GEOTECHNICAL EXPLORATION REPORT
PROPOSED HOSPITAL EXPANSION PROJECT
HOAG HOSPITAL IRVINE
16200 SAND CANYON AVENUE
IRVINE, CALIFORNIA

Prepared for:

HOAG MEMORIAL
HOSPITAL PRESBYTERIAN

510 Superior Avenue, Suite 290
Newport Beach, California 92663

Project No. 11753.004

February 27, 2020
(Revised March 11, 2020)

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

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Hoag Memorial Hospital Presbyterian
510 Superior Avenue, Suite 290
Newport Beach, California 92663

Attention: Ms. Karen Costello, Sr. Facility Planner

Subject: Geotechnical Exploration Report
Proposed Hospital Expansion Project
Hoag Hospital Irvine
16200 Sand Canyon Avenue
Irvine, California

In response to your request and authorization, Leighton Consulting, Inc. (Leighton) is pleased to present this geotechnical exploration report for the subject project. The purpose of our work was to evaluate the soil and groundwater conditions at the site through review of available data and subsurface explorations in order to provide geotechnical recommendations to aid in design and construction for the project as currently proposed. This report has been revised to include foundation recommendations for ancillary site structures.

The proposed expansion project will include construction of three (3) new parking structures, three (3) new inpatient hospital buildings, four (4) new hospital support facility buildings, emergency department (ED) expansion with pharmacy, pathology lab and intensive care unit (ICU), new central utility plant, auditorium building, two (2) tunnels connecting to the new hospital buildings, lobby expansion, loading area expansion, surface parking, and utility infrastructure improvements.

Based on our exploration and analysis, the proposed improvements are considered feasible from a geotechnical standpoint. Presented in this report are findings and geotechnical recommendations to aid in the design and construction of the proposed improvements.

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We appreciate this opportunity to be of service. If you have any questions regarding this report or if we can be of further service, please call us at your convenience at **(866) *LEIGHTON***, directly at the phone extensions or e-mail addresses listed below.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

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1.0 INTRODUCTION

1.1 Site Location and Proposed Expansion

The site for the existing Hoag Hospital Irvine is located at 16200 Sand Canyon Avenue in the City of Irvine, California. The site is bordered by Sand Canyon Avenue to the northwest; Alton Parkway to the southwest; San Diego Creek Channel to the northeast; and an existing commercial property containing vacant land, existing asphalt paved parking and above ground high voltage electrical power lines with associated towers to the southeast. The proposed expansion areas are located throughout the site, primarily within existing paved parking areas to the north, south, east, and west of the existing main hospital buildings. The site location (latitude 33.6606°, longitude -117.7719°) and immediate vicinity are shown on Figure 1, *Site Location Map.*

The project site is relatively flat and currently used as asphalt concrete paved staff and patient parking lots surrounding the centrally located main hospital buildings. According to the United States Geologic Survey (USGS) Tustin 7.5 Minute Series Quadrangle (USGS, 1981), the ground surface at the site ranges from approximately Elevation +151 to +157 feet mean sea level. The existing San Diego Creek Channel is located adjacent to and northeast of the project site. A slope descends to the northeast of the site toward the channel approximately 15 to 20 feet vertically at variable inclinations that are generally steeper than 2:1 (horizontal:vertical).

Based on review of the *HHIX 3.0 Master Plan / Enlarged Campus Plan* prepared by LPA, dated December 4, 2019, the proposed expansion project will include construction of three (3) new parking structures, three (3) new inpatient hospital buildings, four (4) new hospital support facility buildings, emergency department (ED) expansion with pharmacy, pathology lab and intensive care unit (ICU), new central utility plant, auditorium building, two (2) tunnels connecting to the new hospital buildings, lobby expansion, loading area expansion, surface parking, and utility infrastructure improvements. Loading information for the proposed structures was not available at the time of this evaluation. However, it is our understanding that several buildings will be supported on foundations established partly at ground level and partly at basement level.

The *HHIX 3.0 Site Plan* dated February 17, 2020 prepared by LPA was used as the base map for Plate 1, *Exploration Location Map,* included with this report. It is

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our understanding that the improvements located in the southwestern portion of the site, including one (1) parking structure, two (2) hospital support facility buildings, one (1) inpatient hospital building and the auditorium building, will be part of a future phase of the project. Of these, only the parking structure is shown on Plate 1 in the southern corner of the site.

1.2 Purpose and Scope

The purpose of our work was to evaluate the soil and groundwater conditions at the site through review of available data and subsurface explorations in order to provide geotechnical recommendations to aid in design and construction for the project as currently proposed. The scope of this geotechnical evaluation included the following tasks:

- *Background Review* – In preparation of this report, we performed a review of readily available geotechnical and geological literature pertinent to the project. References used in preparation of this report are listed in Section 6.0.

- *Field Exploration* – Prior to performing the subsurface exploration, reconnaissance of the site was carried out by Leighton personnel. The locations of proposed borings were marked on the ground surface. Hoag Hospital and Underground Service Alert (USA) were notified to provide clearance for any underground utility lines.

  Our field exploration was performed on January 8, 9, and 15, 2020, and consisted of six (6) hollow-stem auger borings (designated LB-1-2020 through LB-6-2020) drilled to depths of approximately 51.5 feet below existing ground surface (bgs). In addition to the hollow-stem auger borings, eight (8) Cone Penetrometer Test (CPT) soundings were advanced at the site (designated C-1 through C-8) to depths between approximately 27.5 and 50.7 feet bgs. It should be noted that CPT-3 encountered refusal at 27.5 feet bgs, the only CPT that did not reach the target depth of approximately 50 feet bgs. Shear wave velocity measurements were taken at C-2 and C-5 (See Table 1) to develop seismic design parameters. Approximate locations of the borings are shown on Plate 1, *Exploration Location Map*.

  During drilling of the hollow-stem auger borings, bulk and drive samples were obtained from the borings for geotechnical laboratory testing and evaluation. Drive samples were collected from the borings using a Modified California Ring sampler in accordance with ASTM Test Method D3550. Standard Penetration

Tests (SPTs) were also performed within the hollow-stem auger borings in accordance with ASTM Test Method D1586. The samplers were driven for a total penetration of 18 inches, unless practical refusal was encountered, using a 140-pound automatic hammer falling freely for 30 inches. The number of blows per 6 inches of penetration was recorded on the boring logs.

The borings were logged in the field by a member of our technical staff. 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 with cement-bentonite grout to the ground surface and patched at the surface with rapid-set concrete. Logs of the borings are presented in Appendix A, *Geotechnical Boring and CPT Logs*.

The CPT soundings were performed in accordance with ASTM D5778 advanced by a 30-ton CPT rig in which a standard cone equipped with a 15 cm^2 tip was advanced at a constant rate of approximately 1 inch per second.

The CPT provides a continuous record of the subsurface stratigraphy via data regarding tip and sleeve resistance which is continuously recorded electronically as the probe is advanced through the subsurface stratigraphy. The recorded data is processed yielding interpretations of soil type based upon the anticipated engineering behavior of the various soil strata though which the probe penetrates. Graphical logs of the interpreted soil conditions at the CPT sounding locations are included in Appendix A

- *<u>Laboratory Testing</u>* – Geotechnical laboratory tests were conducted on selected bulk and relatively undisturbed drive soil samples obtained during our field exploration. The laboratory testing program was designed to evaluate the engineering characteristics of the onsite soil and included in-situ moisture content and dry density, direct shear, consolidation, Expansion Index, R-value, maximum density and optimum moisture content, and corrosivity (sulfate and chloride content, minimum resistivity, and pH). The laboratory tests results are presented in Appendix B, *Laboratory Test Results*.

- *<u>Engineering Analysis</u>* – Geotechnical analysis was performed on the collected data to develop conclusions and geotechnical recommendations for design and construction of the planned improvements.

- *Report Preparation* – This report presents our findings, conclusions and recommendations for the proposed Hospital Expansion Project. It should be noted that the recommendations contained in this report are subject to the limitations presented in Section 5.0. An information sheet prepared by GBA (Geoprofessional Business Association) is also included at the end of the report text. We recommend that all individuals using this report read the limitations along with the attached information sheet.

1.3 Previous Studies

In 1984, Converse Consultants, Inc. (Converse) performed a geotechnical exploration for the proposed Irvine Medical Center located to at the northeast corner of Sand Canyon Avenue and Barranca Road (Converse, 1984). As a part of that investigation, eight (8) rotary wash borings were drilled at the site to depths between approximately 28 and 75 feet bgs and geotechnical laboratory testing was performed on selected samples. In 1985, ten (10) additional rotary wash borings were drilled at the site by Converse to depths between approximately 26 and 71 feet bgs and geotechnical laboratory testing was performed on selected samples (Converse, 1985). Approximate locations of the previous borings by Converse are shown on Plate 1 and copies of the previous boring logs and laboratory test results by Converse (1984 and 1985) are included in Appendix C.

In 2014, Leighton performed a geotechnical exploration for the proposed Emergency Department Expansion Project located to at the eastern side of the existing centrally located main hospital building (Leighton, 2015). As a part of that investigation, three (3) hollow-stem auger borings were drilled at the site to depths between approximately 6 and 61.5 feet bgs and geotechnical laboratory testing was performed on selected samples. In 2016, Leighton performed a supplemental geotechnical exploration that included two (2) additional hollow-stem auger borings were drilled at the site to approximately 51.5 feet bgs and geotechnical laboratory testing was performed on selected samples (Leighton, 2016a). In 2017, Leighton performed a geotechnical exploration for the proposed Hospital Expansion Project (at that time) that included drilling of three (3) hollow-stem auger borings drilled to depths between 46.5 and 51.5 feet bgs, and one (1) percolation test boring drilled to approximately 10 feet bgs and tested for infiltration feasibility between 5 and 10 feet bgs (Leighton, 2017). Geotechnical laboratory testing was performed on selected samples. In addition to the hollow-stem auger borings, fourteen (14) Cone Penetrometer Test (CPT) soundings, advanced to depths between 22 and 88 feet bgs. Approximate locations of the previous explorations by Leighton are shown on Plate 1 and copies of the previous boring logs, laboratory test results and percolation test results by Leighton (2015, 2016a and 2017) are included in Appendix D.

2.0 GEOTECHNICAL FINDINGS

2.1 Geologic Setting

The project site lies at the southern end of a broad coastal plain, in a region referred to as the Tustin Plain by Singer (1972 and 1973). The Tustin Plain is part of the southern coastal section of the Peninsular Ranges geomorphic province of California, which extends 900 miles southward from the Los Angeles basin to the tip of Baja California (Yerkes, et al., 1965). The Peninsular Ranges province is characterized by elongate northwest-trending mountain ridges separated by sediment-floored valleys. The Tustin Plain separates the Santa Ana Mountains, to the north and east, from the San Joaquin Hills to the south. The northwest-trending Santa Ana Mountains are a large flexure, which has been uplifted on its eastern side along the Whittier-Elsinore Fault Zone, producing a tilted, irregular and complex highland that slopes westward toward the sea. Regional tectonic activity has uplifted the San Joaquin Hills into an elongated arched fold trending to the northwest from San Juan Capistrano and Huntington Mesa. This folding has occurred as this entire section of the coast was uplifted by the San Joaquin Hills blind thrust fault (Grant et al., 1997, 1999, and 2002; Mueller et al., 1998).

In general, the Tustin Plain consists of approximately 1,300 feet of unconsolidated to semi-consolidated Quaternary-age young alluvial sediments deposited in a low-energy, back-bay environment, with periods of channeling and backfill by the San Diego Creek drainage system and its tributaries. Older alluvium and Miocene and Pliocene age marine and non-marine sedimentary rocks (exposed on the edges of the San Joaquin Hills south of the site) are present at depth beneath the younger sediments. The surficial deposits at the site and in the vicinity consist of Quaternary age, young alluvial fan deposits (alluvium) deposited by the San Diego Creek and tributaries (Morton and Miller, 2006). A map showing the mapped geologic units in the vicinity of the project site is presented as Figure 2, *Regional Geology Map*. These unconsolidated alluvial sediments are comprised of generally flat-lying, non-marine deposits of sand and minor amount of silt (Morton and Miller, 2006). These sandy deposits are geologically youthful (Holocene age or less than 11,000 years old).

2.2 Subsurface Soil Conditions

Based on our subsurface explorations, the site is underlain by a relatively thin veneer of artificial fill materials overlying Quaternary-age young alluvial fan deposits. The stratigraphy of the subsurface soils encountered in each soil boring is presented in the boring logs (Appendices A, C and D) and the general subsurface conditions across the site are shown on Plate 2, *Geologic Cross-Sections A-A', B-B', C-C', D-D', and E-E'*. General descriptions of the earth materials as encountered are as follows:

Artificial Fill: The existing near-surface artificial fill soils encountered in our exploratory borings performed for the current and previous studies are approximately 4 to 7 feet thick across the project site and consist primarily of grayish brown to dark brown, slightly moist, silty to clayey sand, sandy clay and clay. Localized thicker accumulations of fill materials should be anticipated during future earthwork construction. The existing artificial fill materials encountered at the site are likely associated with the existing improvements and initial development of the site. Based on available information, rough grading for the concourse, office medical building and nursing tower was performed under geotechnical observation and testing and approved by Converse (1986b). However, records documenting observation and testing during results fill placement were not available for review.

Quaternary Age Young Alluvial Fan Deposits: The Quaternary age young alluvial fan deposits encountered beneath the artificial fill materials in our exploratory borings performed for the current and previous studies generally consist of interbedded dark brown to olive gray clay, sandy clay, sandy silt, silty sand, clayey sand, and gravelly sand. The consistency of the fine-grained alluvial soils encountered is generally ranges from stiff to hard while the consistency of the predominantly granular or sandy soils is generally ranges from loose to very dense.

2.2.1 Shear Wave Velocity Profile

Shear wave velocities were measured downhole in two CPT's (C-2 and C-5) performed at the site as a part of the current study and in one CPT (CPT-8) performed as a part of our previous study (Leighton, 2017). C-2 was pushed at the northwestern portion of the site below the proposed western hospital support facility building and C-5 was pushed at the southern portion of the site below the proposed 6-level parking structure (see Plate 1). CPT-8 was pushed at the northeastern edge of the site below the proposed 5-level parking structure (see Plate 1). Results are summarized as follows:

Table 1 - S-CPT Measured Shear Wave Velocities

CPT Sounding	Tip Depth (ft)	S-Wave Velocity (ft/sec)
C-2	5	959
	10	876
	15	863
	20	812
	25	849
	30	886
	35	911
	40	938
	45	952
	50	969
C-5	5	1097
	10	966
	15	951
	20	946
	25	931
	30	979
	40	975
	45	978
	50	981
CPT-8	20	732
	30	1047
	40	986
	50	1165
	60	1137

2.2.2 Expansive Soil Characteristics

Expansive soils contain significant amounts of clay particles that swell considerably when wetted and 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.

Representative samples of the near surface (upper 5 feet) soil performed as a part of this study were subjected to Expansion Index (EI) testing to evaluate the expansion potential. The results of the testing indicate the near surface soils generally exhibit very low to low potential for expansion (EI = 8 and 37). Previous laboratory test results (Leighton, 2015, 2016a, and 2017) of representative samples of the near surface soil indicate the near surface soils generally exhibit low to moderate potential for expansion (EI = 34, 37, 50, 53, 67 and 70).

A sample collected from boring LB-1-2020 from the assumed basement level (10 to 15 feet bgs) for the inpatient hospital buildings in the northwestern portion of the site was subjected to EI testing and test results indicate soils at this depth exhibit a high potential for expansion (EI = 91).

Since variance in expansion potential of onsite soil is anticipated, additional testing is recommended upon completion of grading and excavation to confirm the expansion potential results presented in this report. Standard engineering and earthwork construction practices, such as proper foundation design and controlled moisture conditioning or mixing with non-expansive soils will reduce the effects associated with expansive soils.

2.2.3 Soil Corrosivity

In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor for ferrous corrosivity. Based on findings of studies presented in the American Society for Testing and Materials (ASTM) STP 1013 titled "Effects of Soil Characteristics on Corrosion" (February, 1989), an approximate relationship between soil resistivity and soil corrosiveness was developed as shown in Table 2 below.

Table 2 - Soil Corrosivity as a Function of Resistivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very severe corrosion
900 to 2,300	Severely corrosive
2,300 to 5,000	Moderately corrosive
5,000 to 10,000	Mildly corrosive
10,000 to >100,000	Very mildly corrosive

Sulfate ions in the soil can lower the soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. High sulfate content could also cause corrosion of reinforcing steel in concrete. Section 1904A of the 2019 California Building Code (CBC) defers to the American Concrete Institute's (ACI's) ACI 318 for concrete durability requirements. Table 19.3.1.1 of ACI 318-14 lists "*Exposure categories and classes*," including sulfate exposure as follows:

Table 3 - Sulfate Concentration and Exposure

Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	ACI 318-14 Sulfate Class
0.00 - 0.10	S0 (negligible)
0.10 - 0.20	S1 (moderate*)
0.20 - 2.00	S2 (severe)
>2.00	S3 (very severe)

*or seawater

For screening purposes, two representative samples of the near surface (upper 5 feet) soil (LB-2-2020 and LB-4-2020), and one representative sample at presumed basement level (LB-1-2020) collected as a part of this study were tested to provide a preliminary evaluation of corrosivity. The test results indicate soluble sulfate concentrations of 109 to 277 ppm, chloride contents of 99 to 162 ppm, pH values of 6.56 to 7.88 and minimum resistivity values of 650 to 1220 ohm-cm. Results are summarized in the table below.

Table 4 - Corrosivity Test Results

Test Parameter	Test Results			General Classification of Hazard
	LB-1-2020	LB-2-2020	LB-4-2020	
Water-Soluble Sulfate-SO_4 in Soil (percent by weight)	0.0109	0.0204	0.0277	Negligible sulfate exposure to buried concrete
Water-Soluble Chloride in Soil (ppm)	99	162	112	Non-corrosive to buried concrete (per Caltrans Specifications)
Percent by Weight (Chl^-)	0.0099	0.0162	0.0112	
pH	7.88	7.36	6.56	Mildly alkaline to mildly acidic
Minimum Resistivity (saturated, ohm-cm)	998	1220	650	Severely to Very Severely Corrosive to buried ferrous pipes

The results of the resistivity tests indicate that the underlying soil is severely to very 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 exposure to sulfate attack per ACI 318-14. 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. Results from prior explorations suggest that underlying soils are very corrosive to buried ferrous metals, pose a negligible risk of water-soluble sulfate attack to buried concrete, and low potential for corrosion of steel in concrete based on water-soluble chloride contents. The chemical analysis test results for the onsite soil from our current and prior explorations are included in Appendices B and D of this report, respectively.

2.2.4 Soil Compressibility

As a part of this study, six (6) samples of the onsite soils recovered from the borings were subjected to consolidation testing to evaluate the compressibility of these materials under loads representative of anticipated structural bearing stresses. The results of in-situ resistance testing in our explorations and laboratory consolidation testing based on the anticipated structural loading indicate that the onsite soils generally have relatively low compressibility below the bearing grade of the planned building foundations. The results of testing are presented in Appendix B, *Laboratory Test Results.*

2.2.5 Shear Strength

Evaluation of the shear strength characteristics of the soils included laboratory Direct Shear testing of five (5) samples of the onsite soils recovered from the borings as a part of this study. The results of testing are included in Appendix B.

2.3 Groundwater Conditions

Groundwater was initially encountered at depths between approximately 38 to 43 feet bgs in borings LB-1-2020 through LB-6-2020 drilled as a part of this study. Groundwater was encountered at depths between approximately 38 and 45 feet bgs in borings drilled as a part of our previous studies (Leighton, 2015, 2016a, and 2017). Groundwater was encountered at depths between approximately 21 and 23 feet bgs in the previous borings drilled throughout the site as a part of the previous studies by Converse (1984 and 1985).

According to groundwater information obtained through the California Geological Survey (CGS) and presented in the Seismic Hazard Zone Report for the Tustin Quadrangle (CGS, 1998), the historically shallowest groundwater depth in the vicinity of the project site is on the order of approximately 40 feet bgs.

Groundwater reported during prior explorations at depths shallower than the historic high depth of 40 feet bgs is likely perched groundwater. Perched groundwater may be encountered in basement excavations.

3.0 GEOLOGIC AND SEISMIC HAZARDS

Geologic and seismic hazards include surface fault rupture, seismic shaking, liquefaction, seismically-induced settlement, lateral spreading, seismically-induced landslides, flooding, seismically-induced flooding, seiches and tsunamis. The following sections discuss these hazards and their potential impact at the project site.

3.1 Surface Fault Rupture

Our review of available in-house literature indicates that no known active faults have been mapped across the site, and the site is **not** located within a designated Alquist-Priolo Earthquake Fault Zone (Bryant and Hart, 2007). In addition, no known faults are known or mapped to project towards the site (Morton and Miller, 2006) and no lineaments or evidence of faulting were observed at the site or projecting towards the project site (NETR, 2020). Therefore, the potential for surface fault rupture at the site is expected to be low and a surface fault rupture hazard evaluation is not mandated for this site.

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). Based on the results of the search, the closest active faults to the site are the San Joaquin Hills fault, Newport-Inglewood Fault Zone and Elsinore Fault Zone located approximately 0.18 mile, 9 miles and 14.9 miles from the site, respectively. The San Joaquin Hills fault is a blind thrust fault that is concealed at depth, without the likelihood for surface fault rupture. The San Andreas fault, which is the largest active fault in California, is approximately 45 miles northeast of the site. Major regional faults with surface expression in proximity to the site are shown on Figure 3, *Regional Fault and Historic Seismicity Map*.

3.2 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 3). 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 2019 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. As such, code-based and site-specific seismic parameters developed in accordance with the 2019 CBC and presented in Section 4.4 of this report should be considered for design of the project.

3.3 Historical Seismicity

Although Southern California has been seismically active during the past 200 years, written accounts of only the strongest shocks survive the early part of this period. Early descriptions of earthquakes are rarely specific enough to allow an association with any particular fault zone. It is also not possible to precisely locate epicenters of earthquakes that have occurred prior to the twentieth century.

A search of historical earthquakes was performed using the computer program EQSearch (Blake, 2018) for the time period between 1800 and 2018 (see Appendix E, *Seismicity Data*). Within that time frame, 485 earthquakes were found within a 62-mile (100 kilometer) radius of the project site. Of these earthquakes, the closest was located 7.8 miles (12.5 kilometers) west of the site and occurred on August 22, 1936. This earthquake registered a 4.0 Mw and induced recorded peak ground acceleration at the site of about 0.077g. The largest recorded peak ground acceleration at the site was 0.196g from an earthquake with magnitude of 6.3 Mw and located at a distance of 11.6 miles (18.7 kilometers) west of the site. A general view of recorded historical seismic activity is presented on Figure 3, *Regional Fault and Historical Seismicity Map*.

Review of additional data available from the Center for Engineering Strong Motion Data (CESMD) website (http://strongmotioncenter.org/) indicates that the highest recorded ground acceleration in the vicinity of the project site was 0.034g for a station located less than a half-mile northeast of the site. The recorded ground acceleration was from the magnitude 5.4 earthquake that occurred in Chino Hills on July 29, 2008.

3.4 Liquefaction Potential

Liquefaction is the loss of soil strength or stiffness due to a buildup of pore-water pressure during severe ground shaking. Liquefaction is associated primarily with loose (low density), saturated, fine-to-medium grained, cohesionless soils. As the shaking action of an earthquake progresses, the soil grains are rearranged and the soil densifies within a short period of time. Rapid densification of the soil results in a buildup of pore-water pressure. When the pore-water pressure approaches the overburden pressure, the soil reduces greatly in strength and temporarily behaves similarly to a fluid. Effects of liquefaction can include sand boils, settlement, and bearing capacity failures below structural foundations.

Based on review of the State of California Seismic Hazard Zones Map for the Tustin Quadrangle (CGS, 2001), the site is **not** located within an area that has been identified by the State of California as being potentially susceptible to the occurrence of liquefaction (Figure 4, *Seismic Hazard Map*). Quantitative liquefaction evaluation was conducted using a peak horizontal ground acceleration of 0.58g, a Moment Magnitude (Mw) of 7.0, and historically high groundwater of 40 feet below grade. Our analysis, presented in Appendix F, *Liquefaction Analysis*, indicates that the potential for liquefaction is low.

3.5 Seismically-Induced Settlements

Seismically-induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). These settlements occur primarily within loose to medium dense sandy soil due to reduction in volume during, and shortly after, an earthquake event. The settlements of these strata were estimated to result in a cumulative settlement on the order of ½ inch or less (Appendix F). Differential settlement is estimated to be approximately one half of the total settlement over a distance of 30 feet.

3.6 Seismically-Induced Lateral Ground Displacements

Depending on the site topography, modes of seismically induced lateral ground displacement associated with soil liquefaction consist of, ground oscillation (ground slope less than 0.3 percent), lateral spread (0.3 to 5 percent ground slope), or flow failure (ground slope greater than 5 percent). Because liquefaction is not considered a hazard at the site, seismically induced lateral ground displacements are also not considered to be hazards at the site.

3.7 Seismically-Induced Landslides

The potential for seismically induced landsliding is considered low due to the absence of slopes at the site. In addition, based on the State of California Seismic

Hazard Zones Map for the Tustin Quadrangle (CGS, 2001), the site is **not** located within an area that has been identified by the State of California as being potentially susceptible to seismically induced landslides (Figure 4, *Seismic Hazard Map*). Proposed slopes, if any, should be engineered and constructed at a gradient of 2:1 (horizontal:vertical) or flatter.

3.8 Flooding

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map (FEMA, 2009), the site is located within a flood hazard area identified as “Zone X”, which is defined as an area of minimal flood hazard. As shown on Figure 5, *Flood Hazard and Dam Inundation 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. The project site is **not** located within a flood impact zone from dam failure as shown on Figure 5, *Flood Hazard and Dam Inundation Map.* Therefore, the potential for earthquake-induced flooding to occur due to a failure of a nearby dam is considered low.

3.9 Seiches and Tsunamis

Seiches are large waves generated in very large enclosed bodies of water or partially enclosed arms of the sea in response to ground shaking. Tsunamis are waves generated in large bodies of water by fault displacement or major ground movement. Based on the inland location of the project site and the lack of large enclosed water bodies nearby, seiche and tsunami risks are considered very low.

3.10 Subsidence

Subsidence is sinking of the Earth’s surface in response to geologic or man-induced causes. Subsurface solution of limestone during cave formation may lead to a series of subsidence features at the ground surface, which, collectively, are termed karst topography. Since the site is not underlain by limestone, the potential for subsidence to affect the site due to this condition is not a consideration for the project. Subsidence effects can also be produced by mining or by the extraction of water or petroleum by means of wells. Since the site is not located in a known oil field and groundwater resources in the Coastal Plain of Orange County Groundwater Basin are monitored and managed by the Orange County Water District, the potential for subsidence to affect the site due to extraction of water or petroleum considered low.

4.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

Geotechnical recommendations for the proposed development are presented in the following sections and are intended to provide sufficient geotechnical information to develop the project in general accordance with 2019 CBC requirements. The geotechnical consultant should review the grading plans, shoring plans, foundation plans and specifications as they become available to verify that the recommendations presented in this report have been properly interpreted and incorporated. These recommendations are based upon the exhibited geotechnical engineering properties of the soils and their anticipated response both during and after construction. These recommendations are considered minimal and may be superseded by more restrictive requirements of the civil and structural engineers, and the City of Irvine.

4.1 Site Grading

All site grading should be performed in accordance with the applicable local codes (2019 CBC) and in accordance with the project specifications that are prepared by the appropriate design professionals.

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. Footings for the existing building, existing airway retaining walls, and other improvements to remain in place should be properly protected. Efforts should be made to locate any existing utility lines and underground obstructions within the proposed construction area. Those lines or obstructions should be removed or rerouted if they interfere with the proposed construction and the 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 unsuitable deposits and undocumented fill should be excavated and removed from the proposed building footprint prior to placement of engineered fill.

Overexcavation and Recompaction: The proposed at grade (non-basement) structures may be supported on a conventional shallow foundation system established on engineered fill. We recommend that foundations for the proposed at grade structures be underlain by a minimum 3 feet of compacted fill. The compacted fill should extend a minimum horizontal distance of 3 feet from the edge of the foundation. The proposed subterranean structures may be supported on a conventional shallow foundation system established on competent native alluvial soils. Excavations near existing footings should be performed with care so that the existing footings are not undermined and the subgrade supporting the footings is not disturbed.

The existing artificial fill, ranging from approximately 4 to 7 feet as encountered in our borings, should be removed and replaced as engineered fill. This removal depth is preliminary and should be verified during grading as local conditions may be encountered that may require additional removals. The exact extent of removals can best be determined during grading when direct observation and evaluation of materials are possible.

Prior to replacing the overexcavated material, the area to receive engineered fill should be scarified a minimum of 6 inches, moisture-conditioned as necessary, and recompacted to a minimum 90 percent relative compaction (ASTM Test Method D 1557).

After excavating as recommended, the moisture content of the soils to be used as engineered fill should be determined, and the soils slowly and uniformly moistened (or dried) as necessary to bring the soils to a uniform moist condition. All concrete slabs on grade, including floor slabs, should be underlain by at least 2 feet of relatively non-expansive natural soil or engineered fill.

The moisture content of relatively non-expansive and predominantly granular soils should be brought to within 2 percent of optimum moisture content to a depth of 18 inches. The moisture content of any clayey soils should be brought to about 4 percent over optimum moisture content to a depth of 18 inches. The moisture content of the subgrade should be checked and approved by Leighton prior to placing the required fill.

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.

Wet and Pumping Soil: Subgrade stability issues may be encountered during basement subgrade preparation and grading due perched groundwater and clayey soils. Stability problems may be mitigated by either undercutting unstable soils or performing chemical or mechanical modification of the subgrade to allow grading activities to proceed. Chemical modification consists of the addition of either lime or Portland cement to a properly processed subgrade followed by recompaction. Chemical modification will require the geotechnical engineer’s approval prior to implementing a modification program. Mechanical stabilization consists of the placement of a coarse (2 to 4 inch nominal particle diameter) crushed aggregate to serve as working mat. Depending upon the degree of instability, a geogrid may also be required in conjunction with the coarse aggregate.

Fill Placement and Compaction: The on-site soil free of organics and construction debris is suitable to be used as fill. Any imported soils should have an Expansion Index (EI) less than 50 and should be approved by the geotechnical engineer prior to placement as fill. Fill soils should be placed in loose lifts not exceeding 8 inches, moisture-conditioned to within 2 percent of optimum moisture content, and compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D 1557. Due to the cohesive nature of on-site soils, care must be used during site grading and construction to not allow the soils to become dry or desiccated. Soils that become dry should be removed, moisture conditioned, and recompacted.

Subgrade Moisture Content: Soils within the upper 18 inches of subgrade for slab-on-grade and concrete flatwork should be maintained in a thoroughly moist condition of at least 1.2 times the optimum moisture content to reduce potential for future expansion due to wetting. The moisture content can usually be maintained by periodic sprinkling, deep irrigation, ponding or other appropriate measures. Presoaking will be necessary if the soil moisture does not meet the required condition or is not maintained between grading and construction.

4.2 Allowable Bearing Capacity

Following the site grading mentioned above, footings for the proposed structures may be designed using an allowable bearing capacity of 4,000 pounds per square foot (psf) for foundations at ground level. Foundations for basement levels deeper than 15 feet bgs may be designed using an allowable bearing capacity of 6,000 psf. The recommended allowable bearing pressures are intended to enable support of the planned structures partly at ground level and partly at basement level while reducing the magnitude of differential settlement across the tower footprint.

The bearing capacity is for footings with a minimum width of 24 inches for continuous footings and 36 inches for isolated footings, both with a minimum embedment depth of 12 inches below the lowest adjacent grade.

A one-third increase in the allowable bearing may be used for wind or seismic loading. The recommended bearing value is a net value, and the weight of concrete in the footings can be taken as 50 pounds per cubic foot (pcf); the weight of soil backfill can be neglected when determining the downward loads.

To calculate ultimate bearing capacities, the allowable capacities provided above may be multiplied by a factor of safety of 3, which was used in our calculations to derive allowable capacities.

The allowable bearing capacities are also based on a total static settlement of 1 inch and differential settlement of ½ inch over a horizontal distance of 30 feet. In addition to the static settlement, seismic settlement described in Section 3.5 should be considered. 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. The settlement estimate should be reviewed by Leighton when final foundation plans and loads for the proposed structures become available.

Soil resistance available to withstand lateral loads on a shallow foundation is a function of the frictional resistance along the base of the footing and the passive resistance that may develop as the face of the structure tends to move into the soil. The frictional resistance between the base of the foundation and the subgrade soil may be computed using a coefficient of friction of 0.30. The passive resistance may be computed using an equivalent fluid pressure of 250 pcf, assuming there is constant contact between the footing and undisturbed soil. The passive resistance can be increased by one-third when considering short-duration wind or seismic loads. The friction resistance and the passive resistance of the soils can be combined without reduction in determining the total lateral resistance.

4.2.1 Ancillary Structures – Spread Footings

Footings for ancillary structures, including retaining walls, established in engineered fill or undisturbed natural soils may be designed using an allowable bearing capacity of 3,000 psf. The bearing capacity is for footings with a minimum width of 12 inches for continuous footings and 18 inches for isolated footings, both with a minimum embedment depth of 12 inches below the lowest adjacent grade.

A one-third increase in the allowable bearing may be used for wind or seismic loading. The recommended bearing value is a net value, and the weight of concrete in the footings can be taken as 50 pcf; the weight of soil backfill can be neglected when determining the downward loads.

To calculate ultimate bearing capacities, the allowable capacities provided above may be multiplied by a factor of safety of 3, which was used in our calculations to derive allowable capacities.

The allowable bearing capacities are also based on a total static settlement of ½ inch and differential settlement of ¼ inch over a horizontal distance of 30 feet. In addition to the static settlement, seismic settlement described in Section 3.5 should be considered. 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. The settlement estimate should be reviewed by Leighton when final foundation plans and loads for the proposed structure become available.

Soil resistance available to withstand lateral loads on a shallow foundation is a function of the frictional resistance along the base of the footing and the passive resistance that may develop as the face of the structure tends to move into the soil. The frictional resistance between the base of the foundation and the subgrade soil may be computed using a coefficient of friction of 0.30. The passive resistance may be computed using an equivalent fluid pressure of 250 pcf, assuming there is constant contact between the footing and undisturbed soil. The passive resistance can be increased by one-third when considering short-duration wind or seismic loads. The friction resistance and the passive resistance of the soils can be combined without reduction in determining the total lateral resistance.

4.2.2 Ancillary Structures – Flagpole Footings

For flagpole type footings (short caissons) established either in undisturbed natural soils or engineered fill may be used to support ancillary structures. Short caissons should extend through any existing undocumented fill and derive support from the underlying undisturbed natural soils. Caisson segments through undocumented fill should be isolated from contacting those materials by using Sonotubes or equivalents.

Flagpole type footings established directly on undisturbed natural soils or on engineered fill underlain by natural soils may be designed to impose an allowable bearing pressure due to dead-plus-live (static) loads of 3,000 psf.

A one-third increase can be used for wind or seismic loads. The recommended bearing value is net value, and the weight of concrete in the footings can be taken as 50 pcf.

The estimated total settlement of the structures supported on spread footings not established over refuse is on the order of ½ inch or less. Differential settlement is anticipated to be on the order of ¼ inch over 30 feet. Most of the settlement is anticipated to occur within a few months of the application of dead loads.

Lateral loads can be resisted by the passive resistance of the soils. The passive resistance of natural soils or engineered fill against flagpole type footings, with on-center spacing of at least 3 diameters, may be assumed to be equal to the pressure developed by a fluid with a density of 500 pcf. The passive resistance of undocumented fill against flagpole type footings, with on-center spacing of at least 3 diameters, may be assumed to be equal to the pressure developed by a fluid with a density of 250 pcf.

A one-third increase in the passive value can be used for wind or seismic loads. The frictional resistance and the passive resistance of the soils can be combined without reduction in determining the total lateral resistance.

A friction coefficient of 0.35 may be used at the soil-concrete interface for calculating uplift resistance. The coefficient of horizontal earth pressure (ratio of horizontal vs vertical earth pressure) may be assumed to be 0.5.

4.3 Slabs-on-Grade

4.3.1 Building Floor Slabs

The floor slab of the proposed structures should be placed on properly moisture conditioned and compacted structural fill as described in Section 3.1 of this report. Building floor slabs should be designed and constructed as promulgated by the Portland Cement Association. Design may be performed using a modulus of subgrade reaction of 115 (pci). Building floor slabs are recommended to be at least 5 inches in thickness and include No.

3 bars at a maximum on-center spacing of 18 inches each way. The design of the floor slabs should be performed by the project structural engineer based upon actual load demands.

Floor slabs are recommended to be underlain by a synthetic sheeting to serve as a retarder to moisture vapor transmission in areas where a moisture-sensitive floor covering or equipment is planned. The sheeting is recommended to be a minimum 10 mil thick and consist of polyethylene or similar material. The sheeting may be underlain by a 2-inch thick layer of clean fine to medium sand to protect the sheeting from puncture. The sheeting should be evaluated prior to installation for the presence of punctures or tears. Installation of the sheeting should include proper overlap and taping of seams.

4.3.2 Concrete Flatwork

Exterior concrete slabs such as sidewalks, courtyards and pedestrian access ramps often crack after concrete placement and curing. Inclusion of joints at frequent intervals and reinforcement will help control the locations of the cracks, and thus improve aesthetic appearance. When cracking occurs, repairs may be needed to mitigate a trip hazard and/or improve the appearance.

A number of actions can be taken during construction to reduce the amount of cracking or its consequences. These steps include, but are not limited to, the following. As a minimum, exterior concrete slabs should be at least 4 inches thick. Construction or weakened plane joints should be spaced at intervals of 8 feet or less. We suggest concrete slabs be reinforced using No. 3 rebar, 18 inches on center in both directions, placed at mid-thickness.

Cracking of concrete is often not due to settlement or heave of soils, but often due to other factors such as the use of too high a water/cement ratio and/or inadequate steps taken to prevent moisture loss during curing. These causes of concrete distress can be reduced by proper design of the concrete mix and by proper placement and curing of the concrete.

4.4 Seismic Design Parameters

Moderate to strong ground shaking due to seismic activity is expected at the site during the life span of the project. The 2019 CBC code-based seismic design parameters are summarized in the table below. Details are presented in Appendix E.

Table 5 – Code-Based 2019 CBC Seismic Design Parameters

Categorization/Coefficients	Design Value
Site Latitude	33.6606
Site Longitude	-117.7719
Site Class	D
Seismic Design Category	D
Mapped Spectral Response Acceleration at 0.2s Period, S_S	1.241g
Mapped Spectral Response Acceleration at 1s Period, S_1	0.445g
Short Period Site Coefficient at 0.2s Period, F_a	1.0
Long Period Site Coefficient at 1s Period, F_v	1.855
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.245g
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	0.825g
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	0.830g
Design Spectral Response Acceleration at 1s Period, S_{D1}	0.550g
Design Peak Ground Acceleration, PGA_M	0.57g

The 2019 CBC site-specific seismic design parameters are summarized below. Details, including the site-specific response spectra are presented in Appendix E.

Table 6 – Site-Specific 2019 CBC Seismic Design Parameters

Categorization/Coefficients	Design Value
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.633g
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	1.152g
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	1.089g
Design Spectral Response Acceleration at 1s Period, S_{D1}	0.768g

4.5 Retaining Walls

The following coefficient of friction and lateral earth pressures (triangular distribution increasing with depth) may be used for the design of retaining walls with a level backfill and for tunnel walls.

Table 7 – Lateral Earth Pressures

Condition	Equivalent Fluid Unit Weight for Level Backfill (psf/ft)
Active	40
Seismic Increment (Additive to Active Pressure)	30
At-Rest	60
Passive	250
Coefficient of Friction	0.30

Retaining structures should be provided with a drainage system to prevent buildup of hydrostatic pressure behind the wall. Hydrostatic pressure should be included in the retaining wall design if a drainage system is not provided. The above 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.

To design an unrestrained retaining wall, such as a cantilever wall, the active earth pressure may be used. For a restrained retaining wall, such as a basement wall, curved walls without joints or restrained-wall corners, the at-rest pressure should be used. If tilting of wall segments are acceptable and construction joints are provided at all angle points and frequently along curved-wall segments, preferably not exceeding 20 feet, the active pressure may be used.

For sliding resistance, a friction coefficient of 0.30 may be used at the soil-concrete interface. The lateral passive resistance can be taken into account only if it is ensured that the soil against embedded structures will remain intact with time.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure, should be considered in the design of the retaining wall. Loads applied within a 1:1 projection from the surcharging structure on the stem of the wall shall be considered as lateral surcharge. For lateral surcharge conditions, we recommend utilizing a horizontal load equal to 50 percent of the vertical load, as a minimum. This horizontal load should be applied below the 1:1 projection plane. To minimize the surcharge load from an adjacent building, deepened building footings may be considered.

In addition to the recommended earth pressures, walls below grade adjacent to existing structures or streets and areas of traffic should be designed to accommodate surcharge loads. For traffic surcharge, a uniform lateral pressure of 100 pounds per square foot acting as a result of an assumed 300 pounds per square foot surcharge behind the wall due to normal traffic; the traffic surcharge load may be neglected provided a minimum of 10-foot clearance between the wall and the traffic is maintained. Firetruck loading surcharge on walls may be assumed as 2 times normal vehicular surcharge. We will provide surcharge loading from adjacent foundations after reviewing details of the planned basement walls in relation to existing foundations.

We understand that footings for structural elements of the proposed expansion project may be located within approximately 2 to 8 feet from existing retaining walls for existing subterranean site improvements. The new footings will induce lateral surcharge on these existing retaining walls, which should be considered in design of the proposed expansion and in protection of existing improvements.

4.6 Pavement Design

Driveways and fire access road can be constructed using conventional asphalt concrete (AC) over aggregate base (AB). We have designed the pavement sections using the R-value of 20 for different Traffic Indices (TI) and the minimum pavement thickness is presented Table 7 below. The pavement design was performed using the method in the Orange County *Highway Design Manual*.

Concrete pavement may also be considered. The PCC should have a minimum 28-day compressive strength of 4,000 psi. Because concrete will crack, the PCC pavement sections should be provided with crack-control joints spaced no more than 12 feet on-center each way, to control where cracks develop. As a minimum, we suggest concrete pavement be reinforced using No. 3 rebar, 18 inches on center in both directions, placed at mid-thickness. Concrete reinforcement should be designed by the structural engineer for appropriate loading conditions. The recommended minimum pavement thickness is presented in Table 7 below.

Table 8 – Pavement Sections

Traffic Index	Flexible Pavement (inches)		Rigid Pavement (inches)	
	AC	AB	PCC	AB
4	3	6	6.5	4
5	3	8	7	4
6	4	9	7.5	4
7	5	12	N/A	N/A

All pavement construction should be performed in accordance with the Standard Specifications for Public Works Construction. Field inspection and periodic testing, as needed during placement of the base course materials, should be undertaken to ensure that the requirements of the standard specifications are fulfilled. Prior to placement of aggregate base, the subgrade soil should be processed to a minimum depth of 8 inches, moisture-conditioned, as necessary, and recompacted to a minimum of 90 percent relative compaction. Portland cement concrete paving sections as well as other concrete slabs and walks supported on grade **should be underlain by at least 2 feet of properly compacted fill consisting of relatively non-expansive soils**. We have assumed that such a subgrade will have an R-value of at least 40, which will need to be verified during grading.

If wet and pumping soils are encountered, a layer of geofabric (Mirafi HP570 or equivalent) may be placed to stabilize the subgrade and provide a firm working surface for placement of compacted fill and aggregate base. Localized areas of loose soils may be encountered that require deeper removal and recompaction. The actual extent of the removal depth will be best determined during construction when direct observation of the subgrade soils can be made.

Aggregate base should be moisture conditioned, as necessary, and compacted to a minimum of 95 percent relative compaction.

Aggregate base and asphalt materials should conform to Sections 200-2 and 203, respectively, of the *Standard Specifications for Public Works Construction*. PCC should conform to Section 201 of the *Standard Specifications for Public Works Construction*.

4.7 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 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 the 2019 CBC requirements. However, concrete exposed to recycled water should be designed using Type V cement.

Based on our laboratory testing, the onsite soil is considered severely to very 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.

4.8 Shoring

The shoring system for the site will likely consist of soldier piles and lagging. Soldier piles may consist of steel H-beams set in pre-drilled holes and backfilled with lean-mix concrete to the ground surface.

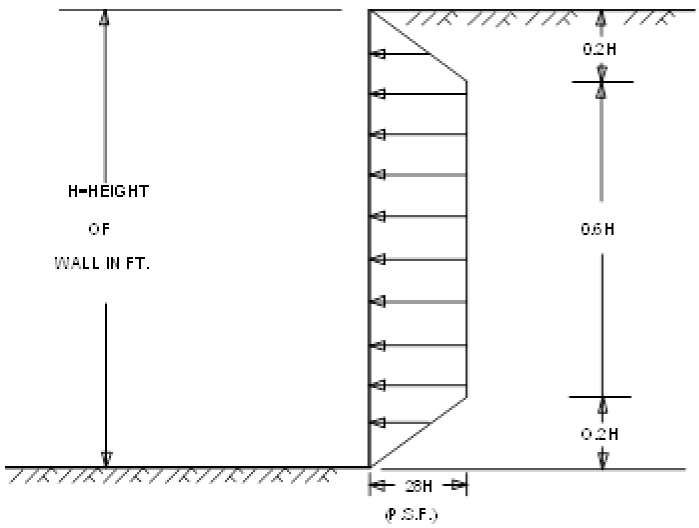
The steel H-beams may also be installed with a vibratory hammer if vibration monitoring is performed during initial installation to establish that peak particle velocity thresholds are not exceeded. We can provide details for vibration monitoring if this option is selected. If pre-drilling is required, the pre-drilling auger diameter should be smaller than the diagonal dimension of the H-beam.

If the depth of the excavation is less than approximately 15 feet, tieback anchors, or internal bracing are not expected to be required. Deeper excavations will require some form of bracing. The potential raveling and caving of sand layers, and the presence of dense sand and hard silt and clay layers may pose difficulties in the installation of the soldier piles and tie-back anchors. Accordingly, the shoring contractor should be prepared to use special techniques and measures, if necessary, to permit the proper installation of the soldier piles and tie-back anchors.

4.8.1 Lateral Earth Pressures

For design of cantilevered shoring, where the surface of the backfill is level, it can be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 35 pcf. In addition to the recommended earth pressure, the shoring should be designed to resist any applicable surcharge loads due to foundation, storage, traffic, or other anticipated loads.

For the design of braced shoring, a trapezoidal distribution of lateral earth pressure plus any surcharge loadings occurring as a result of traffic and adjacent foundations should be used. The recommended pressure distribution for the case where the grade is level behind the walls is illustrated in the following diagram, where the maximum lateral pressure will be 28***H*** in pounds per square foot (psf), where ***H*** is the height of the wall in feet:



In addition to the recommended earth pressure, the upper 10 feet of shoring adjacent to streets should be designed to resist a uniform lateral pressure 100 psf, acting as a result of an assumed 100 psf surcharge behind the shoring due to normal street traffic. If the traffic is kept back at least 10 feet from the shoring, the traffic surcharge may be neglected. We can determine lateral surcharge pressures for specific cases, such as construction crane, concrete trucks, and other heavy construction equipment adjacent to shoring, if requested.

4.8.2 Surcharge Pressure from Adjacent Foundations

Where building foundations are within a 1:1 plan projected upward from the bottom of the planned shoring and basement walls, a lateral surcharge load should be applied to the earth pressure to account for the pressure imposed by the foundation. For preliminary design, surcharge pressure from adjacent foundations on shoring and basement walls may be estimated as half the foundation bearing pressure distributed uniformly along the height of the shoring or wall. Once details of existing adjacent foundations are established, we can provide final design surcharge pressures to be applied to shoring and basement walls.

4.8.3 Design of Soldier Piles

For the design of soldier piles spaced at least two diameters on centers (OC), the allowable lateral bearing value (passive value) of the soils below the level of excavation but above the design groundwater level of 40 feet bgs may be assumed to be 600 psf at the excavated surface, up to a maximum of 6,000 psf.

Below 40 feet bgs, the allowable passive value should be reduced to 400 psf up to a maximum of 4,000 psf.

To develop the full lateral value, provisions should be taken to assure firm contact between the soldier piles and soils.

Concrete placed in the soldier pile excavations may be a lean-mix concrete. However, the concrete used in that portion of the soldier pile which is below the planned excavated level should be of sufficient strength to adequately transfer the imposed loads from the soldier pile to the surrounding soils.

The frictional resistance between the soldier piles and the retained earth may be used in resisting the downward component of the design load. For piles encased in concrete, the coefficient of friction between the soldier piles and the retained earth may be taken as 0.4. This value is based on the assumption that uniform full bearing will be developed between the steel soldier beam and the lean-mix concrete and between the lean-mix concrete and the retained earth. In addition, provided that the portion of the soldier piles below the excavated level is backfilled with structural concrete, the soldier piles below the excavated level may be used to resist downward loads. The frictional resistance between the concrete soldier piles and the soils below the excavated level may be taken as equal to 500 psf.

For piles not encased in concrete (vibrated into place), the coefficient of friction between the soldier piles and the retained earth may be taken as 0.2.

4.8.4 <u>Lagging</u>

Continuous lagging will be required between the soldier piles. Careful installation of the lagging will be necessary to achieve bearing against the retained earth.

The soldier piles should be designed for the full anticipated lateral pressure. However, the pressure on the lagging will be less due to arching in the soils. For clear spans up to 8 feet, we recommend that the lagging be designed for a semi-circular distribution of earth pressure where the maximum pressure is 400 psf at the midline between soldier piles, and 0 psf at the soldier piles.

4.8.5 <u>Anchor Design</u>

Tie-back friction anchors may be used to resist lateral loads. For design purposes, it may be assumed that the active wedge adjacent to the shoring is defined by a plane drawn at 35 degrees from the vertical through the bottom of the excavation. The anchors should extend at least 30 feet beyond the potential active wedge and to a greater length if necessary to develop the desired capacities.

The capacities of anchors should be determined by testing of the initial anchors as outlined in the following section, Anchor Testing. For design purposes, it may be estimated that drilled friction anchors will develop an average friction value of 1,000 psf. For post-grouted anchors, it may be estimated that the anchors could develop an average friction of up to 3,000 psf. Only the frictional resistance developed beyond the active wedge would be effective in resisting lateral loads. If the anchors are spaced at least 6 feet on centers, no reduction in the capacity of the anchors need be considered due to group action.

4.8.6 <u>Anchor Installation</u>

The anchors may be installed at angles of 15 to 45 degrees below the horizontal. Caving of the anchor holes should be anticipated and provisions made to minimize such caving. Mining (removal of soils from the anchor holes without advancing the drilling auger) of the sandy and gravelly soils could occur and the shoring contractor should take special care to prevent, or at least minimize, such mining.

Conventional anchors should be filled with concrete placed by pumping from the tip outward, and the concrete should extend from the tip of the anchor to the active wedge. To minimize chances of caving, we suggest that the portion of the anchor shaft within the active wedge be backfilled with sand before testing the anchor. This portion of the shaft should be filled tightly and flush with the face of the excavation. The sand backfill may contain a small amount of cement to allow the sand to be placed by pumping.

4.8.7 Anchor Testing

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

For post-grouted anchors where concrete is used to backfill the anchor along its entire length, the test load should be computed as that required to develop the appropriate friction along the entire bonded length of the anchor. The test load should therefore be computed as:

$$P_{test} = P_{design} * \frac{L_t}{L_b} * M$$

where L_t=Total Length of Anchor

L_b=Post-grouted Length of Anchor

M=150% or 200% depending on test performed

However, we understand that for this project, the unbonded length of anchors within the active wedge may be encased in PVC sheathing to prevent load transfer to surrounding soil. Accordingly, the test loads need not be increased using the criteria described above if the unbounded length of anchors is thus isolated from surrounding soil.

The total deflection during the 24-hour 200% tests should not exceed 12 inches during loading; the anchor deflection should not exceed ¾ inch during the 24-hour period, measured after the 200% test load is applied. If the anchor movement after the 200% load has been applied for 12 hours is less than ½ inch, and the movement over the previous 4 hours has been less than 0.1 inch, the test may be terminated.

For the quick 200% tests, the 200% test load should be maintained for at least 15 minutes. The total deflection of the anchor during the 200% quick tests should not exceed 12 inches; the deflection after the 200% test load has been applied should not exceed 0.2 inch during the 15-minute period. Where satisfactory tests are not achieved on the initial anchors, the anchor diameter and/or length should be increased until satisfactory test results are obtained.

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

After a satisfactory test, each production anchor should be locked-off at the design load. The locked-off load should be verified by rechecking the load in the anchor. If the locked-off load varies by more than 10% from the design load, the load should be reset until the anchor is locked-off within 10% of the design load.

The installation of the anchors and the testing of the completed anchors should be observed by our firm.

4.8.8 Internal Bracing

Raker bracing, if used, could be supported laterally by temporary concrete footings (deadmen). For design of such temporary footings, poured with the bearing surface normal to rakers inclined at 45 to 60 degrees with the vertical, a bearing value of 4,000 psf may be used, provided the shallowest point of the footing is at least 1 foot below the lowest adjacent grade. To reduce the movement of the shoring, the rakers should be tightly wedged against the footings and/or shoring system.

4.8.9 Deflection

It is difficult to accurately predict the amount of deflection of a shored embankment. It should be realized, however, that some deflection will occur. The maximum allowable horizontal shoring deflection adjacent to existing buildings, as measured at the top of the excavation, is ½ inch. The maximum allowable horizontal shoring deflection, as measured at the top of the excavation, should be limited to 1 inch in other areas.

If greater deflection occurs during construction, additional bracing may be necessary to minimize settlement of adjacent structures and of any utilities in the adjacent streets. To reduce the deflection of the shoring, if desired, a greater active pressure could be used in the shoring design.

4.8.10 Monitoring

Some means of monitoring the performance of the shoring system is recommended. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all the soldier piles. We will be pleased to discuss this further with the design consultants and the contractor when the design of the shoring system is finalized.

We recommend that the adjacent existing streets be surveyed for horizontal and vertical locations. Also, a careful survey of existing cracks and offsets in the streets should be performed and recorded along with photographic records. A pre-construction benchmark survey establishing horizontal locations and vertical elevations for the adjacent buildings combined with documentation of existing cracks and offsets may be useful in responding to claims of building distress and damage (if any).

4.9 Temporary Excavations

All temporary excavations, including utility trenches and retaining wall excavations, should be performed in accordance with project plans, specifications and all OSHA requirements.

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 slope, 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 structures.

During construction, the soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor should 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

4.10 Trench Backfill

Utility trenches can be backfilled with the onsite material, provided it is free of debris, organic material and oversized material (greater than 6 inches in diameter). Prior to backfilling the trench, pipes should be bedded in and covered with sand that exhibits a Sand Equivalent (SE) of 30 or greater. The pipe bedding should be densified in-place using mechanical compaction equipment with care to not damage the pipe. Jetting is not recommended at this site due to the clayey soils that underlie a majority of the site. Backfill material should be placed in loose lifts, moisture conditioned as necessary to achieve moisture content 2 to 4 percentage points above optimum, and mechanically compacted using a minimum standard of 90 percent relative compaction (ASTM 1557). The maximum lift thickness should also be determined based on the compaction equipment used in accordance with the latest edition of the *Standard Specifications for Public Works Construction* (SSPWC). Where utility trenches cross underneath building footing, the trenches should be plugged by a minimum of 2 feet of onsite impermeable clayey soil or sand/cement slurry to reduce the potential for water intrusion underneath the slab.

4.11 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;
- Shoring construction;
- 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.

5.0 LIMITATIONS

This report was based in part on data obtained from a limited number of observations, site visits, soil excavations, samples, and tests. Such information is, by necessity, incomplete. 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 has the opportunity to observe subsurface conditions during grading and construction, to confirm that our preliminary data are representative for the site. Leighton should also review the construction plans and project specifications, when available, to comment on the geotechnical aspects.

This exploration was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. The findings, conclusion, and recommendations included in this report are considered preliminary and are subject to verification. We do not make any warranty, either expressed or implied. The report may not be used by others or for other projects without the expressed written consent of our client and our firm.

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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 <u>not</u> 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 <u>not</u> be adequate to develop geotechnical design recommendations for the project.

Do <u>not</u> 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 <u>not</u> rely on an executive summary. Do <u>not</u> 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 <u>not</u> 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 <u>Not</u> 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 <u>not</u> 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 <u>not</u> building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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

Project: 11753.004	Eng/Geol: CCK/JAR	Figure 1
Scale:1 " = 2,000 '	Date: February 2020	

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton
Author: Leighton Geomatics (btran)

SITE LOCATION MAP

Hoag Hospital Irvine Expansion
16200 Sand Canyon Avenue
Irvine, California

Leighton

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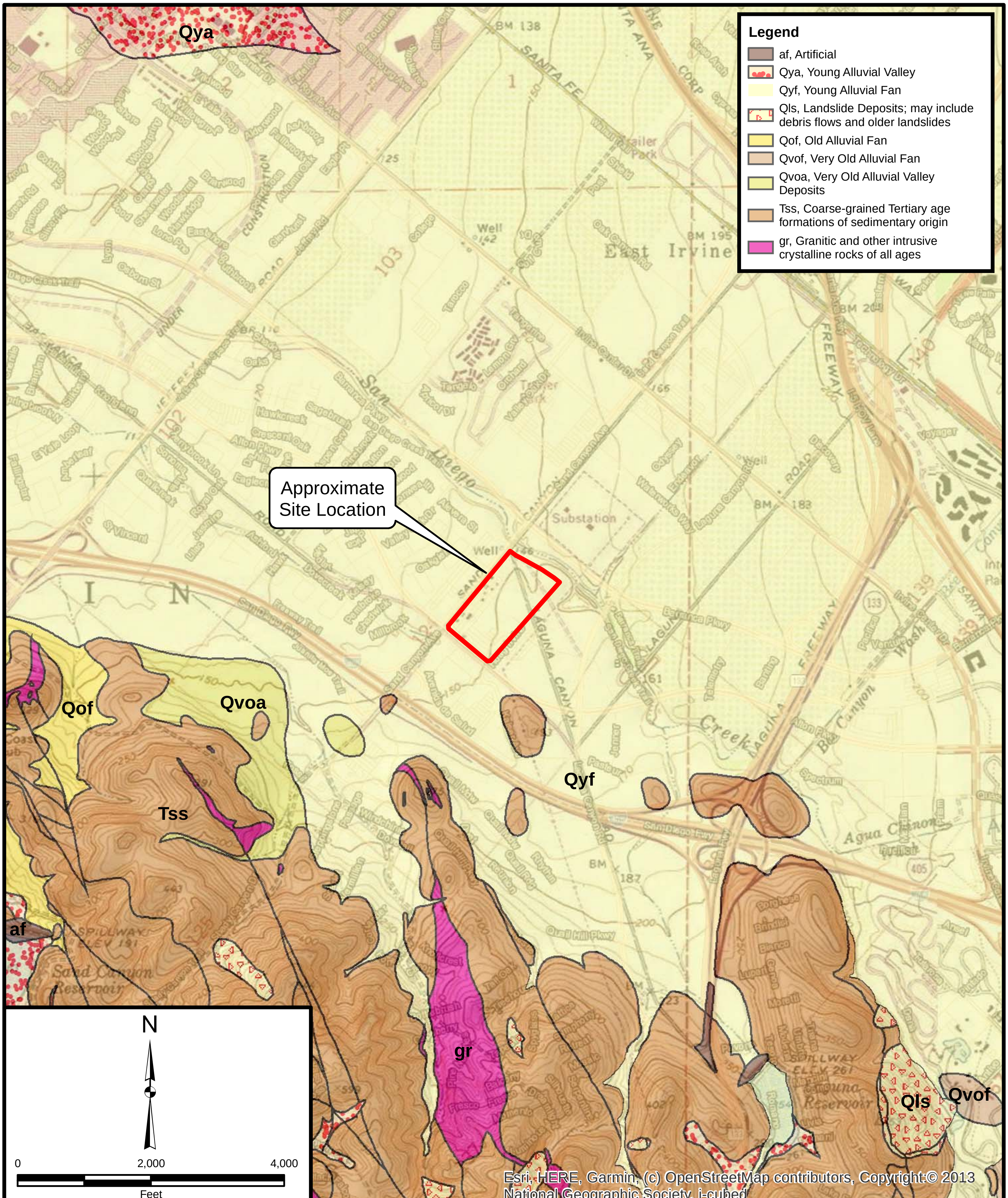

Project: 11753.004	Eng/Geol: CCK/JAR
Scale:1 " = 2,000 '	Date: February 2020

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton, USGS
Author: Leighton Geomatics (btran)

REGIONAL GEOLOGY MAP

Hoag Hospital Irvine Expansion
16200 Sand Canyon Avenue
Irvine, California

Figure 2

Leighton

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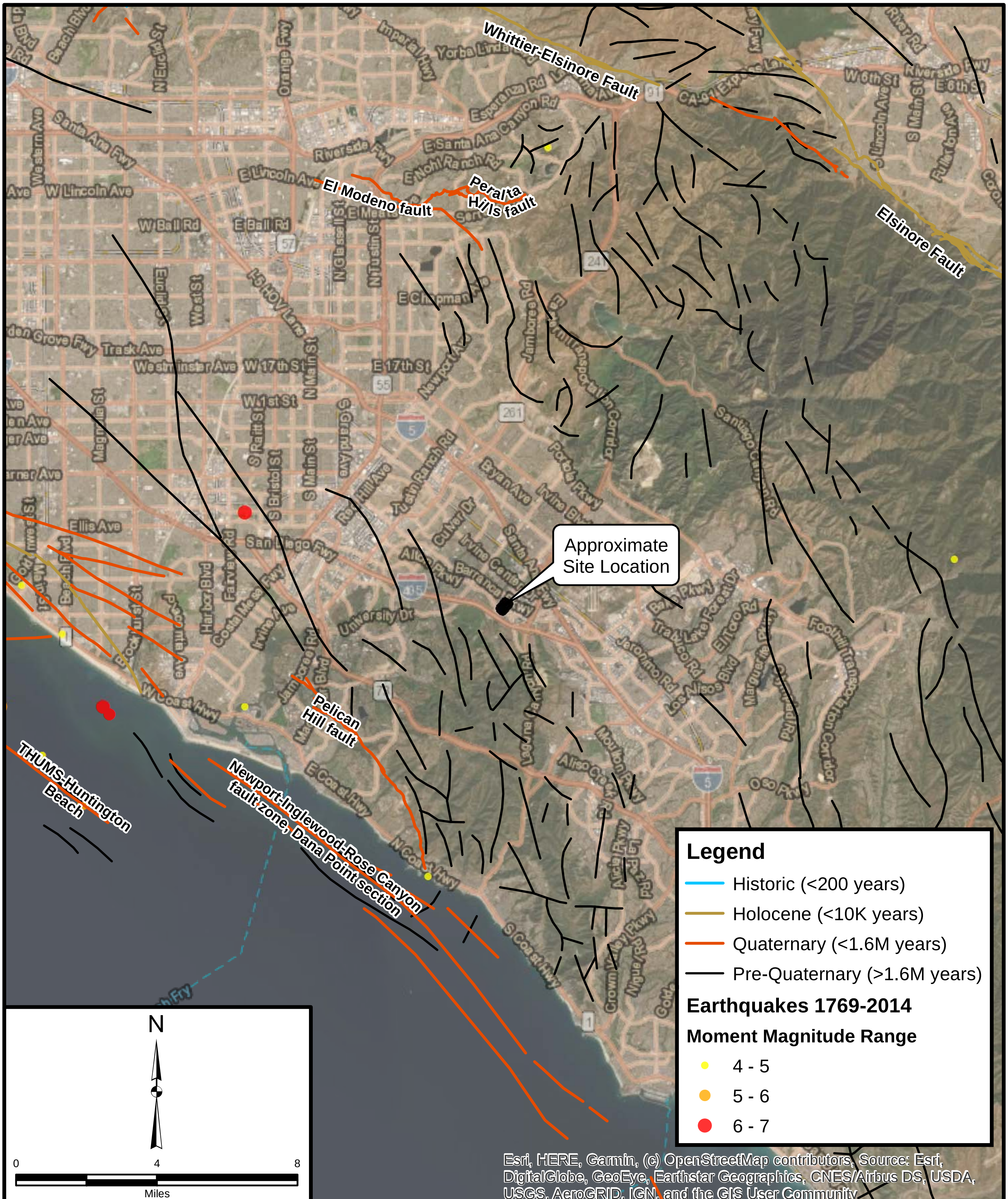

Project: 11753.004	Eng/Geol: CCK/JAR
Scale:1 " = 4 miles	Date: February 2020

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton, CGS, Bryant 2010
Author: Leighton Geomatics (btran)

REGIONAL FAULT AND HISTORIC SEISMICITY MAP

Hoag Hospital Irvine Expansion
16200 Sand Canyon Avenue
Irvine, California

Figure 3

Leighton

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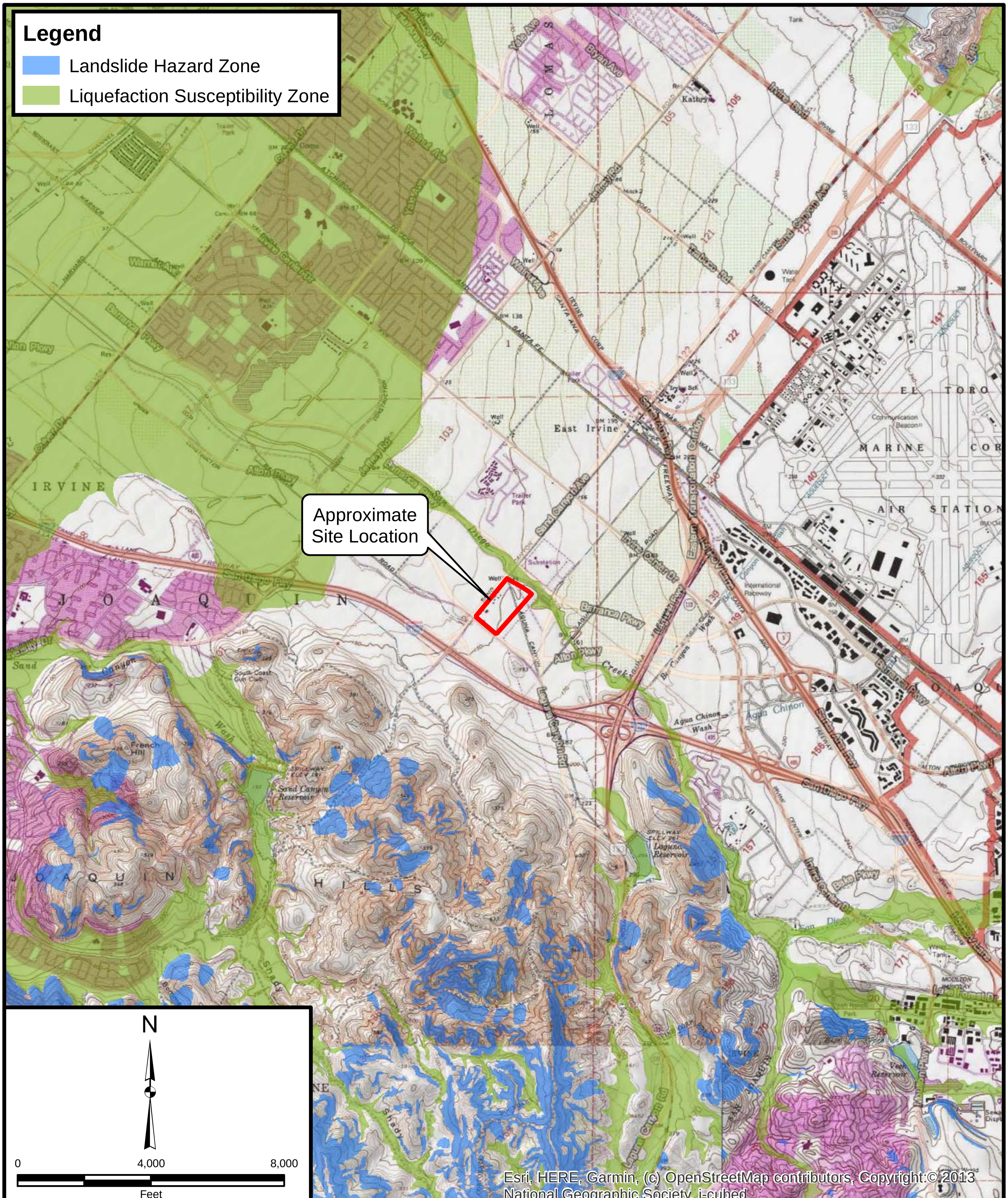

Project: 11753.004	Eng/Geol: CCK/JAR	
Scale:1 " = 4,000 '	Date: February 2020	

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton, CGS
Author: Leighton Geomatics (btran)

SEISMIC HAZARD MAP

Hoag Hospital Irvine Expansion
16200 Sand Canyon Avenue
Irvine, California

Figure 4

Leighton

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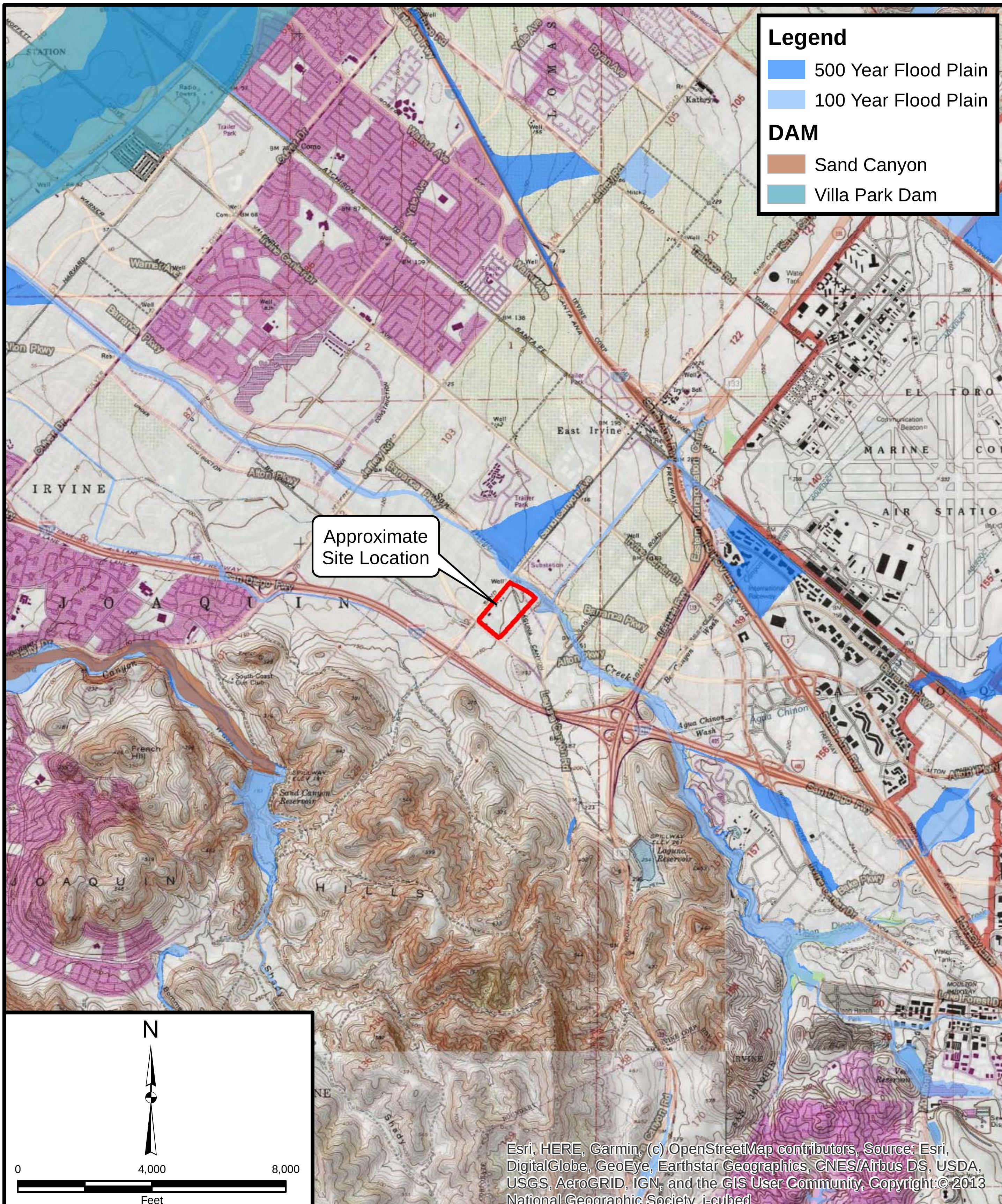

Project: 11753.004	Eng/Geol: CCK/JAR	Figure 5
Scale:1 " = 4,000 '	Date: February 2020	

Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton, CA DWR, FEMA
Author: Leighton Geomatics (btran)

FLOOD HAZARD AND DAM INUNDATION MAP

Hoag Hospital Irvine Expansion
16200 Sand Canyon Avenue
Irvine, California

Leighton

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APPENDIX A

Geotechnical Boring and CPT Logs

Leighton

GEOTECHNICAL BORING LOG LB-1-2020

Project No.	11753.004	**Date Drilled**	1-8-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	144'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

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.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0									@0': 3.5 inches of asphalt concrete over 9 inches of base.	
				B-1					SM	**Artificial Fill (Af):**	
140										@4': Silty SAND; brown; slightly moist; fine to medium sand; some coarse sand; some base gravel.	
	5			R-1		9 14 19	108	16	SC-CL	**Quaternary Young Alluvial Fan (Qyf):** @5': Sandy CLAY to Clayey SAND; very stiff/medium dense; dark brown; moist; fine sand; few medium sand; trace coarse sand; abundant CaCO3 stringers.	
135											
	10			S-1 B-2		6 12 19		14	SC CL	@10': Clayey SAND; dense; dark brown; moist; fine sand; few medium sand; some coarse sand; abundant CaCO3 stringers. @11.25': Lean CLAY; very stiff; dark brown; moist; some fine to medium sand; CaCO3 stringers.	EI, CR
130											
	15			R-2		10 12 22			SC CL	@15': Clayey SAND; medium dense; dark brown; moist; fine sand; few medium sand; some coarse sand; abundant CaCO3 stringers. @16': Lean CLAY; very stiff; olive brown; moist; some fine sand; few medium sand; nonplastic; waxy; CaCO3 stringers; some pinhole porosity.	DS, CN
125											
	20			S-2		6 9 12		10	SM	@20': Silty SAND; medium dense; light brown; slightly moist; very fine to fine sand; trace coarse sand; interbeds of sandy silt; few to some CaCO3 stringers.	
120											
	25			R-3		17 28 50/6			SP	@25': SAND; very dense; light brown; moist; fine to coarse sand; few silt; unconsolidated.	DS
115											
	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-1-2020

Project No.	11753.004	**Date Drilled**	1-8-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	144'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			S-3		3 6 8		5	SPg	@30': SAND with gravel to gravelly SAND; loose; light brown; moist; fine to medium sand; some coarse sand; few silt; fine gravel.	
									SCg	@31': Clayey Gravelly SAND; loose; reddish brown; very moist; fine to coarse sand; fine gravel; thinly bedded.	
									SPg		
110											
	35			R-4		14 25 34			SM	@35': Silty SAND; dense; yellowish brown; very moist; fine to medium sand; some coarse sand.	DS, CN
									CL	@36.25': Sandy CLAY; dark orangey brown; very moist; fine sand; low plasticity.	
105 ▽											
	40			S-4		3 8 12		20	ML-SM	@40': Sandy SILT to Silty SAND; very stiff/medium dense; strong brown; very moist to wet; mostly fine sand; some medium to coarse sand. Interbeds of Silty Gravelly SAND and Silty Sandy GRAVEL; medium dense; colored black, pink and brown; wet; fine to coarse sand; some clay; fine to medium gravel.	
100											
	45			R-5		9 15 27	105	22	SC	@45': Clayey SAND; dense; olive brown; wet; mostly fine sand; some medium sand.	
									SC-CL	@46.25': Clayey SAND to Sandy CLAY; dense/hard; gray-green; wet, fine to medium sand.	
95											
	50			S-5		15 18 40		19	SP	@50': SAND; very dense; light tan; wet; fine to coarse sand; few fine gravel; shoe contained silty sand.	
										Total Depth: 51.5 feet **Groundwater encountered at 39.3 feet** **Backfilled with grout and patched surface with concrete.**	
90											
	55										
85											
	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 LB-2-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	144'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

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
144	0							@0': 3.5 inches of asphalt concrete over 8 inches of base.	
			B-1				SC	**Artificial Fill (Af):** @1': Clayey SAND; dark brown; slightly moist; mostly fine to medium sand; some coarse sand; few fine gravel; some asphalt concrete debris; some silty sand regions.	CR, CN, EI, MD RV
140	5		S-1	5 3 3		7	SC	@5': Clayey SAND; loose; dark brown; slightly moist; few fine sand; some medium sand; few coarse sand.	
								Quaternary Young Alluvial Fan (Qyf):	
135	10		R-1 B-2	10 10 12	97	12	SM	@10': Silty SAND with Clay; medium dense; brown; slightly moist to moist; fine sand; pinhole pores; abundant CaCO3 stringers and CaCO3 filled root casts.	
130	15		S-2	4 7 9		13	SC	@15': Clayey SAND with Silt; medium dense; brown; slightly moist to moist; fine sand; pinhole pores; abundant CaCO3 stringers and CaCO3 filled root casts.	
125	20		R-2	8 13 18	101	5	SP	@20': SAND with Silt; medium dense; pale yellow brown; moist; very fine sand; few pinhole pores; few MnO spots; some CaCO3 blebs and stringers; weak parting planes; moderately cemented.	
120	25		S-3	8 17 18		1		@25': SAND; dense; pale tan; slightly moist; fine sand; few medium sand; few silt. @25.75': SAND with gravel; dense; pale tan; slightly moist; fine to coarse sand; fine gravel.	
115	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-2-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	144'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	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.	
	30			R-3		23 40 47	115	3	SPg	@30': Gravelly SAND; very dense; dark orange brown; very moist; some fine sand; medium to coarse sand; fine to coarse gravel, some medium gravel fragments; moderately to well cemented; regions of clayey gravelly sand; broken cobble at approximately 30.5'.	
110											
	35			S-4		2 9 12		19	CL-SC	@35': Silty Sandy CLAY grading to Clayey Silty SAND; medium dense/very stiff; mottled gray-green and reddish brown; very moist; fine sand; MnO spotting; thinly bedded to laminated; micaceous.	
105											
	40			R-4		2 8 12		18	SP-SM	@40': Silty SAND to SAND with Silt; medium dense; brown; wet; fine to medium sand; few to trace coarse sand.	
100											
	45			S-5		18 19 19		18	SP	@45': SAND; dense; brown; wet; fine to medium sand; grading to medium to coarse sand.	
95										@50': SAND; dense; brown; wet; fine to medium sand; grading to medium to coarse sand; likely heaved sand.	
	50			S-6		4 12 21		14		@51.25': Clayey SAND; hard; gray-green; wet; fine sand; few medium sand in shoe.	
										Total Depth: 51.5 feet Groundwater encountered at approximately 38.5 feet Backfilled with grout and patched surface with concrete.	
90											
	55										
85											
	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-3-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	142'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

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.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0									@0': 3 inches of asphalt concrete over 9 inches of base.	
140				B-1					SM	**Artificial Fill (Af):** @1':Silty SAND; brown; slightly moist; fine to medium sand; few coarse sand; asphalt debris and base aggregate present. Regions of Clayey SAND; dark brown; slightly moist; fine to medium sand; few coarse sand.	
	5			R-1		7 10 17	98	12	SC	**Quaternary Young Alluvial Fan (Qyf):** @5.5': Clayey SAND; medium dense; mottled medium and dark brown; slightly moist; mostly fine sand; few medium sand; pinhole pores.	
135											
	10			S-1		3 6 9		12	ML-SM	@10': Sandy SILT to Silty SAND; stiff/medium dense; medium brown; slightly moist; very fine to fine sand; abundant CaCO3 stringers.	
130											
	15			R-2		12 11 20	110	3	SP	@15': SAND; medium dense; gray-brown; slightly moist; very fine to fine sand; few medium sand; some silt; CaCO3 stringers; few pinhole pores. Interbeds of Clayey SAND; dark brown; slightly moist to moist; medium to coarse sand. @16.25': SAND; medium dense; gray-brown; slightly moist; fine to coarse sand.	
125											
	20			S-2		6 11 15		1		@20': SAND with Gravel; pale tan; moist; medium dense; mostly fine to medium sand; some coarse sand; fine gravel; unconsolidated.	
120											
	25			R-3		40 50/3		1		@25': SAND with Gravel and Cobbles; pale tan; slightly moist; very dense; fine to coarse sand; few silt; fine gravel; few medium gravel; medium cobble in lower rings, fractured.	
115											
	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

GEOTECHNICAL BORING LOG LB-3-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	142'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

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-3	50/3		16	CL	@30': Sandy Silty CLAY; hard; gray-green with red oxidation splotches; very moist; plastic; FeO and MnO stains; regions of Clayey Silty SAND.	
110										
	35			R-4	7 7 11	105	22	ML	@35': Clayey SILT with SAND; very stiff; olive; very moist; fine sand; MnO and MnO spots; plastic. Grades to Silty CLAY with Sand; dark olive; very moist; fine sand.	
105										
	40			S-4	4 6 7		20	ML-SM ML	@40': Interbedded Sandy SILT and Silty SAND; stiff/medium dense; strong brown to reddish brown; very moist to wet; fine sand in silt regions; medium to coarse sand in sandy regions. @41.25': SILT; stiff; gray-green; very moist.	
100										
	45			R-5	4 6 7	86	35		@45': SILT; firm; mottled gray-green and reddish gray; wet; MnO spotting; blocky structure.	
95										
	50			S-5	2 7 18		31	SM	@50.9': Silty SAND; medium dense; brown; brown; wet; fine sand; some medium sand.	
90									**Total Depth: 51.5 feet** **Groundwater encountered at approximately 38.6 feet** **Backfilled with grout and patched surface with concrete.**	
	55									
85										
	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
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- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
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- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-4-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	144'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

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							@0': 3.5 inches of asphalt concrete over 6 inches of base.	
			B-1				SC	**Artificial Fill (Af):** @0.8': Clayey SAND; brown; slightly moist to moist; fine sand; few to some medium sand; few coarse sand; some silt; asphalt debris.	CR, CN, EI, MD RV
140	5		S-1	3 7 8		8	SM	**Quaternary Young Alluvial Fan (Qyf):** @5.25': Silty SAND; medium dense; reddish brown; slightly moist; very fine sand; CaCO3 filled rootlet casts or pinholes.	
135	10		R-1	9 13 16	100	10	SC	@10': Silty Clayey SAND; medium dense; dark brown; moist; very fine to fine sand; trace coarse sand; trace fine gravel; pinhole pores; CaCO3 stringers.	
130	15		S-2	7 10 14		12	CL	@15': CLAY; very stiff; mottled pale brown and dark brown; slightly moist; pinhole pores; fine rootlets, CaCO3 blebs; micaceous, laminated, trace fine gravel (siltstone clasts).	
							SP-SC	@15.75': SAND with Clay to Clayey SAND; medium dense; dark brown; moist; fine sand; trace coarse sand; CaCO3 stringers.	
125	20		R-2	12 18 50/4			CL-ML	@20': Interbedded Sandy CLAY and Silty CLAY; hard; mottled yellow-gray; slightly moist to moist; fine sand.	DS, CN
							SP-SM	@21': Silty SAND to SAND with Silt; very dense; gray-brown; slightly moist; fine to medium sand.	
120	25		S-3	21 28 31		1	SM	@25': Silty SAND with Gravel; dense; pale yellow; slightly moist; fine to coarse sand; mechanically fractured medium to coarse gravel.	
115	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
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GEOTECHNICAL BORING LOG LB-4-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	144'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

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.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			R-3		4 8 14			CL	@30': Lean CLAY; stiff; mottled light olive brown and reddish brown; very moist; plastic.	DS, CN
110	35			S-4		2 2 4		30	ML	@35': Sandy SILT; firm; strong brown; very moist; fine sand. Silty CLAY; mottled olive-gray and reddish brown; very moist; plastic.	
105	40			R-4		4 6 8	106	22	SM-ML	@40': Interbedded Sandy SILT and Silty SAND; olive brown; wet; fine sand; micaceous.	
100	45			S-5		4 2 9		17	SM	@45': Silty SAND; medium dense; brown; mostly fine to medium sand. Transitions to SAND with Silt; brown; wet; fine to medium sand; some coarse sand.	
									CL	@46.25': CLAY; stiff; dark brown; very moist; plastic; some CaCO3; blocky structure; waxy.	
95	50			S-6		3 5 6		24	SM-ML	@50': Sandy SILT and Silty SAND; stiff/medium dense; olive brown; wet; fine sand.	
90	55									**Total Depth: 51.5 feet** **Groundwater encountered at approximately 41.5 feet** **Backfilled with grout and patched surface with concrete.**	
85	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
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GEOTECHNICAL BORING LOG LB-5-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	145'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	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
145	0									@0': 3 inches of asphalt concrete over 8 inches of base.	
				B-1					SP	**Artificial Fill (Af):** @0.92': SAND with Silt; brown; slightly moist; fine to medium sand; some coarse sand; few fine gravel; some clay nodules; some asphalt concrete debris.	
140	5			R-1		7 9 12	112	16	SP-CL	@5': SAND with Silt and Silty Sandy CLAY; medium dense/stiff; brown; moist; fine sand; some medium sand.	
										Quaternary Young Alluvial Fan (Qyf):	
135	10			S-1 B-2		4 6 9		16	SM-ML	@10': Sandy Clayey SILT to Silty Clayey SAND; stiff/medium dense; dark brown; moist; fine sand; CaCO3 filled pinhole pores.	
130	15			R-2		8 9 17	112	11	CL-SC	@15': Sandy CLAY to Clayey SAND; very stiff/medium dense; dark brown; moist; fine sand; abundant CaCO3 veins/stringers.	
125	20			S-2		7 10 16		3	SP	@20': SAND; medium dense; pale tan; slightly moist to moist; very fine to fine sand; trace medium to coarse sand; few silt; trace fine gravel. Transitions to medium to coarse sand in the last inch.	
120	25			R-3		6 6 9	121	2		@25': SAND; medium dense; pale tan; slightly moist to moist; fine to coarse sand; few fine to medium gravel. @26.25': SAND with Clay; medium dense; brown; moist to very moist; fine to coarse sand; trace fine gravel.	
115	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
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- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

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GEOTECHNICAL BORING LOG LB-5-2020

Project No.	11753.004	**Date Drilled**	1-9-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	145'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

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
115	30			S-3	11 17 15		8	SC	@30': Clayey SAND with Gravel; red brown; very moist; fine to coarse sand; fine to medium gravel. Transitions to Clayey SAND with few to some gravel and gravel beds.	
110	35			R-4	8 32 50/6	110	7	SP	@35': SAND; very dense; orange brown; some fine sand; mostly medium to coarse sand; some silt and clay; trace fine gravel; indistinct thin beddind, beds mostly fine to medium sand.	
105	40			S-4	2 4 6		22	SM ML	@40': Silty SAND; loose; olive; very moist to wet; very fine sand. @40.25': SILT; stiff; olive; very moist; few fine sand; some clay; abundant MnO spotting.	
100	45			R-5	3 4 8	105	22	SM	@45': Silty SAND; loose; dark reddish brown; wet; mostly fine sand. Interbeds of Sandy SILT; firm; wet.	
95	50			S-5	4 4 6		24	ML	@50': Sandy SILT; stiff; mottled gray-green and reddish brown; wet; fine sand; regions of heavy MnO spotting.	
90	55								**Total Depth: 51.5 feet** **Groundwater encountered at approximately 38.4 feet** **Backfilled with grout and patched surface with concrete.**	
85	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

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

GEOTECHNICAL BORING LOG LB-6-2020

Project No.	11753.004	**Date Drilled**	1-8-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	149'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk/Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1					SC	**Artificial Fill (Af):** @0': Gravel at the surface. Clayey SAND; medium brown; moist; fine sand; few silt.	
145	5			S-1		5 10 11		11		@5': Clayey SAND; medium dense; medium brown; moist; fine sand; few silt.	
									SP SC	**Quaternary Young Alluvial Fan (Qyf):** @5.75': SAND; light brown; slightly moist; fine sand; few silt. @6': Clayey SAND; medium dense; brown; moist; fine sand; abundant CaCO3 stringers.	
140	10			R-1		7 6 9	109	13	SP	@10': SAND with Clay; medium dense; light to medium brown; moist; fine sand. Transitions to Clayey SAND; dark brown; some CaCO3 stringers.	
135	15			S-2		3 6 10		17	CL-SC	@15': Sandy CLAY to Clayey SAND; medium dense/stiff; light to medium brown; moist; fine sand. Transitions to Clayey SAND; dark brown; some CaCO3 stringers.	
130	20			R-2		5 8 15	105	14	SP	@20': SAND with CLAY; medium dense; medium brown; moist; fine sand. Transitions to SAND; medium dense; light brown; slightly moist; very fine to fine sand; few silt. Transitions to coarser SAND to include few to some medium sand.	
125	25			S-3		3 4 5		17	SM	@25': Silty SAND; loose; light brown; moist to very moist; very fine sand with interbedded Sandy SILT. @26': Thin CLAY bed; stiff; strong brown; very moist; plastic.	
120	30										

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

GEOTECHNICAL BORING LOG LB-6-2020

Project No.	11753.004	**Date Drilled**	1-8-20
Project	Hoag Hospital Irvine	**Logged By**	KMD
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	149'
Location	See Plate 1- Exploration Location Map	**Sampled By**	KMD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			R-3		9 21 40		1	SP	@30': SAND; dense; light tan; very moist; fine to coarse sand; trace fine gravel; unconsolidated.	
115											
	35			S-4		5 15 19		12	SPg	@35': Gravelly SAND; dense; light tan; moist; fine to coarse sand; fine to medium gravel, some mechanically broken.	
									CL	@36.25': Sandy CLAY; very stiff; olive; moist; fine sand; plastic.	
110											
	40			R-4		5 11 16	102	17	CL-SC	@40': Sandy CLAY to Clayey SAND; very stiff/medium dense; mottled greenish brown and reddish brown; very moist; fine sand.	
105											
	45			S-5		5 11 22		16	SPg	@45': Gravelly SAND; dense; tan; wet; fine to coarse sand; fine gravel.	
100											
	50			S-6		6 12 19		14		@50': Gravelly SAND (likely heaving sand); dense; tan; wet; fine to coarse sand; fine gravel. Clayey Gravelly SAND in shoe; patches of pink and yellow.	
95										**Total Depth: 51.5 feet** **Groundwater encountered at approximately 43.3 feet** **Backfilled with grout.**	
	55										
90											
	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.

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- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

SUMMARY

OF

CONE PENETRATION TEST DATA

Project:

Hoag Hospital Irvine
Irvine, CA
January 15, 2020

Prepared for:

Mr. Jeff Pflueger
Leighton Consulting
17781 Cowan
Irvine, CA 92614-6009
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 Hoag Hospital Irvine project located in Irvine, California. The work was performed by Kehoe Testing & Engineering (KTE) on January 15, 2020. 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:
C-1	50	
C-2	50	
C-3	27	Refusal
C-4	50	
C-5	50	
C-6	50	
C-7	50	
C-8	50	

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 and recorded the following parameters at approximately 2.5 cm depth intervals:

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

At locations C-2 & C-5, shear wave measurements were obtained at various depths. 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

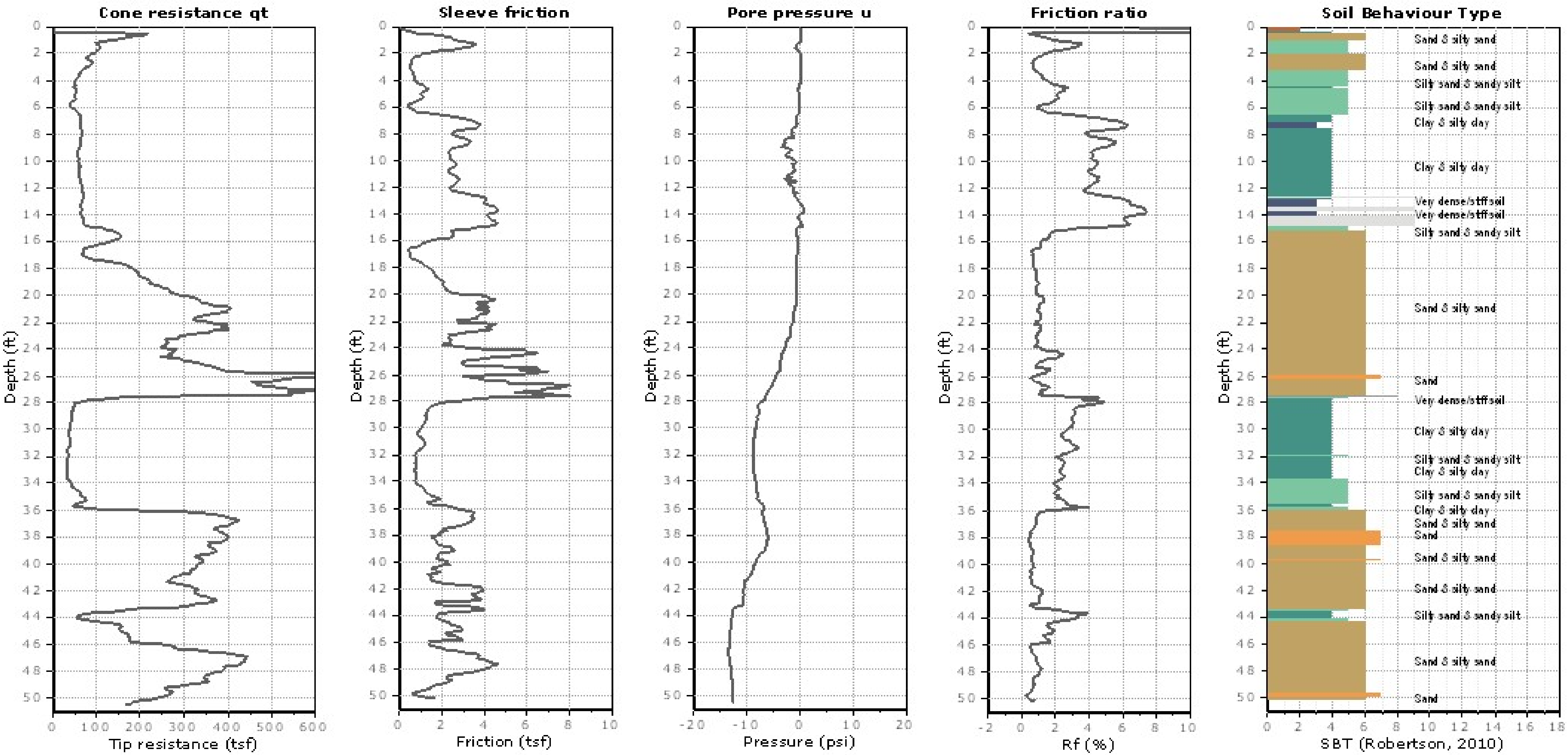
01/23/20-kk-1318

APPENDIX

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

Project: **Leighton Consulting / Hoag Hospital** **C-1**

Location: **Irvine, CA** Total depth: 50.50 ft, Date: 1/15/2020



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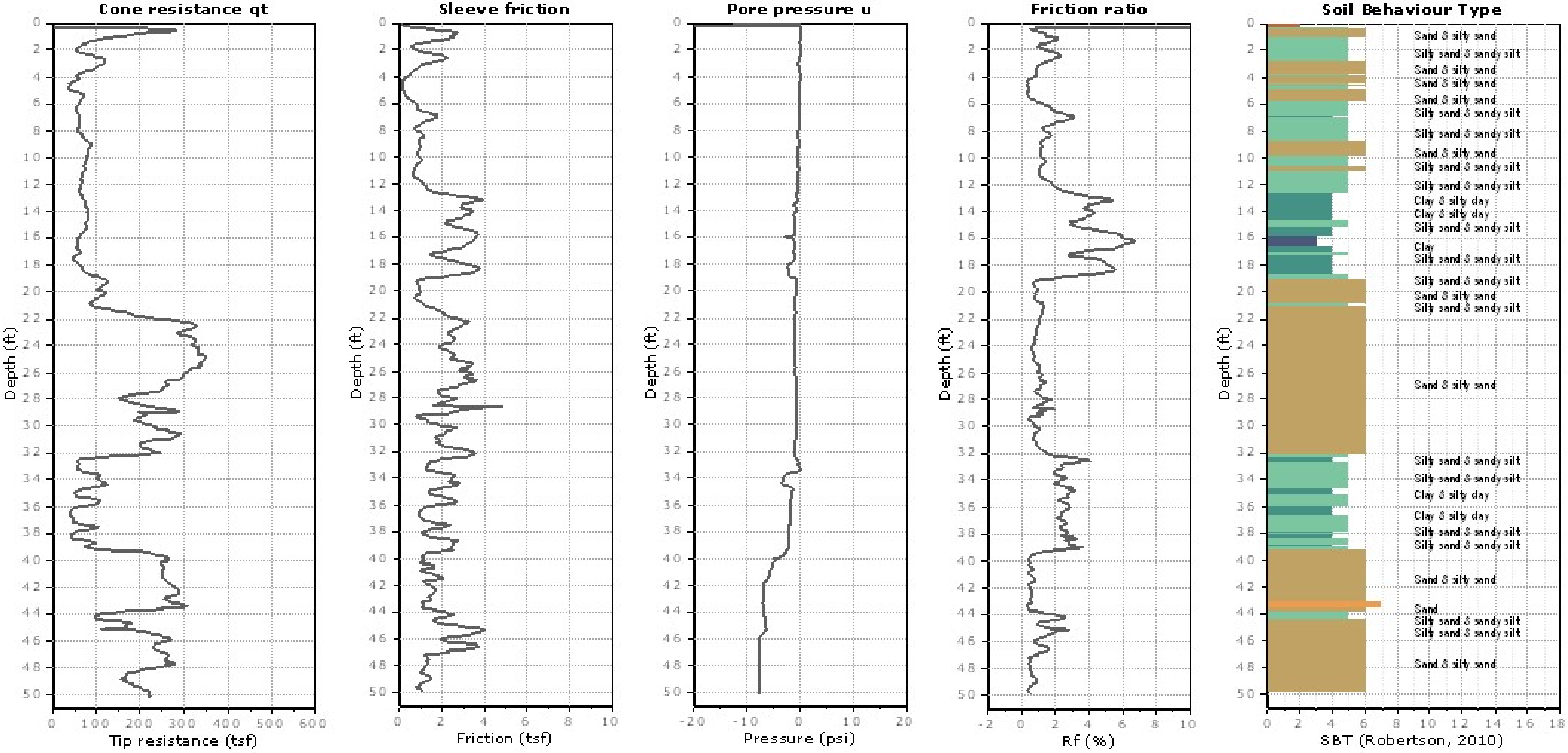
www.kehoetesting.com

Project: Leighton Consulting / Hoag Hospital
Location: Irvine, CA

C-2
Total depth: 50.17 ft, Date: 1/15/2020



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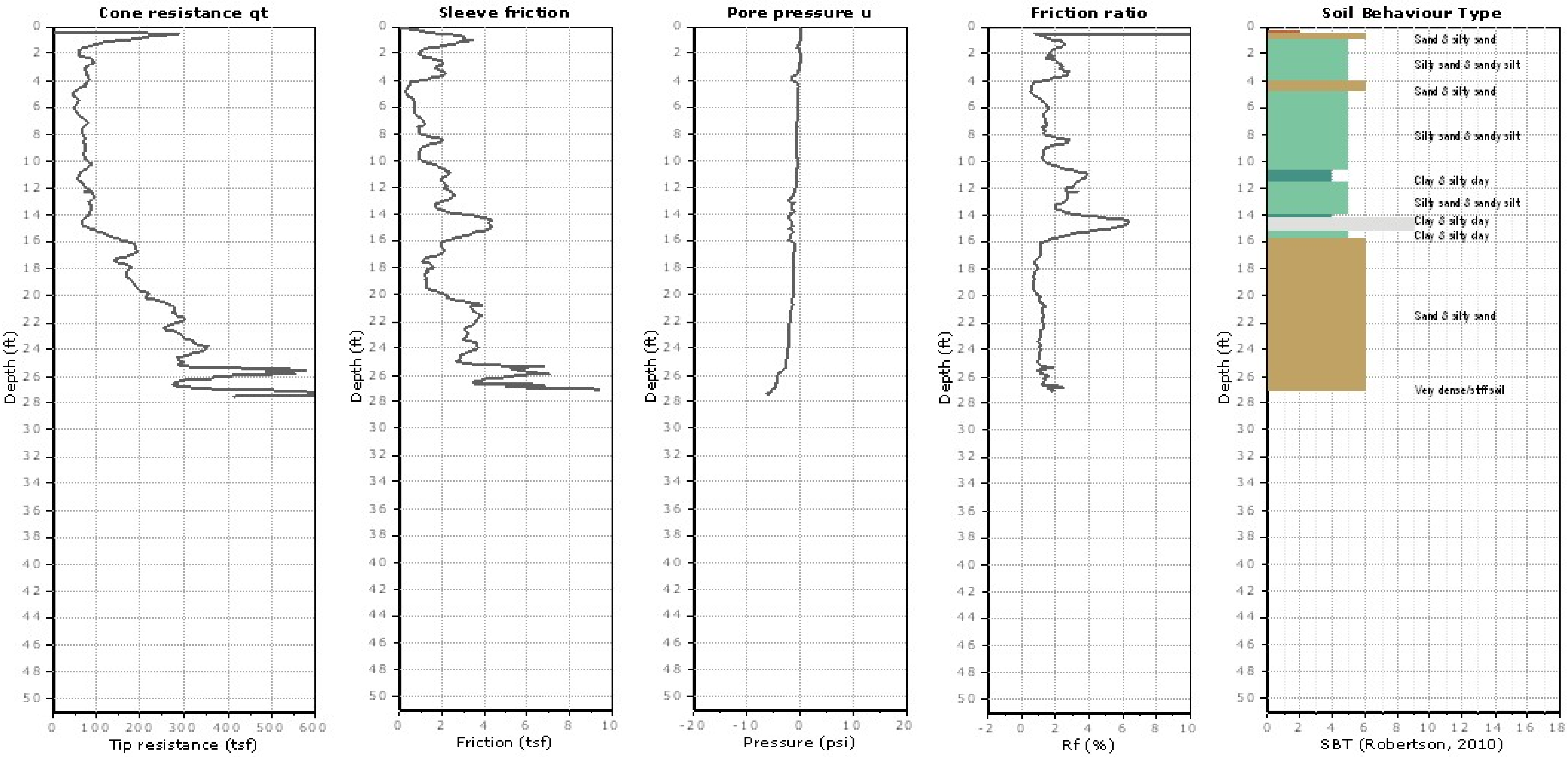
Project: Leighton Consulting / Hoag Hospital

Location: Irvine, CA

C-3

Total depth: 27.49 ft, Date: 1/15/2020



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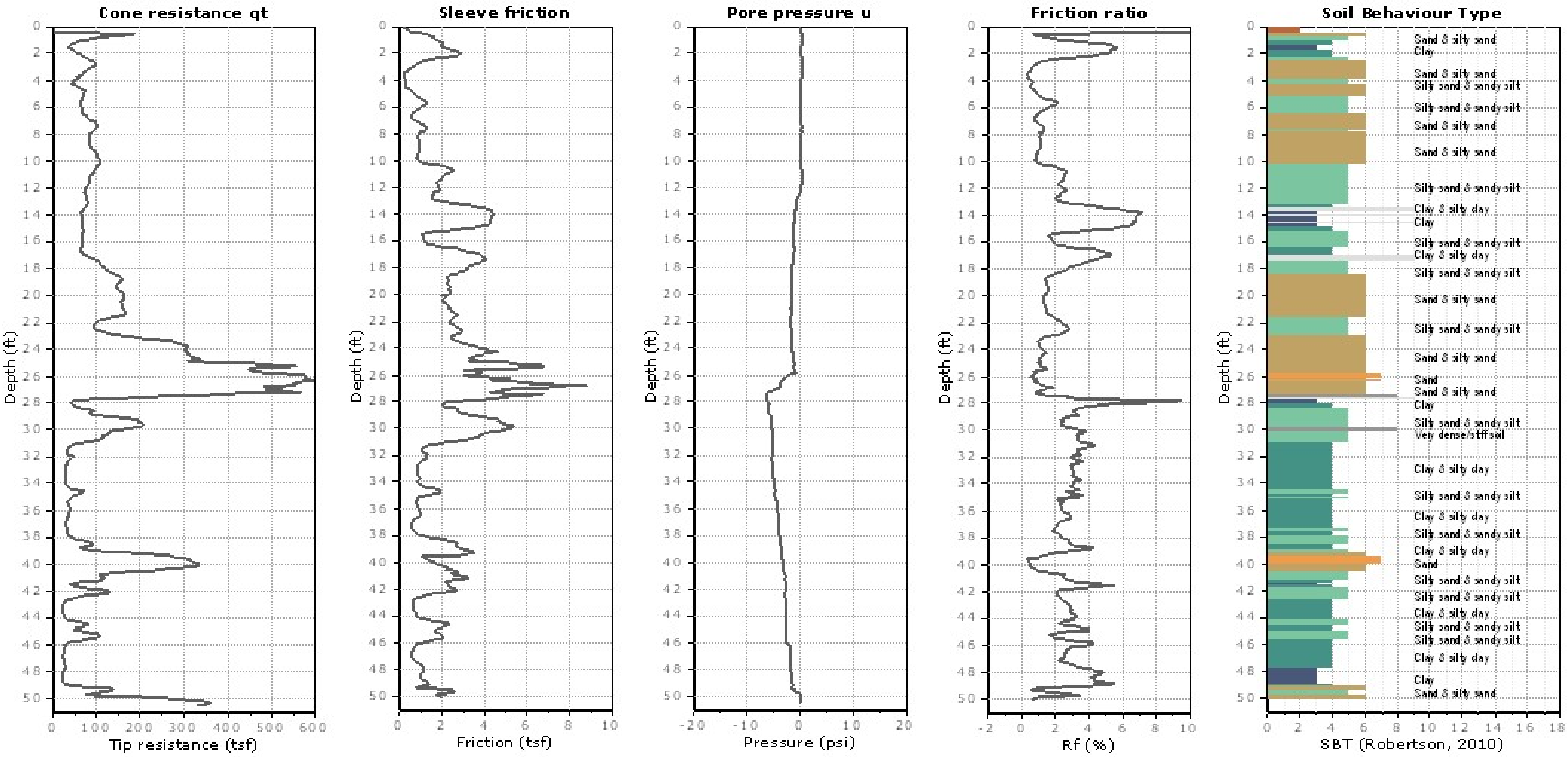
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: **Leighton Consulting / Hoag Hospital** **C-4**

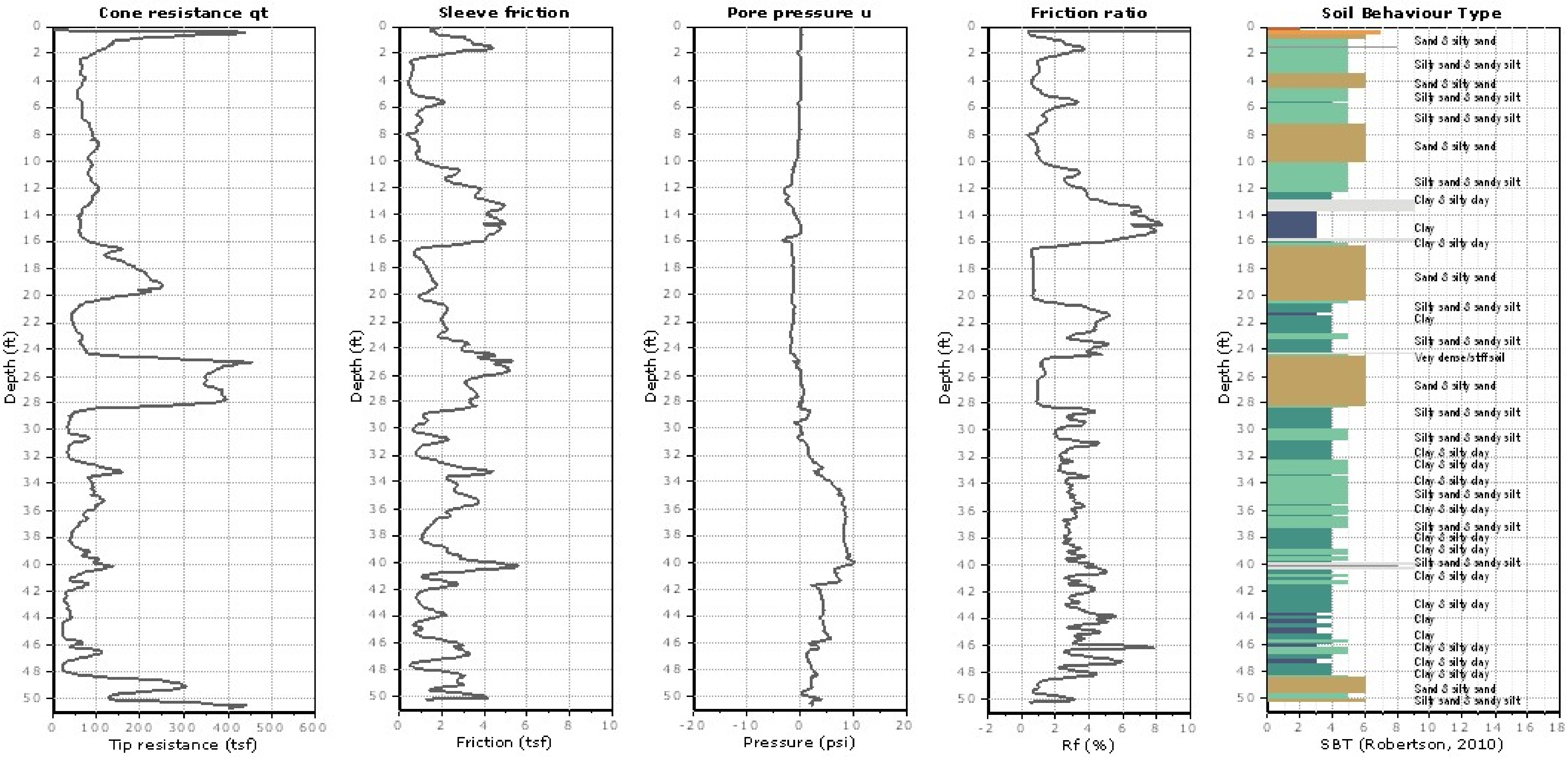
Location: **Irvine, CA** Total depth: 50.48 ft, Date: 1/15/2020



