
70									**Total Depth 31.5' bgs** **No Groundwater encountered during drilling** **Boring backfilled to ground surface with spoils and patched with cold-mix asphalt concrete**	
	35									
65										
	40									
60										
	45									
55										
	50									
50										
	55									
45										
	60									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LP-1

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	107'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								@Surface: 4.5-inch asphalt concrete over 3-inch aggregate base	
105				B-1				SC-SM	**Artificial Fill, Undocumented (Afu)** Clayey SAND, olive brown, very moist, fine grained sand, mottled red/yellow	MD,DS, EI,CN, RV,CR
									Quaternary Age Old Eolian and Dune Deposits (Qoe) @4': Sandy CLAY, reddish brown, moist, fine grained sand, medium plasticity, oxidized, MnO Specs	
100	5			S-1	2 6 10		19	CL	@5': CLAY, reddish brown, slightly moist, very stiff, medium to high plasticity, CaCO3 precipitates, MnO specs, trace coarse-grained sand	
				S-2	7 12 14		12		@8.5': Sandy CLAY, reddish olive brown, moist, hard, some fine grained sand, low plasticity, micaceous, oxidized	
95	10								**Total Depth 10' bgs** **No groundwater encountered during drilling** **Installed temporary percolation test well using 2" diameter pipe. Solid pipe from 0'-5' and 0.020" screened pipe from 5'-10'. No. 3 Monterey SAND placed in annulus from 4'-10'. Upon completion of percolation test, pipe was removed and boring was backfilled with soil cuttings and patched with cold-mix asphalt concrete**	
90	15									
85	20									
80	25									
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

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GEOTECHNICAL BORING LOG LP-2

Project No.	13837.001	**Date Drilled**	2-28-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	106'
Location	See Figure 2 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								@Surface: 2-inch asphalt concrete over 5-inch aggregate base	
105								CL	**Artificial Fill, Undocumented (Afu)** @0.6': CLAY, dark brown, moist, medium plasticity, some fine sand	
									@4': Sandy CLAY, reddish brown, moist, low plasticity, fine grained sand	
	5			S-1	5 3 5		18		@5': CLAY, dark gray, medium stiff, mottled green/ blue/gray, miscellaneous compositions of soils	
100										
								CL	**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @7': CLAY, reddish brown, moist, some fine grained sand, MnO specs, oxidized, medium plasticity	
				S-2	6 13 18		17		@8.5': Silty CLAY, reddish brown, slightly moist, hard, low plasticity, some fine grained sand, oxidized stains	
	10									
95									**Total Depth 10' bgs** **No groundwater encountered during drilling** **Installed temporary percolation test well using 2" diameter pipe. Solid pipe from 0'-5' and 0.020" screened pipe from 5'-10'. No. 3 Monterey SAND placed in annulus from 4'-10'. Upon completion of percolation test, pipe was removed and boring was backfilled with soil cuttings and patched with cold-mix asphalt concrete**	
	15									
90										
	20									
85										
	25									
80										
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

SUMMARY

OF

CONE PENETRATION TEST DATA

Project:

Rexford
9000 Airport Blvd.
Los Angeles, CA
February 28, 2023

Prepared for:

Mr. Jeff Pflueger
Leighton Consulting
2600 Michelson Drive, Ste 400
Irvine, CA 92612
Office (800) 253-4567 / Fax (949) 250-1114

Prepared by:

KEHOE TESTING & ENGINEERING
5415 Industrial Drive
Huntington Beach, CA 92649-1518
Office (714) 901-7270 / Fax (714) 901-7289
www.kehoetesting.com

TABLE OF CONTENTS

SUMMARY

OF

CONE PENETRATION TEST DATA

1. INTRODUCTION

This report presents the results of a Cone Penetration Test (CPT) program carried out for the Rexford project located at 9000 Airport Blvd. in Los Angeles, California. The work was performed by Kehoe Testing & Engineering (KTE) on February 28, 2023. The scope of work was performed as directed by Leighton Consulting personnel.

2. SUMMARY OF FIELD WORK

The fieldwork consisted of performing CPT soundings at eight locations to determine the soil lithology. A summary is provided in **TABLE 2.1**.

LOCATION	DEPTH OF CPT (ft)	COMMENTS/NOTES:
CPT-1	29	Refusal
CPT-2	30	
CPT-3	30	
CPT-4	30	
CPT-5	26	Refusal
CPT-6	30	
CPT-7	50	
CPT-8	30	

TABLE 2.1 - Summary of CPT Soundings

3. FIELD EQUIPMENT & PROCEDURES

The CPT soundings were carried out by **KTE** using an integrated electronic cone system manufactured by Vertek. The CPT soundings were performed in accordance with ASTM standards (D5778). The cone penetrometers were pushed using a 30-ton CPT rig. The cone used during the program was a 15 cm^2 cone with a cone net area ratio of 0.83. The following parameters were recorded at approximately 2.5 cm depth intervals:

- Cone Resistance (qc)
- Sleeve Friction (fs)
- Dynamic Pore Pressure (u)
- Inclination
- Penetration Speed
- Pore Pressure Dissipation (at selected depths)

At locations CPT-2 & CPT-7, shear wave measurements were obtained at approximately 5-foot intervals. The shear wave is generated using an air-actuated hammer, which is located inside the front jack of the CPT rig. The cone has a triaxial geophone, which recorded the shear wave signal generated by the air hammer.

The above parameters were recorded and viewed in real time using a laptop computer. Data is stored at the KTE office for up to 2 years for future analysis and reference. A complete set of baseline readings was taken prior to each sounding to determine temperature shifts and any zero load offsets. Monitoring base line readings ensures that the cone electronics are operating properly.

4. CONE PENETRATION TEST DATA & INTERPRETATION

The Cone Penetration Test data is presented in graphical form in the attached Appendix. These plots were generated using the CPeT-IT program. Penetration depths are referenced to ground surface. The soil behavior type on the CPT plots is derived from the attached CPT SBT plot (Robertson, “Interpretation of Cone Penetration Test…”, 2009) and presents major soil lithologic changes. The stratigraphic interpretation is based on relationships between cone resistance (qc), sleeve friction (fs), and penetration pore pressure (u). The friction ratio (Rf), which is sleeve friction divided by cone resistance, is a calculated parameter that is used along with cone resistance to infer soil behavior type. Generally, cohesive soils (clays) have high friction ratios, low cone resistance and generate excess pore water pressures. Cohesionless soils (sands) have lower friction ratios, high cone bearing and generate little (or negative) excess pore water pressures.

The CPT data files have also been provided. These files can be imported in CPeT-IT (software by GeoLogismiki) and other programs to calculate various geotechnical parameters.

It should be noted that it is not always possible to clearly identify a soil type based on qc, fs and u. In these situations, experience, judgement and an assessment of the pore pressure data should be used to infer the soil behavior type.

If you have any questions regarding this information, please do not hesitate to call our office at (714) 901-7270.

Sincerely,

KEHOE TESTING & ENGINEERING

Steven P. Kehoe
President

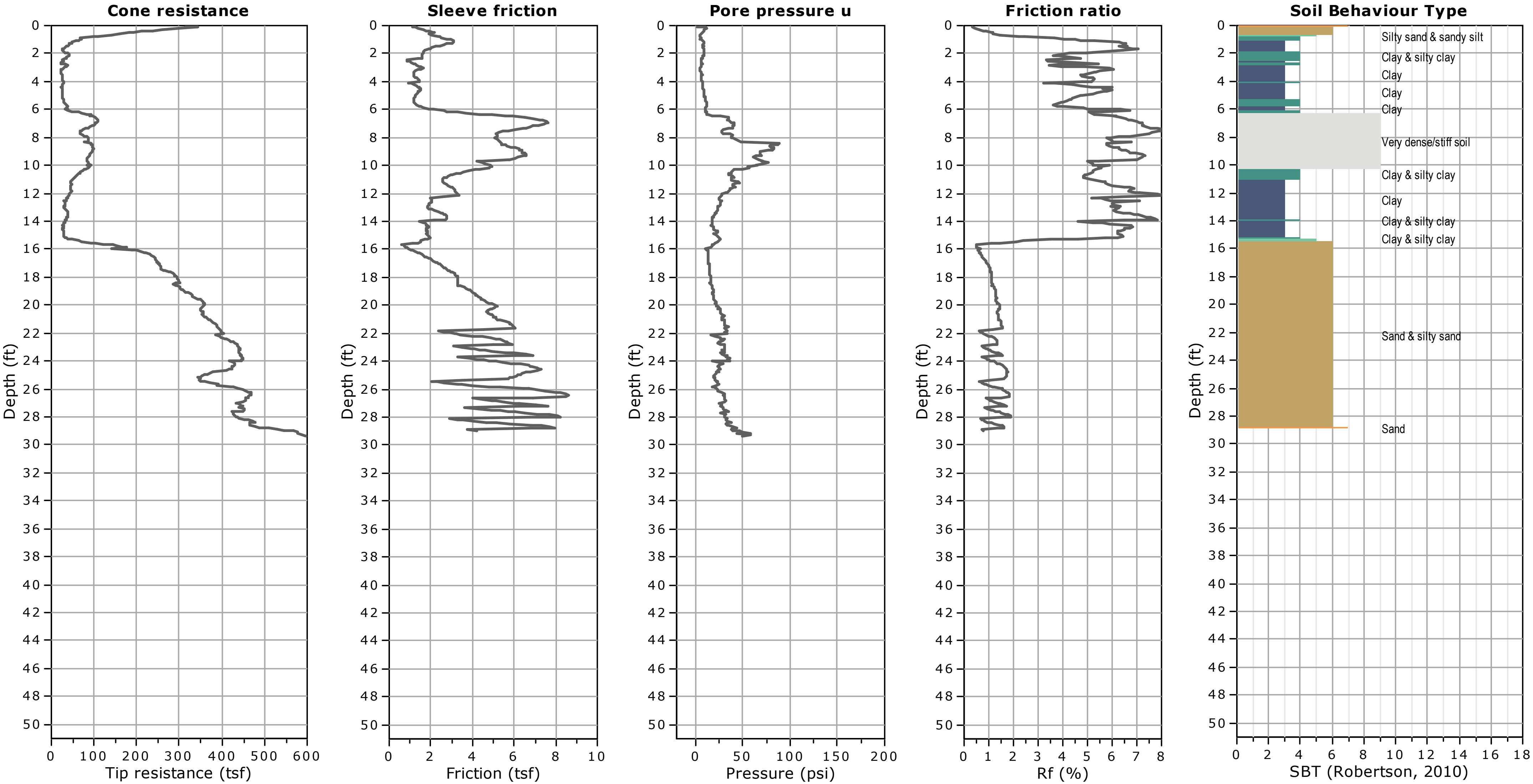
03/02/23-aga-5162

APPENDIX

Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Leighton Consulting / Rexford**
Location: **9000 Airport Blvd, Los Angeles, CA**

CPT-1
Total depth: 29.33 ft, Date: 2/28/2023



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714-901-7270
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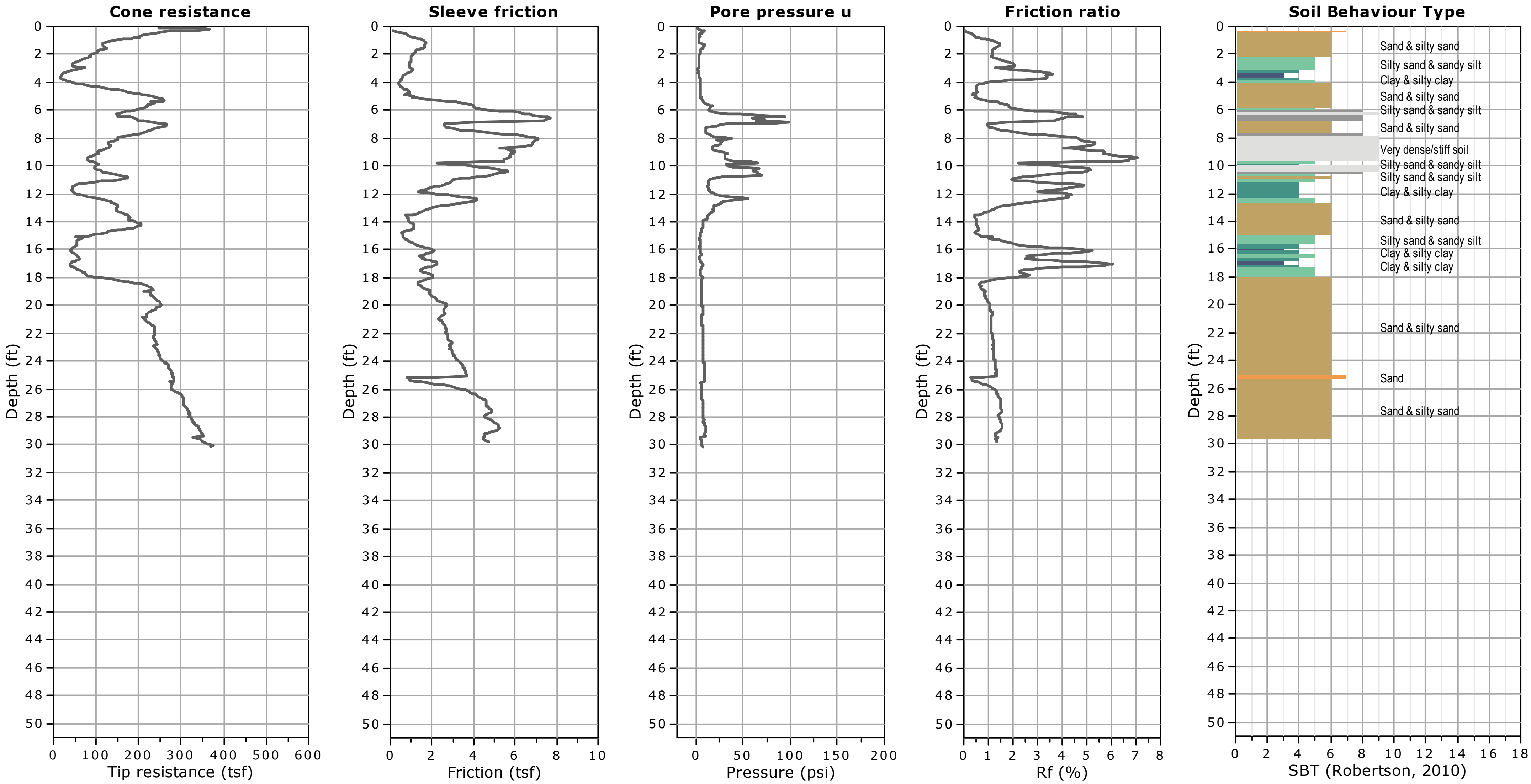
www.kehoetesting.com

Project: **Leighton Consulting / Rexford**
Location: **9000 Airport Blvd, Los Angeles, CA**

CPT-2
Total depth: 30.13 ft, Date: 2/28/2023



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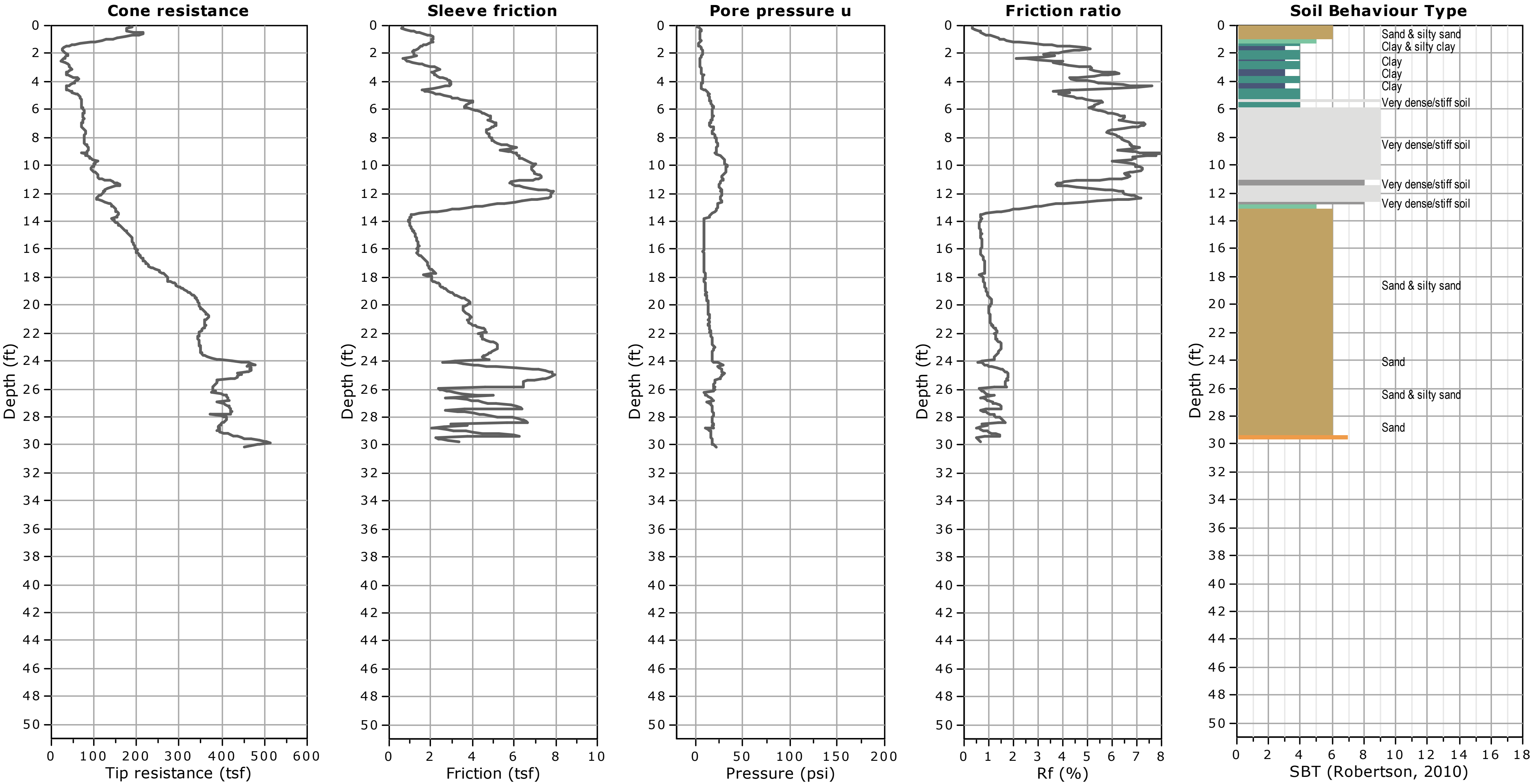
steve@kehoetesting.com
www.kehoetesting.com

Project: **Leighton Consulting / Rexford**
Location: **9000 Airport Blvd, Los Angeles, CA**

CPT-3
Total depth: 30.12 ft, Date: 2/28/2023



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steve@kehoetesting.com
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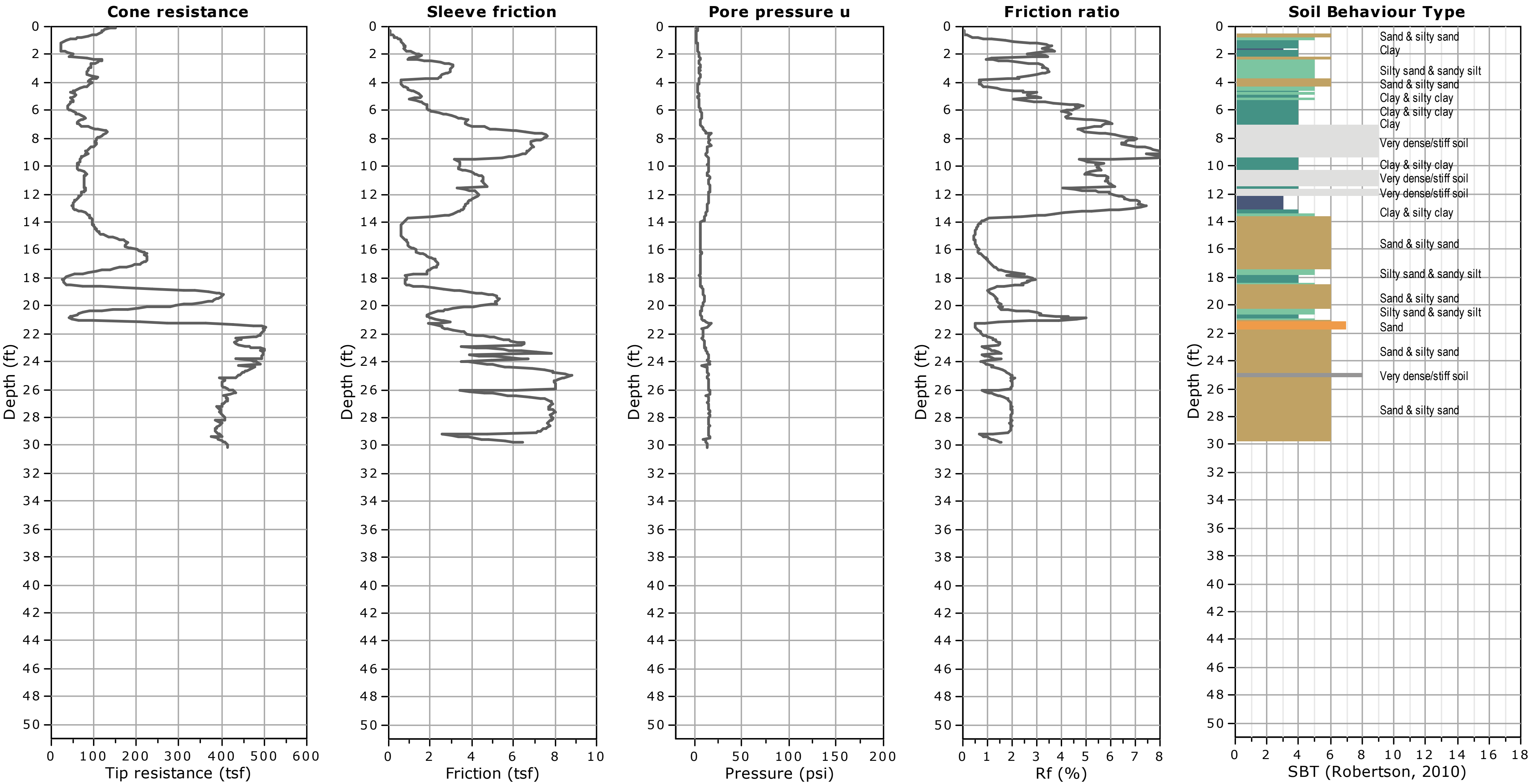
Project: **Leighton Consulting / Rexford** **CPT-4**

Location: **9000 Airport Blvd, Los Angeles, CA** Total depth: 30.18 ft, Date: 2/28/2023



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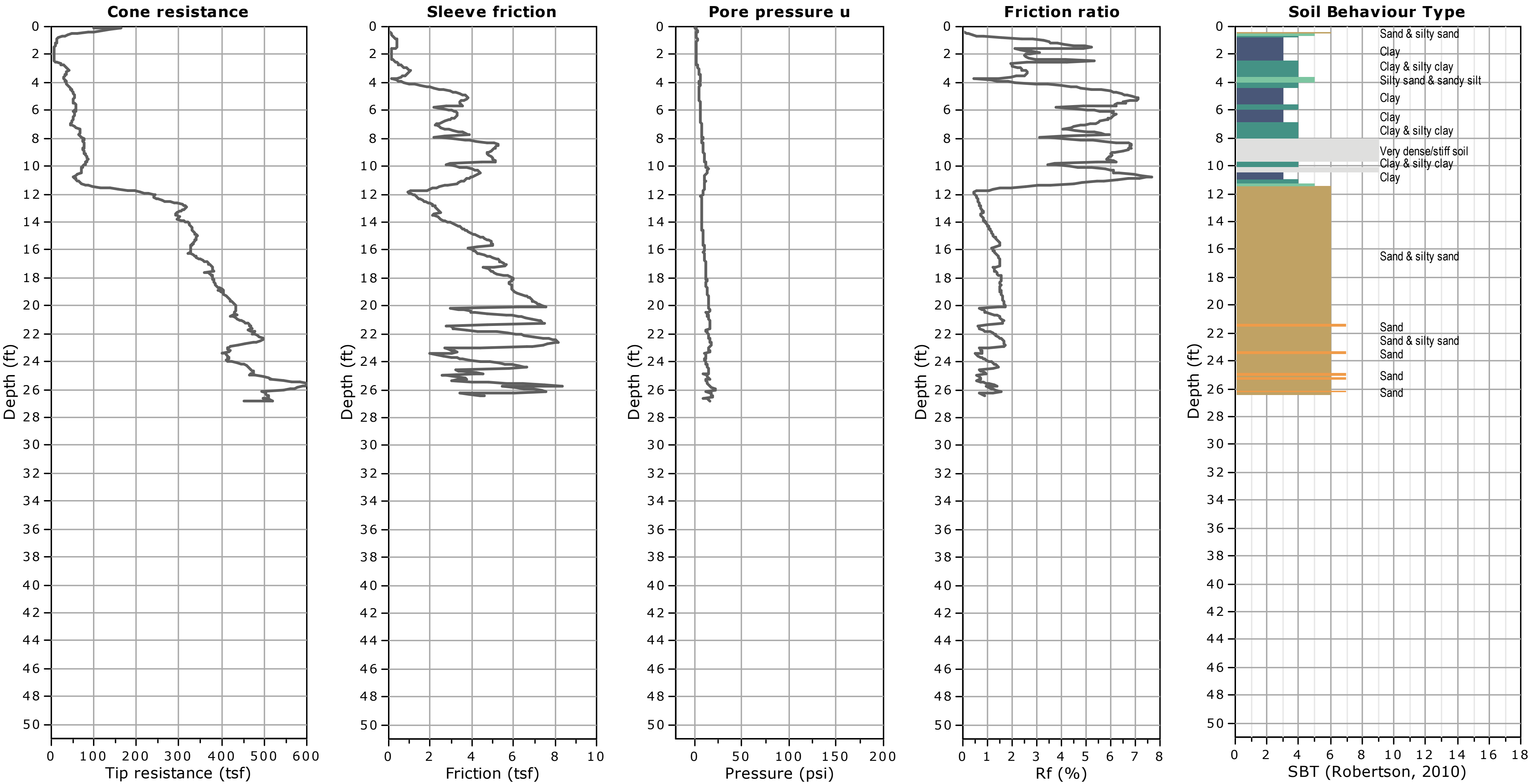
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: Leighton Consulting / Rexford
Location: 9000 Airport Blvd, Los Angeles, CA

CPT-5
Total depth: 26.84 ft, Date: 2/28/2023



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steve@kehoetesting.com
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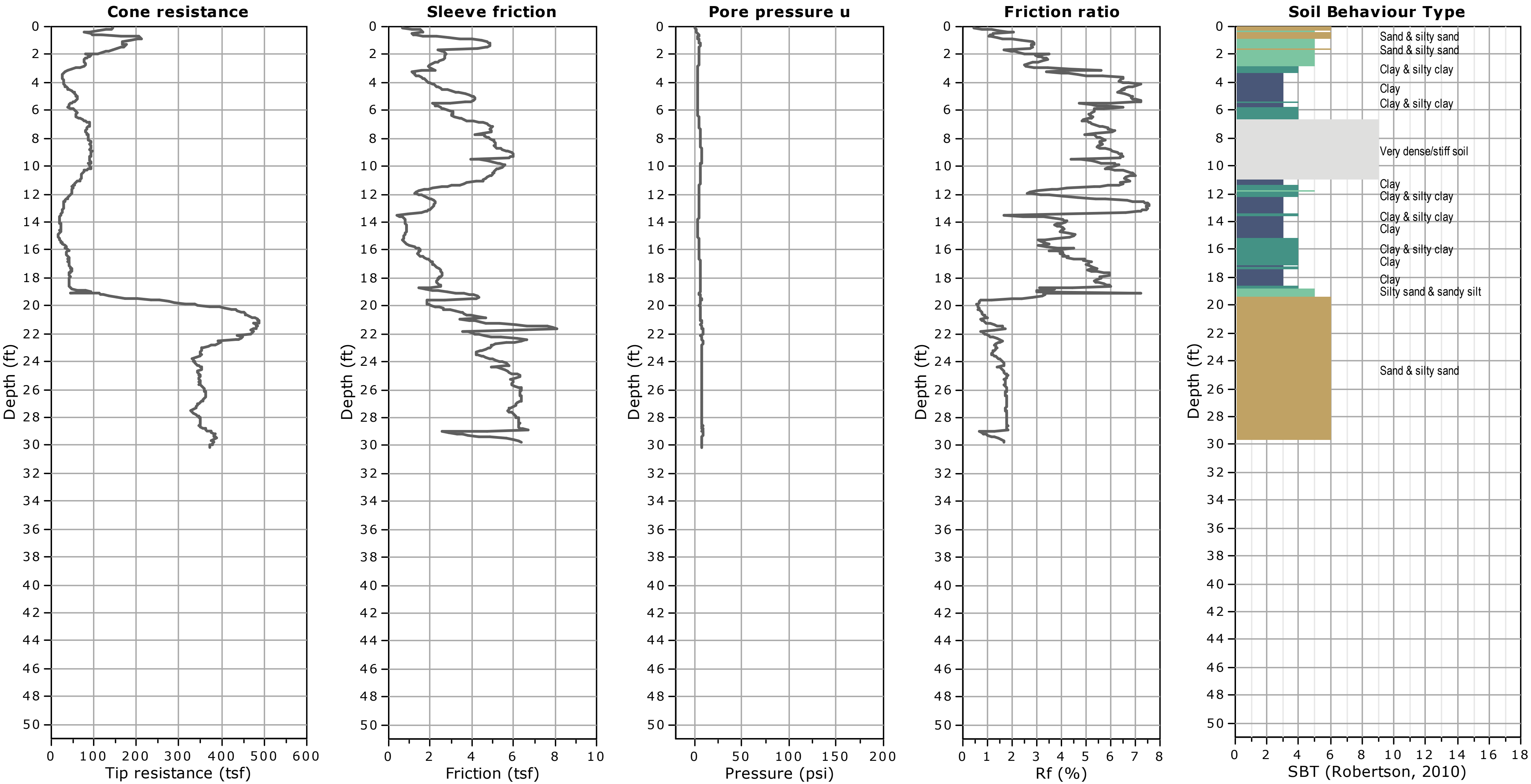
Project: Leighton Consulting / Rexford

Location: 9000 Airport Blvd, Los Angeles, CA

CPT-6

Total depth: 30.12 ft, Date: 2/28/2023



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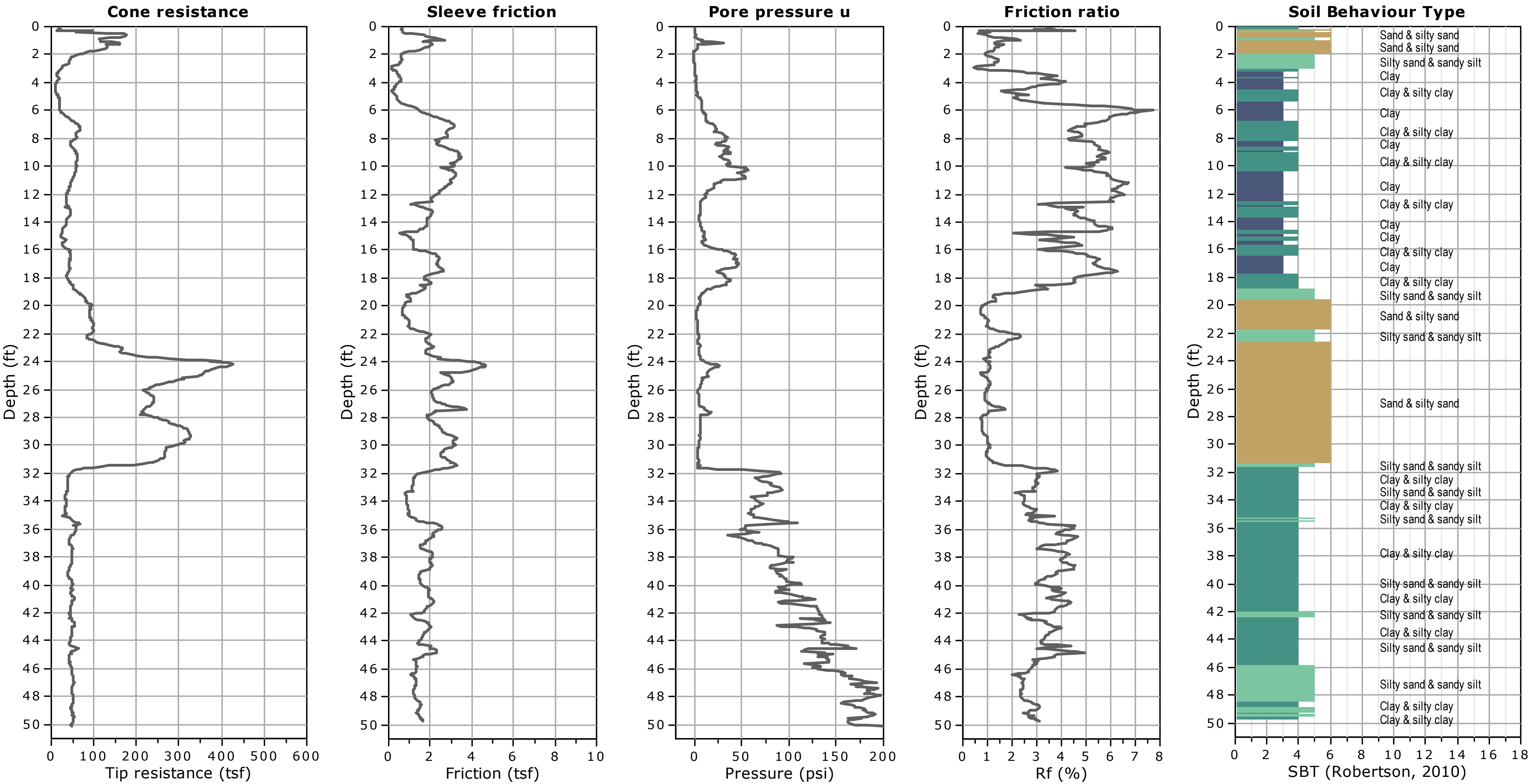
steve@kehoetesting.com
www.kehoetesting.com