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

Project: **Leighton Consulting / Hoag Hospital** **C-5**

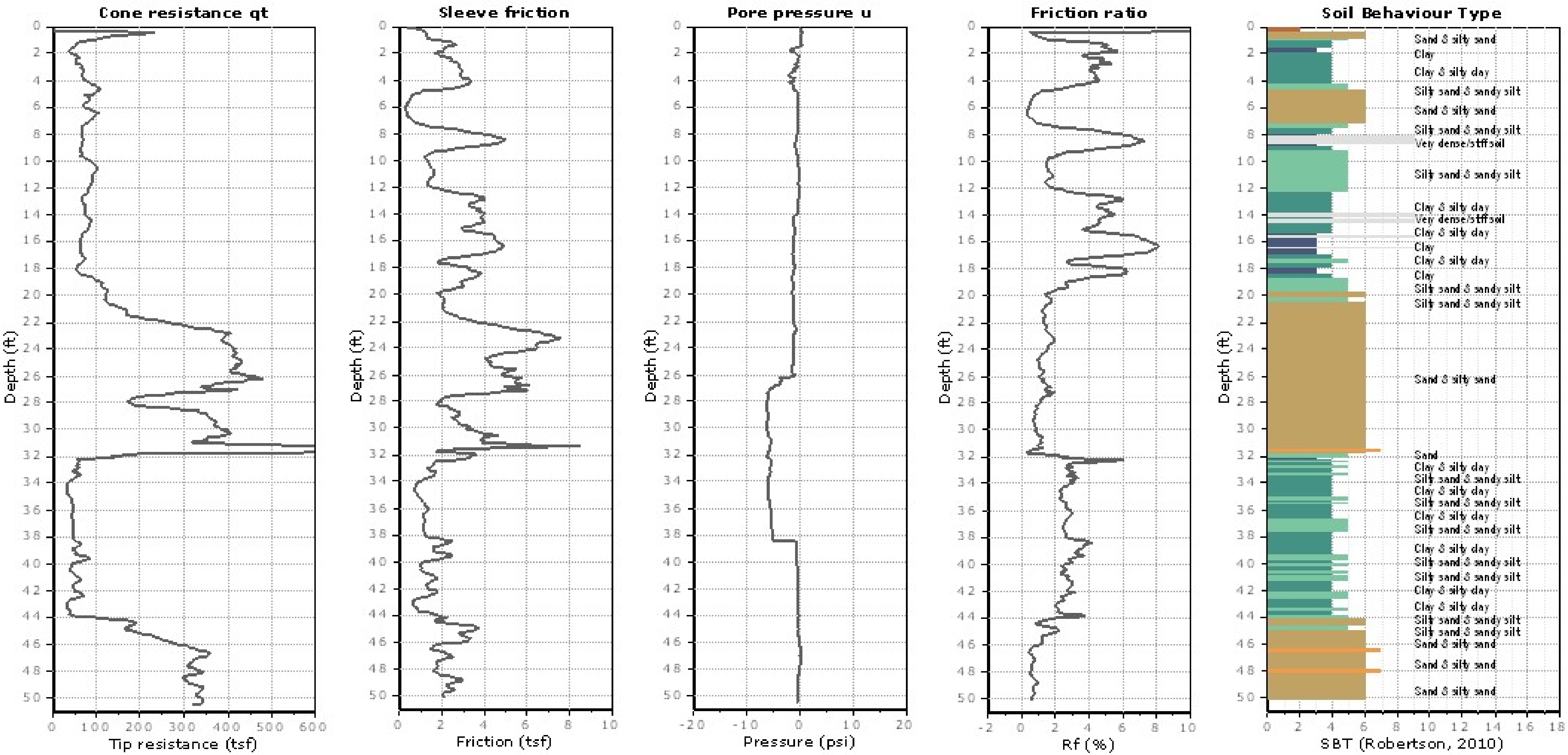
Location: **Irvine, CA** Total depth: 50.67 ft, Date: 1/15/2020



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

Project: **Leighton Consulting / Hoag Hospital** **C-6**

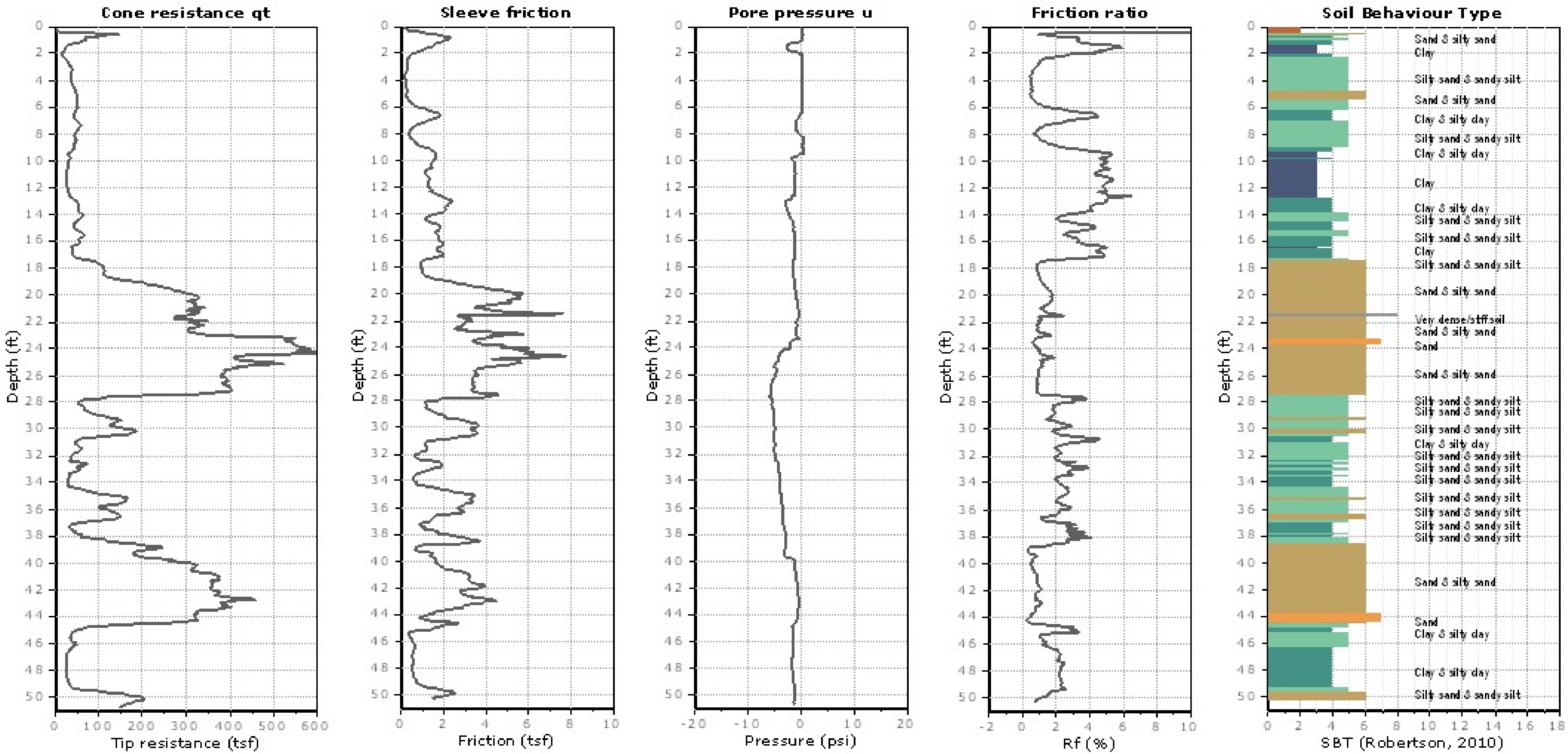
Location: **Irvine, CA** Total depth: 50.55 ft, Date: 1/15/2020



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

Project: **Leighton Consulting / Hoag Hospital** **C-7**

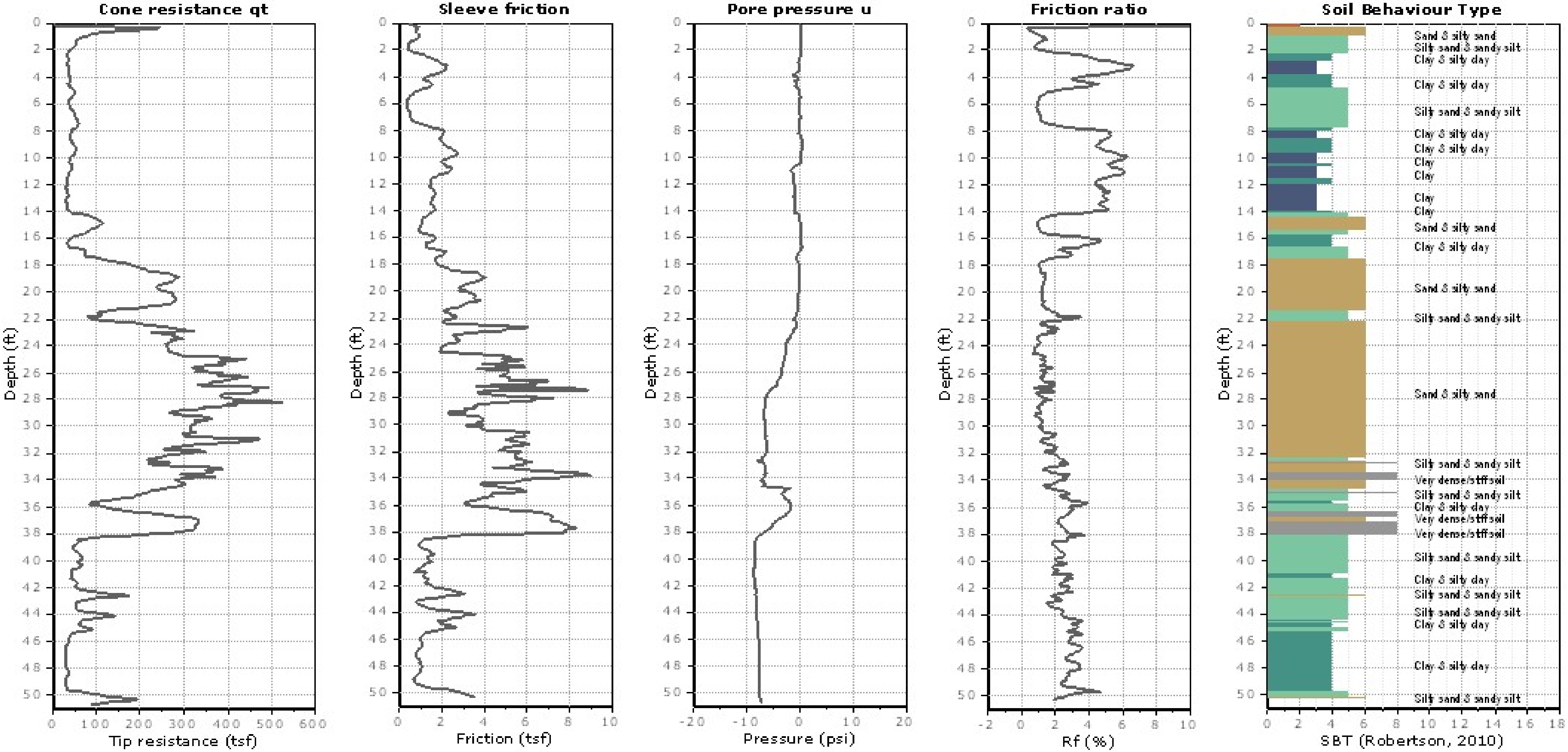
Location: **Irvine, CA** Total depth: 50.66 ft, Date: 1/15/2020



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

Project: **Leighton Consulting / Hoag Hospital** **C-8**

Location: **Irvine, CA** Total depth: 50.67 ft, Date: 1/15/2020



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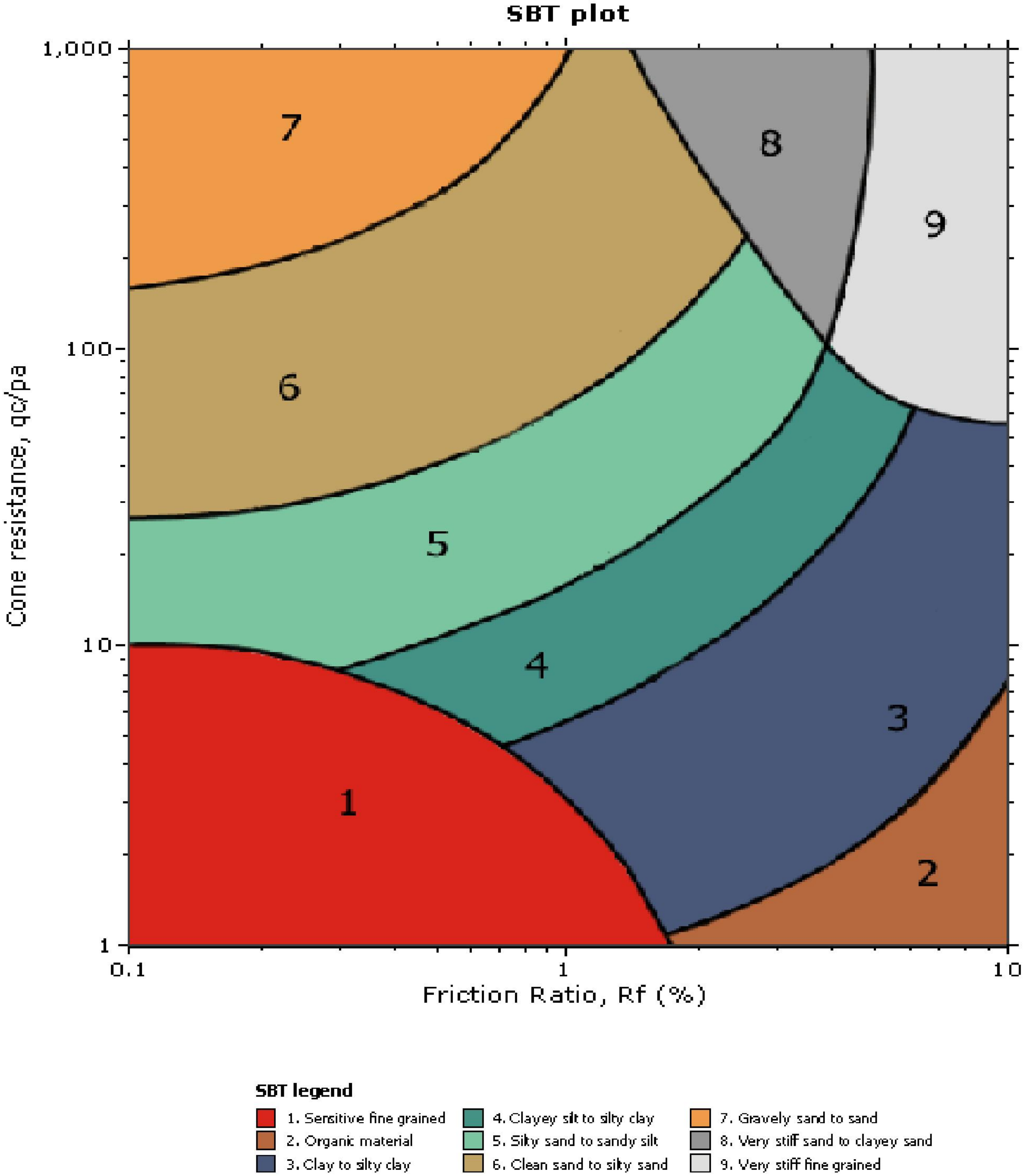


Leighton Consulting
Hoag Hospital
Irvine CA

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)
C-2	5.02	4.02	4.49	4.68	959.41	
	10.07	9.07	9.29	10.60	876.22	810.45
	14.99	13.99	14.13	16.36	863.83	841.03
	20.11	19.11	19.21	23.64	812.79	698.10
	25.10	24.10	24.18	28.48	849.12	1026.54
	30.05	29.05	29.12	32.86	886.15	1126.92
	35.01	34.01	34.07	37.36	911.90	1100.00
	40.03	39.03	39.08	41.66	938.10	1165.69
	45.08	44.08	44.13	46.34	952.21	1077.81
	50.16	49.16	49.20	50.74	969.66	1153.48
C-5	5.25	4.25	4.70	4.28	1097.45	
	10.30	9.30	9.51	9.84	966.73	866.11
	15.09	14.09	14.23	14.96	951.29	921.60
	20.05	19.05	19.15	20.24	946.38	932.47
	25.03	24.03	24.11	25.88	931.73	879.15
	30.05	29.05	29.12	29.72	979.77	1303.56
	40.09	39.09	39.14	40.12	975.60	963.69
	45.14	44.14	44.19	45.16	978.42	1000.82
	50.66	49.66	49.70	50.64	981.44	1006.38

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)

APPENDIX B

Laboratory Test Results

Leighton

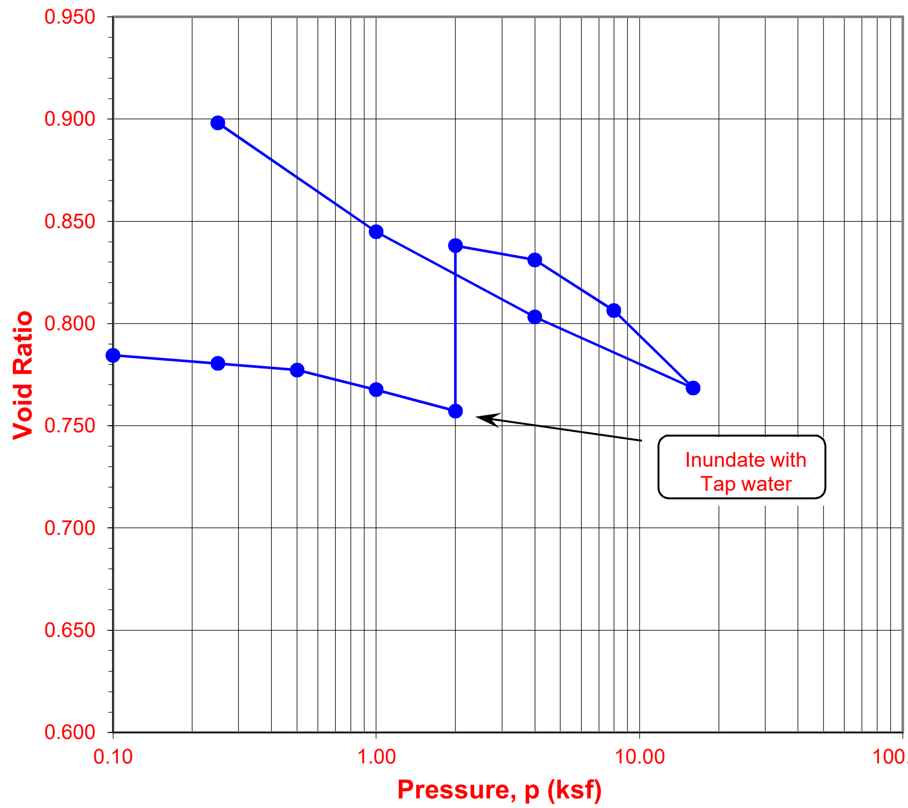
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Hoag Irvine	Tested By: G. Bathala	Date: 01/14/20
Project No.:	11753.004	Checked By: J. Ward	Date: 02/13/20
Boring No.:	LB-1-2020	Depth (ft.): 15.0	
Sample No.:	R-2	Sample Type:	Ring
Soil Identification:	Olive brown lean clay (CL)		

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	188.47
Weight of Ring (g):	45.56
Height after consol. (in.):	1.0634
Before Test	
Wt. of Wet Sample+Cont. (g):	168.29
Wt. of Dry Sample+Cont. (g):	145.14
Weight of Container (g):	36.76
Initial Moisture Content (%)	21.4
Initial Dry Density (pcf)	97.9
Initial Saturation (%):	76
Initial Vertical Reading (in.)	0.1894
After Test	
Wt. of Wet Sample+Cont. (g):	254.77
Wt. of Dry Sample+Cont. (g):	214.93
Weight of Container (g):	57.49
Final Moisture Content (%)	35.61
Final Dry Density (pcf):	87.5
Final Saturation (%):	100
Final Vertical Reading (in.)	0.1286
Specific Gravity (assumed):	2.80
Water Density (pcf):	62.43

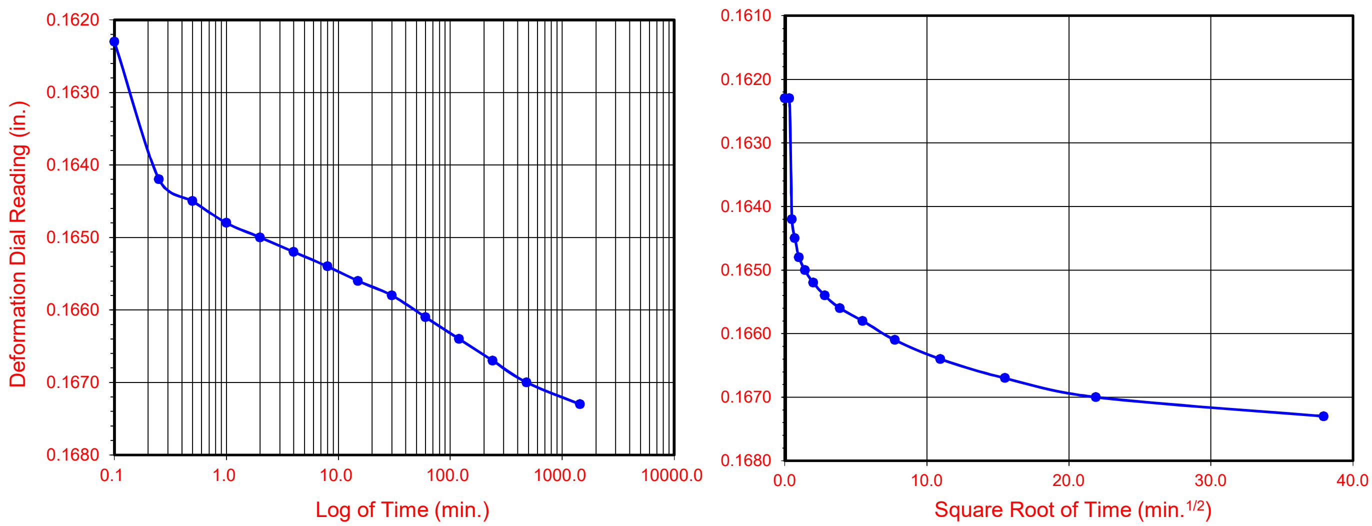


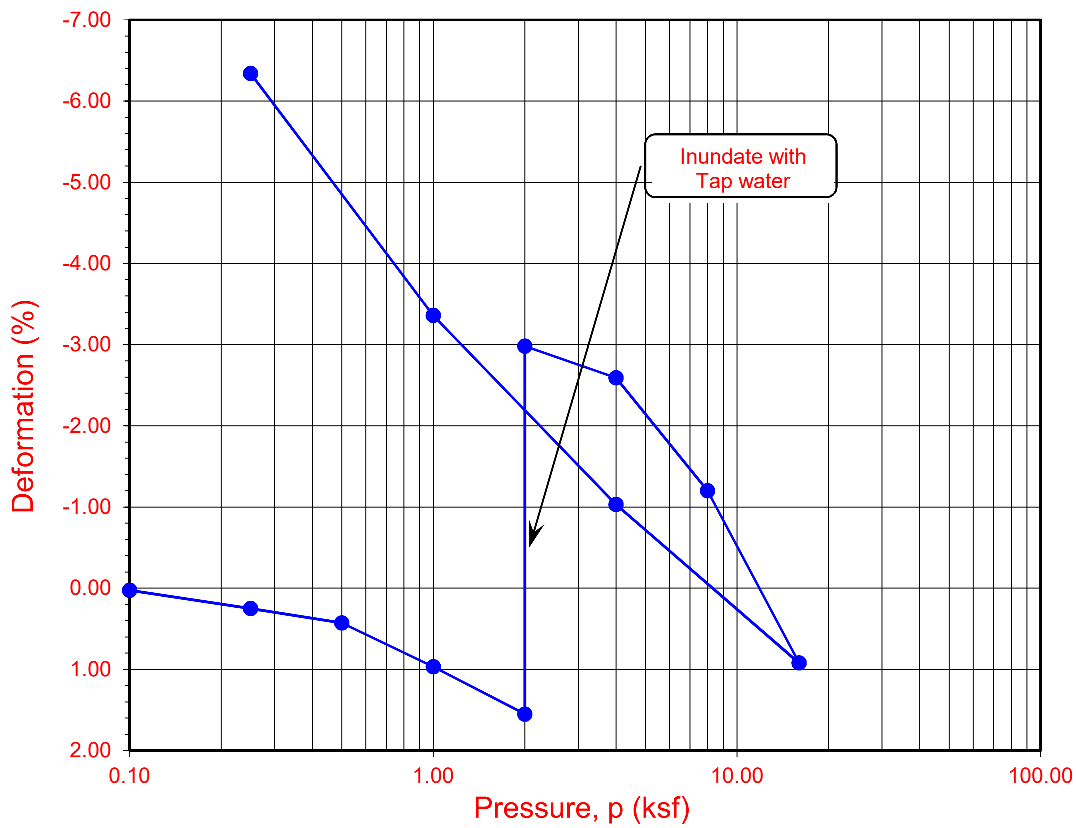
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.1897	0.9998	0.00	0.02	0.784	0.02
0.25	0.1923	0.9971	0.04	0.29	0.780	0.25
0.50	0.1946	0.9948	0.09	0.52	0.777	0.43
1.00	0.2007	0.9887	0.16	1.13	0.768	0.97
2.00	0.2076	0.9818	0.27	1.82	0.757	1.55
2.00	0.1623	1.0271	0.27	-2.71	0.838	-2.98
4.00	0.1673	1.0221	0.38	-2.21	0.831	-2.59
8.00	0.1823	1.0071	0.49	-0.71	0.806	-1.20
16.00	0.2049	0.9845	0.63	1.55	0.768	0.92
4.00	0.1842	1.0052	0.51	-0.52	0.803	-1.03
1.00	0.1595	1.0299	0.37	-2.99	0.845	-3.36
0.25	0.1286	1.0608	0.26	-6.08	0.898	-6.34

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
1/20/20	10:12:00	0.0	0.0	0.1623
1/20/20	10:12:06	0.1	0.3	0.1623
1/20/20	10:12:15	0.2	0.5	0.1642
1/20/20	10:12:30	0.5	0.7	0.1645
1/20/20	10:13:00	1.0	1.0	0.1648
1/20/20	10:14:00	2.0	1.4	0.1650
1/20/20	10:16:00	4.0	2.0	0.1652
1/20/20	10:20:00	8.0	2.8	0.1654
1/20/20	10:27:00	15.0	3.9	0.1656
1/20/20	10:42:00	30.0	5.5	0.1658
1/20/20	11:12:00	60.0	7.7	0.1661
1/20/20	12:12:00	120.0	11.0	0.1664
1/20/20	14:12:00	240.0	15.5	0.1667
1/20/20	18:12:00	480.0	21.9	0.1670
1/21/20	10:12:00	1440.0	37.9	0.1673

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-1-2020	**R-2**	**15**	**21.4**	**35.6**	**97.9**	**87.5**	**0.785**	**0.898**	**76**	**100**

Soil Identification: Olive brown lean clay (CL)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11753.004

Hoag Irvine

02-20

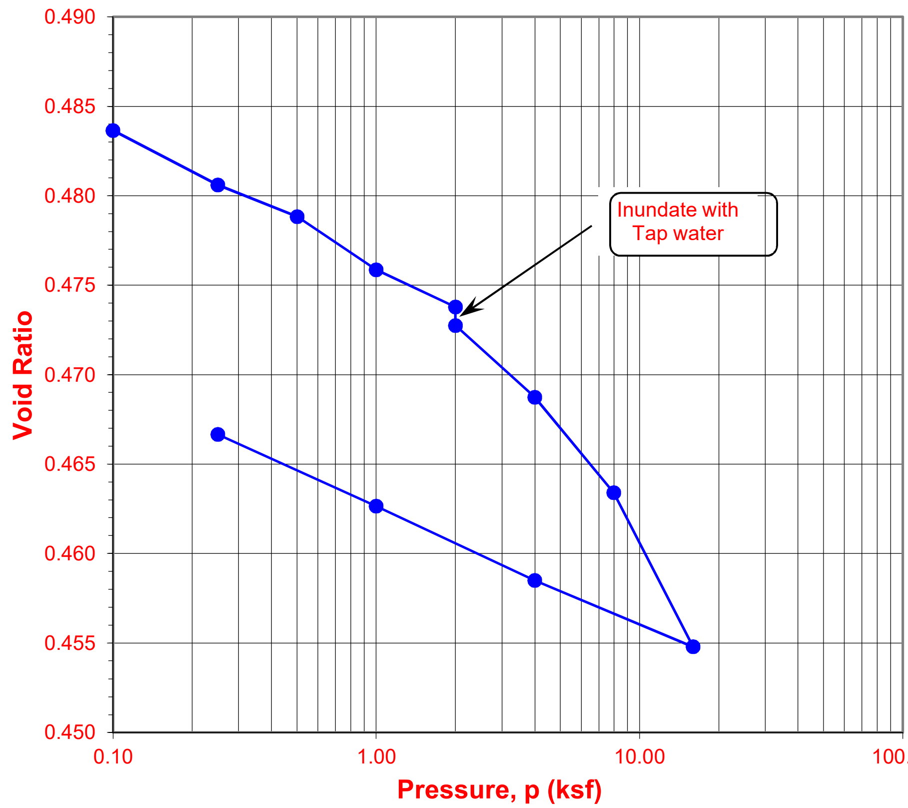
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Hoag Irvine	Tested By: G. Bathala	Date: 01/14/20
Project No.:	11753.004	Checked By: A Santos	Date: 02/13/20
Boring No.:	LB-1-2020	Depth (ft.): 35.0	
Sample No.:	R-4	Sample Type:	Ring
Soil Identification:	Yellowish brown silty sand (SM)		

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	190.25
Weight of Ring (g):	45.76
Height after consol. (in.):	0.9884
Before Test	
Wt. of Wet Sample+Cont. (g):	178.49
Wt. of Dry Sample+Cont. (g):	166.78
Weight of Container (g):	36.88
Initial Moisture Content (%)	9.0
Initial Dry Density (pcf)	110.2
Initial Saturation (%):	49
Initial Vertical Reading (in.)	0.1390
After Test	
Wt. of Wet Sample+Cont. (g):	260.35
Wt. of Dry Sample+Cont. (g):	236.10
Weight of Container (g):	59.50
Final Moisture Content (%)	18.53
Final Dry Density (pcf):	110.1
Final Saturation (%):	100
Final Vertical Reading (in.)	0.1530
Specific Gravity (assumed):	2.62
Water Density (pcf):	62.43

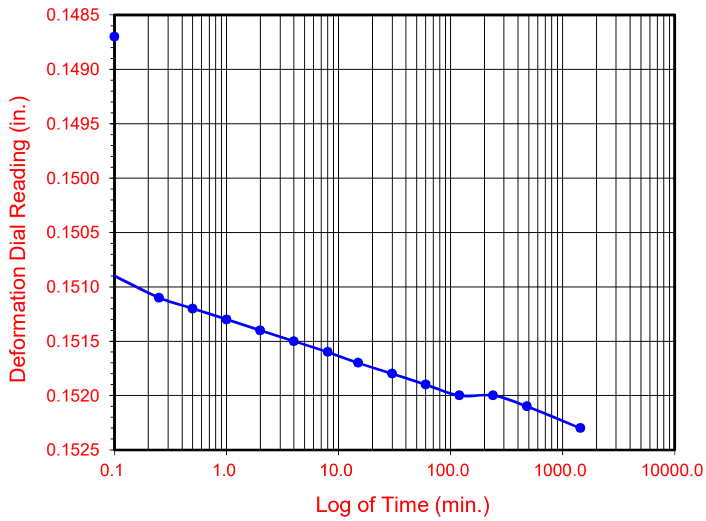


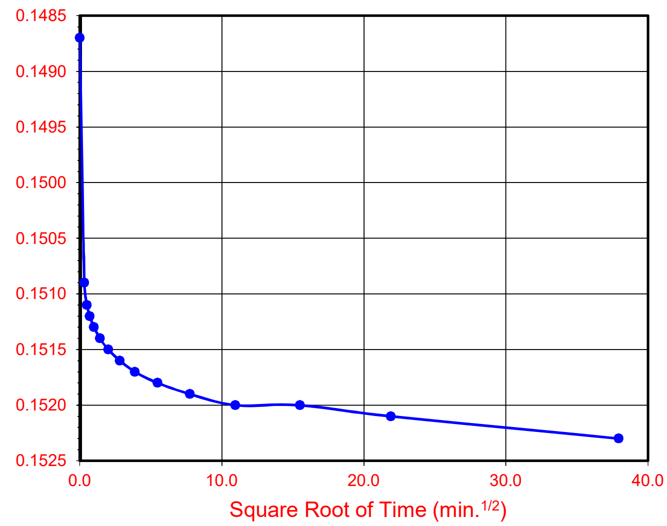
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.1392	0.9999	0.00	0.01	0.484	0.01
0.25	0.1415	0.9975	0.03	0.25	0.481	0.22
0.50	0.1432	0.9958	0.08	0.42	0.479	0.34
1.00	0.1458	0.9932	0.14	0.68	0.476	0.54
2.00	0.1480	0.9910	0.22	0.90	0.474	0.68
2.00	0.1487	0.9903	0.22	0.97	0.473	0.75
4.00	0.1523	0.9867	0.31	1.33	0.469	1.02
8.00	0.1568	0.9822	0.40	1.78	0.463	1.38
16.00	0.1636	0.9754	0.50	2.46	0.455	1.96
4.00	0.1602	0.9788	0.41	2.12	0.458	1.71
1.00	0.1565	0.9825	0.32	1.75	0.463	1.43
0.25	0.1530	0.9860	0.24	1.40	0.467	1.16

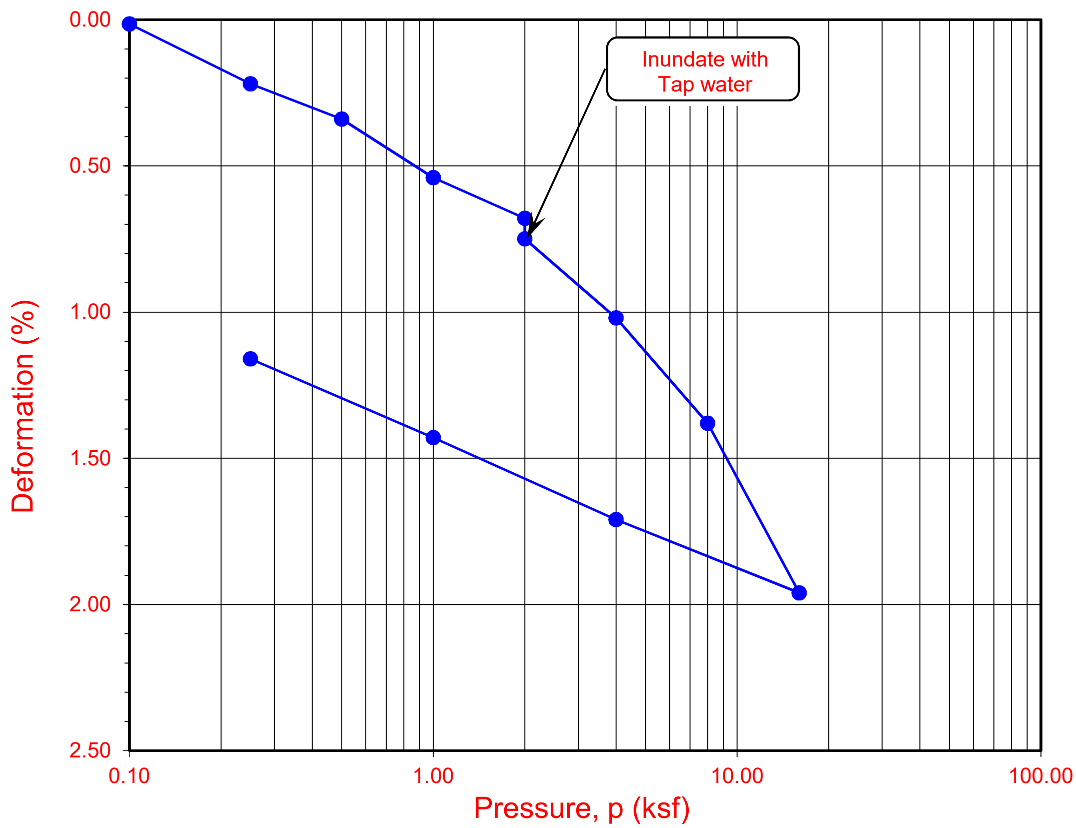
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
1/14/20	10:23:00	0.0	0.0	0.1487
1/14/20	10:23:06	0.1	0.3	0.1509
1/14/20	10:23:15	0.2	0.5	0.1511
1/14/20	10:23:30	0.5	0.7	0.1512
1/14/20	10:24:00	1.0	1.0	0.1513
1/14/20	10:25:00	2.0	1.4	0.1514
1/14/20	10:27:00	4.0	2.0	0.1515
1/14/20	10:31:00	8.0	2.8	0.1516
1/14/20	10:38:00	15.0	3.9	0.1517
1/14/20	10:53:00	30.0	5.5	0.1518
1/14/20	11:23:00	60.0	7.7	0.1519
1/14/20	12:23:00	120.0	11.0	0.1520
1/14/20	14:23:00	240.0	15.5	0.1520
1/14/20	18:23:00	480.0	21.9	0.1521
1/15/20	10:23:00	1440.0	37.9	0.1523

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-1-2020	**R-4**	**35**	**9.0**	**18.5**	**110.2**	**110.1**	**0.484**	**0.467**	**49**	**100**

Soil Identification: Yellowish brown silty sand (SM)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11753.004

Hoag Irvine

02-20

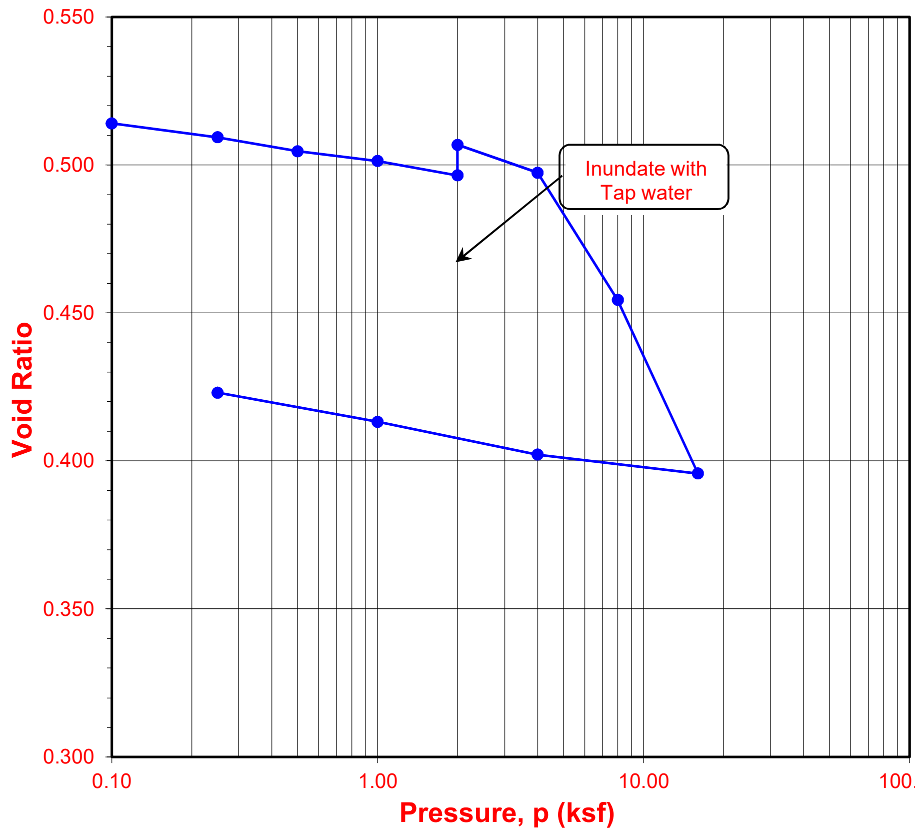
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Hoag Irvine	Tested By: O. Figueroa	Date: 01/21/20
Project No.:	11753.004	Checked By: A Santos	Date: 02/13/20
Boring No.:	LB-2-2020	Depth (ft.):	0-5
Sample No.:	B-1	Sample Type:	Bulk
Soil Identification:	Dark brown clayey sand (SC)		

Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	186.18
Weight of Ring (g)	41.17
Height after consol. (in.)	0.9397
Before Test	
Wt.Wet Sample+Cont. (g)	169.63
Wt.of Dry Sample+Cont. (g)	160.65
Weight of Container (g)	66.75
Initial Moisture Content (%)	9.6
Initial Dry Density (pcf)	110.1
Initial Saturation (%)	50
Initial Vertical Reading (in.)	0.1808
After Test	
Wt.of Wet Sample+Cont. (g)	251.62
Wt. of Dry Sample+Cont. (g)	230.51
Weight of Container (g)	57.43
Final Moisture Content (%)	16.00
Final Dry Density (pcf)	116.7
Final Saturation (%)	100
Final Vertical Reading (in.)	0.1170
Specific Gravity (assumed)	2.67
Water Density (pcf)	62.43

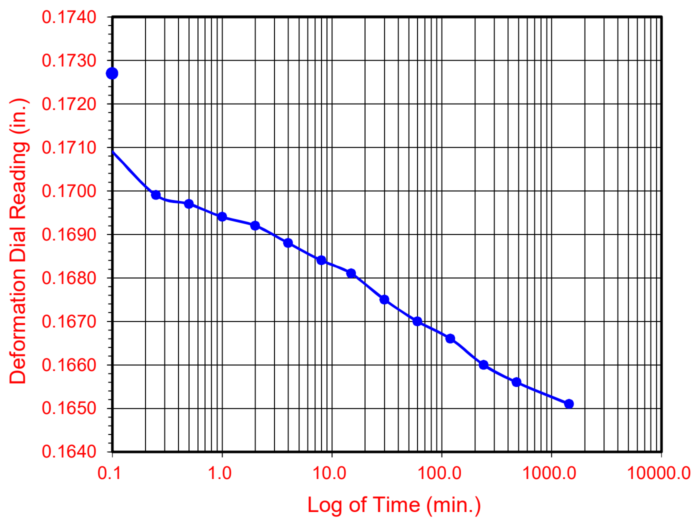


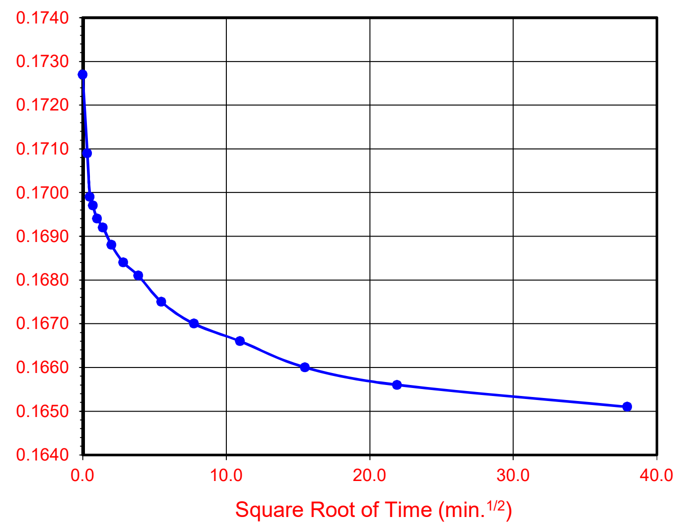
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.1806	0.9998	0.00	0.02	0.514	0.02
0.25	0.1770	0.9962	0.05	0.38	0.509	0.33
0.50	0.1733	0.9925	0.11	0.75	0.505	0.64
1.00	0.1702	0.9894	0.20	1.06	0.501	0.86
2.00	0.1659	0.9851	0.31	1.49	0.496	1.18
2.00	0.1727	0.9919	0.31	0.81	0.507	0.50
4.00	0.1651	0.9843	0.45	1.57	0.497	1.12
8.00	0.1351	0.9543	0.61	4.57	0.454	3.96
16.00	0.0944	0.9136	0.81	8.64	0.396	7.83
4.00	0.1000	0.9192	0.67	8.08	0.402	7.41
1.00	0.1091	0.9283	0.49	7.17	0.413	6.68
0.25	0.1170	0.9362	0.35	6.38	0.423	6.03

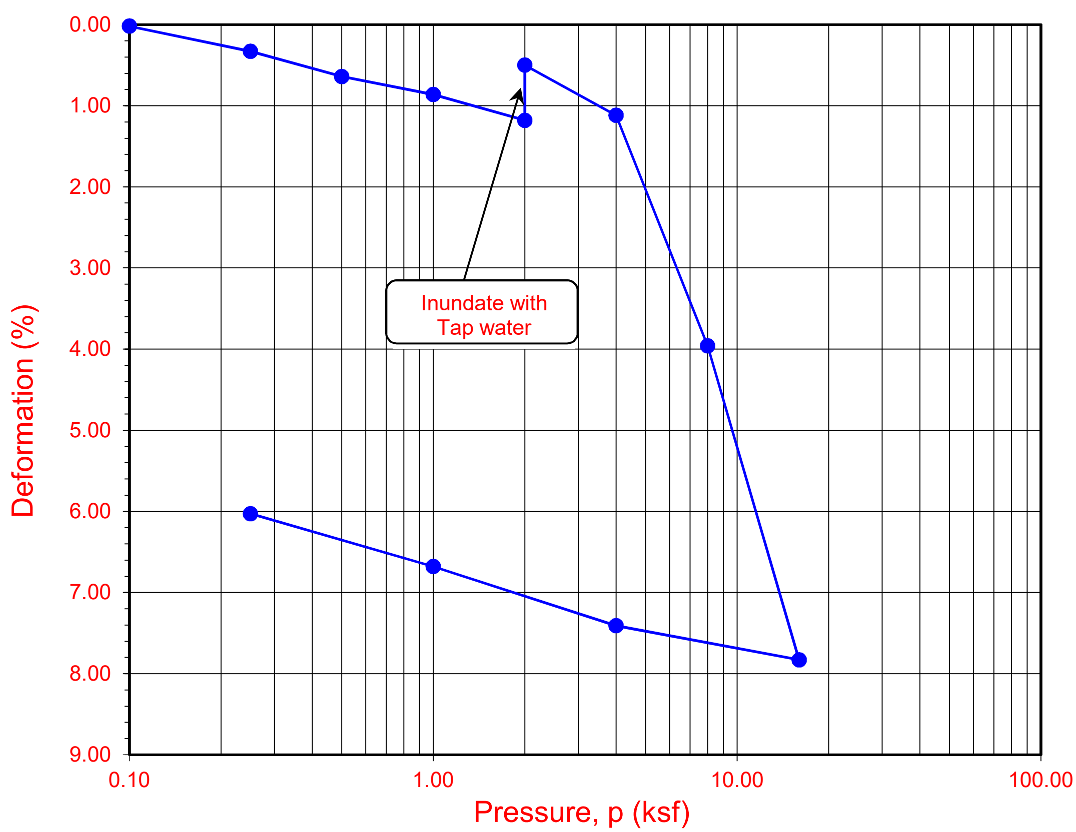
Time Readings @ 4 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
1/27/20	7:56:00	0.0	0.0	0.1727
1/27/20	7:56:06	0.1	0.3	0.1709
1/27/20	7:56:15	0.2	0.5	0.1699
1/27/20	7:56:30	0.5	0.7	0.1697
1/27/20	7:57:00	1.0	1.0	0.1694
1/27/20	7:58:00	2.0	1.4	0.1692
1/27/20	8:00:00	4.0	2.0	0.1688
1/27/20	8:04:00	8.0	2.8	0.1684
1/27/20	8:11:00	15.0	3.9	0.1681
1/27/20	8:26:00	30.0	5.5	0.1675
1/27/20	8:56:00	60.0	7.7	0.1670
1/27/20	9:56:00	120.0	11.0	0.1666
1/27/20	11:56:00	240.0	15.5	0.1660
1/27/20	15:56:00	480.0	21.9	0.1656
1/28/20	7:56:00	1440.0	37.9	0.1651

Time Readings @ 4 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-2-2020	**B-1**	**0-5**	**9.6**	**16.0**	**110.1**	**116.7**	**0.514**	**0.423**	**50**	**100**

Soil Identification: Dark brown clayey sand (SC)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project No.: 11753.004

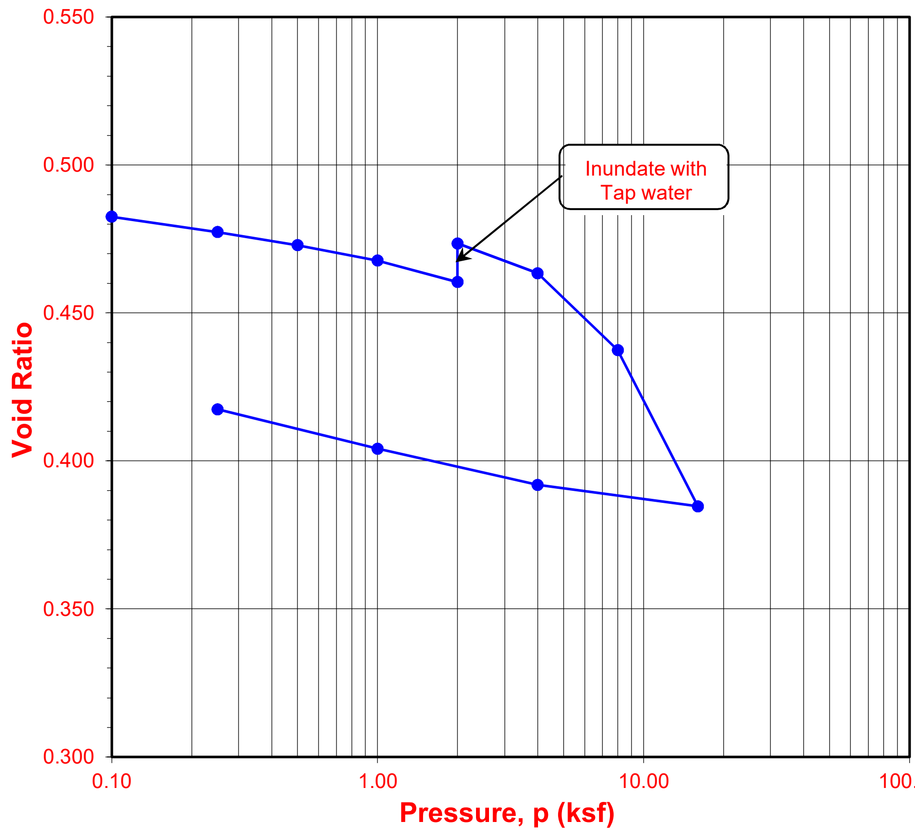
Hoag Irvine

02-20

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project Name:	Hoag Irvine	Tested By:	O. Figueroa
Date:	01/21/20		
Project No.:	11753.004	Checked By:	A. Santos
Date:	02/19/20		
Boring No.:	LB-4-2020	Depth (ft.):	0-5
Sample No.:	B-1	Sample Type:	Bulk
Soil Identification:	Brown clayey sand (SC)		

Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	189.81
Weight of Ring (g)	44.26
Height after consol. (in.)	0.9561
Before Test	
Wt.Wet Sample+Cont. (g)	174.06
Wt.of Dry Sample+Cont. (g)	165.23
Weight of Container (g)	74.34
Initial Moisture Content (%)	9.7
Initial Dry Density (pcf)	110.3
Initial Saturation (%)	53
Initial Vertical Reading (in.)	0.1032
After Test	
Wt.of Wet Sample+Cont. (g)	266.64
Wt. of Dry Sample+Cont. (g)	245.38
Weight of Container (g)	68.93
Final Moisture Content (%)	16.08
Final Dry Density (pcf)	115.0
Final Saturation (%)	100
Final Vertical Reading (in.)	0.0558
Specific Gravity (assumed)	2.62
Water Density (pcf)	62.43

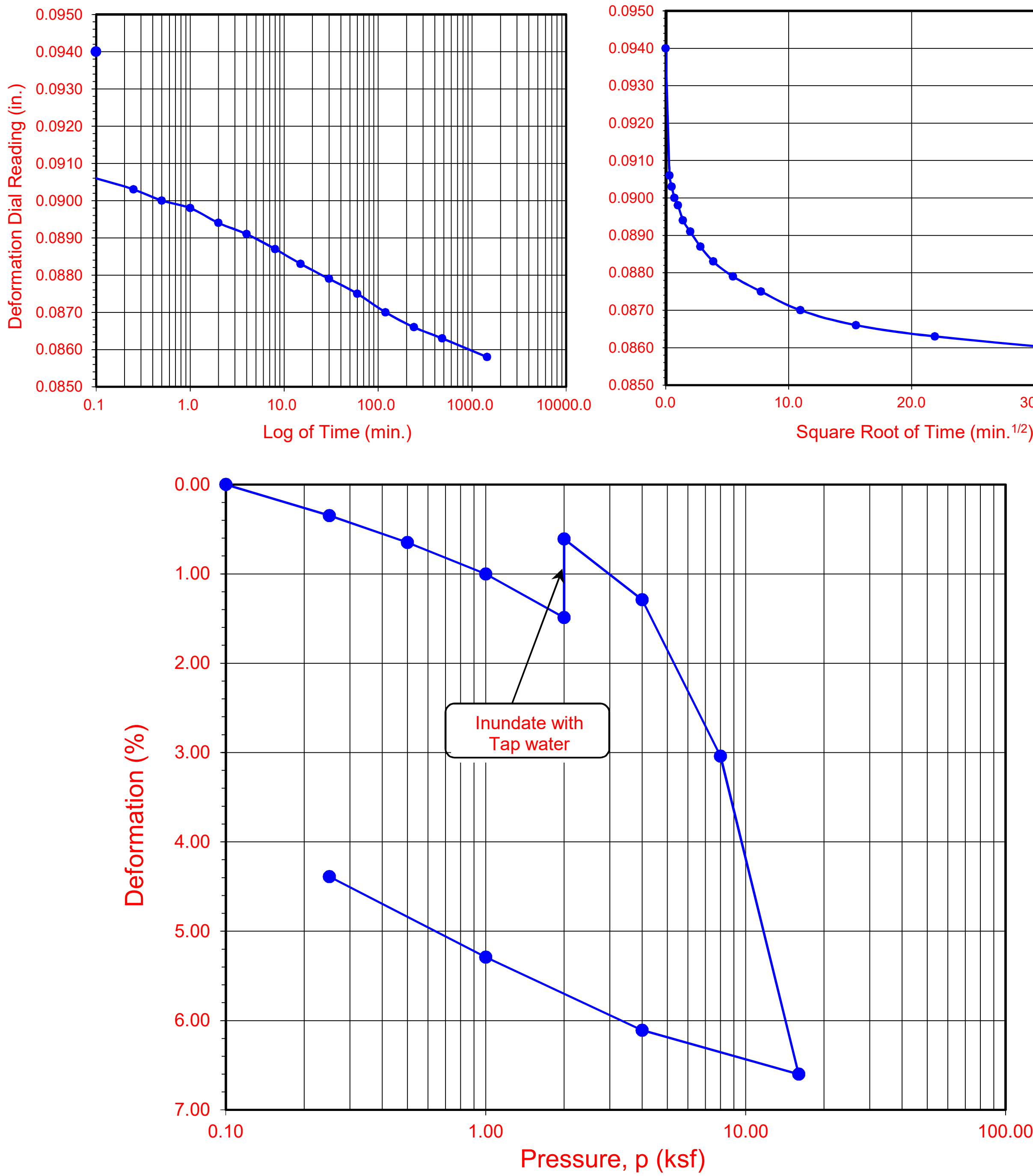


Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.1032	1.0000	0.00	0.00	0.483	0.00
0.25	0.0992	0.9960	0.05	0.40	0.477	0.35
0.50	0.0956	0.9924	0.11	0.76	0.473	0.65
1.00	0.0912	0.9880	0.20	1.20	0.468	1.00
2.00	0.0852	0.9820	0.31	1.80	0.460	1.49
2.00	0.0940	0.9908	0.31	0.92	0.473	0.61
4.00	0.0858	0.9826	0.45	1.74	0.463	1.29
8.00	0.0667	0.9635	0.61	3.65	0.437	3.04
16.00	0.0291	0.9259	0.81	7.41	0.385	6.60
4.00	0.0354	0.9322	0.67	6.78	0.392	6.11
1.00	0.0454	0.9422	0.49	5.78	0.404	5.29
0.25	0.0558	0.9526	0.35	4.74	0.417	4.39

Time Readings @ 4 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
1/27/20	8:12:00	0.0	0.0	0.0940
1/27/20	8:12:06	0.1	0.3	0.0906
1/27/20	8:12:15	0.2	0.5	0.0903
1/27/20	8:12:30	0.5	0.7	0.0900
1/27/20	8:13:00	1.0	1.0	0.0898
1/27/20	8:14:00	2.0	1.4	0.0894
1/27/20	8:16:00	4.0	2.0	0.0891
1/27/20	8:20:00	8.0	2.8	0.0887
1/27/20	8:27:00	15.0	3.9	0.0883
1/27/20	8:42:00	30.0	5.5	0.0879
1/27/20	9:12:00	60.0	7.7	0.0875
1/27/20	10:12:00	120.0	11.0	0.0870
1/27/20	12:12:00	240.0	15.5	0.0866
1/27/20	16:12:00	480.0	21.9	0.0863
1/28/20	8:12:00	1440.0	37.9	0.0858

Time Readings @ 4 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-4-2020	**B-1**	**0-5**	**9.7**	**16.1**	**110.3**	**115.0**	**0.483**	**0.417**	**53**	**100**

Soil Identification: Brown clayey sand (SC)

Leighton	**ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS** **ASTM D 2435**	Project No.: 11753.004 Hoag Irvine 02-20

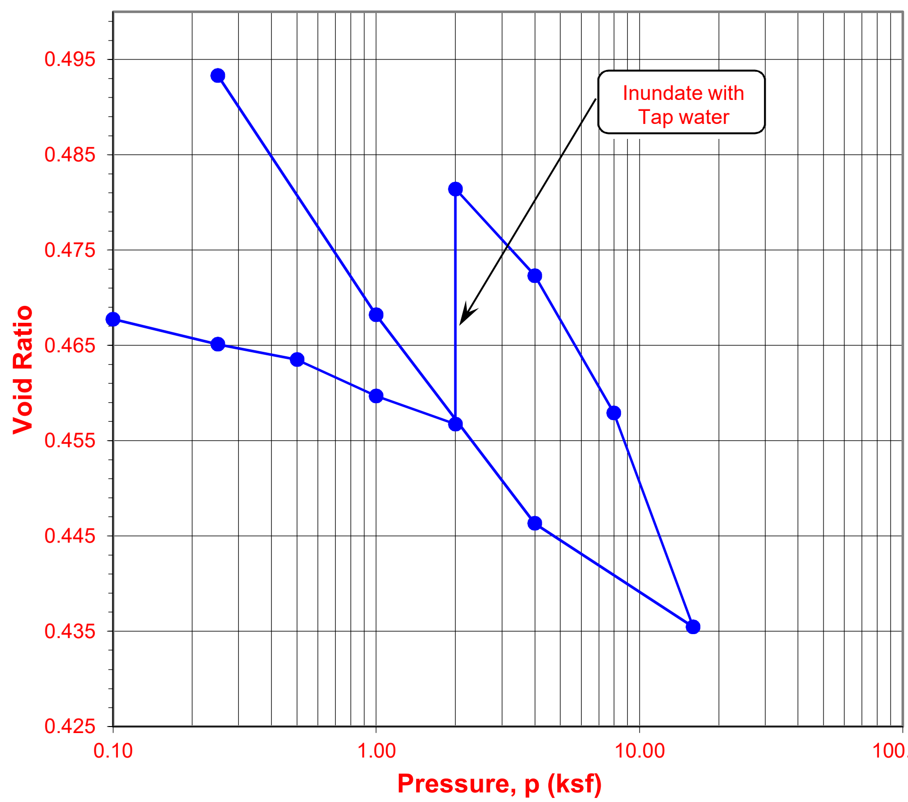
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Hoag Irvine	Tested By: G. Bathala	Date: 01/14/20
Project No.:	11753.004	Checked By: A. Santos	Date: 02/13/20
Boring No.:	LB-4-2020	Depth (ft.): 20.0	
Sample No.:	R-2	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):	195.85
Weight of Ring (g):	43.70
Height after consol. (in.):	1.0171
Before Test	
Wt. of Wet Sample+Cont. (g):	165.61
Wt. of Dry Sample+Cont. (g):	158.37
Weight of Container (g):	60.94
Initial Moisture Content (%)	7.4
Initial Dry Density (pcf)	117.8
Initial Saturation (%):	44
Initial Vertical Reading (in.)	0.1932
After Test	
Wt. of Wet Sample+Cont. (g):	283.43
Wt. of Dry Sample+Cont. (g):	256.40
Weight of Container (g):	75.90
Final Moisture Content (%)	19.76
Final Dry Density (pcf):	111.9
Final Saturation (%):	100
Final Vertical Reading (in.)	0.1792
Specific Gravity (assumed):	2.77
Water Density (pcf):	62.43

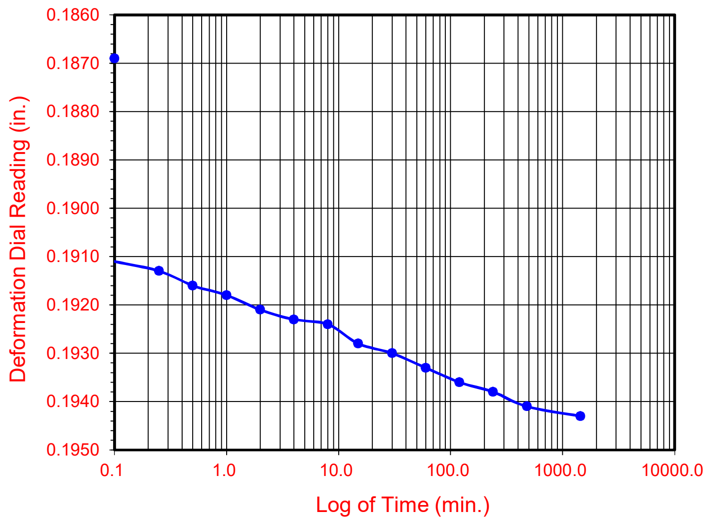


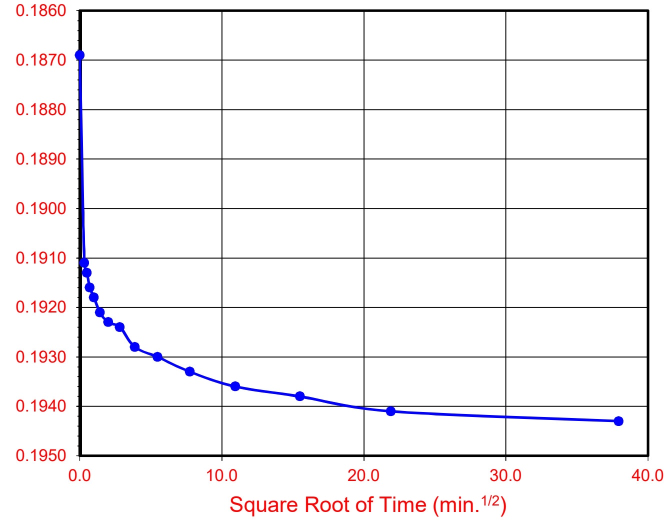
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.1935	0.9997	0.00	0.03	0.468	0.03
0.25	0.1959	0.9973	0.06	0.27	0.465	0.21
0.50	0.1975	0.9957	0.11	0.43	0.464	0.32
1.00	0.2008	0.9924	0.18	0.76	0.460	0.58
2.00	0.2038	0.9894	0.28	1.06	0.457	0.78
2.00	0.1870	1.0062	0.28	-0.62	0.481	-0.90
4.00	0.1943	0.9989	0.39	0.11	0.472	-0.28
8.00	0.2054	0.9878	0.52	1.22	0.458	0.70
16.00	0.2220	0.9712	0.65	2.88	0.435	2.23
4.00	0.2134	0.9798	0.53	2.02	0.446	1.49
1.00	0.1974	0.9958	0.42	0.42	0.468	0.00
0.25	0.1792	1.0140	0.31	-1.40	0.493	-1.71

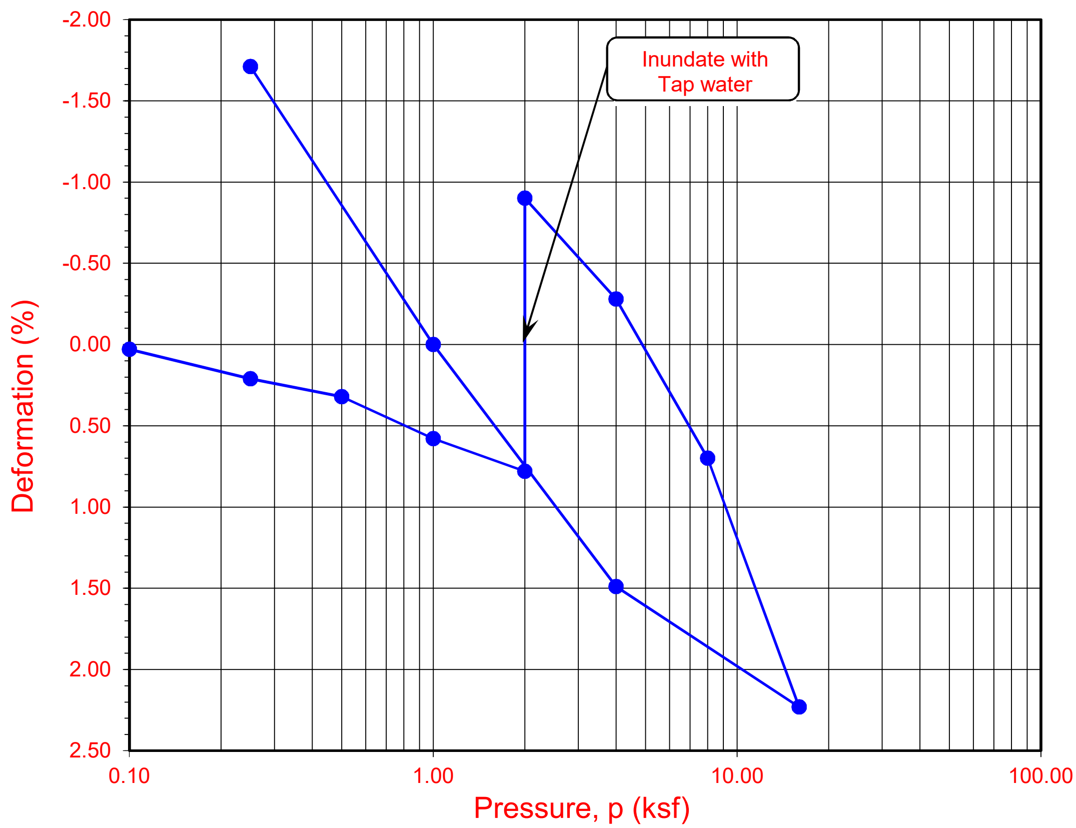
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
1/20/20	10:30:00	0.0	0.0	0.1869
1/20/20	10:30:06	0.1	0.3	0.1911
1/20/20	10:30:15	0.2	0.5	0.1913
1/20/20	10:30:30	0.5	0.7	0.1916
1/20/20	10:31:00	1.0	1.0	0.1918
1/20/20	10:32:00	2.0	1.4	0.1921
1/20/20	10:34:00	4.0	2.0	0.1923
1/20/20	10:38:00	8.0	2.8	0.1924
1/20/20	10:45:00	15.0	3.9	0.1928
1/20/20	11:00:00	30.0	5.5	0.1930
1/20/20	11:30:00	60.0	7.7	0.1933
1/20/20	12:30:00	120.0	11.0	0.1936
1/20/20	14:30:00	240.0	15.5	0.1938
1/20/20	18:30:00	480.0	21.9	0.1941
1/21/20	10:30:00	1440.0	37.9	0.1943

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-4-2020	**R-2**	**20**	**7.4**	**19.8**	**117.8**	**111.9**	**0.468**	**0.493**	**44**	**100**

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

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11753.004

Hoag Irvine

02-20

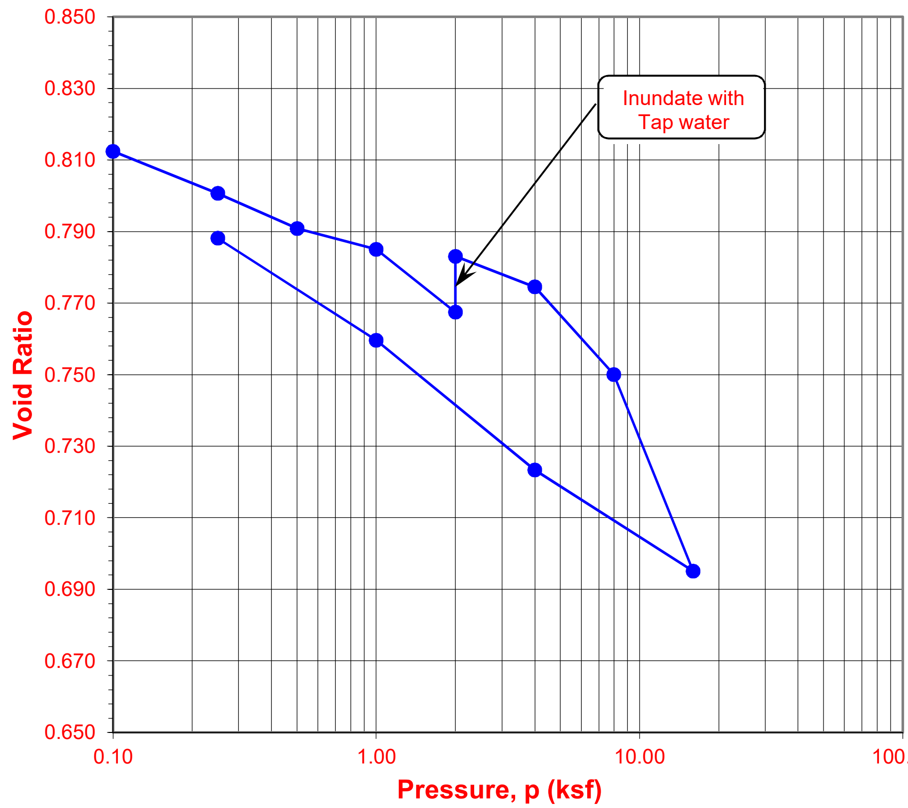
Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Hoag Irvine	Tested By: G. Bathala	Date: 01/14/20
Project No.:	11753.004	Checked By: A. Santos	Date: 02/13/20
Boring No.:	LB-4-2020	Depth (ft.): 30.0	
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):	193.75
Weight of Ring (g):	46.55
Height after consol. (in.):	0.9857
Before Test	
Wt. of Wet Sample+Cont. (g):	222.34
Wt. of Dry Sample+Cont. (g):	189.62
Weight of Container (g):	64.46
Initial Moisture Content (%)	26.1
Initial Dry Density (pcf)	97.0
Initial Saturation (%):	91
Initial Vertical Reading (in.)	0.1269
After Test	
Wt. of Wet Sample+Cont. (g):	261.42
Wt. of Dry Sample+Cont. (g):	227.66
Weight of Container (g):	67.40
Final Moisture Content (%)	29.69
Final Dry Density (pcf):	95.9
Final Saturation (%):	100
Final Vertical Reading (in.)	0.1451
Specific Gravity (assumed):	2.82
Water Density (pcf):	62.43

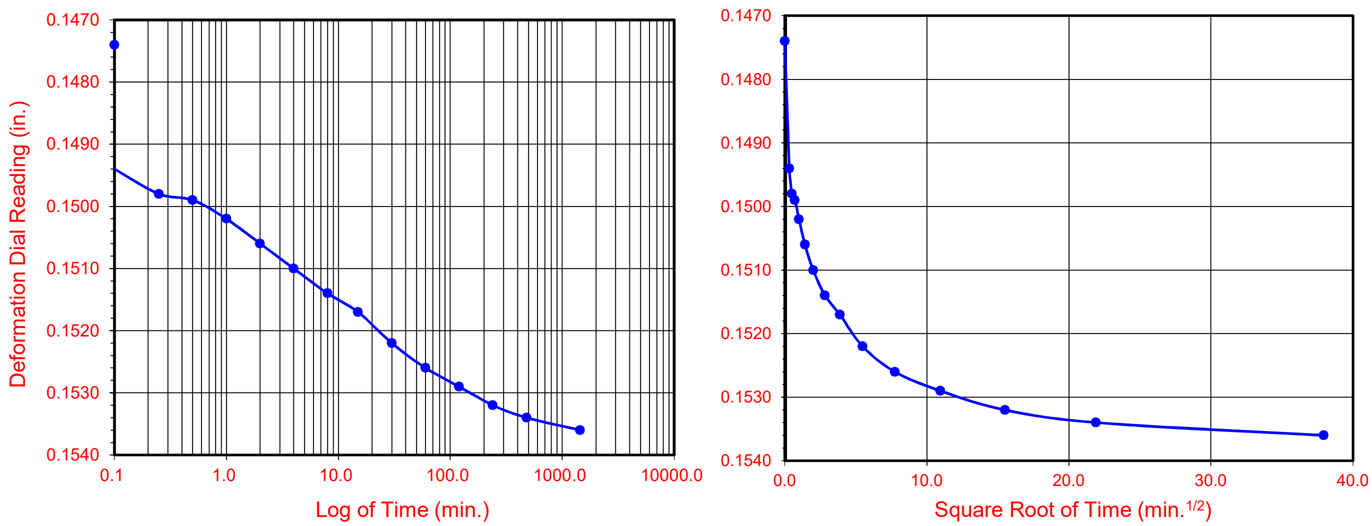


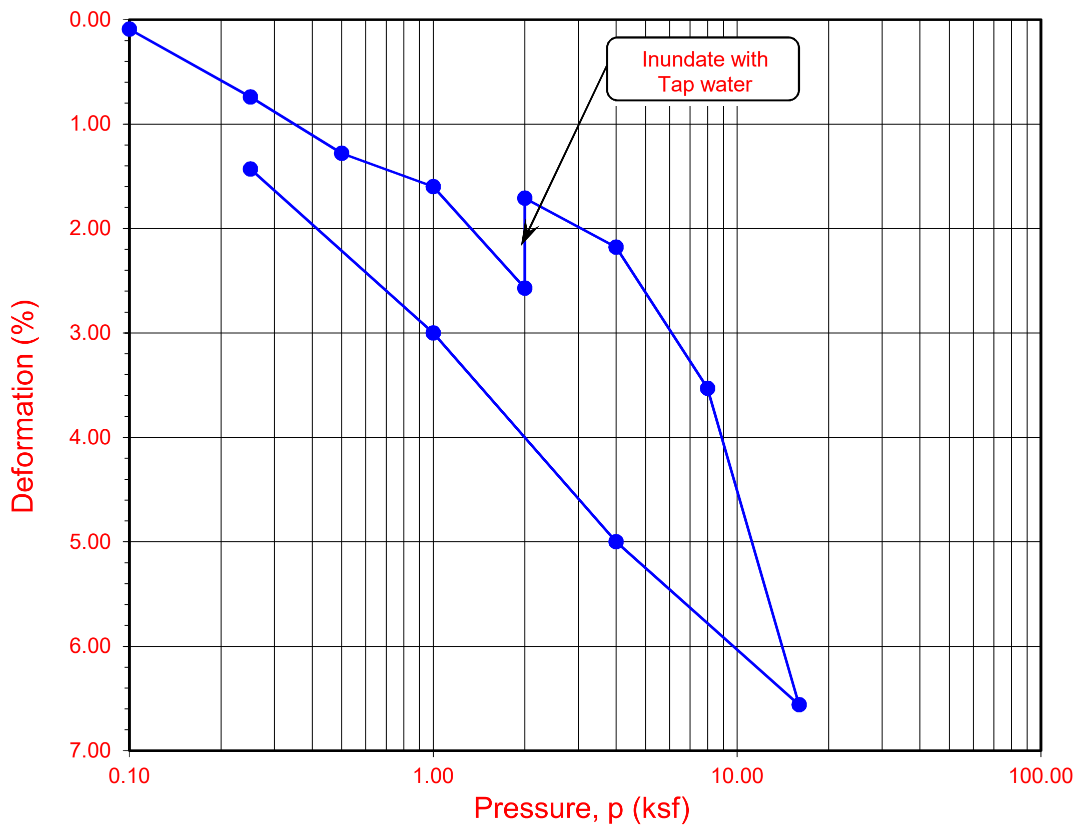
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.1278	0.9991	0.00	0.09	0.812	0.09
0.25	0.1348	0.9921	0.05	0.79	0.801	0.74
0.50	0.1408	0.9861	0.11	1.39	0.791	1.28
1.00	0.1448	0.9821	0.19	1.79	0.785	1.60
2.00	0.1560	0.9709	0.34	2.91	0.767	2.57
2.00	0.1474	0.9795	0.34	2.05	0.783	1.71
4.00	0.1536	0.9733	0.49	2.67	0.775	2.18
8.00	0.1686	0.9583	0.64	4.17	0.750	3.53
16.00	0.2004	0.9265	0.79	7.35	0.695	6.56
4.00	0.1835	0.9434	0.66	5.66	0.723	5.00
1.00	0.1620	0.9649	0.51	3.51	0.760	3.00
0.25	0.1451	0.9818	0.39	1.82	0.788	1.43

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
1/20/20	10:45:00	0.0	0.0	0.1474
1/20/20	10:45:06	0.1	0.3	0.1494
1/20/20	10:45:15	0.2	0.5	0.1498
1/20/20	10:45:30	0.5	0.7	0.1499
1/20/20	10:46:00	1.0	1.0	0.1502
1/20/20	10:47:00	2.0	1.4	0.1506
1/20/20	10:49:00	4.0	2.0	0.1510
1/20/20	10:53:00	8.0	2.8	0.1514
1/20/20	11:00:00	15.0	3.9	0.1517
1/20/20	11:15:00	30.0	5.5	0.1522
1/20/20	11:45:00	60.0	7.7	0.1526
1/20/20	12:45:00	120.0	11.0	0.1529
1/20/20	14:45:00	240.0	15.5	0.1532
1/20/20	18:45:00	480.0	21.9	0.1534
1/21/20	10:45:00	1440.0	37.9	0.1536

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-4-2020	**R-3**	**30**	**26.1**	**29.7**	**97.0**	**95.9**	**0.814**	**0.788**	**91**	**100**

Soil Identification: Light olive brown lean clay (CL)

Leighton

TESTS for SULFATE CONTENT
CHLORIDE CONTENT and pH of SOILS

Project Name: Hoag Irvine | Tested By : G. Berdy | Date: 01/16/20

Project No. : 11753.004 | Input By: J. Ward | Date: 08/15/18

Boring No.	LB-1-2020	LB-2-2020	LB-4-2020	
Sample No.	B-2	B-1	B-1	
Sample Depth (ft)	10-15	0-5	0-5	
Soil Identification:	Dark brown lean clay (CL)	Dark brown (SC)	Brown (SC)	
Wet Weight of Soil + Container (g)	126.00	157.40	213.20	
Dry Weight of Soil + Container (g)	118.80	156.30	210.50	
Weight of Container (g)	39.30	57.70	69.50	
Moisture Content (%)	9.06	1.12	1.91	
Weight of Soaked Soil (g)	100.70	100.20	100.30	

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	2	201	200A	
Crucible No.	14	11	14	
Furnace Temperature (°C)	860	860	860	
Time In / Time Out	8:00/8:45	8:15/9:00	8:15/9:00	
Duration of Combustion (min)	45	45	45	
Wt. of Crucible + Residue (g)	19.6888	18.0326	19.6941	
Wt. of Crucible (g)	19.6864	18.0277	19.6875	
Wt. of Residue (g) (A)	0.0024	0.0049	0.0066	
PPM of Sulfate (A) x 41150	98.76	201.64	271.59	
PPM of Sulfate, Dry Weight Basis	**109**	**204**	**277**	

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	15	30	
ml of AgNO3 Soln. Used in Titration (C)	1.1	1.0	1.3	
PPM of Chloride (C -0.2) * 100 * 30 / B	90	160	110	
PPM of Chloride, Dry Wt. Basis	**99**	**162**	**112**	

pH TEST, DOT California Test 643

pH Value	**7.88**	**7.36**	**6.56**	
Temperature °C	21.5	23.0	22.2	

SOIL RESISTIVITY TEST
DOT CA TEST 643

Project Name:	Hoag Irvine	Tested By :	G. Berdy	Date:	01/16/20
Project No. :	11753.004	Input By:	J. Ward	Date:	08/15/18
Boring No.:	LB-1-2020	Depth (ft.) :	10-15		
Sample No. :	B-2				

Soil Identification:* Dark brown lean clay (CL)

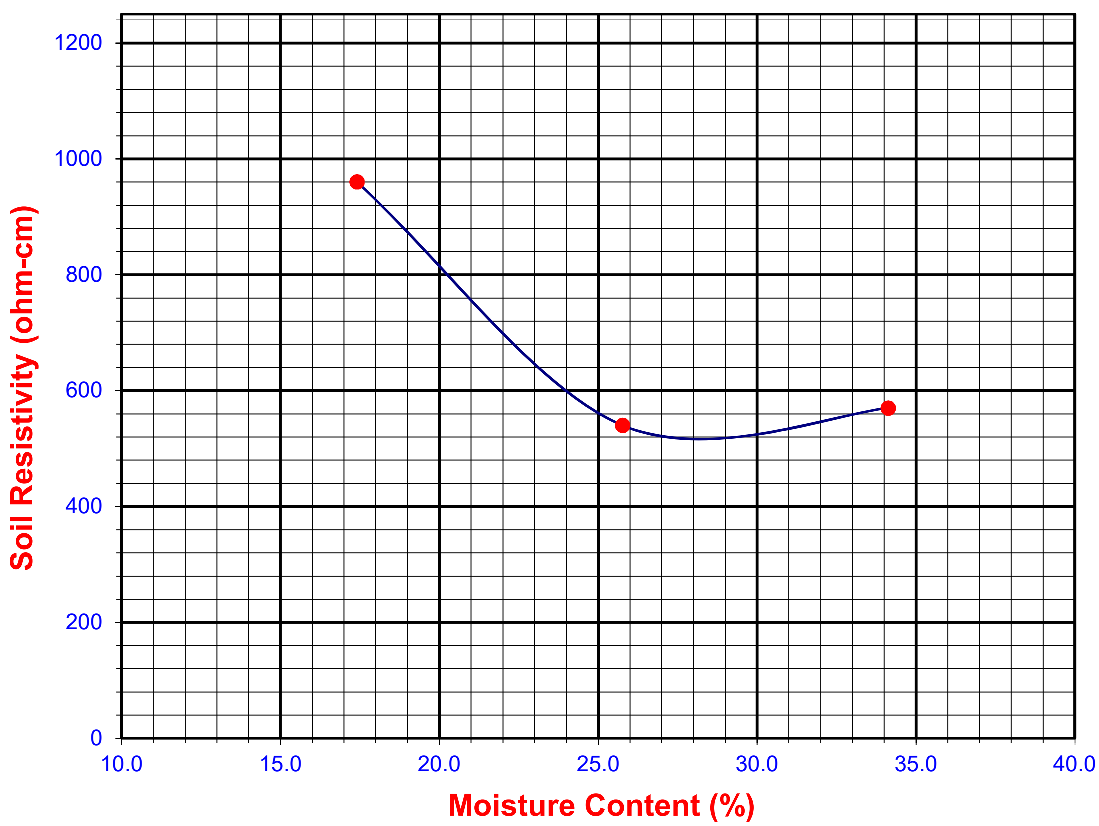
*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	10	17.41	960	960
2	20	25.77	540	540
3	30	34.13	570	570
4				
5				

Moisture Content (%) (MCi)	9.06
Wet Wt. of Soil + Cont. (g)	126.00
Dry Wt. of Soil + Cont. (g)	118.80
Wt. of Container (g)	39.30
Container No.	
Initial Soil Wt. (g) (Wt)	130.51
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	
998	**33.5**	**109**	**99**	**7.88**	**21.5**



SOIL RESISTIVITY TEST
DOT CA TEST 643

Project Name:	Hoag Irvine	Tested By :	G. Berdy Date: 01/16/20
Project No. :	11753.004	Input By:	J. Ward Date: 08/15/18
Boring No.:	LB-2-2020	Depth (ft.) :	0-5
Sample No. :	B-1		

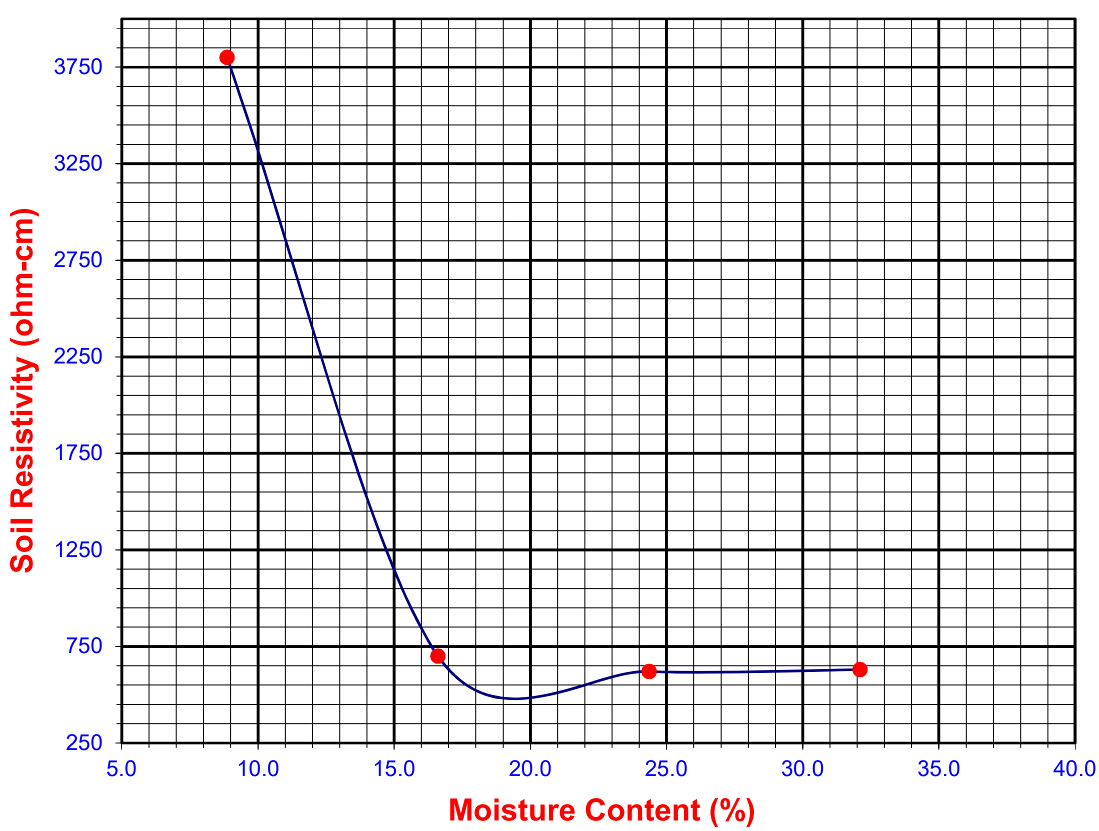
Soil Identification:* Dark brown (SC)

*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	10	8.86	3800	3800
2	20	16.61	700	700
3	30	24.36	620	620
4	40	32.10	630	630
5				

Moisture Content (%) (MCi)	1.12
Wet Wt. of Soil + Cont. (g)	157.40
Dry Wt. of Soil + Cont. (g)	156.30
Wt. of Container (g)	57.70
Container No.	
Initial Soil Wt. (g) (Wt)	130.52
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	
1220	**23.5**	**204**	**162**	**7.36**	**23.0**



SOIL RESISTIVITY TEST

DOT CA TEST 643

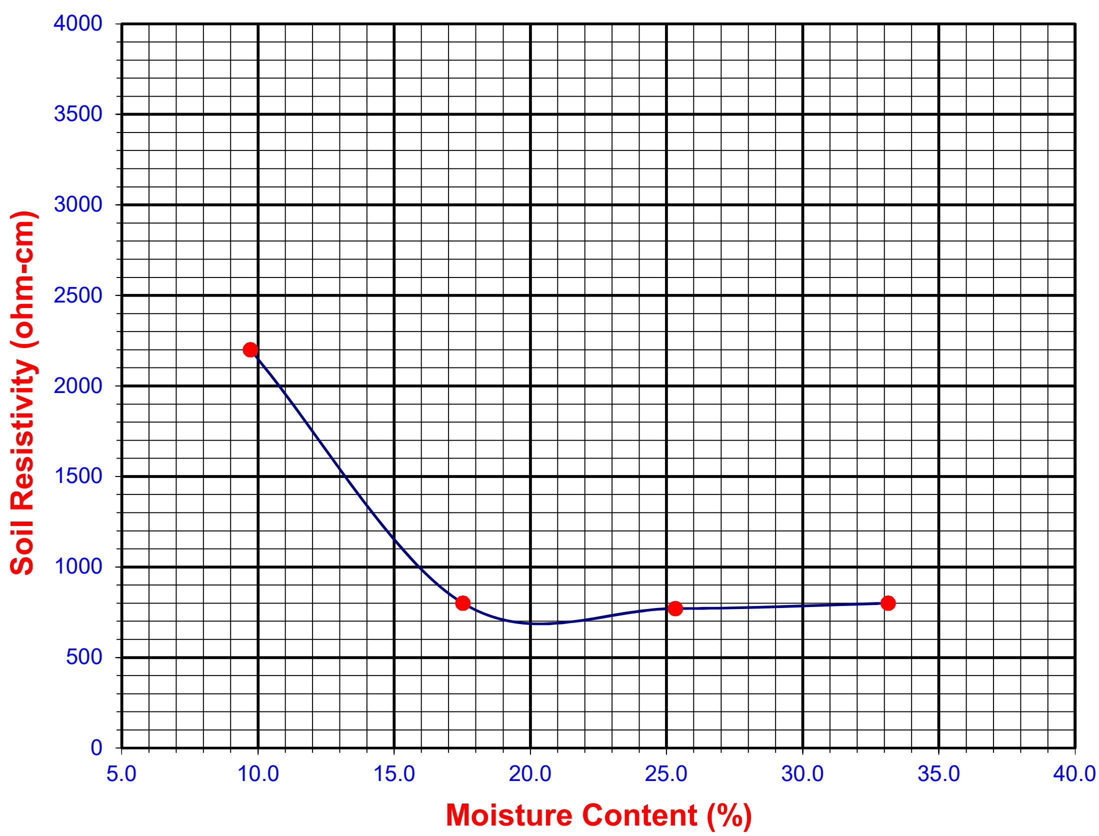
Project Name:	Hoag Irvine	Tested By :	G. Berdy Date: 01/16/20
Project No. :	11753.004	Input By:	J. Ward Date: 08/15/18
Boring No.:	LB-4-2020	Depth (ft.) :	0-5
Sample No. :	B-1		
Soil Identification:*	Brown (SC)		

*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	10	9.72	2200	2200
2	20	17.52	800	800
3	30	25.33	770	770
4	40	33.13	800	800
5				

Moisture Content (%) (MCi)	1.91
Wet Wt. of Soil + Cont. (g)	213.20
Dry Wt. of Soil + Cont. (g)	210.50
Wt. of Container (g)	69.50
Container No.	
Initial Soil Wt. (g) (Wt)	130.58
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	
650	**54.0**	**277**	**112**	**6.56**	**22.2**



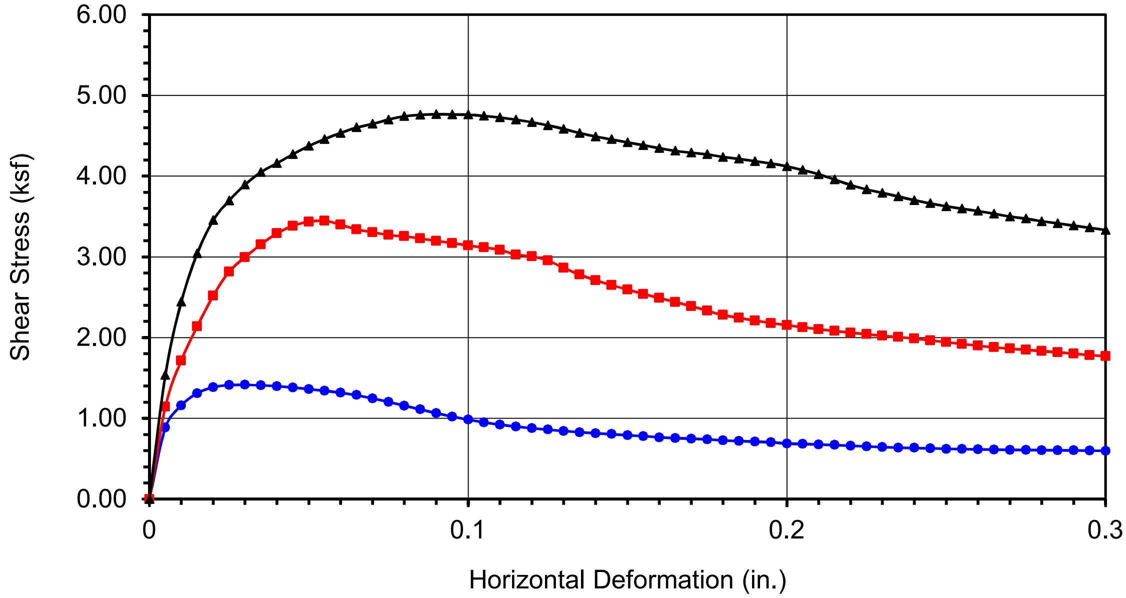
DIRECT SHEAR TEST

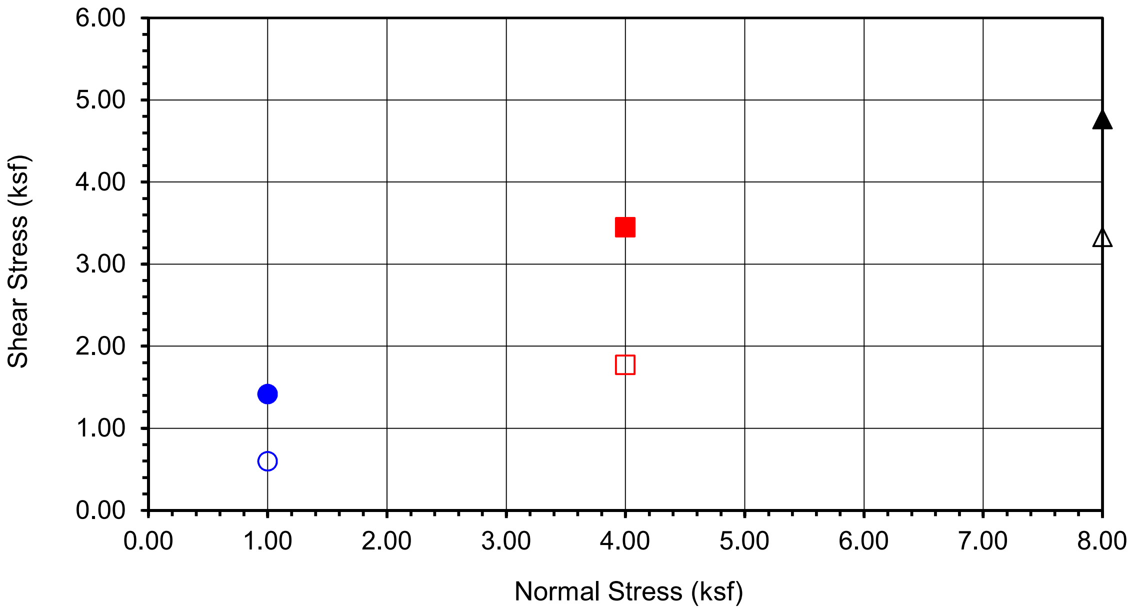
Consolidated Drained - ASTM D 3080

Leighton

Project Name:	Hoag Irvine	Tested By:	G. Bathala	Date:	01/14/20
Project No.:	11753.004	Checked By:	J. Ward	Date:	02/11/20
Boring No.:	LB-1-2020	Sample Type:	Ring		
Sample No.:	R-2	Depth (ft.):	15.0		
Soil Identification:	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):	184.69	185.76	189.15
Weight of Ring(gm):	44.78	42.75	45.57
Before Shearing			
Weight of Wet Sample+Cont.(gm):	168.79	168.79	168.79
Weight of Dry Sample+Cont.(gm):	145.14	145.14	145.14
Weight of Container(gm):	36.76	36.76	36.76
Vertical Rdg.(in): Initial	0.0000	0.2645	0.0000
Vertical Rdg.(in): Final	0.0218	0.2610	-0.0192
After Shearing			
Weight of Wet Sample+Cont.(gm):	214.90	217.05	205.32
Weight of Dry Sample+Cont.(gm):	179.18	182.73	174.20
Weight of Container(gm):	65.89	68.57	57.10
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-1-2020**
Sample No.	**R-2**
Depth (ft)	**15**

Sample Type:

Ring

Soil Identification:
Olive brown lean clay (CL)

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.415	■ 3.446	▲ 4.766
Shear Stress @ End of Test (ksf)	○ 0.597	□ 1.770	△ 3.332
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 (%)	21.82	21.82	21.82
Dry Density (pcf)	95.5	97.6	98.0
Saturation (%)	77.0	81.1	81.9
Soil Height Before Shearing (in.)	1.0218	1.0035	0.9808
Final Moisture Content (%)	31.5	30.1	26.6

Leighton

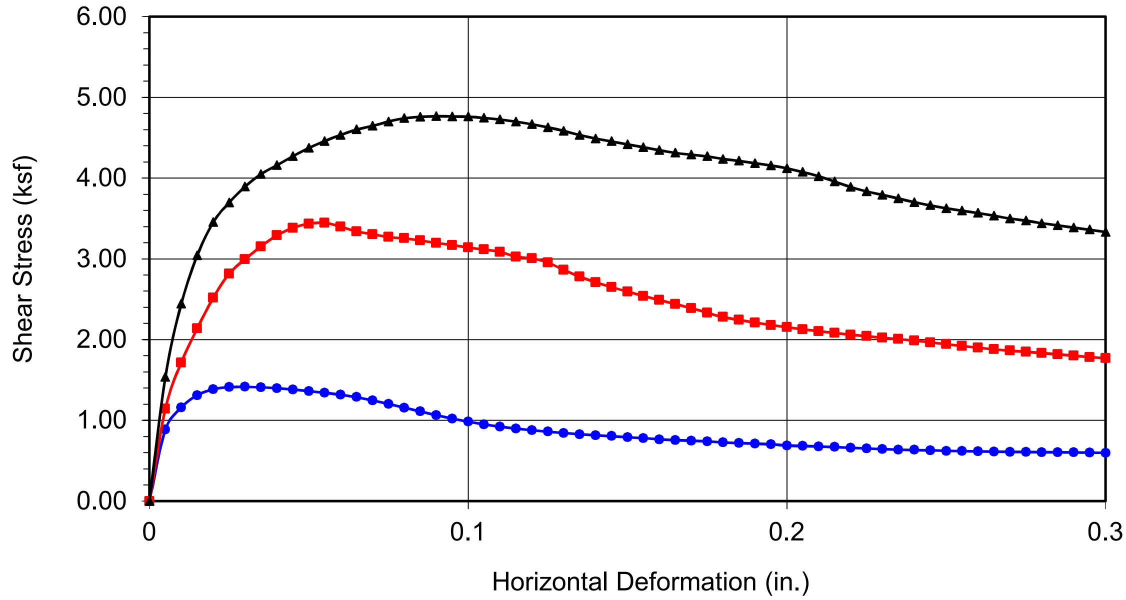
DIRECT SHEAR TEST RESULTS

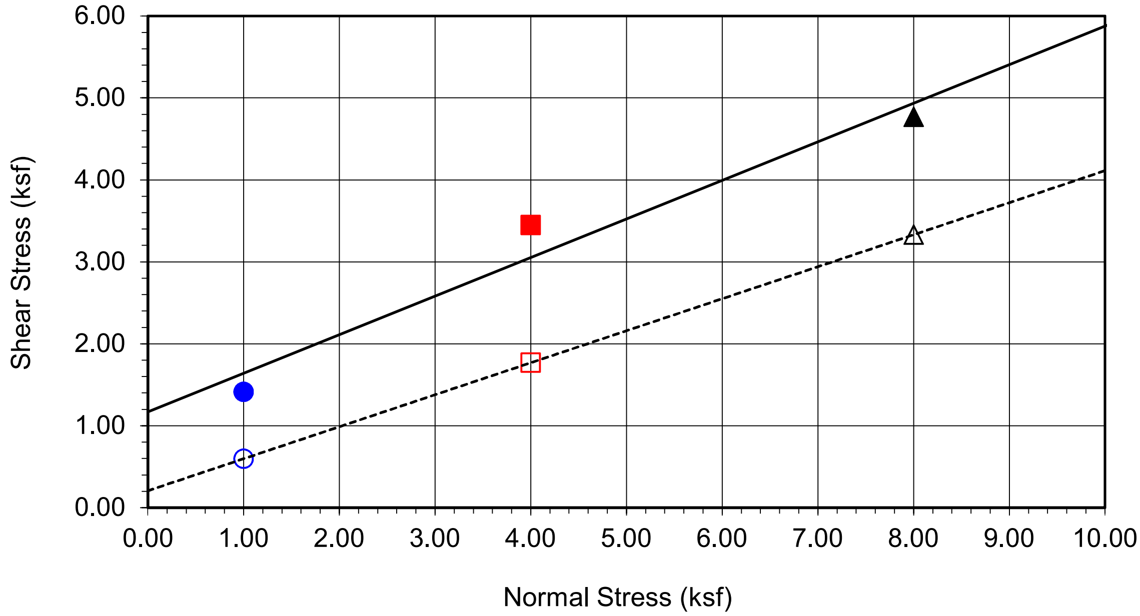
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20





Boring No.	**LB-1-2020**
Sample No.	**R-2**
Depth (ft)	**15**
Sample Type:	Ring

Soil Identification:
Olive brown lean clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	1169	25
Ultimate	207	21

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.415	■ 3.446	▲ 4.766
Shear Stress @ End of Test (ksf)	○ 0.597	□ 1.770	△ 3.332
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 (%)	21.82	21.82	21.82
Dry Density (pcf)	95.5	97.6	98.0
Saturation (%)	77.0	81.1	81.9
Soil Height Before Shearing (in.)	1.0218	1.0035	0.9808
Final Moisture Content (%)	31.5	30.1	26.6

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20

DIRECT SHEAR TEST

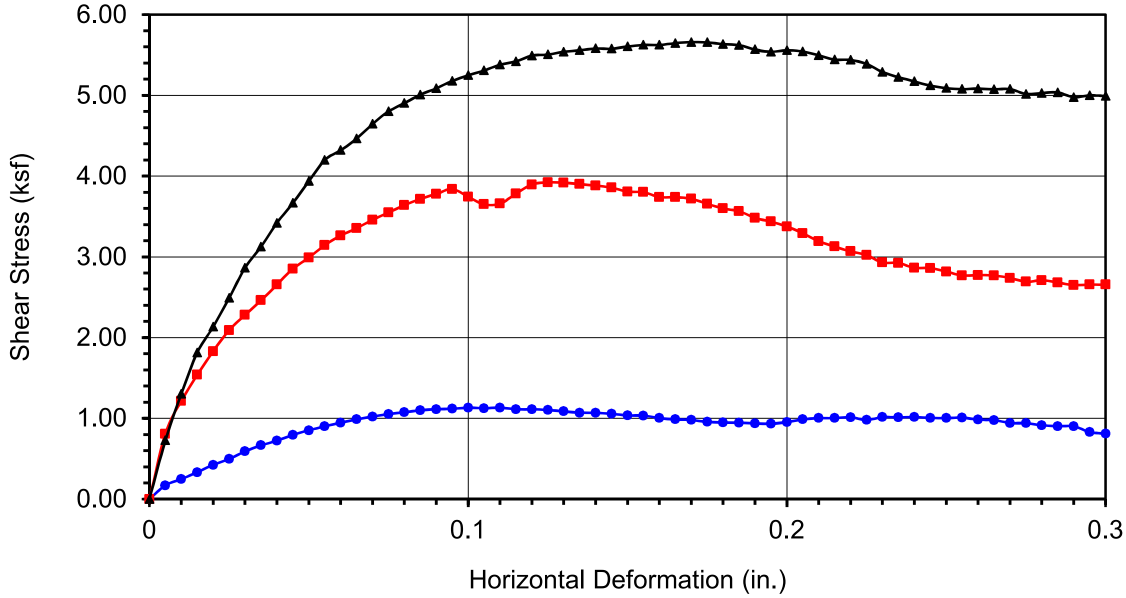
Consolidated Drained - ASTM D 3080

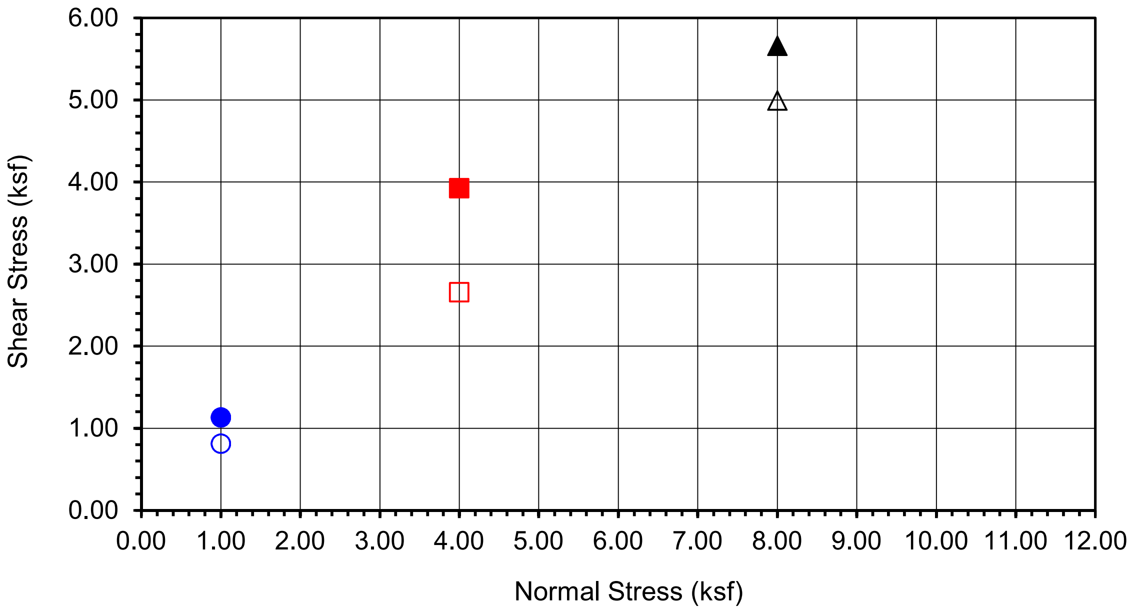
Leighton

Project Name:	Hoag Irvine	Tested By:	OHF/ACS	Date:	01/29/20
Project No.:	11753.004	Checked By:	A. Santos	Date:	02/11/20
Boring No.:	LB-1-2020	Sample Type:	Ring		
Sample No.:	R-3	Depth (ft.):	25.0		

Soil Identification: Light brown poorly graded sand (SP)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	172.15	174.77	178.17
Weight of Ring(gm):	42.34	44.21	45.49
Before Shearing			
Weight of Wet Sample+Cont.(gm):	196.02	196.02	196.02
Weight of Dry Sample+Cont.(gm):	194.80	194.80	194.80
Weight of Container(gm):	68.15	68.15	68.15
Vertical Rdg.(in): Initial	0.2474	0.2485	0.2065
Vertical Rdg.(in): Final	0.2692	0.2995	0.2410
After Shearing			
Weight of Wet Sample+Cont.(gm):	219.61	183.23	186.25
Weight of Dry Sample+Cont.(gm):	197.68	161.08	162.82
Weight of Container(gm):	75.86	36.76	36.88
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-1-2020**
Sample No.	**R-3**
Depth (ft)	**25**

Sample Type:

Ring

Soil Identification:
Light brown poorly graded sand (SP)

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.132	■ 3.923	▲ 5.659
Shear Stress @ End of Test (ksf)	○ 0.811	□ 2.656	△ 4.992
Deformation Rate (in./min.)	0.0050	0.0050	0.0050
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	0.96	0.96	0.96
Dry Density (pcf)	106.9	107.5	109.3
Saturation (%)	4.5	4.6	4.8
Soil Height Before Shearing (in.)	0.9782	0.9491	0.9655
Final Moisture Content (%)	18.0	17.8	18.6

Leighton

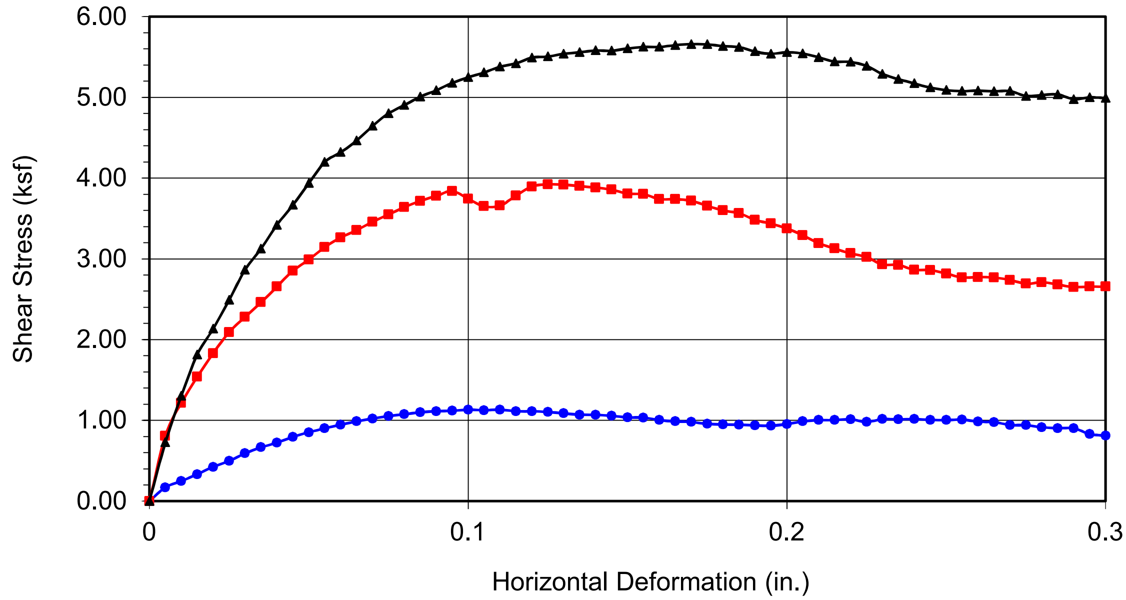
DIRECT SHEAR TEST RESULTS

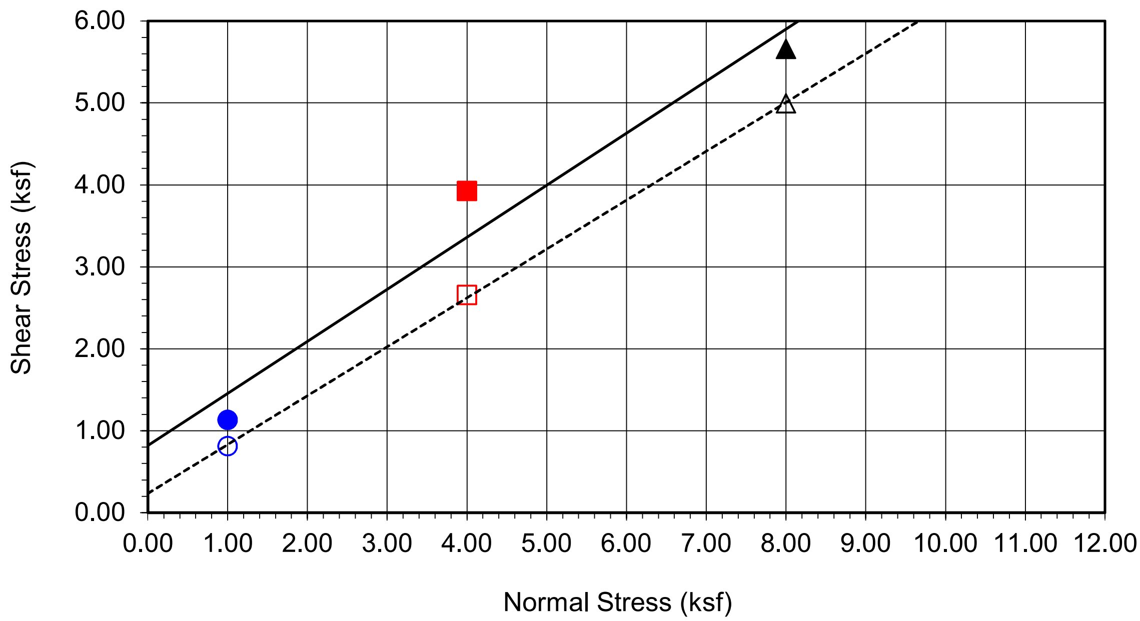
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20





Boring No.	**LB-1-2020**
Sample No.	**R-3**
Depth (ft)	**25**
Sample Type:	Ring

Soil Identification:
Light brown poorly graded sand (SP)

Strength Parameters

	C (psf)	ϕ (°)
Peak	819	32
Ultimate	235	31

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.132	■ 3.923	▲ 5.659
Shear Stress @ End of Test (ksf)	○ 0.811	□ 2.656	△ 4.992
Deformation Rate (in./min.)	0.0050	0.0050	0.0050
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	0.96	0.96	0.96
Dry Density (pcf)	106.9	107.5	109.3
Saturation (%)	4.5	4.6	4.8
Soil Height Before Shearing (in.)	0.9782	0.9491	0.9655
Final Moisture Content (%)	18.0	17.8	18.6