Project: Leighton Consulting / Rexford

Location: 9000 Airport Blvd, Los Angeles, CA

CPT-7

Total depth: 50.15 ft, Date: 2/28/2023



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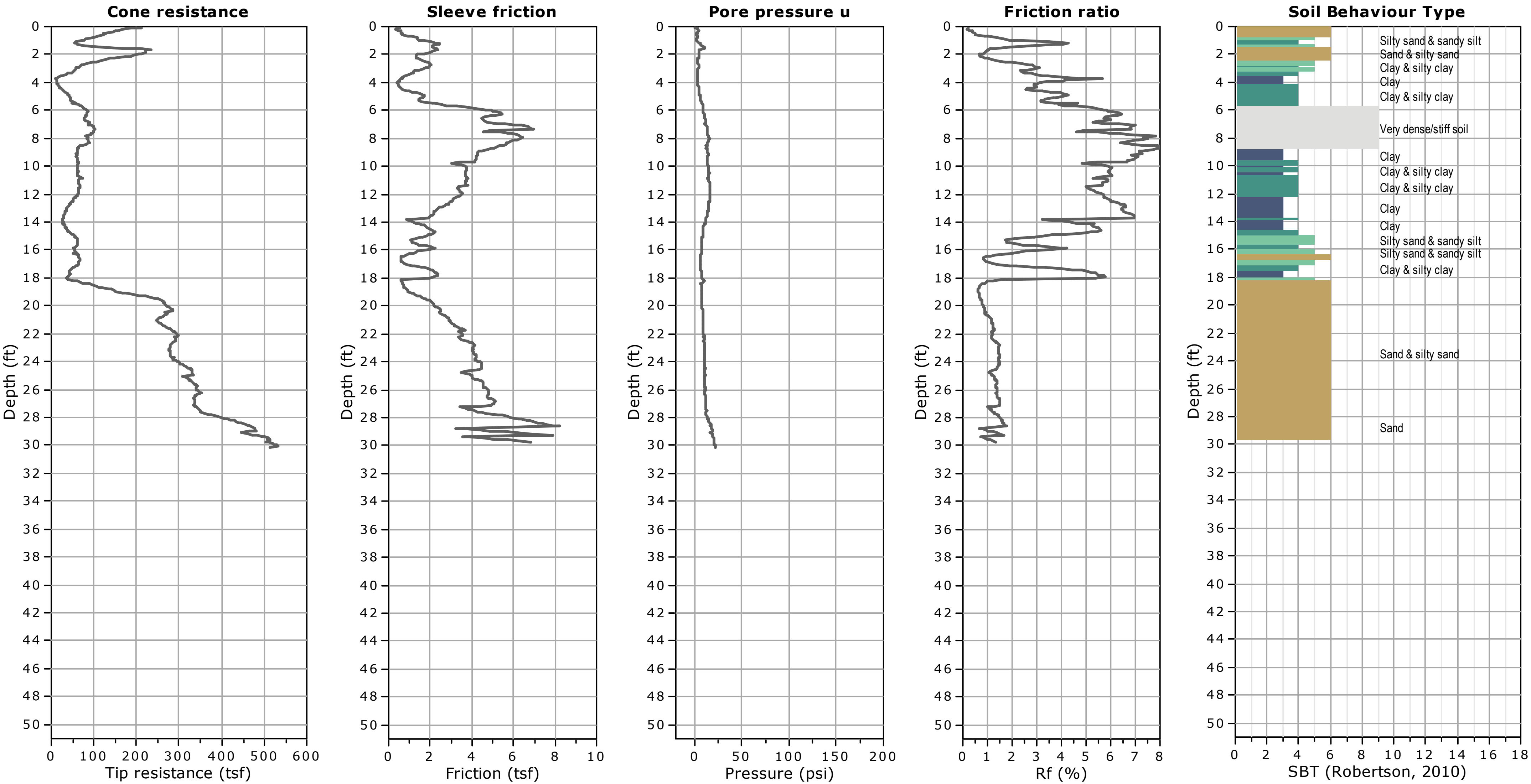
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

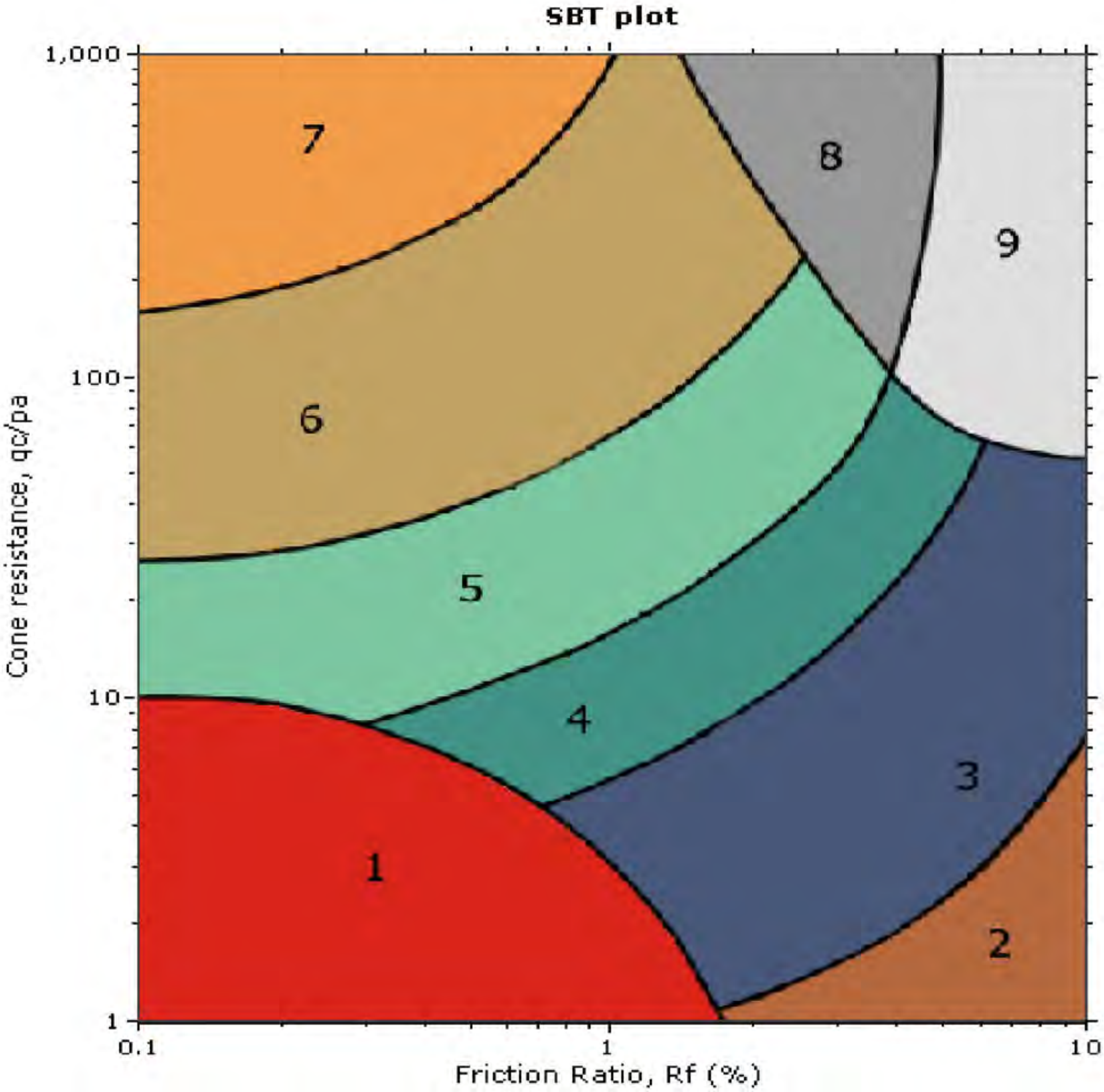
Project: Leighton Consulting / Rexford

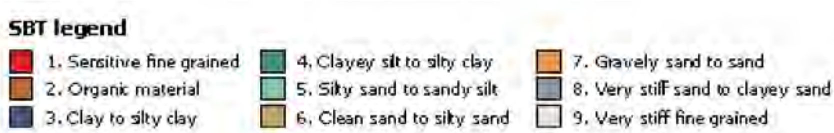
Location: 9000 Airport Blvd, Los Angeles, CA

CPT-8

Total depth: 30.14 ft, Date: 2/28/2023




SBT plot
1,000
100
10
1
Cone resistance, qc/pa
0.1
1
10
Friction Ratio, Rf (%)
7
6
5
4
1
8
9
3
2


SBT legend
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Leighton Consulting
Rexford Airport Blvd.
Los Angeles, CA

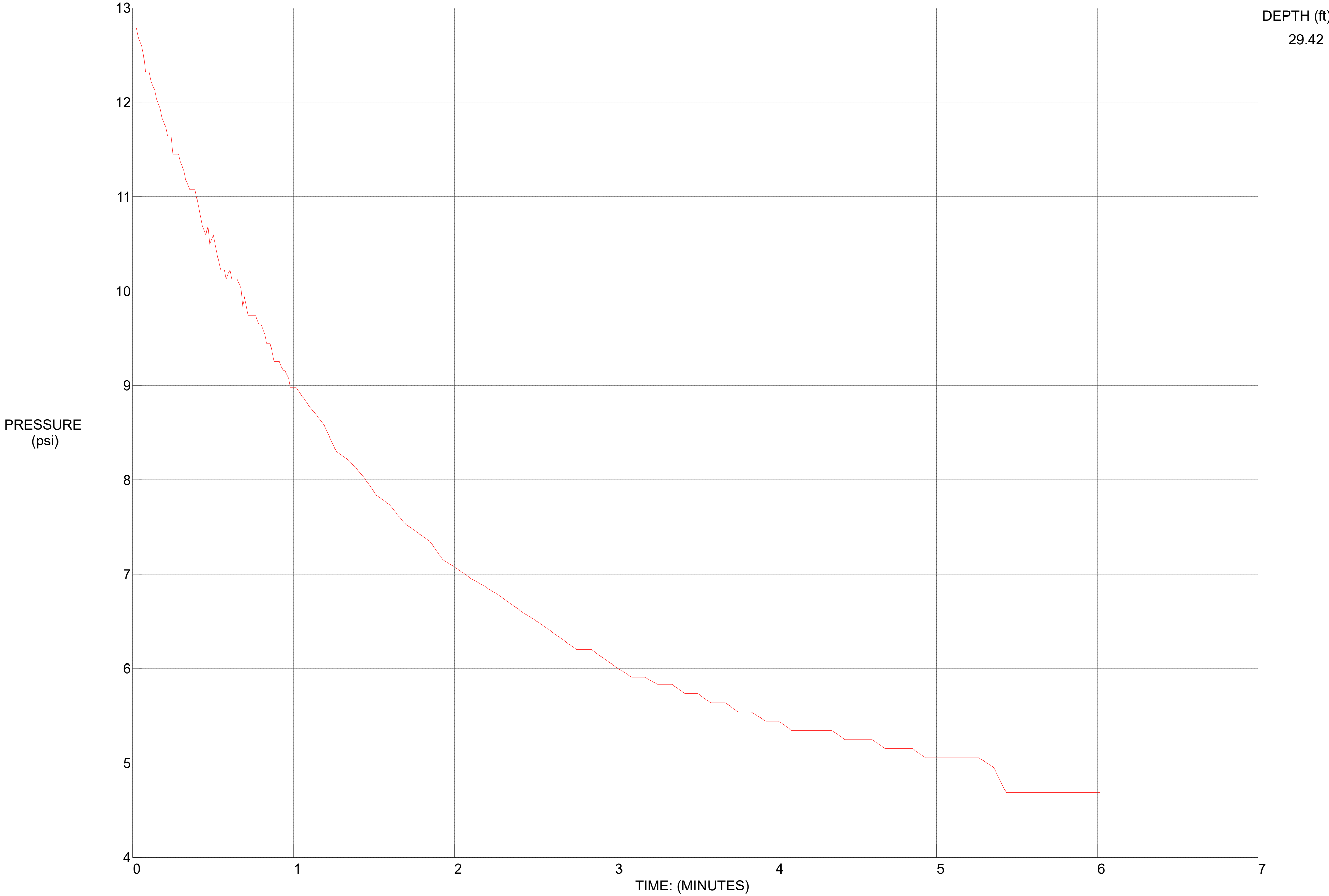
CPT Shear Wave Measurements

Location	Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
CPT-2	5.05	4.05	4.52	5.44	830	
	10.07	9.07	9.29	10.28	903	986
	15.09	14.09	14.23	14.56	977	1155
	20.08	19.08	19.18	18.72	1025	1191
	25.07	24.07	24.15	22.38	1079	1357
	30.09	29.09	29.16	25.48	1144	1615
CPT-7	5.02	4.02	4.49	4.90	916	
	10.01	9.01	9.23	10.92	845	787
	15.06	14.06	14.20	16.16	879	949
	20.05	19.05	19.15	21.40	895	945
	25.07	24.07	24.15	26.42	914	996
	30.09	29.09	29.16	29.76	980	1499
	35.04	34.04	34.10	34.80	980	980
	40.06	39.06	39.11	40.36	969	902
	45.05	44.05	44.10	45.26	974	1017
	50.16	49.16	49.20	49.88	986	1105

Shear Wave Source Offset - 2 ft

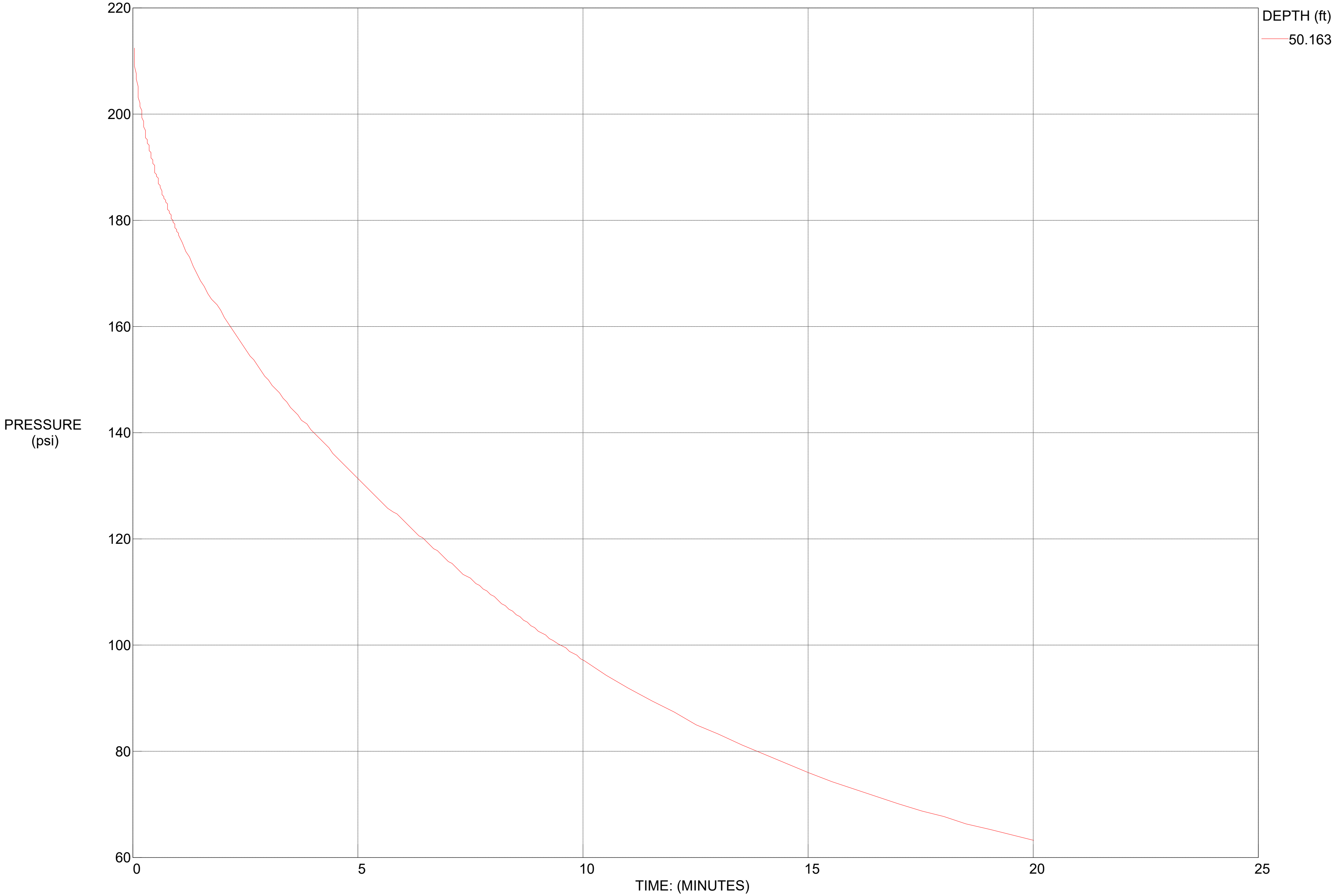
S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)

TEST ID: CPT-2



PRESSURE (psi)
TIME: (MINUTES)
DEPTH (ft)
29.42
13
12
11
10
9
8
7
6
5
4
0
1
2
3
4
5
6
7

TEST ID: CPT-7


PRESSURE (psi)
220
200
180
160
140
120
100
80
60
0
5
10
15
20
25
TIME: (MINUTES)
DEPTH (ft)
50.163

APPENDIX B

PERCOLATION TEST DATA

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Boring Percolation Test Data Sheet

Project Number:	13837.001	**Test Hole Number:**	LP-1
Project Name:	Rexford LA Airport Blvd	**Date Excavated:**	2/28/2023
Earth Description:	Alluvium	**Date Tested:**	3/2/2023
Liquid Description:	Tap water	**Depth of boring (ft):**	10
Tested By:	ECB	**Radius of boring (in):**	4
Time Interval Standard		**Radius of casing (in):**	1
Start Time for Pre-Soak:	9:00	**Length of slotted of casing (ft):**	5
Start Time for Standard:	10:00	**Depth to Initial Water Depth (ft):**	5
Standard Time Interval Between Readings, mins:	30	**Porosity of Annulus Material, *n* :**	0.35
		Bentonite Plug at Bottom:	No

Field Percolation Data - Falling Head Test

Reading	Time	Time Interval, Δt (min.)	Initial/Final Depth to Water (ft.)	Initial/Final Water Height, H_0/H_f (in.)	Total Water Drop, Δd (in.)	Infiltration Rate (in./hr.)
1	10:30	30	5.00	60.0	1.2	0.03
	11:00		5.10	58.8		
2	11:00	30	5.00	60.0	1.2	0.03
	11:30		5.10	58.8		
3	11:30	30	5.00	60.0	1.3	0.03
	12:00		5.11	58.7		
4	12:00	30	5.00	60.0	1.2	0.03
	12:30		5.10	58.8		
5	12:30	30	5.00	60.0	1.4	0.04
	13:00		5.12	58.6		
6	13:00	30	5.00	60.0	1.2	0.03
	13:30		5.10	58.8		
7	13:30	30	5.00	60.0	1.1	0.03
	14:00		5.09	58.9		
8	14:00	30	5.00	60.0	1.2	0.03
	14:30		5.10	58.8		

Infiltration Rate (I) = Discharge Volume/Surface Area of Test Section/Time Interval

Measured Infiltration Rate, I (Average of Last 3 Readings) = 0.03 in./hr.

Design Infiltration Rate

Reduction Factor from Test Procedure, RF_t = 1

Reduction Factor for Site Variability, # of Tests and Investigation, RF_v = 1

Reduction Factor for Long Term Siltation, Plugging and Maintenance, RF_t = 1

Reduction Factor, $RF = RF_t + RF_v + RF_s$ = 3

Design Infiltration Rate = Measured Infiltration Rate / Reduction Factor (RF) = 0.01 in./hr.

Boring Percolation Test Data Sheet

Project Number: 13837.001
Project Name: Rexford LA Airport Blvd
Earth Description: Alluvium
Liquid Description: Tap water
Tested By: ECB
Time Interval Standard
Start Time for Pre-Soak: 8:30
Start Time for Standard: 9:30
Standard Time Interval Between Readings, mins: 30

Test Hole Number: LP-2
Date Excavated: 2/28/2023
Date Tested: 3/2/2023
Depth of boring (ft): 10
Radius of boring (in): 4
Radius of casing (in): 1
Length of slotted of casing (ft): 5
Depth to Initial Water Depth (ft): 5
Porosity of Annulus Material, *n* : 0.35
Bentonite Plug at Bottom: No

Field Percolation Data - Falling Head Test

Reading	Time	Time Interval, Δt (min.)	Initial/Final Depth to Water (ft.)	Initial/Final Water Height, H_0/H_f (in.)	Total Water Drop, Δd (in.)	Infiltration Rate (in./hr.)
1	9:30	30	5.00	60.0	0.2	0.01
	10:00		5.02	59.8		
2	10:00	30	5.00	60.0	0.2	0.01
	10:30		5.02	59.8		
3	10:30	30	5.00	60.0	0.4	0.01
	11:00		5.03	59.6		
4	11:00	30	5.00	60.0	0.5	0.01
	11:30		5.04	59.5		
5	11:30	30	5.00	60.0	0.5	0.01
	12:00		5.04	59.5		
6	12:00	30	5.00	60.0	0.4	0.01
	12:30		5.03	59.6		
7	12:30	30	5.00	60.0	0.4	0.01
	13:00		5.03	59.6		
8	13:00	30	5.00	60.0	0.4	0.01
	13:30		5.03	59.6		

Infiltration Rate (I) = Discharge Volume/Surface Area of Test Section/Time Interval

Measured Infiltration Rate, I (Average of Last 3 Readings) = 0.01 in./hr.

Design Infiltration Rate

Reduction Factor from Test Procedure, RF_t = 1
Reduction Factor for Site Variability, # of Tests and Investigation, RF_v = 1
Reduction Factor for Long Term Siltation, Plugging and Maintenance, RF_t = 1
Reduction Factor, $RF = RF_t + RF_v + RF_s$ = 3

Design Infiltration Rate = Measured Infiltration Rate / Reduction Factor (RF) = 0.00 in./hr.

APPENDIX C

LABORATORY TEST RESULTS

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MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	Rexford LA Airport Blvd	Tested By:	O. Figueroa	Date:	03/07/23
Project No.:	13837.001	Checked By:	A. Santos	Date:	03/08/23
Boring No.:	LB-1	Depth (ft.):	0-5		
Sample No.:	B-1				
Soil Identification:	Dark brown yellowish brown silty sand (SM)				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

			Scalp Fraction (%)			
Preparation Method:	X	Moist	#3/4		Rammer Weight (lb.) =	10.0
		Dry			Height of Drop (in.) =	18.0
Compaction Method	X	Mechanical Ram	#3/8			
		Manual Ram	#4	8.9	Mold Volume (ft³)	0.03320

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3892	3968	3873			
Weight of Mold (g)	1808	1808	1808			
Net Weight of Soil (g)	2084	2160	2065			
Wet Weight of Soil + Cont. (g)	386.0	423.3	416.8			
Dry Weight of Soil + Cont. (g)	364.5	391.1	377.5			
Weight of Container (g)	39.5	39.0	40.4			
Moisture Content (%)	6.62	9.15	11.66			
Wet Density (pcf)	138.4	143.4	137.1			
Dry Density (pcf)	129.8	131.4	122.8			

Maximum Dry Density (pcf)	**132.0**	**Optimum Moisture Content (%)**	**8.3**
Corrected Dry Density (pcf)	**134.6**	**Corrected Moisture Content (%)**	**7.7**

☒ **Procedure 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 +#4 is 20% or less

☐ **Procedure 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)
Use if +#4 is >20% and +3/8 in. is 20% or less

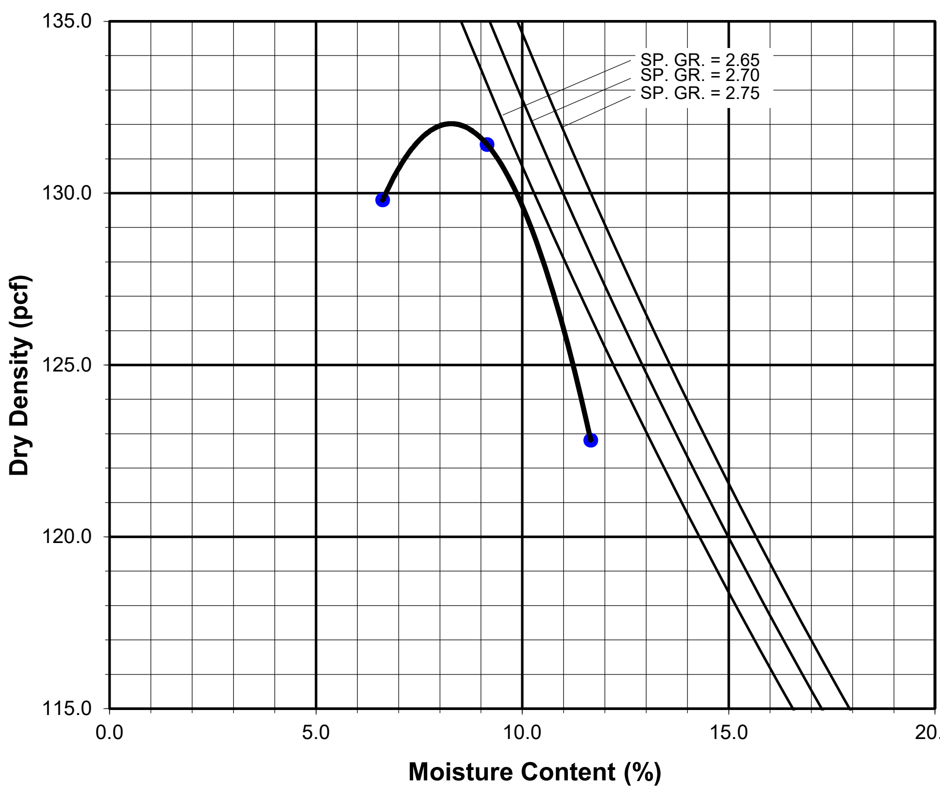
☐ **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	Rexford LA Airport Blvd	Tested By:	O. Figueroa	Date:	03/06/23
Project No.:	13837.001	Checked By:	A. Santos	Date:	03/08/23
Boring No.:	LB-6	Depth (ft.):	0-3		
Sample No.:	B-1				
Soil Identification:	Olive brown silty, clayey sand (SC-SM)				

Preparation Method: [X] Moist [ ] Dry — [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03320 — *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3717	3896	3918			
Weight of Mold (g)	1808	1808	1808			
Net Weight of Soil (g)	1909	2088	2110			
Wet Weight of Soil + Cont. (g)	447.5	356.2	343.6			
Dry Weight of Soil + Cont. (g)	427.8	333.5	316.0			
Weight of Container (g)	40.5	37.9	39.0			
Moisture Content (%)	5.09	7.68	9.96			
Wet Density (pcf)	126.8	138.6	140.1			
Dry Density (pcf)	120.6	128.8	127.4			

Maximum Dry Density (pcf) **129.2** **Optimum Moisture Content (%)** **8.4**

PROCEDURE USED

[X] **Procedure 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 +#4 is 20% or less

[ ] **Procedure 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)
Use if +#4 is >20% and +3/8 in. is 20% or less

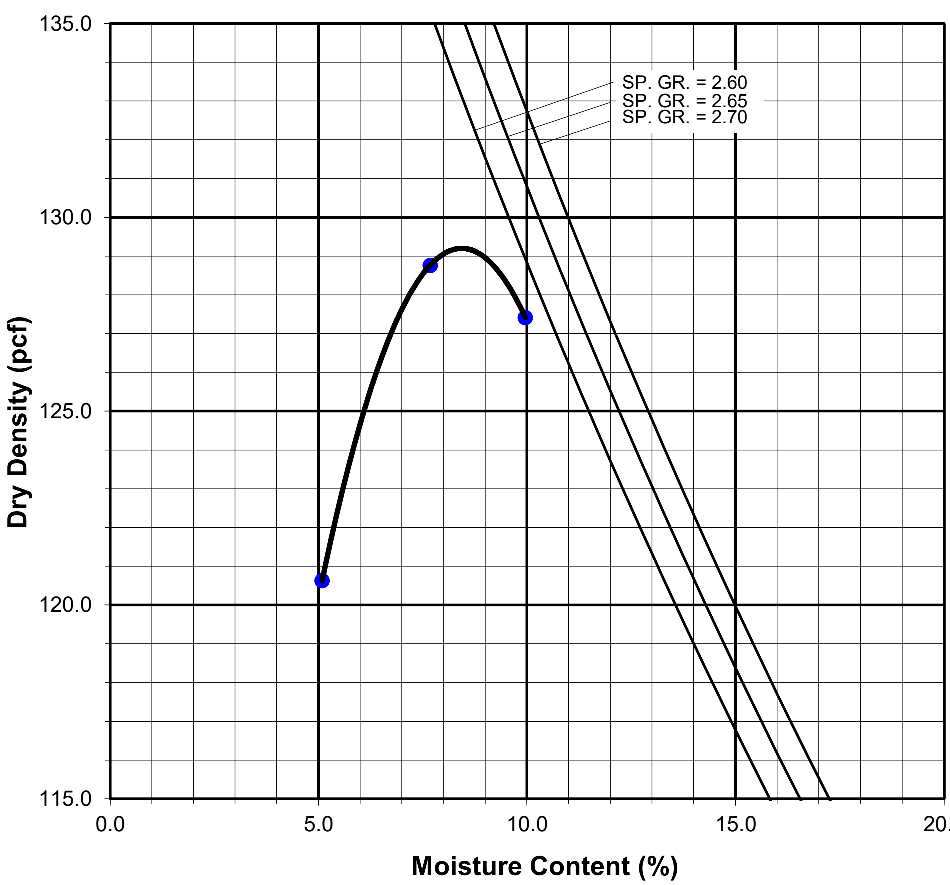
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name: Rexford LA Airport Blvd
Tested By: O. Figueroa
Date: 03/08/23

Project No.: 13837.001
Checked By: A. Santos
Date: 03/13/23

Boring No.: LP-1
Depth (ft.): 0-5

Sample No.: B-1

Soil Identification: Olive brown silty, clayey sand (SC-SM)

Preparation Method: [X] Moist [ ] Dry

[X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03320

Ram Weight = 10 lb.; Drop = 18 in.