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20

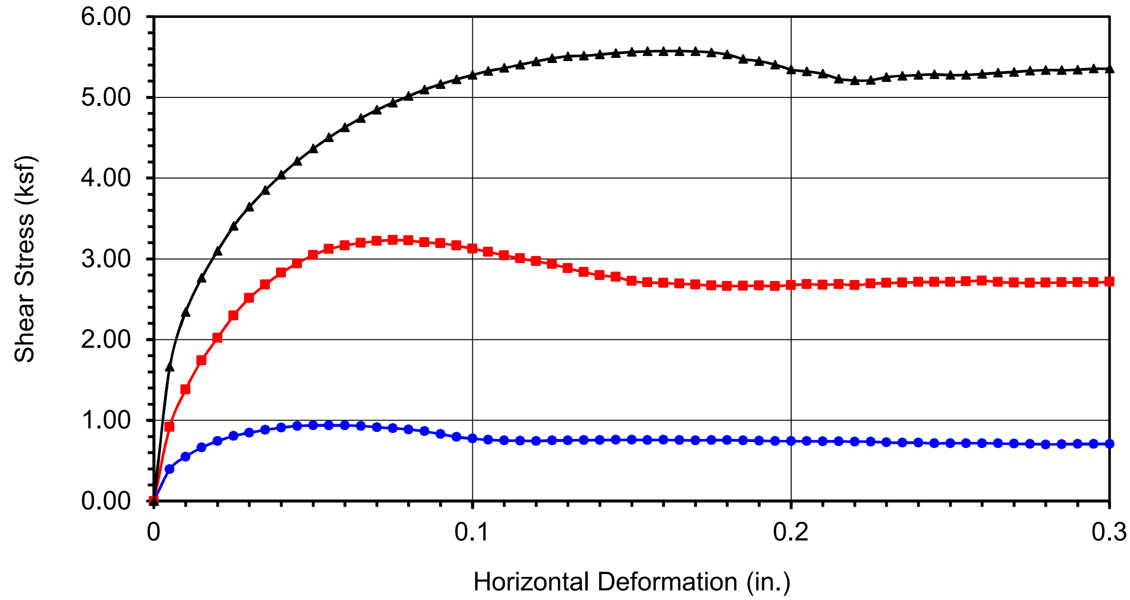
DIRECT SHEAR TEST

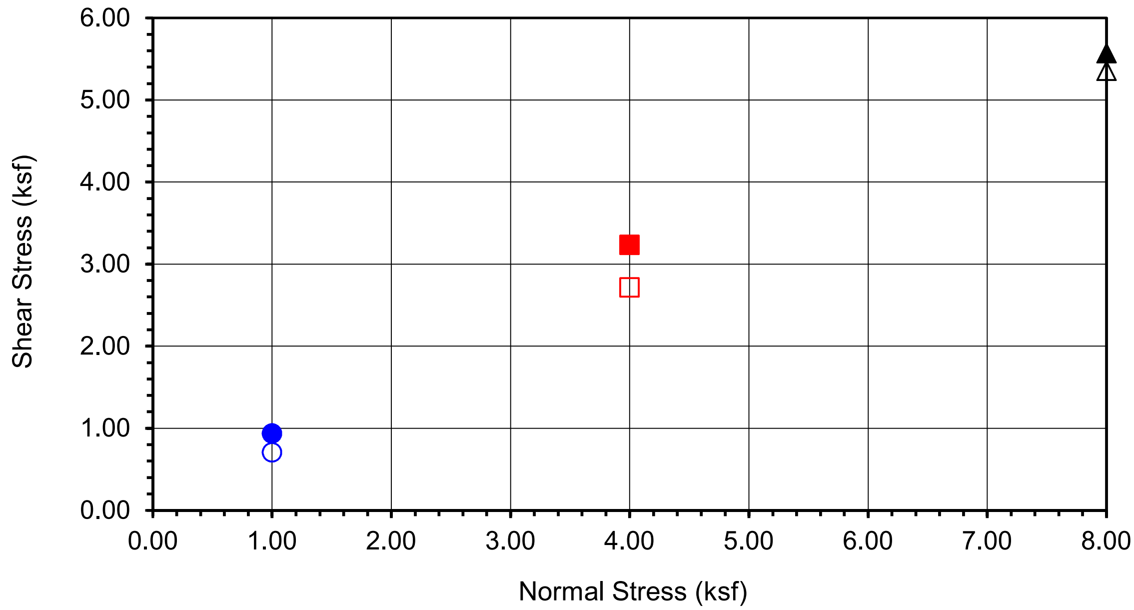
Consolidated Drained - ASTM D 3080

Leighton

Project Name: Hoag Irvine
Tested By: G. Bathala
Date: 01/14/20
Project No.: 11753.004
Checked By: A. Santos
Date: 02/11/20
Boring No.: LB-1-2020
Sample Type: Ring
Sample No.: R-4
Depth (ft.): 35.0
Soil Identification: 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):	192.52	192.54	196.19
Weight of Ring(gm):	45.59	42.84	45.44
Before Shearing			
Weight of Wet Sample+Cont.(gm):	178.49	178.49	178.49
Weight of Dry Sample+Cont.(gm):	166.78	166.78	166.78
Weight of Container(gm):	36.88	36.88	36.88
Vertical Rdg.(in): Initial	0.0000	0.2520	0.2642
Vertical Rdg.(in): Final	-0.0119	0.2737	0.2863
After Shearing			
Weight of Wet Sample+Cont.(gm):	222.30	207.04	233.11
Weight of Dry Sample+Cont.(gm):	200.25	186.29	212.17
Weight of Container(gm):	66.80	50.91	78.15
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-1-2020**
Sample No.	**R-4**
Depth (ft)	**35**

Sample Type:

Ring

Soil Identification:
Yellowish brown silty sand (SM)

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.937	■ 3.232	▲ 5.571
Shear Stress @ End of Test (ksf)	○ 0.707	□ 2.716	△ 5.354
Deformation Rate (in./min.)	0.0033	0.0033	0.0033
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	9.01	9.01	9.01
Dry Density (pcf)	112.1	114.2	115.0
Saturation (%)	48.3	51.1	52.3
Soil Height Before Shearing (in.)	0.9881	0.9783	0.9779
Final Moisture Content (%)	16.5	15.3	15.6

Leighton

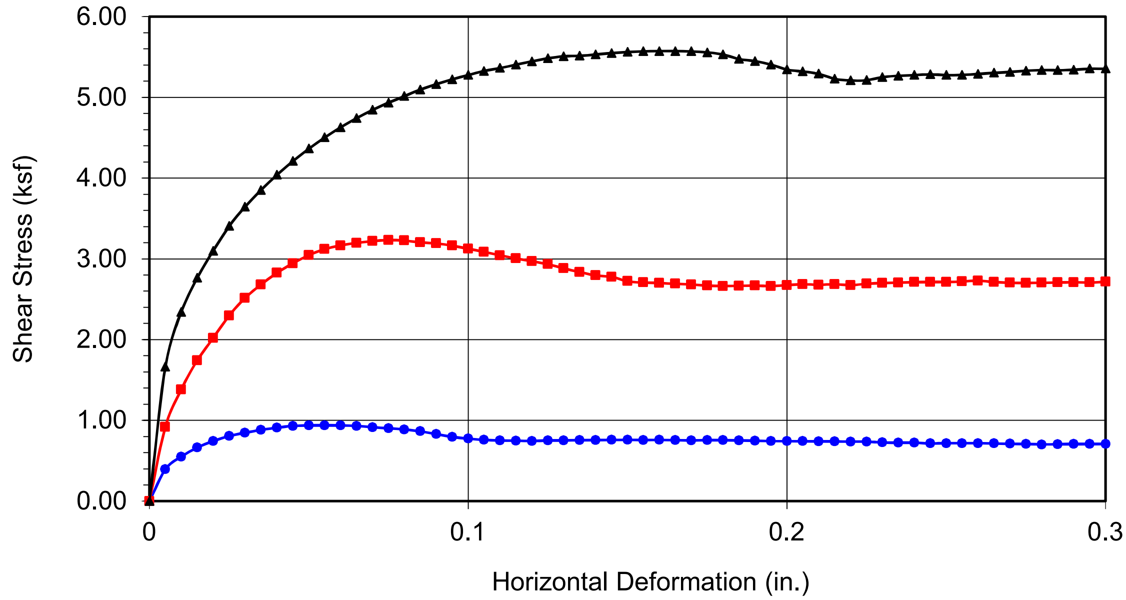
DIRECT SHEAR TEST RESULTS

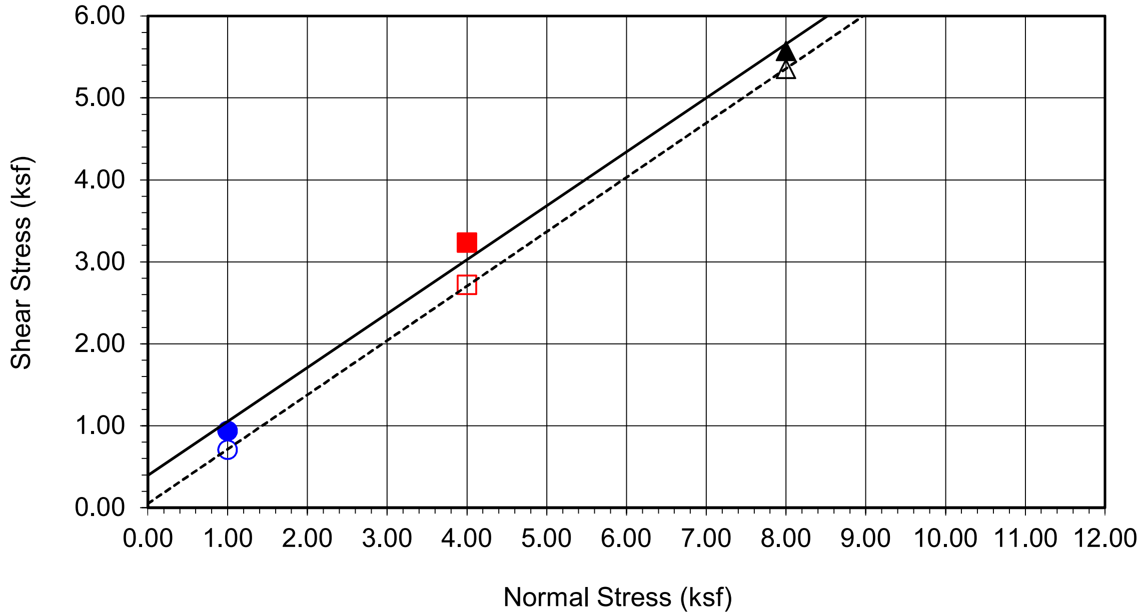
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20





Boring No.	**LB-1-2020**
Sample No.	**R-4**
Depth (ft)	**35**
Sample Type:	Ring

Soil Identification:
Yellowish brown silty sand (SM)

Strength Parameters

	C (psf)	ϕ (°)
Peak	396	33
Ultimate	50	34

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.937	■ 3.232	▲ 5.571
Shear Stress @ End of Test (ksf)	○ 0.707	□ 2.716	△ 5.354
Deformation Rate (in./min.)	0.0033	0.0033	0.0033
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	9.01	9.01	9.01
Dry Density (pcf)	112.1	114.2	115.0
Saturation (%)	48.3	51.1	52.3
Soil Height Before Shearing (in.)	0.9881	0.9783	0.9779
Final Moisture Content (%)	16.5	15.3	15.6

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20

DIRECT SHEAR TEST

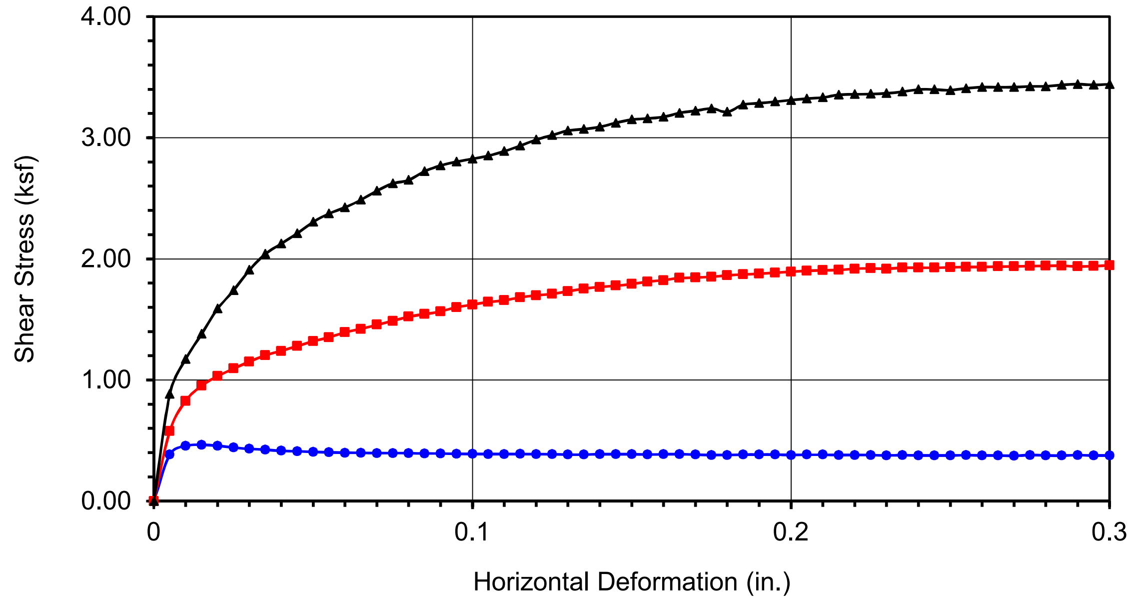
Consolidated Drained - ASTM D 3080

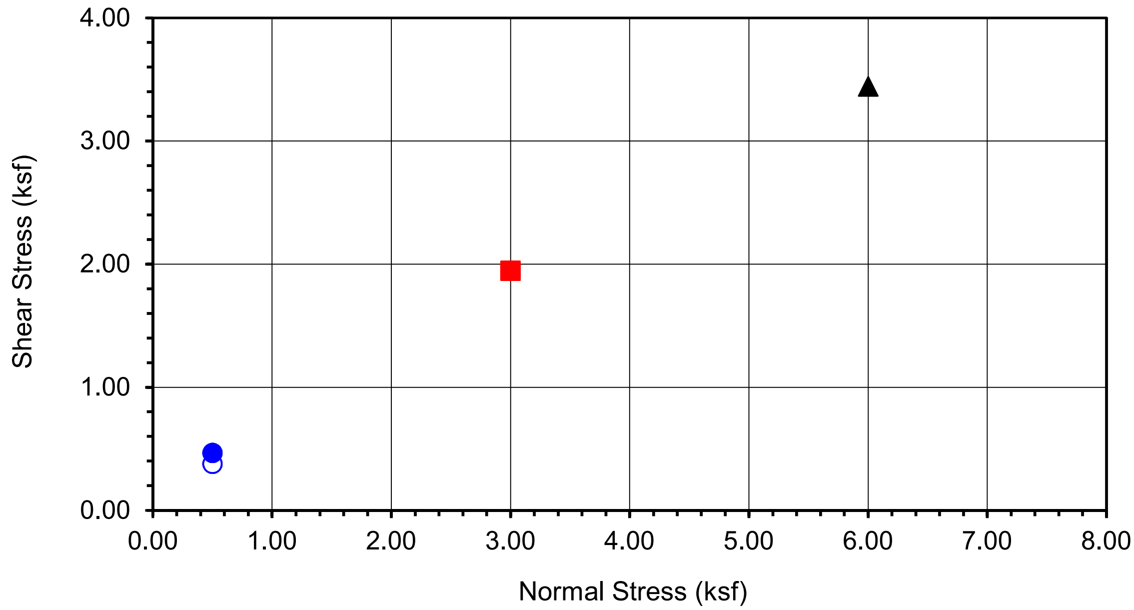
Leighton

Project Name:	Hoag Irvine	Tested By:	O. Figueroa	Date:	01/21/20
Project No.:	11753.004	Checked By:	A. Santos	Date:	02/10/20
Boring No.:	LB-2-2020	Sample Type:	90% Remold		
Sample No.:	B-1	Depth (ft.):	0-5		

Soil Identification: Dark brown clayey sand (SC)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	190.31	190.57	190.17
Weight of Ring(gm):	45.61	45.82	45.82
Before Shearing			
Weight of Wet Sample+Cont.(gm):	169.63	169.63	169.63
Weight of Dry Sample+Cont.(gm):	160.65	160.65	160.65
Weight of Container(gm):	66.75	66.75	66.75
Vertical Rdg.(in): Initial	0.2488	0.2641	0.2545
Vertical Rdg.(in): Final	0.2331	0.2803	0.3058
After Shearing			
Weight of Wet Sample+Cont.(gm):	225.91	219.95	207.23
Weight of Dry Sample+Cont.(gm):	198.68	197.01	186.49
Weight of Container(gm):	69.46	68.15	55.99
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-2-2020**
Sample No.	**B-1**
Depth (ft)	**0-5**

Sample Type:

90% Remold

Soil Identification:
Dark brown clayey sand (SC)

Normal Stress (kip/ft²)	0.500	3.000	6.000
Peak Shear Stress (kip/ft²)	● 0.465	■ 1.946	▲ 3.442
Shear Stress @ End of Test (ksf)	○ 0.377	□ 1.946	△ 3.442
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 (%)	9.56	9.56	9.56
Dry Density (pcf)	109.8	109.9	109.6
Saturation (%)	48.3	48.3	48.0
Soil Height Before Shearing (in.)	1.0157	0.9838	0.9487
Final Moisture Content (%)	21.1	17.8	15.9

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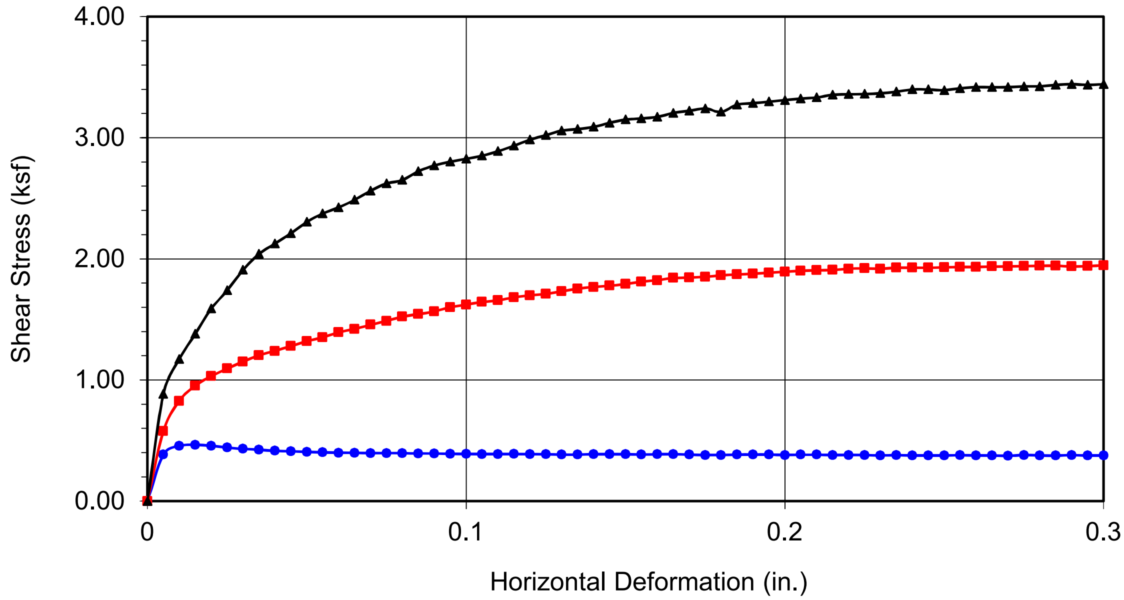
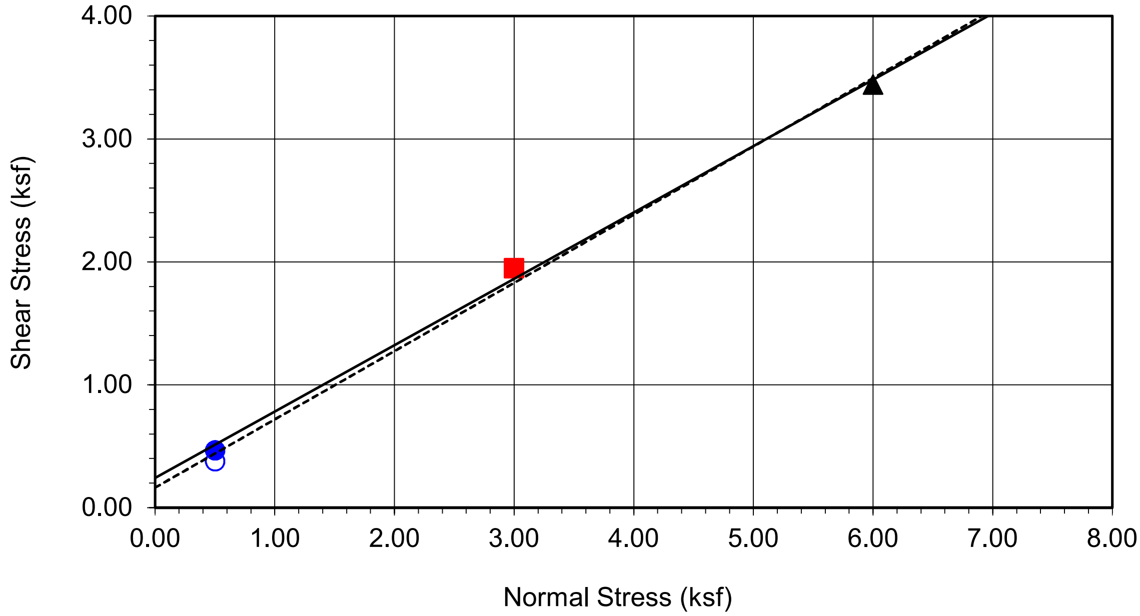
DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20





Boring No.	**LB-2-2020**
Sample No.	**B-1**
Depth (ft)	**0-5**
Sample Type:	90% Remold

Soil Identification:
Dark brown clayey sand (SC)

Strength Parameters

	C (psf)	ϕ (°)
Peak	241	28
Ultimate	163	29

Normal Stress (kip/ft²)	0.500	3.000	6.000
Peak Shear Stress (kip/ft²)	● 0.465	■ 1.946	▲ 3.442
Shear Stress @ End of Test (ksf)	○ 0.377	□ 1.946	△ 3.442
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 (%)	9.56	9.56	9.56
Dry Density (pcf)	109.8	109.9	109.6
Saturation (%)	48.3	48.3	48.0
Soil Height Before Shearing (in.)	1.0157	0.9838	0.9487
Final Moisture Content (%)	21.1	17.8	15.9

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20

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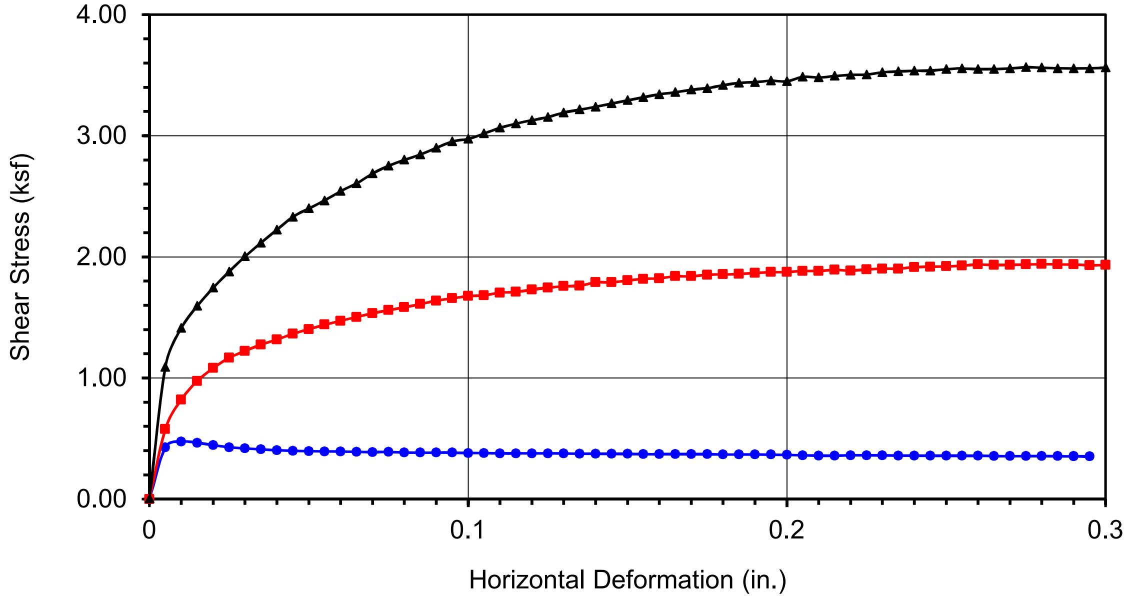
DIRECT SHEAR TEST

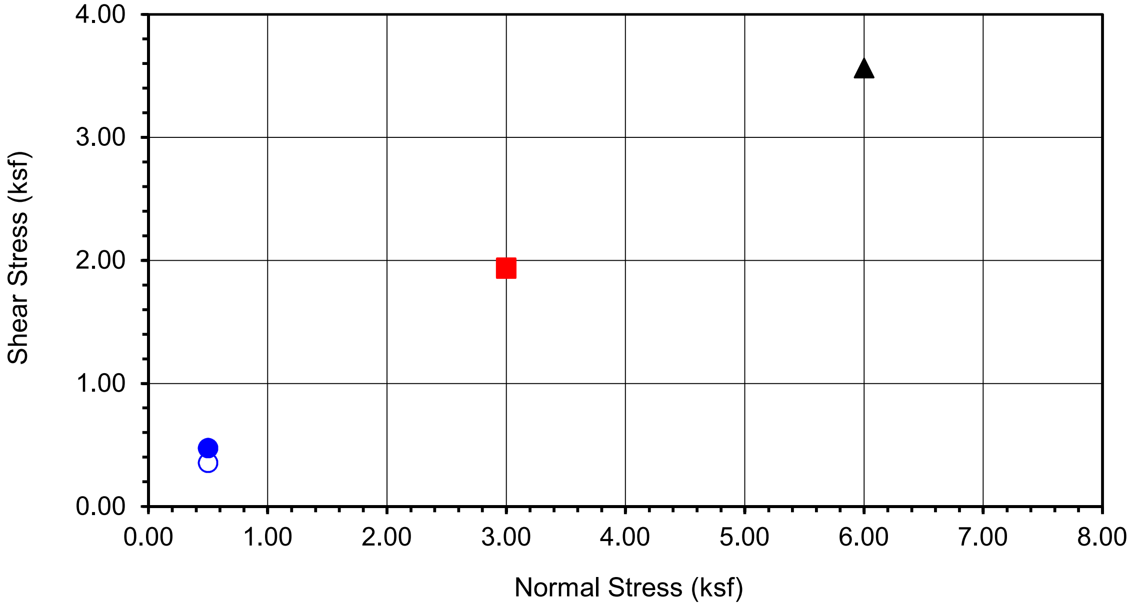
Consolidated Drained - ASTM D 3080

Project Name: Hoag Irvine
Project No.: 11753.004
Boring No.: LB-4-2020
Sample No.: B-1
Soil Identification: Brown clayey sand (SC)

Tested By: O. Figueroa — Date: 01/21/20
Checked By: A. Santos — Date: 02/11/20
Sample Type: 90% Remold
Depth (ft.): 0-5

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	191.70	191.17	191.32
Weight of Ring(gm):	46.07	45.64	45.82
Before Shearing			
Weight of Wet Sample+Cont.(gm):	174.06	174.06	174.06
Weight of Dry Sample+Cont.(gm):	165.23	165.23	165.23
Weight of Container(gm):	74.34	74.34	74.34
Vertical Rdg.(in): Initial	0.2956	0.2301	0.2478
Vertical Rdg.(in): Final	0.2825	0.2453	0.2713
After Shearing			
Weight of Wet Sample+Cont.(gm):	232.05	191.15	209.08
Weight of Dry Sample+Cont.(gm):	205.68	168.26	187.94
Weight of Container(gm):	75.45	37.34	57.41
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-4-2020**
Sample No.	**B-1**
Depth (ft)	**0-5**

Sample Type:

90% Remold

Soil Identification:
Brown clayey sand (SC)

Normal Stress (kip/ft²)	0.500	3.000	6.000
Peak Shear Stress (kip/ft²)	● 0.475	■ 1.940	▲ 3.565
Shear Stress @ End of Test (ksf)	○ 0.355	□ 1.933	△ 3.562
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 (%)	9.72	9.72	9.72
Dry Density (pcf)	110.4	110.3	110.3
Saturation (%)	49.8	49.7	49.6
Soil Height Before Shearing (in.)	1.0131	0.9848	0.9765
Final Moisture Content (%)	20.2	17.5	16.2

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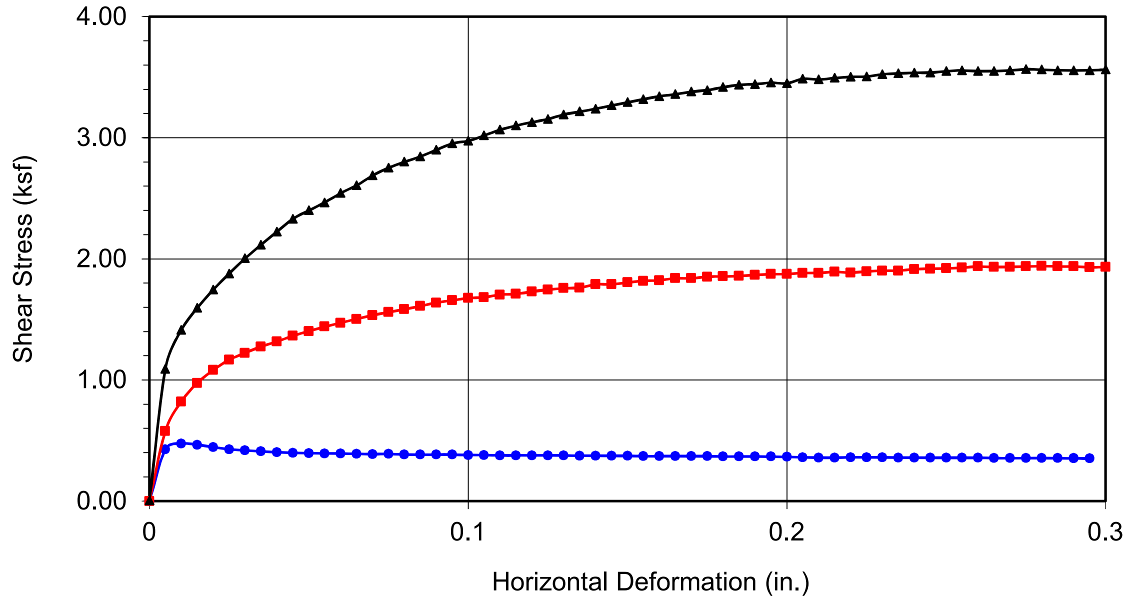
DIRECT SHEAR TEST RESULTS

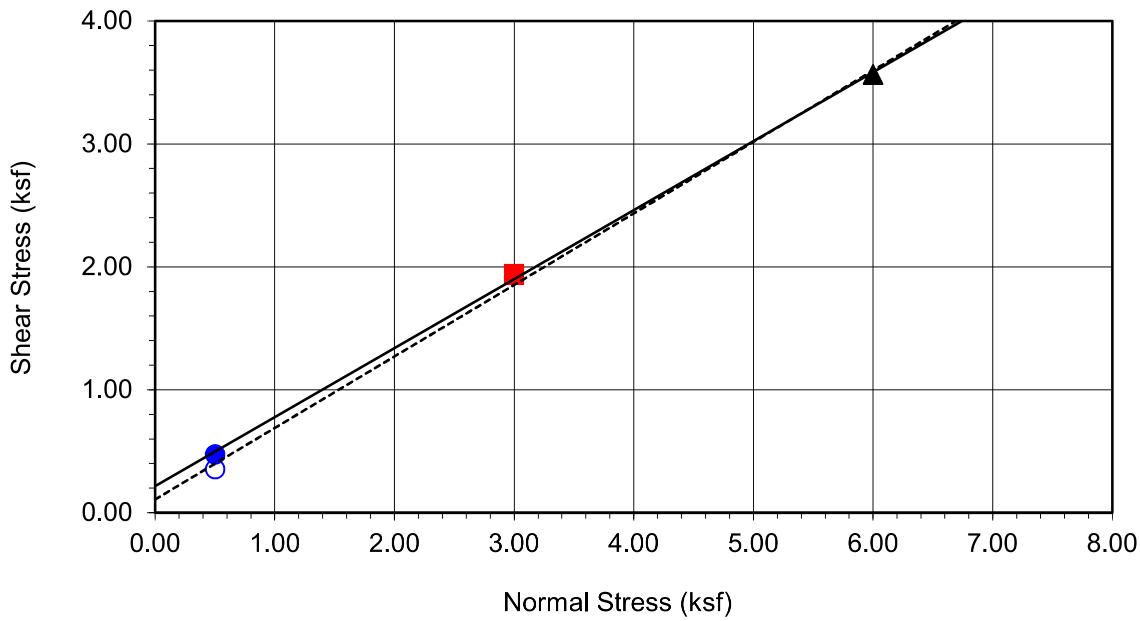
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20





Boring No.	**LB-4-2020**
Sample No.	**B-1**
Depth (ft)	**0-5**
Sample Type: 90% Remold	
Soil Identification: Brown clayey sand (SC)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	216	29
Ultimate	108	30

Normal Stress (kip/ft²)	0.500	3.000	6.000
Peak Shear Stress (kip/ft²)	● 0.475	■ 1.940	▲ 3.565
Shear Stress @ End of Test (ksf)	○ 0.355	□ 1.933	△ 3.562
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 (%)	9.72	9.72	9.72
Dry Density (pcf)	110.4	110.3	110.3
Saturation (%)	49.8	49.7	49.6
Soil Height Before Shearing (in.)	1.0131	0.9848	0.9765
Final Moisture Content (%)	20.2	17.5	16.2

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

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DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

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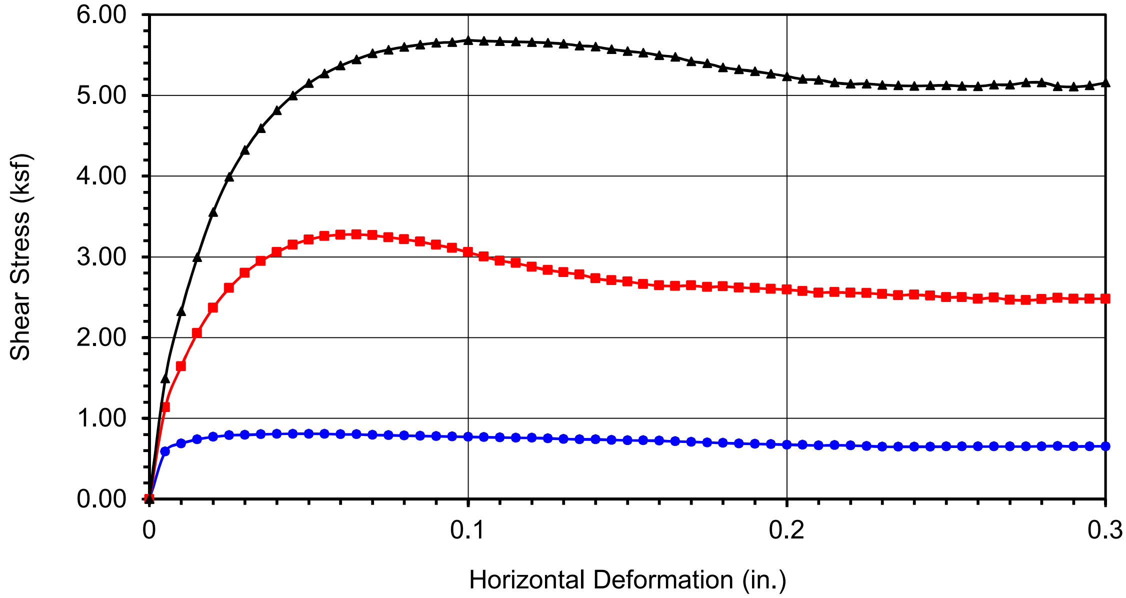
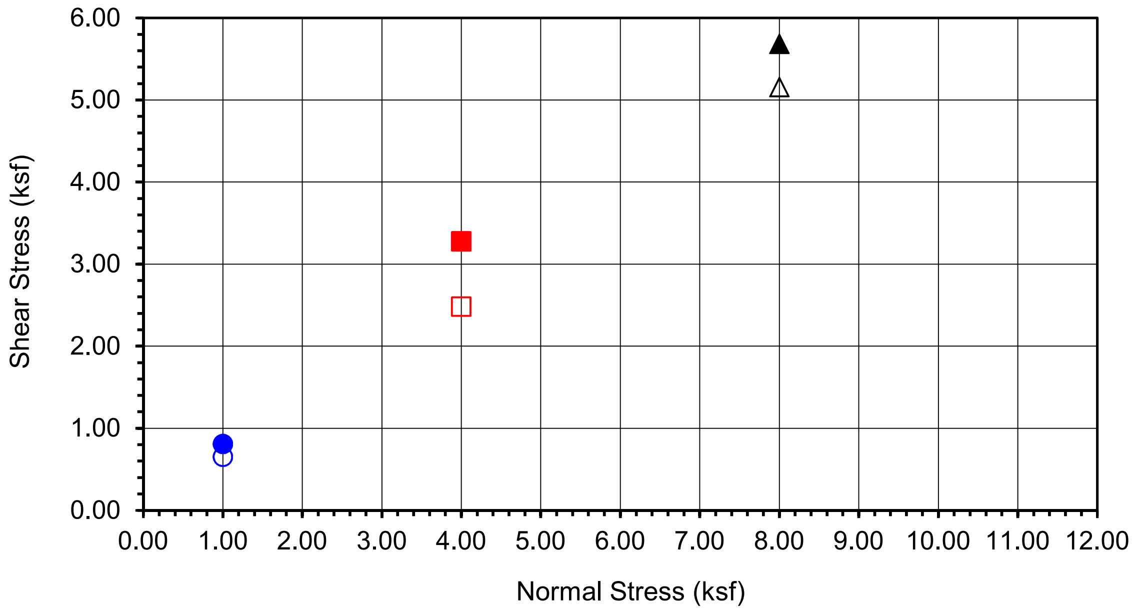
Project Name:	Hoag Irvine	Tested By:	G. Bathala	Date:	01/14/20
Project No.:	11753.004	Checked By:	A. Santos	Date:	02/11/20
Boring No.:	LB-4-2020	Sample Type:	Ring		
Sample No.:	R-2	Depth (ft.):	20.0		

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):	187.19	188.63	189.68
Weight of Ring(gm):	45.36	42.84	42.03
Before Shearing			
Weight of Wet Sample+Cont.(gm):	165.61	165.61	165.61
Weight of Dry Sample+Cont.(gm):	158.37	158.37	158.37
Weight of Container(gm):	60.94	60.94	60.94
Vertical Rdg.(in): Initial	0.2618	0.0000	0.2763
Vertical Rdg.(in): Final	0.2648	-0.0200	0.2971
After Shearing			
Weight of Wet Sample+Cont.(gm):	230.20	222.76	200.13
Weight of Dry Sample+Cont.(gm):	206.90	203.79	179.91
Weight of Container(gm):	73.54	64.80	39.44
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-4-2020**
Sample No.	**R-2**
Depth (ft)	**20**

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)	● 0.808	■ 3.276	▲ 5.681
Shear Stress @ End of Test (ksf)	○ 0.654	□ 2.480	△ 5.156
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 (%)	7.43	7.43	7.43
Dry Density (pcf)	109.8	112.9	114.3
Saturation (%)	37.5	40.7	42.3
Soil Height Before Shearing (in.)	0.9970	0.9800	0.9792
Final Moisture Content (%)	17.5	13.6	14.4

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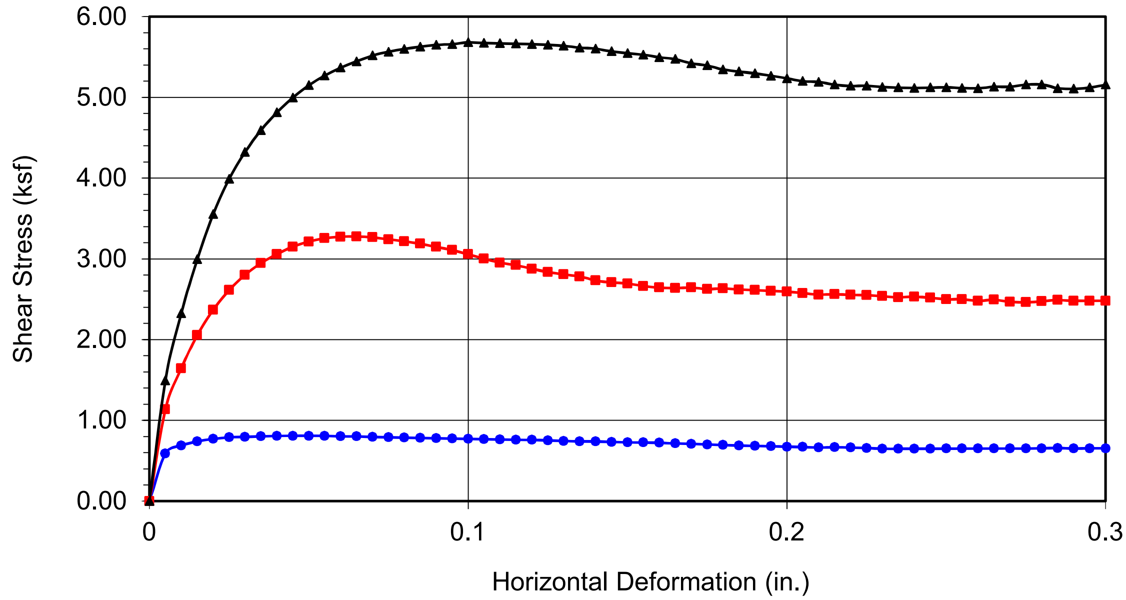
DIRECT SHEAR TEST RESULTS

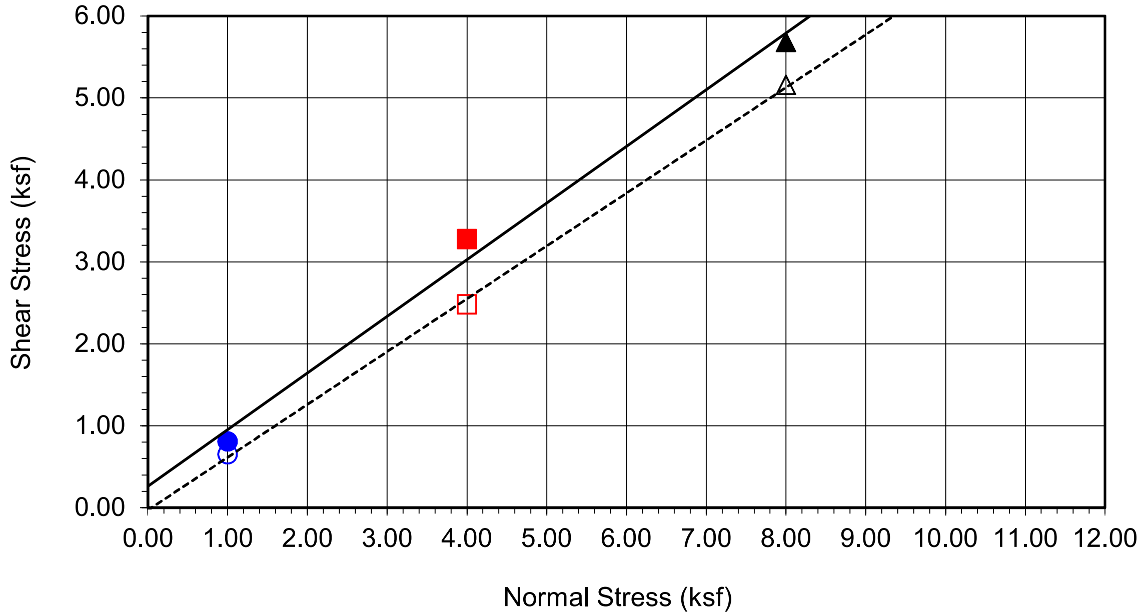
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20





Boring No.	**LB-4-2020**
Sample No.	**R-2**
Depth (ft)	**20**
Sample Type:	Ring
Soil Identification: Light olive brown silty clay (CL-ML)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	261	35
Ultimate	-30	33

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.808	■ 3.276	▲ 5.681
Shear Stress @ End of Test (ksf)	○ 0.654	□ 2.480	△ 5.156
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 (%)	7.43	7.43	7.43
Dry Density (pcf)	109.8	112.9	114.3
Saturation (%)	37.5	40.7	42.3
Soil Height Before Shearing (in.)	0.9970	0.9800	0.9792
Final Moisture Content (%)	17.5	13.6	14.4

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

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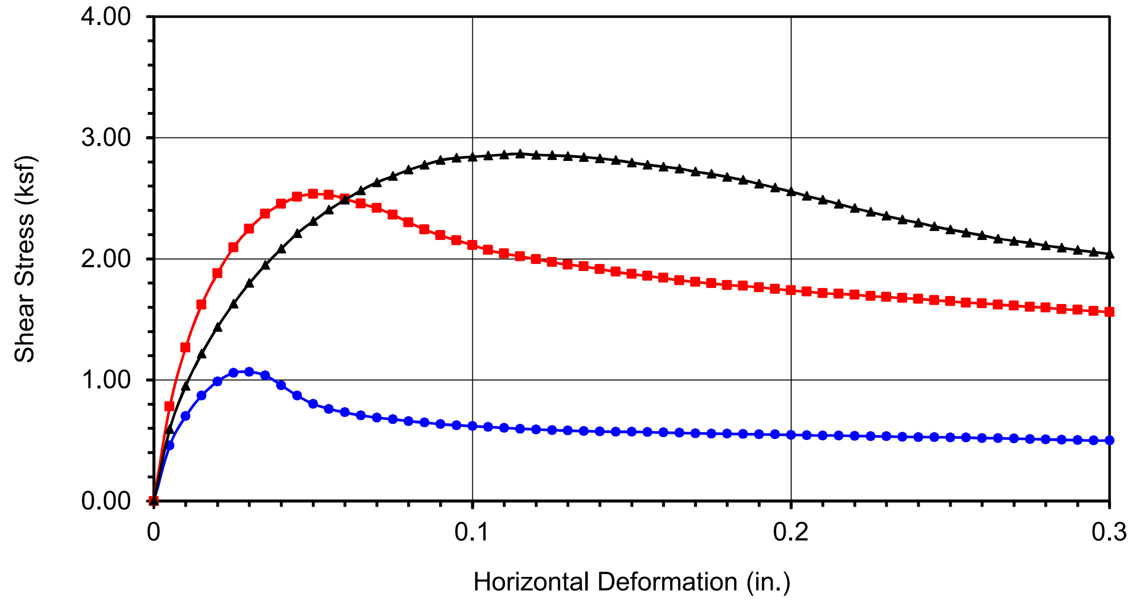
DIRECT SHEAR TEST

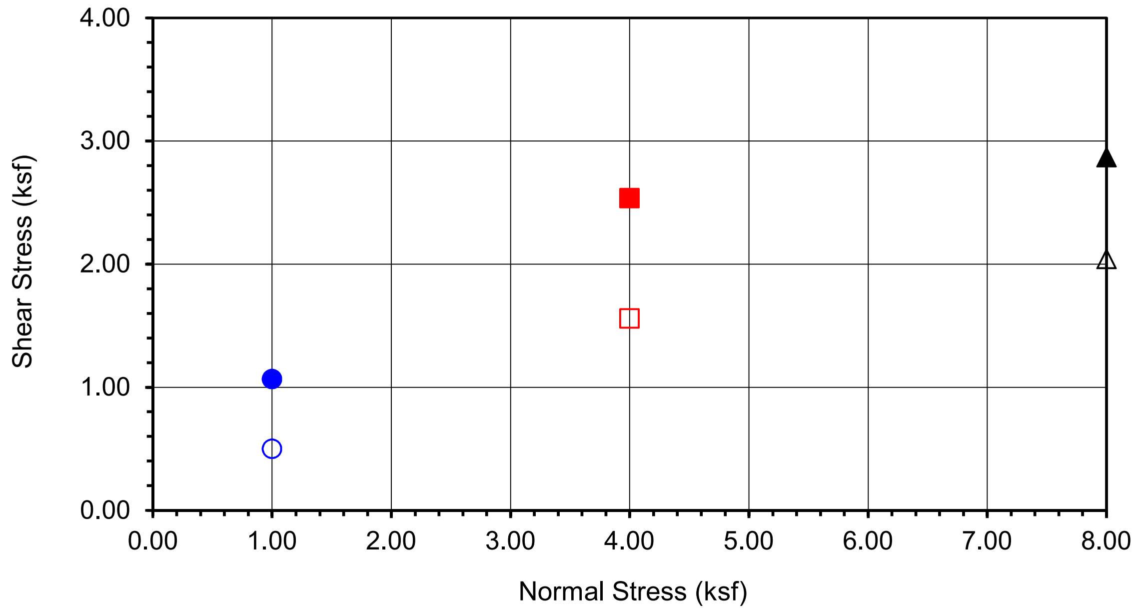
Consolidated Drained - ASTM D 3080

Project Name:	Hoag Irvine	Tested By:	O. Figueroa	Date:	01/14/20
Project No.:	11753.004	Checked By:	A. Santos	Date:	02/11/20
Boring No.:	LB-4-2020	Sample Type:	Ring		
Sample No.:	R-3	Depth (ft.):	30.0		

Soil Identification: Light olive brown 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):	187.36	185.36	181.35
Weight of Ring(gm):	41.74	42.83	41.01
Before Shearing			
Weight of Wet Sample+Cont.(gm):	222.34	222.34	222.34
Weight of Dry Sample+Cont.(gm):	189.62	189.62	189.62
Weight of Container(gm):	64.46	64.46	64.46
Vertical Rdg.(in): Initial	0.2391	0.2357	0.2530
Vertical Rdg.(in): Final	0.2425	0.2498	0.2927
After Shearing			
Weight of Wet Sample+Cont.(gm):	206.11	218.94	191.44
Weight of Dry Sample+Cont.(gm):	170.71	182.80	159.05
Weight of Container(gm):	59.22	75.48	57.42
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-4-2020**
Sample No.	**R-3**
Depth (ft)	**30**

Sample Type:

Ring

Soil Identification:
Light olive brown clay (CL)

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.066	■ 2.534	▲ 2.867
Shear Stress @ End of Test (ksf)	○ 0.500	□ 1.559	△ 2.040
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 (%)	26.14	26.14	26.14
Dry Density (pcf)	96.0	94.0	92.5
Saturation (%)	93.4	88.9	85.9
Soil Height Before Shearing (in.)	0.9966	0.9859	0.9603
Final Moisture Content (%)	31.8	33.7	31.9

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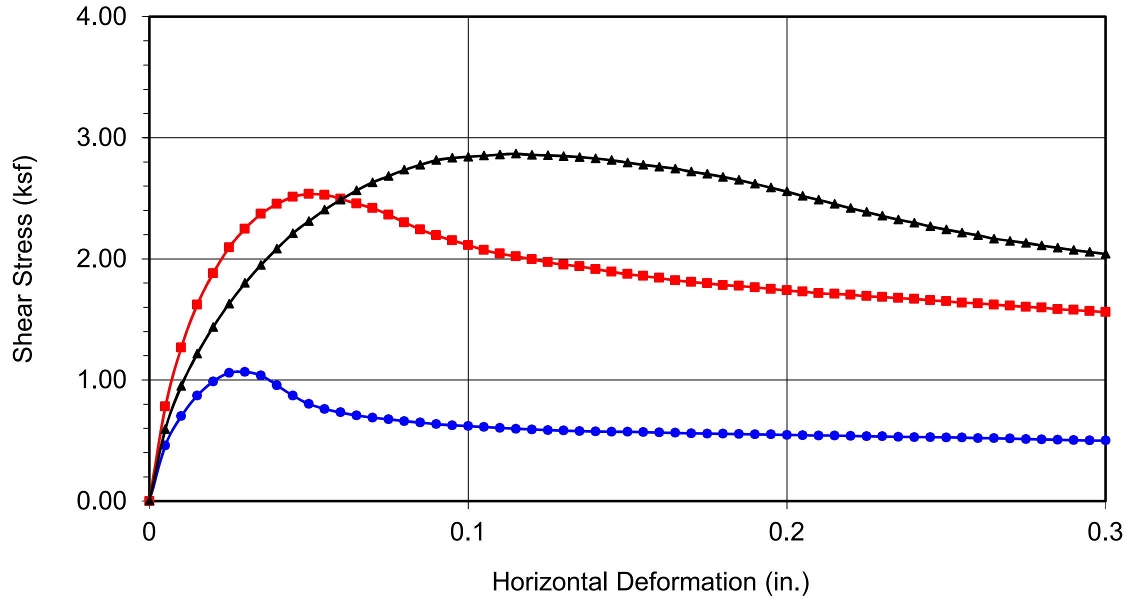
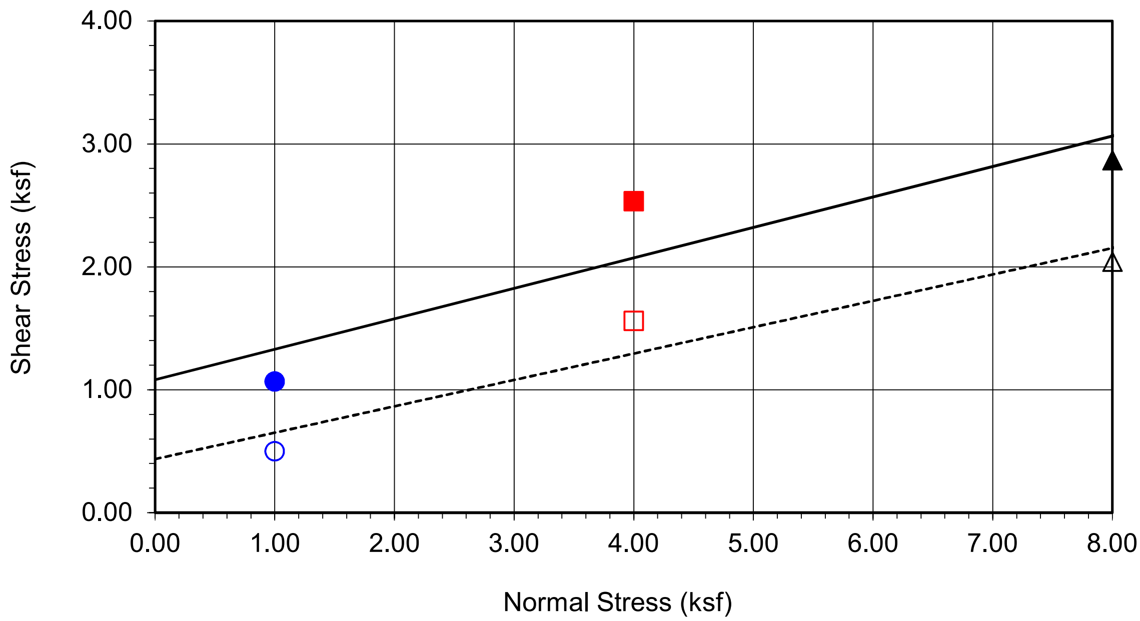
DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20





Boring No.	**LB-4-2020**
Sample No.	**R-3**
Depth (ft)	**30**
Sample Type:	Ring

Soil Identification:
Light olive brown clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	1082	14
Ultimate	436	12

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.066	■ 2.534	▲ 2.867
Shear Stress @ End of Test (ksf)	○ 0.500	□ 1.559	△ 2.040
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 (%)	26.14	26.14	26.14
Dry Density (pcf)	96.0	94.0	92.5
Saturation (%)	93.4	88.9	85.9
Soil Height Before Shearing (in.)	0.9966	0.9859	0.9603
Final Moisture Content (%)	31.8	33.7	31.9

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.004

Hoag Irvine

01-20

EXPANSION INDEX of SOILS
ASTM D 4829

Leighton

Project Name:	Hoag Irvine	Tested By:	S. Felter	Date:	01/28/20
Project No.:	11753.004	Checked By:	J. Ward	Date:	02/17/20
Boring No.:	LB-1-2020	Depth (ft.):	10-15		
Sample No.:	B-2				
Soil Identification:	Dark brown lean clay (CL)				

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	1.0880
Wt. Comp. Soil + Mold (g)	581.00	434.30
Wt. of Mold (g)	206.00	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	741.80	640.30
Dry Wt. of Soil + Cont. (g)	656.50	537.86
Wt. of Container (g)	0.00	206.00
Moisture Content (%)	12.99	30.87
Wet Density (pcf)	113.1	120.4
Dry Density (pcf)	100.1	92.0
Void Ratio	0.684	0.832
Total Porosity	0.406	0.454
Pore Volume (cc)	84.1	102.3
Degree of Saturation (%) [S_{meas}]	**51.3**	100.1

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.)
01/28/20	9:35	1.0	0	0.5240
01/28/20	9:45	1.0	10	0.5210
Add Distilled Water to the Specimen				
01/28/20	10:47	1.0	62	0.5890
01/29/20	6:30	1.0	1245	0.6120
01/29/20	8:00	1.0	1335	0.6120

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**91**

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Hoag Irvine	Tested By:	S. Felter	Date:	01/24/20
Project No.:	11753.004	Checked By:	J. Ward	Date:	02/17/20
Boring No.:	LB-2-2020	Depth (ft.):	0-5		
Sample No.:	B-1				
Soil Identification:	Dark brown clayey sand (SC)				

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	1.0075
Wt. Comp. Soil + Mold (g)	601.50	429.10
Wt. of Mold (g)	180.70	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	835.60	609.80
Dry Wt. of Soil + Cont. (g)	771.60	569.25
Wt. of Container (g)	0.00	180.70
Moisture Content (%)	8.29	10.44
Wet Density (pcf)	126.9	128.5
Dry Density (pcf)	117.2	116.3
Void Ratio	0.438	0.449
Total Porosity	0.305	0.310
Pore Volume (cc)	63.1	64.6
Degree of Saturation (%) [S_{meas}]	**51.1**	62.7

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.)
01/24/20	11:05	1.0	0	0.4975
01/24/20	11:15	1.0	10	0.4975
Add Distilled Water to the Specimen				
01/24/20	12:02	1.0	47	0.4980
01/25/20	6:50	1.0	1175	0.5050
01/25/20	8:11	1.0	1256	0.5050

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**8**

EXPANSION INDEX of SOILS

ASTM D 4829

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Project Name:	Hoag Irvine	Tested By:	S. Felter	Date:	01/22/20
Project No.:	11753.004	Checked By:	A. Santos	Date:	02/17/20
Boring No.:	LB-4-2020	Depth (ft.):	0-5		
Sample No.:	B-1				
Soil Identification:	Brown clayey sand (SC)				

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	1.0370
Wt. Comp. Soil + Mold (g)	585.70	438.40
Wt. of Mold (g)	172.10	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	819.60	610.50
Dry Wt. of Soil + Cont. (g)	751.90	551.55
Wt. of Container (g)	0.00	172.10
Moisture Content (%)	9.00	15.54
Wet Density (pcf)	124.8	127.5
Dry Density (pcf)	114.5	110.4
Void Ratio	0.473	0.527
Total Porosity	0.321	0.345
Pore Volume (cc)	66.5	74.1
Degree of Saturation (%) [S_{meas}]	**51.4**	79.5

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.)
01/22/20	10:50	1.0	0	0.5280
01/22/20	11:00	1.0	10	0.5280
Add Distilled Water to the Specimen				
01/22/20	11:50	1.0	50	0.5550
01/23/20	6:33	1.0	1173	0.5650
01/23/20	8:04	1.0	1264	0.5650

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**37**

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Leighton

Project Name:	Hoag Irvine	Tested By:	J. Gonzalez	Date:	01/15/20
Project No.:	11753.004	Input By:	A. Santos	Date:	01/17/20
Boring No.:	LB-2-2020	Depth (ft.):	0-5		
Sample No.:	B-1				
Soil Identification:	Dark brown clayey sand (SC)				

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)	3752	3834	3844			
Weight of Mold (g)	1808	1808	1808			
Net Weight of Soil (g)	1944	2026	2036			
Wet Weight of Soil + Cont. (g)	474.8	461.0	421.0			
Dry Weight of Soil + Cont. (g)	445.1	420.7	378.0			
Weight of Container (g)	40.0	38.9	39.0			
Moisture Content (%)	7.33	10.56	12.68			
Wet Density (pcf)	129.1	134.5	135.2			
Dry Density (pcf)	120.3	121.7	120.0			

Maximum Dry Density (pcf) 121.8 **Optimum Moisture Content (%)** 9.9

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

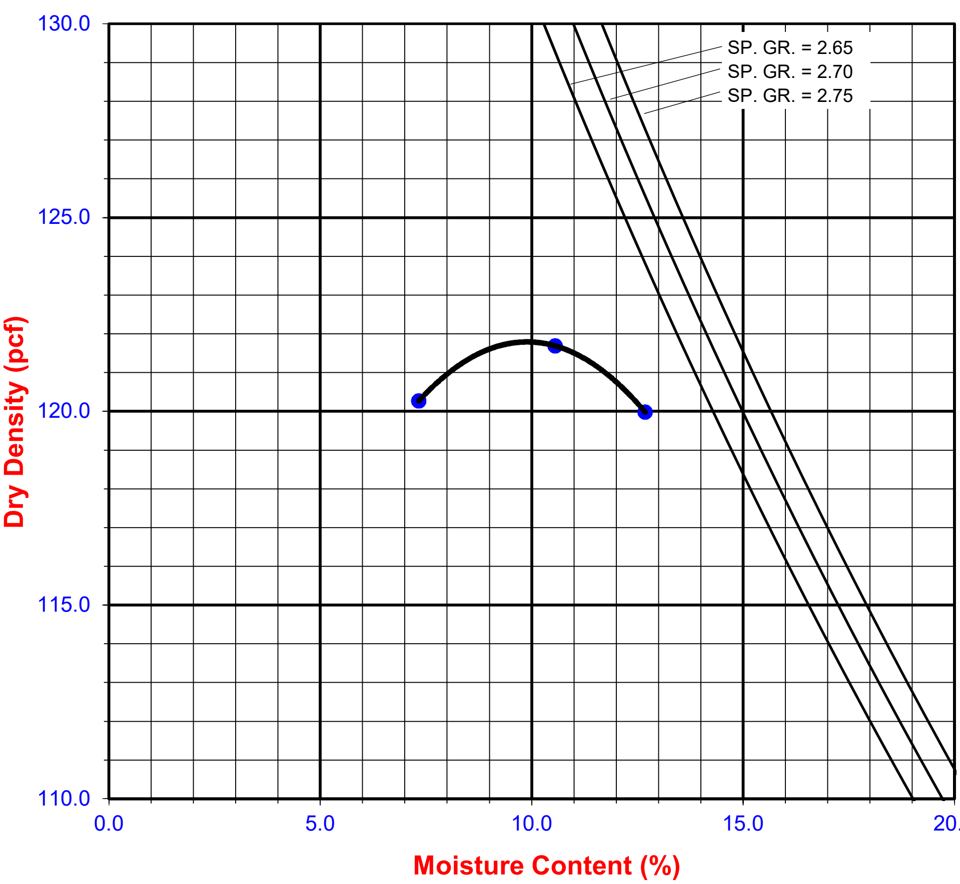
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Leighton

Project Name: Hoag Irvine
Tested By: J. Gonzalez
Date: 01/16/20

Project No.: 11753.004
Input By: A. Santos
Date: 01/17/20

Boring No.: LB-4-2020
Depth (ft.): 0-5

Sample No.: B-1

Soil Identification: Brown clayey sand (SC)

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)	3705	3815	3843			
Weight of Mold (g)	1808	1808	1808			
Net Weight of Soil (g)	1897	2007	2035			
Wet Weight of Soil + Cont. (g)	488.6	456.1	438.0			
Dry Weight of Soil + Cont. (g)	460.9	421.9	397.3			
Weight of Container (g)	39.2	38.7	39.3			
Moisture Content (%)	6.57	8.92	11.37			
Wet Density (pcf)	126.0	133.3	135.1			
Dry Density (pcf)	118.2	122.4	121.3			

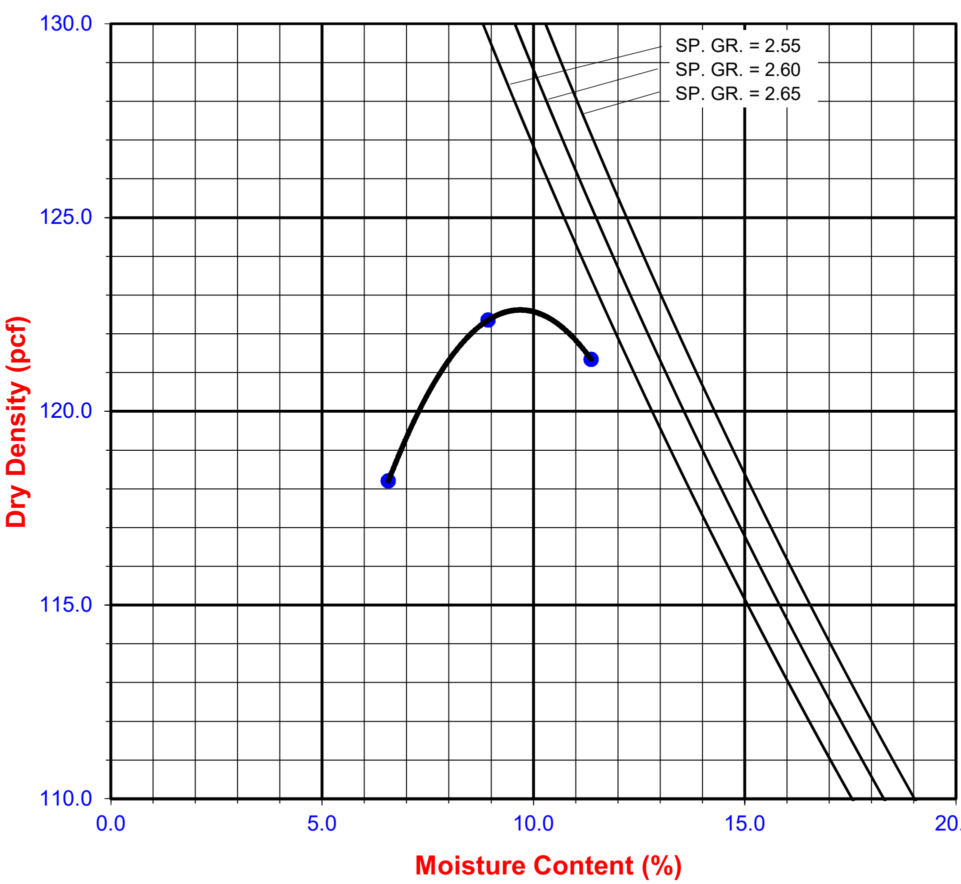
Maximum Dry Density (pcf) 122.6 **Optimum Moisture Content (%)** 9.7

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

MX LB-4-2020, B-1 @ 0-5

R-VALUE TEST RESULTS

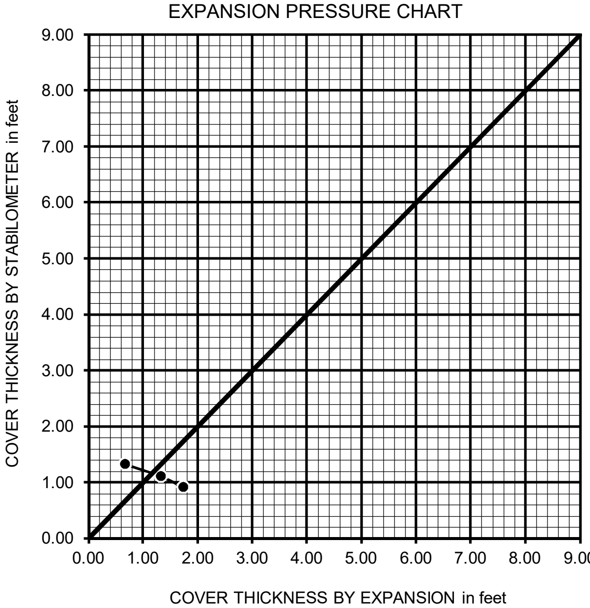
DOT CA Test 301

PROJECT NAME:	Hoag Irvine	PROJECT NUMBER:	11753.004
BORING NUMBER:	LB-2-2020	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	R. Manning
SAMPLE DESCRIPTION:	Dark brown clayey sand (SC)	DATE COMPLETED:	1/20/2020

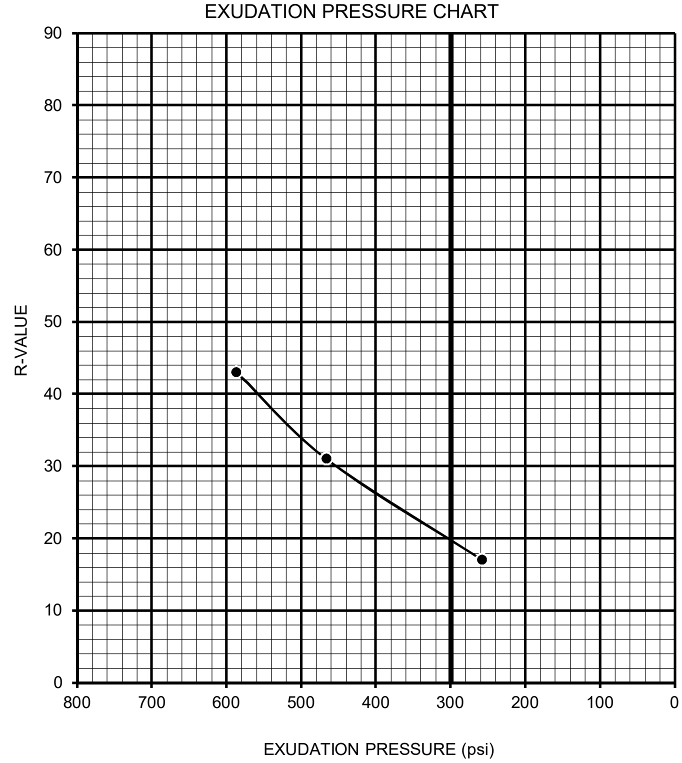
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	11.9	13.1	14.9
HEIGHT OF SAMPLE, Inches	2.45	2.50	2.55
DRY DENSITY, pcf	121.7	119.2	116.9
COMPACTOR PRESSURE, psi	225	150	80
EXUDATION PRESSURE, psi	587	466	258
EXPANSION, Inches x 10exp-4	52	40	20
STABILITY Ph 2,000 lbs (160 psi)	78	98	120
TURNS DISPLACEMENT	3.50	3.60	3.95
R-VALUE UNCORRECTED	43	31	17
R-VALUE CORRECTED	43	31	17

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.	0.91	1.10	1.33
EXPANSION PRESSURE THICKNESS, ft.	1.73	1.33	0.67

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	27
R-VALUE BY EXUDATION:	20
EQUILIBRIUM R-VALUE:	20

Leighton

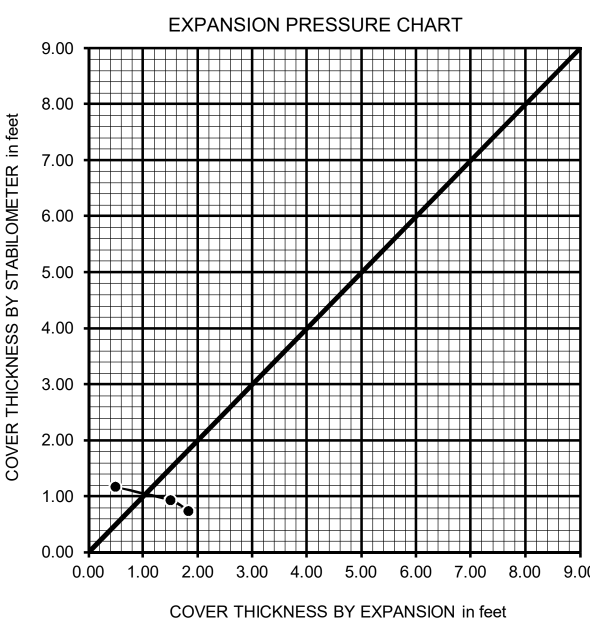
R-VALUE TEST RESULTS

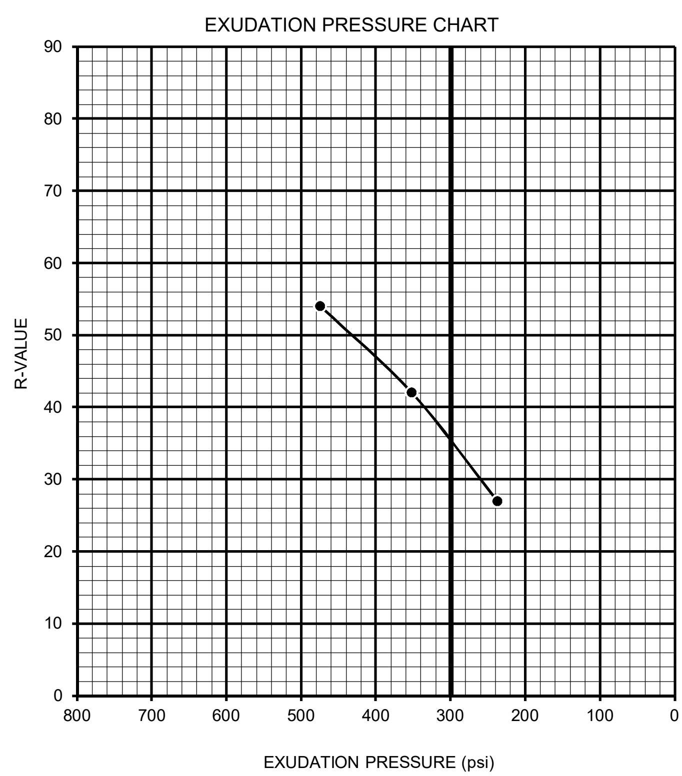
DOT CA Test 301

PROJECT NAME:	Hoag Irvine	PROJECT NUMBER:	11753.004
BORING NUMBER:	LB-4-2020	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	R. Manning
SAMPLE DESCRIPTION:	Brown clayey sand (SC)	DATE COMPLETED:	1/20/2020

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	11.5	12.5	13.7
HEIGHT OF SAMPLE, Inches	2.50	2.53	2.56
DRY DENSITY, pcf	121.8	120.3	118.9
COMPACTOR PRESSURE, psi	250	150	110
EXUDATION PRESSURE, psi	474	352	237
EXPANSION, Inches x 10exp-4	55	45	15
STABILITY Ph 2,000 lbs (160 psi)	60	77	96
TURNS DISPLACEMENT	3.54	3.72	4.00
R-VALUE UNCORRECTED	54	42	29
R-VALUE CORRECTED	54	42	27

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.	0.74	0.93	1.17
EXPANSION PRESSURE THICKNESS, ft.	1.83	1.50	0.50





R-VALUE BY EXPANSION:	38
R-VALUE BY EXUDATION:	35
EQUILIBRIUM R-VALUE:	35

APPENDIX C

Geotechnical Boring Logs and Laboratory Test Results (Converse, 1984 and 1985)

SUMMARY
BORING NO. 1

DATE DRILLED: 10-26-84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 145'±

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0	(1)	SC	moist	medium dense	dark brown	CLAYEY SAND fine sand trace coarse sand				
	1						4.8	9.6	102	0.48 0.90 a 1.68
	2	CL	slightly moist	stiff	dark yellow brwon	SILTY CLAY little sand	5.5	14.6	93	
	1*						11*	23.1		
15		SM	moist	medium dense	brown	SILTY SAND fine to coarse				
	3					layers of coarse clean sand	5.5	6.7	108	▲2.4
20					light brown					
	4	SW				SAND fine to coarse trace gravel	15.5	14.4		
	2*	SC	wet	medium dense	mottled light olive gray & medium yellow brown	CLAYEY SAND interbeds of silty clay fine to coarse, trace gravel	20*			
35	3*						20*			
		CL		stiff		SILTY CLAY with interbeds of silty sand				
40	5						13.0	27.5	95	▲1.2:

(1) Indicates number and range of bulk sample

a Sample soaked and sheared at 0.5, 1.0 and 3.0 ksf normal pressures.

▲Direct shear test.

* Standard Penetration Test (SPT) Resistance in blows/ft.

(Continued)

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No 84-2272-01

Converse Consultants

SUMMARY

BORING NO. 1 (Continued)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ FT.
40		CL	very moist	stiff	light brown	SILTY CLAY fine to medium sand				
45							7.4	30.0	88	
50							12*	34.7		
55		SP		medium dense	light olive brown	GRAVELLY SAND fine to coarse clean	11.7	12.6	113	4.0
60					moderate yellow brown	medium to coarse sand	17.4	11.1	103	
65							48*	13.5		
			free groundwater measured at 23'			end of boring at 65.5'				
70										
75										
80										

* Standard Penetration Test (SPT) Resistance in blows/ft.

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SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No 84-2272-01

Converse Consultants

SUMMARY
BORING NO. 2

DATE DRILLED 10-29-84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 146'±

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0		SC	moist	medium dense	dark yellow brown	CLAYEY SAND fine to coarse sand				
	1						4.0	9.9	93	
5		CL	very stiff	very stiff		SILTY CLAY fine to medium sand				
	1*						16*	19.8		
10	2						6.4	21.5	89	**3.0
15	2*				black	decreasing sand	29*	26.7		
	3*						18*	19.1		
20		SM/SP		medium dense	yellow brown	SILTY SAND				
	3	SW	wet			GRAVELLY SAND fine to coarse sand	15.5	12.3	115	
25						diminishing gravel content fine to coarse sand				
		SC				CLAYEY SAND fine to coarse				
30	4*	CL	very moist	very stiff	dark yellow brown	SANDY CLAY with silty clay interlayers	17*	20.0		
35		CL/CH			dark yellow brown & olive	SILTY CLAY with few sandy clay lenses and layers				
40	4						16.1	29.7		

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer

end of boring at 40'

groundwater encountered at 23'

PROPOSED IRVINE MEDICAL CENTER
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FOR: JAMES LAWSON PIRDY, A.I.A

Project No. 84-2272-01

Converse Consultants

Drawing No. A-5

SUMMARY
BORING NO. 3

DATE DRILLED 10-27-84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION 145'±

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0	1	CL	dry sl. moist moist	stiff to very stiff	dusky yellow brown	**SILTY CLAY** fine to medium sand slightly porous	5.4	15.2	112	
5	2	CL/ML			moderate yellow brown	**SANDY CLAY** fine to medium sand trace clacium	2.9	19.9	102	**3.0
						/SANDY SILT little clay				
10	3						3.6	21.3	100	**3.0
		CL		stiff	dusky yellow brown	**SILTY CLAY** frace fine to medium sand				
15	1*				& medium yellow brown					
		SM		medium dense	olive gray	**SILTY SAND** fine to medium sand				
20	4				light gray		7.3	20.9	98	
			wet							
25	5	SW		to dense	pale olive to yellow gray	**SAND** trace silt	19.3	21.3	108	
		SC			olive gray & olive brown mottling	**CLAYEY SAND** fine to coarse				
30	2*		very moist to wet				20*			
		CL	very moist	stiff to very stiff	olive gray & olive brown mottles	**SILTY CLAY** little fine to coarse sand				
35	6						6.7	33.1	91	**3.2
		SP	wet	dense	moderate brown	**SAND** fine to coarse trace silt				
40	7						19.3	16.2	107	

GP 1781

* Standard Penetration Test (SPT) Resistance in blows/ft.
** Pocket Penetrometer Test

(Continued)

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Project No 84-2272-01

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A-6

MMARY
BORING NO. 3 (Continued)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU FT.	SHEAR RESISTANCE KIPS/SQ. FT.
40		ML/CL	very moist	stiff	light olive gray	SILTY CLAY/CLAYEY SILT trace fine sand slightly micaceous				
		ML			& olive brown	SANDY SILT fine to medium sand				
45	3*						15*			
						little clay fine to coarse sand				
50	8					& silty sand lenses fine to medium sand	5.4	31.9	90	
55										
		SP	wet	dense	pale olive	SAND fine to coarse trace silt				
60	9						25.6	16.8	108	
			groundwater encountered at 21'			end of boring at 60'				
65										
70										
75										
80										

* Standard Penetration Test (SPT) Resistance in blows/ft.

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No. 84-2272-01

Converse Consultants

SUMMARY
BORING NO. 4

DATE DRILLED: 10/26-27/84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 147'±

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0	(1)	SC	moist	loose to medium dense	dark brown	CLAYEY SAND fine to coarse sand				
	1						2.9	16.5	100	0.37 0.63 1.33 a
5	2						2.9	18.8	102	▲1.9
		CL		stiff	light brown	SILTY CLAY some sand				
10	1*						10*			
15	3	SC		medium dense		CLAYEY SAND	5.5	13.3	107	▲2.3
20		SW			olive gray	SAND fine to coarse little to no fines trace gravel				▲2.7
	4						9.8	13.2	114	
25						increasing gravel				
	2*			dense			44*			
30			wet							
	5					clay layers	23.7	11.1	126	
35						SAND trace silt fine to coarse				
	6						16.1	22.7	[illegible]	
40										

(1) Indicates number and range of bulk sample

* Standard Penetration Test (SPT) Resistance in blows/ft.

▲ Direct shear test.

a Sample soaked and sheared at 0.5, 1.5 and 3.0 ksf normal pressures.

(Continued)

PROPOSED IRVINE MEDICAL CENTER
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Project No. 84-2272-01

Converse Consultants

SUMMARY
BORING NO. 4 (Continued)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
40	3*	SW	wet	dense	light brown	SAND trace silt fine to coarse sand occasional gravel to ¼" little gravel to 3/8"	33*			
45	7	CL	moist to very moist	very stiff	light olive gray & light olive brown mottled	SILTY CLAY little to some fine to medium sand	9.8	26.6	100	**3.2 ▲2.7
50	8	ML	very moist	very stiff	pale olive	SANDY SILT little clay	7.3	28.0	96	
55		CL				SILTY CLAY some fine to coarse sand				
	4*	SW	very moist to wet	very dense	yellow gray	SAND fine to coarse sand trace silt trace gravel to 3/8"	70*			
60		SC				CLAYEY SAND fine to coarse sand				
65	9	SP				SAND medium to coarse trace gravel to 1" trace silt	32.5	17.5	108	▲6.2
70		SC				CLAYEY SAND				
	10	SM	v. moist to wet		pale yel. brn & lt. brn. mot.	SILTY SAND fine to coarse sand	19.3	14.6	113	
75						end of boring at 75'				
80										

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket penetrometer test.
▲ Direct shear test.

PROPOSED IRVINE MEDICAL CENTER
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FOR: JAMES LAWSON PIRDY, A.I.A

Project No. 84-2272-01

Converse Consultants

SUMMARY BORING NO. 5

DATE DRILLED 10/27/84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION 147'±

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
0		CL	dry / slightly moist	stiff	olive gray	SILTY CLAY little fine to coarse sand porous				
	1	SC	moist	medium dense	light olive	CLAYEY SAND fine to coarse sand	3.6	10.5	95	
5	2	CL/ML		stiff to very stiff	moderate olive	SILTY CLAY trace fine to coarse sand calcium streaks		19.3	104	
				stiff		/CLAYEY SILT some fine to medium sand calcium streaks				
10	1*					slightly porous	10*			
15	3	CL		to very stiff	dusky brown	SILTY CLAY	4.8	24.4	96	**4.2
20	4	SM	very moist	medium dense	light olive	SILTY SAND fine to coarse	3.6	19.8	106	
▽			wet	to dense						
				dense to very dense		trace gravel to ½"				
25		SW			yellow gray	SAND trace silt fine to coarse sand				
	2*					layers of silty clay	53*			
						little gravel to 1"				
30	5					gravel to 3"	16.8	16.9		
		SC			moderate yellow brown	CLAYEY SAND fine to coarse sand				
35	6						19.3	14.5	111	
						with clean sand layers				
40										

* Standard Penetration Test (SPT) Resistance in blows/ft.

(Continued)

** Pocket penetrometer test.

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No. 84-2272-01

Converse Consultants

SUMMARY
BORING NO. 5 (Continued)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
40	3*	SC	wet	dense to very dense	light yellow brown	CLAYEY SAND fine to coarse	48*			
45						trace gravel few cobbles				
	7						16.2	16.6	116	
		SC				CLAYEY SAND fine sandy clay interlayers				
50		CL	very moist	stiff to very stiff	olive	SANDY CLAY fine sand				
	4*						26*			
55			groundwater encountered at 22'			end of boring at 55'				
60										
65										
70										
75										
80										

* Standard Penetration Test (SPT) Resistance in blows/ft.

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No.
84-2272-01

Converse Consultants

SUMMARY
BORING NO. 6

DATE DRILLED 10-30-84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLES	SYMBOL	ELEVATION				DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
0	(1)	CL				GRAVEL BLANKET clayey sand				
	1		slightly moist to moist	medium dense	dark brown	CLAYEY SAND fine to coarse	3.3	15.9	91	
5	1*						21*			
10	2						5.0	13.4	10[illegible]	
		CL				SANDY CLAY layers of clayey sand				
	2*	SM				SILTY SAND fine to medium sand	31*	23.5		
15						becoming well graded (fine to coarse)				
	3*						32*			
20		SW	moist	medium dense to dense	tan	well graded				
	3						8.9	17.5	99	
25						more gravel				
	4*						55*			
						end of boring at 28.5'				
30										
35										
40										

(1) Indicates number and range of bulk sample

* Standard Penetration Test (SPT) Resistance in blows/ft.

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No. 84-2272-01

Converse Consultants

A-12

FORM NO. D6/77 Approved for publication by

SUMMARY BORING NO. 7

DATE DRILLED: 10-29-84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION 149'±

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ FT.
0	1	CL	sl. moist moist	very stiff	very dark gray brn. to dark brown	**SANDY CLAY** fine to medium sand porous	3.6	14.1	112	**4.5+
5	2			stiff to very stiff	dark brown	fine to medium much calcium in pores lenses of silty sand with clay LL = 49 PL = 24	2.9	25.7	92	**3.5
	1*			stiff		fine to medium	8*			
10–15	3	SC		medium dense	very dark gray brown to dark brown	**CLAYEY SAND** fine to coarse slightly porous lenses of sandy clay	3.6	17.9	110	
15	2*	CL		stiff to very stiff	dark gray brown & olive gray	**SANDY CLAY** lenses & thin sand infillings	15*			
				very stiff		**SILTY CLAY** trace calcium trace fine sand some sand				
20		SC	moist	dense	olive gray to dark gray brown	**CLAYEY SAND** fine to medium		17.2	110	
		SW	wet		light brown gray to pale yellow	**SAND** fine to medium	10.5	11.1	101	
25	3*			dense		fine to coarse	44*			
						little gravel trace gravel increase in gravel & cobbles				
30	5	SM			dark yellow brown	**SILTY SAND** fine to medium trace coarse trace gravel & cobbles	18.1	16.4	107	
35		CL	very moist	very stiff	olive	**SANDY CLAY**				
	4*	SM	wet	dense	yellow brown	**SILTY SAND** fine to medium	43*			
40						streaks of clayey sand				

* Standard Penetration Test (SPT) Resistance in blows/ft. (Continued) ** Pocket penetrometer test.

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No 84-2272-01

Converse Consultants

SUMMARY
BORING NO. 7 (Continued)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLES	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ. FT
40		SC	wet	dense	yellow brown	**CLAYEY SAND** fine to medium				
	6						13.0	19.7	107	
		SM				**SILTY SAND** fine to medium				
		CL	v. moist	v. stiff	ol. & y. bn	**SANDY CLAY - SILTY CLAY** with sand				
45	5*	SM	wet	dense	yellow brown	**SILTY SAND** fine to medium	23*			
		SC				**CLAYEY SAND** fine to coarse				
		SM			olive	**SILTY SAND** fine to coarse lenses and layers of clayey sand (fine to coarse)				
50	7						9.2	24.5	100	
		ML		stiff to very stiff		**CLAYEY SILT** little fine sand				
	6*						24*			
55			groundwater encountered at 22.5'			end of boring at 55'				
60										
65										
70										
75										
80										

* Standard Penetration Test (SPT) Resistance in blows/ft.

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No. 84-2272-01

Converse Consultants

SUMMARY
BORING NO. 8

DATE DRILLED: 10-29-84

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 147'±

DEPTH IN FEET	SYMBOL					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT	SHEAR RESISTANCE KIPS/SQ FT.
0	SC	sl. moist / moist	loose to medium dense	brown to dark brown	CLAYEY SAND fine to medium porous	2.3	10.8	106	
5	CL		very stiff	dark brown	SILTY CLAY trace sand, some calcium streaking & infilling of pores	3.6	226	98.4	**3.5-4.0
				brown to dark brown	SANDY CLAY slightly porous	12*			
				very dark gray to dark gray brown	SILTY CLAY little fine sand with lenses and layers of sandy clay	4.8	19.8	108	**3.6-4.0
	SM	slightly moist to moist	dense	gr. brown to light ol. brown	SILTY SAND fine to coarse	38*			
20	SW	slightly moist		pale olive	SAND fine to coarse				
	SC	wet		light yellow brown to moderate yellow brown	CLAYEY SAND fine to coarse little gravel	16.1	15.1	112	
25					increase in gravel				
	CL	very moist	very stiff to hard	olive with dark yellow brown mottles	SANDY CLAY fine to medium	24*			
	SC		dense	dark yellow brown	CLAYEY SAND fine to medium	13.0			
35				olive	fine to coarse				
	CL		very stiff	mottled olive & yellow brown	SANDY CLAY	24*			
40									

* Standard Penetration Test (SPT) Resistance in blows/ft.
** Pocket Penetrometer Test

(Continued)

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No 84-2272-01

Converse Consultants

SUMMARY
BORING NO. 8 (Continued)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	Sample	ELEVATION					DRIVE ENERGY FT. KIPS/FT.	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB./CU. FT.	SHEAR RESISTANCE KIPS/SQ. FT.
40		CL	very moist	very stiff	mottled olive & yel. brn.	SANDY CLAY fine to medium				
	6	SW	wet	very dense	light yellow brown to yellow brown	SAND fine to coarse trace silt	31.9	17.6	108	
45						thin clayey sand layers with trace gravel				
		CL		very stiff		SANDY CLAY				
50	5*	SM		medium dense to dense	pale olive to olive to green olive	SILTY SAND fine	15*			
		SM/SC				SILTY SAND & CLAYEY SAND fine some sandy clay interlayers				
	7						10.5	22.3	100	
55			groundwater encountered at 22.5'			end of boring at 55'				
60										
65										
70										
75										
80										

GP 1781

* Standard Penetration Test (SPT) Resistance in blows/ft.

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A

Project No 84-2272-01

Converse Consultants

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BORING NO. 9

SHEET 1 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./ WESTERN DIVISION DATE 10-15-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
				CL	**ALLUVIUM - SANDY CLAY** dark brown, fine sand, slightly porous, with caliche	sl. moist	hard	0-75-15				
		1			clayey sand in tip 1-3" thick				3.9	13.6	102	**4.0
5				ML	**CLAYEY SILT** little fine sand, light olive brown			0-30-70				
		2							3.9	13.3	110	
10			1						11*			
				CL	**SILTY CLAY** dark gray little fine sand			0-20-80				
15		3							7.5	27.4 20.8	96 101	**3.5
				ML	**SANDY SILT** light grayish brown, little fine sand							
					increase in sand							
20												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 9

SHEET 2 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-15-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	CORE	SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT (GRAVEL-SAND-FINES)	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		4		SM/ML	ALLUVIUM - SILTY SAND/SANDY SILT light brown, fine sand, with dark olive brown sandy clay interbeds	moist	med. dense	0-50-50	5.2	21.2	104	
				SP	SAND trace gravel to ½" fine to medium sand light gray/white		dense	2-95-3				
25												
			2		@ 27' - heavy chatter				41*			
30												
		5			fine sand hard drilling down pressure lifting rig				30.4			
					increase clay & coarse sand							
35												
			3						37*			
				CL	SILTY CLAY little fine sand light brown mottled gray/blue		hard					
					increase sand							
40												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 9

SHEET 3 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-15-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		6		SC	ALLUVIUM - CLAYEY SAND trace gravel to 1" medium reddish brown with 1-2" thick green/blue silty clay interbeds	moist	dense	1-60-39	22.8	23.2 28.1	104 102	
45												
				SM	SILTY SAND light brown fine sand micaceous			0-60-40				
50												
									20.5	11.7	111	
55												
				CL	SILTY CLAY dark gray fine sand		very stiff	0-29-80				
				SP	SAND trace gravel to 1" light gray brown fine to medium sand		very dense	0-95-4				
60												

(Continued)

Converse Consultants

BORING NO. 9

SHEET 4 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-15-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LBS/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			4	SP	ALLUVIUM - SAND trace gravel	moist	very dense	1-95-4	80*			
					End of boring at 61½'							
					* Standard Penetration Test (SPT) Resistance in blows/ft.							
65												
70												
75												
80												

Converse Consultants

BORING NO. 10

SHEET 1 OF 3

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION
DATE: 10-14-85

PROJECT NO.: 84-2272-02
DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH
DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18"
HOLE DIAMETER: 4 7/8"
ELEVATION: 150'±
GROUNDWATER:
ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

Depth in Feet	Sample Number: Bulk	Sample Number: Core	Sample Number: SPT	Group Symbol	Description	Moisture	Consistency or Density	Visual Field Estimate, Percent Gravel-Sand-Fines	Drive Energy ft kips/ft	Field Moisture % Dry Weight	Dry Density lb/cu ft	Shear Resistance kips/sq ft
				CL	**ALLUVIUM - SILTY CLAY**	sl. moist	hard					
					dark brown			0-20-80				
					little fine sand	moist						
		1			slightly porous with caliche				3.9	13.5	97	
					trace coarse sand							
							very stiff					
5		2			reddish brown				5.3	32.3	100	**3.5
					caliche stringers							
					porous							
					increase sand			0-30-70				
10					silty clay, little sand							
			1					0-30-70	7*			
					increase sand							
					SANDY CLAY			0-25-75				
					dark brown							
					slightly porous with caliche							
					fine sand							
15		3							7.5	19.5	108	
				ML	**SANDY SILT**							
					light brown							
					fine sand							
				SP	**SAND**		dense	0-95-5				
					trace gravel							
					light gray brown			5-95-5				
20												

GP 1781

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 10

SHEET 2 OF 3

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-14-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER (BULK / CORE / SPT)	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
	4	SP	ALLUVIUM - SAND trace gravle to ½" light gray white	moist	dense	0-90-5	23.2	15.3	108	
			moderate chatter							
25	2						34*			
30			gravel to ½", moderate/heavy chatter							
		CL	SILTY CLAY dark gray brown fine sand							
35		SP	SAND trace gravel light reddish brown fine sand gravel to ½"		very dense	5-85-10				
	3						60*			
		ML	SANDY SILT light reddish brown, mottled gray		stiff	0-30-70				
						0-40-60				
40										

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 10

SHEET 3 OF 3

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION — DATE: 10-14-85

PROJECT NO.: 84-2272-02 — DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH — DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" — HOLE DIAMETER: 4 1/2" — ELEVATION: 150'± — GROUNDWATER: — ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

Depth in feet	Sample number: Drive	Sample number: Core	Sample number: SPT	Group symbol	Description	Moisture	Consistency or density	Visual field estimate: percent gravel-sand-fines	Drive energy ft kips/ft	Field moisture % dry weight	Dry density lb/cu ft	Shear resistance kips/sq ft
		5		ML	ALLUVIUM - SANDY SILT				17.4	21.8	104	
				SM/ML	SANDY SILT/SILTY SAND light reddish brown	moist	med. dense	0-50-50				
45												
				SP	SAND trace gravel light gray white fine to medium sand with trace coarse gravel to 1"			2-95-3				
50			4						35*			
					End of boring at 51½' * Standard Penetration Test (SPT) Resistance in blows/ft.							
55												
60												

Converse Consultants

BORING NO. 11

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-11-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 200 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 151'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
	1			CL	**ALLUVIUM - SANDY CLAY** trace sand	sl. moist	hard	0-75-15				
					dark reddish brown fine to medium sand slightly porous with caliche	moist	very stiff					
		1							7.5	27.9	92	
5												
					increase sand & silt							
			1						8*			
				ML	**CLAYEY SILT** dark brown trace sand & gravel to ½" caliche pores			1-30-69				
10		2							3.9	20.5	104	**3.0
				CL	**SILTY CLAY** dark brown fine sand caliche pores							
15			2						20*			
					increase sand			0-30-70				
								0-35-65				
20												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 11

SHEET 2 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-11-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 151'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER TUBE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		3		SM	ALLUVIUM - SILTY SAND light gray brown fine sand	moist	med. dense	0-55-45	4.8	20.3	105	
					heavy chatter							
				SP	SAND trace gravel fine to medium sand, trace coarse gravel to 1" light gray, white		dense	5-93-2				
25			3						40*			
							very dense					
30												
					@ 34' - increase in clay							
35			4					5-85-10	80*			
				CL	SILTY CLAY trace sand medium grained			0-20-80				
40												

GP 1781

(Continued) * Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 11

SHEET 3 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./ DATE 10-11-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 151'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		4		CL	ALLUVIUM - SILTY CLAY	moist	very stiff	0-25-75	11.6	25.3	103	
				SP	SAND trace gravel light gray/white		very dense					
45			5		sand, trace gravel with clay interbeds to 1"				58*			
					rig chatter 47-48' gravel ?							
					increase fines			2-80-18				
50		5		SC	CLAYEY SAND light red brown fine sand, gravel to 2"			1-80-19	19.2	13.3	107	
55					occasional 1-6" bands of clean sand							
60												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

![Converse Consultants]

Converse Consultants

BORING NO. 11

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-11-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 151'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			6	SC/SP	ALLUVIUM - CLAYEY SAND with poorly graded sand layers	moist	very dense	1-90-9	73*			
					End of boring at 61½'							
					* Standard Penetration Test (SPT) Resistance in blows/ft.							
65												
70												
75												
80												

Converse Consultants

BORING NO. 12

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE: 10-10-85

PROJECT NO.: 84-2272-02 DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" HOLE DIAMETER: 4 7/8" ELEVATION: 151'± GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

...MARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE ... DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS ... CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRE...TED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
				CL	ALLUVIUM - SILTY CLAY dark brown fine sand porous root hairs	dry sl. moist	loose very stiff	0-25-75				
		1							4.8	9.0	93	**3.0
5		2			sandstone chunk, not representative of soil				8.4	5.1	121	
					SANDY CLAY dark reddish brown fine sand	moist		0-35-65				
10			1						18*			
					SILTY CLAY trace sand dark brown, mottled grayish green calcium fine sand			0-25-75				
15		3							8.4	24.3	102	
				ML	SANDY SILT light olive gray with occasional silty sand layers 1-2" fine sand		stiff	0-45-55				
20												

GP 1781

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 12

SHEET 2 OF 4

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE: 10-10-85

PROJECT NO.: 84-2272-02 DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" HOLE DIAMETER: 4 7/8" ELEVATION: GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		4		ML	ALLUVIUM - SILTY SAND	moist	stiff	0-40-60	5.2	22.2	101	**1.5
					increase sand							
				SP	SAND		very dense					
					fine to medium sand, trace coarse gravel to 1"							
25												
			2						63*			
					rig chatter 27'							
30												
			3		trace of coarse sand		dense		35*			
35					medium to heavy chatter							
40												

(Continued) * Standard Penetration Test (SPT) Resistance in blows/ft. ** Pocket Penetrometer Test

Converse Consultants

BORING NO. 12

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION — DATE: 10-10-85

PROJECT NO.: 84-2272-02 — DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH — DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" — HOLE DIAMETER: 4 7/8" — ELEVATION: 151'± — GROUNDWATER: — ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT (GRAVEL-SAND-FINES)	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
	4	SP	ALLUVIUM - SAND trace gravel & clay	moist	very dense	5-90-5	52*			
45		CL	SILTY CLAY trace sand dark gray brown fine sand		very stiff					
		SP	SAND trace gravel & clay fine to medium grained sand		dense					
50	5	CL	SILTY CLAY medium reddish brown with sandy clay interbeds mottled blue/gray fine sand with 6-8" sand layers		very stiff		31*			
55			@ 57-58' - predominately sand							
			heavy chatter @ 59'							
60										

GP 1781

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 12

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-11-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 151'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	CORE	SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT (GRAVEL-SAND-FINES)	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			6	SP	ALLUVIUM - SAND trace gravel fine to medium sand trace coarse	moist	very dense	5-95-0	106*			
65					heavy rig chatter constant to 70'							
70					End of boring at 70'							
					* Standard Penetration Test (SPT) Resistance in blows/ft.							
75												
80												

Converse Consultants

BORING NO. 13

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE: 10-14-85

PROJECT NO.: 84-2272-02 DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" HOLE DIAMETER: 4 7/8" ELEVATION: 150'± GROUNDWATER: 22'± ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
				CL	**ALLUVIUM - SILTY CLAY** little sand with clayey sand stringers dark reddish brown	sl. moist moist		0-25-45				
		1							3.9	11.5	95	0.4 a 0.9 1.7
					slightly porous with root hairs & caliche							
5								0-30-70				
		2			trace sand below 6' slightly porous			0-20-80	3.4	16.0	93	**4.0 1.7
10			1		decrease sand		very stiff	0-15-85	17*			
					occasional 1-2" thick sand stringers			0-80-20				
15		3							6.7	7.3	111	**3.5 2.4
				ML	**CLAYEY SILT** light olive gray/medium brown little sand		stiff	0-25-75				
20												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

a Sample soaked before shearing at 0.5, 1.5 and 3.0 ksf normal pressures

Converse Consultants

BORING NO. 13

SHEET 2 OF 4

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE: 10-14-85

PROJECT NO.: 84-2272-02 DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" HOLE DIAMETER: 4 7/8" ELEVATION: 150'± GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

Depth in Feet	Sample Number: Bulk	Sample Number: Core	Sample Number: SPT	Group Symbol	Description	Moisture	Consistency or Density	Visual Field Estimate (Percent Gravel-Sand-Fines)	Drive Energy Ft Kips/Ft	Field Moisture % Dry Weight	Dry Density Lb/Cu Ft	Shear Resistance Kips/Sq Ft
			2	ML	ALLUVIUM - CLAYEY SILT light olive gray	moist	stiff		10*			
					increase sand							
				SP	SAND trace clay light brown fine sand		med. dense	0-90-10				
25		4							16.0	18.6	108	3.0
				SC	CLAYEY SAND dark brown fine to medium sand			0-80-20				
				SP	SAND trace gravel fine to coarse sand light gray			5-90-5				
30		5			with clayey sand/sandy clay interbeds				17.4	16.6	117	**3.5 4.2
				CL	SANDY CLAY dark brown/grayish brown fine to medium sand		very	0-25-75				
					occasional 1-2" sand/gravel stringers							
35			3						29*			
					increase sand							
40												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 13

SHEET 3 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-14-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		6		SM/ML	ALLUVIUM - SANDY SILT/SILTY SAND light reddish brown very fine sand	moist	med. dense	0-50-50	22.8	18.1	111	3.7
				SP	SAND trace gravel moderate rig chatter 44-47' cuttings sand & gravel							
45												
				ML	SANDY SILT light olive brown with silty clay & silty sand interbeds fine sand		stiff					
50			4	ML/CL					13*			
				SP	SAND trace gravel & clay light gray brown fine sand with gravel & clay stringers		very dense					
55												
60												

GP 1781

(Continued)

* Standard Penetration Test (SPT)
Resistance in blows/ft.

Converse Consultants

BORING NO. 13

SHEET 4 OF 4

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION   DATE: 10-14-85

PROJECT NO.: 84-2272-02   DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH   DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18"   HOLE DIAMETER: 4 7/8"   ELEVATION: 150'±   GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			5	SP	ALLUVIUM - SAND	moist	very dense		107*			
					End of boring at 61½'							
					* Standard Penetration Test (SPT) Resistance in blows/ft.							
					Standpipe piezometer installed.							
65					Groundwater level measured at 22 feet below the ground surface on 10/15/85.							
70												
75												
80												

Converse Consultants

BORING NO. 14

SHEET 1 OF 4

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE: 10-10-85

PROJECT NO.: 84-2272-02 DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" HOLE DIAMETER: 4 7/8" ELEVATION: 150'± GROUNDWATER: ___ ENG/GEO: GHD

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
				CL	ALLUVIUM - SILTY CLAY little sand dark brown porous root hairs	sl. moist	very stiff	0-30-70				
		1							[illegible].8	11.5	102	**3.5
				SC	CLAYEY SAND light red fine to medium sand			0-70-30				
		2							5.1	7.7	102	**3.5
5				CL	SANDY CLAY dark reddish brown fine to medium sand	moist	stiff	0-35-65				
			1						14*			
				ML	CLAYEY SILT cuttings mainly silt light reddish brown fine sand porous with calcium deposits							
10		3							3.9	14.7	109	
				CL	SILTY CLAY trace sand fine sand		very stiff	0-20-80				
15			2						22*			
				ML	SANDY SILT olive brown fine sand		med. dense	0-40-60				
20												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 14

SHEET 2 OF 4

PROJECT NAME: PROPOSED IRVINE MEDI[illegible]AL CENTER - AMI, INC./WESTERN DIVISION   DATE: 10-10-85

PROJECT NO.: 84-2272-02   DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH   DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18"   HOLE DIAMETER: 4 7/8"   ELEVATION: 150'±   GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		NR		ML	ALLUVIUM - SANDY SILT	moist	med. dense	0-50-50	4.3			
25		NR			layer 1-2" pieces				30.4			
				CL	SILTY CLAY trace sand dark olive brown		very stiff					
					occasional gravel layer							
30			3		mottled blueish gray				20*			
35		NR			NR = no recovery				27.4			
		NR										
				SP	SAND trace gravel light reddish brown			3-90-7				
40												

GP 1781

(Continued)   * Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 14

SHEET 3 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTON DIVISION DATE 10-10-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		SP	ALLUVIUM - SAND	moist	dense	0-95-5				
		CL	SILTY CLAY medium reddish brown fine sand		very stiff	0-20-80	22*			
		SC	CLAYEY SAND light reddish brown fine sand, alternating clean/clayey gravel to ½"		dense	1-60-39				
45	4					2-85-13	31.8	17.8	110	
		ML	SANDY SILT medium brown with 1-2" silty clay & 1-2" sandy gravel layers fine sand			0-40-60				
50	5						36*			
55										
		SP	SAND trace gravel light brown/gray white fine to medium sand, trace coarse gravel to ½"	moist	very dense	5-93-2				
60										

(Continued) * Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 14

SHEET 4 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-10-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 150'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		5		SP	ALLUVIUM - SAND trace gravel	moist	very dense	5-93-2	45.3	15.5	106	5.8
65					@ 65' - 1-2" thick clay interbeds							
					heavy rig chatter at 68' and 69'							
70			6						109*			
					End of boring at 71½' * Standard Penetration Test (SPT) Resistance in blows/ft.							
75												
80												

Converse Consultants

BORING NO. 15

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-9-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 149'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
				CL	ALLUVIUM - SANDY CLAY dark red fine to coarse sand, upper 12" dry & loose slightly porous root hairs	sl. moist	loose					
		1				moist	very stiff	0-35-65	5.2	16.2	101	**3.5
				SC	CLAYEY SAND light red fine to coarse sand with sandy clay stringers to 1"		med. dense	0-80-20				
		2							4.3	11.6	101	
5				CL	SANDY CLAY dark red fine to coarse sand calcium deposits		firm	0-35-65				
			1						9*			
				ML	SANDY SILT yellowish red fine sand slightly porous calcium deposits 1-3" stringers of sandy clay			0-25-75				
10		3							4.3	19.9	101	**3.0
				CL	SILTY CLAY dark yellowish brown mottled olive green fine sand trace coarse sand		very stiff to hard	0-20-80				
15		4							7.0	24.0	96	
					silty sand cuttings 1-6" thick							
20												

GP 1781

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 15

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-9-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 149'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			2	CL	ALLUVIUM - SILTY CLAY dark yellowish brown	moist	very stiff		10*			
				SP	SAND fine grained, gray/white			0-99-1				
25				GP	SANDY GRAVEL heavy chatter gravel chips very heavy chatter 27'		dense	90-10-0				
					GRAVEL			90-10-0				
			3	SP	SAND light gray/white			0-99-1	35*			
30		5							33*			
				SP/GP	SAND & GRAVEL moderate to heavy rig chatter gravel to 3/8" rods sticking due to gravel in hole @ 34' - violent rig chatter @ 35' - smooth drilling			50-50-0 5-90-5				
35			4	CL	SILTY CLAY light olive gray, mottled light red		stiff		30*			
				SM	SILTY SAND light red fine sand							
40												

(Continued) * Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 15

SHEET 3 OF 4

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./ WESTERN DIVISION — DATE: 10-9-85

PROJECT NO.: 84-2272-02 — DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH — DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" — HOLE DIAMETER: 4 7/8" — ELEVATION: 149'± — GROUNDWATER: — ENG/GEO: GMD

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	SAMPLE NUMBER CORE	SAMPLE NUMBER SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
		6		SP	ALLUVIUM - GRAVELLY SAND medium grained sand gravel to 1"	moist	med. dense	25-75-tr	22.8			
	1				moderate chatter							
					heavy chatter							
45			5	CL	SANDY CLAY medium brown, mottled green fine sand calcium deposits		very stiff	0-20-80	29*			
					increase sand							
50		7		SP	SAND trace gravel medium to coarse sand gravel to 1" light gray white		very dense	10-85-5	13.3			
					moderate chatter							
					hard drilling - needs pulldown to progress							
55					occasional silty sand interbeds							
					silty land layer 1-2' thick			0-60-40				
60					increase silt & clay, decrease gravel							

(Continued) * Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 15

SHEET 4 OF 4

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-9-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 149'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			6	SM	ALLUVIUM - SILTY SAND medium brown	moist	very dense	0-70-30	59*			
					End of boring at 61½'							
					* Standard Penetration Test (SPT) Resistance in blows/ft.							
65												
70												
75												
80												

Converse Consultants

BORING NO. 16

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE: 10-9-85

PROJECT NO.: 84-2272-02 DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" HOLE DIAMETER: 4 7/8" ELEVATION: 149'± GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: CORE	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
				CL	ALLUVIUM - SANDY CLAY medium reddish brown fine sand porous with roots & calcium deposits upper 3'	sl. moist	loose					
						moist	firm	0-30-70				
		1							4.3	10.8	93	**3.0
							very stiff					
5			1		increase sand			0-30-70	14*			
10		10			porous with calcium deposits				3.5	23.0	95	**2.0
				CL	SILTY CLAY dark reddish brown fine sand sandy @ 14½'			0-20-80				
15		3		ML	SANDY SILT dark brown porous roots fine sand			0-30-70	6.6	17.2	104	
				SM	SILTY SAND light gray brown fine sand		med. dense	0-70-30				
20												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 16

SHEET 2 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./ WESTERN DIVISION DATE 10-9-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 149'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER (BULK / CORE / SPT)	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LBS/CU FT	SHEAR RESISTANCE KIPS/SQ FT
	2	SM	ALLUVIUM - SILTY SAND light gray brown fine to medium sand	moist	med. dense	0-70-30	23*			
			SANDY GRAVEL heavy chatter			50-50-0				
25		CL	SILTY CLAY little sand		very stiff	0-25-75				
		SC	SAND dark olive brown							
	3	CL	medium sand (rounded quartz)				28*			
			@ 27-27½' - sandy layer, medium grained							
30	4						12.9	19.4	110	
			increase sand							
			SANDY CLAY reddish brown fine sand micaceous slightly porous		firm	0-25-75				
35	5		mottled dark brown with clayey sand stringers to 1"				8.4	21.2	106	
			SILTY CLAY little sand medium red brown fine sand			0-25-75				
40										

GP 1 8 1

(Continued) * Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 16

SHEET 3 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-9-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 149'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LBS/CU FT	SHEAR RESISTANCE KIPS/SQ FT
	4	CL	ALLUVIUM - SILTY CLAY little sand medium reddish brown	moist	very stiff	0-25-75	22*			
			4-6" thick sandy clay interbeds							
45	5	SP	GRAVELLY SAND light brown medium sand gravel to ½"	moist	very dense	2-95-3	93*			
		CL	SILTY CLAY dark olive gray & brown little fine sand with gravel & sand interbeds 1-3" thick		very stiff	0-25-75				
50	6						30.4			
			@ 52' - mild rig chatter with sandy clay & sand layers							
55		SP	SAND trace gravel hard drilling		very dense	5-90-5				
60										

(Continued) * Standard Penetration Test (SPT) Resistance in blows/ft.