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3683	3850	3859			
Weight of Mold (g)	1808	1808	1808			
Net Weight of Soil (g)	1875	2042	2051			
Wet Weight of Soil + Cont. (g)	332.8	467.4	474.4			
Dry Weight of Soil + Cont. (g)	311.4	426.6	423.8			
Weight of Container (g)	39.8	39.1	39.1			
Moisture Content (%)	7.88	10.53	13.15			
Wet Density (pcf)	124.5	135.6	136.2			
Dry Density (pcf)	115.4	122.7	120.4			

Maximum Dry Density (pcf) **123.0** **Optimum Moisture Content (%)** **11.3**

PROCEDURE USED

[X] **Procedure 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 +#4 is 20% or less

[ ] **Procedure 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)
Use if +#4 is >20% and +3/8 in. is 20% or less

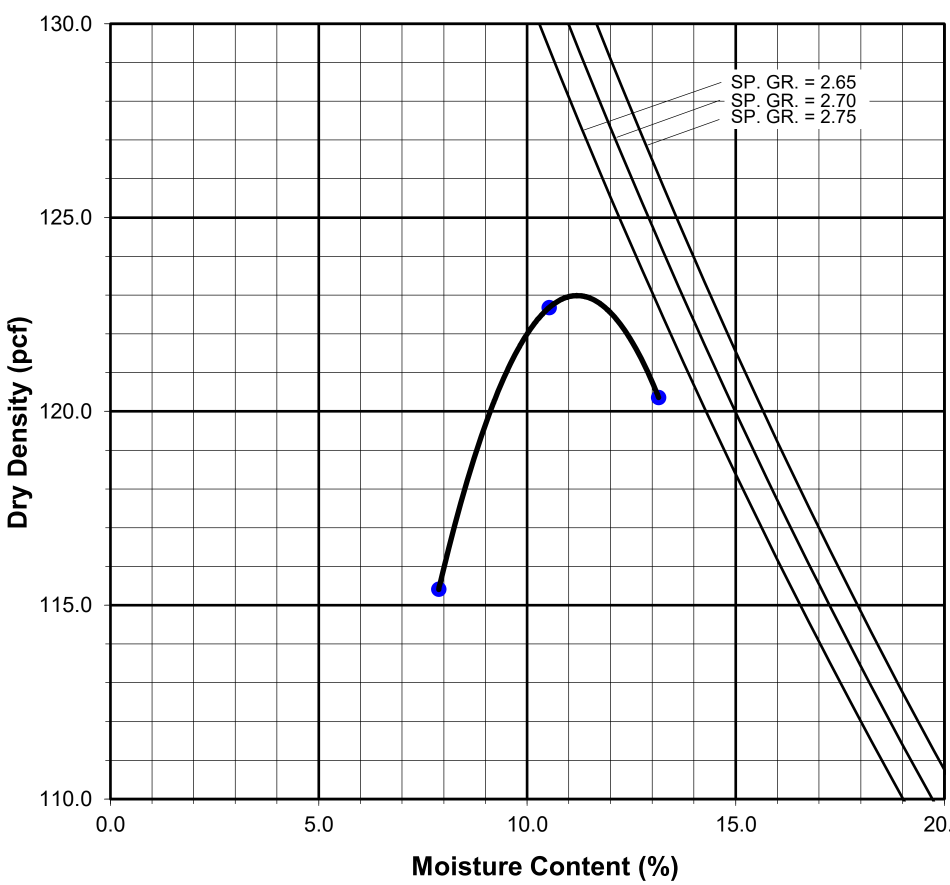
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



EXPANSION INDEX of SOILS

ASTM D 4829

Leighton

Project Name:	Rexford LA Airport Blvd	Tested By:	G. Berdy	Date:	03/03/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	03/31/23
Boring No.:	LB-1	Depth (ft.):	0-5		
Sample No.:	B-1				
Soil Identification:	Dark yellowish brown silty sand (SM)				

Dry Wt. of Soil + Cont. (g)	1000.00
Wt. of Container No. (g)	0.00
Dry Wt. of Soil (g)	1000.00
Weight Soil Retained on #4 Sieve	0.00
Percent Passing # 4	100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0005
Wt. Comp. Soil + Mold (g)	633.00	452.08
Wt. of Mold (g)	204.30	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	854.90	656.38
Dry Wt. of Soil + Cont. (g)	795.20	603.09
Wt. of Container (g)	0.00	204.30
Moisture Content (%)	7.51	13.36
Wet Density (pcf)	129.3	136.3
Dry Density (pcf)	120.3	120.2
Void Ratio	0.402	0.402
Total Porosity	0.287	0.287
Pore Volume (cc)	59.3	59.4
Degree of Saturation (%) [S_{meas}]	**50.5**	89.7

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
03/03/23	12:30	1.0	0	0.4275
03/03/23	12:40	1.0	10	0.4270
Add Distilled Water to the Specimen				
03/03/23	13:49	1.0	69	0.4280
03/06/23	6:20	1.0	3940	0.4280
03/06/23	7:21	1.0	4001	0.4280

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**1**

EXPANSION INDEX of SOILS
ASTM D 4829

Project Name:	Rexford LA Airport Blvd	Tested By:	GEB/ACS	Date:	03/08/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	03/31/23
Boring No.:	LB-6	Depth (ft.):	0-3		
Sample No.:	B-1				
Soil Identification:	Olive brown silty, clayey sand (SC-SM)				

Dry Wt. of Soil + Cont.	(g)	1000.00
Wt. of Container No.	(g)	0.00
Dry Wt. of Soil	(g)	1000.00
Weight Soil Retained on #4 Sieve		0.00
Percent Passing # 4		100.00

MOLDED SPECIMEN		Before Test	After Test
Specimen Diameter	(in.)	4.01	4.01
Specimen Height	(in.)	1.0000	1.0125
Wt. Comp. Soil + Mold	(g)	626.00	459.20
Wt. of Mold	(g)	202.10	0.00
Specific Gravity (Assumed)		2.70	2.70
Container No.		O	O
Wet Wt. of Soil + Cont.	(g)	854.90	661.30
Dry Wt. of Soil + Cont.	(g)	795.20	596.38
Wt. of Container	(g)	0.00	202.10
Moisture Content	(%)	7.51	16.47
Wet Density	(pcf)	127.9	136.8
Dry Density	(pcf)	118.9	117.5
Void Ratio		0.417	0.435
Total Porosity		0.294	0.303
Pore Volume	(cc)	61.0	63.6
Degree of Saturation (%) [S_{meas}]		**48.6**	102.2

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
03/08/23	10:19	1.0	0	0.4435
03/08/23	10:29	1.0	10	0.4425
Add Distilled Water to the Specimen				
03/08/23	10:50	1.0	21	0.4515
03/09/23	8:18	1.0	1309	0.4560
03/09/23	9:30	1.0	1381	0.4560

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**14**

EXPANSION INDEX of SOILS
ASTM D 4829

Project Name:	Rexford LA Airport Blvd	Tested By:	G. Berdy	Date:	03/03/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	03/31/23
Boring No.:	LP-1	Depth (ft.):	0-5		
Sample No.:	B-1				
Soil Identification:	Olive brown silty, clayey sand (SC-SM)				

Dry Wt. of Soil + Cont.	(g)	1000.00
Wt. of Container No.	(g)	0.00
Dry Wt. of Soil	(g)	1000.00
Weight Soil Retained on #4 Sieve		0.00
Percent Passing # 4		100.00

MOLDED SPECIMEN		Before Test	After Test
Specimen Diameter	(in.)	4.01	4.01
Specimen Height	(in.)	1.0000	1.0165
Wt. Comp. Soil + Mold	(g)	603.20	436.08
Wt. of Mold	(g)	201.30	0.00
Specific Gravity (Assumed)		2.70	2.70
Container No.		O	O
Wet Wt. of Soil + Cont.	(g)	804.40	637.38
Dry Wt. of Soil + Cont.	(g)	733.30	567.38
Wt. of Container	(g)	0.00	201.30
Moisture Content	(%)	9.70	19.12
Wet Density	(pcf)	121.2	129.4
Dry Density	(pcf)	110.5	108.6
Void Ratio		0.525	0.552
Total Porosity		0.344	0.356
Pore Volume	(cc)	71.3	74.8
Degree of Saturation (%) [S_{meas}]		**49.8**	93.6

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
03/03/23	13:50	1.0	0	0.3915
03/03/23	14:00	1.0	10	0.3900
Add Distilled Water to the Specimen				
03/03/23	14:35	1.0	35	0.4000
03/06/23	6:15	1.0	3855	0.4080
03/06/23	7:20	1.0	3920	0.4080

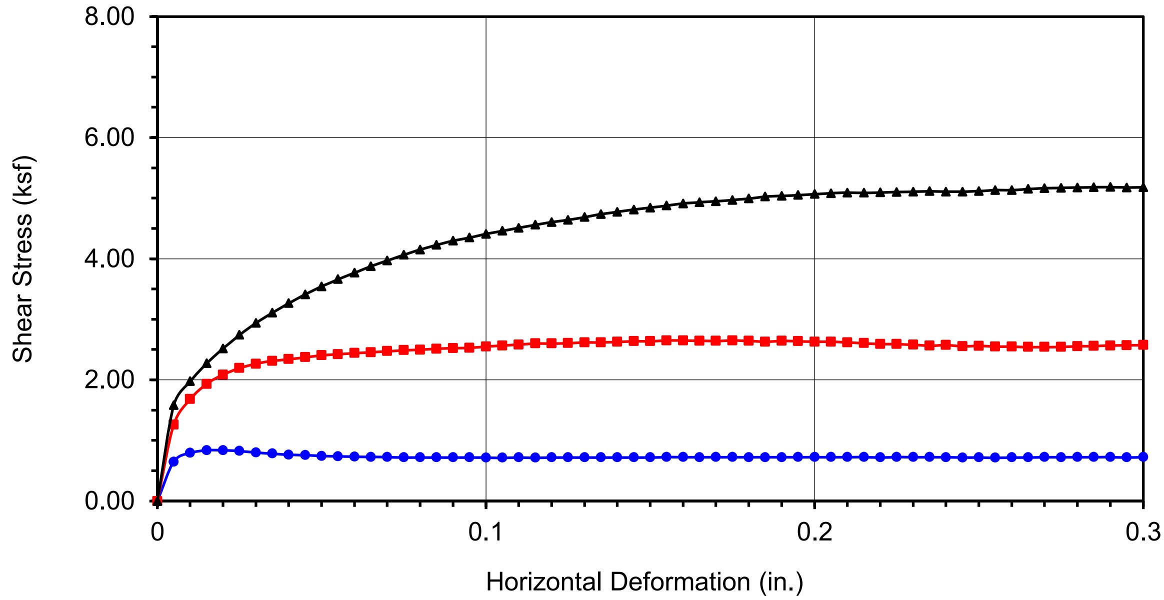
Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**18**

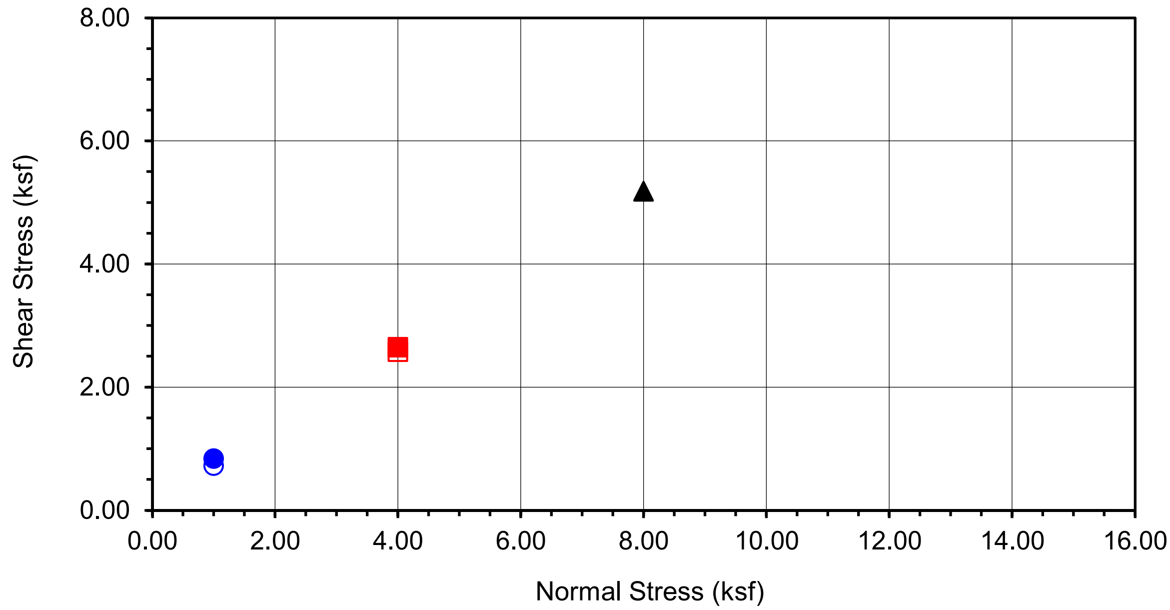
DIRECT SHEAR TEST
Consolidated Drained - ASTM D 3080

Project Name:	Rexford LA Airport Blvd	Tested By:	G. Bathala	Date:	03/14/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	04/03/23
Boring No.:	LB-1	Sample Type:	90% Remold		
Sample No.:	B-1	Depth (ft.):	0-5		

Soil Identification: Dark yellowish brown silty sand (SM)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	200.80	201.38	201.28
Weight of Ring(gm):	45.41	45.80	45.64
Before Shearing			
Weight of Wet Sample+Cont.(gm):	182.16	182.16	182.16
Weight of Dry Sample+Cont.(gm):	172.90	172.90	172.90
Weight of Container(gm):	60.27	60.27	60.27
Vertical Rdg.(in): Initial	0.2570	0.2444	0.0000
Vertical Rdg.(in): Final	0.2638	0.2634	-0.0307
After Shearing			
Weight of Wet Sample+Cont.(gm):	228.98	216.93	222.37
Weight of Dry Sample+Cont.(gm):	210.66	199.80	206.58
Weight of Container(gm):	69.46	58.01	64.17
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-1**
Sample No.	**B-1**
Depth (ft)	**0-5**
Sample Type: 90% Remold	
Soil Identification: Dark yellowish brown silty sand (SM)	

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.839	■ 2.650	▲ 5.184
Shear Stress @ End of Test (ksf)	○ 0.726	□ 2.575	△ 5.181
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	8.22	8.22	8.22
Dry Density (pcf)	119.4	119.6	119.6
Saturation (%)	53.9	54.2	54.2
Soil Height Before Shearing (in.)	0.9932	0.9810	0.9693
Final Moisture Content (%)	13.0	12.1	11.1

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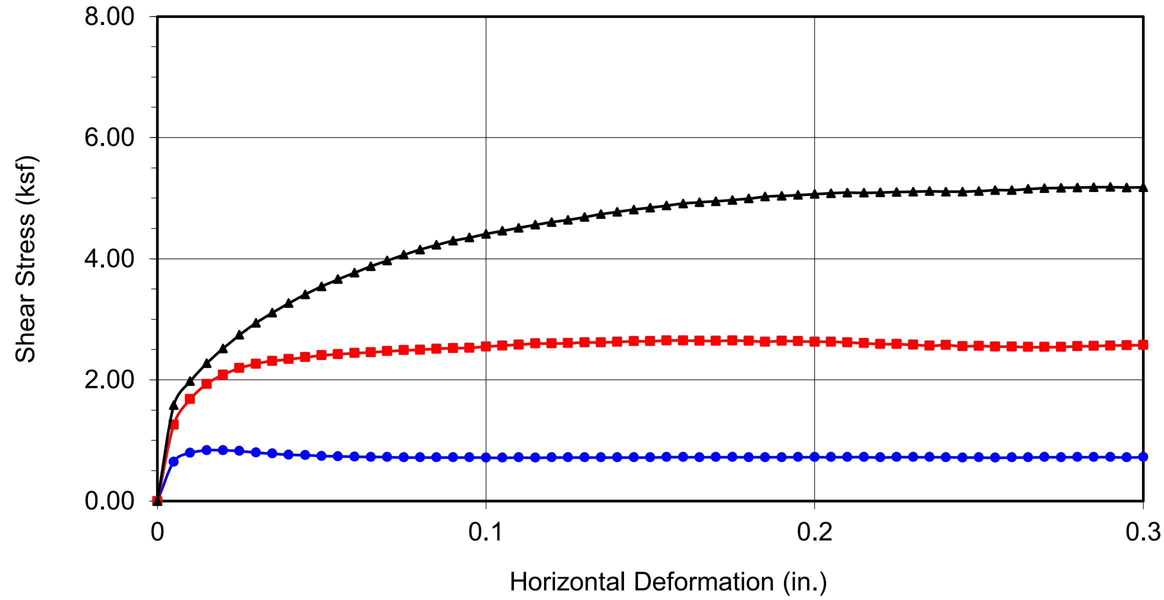
DIRECT SHEAR TEST RESULTS

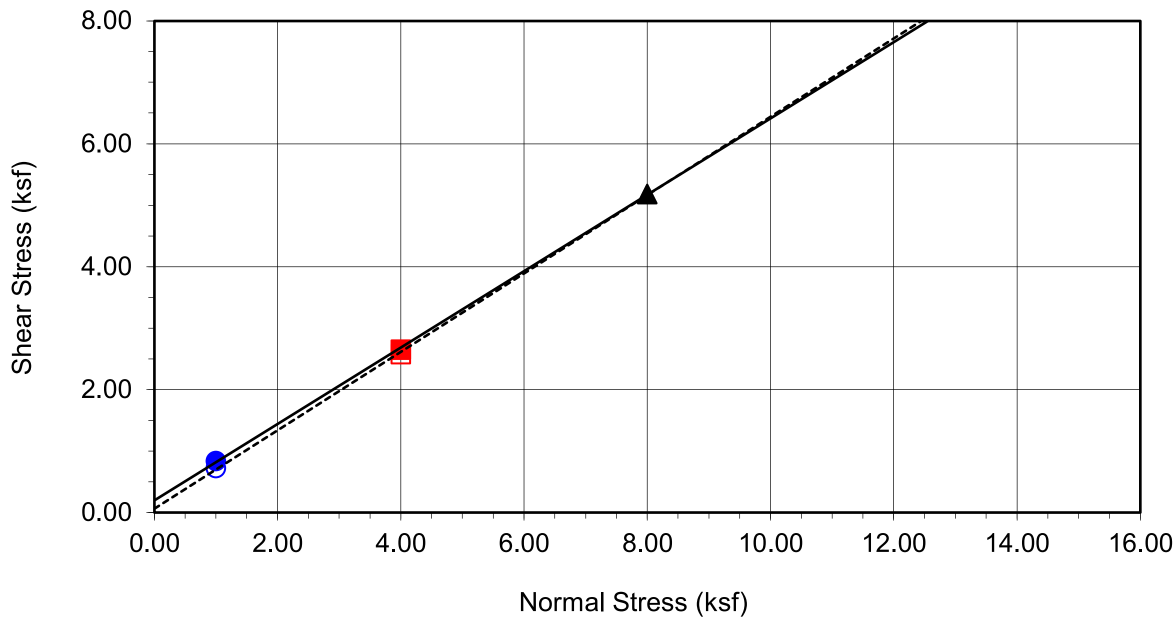
Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23





Boring No.	**LB-1**
Sample No.	**B-1**
Depth (ft)	**0-5**
Sample Type:	90% Remold
Soil Identification: Dark yellowish brown silty sand (SM)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	198	32
Ultimate	66	33

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.839	■ 2.650	▲ 5.184
Shear Stress @ End of Test (ksf)	○ 0.726	□ 2.575	△ 5.181
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	8.22	8.22	8.22
Dry Density (pcf)	119.4	119.6	119.6
Saturation (%)	53.9	54.2	54.2
Soil Height Before Shearing (in.)	0.9932	0.9810	0.9693
Final Moisture Content (%)	13.0	12.1	11.1

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23

DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name: Rexford LA Airport Blvd
Tested By: G. Bathala
Date: 03/07/23

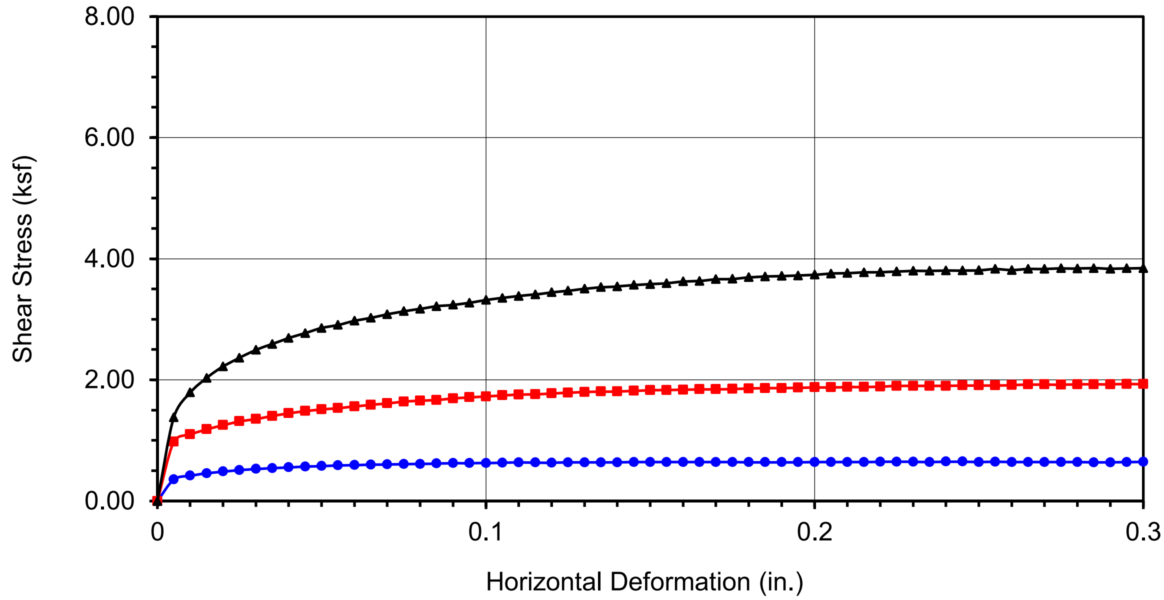
Project No.: 13837.001
Checked By: J. Ward
Date: 04/03/23

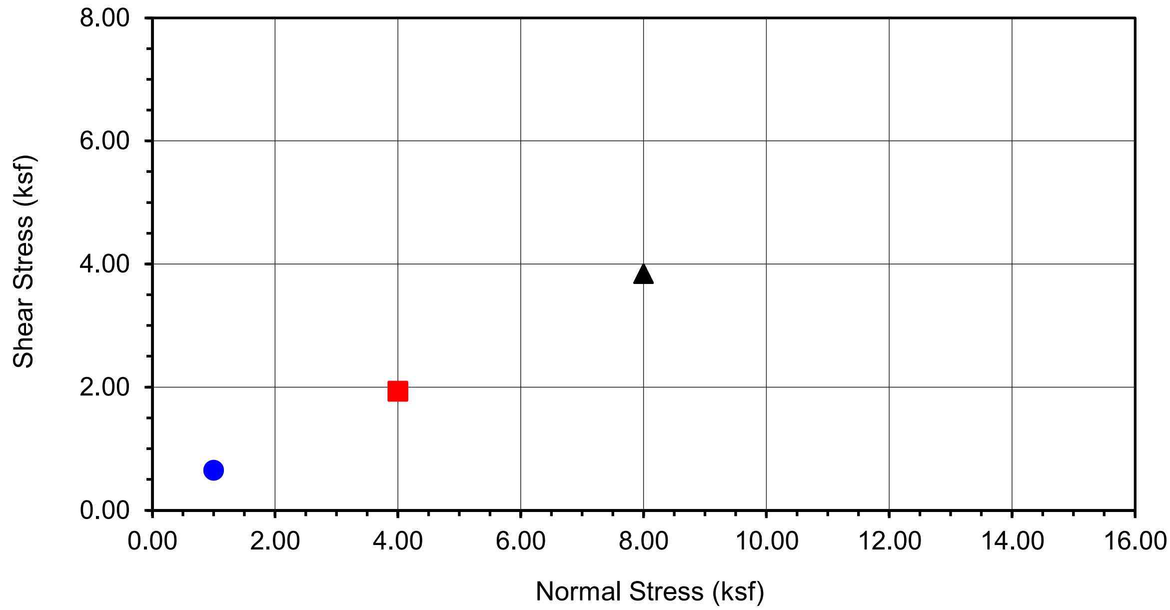
Boring No.: LB-3
Sample Type: Ring

Sample No.: R-2
Depth (ft.): 7.5

Soil Identification: Brown lean clay (CL)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	198.82	200.49	202.11
Weight of Ring(gm):	45.88	44.80	45.48
Before Shearing			
Weight of Wet Sample+Cont.(gm):	215.15	215.15	215.15
Weight of Dry Sample+Cont.(gm):	184.35	184.35	184.35
Weight of Container(gm):	58.52	58.52	58.52
Vertical Rdg.(in): Initial	0.0000	0.2633	0.2571
Vertical Rdg.(in): Final	-0.0177	0.3334	0.3738
After Shearing			
Weight of Wet Sample+Cont.(gm):	217.48	208.95	206.03
Weight of Dry Sample+Cont.(gm):	190.40	184.60	183.13
Weight of Container(gm):	67.75	58.00	58.52
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-3**
Sample No.	**R-2**
Depth (ft)	**7.5**
Sample Type: Ring	
Soil Identification: Brown lean clay (CL)	

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.651	■ 1.933	▲ 3.845
Shear Stress @ End of Test (ksf)	○ 0.648	□ 1.930	△ 3.845
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	24.48	24.48	24.48
Dry Density (pcf)	102.2	104.0	104.6
Saturation (%)	101.7	106.5	108.2
Soil Height Before Shearing (in.)	0.9823	0.9299	0.8833
Final Moisture Content (%)	22.1	19.2	18.4

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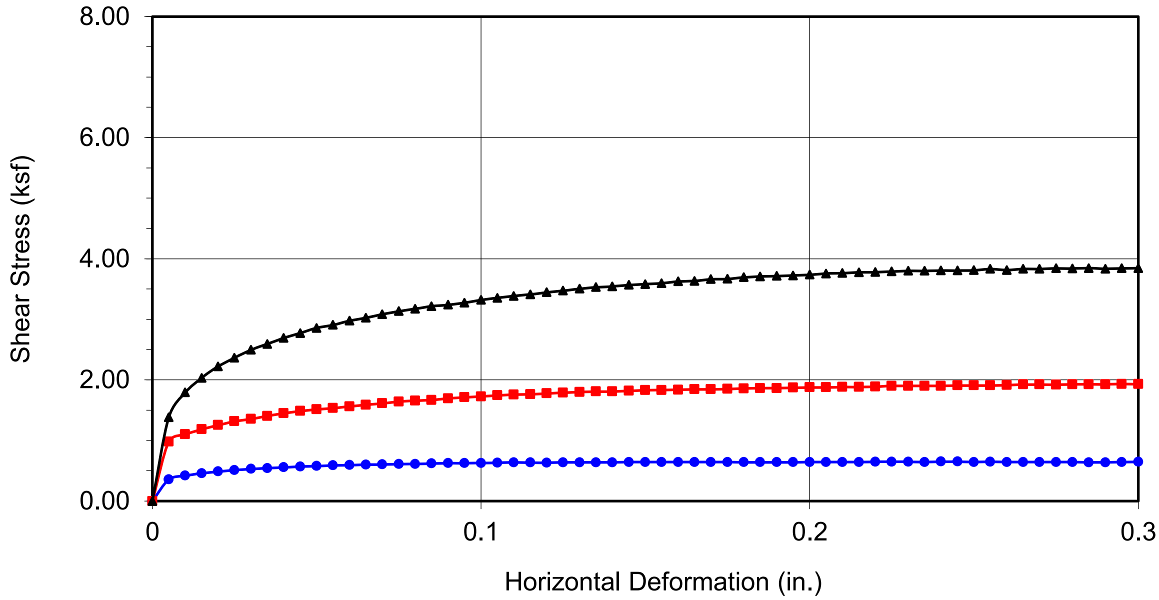
DIRECT SHEAR TEST RESULTS

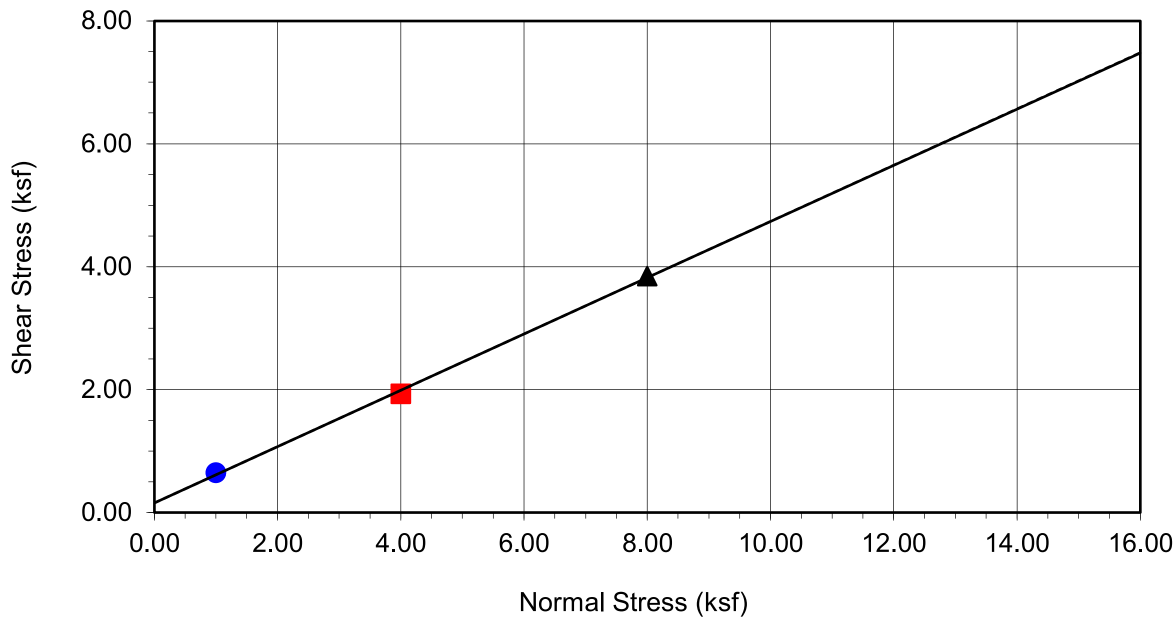
Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23





Boring No.	**LB-3**
Sample No.	**R-2**
Depth (ft)	**7.5**
Sample Type:	Ring

Soil Identification:
Brown lean clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	161	25
Ultimate	157	25

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.651	■ 1.933	▲ 3.845
Shear Stress @ End of Test (ksf)	○ 0.648	□ 1.930	△ 3.845
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	24.48	24.48	24.48
Dry Density (pcf)	102.2	104.0	104.6
Saturation (%)	101.7	106.5	108.2
Soil Height Before Shearing (in.)	0.9823	0.9299	0.8833
Final Moisture Content (%)	22.1	19.2	18.4

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

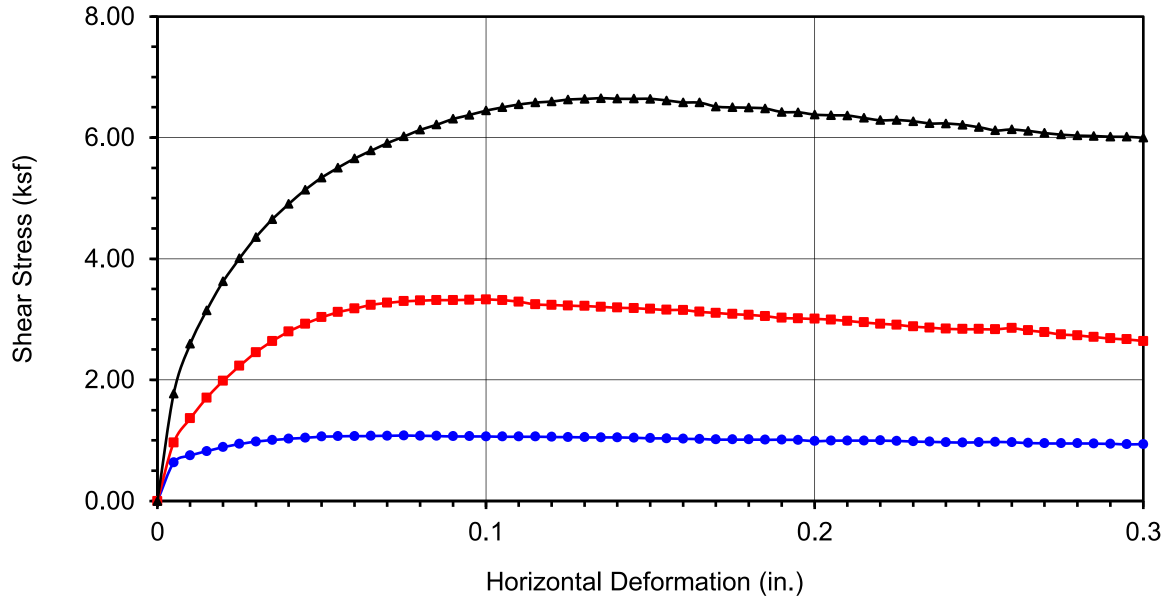
03-23

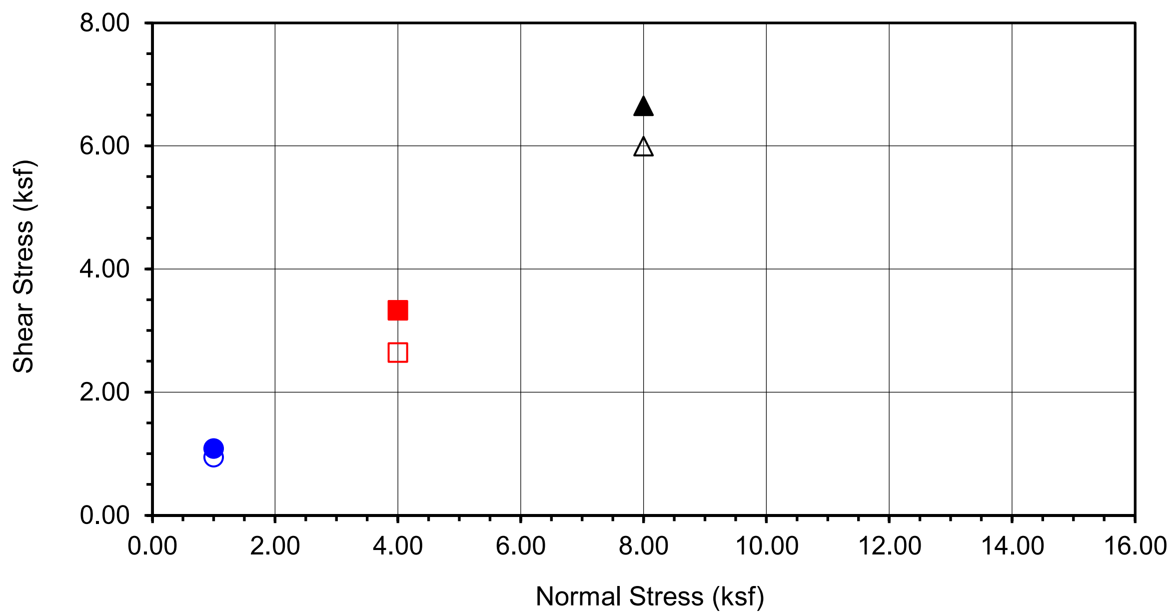
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name:	Rexford LA Airport Blvd	Tested By:	G. Bathala	Date:	03/08/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	04/03/23
Boring No.:	LB-5	Sample Type:	Ring		
Sample No.:	R-1	Depth (ft.):	5.0		
Soil Identification:	Light olive brown silty clay (CL-ML)				

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	201.76	200.27	206.97
Weight of Ring(gm):	43.03	38.98	42.18
Before Shearing			
Weight of Wet Sample+Cont.(gm):	198.48	198.48	198.48
Weight of Dry Sample+Cont.(gm):	189.24	189.24	189.24
Weight of Container(gm):	67.68	67.68	67.68
Vertical Rdg.(in): Initial	0.0000	0.2500	0.2768
Vertical Rdg.(in): Final	-0.0121	0.2744	0.3216
After Shearing			
Weight of Wet Sample+Cont.(gm):	216.00	224.76	217.20
Weight of Dry Sample+Cont.(gm):	188.82	209.83	200.95
Weight of Container(gm):	57.98	67.75	55.74
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-5**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type: Ring	
Soil Identification: Light olive brown silty clay (CL-ML)	

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.081	■ 3.329	▲ 6.652
Shear Stress @ End of Test (ksf)	○ 0.940	□ 2.641	△ 5.998
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	7.60	7.60	7.60
Dry Density (pcf)	122.7	124.7	127.4
Saturation (%)	54.9	58.3	63.5
Soil Height Before Shearing (in.)	0.9879	0.9756	0.9552
Final Moisture Content (%)	20.8	10.5	11.2

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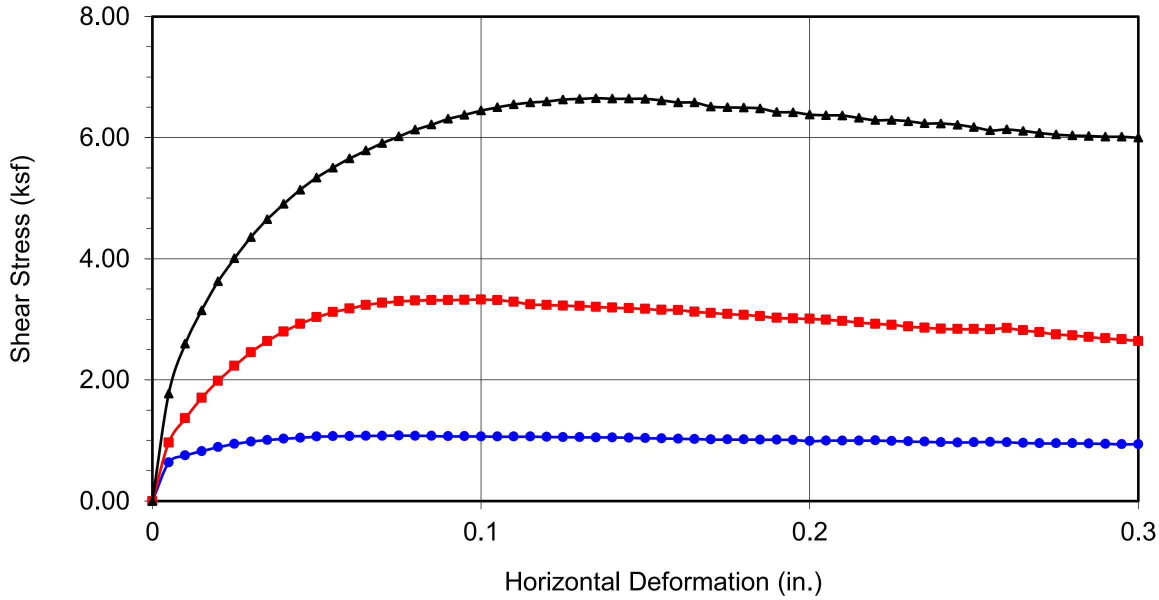
DIRECT SHEAR TEST RESULTS

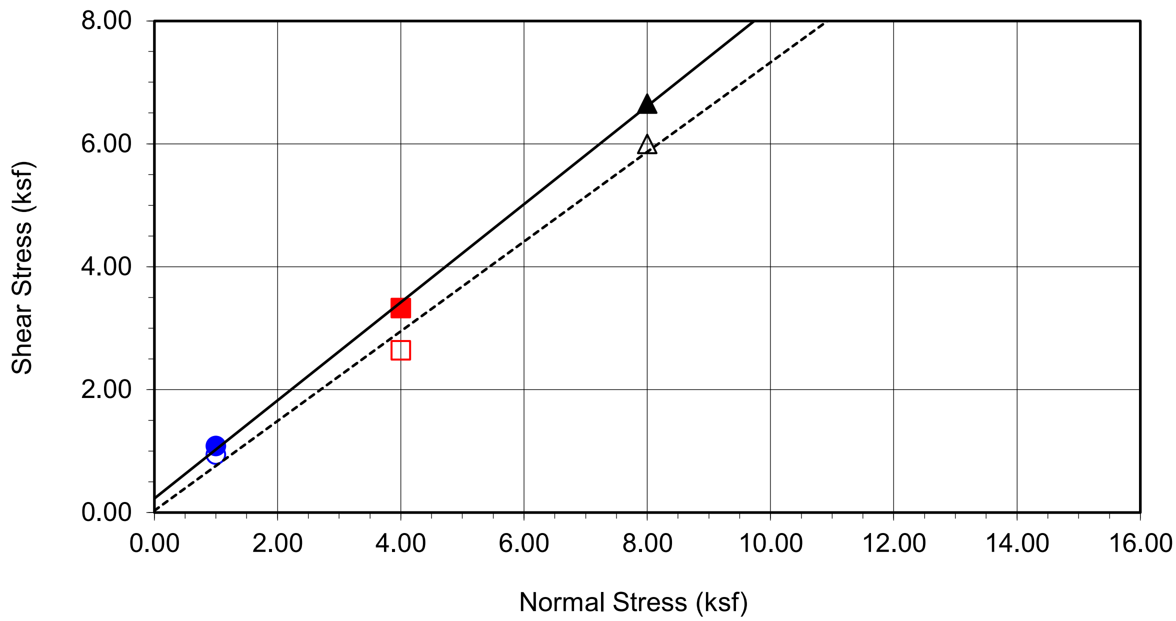
Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23





Boring No.	**LB-5**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type:	Ring
Soil Identification: Light olive brown silty clay (CL-ML)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	230	39
Ultimate	35	36

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.081	■ 3.329	▲ 6.652
Shear Stress @ End of Test (ksf)	○ 0.940	□ 2.641	△ 5.998
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	7.60	7.60	7.60
Dry Density (pcf)	122.7	124.7	127.4
Saturation (%)	54.9	58.3	63.5
Soil Height Before Shearing (in.)	0.9879	0.9756	0.9552
Final Moisture Content (%)	20.8	10.5	11.2

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23

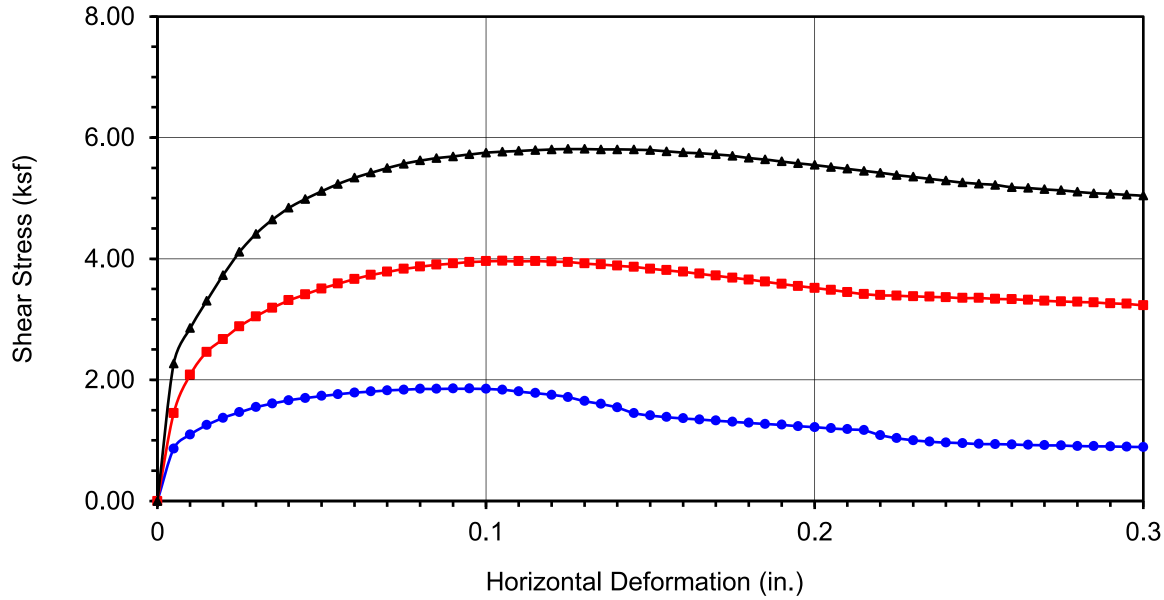
DS LB-5, R-1 @ 5

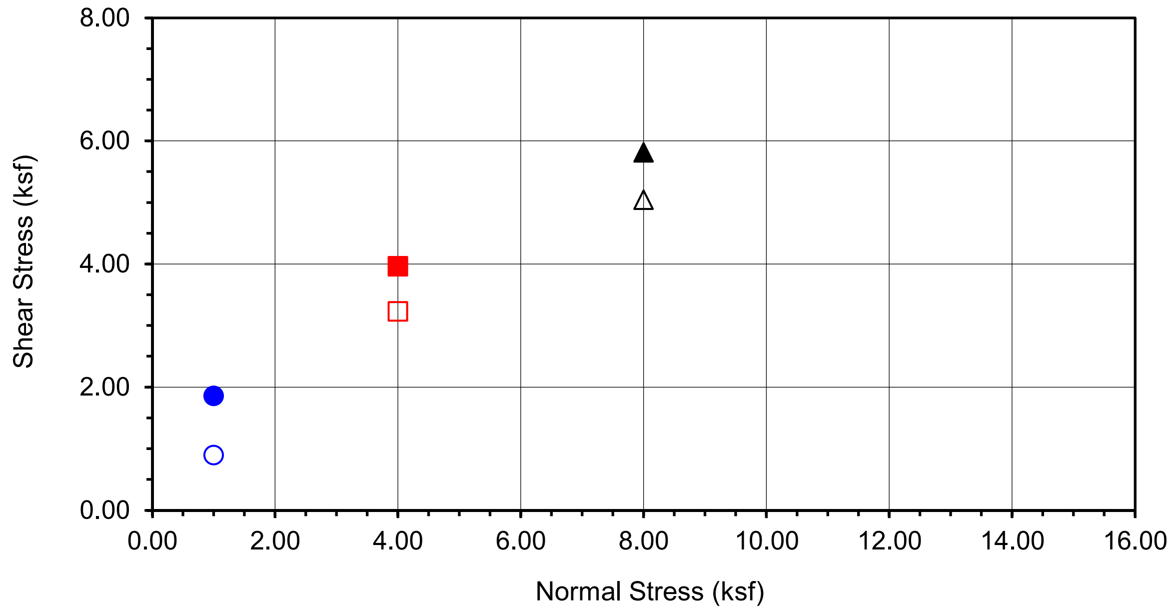
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name:	Rexford LA Airport Blvd	Tested By:	G. Bathala	Date:	03/06/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	04/03/23
Boring No.:	LB-5	Sample Type:	Ring		
Sample No.:	R-3	Depth (ft.):	10.0		
Soil Identification:	Light olive brown lean clay (CL)				

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	208.67	211.43	211.72
Weight of Ring(gm):	45.45	46.28	45.08
Before Shearing			
Weight of Wet Sample+Cont.(gm):	192.59	192.59	192.59
Weight of Dry Sample+Cont.(gm):	175.45	175.45	175.45
Weight of Container(gm):	55.72	55.72	55.72
Vertical Rdg.(in): Initial	0.2626	0.2699	0.0000
Vertical Rdg.(in): Final	0.2563	0.2815	-0.0228
After Shearing			
Weight of Wet Sample+Cont.(gm):	223.11	220.74	233.47
Weight of Dry Sample+Cont.(gm):	196.24	195.90	209.78
Weight of Container(gm):	57.98	56.95	67.75
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-5**
Sample No.	**R-3**
Depth (ft)	**10**
Sample Type: Ring	
Soil Identification: Light olive brown lean clay (CL)	

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.855	■ 3.964	▲ 5.813
Shear Stress @ End of Test (ksf)	○ 0.893	□ 3.232	△ 5.043
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	14.32	14.32	14.32
Dry Density (pcf)	118.7	120.1	121.2
Saturation (%)	92.1	95.9	99.0
Soil Height Before Shearing (in.)	1.0063	0.9884	0.9772
Final Moisture Content (%)	19.4	17.9	16.7

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DIRECT SHEAR TEST RESULTS

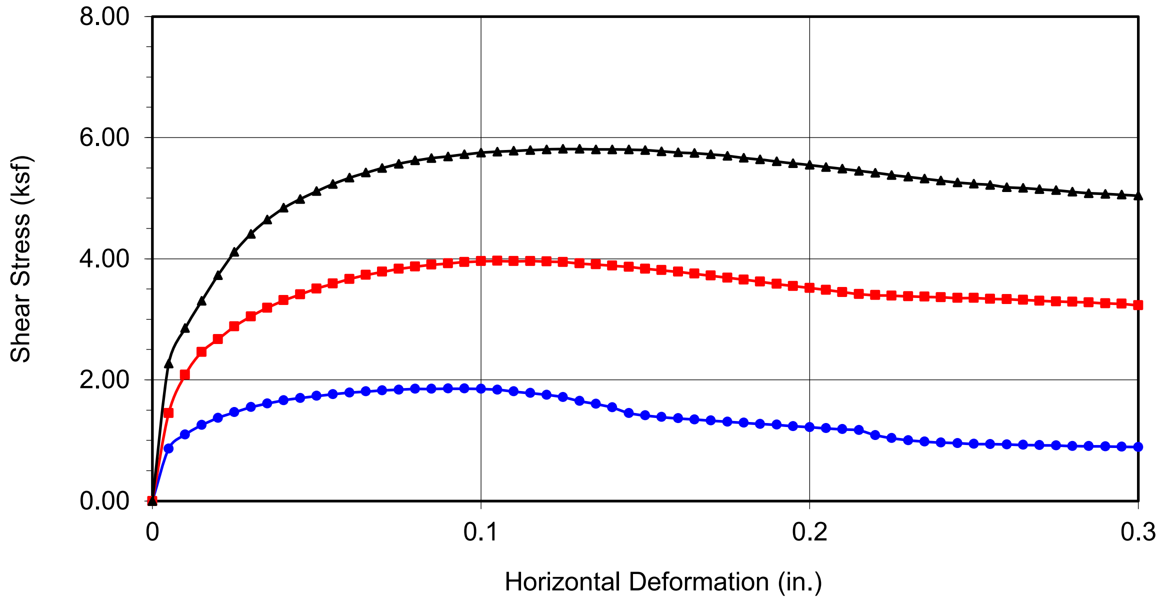
Consolidated Drained - ASTM D 3080

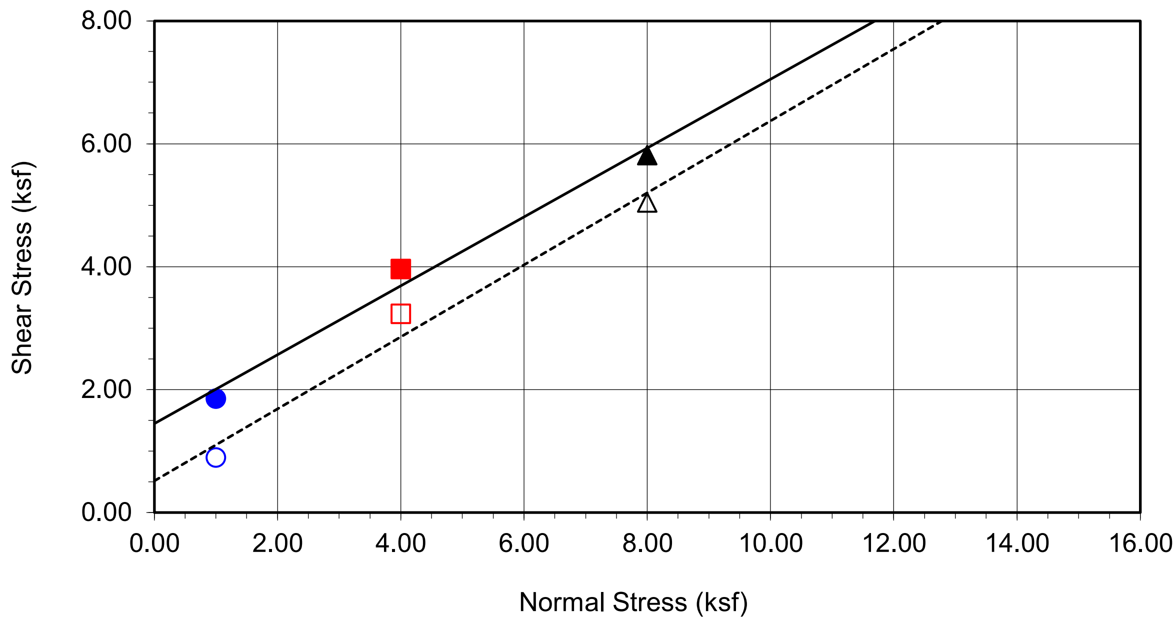
Project No.: 13837.001

Rexford LA Airport Blvd

03-23

DS LB-5, R-3 @ 10





Boring No.	**LB-5**
Sample No.	**R-3**
Depth (ft)	**10**
Sample Type:	Ring
Soil Identification: Light olive brown lean clay (CL)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	1451	29
Ultimate	520	30

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.855	■ 3.964	▲ 5.813
Shear Stress @ End of Test (ksf)	○ 0.893	□ 3.232	△ 5.043
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	14.32	14.32	14.32
Dry Density (pcf)	118.7	120.1	121.2
Saturation (%)	92.1	95.9	99.0
Soil Height Before Shearing (in.)	1.0063	0.9884	0.9772
Final Moisture Content (%)	19.4	17.9	16.7

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23

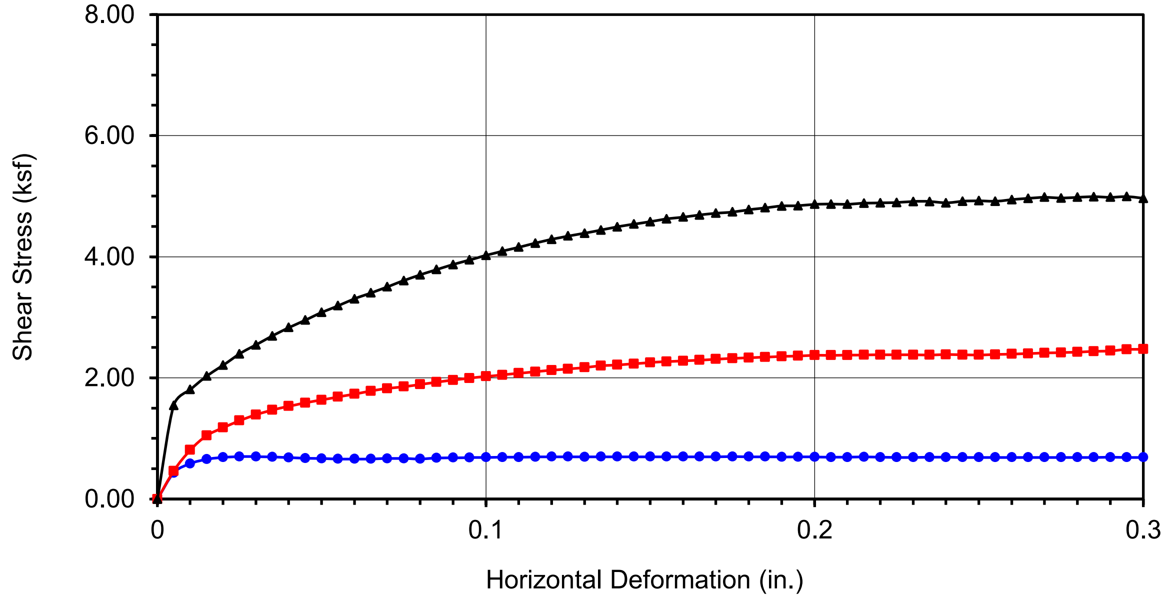
DIRECT SHEAR TEST

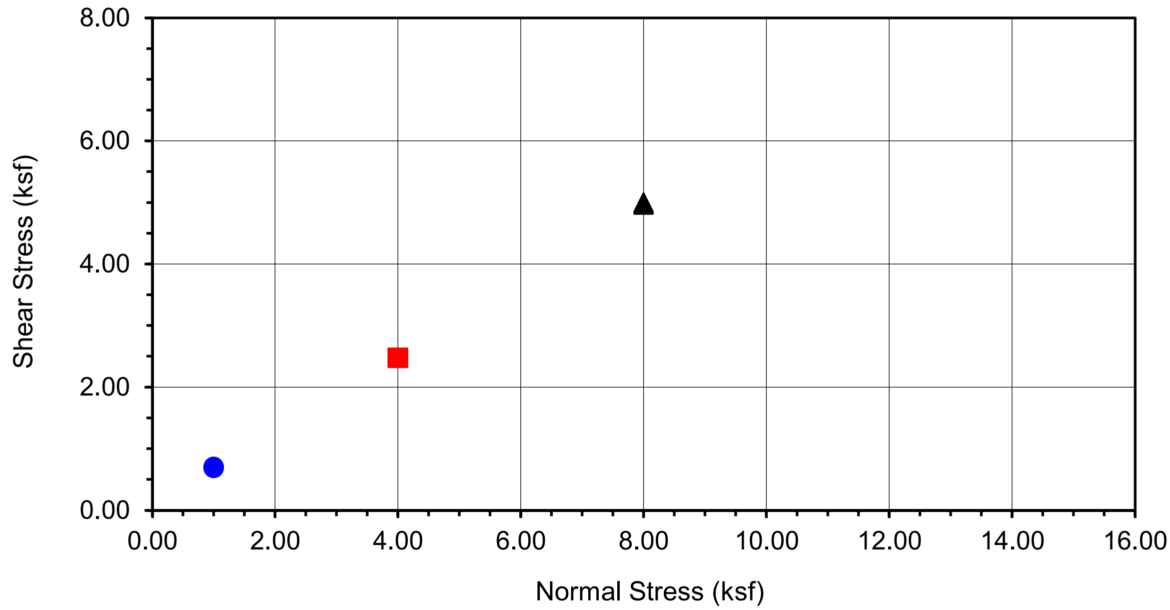
Consolidated Drained - ASTM D 3080

Project Name:	Rexford LA Airport Blvd	Tested By:	G. Bathala	Date:	03/14/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	04/03/23
Boring No.:	LB-6	Sample Type:	90% Remold		
Sample No.:	B-1	Depth (ft.):	0-3		

Soil Identification: Olive brown silty, clayey sand (SC-SM)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	197.56	198.03	198.31
Weight of Ring(gm):	45.41	45.60	45.80
Before Shearing			
Weight of Wet Sample+Cont.(gm):	180.49	180.49	180.49
Weight of Dry Sample+Cont.(gm):	170.90	170.90	170.90
Weight of Container(gm):	56.14	56.14	56.14
Vertical Rdg.(in): Initial	0.2604	0.2228	0.0000
Vertical Rdg.(in): Final	0.2688	0.2452	-0.0378
After Shearing			
Weight of Wet Sample+Cont.(gm):	226.94	214.52	233.03
Weight of Dry Sample+Cont.(gm):	206.66	196.69	216.24
Weight of Container(gm):	68.09	58.51	77.77
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-6**
Sample No.	**B-1**
Depth (ft)	**0-3**

Sample Type:

90% Remold

Soil Identification:
Olive brown silty, clayey sand (SC-SM)

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.701	■ 2.474	▲ 4.995
Shear Stress @ End of Test (ksf)	○ 0.688	□ 2.474	△ 4.967
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	8.36	8.36	8.36
Dry Density (pcf)	116.8	117.0	117.1
Saturation (%)	50.9	51.2	51.3
Soil Height Before Shearing (in.)	0.9916	0.9776	0.9622
Final Moisture Content (%)	14.6	12.9	12.1

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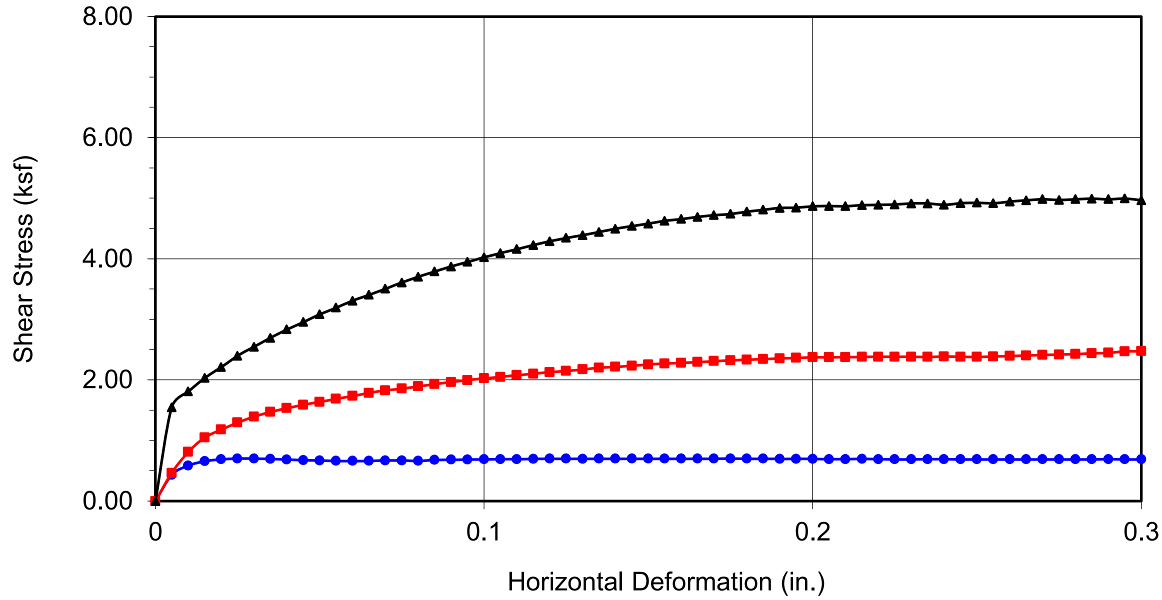
DIRECT SHEAR TEST RESULTS

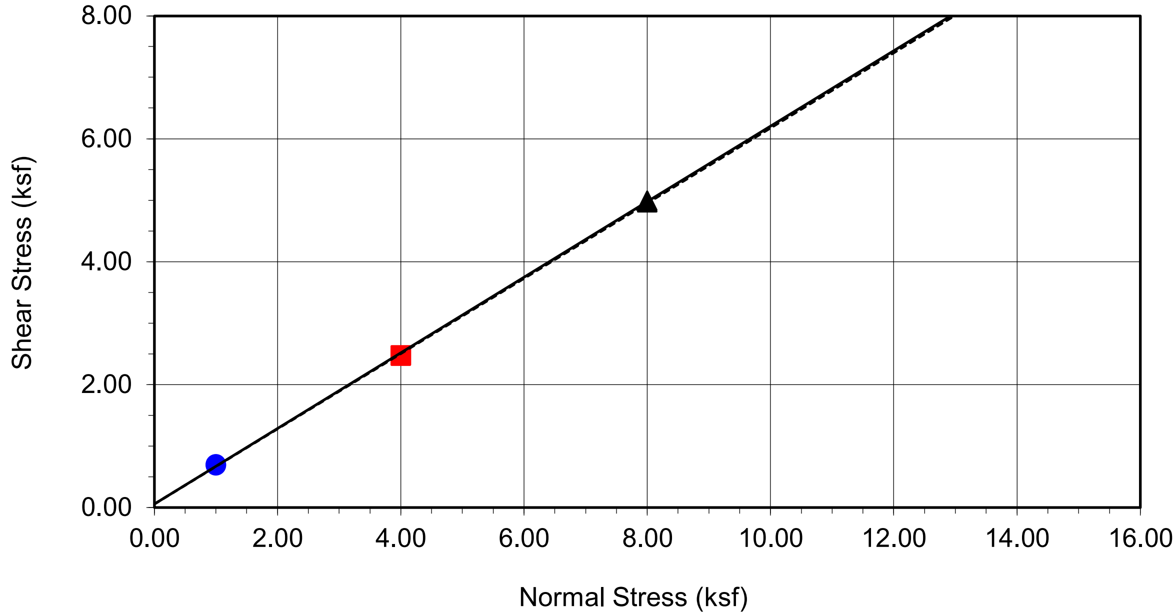
Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23





Boring No.	**LB-6**
Sample No.	**B-1**
Depth (ft)	**0-3**
Sample Type:	90% Remold
Soil Identification: Olive brown silty, clayey sand (SC-SM)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	61	32
Ultimate	58	31

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.701	■ 2.474	▲ 4.995
Shear Stress @ End of Test (ksf)	○ 0.688	□ 2.474	△ 4.967
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	8.36	8.36	8.36
Dry Density (pcf)	116.8	117.0	117.1
Saturation (%)	50.9	51.2	51.3
Soil Height Before Shearing (in.)	0.9916	0.9776	0.9622
Final Moisture Content (%)	14.6	12.9	12.1

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

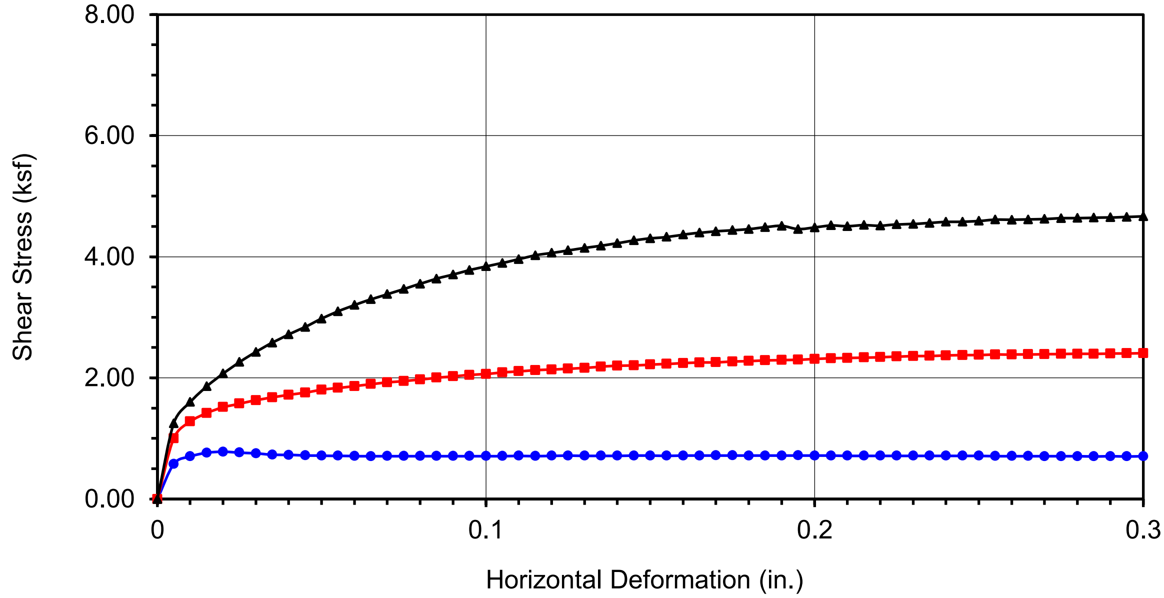
03-23

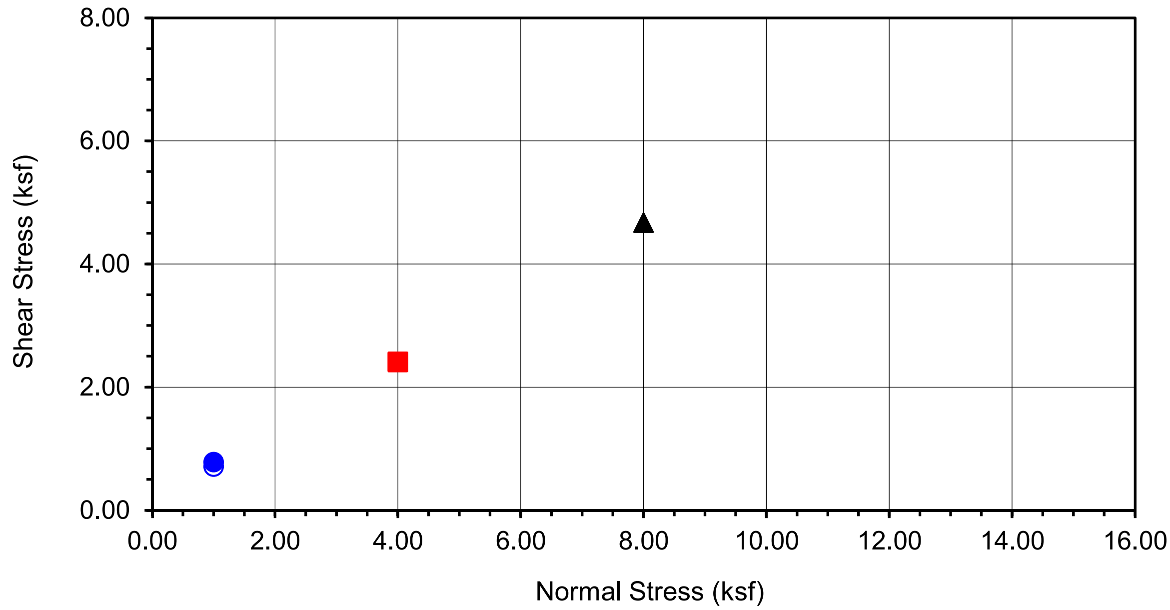
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name: Rexford LA Airport Blvd
Tested By: G. Bathala
Date: 03/14/23
Project No.: 13837.001
Checked By: J. Ward
Date: 04/03/23
Boring No.: LP-1
Sample Type: 90% Remold
Sample No.: B-1
Depth (ft.): 0-5
Soil Identification: Olive brown silty, clayey sand (SC-SM)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	193.80	194.44	194.29
Weight of Ring(gm):	45.41	45.80	45.60
Before Shearing			
Weight of Wet Sample+Cont.(gm):	214.24	214.24	214.24
Weight of Dry Sample+Cont.(gm):	198.26	198.26	198.26
Weight of Container(gm):	57.18	57.18	57.18
Vertical Rdg.(in): Initial	0.0000	0.2356	0.2469
Vertical Rdg.(in): Final	-0.0049	0.2550	0.2831
After Shearing			
Weight of Wet Sample+Cont.(gm):	221.89	211.61	209.43
Weight of Dry Sample+Cont.(gm):	198.34	190.08	189.17
Weight of Container(gm):	66.43	59.01	58.55
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LP-1**
Sample No.	**B-1**
Depth (ft)	**0-5**
Sample Type: 90% Remold	
Soil Identification: Olive brown silty, clayey sand (SC-SM)	

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.780	■ 2.408	▲ 4.669
Shear Stress @ End of Test (ksf)	○ 0.707	□ 2.408	△ 4.669
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	11.33	11.33	11.33
Dry Density (pcf)	110.9	111.0	111.1
Saturation (%)	58.7	59.0	59.1
Soil Height Before Shearing (in.)	0.9951	0.9806	0.9638
Final Moisture Content (%)	17.9	16.4	15.5

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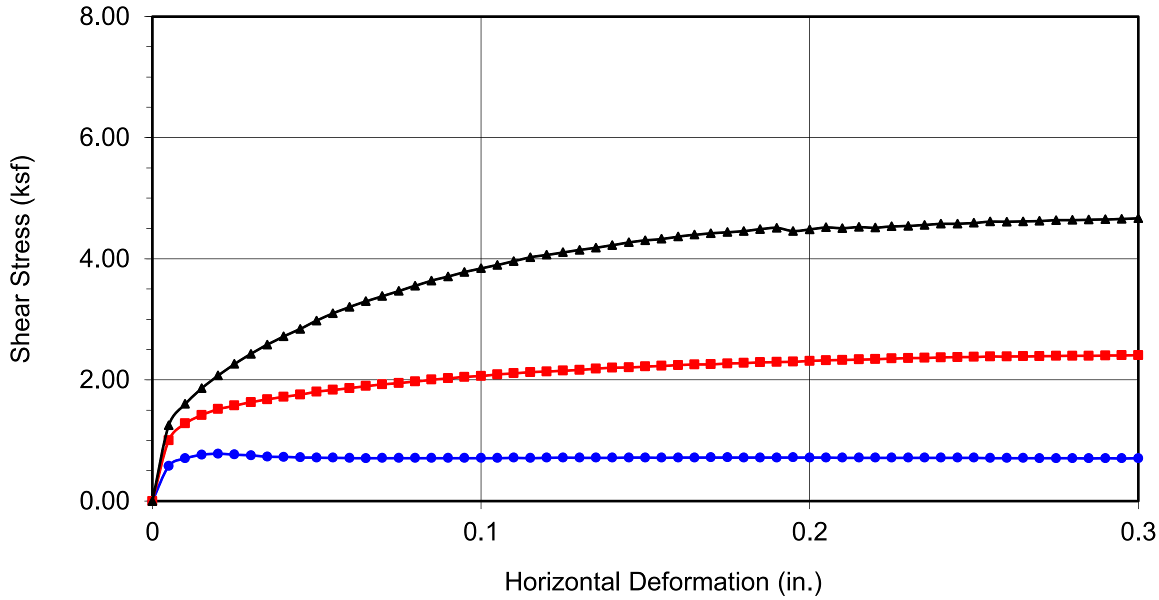
DIRECT SHEAR TEST RESULTS