Converse Consultants

BORING NO. 16

SHEET 4 OF 4

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-9-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 149'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	RING	SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			6	SP	ALLUVIUM - GRAVELLY SAND light brown	moist	very dense	5-94-1	77*			
					@ 62-64' - clay layers 1-2" thick							
65												
70			7						120*			
					End of boring at 71½'							
					* Standard Penetration Test (SPT) Resistance in blows/ft.							
75												
80												

Converse Consultants

BORING NO. 17

SHEET 1 OF 2

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-15-85

PROJECT NO. 84-2272-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 151'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER BULK	CORE	SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
				CL	ALLUVIUM - SILTY CLAY dark reddish brown fine sand slightly porous	dry	hard	0-20-80				
		1				moist			6.6	12.8	104	
				SC	CLAYEY SAND light red fine sand with sandy clay interbeds		med. dense	0-60-40				
		2							7.5	4.8	103	
5				ML	CLAYEY SILT dark brown fine sand slightly porous		very stiff	0-25-75				
		3							4.8	18.4	98	
10				CL	SILTY CLAY little sand medium reddish brown							
			1						17*			
15		4			caliche stringers dark greenish gray				7.0	22.9	102	**3.5
					light grayish green							
20												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 17

PROJECT NAME PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE 10-15-85

PROJECT NO. 84-22/2-02 DRILLING COMPANY A & W

EQUIPMENT ROTARY WASH DRIVING WEIGHT 300 #

AVERAGE DROP (IN.) 18" HOLE DIAMETER 4 7/8" ELEVATION 151'± GROUNDWATER ENG/GEO GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER (BULK / CORE / SPT)	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
	5	CL	ALLUVIUM - SILTY CLAY light green fine sand	moist	stiff	0-20-80	7.0	29.7	95	**4.0
		SM	SILTY SAND medium brown fine sand		dense	0-60-40				
		SP	SAND trace gravel light gray brown fine to medium sand							
25	2						32*			
30	6						27.4			

End of boring at 30'

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

35

40

Converse Consultants

BORING NO. 18

SHEET 1 OF 2

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION DATE: 10-11-85

PROJECT NO.: 84-2272-02 DRILLING COMPANY: A & W

EQUIPMENT: ROTARY WASH DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18" HOLE DIAMETER: 4 7/8" ELEVATION: 152'± GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

Depth in Feet	Sample Number: Bulk	Sample Number: Core	Sample Number: SPT	Group Symbol	Description	Moisture	Consistency or Density	Visual Field Estimate (Percent Gravel-Sand-Fines)	Drive Energy Ft Kips/Ft	Field Moisture % Dry Weight	Dry Density Lb/Cu Ft	Shear Resistance Kips/Sq Ft
				CL	ALLUVIUM - SILTY CLAY dark brown fine sand	sl. moist	hard	0-25-75				
		1							9.3	8.0	99	
				SC/CL	CLAYEY SAND/SANDY CLAY light red fine sand		very stiff	0-50-50				
		2							8.4	6.3	103	
				CL	SILTY CLAY dark reddish brown fine sand caliche & pores							
5			1						20*			
10		3			porous, root hairs & caliche				8.4	17.3	95	**4.0
					increase sand			0-23-75				
15		4			SANDY CLAY dark brown fine sand caliche				7.5	20.4	107	**4.0
20												

(Continued)

* Standard Penetration Test (SPT) Resistance in blows/ft.

** Pocket Penetrometer Test

Converse Consultants

BORING NO. 18

SHEET 2 OF 2

PROJECT NAME: PROPOSED IRVINE MEDICAL CENTER - AMI, INC./WESTERN DIVISION   DATE: 10-11-85

PROJECT NO.: 84-2272-02   DRILLING COMPANY: A & W

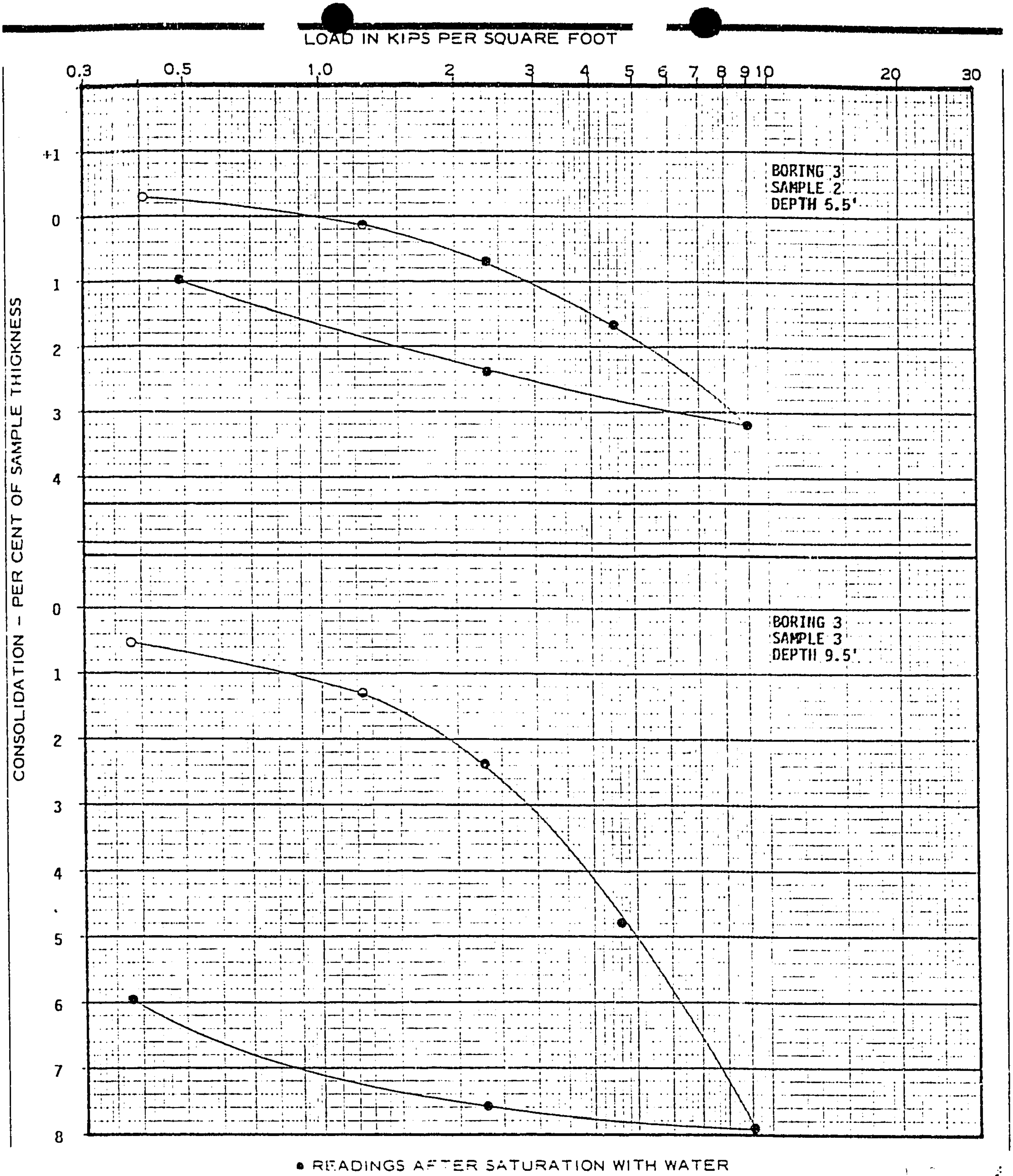
EQUIPMENT: ROTARY WASH   DRIVING WEIGHT: 300 #

AVERAGE DROP (IN.): 18"   HOLE DIAMETER: 4 7/8"   ELEVATION: 152'±   GROUNDWATER: ENG/GEO: GND

SUMMARY OF BORING

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

DEPTH IN FEET	SAMPLE NUMBER: BULK	SAMPLE NUMBER: [illegible]	SAMPLE NUMBER: SPT	GROUP SYMBOL	DESCRIPTION	MOISTURE	CONSISTENCY OR DENSITY	VISUAL FIELD ESTIMATE PERCENT GRAVEL-SAND-FINES	DRIVE ENERGY FT KIPS/FT	FIELD MOISTURE % DRY WEIGHT	DRY DENSITY LB/CU FT	SHEAR RESISTANCE KIPS/SQ FT
			2	SM/ML	ALLUVIUM - SILTY SAND/SANDY SILT light olive brown fine sand interbeds 1-2"	moist	firm	0-50-50	8*			
				SM	SILTY SAND medium brown fine sand			0-60-40				
25		5		SP	SAND light gray white				8.4	21.8	105	
					End of boring at 26' * Standard Penetration Test (SPT) Resistance in blows/ft.							
30												
35												
40												

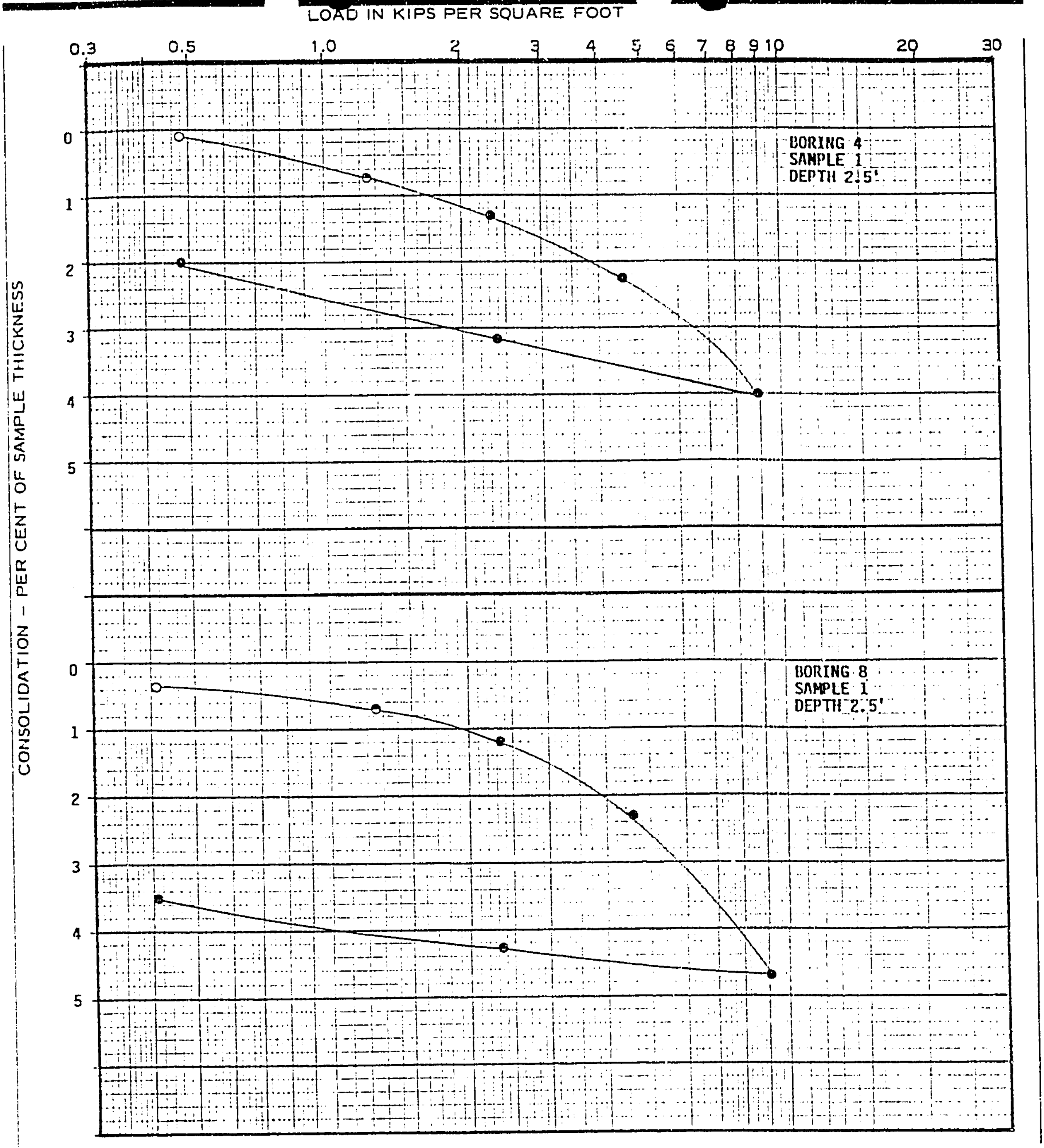


CONSOLIDATION TESTS

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A.

Project No
84-2272-01

Converse Consultants Geotechnical Engineering and Applied Sciences



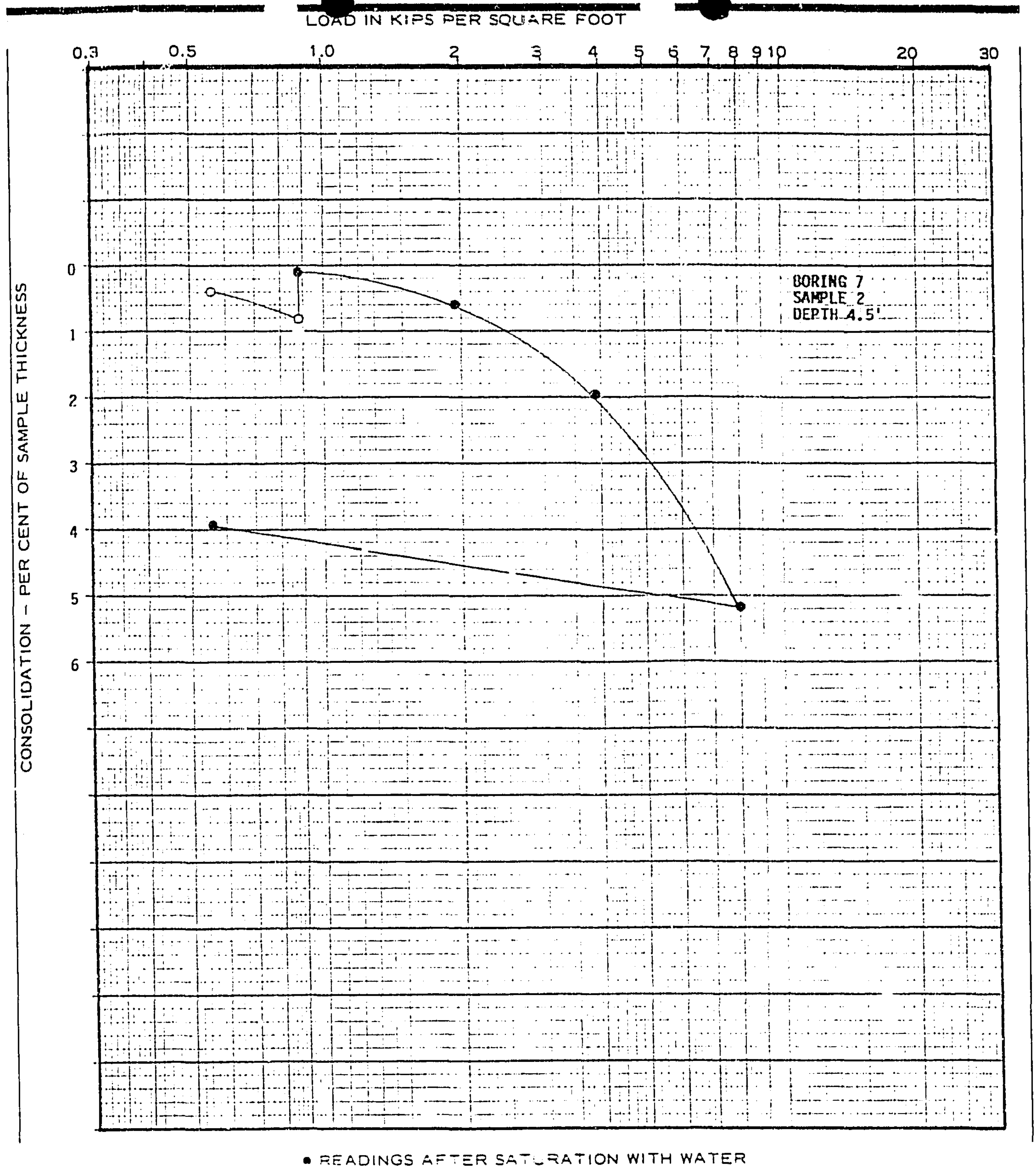
• READINGS AFTER SATURATION WITH WATER

CONSOLIDATION TESTS

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A.

Project No
84-2272-01

Converse Consultants Geotechnical Engineering and Applied Sciences

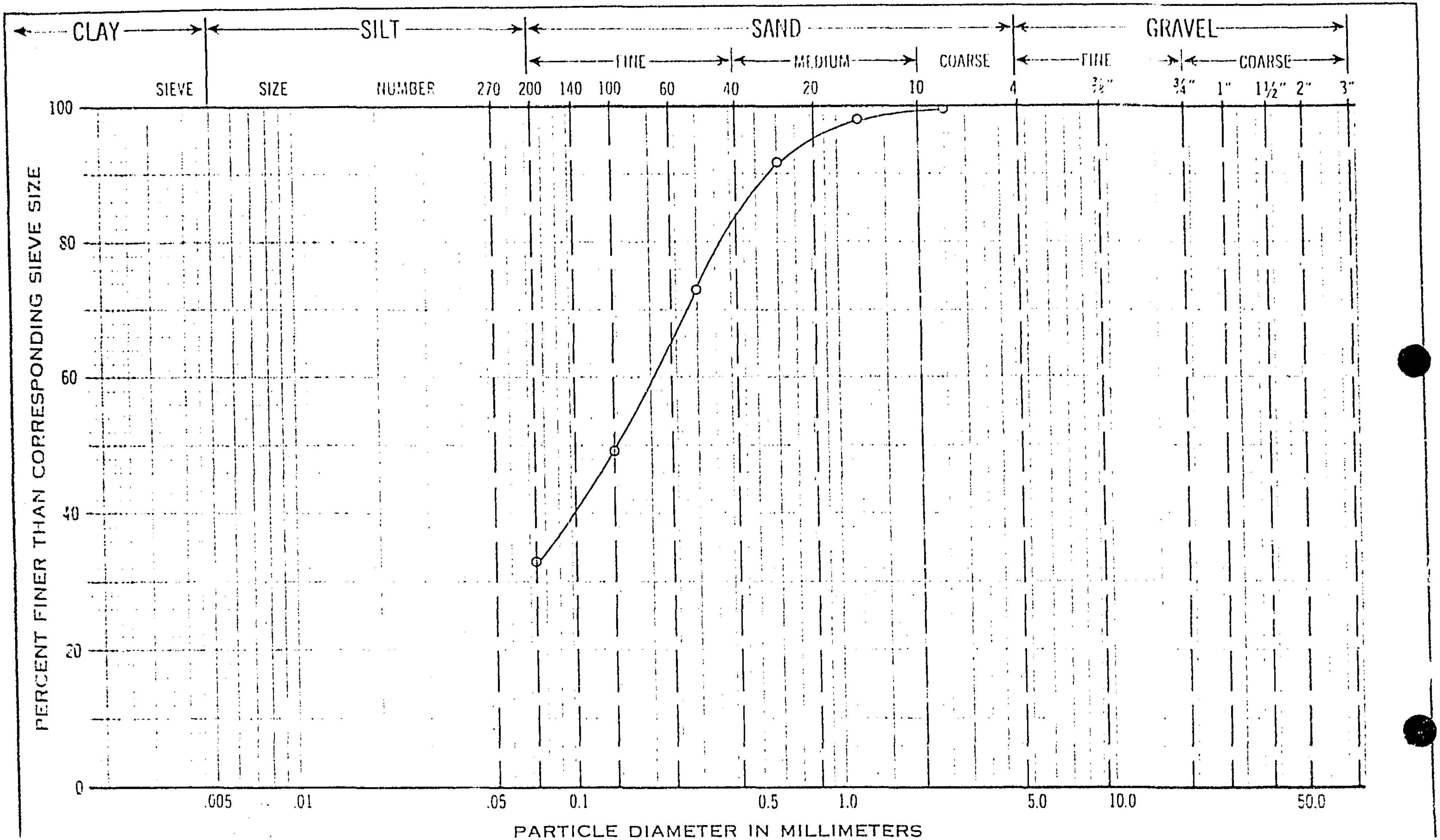


CONSOLIDATION TESTS

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A.

Project No
84-2272-01

Converse Consultants Geotechnical Engineering and Applied Sciences



BORING 4
SAMPLE 1
DEPTH 2.5'

GRAIN-SIZE DISTRIBUTION CHART

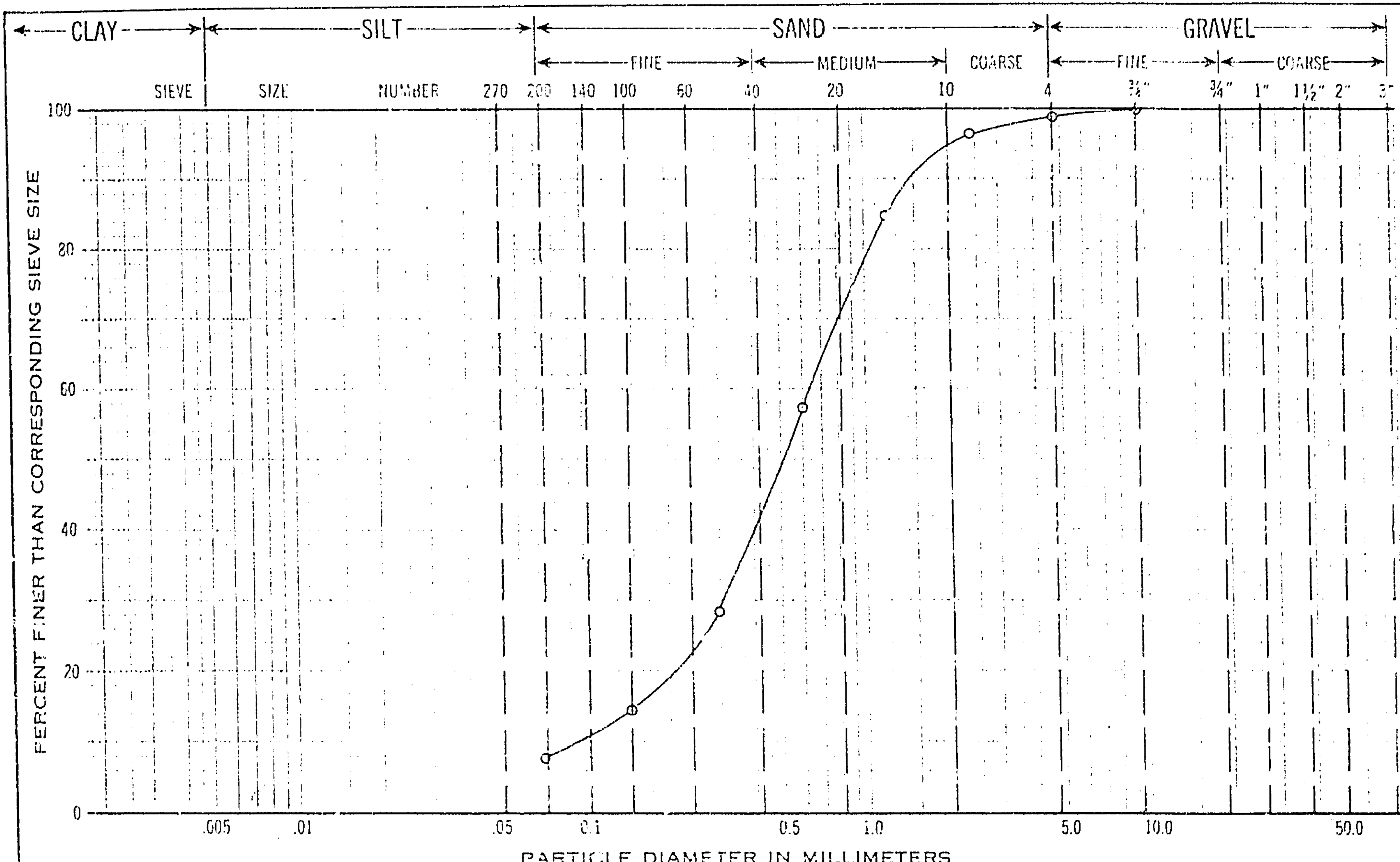
PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A.

Project No.
84-2272-01

Converse Consultants
Geotechnical Engineering and Applied Sciences

B-6

FORM NO. 0-3-10.81 Approved for publication



BORING 4
SAMPLE 4
DEPTH 22.5'

GRAIN-SIZE DISTRIBUTION CHART

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: JAMES LAWSON PIRDY, A.I.A.

Project No. 84-2272-01

Converse Consultants
Geotechnical Engineering and Applied Sciences

B-7

ANAHEIM TEST LABORATORY

3004 S. ORANGE AVENUE
SANTA ANA, CALIFORNIA 92707
PHONE (714) 549-7267

TO: CONVERSE

DATE: 11-6-84
P.O. No. 84-2272-01
Shipper No.
Lab. No. J-1567-1-2
Specification:
Material: Soil

-1 B1-1
@2.5-3

-2 B7-2
@ 4.5-5

SOIL TESTS

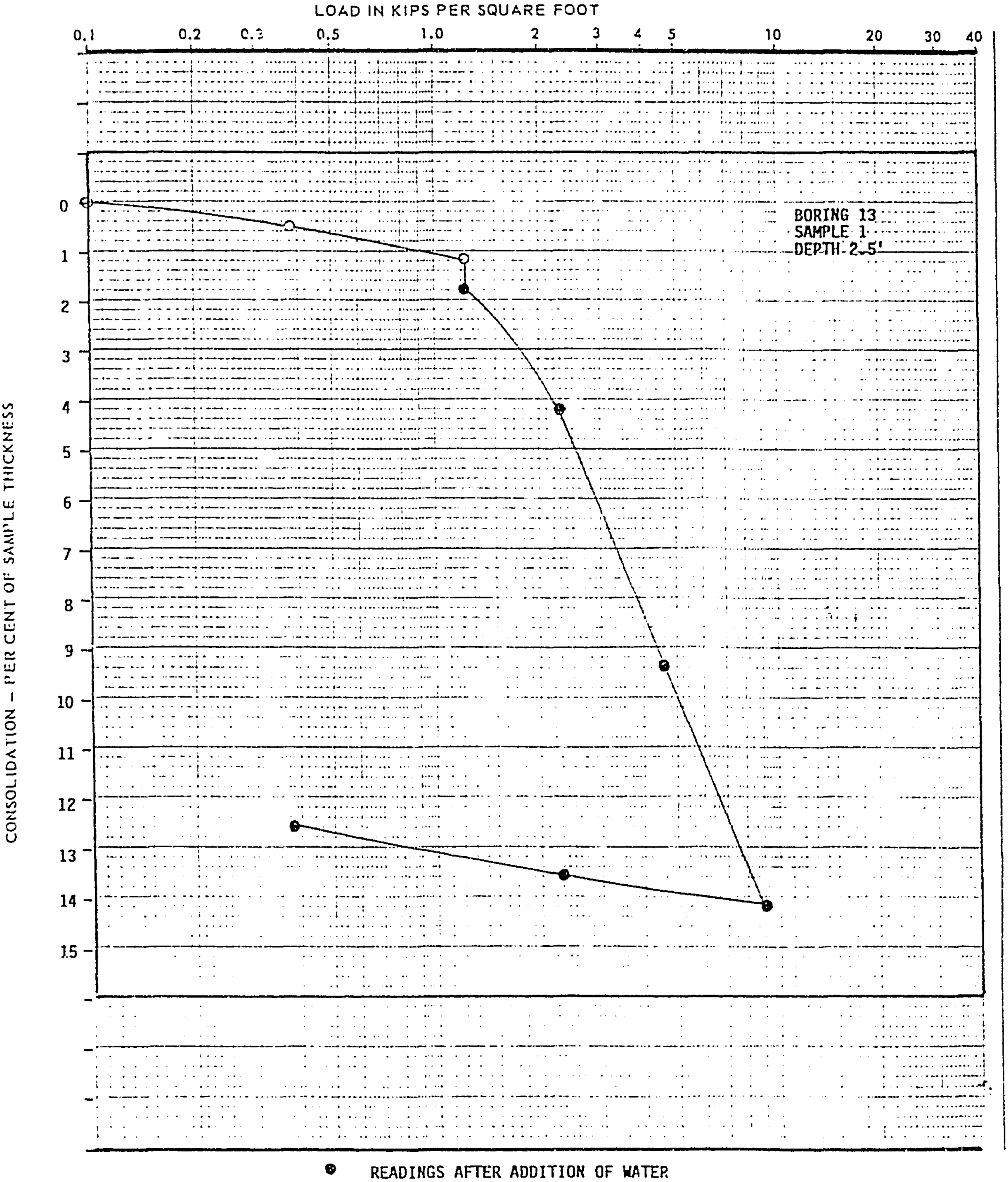
	#1	-2
Ph	7.15	7.30
Soluble Sulfates	155 ppm	175 ppm
Soluble Chlorides	165 ppm	200 ppm
Minimum Resistivity	1,900 Ohm/Cm	2,350 Ohm/Cm

ANAHEIM TEST LABORATORY

James Kallas

James A. Kallas, Chief Chemist

FORM #2

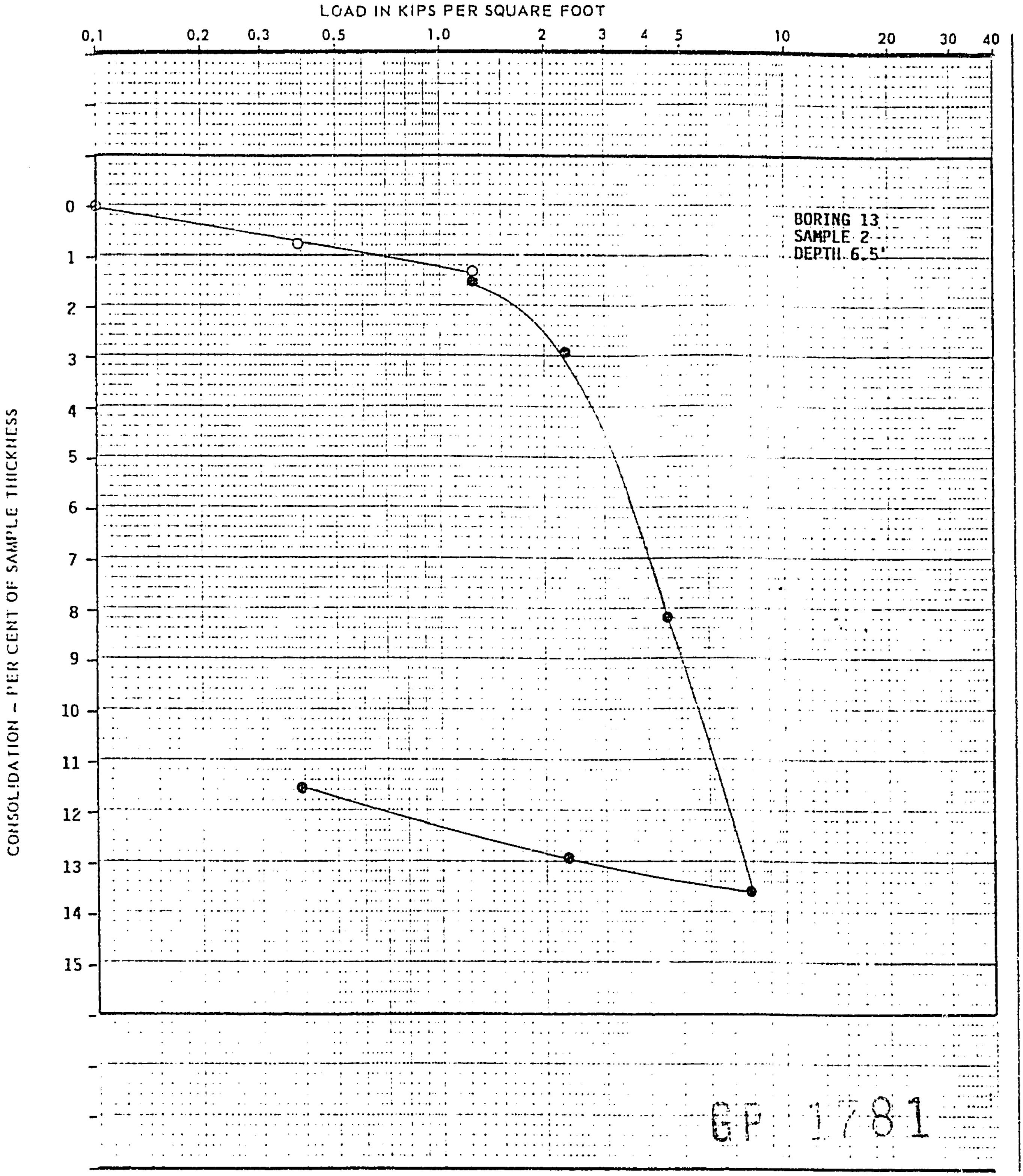


CONSOLIDATION TESTS

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTERN DIVISION

Project No
84-2272-02

Converse Consultants
Geotechnical Engineering and Applied Sciences



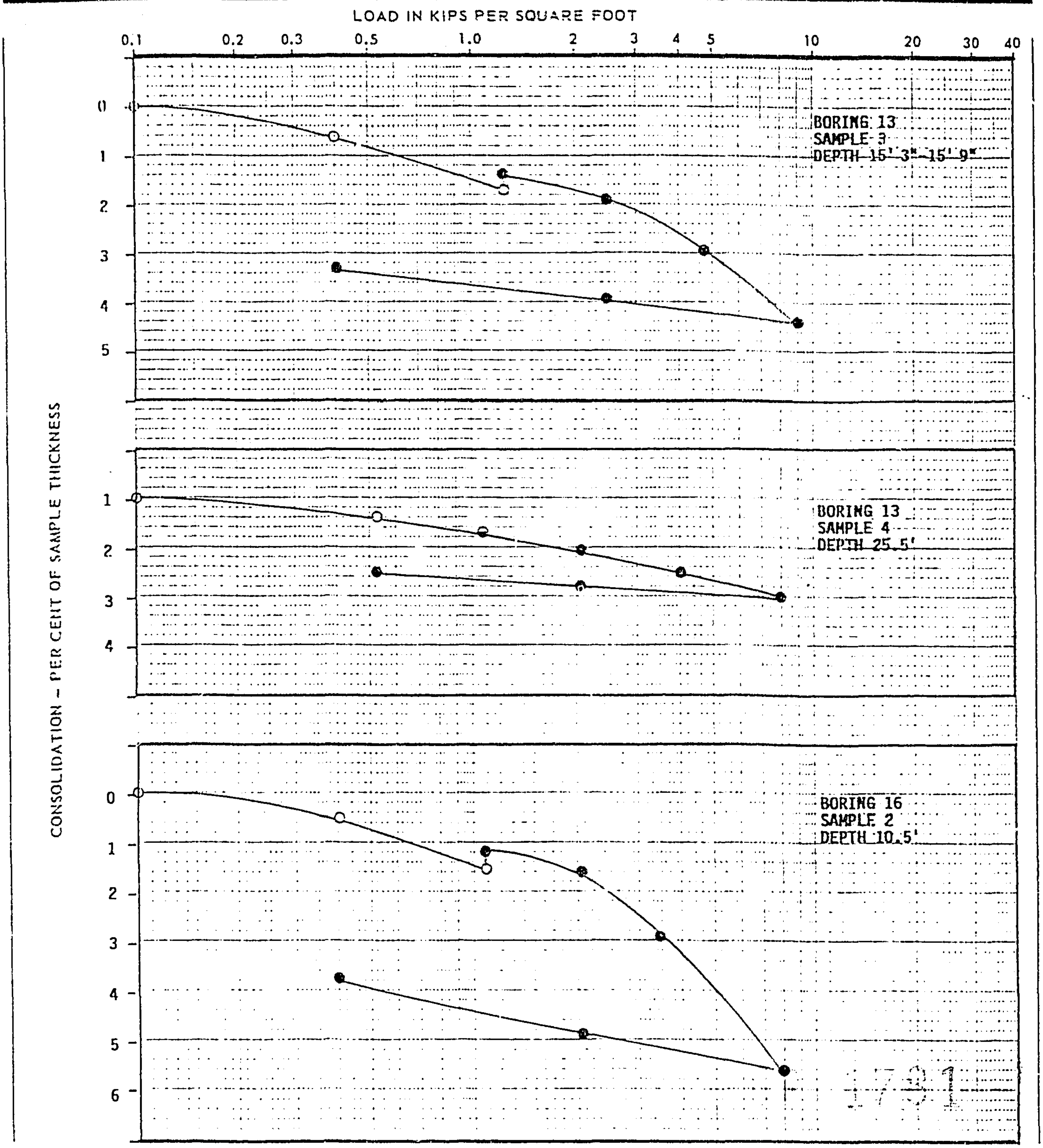
● READINGS AFTER ADDITION OF WATER

CONSOLIDATION TESTS

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTERN DIVISION

Project No
84-2272-02

Converse Consultants Geotechnical Engineering and Applied Sciences



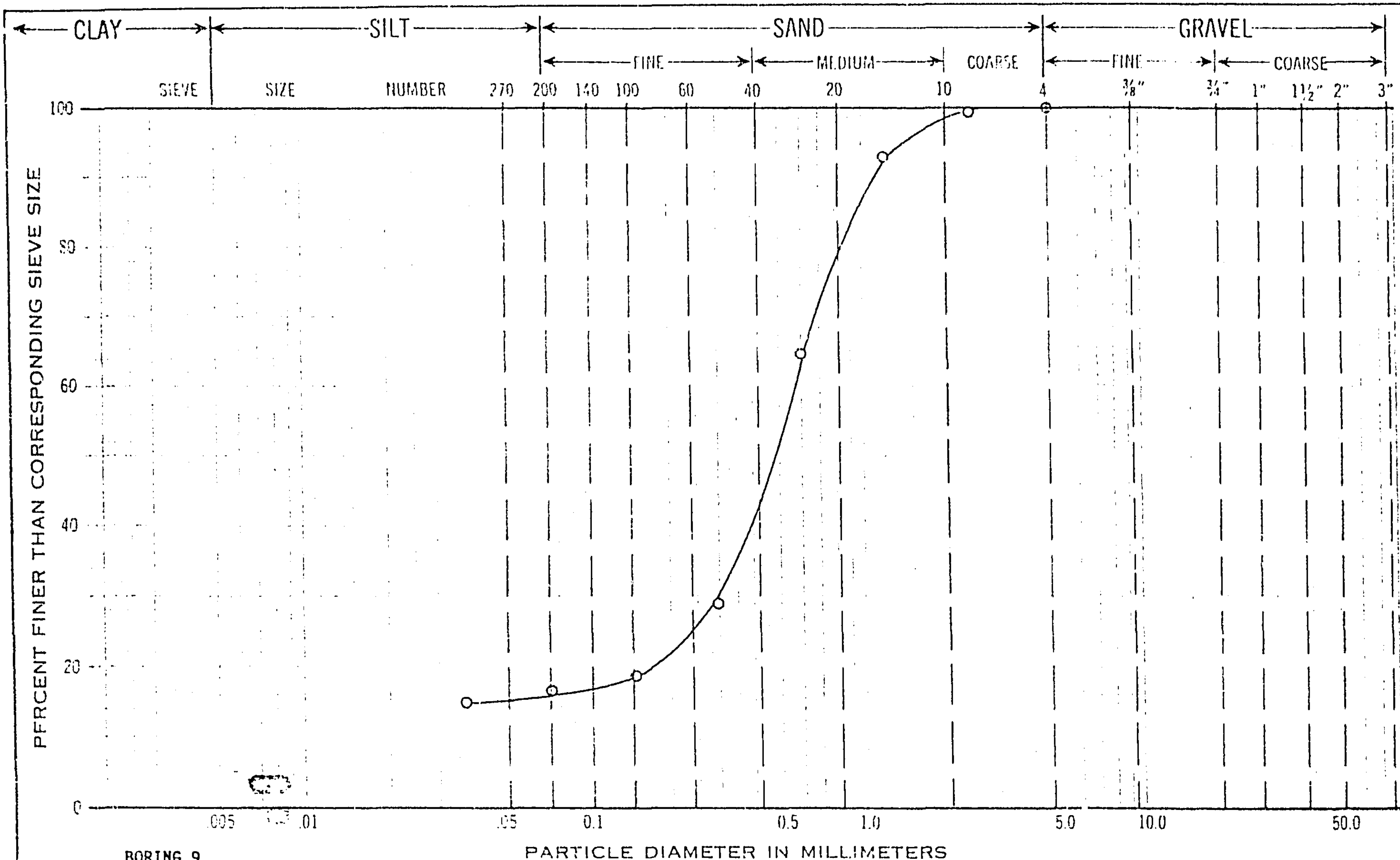
● READINGS AFTER ADDITION OF WATER

CONSOLIDATION TESTS

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTERN DIVISION

Project No
84-2272-02

Converse Consultants Geotechnical Engineering and Applied Sciences



BORING 9
SAMPLE 6
DEPTH 40-41'

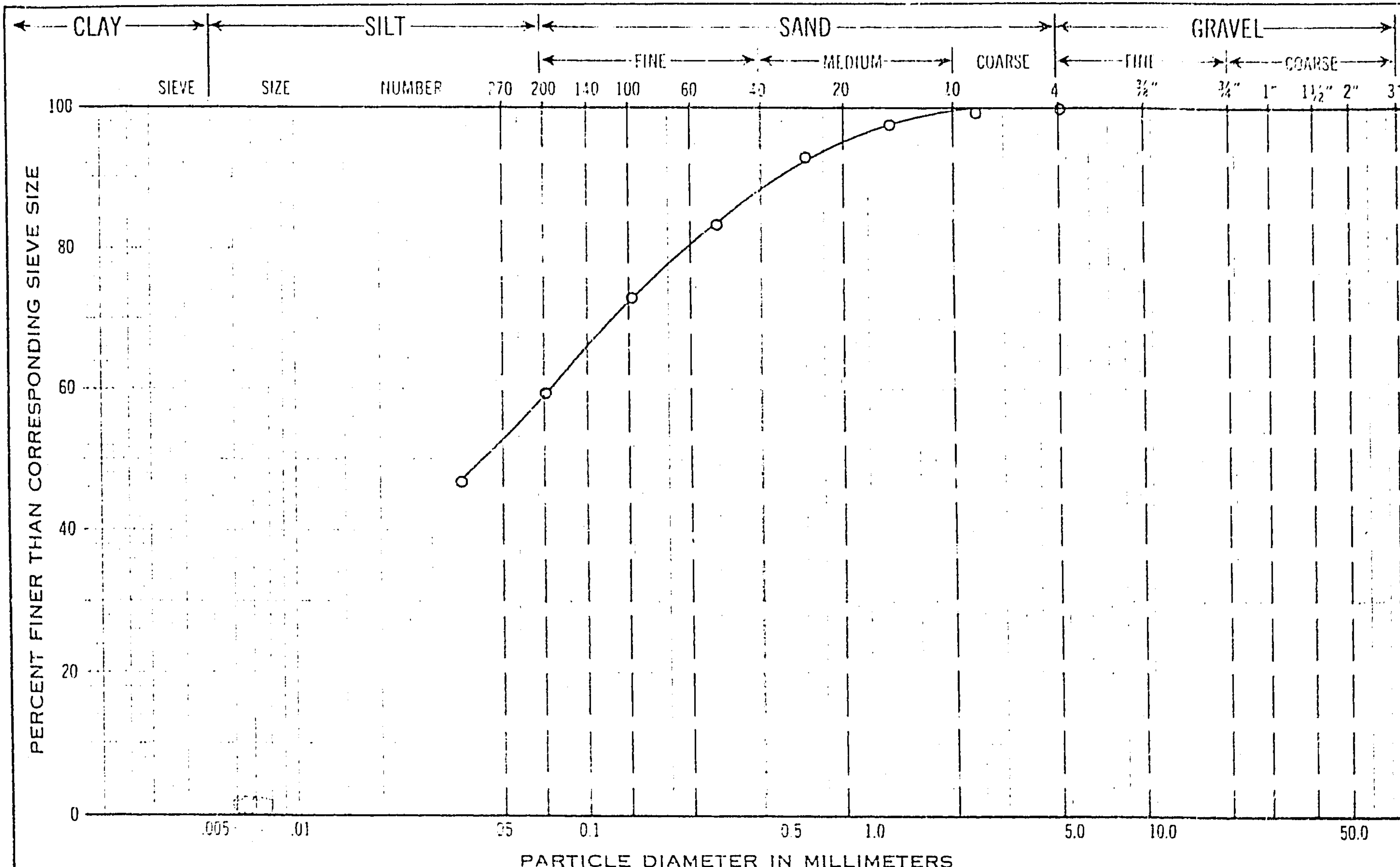
GRAIN-SIZE DISTRIBUTION CHART

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTERN DIVISION

Project No.
84-2272-02

Converse Consultants
Geotechnical Engineering
and Applied Sciences

B-6



BORING 11
SAMPLE 1
DEPTH 0-1'

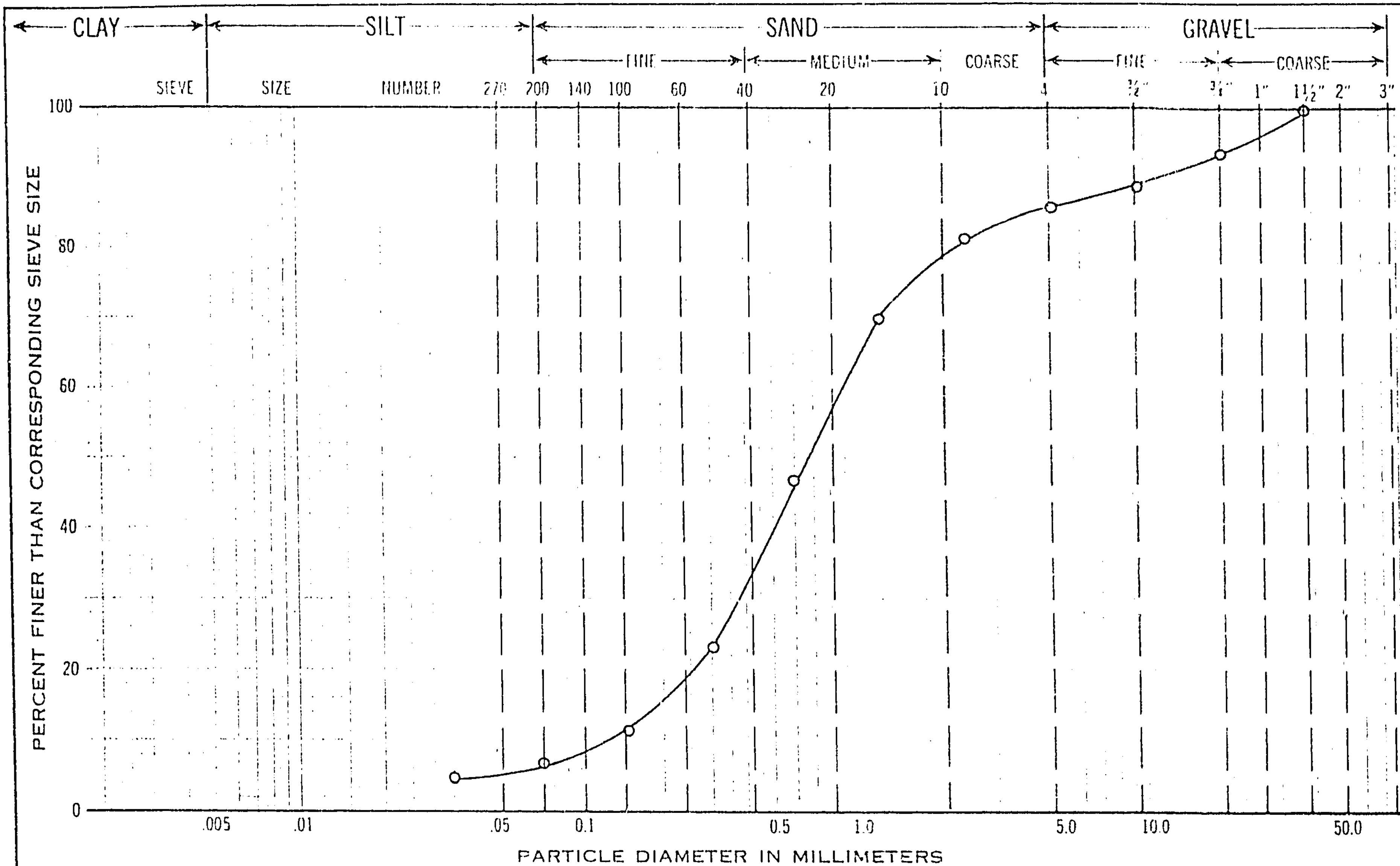
GRAIN-SIZE DISTRIBUTION CHART

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTERN DIVISION

Project No.
84-2272-02

Converse Consultants
Geotechnical Engineering
and Applied Sciences

B-7



BORING 12
SPT SAMPLE 2
DEPTH 25-26½'

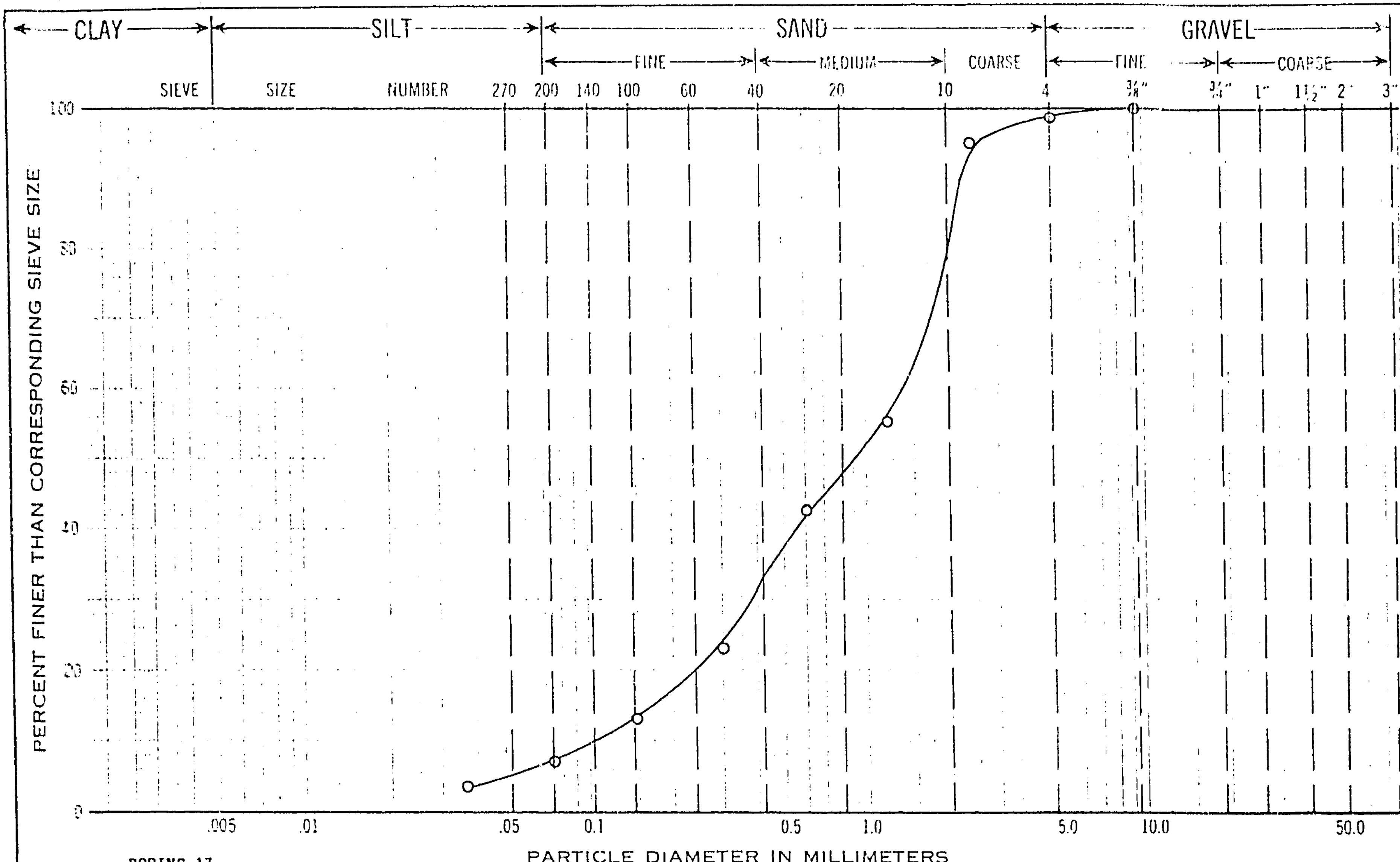
GRAIN-SIZE DISTRIBUTION CHART

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTERN DIVISION

Project No.
84-2272-02

Converse Consultants
Geotechnical Engineering
and Applied Sciences

B-8



BORING 17
SPT SAMPLE 2
DEPTH 25-26½'

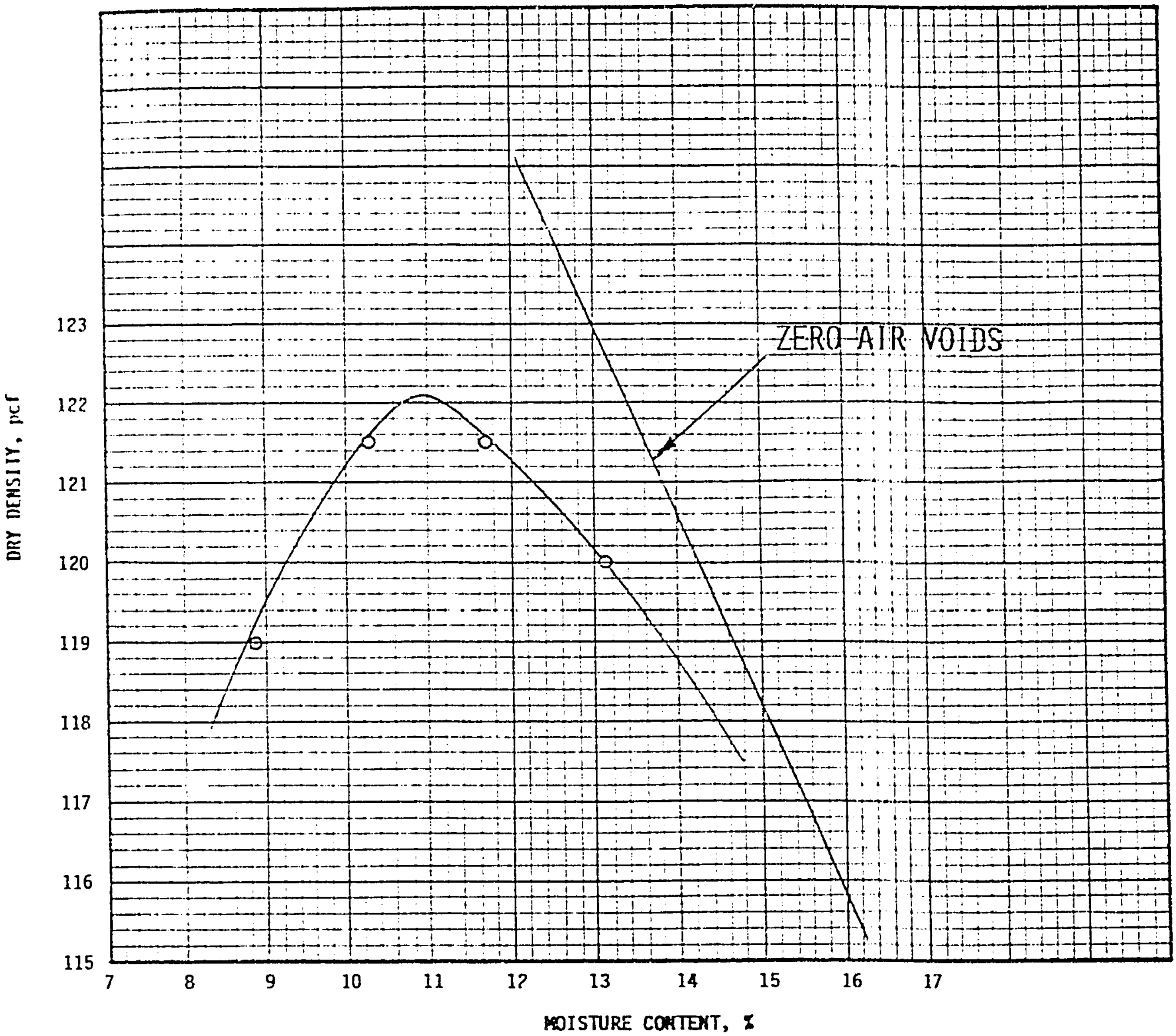
GRAIN-SIZE DISTRIBUTION CHART

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTERN DIVISION

Project No.
84-2272-02

Converse Consultants
Geotechnical Engineering
and Applied Sciences

B-9



TEST DESIGNATION: ASTM D - 1557 - 78A

BORING NO.	SAMPLE DEPTH, FT.	SAMPLE DESCRIPTION	PERCENT GRAVEL	PERCENT SAND	PERCENT FINES	MAXIMUM DRY DENSITY, pcf	OPTIMUM MOISTURE CONTENT, %
11	0-1'	dark brown CLAY with sand				122.1	10.8

COMPACTION TEST RESULTS

PROPOSED IRVINE MEDICAL CENTER
SAND CANYON AND BARRANCA ROAD, IRVINE, CALIFORNIA
FOR: AMI, INC./WESTON DIVISION

Project No. 84-2272-02

Converse Consultants Geotechnical Engineering and Applied Sciences

ANAHEIM TEST LABORATORY

3004 S. ORANGE AVENUE
SANTA ANA, CALIFORNIA 92707
PHONE (714) 549-7267

: CONVERSE

DATE: 10-24-85

P.O. No. 84-2272-02

Shipper No.

Lab. No. J-2045-1

Specification:

Material: Soil

1 Sam 1
0-1

SOIL TESTS

pH	6.94
Soluble Sulfates	210 ppm
Soluble Chlorides	1160 ppm
Minimum Resistivity	4670 ohm/cm

8? 1781 1

ANAHEIM TEST LABORATORY

James A. Kallas, Chief Chemist

B-11

FORM #2

APPENDIX D

Geotechnical Boring Logs, Laboratory Test Results and Percolation Test Results (Leighton, 2015, 2016a and 2017)

Leighton

GEOTECHNICAL BORING LOG LB-1

Project No.	10572.001	**Date Drilled**	5-30-14
Project	Hoag Hospital Emergency Department Expansion	**Logged By**	JWJ
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	152'
Location	See Figure 2 - Boring Location Map	**Sampled By**	JWJ

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		B-1				CL	@Surface: Topsoil - Landscaping area, vegetated **Artificial Fill: (Af)** @2-inches: CLAY, dark brown, moist, interbedded with light olive gray silty sand, rootlets	CR
150			R-1	4 4 7	110	17		@2': medium stiff **Quaternary Young Alluvial Fan Deposits: (Qyf)**	
	5		R-2	3 5 5	110	16	CL	@5': Sandy CLAY, medium stiff, olive brown, moist, low to medium plasticity, fine grained sand, some fine subrounded to subangular gravels	DS
145			R-3	5 7 4	122	7	SC	@7': Clayey SAND, loose to medium dense, olive brown, moist, fine grained sand, trace Fe stains between clay faces	CN
	10		R-4	4 5 9	107	21	CL-ML	@10': Silty CLAY, stiff, dark brown, moist, trace sand, trace $CaCO_3$ nodules	
140									
	15		R-5	6 8 10	110	18		@15': Becomes stiff, $CaCO_3$ stringers prevalent throughout sample	
135									
	20		SPT-1	3 3 4			SM	@20': Silty SAND, loose to medium dense, yellow orange interbedded with light olive gray clays and silts, moist, fine to very fine grained, weakly laminated thin beds	
130									
	25		SPT-2	3 5 6				@25': Becomes medium dense	
125									
	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

GEOTECHNICAL BORING LOG LB-1

Project No.	10572.001	**Date Drilled**	5-30-14
Project	Hoag Hospital Emergency Department Expansion	**Logged By**	JWJ
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	152'
Location	See Figure 2 - Boring Location Map	**Sampled By**	JWJ

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			SPT-3	15 20 13			SP	@30': SAND, dense, white to yellow brown, moist, fine to coarse grained, with fine subangular gravels	
120										
	35			SPT-4	4 7 10		19	CL	@35': Lean CLAY, very stiff, dark olive gray, moist, medium plasticity	AL
115										
	40			SPT-5	9 14 9			SP-SM	@40': SAND, medium dense, reddish brown interbedded with light olive gray clays and silts, wet, trace fine subangular gravels, weakly laminated thin beds	
110										
	45			SPT-6	5 11 10					
105										
	50			SPT-7	10 22 25			SP	@50': SAND, dense, white to yellow brown, wet, coarse grained, abundant subrounded quartz grains	
100									Total Depth of Boring: 51.5 feet bgs Groundwater encountered at 38.4 feet bgs Boring Backfilled with soil cuttings upon completion of drilling on 5/30/14. Excess cuttings spread in landscaping area on site.	
	55									
95										
	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

GEOTECHNICAL BORING LOG LB-2

Project No.	10572.001	**Date Drilled**	5-30-14
Project	Hoag Hospital Emergency Department Expansion	**Logged By**	JWJ
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	152'
Location	See Figure 2 - Boring Location Map	**Sampled By**	JWJ

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
	0			B-1				CL	@Surface: Topsoil - Landscaping area, vegetated **Artificial Fill: (Af)**	EI = 50
150				R-1	5 11 14	114	16		@2-inches: Sandy CLAY, dark brown, moist to wet (perched water on clay face observed), rootlets, mottled with reddish Sandy CLAY, no structure @2': Stiff **Quaternary Young Alluvial Fan Deposits (Qyf)**	
	5			R-2	4 5 5	112	16	CL	@5': CLAY, with sand, medium stiff, reddish brown, moist, low to medium plasticity, fine to medium grained sand, trace fine (1/2-inch) subrounded gravels	AL, CN
145				R-3	5 5 6	112	9		@7': Becomes light reddish brown, trace $CaCO_3$ nodules, trace Fe stains between soil faces	
	10			R-4	4 6 8	106	20	CL-ML	@10': Grades to Silty Sandy CLAY, stiff, reddish brown, moist, $CaCO_3$ stringers prevalent throughout sample	
140										
	15			SPT-1	2 4 6	112	14		@15': Becomes stiff, reddish brown mottled with dark brown	
135										
	20			R-5	9 16 21			SM	@20': Silty SAND, medium dense, light olive gray, moist, very fine to fine grained	
130										
	25			SPT-2	3 4 6					
125										
	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

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

GEOTECHNICAL BORING LOG LB-2

Project No.	10572.001	**Date Drilled**	5-30-14
Project	Hoag Hospital Emergency Department Expansion	**Logged By**	JWJ
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	152'
Location	See Figure 2 - Boring Location Map	**Sampled By**	JWJ

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			SPT-3	7 12 10			SP	@30': SAND, medium dense, orange brown to olive gray, moist, coarse grained, fine subangular granitic gravels, weathered	
120										
	35			SPT-4	6 7 9			SM	@35': Silty SAND, medium dense, reddish orange interbedded with light olive gray clays and silts, moist, Fe stains between well defined light olive gray laminations, sample wet at tip	
115										
	40			SPT-5	10 12 15				@40': Becomes wet, fine to coarse grained, friable	
110										
	45			SPT-6	4 5 13					
105										
	50			SPT-7	10 16 28				@50': Becomes dense, interbedded white to yellow brown SAND	
100										
	55			SPT-8	5 7 12				@55': Medium dense	
95										
	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

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

GEOTECHNICAL BORING LOG LB-2

Project No.	10572.001	**Date Drilled**	5-30-14
Project	Hoag Hospital Emergency Department Expansion	**Logged By**	JWJ
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	152'
Location	See Figure 2 - Boring Location Map	**Sampled By**	JWJ

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
	60			SPT-9	8 24 30				@60': SAND, very dense, white to yellow brown, wet, coarse grained, abundant subrounded quartz grains	
90									Total Depth of Boring: 61.5 feet bgs Groundwater encountered at 39.0 feet bgs Boring Backfilled with soil cuttings upon completion of drilling on 5/30/14. Excess cuttings spread in landscaping area on site.	
	65									
85										
	70									
80										
	75									
75										
	80									
70										
	85									
65										
	90									

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

GEOTECHNICAL BORING LOG LB-3

Project No.	10572.001	**Date Drilled**	5-30-14
Project	Hoag Hospital Emergency Department Expansion	**Logged By**	JWJ
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	151'
Location	See Figure 2 - Boring Location Map	**Sampled By**	JWJ

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: 4.5-inches Asphalt over 11.5-inches Aggregate Base	
150										
				R-1	11 16 19			CL	**Artificial Fill: (Af)** @2': Sandy CLAY, very stiff, dark grayish brown, moist, topsoil - fertilizer odor	
				R-2	9 7 8			CL	**Quaternary Young Alluvial Fan Deposits (Qyf)** @4': Sandy CLAY, stiff, reddish brown, moist, fine to medium grained, pinhole voids, trace rootlets	
	5									
145									Total Depth of Boring: 6 feet bgs No free groundwater encountered during drilling. Percolation well installed upon completion of drilling. Well demolished on 5/30/14 upon completion of Percolation Testing. Boring backfilled with soil cuttings and capped with 6-inches of cold patch mix asphalt.	
	10									
140										
	15									

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

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

GEOTECHNICAL BORING LOG LB-4

Project No.	10572.004	**Date Drilled**	1-14-16
Project	Hoag Hospital	**Logged By**	EBP
Drilling Co.	Martini Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	155'
Location	See Figure 1 - Boring Location Map	**Sampled By**	EBP

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
155	0								@0': 5-inches Asphalt Concrete over 9-inches Aggregate Base	
				BB-1				CL	**Artificial Fill: (Af)** @1.5': Sandy CLAY to Clayey SAND, firm, dark brown, very moist, trace fine to medium gravel	CR, EI
									Quaternary Young Alluvial Fan Deposits: (Qyf)	
								CL	@4': Sandy CLAY, firm, brown, moist, fine grained, low plasticity	
150	5			S-1	2 3 4		12	SM	@5': Silty SAND, loose, dark yellowish brown, moist, fine grained, trace coarse grained sand	-200
145	10			R-1	5 8 12	108	16	CL	@10': CLAY, stiff, dark yellowish brown, moist, fine grained, low plasticity, $CaCO_3$ stringers	DS
140	15			S-2	4 5 7		21	ML	@15': Silty CLAY, stiff, dark brown, moist, trace fine grained sand, low plasticity, $CaCO_3$ specs	
135	20			R-2	6 8 22	107	13	SC	@20': Clayey SAND, medium dense, dark brown, moist, fine to coarse grained, few gravel	-200
								SP	@21.2': SAND, medium dense, light yellowish brown, slightly moist, fine to medium grained, poorly graded	
130	25			S-3	6 13 14				@25': Trace coarse gravel	
125	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	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

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

GEOTECHNICAL BORING LOG LB-4

Project No.	10572.004	**Date Drilled**	1-14-16
Project	Hoag Hospital	**Logged By**	EBP
Drilling Co.	Martini Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	155'
Location	See Figure 1 - Boring Location Map	**Sampled By**	EBP

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
125	30			S-4	5 10 11			SP	@30': SAND, medium dense, light yellowish brown, slightly moist, fine to medium grained, poorly graded	
120	35			S-5	10 16 13		18			
115	40			S-6	4 6 9		25	SP-CL	@40': Silty CLAY, stiff, brown, saturated, medium plasticity, 1/2-inch to 2-inch beds of sand, yellowish brown	
110	45			S-7	6 14 16			SM	@45': Silty SAND, medium dense, yellowish brown, saturated, fine to medium grained, trace gravel	
105	50			S-8	13 23 32			SP	@50': SAND, very dense, yellowish brown, saturated, medium to coarse grained, poorly graded, trace coarse gravel, 2-inch lens of Sandy CLAY	
									Total Depth of Boring: 51.5 feet bgs Groundwater encountered at 39.0 feet bgs during drilling Boring backfilled with soil cuttings and cement mix, tamped, and capped with cold patch asphalt mix on 1-14-16.	
100	55									
95	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

GEOTECHNICAL BORING LOG LB-5

Project No.	10572.004	**Date Drilled**	1-14-16
Project	Hoag Hospital	**Logged By**	EBP
Drilling Co.	Martini Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	155'
Location	See Figure 1 - Boring Location Map	**Sampled By**	EBP

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
155	0								@Surface: 5-inches of Asphalt Concrete over 8-inches Aggregate Base	
				BB-1				CL/SC	**Artificial Fill: (Af)** @1.5': Sandy CLAY, firm, dark brown, very moist, fine to medium grained, trace gravel	EI
								CL	**Quaternary Young Alluvial Fan Deposits: (Qyf)** @4': CLAY with sand, stiff, reddish brown to dark brown, moist, fine grained, low plasticity, $CaCO_3$ specs,	
150	5			R-1	3 6 7	117	13			AL, CN
145	10			S-1	3 5 5				@10': Reddish brown, $CaCO_3$ stringers	
140	15			R-2	6 14 21	121	18	CL-ML	@15': Silty CLAY, very stiff, dark brown, moist, trace sand, $CaCO_3$ stringers, low plasticity	
135	20			S-2	2 4 6			SM/ML	@20': Silty SAND to Sandy SILT, medium dense, light yellowish brown, moist, fine grained, $CaCO_3$ stringers, trace clay	
130	25			S-3	8 17 20			SP	@25': SAND, dense, light yellowish brown, dry, fine to coarse grained, poorly graded, trace fine gravel	
125	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

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

GEOTECHNICAL BORING LOG LB-5

Project No.	10572.004	**Date Drilled**	1-14-16
Project	Hoag Hospital	**Logged By**	EBP
Drilling Co.	Martini Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	155'
Location	See Figure 1 - Boring Location Map	**Sampled By**	EBP

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
125	30			S-4	5 11 14			SP	@30': SAND, medium dense, light yellowish brown, moist, medium dense, medium to coarse grained, poorly graded	
120	35			S-5	6 10 9			CL	@35': Sandy CLAY, very stiff, mottled reddish brown to light olive brown, moist, fine grained, low plasticity	
115	40			S-6	3 4 8			CL	@40': CLAY, stiff, brown to olive gray, wet, trace fine grained sand, moderate plasticity	
110	45			S-7	8 29 50			SP	@45': SAND, very dense, yellowish brown, saturated, medium to coarse grained, poorly graded	
105	50			S-8	14 17 13			SC	@50.5': Clayey SAND, dense, reddish brown, saturated, medium to coarse grained	
								CL-ML	@51.4': Silty CLAY, very stiff, yellowish brown, saturated, moderate to high plasticity	
									Total Depth of Boring: 51.5 feet bgs Groundwater encountered at 39.0 feet bgs during drilling Boring backfilled with soil cuttings and cement mix, tamped, and capped with cold patch asphalt mix on 1-14-16.	
100	55									
95	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	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

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

GEOTECHNICAL BORING LOG LB-1

Project No.	11753.001	**Date Drilled**	9-7-17
Project	Hoag Hospital Irvine	**Logged By**	SAM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	151'
Location	See Plate 1- Exploration Location Map	**Sampled By**	SAM

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							@0': 3.5-inches of Asphalt Concrete over 9-inches of Aggregate Base	
150			BB-1				CLs	@1': **Artificial Fill (Af):** Sandy CLAY, dark brown, slightly moist, fine sand, some clay, low plasticity, trace asphalt debris, organic odor	
								@4.5': **Quaternary Young Alluvial Fan Deposits (Qyf):**	
	5		R1	8 11 13	101	6	SM	@5': Silty SAND, medium brown to grayish dark brown, medium dense, slightly moist, fine sand, trace $CaCO_3$ stringers	
145							CL	@6.5': CLAY, dark brown, slightly moist, abundant $CaCO_3$ stringers (shoe)	
140	10		S1	4 6 7		11	SM-ML	@10': Sandy SILT to Silty SAND, dark brown, stiff/loose, slightly moist to dry, fine sand, abundant $CaCO_3$ stringers, trace mica	
135	15		R2	8 19 29	113	13	SM	@15': Silty SAND, dark brown, dense, slightly moist to dry, fine sand, trace mica, trace $CaCO_3$ stringers, porous	
130	20		S2	4 6 8		15	CL	@20': Interbedded CLAY and Sandy CLAY, dark brown, stiff, slightly moist, fine to coarse sand, trace oxidation staining in $CaCO_3$ stringers, low plasticity	
125	25		R3	13 18 22	110	19	SM	@25': Silty SAND, medium brown to tannish gray, dense, slightly moist, very fine to fine sand, few oxidized $CaCO_3$ stringers, minor gleying, trace medium sand	
	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-1

Project No.	11753.001	**Date Drilled**	9-7-17
Project	Hoag Hospital Irvine	**Logged By**	SAM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	151'
Location	See Plate 1- Exploration Location Map	**Sampled By**	SAM

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
120	30			S3	9 7 11		17	CL-ML	@30': Silty CLAY, dark brown, stiff, slightly moist to dry, some fine sand, trace mica, some $CaCO_3$ nodules, black oxidation staining, low plasticity	
115	35			R4	7 11 16	101	25		@35': Very stiff	
110	40			S4	3 6 8		20	SC-SM	@40': Silty Clayey SAND, tan and orange brown, mottled, medium dense, moist to very moist, fine sand, trace mica, oxidation staining and gleying, low plasticity	
									@42': Groundwater encountered @1250 hours	
105	45			S5	7 22 35		14	SP	@45': SAND, dark tan, dense, wet, fine to coarse sand, some fine to coarse subrounded gravel *Sampler gets stuck, caving a likely cause. Driller refusal @46.5'	
100	50								Total Depth of Boring: 46.5 feet bgs Groundwater encountered @42.5 feet bgs Boring backfilled with bentonite to 30 feet bgs, then dry soil cuttings to surface upon completion of drilling	
95	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

GEOTECHNICAL BORING LOG LB-2

Project No.	11753.001	**Date Drilled**	9-7-17
Project	Hoag Hospital Irvine	**Logged By**	SAM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	154'
Location	See Plate 1- Exploration Location Map	**Sampled By**	SAM

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
154	0								@0': 3-inches of Asphalt Concrete over 9-inches of Aggregate Base	
				BB-1				CLs	@1': **Artificial Fill (Af):** Sandy CLAY, grayish brown, slightly moist, fine sand, some clay, low plasticity, trace asphalt debris, organic odor	
150								SM	@4': **Quaternary Young Alluvial Fan Deposits (Qyf):**	
	5			S1	3 2 2		9		@5': Silty SAND, dark grayish brown, medium dense, slightly moist, fine sand, trace coarse sand, trace $CaCO_3$ stringers	
145	10			R1	6 8 10	110	14		@10': Increase in $CaCO_3$ deposits	
140	15			S2	7 10 15		14			
135	20			R2	17 50/5			SC-SM	@20': Silty Clayey SAND, grayish brown, hard, dry, fine sand, some coarse sand, trace fine subrounded gravel, well cemented, porous, trace $CaCO_3$ deposits	
130	25			S3 BB-2	15 16 21		7	SM	@25': Silty SAND, light orange brown, medium dense, slightly moist to dry, fine sand, trace $CaCO_3$ deposits	
125	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.	11753.001	**Date Drilled**	9-7-17
Project	Hoag Hospital Irvine	**Logged By**	SAM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	154'
Location	See Plate 1- Exploration Location Map	**Sampled By**	SAM

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			R3	5 15 22			CL	@30': CLAY, olive brown, mottled with orange brown, hard, dry, trace fine sand, trace $CaCO_3$ deposits, low plasticity *Driller adds water to cool auger	
120										
	35			S4	4 7 10		32		@35': Stiff, grades sandy with depth, fine to coarse sand, trace black oxidation staining	
115										
	40			R4	3 5 8	105	20	SM-ML	@40': Sandy SILT to Silty SAND, orange brown, stiff/loose, very moist, fine to medium sand, occasional fine subrounded gravel @42': Groundwater encountered @1052 hours	
110										
	45			S5	3 6 8		31	SP CL	@45': SAND, dark tan, medium dense, very moist to wet, fine to coarse sand @46': CLAY, dark brown, slightly moist to dry, some gleying and black oxidation staining, increases with depth, low plasticity	
105										
	50			S6	6 19 43		17	SP	@50': SAND, dark tan, dense, wet, fine to coarse sand, trace fine subangular gravel, some mica	
									Total Depth of Boring: 51.5 feet bgs Groundwater encountered @42 feet bgs Boring backfilled with bentonite to 30 feet bgs, then dry soil cuttings to surface upon completion of drilling	
100										
	55									
95										
	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
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- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG LB-3

Project No.	11753.001	**Date Drilled**	9-7-17
Project	Hoag Hospital Irvine	**Logged By**	SAM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	156'
Location	See Plate 1- Exploration Location Map	**Sampled By**	SAM

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							@0': 3.5-inches of Asphalt Concrete over 6.5-inches of Aggregate Base	
155			BB-1				CLs	@0.8': **Artificial Fill (Af):** Sandy CLAY, dark brown, slightly moist, fine sand, some clay, low plasticity, trace asphalt debris, trace organics, organic odor	
							SM	@4': **Quaternary Young Alluvial Fan Deposits (Qyf):**	
150	5		R1	8 12 12	111	8		@5': Silty SAND, grayish brown, medium dense, slightly moist to dry, fine sand, trace micas, trace $CaCO_3$ stringers, occasional coarse sand grains	
145	10		S1 BB-2	2 3 3		10	ML	@10': SILT, brown to orange brown, firm, slightly moist, some very fine sand, $CaCO_3$ stringers, trace mica	
140	15		R2	4 8 18			CL	@15': CLAY, olive brown, very stiff, slightly moist to dry, some very fine sand, trace mica, $CaCO_3$ stringers	
135	20		S2	8 11 7		18	SM-ML	@21': Sandy SILT to Silty SAND, light orange brown, medium dense/stiff, slightly moist to dry, very fine to fine sand, trace mica, trace $CaCO_3$ stringers	
130	25		R3	8 11 20			CL-ML	@25': Silty CLAY, olive brown, medium dense, slightly moist, very fine to fine sand with some zones of fine to coarse sand, trace $CaCO_3$ stringers	
	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.	11753.001	**Date Drilled**	9-7-17
Project	Hoag Hospital Irvine	**Logged By**	SAM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	156'
Location	See Plate 1- Exploration Location Map	**Sampled By**	SAM

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
125	30			S3	8 14 20		2	SP	@30': Grades to SAND, light tan, medium dense, slightly moist, fine to coarse sand, predominantly quartz	
120	35			R4	13 17 27	103	2		@35': Dense, some fine subrounded gravel, becomes moist	
115	40			S4	14 26 15		3	SM-SP	@40': Interbedded Silty SAND and Gravelly SAND, Silty SAND is dark brown, dense, wet, fine sand with trace fine subrounded gravel, Gravelly SAND is light tan, dense, wet, fine to coarse sand, fine to coarse subangular to subroundd gravel, coarse gravels show signs of weathering	
110	45			R5	3 7 12	97	27	CL	@45': Sandy Silty CLAY, dark brown, stiff, wet, very fine sand, trace mica, light oxidation staining and gleying, very minor black staining, low plasticity *Groundwater encountered @0836 hours	
105	50			S5	11 38 50/5		14	SP-GP	@50': Gravelly SAND, light tan, very dense, very moist, fine to coarse sand, fine subangular to subrounded gravel, one 1-inch subrounded gravel in long dimension *Sampler gets stuck in boring. Gravels are becoming more dense with depth at this sample interval Total Depth of Boring: 51.5 feet bgs Groundwater encountered @45 feet bgs, then stabilized @32 feet bgs after 22 minutes. Shortly after, boring caved to 30 feet bgs. Boring backfilled with bentonite grout to 25 feet bgs, then backfilled with dry soil cuttings to surface upon completion of drilling	
100	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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GEOTECHNICAL BORING LOG PB-1

Project No.	11753.001	**Date Drilled**	9-7-17
Project	Hoag Hospital Irvine	**Logged By**	SAM
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	154'
Location	See Plate 1- Exploration Location Map	**Sampled By**	SAM

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								@0': 3-inches of Asphalt Concrete over 9-inches of Aggregate Base	
								CLs	@1': **Artificial Fill (Af):** Sandy CLAY, grayish brown, slightly moist, fine sand, some clay, low plasticity, trace asphalt debris, organic odor	
150									@4': **Quaternary Young Alluvial Fan Deposits (Qyf):**	
	5			S1	8 11 11		21	SM	@5': Silty SAND, dark grayish brown, medium dense, slightly moist, fine sand, trace coarse sand, trace $CaCO_3$ stringers	
				S2	7 7 9		12		@7': Abundant $CaCO_3$ deposits	
145				S3	5 5 6		9	SM-ML	@8.5': Sandy SILT to Silty SAND, light orange brown, loose/firm, very fine to fine sand	
	10								Total Depth of Boring: 10 feet bgs No groundwater encountered during drilling Temporary percolation well installed 0-5 feet bgs: 2-inch blank PVC 5-10 feet bgs: 2-inch slotted 0.020 PVC #3 Monterey Sand used as filter pack between 4 and 10 feet bgs Percolation boring pre-soaked @1150 hours	
140	15									
135	20									
130	25									
125	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
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Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(001).cpt
CPT Date: 9/28/2017 8:26:16 AM
GW During Test: 23 ft

Sounding ID: CPT-01
Project No: 11753.001
Cone/Rig: DDG1333

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	1.1	0.0	-	1.1	0.0	0.0	0.1	1	sensitive fine SOIL	115	2.0	1	1	-	-	0.1	9.9	95	3.48	15	N/A	N/A
0.49	1.1	0.1	-	1.1	0.0	0.0	9.9	2	Organic SOILS - Peats	100	1.0	1	0	-	-	0.1	9.9	95	5.99	10	N/A	N/A
0.66	20.6	33.0	53.9	20.6	0.1	0.0	0.6	5	silty SAND to sandy SILT	120	3.0	7	11	30	48	-	-	19	2.19	16	N/A	N/A
0.82	17.0	27.3	54.9	17.0	0.1	0.1	0.8	5	silty SAND to sandy SILT	120	3.0	6	9	24	47	-	-	23	2.32	16	N/A	N/A
0.98	14.3	22.9	-	14.3	0.3	0.1	2.2	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	37	2.63	15	N/A	N/A
1.15	13.1	20.9	-	13.1	0.5	0.1	3.9	3	silty CLAY to CLAY	115	1.5	9	14	-	-	0.9	9.9	46	2.81	15	N/A	N/A
1.31	12.5	20.1	-	12.5	0.7	0.1	5.5	3	silty CLAY to CLAY	115	1.5	8	13	-	-	0.9	9.9	54	2.93	15	N/A	N/A
1.48	20.0	32.1	61.1	20.0	0.2	0.2	0.9	5	silty SAND to sandy SILT	120	3.0	7	11	30	45	-	-	22	2.28	16	N/A	N/A
1.64	9.7	15.6	-	9.7	0.1	0.3	1.1	4	clayy SILT to silty CLAY	115	2.0	5	8	-	-	0.7	9.9	36	2.61	15	N/A	N/A
1.80	11.1	17.9	51.4	11.2	0.1	0.3	0.9	5	silty SAND to sandy SILT	120	3.0	4	6	10	41	-	-	32	2.52	16	N/A	N/A
1.97	16.9	27.2	48.5	17.0	0.1	0.2	0.5	5	silty SAND to sandy SILT	120	3.0	6	9	24	43	-	-	21	2.24	16	N/A	N/A
2.13	20.0	32.1	50.4	20.0	0.1	0.5	0.5	5	silty SAND to sandy SILT	120	3.0	7	11	30	43	-	-	18	2.16	16	N/A	N/A
2.30	15.6	25.0	45.4	15.6	0.1	0.3	0.5	5	silty SAND to sandy SILT	120	3.0	5	8	21	41	-	-	21	2.26	16	N/A	N/A
2.46	10.7	17.1	44.2	10.7	0.1	0.1	0.6	5	silty SAND to sandy SILT	120	3.0	4	6	9	39	-	-	29	2.46	16	N/A	N/A
2.62	11.1	17.9	44.8	11.1	0.1	0.1	0.6	5	silty SAND to sandy SILT	120	3.0	4	6	10	39	-	-	28	2.45	16	N/A	N/A
2.79	12.8	20.5	47.8	12.8	0.1	0.1	0.7	5	silty SAND to sandy SILT	120	3.0	4	7	15	39	-	-	27	2.40	16	N/A	N/A
2.95	21.5	34.5	55.2	21.5	0.1	0.2	0.6	5	silty SAND to sandy SILT	120	3.0	7	11	32	42	-	-	18	2.17	16	N/A	N/A
3.12	18.7	30.1	50.2	18.7	0.1	0.1	0.5	5	silty SAND to sandy SILT	120	3.0	6	10	27	41	-	-	19	2.20	16	N/A	N/A
3.28	14.0	22.5	45.5	14.0	0.1	0.1	0.5	5	silty SAND to sandy SILT	120	3.0	5	7	18	39	-	-	23	2.32	16	N/A	N/A
3.45	9.8	15.8	42.1	9.8	0.1	0.1	0.6	5	silty SAND to sandy SILT	120	3.0	3	5	6	36	-	-	30	2.48	16	N/A	N/A
3.61	7.4	11.9	38.4	7.4	0.0	0.1	0.5	5	silty SAND to sandy SILT	120	3.0	2	4	5	34	-	-	35	2.58	16	N/A	N/A
3.77	5.6	9.0	-	5.6	0.0	0.1	0.7	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	8.0	43	2.74	15	N/A	N/A
3.94	4.9	7.8	-	4.9	0.0	0.0	0.7	4	clayy SILT to silty CLAY	115	2.0	2	4	-	-	0.3	6.6	47	2.81	15	N/A	N/A
4.10	4.6	7.5	-	4.6	0.0	0.0	0.7	4	clayy SILT to silty CLAY	115	2.0	2	4	-	-	0.3	6.0	48	2.83	15	N/A	N/A
4.27	4.8	7.7	-	4.8	0.0	-0.1	0.6	4	clayy SILT to silty CLAY	115	2.0	2	4	-	-	0.3	6.0	45	2.79	15	N/A	N/A
4.43	4.5	7.2	-	4.5	0.0	-0.1	0.8	4	clayy SILT to silty CLAY	115	2.0	2	4	-	-	0.3	5.3	50	2.86	15	N/A	N/A
4.59	4.0	6.4	-	4.0	0.0	-0.1	0.8	4	clayy SILT to silty CLAY	115	2.0	2	3	-	-	0.3	4.5	54	2.93	15	N/A	N/A
4.76	4.2	6.7	-	4.2	0.0	-0.1	0.9	4	clayy SILT to silty CLAY	115	2.0	2	3	-	-	0.3	4.6	54	2.93	15	N/A	N/A
4.92	4.7	7.6	-	4.7	0.1	-0.1	1.5	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	5.1	56	2.96	15	N/A	N/A
5.09	6.7	10.8	-	6.7	0.1	-0.1	1.1	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.5	7.1	44	2.76	15	N/A	N/A
5.25	14.2	22.7	43.4	14.2	0.1	-0.1	0.4	5	silty SAND to sandy SILT	120	3.0	5	8	18	36	-	-	22	2.29	16	N/A	N/A
5.41	12.5	20.1	42.4	12.5	0.1	-0.1	0.5	5	silty SAND to sandy SILT	120	3.0	4	7	14	35	-	-	24	2.35	16	N/A	N/A
5.58	12.2	19.6	53.2	12.2	0.1	-0.1	0.9	5	silty SAND to sandy SILT	120	3.0	4	7	13	35	-	-	30	2.49	16	N/A	N/A
5.74	18.0	28.8	61.4	18.0	0.2	-0.1	1.0	5	silty SAND to sandy SILT	120	3.0	6	10	26	37	-	-	25	2.35	16	N/A	N/A
5.91	52.1	83.6	103.7	52.1	0.5	-0.1	0.9	6	clean SAND to silty SAND	125	5.0	10	17	61	43	-	-	12	1.95	16	N/A	N/A
6.07	67.0	107.5	132.5	67.0	0.8	0.4	1.2	6	clean SAND to silty SAND	125	5.0	13	22	69	44	-	-	11	1.94	16	N/A	N/A
6.23	67.1	107.6	140.8	67.1	1.0	0.7	1.5	6	clean SAND to silty SAND	125	5.0	13	22	69	44	-	-	13	2.01	16	N/A	N/A
6.40	67.2	106.3	140.4	67.2	1.0	0.3	1.5	6	clean SAND to silty SAND	125	5.0	13	21	69	43	-	-	13	2.02	16	N/A	N/A
6.56	66.9	104.4	140.6	66.9	1.1	0.2	1.6	5	silty SAND to sandy SILT	120	3.0	22	35	68	43	-	-	14	2.03	16	N/A	N/A
6.73	67.9	104.7	141.8	67.9	1.1	0.1	1.6	5	silty SAND to sandy SILT	120	3.0	23	35	69	43	-	-	14	2.04	16	N/A	N/A
6.89	66.0	100.5	140.1	66.0	1.1	0.0	1.7	5	silty SAND to sandy SILT	120	3.0	22	34	67	43	-	-	15	2.06	16	N/A	N/A
7.05	61.0	91.8	133.7	61.0	1.1	0.0	1.7	5	silty SAND to sandy SILT	120	3.0	20	31	64	42	-	-	16	2.10	16	N/A	N/A
7.22	60.5	90.0	128.6	60.5	1.0	0.0	1.6	5	silty SAND to sandy SILT	120	3.0	20	30	64	42	-	-	15	2.09	16	N/A	N/A
7.38	61.6	90.6	127.4	61.6	1.0	0.0	1.6	5	silty SAND to sandy SILT	120	3.0	21	30	64	42	-	-	15	2.07	16	N/A	N/A
7.55	59.9	87.1	123.3	59.9	0.9	0.0	1.5	5	silty SAND to sandy SILT	120	3.0	20	29	62	42	-	-	15	2.08	16	N/A	N/A
7.71	64.4	92.7	125.9	64.4	0.9	-0.1	1.4	5	silty SAND to sandy SILT	120	3.0	21	31	64	42	-	-	14	2.04	16	N/A	N/A
7.87	66.6	94.8	133.4	66.6	1.1	0.1	1.6	5	silty SAND to sandy SILT	120	3.0	22	32	65	42	-	-	15	2.07	16	N/A	N/A
8.04	69.0	97.1	134.1	69.0	1.1	0.0	1.6	5	silty SAND to sandy SILT	120	3.0	23	32	66	42	-	-	15	2.06	16	N/A	N/A
8.20	61.1	85.2	125.1	61.1	1.0	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	20	28	62	42	-	-	16	2.11	16	N/A	N/A
8.37	60.1	83.0	125.1	60.1	1.0	-0.3	1.7	5	silty SAND to sandy SILT	120	3.0	20	28	61	42	-	-	17	2.13	16	N/A	N/A
8.53	51.4	70.2	116.1	51.4	0.9	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	17	23	55	41	-	-	19	2.19	16	N/A	N/A
8.69	45.8	62.0	109.2	45.8	0.8	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	15	21	51	40	-	-	20	2.24	16	N/A	N/A
8.86	48.2	64.7	108.3	48.2	0.8	-0.2	1.7	5	silty SAND to sandy SILT	120	3.0	16	22	53	40	-	-	19	2.20	16	N/A	N/A
9.02	51.7	68.7	113.1	51.7	0.9	-0.2	1.7	5	silty SAND to sandy SILT	120	3.0	17	23	55	40	-	-	19	2.19	16	N/A	N/A
9.19	56.6	74.4	119.8	56.6	1.0	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	19	25	57	41	-	-	18	2.18	16	N/A	N/A
9.35	58.0	75.7	121.9	58.0	1.0	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	19	25	58	41	-	-	18	2.18	16	N/A	N/A
9.51	57.2	73.9	120.5	57.2	1.0	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	19	25	57	41	-	-	18	2.18	16	N/A	N/A
9.68	58.5	74.9	124.1	58.4	1.1	-0.2	1.9	5	silty SAND to sandy SILT	120	3.0	19	25	57	41	-	-	19	2.20	16	N/A	N/A
9.84	61.2	77.8	124.3	61.2	1.1	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	20	26	59	41	-	-	18	2.17	16	N/A	N/A
10.01	58.7	74.0	124.0	58.7	1.1	-0.2	1.9	5	silty SAND to sandy SILT	120	3.0	20	25	57	40	-	-	19	2.20	16	N/A	N/A
10.17	61.1	76.4	125.8	61.1	1.2	-0.2	1.9	5	silty SAND to sandy SILT	120	3.0	20	25	58	41	-	-	19	2.19	16	N/A	N/A
10.34	61.8	76.7	126.5	61.8	1.2	-0.1	2.0	5	silty SAND to sandy SILT	120	3.0	21	26	58	41	-	-	19	2.19	16	N/A	N/A
10.50	62.3	76.6	135.9	62.3	1.4	-0.2	2.3	5	silty SAND to sandy SILT	120	3.0	21	26	58	41	-	-	20	2.24	16	N/A	N/A
10.66	59.9	73.2	152.8	59.9	1.8	0.0	3.0	5	silty SAND to sandy SILT	120	3.0	20	24	57	40	-	-	24	2.34	16	N/A	N/A
10.83	56.7	68.7	172.0	56.7	2.2	0.3	3.9	4	clayy SILT to silty CLAY	115	2.0	28	34	-	-	4.0	9.9	28	2.44	15	N/A	N/A
10.99	54.9	66.0	176.5	54.9	2.3	0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	27	33	-	-	3.8	9.9	30	2.48	15	N/A	N/A
11.16	52.2	62.3	176.9	52.2	2.3	0.0	4.5	4	clayy SILT to silty CLAY	115	2.0	26	31	-	-	3.6	9.9	31	2.51	15	N/A	N/A
11.32	52.1	61.7	178.3	52.1	2.3	-0.1	4.6	4	clayy SILT to silty CLAY	115	2.0	26	31	-	-	3.6	9.9	32	2.52	15	N/A	N/A
11.48	52.1	61.3	178.0	52.1	2.3	-0.2	4.6	4	clayy SILT to silty CLAY	115	2.0	26	31	-	-	3.6	9.9	32	2.53	15	N/A	N/A
11.65	51.7	60.5	184.4	51.7	2.5	-0.2	4.9	4	clayy SILT to silty CLAY	115	2.0	26	30	-	-	3.6	9.9	33	2.55	15	N/A	N/A
11.81	53.3	61.9	164.0	53.3	2.1	-0.1	3.9	4	clayy SILT to silty CLAY	115	2.0	27	31	-	-	3.7	9.9	30	2.48	15	N/A	N/A
11.98	51.8	59.7	174.6	51.8	2.3	-0.2	4.5	4	clayy SILT to silty CLAY	115	2.0	26	30	-	-	3.6	9.9	32	2.53	15	N/A	N/A
12.14	52.8	60.5	190.0	52.8	2.7	-0.2	5.1	4	clayy SILT to silty CLAY	115	2.0	26	30	-	-	3.7	9.9	34	2.57	15	N/A	N/A
12.30	53.5	61.0	196.9	53.5	2.9	-0.4	5.4	4	clayy SILT to silty CLAY	115	2.0	27	30	-	-	3.7	9.9	35	2.58	15	N/A	N/A
12.47	54.8	61.9	194.2	54.8	2.8	-0.4	5.2	4	clayy SILT to silty CLAY	115	2.0	27	31	-	-	3.8	9.9	34	2.57	15	N/A	N/A
12.63	57.4	64.5	206.5	57.4	3.2	-0.4	5.6	4	clayy SILT to silty CLAY	115	2.0	29	32	-	-	4.0	9.9	34	2.58	15	N/A	N/A
12.80	68.8	76.8	209.5	68.8	3.4	-0.2	5.0	4	clayy SILT to silty CLAY	115	2.0	34	38	-	-	4.8	9.9	30	2.49	15	N/A	N/A
12.96	76.5	84.9	211.2	76.5	3.5	-0.4	4.7	4	clayy SILT to silty CLAY	115	2.0	38	42	-	-	5.4	9.9	28	2.44	15	N/A	N/A
13.12	79.4	87.6	214.1	79.4	3.7	-0.6	4.7	4	clayy SILT to silty CLAY	115	2.0	40	44	-	-	5.6	9.9	28	2.43	15	N/A	N/A
13.29	78.1	85.6	191.4	78.1	3.0	-0.4	3.9	4	clayy SILT to silty CLAY	115	2.0	39	43	-	-	5.5	9.9	26	2.38	15	N/A	N/A
13.45	84.0	91.6	171.7	84.0	2.5	-0.7	3.0	5	silty SAND to sandy SILT	120	3.0	28	31	64	41	-	-	22	2.28	16	N/A	N/A
13.62	101.2	109.6	179.9	101.2	2.7	-0.5	2.7	5	silty SAND to sandy SILT	120	3.0	34	37	70	42	-	-	19	2.19	16	N/A	N/A
13.78	113.7	122.4	197.7	113.7	3.3	-0.3	2.9	5	silty SAND to sandy SILT	120	3.0	38	41	74	42	-	-	18	2.18	16	N/A	N/A
13.94	126.5	135.4	215.6	126.5	3.8	-0.3	3.0	5	silty SAND to sandy SILT	120	3.0	42	45	77	43	-	-	18	2.17	16	N/A	N/A
14.11	142.2	151.3	230.4	142.2	4.3	-0.4	3.0	5	silty SAND to sandy SILT	120	3.0	47	50	81	43	-	-	17	2.14	16	N/A	N/A
14.27	154.3	163.2	242.7	154.3	4.7	-0.4	3.0	5	silty SAND to sandy SILT	120	3.0	51	54	83	44	-	-	16	2.12	16	N/A	N/A
14.44	160.3	168.6	247.7	160.3	4.8	-0.5	3.0	5	silty SAND to sandy SILT	120	3.0	53	56	84	44	-	-	16	2.11	16	N/A	N/A
14.60	165.4	173.0	256.7	165.4	5.2	-0.5	3.2	5	silty SAND to sandy SILT	120	3.0	55	58	85	44	-	-	16	2.12	16	N/A	N/A
14.76	168.2	174.9	266.1	168.2	5.6	-0.5	3.4	8	stiff SAND to clayy SAND	115	5.0	34	35	85	44	-	-	17	2.13	16	N/A	N/A
14.93	161.5	167.0	278.9	161.5	6.3	-0.4	3.9	8	stiff SAND to clayy SAND	115	5.0	32	33	84	44	-	-	19	2.20	16	N/A	N/A
15.09	153.5	157.9	287.3	153.5	6.7	-0.3	4.4	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.4	9.9	21	2.26	30	N/A	N/A
15.26	145.0	148.3	293.7	145.0	7.0	-0.5	4.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.1	9.9	23	2.31	30	N/A	N/A
15.42	138.7	141.1	266.7	138.7	6.0	-0.3	4.3	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.9	9.9	22	2.28	30	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(001).cpt
CPT Date: 9/28/2017 8:26:16 AM
GW During Test: 23 ft

Sounding ID: CPT-01
Project No: 11753.001
Cone/Rig: DDG1333

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	136.2	137.9	263.9	136.2	5.9	-0.6	4.4	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.8	9.9	22	2.29	30	N/A	N/A
15.75	133.0	133.9	255.3	133.0	5.6	-0.9	4.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.7	9.9	22	2.29	30	N/A	N/A
15.91	125.0	125.1	283.3	125.0	6.7	-1.0	5.4	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.4	9.9	26	2.39	30	N/A	N/A
16.08	125.1	124.6	295.8	125.0	7.2	-0.9	5.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.4	9.9	27	2.42	30	N/A	N/A
16.24	125.5	124.4	291.8	125.5	7.1	-1.0	5.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.4	9.9	27	2.41	30	N/A	N/A
16.40	120.3	118.7	283.3	120.3	6.7	-1.4	5.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.2	9.9	27	2.42	30	N/A	N/A
16.57	117.1	114.8	284.4	117.0	6.8	-2.7	5.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.1	9.9	28	2.44	30	N/A	N/A
16.73	116.8	114.0	281.1	116.7	6.7	-2.9	5.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.1	9.9	28	2.44	30	N/A	N/A
16.90	118.6	115.2	286.8	118.5	6.9	-2.7	5.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.2	9.9	28	2.44	30	N/A	N/A
17.06	125.9	121.7	300.7	125.9	7.6	-2.5	6.1	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.4	9.9	28	2.44	30	N/A	N/A
17.23	137.4	132.2	310.8	137.3	8.1	-3.1	5.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.8	9.9	27	2.41	30	N/A	N/A
17.39	146.6	140.4	314.8	146.6	8.4	-3.3	5.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.1	9.9	26	2.38	30	N/A	N/A
17.55	156.4	149.0	311.1	156.4	8.3	-3.6	5.3	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.5	9.9	24	2.34	30	N/A	N/A
17.72	167.2	158.5	315.1	167.1	8.5	-3.1	5.1	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.9	9.9	23	2.31	30	N/A	N/A
17.88	182.2	172.0	322.3	182.2	8.9	-1.4	4.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.4	9.9	22	2.28	30	N/A	N/A
18.05	183.1	172.0	313.0	183.1	8.5	-1.0	4.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.4	9.9	21	2.26	30	N/A	N/A
18.21	176.2	164.8	271.7	176.2	6.6	-0.8	3.8	8	stiff SAND to clayy SAND	115	5.0	35	33	83	43	-	-	19	2.19	16	N/A	N/A
18.37	171.4	159.6	198.4	171.3	3.1	-0.7	1.8	6	clean SAND to silty SAND	125	5.0	34	32	82	43	-	-	12	1.95	16	N/A	N/A
18.54	172.8	160.1	191.7	172.7	2.8	-0.7	1.6	6	clean SAND to silty SAND	125	5.0	35	32	83	43	-	-	11	1.91	16	N/A	N/A
18.70	183.5	169.2	193.3	183.4	2.5	-0.7	1.4	6	clean SAND to silty SAND	125	5.0	37	34	84	43	-	-	9	1.85	16	N/A	N/A
18.87	193.8	178.0	203.1	193.8	2.8	-0.6	1.5	6	clean SAND to silty SAND	125	5.0	39	36	86	43	-	-	9	1.85	16	N/A	N/A
19.03	203.7	186.2	210.2	203.7	2.9	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	41	37	88	44	-	-	9	1.83	16	N/A	N/A
19.19	215.7	196.3	216.8	215.7	2.9	-0.7	1.4	6	clean SAND to silty SAND	125	5.0	43	39	89	44	-	-	8	1.80	16	N/A	N/A
19.36	226.1	204.8	222.5	226.1	3.0	-0.6	1.3	6	clean SAND to silty SAND	125	5.0	45	41	91	44	-	-	8	1.77	16	N/A	N/A
19.52	228.5	206.1	224.2	228.5	3.0	-0.6	1.3	6	clean SAND to silty SAND	125	5.0	46	41	91	44	-	-	8	1.77	16	N/A	N/A
19.69	231.3	207.7	222.9	231.2	2.9	-0.6	1.3	6	clean SAND to silty SAND	125	5.0	46	42	91	44	-	-	7	1.75	16	N/A	N/A
19.85	234.7	209.8	226.3	234.7	3.0	-0.2	1.3	6	clean SAND to silty SAND	125	5.0	47	42	91	44	-	-	7	1.76	16	N/A	N/A
20.01	241.9	215.3	233.3	241.9	3.3	-0.1	1.4	6	clean SAND to silty SAND	125	5.0	48	43	92	44	-	-	7	1.77	16	N/A	N/A
20.18	242.8	215.2	235.0	242.8	3.4	-0.3	1.4	6	clean SAND to silty SAND	125	5.0	49	43	92	44	-	-	8	1.78	16	N/A	N/A
20.34	247.0	218.0	233.1	247.0	3.2	-0.5	1.3	6	clean SAND to silty SAND	125	5.0	49	44	93	44	-	-	7	1.75	16	N/A	N/A
20.51	249.5	219.3	236.9	249.5	3.4	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	50	44	93	44	-	-	7	1.76	16	N/A	N/A
20.67	254.7	223.0	241.0	254.7	3.5	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	51	45	93	44	-	-	7	1.76	16	N/A	N/A
20.83	255.0	222.3	232.7	255.0	3.0	-0.3	1.2	6	clean SAND to silty SAND	125	5.0	51	44	93	44	-	-	6	1.71	16	N/A	N/A
21.00	258.5	224.3	234.6	258.4	3.0	-0.5	1.2	6	clean SAND to silty SAND	125	5.0	52	45	94	44	-	-	6	1.71	16	N/A	N/A
21.16	273.6	236.5	236.5	273.6	2.5	0.0	0.9	6	clean SAND to silty SAND	125	5.0	55	47	95	44	-	-	5	1.62	16	N/A	N/A
21.33	276.1	237.8	246.1	276.1	3.3	-0.6	1.2	6	clean SAND to silty SAND	125	5.0	55	48	95	44	-	-	6	1.70	16	N/A	N/A
21.49	280.6	240.7	261.2	280.6	4.2	-0.2	1.5	6	clean SAND to silty SAND	125	5.0	56	48	95	44	-	-	7	1.77	16	N/A	N/A
21.65	312.9	267.3	268.2	312.9	3.6	-0.4	1.1	6	clean SAND to silty SAND	125	5.0	63	53	95	45	-	-	5	1.65	16	N/A	N/A
21.82	292.0	248.4	262.0	292.0	3.9	0.7	1.3	6	clean SAND to silty SAND	125	5.0	58	50	95	45	-	-	7	1.73	16	N/A	N/A
21.98	300.5	254.7	257.0	300.5	3.4	-0.4	1.1	6	clean SAND to silty SAND	125	5.0	60	51	95	45	-	-	5	1.66	16	N/A	N/A
22.15	335.1	282.9	290.7	335.1	4.4	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	67	57	95	45	-	-	6	1.69	16	N/A	N/A
22.31	344.7	289.8	305.1	344.7	5.1	-0.3	1.5	6	clean SAND to silty SAND	125	5.0	69	58	95	45	-	-	7	1.72	16	N/A	N/A
22.47	367.6	307.9	329.1	367.6	6.1	0.4	1.7	6	clean SAND to silty SAND	125	5.0	74	62	95	45	-	-	7	1.75	16	N/A	N/A
22.64	408.9	341.2	356.0	408.9	6.6	1.1	1.6	6	clean SAND to silty SAND	125	5.0	82	68	95	46	-	-	6	1.71	16	N/A	N/A
22.80	451.6	375.4	404.9	451.7	8.9	2.8	2.0	6	clean SAND to silty SAND	125	5.0	90	75	95	46	-	-	7	1.76	16	N/A	N/A
22.97	485.9	402.5	442.4	485.9	10.7	1.7	2.2	8	stiff SAND to clayy SAND	115	5.0	97	80	95	47	-	-	8	1.79	16	N/A	N/A
23.13	485.2	401.2	406.7	485.2	7.7	1.4	1.6	6	clean SAND to silty SAND	125	5.0	97	80	95	47	-	-	5	1.66	16	0.00	0.0
23.30	516.3	426.2	426.2	516.3	7.7	0.8	1.5	6	clean SAND to silty SAND	125	5.0	100	85	95	47	-	-	5	1.63	16	0.00	0.0

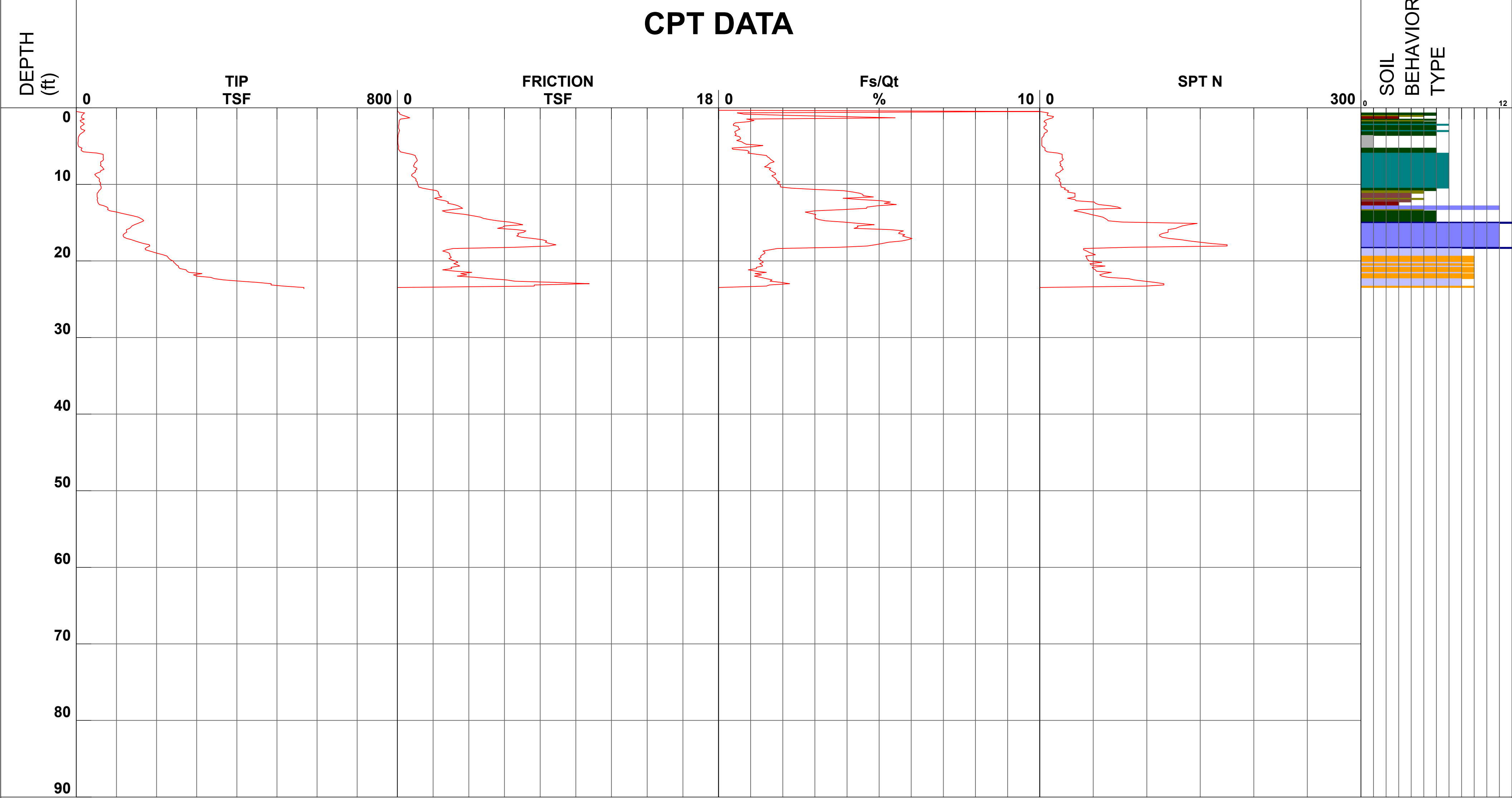
* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	KK RB	Filename	SDF(001).cpt
Job Number	11753.001	Cone Number	DDG1333	GPS	
Hole Number	CPT-01	Date and Time	9/28/2017 8:26:16 AM	Maximum Depth	23.62 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(002).cpt
CPT Date: 9/28/2017 8:53:05 AM
GW During Test: 23 ft