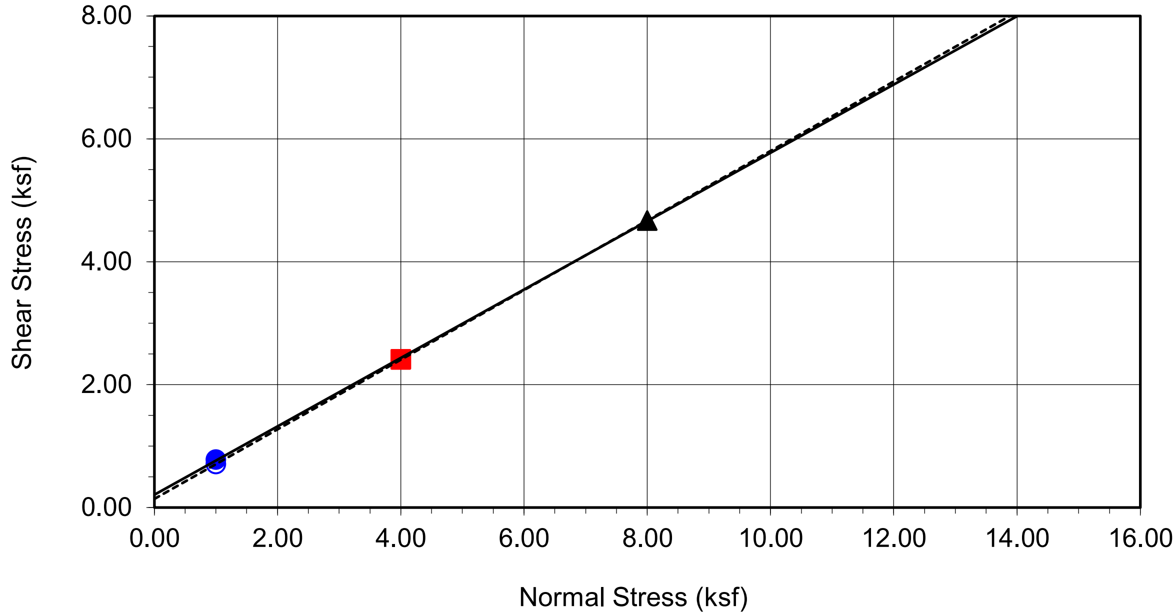
Consolidated Drained - ASTM D 3080

Project No.: 13837.001

Rexford LA Airport Blvd

03-23





Boring No.	**LP-1**
Sample No.	**B-1**
Depth (ft)	**0-5**
Sample Type:	90% Remold

Soil Identification:
Olive brown silty, clayey sand (SC-SM)

Strength Parameters

	C (psf)	ϕ (°)
Peak	209	29
Ultimate	142	30

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.780	■ 2.408	▲ 4.669
Shear Stress @ End of Test (ksf)	○ 0.707	□ 2.408	△ 4.669
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	11.33	11.33	11.33
Dry Density (pcf)	110.9	111.0	111.1
Saturation (%)	58.7	59.0	59.1
Soil Height Before Shearing (in.)	0.9951	0.9806	0.9638
Final Moisture Content (%)	17.9	16.4	15.5

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

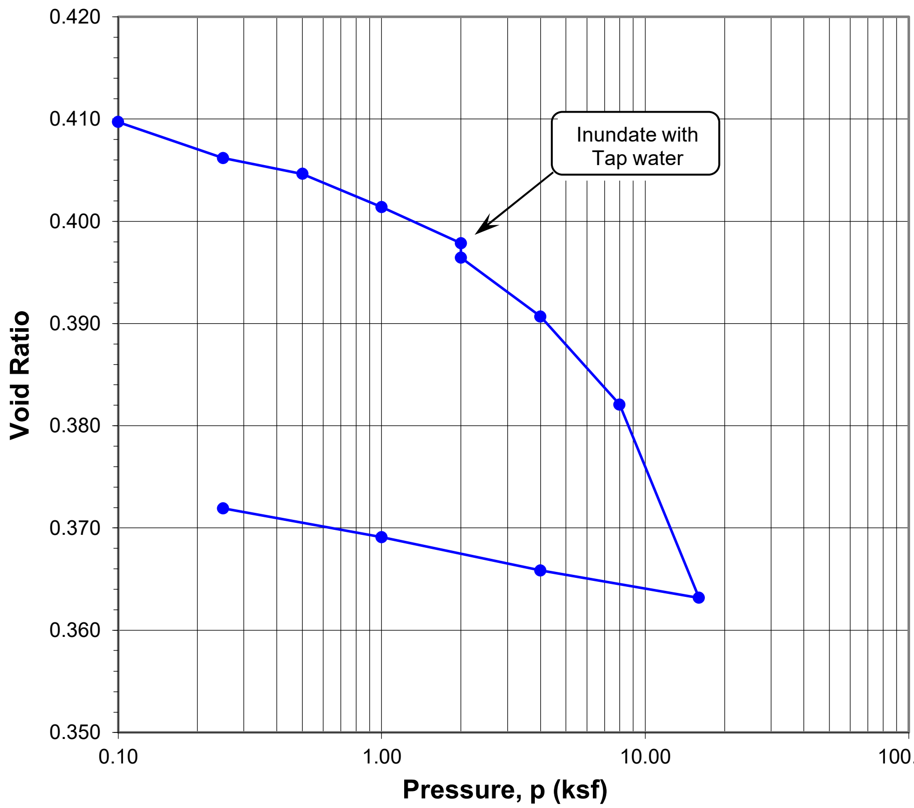
Project No.: 13837.001
Rexford LA Airport Blvd
03-23

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Rexford LA Airport Blvd	Tested By:	GB/JD	Date:	03/13/23
Project No.:	13837.001	Checked By:	J. Ward	Date:	04/03/23
Boring No.:	LB-1	Depth (ft.):	0-5		
Sample No.:	B-1	Sample Type:	90% Remold		
Soil Identification:	Dark yellowish brown silty sand (SM)				

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	200.79
Weight of Ring (g):	45.21
Height after consol. (in.):	0.9731
Before Test	
Wt. of Wet Sample+Cont. (g):	182.16
Wt. of Dry Sample+Cont. (g):	172.90
Weight of Container (g):	60.27
Initial Moisture Content (%)	8.2
Initial Dry Density (pcf)	119.6
Initial Saturation (%):	54
Initial Vertical Reading (in.)	0.0994
After Test	
Wt. of Wet Sample+Cont. (g):	266.33
Wt. of Dry Sample+Cont. (g):	249.02
Weight of Container (g):	60.19
Final Moisture Content (%)	12.05
Final Dry Density (pcf):	122.7
Final Saturation (%):	87
Final Vertical Reading (in.)	0.1294
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43

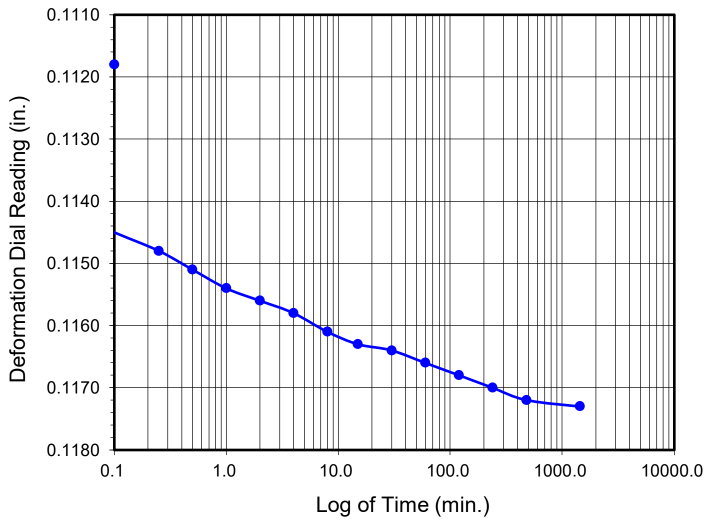


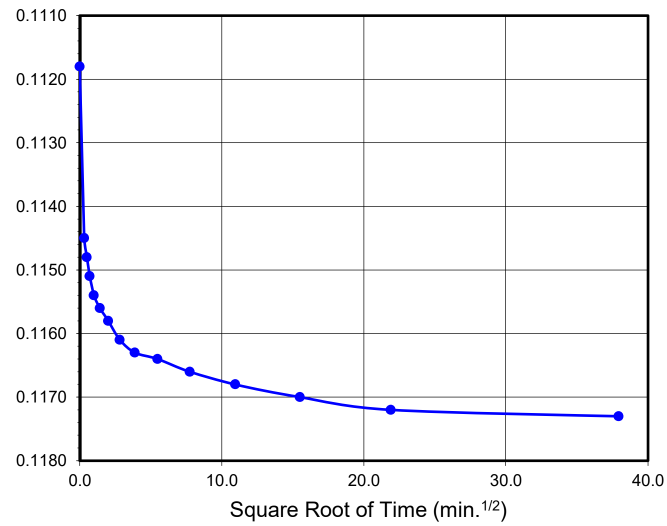
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.0995	0.9999	0.00	0.01	0.410	0.01
0.25	0.1025	0.9969	0.05	0.31	0.406	0.26
0.50	0.1042	0.9952	0.11	0.48	0.405	0.37
1.00	0.1073	0.9921	0.19	0.79	0.401	0.60
2.00	0.1108	0.9886	0.29	1.14	0.398	0.85
2.00	0.1118	0.9876	0.29	1.24	0.396	0.95
4.00	0.1173	0.9821	0.43	1.79	0.391	1.36
8.00	0.1249	0.9745	0.58	2.55	0.382	1.97
16.00	0.1401	0.9593	0.76	4.07	0.363	3.31
4.00	0.1364	0.9630	0.58	3.70	0.366	3.12
1.00	0.1324	0.9670	0.41	3.30	0.369	2.89
0.25	0.1294	0.9700	0.31	3.00	0.372	2.69

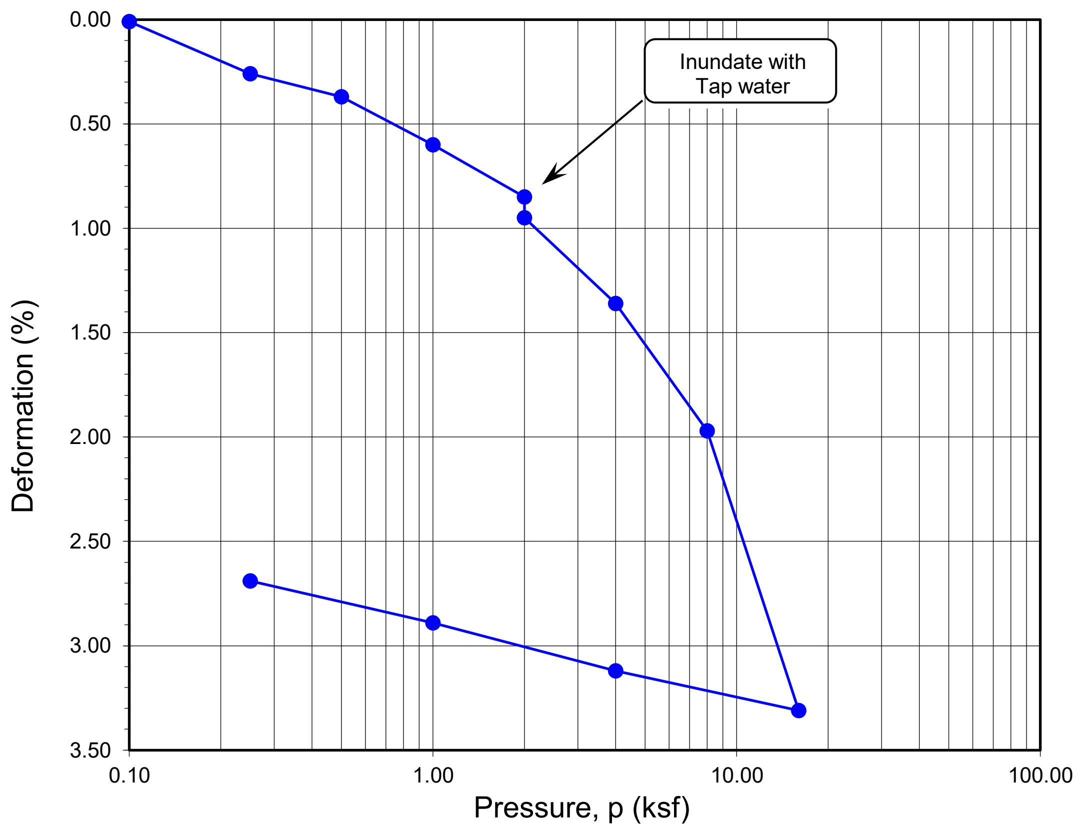
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
3/16/23	7:40:00	0.0	0.0	0.1118
3/16/23	7:40:06	0.1	0.3	0.1145
3/16/23	7:40:15	0.2	0.5	0.1148
3/16/23	7:40:30	0.5	0.7	0.1151
3/16/23	7:41:00	1.0	1.0	0.1154
3/16/23	7:42:00	2.0	1.4	0.1156
3/16/23	7:44:00	4.0	2.0	0.1158
3/16/23	7:48:00	8.0	2.8	0.1161
3/16/23	7:55:00	15.0	3.9	0.1163
3/16/23	8:10:00	30.0	5.5	0.1164
3/16/23	8:40:00	60.0	7.7	0.1166
3/16/23	9:40:00	120.0	11.0	0.1168
3/16/23	11:40:00	240.0	15.5	0.1170
3/16/23	15:40:00	480.0	21.9	0.1172
3/17/23	7:40:00	1440.0	37.9	0.1173

Time Readings @ 4.0 ksf







Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-1	**B-1**	**0-5**	**8.2**	**12.1**	**119.6**	**122.7**	**0.410**	**0.372**	**54**	**87**

Soil Identification: Dark yellowish brown silty sand (SM)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 13837.001

Rexford LA Airport Blvd

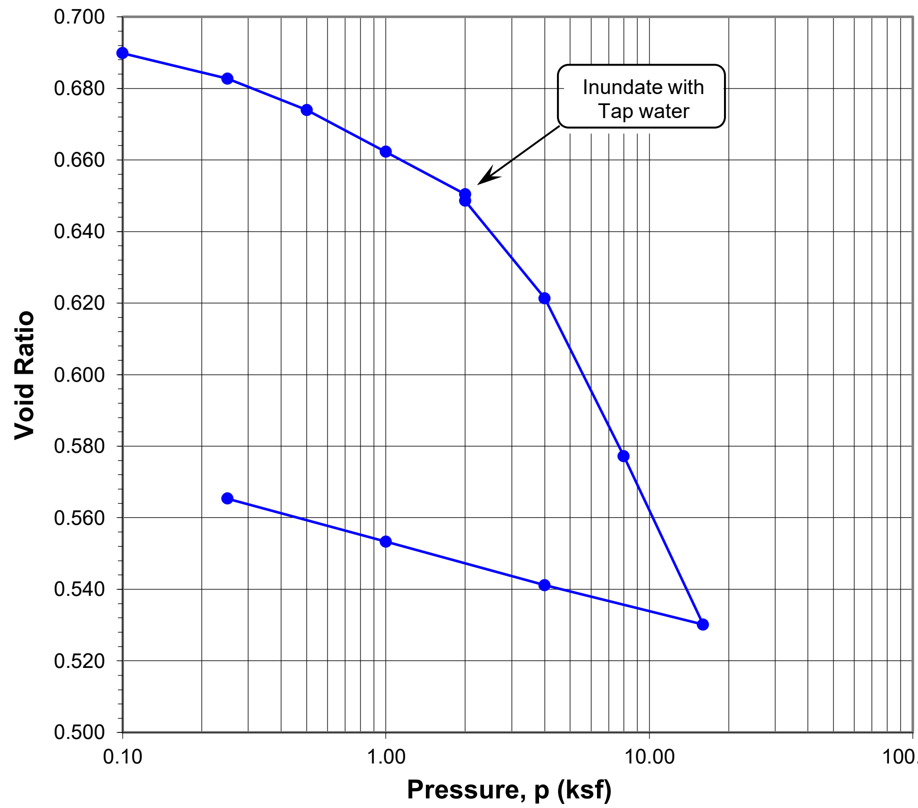
04-23

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Rexford LA Airport Blvd	Tested By:	GB/JD	Date:	03/14/23
Project No.:	13837.001	Checked By:	ACS/JHW	Date:	03/23/23
Boring No.:	LB-3	Depth (ft.):	7.5		
Sample No.:	R-2	Sample Type:	Ring		
Soil Identification:	Brown lean clay (CL)				

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	194.69
Weight of Ring (g):	45.51
Height after consol. (in.):	0.9256
Before Test	
Wt. of Wet Sample+Cont. (g):	215.15
Wt. of Dry Sample+Cont. (g):	184.35
Weight of Container (g):	58.52
Initial Moisture Content (%)	24.5
Initial Dry Density (pcf)	99.7
Initial Saturation (%):	96
Initial Vertical Reading (in.)	0.0240
After Test	
Wt. of Wet Sample+Cont. (g):	247.35
Wt. of Dry Sample+Cont. (g):	223.77
Weight of Container (g):	57.87
Final Moisture Content (%)	19.59
Final Dry Density (pcf):	108.2
Final Saturation (%):	95
Final Vertical Reading (in.)	0.1012
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43

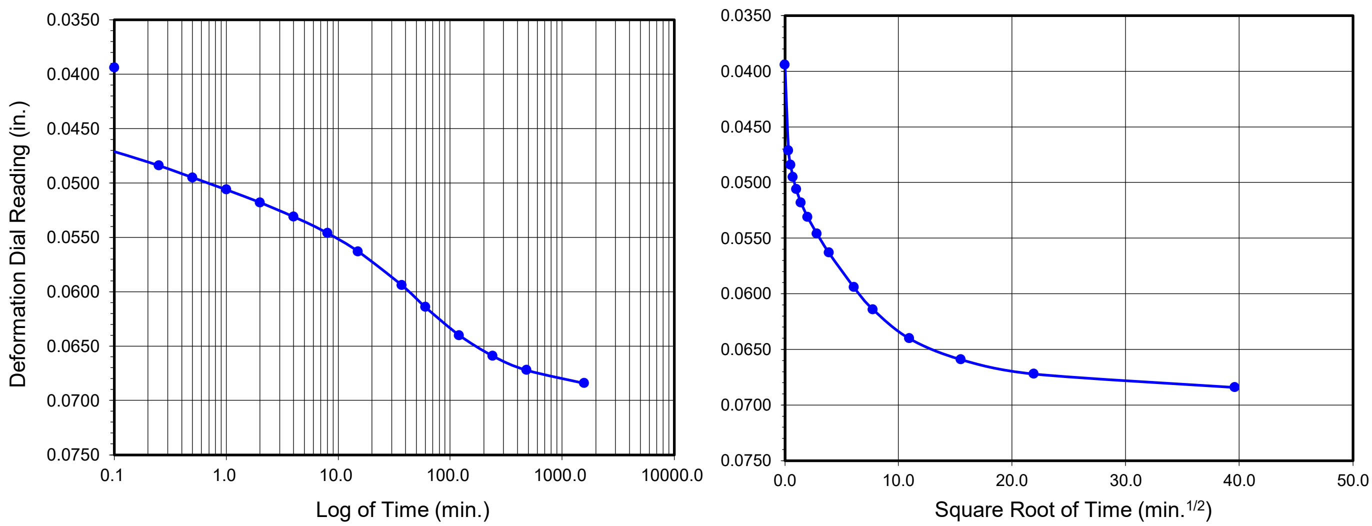


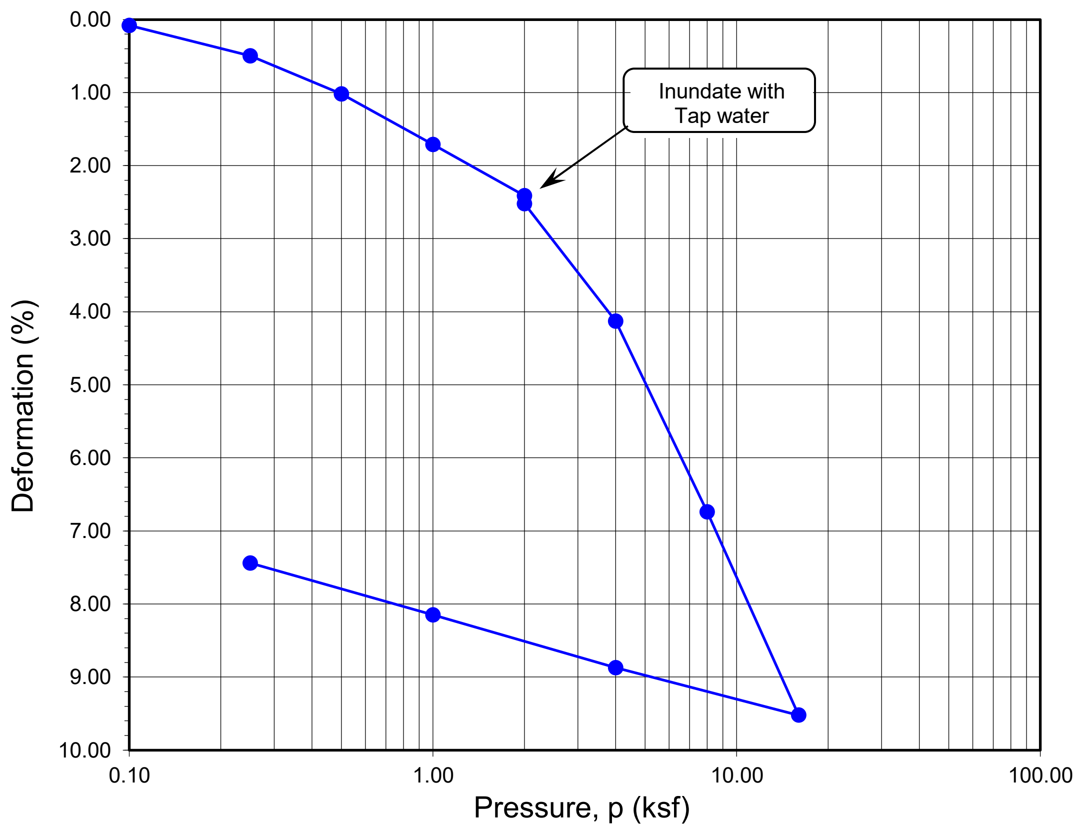
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.0248	0.9992	0.00	0.08	0.690	0.08
0.25	0.0293	0.9947	0.03	0.53	0.683	0.50
0.50	0.0349	0.9891	0.07	1.09	0.674	1.02
1.00	0.0425	0.9815	0.14	1.85	0.662	1.71
2.00	0.0503	0.9737	0.22	2.63	0.650	2.41
2.00	0.0514	0.9726	0.22	2.74	0.649	2.52
4.00	0.0684	0.9556	0.31	4.44	0.621	4.13
8.00	0.0954	0.9286	0.40	7.14	0.577	6.74
16.00	0.1243	0.8997	0.51	10.03	0.530	9.52
4.00	0.1171	0.9069	0.44	9.31	0.541	8.87
1.00	0.1090	0.9150	0.35	8.50	0.553	8.15
0.25	0.1012	0.9228	0.28	7.72	0.565	7.44

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
3/17/23	7:35:00	0.0	0.0	0.0394
3/17/23	7:35:06	0.1	0.3	0.0471
3/17/23	7:35:15	0.2	0.5	0.0484
3/17/23	7:35:30	0.5	0.7	0.0495
3/17/23	7:36:00	1.0	1.0	0.0506
3/17/23	7:37:00	2.0	1.4	0.0518
3/17/23	7:39:00	4.0	2.0	0.0531
3/17/23	7:43:00	8.0	2.8	0.0546
3/17/23	7:50:00	15.0	3.9	0.0563
3/17/23	8:12:00	37.0	6.1	0.0594
3/17/23	8:35:00	60.0	7.7	0.0614
3/17/23	9:35:00	120.0	11.0	0.0640
3/17/23	11:35:00	240.0	15.5	0.0659
3/17/23	15:35:00	480.0	21.9	0.0672
3/18/23	9:44:00	1569.0	39.6	0.0684

Time Readings @ 4.0 ksf





Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-3	**R-2**	**7.5**	**24.5**	**19.6**	**99.7**	**108.2**	**0.691**	**0.565**	**96**	**95**

Soil Identification: Brown lean clay (CL)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 13837.001

Rexford LA Airport Blvd

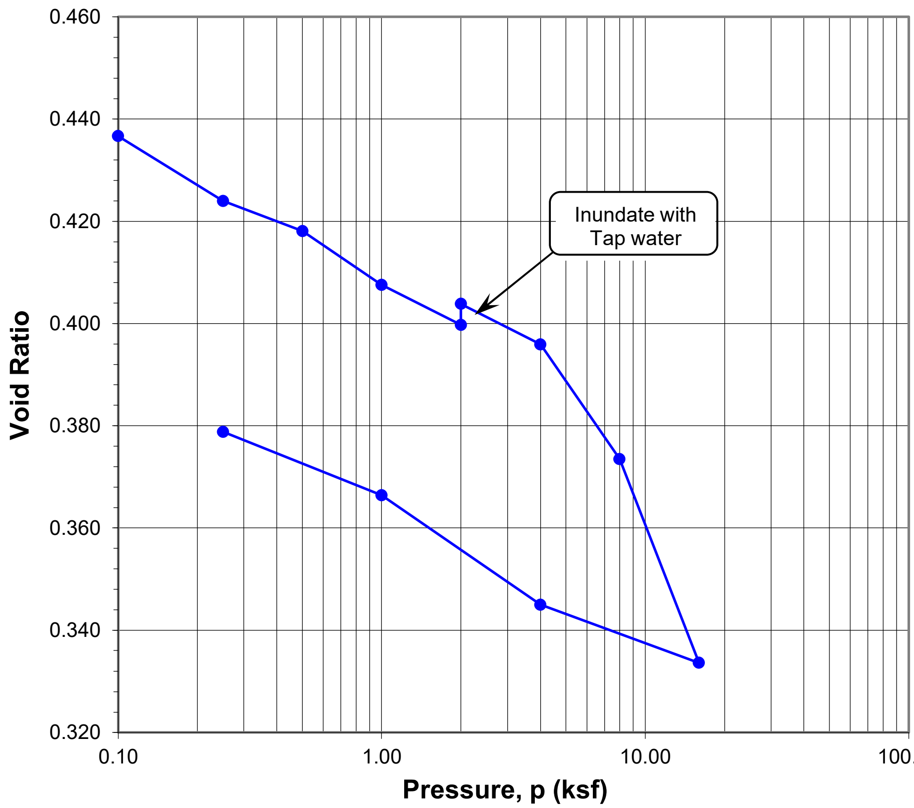
04-23

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Rexford LA Airport Blvd	Tested By:	GB/JD	Date: 03/20/23
Project No.:	13837.001	Checked By:	J. Ward	Date: 04/03/23
Boring No.:	LB-5	Depth (ft.):	5.0	
Sample No.:	R-1	Sample Type:	Ring	
Soil Identification:	Light olive brown silty clay (CL-ML)			

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	199.28
Weight of Ring (g):	41.53
Height after consol. (in.):	0.9583
Before Test	
Wt. of Wet Sample+Cont. (g):	198.48
Wt. of Dry Sample+Cont. (g):	189.24
Weight of Container (g):	67.68
Initial Moisture Content (%)	7.6
Initial Dry Density (pcf)	121.9
Initial Saturation (%):	49
Initial Vertical Reading (in.)	0.0166
After Test	
Wt. of Wet Sample+Cont. (g):	271.27
Wt. of Dry Sample+Cont. (g):	245.26
Weight of Container (g):	74.34
Final Moisture Content (%)	20.10
Final Dry Density (pcf):	112.3
Final Saturation (%):	100
Final Vertical Reading (in.)	0.0624
Specific Gravity (assumed):	2.81
Water Density (pcf):	62.43

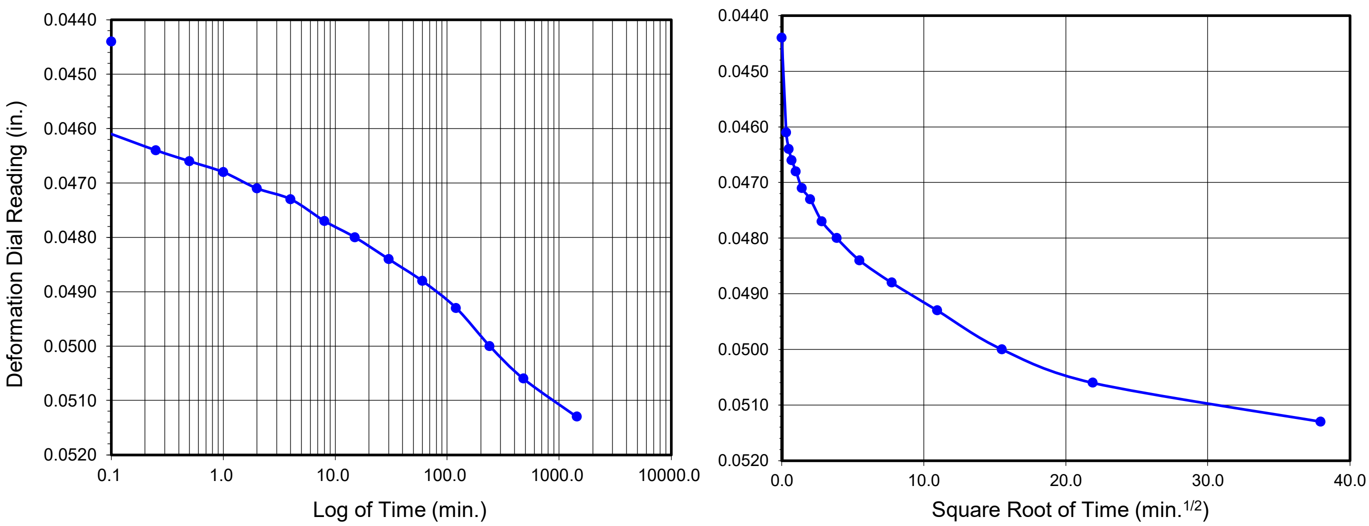


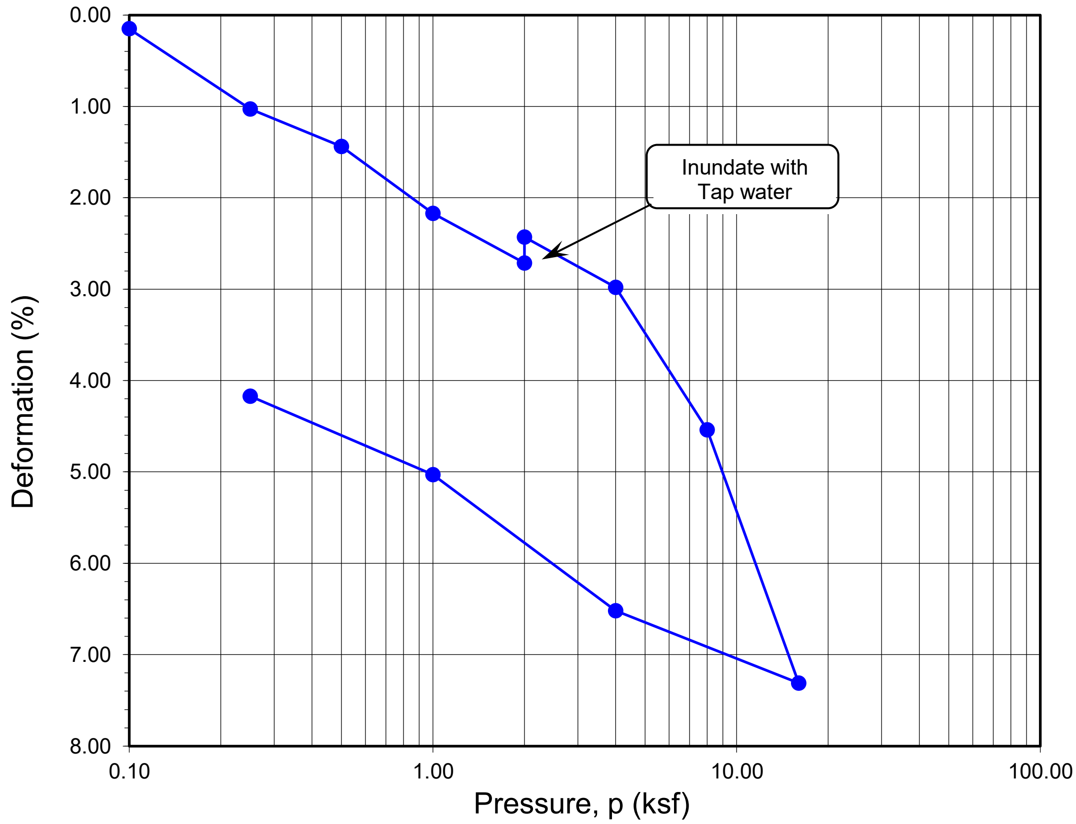
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.0181	0.9985	0.00	0.15	0.437	0.15
0.25	0.0274	0.9892	0.05	1.08	0.424	1.03
0.50	0.0322	0.9844	0.12	1.56	0.418	1.44
1.00	0.0405	0.9761	0.22	2.39	0.408	2.17
2.00	0.0473	0.9694	0.35	3.07	0.400	2.72
2.00	0.0444	0.9722	0.35	2.78	0.404	2.43
4.00	0.0513	0.9653	0.49	3.47	0.396	2.98
8.00	0.0685	0.9481	0.65	5.19	0.373	4.54
16.00	0.0979	0.9187	0.82	8.13	0.334	7.31
4.00	0.0886	0.9280	0.68	7.20	0.345	6.52
1.00	0.0721	0.9445	0.52	5.55	0.366	5.03
0.25	0.0624	0.9542	0.41	4.58	0.379	4.17

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
3/23/23	7:30:00	0.0	0.0	0.0444
3/23/23	7:30:06	0.1	0.3	0.0461
3/23/23	7:30:15	0.2	0.5	0.0464
3/23/23	7:30:30	0.5	0.7	0.0466
3/23/23	7:31:00	1.0	1.0	0.0468
3/23/23	7:32:00	2.0	1.4	0.0471
3/23/23	7:34:00	4.0	2.0	0.0473
3/23/23	7:38:00	8.0	2.8	0.0477
3/23/23	7:45:00	15.0	3.9	0.0480
3/23/23	8:00:00	30.0	5.5	0.0484
3/23/23	8:30:00	60.0	7.7	0.0488
3/23/23	9:30:00	120.0	11.0	0.0493
3/23/23	11:30:00	240.0	15.5	0.0500
3/23/23	15:30:00	480.0	21.9	0.0506
3/24/23	7:30:00	1440.0	37.9	0.0513

Time Readings @ 4.0 ksf





Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-5	**R-1**	**5**	**7.6**	**20.1**	**121.9**	**112.3**	**0.439**	**0.379**	**49**	**100**

Soil Identification: Light olive brown silty clay (CL-ML)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 13837.001

Rexford LA Airport Blvd

04-23

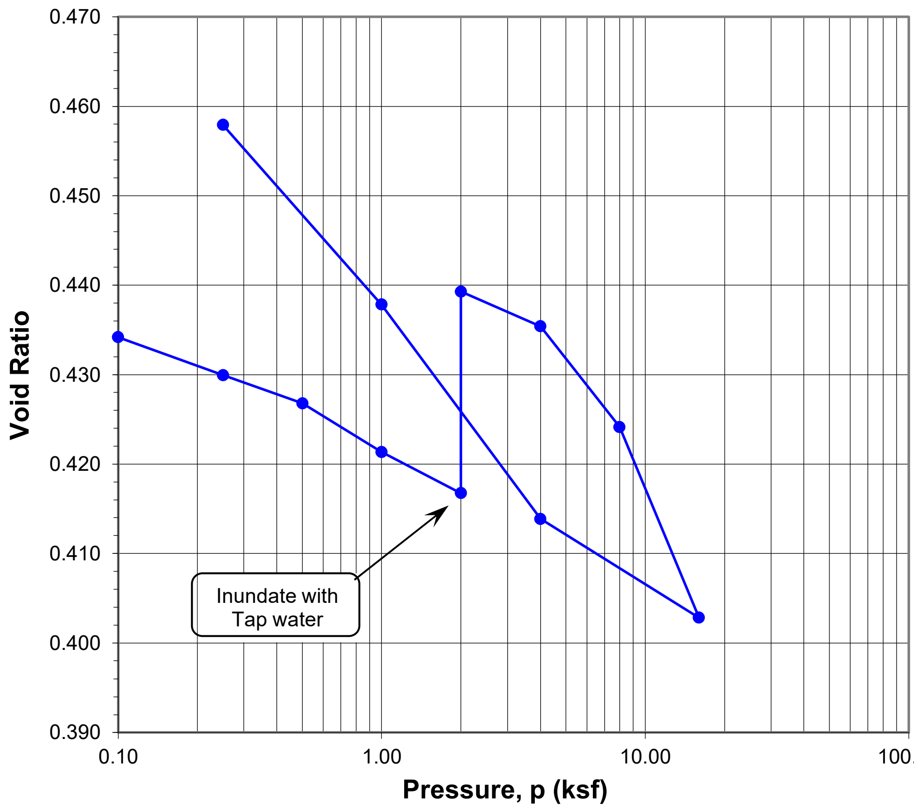
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Rexford LA Airport Blvd	Tested By: GB/JD	Date: 03/20/23
Project No.:	13837.001	Checked By: J. Ward	Date: 04/03/23
Boring No.:	LB-5	Depth (ft.): 10.0	
Sample No.:	R-3	Sample Type: Ring	
Soil Identification:	Light olive brown lean clay (CL)		

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	206.87
Weight of Ring (g):	44.76
Height after consol. (in.):	1.0163
Before Test	
Wt. of Wet Sample+Cont. (g):	192.59
Wt. of Dry Sample+Cont. (g):	175.45
Weight of Container (g):	55.72
Initial Moisture Content (%)	14.3
Initial Dry Density (pcf)	117.9
Initial Saturation (%):	89
Initial Vertical Reading (in.)	0.1016
After Test	
Wt. of Wet Sample+Cont. (g):	286.58
Wt. of Dry Sample+Cont. (g):	262.18
Weight of Container (g):	76.75
Final Moisture Content (%)	17.35
Final Dry Density (pcf):	115.1
Final Saturation (%):	100
Final Vertical Reading (in.)	0.0884
Specific Gravity (assumed):	2.71
Water Density (pcf):	62.43

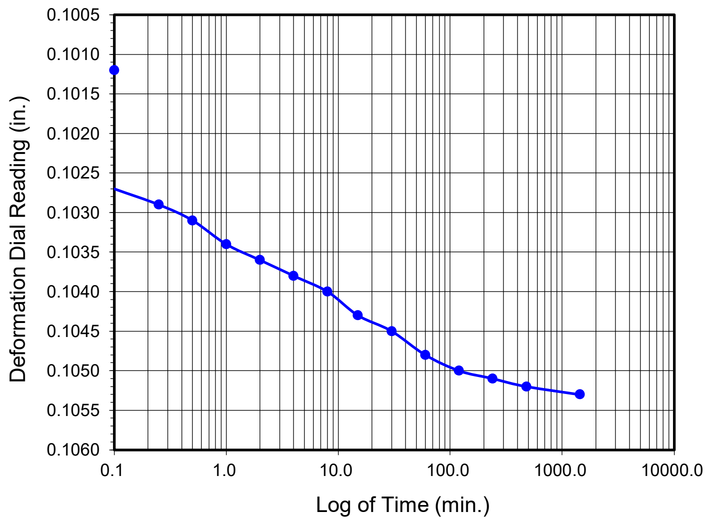


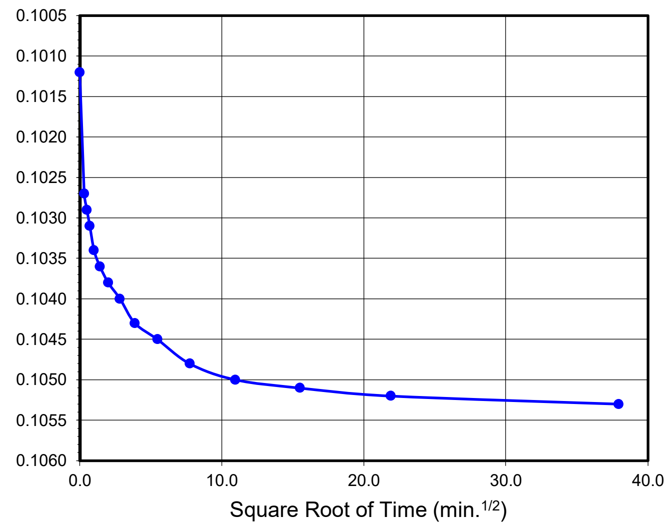
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.1019	0.9998	0.00	0.02	0.434	0.02
0.25	0.1053	0.9963	0.05	0.37	0.430	0.32
0.50	0.1081	0.9935	0.11	0.65	0.427	0.54
1.00	0.1127	0.9889	0.19	1.11	0.421	0.92
2.00	0.1169	0.9847	0.29	1.53	0.417	1.24
2.00	0.1012	1.0004	0.29	-0.04	0.439	-0.33
4.00	0.1053	0.9963	0.43	0.37	0.435	-0.06
8.00	0.1147	0.9870	0.58	1.31	0.424	0.73
16.00	0.1313	0.9703	0.76	2.97	0.403	2.21
4.00	0.1218	0.9798	0.58	2.02	0.414	1.44
1.00	0.1034	0.9982	0.41	0.18	0.438	-0.23
0.25	0.0884	1.0132	0.31	-1.32	0.458	-1.63

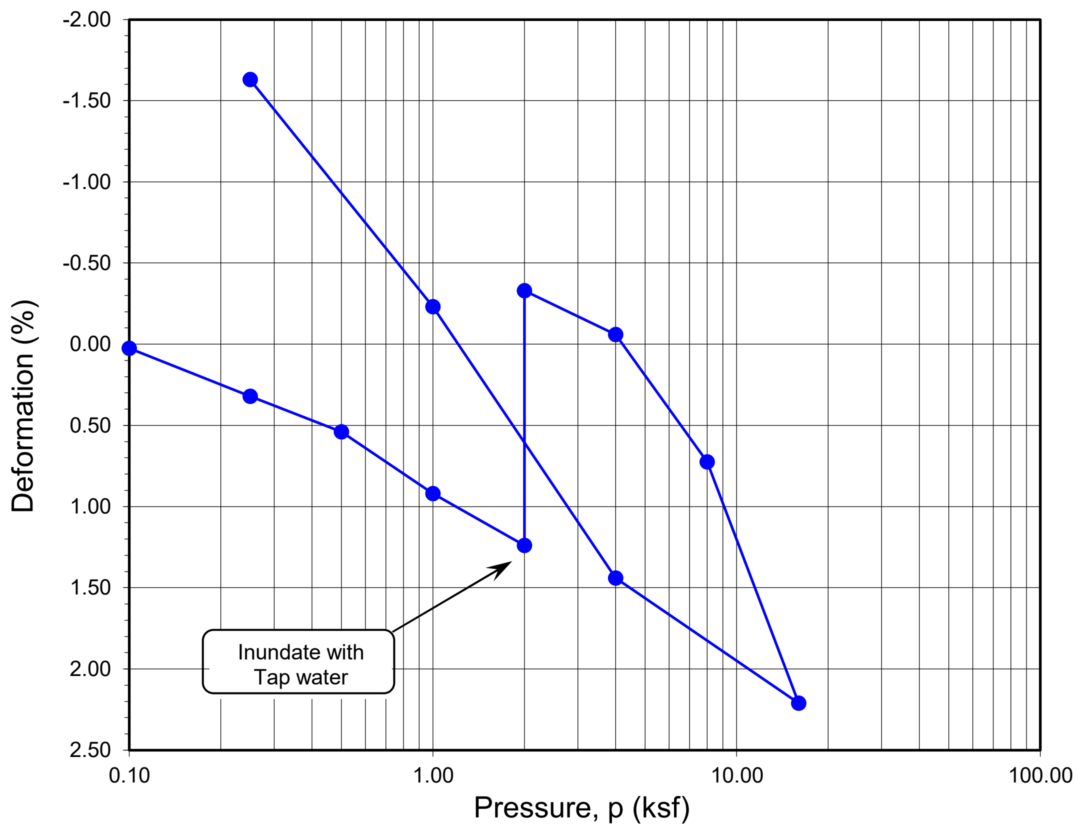
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
3/23/23	7:35:00	0.0	0.0	0.1012
3/23/23	7:35:06	0.1	0.3	0.1027
3/23/23	7:35:15	0.2	0.5	0.1029
3/23/23	7:35:30	0.5	0.7	0.1031
3/23/23	7:36:00	1.0	1.0	0.1034
3/23/23	7:37:00	2.0	1.4	0.1036
3/23/23	7:39:00	4.0	2.0	0.1038
3/23/23	7:43:00	8.0	2.8	0.1040
3/23/23	7:50:00	15.0	3.9	0.1043
3/23/23	8:05:00	30.0	5.5	0.1045
3/23/23	8:35:00	60.0	7.7	0.1048
3/23/23	9:35:00	120.0	11.0	0.1050
3/23/23	11:35:00	240.0	15.5	0.1051
3/23/23	15:35:00	480.0	21.9	0.1052
3/24/23	7:35:00	1440.0	37.9	0.1053

Time Readings @ 4.0 ksf







Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-5	**R-3**	**10**	**14.3**	**17.3**	**117.9**	**115.1**	**0.435**	**0.458**	**89**	**100**

Soil Identification: Light olive brown lean clay (CL)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 13837.001

Rexford LA Airport Blvd

04-23

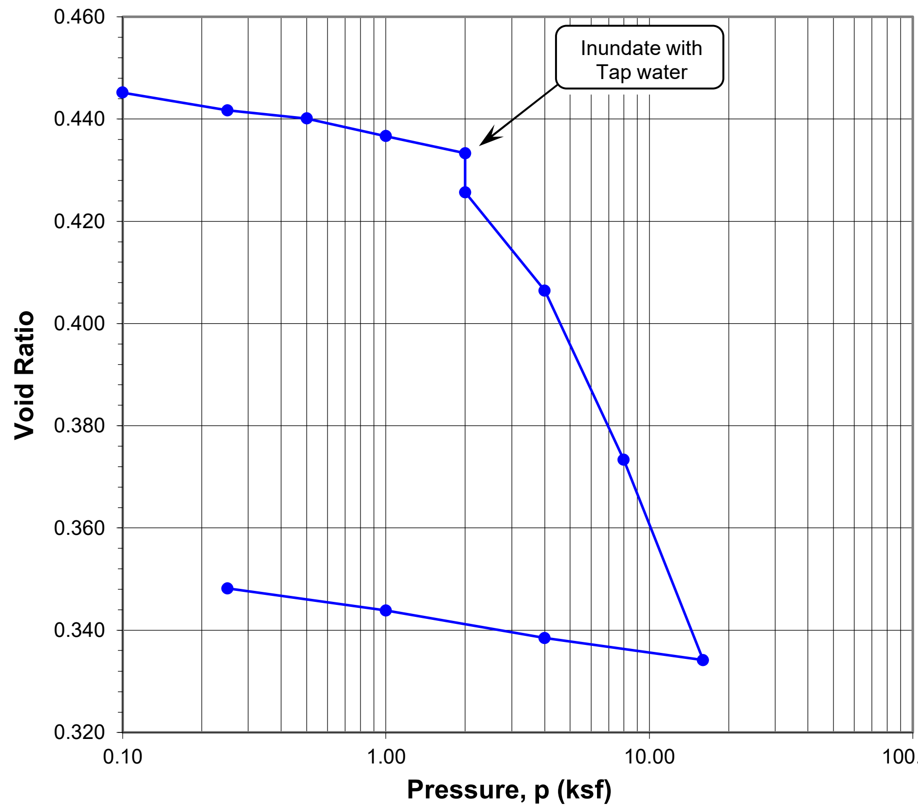
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name: Rexford LA Airport Blvd
Project No.: 13837.001
Boring No.: LB-6
Sample No.: B-1
Soil Identification: Olive brown silty, clayey sand (SC-SM)

Tested By: GB/JD Date: 03/13/23
Checked By: J. Ward Date: 04/03/23
Depth (ft.): 0-3
Sample Type: 90% Remold

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	197.15
Weight of Ring (g):	45.23
Height after consol. (in.):	0.9326
Before Test	
Wt. of Wet Sample+Cont. (g):	180.49
Wt. of Dry Sample+Cont. (g):	170.90
Weight of Container (g):	56.14
Initial Moisture Content (%)	8.4
Initial Dry Density (pcf)	116.6
Initial Saturation (%):	51
Initial Vertical Reading (in.)	0.0413
After Test	
Wt. of Wet Sample+Cont. (g):	280.01
Wt. of Dry Sample+Cont. (g):	261.90
Weight of Container (g):	76.74
Final Moisture Content (%)	12.94
Final Dry Density (pcf):	124.8
Final Saturation (%):	100
Final Vertical Reading (in.)	0.1115
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43

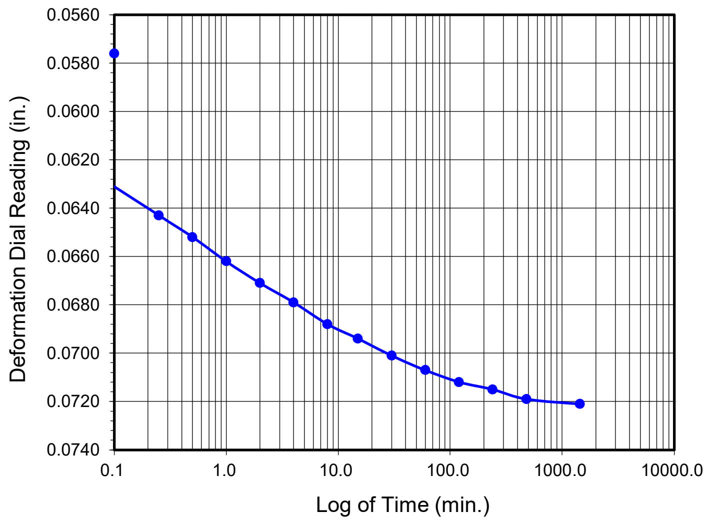


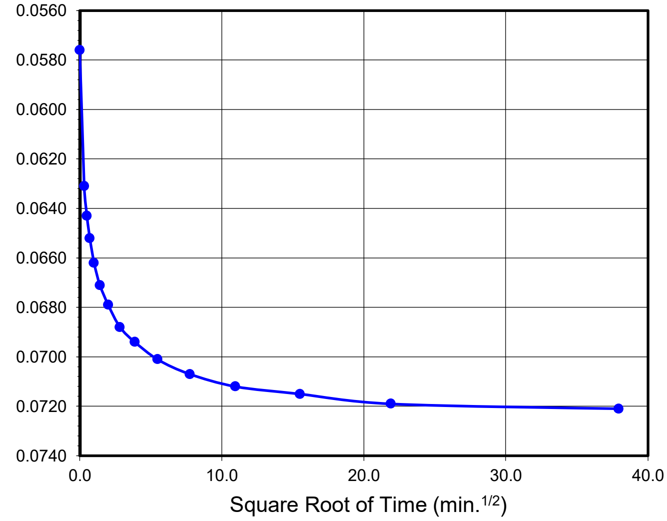
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.0416	0.9997	0.00	0.03	0.445	0.03
0.25	0.0444	0.9969	0.04	0.31	0.442	0.27
0.50	0.0460	0.9953	0.09	0.47	0.440	0.38
1.00	0.0490	0.9923	0.15	0.77	0.437	0.62
2.00	0.0523	0.9890	0.25	1.10	0.433	0.85
2.00	0.0576	0.9837	0.25	1.63	0.426	1.38
4.00	0.0721	0.9692	0.37	3.08	0.406	2.71
8.00	0.0962	0.9451	0.49	5.49	0.373	5.00
16.00	0.1249	0.9164	0.65	8.36	0.334	7.71
4.00	0.1205	0.9208	0.51	7.92	0.338	7.41
1.00	0.1156	0.9257	0.39	7.43	0.344	7.04
0.25	0.1115	0.9298	0.28	7.02	0.348	6.74

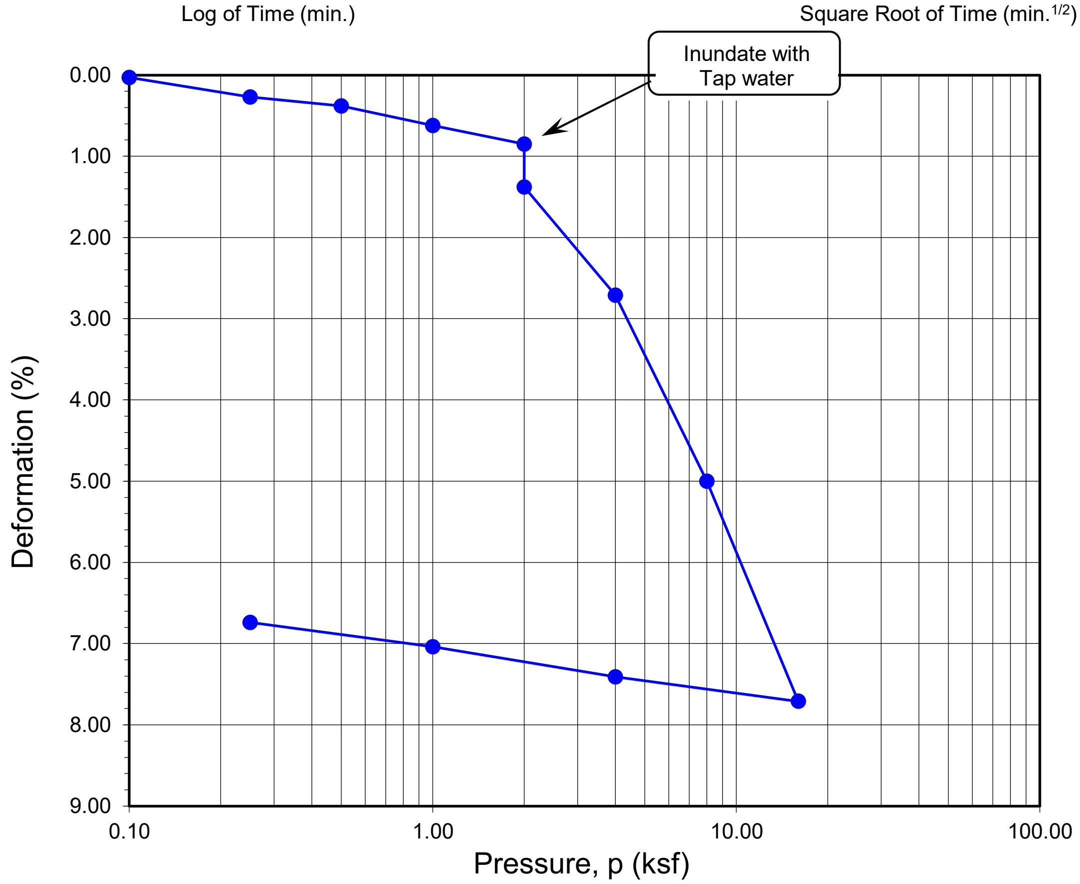
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
3/16/23	7:45:00	0.0	0.0	0.0576
3/16/23	7:45:06	0.1	0.3	0.0631
3/16/23	7:45:15	0.2	0.5	0.0643
3/16/23	7:45:30	0.5	0.7	0.0652
3/16/23	7:46:00	1.0	1.0	0.0662
3/16/23	7:47:00	2.0	1.4	0.0671
3/16/23	7:49:00	4.0	2.0	0.0679
3/16/23	7:53:00	8.0	2.8	0.0688
3/16/23	8:00:00	15.0	3.9	0.0694
3/16/23	8:15:00	30.0	5.5	0.0701
3/16/23	8:45:00	60.0	7.7	0.0707
3/16/23	9:45:00	120.0	11.0	0.0712
3/16/23	11:45:00	240.0	15.5	0.0715
3/16/23	15:45:00	480.0	21.9	0.0719
3/17/23	7:45:00	1440.0	37.9	0.0721

Time Readings @ 4.0 ksf







Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-6	**B-1**	**0-3**	**8.4**	**12.9**	**116.6**	**124.8**	**0.446**	**0.348**	**51**	**100**

Soil Identification: Olive brown silty, clayey sand (SC-SM)

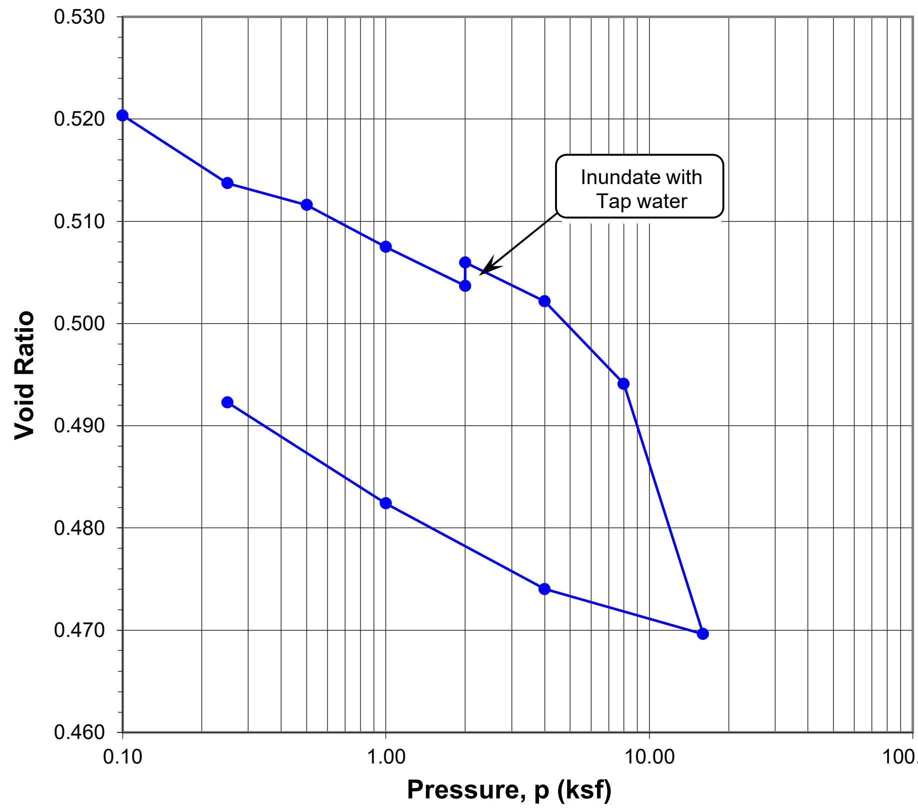
Leighton	ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS ASTM D 2435	Project No.: 13837.001 Rexford LA Airport Blvd 04-23

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Rexford LA Airport Blvd	Tested By: GB/JD	Date: 03/14/23
Project No.:	13837.001	Checked By: J. Ward	Date: 04/03/23
Boring No.:	LP-1	Depth (ft.): 0-5	
Sample No.:	B-1	Sample Type:	90% Remold
Soil Identification:	Olive brown silty, clayey sand (SC-SM)		

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	189.04
Weight of Ring (g):	40.65
Height after consol. (in.):	0.9814
Before Test	
Wt. of Wet Sample+Cont. (g):	214.24
Wt. of Dry Sample+Cont. (g):	198.26
Weight of Container (g):	57.18
Initial Moisture Content (%)	11.3
Initial Dry Density (pcf)	110.9
Initial Saturation (%):	59
Initial Vertical Reading (in.)	0.0882
After Test	
Wt. of Wet Sample+Cont. (g):	260.46
Wt. of Dry Sample+Cont. (g):	238.81
Weight of Container (g):	65.44
Final Moisture Content (%)	16.31
Final Dry Density (pcf):	112.5
Final Saturation (%):	88
Final Vertical Reading (in.)	0.1096
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43

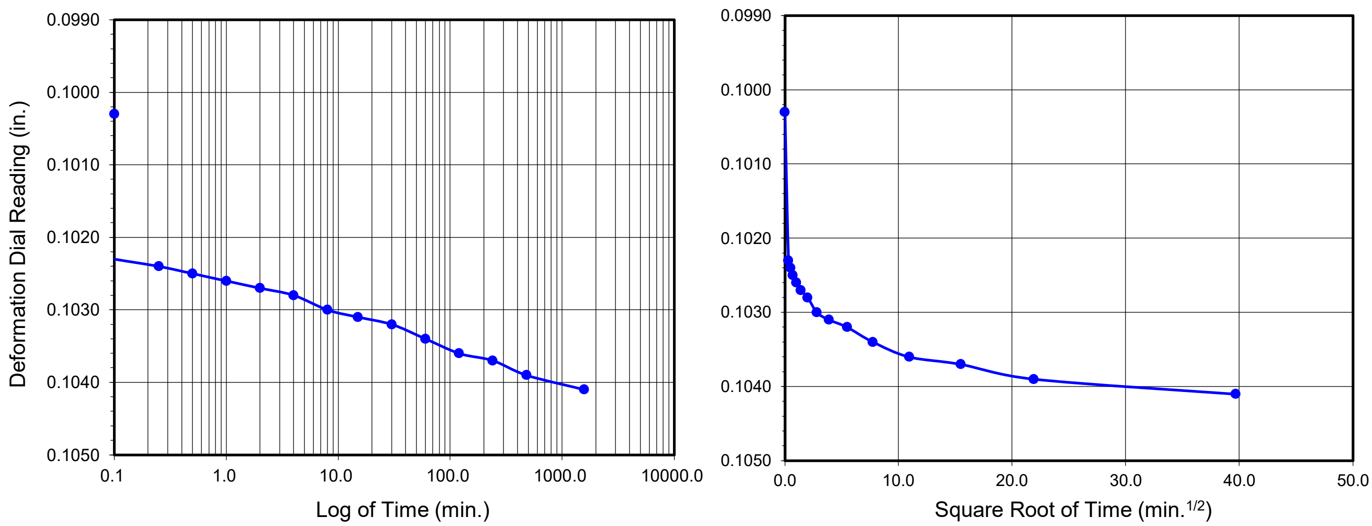


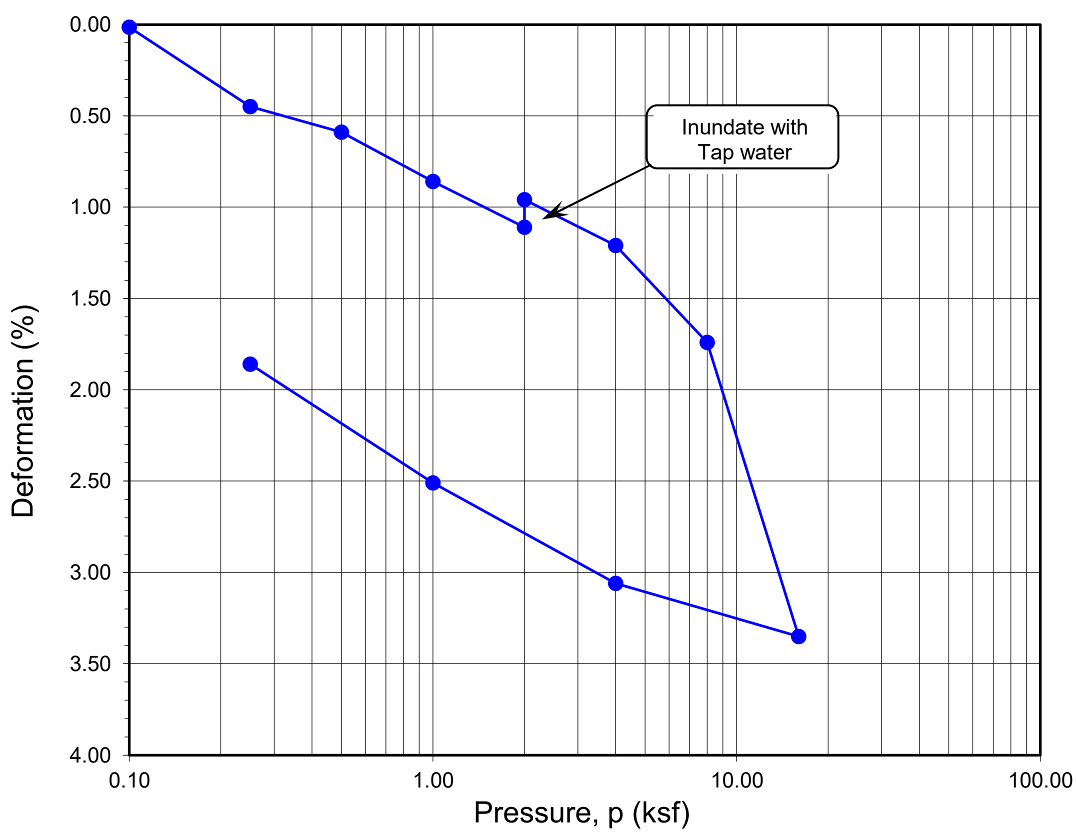
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.0884	0.9999	0.00	0.01	0.520	0.01
0.25	0.0931	0.9951	0.04	0.49	0.514	0.45
0.50	0.0950	0.9932	0.09	0.68	0.512	0.59
1.00	0.0984	0.9898	0.16	1.02	0.507	0.86
2.00	0.1018	0.9864	0.25	1.36	0.504	1.11
2.00	0.1003	0.9879	0.25	1.21	0.506	0.96
4.00	0.1041	0.9841	0.38	1.59	0.502	1.21
8.00	0.1107	0.9775	0.51	2.25	0.494	1.74
16.00	0.1283	0.9599	0.66	4.01	0.470	3.35
4.00	0.1240	0.9642	0.52	3.58	0.474	3.06
1.00	0.1171	0.9711	0.38	2.89	0.482	2.51
0.25	0.1096	0.9786	0.28	2.14	0.492	1.86

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
3/17/23	7:25:00	0.0	0.0	0.1003
3/17/23	7:25:06	0.1	0.3	0.1023
3/17/23	7:25:15	0.2	0.5	0.1024
3/17/23	7:25:30	0.5	0.7	0.1025
3/17/23	7:26:00	1.0	1.0	0.1026
3/17/23	7:27:00	2.0	1.4	0.1027
3/17/23	7:29:00	4.0	2.0	0.1028
3/17/23	7:33:00	8.0	2.8	0.1030
3/17/23	7:40:00	15.0	3.9	0.1031
3/17/23	7:55:00	30.0	5.5	0.1032
3/17/23	8:25:00	60.0	7.7	0.1034
3/17/23	9:25:00	120.0	11.0	0.1036
3/17/23	11:25:00	240.0	15.5	0.1037
3/17/23	15:25:00	480.0	21.9	0.1039
3/18/23	9:40:00	1575.0	39.7	0.1041

Time Readings @ 4.0 ksf





Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LP-1	**B-1**	**0-5**	**11.3**	**16.3**	**110.9**	**112.5**	**0.521**	**0.492**	**59**	**88**

Soil Identification: Olive brown silty, clayey sand (SC-SM)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 13837.001