Sounding ID: CPT-02
Project No: 11753.001
Cone/Rig: DDG1333

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	29.4	47.2	66.7	29.4	0.2	-0.1	0.7	5	silty SAND to sandy SILT	120	3.0	10	16	42	48	-	-	15	2.08	16	N/A	N/A
0.49	21.6	34.7	61.7	21.6	0.2	-0.1	0.8	5	silty SAND to sandy SILT	120	3.0	7	12	32	48	-	-	20	2.24	16	N/A	N/A
0.66	14.0	22.4	74.1	14.0	0.3	0.0	1.9	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	35	2.60	15	N/A	N/A
0.82	16.3	26.2	78.1	16.3	0.3	0.0	1.9	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.2	9.9	33	2.54	15	N/A	N/A
0.98	16.8	27.0	-	16.8	0.6	0.0	3.7	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.2	9.9	41	2.72	15	N/A	N/A
1.15	26.9	43.1	104.6	26.9	0.6	0.0	2.3	5	silty SAND to sandy SILT	120	3.0	9	14	39	47	-	-	28	2.43	16	N/A	N/A
1.31	14.6	23.4	-	14.6	0.3	0.1	2.1	4	clayy SILT to silty CLAY	115	2.0	7	12	-	-	1.0	9.9	36	2.60	15	N/A	N/A
1.48	11.4	18.3	-	11.4	0.2	0.0	1.9	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	39	2.68	15	N/A	N/A
1.64	9.0	14.5	-	9.0	0.2	0.1	2.6	4	clayy SILT to silty CLAY	115	2.0	5	7	-	-	0.6	9.9	48	2.84	15	N/A	N/A
1.80	9.2	14.7	-	9.2	0.3	0.1	2.9	3	silty CLAY to CLAY	115	1.5	6	10	-	-	0.6	9.9	49	2.86	15	N/A	N/A
1.97	9.1	14.6	-	9.1	0.3	0.1	3.1	3	silty CLAY to CLAY	115	1.5	6	10	-	-	0.6	9.9	51	2.88	15	N/A	N/A
2.13	11.2	17.9	-	11.2	0.3	0.1	3.0	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	46	2.79	15	N/A	N/A
2.30	21.3	34.1	92.8	21.3	0.5	0.2	2.2	4	clayy SILT to silty CLAY	115	2.0	11	17	-	-	1.5	9.9	30	2.49	15	N/A	N/A
2.46	34.5	55.4	135.7	34.5	1.1	0.1	3.1	4	clayy SILT to silty CLAY	115	2.0	17	28	-	-	2.4	9.9	28	2.43	15	N/A	N/A
2.62	35.9	57.6	125.1	35.9	0.9	0.1	2.6	5	silty SAND to sandy SILT	120	3.0	12	19	49	45	-	-	25	2.36	16	N/A	N/A
2.79	17.2	27.6	-	17.2	0.6	0.1	3.3	4	clayy SILT to silty CLAY	115	2.0	9	14	-	-	1.2	9.9	39	2.68	15	N/A	N/A
2.95	13.2	21.2	70.4	13.2	0.2	0.1	1.7	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	0.9	9.9	35	2.60	15	N/A	N/A
3.12	11.0	17.7	-	11.0	0.2	0.1	1.5	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	37	2.63	15	N/A	N/A
3.28	11.2	18.0	55.6	11.2	0.1	0.1	1.1	5	silty SAND to sandy SILT	120	3.0	4	6	10	38	-	-	33	2.56	16	N/A	N/A
3.45	10.3	16.5	-	10.3	0.1	0.1	1.2	4	clayy SILT to silty CLAY	115	2.0	5	8	-	-	0.7	9.9	36	2.61	15	N/A	N/A
3.61	9.6	15.5	47.1	9.6	0.1	0.1	0.8	5	silty SAND to sandy SILT	120	3.0	3	5	5	36	-	-	33	2.55	16	N/A	N/A
3.77	9.8	15.8	-	9.8	0.2	0.2	1.8	4	clayy SILT to silty CLAY	115	2.0	5	8	-	-	0.7	9.9	41	2.72	15	N/A	N/A
3.94	15.1	24.2	76.8	15.1	0.3	0.1	1.9	4	clayy SILT to silty CLAY	115	2.0	8	12	-	-	1.0	9.9	34	2.57	15	N/A	N/A
4.10	25.1	40.3	77.6	25.1	0.3	0.1	1.3	5	silty SAND to sandy SILT	120	3.0	8	13	37	41	-	-	22	2.29	16	N/A	N/A
4.27	18.8	30.1	73.3	18.8	0.3	0.1	1.5	5	silty SAND to sandy SILT	120	3.0	6	10	27	39	-	-	28	2.43	16	N/A	N/A
4.43	16.6	26.6	70.9	16.6	0.2	0.1	1.5	5	silty SAND to sandy SILT	120	3.0	6	9	23	38	-	-	30	2.48	16	N/A	N/A
4.59	16.0	25.7	70.6	16.0	0.2	0.1	1.5	5	silty SAND to sandy SILT	120	3.0	5	9	22	38	-	-	31	2.50	16	N/A	N/A
4.76	13.9	22.3	-	13.9	0.3	0.1	1.9	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	36	2.61	15	N/A	N/A
4.92	13.4	21.4	49.7	13.4	0.1	0.1	0.7	5	silty SAND to sandy SILT	120	3.0	4	7	16	36	-	-	26	2.40	16	N/A	N/A
5.09	24.2	38.8	91.1	24.2	0.5	0.2	1.9	5	silty SAND to sandy SILT	120	3.0	8	13	36	39	-	-	27	2.41	16	N/A	N/A
5.25	35.5	57.0	117.1	35.5	0.8	0.2	2.3	5	silty SAND to sandy SILT	120	3.0	12	19	48	41	-	-	24	2.33	16	N/A	N/A
5.41	37.0	59.3	133.2	37.0	1.0	0.2	2.8	5	silty SAND to sandy SILT	120	3.0	12	20	50	41	-	-	26	2.38	16	N/A	N/A
5.58	37.6	60.2	134.2	37.6	1.1	0.1	2.8	5	silty SAND to sandy SILT	120	3.0	13	20	50	41	-	-	26	2.38	16	N/A	N/A
5.74	37.5	60.1	137.3	37.5	1.1	0.1	2.9	5	silty SAND to sandy SILT	120	3.0	12	20	50	41	-	-	26	2.39	16	N/A	N/A
5.91	37.7	60.5	139.4	37.7	1.1	0.1	3.0	4	clayy SILT to silty CLAY	115	2.0	19	30	-	-	2.6	9.9	26	2.40	15	N/A	N/A
6.07	37.4	60.0	141.6	37.4	1.2	0.1	3.1	4	clayy SILT to silty CLAY	115	2.0	19	30	-	-	2.6	9.9	27	2.41	15	N/A	N/A
6.23	37.7	60.4	138.4	37.7	1.1	0.1	3.0	5	silty SAND to sandy SILT	120	3.0	13	20	50	41	-	-	26	2.39	16	N/A	N/A
6.40	38.5	61.1	140.9	38.5	1.2	0.1	3.0	4	clayy SILT to silty CLAY	115	2.0	19	31	-	-	2.7	9.9	26	2.40	15	N/A	N/A
6.56	39.2	61.4	139.9	39.2	1.2	0.2	3.0	5	silty SAND to sandy SILT	120	3.0	13	20	51	41	-	-	26	2.39	16	N/A	N/A
6.73	43.7	67.5	141.5	43.7	1.2	0.2	2.8	5	silty SAND to sandy SILT	120	3.0	15	23	54	41	-	-	24	2.34	16	N/A	N/A
6.89	47.3	72.2	143.3	47.3	1.3	0.2	2.7	5	silty SAND to sandy SILT	120	3.0	16	24	56	41	-	-	23	2.31	16	N/A	N/A
7.05	51.0	76.9	146.0	51.0	1.3	0.2	2.6	5	silty SAND to sandy SILT	120	3.0	17	26	58	42	-	-	22	2.28	16	N/A	N/A
7.22	55.5	82.7	149.2	55.5	1.4	0.2	2.6	5	silty SAND to sandy SILT	120	3.0	18	28	61	42	-	-	21	2.25	16	N/A	N/A
7.38	62.4	92.0	159.6	62.4	1.6	0.2	2.6	5	silty SAND to sandy SILT	120	3.0	21	31	64	42	-	-	20	2.23	16	N/A	N/A
7.55	65.6	95.6	169.4	65.6	1.8	0.2	2.8	5	silty SAND to sandy SILT	120	3.0	22	32	66	43	-	-	20	2.24	16	N/A	N/A
7.71	62.6	90.2	172.9	62.6	1.9	0.2	3.1	5	silty SAND to sandy SILT	120	3.0	21	30	64	42	-	-	22	2.29	16	N/A	N/A
7.87	55.8	79.7	175.2	55.8	2.0	0.2	3.6	4	clayy SILT to silty CLAY	115	2.0	28	40	-	-	3.9	9.9	25	2.37	15	N/A	N/A
8.04	53.0	74.9	179.0	53.0	2.1	0.2	3.9	4	clayy SILT to silty CLAY	115	2.0	26	37	-	-	3.7	9.9	27	2.42	15	N/A	N/A
8.20	53.6	75.0	183.9	53.7	2.2	0.2	4.1	4	clayy SILT to silty CLAY	115	2.0	27	38	-	-	3.8	9.9	28	2.43	15	N/A	N/A
8.37	52.7	73.0	195.4	52.7	2.4	0.2	4.7	4	clayy SILT to silty CLAY	115	2.0	26	37	-	-	3.7	9.9	30	2.48	15	N/A	N/A
8.53	50.6	69.5	206.7	50.6	2.7	0.1	5.3	4	clayy SILT to silty CLAY	115	2.0	25	35	-	-	3.5	9.9	32	2.54	15	N/A	N/A
8.69	46.6	73.2	233.7	46.6	2.9	0.1	6.2	9	very stiff fine SOIL	120	1.0	47	73	-	-	1.6	9.9	34	2.58	30	N/A	N/A
8.86	43.0	66.7	-	43.0	2.7	-0.1	6.3	9	very stiff fine SOIL	120	1.0	43	67	-	-	1.5	9.9	36	2.61	30	N/A	N/A
9.02	41.6	63.8	-	41.6	2.5	-0.3	6.1	9	very stiff fine SOIL	120	1.0	42	64	-	-	1.5	9.9	36	2.61	30	N/A	N/A
9.19	40.1	60.7	197.0	40.1	2.2	-0.1	5.4	4	clayy SILT to silty CLAY	115	2.0	20	30	-	-	2.8	9.9	35	2.59	15	N/A	N/A
9.35	39.4	58.9	192.8	39.4	2.1	0.1	5.4	4	clayy SILT to silty CLAY	115	2.0	20	29	-	-	2.7	9.9	35	2.59	15	N/A	N/A
9.51	40.5	59.8	186.9	40.5	2.0	0.0	5.0	4	clayy SILT to silty CLAY	115	2.0	20	30	-	-	2.8	9.9	34	2.57	15	N/A	N/A
9.68	41.1	53.0	174.2	41.1	2.0	0.1	4.9	4	clayy SILT to silty CLAY	115	2.0	21	26	-	-	2.9	9.9	35	2.59	15	N/A	N/A
9.84	42.3	54.0	167.5	42.3	1.9	-0.1	4.5	4	clayy SILT to silty CLAY	115	2.0	21	27	-	-	2.9	9.9	34	2.56	15	N/A	N/A
10.01	43.0	54.5	161.3	43.0	1.8	-0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	21	27	-	-	3.0	9.9	32	2.54	15	N/A	N/A
10.17	42.5	53.4	159.0	42.5	1.8	-0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	21	27	-	-	3.0	9.9	32	2.54	15	N/A	N/A
10.34	43.9	54.8	158.0	43.9	1.8	-0.1	4.1	4	clayy SILT to silty CLAY	115	2.0	22	27	-	-	3.1	9.9	32	2.52	15	N/A	N/A
10.50	46.8	57.9	158.3	46.8	1.8	-0.1	3.9	4	clayy SILT to silty CLAY	115	2.0	23	29	-	-	3.3	9.9	30	2.49	15	N/A	N/A
10.66	47.6	58.5	158.7	47.6	1.8	-0.1	3.9	4	clayy SILT to silty CLAY	115	2.0	24	29	-	-	3.3	9.9	30	2.49	15	N/A	N/A
10.83	46.9	57.2	153.9	46.9	1.7	0.0	3.7	4	clayy SILT to silty CLAY	115	2.0	23	29	-	-	3.3	9.9	30	2.48	15	N/A	N/A
10.99	47.1	57.0	156.6	47.1	1.8	0.0	3.9	4	clayy SILT to silty CLAY	115	2.0	24	29	-	-	3.3	9.9	30	2.50	15	N/A	N/A
11.16	48.2	57.9	160.4	48.2	1.9	-0.1	4.0	4	clayy SILT to silty CLAY	115	2.0	24	29	-	-	3.4	9.9	31	2.50	15	N/A	N/A
11.32	47.2	56.3	163.1	47.2	2.0	-0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	24	28	-	-	3.3	9.9	32	2.52	15	N/A	N/A
11.48	47.3	56.0	162.1	47.3	1.9	-0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	24	28	-	-	3.3	9.9	32	2.52	15	N/A	N/A
11.65	48.3	56.8	163.8	48.3	2.0	-0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	24	28	-	-	3.4	9.9	32	2.52	15	N/A	N/A
11.81	49.6	57.9	167.7	49.6	2.1	0.0	4.3	4	clayy SILT to silty CLAY	115	2.0	25	29	-	-	3.5	9.9	32	2.52	15	N/A	N/A
11.98	51.8	60.1	190.1	51.8	2.6	0.0	5.2	4	clayy SILT to silty CLAY	115	2.0	26	30	-	-	3.6	9.9	34	2.57	15	N/A	N/A
12.14	54.2	67.7	-	54.2	3.3	0.0	6.2	9	very stiff fine SOIL	120	1.0	54	68	-	-	1.9	9.9	35	2.60	30	N/A	N/A
12.30	52.1	72.4	-	52.1	3.7	-0.3	7.3	9	very stiff fine SOIL	120	1.0	52	72	-	-	1.8	9.9	37	2.63	30	N/A	N/A
12.47	51.4	70.5	-	51.4	3.6	-0.5	7.1	9	very stiff fine SOIL	120	1.0	51	70	-	-	1.8	9.9	37	2.63	30	N/A	N/A
12.63	45.2	61.1	-	45.2	3.2	-0.4	7.1	3	silty CLAY to CLAY	115	1.5	30	41	-	-	3.1	9.9	39	2.68	15	N/A	N/A
12.80	43.6	58.2	-	43.6	2.8	0.9	6.6	3	silty CLAY to CLAY	115	1.5	29	39	-	-	3.0	9.9	38	2.66	15	N/A	N/A
12.96	43.3	57.1	-	43.3	2.8	1.4	6.6	3	silty CLAY to CLAY	115	1.5	29	38	-	-	3.0	9.9	39	2.67	15	N/A	N/A
13.12	44.2	57.6	-	44.3	2.8	1.5	6.4	3	silty CLAY to CLAY	115	1.5	29	38	-	-	3.1	9.9	38	2.66	15	N/A	N/A
13.29	44.5	57.2	-	44.5	2.8	1.5	6.4	3	silty CLAY to CLAY	115	1.5	30	38	-	-	3.1	9.9	38	2.66	15	N/A	N/A
13.45	44.1	56.1	-	44.1	2.8	1.2	6.4	3	silty CLAY to CLAY	115	1.5	29	37	-	-	3.1	9.9	38	2.66	15	N/A	N/A
13.62	46.3	58.1	-	46.3	3.0	1.6	6.5	3	silty CLAY to CLAY	115	1.5	31	39	-	-	3.2	9.9	38	2.66	15	N/A	N/A
13.78	47.5	59.0	-	47.5	3.2	1.1	6.8	3	silty CLAY to CLAY	115	1.5	32	39	-	-	3.3	9.9	39	2.67	15	N/A	N/A
13.94	48.2	59.2	-	48.3	3.3	0.9	6.9	3	silty CLAY to CLAY	115	1.5	32	39	-	-	3.4	9.9	39	2.67	15	N/A	N/A
14.11	47.9	58.1	-	47.9	3.3	1.3	7.0	3	silty CLAY to CLAY	115	1.5	32	39	-	-	3.3	9.9	40	2.68	15	N/A	N/A
14.27	47.9	57.4	-	47.9	3.3	1.3	7.0	3	silty CLAY to CLAY	115	1.5	32	38	-	-	3.3	9.9	40	2.69	15	N/A	N/A
14.44	49.8	59.1	-	49.8	3.5	1.5	7.1	3	silty CLAY to CLAY	115	1.5	33	39	-	-	3.5	9.9	40	2.68	15	N/A	N/A
14.60	51.6	60.6	-	51.7	3.5	1.7	7.0	3	silty CLAY to CLAY	115	1.5	34	40	-	-	3.6	9.9	39	2.67	15	N/A	N/A
14.76	53.7	62.3	-	53.8	3.5	2.8	6.7	9	very stiff fine SOIL	120	1.0	54	62	-	-	1.9	9.9	38	2.65	30	N/A	N/A
14.93	52.3	60.0	-	52.4	3.5	3.1	6.8	3	silty CLAY to CLAY	115	1.5	35	40	-	-	3.6	9.9	39	2.66	15	N/A	N/A
15.09	52.6	59.7	-	52.7	3.4	3.3	6.6	3	silty CLAY to CLAY	115	1.5	35	40	-	-	3.7	9.9	38	2.66	15	N/A	N/A
15.26	52.0	58.4	-	52.1	3.1	3.5	6.0	3	silty CLAY to CLAY	115	1.5	35	39	-	-	3.6	9.9	37	2.63	15	N/A	N/A
15.42	49.0	54.5	-	49.1	2.9	3.5	6.0	3	silty CLAY to CLAY	115	1.5	33	36	-	-	3.4	9.9	38	2.65	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Project ID: Leighton Group
Data File: SDF(002).cpt
CPT Date: 9/28/2017 8:53:05 AM
GW During Test: 23 ft

Sounding ID: CPT-02
Project No: 11753.001
Cone/Rig: DDG1333

Depth ft	qc PS tsf	* qc1n PS -	qncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	47.3	52.0	-	47.4	2.9	4.6	6.2	3	silty CLAY to CLAY	115	1.5	32	35	-	-	3.3	9.9	39	2.67	15	N/A	N/A
15.75	46.9	51.0	-	47.0	2.7	4.4	5.8	3	silty CLAY to CLAY	115	1.5	31	34	-	-	3.2	9.9	38	2.66	15	N/A	N/A
15.91	54.8	59.1	-	54.9	3.3	3.7	6.2	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.8	9.9	37	2.64	15	N/A	N/A
16.08	75.7	75.9	228.6	75.7	4.3	-0.9	5.8	9	very stiff fine SOIL	120	1.0	76	76	-	-	2.6	9.9	33	2.55	30	N/A	N/A
16.24	80.8	80.6	257.9	80.8	5.4	-2.2	6.7	9	very stiff fine SOIL	120	1.0	81	81	-	-	2.8	9.9	34	2.58	30	N/A	N/A
16.40	74.8	78.1	-	74.7	5.5	-2.5	7.5	9	very stiff fine SOIL	120	1.0	75	78	-	-	2.6	9.9	37	2.62	30	N/A	N/A
16.57	65.8	68.1	-	65.8	4.9	-2.5	7.6	9	very stiff fine SOIL	120	1.0	66	68	-	-	2.3	9.9	39	2.67	30	N/A	N/A
16.73	59.3	60.7	-	59.3	4.3	-1.9	7.4	3	silty CLAY to CLAY	115	1.5	40	40	-	-	4.1	9.9	40	2.69	15	N/A	N/A
16.90	61.2	62.1	-	61.2	4.3	-1.2	7.2	9	very stiff fine SOIL	120	1.0	61	62	-	-	2.1	9.9	39	2.67	30	N/A	N/A
17.06	64.6	64.8	-	64.5	4.9	-1.2	7.7	9	very stiff fine SOIL	120	1.0	65	65	-	-	2.2	9.9	40	2.68	30	N/A	N/A
17.23	68.2	67.8	-	68.2	5.1	-1.2	7.6	9	very stiff fine SOIL	120	1.0	68	68	-	-	2.4	9.9	39	2.67	30	N/A	N/A
17.39	68.5	67.4	-	68.4	4.8	-1.0	7.1	9	very stiff fine SOIL	120	1.0	68	67	-	-	2.4	9.9	38	2.65	30	N/A	N/A
17.55	66.4	64.7	-	66.4	4.8	-2.0	7.3	9	very stiff fine SOIL	120	1.0	66	65	-	-	2.3	9.9	39	2.67	30	N/A	N/A
17.72	78.3	75.6	-	78.2	5.4	-2.5	7.0	9	very stiff fine SOIL	120	1.0	78	76	-	-	2.7	9.9	36	2.61	30	N/A	N/A
17.88	101.9	96.7	272.6	101.8	6.4	-2.1	6.3	9	very stiff fine SOIL	120	1.0	100	97	-	-	3.6	9.9	31	2.51	30	N/A	N/A
18.05	122.7	116.0	281.7	122.7	6.9	-2.0	5.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.3	9.9	28	2.43	30	N/A	N/A
18.21	140.7	132.4	271.0	140.6	6.6	-1.8	4.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.9	9.9	24	2.33	30	N/A	N/A
18.37	153.6	143.9	275.5	153.6	6.9	-1.5	4.5	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.4	9.9	22	2.29	30	N/A	N/A
18.54	157.9	147.2	280.8	157.9	7.1	-0.4	4.6	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.5	9.9	22	2.29	30	N/A	N/A
18.70	145.9	135.4	289.8	145.9	7.5	-0.6	5.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.1	9.9	25	2.36	30	N/A	N/A
18.87	128.2	118.5	299.2	128.2	7.8	-0.7	6.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.5	9.9	28	2.45	30	N/A	N/A
19.03	107.6	99.0	299.9	107.6	7.6	-0.9	7.2	9	very stiff fine SOIL	120	1.0	100	99	-	-	3.8	9.9	33	2.55	30	N/A	N/A
19.19	92.4	82.2	-	92.4	6.7	-1.7	7.3	9	very stiff fine SOIL	120	1.0	92	82	-	-	3.2	9.9	36	2.60	30	N/A	N/A
19.36	86.7	76.4	-	86.6	5.9	-2.2	6.9	9	very stiff fine SOIL	120	1.0	87	76	-	-	3.0	9.9	35	2.60	30	N/A	N/A
19.52	82.7	72.3	-	82.6	5.6	-2.5	6.8	9	very stiff fine SOIL	120	1.0	83	72	-	-	2.9	9.9	36	2.62	30	N/A	N/A
19.69	81.1	70.3	-	81.0	5.5	-2.4	6.9	9	very stiff fine SOIL	120	1.0	81	70	-	-	2.8	9.9	37	2.63	30	N/A	N/A
19.85	85.4	73.4	-	85.4	5.8	-2.2	6.8	9	very stiff fine SOIL	120	1.0	85	73	-	-	3.0	9.9	36	2.61	30	N/A	N/A
20.01	93.9	84.2	266.1	93.8	6.3	-2.4	6.8	9	very stiff fine SOIL	120	1.0	94	84	-	-	3.3	9.9	34	2.57	30	N/A	N/A
20.18	104.7	93.5	271.1	104.7	6.7	-0.2	6.4	9	very stiff fine SOIL	120	1.0	100	93	-	-	3.7	9.9	32	2.53	30	N/A	N/A
20.34	124.1	110.3	272.9	124.0	7.0	-1.7	5.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.3	9.9	28	2.44	30	N/A	N/A
20.51	138.5	122.6	266.7	138.5	6.8	-0.4	5.0	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.9	9.9	25	2.36	30	N/A	N/A
20.67	148.4	130.9	250.5	148.4	6.2	-0.4	4.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.2	9.9	22	2.29	30	N/A	N/A
20.83	165.1	145.0	246.9	165.1	6.0	-0.2	3.7	8	stiff SAND to clayy SAND	115	5.0	33	29	79	42	-	-	19	2.21	16	N/A	N/A
21.00	175.7	153.7	249.9	175.7	6.1	0.0	3.5	8	stiff SAND to clayy SAND	115	5.0	35	31	81	42	-	-	18	2.18	16	N/A	N/A
21.16	197.1	171.8	261.5	197.1	6.5	0.1	3.3	8	stiff SAND to clayy SAND	115	5.0	39	34	85	43	-	-	17	2.14	16	N/A	N/A
21.33	206.2	179.0	264.5	206.2	6.5	0.1	3.2	8	stiff SAND to clayy SAND	115	5.0	41	36	86	43	-	-	16	2.11	16	N/A	N/A
21.49	219.6	190.0	246.7	219.6	5.3	-0.1	2.4	5	silty SAND to sandy SILT	120	3.0	73	63	88	43	-	-	13	2.00	16	N/A	N/A
21.65	251.4	216.6	300.0	251.4	7.8	0.1	3.1	8	stiff SAND to clayy SAND	115	5.0	50	43	93	44	-	-	15	2.06	16	N/A	N/A
21.82	296.6	254.6	280.4	296.6	4.9	0.3	1.7	6	clean SAND to silty SAND	125	5.0	59	51	95	45	-	-	8	1.79	16	N/A	N/A
21.98	242.9	207.7	260.2	242.9	5.6	0.2	2.3	6	clean SAND to silty SAND	125	5.0	49	42	91	44	-	-	12	1.96	16	N/A	N/A
22.15	269.2	229.3	262.0	269.2	4.8	0.4	1.8	6	clean SAND to silty SAND	125	5.0	54	46	94	44	-	-	9	1.85	16	N/A	N/A
22.31	307.9	261.2	267.5	307.9	3.7	0.6	1.2	6	clean SAND to silty SAND	125	5.0	62	52	95	45	-	-	6	1.68	16	N/A	N/A
22.47	313.6	265.0	292.1	313.6	5.4	0.8	1.7	6	clean SAND to silty SAND	125	5.0	63	53	95	45	-	-	8	1.79	16	N/A	N/A
22.64	335.6	282.5	299.9	335.7	5.1	1.7	1.5	6	clean SAND to silty SAND	125	5.0	67	57	95	45	-	-	7	1.74	16	N/A	N/A
22.80	327.4	274.5	336.0	327.4	8.5	0.6	2.6	8	stiff SAND to clayy SAND	115	5.0	65	55	95	45	-	-	11	1.94	16	N/A	N/A
22.97	388.4	324.6	348.8	388.5	6.9	1.0	1.8	6	clean SAND to silty SAND	125	5.0	78	65	95	46	-	-	7	1.75	16	N/A	N/A
23.13	374.4	312.3	342.9	374.5	7.1	1.9	1.9	6	clean SAND to silty SAND	125	5.0	75	62	95	46	-	-	8	1.79	16	0.00	0.0
23.30	453.8	377.8	377.8	453.8	4.7	2.2	1.0	6	clean SAND to silty SAND	125	5.0	91	76	95	46	-	-	5	1.53	16	0.00	0.0
23.46	510.5	424.2	424.2	510.6	6.3	2.5	1.2	6	clean SAND to silty SAND	125	5.0	100	85	95	47	-	-	5	1.56	16	0.00	0.0
23.62	401.1	332.6	342.5	401.1	6.0	2.7	1.5	6	clean SAND to silty SAND	125	5.0	80	67	95	46	-	-	6	1.69	16	0.00	0.0
23.79	368.2	304.8	304.8	368.2	4.2	2.4	1.2	6	clean SAND to silty SAND	125	5.0	74	61	95	45	-	-	5	1.62	16	0.00	0.0
23.95	345.0	285.0	285.0	345.0	4.0	3.3	1.2	6	clean SAND to silty SAND	125	5.0	69	57	95	45	-	-	5	1.64	16	0.00	0.0
24.12	337.3	278.2	283.9	337.4	4.2	3.3	1.3	6	clean SAND to silty SAND	125	5.0	67	56	95	45	-	-	6	1.67	16	0.00	0.0
24.28	333.0	274.1	281.7	333.0	4.3	0.8	1.3	6	clean SAND to silty SAND	125	5.0	67	55	95	45	-	-	6	1.68	16	0.00	0.0
24.44	337.3	277.2	289.7	337.4	4.7	1.0	1.4	6	clean SAND to silty SAND	125	5.0	67	55	95	45	-	-	6	1.71	16	0.00	0.0
24.61	334.5	274.3	291.3	334.5	5.0	0.9	1.5	6	clean SAND to silty SAND	125	5.0	67	55	95	45	-	-	7	1.74	16	0.00	0.0
24.77	341.6	279.7	298.9	341.6	5.3	1.0	1.6	6	clean SAND to silty SAND	125	5.0	68	56	95	45	-	-	7	1.75	16	0.00	0.0
24.94	350.1	286.1	309.6	350.1	5.8	1.2	1.7	6	clean SAND to silty SAND	125	5.0	70	57	95	45	-	-	7	1.77	16	0.00	0.0
25.10	342.4	279.3	307.0	342.5	6.0	1.3	1.8	6	clean SAND to silty SAND	125	5.0	68	56	95	45	-	-	8	1.79	16	0.00	0.0
25.26	348.2	283.5	310.5	348.2	6.1	1.4	1.8	6	clean SAND to silty SAND	125	5.0	70	57	95	45	-	-	8	1.78	16	0.00	0.0
25.43	357.4	290.5	317.6	357.4	6.3	1.1	1.8	6	clean SAND to silty SAND	125	5.0	71	58	95	45	-	-	8	1.78	16	0.00	0.0
25.59	415.9	337.4	367.9	415.9	8.0	1.5	1.9	6	clean SAND to silty SAND	125	5.0	83	67	95	46	-	-	8	1.78	16	0.00	0.0
25.76	454.2	367.8	408.6	454.2	9.9	1.9	2.2	6	clean SAND to silty SAND	125	5.0	91	74	95	46	-	-	8	1.81	16	0.00	0.0
25.92	468.3	378.6	431.4	468.3	11.5	2.0	2.5	8	stiff SAND to clayy SAND	115	5.0	94	76	95	46	-	-	9	1.84	16	0.00	0.0
26.08	470.5	379.8	437.8	470.6	12.1	2.2	2.6	8	stiff SAND to clayy SAND	115	5.0	94	76	95	46	-	-	9	1.86	16	0.00	0.0
26.25	458.7	369.7	418.4	458.7	10.8	2.6	2.4	8	stiff SAND to clayy SAND	115	5.0	92	74	95	46	-	-	9	1.83	16	0.00	0.0
26.41	481.9	387.9	427.6	482.0	10.6	2.7	2.2	8	stiff SAND to clayy SAND	115	5.0	96	78	95	46	-	-	8	1.79	16	0.00	0.0
26.58	436.5	350.8	405.4	436.6	10.8	1.6	2.5	8	stiff SAND to clayy SAND	115	5.0	87	70	95	46	-	-	10	1.86	16	0.00	0.0
26.74	396.7	318.4	366.8	396.8	9.2	1.7	2.3	6	clean SAND to silty SAND	125	5.0	79	64	95	45	-	-	9	1.86	16	0.00	0.0
26.90	311.6	249.6	293.7	311.6	6.6	4.1	2.1	6	clean SAND to silty SAND	125	5.0	62	50	95	44	-	-	10	1.89	16	0.00	0.0
27.07	308.2	246.5	289.8	308.2	6.5	1.3	2.1	6	clean SAND to silty SAND	125	5.0	62	49	95	44	-	-	10	1.89	16	0.00	0.0
27.23	77.3	52.2	-	77.3	4.7	1.3	6.2	3	silty CLAY to CLAY	115	1.5	52	35	-	-	5.4	9.9	39	2.67	15	-	-
27.40	40.0	27.0	-	40.1	1.8	2.8	4.6	3	silty CLAY to CLAY	115	1.5	27	18	-	-	2.7	8.5	45	2.79	15	-	-
27.56	29.0	19.5	-	29.1	1.1	5.2	3.8	3	silty CLAY to CLAY	115	1.5	19	13	-	-	1.9	6.1	49	2.85	15	-	-
27.72	30.1	20.2	-	30.1	1.1	1.5	3.9	3	silty CLAY to CLAY	115	1.5	20	13	-	-	2.0	6.3	48	2.84	15	-	-
27.89	32.4	21.6	-	32.4	1.2	1.8	3.9	3	silty CLAY to CLAY	115	1.5	22	14	-	-	2.2	6.8	47	2.82	15	-	-
28.05	27.4	18.3	-	27.4	1.2	-0.1	4.7	3	silty CLAY to CLAY	115	1.5	18	12	-	-	1.8	5.7	54	2.93	15	-	-
28.22	27.7	18.4	-	27.7	1.0	0.9	3.8	3	silty CLAY to CLAY	115	1.5	18	12	-	-	1.9	5.7	50	2.86	15	-	-
28.38	33.4	22.1	-	33.4	0.9	2.0	2.9	4	clayy SILT to silty CLAY	115	2.0	17	11	-	-	2.3	6.9	42	2.73	15	-	-
28.54	36.3	23.9	-	36.3	1.1	1.8	3.2	4	clayy SILT to silty CLAY	115	2.0	18	12	-	-	2.5	7.5	42	2.72	15	-	-
28.71	42.6	28.0	-	42.6	1.3	2.2	3.3	4	clayy SILT to silty CLAY	115	2.0	21	14	-	-	2.9	8.9	39	2.68	15	-	-
28.87	60.4	47.5	124.1	60.4	1.7	2.9	2.9	4	clayy SILT to silty CLAY	115	2.0	30	24	-	-	4.2	9.9	29	2.47	15	1.22	41.2
29.04	68.5	53.8	114.5	68.5	1.5	1.5	2.2	5	silty SAND to sandy SILT	120	3.0	23	18	47	36	-	-	24	2.35	16	1.89	36.7
29.20	47.4	30.9	-	47.4	1.3	2.2	3.0	4	clayy SILT to silty CLAY	115	2.0	24	15	-	-	3.2	9.8	36	2.62	15	-	-
29.36	43.3	33.9	100.0	43.3	1.0	3.1	2.5	4	clayy SILT to silty CLAY	115	2.0	22	17	-	-	2.9	8.9	32	2.53	15	2.34	51.2
29.53	42.3	27.4	-	42.3	1.1	3.1	2.6	4	clayy SILT to silty CLAY	115	2.0	21	14	-	-	2.9	8.7	36	2.62	15	-	-
29.69	42.0	27.2	-	42.1	1.1	3.2	2.8	4	clayy SILT to silty CLAY	115	2.0	21	14	-	-	2.9	8.6	37	2.64	15	-	-
29.86	42.6	27.5	-	42.6	1.2	3.2	2.9	4	clayy SILT to silty CLAY	115	2.0	21	14	-	-	2.9	8.7	38	2.65	15	-	-
30.02	41.8	26.9	-	41.9	1.2	3.3	3.1	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.8	8.5	39	2.68	15	-	-
30.19	42.3	27.1	-	42.4	1.4	3.3	3.5	4	clayy SILT to silty CLAY	115	2.0	21	14	-	-	2.9	8.6	41	2.71	15	-	-
30.35	45.3	29.0	-	45.3	1.6	3.6	3.6	4	clayy SILT to silty CLAY	115	2.0	23	14	-	-	3.1	9.2	40	2.69	15	-	-
30.51	48.5	31.0	-	48.6	1.7	3.6	3.6	4	clayy SILT to silty CLAY	115	2.0	24	15	-	-	3.3	9.8	39	2.67	15	-	-
30.68	48.7	31.0	-	48.8	2.8	3.0	5.9	3	silty CLAY to CLAY	115	1.5	32	21	-	-	3.3	9.8	47	2.82	15	-	-
30.84	117.6	91.0	200.3	117.7	4.6	4.2	4.0	4	clayy SILT to silty CLAY	115	2.0	59	46	-	-	8.2	9.9	25	2.37	15	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Project ID: Leighton Group
Data File: SDF(002).cpt
CPT Date: 9/28/2017 8:53:05 AM
GW During Test: 23 ft

Sounding ID: CPT-02
Project No: 11753.001
Cone/Rig: DDG1333

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.	qc	qc1n	q1ncs	qt	Slv	pore	Frct	Mat	Material	Unit	Qc	SPT	SPT	Rel	Ftn	Und	OCR	Fin	Ic	Nk	Vol	Cycl
Depth	PS	PS	PS	PS	Stss	prss	Rato	Typ	Behavior	Wght	to	R-N	R-N1	Den	Ang	Shr	-	Ic	SBT	-	Strn	SStn
ft	tsf	-	-	tsf	tsf	(psi)	%	Zon	Description	pcf	N	60%	60%	%	deg	tsf	-	%	Indx	-	%	%
31.01	176.6	136.5	239.0	176.7	6.4	2.4	3.7	8	stiff SAND to clayy SAND	115	5.0	35	27	77	41	-	-	20	2.23	16	0.00	0.0
31.17	206.6	159.4	251.1	206.6	6.9	3.1	3.4	8	stiff SAND to clayy SAND	115	5.0	41	32	82	42	-	-	18	2.16	16	0.00	0.0
31.33	256.4	197.6	258.4	256.5	6.5	3.3	2.5	5	silty SAND to sandy SILT	120	3.0	85	66	89	43	-	-	13	2.01	16	0.00	0.0
31.50	241.5	185.8	242.5	241.6	5.8	2.8	2.4	5	silty SAND to sandy SILT	120	3.0	81	62	87	43	-	-	13	2.00	16	0.00	0.0
31.66	206.6	158.7	223.5	206.6	5.3	2.0	2.6	5	silty SAND to sandy SILT	120	3.0	69	53	82	42	-	-	15	2.07	16	0.00	0.0
31.83	160.2	122.9	231.5	160.2	6.2	1.8	3.9	8	stiff SAND to clayy SAND	115	5.0	32	25	74	41	-	-	22	2.28	16	0.00	0.0
31.99	137.0	105.0	243.1	137.1	6.6	3.2	4.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.8	9.9	26	2.40	30	0.00	0.0
32.15	155.4	118.9	236.6	155.5	6.4	4.0	4.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.4	9.9	23	2.31	30	0.00	0.0
32.32	205.9	157.3	226.1	206.0	5.5	4.4	2.7	5	silty SAND to sandy SILT	120	3.0	69	52	82	42	-	-	16	2.09	16	0.00	0.0
32.48	226.0	172.4	220.5	226.1	4.8	3.6	2.1	5	silty SAND to sandy SILT	120	3.0	75	57	85	42	-	-	13	1.98	16	0.00	0.0
32.65	221.7	168.9	232.1	221.7	5.7	3.2	2.6	5	silty SAND to sandy SILT	120	3.0	74	56	84	42	-	-	14	2.05	16	0.00	0.0
32.81	171.6	130.5	239.1	171.7	6.6	2.9	3.9	8	stiff SAND to clayy SAND	115	5.0	34	26	76	41	-	-	21	2.26	16	0.00	0.0
32.97	143.9	109.3	241.4	144.0	6.6	4.0	4.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.0	9.9	25	2.37	30	0.00	0.0
33.14	99.1	75.2	222.9	99.2	5.4	3.5	5.6	9	very stiff fine SOIL	120	1.0	99	75	-	-	3.4	9.9	32	2.54	30	0.00	0.0
33.30	167.1	126.6	218.4	167.2	5.6	6.0	3.4	5	silty SAND to sandy SILT	120	3.0	56	42	75	41	-	-	20	2.22	16	0.00	0.0
33.47	176.8	133.7	239.4	176.9	6.6	5.4	3.8	8	stiff SAND to clayy SAND	115	5.0	35	27	77	41	-	-	21	2.25	16	0.00	0.0
33.63	180.4	136.3	226.2	180.6	5.9	5.3	3.3	5	silty SAND to sandy SILT	120	3.0	60	45	77	41	-	-	19	2.20	16	0.00	0.0
33.79	96.3	72.6	178.3	96.4	3.7	3.6	4.0	4	clayy SILT to silty CLAY	115	2.0	48	36	-	-	6.7	9.9	28	2.43	15	0.00	0.0
33.96	59.8	35.9	-	59.8	2.5	3.3	4.3	4	clayy SILT to silty CLAY	115	2.0	30	18	-	-	4.1	9.9	39	2.68	15	-	-
34.12	43.3	26.0	-	43.4	1.6	4.1	3.8	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	2.9	8.2	43	2.75	15	-	-
34.29	38.7	23.1	-	38.8	1.1	4.1	2.9	4	clayy SILT to silty CLAY	115	2.0	19	12	-	-	2.6	7.2	41	2.71	15	-	-
34.45	38.6	23.0	-	38.6	1.1	3.9	3.0	4	clayy SILT to silty CLAY	115	2.0	19	12	-	-	2.6	7.2	42	2.72	15	-	-
34.61	43.6	26.0	-	43.7	1.1	3.7	2.7	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.2	38	2.65	15	-	-
34.78	42.8	25.4	-	42.9	1.0	4.0	2.5	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.9	8.0	38	2.65	15	-	-
34.94	52.4	39.2	107.9	52.5	1.3	3.8	2.6	4	clayy SILT to silty CLAY	115	2.0	26	20	-	-	3.6	9.8	31	2.50	15	2.20	51.2
35.11	40.1	23.7	-	40.1	1.2	2.8	3.1	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.4	42	2.73	15	-	-
35.27	30.2	17.8	-	30.2	0.8	3.4	3.0	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.0	5.5	47	2.82	15	-	-
35.43	27.4	16.1	-	27.5	0.6	3.9	2.4	4	clayy SILT to silty CLAY	115	2.0	14	8	-	-	1.8	4.9	46	2.80	15	-	-
35.60	26.4	15.5	-	26.5	0.6	3.9	2.3	4	clayy SILT to silty CLAY	115	2.0	13	8	-	-	1.7	4.7	47	2.81	15	-	-
35.76	28.4	16.6	-	28.5	0.6	4.1	2.1	4	clayy SILT to silty CLAY	115	2.0	14	8	-	-	1.9	5.1	44	2.76	15	-	-
35.93	30.4	17.7	-	30.5	0.6	4.1	2.0	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.0	5.4	41	2.72	15	-	-
36.09	30.9	18.0	-	31.0	0.6	4.0	2.1	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.1	5.5	42	2.73	15	-	-
36.26	29.4	17.1	-	29.5	0.6	3.8	2.4	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.0	5.2	45	2.77	15	-	-
36.42	26.8	15.5	-	26.8	0.6	3.5	2.6	4	clayy SILT to silty CLAY	115	2.0	13	8	-	-	1.8	4.7	48	2.83	15	-	-
36.58	23.9	13.8	-	24.0	0.6	4.1	2.7	3	silty CLAY to CLAY	115	1.5	16	9	-	-	1.6	4.1	51	2.89	15	-	-
36.75	22.8	13.2	-	22.9	0.6	4.2	2.7	3	silty CLAY to CLAY	115	1.5	15	9	-	-	1.5	3.9	52	2.91	15	-	-
36.91	24.5	14.1	-	24.6	0.5	4.4	2.1	4	clayy SILT to silty CLAY	115	2.0	12	7	-	-	1.6	4.2	47	2.82	15	-	-
37.08	26.3	15.1	-	26.4	0.6	4.4	2.3	4	clayy SILT to silty CLAY	115	2.0	13	8	-	-	1.7	4.6	47	2.82	15	-	-
37.24	44.0	25.2	-	44.1	1.1	4.6	2.7	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	7.9	38	2.66	15	-	-
37.40	41.9	23.9	-	41.9	1.1	3.4	2.8	4	clayy SILT to silty CLAY	115	2.0	21	12	-	-	2.8	7.5	40	2.70	15	-	-
37.57	32.4	18.4	-	32.5	1.0	3.9	3.2	3	silty CLAY to CLAY	115	1.5	22	12	-	-	2.2	5.7	48	2.83	15	-	-
37.73	30.4	17.3	-	30.5	0.7	5.2	2.5	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.0	5.3	45	2.79	15	-	-
37.90	34.4	19.5	-	34.5	0.7	6.2	2.1	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.3	6.0	40	2.70	15	-	-
38.06	39.0	22.0	-	39.1	0.8	7.1	2.1	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.6	6.8	38	2.65	15	-	-
38.22	40.3	22.7	-	40.4	1.7	6.9	4.4	3	silty CLAY to CLAY	115	1.5	27	15	-	-	2.7	7.1	48	2.84	15	-	-
38.39	64.2	36.1	-	64.3	2.7	6.0	4.3	4	clayy SILT to silty CLAY	115	2.0	32	18	-	-	4.4	9.9	39	2.68	15	-	-
38.55	77.7	43.6	-	77.8	3.6	3.7	4.7	4	clayy SILT to silty CLAY	115	2.0	39	22	-	-	5.4	9.9	37	2.64	15	-	-
38.72	70.4	39.4	-	70.5	3.8	4.1	5.5	3	silty CLAY to CLAY	115	1.5	47	26	-	-	4.8	9.9	42	2.72	15	-	-
38.88	50.8	28.3	-	50.9	2.9	3.8	6.0	3	silty CLAY to CLAY	115	1.5	34	19	-	-	3.5	8.9	49	2.85	15	-	-
39.04	69.6	50.5	139.4	69.7	2.3	5.2	3.4	4	clayy SILT to silty CLAY	115	2.0	35	25	-	-	4.8	9.9	31	2.50	15	0.57	2.9
39.21	41.0	22.8	-	41.1	1.5	3.8	3.8	3	silty CLAY to CLAY	115	1.5	27	15	-	-	2.8	7.1	45	2.79	15	-	-
39.37	27.4	15.2	-	27.5	0.8	5.8	3.3	3	silty CLAY to CLAY	115	1.5	18	10	-	-	1.8	4.6	52	2.91	15	-	-
39.54	25.9	14.3	-	26.1	0.7	7.0	2.9	3	silty CLAY to CLAY	115	1.5	17	10	-	-	1.7	4.3	52	2.90	15	-	-
39.70	26.0	14.3	-	26.1	0.8	7.1	3.5	3	silty CLAY to CLAY	115	1.5	17	10	-	-	1.7	4.3	55	2.94	15	-	-
39.86	28.3	15.6	-	28.4	0.9	6.9	3.4	3	silty CLAY to CLAY	115	1.5	19	10	-	-	1.9	4.7	52	2.90	15	-	-
40.03	27.3	15.0	-	27.5	1.0	7.3	3.8	3	silty CLAY to CLAY	115	1.5	18	10	-	-	1.8	4.5	55	2.95	15	-	-
40.19	30.2	16.5	-	30.3	1.1	7.5	4.0	3	silty CLAY to CLAY	115	1.5	20	11	-	-	2.0	5.0	54	2.92	15	-	-
40.36	31.2	17.0	-	31.3	1.2	7.6	4.0	3	silty CLAY to CLAY	115	1.5	21	11	-	-	2.1	5.2	53	2.92	15	-	-
40.52	34.7	18.9	-	34.9	1.1	8.2	3.4	3	silty CLAY to CLAY	115	1.5	23	13	-	-	2.3	5.8	48	2.83	15	-	-
40.68	35.3	19.2	-	35.5	1.1	8.1	3.4	3	silty CLAY to CLAY	115	1.5	24	13	-	-	2.4	5.9	48	2.83	15	-	-
40.85	32.6	17.7	-	32.8	1.1	8.5	3.8	3	silty CLAY to CLAY	115	1.5	22	12	-	-	2.2	5.4	51	2.88	15	-	-
41.01	34.0	18.4	-	34.1	1.1	8.7	3.4	3	silty CLAY to CLAY	115	1.5	23	12	-	-	2.3	5.6	48	2.84	15	-	-
41.18	32.5	17.5	-	32.6	1.1	8.8	3.6	3	silty CLAY to CLAY	115	1.5	22	12	-	-	2.2	5.4	50	2.87	15	-	-
41.34	32.1	17.3	-	32.3	1.1	9.1	3.8	3	silty CLAY to CLAY	115	1.5	21	12	-	-	2.1	5.3	52	2.89	15	-	-
41.50	31.2	16.8	-	31.4	1.2	8.7	4.2	3	silty CLAY to CLAY	115	1.5	21	11	-	-	2.1	5.1	54	2.93	15	-	-
41.67	28.5	15.3	-	28.7	1.2	8.6	4.5	3	silty CLAY to CLAY	115	1.5	19	10	-	-	1.9	4.6	57	2.98	15	-	-
41.83	26.0	13.9	-	26.2	1.1	8.1	4.5	3	silty CLAY to CLAY	115	1.5	17	9	-	-	1.7	4.2	60	3.02	15	-	-
42.00	23.6	12.6	-	23.7	1.0	8.0	4.5	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.5	3.7	63	3.06	15	-	-
42.16	23.9	12.7	-	24.1	1.0	8.4	4.8	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.6	3.8	64	3.07	15	-	-
42.32	34.2	18.2	-	34.4	1.9	8.9	5.8	3	silty CLAY to CLAY	115	1.5	23	12	-	-	2.3	5.6	58	3.00	15	-	-
42.49	57.7	30.6	-	57.9	2.1	9.3	3.7	4	clayy SILT to silty CLAY	115	2.0	29	15	-	-	3.9	9.7	40	2.69	15	-	-
42.65	63.9	33.8	-	64.1	2.5	11.1	4.1	4	clayy SILT to silty CLAY	115	2.0	32	17	-	-	4.4	9.9	40	2.69	15	-	-
42.82	49.2	25.9	-	49.4	1.8	10.4	3.9	4	clayy SILT to silty CLAY	115	2.0	25	13	-	-	3.3	8.1	43	2.76	15	-	-
42.98	46.1	24.3	-	46.4	2.9	13.5	6.7	3	silty CLAY to CLAY	115	1.5	31	16	-	-	3.1	7.6	54	2.94	15	-	-
43.15	89.0	46.7	-	89.3	4.0	16.3	4.6	4	clayy SILT to silty CLAY	115	2.0	44	23	-	-	6.2	9.9	36	2.62	15	-	-
43.31	152.1	107.0	207.3	152.4	5.5	14.5	3.7	5	silty SAND to sandy SILT	120	3.0	51	36	69	39	-	-	22	2.30	16	0.00	0.0
43.47	204.5	143.6	217.2	204.7	5.7	8.0	2.8	5	silty SAND to sandy SILT	120	3.0	68	48	79	41	-	-	17	2.13	16	0.00	0.0
43.64	223.3	156.6	240.3	223.4	6.9	4.9	3.1	5	silty SAND to sandy SILT	120	3.0	74	52	82	41	-	-	17	2.14	16	0.00	0.0
43.80	189.1	132.5	257.4	189.2	8.1	3.9	4.3	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.6	9.9	22	2.30	30	0.00	0.0
43.97	159.2	111.4	244.9	159.3	7.3	6.2	4.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.6	9.9	25	2.37	30	0.00	0.0
44.13	207.4	144.9	196.1	207.5	4.5	5.9	2.2	5	silty SAND to sandy SILT	120	3.0	69	48	79	41	-	-	14	2.04	16	0.00	0.0
44.29	206.2	143.9	167.1	206.3	2.6	3.8	1.3	6	clean SAND to silty SAND	125	5.0	41	29	79	41	-	-	10	1.87	16	0.00	0.0
44.46	196.4	136.9	165.0	196.5	2.7	3.3	1.4	6	clean SAND to silty SAND	125	5.0	39	27	77	41	-	-	11	1.92	16	0.00	0.0
44.62	185.0	128.7	165.8	185.0	3.1	3.1	1.7	6	clean SAND to silty SAND	125	5.0	37	26	75	40	-	-	13	1.99	16	0.00	0.0
44.79	188.0	130.7	160.2	188.0	2.7	2.5	1.4	6	clean SAND to silty SAND	125	5.0	38	26	76	40	-	-	11	1.94	16	0.00	0.0
44.95	192.9	133.9	154.2	192.9	2.2	2.2	1.1	6	clean SAND to silty SAND	125	5.0	39	27	77	40	-	-	9	1.86	16	0.33	2.2
45.11	192.3	133.3	151.6	192.3	2.0	1.9	1.1	6	clean SAND to silty SAND	125	5.0	38	27	76	40	-	-	9	1.84	16	0.39	2.4
45.28	189.9	131.5	149.2	189.9	2.0	1.7	1.0	6	clean SAND to silty SAND	125	5.0	38	26	76	40	-	-	9	1.84	16	0.46	2.7
45.44	193.9	134.1	147.2	193.9	1.7	1.5	0.9	6	clean SAND to silty SAND	125	5.0	39	27	77	40	-	-	8	1.79	16	0.53	2.9
45.61	200.5	138.5	146.0	200.5	1.5	1.3	0.7	6	clean SAND to silty SAND	125	5.0	40	28	78	41	-	-	7	1.72	16	0.58	3.1
45.77	204.1	140.8	143.2	204.1	1.3	1.2	0.6	6	clean SAND to silty SAND	125	5.0	41	28	78	41	-	-	6	1.67	16	0.70	3.4
45.93	212.3	146.3	149.6	212.4	1.4	1.1	0.7	6	clean SAND to silty SAND	125	5.0	42	29	80	41	-	-	6	1.68	16	0.47	2.8
46.10	226.4	155.8	160.4	226.4	1.7	1.1	0.8	6	clean SAND to silty SAND	125	5.0	45	31	82	41	-	-	6	1.69	16	0.00	0.0
46.26	242.3	166.5	170.9	242.3	1.9	1.2	0.8	6	clean SAND to silty SAND	125	5.0	48	33	84	42	-	-	6	1.68	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(002).cpt
CPT Date: 9/28/2017 8:53:05 AM
GW During Test: 23 ft

Sounding ID: CPT-02
Project No: 11753.001
Cone/Rig: DDG1333

.	.	*	.	*	.	.	.	*	*	.	.	.	*	*	*	.	.	*	*	*	*	*
.	qc	qc1n	q1ncs	qt	Slv	pore	Frct	Mat	Material	Unit	Qc	SPT	SPT	Rel	Ftn	Und	OCR	Fin	Ic	Nk	Vol	Cycl
Depth	PS	PS	PS	PS	Stss	prss	Rato	Typ	Behavior	Wght	to	R-N	R-N1	Den	Ang	Shr	-	Ic	SBT	-	Strn	SStn
ft	tsf	-	-	tsf	tsf	(psi)	%	Zon	Description	pcf	N	60%	60%	%	deg	tsf	-	%	Indx	-	%	%
46.43	260.8	178.9	188.4	260.8	2.5	1.4	1.0	6	clean SAND to silty SAND	125	5.0	52	36	86	42	-	-	7	1.72	16	0.00	0.0
46.59	265.7	182.1	191.4	265.7	2.6	2.0	1.0	6	clean SAND to silty SAND	125	5.0	53	36	87	42	-	-	7	1.72	16	0.00	0.0
46.75	235.8	161.4	188.6	235.8	3.4	0.9	1.5	6	clean SAND to silty SAND	125	5.0	47	32	83	41	-	-	10	1.88	16	0.00	0.0
46.92	146.6	100.2	168.1	146.6	3.8	1.9	2.6	5	silty SAND to sandy SILT	120	3.0	49	33	67	39	-	-	19	2.20	16	0.00	0.0
47.08	61.0	30.1	-	61.1	2.2	2.5	3.8	4	clayy SILT to silty CLAY	115	2.0	31	15	-	-	4.2	9.5	40	2.70	15	-	-
47.25	45.1	22.2	-	45.2	1.0	6.6	2.4	4	clayy SILT to silty CLAY	115	2.0	23	11	-	-	3.0	6.9	39	2.68	15	-	-
47.41	35.0	17.2	-	35.1	0.8	9.1	2.5	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.3	5.2	45	2.78	15	-	-
47.57	34.8	17.1	-	34.9	0.9	9.5	2.8	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.3	5.2	47	2.82	15	-	-
47.74	32.3	15.8	-	32.5	0.9	9.7	3.0	3	silty CLAY to CLAY	115	1.5	22	11	-	-	2.1	4.8	50	2.86	15	-	-
47.90	28.8	14.1	-	29.0	0.9	10.4	3.6	3	silty CLAY to CLAY	115	1.5	19	9	-	-	1.9	4.2	56	2.96	15	-	-
48.07	28.0	13.7	-	28.2	0.8	10.7	3.1	3	silty CLAY to CLAY	115	1.5	19	9	-	-	1.8	4.1	54	2.93	15	-	-
48.23	27.3	13.3	-	27.5	0.7	10.6	2.8	3	silty CLAY to CLAY	115	1.5	18	9	-	-	1.8	3.9	53	2.92	15	-	-
48.39	25.0	12.1	-	25.2	0.8	10.4	3.8	3	silty CLAY to CLAY	115	1.5	17	8	-	-	1.6	3.6	60	3.03	15	-	-
48.56	24.7	12.0	-	24.9	0.9	10.2	4.2	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.6	3.5	63	3.06	15	-	-
48.72	25.7	12.4	-	25.9	1.0	8.5	4.2	3	silty CLAY to CLAY	115	1.5	17	8	-	-	1.7	3.6	62	3.05	15	-	-
48.89	24.7	11.9	-	24.9	0.9	8.7	4.1	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.6	3.5	62	3.06	15	-	-
49.05	23.6	11.4	-	23.8	0.8	8.7	3.7	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.5	3.3	62	3.05	15	-	-
49.22	22.7	10.9	-	22.8	0.6	8.9	3.2	3	silty CLAY to CLAY	115	1.5	15	7	-	-	1.5	3.1	61	3.03	15	-	-
49.38	22.8	11.0	-	23.0	0.7	9.2	3.6	3	silty CLAY to CLAY	115	1.5	15	7	-	-	1.5	3.2	63	3.06	15	-	-
49.54	26.1	12.5	-	26.3	1.0	9.3	4.1	3	silty CLAY to CLAY	115	1.5	17	8	-	-	1.7	3.7	61	3.04	15	-	-
49.71	24.2	11.6	-	24.4	1.0	9.2	4.7	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.6	3.4	66	3.10	15	-	-
49.87	23.1	11.0	-	23.3	0.8	8.9	4.0	3	silty CLAY to CLAY	115	1.5	15	7	-	-	1.5	3.2	64	3.08	15	-	-

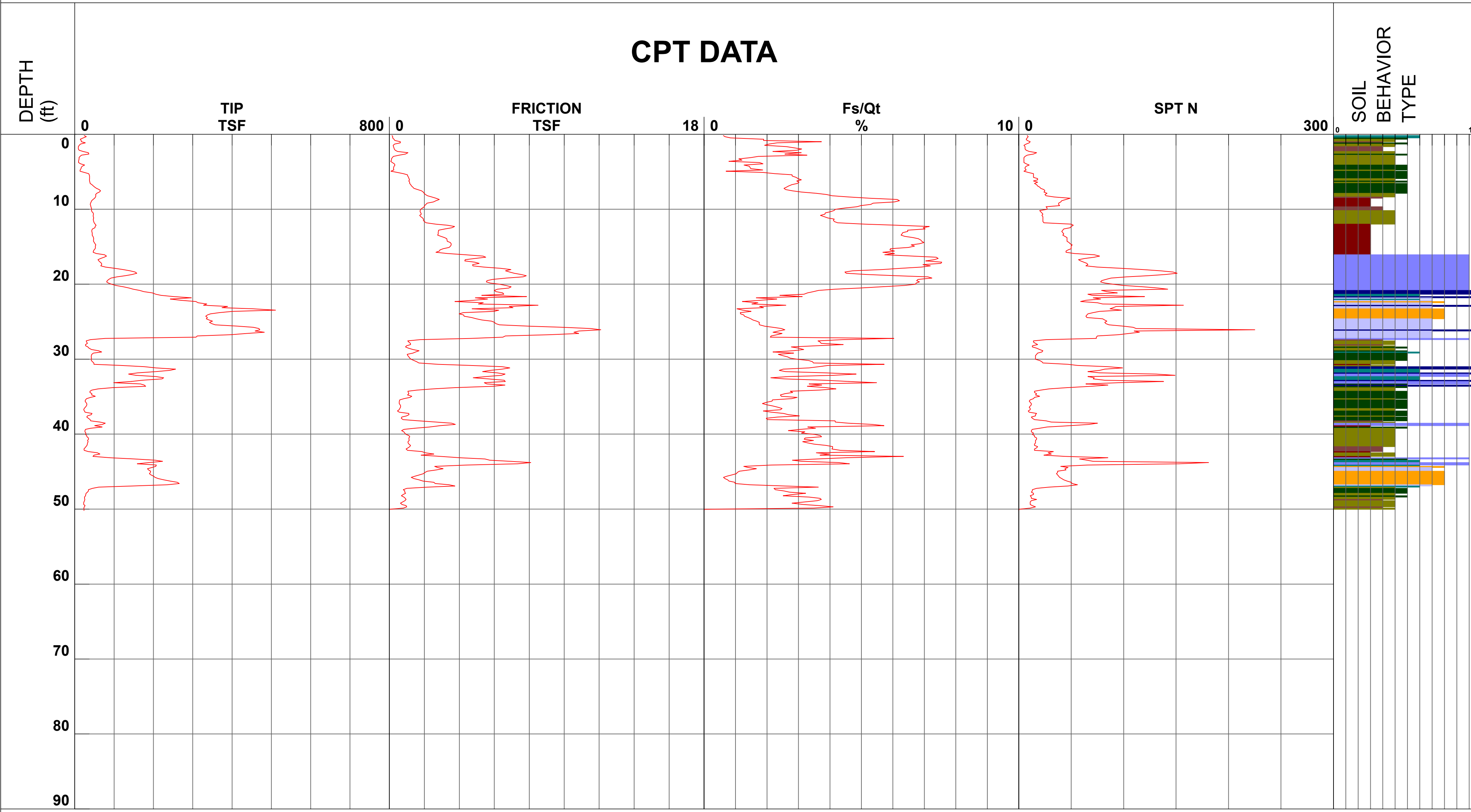
* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	KK RB	Filename	SDF(002).cpt
Job Number	11753.001	Cone Number	DDG1333	GPS	
Hole Number	CPT-02	Date and Time	9/28/2017 8:53:05 AM	Maximum Depth	50.20 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(040).cpt
CPT Date: 9/29/2017 10:13:46 AM
GW During Test: 23 ft

Sounding ID: CPT-03
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	4.8	7.7	-	4.8	0.1	0.1	2.3	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	9.9	61	3.03	15	N/A	N/A
0.49	15.1	24.3	59.4	15.1	0.2	0.1	1.1	5	silty SAND to sandy SILT	120	3.0	5	8	20	48	-	-	28	2.43	16	N/A	N/A
0.66	11.4	18.2	-	11.4	0.2	0.1	1.9	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	39	2.67	15	N/A	N/A
0.82	9.0	14.4	-	9.0	0.4	0.1	4.6	3	silty CLAY to CLAY	115	1.5	6	10	-	-	0.6	9.9	57	2.98	15	N/A	N/A
0.98	7.9	12.6	-	7.9	0.6	0.2	8.3	3	silty CLAY to CLAY	115	1.5	5	8	-	-	0.6	9.9	72	3.19	15	N/A	N/A
1.15	11.8	18.9	-	11.8	0.6	0.0	5.3	3	silty CLAY to CLAY	115	1.5	8	13	-	-	0.8	9.9	54	2.93	15	N/A	N/A
1.31	12.7	20.4	-	12.7	0.6	0.2	4.9	3	silty CLAY to CLAY	115	1.5	8	14	-	-	0.9	9.9	51	2.89	15	N/A	N/A
1.48	16.8	26.9	-	16.8	0.4	0.0	2.6	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.2	9.9	36	2.62	15	N/A	N/A
1.64	24.3	39.0	98.4	24.3	0.5	-0.1	2.2	5	silty SAND to sandy SILT	120	3.0	8	13	36	45	-	-	28	2.45	16	N/A	N/A
1.80	18.8	30.2	-	18.8	0.7	-0.1	3.9	4	clayy SILT to silty CLAY	115	2.0	9	15	-	-	1.3	9.9	40	2.69	15	N/A	N/A
1.97	22.8	36.5	111.9	22.8	0.7	0.0	3.0	4	clayy SILT to silty CLAY	115	2.0	11	18	-	-	1.6	9.9	33	2.56	15	N/A	N/A
2.13	15.7	25.1	77.8	15.7	0.3	-0.3	1.9	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.1	9.9	33	2.56	15	N/A	N/A
2.30	10.7	17.2	-	10.7	0.3	-0.3	3.1	3	silty CLAY to CLAY	115	1.5	7	11	-	-	0.7	9.9	47	2.82	15	N/A	N/A
2.46	12.4	19.9	-	12.4	0.2	-0.1	1.9	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.9	9.9	37	2.64	15	N/A	N/A
2.62	9.3	14.9	-	9.3	0.2	-0.2	2.1	4	clayy SILT to silty CLAY	115	2.0	5	7	-	-	0.6	9.9	45	2.78	15	N/A	N/A
2.79	11.5	18.4	-	11.5	0.3	-0.2	3.0	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	45	2.79	15	N/A	N/A
2.95	17.5	28.1	-	17.5	0.5	-0.3	2.9	4	clayy SILT to silty CLAY	115	2.0	9	14	-	-	1.2	9.9	37	2.64	15	N/A	N/A
3.12	24.4	39.1	88.5	24.4	0.4	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	8	13	36	42	-	-	26	2.39	16	N/A	N/A
3.28	19.0	30.5	77.7	19.0	0.3	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	6	10	28	41	-	-	29	2.45	16	N/A	N/A
3.45	17.6	28.3	75.2	17.6	0.3	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	6	9	25	40	-	-	30	2.48	16	N/A	N/A
3.61	15.6	25.1	74.3	15.6	0.3	-0.3	1.7	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.1	9.9	32	2.54	15	N/A	N/A
3.77	16.1	25.8	68.0	16.1	0.2	-0.3	1.4	5	silty SAND to sandy SILT	120	3.0	5	9	22	39	-	-	29	2.47	16	N/A	N/A
3.94	16.1	25.8	67.4	16.1	0.2	-0.3	1.4	5	silty SAND to sandy SILT	120	3.0	5	9	22	39	-	-	29	2.47	16	N/A	N/A
4.10	14.1	22.6	68.0	14.1	0.2	-0.3	1.5	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	33	2.55	15	N/A	N/A
4.27	15.2	24.4	74.1	15.2	0.3	-0.2	1.7	4	clayy SILT to silty CLAY	115	2.0	8	12	-	-	1.1	9.9	33	2.55	15	N/A	N/A
4.43	15.6	25.1	77.3	15.6	0.3	-0.2	1.9	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.1	9.9	33	2.56	15	N/A	N/A
4.59	15.3	24.5	73.2	15.3	0.3	-0.2	1.7	4	clayy SILT to silty CLAY	115	2.0	8	12	-	-	1.1	9.9	33	2.54	15	N/A	N/A
4.76	16.3	26.1	-	16.3	0.7	-0.3	4.2	3	silty CLAY to CLAY	115	1.5	11	17	-	-	1.1	9.9	44	2.77	15	N/A	N/A
4.92	31.8	50.9	129.4	31.7	1.0	-0.5	3.0	4	clayy SILT to silty CLAY	115	2.0	16	25	-	-	2.2	9.9	29	2.45	15	N/A	N/A
5.09	42.7	68.5	143.1	42.7	1.2	-0.5	2.8	5	silty SAND to sandy SILT	120	3.0	14	23	54	42	-	-	24	2.34	16	N/A	N/A
5.25	45.6	73.1	140.4	45.6	1.2	-0.6	2.6	5	silty SAND to sandy SILT	120	3.0	15	24	57	43	-	-	22	2.29	16	N/A	N/A
5.41	47.3	75.9	136.7	47.3	1.1	-0.6	2.3	5	silty SAND to sandy SILT	120	3.0	16	25	58	43	-	-	21	2.25	16	N/A	N/A
5.58	47.1	75.5	135.2	47.1	1.1	-0.7	2.3	5	silty SAND to sandy SILT	120	3.0	16	25	58	42	-	-	21	2.25	16	N/A	N/A
5.74	46.0	73.8	132.9	46.0	1.0	-0.7	2.3	5	silty SAND to sandy SILT	120	3.0	15	25	57	42	-	-	21	2.25	16	N/A	N/A
5.91	44.6	71.5	134.2	44.5	1.1	-0.6	2.4	5	silty SAND to sandy SILT	120	3.0	15	24	56	42	-	-	22	2.28	16	N/A	N/A
6.07	44.9	72.0	134.0	44.9	1.1	-0.6	2.4	5	silty SAND to sandy SILT	120	3.0	15	24	56	42	-	-	21	2.27	16	N/A	N/A
6.23	45.8	73.5	132.0	45.8	1.0	-0.6	2.3	5	silty SAND to sandy SILT	120	3.0	15	24	57	42	-	-	21	2.25	16	N/A	N/A
6.40	42.7	67.8	122.6	42.7	0.9	-0.7	2.1	5	silty SAND to sandy SILT	120	3.0	14	23	54	41	-	-	21	2.25	16	N/A	N/A
6.56	36.0	56.5	116.8	36.0	0.8	-0.7	2.3	5	silty SAND to sandy SILT	120	3.0	12	19	48	40	-	-	24	2.34	16	N/A	N/A
6.73	33.3	51.5	123.9	33.3	0.9	-0.6	2.8	5	silty SAND to sandy SILT	120	3.0	11	17	45	40	-	-	27	2.42	16	N/A	N/A
6.89	39.1	59.8	137.5	39.1	1.1	-0.6	3.0	4	clayy SILT to silty CLAY	115	2.0	20	30	-	-	2.7	9.9	26	2.40	15	N/A	N/A
7.05	46.5	70.2	158.9	46.5	1.6	-0.7	3.4	4	clayy SILT to silty CLAY	115	2.0	23	35	-	-	3.3	9.9	26	2.39	15	N/A	N/A
7.22	53.9	80.5	174.9	53.8	1.9	-0.7	3.5	4	clayy SILT to silty CLAY	115	2.0	27	40	-	-	3.8	9.9	25	2.36	15	N/A	N/A
7.38	60.4	89.3	182.9	60.4	2.1	-0.7	3.5	5	silty SAND to sandy SILT	120	3.0	20	30	63	42	-	-	24	2.33	16	N/A	N/A
7.55	64.0	93.5	194.6	64.0	2.4	-0.8	3.7	4	clayy SILT to silty CLAY	115	2.0	32	47	-	-	4.5	9.9	24	2.34	15	N/A	N/A
7.71	61.3	88.7	207.2	61.3	2.7	-0.8	4.4	4	clayy SILT to silty CLAY	115	2.0	31	44	-	-	4.3	9.9	27	2.41	15	N/A	N/A
7.87	59.7	85.4	215.8	59.6	2.9	-1.0	4.8	4	clayy SILT to silty CLAY	115	2.0	30	43	-	-	4.2	9.9	28	2.45	15	N/A	N/A
8.04	59.3	84.0	212.5	59.3	2.8	-1.0	4.8	4	clayy SILT to silty CLAY	115	2.0	30	42	-	-	4.2	9.9	29	2.45	15	N/A	N/A
8.20	58.5	82.1	201.4	58.5	2.6	-1.1	4.4	4	clayy SILT to silty CLAY	115	2.0	29	41	-	-	4.1	9.9	28	2.43	15	N/A	N/A
8.37	58.2	80.9	212.3	58.2	2.8	-1.2	4.9	4	clayy SILT to silty CLAY	115	2.0	29	40	-	-	4.1	9.9	29	2.47	15	N/A	N/A
8.53	57.7	79.3	206.5	57.6	2.7	-1.6	4.8	4	clayy SILT to silty CLAY	115	2.0	29	40	-	-	4.0	9.9	29	2.47	15	N/A	N/A
8.69	56.8	77.4	185.0	56.7	2.3	-1.4	4.0	4	clayy SILT to silty CLAY	115	2.0	28	39	-	-	4.0	9.9	27	2.42	15	N/A	N/A
8.86	56.9	76.8	162.2	56.8	1.8	-1.3	3.2	5	silty SAND to sandy SILT	120	3.0	19	26	58	41	-	-	24	2.35	16	N/A	N/A
9.02	57.0	76.3	149.9	57.0	1.6	-1.2	2.8	5	silty SAND to sandy SILT	120	3.0	19	25	58	41	-	-	23	2.31	16	N/A	N/A
9.19	57.6	76.4	146.5	57.6	1.5	-1.2	2.7	5	silty SAND to sandy SILT	120	3.0	19	25	58	41	-	-	22	2.29	16	N/A	N/A
9.35	56.4	74.1	148.7	56.4	1.6	-1.2	2.8	5	silty SAND to sandy SILT	120	3.0	19	25	57	41	-	-	23	2.32	16	N/A	N/A
9.51	54.7	71.2	150.1	54.7	1.6	-1.2	3.0	5	silty SAND to sandy SILT	120	3.0	18	24	56	40	-	-	24	2.35	16	N/A	N/A
9.68	56.5	72.9	156.7	56.5	1.8	-1.2	3.2	5	silty SAND to sandy SILT	120	3.0	19	24	57	40	-	-	25	2.36	16	N/A	N/A
9.84	58.9	75.4	143.4	58.9	1.5	-1.3	2.6	5	silty SAND to sandy SILT	120	3.0	20	25	58	41	-	-	22	2.29	16	N/A	N/A
10.01	58.4	74.1	149.8	58.4	1.7	-1.4	2.9	5	silty SAND to sandy SILT	120	3.0	19	25	57	40	-	-	23	2.32	16	N/A	N/A
10.17	58.1	73.1	150.7	58.0	1.7	-1.7	2.9	5	silty SAND to sandy SILT	120	3.0	19	24	57	40	-	-	24	2.33	16	N/A	N/A
10.34	60.7	75.7	163.2	60.6	2.0	-1.7	3.3	5	silty SAND to sandy SILT	120	3.0	20	25	58	41	-	-	25	2.36	16	N/A	N/A
10.50	63.4	78.5	175.7	63.4	2.3	-1.7	3.7	4	clayy SILT to silty CLAY	115	2.0	32	39	-	-	4.4	9.9	26	2.38	15	N/A	N/A
10.66	60.8	74.6	197.2	60.7	2.8	-1.8	4.6	4	clayy SILT to silty CLAY	115	2.0	30	37	-	-	4.2	9.9	30	2.47	15	N/A	N/A
10.83	59.1	72.0	207.4	59.0	3.0	-1.8	5.2	4	clayy SILT to silty CLAY	115	2.0	30	36	-	-	4.1	9.9	32	2.52	15	N/A	N/A
10.99	57.4	69.5	206.9	57.3	3.0	-1.8	5.3	4	clayy SILT to silty CLAY	115	2.0	29	35	-	-	4.0	9.9	33	2.54	15	N/A	N/A
11.16	55.9	67.1	193.9	55.8	2.7	-1.9	4.9	4	clayy SILT to silty CLAY	115	2.0	28	34	-	-	3.9	9.9	32	2.52	15	N/A	N/A
11.32	55.0	65.7	175.6	55.0	2.3	-1.8	4.2	4	clayy SILT to silty CLAY	115	2.0	28	33	-	-	3.8	9.9	30	2.48	15	N/A	N/A
11.48	54.2	64.2	159.1	54.2	1.9	-1.8	3.6	4	clayy SILT to silty CLAY	115	2.0	27	32	-	-	3.8	9.9	28	2.44	15	N/A	N/A
11.65	56.4	66.3	150.7	56.3	1.8	-1.6	3.2	4	clayy SILT to silty CLAY	115	2.0	28	33	-	-	3.9	9.9	26	2.39	15	N/A	N/A
11.81	58.1	67.8	146.8	58.0	1.7	-1.6	3.0	5	silty SAND to sandy SILT	120	3.0	19	23	54	40	-	-	25	2.36	16	N/A	N/A
11.98	62.4	72.3	148.9	62.3	1.8	-1.7	2.9	5	silty SAND to sandy SILT	120	3.0	21	24	56	40	-	-	24	2.33	16	N/A	N/A
12.14	73.0	84.1	155.5	72.9	2.0	-1.8	2.7	5	silty SAND to sandy SILT	120	3.0	24	28	61	41	-	-	21	2.27	16	N/A	N/A
12.30	80.3	91.9	167.4	80.3	2.3	-1.8	2.9	5	silty SAND to sandy SILT	120	3.0	27	31	64	41	-	-	21	2.26	16	N/A	N/A
12.47	85.0	96.7	174.5	85.0	2.5	-1.9	3.0	5	silty SAND to sandy SILT	120	3.0	28	32	66	41	-	-	21	2.25	16	N/A	N/A
12.63	86.5	97.7	175.9	86.5	2.5	-1.8	3.0	5	silty SAND to sandy SILT	120	3.0	29	33	66	41	-	-	21	2.25	16	N/A	N/A
12.80	89.8	100.7	176.4	89.8	2.6	-1.8	2.9	5	silty SAND to sandy SILT	120	3.0	30	34	67	41	-	-	20	2.23	16	N/A	N/A
12.96	93.5	104.2	175.3	93.5	2.5	-1.7	2.7	5	silty SAND to sandy SILT	120	3.0	31	35	68	42	-	-	19	2.21	16	N/A	N/A
13.12	87.1	96.5	178.9	87.1	2.7	-1.9	3.1	5	silty SAND to sandy SILT	120	3.0	29	32	66	41	-	-	21	2.27	16	N/A	N/A
13.29	84.6	93.0	201.0	84.5	3.3	-1.8	4.0	4	clayy SILT to silty CLAY	115	2.0	42	47	-	-	5.9	9.9	25	2.36	15	N/A	N/A
13.45	92.6	101.2	235.9	92.5	4.4	-2.3	4.8	9	very stiff fine SOIL	120	1.0	93	100	-	-	3.2	9.9	27	2.40	30	N/A	N/A
13.62	92.4	100.4	258.7	92.3	5.2	-2.8	5.6	9	very stiff fine SOIL	120	1.0	92	100	-	-	3.2	9.9	29	2.46	30	N/A	N/A
13.78	87.7	94.7	252.0	87.7	4.9	-3.4	5.7	9	very stiff fine SOIL	120	1.0	88	95	-	-	3.1	9.9	30	2.48	30	N/A	N/A
13.94	83.7	89.9	234.0	83.7	4.4	-2.6	5.3	9	very stiff fine SOIL	120	1.0	84	90	-	-	2.9	9.9	29	2.47	30	N/A	N/A
14.11	77.7	82.9	232.3	77.6	4.3	-2.4	5.6	9	very stiff fine SOIL	120	1.0	78	83	-	-	2.7	9.9	31	2.51	30	N/A	N/A
14.27	76.0	80.6	212.5	75.9	3.7	-2.3	4.9	4	clayy SILT to silty CLAY	115	2.0	38	40	-	-	5.3	9.9	30	2.47	15	N/A	N/A
14.44	77.8	82.1	234.6	77.7	4.4	-2.8	5.7	9	very stiff fine SOIL	120	1.0	78	82	-	-	2.7	9.9	31	2.52	30	N/A	N/A
14.60	58.8	68.6	-	58.8	4.4	-2.3	7.6	9	very stiff fine SOIL	120	1.0	59	69	-	-	2.0	9.9	39	2.67	30	N/A	N/A
14.76	61.4	70.8	-	61.3	4.5	-2.5	7.5	9	very stiff fine SOIL	120	1.0	61	71	-	-	2.1	9.9	38	2.65	30	N/A	N/A
14.93	62.2	70.9	-	62.2	4.7	-2.6	7.6	9	very stiff fine SOIL	120	1.0	62	71	-	-	2.2	9.9	38	2.66	30	N/A	N/A
15.09	66.6	75.1	-	66.6	4.8	-2.8	7.4	9	very stiff fine SOIL	120	1.0	67	75	-	-	2.3	9.9	37	2.63	30	N/A	N/A
15.26	65.8	73.3	-	65.7	5.0	-3.4	7.7	9	very stiff fine SOIL	120	1.0	66	73	-	-	2.3	9.9	38	2.65	30	N/A	N/A
15.42	62.5	68.9	-	62.4	5.0	-2.9	8.1	9	very stiff fine SOIL	120	1.0	62	69	-	-	2.2	9.9	40	2.69	30	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(040).cpt
CPT Date: 9/29/2017 10:13:46 AM
GW During Test: 23 ft

Sounding ID: CPT-03
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	58.6	63.9	-	58.5	4.5	-3.1	7.9	9	very stiff fine SOIL	120	1.0	59	64	-	-	2.0	9.9	40	2.70	30	N/A	N/A
15.75	58.7	63.4	-	58.7	4.0	-2.9	6.9	9	very stiff fine SOIL	120	1.0	59	63	-	-	2.0	9.9	38	2.65	30	N/A	N/A
15.91	60.6	64.7	-	60.5	3.7	-2.5	6.1	9	very stiff fine SOIL	120	1.0	61	65	-	-	2.1	9.9	36	2.61	30	N/A	N/A
16.08	55.8	59.0	-	55.7	3.5	-1.8	6.4	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.9	9.9	38	2.65	15	N/A	N/A
16.24	57.2	58.0	-	57.2	3.1	-1.7	5.5	4	clayy SILT to silty CLAY	115	2.0	29	29	-	-	4.0	9.9	35	2.60	15	N/A	N/A
16.40	62.9	62.2	181.0	62.9	2.9	-1.8	4.6	4	clayy SILT to silty CLAY	115	2.0	31	31	-	-	4.4	9.9	32	2.53	15	N/A	N/A
16.57	56.6	55.7	183.4	56.6	2.9	-1.7	5.2	4	clayy SILT to silty CLAY	115	2.0	28	28	-	-	3.9	9.9	35	2.59	15	N/A	N/A
16.73	47.2	47.9	-	47.1	2.8	-1.8	6.1	3	silty CLAY to CLAY	115	1.5	31	32	-	-	3.3	9.9	40	2.70	15	N/A	N/A
16.90	44.0	44.3	-	43.9	2.4	-1.7	5.7	3	silty CLAY to CLAY	115	1.5	29	30	-	-	3.0	9.9	40	2.69	15	N/A	N/A
17.06	42.5	42.3	-	42.4	2.2	-1.8	5.4	3	silty CLAY to CLAY	115	1.5	28	28	-	-	2.9	9.9	40	2.69	15	N/A	N/A
17.23	41.4	41.0	-	41.4	2.2	-1.9	5.3	3	silty CLAY to CLAY	115	1.5	28	27	-	-	2.9	9.9	40	2.70	15	N/A	N/A
17.39	38.1	37.3	-	38.1	2.3	-1.9	6.1	3	silty CLAY to CLAY	115	1.5	25	25	-	-	2.6	9.9	44	2.77	15	N/A	N/A
17.55	37.3	36.2	-	37.3	2.0	-2.0	5.6	3	silty CLAY to CLAY	115	1.5	25	24	-	-	2.6	9.9	43	2.75	15	N/A	N/A
17.72	34.4	33.0	-	34.3	1.8	-1.3	5.3	3	silty CLAY to CLAY	115	1.5	23	22	-	-	2.4	9.9	44	2.76	15	N/A	N/A
17.88	34.4	32.8	-	34.4	1.6	-1.1	4.8	3	silty CLAY to CLAY	115	1.5	23	22	-	-	2.4	9.9	42	2.73	15	N/A	N/A
18.05	39.2	37.0	-	39.2	1.7	-0.8	4.4	4	clayy SILT to silty CLAY	115	2.0	20	19	-	-	2.7	9.9	39	2.67	15	N/A	N/A
18.21	42.3	39.6	-	42.2	1.9	-1.3	4.6	4	clayy SILT to silty CLAY	115	2.0	21	20	-	-	2.9	9.9	38	2.66	15	N/A	N/A
18.37	41.1	38.1	-	41.0	2.0	-1.5	5.0	3	silty CLAY to CLAY	115	1.5	27	25	-	-	2.8	9.9	40	2.70	15	N/A	N/A
18.54	40.6	37.4	-	40.6	1.8	-1.1	4.6	4	clayy SILT to silty CLAY	115	2.0	20	19	-	-	2.8	9.9	40	2.68	15	N/A	N/A
18.70	38.5	35.1	-	38.5	1.7	-0.7	4.6	3	silty CLAY to CLAY	115	1.5	26	23	-	-	2.6	9.9	40	2.70	15	N/A	N/A
18.87	36.6	33.1	-	36.6	1.7	-0.5	4.9	3	silty CLAY to CLAY	115	1.5	24	22	-	-	2.5	9.9	43	2.74	15	N/A	N/A
19.03	34.5	30.9	-	34.5	1.8	-0.5	5.3	3	silty CLAY to CLAY	115	1.5	23	21	-	-	2.4	9.9	45	2.79	15	N/A	N/A
19.19	32.1	28.5	-	32.1	1.7	-0.7	5.6	3	silty CLAY to CLAY	115	1.5	21	19	-	-	2.2	9.1	48	2.83	15	N/A	N/A
19.36	28.9	25.5	-	28.9	1.6	-0.7	5.6	3	silty CLAY to CLAY	115	1.5	19	17	-	-	2.0	8.1	50	2.87	15	N/A	N/A
19.52	26.3	23.0	-	26.3	1.3	-0.1	5.1	3	silty CLAY to CLAY	115	1.5	18	15	-	-	1.8	7.3	50	2.87	15	N/A	N/A
19.69	24.2	21.0	-	24.2	1.1	0.2	4.7	3	silty CLAY to CLAY	115	1.5	16	14	-	-	1.6	6.6	51	2.88	15	N/A	N/A
19.85	21.8	18.8	-	21.8	0.9	0.3	4.6	3	silty CLAY to CLAY	115	1.5	15	13	-	-	1.5	5.9	53	2.91	15	N/A	N/A
20.01	25.0	21.3	-	25.0	1.0	0.3	4.4	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.7	49	2.85	15	N/A	N/A
20.18	26.9	22.7	-	26.9	1.1	0.0	4.3	3	silty CLAY to CLAY	115	1.5	18	15	-	-	1.8	7.2	48	2.83	15	N/A	N/A
20.34	23.2	19.5	-	23.2	1.1	-0.2	5.1	3	silty CLAY to CLAY	115	1.5	15	13	-	-	1.6	6.1	54	2.93	15	N/A	N/A
20.51	22.8	19.0	-	22.8	1.1	-0.2	4.9	3	silty CLAY to CLAY	115	1.5	15	13	-	-	1.5	5.9	53	2.92	15	N/A	N/A
20.67	27.4	22.7	-	27.4	1.1	0.1	4.1	3	silty CLAY to CLAY	115	1.5	18	15	-	-	1.9	7.2	47	2.81	15	N/A	N/A
20.83	25.6	21.0	-	25.6	1.2	-0.8	4.8	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.6	51	2.88	15	N/A	N/A
21.00	25.7	20.9	-	25.7	1.2	0.3	5.0	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.6	52	2.90	15	N/A	N/A
21.16	25.4	20.5	-	25.4	1.3	0.0	5.3	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.4	53	2.92	15	N/A	N/A
21.33	25.6	20.5	-	25.6	1.3	0.1	5.4	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.4	54	2.93	15	N/A	N/A
21.49	26.5	21.1	-	26.5	1.3	0.3	5.0	3	silty CLAY to CLAY	115	1.5	18	14	-	-	1.8	6.6	52	2.90	15	N/A	N/A
21.65	25.8	20.3	-	25.8	1.2	0.3	4.9	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.4	52	2.90	15	N/A	N/A
21.82	25.8	20.2	-	25.8	1.1	0.7	4.6	3	silty CLAY to CLAY	115	1.5	17	13	-	-	1.7	6.3	51	2.89	15	N/A	N/A
21.98	24.7	19.2	-	24.7	1.1	0.5	4.7	3	silty CLAY to CLAY	115	1.5	16	13	-	-	1.7	6.0	53	2.91	15	N/A	N/A
22.15	22.7	17.5	-	22.7	1.1	0.2	4.9	3	silty CLAY to CLAY	115	1.5	15	12	-	-	1.5	5.5	56	2.96	15	N/A	N/A
22.31	21.5	16.5	-	21.6	0.9	0.5	4.6	3	silty CLAY to CLAY	115	1.5	14	11	-	-	1.4	5.1	56	2.96	15	N/A	N/A
22.47	22.7	17.2	-	22.7	0.9	0.7	4.0	3	silty CLAY to CLAY	115	1.5	15	11	-	-	1.5	5.4	52	2.91	15	N/A	N/A
22.64	21.7	16.4	-	21.8	0.8	0.6	4.1	3	silty CLAY to CLAY	115	1.5	14	11	-	-	1.4	5.1	54	2.93	15	N/A	N/A
22.80	19.9	14.9	-	19.9	0.8	0.7	4.1	3	silty CLAY to CLAY	115	1.5	13	10	-	-	1.3	4.6	56	2.96	15	N/A	N/A
22.97	18.8	14.0	-	18.8	0.7	1.3	4.0	3	silty CLAY to CLAY	115	1.5	13	9	-	-	1.2	4.3	57	2.98	15	N/A	N/A
23.13	18.5	13.8	-	18.5	0.7	1.1	4.1	3	silty CLAY to CLAY	115	1.5	12	9	-	-	1.2	4.2	58	2.99	15	-	-
23.30	18.5	13.7	-	18.5	0.7	1.2	4.2	3	silty CLAY to CLAY	115	1.5	12	9	-	-	1.2	4.2	58	3.00	15	-	-
23.46	18.7	13.8	-	18.7	0.8	1.2	4.4	3	silty CLAY to CLAY	115	1.5	12	9	-	-	1.2	4.2	59	3.01	15	-	-
23.62	20.6	15.2	-	20.6	0.8	1.3	4.0	3	silty CLAY to CLAY	115	1.5	14	10	-	-	1.4	4.7	55	2.95	15	-	-
23.79	26.5	19.4	-	26.5	0.8	1.2	3.3	3	silty CLAY to CLAY	115	1.5	18	13	-	-	1.8	6.1	46	2.81	15	-	-
23.95	32.9	24.0	-	32.9	1.0	0.6	3.3	4	clayy SILT to silty CLAY	115	2.0	16	12	-	-	2.2	7.6	42	2.73	15	-	-
24.12	26.4	19.2	-	26.4	1.2	-1.0	5.0	3	silty CLAY to CLAY	115	1.5	18	13	-	-	1.8	6.0	54	2.93	15	-	-
24.28	23.8	17.3	-	23.7	1.3	-0.9	5.6	3	silty CLAY to CLAY	115	1.5	16	12	-	-	1.6	5.4	58	3.00	15	-	-
24.44	22.9	16.6	-	22.9	1.1	-0.9	5.2	3	silty CLAY to CLAY	115	1.5	15	11	-	-	1.5	5.1	58	2.99	15	-	-
24.61	22.7	16.4	-	22.7	1.2	-1.0	5.4	3	silty CLAY to CLAY	115	1.5	15	11	-	-	1.5	5.1	59	3.01	15	-	-
24.77	20.1	14.5	-	20.1	1.1	-0.8	5.8	3	silty CLAY to CLAY	115	1.5	13	10	-	-	1.3	4.4	63	3.07	15	-	-
24.94	17.5	12.6	-	17.5	0.8	-0.1	5.3	3	silty CLAY to CLAY	115	1.5	12	8	-	-	1.1	3.8	65	3.09	15	-	-
25.10	14.7	10.5	-	14.7	0.7	0.3	5.2	3	silty CLAY to CLAY	115	1.5	10	7	-	-	0.9	3.1	70	3.16	15	-	-
25.26	15.4	10.9	-	15.4	0.7	0.6	4.9	3	silty CLAY to CLAY	115	1.5	10	7	-	-	1.0	3.3	67	3.12	15	-	-
25.43	18.7	13.3	-	18.7	0.8	0.7	4.8	3	silty CLAY to CLAY	115	1.5	12	9	-	-	1.2	4.0	62	3.05	15	-	-
25.59	27.0	19.2	-	27.0	1.1	0.5	4.3	3	silty CLAY to CLAY	115	1.5	18	13	-	-	1.8	6.0	51	2.89	15	-	-
25.76	28.0	19.8	-	28.0	1.4	-0.9	5.4	3	silty CLAY to CLAY	115	1.5	19	13	-	-	1.9	6.2	55	2.94	15	-	-
25.92	34.7	24.5	-	34.8	1.8	0.1	5.3	3	silty CLAY to CLAY	115	1.5	23	16	-	-	2.4	7.7	50	2.86	15	-	-
26.08	81.9	66.7	126.7	81.9	1.8	-0.7	2.3	5	silty SAND to sandy SILT	120	3.0	27	22	54	37	-	-	22	2.28	16	0.89	5.3
26.25	111.3	90.4	124.2	111.3	1.6	-0.5	1.4	5	silty SAND to sandy SILT	120	3.0	37	30	64	39	-	-	14	2.05	16	1.15	5.3
26.41	106.3	86.2	124.7	106.2	1.7	-0.6	1.6	5	silty SAND to sandy SILT	120	3.0	35	29	62	39	-	-	16	2.10	16	1.12	5.3
26.58	104.5	84.6	125.8	104.5	1.7	-0.6	1.7	5	silty SAND to sandy SILT	120	3.0	35	28	61	39	-	-	16	2.12	16	1.04	5.1
26.74	136.7	110.5	141.7	136.7	1.9	-0.7	1.4	6	clean SAND to silty SAND	125	5.0	27	22	70	40	-	-	13	1.99	16	0.35	2.0
26.90	181.7	146.6	163.2	181.6	1.9	-0.5	1.1	6	clean SAND to silty SAND	125	5.0	36	29	80	42	-	-	8	1.81	16	0.00	0.0
27.07	217.4	175.1	184.4	217.4	2.1	-0.2	1.0	6	clean SAND to silty SAND	125	5.0	43	35	85	43	-	-	7	1.72	16	0.00	0.0
27.23	231.6	186.3	194.4	231.6	2.3	-0.3	1.0	6	clean SAND to silty SAND	125	5.0	46	37	88	43	-	-	6	1.71	16	0.00	0.0
27.40	233.1	187.2	195.4	233.1	2.3	-0.2	1.0	6	clean SAND to silty SAND	125	5.0	47	37	88	43	-	-	6	1.71	16	0.00	0.0
27.56	223.2	178.9	184.5	223.2	2.0	-0.2	0.9	6	clean SAND to silty SAND	125	5.0	45	36	86	43	-	-	6	1.69	16	0.00	0.0
27.72	220.7	176.5	185.3	220.6	2.1	-0.3	1.0	6	clean SAND to silty SAND	125	5.0	44	35	86	43	-	-	6	1.72	16	0.00	0.0
27.89	227.4	181.6	189.7	227.4	2.2	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	45	36	87	43	-	-	6	1.71	16	0.00	0.0
28.05	243.8	194.3	201.1	243.8	2.4	-0.7	1.0	6	clean SAND to silty SAND	125	5.0	49	39	89	43	-	-	6	1.70	16	0.00	0.0
28.22	249.5	198.5	205.3	249.4	2.5	-0.7	1.0	6	clean SAND to silty SAND	125	5.0	50	40	90	43	-	-	6	1.69	16	0.00	0.0
28.38	252.5	200.6	205.8	252.5	2.4	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	50	40	90	43	-	-	6	1.68	16	0.00	0.0
28.54	243.7	193.3	198.0	243.6	2.3	-0.8	0.9	6	clean SAND to silty SAND	125	5.0	49	39	89	43	-	-	6	1.68	16	0.00	0.0
28.71	234.0	185.3	189.6	234.0	2.1	-0.9	0.9	6	clean SAND to silty SAND	125	5.0	47	37	87	43	-	-	6	1.68	16	0.00	0.0
28.87	224.7	177.6	184.3	224.7	2.0	-0.8	0.9	6	clean SAND to silty SAND	125	5.0	45	36	86	43	-	-	6	1.70	16	0.00	0.0
29.04	211.1	166.6	177.1	211.1	2.0	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	42	33	84	42	-	-	7	1.74	16	0.00	0.0
29.20	203.4	160.2	176.8	203.4	2.3	-0.7	1.1	6	clean SAND to silty SAND	125	5.0	41	32	83	42	-	-	8	1.80	16	0.00	0.0
29.36	217.2	170.8	189.5	217.2	2.6	-0.8	1.2	6	clean SAND to silty SAND	125	5.0	43	34	85	42	-	-	8	1.80	16	0.00	0.0
29.53	233.8	183.6	203.9	233.8	3.1	-0.9	1.3	6	clean SAND to silty SAND	125	5.0	47	37	87	43	-	-	8	1.81	16	0.00	0.0
29.69	235.4	184.5	205.5	235.4	3.1	-0.8	1.3	6	clean SAND to silty SAND	125	5.0	47	37	87	43	-	-	8	1.81	16	0.00	0.0
29.86	249.2	195.0	214.1	249.2	3.3	-0.8	1.3	6	clean SAND to silty SAND	125	5.0	50	39	89	43	-	-	8	1.79	16	0.00	0.0
30.02	272.2	212.7	228.8	272.2	3.5	-0.8	1.3	6	clean SAND to silty SAND	125	5.0	54	43	92	43	-	-	7	1.76	16	0.00	0.0
30.19	282.4	220.3	235.9	282.4	3.7	-1.3	1.3	6	clean SAND to silty SAND	125	5.0	56	44	93	44	-	-	7	1.75	16	0.00	0.0
30.35	298.9	232.7	245.8	298.9	3.8	-1.3	1.3	6	clean SAND to silty SAND	125	5.0	60	47	95	44	-	-	7	1.73	16	0.00	0.0
30.51	340.5	264.7	267.7	340.5	4.0	-1.6	1.2	6	clean SAND to silty SAND	125	5.0	68	53	95	44	-	-	5	1.66	16	0.00	0.0
30.68	393.7	305.5	305.5	393.7	4.4	-1.5	1.1	6	clean SAND to silty SAND	125	5.0	79	61	95	45	-	-	5	1.61	16	0.00	0.0
30.84	324.8	251.6	265.9	324.8	4.4	-2.0	1.4	6	clean SAND to silty SAND	125	5.0	65	50	95	44	-	-	7	1.73	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

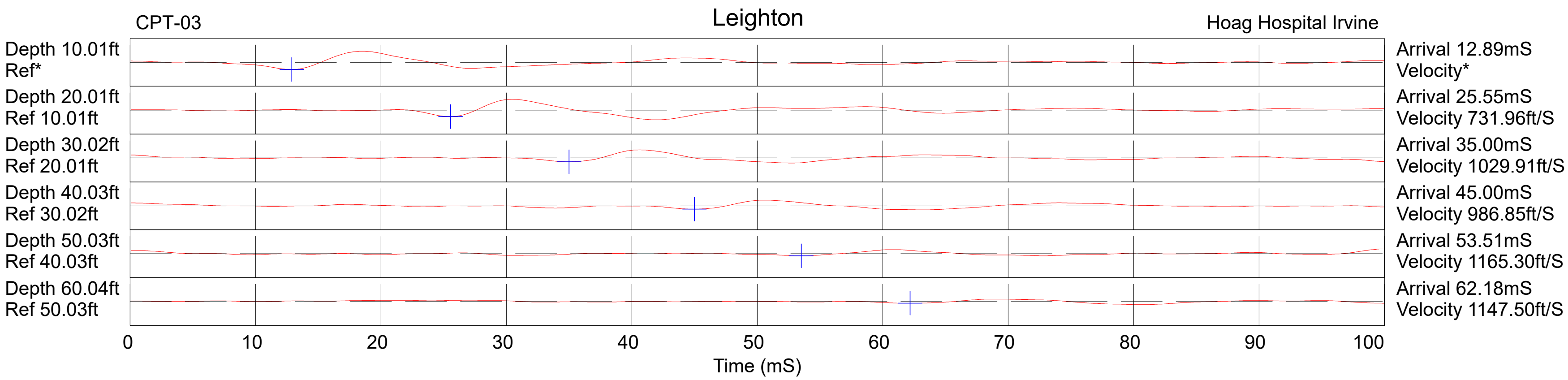
Project ID: Leighton Group
Data File: SDF(040).cpt
CPT Date: 9/29/2017 10:13:46 AM
GW During Test: 23 ft

Sounding ID: CPT-03
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
31.01	199.2	154.1	232.1	199.2	5.9	-1.1	3.0	5	silty SAND to sandy SILT	120	3.0	66	51	81	42	-	-	17	2.13	16	0.00	0.0
31.17	108.5	83.8	170.9	108.5	3.5	-1.1	3.3	5	silty SAND to sandy SILT	120	3.0	36	28	61	38	-	-	24	2.33	16	0.00	0.0
31.33	59.3	45.8	127.9	59.3	1.8	-0.6	3.2	4	clayy SILT to silty CLAY	115	2.0	30	23	-	-	4.1	9.9	31	2.51	15	1.06	46.0
31.50	52.2	40.2	112.9	52.2	1.4	-1.2	2.7	4	clayy SILT to silty CLAY	115	2.0	26	20	-	-	3.6	9.9	31	2.51	15	2.04	51.2
31.66	52.3	40.3	109.9	52.3	1.3	-1.1	2.6	4	clayy SILT to silty CLAY	115	2.0	26	20	-	-	3.6	9.9	30	2.49	15	2.16	51.2
31.83	47.8	29.9	-	47.8	1.2	-0.9	2.7	4	clayy SILT to silty CLAY	115	2.0	24	15	-	-	3.3	9.5	36	2.60	15	-	-
31.99	39.6	24.7	-	39.6	1.1	-1.3	2.8	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.8	40	2.68	15	-	-
32.15	35.3	22.0	-	35.3	1.0	-1.3	2.9	4	clayy SILT to silty CLAY	115	2.0	18	11	-	-	2.4	6.9	42	2.74	15	-	-
32.32	36.2	22.5	-	36.2	1.0	-1.3	2.8	4	clayy SILT to silty CLAY	115	2.0	18	11	-	-	2.4	7.0	41	2.72	15	-	-
32.48	37.4	23.2	-	37.4	1.0	-1.3	2.7	4	clayy SILT to silty CLAY	115	2.0	19	12	-	-	2.5	7.3	40	2.70	15	-	-
32.65	39.7	24.5	-	39.7	1.0	-1.3	2.7	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.7	39	2.67	15	-	-
32.81	41.3	25.4	-	41.2	1.1	-1.5	2.9	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.8	8.0	39	2.68	15	-	-
32.97	40.3	24.7	-	40.3	1.3	-1.6	3.4	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.8	42	2.73	15	-	-
33.14	40.8	25.0	-	40.8	1.4	-1.7	3.6	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.8	7.8	43	2.75	15	-	-
33.30	41.7	25.5	-	41.7	1.5	-1.8	3.8	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.8	8.0	43	2.75	15	-	-
33.47	42.8	26.1	-	42.8	1.6	-1.8	3.8	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.9	8.2	43	2.75	15	-	-
33.63	41.7	25.3	-	41.7	1.6	-1.7	4.1	3	silty CLAY to CLAY	115	1.5	28	17	-	-	2.8	8.0	45	2.78	15	-	-
33.79	41.2	25.0	-	41.2	1.5	-2.0	3.9	4	clayy SILT to silty CLAY	115	2.0	21	12	-	-	2.8	7.8	44	2.77	15	-	-
33.96	39.6	23.9	-	39.6	1.3	-1.9	3.5	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.5	43	2.76	15	-	-
34.12	35.1	21.2	-	35.1	1.1	-2.0	3.3	4	clayy SILT to silty CLAY	115	2.0	18	11	-	-	2.4	6.6	45	2.78	15	-	-
34.29	31.8	19.1	-	31.8	0.8	-2.0	2.6	4	clayy SILT to silty CLAY	115	2.0	16	10	-	-	2.1	5.9	44	2.76	15	-	-
34.45	32.2	19.3	-	32.2	0.9	-2.1	3.1	4	clayy SILT to silty CLAY	115	2.0	16	10	-	-	2.2	6.0	46	2.80	15	-	-
34.61	29.8	17.8	-	29.7	0.9	-1.9	3.2	3	silty CLAY to CLAY	115	1.5	20	12	-	-	2.0	5.5	48	2.83	15	-	-
34.78	33.5	20.0	-	33.4	0.8	-1.8	2.6	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.2	6.2	42	2.73	15	-	-
34.94	34.6	20.6	-	34.6	0.9	-2.0	2.7	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.3	6.4	42	2.73	15	-	-
35.11	35.0	20.8	-	34.9	1.1	-2.0	3.2	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.4	6.4	45	2.78	15	-	-
35.27	33.0	19.5	-	33.0	1.4	-2.0	4.5	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.0	52	2.89	15	-	-
35.43	43.8	25.8	-	43.7	1.4	-2.0	3.4	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.1	42	2.72	15	-	-
35.60	37.9	22.3	-	37.9	1.5	-0.3	4.2	3	silty CLAY to CLAY	115	1.5	25	15	-	-	2.6	7.0	48	2.83	15	-	-
35.76	51.1	30.0	-	51.1	1.9	-0.1	3.8	4	clayy SILT to silty CLAY	115	2.0	26	15	-	-	3.5	9.5	41	2.70	15	-	-
35.93	73.3	54.5	141.4	73.3	2.3	-0.2	3.3	4	clayy SILT to silty CLAY	115	2.0	37	27	-	-	5.1	9.9	29	2.46	15	0.48	2.3
36.09	149.0	110.6	149.7	149.0	2.5	-0.4	1.7	5	silty SAND to sandy SILT	120	3.0	50	37	70	40	-	-	14	2.04	16	0.34	2.1
36.26	160.9	119.3	164.1	160.8	3.0	-2.1	1.9	5	silty SAND to sandy SILT	120	3.0	54	40	73	40	-	-	14	2.05	16	0.00	0.0
36.42	93.4	69.2	135.3	93.4	2.3	-2.5	2.5	5	silty SAND to sandy SILT	120	3.0	31	23	55	37	-	-	23	2.30	16	0.81	5.0
36.58	50.3	37.2	106.0	50.3	1.2	-2.1	2.6	4	clayy SILT to silty CLAY	115	2.0	25	19	-	-	3.4	9.2	31	2.52	15	2.23	51.2
36.75	39.7	22.9	-	39.6	0.8	-1.6	2.2	4	clayy SILT to silty CLAY	115	2.0	20	11	-	-	2.7	7.2	38	2.65	15	-	-
36.91	36.2	20.9	-	36.2	0.8	-1.5	2.3	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.4	6.5	40	2.69	15	-	-
37.08	37.1	21.3	-	37.0	0.8	-1.4	2.3	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.5	6.6	40	2.68	15	-	-
37.24	35.0	20.1	-	34.9	0.8	-1.2	2.4	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.3	6.2	41	2.71	15	-	-
37.40	32.5	18.6	-	32.5	0.7	-1.1	2.4	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.2	5.7	43	2.74	15	-	-
37.57	31.1	17.8	-	31.1	0.8	-1.0	2.6	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.1	5.4	45	2.78	15	-	-
37.73	31.9	18.2	-	31.9	0.8	-0.9	2.6	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.1	5.6	45	2.78	15	-	-
37.90	35.0	19.9	-	35.0	0.8	-0.9	2.4	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.3	6.1	42	2.72	15	-	-
38.06	32.8	18.6	-	32.7	0.8	-0.8	2.6	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.2	5.7	44	2.77	15	-	-
38.22	29.9	16.9	-	29.9	0.9	-0.9	3.1	3	silty CLAY to CLAY	115	1.5	20	11	-	-	2.0	5.2	49	2.85	15	-	-
38.39	34.7	19.6	-	34.7	0.8	-0.8	2.4	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.3	6.0	42	2.72	15	-	-
38.55	37.4	21.0	-	37.4	0.8	-0.8	2.2	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.5	6.5	39	2.68	15	-	-
38.72	36.2	20.3	-	36.2	0.8	-0.7	2.5	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.4	6.3	42	2.72	15	-	-
38.88	33.1	18.5	-	33.1	0.8	-0.8	2.6	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.2	5.7	44	2.77	15	-	-
39.04	32.3	18.1	-	32.3	0.9	-0.8	2.9	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.2	5.5	46	2.80	15	-	-
39.21	33.3	18.5	-	33.3	0.8	-0.7	2.7	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.2	5.7	45	2.77	15	-	-
39.37	34.9	19.4	-	34.9	1.2	-0.7	3.7	3	silty CLAY to CLAY	115	1.5	23	13	-	-	2.3	6.0	49	2.84	15	-	-
39.54	41.4	23.0	-	41.4	1.6	-0.6	4.2	3	silty CLAY to CLAY	115	1.5	28	15	-	-	2.8	7.2	47	2.82	15	-	-
39.70	54.0	29.9	-	54.0	2.0	-0.3	4.0	4	clayy SILT to silty CLAY	115	2.0	27	15	-	-	3.7	9.4	41	2.71	15	-	-
39.86	52.5	29.0	-	52.5	2.7	-0.3	5.4	3	silty CLAY to CLAY	115	1.5	35	19	-	-	3.6	9.1	47	2.81	15	-	-
40.03	45.3	24.9	-	45.3	2.9	-0.2	6.8	3	silty CLAY to CLAY	115	1.5	30	17	-	-	3.1	7.8	54	2.94	15	-	-
40.19	63.7	35.0	-	63.7	3.2	0.7	5.2	3	silty CLAY to CLAY	115	1.5	42	23	-	-	4.4	9.9	43	2.74	15	-	-
40.36	76.5	55.0	156.6	76.6	2.9	0.8	3.9	4	clayy SILT to silty CLAY	115	2.0	38	28	-	-	5.3	9.9	31	2.52	15	0.20	0.5
40.52	61.8	33.8	-	61.8	2.8	0.9	4.7	3	silty CLAY to CLAY	115	1.5	41	23	-	-	4.2	9.9	42	2.72	15	-	-
40.68	64.5	35.2	-	64.6	3.1	1.1	5.0	3	silty CLAY to CLAY	115	1.5	43	23	-	-	4.4	9.9	42	2.73	15	-	-
40.85	89.4	48.7	-	89.5	5.0	1.3	5.8	3	silty CLAY to CLAY	115	1.5	60	32	-	-	6.2	9.9	39	2.67	15	-	-
41.01	102.9	55.9	-	102.9	5.3	1.2	5.3	4	clayy SILT to silty CLAY	115	2.0	51	28	-	-	7.1	9.9	35	2.60	15	-	-
41.18	157.0	112.2	203.6	157.1	5.2	1.9	3.4	5	silty SAND to sandy SILT	120	3.0	52	37	71	40	-	-	21	2.26	16	0.00	0.0
41.34	209.3	149.4	211.1	209.3	5.2	1.8	2.5	5	silty SAND to sandy SILT	120	3.0	70	50	80	41	-	-	15	2.08	16	0.00	0.0
41.50	232.7	165.9	218.7	232.8	5.2	1.5	2.3	5	silty SAND to sandy SILT	120	3.0	78	55	84	42	-	-	13	2.01	16	0.00	0.0
41.67	250.6	178.4	231.4	250.6	5.7	1.4	2.3	5	silty SAND to sandy SILT	120	3.0	84	59	86	42	-	-	13	2.00	16	0.00	0.0
41.83	268.7	191.1	234.5	268.7	5.4	1.4	2.0	6	clean SAND to silty SAND	125	5.0	54	38	88	42	-	-	11	1.94	16	0.00	0.0
42.00	284.3	201.9	235.3	284.3	5.0	0.9	1.8	6	clean SAND to silty SAND	125	5.0	57	40	90	43	-	-	10	1.87	16	0.00	0.0
42.16	290.9	206.4	241.9	291.0	5.3	0.7	1.8	6	clean SAND to silty SAND	125	5.0	58	41	91	43	-	-	10	1.88	16	0.00	0.0
42.32	287.9	203.9	226.7	287.9	4.1	0.5	1.5	6	clean SAND to silty SAND	125	5.0	58	41	91	43	-	-	8	1.81	16	0.00	0.0
42.49	293.7	207.8	232.7	293.7	4.4	-0.1	1.5	6	clean SAND to silty SAND	125	5.0	59	42	91	43	-	-	9	1.82	16	0.00	0.0
42.65	317.2	224.1	243.6	317.2	4.5	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	63	45	94	43	-	-	8	1.77	16	0.00	0.0
42.82	380.1	268.1	268.1	380.0	3.9	-1.1	1.0	6	clean SAND to silty SAND	125	5.0	76	54	95	44	-	-	5	1.61	16	0.00	0.0
42.98	426.5	300.5	300.5	426.5	3.9	-1.2	0.9	6	clean SAND to silty SAND	125	5.0	85	60	95	45	-	-	5	1.55	16	0.00	0.0
43.15	443.9	312.2	312.2	443.8	4.6	-1.5	1.0	6	clean SAND to silty SAND	125	5.0	89	62	95	45	-	-	5	1.58	16	0.00	0.0
43.31	441.5	310.2	309.2	441.5	5.5	-1.5	1.2	6	clean SAND to silty SAND	125	5.0	88	62	95	45	-	-	5	1.64	16	0.00	0.0
43.47	433.8	304.4	314.1	433.8	6.1	-1.5	1.4	6	clean SAND to silty SAND	125	5.0	87	61	95	45	-	-	6	1.69	16	0.00	0.0
43.64	437.8	306.8	316.6	437.8	6.2	-1.3	1.4	6	clean SAND to silty SAND	125	5.0	88	61	95	45	-	-	6	1.69	16	0.00	0.0
43.80	440.1	308.0	314.0	440.1	5.9	-1.2	1.4	6	clean SAND to silty SAND	125	5.0	88	62	95	45	-	-	6	1.67	16	0.00	0.0
43.97	438.7	306.5	314.7	438.6	6.1	-1.0	1.4	6	clean SAND to silty SAND	125	5.0	88	61	95	45	-	-	6	1.68	16	0.00	0.0
44.13	439.3	306.6	325.9	439.3	7.1	-1.5	1.6	6	clean SAND to silty SAND	125	5.0	88	61	95	45	-	-	7	1.74	16	0.00	0.0
44.29	439.1	306.0	328.8	439.0	7.4	-1.8	1.7	6	clean SAND to silty SAND	125	5.0	88	61	95	45	-	-	7	1.75	16	0.00	0.0
44.46	420.0	292.3	307.5	419.9	6.3	-1.7	1.5	6	clean SAND to silty SAND	125	5.0	84	58	95	44	-	-	7	1.72	16	0.00	0.0
44.62	385.9	268.2	280.2	385.9	5.2	-2.0	1.4	6	clean SAND to silty SAND	125	5.0	77	54	95	44	-	-	6	1.71	16	0.00	0.0
44.79	356.7	247.6	253.6	356.7	4.1	-1.3	1.2	6	clean SAND to silty SAND	125	5.0	71	50	95	44	-	-	6	1.68	16	0.00	0.0
44.95	362.7	251.5	251.5	362.7	3.7	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	73	50	95	44	-	-	5	1.64	16	0.00	0.0
45.11	364.7	252.5	252.5	364.7	3.0	-0.4	0.8	6	clean SAND to silty SAND	125	5.0	73	51	95	44	-	-	5	1.56	16	0.00	0.0
45.28	349.2	241.5	241.5	349.2	3.3	0.0	0.9	6	clean SAND to silty SAND	125	5.0	70	48	95	43	-	-	5	1.62	16	0.00	0.0
45.44	337.4	233.0	233.0	337.4	2.9	0.2	0.9	6	clean SAND to silty SAND	125	5.0	67	47	95	43	-	-	5	1.60	16	0.00	0.0
45.61	337.9	233.1	243.4	337.9	4.1	0.5	1.2	6	clean SAND to silty SAND	125	5.0	68	47	95	43	-	-	6	1.71	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing



Hammer to Rod String Distance (ft): 5.83
* = Not Determined

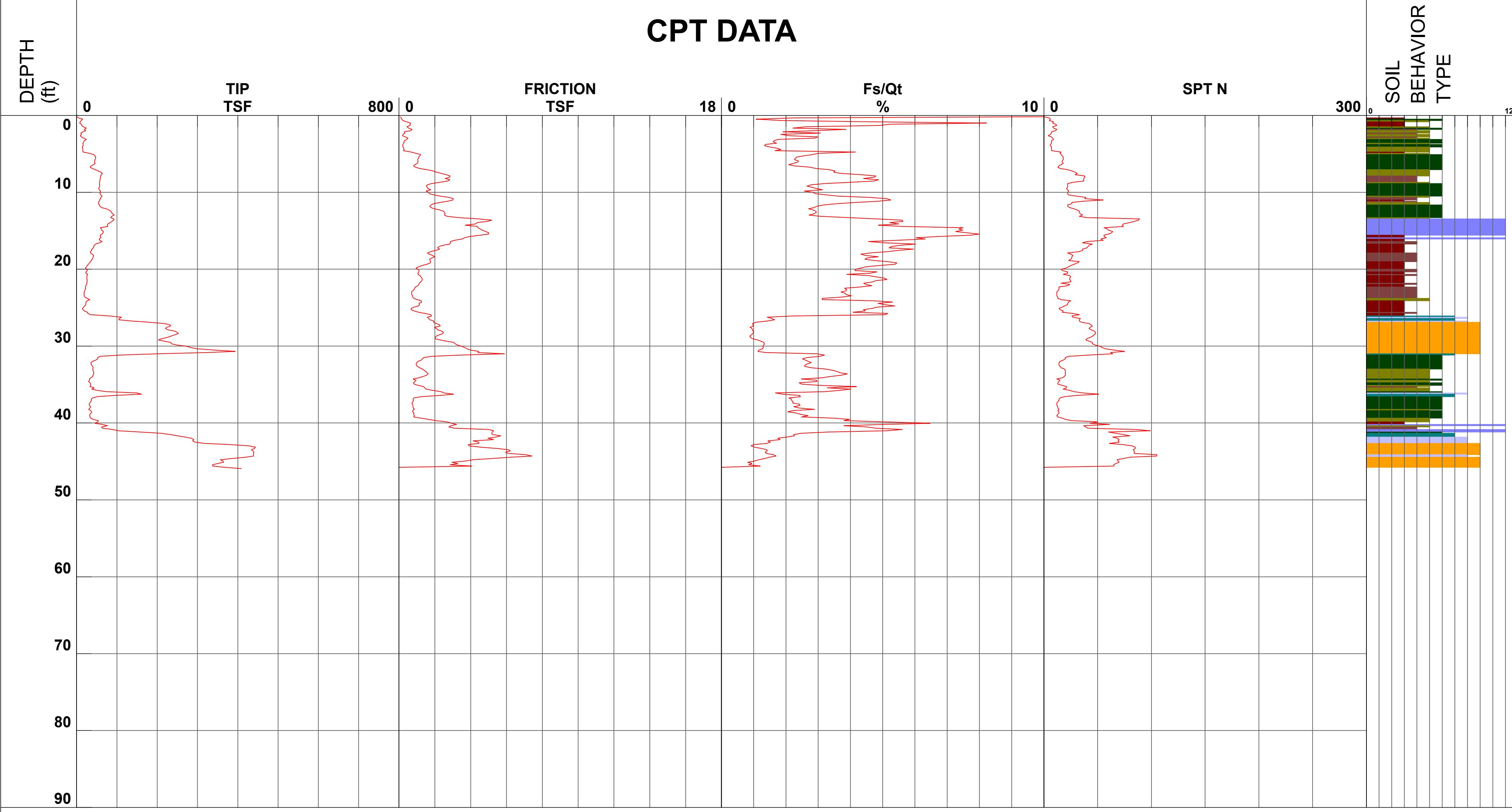
COMMENT:

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(040).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-03	Date and Time	9/29/2017 10:13:46 AM	Maximum Depth	45.93 ft
EST GW Depth During Test			23.00 ft		

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(003).cpt
CPT Date: 9/28/2017 9:48:38 AM
GW During Test: 23 ft

Page: 1
Sounding ID: CPT-04
Project No: 11753.001
Cone/Rig: DDG1333

. . Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	12.9	20.7	-	12.9	0.3	-0.1	2.7	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.9	9.9	41	2.71	15	N/A	N/A
0.49	14.9	23.8	-	14.9	0.4	0.0	2.6	4	clayy SILT to silty CLAY	115	2.0	7	12	-	-	1.0	9.9	38	2.66	15	N/A	N/A
0.66	13.3	21.4	65.9	13.3	0.2	-0.3	1.5	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	0.9	9.9	33	2.56	15	N/A	N/A
0.82	6.5	10.4	-	6.5	0.0	0.1	0.5	5	silty SAND to sandy SILT	120	3.0	2	3	5	42	-	-	36	2.61	16	N/A	N/A
0.98	5.4	8.6	26.3	5.4	0.0	0.0	0.1	1	sensitive fine SOIL	115	2.0	3	4	-	-	0.4	9.9	33	2.55	15	N/A	N/A
1.15	5.1	8.2	-	5.1	0.1	0.0	1.7	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.4	9.9	55	2.95	15	N/A	N/A
1.31	6.0	9.7	-	6.0	0.3	0.0	4.5	3	silty CLAY to CLAY	115	1.5	4	6	-	-	0.4	9.9	66	3.11	15	N/A	N/A
1.48	11.0	17.6	-	11.0	0.5	0.0	4.6	3	silty CLAY to CLAY	115	1.5	7	12	-	-	0.8	9.9	53	2.92	15	N/A	N/A
1.64	17.6	28.2	-	17.6	0.5	0.1	2.8	4	clayy SILT to silty CLAY	115	2.0	9	14	-	-	1.2	9.9	36	2.62	15	N/A	N/A
1.80	9.0	14.4	-	9.0	0.2	0.0	2.1	4	clayy SILT to silty CLAY	115	2.0	4	7	-	-	0.6	9.9	45	2.78	15	N/A	N/A
1.97	7.8	12.4	-	7.8	0.1	-0.1	1.1	4	clayy SILT to silty CLAY	115	2.0	4	6	-	-	0.5	9.9	41	2.70	15	N/A	N/A
2.13	5.8	9.4	-	5.8	0.0	-0.1	0.7	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	9.9	41	2.71	15	N/A	N/A
2.30	4.7	7.5	-	4.7	0.0	-0.2	0.1	1	sensitive fine SOIL	115	2.0	2	4	-	-	0.3	9.9	37	2.63	15	N/A	N/A
2.46	4.4	7.0	-	4.4	0.0	0.0	0.1	1	sensitive fine SOIL	115	2.0	2	3	-	-	0.3	9.8	38	2.65	15	N/A	N/A
2.62	4.6	7.4	-	4.6	0.0	0.0	0.3	1	sensitive fine SOIL	115	2.0	2	4	-	-	0.3	9.7	40	2.69	15	N/A	N/A
2.79	4.2	6.8	-	4.2	0.0	-0.2	0.1	1	sensitive fine SOIL	115	2.0	2	3	-	-	0.3	8.3	39	2.68	15	N/A	N/A
2.95	3.6	5.7	-	3.6	0.0	0.1	0.2	1	sensitive fine SOIL	115	2.0	2	3	-	-	0.2	6.6	45	2.79	15	N/A	N/A
3.12	4.4	7.0	-	4.4	0.0	0.1	0.7	4	clayy SILT to silty CLAY	115	2.0	2	4	-	-	0.3	7.7	49	2.85	15	N/A	N/A
3.28	6.7	10.7	-	6.7	0.3	0.1	4.3	3	silty CLAY to CLAY	115	1.5	4	7	-	-	0.5	9.9	64	3.08	15	N/A	N/A
3.45	12.2	19.6	-	12.2	0.5	0.0	4.3	3	silty CLAY to CLAY	115	1.5	8	13	-	-	0.9	9.9	50	2.86	15	N/A	N/A
3.61	18.1	29.0	-	18.1	0.6	-0.2	3.2	4	clayy SILT to silty CLAY	115	2.0	9	15	-	-	1.3	9.9	38	2.65	15	N/A	N/A
3.77	12.0	19.3	-	12.0	0.3	0.1	2.2	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.8	9.9	40	2.69	15	N/A	N/A
3.94	8.1	13.0	-	8.1	0.1	0.0	1.1	4	clayy SILT to silty CLAY	115	2.0	4	7	-	-	0.6	9.9	40	2.69	15	N/A	N/A
4.10	6.6	10.6	-	6.6	0.1	-0.1	0.8	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	8.9	41	2.71	15	N/A	N/A
4.27	5.8	9.4	-	5.8	0.0	0.0	0.9	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	7.5	44	2.77	15	N/A	N/A
4.43	5.0	8.1	-	5.0	0.0	0.0	0.8	4	clayy SILT to silty CLAY	115	2.0	3	4	-	-	0.3	6.2	47	2.82	15	N/A	N/A
4.59	4.3	6.8	-	4.3	0.0	0.0	0.3	1	sensitive fine SOIL	115	2.0	2	3	-	-	0.3	5.0	44	2.76	15	N/A	N/A
4.76	4.1	6.5	-	4.1	0.0	0.1	0.3	1	sensitive fine SOIL	115	2.0	2	3	-	-	0.3	4.6	45	2.79	15	N/A	N/A
4.92	5.1	8.1	-	5.1	0.2	0.0	4.2	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	5.6	71	3.17	15	N/A	N/A
5.09	8.6	13.8	-	8.6	0.7	0.0	8.9	3	silty CLAY to CLAY	115	1.5	6	9	-	-	0.6	9.4	73	3.19	15	N/A	N/A
5.25	21.1	33.8	-	21.1	1.2	-0.1	5.8	3	silty CLAY to CLAY	115	1.5	14	23	-	-	1.5	9.9	45	2.78	15	N/A	N/A
5.41	24.9	39.9	-	24.9	1.6	-0.6	6.7	3	silty CLAY to CLAY	115	1.5	17	27	-	-	1.7	9.9	45	2.78	15	N/A	N/A
5.58	26.5	42.4	-	26.5	1.8	-0.8	6.8	3	silty CLAY to CLAY	115	1.5	18	28	-	-	1.8	9.9	44	2.76	15	N/A	N/A
5.74	27.0	43.3	-	26.9	1.8	-1.7	6.7	3	silty CLAY to CLAY	115	1.5	18	29	-	-	1.9	9.9	43	2.75	15	N/A	N/A
5.91	31.2	50.1	-	31.2	2.0	-0.9	6.6	3	silty CLAY to CLAY	115	1.5	21	33	-	-	2.2	9.9	41	2.71	15	N/A	N/A
6.07	33.8	54.2	-	33.8	2.3	-1.0	7.0	3	silty CLAY to CLAY	115	1.5	23	36	-	-	2.4	9.9	40	2.70	15	N/A	N/A
6.23	33.5	53.8	-	33.5	2.4	-1.0	7.4	3	silty CLAY to CLAY	115	1.5	22	36	-	-	2.3	9.9	42	2.72	15	N/A	N/A
6.40	34.2	54.9	-	34.2	2.5	-1.0	7.2	3	silty CLAY to CLAY	115	1.5	23	37	-	-	2.4	9.9	41	2.71	15	N/A	N/A
6.56	34.3	55.1	-	34.3	2.5	-1.1	7.5	3	silty CLAY to CLAY	115	1.5	23	37	-	-	2.4	9.9	41	2.72	15	N/A	N/A
6.73	34.9	55.9	-	34.9	2.4	-1.5	7.0	3	silty CLAY to CLAY	115	1.5	23	37	-	-	2.4	9.9	40	2.69	15	N/A	N/A
6.89	34.1	54.6	-	34.0	2.3	-1.6	6.9	3	silty CLAY to CLAY	115	1.5	23	36	-	-	2.4	9.9	40	2.69	15	N/A	N/A
7.05	34.8	55.8	-	34.8	2.4	-1.5	6.8	3	silty CLAY to CLAY	115	1.5	23	37	-	-	2.4	9.9	40	2.68	15	N/A	N/A
7.22	37.6	60.3	-	37.6	2.5	-1.4	6.7	3	silty CLAY to CLAY	115	1.5	25	40	-	-	2.6	9.9	38	2.65	15	N/A	N/A
7.38	40.0	64.2	-	40.0	2.6	-0.8	6.6	9	very stiff fine SOIL	120	1.0	40	64	-	-	1.4	9.9	37	2.64	30	N/A	N/A
7.55	44.0	70.5	-	44.0	2.9	-0.8	6.8	9	very stiff fine SOIL	120	1.0	44	71	-	-	1.5	9.9	36	2.62	30	N/A	N/A
7.71	49.7	72.3	239.7	49.7	3.2	0.1	6.5	9	very stiff fine SOIL	120	1.0	50	72	-	-	1.7	9.9	35	2.60	30	N/A	N/A
7.87	54.7	78.9	236.5	54.7	3.2	-0.2	6.0	9	very stiff fine SOIL	120	1.0	55	79	-	-	1.9	9.9	33	2.54	30	N/A	N/A
8.04	63.1	89.9	242.7	63.1	3.5	-0.3	5.6	9	very stiff fine SOIL	120	1.0	63	90	-	-	2.2	9.9	30	2.49	30	N/A	N/A
8.20	66.0	93.1	264.0	66.0	4.1	-0.2	6.2	9	very stiff fine SOIL	120	1.0	66	93	-	-	2.3	9.9	31	2.51	30	N/A	N/A
8.37	67.7	94.6	286.8	67.7	4.7	-0.7	7.0	9	very stiff fine SOIL	120	1.0	68	95	-	-	2.4	9.9	33	2.55	30	N/A	N/A
8.53	66.4	91.7	292.2	66.3	4.8	-0.9	7.4	9	very stiff fine SOIL	120	1.0	66	92	-	-	2.3	9.9	34	2.58	30	N/A	N/A
8.69	62.7	85.8	272.1	62.7	4.3	-1.1	7.0	9	very stiff fine SOIL	120	1.0	63	86	-	-	2.2	9.9	34	2.57	30	N/A	N/A
8.86	59.3	80.4	266.9	59.3	4.2	-1.1	7.1	9	very stiff fine SOIL	120	1.0	59	80	-	-	2.1	9.9	35	2.60	30	N/A	N/A
9.02	57.1	88.4	277.2	57.1	4.0	-1.7	7.0	9	very stiff fine SOIL	120	1.0	57	88	-	-	2.0	9.9	34	2.57	30	N/A	N/A
9.19	57.7	76.8	252.1	57.7	3.9	-1.6	6.7	9	very stiff fine SOIL	120	1.0	58	77	-	-	2.0	9.9	35	2.59	30	N/A	N/A
9.35	59.5	78.5	252.4	59.5	3.9	-0.8	6.6	9	very stiff fine SOIL	120	1.0	60	78	-	-	2.1	9.9	34	2.58	30	N/A	N/A
9.51	57.2	85.1	279.2	57.2	4.1	-1.0	7.3	9	very stiff fine SOIL	120	1.0	57	85	-	-	2.0	9.9	35	2.59	30	N/A	N/A
9.68	54.9	88.1	-	54.9	4.2	-0.9	7.7	9	very stiff fine SOIL	120	1.0	55	88	-	-	1.9	9.9	35	2.60	30	N/A	N/A
9.84	54.9	79.7	-	54.9	4.1	-1.1	7.5	9	very stiff fine SOIL	120	1.0	55	80	-	-	1.9	9.9	36	2.62	30	N/A	N/A
10.01	58.4	83.8	263.2	58.4	3.9	-1.0	6.7	9	very stiff fine SOIL	120	1.0	58	84	-	-	2.0	9.9	34	2.57	30	N/A	N/A
10.17	64.1	80.9	235.0	64.1	3.7	-0.9	5.8	9	very stiff fine SOIL	120	1.0	64	81	-	-	2.2	9.9	32	2.53	30	N/A	N/A
10.34	63.7	79.7	234.1	63.6	3.7	-0.8	5.8	9	very stiff fine SOIL	120	1.0	64	80	-	-	2.2	9.9	32	2.53	30	N/A	N/A
10.50	56.5	70.2	201.4	56.5	2.8	-0.8	5.0	4	clayy SILT to silty CLAY	115	2.0	28	35	-	-	4.0	9.9	32	2.52	15	N/A	N/A
10.66	36.0	44.4	134.6	36.0	1.3	-0.5	3.6	4	clayy SILT to silty CLAY	115	2.0	18	22	-	-	2.5	9.9	33	2.55	15	N/A	N/A
10.83	27.9	44.2	-	27.9	1.3	-0.4	4.9	4	clayy SILT to silty CLAY	115	2.0	14	22	-	-	1.9	9.9	38	2.65	15	N/A	N/A
10.99	46.2	62.0	198.8	46.2	2.5	0.0	5.4	4	clayy SILT to silty CLAY	115	2.0	23	31	-	-	3.2	9.9	34	2.58	15	N/A	N/A
11.16	62.8	75.6	223.0	62.8	3.5	-0.4	5.6	9	very stiff fine SOIL	120	1.0	63	76	-	-	2.2	9.9	32	2.53	30	N/A	N/A
11.32	69.6	83.2	259.1	69.6	4.5	-0.3	6.6	9	very stiff fine SOIL	120	1.0	70	83	-	-	2.4	9.9	34	2.56	30	N/A	N/A
11.48	75.9	90.1	265.0	75.9	4.8	-0.5	6.4	9	very stiff fine SOIL	120	1.0	76	90	-	-	2.7	9.9	32	2.53	30	N/A	N/A
11.65	76.9	90.6	261.0	76.9	4.7	-1.2	6.2	9	very stiff fine SOIL	120	1.0	77	91	-	-	2.7	9.9	32	2.52	30	N/A	N/A
11.81	75.3	88.1	235.0	75.3	4.0	-1.5	5.4	9	very stiff fine SOIL	120	1.0	75	88	-	-	2.6	9.9	30	2.48	30	N/A	N/A
11.98	73.3	85.2	253.3	73.3	4.5	-1.2	6.2	9	very stiff fine SOIL	120	1.0	73	85	-	-	2.6	9.9	32	2.54	30	N/A	N/A
12.14	74.9	86.5	268.8	74.9	5.0	-0.9	6.8	9	very stiff fine SOIL	120	1.0	75	86	-	-	2.6	9.9	34	2.56	30	N/A	N/A
12.30	73.2	83.9	268.3	73.2	5.0	-0.9	6.9	9	very stiff fine SOIL	120	1.0	73	84	-	-	2.6	9.9	34	2.58	30	N/A	N/A
12.47	65.0	79.8	-	65.0	4.9	-1.5	7.6	9	very stiff fine SOIL	120	1.0	65	80	-	-	2.3	9.9	37	2.63	30	N/A	N/A
12.63	67.9	82.5	268.3	67.8	4.7	-1.2	7.0	9	very stiff fine SOIL	120	1.0	68	82	-	-	2.4	9.9	35	2.59	30	N/A	N/A
12.80	61.5	74.1	-	61.5	4.4	-1.1	7.2	9	very stiff fine SOIL	120	1.0	62	74	-	-	2.1	9.9	37	2.63	30	N/A	N/A
12.96	52.4	69.2	-	52.4	3.9	-0.4	7.5	9	very stiff fine SOIL	120	1.0	52	69	-	-	1.8	9.9	38	2.66	30	N/A	N/A
13.12	50.3	65.6	-	50.3	3.2	0.2	6.5	9	very stiff fine SOIL	120	1.0	50	66	-	-	1.8	9.9	37	2.63	30	N/A	N/A
13.29	51.0	65.6	-	51.0	3.3	0.3	6.5	9	very stiff fine SOIL	120	1.0	51	66	-	-	1.8	9.9	36	2.62	30	N/A	N/A
13.45	51.2	65.0	-	51.2	3.3	0.2	6.5	9	very stiff fine SOIL	120	1.0	51	65	-	-	1.8	9.9	37	2.63	30	N/A	N/A
13.62	51.5	64.6	-	51.5	3.4	0.2	6.7	9	very stiff fine SOIL	120	1.0	52	65	-	-	1.8	9.9	37	2.64	30	N/A	N/A
13.78	50.4	62.4	-	50.4	3.5	0.4	7.0	9	very stiff fine SOIL	120	1.0	50	62	-	-	1.8	9.9	39	2.67	30	N/A	N/A
13.94	49.2	60.2	-	49.2	3.4	1.1	7.0	3	silty CLAY to CLAY	115	1.5	33	40	-	-	3.4	9.9	39	2.67	15	N/A	N/A
14.11	47.1	57.0	-	47.2	3.2	1.7	7.0	3	silty CLAY to CLAY	115	1.5	31	38	-	-	3.3	9.9	40	2.69	15	N/A	N/A
14.27	45.4	54.3	-	45.4	3.1	1.2	7.0	3	silty CLAY to CLAY	115	1.5	30	36	-	-	3.1	9.9	41	2.70	15	N/A	N/A
14.44	45.9	54.3	-	45.9	3.0	1.5	6.6	3	silty CLAY to CLAY	115	1.5	31	36	-	-	3.2	9.9	39	2.68	15	N/A	N/A
14.60	44.4	52.0	-	44.4	2.8	1.2	6.5	3	silty CLAY to CLAY	115	1.5	30	35	-	-	3.1	9.9	40	2.69	15	N/A	N/A
14.76	44.1	51.1	-	44.1	2.7	0.4	6.3	3	silty CLAY to CLAY	115	1.5	29	34	-	-	3.1	9.9	40	2.68	15	N/A	N/A
14.93	45.9	52.5	-	45.9	2.6	1.5	5.8	3	silty CLAY to CLAY	115	1.5	31	35	-	-	3.2	9.9	38	2.65	15	N/A	N/A
15.09	46.2	52.3	-	46.2	2.5	1.3	5.5	4	clayy SILT to silty CLAY	115	2.0	23	26	-	-	3.2	9.9	37	2.63	15	N/A	N/A
15.26	48.2	54.0	-	48.2	2.5	1.5	5.2	4	clayy SILT to silty CLAY	115	2.0	24	27	-	-	3.3	9.9	36	2.61	15	N/A	N/A
15.42	50.0	52.8	-	50.0	2.6	-0.6	5.2	4	clayy SILT to silty CLAY	115	2.0	25	26	-	-	3.5	9.9	36	2.61	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Project ID: Leighton Group
Data File: SDF(003).cpt
CPT Date: 9/28/2017 9:48:38 AM
GW During Test: 23 ft

Sounding ID: CPT-04
Project No: 11753.001
Cone/Rig: DDG1333

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR - -	* Fin Ic %	* Ic SBT Indx	* Nk - -	* Vol Strn %	* Cycl SStn %
15.58	50.9	55.8	-	50.9	2.9	-0.3	5.7	3	silty CLAY to CLAY	115	1.5	34	37	-	-	3.5	9.9	37	2.63	15	N/A	N/A
15.75	55.4	60.1	-	55.4	3.3	-0.4	6.1	3	silty CLAY to CLAY	115	1.5	37	40	-	-	3.8	9.9	37	2.63	15	N/A	N/A
15.91	60.7	62.7	207.4	60.7	3.4	-1.0	5.8	4	clayy SILT to silty CLAY	115	2.0	30	31	-	-	4.2	9.9	35	2.60	15	N/A	N/A
16.08	61.8	61.9	203.3	61.8	3.4	-1.6	5.6	4	clayy SILT to silty CLAY	115	2.0	31	31	-	-	4.3	9.9	35	2.59	15	N/A	N/A
16.24	55.5	58.4	-	55.4	3.3	-1.3	6.1	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.9	9.9	37	2.64	15	N/A	N/A
16.40	54.0	56.4	-	54.0	3.3	-1.2	6.3	3	silty CLAY to CLAY	115	1.5	36	38	-	-	3.8	9.9	38	2.65	15	N/A	N/A
16.57	60.6	61.0	201.6	60.6	3.4	-1.2	5.6	4	clayy SILT to silty CLAY	115	2.0	30	30	-	-	4.2	9.9	35	2.60	15	N/A	N/A
16.73	63.9	62.8	206.5	63.9	3.6	-0.7	5.7	4	clayy SILT to silty CLAY	115	2.0	32	31	-	-	4.4	9.9	35	2.59	15	N/A	N/A
16.90	63.4	62.0	199.9	63.4	3.4	-0.8	5.5	4	clayy SILT to silty CLAY	115	2.0	32	31	-	-	4.4	9.9	35	2.58	15	N/A	N/A
17.06	59.8	58.2	190.0	59.8	3.1	-0.9	5.3	4	clayy SILT to silty CLAY	115	2.0	30	29	-	-	4.2	9.9	35	2.59	15	N/A	N/A
17.23	60.9	59.0	179.3	60.9	2.8	-0.8	4.7	4	clayy SILT to silty CLAY	115	2.0	30	30	-	-	4.2	9.9	33	2.55	15	N/A	N/A
17.39	64.4	62.1	182.3	64.4	3.0	-0.4	4.7	4	clayy SILT to silty CLAY	115	2.0	32	31	-	-	4.5	9.9	32	2.53	15	N/A	N/A
17.55	66.1	63.4	184.5	66.1	3.1	-0.1	4.7	4	clayy SILT to silty CLAY	115	2.0	33	32	-	-	4.6	9.9	32	2.53	15	N/A	N/A
17.72	63.6	60.7	187.6	63.6	3.1	-0.6	5.0	4	clayy SILT to silty CLAY	115	2.0	32	30	-	-	4.4	9.9	33	2.56	15	N/A	N/A
17.88	63.9	60.8	194.6	63.9	3.3	-0.6	5.3	4	clayy SILT to silty CLAY	115	2.0	32	30	-	-	4.4	9.9	34	2.58	15	N/A	N/A
18.05	64.9	61.4	197.4	64.9	3.4	-0.6	5.4	4	clayy SILT to silty CLAY	115	2.0	32	31	-	-	4.5	9.9	34	2.58	15	N/A	N/A
18.21	67.6	63.7	173.8	67.6	2.8	-0.6	4.2	4	clayy SILT to silty CLAY	115	2.0	34	32	-	-	4.7	9.9	30	2.49	15	N/A	N/A
18.37	68.4	64.2	161.0	68.4	2.5	-0.7	3.7	4	clayy SILT to silty CLAY	115	2.0	34	32	-	-	4.8	9.9	28	2.45	15	N/A	N/A
18.54	77.6	72.5	154.9	77.6	2.4	0.0	3.1	5	silty SAND to sandy SILT	120	3.0	26	24	56	39	-	-	25	2.35	16	N/A	N/A
18.70	116.5	108.4	164.7	116.5	2.6	0.1	2.3	5	silty SAND to sandy SILT	120	3.0	39	36	70	41	-	-	17	2.13	16	N/A	N/A
18.87	164.4	152.2	197.4	164.4	3.3	0.3	2.0	5	silty SAND to sandy SILT	120	3.0	55	51	81	43	-	-	13	2.00	16	N/A	N/A
19.03	193.7	178.5	221.1	193.7	3.8	0.0	2.0	6	clean SAND to silty SAND	125	5.0	39	36	86	43	-	-	12	1.95	16	N/A	N/A
19.19	197.8	181.4	223.2	197.8	3.9	0.1	2.0	6	clean SAND to silty SAND	125	5.0	40	36	87	43	-	-	11	1.94	16	N/A	N/A
19.36	200.7	183.3	229.2	200.7	4.2	0.2	2.1	6	clean SAND to silty SAND	125	5.0	40	37	87	43	-	-	12	1.96	16	N/A	N/A
19.52	234.9	213.6	256.3	234.9	4.8	0.4	2.1	6	clean SAND to silty SAND	125	5.0	47	43	92	44	-	-	11	1.91	16	N/A	N/A
19.69	258.3	233.8	279.9	258.3	5.6	0.5	2.2	6	clean SAND to silty SAND	125	5.0	52	47	95	45	-	-	11	1.91	16	N/A	N/A
19.85	260.4	234.7	285.4	260.5	6.0	0.7	2.3	6	clean SAND to silty SAND	125	5.0	52	47	95	45	-	-	11	1.93	16	N/A	N/A
20.01	247.2	221.8	276.1	247.2	5.9	1.0	2.4	6	clean SAND to silty SAND	125	5.0	49	44	93	44	-	-	12	1.95	16	N/A	N/A
20.18	252.0	225.1	275.0	252.0	5.7	1.1	2.3	6	clean SAND to silty SAND	125	5.0	50	45	94	44	-	-	11	1.93	16	N/A	N/A
20.34	266.5	237.1	288.0	266.6	6.1	1.2	2.3	6	clean SAND to silty SAND	125	5.0	53	47	95	45	-	-	11	1.93	16	N/A	N/A
20.51	287.5	254.6	311.5	287.5	7.1	1.5	2.5	6	clean SAND to silty SAND	125	5.0	58	51	95	45	-	-	11	1.93	16	N/A	N/A
20.67	273.6	241.3	308.2	273.7	7.4	1.7	2.7	8	stiff SAND to clayy SAND	115	5.0	55	48	95	45	-	-	12	1.98	16	N/A	N/A
20.83	256.3	225.1	289.8	256.3	6.8	2.0	2.7	8	stiff SAND to clayy SAND	115	5.0	51	45	94	44	-	-	13	1.99	16	N/A	N/A
21.00	260.2	227.7	287.9	260.3	6.6	2.3	2.5	5	silty SAND to sandy SILT	120	3.0	87	76	94	44	-	-	12	1.97	16	N/A	N/A
21.16	306.4	267.1	315.7	306.5	7.0	2.6	2.3	6	clean SAND to silty SAND	125	5.0	61	53	95	45	-	-	10	1.89	16	N/A	N/A
21.33	331.3	287.6	339.1	331.3	7.8	2.9	2.4	6	clean SAND to silty SAND	125	5.0	66	58	95	45	-	-	10	1.89	16	N/A	N/A
21.49	308.8	266.9	323.8	308.8	7.7	3.2	2.5	8	stiff SAND to clayy SAND	115	5.0	62	53	95	45	-	-	11	1.92	16	N/A	N/A
21.65	285.6	246.0	303.4	285.7	7.1	3.1	2.5	6	clean SAND to silty SAND	125	5.0	57	49	95	45	-	-	11	1.94	16	N/A	N/A
21.82	254.8	218.6	277.2	254.8	6.3	3.0	2.5	5	silty SAND to sandy SILT	120	3.0	85	73	93	44	-	-	12	1.97	16	N/A	N/A
21.98	244.5	209.0	260.9	244.6	5.6	2.9	2.3	6	clean SAND to silty SAND	125	5.0	49	42	91	44	-	-	12	1.96	16	N/A	N/A
22.15	243.8	207.5	263.3	243.8	5.8	2.9	2.4	5	silty SAND to sandy SILT	120	3.0	81	69	91	44	-	-	12	1.98	16	N/A	N/A
22.31	274.7	232.9	259.6	274.7	4.5	2.9	1.6	6	clean SAND to silty SAND	125	5.0	55	47	95	44	-	-	8	1.81	16	N/A	N/A
22.47	339.7	286.9	299.4	339.7	4.8	3.4	1.4	6	clean SAND to silty SAND	125	5.0	68	57	95	45	-	-	6	1.71	16	N/A	N/A
22.64	405.2	341.0	341.0	405.3	3.3	2.3	0.8	6	clean SAND to silty SAND	125	5.0	81	68	95	46	-	-	5	1.47	16	N/A	N/A
22.80	470.9	394.8	402.5	471.0	7.6	2.2	1.6	6	clean SAND to silty SAND	125	5.0	94	79	95	47	-	-	6	1.67	16	N/A	N/A
22.97	517.6	432.2	432.2	517.6	7.8	1.4	1.5	6	clean SAND to silty SAND	125	5.0	100	86	95	47	-	-	5	1.63	16	N/A	N/A
23.13	360.2	300.2	350.7	360.2	8.5	0.8	2.4	6	clean SAND to silty SAND	125	5.0	72	60	95	45	-	-	10	1.88	16	0.00	0.0
23.30	284.9	237.0	272.2	284.9	5.3	0.8	1.9	6	clean SAND to silty SAND	125	5.0	57	47	95	44	-	-	9	1.85	16	0.00	0.0
23.46	196.8	163.4	205.0	196.8	3.8	0.8	1.9	6	clean SAND to silty SAND	125	5.0	39	33	83	42	-	-	12	1.96	16	0.00	0.0
23.62	197.1	163.3	197.3	197.1	3.3	1.8	1.7	6	clean SAND to silty SAND	125	5.0	39	33	83	42	-	-	11	1.92	16	0.00	0.0
23.79	204.1	168.8	174.1	204.1	1.7	1.5	0.8	6	clean SAND to silty SAND	125	5.0	41	34	84	43	-	-	6	1.69	16	0.00	0.0
23.95	180.3	148.9	171.3	180.3	2.3	0.9	1.3	6	clean SAND to silty SAND	125	5.0	36	30	80	42	-	-	9	1.86	16	0.00	0.0
24.12	137.6	113.4	168.4	137.5	3.0	-0.5	2.2	5	silty SAND to sandy SILT	120	3.0	46	38	71	40	-	-	16	2.12	16	0.00	0.0
24.28	142.9	117.6	179.1	142.9	3.5	0.4	2.5	5	silty SAND to sandy SILT	120	3.0	48	39	72	41	-	-	17	2.14	16	0.00	0.0
24.44	201.1	165.1	190.2	201.1	2.8	0.6	1.4	6	clean SAND to silty SAND	125	5.0	40	33	84	42	-	-	9	1.86	16	0.00	0.0
24.61	249.7	204.7	214.0	249.7	2.7	0.3	1.1	6	clean SAND to silty SAND	125	5.0	50	41	91	43	-	-	6	1.71	16	0.00	0.0
24.77	236.9	193.9	202.6	236.9	2.4	-1.2	1.0	6	clean SAND to silty SAND	125	5.0	47	39	89	43	-	-	6	1.71	16	0.00	0.0
24.94	203.0	165.8	182.6	203.0	2.3	-1.3	1.2	6	clean SAND to silty SAND	125	5.0	41	33	84	42	-	-	8	1.79	16	0.00	0.0
25.10	193.1	157.4	177.2	193.1	2.3	-1.2	1.2	6	clean SAND to silty SAND	125	5.0	39	31	82	42	-	-	9	1.83	16	0.00	0.0
25.26	202.0	164.4	180.8	202.0	2.3	-1.1	1.1	6	clean SAND to silty SAND	125	5.0	40	33	83	42	-	-	8	1.79	16	0.00	0.0
25.43	199.7	162.3	174.6	199.7	2.0	-1.1	1.0	6	clean SAND to silty SAND	125	5.0	40	32	83	42	-	-	7	1.76	16	0.00	0.0
25.59	192.5	156.1	165.8	192.5	1.7	-0.9	0.9	6	clean SAND to silty SAND	125	5.0	39	31	82	42	-	-	7	1.74	16	0.00	0.0
25.76	184.2	149.1	159.7	184.1	1.6	-0.9	0.9	6	clean SAND to silty SAND	125	5.0	37	30	80	42	-	-	7	1.75	16	0.13	1.3
25.92	175.4	141.8	153.2	175.4	1.5	-1.0	0.9	6	clean SAND to silty SAND	125	5.0	35	28	79	42	-	-	7	1.76	16	0.18	1.5
26.08	170.6	137.6	152.4	170.6	1.6	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	34	28	78	41	-	-	8	1.80	16	0.19	1.5
26.25	171.2	137.9	158.0	171.2	2.0	-0.6	1.2	6	clean SAND to silty SAND	125	5.0	34	28	78	41	-	-	9	1.85	16	0.15	1.3
26.41	176.8	142.1	164.1	176.8	2.2	-0.6	1.2	6	clean SAND to silty SAND	125	5.0	35	28	79	42	-	-	9	1.86	16	0.00	0.0
26.58	180.4	144.8	167.5	180.4	2.3	-0.7	1.3	6	clean SAND to silty SAND	125	5.0	36	29	79	42	-	-	10	1.86	16	0.00	0.0
26.74	179.2	143.6	166.7	179.2	2.3	-0.5	1.3	6	clean SAND to silty SAND	125	5.0	36	29	79	42	-	-	10	1.87	16	0.00	0.0
26.90	176.0	140.7	164.4	175.9	2.2	-0.5	1.3	6	clean SAND to silty SAND	125	5.0	35	28	78	41	-	-	10	1.88	16	0.00	0.0
27.07	167.3	133.5	163.5	167.3	2.4	-0.5	1.5	6	clean SAND to silty SAND	125	5.0	33	27	77	41	-	-	11	1.94	16	0.00	0.0
27.23	162.6	129.6	160.9	162.6	2.4	-0.6	1.5	6	clean SAND to silty SAND	125	5.0	33	26	76	41	-	-	12	1.95	16	0.00	0.0
27.40	143.2	113.9	159.1	143.2	2.7	-0.3	1.9	5	silty SAND to sandy SILT	120	3.0	48	38	71	40	-	-	15	2.07	16	0.14	1.0
27.56	142.8	113.4	148.8	142.8	2.2	-0.4	1.6	6	clean SAND to silty SAND	125	5.0	29	23	71	40	-	-	13	2.01	16	0.23	1.6
27.72	140.4	111.3	147.8	140.4	2.2	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	47	37	71	40	-	-	14	2.02	16	0.26	1.7
27.89	137.8	109.1	145.0	137.8	2.2	-0.5	1.6	5	silty SAND to sandy SILT	120	3.0	46	36	70	40	-	-	14	2.02	16	0.31	1.9
28.05	144.7	114.4	145.4	144.7	2.1	-0.7	1.4	6	clean SAND to silty SAND	125	5.0	29	23	71	40	-	-	12	1.98	16	0.31	1.9
28.22	141.4	111.6	150.6	141.4	2.4	-0.4	1.7	5	silty SAND to sandy SILT	120	3.0	47	37	71	40	-	-	14	2.04	16	0.22	1.5
28.38	146.9	115.7	156.9	146.9	2.6	-0.4	1.8	5	silty SAND to sandy SILT	120	3.0	49	39	72	40	-	-	14	2.04	16	0.17	1.2
28.54	161.3	126.9	164.9	161.3	2.7	-0.5	1.7	6	clean SAND to silty SAND	125	5.0	32	25	75	41	-	-	13	2.00	16	0.00	0.0
28.71	195.7	153.7	194.4	195.7	3.6	-0.4	1.9	6	clean SAND to silty SAND	125	5.0	39	31	81	42	-	-	12	1.97	16	0.00	0.0
28.87	301.0	236.0	236.0	301.0	2.4	-0.2	0.8	6	clean SAND to silty SAND	125	5.0	60	47	95	44	-	-	5	1.58	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

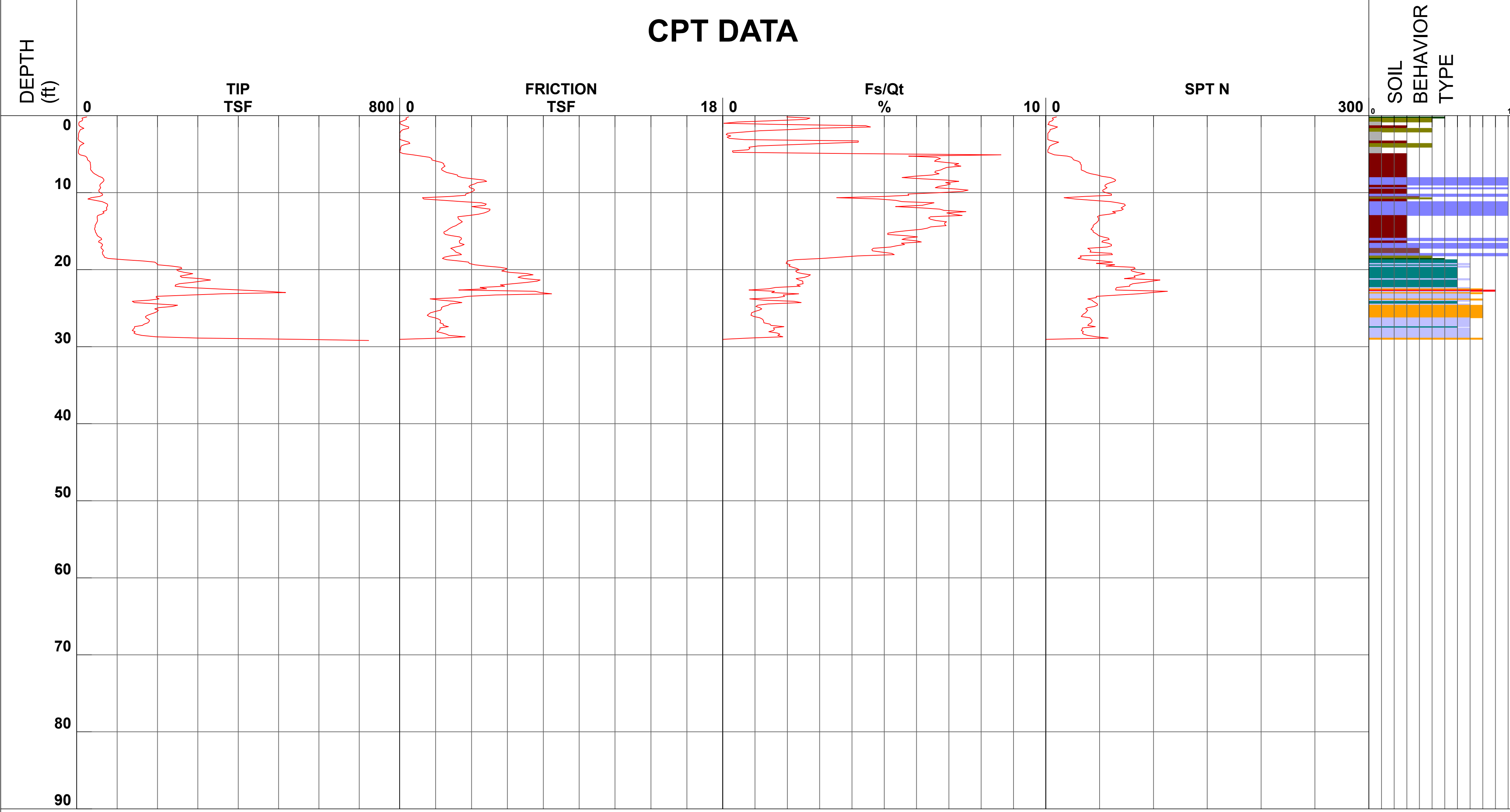
Middle Earth Geo Testing

Leighton

Middle Earth GEO TESTING INC.

Project	Hoag Hospital Irvine	Operator	KK RB	Filename	SDF(003).cpt
Job Number	11753.001	Cone Number	DDG1333	GPS	
Hole Number	CPT-04	Date and Time	9/28/2017 9:48:38 AM	Maximum Depth	29.20 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(039).cpt
CPT Date: 9/29/2017 8:27:44 AM
GW During Test: 23 ft

Page: 1
Sounding ID: CPT-05
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	1.1	0.0	-	1.1	0.1	0.0	0.1	1	sensitive fine SOIL	115	2.0	1	1	-	-	0.1	9.9	95	3.48	15	N/A	N/A
0.49	3.0	4.8	-	3.0	0.2	0.1	6.0	3	silty CLAY to CLAY	115	1.5	2	3	-	-	0.2	9.9	93	3.43	15	N/A	N/A
0.66	16.5	26.5	59.3	16.5	0.2	0.0	1.0	5	silty SAND to sandy SILT	120	3.0	6	9	23	48	-	-	26	2.38	16	N/A	N/A
0.82	14.1	22.6	-	14.1	0.3	0.0	2.2	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	37	2.63	15	N/A	N/A
0.98	16.6	26.6	-	16.6	0.6	0.0	3.4	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.2	9.9	40	2.69	15	N/A	N/A
1.15	29.8	47.8	89.0	29.8	0.4	0.2	1.5	5	silty SAND to sandy SILT	120	3.0	10	16	43	48	-	-	22	2.27	16	N/A	N/A
1.31	22.7	36.5	105.7	22.7	0.6	0.0	2.7	4	clayy SILT to silty CLAY	115	2.0	11	18	-	-	1.6	9.9	32	2.52	15	N/A	N/A
1.48	21.9	35.2	91.7	21.9	0.5	0.0	2.1	5	silty SAND to sandy SILT	120	3.0	7	12	33	45	-	-	29	2.47	16	N/A	N/A
1.64	17.8	28.6	88.2	17.8	0.4	0.1	2.3	4	clayy SILT to silty CLAY	115	2.0	9	14	-	-	1.3	9.9	33	2.56	15	N/A	N/A
1.80	19.5	31.2	87.9	19.5	0.4	-0.1	2.1	4	clayy SILT to silty CLAY	115	2.0	10	16	-	-	1.4	9.9	31	2.51	15	N/A	N/A
1.97	22.2	35.6	108.7	22.2	0.6	0.1	2.9	4	clayy SILT to silty CLAY	115	2.0	11	18	-	-	1.6	9.9	33	2.55	15	N/A	N/A
2.13	30.1	48.2	127.1	30.1	0.9	-0.3	3.1	4	clayy SILT to silty CLAY	115	2.0	15	24	-	-	2.1	9.9	29	2.47	15	N/A	N/A
2.30	39.2	62.9	124.4	39.2	0.9	-0.3	2.4	5	silty SAND to sandy SILT	120	3.0	13	21	52	46	-	-	23	2.31	16	N/A	N/A
2.46	37.5	60.1	120.9	37.5	0.9	-0.5	2.3	5	silty SAND to sandy SILT	120	3.0	12	20	50	45	-	-	23	2.32	16	N/A	N/A
2.62	38.5	61.7	115.2	38.5	0.8	-0.5	2.0	5	silty SAND to sandy SILT	120	3.0	13	21	51	45	-	-	22	2.27	16	N/A	N/A
2.79	39.8	63.8	120.8	39.8	0.9	-0.5	2.2	5	silty SAND to sandy SILT	120	3.0	13	21	52	45	-	-	22	2.28	16	N/A	N/A
2.95	41.7	66.8	129.4	41.6	1.0	-0.5	2.4	5	silty SAND to sandy SILT	120	3.0	14	22	54	45	-	-	22	2.30	16	N/A	N/A
3.12	41.4	66.5	137.3	41.4	1.1	-0.5	2.7	5	silty SAND to sandy SILT	120	3.0	14	22	54	45	-	-	24	2.33	16	N/A	N/A
3.28	43.6	69.9	141.3	43.6	1.2	-0.4	2.7	5	silty SAND to sandy SILT	120	3.0	15	23	55	45	-	-	23	2.32	16	N/A	N/A
3.45	49.1	78.8	141.8	49.1	1.2	-0.4	2.4	5	silty SAND to sandy SILT	120	3.0	16	26	59	45	-	-	21	2.25	16	N/A	N/A
3.61	47.8	76.7	138.4	47.8	1.1	-0.4	2.4	5	silty SAND to sandy SILT	120	3.0	16	26	58	45	-	-	21	2.25	16	N/A	N/A
3.77	46.7	74.9	126.3	46.7	0.9	-0.4	2.0	5	silty SAND to sandy SILT	120	3.0	16	25	57	44	-	-	19	2.21	16	N/A	N/A
3.94	46.2	74.1	122.3	46.2	0.9	-0.1	1.9	5	silty SAND to sandy SILT	120	3.0	15	25	57	44	-	-	19	2.19	16	N/A	N/A
4.10	41.4	66.3	118.7	41.4	0.8	-0.1	2.0	5	silty SAND to sandy SILT	120	3.0	14	22	53	43	-	-	21	2.25	16	N/A	N/A
4.27	39.4	63.2	104.6	39.4	0.6	0.1	1.6	5	silty SAND to sandy SILT	120	3.0	13	21	52	43	-	-	19	2.20	16	N/A	N/A
4.43	38.0	60.9	101.1	38.0	0.6	0.3	1.5	5	silty SAND to sandy SILT	120	3.0	13	20	51	42	-	-	19	2.20	16	N/A	N/A
4.59	39.5	63.4	100.2	39.5	0.6	-0.1	1.4	5	silty SAND to sandy SILT	120	3.0	13	21	52	42	-	-	18	2.16	16	N/A	N/A
4.76	39.1	62.7	89.7	39.1	0.4	0.1	1.1	5	silty SAND to sandy SILT	120	3.0	13	21	52	42	-	-	15	2.09	16	N/A	N/A
4.92	37.6	60.3	85.5	37.6	0.4	0.0	1.0	5	silty SAND to sandy SILT	120	3.0	13	20	50	42	-	-	15	2.08	16	N/A	N/A
5.09	36.0	57.8	100.8	36.0	0.6	-0.1	1.6	5	silty SAND to sandy SILT	120	3.0	12	19	49	41	-	-	20	2.23	16	N/A	N/A
5.25	40.5	64.9	100.7	40.5	0.6	-0.2	1.4	5	silty SAND to sandy SILT	120	3.0	13	22	53	42	-	-	17	2.15	16	N/A	N/A
5.41	42.7	68.4	98.1	42.7	0.5	-0.6	1.2	5	silty SAND to sandy SILT	120	3.0	14	23	54	42	-	-	15	2.09	16	N/A	N/A
5.58	40.7	65.2	104.2	40.6	0.6	-0.7	1.5	5	silty SAND to sandy SILT	120	3.0	14	22	53	42	-	-	18	2.17	16	N/A	N/A
5.74	45.2	72.5	112.3	45.2	0.7	-0.4	1.6	5	silty SAND to sandy SILT	120	3.0	15	24	56	42	-	-	17	2.15	16	N/A	N/A
5.91	51.6	82.8	114.5	51.6	0.7	-0.3	1.3	5	silty SAND to sandy SILT	120	3.0	17	28	61	43	-	-	15	2.06	16	N/A	N/A
6.07	45.9	73.6	116.0	45.9	0.8	-0.4	1.7	5	silty SAND to sandy SILT	120	3.0	15	25	57	42	-	-	18	2.16	16	N/A	N/A
6.23	42.9	68.6	128.6	42.9	1.0	-0.4	2.3	5	silty SAND to sandy SILT	120	3.0	14	23	55	41	-	-	22	2.28	16	N/A	N/A
6.40	38.9	61.4	151.2	38.9	1.3	-0.4	3.4	4	clayy SILT to silty CLAY	115	2.0	19	31	-	-	2.7	9.9	28	2.44	15	N/A	N/A
6.56	38.5	59.9	186.9	38.5	1.9	-0.4	5.1	4	clayy SILT to silty CLAY	115	2.0	19	30	-	-	2.7	9.9	34	2.56	15	N/A	N/A
6.73	42.3	65.1	211.2	42.3	2.4	-0.5	5.8	4	clayy SILT to silty CLAY	115	2.0	21	33	-	-	3.0	9.9	35	2.59	15	N/A	N/A
6.89	44.4	71.3	233.3	44.4	2.8	-0.4	6.3	9	very stiff fine SOIL	120	1.0	44	71	-	-	1.6	9.9	35	2.59	30	N/A	N/A
7.05	47.0	75.3	245.8	46.9	3.1	-0.4	6.6	9	very stiff fine SOIL	120	1.0	47	75	-	-	1.6	9.9	35	2.59	30	N/A	N/A
7.22	49.5	73.6	242.3	49.5	3.2	-0.5	6.6	9	very stiff fine SOIL	120	1.0	50	74	-	-	1.7	9.9	35	2.59	30	N/A	N/A
7.38	50.4	74.1	245.3	50.4	3.3	-0.6	6.7	9	very stiff fine SOIL	120	1.0	50	74	-	-	1.8	9.9	35	2.60	30	N/A	N/A
7.55	50.2	80.5	257.1	50.2	3.3	-1.5	6.7	9	very stiff fine SOIL	120	1.0	50	80	-	-	1.8	9.9	34	2.58	30	N/A	N/A
7.71	50.6	81.1	257.7	50.6	3.3	-1.2	6.7	9	very stiff fine SOIL	120	1.0	51	81	-	-	1.8	9.9	34	2.57	30	N/A	N/A
7.87	52.0	74.0	233.2	52.0	3.2	-1.1	6.1	9	very stiff fine SOIL	120	1.0	52	74	-	-	1.8	9.9	34	2.57	30	N/A	N/A
8.04	48.0	76.9	241.5	47.9	3.0	-1.8	6.3	9	very stiff fine SOIL	120	1.0	48	77	-	-	1.7	9.9	34	2.57	30	N/A	N/A
8.20	44.3	71.1	228.1	44.3	2.7	-1.1	6.1	9	very stiff fine SOIL	120	1.0	44	71	-	-	1.5	9.9	34	2.58	30	N/A	N/A
8.37	43.4	69.6	-	43.4	2.8	-0.7	6.4	9	very stiff fine SOIL	120	1.0	43	70	-	-	1.5	9.9	36	2.60	30	N/A	N/A
8.53	44.4	70.2	232.0	44.3	2.8	-1.2	6.3	9	very stiff fine SOIL	120	1.0	44	70	-	-	1.5	9.9	35	2.60	30	N/A	N/A
8.69	42.4	68.0	-	42.4	2.7	-1.3	6.4	9	very stiff fine SOIL	120	1.0	42	68	-	-	1.5	9.9	36	2.61	30	N/A	N/A
8.86	41.0	65.8	-	41.0	2.5	-1.5	6.2	9	very stiff fine SOIL	120	1.0	41	66	-	-	1.4	9.9	36	2.61	30	N/A	N/A
9.02	41.8	67.0	-	41.8	2.5	-1.3	6.2	9	very stiff fine SOIL	120	1.0	42	67	-	-	1.5	9.9	35	2.60	30	N/A	N/A
9.19	44.2	66.4	-	44.1	2.7	-1.6	6.3	9	very stiff fine SOIL	120	1.0	44	66	-	-	1.5	9.9	36	2.61	30	N/A	N/A
9.35	47.7	70.8	227.4	47.7	2.9	-1.6	6.1	9	very stiff fine SOIL	120	1.0	48	71	-	-	1.7	9.9	34	2.58	30	N/A	N/A
9.51	49.9	73.1	231.5	49.8	3.0	-1.8	6.1	9	very stiff fine SOIL	120	1.0	50	73	-	-	1.7	9.9	34	2.57	30	N/A	N/A
9.68	53.2	68.1	225.9	53.1	3.3	-2.0	6.2	9	very stiff fine SOIL	120	1.0	53	68	-	-	1.9	9.9	35	2.60	30	N/A	N/A
9.84	55.3	70.3	227.7	55.3	3.4	-2.0	6.1	9	very stiff fine SOIL	120	1.0	55	70	-	-	1.9	9.9	35	2.59	30	N/A	N/A
10.01	56.8	71.6	226.4	56.8	3.4	-2.0	6.0	9	very stiff fine SOIL	120	1.0	57	72	-	-	2.0	9.9	34	2.57	30	N/A	N/A
10.17	58.5	73.1	220.4	58.5	3.3	-1.7	5.7	9	very stiff fine SOIL	120	1.0	59	73	-	-	2.0	9.9	33	2.55	30	N/A	N/A
10.34	60.9	75.5	219.9	60.9	3.3	-1.6	5.5	9	very stiff fine SOIL	120	1.0	61	76	-	-	2.1	9.9	32	2.53	30	N/A	N/A
10.50	63.6	78.2	215.5	63.5	3.3	-1.6	5.2	4	clayy SILT to silty CLAY	115	2.0	32	39	-	-	4.4	9.9	31	2.50	15	N/A	N/A
10.66	65.3	79.7	204.6	65.3	3.0	-1.8	4.7	4	clayy SILT to silty CLAY	115	2.0	33	40	-	-	4.6	9.9	29	2.46	15	N/A	N/A
10.83	61.4	74.4	177.4	61.4	2.4	-1.6	3.9	4	clayy SILT to silty CLAY	115	2.0	31	37	-	-	4.3	9.9	27	2.42	15	N/A	N/A
10.99	58.4	70.3	159.2	58.4	1.9	-1.5	3.4	4	clayy SILT to silty CLAY	115	2.0	29	35	-	-	4.1	9.9	26	2.39	15	N/A	N/A
11.16	61.7	73.7	160.0	61.7	2.0	-1.5	3.3	5	silty SAND to sandy SILT	120	3.0	21	25	57	40	-	-	25	2.36	16	N/A	N/A
11.32	62.5	74.0	171.0	62.4	2.3	-1.6	3.7	4	clayy SILT to silty CLAY	115	2.0	31	37	-	-	4.4	9.9	26	2.40	15	N/A	N/A
11.48	59.8	70.4	199.2	59.7	2.9	-1.6	4.9	4	clayy SILT to silty CLAY	115	2.0	30	35	-	-	4.2	9.9	31	2.51	15	N/A	N/A
11.65	58.3	68.1	211.9	58.3	3.2	-2.3	5.6	4	clayy SILT to silty CLAY	115	2.0	29	34	-	-	4.1	9.9	34	2.56	15	N/A	N/A
11.81	54.9	69.3	227.3	54.9	3.4	-2.6	6.2	9	very stiff fine SOIL	120	1.0	55	69	-	-	1.9	9.9	35	2.59	30	N/A	N/A
11.98	52.4	65.5	-	52.4	3.2	-2.5	6.2	9	very stiff fine SOIL	120	1.0	52	65	-	-	1.8	9.9	36	2.61	30	N/A	N/A
12.14	51.3	63.5	-	51.3	3.0	-2.5	5.9	4	clayy SILT to silty CLAY	115	2.0	26	32	-	-	3.6	9.9	35	2.60	15	N/A	N/A
12.30	51.4	63.0	209.6	51.4	3.0	-2.5	5.8	4	clayy SILT to silty CLAY	115	2.0	26	32	-	-	3.6	9.9	35	2.60	15	N/A	N/A
12.47	51.0	62.0	204.5	51.0	2.9	-2.5	5.7	4	clayy SILT to silty CLAY	115	2.0	26	31	-	-	3.6	9.9	35	2.60	15	N/A	N/A
12.63	51.5	62.0	-	51.4	3.1	-2.5	6.0	3	silty CLAY to CLAY	115	1.5	34	41	-	-	3.6	9.9	36	2.62	15	N/A	N/A
12.80	52.7	62.9	-	52.6	3.2	-2.2	6.2	3	silty CLAY to CLAY	115	1.5	35	42	-	-	3.7	9.9	36	2.62	15	N/A	N/A
12.96	45.4	59.2	-	45.4	3.6	-1.9	8.1	3	silty CLAY to CLAY	115	1.5	30	39	-	-	3.2	9.9	42	2.73	15	N/A	N/A
13.12	58.9	69.1	-	58.8	3.8	-2.4	6.6	9	very stiff fine SOIL	120	1.0	59	69	-	-	2.1	9.9	36	2.61	30	N/A	N/A
13.29	62.8	73.0	-	62.8	4.1	-2.7	6.6	9	very stiff fine SOIL	120	1.0	63	73	-	-	2.2	9.9	35	2.60	30	N/A	N/A
13.45	64.0	73.7	-	63.9	4.3	-2.8	6.8	9	very stiff fine SOIL	120	1.0	64	74	-	-	2.2	9.9	36	2.61	30	N/A	N/A
13.62	64.0	73.2	-	64.0	4.2	-2.9	6.7	9	very stiff fine SOIL	120	1.0	64	73	-	-	2.2	9.9	36	2.60	30	N/A	N/A
13.78	65.8	70.8	232.6	65.7	4.1	-3.6	6.3	9	very stiff fine SOIL	120	1.0	66	71	-	-	2.3	9.9	35	2.59	30	N/A	N/A
13.94	69.5	74.3	233.5	69.4	4.2	-3.0	6.1	9	very stiff fine SOIL	120	1.0	70	74	-	-	2.4	9.9	34	2.57	30	N/A	N/A
14.11	69.6	73.9	237.6	69.5	4.3	-3.2	6.3	9	very stiff fine SOIL	120	1.0	70	74	-	-	2.4	9.9	34	2.58	30	N/A	N/A
14.27	68.8	76.0	247.3	68.7	4.5	-3.5	6.6	9	very stiff fine SOIL	120	1.0	69	76	-	-	2.4	9.9	35	2.59	30	N/A	N/A
14.44	69.4	76.1	-	69.3	4.7	-3.5	6.8	9	very stiff fine SOIL	120	1.0	69	76	-	-	2.4	9.9	35	2.60	30	N/A	N/A
14.60	71.8	74.9	246.6	71.7	4.7	-3.5	6.6	9	very stiff fine SOIL	120	1.0	72	75	-	-	2.5	9.9	35	2.59	30	N/A	N/A
14.76	72.1	74.9	241.1	72.0	4.6	-3.6	6.4	9	very stiff fine SOIL	120	1.0	72	75	-	-	2.5	9.9	35	2.58	30	N/A	N/A
14.93	68.2	70.4	231.8	68.1	4.2	-3.0	6.3	9	very stiff fine SOIL	120	1.0	68	70	-	-	2.4	9.9	35	2.59	30	N/A	N/A
15.09	66.5	70.6	-	66.4	4.3	-3.0	6.6	9	very stiff fine SOIL	120	1.0	66	71	-	-	2.3	9.9	36	2.61	30	N/A	N/A
15.26	61.9	68.5	-	61.9	4.2	-3.4	6.8	9	very stiff fine SOIL	120	1.0	62	68	-	-	2.2	9.9	37	2.63	30	N/A	N/A
15.42	63.3	69.2	-	63.2	4.4	-3.2	7.0	9	very stiff fine SOIL	120	1.0	63	69	-	-	2.2	9.9	37	2.64	30	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(039).cpt
CPT Date: 9/29/2017 8:27:44 AM
GW During Test: 23 ft

Sounding ID: CPT-05
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	61.2	66.2	-	61.1	4.4	-2.8	7.3	9	very stiff fine SOIL	120	1.0	61	66	-	-	2.1	9.9	38	2.66	30	N/A	N/A
15.75	48.0	51.4	-	47.9	3.9	-2.0	8.3	3	silty CLAY to CLAY	115	1.5	32	34	-	-	3.3	9.9	45	2.78	15	N/A	N/A
15.91	44.5	47.2	-	44.5	3.4	-1.1	7.8	3	silty CLAY to CLAY	115	1.5	30	31	-	-	3.1	9.9	45	2.78	15	N/A	N/A
16.08	45.9	48.2	-	45.9	3.0	-1.5	6.6	3	silty CLAY to CLAY	115	1.5	31	32	-	-	3.2	9.9	41	2.72	15	N/A	N/A
16.24	41.7	43.3	-	41.7	2.7	-1.0	6.7	3	silty CLAY to CLAY	115	1.5	28	29	-	-	2.9	9.9	43	2.75	15	N/A	N/A
16.40	39.3	40.4	-	39.3	2.6	-0.9	6.7	3	silty CLAY to CLAY	115	1.5	26	27	-	-	2.7	9.9	45	2.78	15	N/A	N/A
16.57	37.3	38.0	-	37.3	2.4	-1.0	6.7	3	silty CLAY to CLAY	115	1.5	25	25	-	-	2.6	9.9	46	2.79	15	N/A	N/A
16.73	36.2	36.6	-	36.2	2.3	-0.9	6.6	3	silty CLAY to CLAY	115	1.5	24	24	-	-	2.5	9.9	46	2.80	15	N/A	N/A
16.90	35.7	35.7	-	35.6	2.2	-0.9	6.3	3	silty CLAY to CLAY	115	1.5	24	24	-	-	2.4	9.9	45	2.79	15	N/A	N/A
17.06	36.4	36.1	-	36.4	2.2	-0.8	6.3	3	silty CLAY to CLAY	115	1.5	24	24	-	-	2.5	9.9	45	2.79	15	N/A	N/A
17.23	43.3	42.5	-	43.3	2.2	-1.4	5.1	3	silty CLAY to CLAY	115	1.5	29	28	-	-	3.0	9.9	39	2.67	15	N/A	N/A
17.39	36.9	35.9	-	36.9	2.2	-2.0	6.1	3	silty CLAY to CLAY	115	1.5	25	24	-	-	2.5	9.9	45	2.78	15	N/A	N/A
17.55	33.6	32.4	-	33.5	1.9	-2.0	5.7	3	silty CLAY to CLAY	115	1.5	22	22	-	-	2.3	9.9	46	2.79	15	N/A	N/A
17.72	34.5	33.0	-	34.5	1.9	-2.0	5.5	3	silty CLAY to CLAY	115	1.5	23	22	-	-	2.4	9.9	45	2.78	15	N/A	N/A
17.88	33.8	32.0	-	33.7	1.8	-2.2	5.4	3	silty CLAY to CLAY	115	1.5	23	21	-	-	2.3	9.9	45	2.78	15	N/A	N/A
18.05	33.4	31.3	-	33.4	1.8	-2.2	5.4	3	silty CLAY to CLAY	115	1.5	22	21	-	-	2.3	9.9	45	2.79	15	N/A	N/A
18.21	34.1	31.7	-	34.0	1.7	-2.5	5.3	3	silty CLAY to CLAY	115	1.5	23	21	-	-	2.3	9.9	45	2.78	15	N/A	N/A
18.37	35.5	32.8	-	35.5	1.8	-2.4	5.2	3	silty CLAY to CLAY	115	1.5	24	22	-	-	2.4	9.9	44	2.76	15	N/A	N/A
18.54	36.5	33.4	-	36.5	1.9	-2.4	5.4	3	silty CLAY to CLAY	115	1.5	24	22	-	-	2.5	9.9	44	2.77	15	N/A	N/A
18.70	37.9	34.3	-	37.8	2.1	-2.4	5.6	3	silty CLAY to CLAY	115	1.5	25	23	-	-	2.6	9.9	44	2.77	15	N/A	N/A
18.87	39.2	35.2	-	39.1	2.3	-2.3	6.1	3	silty CLAY to CLAY	115	1.5	26	23	-	-	2.7	9.9	45	2.79	15	N/A	N/A
19.03	39.6	35.2	-	39.5	2.3	-2.7	6.0	3	silty CLAY to CLAY	115	1.5	26	23	-	-	2.7	9.9	45	2.78	15	N/A	N/A
19.19	33.3	29.4	-	33.2	2.2	-2.8	6.9	3	silty CLAY to CLAY	115	1.5	22	20	-	-	2.3	9.4	51	2.88	15	N/A	N/A
19.36	35.4	31.0	-	35.3	2.0	-2.7	5.9	3	silty CLAY to CLAY	115	1.5	24	21	-	-	2.4	9.9	47	2.82	15	N/A	N/A
19.52	38.9	33.8	-	38.8	2.0	-2.3	5.4	3	silty CLAY to CLAY	115	1.5	26	23	-	-	2.7	9.9	44	2.76	15	N/A	N/A
19.69	37.7	32.5	-	37.7	2.0	-2.2	5.3	3	silty CLAY to CLAY	115	1.5	25	22	-	-	2.6	9.9	44	2.77	15	N/A	N/A
19.85	31.3	26.8	-	31.3	1.7	-2.1	5.5	3	silty CLAY to CLAY	115	1.5	21	18	-	-	2.1	8.5	48	2.84	15	N/A	N/A
20.01	24.9	21.1	-	24.9	1.5	-2.0	6.4	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.6	56	2.97	15	N/A	N/A
20.18	24.5	20.6	-	24.4	1.4	-1.7	6.0	3	silty CLAY to CLAY	115	1.5	16	14	-	-	1.6	6.5	55	2.95	15	N/A	N/A
20.34	24.7	20.6	-	24.7	1.4	-1.8	5.9	3	silty CLAY to CLAY	115	1.5	16	14	-	-	1.7	6.5	55	2.95	15	N/A	N/A
20.51	25.6	21.2	-	25.6	1.4	-1.8	5.9	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.7	55	2.94	15	N/A	N/A
20.67	28.1	23.1	-	28.0	1.5	-1.8	5.7	3	silty CLAY to CLAY	115	1.5	19	15	-	-	1.9	7.3	52	2.90	15	N/A	N/A
20.83	32.0	26.1	-	32.0	1.7	-1.7	5.5	3	silty CLAY to CLAY	115	1.5	21	17	-	-	2.2	8.3	49	2.85	15	N/A	N/A
21.00	41.1	33.3	-	41.1	2.0	-1.7	5.0	3	silty CLAY to CLAY	115	1.5	27	22	-	-	2.8	9.9	43	2.74	15	N/A	N/A
21.16	53.1	42.6	-	53.0	2.5	-2.1	4.8	4	clayy SILT to silty CLAY	115	2.0	27	21	-	-	3.7	9.9	38	2.65	15	N/A	N/A
21.33	63.5	55.1	163.6	63.5	2.7	-2.5	4.3	4	clayy SILT to silty CLAY	115	2.0	32	28	-	-	4.4	9.9	32	2.54	15	N/A	N/A
21.49	73.8	63.7	157.3	73.7	2.6	-2.0	3.6	4	clayy SILT to silty CLAY	115	2.0	37	32	-	-	5.1	9.9	28	2.44	15	N/A	N/A
21.65	88.3	76.0	145.6	88.3	2.3	-1.8	2.6	5	silty SAND to sandy SILT	120	3.0	29	25	58	38	-	-	22	2.29	16	N/A	N/A
21.82	95.0	81.4	138.8	95.0	2.1	-1.7	2.2	5	silty SAND to sandy SILT	120	3.0	32	27	60	39	-	-	19	2.21	16	N/A	N/A
21.98	79.4	67.9	130.4	79.4	1.9	-1.7	2.4	5	silty SAND to sandy SILT	120	3.0	26	23	54	38	-	-	22	2.29	16	N/A	N/A
22.15	62.0	52.7	136.4	62.0	1.9	-1.7	3.2	4	clayy SILT to silty CLAY	115	2.0	31	26	-	-	4.3	9.9	29	2.46	15	N/A	N/A
22.31	47.8	36.4	-	47.7	2.1	-1.6	4.6	4	clayy SILT to silty CLAY	115	2.0	24	18	-	-	3.3	9.9	40	2.69	15	N/A	N/A
22.47	45.7	34.6	-	45.7	2.3	-1.7	5.1	3	silty CLAY to CLAY	115	1.5	30	23	-	-	3.1	9.9	43	2.74	15	N/A	N/A
22.64	50.7	38.1	-	50.7	2.4	-1.6	4.9	3	silty CLAY to CLAY	115	1.5	34	25	-	-	3.5	9.9	40	2.70	15	N/A	N/A
22.80	56.3	42.0	-	56.2	2.5	-1.8	4.6	4	clayy SILT to silty CLAY	115	2.0	28	21	-	-	3.9	9.9	38	2.65	15	N/A	N/A
22.97	66.5	55.6	152.2	66.4	2.4	-1.6	3.7	4	clayy SILT to silty CLAY	115	2.0	33	28	-	-	4.6	9.9	30	2.49	15	N/A	N/A
23.13	85.7	71.5	145.8	85.6	2.4	-1.6	2.8	5	silty SAND to sandy SILT	120	3.0	29	24	56	38	-	-	24	2.33	16	0.19	0.7
23.30	101.5	84.6	153.0	101.5	2.6	-1.6	2.6	5	silty SAND to sandy SILT	120	3.0	34	28	61	39	-	-	21	2.25	16	0.14	0.6
23.46	100.1	83.3	155.2	100.1	2.7	-1.5	2.7	5	silty SAND to sandy SILT	120	3.0	33	28	61	39	-	-	22	2.27	16	0.12	0.5
23.62	92.0	76.4	157.6	92.0	2.8	-1.5	3.1	5	silty SAND to sandy SILT	120	3.0	31	25	58	38	-	-	24	2.33	16	0.10	0.3
23.79	91.1	75.5	168.3	91.0	3.1	-1.5	3.5	4	clayy SILT to silty CLAY	115	2.0	46	38	-	-	6.3	9.9	26	2.38	15	0.00	0.0
23.95	86.3	71.4	166.7	86.3	3.0	-1.5	3.6	4	clayy SILT to silty CLAY	115	2.0	43	36	-	-	6.0	9.9	27	2.41	15	0.00	0.0
24.12	79.8	66.0	154.9	79.8	2.6	-1.4	3.4	4	clayy SILT to silty CLAY	115	2.0	40	33	-	-	5.5	9.9	27	2.41	15	0.13	0.3
24.28	74.3	61.3	148.8	74.3	2.4	-1.3	3.3	4	clayy SILT to silty CLAY	115	2.0	37	31	-	-	5.2	9.9	28	2.43	15	0.18	0.5
24.44	91.9	75.7	155.7	91.9	2.7	-1.4	3.0	5	silty SAND to sandy SILT	120	3.0	31	25	58	38	-	-	24	2.33	16	0.13	0.4
24.61	161.5	132.8	180.6	161.5	3.3	-1.6	2.1	5	silty SAND to sandy SILT	120	3.0	54	44	76	41	-	-	14	2.04	16	0.00	0.0
24.77	252.0	206.8	238.2	251.9	4.3	-1.6	1.7	6	clean SAND to silty SAND	125	5.0	50	41	91	44	-	-	9	1.86	16	0.00	0.0
24.94	291.3	238.7	282.5	291.3	6.1	-1.5	2.1	6	clean SAND to silty SAND	125	5.0	58	48	95	44	-	-	10	1.89	16	0.00	0.0
25.10	347.0	283.8	339.0	347.0	8.5	-1.5	2.5	8	stiff SAND to clayy SAND	115	5.0	69	57	95	45	-	-	11	1.91	16	0.00	0.0
25.26	370.6	302.7	362.0	370.6	9.5	-1.4	2.6	8	stiff SAND to clayy SAND	115	5.0	74	61	95	45	-	-	11	1.91	16	0.00	0.0
25.43	384.3	313.4	371.9	384.3	9.8	-1.3	2.6	8	stiff SAND to clayy SAND	115	5.0	77	63	95	45	-	-	10	1.90	16	0.00	0.0
25.59	394.7	321.3	380.0	394.6	10.1	-1.2	2.6	8	stiff SAND to clayy SAND	115	5.0	79	64	95	46	-	-	10	1.89	16	0.00	0.0
25.76	397.2	322.9	333.2	397.1	5.9	-1.0	1.5	6	clean SAND to silty SAND	125	5.0	79	65	95	46	-	-	6	1.69	16	0.00	0.0
25.92	428.2	347.5	363.2	428.2	7.0	-1.2	1.6	6	clean SAND to silty SAND	125	5.0	86	69	95	46	-	-	6	1.71	16	0.00	0.0
26.08	507.0	410.7	410.7	507.0	7.0	-0.7	1.4	6	clean SAND to silty SAND	125	5.0	100	82	95	47	-	-	5	1.61	16	0.00	0.0
26.25	432.1	349.4	356.6	432.1	6.4	-0.2	1.5	6	clean SAND to silty SAND	125	5.0	86	70	95	46	-	-	6	1.67	16	0.00	0.0
26.41	371.0	299.4	299.4	370.9	4.1	-1.1	1.1	6	clean SAND to silty SAND	125	5.0	74	60	95	45	-	-	5	1.61	16	0.00	0.0
26.58	315.5	254.2	254.2	315.5	3.3	-1.4	1.1	6	clean SAND to silty SAND	125	5.0	63	51	95	44	-	-	5	1.64	16	0.00	0.0
26.74	316.8	254.8	254.8	316.8	3.3	-1.6	1.0	6	clean SAND to silty SAND	125	5.0	63	51	95	44	-	-	5	1.63	16	0.00	0.0
26.90	316.8	254.3	260.3	316.7	3.8	-3.3	1.2	6	clean SAND to silty SAND	125	5.0	63	51	95	44	-	-	6	1.68	16	0.00	0.0
27.07	317.9	254.8	271.0	317.8	4.5	-3.6	1.4	6	clean SAND to silty SAND	125	5.0	64	51	95	44	-	-	7	1.74	16	0.00	0.0
27.23	289.9	231.9	234.4	289.8	3.0	-3.3	1.0	6	clean SAND to silty SAND	125	5.0	58	46	95	44	-	-	5	1.66	16	0.00	0.0
27.40	272.5	217.7	225.3	272.4	3.0	-3.1	1.1	6	clean SAND to silty SAND	125	5.0	55	44	93	44	-	-	6	1.70	16	0.00	0.0
27.56	264.4	210.8	214.3	264.3	2.6	-3.5	1.0	6	clean SAND to silty SAND	125	5.0	53	42	92	43	-	-	6	1.67	16	0.00	0.0
27.72	268.5	213.7	217.3	268.4	2.6	-3.6	1.0	6	clean SAND to silty SAND	125	5.0	54	43	92	44	-	-	6	1.67	16	0.00	0.0
27.89	267.2	212.3	222.9	267.2	3.0	-3.9	1.1	6	clean SAND to silty SAND	125	5.0	53	42	92	43	-	-	6	1.72	16	0.00	0.0
28.05	285.4	226.4	238.6	285.3	3.5	-3.9	1.2	6	clean SAND to silty SAND	125	5.0	57	45	94	44	-	-	7	1.72	16	0.00	0.0
28.22	334.1	264.5	268.8	334.0	4.0	-4.1	1.2	6	clean SAND to silty SAND	125	5.0	67	53	95	45	-	-	6	1.67	16	0.00	0.0
28.38	307.3	242.9	259.2	307.2	4.2	-4.0	1.4	6	clean SAND to silty SAND	125	5.0	61	49	95	44	-	-	7	1.74	16	0.00	0.0
28.54	242.5	191.4	206.7	242.5	2.9	-2.5	1.2	6	clean SAND to silty SAND	125	5.0	49	38	88	43	-	-	7	1.76	16	0.00	0.0
28.71	200.7	158.1	194.8	200.6	3.5	-3.5	1.8	6	clean SAND to silty SAND	125	5.0	40	32	82	42	-	-	11	1.94	16	0.00	0.0
28.87	163.2	128.3	198.5	163.1	4.4	-2.1	2.7	5	silty SAND to sandy SILT	120	3.0	54	43	75	41	-	-	17	2.15	16	0.00	0.0
29.04	169.6	133.2	218.4	169.6	5.3	-2.9	3.2	5	silty SAND to sandy SILT	120	3.0	57	44	76	41	-	-	19	2.19	16	0.00	0.0
29.20	231.1	181.2	229.2	231.0	4.9	-3.7	2.2	6	clean SAND to silty SAND	125	5.0	46	36	87	43	-	-	12	1.97	16	0.00	0.0
29.36	256.8	201.0	222.2	256.8	3.6	-4.1	1.4	6	clean SAND to silty SAND	125	5.0	51	40	90	43	-	-	8	1.80	16	0.00	0.0
29.53	341.9	267.2	276.5	341.8	4.4	-3.6	1.3	6	clean SAND to silty SAND	125	5.0	68	53	95	45	-	-	6	1.70	16	0.00	0.0
29.69	370.1	288.7	303.9	370.0	5.5	-4.2	1.5	6	clean SAND to silty SAND	125	5.0	74	58	95	45	-	-	7	1.72	16	0.00	0.0
29.86	290.0	225.9	262.2	290.0	5.5	-2.8	1.9	6	clean SAND to silty SAND	125	5.0	58	45	94	44	-	-	10	1.87	16	0.00	0.0
30.02	159.1	123.7	216.8	159.0	5.4	-2.8	3.4	5	silty SAND to sandy SILT	120	3.0	53	41	74	41	-	-	20	2.23	16	0.00	0.0
30.19	82.6	52.8	-	82.6	4.6	-2.4	5.7	3	silty CLAY to CLAY	115	1.5	55	35	-	-	5.7	9.9	38	2.65	15	-	-
30.35	67.2	42.8	-	67.2	3.0	-2.7	4.6	4	clayy SILT to silty CLAY	115	2.0	34	21	-	-	4.6	9.9	37	2.64	15	-	-
30.51	68.8	53.3	147.5	68.8	2.4	-3.6	3.6	4	clayy SILT to silty CLAY	115	2.0	34	27	-	-	4.8	9.9	31	2.50	15	0.27	0.9
30.68	78.4	60.6	139.8	78.3	2.3	-2.8	3.0	4	clayy SILT to silty CLAY	115	2.0	39	30	-	-	5.4	9.9	26	2.40	15	0.46	2.4
30.84	65.9	50.9	137.4	65.9	2.1	-2.3	3.3	4	clayy SILT to silty CLAY	115	2.0	33	25	-	-	4.5	9.9	30	2.49	15	0.54	2.5

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Project ID: Leighton Group
Data File: SDF(039).cpt
CPT Date: 9/29/2017 8:27:44 AM
GW During Test: 23 ft

Sounding ID: CPT-05
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
31.01	58.5	36.9	-	58.5	2.0	-1.7	3.5	4	clayy SILT to silty CLAY	115	2.0	29	18	-	-	4.0	9.9	36	2.61	15	-	-
31.17	56.0	35.2	-	55.9	1.9	-3.0	3.5	4	clayy SILT to silty CLAY	115	2.0	28	18	-	-	3.8	9.9	36	2.62	15	-	-
31.33	63.7	49.0	144.4	63.6	2.3	-2.8	3.7	4	clayy SILT to silty CLAY	115	2.0	32	24	-	-	4.4	9.9	32	2.53	15	0.33	1.1
31.50	80.0	61.4	159.8	79.9	2.9	-2.6	3.7	4	clayy SILT to silty CLAY	115	2.0	40	31	-	-	5.5	9.9	29	2.47	15	0.15	0.4
31.66	80.7	50.3	-	80.6	4.1	-2.3	5.2	4	clayy SILT to silty CLAY	115	2.0	40	25	-	-	5.6	9.9	37	2.63	15	-	-
31.83	94.0	72.0	198.7	94.0	4.4	-1.0	4.8	4	clayy SILT to silty CLAY	115	2.0	47	36	-	-	6.5	9.9	31	2.50	15	0.00	0.0
31.99	93.6	71.6	197.3	93.6	4.4	-1.2	4.8	4	clayy SILT to silty CLAY	115	2.0	47	36	-	-	6.5	9.9	31	2.50	15	0.00	0.0
32.15	91.0	69.5	198.4	90.9	4.4	-0.9	4.9	4	clayy SILT to silty CLAY	115	2.0	45	35	-	-	6.3	9.9	31	2.52	15	0.00	0.0
32.32	70.7	43.6	-	70.7	3.4	-1.0	4.9	4	clayy SILT to silty CLAY	115	2.0	35	22	-	-	4.9	9.9	38	2.66	15	-	-
32.48	67.9	41.8	-	67.9	3.0	-0.6	4.6	4	clayy SILT to silty CLAY	115	2.0	34	21	-	-	4.7	9.9	38	2.64	15	-	-
32.65	82.8	63.0	157.1	82.8	2.9	-0.3	3.6	4	clayy SILT to silty CLAY	115	2.0	41	31	-	-	5.7	9.9	28	2.44	15	0.18	0.5
32.81	99.8	75.8	171.0	99.8	3.5	0.0	3.6	4	clayy SILT to silty CLAY	115	2.0	50	38	-	-	6.9	9.9	26	2.39	15	0.00	0.0
32.97	90.3	68.6	187.8	90.3	4.0	-0.4	4.5	4	clayy SILT to silty CLAY	115	2.0	45	34	-	-	6.3	9.9	30	2.49	15	0.00	0.0
33.14	76.5	58.0	169.8	76.5	3.2	-0.8	4.3	4	clayy SILT to silty CLAY	115	2.0	38	29	-	-	5.3	9.9	32	2.53	15	0.00	0.0
33.30	64.8	39.3	-	64.8	2.5	-0.2	4.1	4	clayy SILT to silty CLAY	115	2.0	32	20	-	-	4.5	9.9	37	2.63	15	-	-
33.47	60.4	36.6	-	60.4	2.5	-0.6	4.2	4	clayy SILT to silty CLAY	115	2.0	30	18	-	-	4.2	9.9	39	2.66	15	-	-
33.63	66.2	40.0	-	66.2	2.7	-0.4	4.1	4	clayy SILT to silty CLAY	115	2.0	33	20	-	-	4.6	9.9	37	2.63	15	-	-
33.79	52.5	31.7	-	52.5	2.3	-0.6	4.5	3	silty CLAY to CLAY	115	1.5	35	21	-	-	3.6	9.9	42	2.73	15	-	-
33.96	46.3	27.8	-	46.3	1.9	-0.4	4.2	3	silty CLAY to CLAY	115	1.5	31	19	-	-	3.2	8.8	43	2.75	15	-	-
34.12	55.7	33.4	-	55.7	2.5	-0.3	4.6	3	silty CLAY to CLAY	115	1.5	37	22	-	-	3.8	9.9	41	2.72	15	-	-
34.29	73.0	43.6	-	73.0	3.4	0.3	4.8	4	clayy SILT to silty CLAY	115	2.0	37	22	-	-	5.0	9.9	38	2.65	15	-	-
34.45	103.1	77.3	184.1	103.1	4.0	0.5	4.0	4	clayy SILT to silty CLAY	115	2.0	52	39	-	-	7.2	9.9	27	2.42	15	0.00	0.0
34.61	119.0	89.1	182.5	119.0	4.0	0.8	3.5	5	silty SAND to sandy SILT	120	3.0	40	30	63	39	-	-	24	2.33	16	0.00	0.0
34.78	140.5	105.1	182.9	140.5	4.1	0.8	2.9	5	silty SAND to sandy SILT	120	3.0	47	35	69	40	-	-	20	2.23	16	0.00	0.0
34.94	140.0	104.6	181.0	140.0	4.0	0.6	2.9	5	silty SAND to sandy SILT	120	3.0	47	35	68	39	-	-	20	2.23	16	0.00	0.0
35.11	136.0	101.4	172.3	136.0	3.6	0.6	2.7	5	silty SAND to sandy SILT	120	3.0	45	34	67	39	-	-	19	2.21	16	0.00	0.0
35.27	124.0	92.4	166.5	124.0	3.4	0.4	2.8	5	silty SAND to sandy SILT	120	3.0	41	31	64	39	-	-	21	2.25	16	0.00	0.0
35.43	97.8	72.7	171.9	97.8	3.6	0.0	3.7	4	clayy SILT to silty CLAY	115	2.0	49	36	-	-	6.8	9.9	27	2.41	15	0.00	0.0
35.60	86.6	64.3	186.2	86.6	4.0	-0.1	4.7	4	clayy SILT to silty CLAY	115	2.0	43	32	-	-	6.0	9.9	32	2.52	15	0.00	0.0
35.76	81.1	47.3	-	81.1	4.0	-0.1	5.1	4	clayy SILT to silty CLAY	115	2.0	41	24	-	-	5.6	9.9	37	2.64	15	-	-
35.93	73.2	42.6	-	73.2	3.9	0.0	5.5	3	silty CLAY to CLAY	115	1.5	49	28	-	-	5.1	9.9	40	2.70	15	-	-
36.09	90.1	66.7	178.9	90.2	3.7	0.8	4.3	4	clayy SILT to silty CLAY	115	2.0	45	33	-	-	6.2	9.9	30	2.48	15	0.00	0.0
36.26	74.9	43.4	-	75.0	3.8	0.5	5.2	3	silty CLAY to CLAY	115	1.5	50	29	-	-	5.2	9.9	39	2.67	15	-	-
36.42	93.3	68.9	173.0	93.3	3.6	0.8	3.9	4	clayy SILT to silty CLAY	115	2.0	47	34	-	-	6.5	9.9	28	2.45	15	0.00	0.0
36.58	110.4	81.4	193.6	110.5	4.5	0.9	4.1	4	clayy SILT to silty CLAY	115	2.0	55	41	-	-	7.7	9.9	27	2.42	15	0.00	0.0
36.75	75.4	43.3	-	75.4	4.4	1.0	6.0	3	silty CLAY to CLAY	115	1.5	50	29	-	-	5.2	9.9	42	2.72	15	-	-
36.91	79.6	45.7	-	79.6	4.1	1.0	5.3	3	silty CLAY to CLAY	115	1.5	53	30	-	-	5.5	9.9	38	2.66	15	-	-
37.08	83.2	61.2	158.6	83.3	3.0	0.9	3.7	4	clayy SILT to silty CLAY	115	2.0	42	31	-	-	5.8	9.9	29	2.46	15	0.18	0.5
37.24	60.4	34.5	-	60.5	2.5	1.1	4.2	4	clayy SILT to silty CLAY	115	2.0	30	17	-	-	4.1	9.9	40	2.68	15	-	-
37.40	50.9	29.0	-	51.0	2.1	1.3	4.3	3	silty CLAY to CLAY	115	1.5	34	19	-	-	3.5	9.2	43	2.75	15	-	-
37.57	48.9	27.8	-	48.9	2.0	1.7	4.3	3	silty CLAY to CLAY	115	1.5	33	19	-	-	3.3	8.7	44	2.76	15	-	-
37.73	51.3	29.1	-	51.3	1.8	1.9	3.8	4	clayy SILT to silty CLAY	115	2.0	26	15	-	-	3.5	9.2	41	2.71	15	-	-
37.90	53.2	30.1	-	53.2	1.8	2.1	3.5	4	clayy SILT to silty CLAY	115	2.0	27	15	-	-	3.6	9.5	39	2.68	15	-	-
38.06	53.4	30.1	-	53.4	2.2	2.1	4.2	4	clayy SILT to silty CLAY	115	2.0	27	15	-	-	3.6	9.5	42	2.73	15	-	-
38.22	61.8	45.0	127.3	61.9	1.9	2.0	3.1	4	clayy SILT to silty CLAY	115	2.0	31	23	-	-	4.2	9.9	31	2.51	15	1.23	48.5
38.39	46.6	26.1	-	46.6	1.8	2.2	4.0	4	clayy SILT to silty CLAY	115	2.0	23	13	-	-	3.2	8.2	44	2.76	15	-	-
38.55	46.7	26.2	-	46.8	1.9	2.2	4.3	3	silty CLAY to CLAY	115	1.5	31	17	-	-	3.2	8.2	45	2.78	15	-	-
38.72	53.4	29.8	-	53.5	2.1	2.3	4.2	4	clayy SILT to silty CLAY	115	2.0	27	15	-	-	3.6	9.4	42	2.73	15	-	-
38.88	41.6	23.1	-	41.6	2.3	2.2	6.0	3	silty CLAY to CLAY	115	1.5	28	15	-	-	2.8	7.2	53	2.92	15	-	-
39.04	52.3	29.0	-	52.3	2.1	2.3	4.3	3	silty CLAY to CLAY	115	1.5	35	19	-	-	3.6	9.2	43	2.75	15	-	-
39.21	52.1	28.9	-	52.1	2.0	2.3	4.1	4	clayy SILT to silty CLAY	115	2.0	26	14	-	-	3.6	9.1	42	2.73	15	-	-
39.37	44.3	24.5	-	44.4	1.8	2.2	4.3	3	silty CLAY to CLAY	115	1.5	30	16	-	-	3.0	7.7	46	2.80	15	-	-
39.54	40.6	22.4	-	40.7	2.0	2.3	5.3	3	silty CLAY to CLAY	115	1.5	27	15	-	-	2.7	7.0	52	2.90	15	-	-
39.70	62.8	34.6	-	62.8	2.9	2.5	4.7	3	silty CLAY to CLAY	115	1.5	42	23	-	-	4.3	9.9	41	2.72	15	-	-
39.86	96.2	69.2	188.7	96.2	4.2	2.5	4.5	4	clayy SILT to silty CLAY	115	2.0	48	35	-	-	6.7	9.9	30	2.49	15	0.00	0.0
40.03	133.5	96.0	217.5	133.6	5.8	2.3	4.4	9	very stiff fine SOIL	120	1.0	100	96	-	-	4.7	9.9	26	2.39	30	0.00	0.0
40.19	168.8	121.2	205.3	168.9	5.2	2.6	3.1	5	silty SAND to sandy SILT	120	3.0	56	40	73	40	-	-	19	2.21	16	0.00	0.0
40.36	240.7	172.5	208.9	240.7	4.3	2.7	1.8	6	clean SAND to silty SAND	125	5.0	48	35	85	42	-	-	11	1.92	16	0.00	0.0
40.52	314.9	225.5	225.5	315.0	2.8	2.7	0.9	6	clean SAND to silty SAND	125	5.0	63	45	94	43	-	-	5	1.62	16	0.00	0.0
40.68	307.0	219.5	219.5	307.1	2.0	2.6	0.6	6	clean SAND to silty SAND	125	5.0	61	44	93	43	-	-	5	1.53	16	0.00	0.0
40.85	283.6	202.5	202.5	283.7	2.1	1.7	0.8	6	clean SAND to silty SAND	125	5.0	57	40	90	43	-	-	5	1.60	16	0.00	0.0
41.01	271.5	193.6	197.2	271.5	2.4	0.2	0.9	6	clean SAND to silty SAND	125	5.0	54	39	89	42	-	-	6	1.67	16	0.00	0.0
41.18	280.8	199.9	199.9	280.8	2.2	0.0	0.8	6	clean SAND to silty SAND	125	5.0	56	40	90	43	-	-	5	1.62	16	0.00	0.0
41.34	272.1	193.4	193.4	272.1	2.1	-0.2	0.8	6	clean SAND to silty SAND	125	5.0	54	39	89	42	-	-	5	1.63	16	0.00	0.0
41.50	283.0	200.9	207.3	283.0	2.8	-0.2	1.0	6	clean SAND to silty SAND	125	5.0	57	40	90	43	-	-	6	1.69	16	0.00	0.0
41.67	271.0	192.2	202.3	271.0	2.8	-0.5	1.1	6	clean SAND to silty SAND	125	5.0	54	38	89	42	-	-	7	1.72	16	0.00	0.0
41.83	252.5	178.8	193.0	252.5	2.8	-0.5	1.1	6	clean SAND to silty SAND	125	5.0	50	36	86	42	-	-	7	1.76	16	0.00	0.0
42.00	260.7	184.4	195.5	260.7	2.7	-0.6	1.1	6	clean SAND to silty SAND	125	5.0	52	37	87	42	-	-	7	1.73	16	0.00	0.0
42.16	265.3	187.3	199.8	265.3	2.9	-0.7	1.1	6	clean SAND to silty SAND	125	5.0	53	37	88	42	-	-	7	1.74	16	0.00	0.0
42.32	270.4	190.7	241.3	270.4	6.0	-0.8	2.2	5	silty SAND to sandy SILT	120	3.0	90	64	88	42	-	-	12	1.97	16	0.00	0.0
42.49	262.4	184.8	248.0	262.3	6.7	-1.0	2.6	5	silty SAND to sandy SILT	120	3.0	87	62	87	42	-	-	14	2.03	16	0.00	0.0
42.65	277.4	195.2	249.6	277.4	6.5	-0.9	2.4	5	silty SAND to sandy SILT	120	3.0	92	65	89	42	-	-	12	1.98	16	0.00	0.0
42.82	336.1	236.1	256.1	336.1	4.9	-0.6	1.5	6	clean SAND to silty SAND	125	5.0	67	47	95	43	-	-	7	1.77	16	0.00	0.0
42.98	373.6	262.2	262.2	373.6	3.1	-1.2	0.8	6	clean SAND to silty SAND	125	5.0	75	52	95	44	-	-	5	1.55	16	0.00	0.0
43.15	392.7	275.1	275.1	392.6	2.8	-1.1	0.7	6	clean SAND to silty SAND	125	5.0	79	55	95	44	-	-	5	1.49	16	0.00	0.0
43.31	383.1	268.1	268.1	383.1	2.2	-1.7	0.6	6	clean SAND to silty SAND	125	5.0	77	54	95	44	-	-	5	1.44	16	0.00	0.0
43.47	382.2	267.1	267.1	382.1	2.4	-1.9	0.6	6	clean SAND to silty SAND	125	5.0	76	53	95	44	-	-	5	1.46	16	0.00	0.0
43.64	351.1	245.0	245.0	351.1	2.7	-1.2	0.8	6	clean SAND to silty SAND	125	5.0	70	49	95	44	-	-	5	1.55	16	0.00	0.0
43.80	370.8	258.5	258.5	370.8	2.7	-1.2	0.7	6	clean SAND to silty SAND	125	5.0	74	52	95	44	-	-	5	1.52	16	0.00	0.0
43.97	376.0	261.7	261.7	376.0	2.7	-1.4	0.7	6	clean SAND to silty SAND	125	5.0	75	52	95	44	-	-	5	1.51	16	0.00	0.0
44.13	371.8	258.5	258.5	371.8	2.9	-1.6	0.8	6	clean SAND to silty SAND	125	5.0	74	52	95	44	-	-	5	1.54	16	0.00	0.0
44.29	368.0	255.5	255.5	367.9	3.5	-1.7	1.0	6	clean SAND to silty SAND	125	5.0	74	51	95	44	-	-	5	1.61	16	0.00	0.0
44.46	378.9	262.7	262.3	378.8	4.1	-1.6	1.1	6	clean SAND to silty SAND	125	5.0	76	53	95	44	-	-	5	1.64	16	0.00	0.0
44.62	392.4	271.7	271.7	392.3	4.3	-1.6	1.1	6	clean SAND to silty SAND	125	5.0	78	54	95	44	-	-	5	1.64	16	0.00	0.0
44.79	389.0	269.0	277.6	388.9	5.0	-1.6	1.3	6	clean SAND to silty SAND	125	5.0	78	54	95	44	-	-	6	1.69	16	0.00	0.0
44.95	318.6	220.1	272.7	318.6	7.4	-3.1	2.3	6	clean SAND to silty SAND	125	5.0	64	44	93	43	-	-	12	1.95	16	0.00	0.0
45.11	214.1	147.7	257.6	214.1	8.2	-2.7	3.9	8	stiff SAND to clayy SAND	115	5.0	43	30	80	41	-	-	20	2.23	16	0.00	0.0
45.28	118.3	59.5	-	118.2	6.7	-2.4	5.8	4	clayy SILT to silty CLAY	115	2.0	59	30	-	-	8.2	9.9	36	2.61	15	-	-
45.44	66.1	33.2	-	66.0	3.2	-2.7	5.1	3	silty CLAY to CLAY	115	1.5	44	22	-	-	4.5	9.9	43	2.75	15	-	-
45.61	43.6	21.8	-	43.5	1.3	-2.4	3.1	4	clayy SILT to silty CLAY	115	2.0	22	11	-	-	2.9	6.8	44	2.76	15	-	-
45.77	40.0	20.0	-	40.0	1.3	-2.0	3.5	3	silty CLAY to CLAY	115	1.5	27	13	-	-	2.7	6.2	47	2.82	15	-	-
45.93	56.2	28.0	-	56.2	1.8	-2.6	3.4	4	clayy SILT to silty CLAY	115	2.0	28	14	-	-	3.8	8.8	40	2.69	15	-	-
46.10	52.7	26.2	-	52.6	1.6	-2.6	3.3	4	clayy SILT to silty CLAY	115	2.0	26	13	-	-	3.6	8.2	41	2.71	15	-	-
46.26	41.4	20.6	-	41.3	1.5	-2.6	4.0	3	silty CLAY to CLAY	115	1.5	28	14	-	-	2.8	6.3	49	2.84	15	-	-

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(039).cpt
CPT Date: 9/29/2017 8:27:44 AM
GW During Test: 23 ft

Sounding ID: CPT-05
Project No: 11753.001
Cone/Rig: DDG1379

. . Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
46.43	38.2	18.9	-	38.2	1.4	-2.6	3.8	3	silty CLAY to CLAY	115	1.5	25	13	-	-	2.6	5.8	50	2.86	15	-	-
46.59	41.8	20.7	-	41.7	1.5	-2.5	3.7	3	silty CLAY to CLAY	115	1.5	28	14	-	-	2.8	6.4	47	2.82	15	-	-
46.75	38.3	18.9	-	38.2	1.3	-2.6	3.7	3	silty CLAY to CLAY	115	1.5	26	13	-	-	2.6	5.8	49	2.86	15	-	-
46.92	33.6	16.5	-	33.5	1.2	-2.6	3.8	3	silty CLAY to CLAY	115	1.5	22	11	-	-	2.2	5.0	53	2.91	15	-	-
47.08	31.4	15.4	-	31.3	1.1	-2.6	3.8	3	silty CLAY to CLAY	115	1.5	21	10	-	-	2.1	4.6	54	2.94	15	-	-
47.25	33.5	16.4	-	33.4	1.7	-2.6	5.6	3	silty CLAY to CLAY	115	1.5	22	11	-	-	2.2	5.0	60	3.02	15	-	-
47.41	36.5	17.9	-	36.5	2.0	-2.6	5.9	3	silty CLAY to CLAY	115	1.5	24	12	-	-	2.4	5.4	59	3.01	15	-	-
47.57	49.6	24.2	-	49.5	2.7	-2.4	5.8	3	silty CLAY to CLAY	115	1.5	33	16	-	-	3.4	7.5	52	2.90	15	-	-
47.74	90.9	61.6	136.3	90.9	2.4	-2.0	2.8	5	silty SAND to sandy SILT	120	3.0	30	21	51	36	-	-	25	2.37	16	0.84	5.8
47.90	144.0	97.5	141.5	144.0	2.6	-2.0	1.8	5	silty SAND to sandy SILT	120	3.0	48	33	66	39	-	-	16	2.10	16	0.69	3.6
48.07	158.4	107.1	140.1	158.4	2.3	0.1	1.5	6	clean SAND to silty SAND	125	5.0	32	21	69	39	-	-	13	2.01	16	0.80	3.8
48.23	142.0	95.9	144.8	142.0	2.7	-0.6	2.0	5	silty SAND to sandy SILT	120	3.0	47	32	66	38	-	-	17	2.13	16	0.56	3.0
48.39	124.4	83.9	162.0	124.4	3.6	-0.7	2.9	5	silty SAND to sandy SILT	120	3.0	41	28	61	38	-	-	22	2.29	16	0.00	0.0
48.56	104.8	70.6	182.7	104.7	4.3	-0.7	4.2	4	clayy SILT to silty CLAY	115	2.0	52	35	-	-	7.3	9.9	29	2.46	15	0.00	0.0
48.72	106.1	71.5	185.7	106.1	4.4	-0.8	4.3	4	clayy SILT to silty CLAY	115	2.0	53	36	-	-	7.4	9.9	29	2.47	15	0.00	0.0
48.89	124.2	83.6	174.8	124.2	4.1	-0.9	3.4	5	silty SAND to sandy SILT	120	3.0	41	28	61	38	-	-	24	2.34	16	0.00	0.0
49.05	140.4	94.4	172.7	140.4	4.0	-0.8	2.9	5	silty SAND to sandy SILT	120	3.0	47	31	65	38	-	-	21	2.26	16	0.00	0.0
49.22	159.7	107.2	160.7	159.7	3.4	-0.7	2.2	5	silty SAND to sandy SILT	120	3.0	53	36	69	39	-	-	17	2.12	16	0.00	0.0
49.38	188.9	126.6	164.3	188.9	3.2	-0.9	1.7	6	clean SAND to silty SAND	125	5.0	38	25	75	40	-	-	13	2.00	16	0.00	0.0
49.54	215.1	144.0	175.8	215.1	3.3	-0.8	1.6	6	clean SAND to silty SAND	125	5.0	43	29	79	41	-	-	11	1.93	16	0.00	0.0
49.71	217.5	145.5	176.0	217.5	3.3	-0.8	1.5	6	clean SAND to silty SAND	125	5.0	44	29	79	41	-	-	11	1.92	16	0.00	0.0
49.87	217.5	145.3	174.9	217.4	3.2	-0.8	1.5	6	clean SAND to silty SAND	125	5.0	43	29	79	41	-	-	11	1.92	16	0.00	0.0
50.04	205.0	136.8	165.5	205.0	2.9	-0.9	1.4	6	clean SAND to silty SAND	125	5.0	41	27	77	40	-	-	11	1.92	16	0.00	0.0
50.20	176.4	117.5	152.3	176.4	2.7	-1.1	1.6	6	clean SAND to silty SAND	125	5.0	35	24	72	39	-	-	13	2.00	16	0.37	2.3

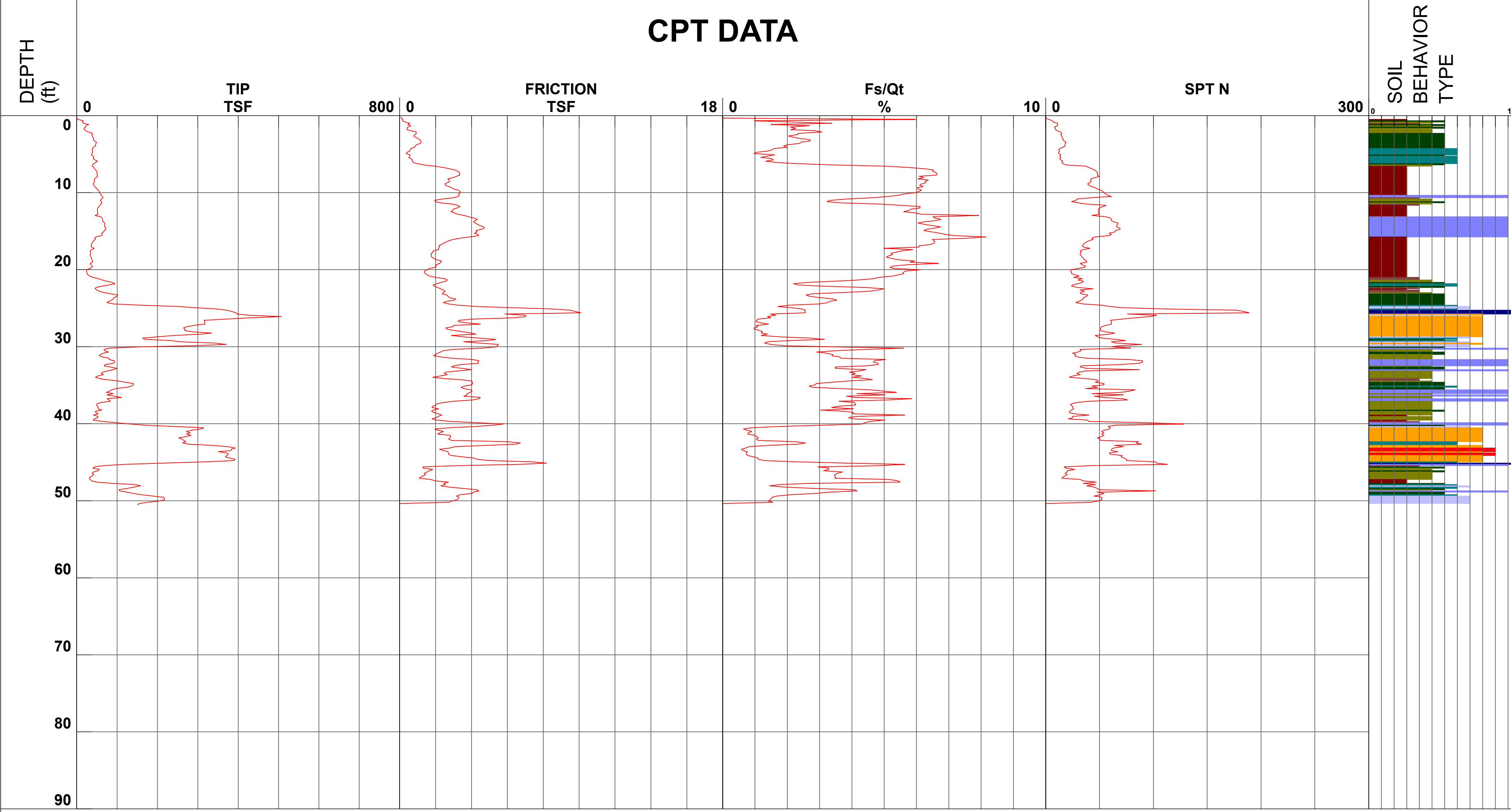
* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(039).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-05	Date and Time	9/29/2017 8:27:44 AM	Maximum Depth	50.52 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Project ID: Leighton Group
Data File: SDF(036).cpt
CPT Date: 9/28/2017 12:13:50 PM
GW During Test: 23 ft