Rexford LA Airport Blvd

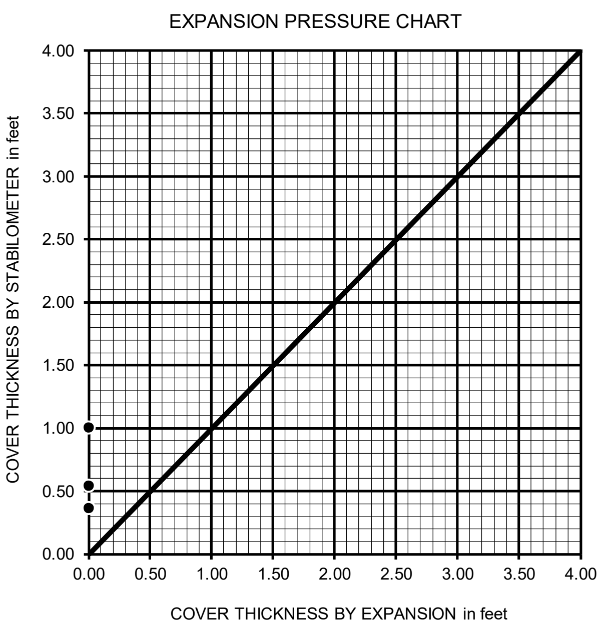
04-23

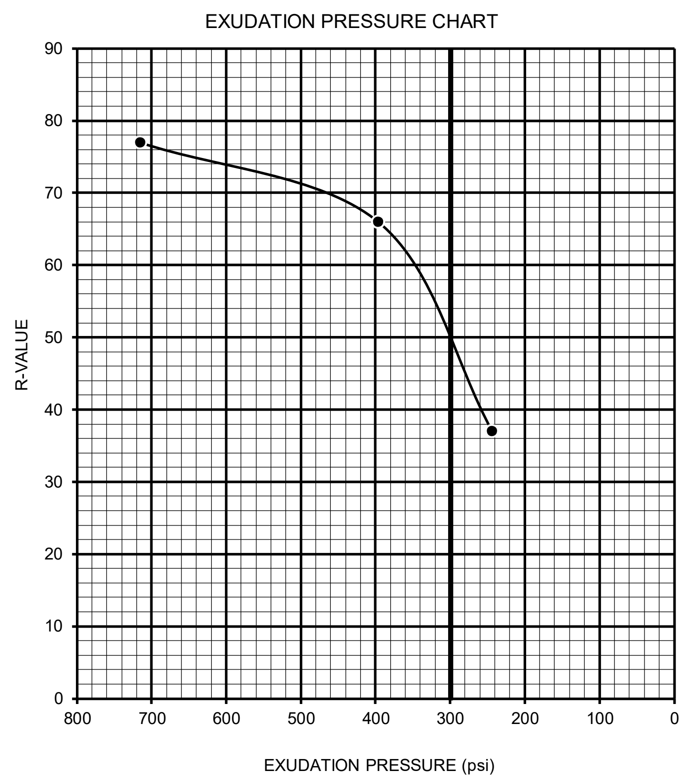
R-VALUE TEST RESULTS
DOT CA Test 301

PROJECT NAME:	Rexford LA Airport Blvd	PROJECT NUMBER:	13837.001
BORING NUMBER:	LB-1	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	F. Mina
SAMPLE DESCRIPTION:	Dark yellowish brown silty sand (SM)	DATE COMPLETED:	3/22/2023

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	8.0	8.5	9.5
HEIGHT OF SAMPLE, Inches	2.48	2.55	2.52
DRY DENSITY, pcf	116.9	115.8	118.8
COMPACTOR PRESSURE, psi	200	175	150
EXUDATION PRESSURE, psi	715	397	244
EXPANSION, Inches x 10exp-4	0	0	0
STABILITY Ph 2,000 lbs (160 psi)	25	37	78
TURNS DISPLACEMENT	4.12	4.28	4.57
R-VALUE UNCORRECTED	77	66	37
R-VALUE CORRECTED	77	66	37

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.37	0.54	1.01
EXPANSION PRESSURE THICKNESS, ft.	0.00	0.00	0.00





R-VALUE BY EXPANSION:	N/A
R-VALUE BY EXUDATION:	50
EQUILIBRIUM R-VALUE:	50

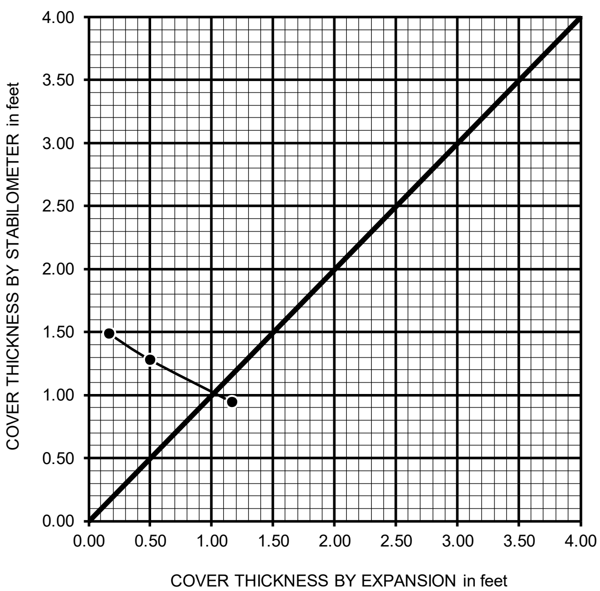
R-VALUE TEST RESULTS
DOT CA Test 301

PROJECT NAME:	Rexford LA Airport Blvd	PROJECT NUMBER:	13837.001
BORING NUMBER:	LB-6	DEPTH (FT.):	0-3
SAMPLE NUMBER:	B-1	TECHNICIAN:	F. Mina
SAMPLE DESCRIPTION:	Olive brown silty, clayey sand (SC-SM)	DATE COMPLETED:	3/22/2023

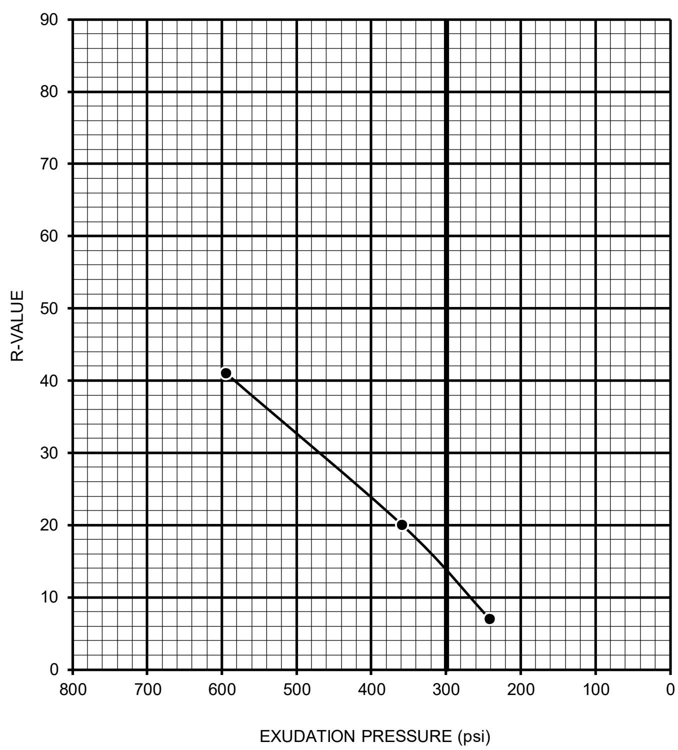
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	9.4	10.4	11.6
HEIGHT OF SAMPLE, Inches	2.51	2.59	2.54
DRY DENSITY, pcf	120.8	118.3	118.4
COMPACTOR PRESSURE, psi	170	130	75
EXUDATION PRESSURE, psi	595	359	241
EXPANSION, Inches x 10exp-4	35	15	5
STABILITY Ph 2,000 lbs (160 psi)	74	116	140
TURNS DISPLACEMENT	4.10	4.30	4.65
R-VALUE UNCORRECTED	41	18	7
R-VALUE CORRECTED	41	20	7

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.94	1.28	1.49
EXPANSION PRESSURE THICKNESS, ft.	1.17	0.50	0.17

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	31
R-VALUE BY EXUDATION:	14
EQUILIBRIUM R-VALUE:	14

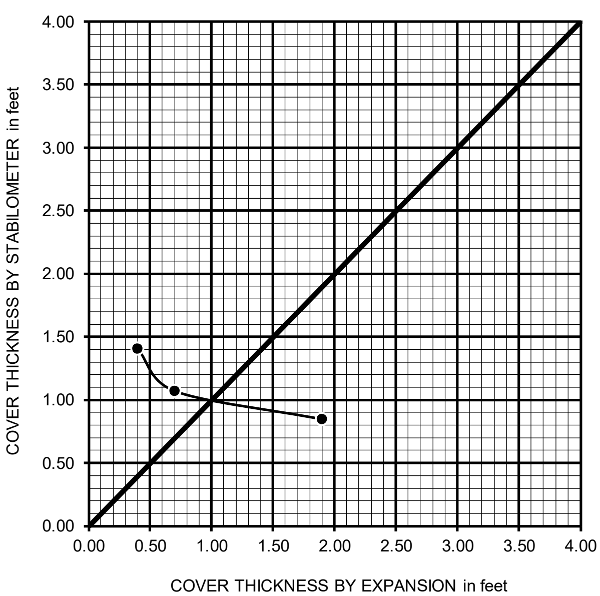
R-VALUE TEST RESULTS
DOT CA Test 301

PROJECT NAME:	Rexford LA Airport Blvd	PROJECT NUMBER:	13837.001
BORING NUMBER:	LP-1	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	F. Mina
SAMPLE DESCRIPTION:	Olive brown silty, clayey sand (SC-SM)	DATE COMPLETED:	3/22/2023

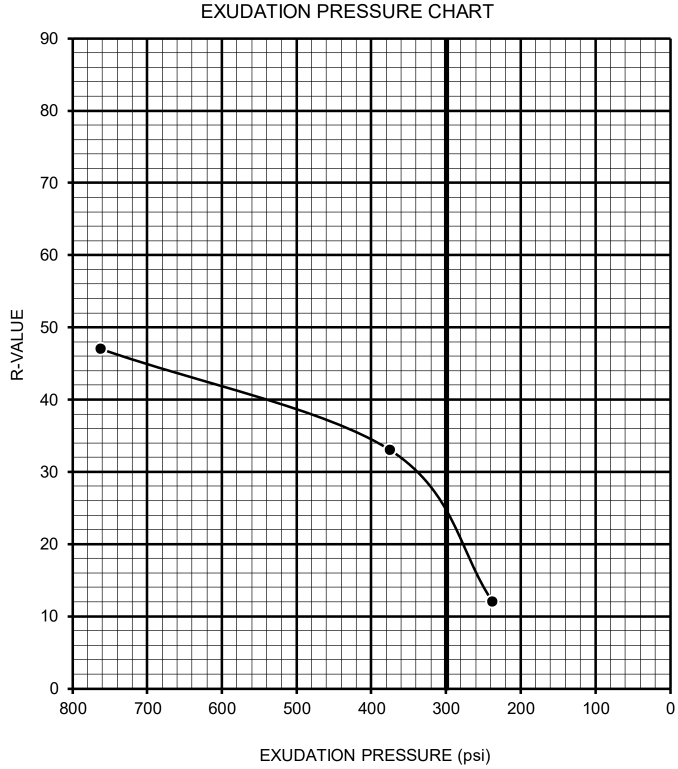
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	11.8	12.8	14.1
HEIGHT OF SAMPLE, Inches	2.49	2.50	2.51
DRY DENSITY, pcf	111.0	110.9	106.8
COMPACTOR PRESSURE, psi	195	125	95
EXUDATION PRESSURE, psi	762	375	238
EXPANSION, Inches x 10exp-4	57	21	12
STABILITY Ph 2,000 lbs (160 psi)	68	90	127
TURNS DISPLACEMENT	3.88	3.95	4.58
R-VALUE UNCORRECTED	47	33	12
R-VALUE CORRECTED	47	33	12

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.85	1.07	1.41
EXPANSION PRESSURE THICKNESS, ft.	1.90	0.70	0.40

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	38
R-VALUE BY EXUDATION:	25
EQUILIBRIUM R-VALUE:	25

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Leighton

Project Name:	Rexford LA Airport Blvd	Tested By :	G. Berdy	Date: 03/03/23
Project No. :	13837.001	Checked By:	J. Ward	Date: 03/31/23

Boring No.	LB-1	LB-6	LP-1	
Sample No.	B-1	B-1	B-1	
Sample Depth (ft)	0-5	0-3	0-5	
Soil Identification:	Dark yellowish brown SM	Olive brown SC-SM	Olive brown SC-SM	
Wet Weight of Soil + Container (g)	0.00	0.00	0.00	
Dry Weight of Soil + Container (g)	0.00	0.00	0.00	
Weight of Container (g)	1.00	1.00	1.00	
Moisture Content (%)	0.00	0.00	0.00	
Weight of Soaked Soil (g)	100.21	100.11	100.44	

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	2	7	402	
Crucible No.	6	7	2	
Furnace Temperature (°C)	860	860	860	
Time In / Time Out	8:30/9:15	8:30/9:15	8:30/9:15	
Duration of Combustion (min)	45	45	45	
Wt. of Crucible + Residue (g)	25.7513	22.7095	28.7224	
Wt. of Crucible (g)	25.7447	22.7067	28.7188	
Wt. of Residue (g) (A)	0.0066	0.0028	0.0036	
PPM of Sulfate (A) x 41150	271.59	115.22	148.14	
PPM of Sulfate, Dry Weight Basis	**272**	**115**	**148**	

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	15	15	15	
ml of AgNO3 Soln. Used in Titration (C)	0.7	0.7	0.7	
PPM of Chloride (C -0.2) * 100 * 30 / B	100	100	100	
PPM of Chloride, Dry Wt. Basis	**100**	**100**	**100**	

pH TEST, DOT California Test 643

pH Value	**8.11**	**7.76**	**7.73**	
Temperature °C	16.3	16.4	16.5	

SOIL RESISTIVITY TEST

DOT CA TEST 643

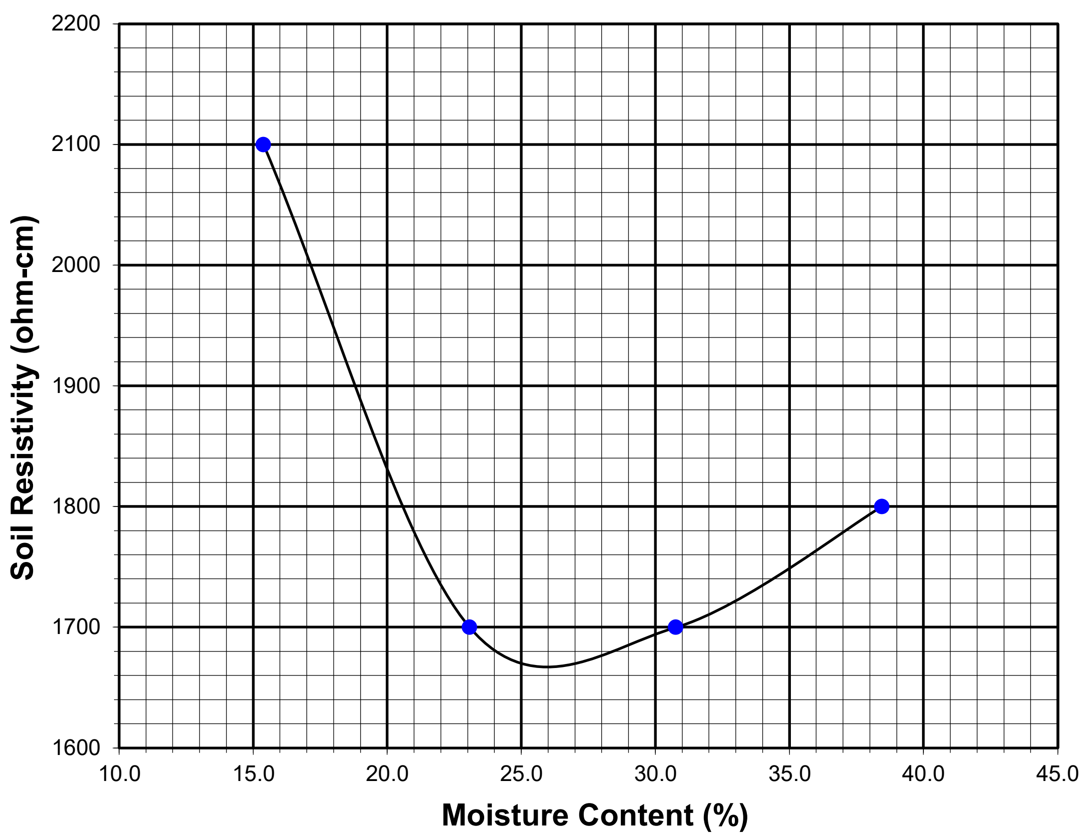
Project Name:	Rexford LA Airport Blvd	Tested By :	G. Berdy	Date:	03/07/23
Project No. :	13837.001	Checked By:	J. Ward	Date:	03/31/23
Boring No.:	LB-1	Depth (ft.) :	0-5		
Sample No. :	B-1				
Soil Identification:*	Dark yellowish brown SM				

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	15.38	2100	2100
2	30	23.07	1700	1700
3	40	30.76	1700	1700
4	50	38.44	1800	1800
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.06
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1670	26.0	272	100	8.11	16.3



SOIL RESISTIVITY TEST

DOT CA TEST 643

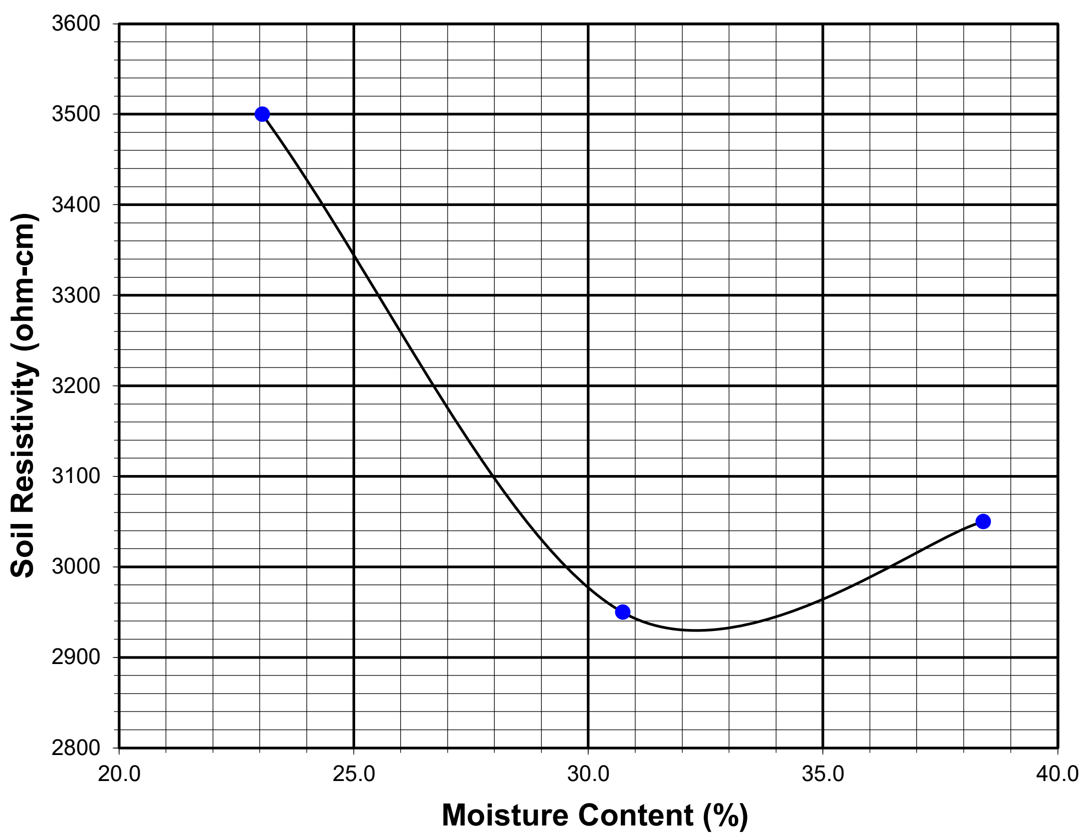
Project Name:	Rexford LA Airport Blvd	Tested By :	G. Berdy Date: 03/07/23
Project No. :	13837.001	Checked By:	J. Ward Date: 03/31/23
Boring No.:	LB-6	Depth (ft.) :	0-3
Sample No. :	B-1		
Soil Identification:*	Olive brown SC-SM		

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	30	23.05	3500	3500
2	40	30.73	2950	2950
3	50	38.41	3050	3050
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.16
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2930	**32.3**	**115**	**100**	**7.76**	**16.4**



SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	Rexford LA Airport Blvd	Tested By :	G. Berdy Date: 03/07/23
Project No. :	13837.001	Checked By:	J. Ward Date: 03/31/23
Boring No.:	LP-1	Depth (ft.) :	0-5
Sample No. :	B-1		

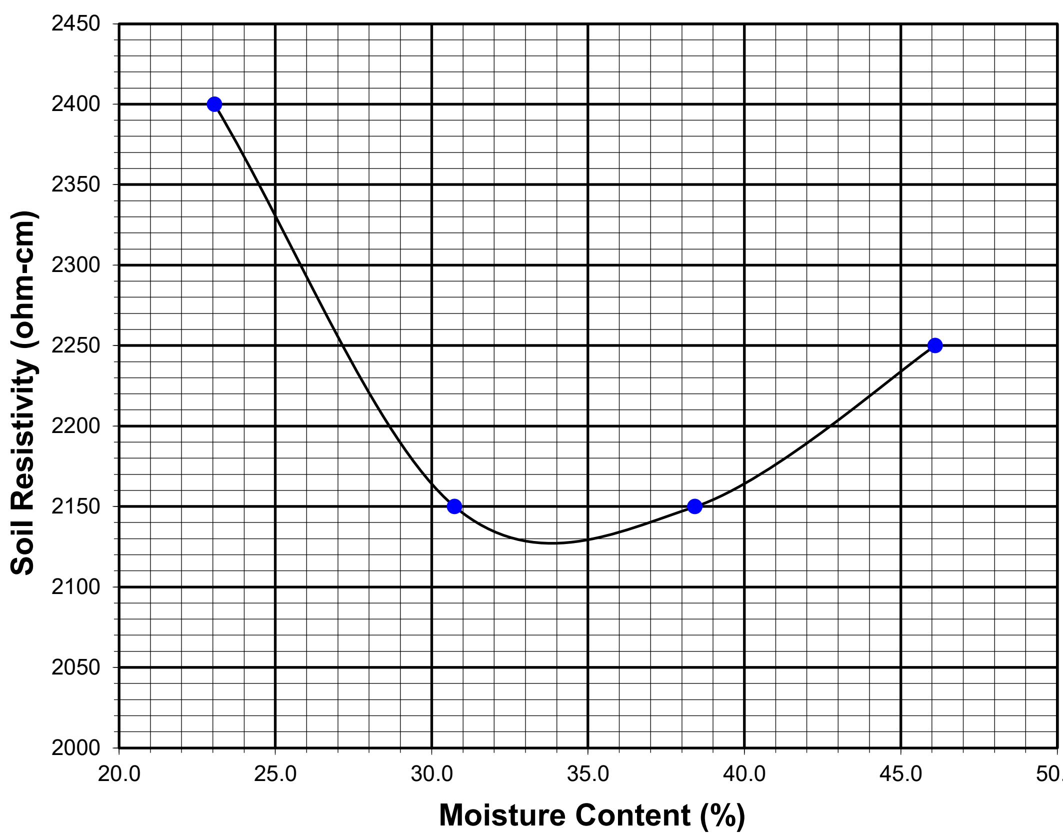
Soil Identification:* Olive brown SC-SM

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	30	23.05	2400	2400
2	40	30.73	2150	2150
3	50	38.41	2150	2150
4	60	46.10	2250	2250
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.16
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH: pH	Soil pH: Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2125	**33.9**	**148**	**100**	**7.73**	**16.5**



APPENDIX D

EARTHWORK AND GRADING GUIDE SPECIFICATIONS

Leighton

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APPENDIX D

LEIGHTON CONSULTING, INC.
EARTHWORK AND GRADING GUIDE SPECIFICATIONS

TABLE OF CONTENTS

D-1.0 GENERAL

D-1.1 Intent

These Earthwork and Grading Guide Specifications are for grading and earthwork shown on the current, approved grading plan(s) and/or indicated in the Leighton Consulting, Inc. geotechnical report(s). These Guide Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the project-specific recommendations in the geotechnical report shall supersede these Guide Specifications. Leighton Consulting, Inc. shall provide geotechnical observation and testing during earthwork and grading. Based on these observations and tests, Leighton Consulting, Inc. may provide new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

D-1.2 Role of Leighton Consulting, Inc.

Prior to commencement of earthwork and grading, Leighton Consulting, Inc. shall meet with the earthwork contractor to review the earthwork contractor’s work plan, to schedule sufficient personnel to perform the appropriate level of observation, mapping and compaction testing. During earthwork and grading, Leighton Consulting, Inc. shall observe, map, and document subsurface exposures to verify geotechnical design assumptions. If observed conditions are found to be significantly different than the interpreted assumptions during the design phase, Leighton Consulting, Inc. shall inform the owner, recommend appropriate changes in design to accommodate these observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include (1) natural ground after clearing to receiving fill but before fill is placed, (2) bottoms of all "remedial removal" areas, (3) all key bottoms, and (4) benches made on sloping ground to receive fill.

Leighton Consulting, Inc. shall observe moisture-conditioning and processing of the subgrade and fill materials, and perform relative compaction testing of fill to determine the attained relative compaction. Leighton Consulting, Inc. shall provide *Daily Field Reports* to the owner and the Contractor on a routine and frequent basis.

D-1.3 The Earthwork Contractor

The earthwork contractor (Contractor) shall be qualified, experienced and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Guide Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing grading and backfilling in accordance with the current, approved plans and specifications.

The Contractor shall inform the owner and Leighton Consulting, Inc. of changes in work schedules at least one working day in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that Leighton Consulting, Inc. is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish earthwork and grading in accordance with the applicable grading codes and agency ordinances, these Guide Specifications, and recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of Leighton Consulting, Inc., unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, adverse weather, etc., are resulting in a quality of work less than required in these specifications, Leighton Consulting, Inc. shall reject the work and may recommend to the owner that earthwork and grading be stopped until unsatisfactory condition(s) are rectified.

D-2.0 PREPARATION OF AREAS TO BE FILLED

D-2.1 <u>Clearing and Grubbing</u>

Vegetation, such as brush, grass, roots and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies and Leighton Consulting, Inc.. Care should be taken not to encroach upon or otherwise damage native and/or historic trees designated by the Owner or appropriate agencies to remain. Pavements, flatwork or other construction should not extend under the “drip line” of designated trees to remain.

Leighton Consulting, Inc. shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 3 percent of organic materials (by dry weight: ASTM D 2974). Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area. As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

D-2.2 Processing

Existing ground that has been declared satisfactory for support of fill, by Leighton Consulting, Inc., shall be scarified to a minimum depth of 6 inches (15 cm). Existing ground that is not satisfactory shall be over-excavated as specified in the following Section D-2.3. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

D-2.3 Overexcavation

In addition to removals and over-excavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be over-excavated to competent ground as evaluated by Leighton Consulting, Inc. during grading. All undocumented fill soils under proposed structure footprints should be excavated

D-2.4 Benching

Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), (>20 percent grade) the ground shall be stepped or benched. The lowest bench or key shall be a minimum of 15 feet (4.5 m) wide and at least 2 feet (0.6 m) deep, into competent material as evaluated by Leighton Consulting, Inc.. Other benches shall be excavated a minimum height of 4 feet (1.2 m) into competent material or as otherwise recommended by Leighton Consulting, Inc.. Fill placed on ground sloping flatter than 5:1 (horizontal to vertical units), (<20 percent grade) shall also be benched or otherwise over-excavated to provide a flat subgrade for the fill.

D-2.5 Evaluation/Acceptance of Fill Areas

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by Leighton Consulting, Inc. as suitable to receive fill. The Contractor shall obtain a written acceptance (*Daily Field Report*) from Leighton Consulting, Inc. prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys and benches.

D-3.0 FILL MATERIAL

D-3.1 Fill Quality

Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by Leighton Consulting, Inc. prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to Leighton Consulting, Inc. or mixed with other soils to achieve satisfactory fill material.

D-3.2 Oversize

Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 6 inches (15 cm), shall not be buried or placed in fill unless location, materials and placement methods are specifically accepted by Leighton Consulting, Inc.. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 feet (3 m) measured vertically from finish grade, or within 2 feet (0.61 m) of future utilities or underground construction.

D-3.3 Import

If importing of fill material is required for grading, proposed import material shall meet the requirements of Section D-3.1, and be free of hazardous materials ("contaminants") and rock larger than 3-inches (8 cm) in largest dimension. All import soils shall have an Expansion Index (EI) of 20 or less and a sulfate content no greater than (≤) 500 parts-per-million (ppm). A representative sample of a potential import source shall be given to Leighton Consulting, Inc. at least four full working days before importing begins, so that suitability of this import material can be determined and appropriate tests performed.

D-4.0 FILL PLACEMENT AND COMPACTION

D-4.1 Fill Layers

Approved fill material shall be placed in areas prepared to receive fill, as described in Section D-2.0, above, in near-horizontal layers not exceeding 8 inches (20 cm) in loose thickness. Leighton Consulting, Inc. may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers, and only if the building officials with the appropriate jurisdiction approve. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

D-4.2 Fill Moisture Conditioning

Fill soils shall be watered, dried back, blended and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM) Test Method D 1557.

D-4.3 Compaction of Fill

After each layer has been moisture-conditioned, mixed, and evenly spread, each layer shall be uniformly compacted to not-less-than (≥) 90 percent of the maximum dry density as determined by ASTM Test Method D 1557. In some cases, structural fill may be specified (see project-specific geotechnical report) to be uniformly compacted to at-least (≥) 95 percent of the ASTM D 1557 modified Proctor laboratory maximum dry density. For fills thicker than (>) 15 feet (4.5 m), the portion of fill deeper than 15 feet below proposed finish grade shall be compacted to 95 percent of the ASTM D 1557 laboratory maximum density. Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

D-4.4 Compaction of Fill Slopes

In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by back rolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet (1 to 1.2 m) in fill elevation, or by other methods producing satisfactory results acceptable to Leighton Consulting, Inc.. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of the ASTM D 1557 laboratory maximum density.

D-4.5 Compaction Testing

Field-tests for moisture content and relative compaction of the fill soils shall be performed by Leighton Consulting, Inc.. Location and frequency of tests shall be at our field representative(s) discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

D-4.6 Compaction Test Locations

Leighton Consulting, Inc. shall document the approximate elevation and horizontal coordinates of each density test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that Leighton

Consulting, Inc. can determine the test locations with sufficient accuracy. Adequate grade stakes shall be provided.

D-5.0 EXCAVATION

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by Leighton Consulting, Inc. during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by Leighton Consulting, Inc. based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, then observed and reviewed by Leighton Consulting, Inc. prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by Leighton Consulting, Inc..

D-6.0 TRENCH BACKFILLS

D-6.1 Safety

The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations. Work should be performed in accordance with Article 6 of the *California Construction Safety Orders*, 2009 Edition or more current (see also: http://www.dir.ca.gov/title8/sb4a6.html).

D-6.2 Bedding and Backfill

All utility trench bedding and backfill shall be performed in accordance with applicable provisions of the 2018 Edition of the *Standard Specifications for Public Works Construction* (Green Book). Bedding material shall have a Sand Equivalent greater than 30 (SE>30). Bedding shall be placed to 1-foot (0.3 m) over the top of the conduit, and densified by jetting in areas of granular soils, if allowed by the permitting agency. Otherwise, the pipe-bedding zone should be backfilled with Controlled Low Strength Material (CLSM) consisting of at least one sack of Portland cement per cubic-yard of sand, and conforming to Section 201-6 of the 2018 Edition of the *Standard Specifications for Public Works Construction* (Green Book). Backfill over the bedding zone shall be placed and densified mechanically to a minimum of 90 percent of relative compaction (ASTM D 1557) from 1 foot (0.3 m) above the top of the conduit to the surface. Backfill above the pipe zone shall **not** be jetted. Jetting of the bedding around the conduits shall be observed by Leighton Consulting, Inc. and backfill above the pipe zone (bedding) shall be observed and tested by Leighton Consulting, Inc..

D-6.3 Lift Thickness

Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to Leighton Consulting, Inc. that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method, and only if the building officials with the appropriate jurisdiction approve.

Appendix IS-3.2

Supplemental Percolation Study

SUPPLEMENTAL PERCOLATION STUDY
9000 AIRPORT BOULEVARD
CITY OF LOS ANGELES, CALIFORNIA

Prepared for

REXFORD INDUSTRIAL REALTY & MANAGEMENT, INC.
11620 WILSHIRE BOULEVARD, SUITE 610
LOS ANGELES, CALIFORNIA 90025

Prepared by

LEIGHTON CONSULTING, INC.
2600 MICHELSON DRIVE, SUITE 400
IRVINE, CALIFORNIA 92612

Project Number 13837.002

September 22, 2023

September 22, 2023

Project No. 13837.002

Rexford Industrial Realty & Management, Inc.
11620 Wilshire Boulevard, Suite 610
Los Angeles, California 90025

Attention: Mr. Brian Garcia

Subject: Supplemental Percolation Study
9000 Airport Boulevard
City of Los Angeles, California

References: Attached

Per your request and authorization, Leighton Consulting, Inc. (Leighton) prepared this report presenting the results of our supplemental percolation study performed at the project site along with recommendations for design and construction of the proposed storm water management devices.

SITE DESCRIPTION AND PROPOSED IMPROVEMENTS

The project site, located at 9000 Airport Boulevard in the city of Los Angeles, is occupied by an existing and active rental car facility (Hertz) with several industrial buildings throughout the site and solar canopies along the southern end of the site. Asphalt concrete (AC) and Portland cement concrete (PCC) paved parking and access is present throughout the site.

Based on discussions with you and the results of our prior exploration performed at the site (Leighton, 2023), we understand that Rexford would like to evaluate the feasibility for deep stormwater infiltration devices (drywells) to be installed in the western portion of the site. Accordingly, we recently performed a supplemental field exploration that included additional percolation testing at the site.

FIELD EXPLORATION

Soil Borings and Temporary Well Installations

Our supplemental subsurface exploration was performed on August 29 and September 8, 2023; which included drilling, logging, and sampling of two (2) 8-inch-diameter hollow-stem auger borings (LP-3 and LP-4) to a depth of approximately 30 feet below ground surface (bgs). The borings were drilled in the western portion of the site at the same locations as the prior percolation tests to evaluate the infiltration characteristics of the subsurface soils at a greater depth. The borings were then converted to temporary test wells for percolation testing. The percolation test wells consisted of a 2-inch-diameter, 0.020-inch slotted PVC pipe within the zone to be tested (bottom 20 to 30 feet of the test wells). The filter pack material surrounding the slotted section of pipe consisted of No. 3 Monterey sand and extended from the bottom of the boring to approximately 3 to 4 feet above the test zone.

The approximate locations of the borings are shown on Figure 1, *Exploration Location Map*, and copies of the boring logs are included in Appendix A, *Exploration Logs*.

Laboratory Testing

Laboratory tests were performed on selected soil samples obtained from the borings during our field investigation. Tests performed during this investigation include:

- In- situ Moisture Content and Dry Density (ASTM D2216 and ASTM D2937) and
- Particle-size Analysis of Soils (ASTM D 7928 & D 6913).