Sounding ID: CPT-06
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	14.0	22.4	34.2	14.0	0.0	0.6	0.1	5	silty SAND to sandy SILT	120	3.0	5	7	18	48	-	-	17	2.14	16	N/A	N/A
0.49	11.8	18.9	32.0	11.8	0.0	0.4	0.1	5	silty SAND to sandy SILT	120	3.0	4	6	12	47	-	-	19	2.21	16	N/A	N/A
0.66	12.0	19.2	32.2	12.0	0.0	0.2	0.1	5	silty SAND to sandy SILT	120	3.0	4	6	13	46	-	-	19	2.20	16	N/A	N/A
0.82	14.2	22.7	49.5	14.2	0.1	0.2	0.7	5	silty SAND to sandy SILT	120	3.0	5	8	18	46	-	-	25	2.37	16	N/A	N/A
0.98	26.8	43.0	70.5	26.8	0.2	0.1	0.9	5	silty SAND to sandy SILT	120	3.0	9	14	39	48	-	-	19	2.19	16	N/A	N/A
1.15	39.7	63.7	79.0	39.7	0.2	0.0	0.6	6	clean SAND to silty SAND	125	5.0	8	13	52	48	-	-	12	1.95	16	N/A	N/A
1.31	29.9	47.9	77.9	29.9	0.3	-0.1	1.1	5	silty SAND to sandy SILT	120	3.0	10	16	43	47	-	-	18	2.18	16	N/A	N/A
1.48	26.1	41.9	56.6	26.1	0.1	0.0	0.4	6	clean SAND to silty SAND	125	5.0	5	8	38	46	-	-	14	2.04	16	N/A	N/A
1.64	20.8	33.4	50.3	20.8	0.1	0.0	0.4	5	silty SAND to sandy SILT	120	3.0	7	11	31	44	-	-	17	2.13	16	N/A	N/A
1.80	16.6	26.7	-	16.6	0.4	0.0	2.7	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.2	9.9	37	2.63	15	N/A	N/A
1.97	21.3	34.2	77.5	21.3	0.3	0.0	1.5	5	silty SAND to sandy SILT	120	3.0	7	11	32	44	-	-	26	2.39	16	N/A	N/A
2.13	18.4	29.4	66.6	18.4	0.2	-0.4	1.2	5	silty SAND to sandy SILT	120	3.0	6	10	27	42	-	-	26	2.39	16	N/A	N/A
2.30	20.0	32.1	61.1	20.0	0.2	-0.1	0.9	5	silty SAND to sandy SILT	120	3.0	7	11	30	42	-	-	22	2.28	16	N/A	N/A
2.46	28.7	46.0	89.7	28.7	0.5	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	10	15	41	44	-	-	23	2.30	16	N/A	N/A
2.62	49.9	80.0	108.5	49.9	0.6	0.0	1.2	5	silty SAND to sandy SILT	120	3.0	17	27	60	46	-	-	14	2.04	16	N/A	N/A
2.79	36.9	59.1	95.9	36.9	0.5	0.0	1.4	5	silty SAND to sandy SILT	120	3.0	12	20	50	44	-	-	18	2.18	16	N/A	N/A
2.95	28.7	46.0	76.3	28.7	0.3	-0.2	1.1	5	silty SAND to sandy SILT	120	3.0	10	15	41	43	-	-	19	2.20	16	N/A	N/A
3.12	23.1	37.0	70.9	23.1	0.3	-0.1	1.1	5	silty SAND to sandy SILT	120	3.0	8	12	34	42	-	-	22	2.29	16	N/A	N/A
3.28	18.6	29.9	65.9	18.6	0.2	-0.2	1.1	5	silty SAND to sandy SILT	120	3.0	6	10	27	40	-	-	25	2.37	16	N/A	N/A
3.45	17.3	27.7	67.5	17.3	0.2	-0.3	1.3	5	silty SAND to sandy SILT	120	3.0	6	9	25	40	-	-	28	2.43	16	N/A	N/A
3.61	15.7	25.2	66.7	15.7	0.2	-0.4	1.4	5	silty SAND to sandy SILT	120	3.0	5	8	21	39	-	-	30	2.48	16	N/A	N/A
3.77	14.4	23.1	61.5	14.4	0.2	-0.3	1.2	5	silty SAND to sandy SILT	120	3.0	5	8	19	38	-	-	30	2.48	16	N/A	N/A
3.94	14.4	23.1	59.6	14.4	0.2	-0.4	1.1	5	silty SAND to sandy SILT	120	3.0	5	8	19	38	-	-	29	2.46	16	N/A	N/A
4.10	14.5	23.3	55.6	14.5	0.1	-0.5	0.9	5	silty SAND to sandy SILT	120	3.0	5	8	19	38	-	-	27	2.42	16	N/A	N/A
4.27	13.1	21.0	45.5	13.1	0.1	-0.2	0.6	5	silty SAND to sandy SILT	120	3.0	4	7	15	37	-	-	25	2.36	16	N/A	N/A
4.43	12.9	20.7	42.8	12.9	0.1	-0.5	0.5	5	silty SAND to sandy SILT	120	3.0	4	7	15	36	-	-	24	2.33	16	N/A	N/A
4.59	12.3	19.7	54.2	12.3	0.1	-0.4	1.0	5	silty SAND to sandy SILT	120	3.0	4	7	13	36	-	-	31	2.50	16	N/A	N/A
4.76	14.6	23.4	62.3	14.6	0.2	-0.5	1.2	5	silty SAND to sandy SILT	120	3.0	5	8	19	37	-	-	30	2.48	16	N/A	N/A
4.92	20.3	32.5	83.6	20.2	0.4	-0.5	1.8	5	silty SAND to sandy SILT	120	3.0	7	11	30	38	-	-	29	2.46	16	N/A	N/A
5.09	41.6	66.8	99.0	41.6	0.5	-0.5	1.3	5	silty SAND to sandy SILT	120	3.0	14	22	54	42	-	-	16	2.12	16	N/A	N/A
5.25	55.4	88.8	119.6	55.3	0.7	-0.7	1.3	5	silty SAND to sandy SILT	120	3.0	18	30	63	43	-	-	14	2.03	16	N/A	N/A
5.41	54.4	87.2	133.5	54.4	1.0	-0.7	1.9	5	silty SAND to sandy SILT	120	3.0	18	29	62	43	-	-	17	2.14	16	N/A	N/A
5.58	55.1	88.4	138.6	55.1	1.1	-0.6	2.0	5	silty SAND to sandy SILT	120	3.0	18	29	63	43	-	-	18	2.16	16	N/A	N/A
5.74	54.6	87.5	146.0	54.5	1.2	-0.8	2.3	5	silty SAND to sandy SILT	120	3.0	18	29	63	43	-	-	19	2.20	16	N/A	N/A
5.91	56.9	91.2	156.5	56.8	1.4	-0.9	2.5	5	silty SAND to sandy SILT	120	3.0	19	30	64	43	-	-	20	2.22	16	N/A	N/A
6.07	58.8	94.2	165.4	58.7	1.6	-0.9	2.7	5	silty SAND to sandy SILT	120	3.0	20	31	65	43	-	-	20	2.23	16	N/A	N/A
6.23	60.8	96.5	168.8	60.7	1.7	-1.0	2.8	5	silty SAND to sandy SILT	120	3.0	20	32	66	43	-	-	20	2.23	16	N/A	N/A
6.40	61.1	95.8	168.1	61.1	1.7	-0.9	2.8	5	silty SAND to sandy SILT	120	3.0	20	32	66	43	-	-	20	2.23	16	N/A	N/A
6.56	60.3	93.4	166.2	60.3	1.7	-1.0	2.8	5	silty SAND to sandy SILT	120	3.0	20	31	65	43	-	-	20	2.24	16	N/A	N/A
6.73	59.3	90.7	170.3	59.3	1.8	-0.9	3.0	5	silty SAND to sandy SILT	120	3.0	20	30	64	43	-	-	22	2.28	16	N/A	N/A
6.89	61.1	92.3	171.9	61.1	1.8	-0.9	3.0	5	silty SAND to sandy SILT	120	3.0	20	31	64	43	-	-	21	2.27	16	N/A	N/A
7.05	58.8	87.8	162.4	58.8	1.7	-0.9	2.8	5	silty SAND to sandy SILT	120	3.0	20	29	63	42	-	-	21	2.27	16	N/A	N/A
7.22	58.7	86.6	149.7	58.7	1.4	-0.9	2.5	5	silty SAND to sandy SILT	120	3.0	20	29	62	42	-	-	20	2.22	16	N/A	N/A
7.38	59.6	87.0	138.3	59.6	1.2	-0.7	2.0	5	silty SAND to sandy SILT	120	3.0	20	29	62	42	-	-	18	2.17	16	N/A	N/A
7.55	59.5	85.9	148.7	59.5	1.4	-1.0	2.4	5	silty SAND to sandy SILT	120	3.0	20	29	62	42	-	-	20	2.23	16	N/A	N/A
7.71	62.0	88.6	158.5	62.0	1.7	-1.2	2.7	5	silty SAND to sandy SILT	120	3.0	21	30	63	42	-	-	21	2.25	16	N/A	N/A
7.87	64.6	91.3	169.3	64.6	1.9	-1.2	3.0	5	silty SAND to sandy SILT	120	3.0	22	30	64	42	-	-	21	2.27	16	N/A	N/A
8.04	61.9	86.6	174.7	61.9	2.0	-1.4	3.3	5	silty SAND to sandy SILT	120	3.0	21	29	62	42	-	-	23	2.32	16	N/A	N/A
8.20	62.6	86.7	177.2	62.6	2.1	-1.5	3.4	5	silty SAND to sandy SILT	120	3.0	21	29	62	42	-	-	24	2.33	16	N/A	N/A
8.37	69.1	94.7	167.7	69.1	1.9	-1.3	2.8	5	silty SAND to sandy SILT	120	3.0	23	32	65	42	-	-	20	2.24	16	N/A	N/A
8.53	74.2	100.8	152.8	74.2	1.6	-1.3	2.1	5	silty SAND to sandy SILT	120	3.0	25	34	67	42	-	-	17	2.13	16	N/A	N/A
8.69	73.3	98.6	137.1	73.3	1.2	-1.3	1.6	5	silty SAND to sandy SILT	120	3.0	24	33	67	42	-	-	15	2.06	16	N/A	N/A
8.86	69.8	93.0	128.2	69.8	1.0	-1.2	1.5	5	silty SAND to sandy SILT	120	3.0	23	31	65	42	-	-	14	2.06	16	N/A	N/A
9.02	67.0	88.4	126.1	67.0	1.0	-1.2	1.6	5	silty SAND to sandy SILT	120	3.0	22	29	63	42	-	-	15	2.08	16	N/A	N/A
9.19	64.8	84.7	127.8	64.7	1.1	-1.2	1.7	5	silty SAND to sandy SILT	120	3.0	22	28	62	41	-	-	17	2.13	16	N/A	N/A
9.35	59.3	76.9	130.0	59.2	1.2	-1.3	2.1	5	silty SAND to sandy SILT	120	3.0	20	26	58	41	-	-	19	2.21	16	N/A	N/A
9.51	52.6	67.6	137.3	52.6	1.4	-1.3	2.6	5	silty SAND to sandy SILT	120	3.0	18	23	54	40	-	-	23	2.32	16	N/A	N/A
9.68	50.3	64.1	166.5	50.3	2.0	-1.4	3.9	4	clayy SILT to silty CLAY	115	2.0	25	32	-	-	3.5	9.9	29	2.46	15	N/A	N/A
9.84	51.2	64.7	189.0	51.1	2.4	-1.5	4.8	4	clayy SILT to silty CLAY	115	2.0	26	32	-	-	3.6	9.9	32	2.53	15	N/A	N/A
10.01	47.6	59.7	198.5	47.5	2.6	-2.0	5.6	4	clayy SILT to silty CLAY	115	2.0	24	30	-	-	3.3	9.9	35	2.60	15	N/A	N/A
10.17	43.4	60.4	-	43.4	2.5	-2.4	5.8	4	clayy SILT to silty CLAY	115	2.0	22	30	-	-	3.0	9.9	36	2.61	15	N/A	N/A
10.34	39.6	54.5	-	39.5	2.3	-2.2	5.8	3	silty CLAY to CLAY	115	1.5	26	36	-	-	2.8	9.9	37	2.64	15	N/A	N/A
10.50	36.0	57.3	-	35.9	2.0	-1.5	5.7	4	clayy SILT to silty CLAY	115	2.0	18	29	-	-	2.5	9.9	36	2.62	15	N/A	N/A
10.66	35.9	48.3	-	35.8	1.9	-1.6	5.3	3	silty CLAY to CLAY	115	1.5	24	32	-	-	2.5	9.9	38	2.64	15	N/A	N/A
10.83	37.2	49.6	-	37.2	1.7	-1.7	4.7	4	clayy SILT to silty CLAY	115	2.0	19	25	-	-	2.6	9.9	35	2.60	15	N/A	N/A
10.99	37.8	45.3	148.0	37.7	1.6	-1.7	4.2	4	clayy SILT to silty CLAY	115	2.0	19	23	-	-	2.6	9.9	35	2.59	15	N/A	N/A
11.16	38.7	46.1	120.9	38.7	1.1	-1.5	2.9	4	clayy SILT to silty CLAY	115	2.0	19	23	-	-	2.7	9.9	29	2.47	15	N/A	N/A
11.32	40.0	47.3	117.0	40.0	1.0	-1.4	2.6	5	silty SAND to sandy SILT	120	3.0	13	16	42	38	-	-	28	2.44	16	N/A	N/A
11.48	41.4	48.6	121.4	41.4	1.1	-1.4	2.8	4	clayy SILT to silty CLAY	115	2.0	21	24	-	-	2.9	9.9	28	2.44	15	N/A	N/A
11.65	45.4	52.9	123.7	45.4	1.2	-1.5	2.7	5	silty SAND to sandy SILT	120	3.0	15	18	46	38	-	-	27	2.41	16	N/A	N/A
11.81	51.6	59.7	119.1	51.6	1.1	-1.5	2.2	5	silty SAND to sandy SILT	120	3.0	17	20	50	39	-	-	23	2.31	16	N/A	N/A
11.98	53.8	61.8	129.2	53.7	1.4	-1.3	2.6	5	silty SAND to sandy SILT	120	3.0	18	21	51	39	-	-	24	2.34	16	N/A	N/A
12.14	51.1	58.4	155.3	51.1	1.9	-1.4	3.7	4	clayy SILT to silty CLAY	115	2.0	26	29	-	-	3.6	9.9	30	2.48	15	N/A	N/A
12.30	47.1	57.5	-	47.1	2.6	-1.8	5.6	4	clayy SILT to silty CLAY	115	2.0	24	29	-	-	3.3	9.9	36	2.61	15	N/A	N/A
12.47	41.9	56.4	-	41.9	3.0	-1.8	7.2	3	silty CLAY to CLAY	115	1.5	28	38	-	-	2.9	9.9	41	2.70	15	N/A	N/A
12.63	37.2	49.5	-	37.2	3.0	-2.6	8.2	3	silty CLAY to CLAY	115	1.5	25	33	-	-	2.6	9.9	45	2.78	15	N/A	N/A
12.80	35.3	46.3	-	35.2	2.7	-3.1	7.8	3	silty CLAY to CLAY	115	1.5	24	31	-	-	2.4	9.9	45	2.78	15	N/A	N/A
12.96	35.5	46.1	-	35.5	2.7	-2.7	7.9	3	silty CLAY to CLAY	115	1.5	24	31	-	-	2.5	9.9	45	2.79	15	N/A	N/A
13.12	38.2	48.9	-	38.1	2.7	-1.9	7.2	3	silty CLAY to CLAY	115	1.5	25	33	-	-	2.6	9.9	43	2.74	15	N/A	N/A
13.29	37.8	47.9	-	37.8	2.7	-1.4	7.4	3	silty CLAY to CLAY	115	1.5	25	32	-	-	2.6	9.9	44	2.76	15	N/A	N/A
13.45	37.1	46.4	-	37.0	2.6	-1.8	7.2	3	silty CLAY to CLAY	115	1.5	25	31	-	-	2.6	9.9	44	2.76	15	N/A	N/A
13.62	38.7	47.9	-	38.7	2.6	-1.8	6.9	3	silty CLAY to CLAY	115	1.5	26	32	-	-	2.7	9.9	42	2.73	15	N/A	N/A
13.78	40.6	49.6	-	40.5	2.7	-2.2	6.8	3	silty CLAY to CLAY	115	1.5	27	33	-	-	2.8	9.9	41	2.72	15	N/A	N/A
13.94	42.7	51.6	-	42.7	2.7	-2.0	6.6	3	silty CLAY to CLAY	115	1.5	28	34	-	-	3.0	9.9	40	2.70	15	N/A	N/A
14.11	44.8	53.6	-	44.8	2.9	-1.9	6.5	3	silty CLAY to CLAY	115	1.5	30	36	-	-	3.1	9.9	40	2.68	15	N/A	N/A
14.27	47.4	56.0	-	47.4	3.0	-2.0	6.4	3	silty CLAY to CLAY	115	1.5	32	37	-	-	3.3	9.9	39	2.66	15	N/A	N/A
14.44	48.7	56.8	-	48.6	3.1	-1.7	6.4	3	silty CLAY to CLAY	115	1.5	32	38	-	-	3.4	9.9	38	2.66	15	N/A	N/A
14.60	53.1	61.4	-	53.1	3.3	-1.6	6.3	3	silty CLAY to CLAY	115	1.5	35	41	-	-	3.7	9.9	37	2.63	15	N/A	N/A
14.76	55.0	62.8	-	54.9	3.5	-1.8	6.4	9	very stiff fine SOIL	120	1.0	55	63	-	-	1.9	9.9	37	2.63	30	N/A	N/A
14.93	46.3	52.4	-	46.3	3.4	-1.6	7.6	3	silty CLAY to CLAY	115	1.5	31	35	-	-	3.2	9.9	43	2.74	15	N/A	N/A
15.09	40.7	45.5	-	40.7	3.1	-1.7	7.8	3	silty CLAY to CLAY	115	1.5	27	30	-	-	2.8	9.9	45	2.79	15	N/A	N/A
15.26	34.1	37.7	-	34.0	2.7	-2.1	8.1	3	silty CLAY to CLAY	115	1.5	23	25	-	-	2.3	9.9	49	2.86	15	N/A	N/A
15.42	30.9	33.9	-	30.9	2.4	-2.3	8.1	3	silty CLAY to CLAY	115	1.5	21	23	-	-	2.1	9.9	51	2.89	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	34.7	37.7	-	34.6	2.6	-5.1	7.7	3	silty CLAY to CLAY	115	1.5	23	25	-	-	2.4	9.9	48	2.84	15	N/A	N/A
15.75	44.2	47.4	-	44.1	3.0	-5.2	6.8	3	silty CLAY to CLAY	115	1.5	29	32	-	-	3.1	9.9	42	2.73	15	N/A	N/A
15.91	53.5	56.9	-	53.5	3.2	-2.9	6.0	3	silty CLAY to CLAY	115	1.5	36	38	-	-	3.7	9.9	37	2.64	15	N/A	N/A
16.08	56.0	57.1	-	56.0	3.0	-2.2	5.4	4	clayy SILT to silty CLAY	115	2.0	28	29	-	-	3.9	9.9	35	2.60	15	N/A	N/A
16.24	61.8	61.3	166.7	61.8	2.5	-2.0	4.1	4	clayy SILT to silty CLAY	115	2.0	31	31	-	-	4.3	9.9	30	2.49	15	N/A	N/A
16.40	67.7	66.8	164.4	67.6	2.5	-1.4	3.7	4	clayy SILT to silty CLAY	115	2.0	34	33	-	-	4.7	9.9	28	2.44	15	N/A	N/A
16.57	80.0	78.5	173.4	80.0	2.8	-1.5	3.6	4	clayy SILT to silty CLAY	115	2.0	40	39	-	-	5.6	9.9	25	2.37	15	N/A	N/A
16.73	116.8	114.1	183.8	116.7	3.1	-1.4	2.7	5	silty SAND to sandy SILT	120	3.0	39	38	71	41	-	-	18	2.18	16	N/A	N/A
16.90	152.5	148.2	199.1	152.4	3.3	-1.2	2.2	5	silty SAND to sandy SILT	120	3.0	51	49	80	43	-	-	14	2.03	16	N/A	N/A
17.06	178.9	173.1	218.3	178.9	3.7	-1.3	2.1	6	clean SAND to silty SAND	125	5.0	36	35	85	43	-	-	12	1.97	16	N/A	N/A
17.23	200.9	193.4	237.1	200.9	4.1	-1.2	2.1	6	clean SAND to silty SAND	125	5.0	40	39	89	44	-	-	11	1.94	16	N/A	N/A
17.39	227.8	218.2	257.7	227.8	4.5	-1.2	2.0	6	clean SAND to silty SAND	125	5.0	46	44	93	45	-	-	10	1.89	16	N/A	N/A
17.55	253.9	242.0	269.5	253.9	4.3	-1.2	1.7	6	clean SAND to silty SAND	125	5.0	51	48	95	45	-	-	8	1.81	16	N/A	N/A
17.72	281.0	266.5	292.9	281.0	4.8	-1.0	1.7	6	clean SAND to silty SAND	125	5.0	56	53	95	45	-	-	8	1.79	16	N/A	N/A
17.88	298.7	281.9	305.3	298.7	5.0	-1.0	1.7	6	clean SAND to silty SAND	125	5.0	60	56	95	46	-	-	7	1.77	16	N/A	N/A
18.05	336.5	316.1	335.2	336.5	5.5	-1.1	1.6	6	clean SAND to silty SAND	125	5.0	67	63	95	46	-	-	7	1.73	16	N/A	N/A
18.21	375.8	351.2	368.7	375.7	6.3	-0.9	1.7	6	clean SAND to silty SAND	125	5.0	75	70	95	47	-	-	6	1.72	16	N/A	N/A
18.37	411.6	382.9	395.3	411.6	6.8	-1.0	1.7	6	clean SAND to silty SAND	125	5.0	82	77	95	47	-	-	6	1.69	16	N/A	N/A
18.54	432.7	400.7	416.6	432.7	7.6	-1.0	1.8	6	clean SAND to silty SAND	125	5.0	87	80	95	47	-	-	6	1.70	16	N/A	N/A
18.70	451.2	415.8	427.7	451.1	7.7	-1.0	1.7	6	clean SAND to silty SAND	125	5.0	90	83	95	47	-	-	6	1.69	16	N/A	N/A
18.87	449.0	411.9	426.7	449.0	7.9	-1.1	1.8	6	clean SAND to silty SAND	125	5.0	90	82	95	47	-	-	6	1.70	16	N/A	N/A
19.03	441.9	403.6	410.7	441.9	7.1	-1.2	1.6	6	clean SAND to silty SAND	125	5.0	88	81	95	47	-	-	6	1.67	16	N/A	N/A
19.19	433.7	394.3	395.1	433.7	6.5	-1.1	1.5	6	clean SAND to silty SAND	125	5.0	87	79	95	47	-	-	5	1.65	16	N/A	N/A
19.36	426.1	385.7	389.6	426.1	6.5	-1.1	1.5	6	clean SAND to silty SAND	125	5.0	85	77	95	47	-	-	5	1.66	16	N/A	N/A
19.52	415.0	373.9	377.8	415.0	6.2	-1.2	1.5	6	clean SAND to silty SAND	125	5.0	83	75	95	47	-	-	5	1.66	16	N/A	N/A
19.69	408.9	366.9	366.9	408.9	5.6	-1.3	1.4	6	clean SAND to silty SAND	125	5.0	82	73	95	47	-	-	5	1.63	16	N/A	N/A
19.85	378.6	338.1	338.5	378.5	5.1	-1.8	1.4	6	clean SAND to silty SAND	125	5.0	76	68	95	46	-	-	5	1.65	16	N/A	N/A
20.01	369.7	328.8	334.0	369.7	5.2	-1.6	1.4	6	clean SAND to silty SAND	125	5.0	74	66	95	46	-	-	6	1.67	16	N/A	N/A
20.18	372.4	329.8	329.4	372.3	4.9	-1.6	1.3	6	clean SAND to silty SAND	125	5.0	74	66	95	46	-	-	5	1.64	16	N/A	N/A
20.34	337.5	297.6	303.9	337.4	4.5	-1.6	1.3	6	clean SAND to silty SAND	125	5.0	67	60	95	46	-	-	6	1.68	16	N/A	N/A
20.51	326.7	286.9	293.8	326.7	4.3	-1.6	1.3	6	clean SAND to silty SAND	125	5.0	65	57	95	45	-	-	6	1.68	16	N/A	N/A
20.67	320.4	280.2	284.2	320.4	4.0	-1.6	1.2	6	clean SAND to silty SAND	125	5.0	64	56	95	45	-	-	5	1.67	16	N/A	N/A
20.83	307.6	267.8	272.4	307.5	3.7	-1.7	1.2	6	clean SAND to silty SAND	125	5.0	62	54	95	45	-	-	6	1.67	16	N/A	N/A
21.00	317.2	275.1	277.0	317.1	3.7	-1.7	1.2	6	clean SAND to silty SAND	125	5.0	63	55	95	45	-	-	5	1.66	16	N/A	N/A
21.16	341.0	294.6	294.6	341.0	4.0	-1.8	1.2	6	clean SAND to silty SAND	125	5.0	68	59	95	45	-	-	5	1.64	16	N/A	N/A
21.33	352.6	303.3	303.3	352.6	4.1	-1.9	1.2	6	clean SAND to silty SAND	125	5.0	71	61	95	46	-	-	5	1.63	16	N/A	N/A
21.49	386.4	331.1	331.1	386.4	4.2	-2.1	1.1	6	clean SAND to silty SAND	125	5.0	77	66	95	46	-	-	5	1.58	16	N/A	N/A
21.65	398.5	340.1	340.1	398.5	4.8	-2.8	1.2	6	clean SAND to silty SAND	125	5.0	80	68	95	46	-	-	5	1.60	16	N/A	N/A
21.82	471.7	401.0	401.0	471.6	5.3	-3.0	1.1	6	clean SAND to silty SAND	125	5.0	94	80	95	47	-	-	5	1.54	16	N/A	N/A
21.98	473.7	401.1	401.1	473.6	6.5	-2.8	1.4	6	clean SAND to silty SAND	125	5.0	95	80	95	47	-	-	5	1.61	16	N/A	N/A
22.15	432.4	364.7	375.7	432.4	6.9	-2.7	1.6	6	clean SAND to silty SAND	125	5.0	86	73	95	46	-	-	6	1.69	16	N/A	N/A
22.31	364.5	306.3	342.5	364.4	7.3	-2.7	2.0	6	clean SAND to silty SAND	125	5.0	73	61	95	45	-	-	8	1.82	16	N/A	N/A
22.47	273.2	228.6	306.3	273.1	8.1	-3.1	3.0	8	stiff SAND to clayy SAND	115	5.0	55	46	94	44	-	-	14	2.03	16	N/A	N/A
22.64	178.8	149.2	287.0	178.8	8.3	-2.4	4.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.3	9.9	22	2.29	30	N/A	N/A
22.80	132.0	109.7	280.0	131.9	7.7	-2.9	5.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.6	9.9	29	2.46	30	N/A	N/A
22.97	125.5	103.9	247.9	125.5	6.3	-2.9	5.1	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.4	9.9	27	2.42	30	N/A	N/A
23.13	146.8	121.3	228.8	146.7	5.6	-2.4	3.9	8	stiff SAND to clayy SAND	115	5.0	29	24	73	41	-	-	22	2.28	16	0.00	0.0
23.30	193.2	159.4	245.6	193.1	6.2	-3.0	3.2	5	silty SAND to sandy SILT	120	3.0	64	53	82	42	-	-	17	2.14	16	0.00	0.0
23.46	196.0	161.5	275.3	195.9	7.7	-3.4	4.0	8	stiff SAND to clayy SAND	115	5.0	39	32	83	42	-	-	20	2.22	16	0.00	0.0
23.62	222.6	183.2	309.3	222.6	9.4	-2.2	4.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.8	9.9	19	2.21	30	0.00	0.0
23.79	259.7	213.3	338.3	259.7	10.7	-1.8	4.2	8	stiff SAND to clayy SAND	115	5.0	52	43	92	44	-	-	18	2.17	16	0.00	0.0
23.95	250.0	205.0	361.9	250.0	12.3	-1.3	4.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	8.8	9.9	20	2.24	30	0.00	0.0
24.12	250.7	205.3	383.3	250.7	13.6	-1.2	5.4	9	very stiff fine SOIL	120	1.0	100	100	-	-	8.8	9.9	22	2.27	30	0.00	0.0
24.28	238.4	194.8	373.1	238.4	13.0	-1.0	5.5	9	very stiff fine SOIL	120	1.0	100	100	-	-	8.4	9.9	22	2.29	30	0.00	0.0
24.44	219.9	179.4	363.5	219.8	12.5	-1.1	5.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.7	9.9	23	2.32	30	0.00	0.0
24.61	201.9	164.4	359.7	201.8	12.3	-2.4	6.1	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.1	9.9	25	2.37	30	0.00	0.0
24.77	199.6	162.3	351.2	199.5	11.8	-2.7	6.0	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.0	9.9	25	2.36	30	0.00	0.0
24.94	223.6	181.6	333.1	223.6	10.9	-2.4	4.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.9	9.9	21	2.26	30	0.00	0.0
25.10	268.7	217.8	346.8	268.6	11.3	-2.2	4.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	9.4	9.9	18	2.17	30	0.00	0.0
25.26	315.5	255.3	383.8	315.4	13.1	-2.7	4.2	8	stiff SAND to clayy SAND	115	5.0	63	51	95	44	-	-	17	2.13	16	0.00	0.0
25.43	306.4	247.6	409.8	306.3	15.0	-1.6	4.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	10.8	9.9	19	2.20	30	0.00	0.0
25.59	288.4	232.7	450.4	288.4	17.8	-1.1	6.2	9	very stiff fine SOIL	120	1.0	100	100	-	-	10.1	9.9	22	2.30	30	0.00	0.0
25.76	241.1	194.2	446.9	241.0	17.5	-1.0	7.3	9	very stiff fine SOIL	120	1.0	100	100	-	-	8.5	9.9	26	2.40	30	0.00	0.0
25.92	175.6	141.2	387.2	175.5	13.6	-1.2	7.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.2	9.9	30	2.49	30	0.00	0.0
26.08	129.9	104.3	303.7	129.9	9.0	-1.0	7.0	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.5	9.9	32	2.53	30	0.00	0.0
26.25	110.1	88.2	253.4	110.1	6.6	0.2	6.1	9	very stiff fine SOIL	120	1.0	100	88	-	-	3.8	9.9	32	2.52	30	0.00	0.0
26.41	94.9	64.4	-	94.9	5.9	-0.1	6.3	9	very stiff fine SOIL	120	1.0	95	64	-	-	3.3	9.9	36	2.62	30	-	-
26.58	82.2	55.6	-	82.2	5.5	0.0	6.8	3	silty CLAY to CLAY	115	1.5	55	37	-	-	5.7	9.9	40	2.69	15	-	-
26.74	75.6	51.0	-	75.6	5.0	-0.2	6.8	3	silty CLAY to CLAY	115	1.5	50	34	-	-	5.2	9.9	41	2.71	15	-	-
26.90	77.6	52.2	-	77.6	4.9	-0.3	6.4	3	silty CLAY to CLAY	115	1.5	52	35	-	-	5.4	9.9	40	2.68	15	-	-
27.07	84.9	57.0	-	84.9	5.0	-0.1	6.0	3	silty CLAY to CLAY	115	1.5	57	38	-	-	5.9	9.9	37	2.64	15	-	-
27.23	99.1	78.7	230.2	99.1	5.5	-0.2	5.7	9	very stiff fine SOIL	120	1.0	99	79	-	-	3.4	9.9	32	2.53	30	0.00	0.0
27.40	123.4	97.9	247.6	123.4	6.5	-0.7	5.4	9	very stiff fine SOIL	120	1.0	100	98	-	-	4.3	9.9	29	2.45	30	0.00	0.0
27.56	153.2	121.3	248.4	153.2	6.8	-1.0	4.5	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.4	9.9	24	2.33	30	0.00	0.0
27.72	187.9	148.6	266.7	187.9	7.7	-1.3	4.1	8	stiff SAND to clayy SAND	115	5.0	38	30	80	42	-	-	21	2.25	16	0.00	0.0
27.89	200.5	158.3	297.6	200.4	9.3	-1.6	4.7	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.0	9.9	22	2.28	30	0.00	0.0
28.05	200.8	158.3	311.8	200.7	10.0	-1.6	5.0	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.0	9.9	23	2.31	30	0.00	0.0
28.22	190.5	149.9	317.0	190.4	10.3	-1.5	5.5	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.7	9.9	24	2.35	30	0.00	0.0
28.38	197.2	155.0	300.8	197.2	9.5	-1.5	4.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.9	9.9	22	2.30	30	0.00	0.0
28.54	169.2	132.7	297.8	169.1	9.3	-1.7	5.5	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.9	9.9	26	2.38	30	0.00	0.0
28.71	171.1	134.0	293.6	171.0	9.1	-1.9	5.4	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.0	9.9	25	2.37	30	0.00	0.0
28.87	253.1	198.0	296.1	253.1	8.8	-1.9	3.5	8	stiff SAND to clayy SAND	115	5.0	51	40	90	43	-	-	16	2.12	16	0.00	0.0
29.04	354.6	276.9	337.9	354.5	9.2	-1.6	2.6	8	stiff SAND to clayy SAND	115	5.0	71	55	95	45	-	-	11	1.93	16	0.00	0.0
29.20	394.4	307.6	362.9	394.3	9.7	-1.4	2.5	8	stiff SAND to clayy SAND	115	5.0	79	62	95	45	-	-	10	1.89	16	0.00	0.0
29.36	423.1	329.6	385.2	423.1	10.5	-1.4	2.5	8	stiff SAND to clayy SAND	115	5.0	85	66	95	45	-	-	10	1.88	16	0.00	0.0
29.53	432.0	336.1	392.4	432.0	10.8	-1.3	2.5	8	stiff SAND to clayy SAND	115	5.0	86	67	95	46	-	-	10	1.88	16	0.00	0.0
29.69	383.6	297.9	361.6	383.5	10.2	-1.0	2.7	8	stiff SAND to clayy SAND	115	5.0	77	60	95	45	-	-	11	1.93	16	0.00	0.0
29.86	282.9	219.4	308.1	282.9	9.2	-1.0	3.3	8	stiff SAND to clayy SAND	115	5.0	57	44	93	44	-	-	15	2.07	16	0.00	0.0
30.02	129.9	100.6	262.8	129.9	7.4	-1.1	5.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.5	9.9	29	2.47	30	0.00	0.0
30.19	72.0	45.7	-	72.0	4.9	-1.7	6.9	3	silty CLAY to CLAY	115	1.5	48	30	-	-	5.0	9.9	43	2.75	15	-	-
30.35	63.7	40.3	-	63.6	3.0	-2.1	4.9	3	silty CLAY to CLAY	115	1.5	42	27	-	-	4.4	9.9	39	2.68	15	-	-
30.51	72.4	55.8	152.1	72.3	2.6	-1.8	3.7	4	clayy SILT to silty CLAY	115	2.0	36	28	-	-	5.0	9.9	30	2.49	15	0.20	0.6
30.68	75.3	58.0	145.4	75.3	2.4	-1.8	3.3	4	clayy SILT to silty CLAY	115	2.0	38	29	-	-	5.2	9.9	28	2.44	15	0.32	1.3
30.84	77.5	59.6	106.0	77.5	1.3	-1.9	1.7	5	silty SAND to sandy SILT	120	3.0	26	20	50	36	-	-	20	2.24	16	2.23	34.2

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Project ID: Leighton Group
Data File: SDF(036).cpt
CPT Date: 9/28/2017 12:13:50 PM
GW During Test: 23 ft

Sounding ID: CPT-06
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
31.01	75.5	58.0	110.7	75.4	1.4	-2.2	2.0	5	silty SAND to sandy SILT	120	3.0	25	19	49	36	-	-	22	2.29	16	2.14	35.8
31.17	77.0	59.1	134.3	77.0	2.1	-3.8	2.8	5	silty SAND to sandy SILT	120	3.0	26	20	50	36	-	-	26	2.39	16	0.70	6.1
31.33	74.3	56.9	151.4	74.2	2.6	-4.3	3.6	4	clayy SILT to silty CLAY	115	2.0	37	28	-	-	5.1	9.9	30	2.48	15	0.21	0.7
31.50	72.9	55.8	155.7	72.8	2.7	-3.9	3.9	4	clayy SILT to silty CLAY	115	2.0	36	28	-	-	5.0	9.9	31	2.50	15	0.18	0.4
31.66	79.9	61.1	153.0	79.9	2.7	-3.1	3.5	4	clayy SILT to silty CLAY	115	2.0	40	31	-	-	5.5	9.9	28	2.44	15	0.20	0.7
31.83	99.5	75.9	157.0	99.5	3.0	-3.3	3.0	5	silty SAND to sandy SILT	120	3.0	33	25	58	38	-	-	24	2.34	16	0.18	0.8
31.99	86.4	65.8	176.9	86.3	3.6	-3.4	4.2	4	clayy SILT to silty CLAY	115	2.0	43	33	-	-	6.0	9.9	30	2.48	15	0.00	0.0
32.15	81.0	49.7	-	80.9	3.8	-4.2	4.7	4	clayy SILT to silty CLAY	115	2.0	40	25	-	-	5.6	9.9	36	2.60	15	-	-
32.32	91.9	69.8	182.0	91.8	3.8	-3.0	4.2	4	clayy SILT to silty CLAY	115	2.0	46	35	-	-	6.4	9.9	29	2.47	15	0.00	0.0
32.48	134.1	101.7	202.1	134.0	4.9	-3.4	3.7	5	silty SAND to sandy SILT	120	3.0	45	34	68	39	-	-	23	2.31	16	0.00	0.0
32.65	128.3	97.2	221.6	128.3	5.7	-2.8	4.5	9	very stiff fine SOIL	120	1.0	100	97	-	-	4.5	9.9	26	2.39	30	0.00	0.0
32.81	72.0	43.7	-	72.0	4.6	-2.4	6.6	3	silty CLAY to CLAY	115	1.5	48	29	-	-	5.0	9.9	43	2.75	15	-	-
32.97	51.1	30.9	-	51.1	2.8	-1.9	5.7	3	silty CLAY to CLAY	115	1.5	34	21	-	-	3.5	9.8	47	2.81	15	-	-
33.14	46.5	28.1	-	46.5	2.0	-1.9	4.4	3	silty CLAY to CLAY	115	1.5	31	19	-	-	3.2	8.9	44	2.76	15	-	-
33.30	46.1	27.8	-	46.1	2.0	-1.8	4.5	3	silty CLAY to CLAY	115	1.5	31	19	-	-	3.1	8.8	44	2.77	15	-	-
33.47	47.5	28.5	-	47.5	2.0	-1.8	4.4	3	silty CLAY to CLAY	115	1.5	32	19	-	-	3.2	9.0	44	2.76	15	-	-
33.63	49.0	29.3	-	48.9	2.0	-1.7	4.3	3	silty CLAY to CLAY	115	1.5	33	20	-	-	3.3	9.3	43	2.74	15	-	-
33.79	50.8	30.4	-	50.8	2.0	-1.7	4.2	4	clayy SILT to silty CLAY	115	2.0	25	15	-	-	3.5	9.6	42	2.72	15	-	-
33.96	51.2	30.5	-	51.2	1.6	-1.8	3.2	4	clayy SILT to silty CLAY	115	2.0	26	15	-	-	3.5	9.7	37	2.64	15	-	-
34.12	47.1	28.0	-	47.1	1.6	-1.7	3.6	4	clayy SILT to silty CLAY	115	2.0	24	14	-	-	3.2	8.8	41	2.71	15	-	-
34.29	45.4	26.9	-	45.4	1.6	-1.8	3.7	4	clayy SILT to silty CLAY	115	2.0	23	13	-	-	3.1	8.5	42	2.73	15	-	-
34.45	48.1	28.5	-	48.1	1.7	-1.7	3.7	4	clayy SILT to silty CLAY	115	2.0	24	14	-	-	3.3	9.0	41	2.71	15	-	-
34.61	46.3	27.3	-	46.3	1.7	-1.7	3.8	4	clayy SILT to silty CLAY	115	2.0	23	14	-	-	3.2	8.6	42	2.73	15	-	-
34.78	44.3	26.1	-	44.3	1.6	-1.8	3.8	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.2	43	2.74	15	-	-
34.94	42.8	25.1	-	42.8	1.6	-1.8	4.0	3	silty CLAY to CLAY	115	1.5	29	17	-	-	2.9	7.9	45	2.78	15	-	-
35.11	45.5	26.6	-	45.4	1.7	-1.6	4.0	4	clayy SILT to silty CLAY	115	2.0	23	13	-	-	3.1	8.4	43	2.75	15	-	-
35.27	45.6	26.6	-	45.6	1.7	-1.7	3.9	4	clayy SILT to silty CLAY	115	2.0	23	13	-	-	3.1	8.4	43	2.75	15	-	-
35.43	37.8	22.0	-	37.8	1.5	-1.7	4.2	3	silty CLAY to CLAY	115	1.5	25	15	-	-	2.6	6.9	48	2.83	15	-	-
35.60	31.6	18.4	-	31.6	1.4	-1.8	4.8	3	silty CLAY to CLAY	115	1.5	21	12	-	-	2.1	5.7	54	2.93	15	-	-
35.76	33.5	19.4	-	33.5	1.5	-1.7	4.8	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.0	53	2.92	15	-	-
35.93	50.2	29.0	-	50.2	1.8	-1.6	3.6	4	clayy SILT to silty CLAY	115	2.0	25	15	-	-	3.4	9.2	40	2.70	15	-	-
36.09	52.5	30.2	-	52.4	2.1	-1.2	4.1	4	clayy SILT to silty CLAY	115	2.0	26	15	-	-	3.6	9.6	41	2.72	15	-	-
36.26	45.9	26.4	-	45.9	2.2	-1.5	5.0	3	silty CLAY to CLAY	115	1.5	31	18	-	-	3.1	8.3	47	2.82	15	-	-
36.42	75.3	55.4	136.6	75.2	2.2	-1.2	3.1	4	clayy SILT to silty CLAY	115	2.0	38	28	-	-	5.2	9.9	28	2.44	15	0.68	16.2
36.58	141.0	103.6	143.0	141.0	2.3	-1.0	1.7	5	silty SAND to sandy SILT	120	3.0	47	35	68	39	-	-	15	2.06	16	0.54	2.8
36.75	109.7	80.5	149.0	109.7	2.8	-1.0	2.6	5	silty SAND to sandy SILT	120	3.0	37	27	60	38	-	-	21	2.27	16	0.33	1.7
36.91	51.7	29.4	-	51.7	2.4	-1.3	4.9	3	silty CLAY to CLAY	115	1.5	34	20	-	-	3.5	9.3	45	2.78	15	-	-
37.08	42.1	23.9	-	42.1	1.7	-1.4	4.2	3	silty CLAY to CLAY	115	1.5	28	16	-	-	2.8	7.5	46	2.80	15	-	-
37.24	31.4	17.8	-	31.4	1.4	-1.0	4.7	3	silty CLAY to CLAY	115	1.5	21	12	-	-	2.1	5.5	55	2.94	15	-	-
37.40	29.3	16.6	-	29.3	1.1	-0.8	4.0	3	silty CLAY to CLAY	115	1.5	20	11	-	-	1.9	5.1	53	2.92	15	-	-
37.57	46.8	26.4	-	46.8	1.5	-0.2	3.5	4	clayy SILT to silty CLAY	115	2.0	23	13	-	-	3.2	8.3	41	2.72	15	-	-
37.73	69.7	50.7	122.3	69.7	1.8	0.3	2.7	5	silty SAND to sandy SILT	120	3.0	23	17	45	35	-	-	27	2.42	16	1.56	36.7
37.90	99.9	72.7	123.3	99.9	1.9	0.6	1.9	5	silty SAND to sandy SILT	120	3.0	33	24	56	37	-	-	19	2.21	16	1.59	14.9
38.06	108.7	79.0	130.3	108.7	2.1	-0.3	2.0	5	silty SAND to sandy SILT	120	3.0	36	26	59	38	-	-	19	2.19	16	1.18	7.2
38.22	103.7	75.3	135.4	103.7	2.3	-0.7	2.3	5	silty SAND to sandy SILT	120	3.0	35	25	58	37	-	-	21	2.25	16	0.87	5.1
38.39	62.9	45.6	117.2	62.9	1.6	-0.7	2.7	4	clayy SILT to silty CLAY	115	2.0	31	23	-	-	4.3	9.9	29	2.46	15	1.87	49.2
38.55	34.5	19.1	-	34.5	1.1	-0.9	3.5	3	silty CLAY to CLAY	115	1.5	23	13	-	-	2.3	5.9	48	2.83	15	-	-
38.72	23.7	13.1	-	23.7	0.8	-0.9	3.7	3	silty CLAY to CLAY	115	1.5	16	9	-	-	1.5	3.9	58	2.99	15	-	-
38.88	20.1	11.1	-	20.1	0.7	-0.7	4.1	3	silty CLAY to CLAY	115	1.5	13	7	-	-	1.3	3.3	64	3.08	15	-	-
39.04	21.4	11.8	-	21.4	0.9	-0.6	4.8	3	silty CLAY to CLAY	115	1.5	14	8	-	-	1.4	3.5	65	3.10	15	-	-
39.21	30.1	16.5	-	30.1	1.4	-0.2	4.9	3	silty CLAY to CLAY	115	1.5	20	11	-	-	2.0	5.0	57	2.98	15	-	-
39.37	38.4	21.1	-	38.4	1.5	-0.2	4.3	3	silty CLAY to CLAY	115	1.5	26	14	-	-	2.6	6.5	49	2.85	15	-	-
39.54	49.3	27.0	-	49.3	1.7	-0.2	3.6	4	clayy SILT to silty CLAY	115	2.0	25	13	-	-	3.4	8.5	41	2.72	15	-	-
39.70	83.8	60.1	121.2	83.8	1.8	-0.3	2.3	5	silty SAND to sandy SILT	120	3.0	28	20	50	36	-	-	23	2.32	16	1.69	25.5
39.86	97.7	70.1	131.8	97.7	2.2	-1.5	2.3	5	silty SAND to sandy SILT	120	3.0	33	23	55	37	-	-	22	2.28	16	1.09	7.6
40.03	71.8	51.4	127.1	71.7	2.0	-1.9	2.8	4	clayy SILT to silty CLAY	115	2.0	36	26	-	-	4.9	9.9	28	2.44	15	1.29	31.9
40.19	48.3	26.2	-	48.3	2.1	-1.9	4.6	3	silty CLAY to CLAY	115	1.5	32	17	-	-	3.3	8.2	46	2.80	15	-	-
40.36	97.4	69.6	135.0	97.4	2.3	-1.5	2.5	5	silty SAND to sandy SILT	120	3.0	32	23	55	37	-	-	22	2.30	16	0.90	5.8
40.52	161.9	115.5	166.8	161.9	3.4	-1.0	2.1	5	silty SAND to sandy SILT	120	3.0	54	38	72	40	-	-	16	2.09	16	0.00	0.0
40.68	203.7	145.1	190.9	203.7	4.1	-1.0	2.0	5	silty SAND to sandy SILT	120	3.0	68	48	79	41	-	-	13	2.01	16	0.00	0.0
40.85	270.5	192.4	217.6	270.5	4.0	-0.7	1.5	6	clean SAND to silty SAND	125	5.0	54	38	89	42	-	-	9	1.83	16	0.00	0.0
41.01	261.8	186.0	193.3	261.8	2.5	-1.2	1.0	6	clean SAND to silty SAND	125	5.0	52	37	87	42	-	-	6	1.70	16	0.00	0.0
41.18	219.2	155.5	180.6	219.2	3.0	-1.1	1.4	6	clean SAND to silty SAND	125	5.0	44	31	82	41	-	-	10	1.87	16	0.00	0.0
41.34	187.4	132.8	175.9	187.4	3.5	-1.1	1.9	5	silty SAND to sandy SILT	120	3.0	62	44	76	40	-	-	13	2.02	16	0.00	0.0
41.50	170.7	120.8	162.6	170.6	3.1	-1.0	1.8	5	silty SAND to sandy SILT	120	3.0	57	40	73	40	-	-	14	2.03	16	0.00	0.0
41.67	131.1	92.7	140.0	131.1	2.5	-1.1	1.9	5	silty SAND to sandy SILT	120	3.0	44	31	64	38	-	-	17	2.13	16	0.71	3.7
41.83	59.0	31.2	-	59.0	2.2	-1.5	3.9	4	clayy SILT to silty CLAY	115	2.0	30	16	-	-	4.0	9.9	40	2.69	15	-	-
42.00	54.4	28.7	-	54.4	2.1	-1.3	4.0	4	clayy SILT to silty CLAY	115	2.0	27	14	-	-	3.7	9.0	42	2.73	15	-	-
42.16	49.2	25.9	-	49.2	2.1	-1.2	4.4	3	silty CLAY to CLAY	115	1.5	33	17	-	-	3.3	8.1	46	2.79	15	-	-
42.32	33.4	17.5	-	33.4	1.4	-1.1	4.6	3	silty CLAY to CLAY	115	1.5	22	12	-	-	2.2	5.3	55	2.94	15	-	-
42.49	22.6	11.8	-	22.6	1.3	-1.3	6.2	3	silty CLAY to CLAY	115	1.5	15	8	-	-	1.5	3.5	71	3.17	15	-	-
42.65	29.6	15.4	-	29.6	1.1	-1.3	4.1	3	silty CLAY to CLAY	115	1.5	20	10	-	-	2.0	4.7	56	2.96	15	-	-
42.82	34.4	17.9	-	34.4	1.7	-1.2	5.3	3	silty CLAY to CLAY	115	1.5	23	12	-	-	2.3	5.5	57	2.97	15	-	-
42.98	44.5	23.1	-	44.5	2.0	-1.1	4.7	3	silty CLAY to CLAY	115	1.5	30	15	-	-	3.0	7.2	49	2.85	15	-	-
43.15	220.8	154.5	158.8	220.8	1.6	-0.6	0.7	6	clean SAND to silty SAND	125	5.0	44	31	81	41	-	-	6	1.69	16	0.25	2.0
43.31	314.7	219.8	219.8	314.7	1.7	-0.5	0.5	6	clean SAND to silty SAND	125	5.0	63	44	93	43	-	-	5	1.48	16	0.00	0.0
43.47	327.5	228.5	228.5	327.5	1.8	-0.5	0.5	6	clean SAND to silty SAND	125	5.0	66	46	94	43	-	-	5	1.47	16	0.00	0.0
43.64	328.6	228.9	228.9	328.6	2.2	-0.6	0.7	6	clean SAND to silty SAND	125	5.0	66	46	94	43	-	-	5	1.53	16	0.00	0.0
43.80	215.7	150.0	175.6	215.7	2.9	-0.4	1.4	6	clean SAND to silty SAND	125	5.0	43	30	80	41	-	-	10	1.88	16	0.00	0.0
43.97	88.1	61.2	137.8	88.1	2.4	-0.9	2.9	5	silty SAND to sandy SILT	120	3.0	29	20	51	36	-	-	26	2.38	16	0.73	4.8
44.13	51.5	26.3	-	51.5	1.7	-0.8	3.6	4	clayy SILT to silty CLAY	115	2.0	26	13	-	-	3.5	8.2	42	2.73	15	-	-
44.29	42.8	21.8	-	42.8	0.8	-0.4	1.9	4	clayy SILT to silty CLAY	115	2.0	21	11	-	-	2.9	6.8	37	2.63	15	-	-
44.46	40.2	20.4	-	40.2	0.7	-0.3	1.7	4	clayy SILT to silty CLAY	115	2.0	20	10	-	-	2.7	6.3	37	2.63	15	-	-
44.62	34.3	17.4	-	34.3	0.7	0.0	2.2	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.3	5.3	43	2.75	15	-	-
44.79	33.1	16.8	-	33.2	0.7	0.2	2.3	4	clayy SILT to silty CLAY	115	2.0	17	8	-	-	2.2	5.1	45	2.78	15	-	-
44.95	35.3	17.8	-	35.3	0.8	0.3	2.4	4	clayy SILT to silty CLAY	115	2.0	18	9	-	-	2.4	5.4	44	2.76	15	-	-
45.11	38.0	19.2	-	38.0	0.8	0.3	2.3	4	clayy SILT to silty CLAY	115	2.0	19	10	-	-	2.5	5.9	42	2.73	15	-	-
45.28	41.2	20.7	-	41.2	0.9	0.4	2.2	4	clayy SILT to silty CLAY	115	2.0	21	10	-	-	2.8	6.4	40	2.69	15	-	-
45.44	37.3	18.7	-	37.3	0.8	0.2	2.4	4	clayy SILT to silty CLAY	115	2.0	19	9	-	-	2.5	5.7	43	2.75	15	-	-
45.61	33.1	16.6	-	33.1	0.9	0.2	2.8	4	clayy SILT to silty CLAY	115	2.0	17	8	-	-	2.2	5.0	48	2.83	15	-	-
45.77	32.8	16.4	-	32.9	0.8	0.4	2.7	4	clayy SILT to silty CLAY	115	2.0	16	8	-	-	2.2	5.0	47	2.82	15	-	-
45.93	31.3	15.6	-	31.3	0.8	0.5	2.8	3	silty CLAY to CLAY	115	1.5	21	10	-	-	2.1	4.7	49	2.86	15	-	-
46.10	28.7	14.3	-	28.7	0.8	0.5	3.2	3	silty CLAY to CLAY	115	1.5	19	10	-	-	1.9	4.3	54	2.92	15	-	-
46.26	26.4	13.1	-	26.4	0.9	0.4	3.6	3	silty CLAY to CLAY	115	1.5	18	9	-	-	1.7	3.9	58	2.99	15	-	-

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(036).cpt
CPT Date: 9/28/2017 12:13:50 PM
GW During Test: 23 ft

Page: 4
Sounding ID: CPT-06
Project No: 11753.001
Cone/Rig: DDG1379

. . Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
46.43	25.5	12.6	-	25.5	0.9	0.4	4.0	3	silty CLAY to CLAY	115	1.5	17	8	-	-	1.7	3.7	60	3.03	15	-	-
46.59	30.5	15.1	-	30.5	1.1	0.4	3.8	3	silty CLAY to CLAY	115	1.5	20	10	-	-	2.0	4.5	55	2.95	15	-	-
46.75	43.2	21.3	-	43.2	1.5	0.6	3.8	3	silty CLAY to CLAY	115	1.5	29	14	-	-	2.9	6.6	47	2.82	15	-	-
46.92	83.8	57.1	125.9	83.8	2.1	0.6	2.5	5	silty SAND to sandy SILT	120	3.0	28	19	49	35	-	-	25	2.37	16	1.43	22.0
47.08	132.5	90.2	149.6	132.5	3.0	0.5	2.3	5	silty SAND to sandy SILT	120	3.0	44	30	64	38	-	-	19	2.20	16	0.39	2.1
47.25	159.7	108.6	163.7	159.7	3.5	-0.3	2.2	5	silty SAND to sandy SILT	120	3.0	53	36	70	39	-	-	17	2.13	16	0.00	0.0
47.41	161.0	109.3	175.3	161.0	4.1	-0.3	2.6	5	silty SAND to sandy SILT	120	3.0	54	36	70	39	-	-	18	2.17	16	0.00	0.0
47.57	193.5	131.2	190.0	193.5	4.5	-0.4	2.4	5	silty SAND to sandy SILT	120	3.0	65	44	76	40	-	-	16	2.10	16	0.00	0.0
47.74	246.1	166.7	188.9	246.1	3.2	-0.5	1.3	6	clean SAND to silty SAND	125	5.0	49	33	84	41	-	-	9	1.84	16	0.00	0.0
47.90	372.9	252.3	252.3	372.8	2.4	-0.5	0.6	6	clean SAND to silty SAND	125	5.0	75	50	95	44	-	-	5	1.48	16	0.00	0.0
48.07	450.8	304.7	304.7	450.8	2.6	-0.4	0.6	6	clean SAND to silty SAND	125	5.0	90	61	95	44	-	-	5	1.39	16	0.00	0.0
48.23	470.7	317.7	317.7	470.7	2.6	-0.4	0.6	6	clean SAND to silty SAND	125	5.0	94	64	95	45	-	-	5	1.37	16	0.00	0.0
48.39	466.4	314.4	314.4	466.4	3.0	-0.2	0.7	6	clean SAND to silty SAND	125	5.0	93	63	95	45	-	-	5	1.42	16	0.00	0.0
48.56	460.3	309.9	309.9	460.3	3.7	-0.1	0.8	6	clean SAND to silty SAND	125	5.0	92	62	95	45	-	-	5	1.50	16	0.00	0.0
48.72	498.3	335.0	335.0	498.3	4.9	0.0	1.0	6	clean SAND to silty SAND	125	5.0	100	67	95	45	-	-	5	1.54	16	0.00	0.0

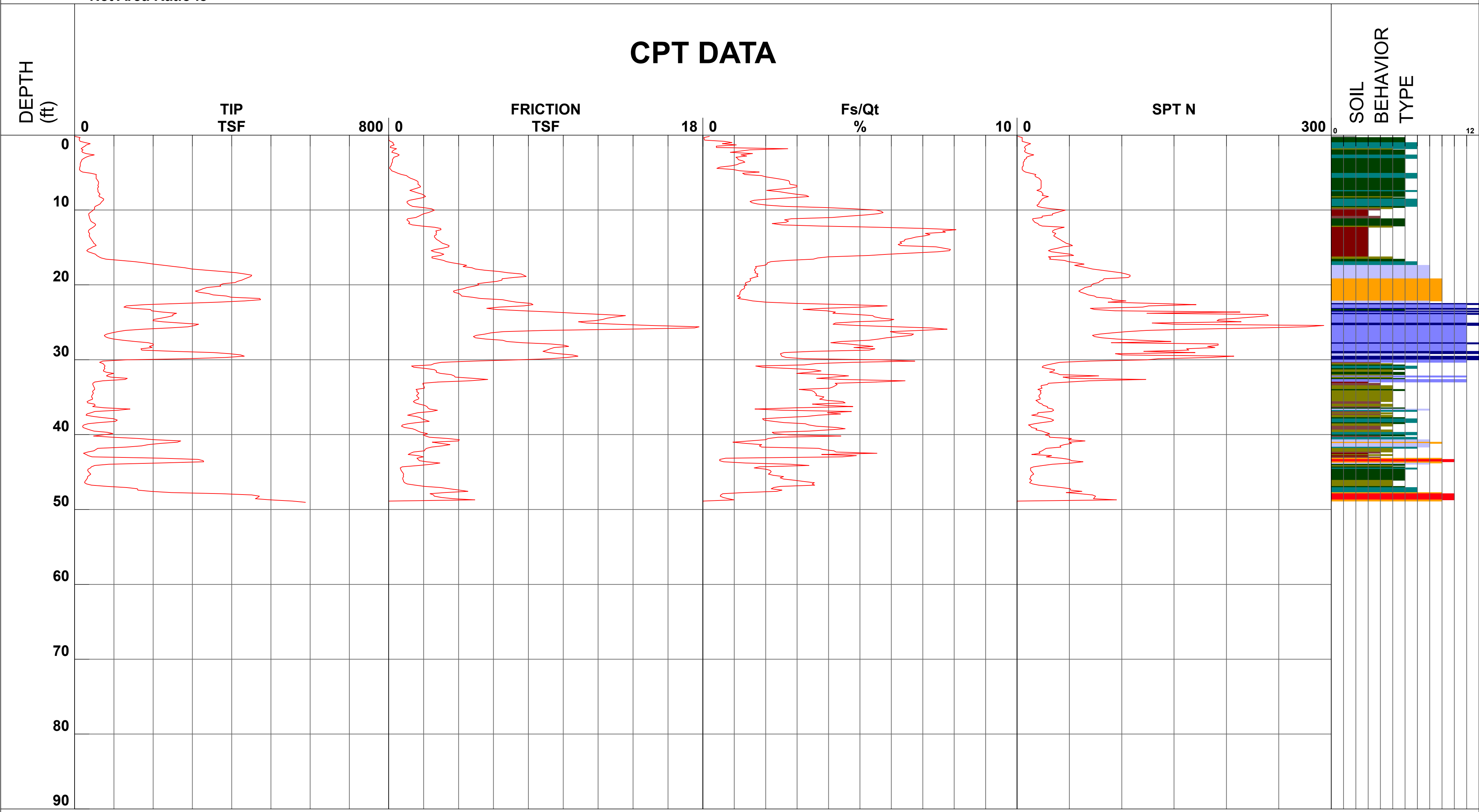
* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(036).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-06	Date and Time	9/28/2017 12:13:50 PM	Maximum Depth	49.05 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(035).cpt
CPT Date: 9/28/2017 11:19:59 AM
GW During Test: 23 ft

Sounding ID: CPT-07
Project No: 11753.001
Cone/Rig: DDG1379

. . Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	13.1	21.0	54.8	13.1	0.1	0.0	1.0	5	silty SAND to sandy SILT	120	3.0	4	7	15	48	-	-	29	2.47	16	N/A	N/A
0.49	14.3	22.9	61.4	14.3	0.2	0.0	1.2	5	silty SAND to sandy SILT	120	3.0	5	8	18	48	-	-	30	2.48	16	N/A	N/A
0.66	11.4	18.2	-	11.4	0.2	0.1	1.7	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	37	2.64	15	N/A	N/A
0.82	9.6	15.5	-	9.6	0.2	0.1	1.8	4	clayy SILT to silty CLAY	115	2.0	5	8	-	-	0.7	9.9	42	2.72	15	N/A	N/A
0.98	11.9	19.1	-	11.9	0.3	0.0	2.6	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.8	9.9	43	2.74	15	N/A	N/A
1.15	26.4	42.3	91.0	26.4	0.5	0.0	1.8	5	silty SAND to sandy SILT	120	3.0	9	14	39	47	-	-	25	2.36	16	N/A	N/A
1.31	33.5	53.7	100.6	33.5	0.6	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	11	18	46	48	-	-	22	2.28	16	N/A	N/A
1.48	31.7	50.8	82.8	31.7	0.4	-0.1	1.2	5	silty SAND to sandy SILT	120	3.0	11	17	45	47	-	-	18	2.19	16	N/A	N/A
1.64	23.6	37.9	77.3	23.6	0.3	0.0	1.4	5	silty SAND to sandy SILT	120	3.0	8	13	35	45	-	-	24	2.33	16	N/A	N/A
1.80	20.8	33.4	75.5	20.8	0.3	-0.3	1.4	5	silty SAND to sandy SILT	120	3.0	7	11	31	44	-	-	26	2.39	16	N/A	N/A
1.97	27.0	43.2	73.5	27.0	0.3	0.0	1.0	5	silty SAND to sandy SILT	120	3.0	9	14	39	45	-	-	19	2.21	16	N/A	N/A
2.13	31.6	50.7	71.6	31.6	0.2	-0.2	0.7	5	silty SAND to sandy SILT	120	3.0	11	17	45	45	-	-	15	2.08	16	N/A	N/A
2.30	25.6	41.0	69.7	25.6	0.2	-0.3	1.0	5	silty SAND to sandy SILT	120	3.0	9	14	38	44	-	-	19	2.21	16	N/A	N/A
2.46	32.5	52.0	73.5	32.4	0.2	-0.3	0.8	5	silty SAND to sandy SILT	120	3.0	11	17	45	45	-	-	15	2.08	16	N/A	N/A
2.62	29.3	46.9	84.2	29.3	0.4	-0.3	1.3	5	silty SAND to sandy SILT	120	3.0	10	16	42	44	-	-	21	2.25	16	N/A	N/A
2.79	35.3	56.6	91.0	35.3	0.5	-0.3	1.3	5	silty SAND to sandy SILT	120	3.0	12	19	48	44	-	-	18	2.18	16	N/A	N/A
2.95	33.1	53.1	84.8	33.1	0.4	-0.4	1.2	5	silty SAND to sandy SILT	120	3.0	11	18	46	44	-	-	18	2.17	16	N/A	N/A
3.12	28.9	46.4	79.2	28.9	0.3	-0.6	1.2	5	silty SAND to sandy SILT	120	3.0	10	15	42	43	-	-	20	2.22	16	N/A	N/A
3.28	28.0	44.9	76.6	28.0	0.3	-0.6	1.1	5	silty SAND to sandy SILT	120	3.0	9	15	41	42	-	-	20	2.22	16	N/A	N/A
3.45	32.9	52.7	92.7	32.9	0.5	-0.3	1.5	5	silty SAND to sandy SILT	120	3.0	11	18	46	43	-	-	20	2.24	16	N/A	N/A
3.61	33.9	54.3	92.3	33.9	0.5	-0.3	1.4	5	silty SAND to sandy SILT	120	3.0	11	18	47	43	-	-	19	2.21	16	N/A	N/A
3.77	26.4	42.4	68.6	26.4	0.2	-0.7	0.9	5	silty SAND to sandy SILT	120	3.0	9	14	39	41	-	-	18	2.18	16	N/A	N/A
3.94	24.3	39.0	81.6	24.3	0.4	-0.5	1.5	5	silty SAND to sandy SILT	120	3.0	8	13	36	41	-	-	24	2.34	16	N/A	N/A
4.10	41.0	65.7	93.8	41.0	0.5	-0.3	1.1	5	silty SAND to sandy SILT	120	3.0	14	22	53	43	-	-	15	2.08	16	N/A	N/A
4.27	36.2	58.1	89.1	36.2	0.4	-0.3	1.2	5	silty SAND to sandy SILT	120	3.0	12	19	49	42	-	-	17	2.14	16	N/A	N/A
4.43	37.0	59.3	85.9	37.0	0.4	-0.4	1.0	5	silty SAND to sandy SILT	120	3.0	12	20	50	42	-	-	16	2.10	16	N/A	N/A
4.59	28.6	45.9	81.0	28.6	0.4	-0.7	1.2	5	silty SAND to sandy SILT	120	3.0	10	15	41	41	-	-	20	2.24	16	N/A	N/A
4.76	24.9	39.9	77.2	24.9	0.3	-0.3	1.3	5	silty SAND to sandy SILT	120	3.0	8	13	37	40	-	-	22	2.30	16	N/A	N/A
4.92	23.8	38.1	80.0	23.8	0.3	-0.5	1.5	5	silty SAND to sandy SILT	120	3.0	8	13	35	39	-	-	24	2.34	16	N/A	N/A
5.09	24.3	38.9	96.4	24.2	0.5	-0.6	2.1	5	silty SAND to sandy SILT	120	3.0	8	13	36	39	-	-	28	2.44	16	N/A	N/A
5.25	32.2	51.6	104.9	32.2	0.6	-0.6	2.0	5	silty SAND to sandy SILT	120	3.0	11	17	45	41	-	-	23	2.32	16	N/A	N/A
5.41	56.6	90.7	124.2	56.5	0.8	-0.5	1.4	5	silty SAND to sandy SILT	120	3.0	19	30	64	43	-	-	14	2.05	16	N/A	N/A
5.58	59.7	95.8	137.8	59.7	1.0	-0.5	1.8	5	silty SAND to sandy SILT	120	3.0	20	32	66	43	-	-	16	2.09	16	N/A	N/A
5.74	53.5	85.8	135.9	53.5	1.1	-0.5	2.0	5	silty SAND to sandy SILT	120	3.0	18	29	62	43	-	-	18	2.16	16	N/A	N/A
5.91	22.7	36.5	120.6	22.7	0.8	-0.8	3.4	4	clayy SILT to silty CLAY	115	2.0	11	18	-	-	1.6	9.9	35	2.60	15	N/A	N/A
6.07	17.5	28.0	-	17.5	0.5	-0.4	2.7	4	clayy SILT to silty CLAY	115	2.0	9	14	-	-	1.2	9.9	36	2.62	15	N/A	N/A
6.23	27.1	43.1	95.0	27.0	0.5	-0.4	1.9	5	silty SAND to sandy SILT	120	3.0	9	14	39	39	-	-	25	2.37	16	N/A	N/A
6.40	38.9	61.2	96.6	38.9	0.5	-0.3	1.4	5	silty SAND to sandy SILT	120	3.0	13	20	51	41	-	-	18	2.16	16	N/A	N/A
6.56	42.2	65.6	98.4	42.2	0.5	-0.3	1.3	5	silty SAND to sandy SILT	120	3.0	14	22	53	41	-	-	17	2.12	16	N/A	N/A
6.73	49.6	76.1	102.6	49.6	0.5	-0.6	1.1	6	clean SAND to silty SAND	125	5.0	10	15	58	42	-	-	14	2.04	16	N/A	N/A
6.89	57.2	86.7	107.4	57.2	0.5	-0.6	1.0	6	clean SAND to silty SAND	125	5.0	11	17	62	42	-	-	12	1.95	16	N/A	N/A
7.05	62.0	92.8	115.5	62.0	0.7	-0.6	1.1	6	clean SAND to silty SAND	125	5.0	12	19	65	43	-	-	12	1.96	16	N/A	N/A
7.22	66.9	98.8	122.1	66.8	0.7	-0.6	1.1	6	clean SAND to silty SAND	125	5.0	13	20	67	43	-	-	12	1.95	16	N/A	N/A
7.38	62.8	91.8	125.0	62.8	0.9	-0.6	1.4	5	silty SAND to sandy SILT	120	3.0	21	31	64	42	-	-	14	2.04	16	N/A	N/A
7.55	59.3	85.6	126.3	59.3	1.0	-0.6	1.7	5	silty SAND to sandy SILT	120	3.0	20	29	62	42	-	-	16	2.11	16	N/A	N/A
7.71	55.2	78.8	129.1	55.1	1.1	-0.6	2.0	5	silty SAND to sandy SILT	120	3.0	18	26	59	41	-	-	19	2.19	16	N/A	N/A
7.87	52.6	74.4	127.1	52.6	1.1	-0.6	2.0	5	silty SAND to sandy SILT	120	3.0	18	25	57	41	-	-	20	2.22	16	N/A	N/A
8.04	54.0	75.6	123.8	54.0	1.0	-0.6	1.9	5	silty SAND to sandy SILT	120	3.0	18	25	58	41	-	-	19	2.19	16	N/A	N/A
8.20	49.0	67.9	106.1	49.0	0.7	-0.6	1.5	5	silty SAND to sandy SILT	120	3.0	16	23	54	40	-	-	18	2.16	16	N/A	N/A
8.37	47.4	65.0	110.9	47.4	0.8	-0.6	1.8	5	silty SAND to sandy SILT	120	3.0	16	22	53	40	-	-	20	2.22	16	N/A	N/A
8.53	56.5	76.7	118.3	56.5	0.9	-1.0	1.7	5	silty SAND to sandy SILT	120	3.0	19	26	58	41	-	-	17	2.14	16	N/A	N/A
8.69	56.6	76.1	122.6	56.6	1.0	-1.0	1.8	5	silty SAND to sandy SILT	120	3.0	19	25	58	41	-	-	18	2.18	16	N/A	N/A
8.86	58.7	78.2	126.8	58.6	1.1	-1.0	1.9	5	silty SAND to sandy SILT	120	3.0	20	26	59	41	-	-	18	2.18	16	N/A	N/A
9.02	59.4	78.5	130.9	59.4	1.2	-1.1	2.1	5	silty SAND to sandy SILT	120	3.0	20	26	59	41	-	-	19	2.20	16	N/A	N/A
9.19	57.1	74.8	131.9	57.1	1.2	-1.1	2.2	5	silty SAND to sandy SILT	120	3.0	19	25	57	41	-	-	20	2.24	16	N/A	N/A
9.35	56.6	73.4	129.7	56.5	1.2	-1.1	2.2	5	silty SAND to sandy SILT	120	3.0	19	24	57	41	-	-	20	2.24	16	N/A	N/A
9.51	55.2	71.1	128.4	55.2	1.2	-1.1	2.2	5	silty SAND to sandy SILT	120	3.0	18	24	56	40	-	-	21	2.25	16	N/A	N/A
9.68	56.2	71.7	131.3	56.2	1.3	-1.1	2.3	5	silty SAND to sandy SILT	120	3.0	19	24	56	40	-	-	21	2.26	16	N/A	N/A
9.84	61.2	77.4	138.4	61.2	1.4	-1.1	2.4	5	silty SAND to sandy SILT	120	3.0	20	26	59	41	-	-	21	2.25	16	N/A	N/A
10.01	67.7	84.9	161.7	67.7	2.0	-1.1	2.9	5	silty SAND to sandy SILT	120	3.0	23	28	62	41	-	-	22	2.29	16	N/A	N/A
10.17	66.2	82.4	198.4	66.2	2.8	-1.2	4.3	4	clayy SILT to silty CLAY	115	2.0	33	41	-	-	4.6	9.9	27	2.42	15	N/A	N/A
10.34	61.6	76.1	229.4	61.6	3.6	-1.5	5.8	9	very stiff fine SOIL	120	1.0	62	76	-	-	2.2	9.9	33	2.55	30	N/A	N/A
10.50	55.9	76.0	-	55.9	3.9	-1.6	7.0	9	very stiff fine SOIL	120	1.0	56	76	-	-	2.0	9.9	36	2.61	30	N/A	N/A
10.66	58.3	70.9	217.1	58.3	3.3	-0.8	5.7	4	clayy SILT to silty CLAY	115	2.0	29	35	-	-	4.1	9.9	33	2.56	15	N/A	N/A
10.83	75.7	91.4	174.7	75.7	2.4	-1.1	3.1	5	silty SAND to sandy SILT	120	3.0	25	30	64	41	-	-	22	2.29	16	N/A	N/A
10.99	86.2	103.2	145.8	86.2	1.5	-1.1	1.8	5	silty SAND to sandy SILT	120	3.0	29	34	68	42	-	-	15	2.08	16	N/A	N/A
11.16	86.8	103.1	140.5	86.7	1.4	-1.1	1.6	5	silty SAND to sandy SILT	120	3.0	29	34	68	42	-	-	14	2.04	16	N/A	N/A
11.32	79.6	93.9	141.5	79.6	1.5	-1.1	1.9	5	silty SAND to sandy SILT	120	3.0	27	31	65	41	-	-	17	2.13	16	N/A	N/A
11.48	73.0	85.6	143.6	73.0	1.6	-1.1	2.3	5	silty SAND to sandy SILT	120	3.0	24	29	62	41	-	-	19	2.20	16	N/A	N/A
11.65	62.4	72.6	159.0	62.4	2.0	-1.2	3.3	4	clayy SILT to silty CLAY	115	2.0	31	36	-	-	4.4	9.9	25	2.37	15	N/A	N/A
11.81	51.1	59.0	183.2	51.1	2.5	-1.1	4.9	4	clayy SILT to silty CLAY	115	2.0	26	30	-	-	3.6	9.9	34	2.56	15	N/A	N/A
11.98	47.0	58.3	-	47.0	2.8	-1.3	6.0	3	silty CLAY to CLAY	115	1.5	31	39	-	-	3.3	9.9	37	2.63	15	N/A	N/A
12.14	45.2	55.6	-	45.2	2.5	-2.8	5.6	4	clayy SILT to silty CLAY	115	2.0	23	28	-	-	3.1	9.9	36	2.62	15	N/A	N/A
12.30	44.1	53.7	175.8	44.0	2.1	-1.6	4.9	4	clayy SILT to silty CLAY	115	2.0	22	27	-	-	3.1	9.9	35	2.59	15	N/A	N/A
12.47	42.8	51.7	165.9	42.7	1.9	-1.2	4.6	4	clayy SILT to silty CLAY	115	2.0	21	26	-	-	3.0	9.9	34	2.58	15	N/A	N/A
12.63	40.4	48.4	160.8	40.3	1.8	-1.4	4.6	4	clayy SILT to silty CLAY	115	2.0	20	24	-	-	2.8	9.9	35	2.60	15	N/A	N/A
12.80	37.8	49.6	-	37.8	1.8	-1.3	4.8	4	clayy SILT to silty CLAY	115	2.0	19	25	-	-	2.6	9.9	36	2.60	15	N/A	N/A
12.96	36.7	47.5	-	36.7	1.9	-1.3	5.4	3	silty CLAY to CLAY	115	1.5	24	32	-	-	2.5	9.9	38	2.66	15	N/A	N/A
13.12	37.4	47.8	-	37.4	2.2	-1.4	5.9	3	silty CLAY to CLAY	115	1.5	25	32	-	-	2.6	9.9	40	2.68	15	N/A	N/A
13.29	37.2	47.0	-	37.2	2.4	-1.2	6.6	3	silty CLAY to CLAY	115	1.5	25	31	-	-	2.6	9.9	42	2.73	15	N/A	N/A
13.45	38.1	47.6	-	38.1	2.6	-1.2	7.0	3	silty CLAY to CLAY	115	1.5	25	32	-	-	2.6	9.9	43	2.74	15	N/A	N/A
13.62	36.5	45.0	-	36.4	2.7	-2.4	7.5	3	silty CLAY to CLAY	115	1.5	24	30	-	-	2.5	9.9	45	2.78	15	N/A	N/A
13.78	33.6	41.0	-	33.5	2.6	-2.5	7.9	3	silty CLAY to CLAY	115	1.5	22	27	-	-	2.3	9.9	47	2.82	15	N/A	N/A
13.94	32.3	39.0	-	32.3	2.4	-1.9	7.5	3	silty CLAY to CLAY	115	1.5	22	26	-	-	2.2	9.9	47	2.82	15	N/A	N/A
14.11	31.8	37.9	-	31.8	2.2	-0.9	7.3	3	silty CLAY to CLAY	115	1.5	21	25	-	-	2.2	9.9	47	2.82	15	N/A	N/A
14.27	31.6	37.3	-	31.6	2.3	-1.8	7.3	3	silty CLAY to CLAY	115	1.5	21	25	-	-	2.2	9.9	48	2.83	15	N/A	N/A
14.44	29.0	33.9	-	29.0	2.1	-1.3	7.5	3	silty CLAY to CLAY	115	1.5	19	23	-	-	2.0	9.9	50	2.87	15	N/A	N/A
14.60	27.3	31.5	-	27.3	1.8	-0.8	6.7	3	silty CLAY to CLAY	115	1.5	18	21	-	-	1.9	9.9	49	2.85	15	N/A	N/A
14.76	24.7	28.2	-	24.7	1.6	-0.7	6.8	3	silty CLAY to CLAY	115	1.5	16	19	-	-	1.7	9.0	52	2.89	15	N/A	N/A
14.93	23.3	26.3	-	23.3	1.6	-0.8	7.1	3	silty CLAY to CLAY	115	1.5	16	18	-	-	1.6	8.3	54	2.93	15	N/A	N/A
15.09	23.0	25.7	-	23.0	1.5	-0.5	7.0	3	silty CLAY to CLAY	115	1.5	15	17	-	-	1.6	8.2	54	2.93	15	N/A	N/A
15.26	25.3	28.0	-	25.3	1.5	0.0	6.0	3	silty CLAY to CLAY	115	1.5	17	19	-	-	1.7	8.9	49	2.86	15	N/A	N/A
15.42	28.8	31.5	-	28.8	1.6	0.5	5.8	3	silty CLAY to CLAY	115	1.5	19	21	-	-	2.0	9.9	46	2.81	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Project ID: Leighton Group
Data File: SDF(035).cpt
CPT Date: 9/28/2017 11:19:59 AM
GW During Test: 23 ft

Page: 2
Sounding ID: CPT-07
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	35.3	38.2	-	35.3	1.9	0.2	5.6	3	silty CLAY to CLAY	115	1.5	24	25	-	-	2.4	9.9	42	2.74	15	N/A	N/A
15.75	36.5	39.2	-	36.5	2.1	-0.3	5.9	3	silty CLAY to CLAY	115	1.5	24	26	-	-	2.5	9.9	43	2.75	15	N/A	N/A
15.91	37.3	39.5	-	37.3	2.2	0.6	6.1	3	silty CLAY to CLAY	115	1.5	25	26	-	-	2.6	9.9	43	2.75	15	N/A	N/A
16.08	37.5	39.4	-	37.5	2.2	0.7	6.1	3	silty CLAY to CLAY	115	1.5	25	26	-	-	2.6	9.9	43	2.75	15	N/A	N/A
16.24	38.2	39.7	-	38.2	2.2	0.8	6.0	3	silty CLAY to CLAY	115	1.5	25	26	-	-	2.6	9.9	43	2.74	15	N/A	N/A
16.40	38.0	39.1	-	38.0	2.1	0.9	5.5	3	silty CLAY to CLAY	115	1.5	25	26	-	-	2.6	9.9	42	2.72	15	N/A	N/A
16.57	43.0	43.8	-	43.0	2.1	1.1	5.1	3	silty CLAY to CLAY	115	1.5	29	29	-	-	3.0	9.9	38	2.66	15	N/A	N/A
16.73	42.5	43.0	-	42.5	2.1	0.8	5.2	3	silty CLAY to CLAY	115	1.5	28	29	-	-	2.9	9.9	39	2.67	15	N/A	N/A
16.90	38.3	38.3	-	38.3	2.1	1.4	5.6	3	silty CLAY to CLAY	115	1.5	26	26	-	-	2.6	9.9	42	2.73	15	N/A	N/A
17.06	37.9	37.5	-	37.9	2.0	1.6	5.5	3	silty CLAY to CLAY	115	1.5	25	25	-	-	2.6	9.9	42	2.74	15	N/A	N/A
17.23	37.1	36.5	-	37.1	2.1	1.6	5.7	3	silty CLAY to CLAY	115	1.5	25	24	-	-	2.6	9.9	43	2.76	15	N/A	N/A
17.39	37.4	36.4	-	37.4	2.1	1.6	5.9	3	silty CLAY to CLAY	115	1.5	25	24	-	-	2.6	9.9	44	2.77	15	N/A	N/A
17.55	37.7	36.3	-	37.7	2.1	1.7	5.8	3	silty CLAY to CLAY	115	1.5	25	24	-	-	2.6	9.9	44	2.76	15	N/A	N/A
17.72	36.6	35.0	-	36.6	2.2	1.7	6.1	3	silty CLAY to CLAY	115	1.5	24	23	-	-	2.5	9.9	45	2.79	15	N/A	N/A
17.88	36.2	34.3	-	36.3	2.1	1.7	6.1	3	silty CLAY to CLAY	115	1.5	24	23	-	-	2.5	9.9	46	2.79	15	N/A	N/A
18.05	35.3	33.1	-	35.3	2.1	1.9	6.0	3	silty CLAY to CLAY	115	1.5	24	22	-	-	2.4	9.9	46	2.80	15	N/A	N/A
18.21	36.4	33.8	-	36.4	2.0	1.9	5.6	3	silty CLAY to CLAY	115	1.5	24	23	-	-	2.5	9.9	44	2.77	15	N/A	N/A
18.37	36.0	33.3	-	36.1	1.9	2.0	5.4	3	silty CLAY to CLAY	115	1.5	24	22	-	-	2.5	9.9	44	2.77	15	N/A	N/A
18.54	31.3	28.6	-	31.3	1.8	1.5	5.9	3	silty CLAY to CLAY	115	1.5	21	19	-	-	2.1	9.1	48	2.84	15	N/A	N/A
18.70	26.8	24.3	-	26.8	1.6	1.2	6.4	3	silty CLAY to CLAY	115	1.5	18	16	-	-	1.8	7.7	53	2.92	15	N/A	N/A
18.87	24.2	21.7	-	24.2	1.4	1.5	6.2	3	silty CLAY to CLAY	115	1.5	16	14	-	-	1.6	6.8	55	2.95	15	N/A	N/A
19.03	25.9	23.1	-	26.0	1.4	2.1	5.7	3	silty CLAY to CLAY	115	1.5	17	15	-	-	1.8	7.3	52	2.90	15	N/A	N/A
19.19	30.9	27.3	-	30.9	1.3	0.4	4.5	3	silty CLAY to CLAY	115	1.5	21	18	-	-	2.1	8.7	45	2.77	15	N/A	N/A
19.36	25.8	22.6	-	25.8	1.4	-0.1	5.5	3	silty CLAY to CLAY	115	1.5	17	15	-	-	1.7	7.1	52	2.90	15	N/A	N/A
19.52	25.5	22.2	-	25.5	1.3	-0.2	5.2	3	silty CLAY to CLAY	115	1.5	17	15	-	-	1.7	7.0	51	2.89	15	N/A	N/A
19.69	25.9	22.3	-	25.9	1.3	-0.2	5.3	3	silty CLAY to CLAY	115	1.5	17	15	-	-	1.7	7.0	52	2.89	15	N/A	N/A
19.85	25.4	21.7	-	25.4	1.4	-0.2	5.7	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.8	54	2.92	15	N/A	N/A
20.01	25.2	21.4	-	25.2	1.4	-0.1	5.8	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.7	54	2.93	15	N/A	N/A
20.18	24.0	20.2	-	24.0	1.3	0.0	5.8	3	silty CLAY to CLAY	115	1.5	16	13	-	-	1.6	6.3	55	2.95	15	N/A	N/A
20.34	25.6	21.4	-	25.6	1.3	0.4	5.5	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.7	53	2.92	15	N/A	N/A
20.51	28.6	23.7	-	28.6	1.5	0.4	5.4	3	silty CLAY to CLAY	115	1.5	19	16	-	-	1.9	7.5	51	2.88	15	N/A	N/A
20.67	30.6	25.2	-	30.6	1.7	0.5	5.7	3	silty CLAY to CLAY	115	1.5	20	17	-	-	2.1	8.0	50	2.88	15	N/A	N/A
20.83	31.3	25.6	-	31.3	1.8	0.7	5.9	3	silty CLAY to CLAY	115	1.5	21	17	-	-	2.1	8.1	51	2.88	15	N/A	N/A
21.00	32.2	26.1	-	32.2	1.9	0.8	6.0	3	silty CLAY to CLAY	115	1.5	21	17	-	-	2.2	8.3	51	2.88	15	N/A	N/A
21.16	32.6	26.2	-	32.7	2.0	0.9	6.5	3	silty CLAY to CLAY	115	1.5	22	17	-	-	2.2	8.3	52	2.90	15	N/A	N/A
21.33	32.4	25.8	-	32.4	2.1	0.6	6.6	3	silty CLAY to CLAY	115	1.5	22	17	-	-	2.2	8.2	53	2.91	15	N/A	N/A
21.49	30.7	24.3	-	30.7	2.1	0.8	7.1	3	silty CLAY to CLAY	115	1.5	20	16	-	-	2.1	7.7	55	2.95	15	N/A	N/A
21.65	30.6	24.1	-	30.7	2.0	1.0	7.0	3	silty CLAY to CLAY	115	1.5	20	16	-	-	2.1	7.6	55	2.95	15	N/A	N/A
21.82	28.7	22.4	-	28.8	1.9	1.2	6.9	3	silty CLAY to CLAY	115	1.5	19	15	-	-	1.9	7.1	56	2.97	15	N/A	N/A
21.98	28.1	21.8	-	28.2	1.8	1.1	6.6	3	silty CLAY to CLAY	115	1.5	19	15	-	-	1.9	6.9	56	2.97	15	N/A	N/A
22.15	29.0	22.3	-	29.1	1.7	1.1	6.3	3	silty CLAY to CLAY	115	1.5	19	15	-	-	2.0	7.0	55	2.94	15	N/A	N/A
22.31	28.3	21.6	-	28.3	1.7	0.3	6.3	3	silty CLAY to CLAY	115	1.5	19	14	-	-	1.9	6.8	55	2.95	15	N/A	N/A
22.47	29.1	22.1	-	29.1	1.7	0.6	6.1	3	silty CLAY to CLAY	115	1.5	19	15	-	-	2.0	6.9	54	2.94	15	N/A	N/A
22.64	33.1	24.9	-	33.1	1.9	0.7	6.0	3	silty CLAY to CLAY	115	1.5	22	17	-	-	2.2	7.9	52	2.89	15	N/A	N/A
22.80	42.0	31.4	-	42.0	2.2	0.8	5.4	3	silty CLAY to CLAY	115	1.5	28	21	-	-	2.9	9.9	45	2.79	15	N/A	N/A
22.97	50.9	37.7	-	50.9	2.7	0.9	5.4	3	silty CLAY to CLAY	115	1.5	34	25	-	-	3.5	9.9	42	2.73	15	N/A	N/A
23.13	55.5	41.0	-	55.5	3.1	1.0	5.7	3	silty CLAY to CLAY	115	1.5	37	27	-	-	3.8	9.9	42	2.72	15	-	-
23.30	55.8	41.2	-	55.9	3.4	1.1	6.2	3	silty CLAY to CLAY	115	1.5	37	27	-	-	3.9	9.9	43	2.75	15	-	-
23.46	59.1	43.4	-	59.1	3.4	1.7	5.9	3	silty CLAY to CLAY	115	1.5	39	29	-	-	4.1	9.9	41	2.71	15	-	-
23.62	57.4	42.0	-	57.4	3.5	2.0	6.2	3	silty CLAY to CLAY	115	1.5	38	28	-	-	4.0	9.9	42	2.74	15	-	-
23.79	56.3	41.1	-	56.2	3.7	-4.9	6.7	3	silty CLAY to CLAY	115	1.5	38	27	-	-	3.9	9.9	44	2.77	15	-	-
23.95	55.6	40.4	-	55.5	3.6	-3.5	6.6	3	silty CLAY to CLAY	115	1.5	37	27	-	-	3.8	9.9	44	2.77	15	-	-
24.12	54.0	39.2	-	53.9	3.3	-2.5	6.3	3	silty CLAY to CLAY	115	1.5	36	26	-	-	3.7	9.9	44	2.77	15	-	-
24.28	50.6	36.6	-	50.6	3.1	-1.4	6.3	3	silty CLAY to CLAY	115	1.5	34	24	-	-	3.5	9.9	45	2.79	15	-	-
24.44	49.6	35.8	-	49.6	2.5	-1.4	5.3	3	silty CLAY to CLAY	115	1.5	33	24	-	-	3.4	9.9	42	2.74	15	-	-
24.61	52.0	37.4	-	51.9	2.1	-0.8	4.1	4	clayy SILT to silty CLAY	115	2.0	26	19	-	-	3.6	9.9	38	2.65	15	-	-
24.77	54.6	39.1	-	54.6	2.0	-0.3	3.7	4	clayy SILT to silty CLAY	115	2.0	27	20	-	-	3.8	9.9	35	2.60	15	-	-
24.94	51.0	36.4	-	51.0	1.8	0.0	3.6	4	clayy SILT to silty CLAY	115	2.0	25	18	-	-	3.5	9.9	36	2.61	15	-	-
25.10	67.7	55.5	128.9	67.7	1.8	0.0	2.8	5	silty SAND to sandy SILT	120	3.0	23	18	48	36	-	-	27	2.40	16	0.65	3.5
25.26	89.5	73.2	119.4	89.5	1.6	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	30	24	57	38	-	-	18	2.18	16	1.37	8.6
25.43	98.5	80.4	123.3	98.5	1.7	0.1	1.7	5	silty SAND to sandy SILT	120	3.0	33	27	60	39	-	-	17	2.14	16	1.13	5.6
25.59	101.4	82.7	124.5	101.4	1.7	0.1	1.7	5	silty SAND to sandy SILT	120	3.0	34	28	61	39	-	-	17	2.13	16	1.06	5.1
25.76	99.3	80.8	132.9	99.2	2.0	0.0	2.0	5	silty SAND to sandy SILT	120	3.0	33	27	60	39	-	-	19	2.19	16	0.56	2.8
25.92	108.2	88.0	141.1	108.2	2.2	-0.4	2.1	5	silty SAND to sandy SILT	120	3.0	36	29	63	39	-	-	18	2.17	16	0.33	1.7
26.08	137.3	111.4	150.3	137.3	2.3	-0.1	1.7	5	silty SAND to sandy SILT	120	3.0	46	37	71	40	-	-	14	2.04	16	0.20	1.3
26.25	180.1	145.9	170.0	180.1	2.4	0.3	1.3	6	clean SAND to silty SAND	125	5.0	36	29	79	42	-	-	10	1.87	16	0.00	0.0
26.41	213.1	172.3	185.8	213.1	2.3	0.2	1.1	6	clean SAND to silty SAND	125	5.0	43	34	85	43	-	-	7	1.76	16	0.00	0.0
26.58	260.1	210.0	226.5	260.1	3.4	0.0	1.3	6	clean SAND to silty SAND	125	5.0	52	42	91	44	-	-	7	1.76	16	0.00	0.0
26.74	279.0	224.8	243.9	279.0	3.9	0.1	1.4	6	clean SAND to silty SAND	125	5.0	56	45	94	44	-	-	7	1.77	16	0.00	0.0
26.90	338.0	271.9	294.9	338.0	5.5	0.1	1.6	6	clean SAND to silty SAND	125	5.0	68	54	95	45	-	-	7	1.77	16	0.00	0.0
27.07	317.3	254.8	272.1	317.3	4.6	0.7	1.4	6	clean SAND to silty SAND	125	5.0	63	51	95	44	-	-	7	1.74	16	0.00	0.0
27.23	314.4	252.0	257.3	314.4	3.7	0.7	1.2	6	clean SAND to silty SAND	125	5.0	63	50	95	44	-	-	6	1.68	16	0.00	0.0
27.40	344.7	275.9	275.9	344.8	3.3	0.8	1.0	6	clean SAND to silty SAND	125	5.0	69	55	95	45	-	-	5	1.59	16	0.00	0.0
27.56	346.2	276.5	276.5	346.2	3.4	0.7	1.0	6	clean SAND to silty SAND	125	5.0	69	55	95	45	-	-	5	1.59	16	0.00	0.0
27.72	309.4	246.7	253.2	309.4	3.6	0.6	1.2	6	clean SAND to silty SAND	125	5.0	62	49	95	44	-	-	6	1.68	16	0.00	0.0
27.89	294.3	234.3	234.3	294.3	2.6	-0.1	0.9	6	clean SAND to silty SAND	125	5.0	59	47	95	44	-	-	5	1.61	16	0.00	0.0
28.05	276.5	219.7	219.7	276.5	2.3	-0.2	0.9	6	clean SAND to silty SAND	125	5.0	55	44	93	44	-	-	5	1.61	16	0.00	0.0
28.22	239.3	189.8	189.8	239.3	1.9	-1.3	0.8	6	clean SAND to silty SAND	125	5.0	48	38	88	43	-	-	5	1.64	16	0.00	0.0
28.38	230.3	182.4	182.4	230.3	1.7	-1.3	0.7	6	clean SAND to silty SAND	125	5.0	46	36	87	43	-	-	5	1.63	16	0.00	0.0
28.54	228.8	180.9	180.9	228.8	1.5	-1.2	0.7	6	clean SAND to silty SAND	125	5.0	46	36	87	43	-	-	5	1.60	16	0.00	0.0
28.71	217.4	171.6	171.6	217.4	1.3	-0.9	0.6	6	clean SAND to silty SAND	125	5.0	43	34	85	42	-	-	5	1.59	16	0.00	0.0
28.87	198.8	156.6	156.6	198.7	1.3	-1.1	0.6	6	clean SAND to silty SAND	125	5.0	40	31	82	42	-	-	5	1.64	16	0.18	1.7
29.04	199.4	156.9	161.2	199.4	1.5	-1.2	0.8	6	clean SAND to silty SAND	125	5.0	40	31	82	42	-	-	6	1.68	16	0.00	0.0
29.20	210.8	165.6	165.6	210.8	1.4	-1.1	0.7	6	clean SAND to silty SAND	125	5.0	42	33	84	42	-	-	5	1.63	16	0.00	0.0
29.36	195.2	153.1	170.9	195.2	2.2	-1.2	1.1	6	clean SAND to silty SAND	125	5.0	39	31	81	42	-	-	8	1.81	16	0.00	0.0
29.53	237.6	186.0	209.9	237.6	3.4	-1.3	1.4	6	clean SAND to silty SAND	125	5.0	48	37	87	43	-	-	9	1.83	16	0.00	0.0
29.69	257.1	200.9	216.4	257.1	3.2	-0.3	1.2	6	clean SAND to silty SAND	125	5.0	51	40	90	43	-	-	7	1.76	16	0.00	0.0
29.86	269.0	209.9	217.1	269.0	2.8	-1.0	1.1	6	clean SAND to silty SAND	125	5.0	54	42	91	43	-	-	6	1.69	16	0.00	0.0
30.02	269.3	209.7	209.7	269.2	2.0	-1.1	0.7	6	clean SAND to silty SAND	125	5.0	54	42	91	43	-	-	5	1.58	16	0.00	0.0
30.19	263.1	204.6	204.6	263.1	2.0	-1.4	0.8	6	clean SAND to silty SAND	125	5.0	53	41	91	43	-	-	5	1.60	16	0.00	0.0
30.35	213.1	165.4	185.0	213.0	2.6	-1.2	1.2	6	clean SAND to silty SAND	125	5.0	43	33	84	42	-	-	8	1.82	16	0.00	0.0
30.51	129.2	100.1	165.7	129.2	3.2	-0.9	2.5	5	silty SAND to sandy SILT	120	3.0	43	33	67	39	-	-	19	2.19	16	0.00	0.0
30.68	64.5	40.9	-	64.4	3.2	-1.5	5.2	3	silty CLAY to CLAY	115	1.5	43	27	-	-	4.4	9.9	40	2.69	15	-	-
30.84	44.8	28.4	-	44.8	2.5	-1.4	5.7	3	silty CLAY to CLAY	115	1.5	30	19	-	-	3.1	9.0	48	2.84	15	-	-

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Project ID: Leighton Group
Data File: SDF(035).cpt
CPT Date: 9/28/2017 11:19:59 AM
GW During Test: 23 ft

Sounding ID: CPT-07
Project No: 11753.001
Cone/Rig: DDG1379

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
31.01	39.1	24.7	-	39.1	1.6	-0.5	4.3	3	silty CLAY to CLAY	115	1.5	26	16	-	-	2.7	7.8	46	2.80	15	-	-
31.17	41.0	25.8	-	41.0	1.3	-0.3	3.4	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.8	8.1	41	2.71	15	-	-
31.33	41.7	26.2	-	41.7	1.3	-0.2	3.3	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.8	8.3	41	2.71	15	-	-
31.50	43.5	27.2	-	43.5	1.4	-0.9	3.4	4	clayy SILT to silty CLAY	115	2.0	22	14	-	-	3.0	8.6	40	2.70	15	-	-
31.66	44.5	27.8	-	44.5	1.5	-0.9	3.5	4	clayy SILT to silty CLAY	115	2.0	22	14	-	-	3.0	8.8	41	2.70	15	-	-
31.83	44.4	27.7	-	44.4	1.5	-1.1	3.5	4	clayy SILT to silty CLAY	115	2.0	22	14	-	-	3.0	8.7	40	2.70	15	-	-
31.99	41.8	26.0	-	41.8	1.4	0.0	3.4	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.8	8.2	42	2.72	15	-	-
32.15	40.7	25.2	-	40.7	1.3	0.1	3.4	4	clayy SILT to silty CLAY	115	2.0	20	13	-	-	2.8	7.9	42	2.72	15	-	-
32.32	41.3	25.5	-	41.3	1.3	0.1	3.3	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.8	8.0	41	2.71	15	-	-
32.48	39.3	24.2	-	39.3	1.3	0.3	3.4	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.6	43	2.74	15	-	-
32.65	39.1	24.0	-	39.1	1.4	0.1	3.7	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.6	7.5	44	2.77	15	-	-
32.81	39.2	24.0	-	39.2	1.4	-0.2	3.8	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.5	45	2.77	15	-	-
32.97	35.5	21.7	-	35.5	1.4	-0.1	4.2	3	silty CLAY to CLAY	115	1.5	24	14	-	-	2.4	6.8	48	2.84	15	-	-
33.14	32.9	20.0	-	32.9	1.3	0.1	4.1	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.2	49	2.86	15	-	-
33.30	33.1	20.1	-	33.1	1.2	0.1	3.9	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.2	49	2.84	15	-	-
33.47	32.5	19.7	-	32.5	1.2	0.2	3.9	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.1	49	2.85	15	-	-
33.63	33.3	20.1	-	33.3	1.2	0.2	3.9	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.2	48	2.84	15	-	-
33.79	36.6	22.1	-	36.6	1.2	0.3	3.4	4	clayy SILT to silty CLAY	115	2.0	18	11	-	-	2.5	6.9	45	2.78	15	-	-
33.96	46.9	28.2	-	46.9	1.5	0.2	3.2	4	clayy SILT to silty CLAY	115	2.0	23	14	-	-	3.2	8.9	39	2.67	15	-	-
34.12	73.3	55.2	124.8	73.4	1.9	0.7	2.6	5	silty SAND to sandy SILT	120	3.0	24	18	47	36	-	-	26	2.39	16	1.36	23.6
34.29	65.5	49.2	127.0	65.5	1.9	0.7	2.9	4	clayy SILT to silty CLAY	115	2.0	33	25	-	-	4.5	9.9	29	2.46	15	1.20	36.4
34.45	54.8	32.7	-	54.8	1.7	1.0	3.2	4	clayy SILT to silty CLAY	115	2.0	27	16	-	-	3.8	9.9	36	2.62	15	-	-
34.61	47.6	28.3	-	47.6	1.4	0.9	3.0	4	clayy SILT to silty CLAY	115	2.0	24	14	-	-	3.2	8.9	38	2.66	15	-	-
34.78	43.8	26.0	-	43.9	1.4	0.9	3.3	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.2	41	2.70	15	-	-
34.94	43.9	26.0	-	44.0	1.3	2.0	3.2	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.2	40	2.70	15	-	-
35.11	44.6	26.4	-	44.7	1.4	2.1	3.2	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.3	40	2.69	15	-	-
35.27	43.9	25.8	-	43.9	1.4	2.2	3.2	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.1	41	2.70	15	-	-
35.43	43.4	25.5	-	43.5	1.4	2.3	3.4	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	2.9	8.0	42	2.72	15	-	-
35.60	42.9	25.2	-	43.0	1.4	2.3	3.3	4	clayy SILT to silty CLAY	115	2.0	21	13	-	-	2.9	7.9	42	2.72	15	-	-
35.76	41.1	24.1	-	41.2	1.3	2.3	3.4	4	clayy SILT to silty CLAY	115	2.0	21	12	-	-	2.8	7.5	43	2.75	15	-	-
35.93	40.9	23.9	-	40.9	1.4	2.3	3.5	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.8	7.5	43	2.75	15	-	-
36.09	39.5	23.0	-	39.6	1.4	2.3	3.6	4	clayy SILT to silty CLAY	115	2.0	20	11	-	-	2.7	7.2	45	2.78	15	-	-
36.26	38.4	22.3	-	38.4	1.3	2.3	3.5	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.6	6.9	45	2.78	15	-	-
36.42	36.4	21.1	-	36.4	1.2	2.4	3.4	4	clayy SILT to silty CLAY	115	2.0	18	11	-	-	2.4	6.5	46	2.79	15	-	-
36.58	34.4	19.9	-	34.5	1.2	2.5	3.6	3	silty CLAY to CLAY	115	1.5	23	13	-	-	2.3	6.1	48	2.83	15	-	-
36.75	32.1	18.5	-	32.2	1.1	2.4	3.7	3	silty CLAY to CLAY	115	1.5	21	12	-	-	2.1	5.7	49	2.86	15	-	-
36.91	28.8	16.6	-	28.9	1.0	2.3	3.8	3	silty CLAY to CLAY	115	1.5	19	11	-	-	1.9	5.1	53	2.91	15	-	-
37.08	30.9	17.7	-	31.0	1.0	2.3	3.6	3	silty CLAY to CLAY	115	1.5	21	12	-	-	2.1	5.4	50	2.87	15	-	-
37.24	39.9	22.8	-	39.9	1.1	2.5	3.0	4	clayy SILT to silty CLAY	115	2.0	20	11	-	-	2.7	7.1	42	2.72	15	-	-
37.40	40.7	23.2	-	40.7	1.0	2.4	2.7	4	clayy SILT to silty CLAY	115	2.0	20	12	-	-	2.7	7.2	40	2.69	15	-	-
37.57	42.9	24.4	-	42.9	1.2	2.7	3.0	4	clayy SILT to silty CLAY	115	2.0	21	12	-	-	2.9	7.6	41	2.70	15	-	-
37.73	48.9	27.7	-	48.9	1.2	2.8	2.5	4	clayy SILT to silty CLAY	115	2.0	24	14	-	-	3.3	8.7	36	2.61	15	-	-
37.90	43.6	24.7	-	43.7	1.9	2.8	4.6	3	silty CLAY to CLAY	115	1.5	29	16	-	-	3.0	7.7	47	2.82	15	-	-
38.06	49.1	27.7	-	49.2	1.9	3.0	4.0	4	clayy SILT to silty CLAY	115	2.0	25	14	-	-	3.3	8.7	43	2.74	15	-	-
38.22	71.0	40.0	-	71.0	2.6	2.5	3.8	4	clayy SILT to silty CLAY	115	2.0	35	20	-	-	4.9	9.9	36	2.61	15	-	-
38.39	86.9	63.3	149.7	86.9	2.8	0.9	3.2	4	clayy SILT to silty CLAY	115	2.0	43	32	-	-	6.0	9.9	27	2.41	15	0.30	1.3
38.55	53.8	30.2	-	53.8	2.3	0.7	4.4	3	silty CLAY to CLAY	115	1.5	36	20	-	-	3.7	9.5	43	2.74	15	-	-
38.72	30.4	17.0	-	30.4	1.5	0.7	5.4	3	silty CLAY to CLAY	115	1.5	20	11	-	-	2.0	5.2	58	3.00	15	-	-
38.88	42.1	23.5	-	42.1	2.4	1.1	6.0	3	silty CLAY to CLAY	115	1.5	28	16	-	-	2.8	7.3	53	2.92	15	-	-
39.04	116.5	84.5	164.9	116.6	3.4	3.1	3.0	5	silty SAND to sandy SILT	120	3.0	39	28	61	38	-	-	23	2.30	16	0.00	0.0
39.21	116.1	84.0	175.6	116.1	3.9	2.4	3.4	5	silty SAND to sandy SILT	120	3.0	39	28	61	38	-	-	24	2.34	16	0.00	0.0
39.37	99.1	71.6	174.7	99.1	3.7	1.1	3.9	4	clayy SILT to silty CLAY	115	2.0	50	36	-	-	6.9	9.9	28	2.43	15	0.00	0.0
39.54	82.1	59.3	163.3	82.1	3.2	0.8	4.0	4	clayy SILT to silty CLAY	115	2.0	41	30	-	-	5.7	9.9	31	2.50	15	0.00	0.0
39.70	60.5	33.4	-	60.5	2.6	0.9	4.4	3	silty CLAY to CLAY	115	1.5	40	22	-	-	4.1	9.9	41	2.71	15	-	-
39.86	74.3	53.5	150.2	74.3	2.7	1.4	3.7	4	clayy SILT to silty CLAY	115	2.0	37	27	-	-	5.1	9.9	31	2.51	15	0.28	1.0
40.03	83.8	60.3	165.6	83.8	3.3	0.6	4.0	4	clayy SILT to silty CLAY	115	2.0	42	30	-	-	5.8	9.9	30	2.50	15	0.00	0.0
40.19	70.1	38.4	-	70.1	3.3	0.4	4.9	3	silty CLAY to CLAY	115	1.5	47	26	-	-	4.8	9.9	40	2.69	15	-	-
40.36	63.8	34.8	-	63.8	3.2	0.5	5.3	3	silty CLAY to CLAY	115	1.5	43	23	-	-	4.4	9.9	43	2.75	15	-	-
40.52	85.7	61.5	169.9	85.8	3.5	1.2	4.1	4	clayy SILT to silty CLAY	115	2.0	43	31	-	-	5.9	9.9	31	2.50	15	0.00	0.0
40.68	120.3	86.2	181.2	120.4	4.1	0.6	3.5	5	silty SAND to sandy SILT	120	3.0	40	29	62	38	-	-	24	2.35	16	0.00	0.0
40.85	125.6	89.8	156.1	125.6	3.1	-0.6	2.5	5	silty SAND to sandy SILT	120	3.0	42	30	63	38	-	-	20	2.23	16	0.23	1.3
41.01	122.0	87.2	157.0	122.0	3.2	-1.1	2.7	5	silty SAND to sandy SILT	120	3.0	41	29	62	38	-	-	21	2.25	16	0.21	1.2
41.18	142.4	101.6	155.6	142.3	3.0	-3.4	2.2	5	silty SAND to sandy SILT	120	3.0	47	34	68	39	-	-	17	2.14	16	0.25	1.6
41.34	141.7	100.9	158.8	141.6	3.2	-4.4	2.3	5	silty SAND to sandy SILT	120	3.0	47	34	67	39	-	-	18	2.16	16	0.20	1.3
41.50	139.2	99.1	145.2	139.1	2.6	-5.7	1.9	5	silty SAND to sandy SILT	120	3.0	46	33	67	39	-	-	16	2.11	16	0.51	2.7
41.67	116.1	82.5	136.1	116.0	2.4	-6.5	2.1	5	silty SAND to sandy SILT	120	3.0	39	27	61	38	-	-	19	2.19	16	0.90	4.9
41.83	78.6	55.8	146.8	78.5	2.6	-6.7	3.5	4	clayy SILT to silty CLAY	115	2.0	39	28	-	-	5.4	9.9	29	2.47	15	0.37	1.6
42.00	74.7	52.9	142.6	74.5	2.5	-6.5	3.4	4	clayy SILT to silty CLAY	115	2.0	37	26	-	-	5.1	9.9	30	2.48	15	0.49	2.3
42.16	101.2	71.6	134.6	101.1	2.3	-6.2	2.4	5	silty SAND to sandy SILT	120	3.0	34	24	56	37	-	-	22	2.28	16	0.95	6.1
42.32	112.5	79.6	150.9	112.4	3.0	-6.3	2.7	5	silty SAND to sandy SILT	120	3.0	38	27	59	38	-	-	22	2.28	16	0.33	1.7
42.49	94.7	66.9	154.2	94.6	3.0	-6.4	3.3	4	clayy SILT to silty CLAY	115	2.0	47	33	-	-	6.6	9.9	26	2.40	15	0.24	1.1
42.65	79.1	55.8	153.2	79.0	2.9	-6.3	3.7	4	clayy SILT to silty CLAY	115	2.0	40	28	-	-	5.5	9.9	30	2.50	15	0.24	0.8
42.82	54.0	28.4	-	53.9	1.9	-6.3	3.7	4	clayy SILT to silty CLAY	115	2.0	27	14	-	-	3.7	8.9	41	2.71	15	-	-
42.98	91.0	64.1	105.0	90.9	1.4	-6.3	1.5	5	silty SAND to sandy SILT	120	3.0	30	21	52	36	-	-	19	2.19	16	2.24	31.5
43.15	99.0	69.6	113.5	98.9	1.6	-6.3	1.7	5	silty SAND to sandy SILT	120	3.0	33	23	55	37	-	-	18	2.18	16	2.08	28.3
43.31	89.9	63.1	140.4	89.8	2.5	-6.5	2.9	5	silty SAND to sandy SILT	120	3.0	30	21	52	36	-	-	26	2.38	16	0.61	3.7
43.47	63.7	44.7	122.8	63.6	1.8	-6.8	2.9	4	clayy SILT to silty CLAY	115	2.0	32	22	-	-	4.4	9.9	31	2.50	15	1.55	49.9
43.64	70.1	49.1	101.3	70.0	1.3	-6.5	1.9	5	silty SAND to sandy SILT	120	3.0	23	16	44	35	-	-	24	2.33	16	2.31	45.2
43.80	137.3	96.0	116.1	137.2	1.3	-6.5	1.0	6	clean SAND to silty SAND	125	5.0	27	19	66	39	-	-	11	1.92	16	2.03	16.1
43.97	154.7	108.1	132.8	154.5	1.8	-6.5	1.2	6	clean SAND to silty SAND	125	5.0	31	22	70	39	-	-	11	1.94	16	1.19	5.2
44.13	158.8	110.8	136.1	158.6	1.9	-5.6	1.2	6	clean SAND to silty SAND	125	5.0	32	22	70	39	-	-	11	1.94	16	1.01	4.4
44.29	141.3	98.4	148.4	141.1	2.8	-6.9	2.0	5	silty SAND to sandy SILT	120	3.0	47	33	66	39	-	-	17	2.13	16	0.42	2.4
44.46	123.7	86.1	166.4	123.6	3.6	-7.4	3.0	5	silty SAND to sandy SILT	120	3.0	41	29	62	38	-	-	22	2.30	16	0.00	0.0
44.62	144.8	100.7	157.4	144.6	3.2	-7.4	2.2	5	silty SAND to sandy SILT	120	3.0	48	34	67	39	-	-	18	2.16	16	0.23	1.5
44.79	252.9	175.6	180.0	252.7	2.1	-7.5	0.8	6	clean SAND to silty SAND	125	5.0	51	35	86	42	-	-	6	1.68	16	0.00	0.0
44.95	249.2	172.8	174.8	249.0	1.9	-7.4	0.8	6	clean SAND to silty SAND	125	5.0	50	35	85	42	-	-	5	1.66	16	0.00	0.0
45.11	190.9	132.2	160.5	190.8	2.6	-7.2	1.4	6	clean SAND to silty SAND	125	5.0	38	26	76	40	-	-	11	1.93	16	0.00	0.0
45.28	95.3	65.9	125.6	95.2	2.1	-7.3	2.2	5	silty SAND to sandy SILT	120	3.0	32	22	53	36	-	-	22	2.29	16	1.49	16.1
45.44	41.0	20.7	-	40.8	0.6	-7.3	1.7	4	clayy SILT to silty CLAY	115	2.0	20	10	-	-	2.8	6.4	36	2.62	15	-	-
45.61	32.4	16.4	-	32.3	0.7	-7.3	2.2	4	clayy SILT to silty CLAY	115	2.0	16	8	-	-	2.2	5.0	45	2.78	15	-	-
45.77	28.4	14.3	-	28.3	0.6	-6.9	2.5	4	clayy SILT to silty CLAY	115	2.0	14	7	-	-	1.9	4.3	50	2.86	15	-	-
45.93	29.4	14.8	-	29.3	0.6	-6.7	2.4	4	clayy SILT to silty CLAY	115	2.0	15	7	-	-	1.9	4.4	48	2.84	15	-	-
46.10	30.4	15.3	-	30.3	0.6	-6.6	2.2	4	clayy SILT to silty CLAY	115	2.0	15	8	-	-	2.0	4.6	46	2.81	15	-	-
46.26	30.7	15.4	-	30.6	0.7	-6.5	2.4	4	clayy SILT to silty CLAY	115	2.0	15	8	-	-	2.0	4.6	47	2.82	15	-	-

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(035).cpt
CPT Date: 9/28/2017 11:19:59 AM
GW During Test: 23 ft