Results of the in-situ moisture content and dry density testing are presented on the boring logs in Appendix A. Other laboratory test results are presented in Appendix B, *Laboratory Test Results*.

Percolation Testing

In-situ percolation testing was performed on September 8, 2023 in general accordance with the County of Los Angeles Department of Public Works (LADPW) *Guidelines for Geotechnical Investigation and Reporting, Low Impact Development Stormwater Infiltration* (LADPW, 2021). A constant-head (high flowrate) test was performed at test wells LP-3 and LP-4 due to the permeable characteristics of the site soils. Detailed results of the field-testing data for the tests performed are presented in Appendix C, *Percolation Test Data*. Upon completion of the percolation testing, the well casing was removed from the borings, and the borings were backfilled with soil cuttings and completed at the surface with cold-mix AC to match existing site conditions.

SUBSURFACE CONDITIONS

Soils

Based on our subsurface explorations, a layer of undocumented artificial fill materials (Afu) was encountered overlying Quaternary-aged (Late to Middle Pleistocene) old eolian and dune deposits (Qoe). The undocumented artificial fill encountered in borings LP-3 and LP-4 ranged from approximately 4 to 7 feet in thickness, likely associated with the existing and previous site improvements. The fill soils consist primarily of clayey sand, sandy clay, and clay. Below the artificial fill materials, old eolian and dune deposits (Qoe) were encountered in the borings to the maximum depth explored. The Qoe deposits encountered generally consist of olive brown to reddish-brown, slightly moist to moist, very stiff to hard clay with varying amounts of silt and sand. Below approximately 15 feet in depth at borings LP-3 and LP-4, the Qoe deposits consist of yellow brown, medium dense to very dense sand and clayey sand. Detailed descriptions of the subsurface materials encountered in the borings are presented on the attached boring logs (Appendix A).

Groundwater

Groundwater was not encountered at the site during our recent and prior subsurface explorations performed at the site to the maximum depth of 50 feet bgs. Based on review of the *Seismic Hazard Zone Report for the Venice Quadrangle* (CGS, 1998), the historically shallowest groundwater depth at the site is greater than 40 feet bgs.

Fluctuations of the groundwater level, localized zones of perched water, and an increase in soil moisture, should be anticipated during and following the rainy seasons or periods of locally intense rainfall, storm water runoff, or from stormwater infiltration.

PERCOLATION TESTING RESULTS

A boring percolation test is useful for field measurements of the infiltration rate of soils and is suited for testing when the design depth of the infiltration device is deeper than current existing grades, especially in areas where it is difficult to dig test pits, or where the depths of these test pits would be considerably deep. At the subject site, testing consisted of advancing the borings to general depths anticipated for the invert of typical infiltration devices.

A constant-head test, or high flowrate test, was implemented at test wells LP-3 and LP-4 due to the permeable characteristics of the site soils. The infiltration rate was calculated by recording the approximate volume of water delivered to the test zone while maintaining a relatively constant height of water in the well over the testing period. A water source (garden hose from onsite hose spigot) was used to deliver water to the wells at a relatively constant rate. The measured infiltration rate was calculated according to the procedure for a high flowrate percolation test, by dividing the total volume of water by the total duration of the test and dividing by the percolation surface area.

Per County of Los Angeles Guidelines (LADPW, 2021), the design infiltration rate incorporates a reduction factor for the test procedure, site variability, number of tests, thoroughness of subsurface investigation and long-term siltation, plugging and maintenance. As such, we have applied an appropriate reduction factor of 5 (minimum) to the small-scale infiltration rates measured at test wells LP-3 and LP-4 for use in design of the system(s) according to County of Los Angeles Guidelines (LADPW, 2021).

Detailed results of the field testing data, measured infiltration rate and design infiltration rate for the tests performed are presented in Appendix C. The test results are summarized in the table below:

Table 1 – Infiltration Rate

Test Well Designation	Depth of Test Zone (feet bgs)	Measured Infiltration Rate (inches per hour)	Design Infiltration Rate (inches per hour)
LP-3	27 to 30	86.6	17.3
LP-4	25 to 30	81.5	16.3

Based on the results of our field percolation testing that was performed at the site, the measured (unfactored) infiltration rates for the two (2) tests performed were 86.6 inches per hour (LP-3) and 81.5 inches per hour (LP-4). The design infiltration rates for the two (2) tests performed at the site are 17.3 inches per hour for LP-3 and 16.3 inches per hour for LP-4.

INFILTRATION BMP DESIGN CONSIDERATIONS

Per County of Los Angeles G*uidelines for Geotechnical Investigation and Reporting – Low Impact Development Stormwater Infiltration* (LADPW, 2021), we have applied a reduction factor to the measured infiltration rates to be used in design of the infiltration system.

In general, a vast majority of geotechnical distress issues are related to improper drainage. Distress in the form of foundation movement could occur. Direct infiltration to the subsurface is not recommended adjacent to curb and gutter, public pavements or within 10 feet away from the design saturation zone as soil saturation could lead to a loss of soil support, settlement or collapse, and internal erosion (piping). The design saturation zone may be assumed as a 1:1 plane projected downward from the top of an infiltration device's discharge zone. Additionally, infiltration water will migrate along pipe backfill (typically sand or gravel bedding) affecting improvements far from the point of infiltration. Proposed direct open bottom infiltration systems, should be located as far away from existing or proposed foundations, rigid improvements and utilities as is practical in order to reduce the geotechnical distress issues related to water. Where sufficient distance from improvements cannot be achieved, additional recommendations may be warranted and can be provided during plan review.

Prior to construction of any infiltration device intended for the site, the plans should be reviewed by the geotechnical consultant to verify that our geotechnical recommendations have been appropriately incorporated into the plans, and the existing and adjacent site improvements are not compromised by the addition of an infiltration system to the site. The designer of any infiltration system should contact the geotechnical consultant for geotechnical input during the design process as they feel necessary.

CLOSING

We appreciate the opportunity to be of service to Rexford Industrial Realty & Management, Inc. If you have any questions or concerns, please contact us at your convenience. The undersigned can be reached at **(866) *LEIGHTON***, specifically at the phone extensions and e-mail addresses listed below.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Jeffrey Pflueger, CEG 2499
Associate Geologist
Ext 4257, jpflueger@leightongroup.com

Carl C. Kim, GE 2620
Senior Principal Engineer
Ext: 4262, ckim@leightongroup.com

MM/JMP/CCK/lr

Attachments: References
Figure 1 – Exploration Location Map
Appendix A – Exploration Logs
Appendix B – Laboratory Test Results
Appendix C – Percolation Test Data

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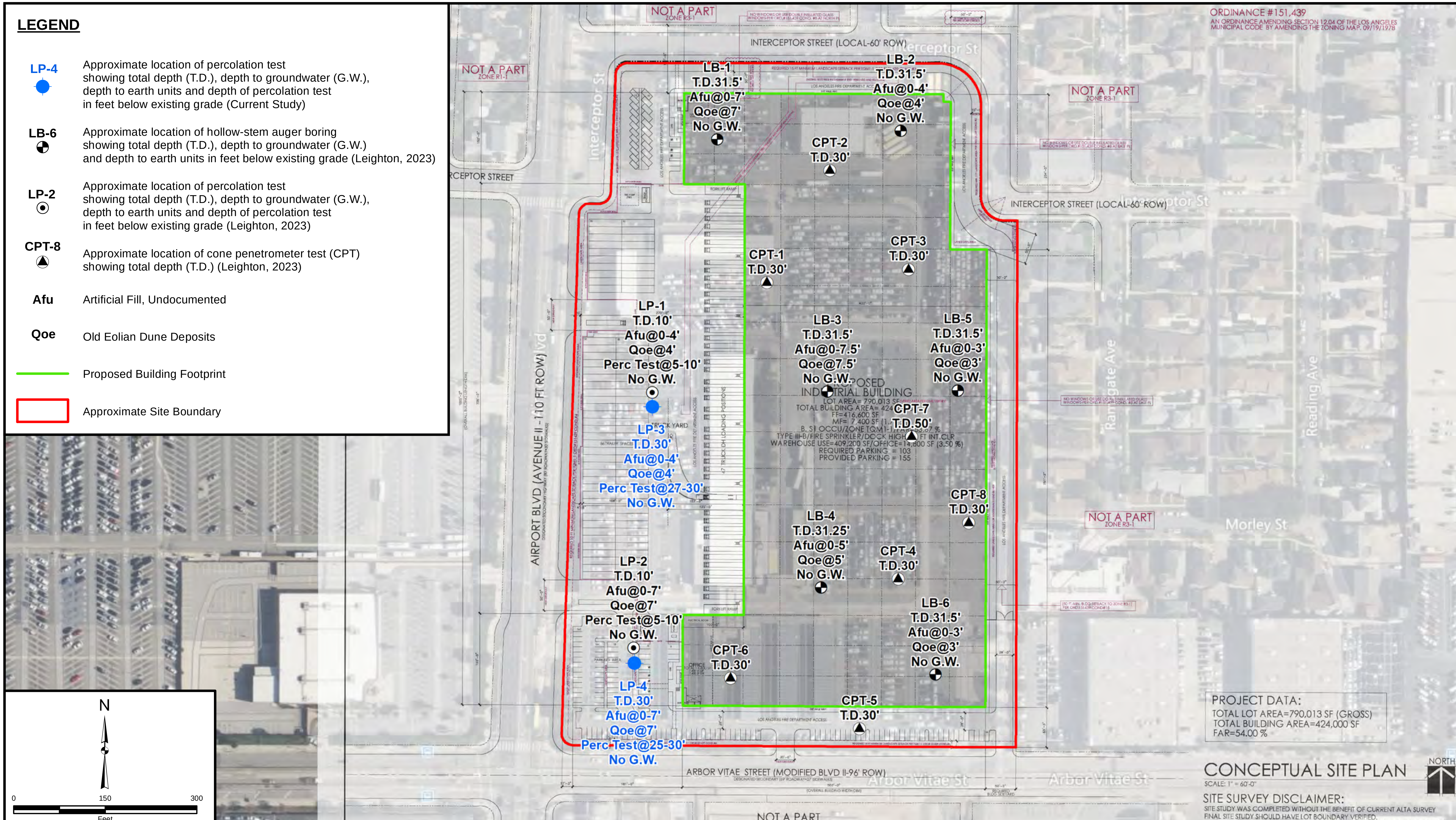

Project: 13837.002	Eng/Geol: CCK/JMP
Scale: 1 " = 150 '	Date: September 2023

Reference: Conceptual Site Plan, Sheet A1-0
Dated: 01/31/2023 by Rexford Industrial

EXPLORATION LOCATION MAP

Proposed Industrial Building
9000 Airport Boulevard
City of Los Angeles, California

FIGURE 1

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Map Saved as J:\Drafting\13837\002\Maps\13837-002_F01_ELM_2023-09-21.mxd on 9/20/2023 4:58:00 PM Author: KVM (btran)

APPENDIX A

EXPLORATION LOGS

GEOTECHNICAL BORING LOG LP-3

Project No.	13837.002	**Date Drilled**	8-29-23
Project	Rexford LA Airport Boulevard	**Logged By**	MM/LM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	107'
Location	See Figure 1 - Exploration Location Map	**Sampled By**	MM/LM

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0								@Surface: 6.5 inches of asphalt concrete	
				B-1				SC	**Artificial Fill, Undocumented (Afu)** @0.54': Clayey SAND, olive, brown, moist	
105									@2': Clayey SAND, olive brown, moist, fine sand, trace fine gravel, mottled appearance	
								CL	@3': CLAY, light brown and olive brown, very moist, low to medium plasticity, trace fine gravel, easy to hand auger through, soil felt soft	
	5			R-1	6 13 26	111	18		**Quaternary Age Old Eolian and Dune Deposits (Qoe)** @4': Reddish brown CLAY @5': CLAY, hard, reddish brown, moist, medium plasticity, CaCO3 stringers	
100				S-2	8 13 25		17	sCL	@7': Sandy CLAY, hard, reddish brown, moist, trace fine gravel, trace MnO, massive	
	10			R-3	8 28 50/6"	124	12		@10': Sandy CLAY, hard, reddish brown, moist, trace fine gravel, trace MnO, massive	
95										
	15			S-4	3 7 8		7	SP	@15': Poorly graded SAND, medium dense, light yellow brown, moist, fine sand, trace MnO spots	
90										
	20			R-5	12 26 40	107	3	SP	@20': Poorly graded SAND, very dense, light yellow brown, fine to medium sand, mostly fine sand, trace FeO spots	
85										
	25			S-6	8 13 16		3		@25': Dense, FeO bands throughout	
80										
				R-7	16 42 50/4"	102	3		@28.5': Very dense	SA
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LP-3

Project No.	13837.002	**Date Drilled**	8-29-23
Project	Rexford LA Airport Boulevard	**Logged By**	MM/LM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	107'
Location	See Figure 1 - Exploration Location Map	**Sampled By**	MM/LM

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30								**Total Depth: 30 feet bgs** **No groundwater encountered during drilling.** **Installed temporary percolation well consisting of 2-inch diameter PVC well casing.** **Solid casing installed from 0-20 feet bgs and 0.020-inch screened casing from 20-30 feet bgs.** **#3 Monterey SAND placed in annulus from 17-30 feet bgs.** **Upon completion of percolation testing, casing was pulled and the boring was backfilled with soil cuttings and patched with cold-mix asphalt.** **Excess soil cuttings were drummed for offsite disposal.**	
75										
	35									
70										
	40									
65										
	45									
60										
	50									
55										
	55									
50										
	60									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LP-4

Project No.	13837.002	**Date Drilled**	9-8-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	106'
Location	See Figure 1 - Exploration Location Map	**Sampled By**	ECB

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0							@Surface: 2.5 inches of asphalt concrete over 5 inches of aggregate base	
105			B-1				CL	**Artificial Fill, Undocumented (Afu)** @0.62': Sandy CLAY, brown to reddish brown, very moist, fine to coarse sand, some gravel, medium plasticity, mottled	
100	5		R-1	6 6 13	118	12		@5': Very stiff, dark brown to black @6': Lean CLAY, very stiff, reddish brown to orange brown, moist, some fine sand, medium to high plasticity, contains FeO specs throughout	
								Quaternary Age Old Eolian and Dune Deposits (Qoe)	
95	10		S-2	6 10 14		15	ML-CL	@10': Silty CLAY, very stiff, olive brown, slightly moist, low plasticity, precipitates throughout	
90	15		R-3	6 9 19	115	13	SC	@15': Clayey SAND, very stiff, yellow brown, moist, fine to medium sand, low plasticity clay, micas, trace FeO specs	
85	20		S-4	3 8 10		4	SP	@20': Poorly graded SAND, medium dense, yellow brown, moist, primarily fine to medium sand, trace fines, slight oxidation	
80	25		R-5	10 23 32	106	3	SP-SM	@25': Poorly graded SAND with silt, dense, orange brown, slightly moist, primarily fine to medium sand, few coarse sand, trace fines	SA
			S-6	4 9 12		4		@28.5': Dense	
	30								

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
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- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LP-4

Project No.	13837.002	**Date Drilled**	9-8-23
Project	Rexford LA Airport Boulevard	**Logged By**	ECB
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	106'
Location	See Figure 1 - Exploration Location Map	**Sampled By**	ECB

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
75	30								**Total Depth: 30 feet bgs** **No groundwater encountered during drilling.** **Installed temporary percolation well consisting of 2-inch diameter PVC well casing.** **Solid casing installed from 0-20 feet bgs and 0.020-inch screened casing from 20-30 feet bgs.** **#3 Monterey SAND placed in annulus from 17-30 feet bgs.** **Upon completion of percolation testing, casing was pulled and the boring was backfilled with soil cuttings and patched with cold-mix asphalt.** **Excess soil cuttings were drummed for offsite disposal.**	
70	35									
65	40									
60	45									
55	50									
50	55									
	60									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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APPENDIX B

LABORATORY TEST RESULTS

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 7928 & D 6913

Project Name:	Rexford LA Airport Blvd	Tested By:	GEB/JD	Date:	09/18/23
Project No.:	13837.002	Checked By:	J. Ward	Date:	09/20/23
Boring No.:	LP-3				
Sample No.:	R-7	Depth (feet):	30.0		
Soil Identification:	Olive yellow poorly-graded sand (SP)				

		Soil Type
% Gravel	**0**	
% Sand	**96**	**SP**
% Fines	**4**	

			Moisture Content of Total Air-Dry Soil	Moisture Content of Oven-Dry Soil Passing #10	After Hydrometer & Wet Sieve ret. in #200 Sieve
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(g)	0.00	81.30	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (g)	0.00	81.29	174.10
Wt.of Air-Dry Soil + Cont. (g)	424.73	Wt. of Container No.___ (g)	1.00	59.13	74.36
Wt. of Container	75.34	Moisture Content (%)	0.00	0.05	
Dry Wt. of Soil (g)	349.39	Wt. of Dry Soil (g)			99.74

Coarse Sieve

U.S. Sieve	Cumulative Wt. Of Dry Soil Retained (g)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

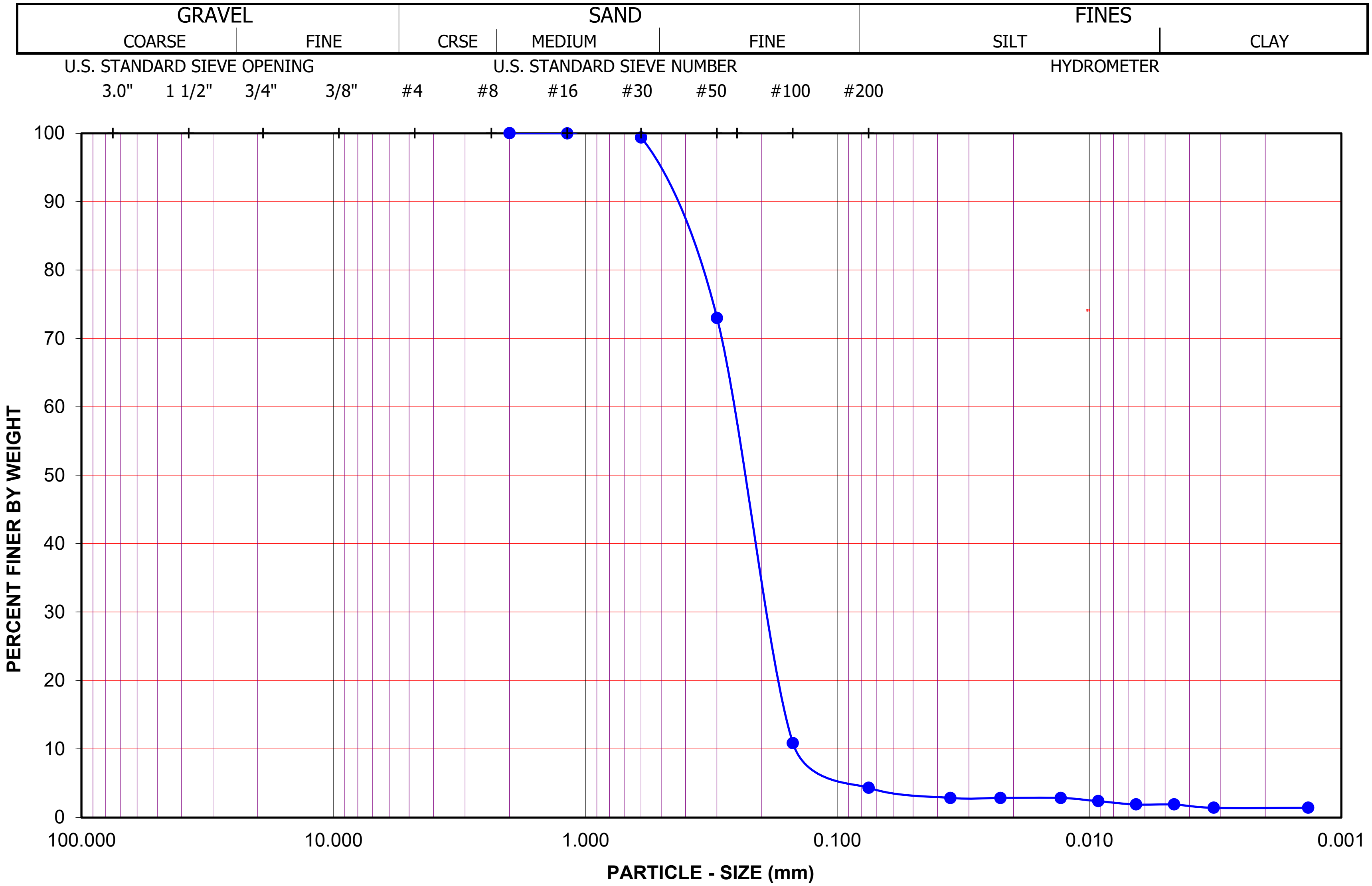
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. Of Dry Soil Retained (g)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.03	100.0	100.0
No. 30	0.66	99.4	99.4
No. 50	28.06	73.0	73.0
No. 100	92.63	10.9	10.9
No. 200	99.38	4.4	4.4
Pan			

Hydrometer Wt. of Air-Dry Soil (g) 103.96 Wt. of Dry Soil (g) 103.91

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature (°C)	Composite Correction 152H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
18-Sep-23	6:50	0		7.0			
	6:52	2	22.5	7.0	10.0	2.9	0.0356
	6:55	5	22.5	7.0	10.0	2.9	0.0225
	7:05	15	22.6	7.0	10.0	2.9	0.0130
	7:20	30	22.5	7.0	9.5	2.4	0.0092
	7:50	60	22.3	7.0	9.0	1.9	0.0065
	8:50	120	22.2	7.0	9.0	1.9	0.0046
	11:00	250	22.1	7.0	8.5	1.4	0.0032
19-Sep-23	6:50	1440	21.0	7.0	8.5	1.4	0.0014



Project Name: Rexford LA Airport Blvd

Project No.: 13837.002

Boring No.: LP-3 Sample No.: R-7

Depth (feet): 30.0 Soil Type : SP

Soil Identification: Olive yellow poorly-graded sand (SP)

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PARTICLE - SIZE DISTRIBUTION
ASTM D 7928 & D 6913

GR:SA:FI : (%) 0 : 96 : 4

Sep-23

PARTICLE-SIZE ANALYSIS OF SOILS

ASTM D 7928 & D 6913

Leighton

Project Name:	Rexford LA Airport Blvd	Tested By:	GEB/JD	Date:	09/18/23
Project No.:	13837.002	Checked By:	J. Ward	Date:	09/20/23
Boring No.:	LP-4				
Sample No.:	R-5	Depth (feet):	25.0		
Soil Identification:	Olive yellow poorly-graded sand with silt (SP-SM)				

% Gravel	**0**	**Soil Type**
% Sand	**94**	**SP-SM**
% Fines	**6**	

			Moisture Content of Total Air-Dry Soil	Moisture Content of Oven-Dry Soil Passing #10	After Hydrometer & Wet Sieve ret. in #200 Sieve
Specific Gravity (Assumed)	2.70	Wt.of Air-Dry Soil + Cont.(g)	0.00	75.82	
Correction for Specific Gravity	0.99	Dry Wt. of Soil + Cont. (g)	0.00	75.81	176.35
Wt.of Air-Dry Soil + Cont. (g)	330.57	Wt. of Container No.___ (g)	1.00	59.57	78.89
Wt. of Container	75.45	Moisture Content (%)	0.00	0.06	
Dry Wt. of Soil (g)	255.12	Wt. of Dry Soil (g)			97.46

Coarse Sieve

U.S. Sieve	Cumulative Wt. Of Dry Soil Retained (g)	% Passing
3"	0.00	100.0
1½"	0.00	100.0
3/4"	0.00	100.0
3/8"	0.00	100.0
No. 4	0.00	100.0
No. 10	0.00	100.0
Pan		

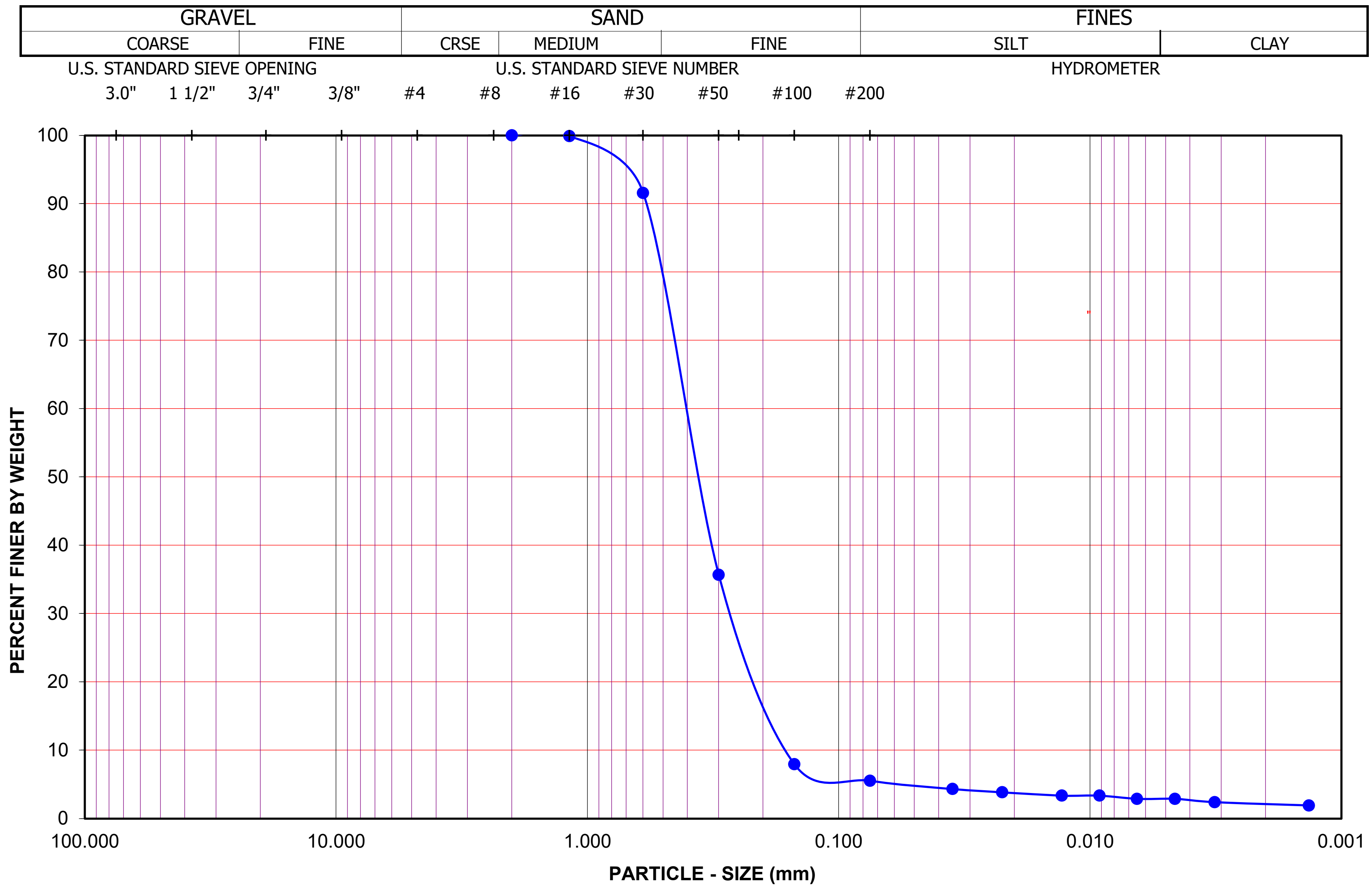
Sieve after Hydrometer & Wet Sieve

U.S. Sieve Size	Cumulative Wt. Of Dry Soil Retained (g)	% Passing	% Total Sample
No. 10	0.00	100.0	100.0
No. 16	0.09	99.9	99.9
No. 30	8.66	91.6	91.6
No. 50	66.26	35.7	35.7
No. 100	94.83	7.9	7.9
No. 200	97.31	5.5	5.5
Pan			

Hydrometer Wt. of Air-Dry Soil (g) 103.08 Wt. of Dry Soil (g) 103.02

Deflocculant 125 cc of 4% Solution

Date	Time	Elapsed Time (min)	Water Temperature (°C)	Composite Correction 152H	Actual Hydrometer Readings	% Total Sample (%)	Soil Particle Diameter (mm)
18-Sep-23	6:46	0		7.0			
	6:48	2	22.4	7.0	11.5	4.3	0.0352
	6:51	5	22.4	7.0	11.0	3.9	0.0223
	7:01	15	22.4	7.0	10.5	3.4	0.0129
	7:16	30	22.3	7.0	10.5	3.4	0.0092
	7:46	60	22.1	7.0	10.0	2.9	0.0065
	8:46	120	22.0	7.0	10.0	2.9	0.0046
	10:56	250	22.0	7.0	9.5	2.4	0.0032
19-Sep-23	6:46	1440	21.1	7.0	9.0	1.9	0.0013



Project Name: Rexford LA Airport Blvd

Project No.: 13837.002

Boring No.: LP-4 Sample No.: R-5

Depth (feet): 25.0 Soil Type : SP-SM

Soil Identification: Olive yellow poorly-graded sand with silt (SP-SM)

PARTICLE - SIZE DISTRIBUTION ASTM D 7928 & D 6913

GR:SA:FI : (%) 0 : 94 : 6

Sep-23

APPENDIX C

PERCOLATION TEST DATA

Boring Percolation Test Data Sheet

Project Number:	13837.002	**Test Hole Number:**	LP-3
Project Name:	Rexford LA Airport Blvd	**Date Excavated:**	8/29/2023
Earth Description:	Alluvium	**Date Tested:**	9/8/2023
Liquid Description:	Tap water	**Depth of boring (ft):**	30
Tested By:	JMW	**Radius of boring, r (in):**	4
Time Interval Standard		**Radius of casing (in):**	1
Start Time for Pre-Soak:	7:00 AM	**Length of slotted of casing (ft):**	10
Start Time for Standard:	7:30 AM	**Porosity of Annulus Material, *n* :**	0.35
Standard Time Interval Between Readings, mins:	15	**Bentonite Plug at Bottom:**	No

Field Percolation Data - High-Flow Constant Head Test

Reading	Time	Time Interval, Δt (minutes)	Depth to Water (feet bgs)	Water Height, H (inches)	Cumulative Water Volume Delivered (gallons)
1	7:30	-	-	-	0.0
2	7:45	15	26.73	39.2	81.8
3	8:00	15	27.72	27.4	163.6
4	8:15	15	27.39	31.3	245.4
5	8:30	15	27.27	32.8	327.2
6	8:45	15	27.31	32.3	409.1
7	9:00	15	27.20	33.6	490.9
8	9:15	15	27.28	32.6	572.7
9	9:30	15	27.30	32.4	654.5
10	9:45	15	27.26	32.9	736.3
11	10:00	15	27.27	32.8	818.1
12	10:15	15	27.30	32.4	899.9
13	10:30	15	27.24	33.1	981.7
14	10:45	15	27.28	32.6	1063.5

Total Volume of Water Delivered (gallons)	1063.5
Total Volume of Water Delivered (cubic inches)	245675.43
Average Water Height (inches)	32.7
Average Percolation Surface Area (cubic Inches)	872.7
Duration of Test (minutes)	195
Duration of Test (hours)	3.25

$$\text{Measured Infiltration Rate} = (\text{Total Volume})/(\text{Test Duration})/(\text{Surface Area})$$

Measured Infiltration Rate = 86.6 **in./hr.**

Design Infiltration Rate

Reduction Factor from Test Procedure, RF_t =	3
Reduction Factor for Site Variability, # of Tests and Investigation, RF_v =	1
Reduction Factor for Long Term Siltation, Plugging and Maintenance, RF_t =	1
Reduction Factor, RF = $RF_t + RF_v + RF_s$ =	5
Design Infiltration Rate = Measured Infiltration Rate / Reduction Factor (RF) =	17.3 **in./hr.**

Boring Percolation Test Data Sheet

Project Number:	13837.002	**Test Hole Number:**	LP-4
Project Name:	Rexford LA Airport Blvd	**Date Excavated:**	9/8/2023
Earth Description:	Alluvium	**Date Tested:**	9/8/2023
Liquid Description:	Tap water	**Depth of boring (ft):**	30
Tested By:	JMW	**Radius of boring, r (in):**	4
Time Interval Standard		**Radius of casing (in):**	1
Start Time for Pre-Soak:	9:00 AM	**Length of slotted of casing (ft):**	10
Start Time for Standard:	10:45 AM	**Porosity of Annulus Material, *n* :**	0.35
Standard Time Interval Between Readings, mins:	15	**Bentonite Plug at Bottom:**	No

Field Percolation Data - High-Flow Constant Head Test

Reading	Time	Time Interval, Δt (minutes)	Depth to Water (feet bgs)	Water Height, H (inches)	Cumulative Water Volume Delivered (gallons)
1	10:45	-	-	-	0.0
2	11:00	15	26.38	43.4	120.0
3	11:15	15	25.56	53.3	240.0
4	11:30	15	25.52	53.8	360.0
5	11:45	15	25.49	54.1	480.0
6	12:00	15	25.48	54.2	600.0
7	12:15	15	25.50	54.0	720.0
8	12:30	15	25.56	53.3	840.0
9	12:45	15	25.68	51.8	960.0
10	13:00	15	25.74	51.1	1080.0
11	13:15	15	25.91	49.1	1200.0
12	13:30	15	25.65	52.2	1320.0
13	13:45	15	25.60	52.8	1440.0
14	14:00	15	25.48	54.2	1560.0

Total Volume of Water Delivered (gallons)	1560.0
Total Volume of Water Delivered (cubic inches)	360360
Average Water Height (inches)	52.1
Average Percolation Surface Area (cubic Inches)	1359.9
Duration of Test (minutes)	195
Duration of Test (hours)	3.25

$$\text{Measured Infiltration Rate} = (\text{Total Volume})/(\text{Test Duration})/(\text{Surface Area})$$

Measured Infiltration Rate = 81.5 in./hr.

Design Infiltration Rate

Reduction Factor from Test Procedure, RF_t = 3

Reduction Factor for Site Variability, # of Tests and Investigation, RF_v = 1

Reduction Factor for Long Term Siltation, Plugging and Maintenance, RF_t = 1

Reduction Factor, $RF = RF_t + RF_v + RF_s$ = 5

Design Infiltration Rate = Measured Infiltration Rate / Reduction Factor (RF) = 16.3 in./hr.