Sounding ID: CPT-07
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
46.43	30.1	15.0	-	30.0	0.7	-6.5	2.5	4	clayy SILT to silty CLAY	115	2.0	15	8	-	-	2.0	4.5	48	2.84	15	-	-
46.59	29.0	14.4	-	28.9	0.7	-6.4	2.5	4	clayy SILT to silty CLAY	115	2.0	14	7	-	-	1.9	4.3	49	2.86	15	-	-
46.75	30.1	15.0	-	30.0	0.6	-6.4	2.3	4	clayy SILT to silty CLAY	115	2.0	15	7	-	-	2.0	4.5	47	2.82	15	-	-
46.92	29.4	14.6	-	29.3	0.7	-6.4	2.7	3	silty CLAY to CLAY	115	1.5	20	10	-	-	1.9	4.4	50	2.87	15	-	-
47.08	28.3	14.0	-	28.2	0.7	-6.4	2.7	3	silty CLAY to CLAY	115	1.5	19	9	-	-	1.9	4.2	51	2.89	15	-	-
47.25	29.4	14.5	-	29.3	0.6	-6.0	2.4	4	clayy SILT to silty CLAY	115	2.0	15	7	-	-	1.9	4.3	49	2.85	15	-	-
47.41	29.9	14.7	-	29.7	0.6	-6.1	2.2	4	clayy SILT to silty CLAY	115	2.0	15	7	-	-	2.0	4.4	47	2.82	15	-	-
47.57	29.3	14.4	-	29.2	0.6	-6.0	2.4	4	clayy SILT to silty CLAY	115	2.0	15	7	-	-	1.9	4.3	49	2.85	15	-	-
47.74	31.2	15.3	-	31.0	0.9	-6.0	3.1	3	silty CLAY to CLAY	115	1.5	21	10	-	-	2.1	4.6	51	2.89	15	-	-
47.90	36.3	17.8	-	36.1	1.5	-6.0	4.4	3	silty CLAY to CLAY	115	1.5	24	12	-	-	2.4	5.4	54	2.93	15	-	-
48.07	70.6	34.5	-	70.4	2.3	-6.2	3.4	4	clayy SILT to silty CLAY	115	2.0	35	17	-	-	4.8	9.9	36	2.62	15	-	-
48.23	108.9	73.9	155.2	108.8	3.2	-5.8	3.0	5	silty SAND to sandy SILT	120	3.0	36	25	57	37	-	-	24	2.34	16	0.25	1.2
48.39	176.2	119.4	174.5	176.1	3.9	-5.8	2.2	5	silty SAND to sandy SILT	120	3.0	59	40	73	40	-	-	16	2.10	16	0.00	0.0
48.56	224.4	151.9	188.4	224.3	3.8	-6.3	1.7	6	clean SAND to silty SAND	125	5.0	45	30	81	41	-	-	12	1.95	16	0.00	0.0
48.72	251.1	169.7	198.4	250.9	3.8	-6.7	1.5	6	clean SAND to silty SAND	125	5.0	50	34	84	42	-	-	10	1.88	16	0.00	0.0
48.89	310.8	209.8	211.7	310.7	2.9	-7.0	0.9	6	clean SAND to silty SAND	125	5.0	62	42	91	43	-	-	5	1.66	16	0.00	0.0
49.05	406.4	274.0	274.0	406.2	4.1	-7.2	1.0	6	clean SAND to silty SAND	125	5.0	81	55	95	44	-	-	5	1.61	16	0.00	0.0
49.22	462.3	311.3	311.3	462.1	4.9	-6.4	1.1	6	clean SAND to silty SAND	125	5.0	92	62	95	45	-	-	5	1.59	16	0.00	0.0
49.38	503.5	338.7	338.7	503.4	5.6	-6.8	1.1	6	clean SAND to silty SAND	125	5.0	100	68	95	45	-	-	5	1.58	16	0.00	0.0
49.54	511.6	343.7	343.7	511.5	6.3	-6.6	1.2	6	clean SAND to silty SAND	125	5.0	100	69	95	45	-	-	5	1.61	16	0.00	0.0
49.71	521.6	350.0	350.0	521.5	6.3	-6.6	1.2	6	clean SAND to silty SAND	125	5.0	100	70	95	45	-	-	5	1.60	16	0.00	0.0
49.87	512.4	343.4	343.4	512.3	5.5	-6.5	1.1	6	clean SAND to silty SAND	125	5.0	100	69	95	45	-	-	5	1.56	16	0.00	0.0
50.04	502.8	336.6	336.6	502.7	5.1	-6.3	1.0	6	clean SAND to silty SAND	125	5.0	100	67	95	45	-	-	5	1.55	16	0.00	0.0
50.20	501.9	335.5	335.5	501.8	4.7	-6.2	0.9	6	clean SAND to silty SAND	125	5.0	100	67	95	45	-	-	5	1.52	16	0.00	0.0
50.36	519.0	346.5	346.5	518.8	5.7	-6.0	1.1	6	clean SAND to silty SAND	125	5.0	100	69	95	45	-	-	5	1.57	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

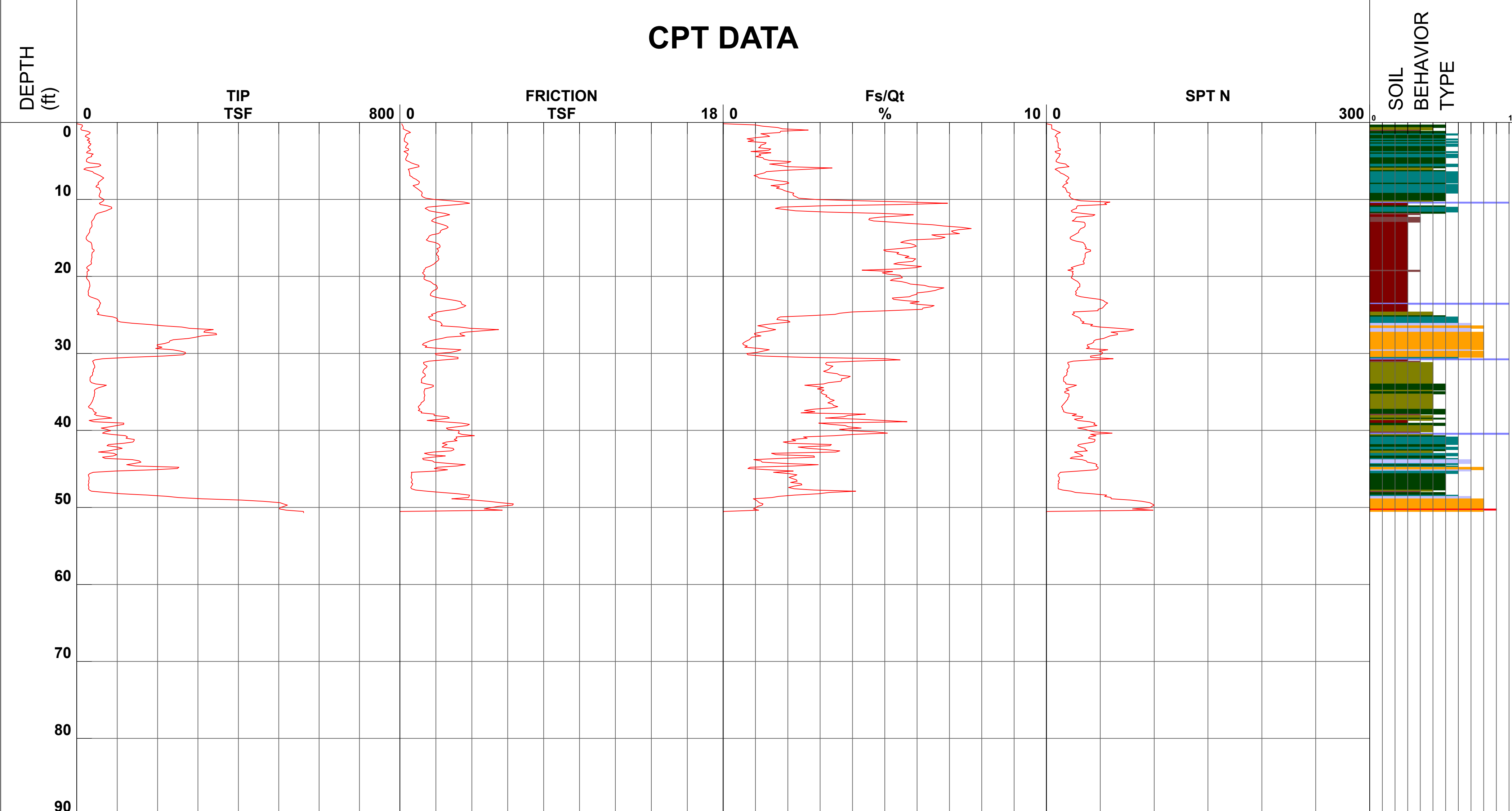
Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(035).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-07	Date and Time	9/28/2017 11:19:59 AM	Maximum Depth	50.69 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(041).cpt
CPT Date: 9/29/2017 12:02:55 PM
GW During Test: 23 ft

Sounding ID: CPT-08
Project No: 11753.001
Cone/Rig: DDG1379

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	20.5	32.8	53.9	20.4	0.1	-0.1	0.6	5	silty SAND to sandy SILT	120	3.0	7	11	30	48	-	-	19	2.19	16	N/A	N/A
0.49	11.2	18.0	-	11.2	0.2	0.1	2.2	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	41	2.71	15	N/A	N/A
0.66	9.1	14.6	-	9.1	0.2	0.0	1.7	4	clayy SILT to silty CLAY	115	2.0	5	7	-	-	0.6	9.9	42	2.73	15	N/A	N/A
0.82	9.3	14.8	-	9.3	0.1	0.1	1.6	4	clayy SILT to silty CLAY	115	2.0	5	7	-	-	0.7	9.9	41	2.70	15	N/A	N/A
0.98	11.4	18.3	-	11.4	0.4	0.1	3.3	3	silty CLAY to CLAY	115	1.5	8	12	-	-	0.8	9.9	47	2.81	15	N/A	N/A
1.15	15.6	25.1	-	15.6	0.5	0.2	2.9	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.1	9.9	39	2.67	15	N/A	N/A
1.31	22.8	36.6	73.5	22.8	0.3	0.0	1.2	5	silty SAND to sandy SILT	120	3.0	8	12	34	46	-	-	23	2.32	16	N/A	N/A
1.48	17.4	27.9	59.3	17.4	0.2	0.0	0.9	5	silty SAND to sandy SILT	120	3.0	6	9	25	44	-	-	25	2.35	16	N/A	N/A
1.64	14.4	23.1	-	14.4	0.4	-0.2	3.1	4	clayy SILT to silty CLAY	115	2.0	7	12	-	-	1.0	9.9	41	2.71	15	N/A	N/A
1.80	16.4	26.3	-	16.4	0.4	0.0	2.5	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.2	9.9	36	2.61	15	N/A	N/A
1.97	11.6	18.6	-	11.6	0.2	0.0	1.6	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	37	2.63	15	N/A	N/A
2.13	11.3	18.2	-	11.3	0.3	0.3	2.9	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	45	2.78	15	N/A	N/A
2.30	17.0	27.2	77.7	17.0	0.3	0.1	1.8	4	clayy SILT to silty CLAY	115	2.0	8	14	-	-	1.2	9.9	31	2.52	15	N/A	N/A
2.46	24.9	39.9	103.1	24.9	0.6	0.2	2.4	5	silty SAND to sandy SILT	120	3.0	8	13	37	43	-	-	29	2.46	16	N/A	N/A
2.62	42.1	67.4	123.0	42.1	0.9	0.2	2.1	5	silty SAND to sandy SILT	120	3.0	14	22	54	46	-	-	21	2.26	16	N/A	N/A
2.79	47.1	75.5	119.2	47.1	0.8	0.1	1.7	5	silty SAND to sandy SILT	120	3.0	16	25	58	46	-	-	18	2.16	16	N/A	N/A
2.95	44.7	71.7	108.0	44.7	0.6	0.1	1.5	5	silty SAND to sandy SILT	120	3.0	15	24	56	45	-	-	17	2.13	16	N/A	N/A
3.12	42.3	67.9	107.7	42.3	0.7	0.3	1.6	5	silty SAND to sandy SILT	120	3.0	14	23	54	45	-	-	18	2.17	16	N/A	N/A
3.28	52.7	84.5	114.6	52.7	0.7	0.0	1.3	5	silty SAND to sandy SILT	120	3.0	18	28	61	45	-	-	14	2.04	16	N/A	N/A
3.45	45.3	72.6	104.4	45.3	0.6	0.1	1.3	5	silty SAND to sandy SILT	120	3.0	15	24	56	45	-	-	16	2.09	16	N/A	N/A
3.61	43.8	70.2	105.7	43.8	0.6	0.1	1.4	5	silty SAND to sandy SILT	120	3.0	15	23	55	44	-	-	17	2.13	16	N/A	N/A
3.77	43.4	69.6	106.6	43.4	0.6	0.1	1.5	5	silty SAND to sandy SILT	120	3.0	14	23	55	44	-	-	17	2.14	16	N/A	N/A
3.94	44.1	70.8	105.1	44.1	0.6	-0.1	1.4	5	silty SAND to sandy SILT	120	3.0	15	24	56	44	-	-	16	2.12	16	N/A	N/A
4.10	38.0	61.0	99.4	38.0	0.6	0.2	1.5	5	silty SAND to sandy SILT	120	3.0	13	20	51	43	-	-	18	2.18	16	N/A	N/A
4.27	36.2	58.0	100.0	36.2	0.6	0.1	1.6	5	silty SAND to sandy SILT	120	3.0	12	19	49	42	-	-	20	2.22	16	N/A	N/A
4.43	36.4	58.3	111.4	36.4	0.7	-0.1	2.0	5	silty SAND to sandy SILT	120	3.0	12	19	49	42	-	-	22	2.29	16	N/A	N/A
4.59	37.3	59.8	112.0	37.3	0.7	0.0	2.0	5	silty SAND to sandy SILT	120	3.0	12	20	50	42	-	-	22	2.28	16	N/A	N/A
4.76	44.9	72.1	115.5	44.9	0.8	-0.1	1.7	5	silty SAND to sandy SILT	120	3.0	15	24	56	43	-	-	18	2.17	16	N/A	N/A
4.92	49.4	79.2	122.2	49.4	0.8	0.3	1.7	5	silty SAND to sandy SILT	120	3.0	16	26	59	43	-	-	17	2.15	16	N/A	N/A
5.09	51.3	82.3	122.5	51.3	0.8	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	17	27	61	43	-	-	16	2.12	16	N/A	N/A
5.25	50.8	81.5	126.7	50.8	0.9	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	17	27	60	43	-	-	17	2.15	16	N/A	N/A
5.41	63.6	102.0	133.9	63.6	0.9	-0.3	1.4	6	clean SAND to silty SAND	125	5.0	13	20	68	44	-	-	13	2.01	16	N/A	N/A
5.58	65.7	105.4	131.4	65.7	0.8	-0.1	1.2	6	clean SAND to silty SAND	125	5.0	13	21	69	44	-	-	12	1.96	16	N/A	N/A
5.74	57.6	92.4	119.4	57.6	0.7	-0.2	1.2	6	clean SAND to silty SAND	125	5.0	12	18	64	43	-	-	13	1.99	16	N/A	N/A
5.91	60.2	96.6	127.1	60.2	0.8	-0.4	1.4	6	clean SAND to silty SAND	125	5.0	12	19	66	43	-	-	13	2.01	16	N/A	N/A
6.07	76.4	122.5	153.6	76.4	1.1	-0.4	1.5	6	clean SAND to silty SAND	125	5.0	15	24	74	44	-	-	12	1.96	16	N/A	N/A
6.23	78.6	125.2	161.5	78.6	1.3	-0.5	1.7	6	clean SAND to silty SAND	125	5.0	16	25	74	44	-	-	13	1.99	16	N/A	N/A
6.40	65.3	102.7	152.3	65.3	1.3	-0.4	2.0	5	silty SAND to sandy SILT	120	3.0	22	34	68	43	-	-	16	2.11	16	N/A	N/A
6.56	56.0	87.0	164.1	56.0	1.6	-0.5	2.9	5	silty SAND to sandy SILT	120	3.0	19	29	62	42	-	-	22	2.28	16	N/A	N/A
6.73	51.7	79.3	183.7	51.7	2.0	-0.5	3.9	4	clayy SILT to silty CLAY	115	2.0	26	40	-	-	3.6	9.9	26	2.40	15	N/A	N/A
6.89	49.4	74.8	209.7	49.4	2.5	-0.6	5.1	4	clayy SILT to silty CLAY	115	2.0	25	37	-	-	3.5	9.9	31	2.51	15	N/A	N/A
7.05	53.4	80.0	235.5	53.4	3.1	-0.7	5.9	9	very stiff fine SOIL	120	1.0	53	80	-	-	1.9	9.9	32	2.53	30	N/A	N/A
7.22	57.5	85.2	250.2	57.5	3.5	-0.8	6.1	9	very stiff fine SOIL	120	1.0	58	85	-	-	2.0	9.9	32	2.53	30	N/A	N/A
7.38	58.5	85.6	243.0	58.5	3.4	-0.8	5.8	9	very stiff fine SOIL	120	1.0	58	86	-	-	2.1	9.9	31	2.51	30	N/A	N/A
7.55	56.1	81.3	219.9	56.1	2.9	-0.6	5.2	9	very stiff fine SOIL	120	1.0	56	81	-	-	2.0	9.9	30	2.49	30	N/A	N/A
7.71	53.0	75.9	194.8	53.0	2.4	-0.6	4.5	4	clayy SILT to silty CLAY	115	2.0	27	38	-	-	3.7	9.9	29	2.46	15	N/A	N/A
7.87	52.2	74.0	179.8	52.2	2.1	-0.6	4.0	4	clayy SILT to silty CLAY	115	2.0	26	37	-	-	3.7	9.9	28	2.43	15	N/A	N/A
8.04	49.9	70.0	165.0	49.9	1.8	-0.5	3.6	4	clayy SILT to silty CLAY	115	2.0	25	35	-	-	3.5	9.9	27	2.41	15	N/A	N/A
8.20	46.9	65.2	138.0	46.9	1.3	-0.5	2.8	5	silty SAND to sandy SILT	120	3.0	16	22	53	40	-	-	24	2.35	16	N/A	N/A
8.37	45.9	63.2	135.6	45.9	1.2	-0.5	2.8	5	silty SAND to sandy SILT	120	3.0	15	21	52	40	-	-	25	2.36	16	N/A	N/A
8.53	44.9	61.2	130.1	44.9	1.2	-0.9	2.6	5	silty SAND to sandy SILT	120	3.0	15	20	51	40	-	-	24	2.35	16	N/A	N/A
8.69	41.0	55.4	129.0	41.0	1.1	-0.9	2.8	5	silty SAND to sandy SILT	120	3.0	14	18	47	39	-	-	27	2.40	16	N/A	N/A
8.86	42.0	56.2	142.4	42.0	1.4	-1.0	3.3	4	clayy SILT to silty CLAY	115	2.0	21	28	-	-	2.9	9.9	29	2.45	15	N/A	N/A
9.02	52.2	69.2	159.9	52.2	1.8	-1.0	3.4	4	clayy SILT to silty CLAY	115	2.0	26	35	-	-	3.6	9.9	26	2.40	15	N/A	N/A
9.19	59.0	77.5	182.2	59.0	2.3	-1.1	3.9	4	clayy SILT to silty CLAY	115	2.0	29	39	-	-	4.1	9.9	27	2.41	15	N/A	N/A
9.35	61.9	80.6	202.2	61.9	2.8	-1.2	4.5	4	clayy SILT to silty CLAY	115	2.0	31	40	-	-	4.3	9.9	28	2.45	15	N/A	N/A
9.51	65.4	84.5	207.9	65.3	3.0	-1.2	4.6	4	clayy SILT to silty CLAY	115	2.0	33	42	-	-	4.6	9.9	28	2.44	15	N/A	N/A
9.68	70.7	90.6	195.8	70.7	2.7	-1.2	3.9	4	clayy SILT to silty CLAY	115	2.0	35	45	-	-	5.0	9.9	25	2.36	15	N/A	N/A
9.84	90.9	115.6	172.4	90.9	2.1	-1.3	2.3	5	silty SAND to sandy SILT	120	3.0	30	39	72	43	-	-	16	2.12	16	N/A	N/A
10.01	113.8	143.4	173.0	113.8	1.7	-1.2	1.5	6	clean SAND to silty SAND	125	5.0	23	29	79	44	-	-	11	1.92	16	N/A	N/A
10.17	125.4	156.7	179.6	125.4	1.6	-1.3	1.3	6	clean SAND to silty SAND	125	5.0	25	31	82	44	-	-	9	1.85	16	N/A	N/A
10.34	129.9	161.0	188.2	129.9	1.9	-1.2	1.5	6	clean SAND to silty SAND	125	5.0	26	32	83	44	-	-	10	1.88	16	N/A	N/A
10.50	125.2	153.9	189.5	125.2	2.1	-1.2	1.7	6	clean SAND to silty SAND	125	5.0	25	31	81	44	-	-	11	1.94	16	N/A	N/A
10.66	102.6	125.0	177.0	102.6	2.2	-1.2	2.2	5	silty SAND to sandy SILT	120	3.0	34	42	74	43	-	-	15	2.08	16	N/A	N/A
10.83	81.8	99.0	169.9	81.8	2.2	-1.1	2.7	5	silty SAND to sandy SILT	120	3.0	27	33	67	42	-	-	20	2.22	16	N/A	N/A
10.99	73.8	88.6	184.0	73.8	2.6	-1.2	3.6	5	silty SAND to sandy SILT	120	3.0	25	30	63	41	-	-	24	2.34	16	N/A	N/A
11.16	69.7	83.0	194.4	69.7	2.9	-1.3	4.1	4	clayy SILT to silty CLAY	115	2.0	35	42	-	-	4.9	9.9	27	2.41	15	N/A	N/A
11.32	68.0	80.4	190.1	67.9	2.8	-1.4	4.1	4	clayy SILT to silty CLAY	115	2.0	34	40	-	-	4.8	9.9	27	2.41	15	N/A	N/A
11.48	63.3	74.4	173.7	63.3	2.3	-1.3	3.7	4	clayy SILT to silty CLAY	115	2.0	32	37	-	-	4.4	9.9	27	2.41	15	N/A	N/A
11.65	57.9	67.6	152.0	57.9	1.8	-1.2	3.2	4	clayy SILT to silty CLAY	115	2.0	29	34	-	-	4.0	9.9	26	2.38	15	N/A	N/A
11.81	56.0	64.9	150.1	55.9	1.8	-1.3	3.2	4	clayy SILT to silty CLAY	115	2.0	28	32	-	-	3.9	9.9	26	2.40	15	N/A	N/A
11.98	56.4	65.0	147.9	56.4	1.8	-1.3	3.1	4	clayy SILT to silty CLAY	115	2.0	28	32	-	-	3.9	9.9	26	2.39	15	N/A	N/A
12.14	57.0	65.2	148.6	57.0	1.8	-1.3	3.2	4	clayy SILT to silty CLAY	115	2.0	29	33	-	-	4.0	9.9	26	2.39	15	N/A	N/A
12.30	57.5	65.3	149.0	57.5	1.8	-1.3	3.2	4	clayy SILT to silty CLAY	115	2.0	29	33	-	-	4.0	9.9	26	2.39	15	N/A	N/A
12.47	56.7	64.0	161.9	56.7	2.1	-1.3	3.7	4	clayy SILT to silty CLAY	115	2.0	28	32	-	-	4.0	9.9	28	2.45	15	N/A	N/A
12.63	52.8	59.3	163.1	52.8	2.1	-1.2	4.0	4	clayy SILT to silty CLAY	115	2.0	26	30	-	-	3.7	9.9	31	2.50	15	N/A	N/A
12.80	56.3	62.8	155.1	56.3	2.0	-1.3	3.5	4	clayy SILT to silty CLAY	115	2.0	28	31	-	-	3.9	9.9	28	2.44	15	N/A	N/A
12.96	62.1	68.8	150.3	62.1	1.9	-1.4	3.1	5	silty SAND to sandy SILT	120	3.0	21	23	55	39	-	-	25	2.37	16	N/A	N/A
13.12	62.4	68.7	147.0	62.4	1.8	-1.3	3.0	5	silty SAND to sandy SILT	120	3.0	21	23	55	39	-	-	25	2.36	16	N/A	N/A
13.29	61.0	66.8	143.6	61.0	1.8	-1.4	2.9	5	silty SAND to sandy SILT	120	3.0	20	22	54	39	-	-	25	2.36	16	N/A	N/A
13.45	62.2	67.7	143.7	62.2	1.8	-1.4	2.9	5	silty SAND to sandy SILT	120	3.0	21	23	54	39	-	-	24	2.35	16	N/A	N/A
13.62	65.1	70.3	145.1	65.1	1.8	-1.3	2.8	5	silty SAND to sandy SILT	120	3.0	22	23	55	39	-	-	24	2.33	16	N/A	N/A
13.78	67.7	72.8	147.3	67.7	1.9	-1.4	2.8	5	silty SAND to sandy SILT	120	3.0	23	24	57	39	-	-	23	2.32	16	N/A	N/A
13.94	68.8	73.4	150.8	68.7	2.0	-1.4	2.9	5	silty SAND to sandy SILT	120	3.0	23	24	57	40	-	-	24	2.33	16	N/A	N/A
14.11	66.6	70.7	151.3	66.5	2.0	-1.5	3.1	5	silty SAND to sandy SILT	120	3.0	22	24	56	39	-	-	25	2.36	16	N/A	N/A
14.27	60.9	64.3	147.5	60.9	1.9	-1.5	3.2	4	clayy SILT to silty CLAY	115	2.0	30	32	-	-	4.2	9.9	26	2.40	15	N/A	N/A
14.44	58.4	61.3	150.6	58.4	2.0	-1.4	3.4	4	clayy SILT to silty CLAY	115	2.0	29	31	-	-	4.1	9.9	28	2.43	15	N/A	N/A
14.60	55.5	57.9	168.7	55.5	2.4	-1.4	4.3	4	clayy SILT to silty CLAY	115	2.0	28	29	-	-	3.9	9.9	32	2.53	15	N/A	N/A
14.76	51.9	59.3	-	51.9	3.0	-1.8	5.8	4	clayy SILT to silty CLAY	115	2.0	26	30	-	-	3.6	9.9	36	2.62	15	N/A	N/A
14.93	49.3	55.8	-	49.3	3.5	-1.6	7.2	3	silty CLAY to CLAY	115	1.5	33	37	-	-	3.4	9.9	41	2.70	15	N/A	N/A
15.09	54.9	61.4	-	54.9	4.0	-1.7	7.3	9	very stiff fine SOIL	120	1.0	55	61	-	-	1.9	9.9	40	2.68	30	N/A	N/A
15.26	52.9	58.5	-	52.8	4.0	-1.9	7.7	3	silty CLAY to CLAY	115	1.5	35	39	-	-	3.7	9.9	41	2.72	15	N/A	N/A
15.42	51.6	56.5	-	51.6	4.0	-1.9	7.8	3	silty CLAY to CLAY	115	1.5	34	38	-	-	3.6	9.9	42	2.73	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Project ID: Leighton Group
Data File: SDF(041).cpt
CPT Date: 9/29/2017 12:02:55 PM
GW During Test: 23 ft

Sounding ID: CPT-08
Project No: 11753.001
Cone/Rig: DDG1379

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	51.9	56.2	-	51.8	4.0	-1.8	7.9	3	silty CLAY to CLAY	115	1.5	35	37	-	-	3.6	9.9	42	2.73	15	N/A	N/A
15.75	52.6	56.5	-	52.6	4.0	-1.8	7.7	3	silty CLAY to CLAY	115	1.5	35	38	-	-	3.7	9.9	42	2.72	15	N/A	N/A
15.91	54.3	57.7	-	54.3	4.0	-1.7	7.5	3	silty CLAY to CLAY	115	1.5	36	38	-	-	3.8	9.9	41	2.71	15	N/A	N/A
16.08	55.7	58.5	-	55.6	4.1	-1.5	7.5	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.9	9.9	41	2.71	15	N/A	N/A
16.24	55.5	57.8	-	55.5	4.2	-1.5	7.7	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.9	9.9	41	2.72	15	N/A	N/A
16.40	55.8	57.5	-	55.8	4.2	-1.4	7.7	3	silty CLAY to CLAY	115	1.5	37	38	-	-	3.9	9.9	41	2.72	15	N/A	N/A
16.57	56.8	58.0	-	56.8	4.3	-1.7	7.6	3	silty CLAY to CLAY	115	1.5	38	39	-	-	3.9	9.9	41	2.71	15	N/A	N/A
16.73	55.6	56.3	-	55.6	4.2	-1.5	7.7	3	silty CLAY to CLAY	115	1.5	37	38	-	-	3.9	9.9	42	2.73	15	N/A	N/A
16.90	55.1	55.2	-	55.1	4.2	-1.4	7.9	3	silty CLAY to CLAY	115	1.5	37	37	-	-	3.8	9.9	42	2.74	15	N/A	N/A
17.06	54.8	54.3	-	54.7	4.3	-1.3	8.1	3	silty CLAY to CLAY	115	1.5	37	36	-	-	3.8	9.9	43	2.75	15	N/A	N/A
17.23	56.4	55.4	-	56.3	4.4	-1.0	8.0	3	silty CLAY to CLAY	115	1.5	38	37	-	-	3.9	9.9	43	2.74	15	N/A	N/A
17.39	60.8	59.3	-	60.8	4.4	-1.0	7.3	3	silty CLAY to CLAY	115	1.5	41	40	-	-	4.2	9.9	40	2.69	15	N/A	N/A
17.55	58.6	56.6	-	58.6	3.8	-1.3	6.6	3	silty CLAY to CLAY	115	1.5	39	38	-	-	4.1	9.9	39	2.67	15	N/A	N/A
17.72	56.6	54.2	-	56.6	3.4	-1.7	6.1	3	silty CLAY to CLAY	115	1.5	38	36	-	-	3.9	9.9	38	2.66	15	N/A	N/A
17.88	56.6	53.6	-	56.6	3.5	-1.7	6.2	3	silty CLAY to CLAY	115	1.5	38	36	-	-	3.9	9.9	39	2.67	15	N/A	N/A
18.05	54.1	50.9	-	54.1	3.8	-2.0	7.2	3	silty CLAY to CLAY	115	1.5	36	34	-	-	3.8	9.9	42	2.73	15	N/A	N/A
18.21	50.2	46.7	-	50.1	3.7	-2.4	7.6	3	silty CLAY to CLAY	115	1.5	33	31	-	-	3.5	9.9	45	2.77	15	N/A	N/A
18.37	48.0	44.3	-	47.9	3.6	-2.2	7.7	3	silty CLAY to CLAY	115	1.5	32	30	-	-	3.3	9.9	45	2.79	15	N/A	N/A
18.54	46.9	42.9	-	46.8	3.3	-1.9	7.2	3	silty CLAY to CLAY	115	1.5	31	29	-	-	3.2	9.9	45	2.78	15	N/A	N/A
18.70	46.2	41.9	-	46.2	3.1	-1.7	7.0	3	silty CLAY to CLAY	115	1.5	31	28	-	-	3.2	9.9	45	2.78	15	N/A	N/A
18.87	42.9	38.6	-	42.8	3.0	-1.5	7.2	3	silty CLAY to CLAY	115	1.5	29	26	-	-	3.0	9.9	47	2.81	15	N/A	N/A
19.03	39.5	35.2	-	39.4	2.9	-2.0	7.6	3	silty CLAY to CLAY	115	1.5	26	23	-	-	2.7	9.9	49	2.86	15	N/A	N/A
19.19	37.9	33.5	-	37.8	2.8	-1.6	7.5	3	silty CLAY to CLAY	115	1.5	25	22	-	-	2.6	9.9	50	2.87	15	N/A	N/A
19.36	37.5	32.9	-	37.5	2.8	-1.6	7.7	3	silty CLAY to CLAY	115	1.5	25	22	-	-	2.6	9.9	51	2.88	15	N/A	N/A
19.52	38.1	33.2	-	38.1	2.8	-1.9	7.5	3	silty CLAY to CLAY	115	1.5	25	22	-	-	2.6	9.9	50	2.87	15	N/A	N/A
19.69	35.2	30.4	-	35.2	2.7	-1.8	7.8	3	silty CLAY to CLAY	115	1.5	23	20	-	-	2.4	9.7	53	2.91	15	N/A	N/A
19.85	33.5	28.6	-	33.4	2.5	-1.9	7.7	3	silty CLAY to CLAY	115	1.5	22	19	-	-	2.3	9.1	54	2.92	15	N/A	N/A
20.01	35.7	30.3	-	35.6	2.6	-2.0	7.5	3	silty CLAY to CLAY	115	1.5	24	20	-	-	2.4	9.7	52	2.90	15	N/A	N/A
20.18	39.7	33.4	-	39.6	2.5	-2.3	6.4	3	silty CLAY to CLAY	115	1.5	26	22	-	-	2.7	9.9	47	2.82	15	N/A	N/A
20.34	44.8	37.5	-	44.8	2.5	-1.1	5.6	3	silty CLAY to CLAY	115	1.5	30	25	-	-	3.1	9.9	43	2.74	15	N/A	N/A
20.51	51.0	42.3	-	51.0	2.5	-1.1	4.9	3	silty CLAY to CLAY	115	1.5	34	28	-	-	3.5	9.9	39	2.66	15	N/A	N/A
20.67	54.0	44.4	-	54.0	2.6	-1.2	4.9	4	clayy SILT to silty CLAY	115	2.0	27	22	-	-	3.7	9.9	38	2.64	15	N/A	N/A
20.83	58.2	51.1	161.1	58.2	2.5	-1.3	4.4	4	clayy SILT to silty CLAY	115	2.0	29	26	-	-	4.0	9.9	34	2.57	15	N/A	N/A
21.00	63.8	55.8	162.4	63.8	2.6	-1.3	4.2	4	clayy SILT to silty CLAY	115	2.0	32	28	-	-	4.4	9.9	32	2.53	15	N/A	N/A
21.16	67.4	58.7	160.5	67.4	2.6	-1.3	3.9	4	clayy SILT to silty CLAY	115	2.0	34	29	-	-	4.7	9.9	30	2.49	15	N/A	N/A
21.33	67.6	58.6	149.2	67.5	2.3	-1.2	3.5	4	clayy SILT to silty CLAY	115	2.0	34	29	-	-	4.7	9.9	29	2.45	15	N/A	N/A
21.49	63.7	55.1	163.4	63.7	2.7	-1.2	4.3	4	clayy SILT to silty CLAY	115	2.0	32	28	-	-	4.4	9.9	32	2.54	15	N/A	N/A
21.65	60.1	47.2	-	60.0	3.3	-1.5	5.6	3	silty CLAY to CLAY	115	1.5	40	31	-	-	4.2	9.9	39	2.67	15	N/A	N/A
21.82	59.7	46.6	-	59.6	3.6	-1.8	6.1	3	silty CLAY to CLAY	115	1.5	40	31	-	-	4.1	9.9	41	2.70	15	N/A	N/A
21.98	59.4	46.0	-	59.4	3.5	-1.6	6.0	3	silty CLAY to CLAY	115	1.5	40	31	-	-	4.1	9.9	41	2.70	15	N/A	N/A
22.15	59.1	45.4	-	59.0	3.5	-1.6	6.0	3	silty CLAY to CLAY	115	1.5	39	30	-	-	4.1	9.9	41	2.70	15	N/A	N/A
22.31	57.3	43.8	-	57.3	3.3	-1.8	5.9	3	silty CLAY to CLAY	115	1.5	38	29	-	-	4.0	9.9	41	2.71	15	N/A	N/A
22.47	58.1	44.0	-	58.0	3.1	-1.5	5.4	3	silty CLAY to CLAY	115	1.5	39	29	-	-	4.0	9.9	39	2.68	15	N/A	N/A
22.64	65.0	48.9	-	64.9	3.3	-1.6	5.2	4	clayy SILT to silty CLAY	115	2.0	32	24	-	-	4.5	9.9	37	2.63	15	N/A	N/A
22.80	67.6	50.5	-	67.6	3.6	-1.7	5.4	4	clayy SILT to silty CLAY	115	2.0	34	25	-	-	4.7	9.9	37	2.64	15	N/A	N/A
22.97	86.4	72.3	186.0	86.4	3.7	-1.2	4.3	4	clayy SILT to silty CLAY	115	2.0	43	36	-	-	6.0	9.9	29	2.46	15	N/A	N/A
23.13	108.2	90.4	183.6	108.2	3.7	-1.1	3.5	5	silty SAND to sandy SILT	120	3.0	36	30	64	39	-	-	23	2.32	16	0.00	0.0
23.30	119.1	99.3	184.5	119.0	3.8	-1.0	3.2	5	silty SAND to sandy SILT	120	3.0	40	33	67	40	-	-	21	2.27	16	0.00	0.0
23.46	123.6	102.9	188.2	123.6	3.9	-1.2	3.2	5	silty SAND to sandy SILT	120	3.0	41	34	68	40	-	-	21	2.26	16	0.00	0.0
23.62	121.8	101.2	199.2	121.8	4.3	-1.3	3.6	5	silty SAND to sandy SILT	120	3.0	41	34	67	40	-	-	23	2.31	16	0.00	0.0
23.79	122.1	101.3	210.0	122.0	4.8	-1.6	4.0	4	clayy SILT to silty CLAY	115	2.0	61	51	-	-	8.5	9.9	24	2.34	15	0.00	0.0
23.95	124.3	103.0	211.1	124.2	4.8	-2.3	3.9	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.3	9.9	24	2.33	30	0.00	0.0
24.12	131.8	109.0	201.7	131.8	4.5	-1.1	3.4	5	silty SAND to sandy SILT	120	3.0	44	36	70	40	-	-	21	2.27	16	0.00	0.0
24.28	145.2	119.9	194.0	145.2	4.1	-1.0	2.8	5	silty SAND to sandy SILT	120	3.0	48	40	73	41	-	-	18	2.18	16	0.00	0.0
24.44	142.3	117.3	189.1	142.3	3.9	-0.9	2.8	5	silty SAND to sandy SILT	120	3.0	47	39	72	41	-	-	18	2.18	16	0.00	0.0
24.61	131.4	108.1	181.3	131.3	3.6	-0.8	2.8	5	silty SAND to sandy SILT	120	3.0	44	36	70	40	-	-	19	2.20	16	0.00	0.0
24.77	137.1	112.6	192.9	137.1	4.1	-0.9	3.0	5	silty SAND to sandy SILT	120	3.0	46	38	71	40	-	-	20	2.22	16	0.00	0.0
24.94	156.2	128.1	212.1	156.2	4.9	-1.0	3.2	5	silty SAND to sandy SILT	120	3.0	52	43	75	41	-	-	19	2.20	16	0.00	0.0
25.10	176.5	144.4	227.4	176.4	5.5	-0.9	3.1	5	silty SAND to sandy SILT	120	3.0	59	48	79	42	-	-	18	2.16	16	0.00	0.0
25.26	182.3	149.0	229.6	182.3	5.5	-1.0	3.1	5	silty SAND to sandy SILT	120	3.0	61	50	80	42	-	-	17	2.14	16	0.00	0.0
25.43	212.0	173.0	249.9	212.0	6.2	-1.1	3.0	5	silty SAND to sandy SILT	120	3.0	71	58	85	43	-	-	16	2.09	16	0.00	0.0
25.59	270.2	220.0	286.2	270.1	7.2	-1.1	2.7	8	stiff SAND to clayy SAND	115	5.0	54	44	93	44	-	-	13	2.00	16	0.00	0.0
25.76	340.1	276.6	338.7	340.1	8.9	-1.1	2.6	8	stiff SAND to clayy SAND	115	5.0	68	55	95	45	-	-	11	1.94	16	0.00	0.0
25.92	374.2	303.9	372.8	374.2	10.4	-1.1	2.8	8	stiff SAND to clayy SAND	115	5.0	75	61	95	45	-	-	11	1.94	16	0.00	0.0
26.08	372.2	301.8	372.1	372.2	10.5	-1.1	2.8	8	stiff SAND to clayy SAND	115	5.0	74	60	95	45	-	-	11	1.94	16	0.00	0.0
26.25	357.8	289.7	358.8	357.7	10.0	-1.1	2.8	8	stiff SAND to clayy SAND	115	5.0	72	58	95	45	-	-	12	1.95	16	0.00	0.0
26.41	360.7	291.6	358.6	360.7	9.9	-1.1	2.7	8	stiff SAND to clayy SAND	115	5.0	72	58	95	45	-	-	11	1.94	16	0.00	0.0
26.58	357.6	288.6	358.6	357.5	10.0	-1.1	2.8	8	stiff SAND to clayy SAND	115	5.0	72	58	95	45	-	-	12	1.95	16	0.00	0.0
26.74	343.0	276.4	354.0	342.9	10.2	-1.5	3.0	8	stiff SAND to clayy SAND	115	5.0	69	55	95	45	-	-	13	1.98	16	0.00	0.0
26.90	348.2	280.2	361.9	348.1	10.7	-1.5	3.1	8	stiff SAND to clayy SAND	115	5.0	70	56	95	45	-	-	13	1.99	16	0.00	0.0
27.07	311.2	250.1	340.9	311.1	10.3	-1.4	3.3	8	stiff SAND to clayy SAND	115	5.0	62	50	95	44	-	-	14	2.04	16	0.00	0.0
27.23	272.7	218.8	297.0	272.7	8.1	-1.3	3.0	8	stiff SAND to clayy SAND	115	5.0	55	44	93	44	-	-	14	2.04	16	0.00	0.0
27.40	282.0	226.0	277.4	282.0	6.5	-1.4	2.3	6	clean SAND to silty SAND	125	5.0	56	45	94	44	-	-	11	1.94	16	0.00	0.0
27.56	342.6	274.0	310.8	342.5	6.8	-1.5	2.0	6	clean SAND to silty SAND	125	5.0	69	55	95	45	-	-	9	1.84	16	0.00	0.0
27.72	347.6	277.5	310.9	347.6	6.6	-2.6	1.9	6	clean SAND to silty SAND	125	5.0	70	56	95	45	-	-	9	1.82	16	0.00	0.0
27.89	367.1	292.6	319.8	367.0	6.5	-2.5	1.8	6	clean SAND to silty SAND	125	5.0	73	59	95	45	-	-	8	1.78	16	0.00	0.0
28.05	346.6	275.8	301.9	346.6	5.9	-2.5	1.7	6	clean SAND to silty SAND	125	5.0	69	55	95	45	-	-	8	1.78	16	0.00	0.0
28.22	351.7	279.4	312.4	351.7	6.6	-2.4	1.9	6	clean SAND to silty SAND	125	5.0	70	56	95	45	-	-	8	1.82	16	0.00	0.0
28.38	383.1	303.8	303.8	383.1	4.4	-2.6	1.2	6	clean SAND to silty SAND	125	5.0	77	61	95	45	-	-	5	1.62	16	0.00	0.0
28.54	397.0	314.3	314.3	397.0	4.4	0.1	1.1	6	clean SAND to silty SAND	125	5.0	79	63	95	45	-	-	5	1.60	16	0.00	0.0
28.71	322.3	254.7	268.4	322.2	4.4	-3.4	1.4	6	clean SAND to silty SAND	125	5.0	64	51	95	44	-	-	7	1.72	16	0.00	0.0
28.87	325.6	256.9	259.4	325.5	3.7	-3.4	1.1	6	clean SAND to silty SAND	125	5.0	65	51	95	44	-	-	5	1.66	16	0.00	0.0
29.04	311.8	245.6	252.5	311.8	3.7	-3.2	1.2	6	clean SAND to silty SAND	125	5.0	62	49	95	44	-	-	6	1.69	16	0.00	0.0
29.20	293.8	231.0	241.5	293.8	3.5	-3.2	1.2	6	clean SAND to silty SAND	125	5.0	59	46	95	44	-	-	6	1.71	16	0.00	0.0
29.36	286.4	224.8	236.0	286.3	3.4	-3.1	1.2	6	clean SAND to silty SAND	125	5.0	57	45	94	44	-	-	6	1.72	16	0.00	0.0
29.53	280.5	219.8	229.6	280.5	3.2	-3.1	1.2	6	clean SAND to silty SAND	125	5.0	56	44	93	44	-	-	6	1.71	16	0.00	0.0
29.69	300.3	235.0	245.8	300.3	3.7	-3.1	1.2	6	clean SAND to silty SAND	125	5.0	60	47	95	44	-	-	6	1.71	16	0.00	0.0
29.86	304.3	237.7	237.7	304.3	3.0	-1.9	1.0	6	clean SAND to silty SAND	125	5.0	61	48	95	44	-	-	5	1.64	16	0.00	0.0
30.02	337.2	262.9	274.1	337.1	4.5	-2.9	1.3	6	clean SAND to silty SAND	125	5.0	67	53	95	44	-	-	6	1.71	16	0.00	0.0
30.19	368.7	287.0	287.0	368.7	4.1	-2.8	1.1	6	clean SAND to silty SAND	125	5.0	74	57	95	45	-	-	5	1.63	16	0.00	0.0
30.35	357.8	278.1	278.1	357.7	3.9	-3.4	1.1	6	clean SAND to silty SAND	125	5.0	72	56	95	45	-	-	5	1.62	16	0.00	0.0
30.51	297.7	231.0	231.0	297.7	2.5	-2.3	0.8	6	clean SAND to silty SAND	125	5.0	60	46	95	44	-	-	5	1.59	16	0.00	0.0
30.68	295.9	229.2	238.2	295.8	3.4	-2.6	1.2	6	clean SAND to silty SAND	125	5.0	59	46	94	44	-	-	6	1.70	16	0.00	0.0
30.84	301.1	232.9	236.1	301.0	3.2	-2.4	1.1	6	clean SAND to silty SAND	125	5.0	60	47	95	44	-	-	5	1.66	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(041).cpt
CPT Date: 9/29/2017 12:02:55 PM
GW During Test: 23 ft

Sounding ID: CPT-08
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
31.01	302.0	233.1	243.7	301.9	3.7	-2.5	1.2	6	clean SAND to silty SAND	125	5.0	60	47	95	44	-	-	6	1.71	16	0.00	0.0
31.17	306.5	236.3	236.3	306.4	2.3	-2.6	0.8	6	clean SAND to silty SAND	125	5.0	61	47	95	44	-	-	5	1.56	16	0.00	0.0
31.33	330.3	254.2	254.2	330.2	3.4	-2.6	1.0	6	clean SAND to silty SAND	125	5.0	66	51	95	44	-	-	5	1.63	16	0.00	0.0
31.50	351.6	270.2	270.2	351.6	3.0	-3.7	0.9	6	clean SAND to silty SAND	125	5.0	70	54	95	44	-	-	5	1.56	16	0.00	0.0
31.66	335.5	257.4	258.4	335.4	3.7	-3.0	1.1	6	clean SAND to silty SAND	125	5.0	67	51	95	44	-	-	5	1.65	16	0.00	0.0
31.83	321.1	245.9	245.9	321.0	2.1	-3.0	0.7	6	clean SAND to silty SAND	125	5.0	64	49	95	44	-	-	5	1.50	16	0.00	0.0
31.99	292.1	223.4	223.4	292.1	2.5	-2.9	0.9	6	clean SAND to silty SAND	125	5.0	58	45	94	44	-	-	5	1.62	16	0.00	0.0
32.15	231.7	176.9	189.0	231.7	2.4	-2.1	1.1	6	clean SAND to silty SAND	125	5.0	46	35	86	42	-	-	7	1.75	16	0.00	0.0
32.32	84.3	64.3	146.4	84.3	2.5	-2.0	3.1	4	clayy SILT to silty CLAY	115	2.0	42	32	-	-	5.8	9.9	26	2.39	15	0.32	1.5
32.48	48.3	29.7	-	48.3	2.3	-2.0	5.0	3	silty CLAY to CLAY	115	1.5	32	20	-	-	3.3	9.4	45	2.78	15	-	-
32.65	36.6	22.4	-	36.5	2.1	-1.7	6.0	3	silty CLAY to CLAY	115	1.5	24	15	-	-	2.5	7.0	54	2.93	15	-	-
32.81	34.3	21.0	-	34.3	1.4	-1.7	4.2	3	silty CLAY to CLAY	115	1.5	23	14	-	-	2.3	6.5	49	2.85	15	-	-
32.97	34.6	21.1	-	34.5	1.2	-2.0	3.7	3	silty CLAY to CLAY	115	1.5	23	14	-	-	2.3	6.6	47	2.81	15	-	-
33.14	34.5	21.0	-	34.5	1.2	-2.2	3.7	3	silty CLAY to CLAY	115	1.5	23	14	-	-	2.3	6.5	47	2.81	15	-	-
33.30	33.8	20.5	-	33.8	1.2	-2.3	3.9	3	silty CLAY to CLAY	115	1.5	23	14	-	-	2.3	6.4	48	2.83	15	-	-
33.47	33.0	20.0	-	33.0	1.3	-2.1	4.1	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.2	50	2.86	15	-	-
33.63	32.2	19.4	-	32.1	1.3	-2.0	4.2	3	silty CLAY to CLAY	115	1.5	21	13	-	-	2.2	6.0	51	2.88	15	-	-
33.79	33.1	19.9	-	33.0	1.2	-2.0	3.9	3	silty CLAY to CLAY	115	1.5	22	13	-	-	2.2	6.2	49	2.85	15	-	-
33.96	31.9	19.2	-	31.9	1.1	-2.1	3.8	3	silty CLAY to CLAY	115	1.5	21	13	-	-	2.1	5.9	49	2.86	15	-	-
34.12	30.9	18.5	-	30.9	1.1	-2.1	3.7	3	silty CLAY to CLAY	115	1.5	21	12	-	-	2.1	5.7	49	2.86	15	-	-
34.29	30.5	18.2	-	30.5	0.8	-2.1	2.7	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.0	5.6	45	2.79	15	-	-
34.45	33.5	19.9	-	33.5	0.8	-2.1	2.4	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.2	6.2	41	2.72	15	-	-
34.61	36.4	21.6	-	36.3	0.8	-1.9	2.2	4	clayy SILT to silty CLAY	115	2.0	18	11	-	-	2.4	6.7	39	2.67	15	-	-
34.78	37.5	22.2	-	37.5	0.8	-1.7	2.3	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.5	6.9	39	2.66	15	-	-
34.94	38.5	22.8	-	38.5	0.9	-1.8	2.4	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.6	7.1	39	2.67	15	-	-
35.11	41.4	24.4	-	41.3	1.0	-1.6	2.4	4	clayy SILT to silty CLAY	115	2.0	21	12	-	-	2.8	7.6	38	2.65	15	-	-
35.27	44.0	25.9	-	44.0	1.1	-1.7	2.6	4	clayy SILT to silty CLAY	115	2.0	22	13	-	-	3.0	8.1	38	2.65	15	-	-
35.43	46.1	27.0	-	46.1	1.3	-1.7	3.0	4	clayy SILT to silty CLAY	115	2.0	23	14	-	-	3.1	8.5	39	2.66	15	-	-
35.60	48.9	28.6	-	48.8	1.4	-1.6	2.9	4	clayy SILT to silty CLAY	115	2.0	24	14	-	-	3.3	9.0	37	2.64	15	-	-
35.76	49.8	29.1	-	49.8	1.4	-1.6	2.9	4	clayy SILT to silty CLAY	115	2.0	25	15	-	-	3.4	9.2	37	2.64	15	-	-
35.93	56.9	42.2	116.0	56.9	1.5	-1.5	2.8	4	clayy SILT to silty CLAY	115	2.0	28	21	-	-	3.9	9.9	31	2.50	15	1.91	51.2
36.09	83.1	61.5	127.9	83.1	2.0	-1.5	2.5	5	silty SAND to sandy SILT	120	3.0	28	20	51	36	-	-	24	2.34	16	1.23	11.0
36.26	83.9	62.0	135.1	83.9	2.2	-1.3	2.7	5	silty SAND to sandy SILT	120	3.0	28	21	51	36	-	-	25	2.37	16	0.79	5.2
36.42	102.3	75.5	139.4	102.3	2.4	-0.4	2.4	5	silty SAND to sandy SILT	120	3.0	34	25	58	38	-	-	21	2.27	16	0.61	3.4
36.58	152.2	112.2	170.4	152.2	3.5	-0.2	2.3	5	silty SAND to sandy SILT	120	3.0	51	37	71	40	-	-	17	2.13	16	0.00	0.0
36.75	181.9	133.9	194.3	181.9	4.4	0.9	2.4	5	silty SAND to sandy SILT	120	3.0	61	45	77	41	-	-	16	2.10	16	0.00	0.0
36.91	195.9	144.0	201.8	195.9	4.6	0.0	2.4	5	silty SAND to sandy SILT	120	3.0	65	48	79	41	-	-	15	2.07	16	0.00	0.0
37.08	197.7	145.1	203.8	197.7	4.7	-0.8	2.4	5	silty SAND to sandy SILT	120	3.0	66	48	79	41	-	-	15	2.07	16	0.00	0.0
37.24	102.0	74.8	186.9	102.0	4.2	-0.7	4.2	4	clayy SILT to silty CLAY	115	2.0	51	37	-	-	7.1	9.9	28	2.44	15	0.00	0.0
37.40	72.5	41.2	-	72.5	3.6	-0.3	5.1	3	silty CLAY to CLAY	115	1.5	48	27	-	-	5.0	9.9	40	2.68	15	-	-
37.57	66.2	37.5	-	66.2	3.0	-0.8	4.7	3	silty CLAY to CLAY	115	1.5	44	25	-	-	4.6	9.9	40	2.69	15	-	-
37.73	72.5	52.9	147.1	72.5	2.5	-0.1	3.6	4	clayy SILT to silty CLAY	115	2.0	36	26	-	-	5.0	9.9	31	2.50	15	0.34	1.3
37.90	66.4	48.5	133.2	66.4	2.1	-0.2	3.2	4	clayy SILT to silty CLAY	115	2.0	33	24	-	-	4.6	9.9	31	2.50	15	0.87	37.2
38.06	60.6	44.1	122.9	60.6	1.7	0.1	3.0	4	clayy SILT to silty CLAY	115	2.0	30	22	-	-	4.2	9.9	31	2.50	15	1.50	51.2
38.22	43.2	24.3	-	43.2	1.5	-0.5	3.5	4	clayy SILT to silty CLAY	115	2.0	22	12	-	-	2.9	7.6	43	2.75	15	-	-
38.39	34.1	19.1	-	34.1	1.0	-0.1	3.3	3	silty CLAY to CLAY	115	1.5	23	13	-	-	2.3	5.9	47	2.82	15	-	-
38.55	30.4	17.0	-	30.4	0.9	0.0	3.2	3	silty CLAY to CLAY	115	1.5	20	11	-	-	2.0	5.2	49	2.85	15	-	-
38.72	31.3	17.5	-	31.3	0.8	0.0	2.8	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.1	5.3	46	2.80	15	-	-
38.88	32.9	18.3	-	32.9	0.8	0.1	2.5	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.2	5.6	44	2.77	15	-	-
39.04	32.6	18.1	-	32.6	0.8	0.1	2.6	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.2	5.5	45	2.78	15	-	-
39.21	34.0	18.8	-	34.0	0.8	0.1	2.5	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.3	5.8	43	2.75	15	-	-
39.37	37.1	20.5	-	37.1	0.8	0.2	2.4	4	clayy SILT to silty CLAY	115	2.0	19	10	-	-	2.5	6.3	41	2.71	15	-	-
39.54	36.7	20.2	-	36.7	0.9	0.4	2.5	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.5	6.2	42	2.73	15	-	-
39.70	35.2	19.3	-	35.2	0.9	0.3	2.7	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.4	6.0	44	2.76	15	-	-
39.86	37.5	20.5	-	37.5	0.8	0.3	2.3	4	clayy SILT to silty CLAY	115	2.0	19	10	-	-	2.5	6.3	40	2.70	15	-	-
40.03	33.1	18.1	-	33.1	0.9	0.4	3.0	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.2	5.5	47	2.82	15	-	-
40.19	28.3	15.4	-	28.3	0.8	0.3	3.0	3	silty CLAY to CLAY	115	1.5	19	10	-	-	1.9	4.7	50	2.87	15	-	-
40.36	27.9	15.2	-	27.9	0.7	0.4	2.7	4	clayy SILT to silty CLAY	115	2.0	14	8	-	-	1.8	4.6	49	2.85	15	-	-
40.52	25.0	13.6	-	25.0	0.7	0.4	3.3	3	silty CLAY to CLAY	115	1.5	17	9	-	-	1.6	4.1	55	2.95	15	-	-
40.68	24.9	13.5	-	24.9	0.8	0.3	3.3	3	silty CLAY to CLAY	115	1.5	17	9	-	-	1.6	4.0	55	2.95	15	-	-
40.85	33.9	18.3	-	33.9	0.8	0.6	2.4	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.3	5.6	43	2.76	15	-	-
41.01	31.4	16.9	-	31.4	0.8	0.7	2.6	4	clayy SILT to silty CLAY	115	2.0	16	8	-	-	2.1	5.2	46	2.80	15	-	-
41.18	28.2	15.2	-	28.2	0.7	0.7	2.8	3	silty CLAY to CLAY	115	1.5	19	10	-	-	1.9	4.6	50	2.86	15	-	-
41.34	26.1	14.0	-	26.2	0.6	0.8	2.4	4	clayy SILT to silty CLAY	115	2.0	13	7	-	-	1.7	4.2	49	2.85	15	-	-
41.50	25.1	13.4	-	25.1	0.5	0.9	2.4	4	clayy SILT to silty CLAY	115	2.0	13	7	-	-	1.6	4.0	50	2.87	15	-	-
41.67	24.4	13.0	-	24.4	0.6	0.9	2.6	3	silty CLAY to CLAY	115	1.5	16	9	-	-	1.6	3.9	52	2.90	15	-	-
41.83	25.3	13.5	-	25.3	0.6	0.9	2.5	3	silty CLAY to CLAY	115	1.5	17	9	-	-	1.7	4.0	51	2.88	15	-	-
42.00	27.5	14.6	-	27.5	0.6	0.9	2.4	4	clayy SILT to silty CLAY	115	2.0	14	7	-	-	1.8	4.4	48	2.84	15	-	-
42.16	27.4	14.5	-	27.4	0.7	0.8	2.6	3	silty CLAY to CLAY	115	1.5	18	10	-	-	1.8	4.4	50	2.87	15	-	-
42.32	27.3	14.4	-	27.3	0.7	0.9	2.7	3	silty CLAY to CLAY	115	1.5	18	10	-	-	1.8	4.3	51	2.88	15	-	-
42.49	27.0	14.2	-	27.0	0.6	0.9	2.6	3	silty CLAY to CLAY	115	1.5	18	9	-	-	1.8	4.3	50	2.87	15	-	-
42.65	25.5	13.4	-	25.5	0.6	0.9	2.7	3	silty CLAY to CLAY	115	1.5	17	9	-	-	1.7	4.0	52	2.90	15	-	-
42.82	24.0	12.6	-	24.0	0.6	1.1	2.8	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.6	3.7	54	2.94	15	-	-
42.98	23.4	12.3	-	23.4	0.5	1.1	2.6	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.5	3.6	54	2.93	15	-	-
43.15	22.0	11.5	-	22.0	0.5	1.1	2.6	3	silty CLAY to CLAY	115	1.5	15	8	-	-	1.4	3.4	55	2.95	15	-	-
43.31	22.2	11.6	-	22.2	0.5	1.0	2.5	3	silty CLAY to CLAY	115	1.5	15	8	-	-	1.4	3.4	55	2.94	15	-	-
43.47	22.5	11.7	-	22.5	0.5	1.1	2.7	3	silty CLAY to CLAY	115	1.5	15	8	-	-	1.5	3.4	56	2.96	15	-	-
43.64	23.4	12.2	-	23.5	0.6	1.0	2.7	3	silty CLAY to CLAY	115	1.5	16	8	-	-	1.5	3.6	54	2.94	15	-	-
43.80	25.7	13.3	-	25.7	0.7	1.1	3.2	3	silty CLAY to CLAY	115	1.5	17	9	-	-	1.7	4.0	55	2.95	15	-	-
43.97	29.7	15.4	-	29.7	0.8	1.0	3.1	3	silty CLAY to CLAY	115	1.5	20	10	-	-	2.0	4.6	51	2.89	15	-	-
44.13	34.8	18.0	-	34.8	0.8	1.2	2.5	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.3	5.5	45	2.78	15	-	-
44.29	30.9	15.9	-	31.0	0.7	1.2	2.3	4	clayy SILT to silty CLAY	115	2.0	15	8	-	-	2.0	4.8	46	2.80	15	-	-
44.46	27.8	14.3	-	27.8	0.5	1.3	2.1	4	clayy SILT to silty CLAY	115	2.0	14	7	-	-	1.8	4.3	47	2.82	15	-	-
44.62	28.5	14.6	-	28.5	0.5	1.3	2.1	4	clayy SILT to silty CLAY	115	2.0	14	7	-	-	1.9	4.4	46	2.80	15	-	-
44.79	28.7	14.7	-	28.7	0.6	1.2	2.4	4	clayy SILT to silty CLAY	115	2.0	14	7	-	-	1.9	4.4	48	2.84	15	-	-
44.95	28.6	14.6	-	28.6	0.7	1.3	2.7	3	silty CLAY to CLAY	115	1.5	19	10	-	-	1.9	4.4	50	2.87	15	-	-
45.11	41.3	21.0	-	41.3	1.3	1.3	3.3	4	clayy SILT to silty CLAY	115	2.0	21	11	-	-	2.8	6.5	45	2.79	15	-	-
45.28	75.4	52.2	136.8	75.4	2.3	1.6	3.2	4	clayy SILT to silty CLAY	115	2.0	38	26	-	-	5.2	9.9	29	2.47	15	0.74	25.5
45.44	116.5	80.6	153.3	116.6	3.1	1.3	2.7	5	silty SAND to sandy SILT	120	3.0	39	27	60	38	-	-	22	2.28	16	0.29	1.5
45.61	144.1	99.6	168.8	144.1	3.7	-2.4	2.6	5	silty SAND to sandy SILT	120	3.0	48	33	67	39	-	-	19	2.21	16	0.00	0.0
45.77	146.5	101.1	181.6	146.5	4.3	-4.1	3.0	5	silty SAND to sandy SILT	120	3.0	49	34	67	39	-	-	21	2.25	16	0.00	0.0
45.93	166.7	114.9	173.8	166.7	3.9	-4.0	2.3	5	silty SAND to sandy SILT	120	3.0	56	38	72	40	-	-	17	2.13	16	0.00	0.0
46.10	181.0	124.6	167.6	180.9	3.3	-4.4	1.9	5	silty SAND to sandy SILT	120	3.0	60	42	74	40	-	-	14	2.03	16	0.00	0.0
46.26	200.3	137.7	168.7	200.2	3.0	-5.4	1.5	6	clean SAND to silty SAND	125	5.0	40	28	78	41	-	-	11	1.94	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(041).cpt
CPT Date: 9/29/2017 12:02:55 PM
GW During Test: 23 ft

Sounding ID: CPT-08
Project No: 11753.001
Cone/Rig: DDG1379

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
46.43	202.9	139.3	165.6	202.7	2.7	-6.1	1.4	6	clean SAND to silty SAND	125	5.0	41	28	78	41	-	-	10	1.90	16	0.00	0.0
46.59	206.0	141.3	163.8	205.9	2.5	-6.5	1.2	6	clean SAND to silty SAND	125	5.0	41	28	78	41	-	-	10	1.87	16	0.00	0.0
46.75	185.7	127.2	154.9	185.5	2.5	-6.5	1.4	6	clean SAND to silty SAND	125	5.0	37	25	75	40	-	-	11	1.93	16	0.32	2.1
46.92	168.5	115.3	150.3	168.4	2.6	-6.4	1.6	6	clean SAND to silty SAND	125	5.0	34	23	72	40	-	-	13	2.00	16	0.41	2.4
47.08	174.7	119.4	145.1	174.6	2.2	-6.8	1.3	6	clean SAND to silty SAND	125	5.0	35	24	73	40	-	-	11	1.93	16	0.59	3.0
47.25	179.8	122.7	142.5	179.7	1.9	-7.2	1.1	6	clean SAND to silty SAND	125	5.0	36	25	74	40	-	-	10	1.87	16	0.71	3.4
47.41	161.4	110.0	137.0	161.2	2.0	-7.5	1.3	6	clean SAND to silty SAND	125	5.0	32	22	70	39	-	-	12	1.96	16	0.98	4.3
47.57	183.6	125.0	151.1	183.5	2.4	-7.4	1.3	6	clean SAND to silty SAND	125	5.0	37	25	74	40	-	-	11	1.92	16	0.40	2.4
47.74	175.7	119.4	157.1	175.5	2.9	-7.4	1.7	6	clean SAND to silty SAND	125	5.0	35	24	73	40	-	-	13	2.01	16	0.27	1.8
47.90	198.4	134.7	170.3	198.2	3.2	-7.3	1.7	6	clean SAND to silty SAND	125	5.0	40	27	77	40	-	-	12	1.97	16	0.00	0.0
48.07	262.1	177.7	190.9	261.9	2.8	-7.3	1.1	6	clean SAND to silty SAND	125	5.0	52	36	86	42	-	-	7	1.75	16	0.00	0.0
48.23	288.7	195.5	195.5	288.6	2.2	-7.4	0.8	6	clean SAND to silty SAND	125	5.0	58	39	89	42	-	-	5	1.62	16	0.00	0.0
48.39	281.2	190.2	194.7	281.1	2.5	-7.3	0.9	6	clean SAND to silty SAND	125	5.0	56	38	88	42	-	-	6	1.68	16	0.00	0.0
48.56	252.1	170.3	183.3	251.9	2.6	-7.4	1.0	6	clean SAND to silty SAND	125	5.0	50	34	85	42	-	-	7	1.76	16	0.00	0.0
48.72	226.4	152.8	171.0	226.3	2.6	-7.4	1.1	6	clean SAND to silty SAND	125	5.0	45	31	81	41	-	-	8	1.82	16	0.00	0.0
48.89	202.1	136.2	161.1	201.9	2.6	-7.4	1.3	6	clean SAND to silty SAND	125	5.0	40	27	77	40	-	-	10	1.89	16	0.00	0.0
49.05	189.2	127.3	155.3	189.0	2.6	-7.4	1.4	6	clean SAND to silty SAND	125	5.0	38	25	75	40	-	-	11	1.93	16	0.32	2.1
49.22	185.5	124.7	154.7	185.4	2.6	-7.5	1.4	6	clean SAND to silty SAND	125	5.0	37	25	74	40	-	-	12	1.95	16	0.33	2.1
49.38	197.4	132.5	161.9	197.2	2.8	-7.5	1.4	6	clean SAND to silty SAND	125	5.0	39	27	76	40	-	-	11	1.93	16	0.00	0.0
49.54	212.1	142.2	159.8	212.0	2.3	-7.5	1.1	6	clean SAND to silty SAND	125	5.0	42	28	79	41	-	-	9	1.82	16	0.25	2.0
49.71	237.9	159.3	159.3	237.7	1.3	-7.6	0.6	6	clean SAND to silty SAND	125	5.0	48	32	82	41	-	-	5	1.60	16	0.26	2.1
49.87	209.9	140.4	142.1	209.8	1.2	-7.6	0.6	6	clean SAND to silty SAND	125	5.0	42	28	78	40	-	-	5	1.66	16	0.79	3.6
50.04	153.2	102.4	116.9	153.0	1.2	-7.5	0.8	6	clean SAND to silty SAND	125	5.0	31	20	68	39	-	-	9	1.85	16	2.02	13.8
50.20	179.1	119.5	127.3	178.9	1.1	-7.8	0.7	6	clean SAND to silty SAND	125	5.0	36	24	73	40	-	-	7	1.74	16	1.56	6.7
50.36	146.0	97.3	119.4	145.9	1.5	-7.6	1.0	6	clean SAND to silty SAND	125	5.0	29	19	66	38	-	-	11	1.94	16	1.93	13.7
50.53	116.5	77.6	116.1	116.4	1.7	-7.8	1.5	5	silty SAND to sandy SILT	120	3.0	39	26	59	37	-	-	16	2.12	16	2.02	24.3
50.69	145.9	97.0	122.1	145.7	1.6	-7.6	1.2	6	clean SAND to silty SAND	125	5.0	29	19	66	38	-	-	12	1.97	16	1.82	11.6
50.86	156.8	104.1	135.8	156.7	2.2	-6.3	1.4	6	clean SAND to silty SAND	125	5.0	31	21	68	39	-	-	13	2.00	16	1.04	4.8
51.02	268.2	178.0	196.9	268.1	3.3	-6.3	1.3	6	clean SAND to silty SAND	125	5.0	54	36	86	42	-	-	8	1.80	16	0.00	0.0
51.18	383.0	253.8	253.8	382.9	3.3	-6.6	0.9	6	clean SAND to silty SAND	125	5.0	77	51	95	43	-	-	5	1.58	16	0.00	0.0
51.35	262.6	173.8	193.2	262.5	3.3	-6.7	1.3	6	clean SAND to silty SAND	125	5.0	53	35	85	42	-	-	8	1.81	16	0.00	0.0
51.51	135.0	89.3	161.7	134.9	3.6	-6.7	2.7	5	silty SAND to sandy SILT	120	3.0	45	30	63	38	-	-	21	2.25	16	0.00	0.0
51.68	70.4	46.5	124.1	70.3	2.0	-5.8	2.9	4	clayy SILT to silty CLAY	115	2.0	35	23	-	-	4.8	9.9	30	2.48	15	1.48	45.4
51.84	55.1	25.4	-	54.9	1.2	-5.5	2.2	4	clayy SILT to silty CLAY	115	2.0	28	13	-	-	3.7	7.9	36	2.61	15	-	-
52.00	52.6	34.6	79.7	52.4	0.7	-5.4	1.5	5	silty SAND to sandy SILT	120	3.0	18	12	32	32	-	-	26	2.40	16	2.82	51.2
52.17	39.2	18.0	-	39.1	0.7	-5.3	2.0	4	clayy SILT to silty CLAY	115	2.0	20	9	-	-	2.6	5.5	41	2.71	15	-	-
52.33	35.9	16.4	-	35.7	0.8	-5.3	2.5	4	clayy SILT to silty CLAY	115	2.0	18	8	-	-	2.4	5.0	47	2.81	15	-	-
52.50	50.4	33.1	83.2	50.3	0.8	-5.3	1.7	5	silty SAND to sandy SILT	120	3.0	17	11	30	32	-	-	28	2.45	16	2.72	51.2
52.66	39.1	17.9	-	39.0	0.8	-5.5	2.4	4	clayy SILT to silty CLAY	115	2.0	20	9	-	-	2.6	5.4	44	2.76	15	-	-
52.82	33.9	15.4	-	33.8	0.8	-5.2	2.5	4	clayy SILT to silty CLAY	115	2.0	17	8	-	-	2.2	4.6	48	2.83	15	-	-
52.99	26.9	12.2	-	26.8	0.6	-5.4	2.4	3	silty CLAY to CLAY	115	1.5	18	8	-	-	1.7	3.6	53	2.92	15	-	-
53.15	26.3	11.9	-	26.2	0.6	-5.2	2.5	3	silty CLAY to CLAY	115	1.5	18	8	-	-	1.7	3.5	54	2.93	15	-	-
53.32	28.4	12.9	-	28.3	0.7	-5.3	2.9	3	silty CLAY to CLAY	115	1.5	19	9	-	-	1.9	3.8	55	2.94	15	-	-
53.48	28.9	13.1	-	28.8	1.1	-5.3	4.2	3	silty CLAY to CLAY	115	1.5	19	9	-	-	1.9	3.8	60	3.03	15	-	-
53.64	61.4	27.7	-	61.3	1.4	-5.3	2.5	4	clayy SILT to silty CLAY	115	2.0	31	14	-	-	4.2	8.7	36	2.61	15	-	-
53.81	86.0	56.0	126.7	85.9	2.2	-5.2	2.6	5	silty SAND to sandy SILT	120	3.0	29	19	48	35	-	-	26	2.39	16	1.36	22.5
53.97	79.0	51.5	126.5	78.9	2.1	-5.2	2.8	4	clayy SILT to silty CLAY	115	2.0	40	26	-	-	5.4	9.9	28	2.43	15	1.35	32.4
54.14	85.9	55.9	125.8	85.8	2.1	-5.2	2.6	5	silty SAND to sandy SILT	120	3.0	29	19	48	35	-	-	26	2.38	16	1.42	24.0
54.30	87.9	57.1	128.7	87.8	2.2	-5.3	2.6	5	silty SAND to sandy SILT	120	3.0	29	19	49	35	-	-	26	2.39	16	1.25	17.8
54.46	74.3	33.2	-	74.2	3.0	-5.2	4.2	4	clayy SILT to silty CLAY	115	2.0	37	17	-	-	5.1	9.9	40	2.70	15	-	-
54.63	55.7	24.8	-	55.6	3.0	-5.2	5.8	3	silty CLAY to CLAY	115	1.5	37	17	-	-	3.8	7.7	51	2.89	15	-	-
54.79	56.2	25.0	-	56.1	2.9	-5.1	5.5	3	silty CLAY to CLAY	115	1.5	37	17	-	-	3.8	7.8	50	2.87	15	-	-
54.96	50.5	22.4	-	50.4	2.8	-5.1	5.9	3	silty CLAY to CLAY	115	1.5	34	15	-	-	3.4	6.9	54	2.93	15	-	-
55.12	73.1	32.4	-	73.0	2.3	-4.8	3.3	4	clayy SILT to silty CLAY	115	2.0	37	16	-	-	5.0	9.9	37	2.63	15	-	-
55.28	108.8	70.3	115.9	108.7	1.8	-5.1	1.7	5	silty SAND to sandy SILT	120	3.0	36	23	55	36	-	-	19	2.19	16	2.02	27.1
55.45	115.9	74.8	114.9	115.8	1.8	-4.9	1.6	5	silty SAND to sandy SILT	120	3.0	39	25	57	37	-	-	17	2.14	16	2.05	25.6
55.61	120.2	77.5	124.2	120.1	2.1	-5.1	1.8	5	silty SAND to sandy SILT	120	3.0	40	26	59	37	-	-	18	2.17	16	1.61	13.8
55.78	124.2	80.0	138.0	124.1	2.7	-5.1	2.2	5	silty SAND to sandy SILT	120	3.0	41	27	60	37	-	-	20	2.22	16	0.81	4.5
55.94	127.0	81.7	136.9	126.9	2.6	-5.2	2.1	5	silty SAND to sandy SILT	120	3.0	42	27	60	37	-	-	19	2.20	16	0.88	4.8
56.11	124.5	80.0	122.9	124.4	2.0	-5.2	1.7	5	silty SAND to sandy SILT	120	3.0	41	27	60	37	-	-	17	2.14	16	1.70	13.9
56.27	125.7	80.7	124.2	125.6	2.1	-5.2	1.7	5	silty SAND to sandy SILT	120	3.0	42	27	60	37	-	-	17	2.14	16	1.62	12.3
56.43	124.5	79.8	136.0	124.4	2.6	-5.2	2.1	5	silty SAND to sandy SILT	120	3.0	41	27	60	37	-	-	19	2.21	16	0.92	5.2
56.60	146.8	94.1	132.0	146.7	2.3	-4.4	1.6	5	silty SAND to sandy SILT	120	3.0	49	31	65	38	-	-	15	2.07	16	1.21	6.3
56.76	166.1	106.3	127.4	166.0	1.7	-4.6	1.0	6	clean SAND to silty SAND	125	5.0	33	21	69	39	-	-	11	1.91	16	1.52	7.2
56.93	138.4	88.5	118.8	138.4	1.7	-4.8	1.3	5	silty SAND to sandy SILT	120	3.0	46	30	63	38	-	-	14	2.03	16	1.94	16.2
57.09	124.2	79.3	130.6	124.1	2.4	-4.7	2.0	5	silty SAND to sandy SILT	120	3.0	41	26	59	37	-	-	19	2.19	16	1.23	7.8
57.25	126.6	80.8	147.2	126.5	3.1	-4.7	2.5	5	silty SAND to sandy SILT	120	3.0	42	27	60	37	-	-	21	2.26	16	0.42	2.3
57.42	141.1	89.9	148.7	141.0	3.1	-4.7	2.3	5	silty SAND to sandy SILT	120	3.0	47	30	64	38	-	-	19	2.19	16	0.40	2.2
57.58	165.3	105.3	132.9	165.2	2.1	-4.8	1.3	6	clean SAND to silty SAND	125	5.0	33	21	69	39	-	-	12	1.97	16	1.19	5.4
57.75	141.1	89.8	141.0	141.1	2.8	-4.9	2.0	5	silty SAND to sandy SILT	120	3.0	47	30	63	38	-	-	18	2.16	16	0.68	3.6
57.91	112.4	71.4	165.5	112.3	3.8	-4.8	3.5	4	clayy SILT to silty CLAY	115	2.0	56	36	-	-	7.8	9.9	26	2.40	15	0.00	0.0
58.07	128.9	81.8	153.2	128.8	3.4	-4.7	2.7	5	silty SAND to sandy SILT	120	3.0	43	27	60	37	-	-	22	2.28	16	0.28	1.5
58.24	176.1	111.7	145.4	176.0	2.6	-4.6	1.5	6	clean SAND to silty SAND	125	5.0	35	22	71	39	-	-	13	2.00	16	0.56	2.9
58.40	224.5	142.2	152.6	224.4	1.9	-4.7	0.8	6	clean SAND to silty SAND	125	5.0	45	28	79	40	-	-	7	1.75	16	0.39	2.5
58.57	215.8	136.5	143.6	215.7	1.5	-4.6	0.7	6	clean SAND to silty SAND	125	5.0	43	27	77	40	-	-	7	1.72	16	0.69	3.4
58.73	182.3	115.2	138.3	182.3	2.1	-4.6	1.2	6	clean SAND to silty SAND	125	5.0	36	23	72	39	-	-	11	1.91	16	0.91	4.0
58.89	189.5	119.6	162.0	189.4	3.4	-4.4	1.8	5	silty SAND to sandy SILT	120	3.0	63	40	73	39	-	-	14	2.04	16	0.00	0.0
59.06	254.9	160.8	189.4	254.8	3.8	-4.3	1.5	6	clean SAND to silty SAND	125	5.0	51	32	83	41	-	-	10	1.89	16	0.00	0.0
59.22	254.9	160.6	177.0	254.8	2.8	-4.4	1.1	6	clean SAND to silty SAND	125	5.0	51	32	83	41	-	-	8	1.79	16	0.00	0.0
59.39	194.1	122.2	147.6	194.0	2.4	-4.3	1.3	6	clean SAND to silty SAND	125	5.0	39	24	74	39	-	-	11	1.92	16	0.50	2.8
59.55	136.6	85.9	134.4	136.5	2.5	-4.3	1.9	5	silty SAND to sandy SILT	120	3.0	46	29	62	37	-	-	18	2.16	16	1.02	5.5
59.71	97.0	60.9	142.5	96.9	2.8	-4.2	3.0	4	clayy SILT to silty CLAY	115	2.0	48	30	-	-	6.7	9.9	27	2.41	15	0.49	2.7
59.88	111.1	69.7	151.7	111.0	3.3	-4.0	3.0	5	silty SAND to sandy SILT	120	3.0	37	23	55	36	-	-	25	2.37	16	0.28	1.3
60.04	152.6	95.7	155.4	152.5	3.5	-4.3	2.3	5	silty SAND to sandy SILT	120	3.0	51	32	66	38	-	-	18	2.18	16	0.26	1.6
60.21	203.4	127.4	152.5	203.4	2.6	-3.9	1.3	6	clean SAND to silty SAND	125	5.0	41	25	75	40	-	-	11	1.91	16	0.37	2.3
60.37	205.2	128.4	152.5	205.1	2.5	-3.9	1.2	6	clean SAND to silty SAND	125	5.0	41	26	75	40	-	-	10	1.90	16	0.37	2.3
60.53	167.3	104.6	162.3	167.2	3.7	-3.8	2.3	5	silty SAND to sandy SILT	120	3.0	56	35	68	38	-	-	17	2.15	16	0.00	0.0
60.70	170.7	106.6	171.3	170.6	4.2	-3.6	2.5	5	silty SAND to sandy SILT	120	3.0	57	36	69	39	-	-	18	2.17	16	0.00	0.0
60.86	198.6	123.9	160.1	198.6	3.2	-3.5	1.6	6	clean SAND to silty SAND	125	5.0	40	25	74	39	-	-	13	1.99	16	0.00	0.0
61.03	238.9	148.8	167.3	238.8	2.7	-3.8	1.1	6	clean SAND to silty SAND	125	5.0	48	30	80	40	-	-	9	1.82	16	0.00	0.0
61.19	265.7	165.4	175.4	265.7	2.5	-3.6	0.9	6	clean SAND to silty SAND	125	5.0	53	33	84	41	-	-	7	1.73	16	0.00	0.0
61.35	270.7	168.3	174.9	270.6	2.3	-3.4	0.9	6	clean SAND to silty SAND	125	5.0	54	34	84	41	-	-	6	1.70	16	0.00	0.0
61.52	258.5	160.6	181.5	258.4	3.2	-3.5	1.3	6	clean SAND to silty SAND	125	5.0	52	32	83	41	-	-	9	1.83	16	0.00	0.0
61.68	262.3	162.7	186.5	262.2	3.5	-3.2	1.4	6	clean SAND to silty SAND	125	5.0	52	33	83	41	-	-	9	1.85	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

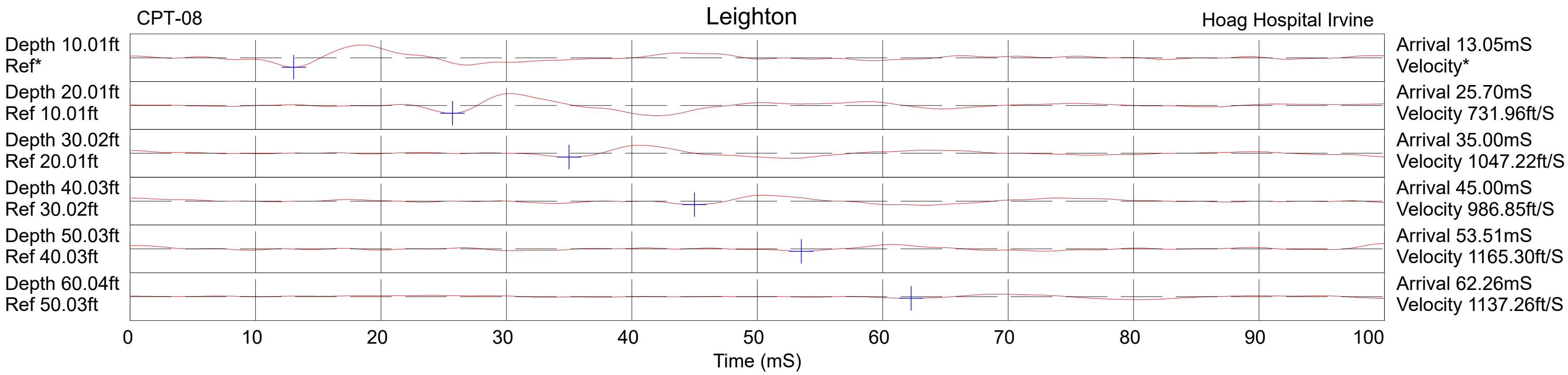
Project ID: Leighton Group
Data File: SDF(041).cpt
CPT Date: 9/29/2017 12:02:55 PM
GW During Test: 23 ft

Sounding ID: CPT-08
Project No: 11753.001
Cone/Rig: DDG1379

. . Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
61.85	270.3	167.5	202.3	270.2	4.6	-3.9	1.7	6	clean SAND to silty SAND	125	5.0	54	34	84	41	-	-	11	1.92	16	0.00	0.0
62.01	303.8	188.1	224.5	303.7	5.4	-4.0	1.8	6	clean SAND to silty SAND	125	5.0	61	38	88	42	-	-	11	1.90	16	0.00	0.0
62.17	304.3	188.2	245.4	304.2	7.3	-4.0	2.4	5	silty SAND to sandy SILT	120	3.0	100	63	88	42	-	-	13	2.00	16	0.00	0.0
62.34	271.0	167.4	213.0	270.9	5.5	-3.7	2.0	6	clean SAND to silty SAND	125	5.0	54	33	84	41	-	-	12	1.98	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing



Hammer to Rod String Distance (ft): 5.83
* = Not Determined

COMMENT:

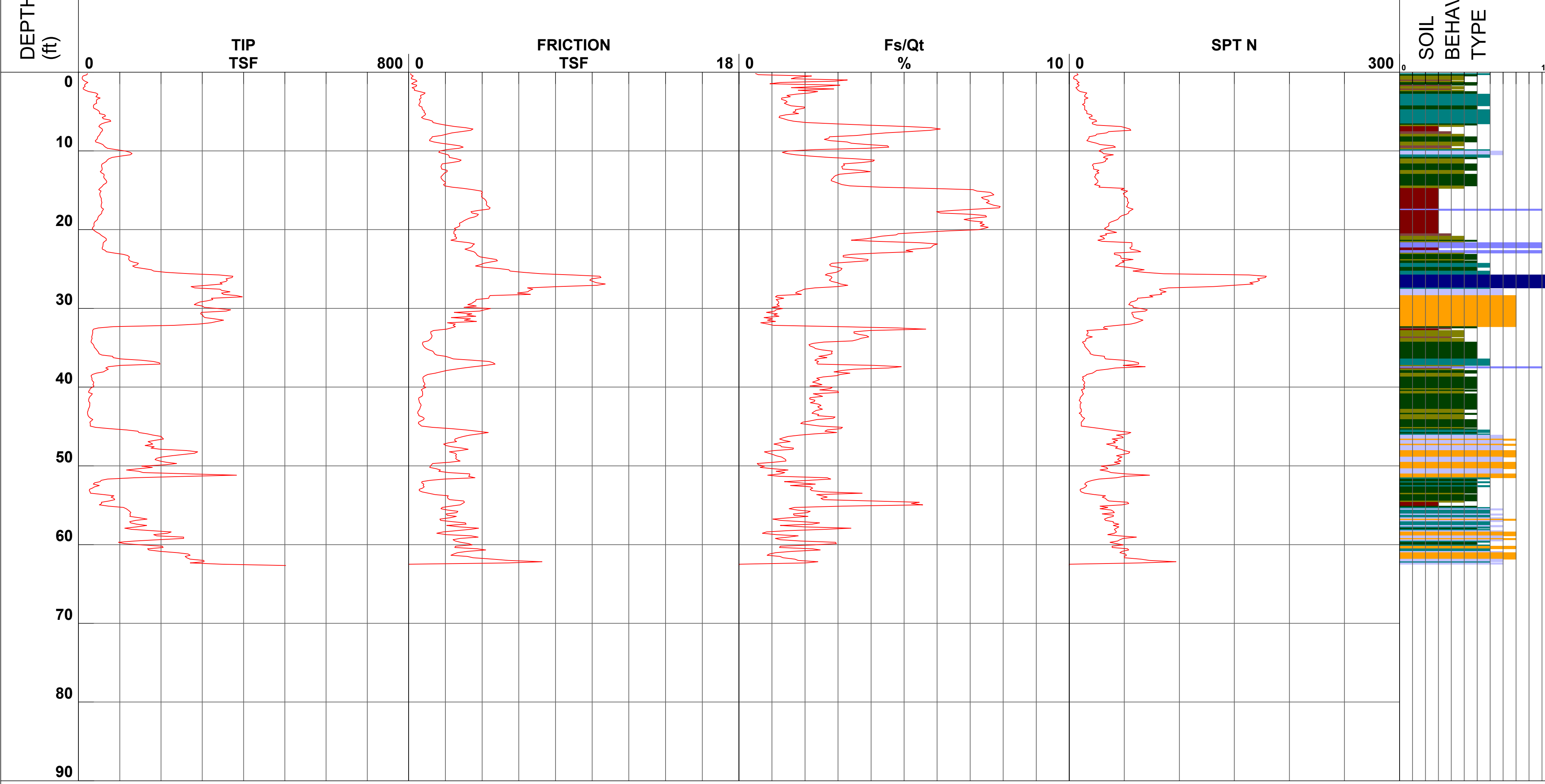
Middle Earth
Geo Testing Inc.

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(041).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-08	Date and Time	9/29/2017 12:02:55 PM	Maximum Depth	62.66 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(043).cpt
CPT Date: 9/29/2017 3:08:30 PM
GW During Test: 23 ft

Sounding ID: CPT-09
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	3.7	6.0	-	3.7	0.2	0.0	6.3	3	silty CLAY to CLAY	115	1.5	2	4	-	-	0.3	9.9	87	3.37	15	N/A	N/A
0.49	9.2	14.7	-	9.2	0.2	0.4	1.8	4	clayy SILT to silty CLAY	115	2.0	5	7	-	-	0.6	9.9	42	2.73	15	N/A	N/A
0.66	13.1	21.0	-	13.1	0.5	-0.1	3.6	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	0.9	9.9	45	2.79	15	N/A	N/A
0.82	20.2	32.4	70.4	20.2	0.3	0.2	1.3	5	silty SAND to sandy SILT	120	3.0	7	11	30	47	-	-	25	2.36	16	N/A	N/A
0.98	13.2	21.2	-	13.2	0.3	0.1	2.3	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	0.9	9.9	39	2.67	15	N/A	N/A
1.15	12.6	20.3	-	12.6	0.3	0.1	2.0	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.9	9.9	38	2.65	15	N/A	N/A
1.31	10.7	17.2	-	10.7	0.5	0.0	4.6	3	silty CLAY to CLAY	115	1.5	7	11	-	-	0.8	9.9	54	2.93	15	N/A	N/A
1.48	16.0	25.6	-	16.0	0.5	0.1	3.5	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.1	9.9	41	2.71	15	N/A	N/A
1.64	11.7	18.8	-	11.7	0.9	-0.2	7.6	3	silty CLAY to CLAY	115	1.5	8	13	-	-	0.8	9.9	61	3.04	15	N/A	N/A
1.80	16.9	27.0	-	16.9	0.9	0.1	5.2	3	silty CLAY to CLAY	115	1.5	11	18	-	-	1.2	9.9	47	2.81	15	N/A	N/A
1.97	15.0	24.1	-	15.0	0.6	0.1	4.4	3	silty CLAY to CLAY	115	1.5	10	16	-	-	1.1	9.9	46	2.80	15	N/A	N/A
2.13	14.2	22.8	-	14.2	0.3	0.0	2.5	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	38	2.66	15	N/A	N/A
2.30	13.5	21.7	-	13.5	0.4	0.0	3.1	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	0.9	9.9	42	2.74	15	N/A	N/A
2.46	15.8	25.4	-	15.8	0.4	-0.3	2.9	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.1	9.9	39	2.66	15	N/A	N/A
2.62	17.3	27.7	-	17.3	0.5	-0.3	3.1	4	clayy SILT to silty CLAY	115	2.0	9	14	-	-	1.2	9.9	38	2.66	15	N/A	N/A
2.79	18.4	29.5	-	18.4	0.6	-0.2	3.5	4	clayy SILT to silty CLAY	115	2.0	9	15	-	-	1.3	9.9	39	2.67	15	N/A	N/A
2.95	20.5	32.8	108.0	20.5	0.6	-0.1	3.0	4	clayy SILT to silty CLAY	115	2.0	10	16	-	-	1.4	9.9	35	2.59	15	N/A	N/A
3.12	19.8	31.7	92.9	19.8	0.5	-0.4	2.3	4	clayy SILT to silty CLAY	115	2.0	10	16	-	-	1.4	9.9	32	2.53	15	N/A	N/A
3.28	18.5	29.6	82.5	18.5	0.3	-0.3	1.9	5	silty SAND to sandy SILT	120	3.0	6	10	27	40	-	-	31	2.50	16	N/A	N/A
3.45	18.7	30.1	73.8	18.7	0.3	-0.3	1.5	5	silty SAND to sandy SILT	120	3.0	6	10	27	40	-	-	28	2.43	16	N/A	N/A
3.61	20.7	33.2	71.0	20.7	0.3	-0.1	1.2	5	silty SAND to sandy SILT	120	3.0	7	11	31	40	-	-	25	2.36	16	N/A	N/A
3.77	22.6	36.2	69.5	22.6	0.2	-0.2	1.1	5	silty SAND to sandy SILT	120	3.0	8	12	34	41	-	-	22	2.29	16	N/A	N/A
3.94	26.3	42.2	68.9	26.3	0.2	-0.2	0.9	5	silty SAND to sandy SILT	120	3.0	9	14	38	41	-	-	19	2.19	16	N/A	N/A
4.10	29.6	47.5	67.7	29.6	0.2	-0.1	0.7	5	silty SAND to sandy SILT	120	3.0	10	16	42	42	-	-	15	2.08	16	N/A	N/A
4.27	35.6	57.1	76.3	35.6	0.3	-0.2	0.7	6	clean SAND to silty SAND	125	5.0	7	11	48	42	-	-	14	2.03	16	N/A	N/A
4.43	35.0	56.1	85.1	35.0	0.4	-0.1	1.1	5	silty SAND to sandy SILT	120	3.0	12	19	48	42	-	-	17	2.13	16	N/A	N/A
4.59	38.2	61.2	109.7	38.2	0.7	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	13	20	51	42	-	-	21	2.25	16	N/A	N/A
4.76	33.1	53.0	154.9	33.0	1.3	-0.2	4.0	4	clayy SILT to silty CLAY	115	2.0	17	27	-	-	2.3	9.9	32	2.53	15	N/A	N/A
4.92	30.6	49.0	-	30.6	1.7	-0.2	5.5	3	silty CLAY to CLAY	115	1.5	20	33	-	-	2.1	9.9	38	2.65	15	N/A	N/A
5.09	32.0	51.4	-	32.0	1.8	-1.1	5.6	3	silty CLAY to CLAY	115	1.5	21	34	-	-	2.2	9.9	38	2.64	15	N/A	N/A
5.25	33.5	53.8	-	33.5	1.8	-1.5	5.4	4	clayy SILT to silty CLAY	115	2.0	17	27	-	-	2.3	9.9	36	2.62	15	N/A	N/A
5.41	36.4	58.4	-	36.4	2.0	-1.1	5.6	4	clayy SILT to silty CLAY	115	2.0	18	29	-	-	2.6	9.9	36	2.60	15	N/A	N/A
5.58	39.2	62.8	209.0	39.1	2.3	-1.5	5.9	4	clayy SILT to silty CLAY	115	2.0	20	31	-	-	2.7	9.9	35	2.60	15	N/A	N/A
5.74	39.4	63.2	204.5	39.4	2.2	-0.4	5.6	4	clayy SILT to silty CLAY	115	2.0	20	32	-	-	2.8	9.9	35	2.58	15	N/A	N/A
5.91	37.2	59.6	188.7	37.1	1.9	-0.9	5.2	4	clayy SILT to silty CLAY	115	2.0	19	30	-	-	2.6	9.9	34	2.57	15	N/A	N/A
6.07	36.1	58.0	185.2	36.1	1.8	-0.2	5.1	4	clayy SILT to silty CLAY	115	2.0	18	29	-	-	2.5	9.9	34	2.58	15	N/A	N/A
6.23	39.2	62.8	194.1	39.2	2.0	-0.6	5.2	4	clayy SILT to silty CLAY	115	2.0	20	31	-	-	2.7	9.9	33	2.56	15	N/A	N/A
6.40	38.6	61.4	184.8	38.6	1.9	-1.4	4.9	4	clayy SILT to silty CLAY	115	2.0	19	31	-	-	2.7	9.9	33	2.55	15	N/A	N/A
6.56	38.3	60.2	136.1	38.3	1.1	-0.8	2.9	5	silty SAND to sandy SILT	120	3.0	13	20	50	41	-	-	26	2.39	16	N/A	N/A
6.73	36.4	56.4	103.5	36.4	0.6	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	12	19	48	40	-	-	21	2.26	16	N/A	N/A
6.89	42.5	65.2	108.0	42.5	0.7	-0.2	1.6	5	silty SAND to sandy SILT	120	3.0	14	22	53	41	-	-	19	2.20	16	N/A	N/A
7.05	52.4	79.4	118.4	52.4	0.8	-0.1	1.6	5	silty SAND to sandy SILT	120	3.0	17	26	59	42	-	-	16	2.12	16	N/A	N/A
7.22	60.2	90.1	126.0	60.2	0.9	-0.1	1.5	5	silty SAND to sandy SILT	120	3.0	20	30	64	42	-	-	15	2.07	16	N/A	N/A
7.38	65.4	96.8	126.6	65.4	0.9	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	13	19	66	43	-	-	13	2.01	16	N/A	N/A
7.55	68.3	99.9	129.6	68.3	0.9	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	14	20	67	43	-	-	13	2.00	16	N/A	N/A
7.71	72.5	104.8	133.3	72.5	1.0	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	14	21	69	43	-	-	12	1.98	16	N/A	N/A
7.87	77.9	111.4	138.2	77.9	1.0	-0.2	1.3	6	clean SAND to silty SAND	125	5.0	16	22	71	43	-	-	12	1.95	16	N/A	N/A
8.04	78.1	110.4	139.6	78.1	1.1	-0.3	1.4	6	clean SAND to silty SAND	125	5.0	16	22	70	43	-	-	12	1.97	16	N/A	N/A
8.20	80.3	112.3	140.4	80.3	1.1	0.0	1.3	6	clean SAND to silty SAND	125	5.0	16	22	71	43	-	-	12	1.96	16	N/A	N/A
8.37	80.9	112.0	141.8	80.9	1.1	-0.3	1.4	6	clean SAND to silty SAND	125	5.0	16	22	71	43	-	-	12	1.97	16	N/A	N/A
8.53	78.7	107.8	138.3	78.7	1.1	-0.3	1.4	6	clean SAND to silty SAND	125	5.0	16	22	69	43	-	-	13	1.99	16	N/A	N/A
8.69	74.1	100.5	136.1	74.1	1.1	0.0	1.6	5	silty SAND to sandy SILT	120	3.0	25	34	67	42	-	-	14	2.04	16	N/A	N/A
8.86	59.7	80.1	140.6	59.7	1.4	0.1	2.3	5	silty SAND to sandy SILT	120	3.0	20	27	60	41	-	-	20	2.23	16	N/A	N/A
9.02	51.7	68.7	152.8	51.7	1.6	-0.1	3.2	4	clayy SILT to silty CLAY	115	2.0	26	34	-	-	3.6	9.9	26	2.38	15	N/A	N/A
9.19	44.9	59.3	152.0	44.9	1.6	-0.3	3.6	4	clayy SILT to silty CLAY	115	2.0	22	30	-	-	3.1	9.9	29	2.46	15	N/A	N/A
9.35	46.2	60.4	138.2	46.2	1.4	-0.1	3.0	5	silty SAND to sandy SILT	120	3.0	15	20	50	40	-	-	26	2.39	16	N/A	N/A
9.51	44.7	57.9	125.1	44.7	1.1	0.0	2.5	5	silty SAND to sandy SILT	120	3.0	15	19	49	39	-	-	25	2.36	16	N/A	N/A
9.68	43.1	55.3	115.5	43.1	1.0	-0.2	2.3	5	silty SAND to sandy SILT	120	3.0	14	18	47	39	-	-	24	2.34	16	N/A	N/A
9.84	41.9	53.4	120.0	41.9	1.0	-0.2	2.5	5	silty SAND to sandy SILT	120	3.0	14	18	46	39	-	-	26	2.38	16	N/A	N/A
10.01	40.8	51.6	127.2	40.8	1.2	-0.3	2.9	4	clayy SILT to silty CLAY	115	2.0	20	26	-	-	2.8	9.9	28	2.44	15	N/A	N/A
10.17	40.6	50.9	131.6	40.6	1.2	-0.9	3.1	4	clayy SILT to silty CLAY	115	2.0	20	25	-	-	2.8	9.9	29	2.46	15	N/A	N/A
10.34	41.4	51.5	127.0	41.4	1.2	-0.5	2.9	4	clayy SILT to silty CLAY	115	2.0	21	26	-	-	2.9	9.9	28	2.44	15	N/A	N/A
10.50	42.5	52.4	123.2	42.5	1.1	-0.1	2.7	5	silty SAND to sandy SILT	120	3.0	14	17	46	38	-	-	27	2.41	16	N/A	N/A
10.66	42.3	51.8	125.8	42.3	1.2	-0.4	2.8	4	clayy SILT to silty CLAY	115	2.0	21	26	-	-	2.9	9.9	28	2.43	15	N/A	N/A
10.83	43.3	52.6	127.0	43.3	1.2	-0.3	2.8	4	clayy SILT to silty CLAY	115	2.0	22	26	-	-	3.0	9.9	27	2.42	15	N/A	N/A
10.99	54.4	65.7	115.8	54.4	1.0	-0.2	1.9	5	silty SAND to sandy SILT	120	3.0	18	22	53	40	-	-	20	2.24	16	N/A	N/A
11.16	58.3	69.9	113.3	58.3	1.0	0.0	1.7	5	silty SAND to sandy SILT	120	3.0	19	23	55	40	-	-	18	2.18	16	N/A	N/A
11.32	69.6	82.7	106.5	69.5	0.7	-0.3	1.0	6	clean SAND to silty SAND	125	5.0	14	17	61	41	-	-	13	1.99	16	N/A	N/A
11.48	73.7	86.9	107.5	73.7	0.7	-0.2	1.0	6	clean SAND to silty SAND	125	5.0	15	17	62	41	-	-	12	1.95	16	N/A	N/A
11.65	79.4	93.0	114.5	79.4	0.8	-0.2	1.0	6	clean SAND to silty SAND	125	5.0	16	19	65	41	-	-	11	1.94	16	N/A	N/A
11.81	81.9	95.2	122.2	81.9	1.0	-0.2	1.2	6	clean SAND to silty SAND	125	5.0	16	19	65	41	-	-	13	1.99	16	N/A	N/A
11.98	67.7	78.1	116.6	67.7	1.0	-0.2	1.6	5	silty SAND to sandy SILT	120	3.0	23	26	59	40	-	-	16	2.12	16	N/A	N/A
12.14	54.5	62.5	128.1	54.5	1.3	-0.3	2.5	5	silty SAND to sandy SILT	120	3.0	18	21	51	39	-	-	24	2.33	16	N/A	N/A
12.30	43.5	49.5	158.7	43.5	1.9	-0.1	4.4	4	clayy SILT to silty CLAY	115	2.0	22	25	-	-	3.0	9.9	34	2.58	15	N/A	N/A
12.47	37.3	50.5	-	37.3	2.3	-0.3	6.2	3	silty CLAY to CLAY	115	1.5	25	34	-	-	2.6	9.9	40	2.69	15	N/A	N/A
12.63	34.5	46.2	-	34.5	2.1	0.0	6.3	3	silty CLAY to CLAY	115	1.5	23	31	-	-	2.4	9.9	41	2.71	15	N/A	N/A
12.80	33.7	44.6	-	33.7	1.9	-1.0	5.7	3	silty CLAY to CLAY	115	1.5	22	30	-	-	2.3	9.9	40	2.70	15	N/A	N/A
12.96	36.1	47.1	-	36.1	2.0	-1.1	5.6	3	silty CLAY to CLAY	115	1.5	24	31	-	-	2.5	9.9	39	2.67	15	N/A	N/A
13.12	37.5	48.3	-	37.5	2.1	-1.4	5.6	3	silty CLAY to CLAY	115	1.5	25	32	-	-	2.6	9.9	39	2.67	15	N/A	N/A
13.29	36.8	46.9	-	36.8	2.1	-1.0	5.7	3	silty CLAY to CLAY	115	1.5	25	31	-	-	2.5	9.9	39	2.68	15	N/A	N/A
13.45	37.1	46.7	-	37.1	1.9	-0.5	5.3	3	silty CLAY to CLAY	115	1.5	25	31	-	-	2.6	9.9	38	2.66	15	N/A	N/A
13.62	37.9	47.1	-	37.8	1.9	-0.5	5.1	4	clayy SILT to silty CLAY	115	2.0	19	24	-	-	2.6	9.9	37	2.64	15	N/A	N/A
13.78	38.4	47.3	-	38.4	2.0	-0.5	5.2	3	silty CLAY to CLAY	115	1.5	26	32	-	-	2.7	9.9	38	2.65	15	N/A	N/A
13.94	39.5	48.0	-	39.4	2.0	-0.5	5.3	3	silty CLAY to CLAY	115	1.5	26	32	-	-	2.7	9.9	38	2.65	15	N/A	N/A
14.11	40.4	48.6	-	40.4	2.1	-0.6	5.2	4	clayy SILT to silty CLAY	115	2.0	20	24	-	-	2.8	9.9	37	2.64	15	N/A	N/A
14.27	40.1	47.7	-	40.1	2.1	-0.8	5.4	3	silty CLAY to CLAY	115	1.5	27	32	-	-	2.8	9.9	38	2.66	15	N/A	N/A
14.44	39.8	46.8	-	39.8	2.1	-0.9	5.5	3	silty CLAY to CLAY	115	1.5	27	31	-	-	2.8	9.9	39	2.67	15	N/A	N/A
14.60	39.0	45.3	-	39.0	2.1	-0.6	5.6	3	silty CLAY to CLAY	115	1.5	26	30	-	-	2.7	9.9	40	2.68	15	N/A	N/A
14.76	38.5	44.2	-	38.5	2.1	-0.7	5.6	3	silty CLAY to CLAY	115	1.5	26	29	-	-	2.7	9.9	40	2.69	15	N/A	N/A
14.93	39.2	44.5	-	39.1	2.1	-0.5	5.4	3	silty CLAY to CLAY	115	1.5	26	30	-	-	2.7	9.9	39	2.68	15	N/A	N/A
15.09	37.5	42.2	-	37.5	2.0	-0.9	5.6	3	silty CLAY to CLAY	115	1.5	25	28	-	-	2.6	9.9	41	2.70	15	N/A	N/A
15.26	35.9	40.0	-	35.9	2.0	-1.2	5.8	3	silty CLAY to CLAY	115	1.5	24	27	-	-	2.5	9.9	42	2.73	15	N/A	N/A
15.42	36.8	40.5	-	36.7	2.1	-1.3	5.9	3	silty CLAY to CLAY	115	1.5	25	27	-	-	2.5	9.9	42	2.73	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(043).cpt
CPT Date: 9/29/2017 3:08:30 PM
GW During Test: 23 ft

Page: 2
Sounding ID: CPT-09
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	39.2	42.7	-	39.1	2.2	-1.6	5.9	3	silty CLAY to CLAY	115	1.5	26	28	-	-	2.7	9.9	41	2.72	15	N/A	N/A
15.75	41.3	44.6	-	41.3	2.2	-1.5	5.4	3	silty CLAY to CLAY	115	1.5	28	30	-	-	2.9	9.9	39	2.68	15	N/A	N/A
15.91	37.2	39.8	-	37.2	2.1	0.1	5.7	3	silty CLAY to CLAY	115	1.5	25	27	-	-	2.6	9.9	42	2.73	15	N/A	N/A
16.08	34.0	36.0	-	34.1	2.0	0.6	6.0	3	silty CLAY to CLAY	115	1.5	23	24	-	-	2.3	9.9	44	2.77	15	N/A	N/A
16.24	33.0	34.6	-	33.0	1.9	0.6	6.0	3	silty CLAY to CLAY	115	1.5	22	23	-	-	2.3	9.9	45	2.79	15	N/A	N/A
16.40	31.9	33.1	-	31.9	1.9	0.7	6.1	3	silty CLAY to CLAY	115	1.5	21	22	-	-	2.2	9.9	46	2.80	15	N/A	N/A
16.57	29.4	30.2	-	29.4	1.8	0.3	6.3	3	silty CLAY to CLAY	115	1.5	20	20	-	-	2.0	9.6	49	2.84	15	N/A	N/A
16.73	26.8	27.2	-	26.8	1.6	0.2	6.2	3	silty CLAY to CLAY	115	1.5	18	18	-	-	1.8	8.7	50	2.88	15	N/A	N/A
16.90	28.6	28.9	-	28.7	1.5	0.6	5.2	3	silty CLAY to CLAY	115	1.5	19	19	-	-	2.0	9.2	46	2.80	15	N/A	N/A
17.06	29.9	29.8	-	29.9	1.6	0.6	5.6	3	silty CLAY to CLAY	115	1.5	20	20	-	-	2.0	9.5	47	2.81	15	N/A	N/A
17.23	29.1	28.8	-	29.2	1.7	0.5	6.1	3	silty CLAY to CLAY	115	1.5	19	19	-	-	2.0	9.2	49	2.85	15	N/A	N/A
17.39	29.3	28.7	-	29.3	1.6	0.2	5.6	3	silty CLAY to CLAY	115	1.5	20	19	-	-	2.0	9.1	48	2.83	15	N/A	N/A
17.55	28.6	27.7	-	28.6	1.5	0.4	5.4	3	silty CLAY to CLAY	115	1.5	19	18	-	-	1.9	8.8	47	2.83	15	N/A	N/A
17.72	29.1	28.0	-	29.1	1.5	0.4	5.3	3	silty CLAY to CLAY	115	1.5	19	19	-	-	2.0	8.9	47	2.82	15	N/A	N/A
17.88	30.8	29.4	-	30.8	1.6	0.0	5.4	3	silty CLAY to CLAY	115	1.5	21	20	-	-	2.1	9.4	46	2.80	15	N/A	N/A
18.05	32.0	30.2	-	32.0	1.6	0.1	5.1	3	silty CLAY to CLAY	115	1.5	21	20	-	-	2.2	9.6	45	2.78	15	N/A	N/A
18.21	33.4	31.2	-	33.4	1.7	0.3	5.2	3	silty CLAY to CLAY	115	1.5	22	21	-	-	2.3	9.9	45	2.77	15	N/A	N/A
18.37	34.5	32.0	-	34.5	1.8	-0.1	5.4	3	silty CLAY to CLAY	115	1.5	23	21	-	-	2.4	9.9	45	2.78	15	N/A	N/A
18.54	35.6	32.7	-	35.6	2.0	-0.3	5.7	3	silty CLAY to CLAY	115	1.5	24	22	-	-	2.4	9.9	45	2.79	15	N/A	N/A
18.70	38.4	35.0	-	38.4	2.1	-0.3	5.7	3	silty CLAY to CLAY	115	1.5	26	23	-	-	2.6	9.9	44	2.77	15	N/A	N/A
18.87	43.8	39.6	-	43.8	2.3	-0.2	5.3	3	silty CLAY to CLAY	115	1.5	29	26	-	-	3.0	9.9	41	2.71	15	N/A	N/A
19.03	48.3	43.3	-	48.3	2.4	-0.2	5.2	3	silty CLAY to CLAY	115	1.5	32	29	-	-	3.3	9.9	39	2.67	15	N/A	N/A
19.19	49.2	43.8	-	49.2	2.4	0.0	5.0	4	clayy SILT to silty CLAY	115	2.0	25	22	-	-	3.4	9.9	38	2.66	15	N/A	N/A
19.36	42.5	37.5	-	42.5	2.1	0.4	5.1	3	silty CLAY to CLAY	115	1.5	28	25	-	-	2.9	9.9	41	2.71	15	N/A	N/A
19.52	32.7	28.6	-	32.7	1.7	0.0	5.4	3	silty CLAY to CLAY	115	1.5	22	19	-	-	2.2	9.1	47	2.81	15	N/A	N/A
19.69	27.5	23.9	-	27.5	1.5	-0.1	5.7	3	silty CLAY to CLAY	115	1.5	18	16	-	-	1.9	7.5	51	2.89	15	N/A	N/A
19.85	28.2	24.3	-	28.2	1.0	0.1	3.6	4	clayy SILT to silty CLAY	115	2.0	14	12	-	-	1.9	7.7	43	2.75	15	N/A	N/A
20.01	23.0	19.6	-	23.0	0.7	0.4	3.1	4	clayy SILT to silty CLAY	115	2.0	12	10	-	-	1.5	6.1	45	2.78	15	N/A	N/A
20.18	18.3	15.5	-	18.3	0.5	0.3	3.2	3	silty CLAY to CLAY	115	1.5	12	10	-	-	1.2	4.8	51	2.88	15	N/A	N/A
20.34	25.2	21.1	-	25.2	0.9	0.3	3.9	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.6	47	2.82	15	N/A	N/A
20.51	26.9	22.4	-	26.9	1.3	0.3	5.0	3	silty CLAY to CLAY	115	1.5	18	15	-	-	1.8	7.1	50	2.87	15	N/A	N/A
20.67	25.9	21.5	-	26.0	1.6	0.4	6.4	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.7	56	2.96	15	N/A	N/A
20.83	28.1	23.0	-	28.0	1.8	-1.5	6.8	3	silty CLAY to CLAY	115	1.5	19	15	-	-	1.9	7.3	56	2.96	15	N/A	N/A
21.00	33.5	27.3	-	33.5	1.7	-1.0	5.1	3	silty CLAY to CLAY	115	1.5	22	18	-	-	2.3	8.7	47	2.82	15	N/A	N/A
21.16	43.2	34.9	-	43.2	1.7	-1.4	4.0	4	clayy SILT to silty CLAY	115	2.0	22	17	-	-	3.0	9.9	38	2.66	15	N/A	N/A
21.33	40.9	32.8	-	40.9	1.9	0.0	4.9	3	silty CLAY to CLAY	115	1.5	27	22	-	-	2.8	9.9	43	2.74	15	N/A	N/A
21.49	44.3	35.3	-	44.3	2.0	0.3	4.6	3	silty CLAY to CLAY	115	1.5	30	24	-	-	3.0	9.9	40	2.70	15	N/A	N/A
21.65	48.2	38.1	-	48.2	2.4	0.2	5.0	3	silty CLAY to CLAY	115	1.5	32	25	-	-	3.3	9.9	41	2.70	15	N/A	N/A
21.82	44.7	35.0	-	44.7	2.3	-0.8	5.4	3	silty CLAY to CLAY	115	1.5	30	23	-	-	3.1	9.9	43	2.75	15	N/A	N/A
21.98	57.7	49.5	149.4	57.7	2.2	-0.4	4.0	4	clayy SILT to silty CLAY	115	2.0	29	25	-	-	4.0	9.9	33	2.55	15	N/A	N/A
22.15	83.7	71.5	139.9	83.7	2.1	-0.9	2.6	5	silty SAND to sandy SILT	120	3.0	28	24	56	38	-	-	23	2.30	16	N/A	N/A
22.31	92.2	78.4	137.6	92.2	2.1	-0.2	2.3	5	silty SAND to sandy SILT	120	3.0	31	26	59	39	-	-	20	2.23	16	N/A	N/A
22.47	92.9	78.7	138.8	92.9	2.1	0.1	2.3	5	silty SAND to sandy SILT	120	3.0	31	26	59	39	-	-	20	2.24	16	N/A	N/A
22.64	93.6	79.0	141.7	93.6	2.2	0.5	2.4	5	silty SAND to sandy SILT	120	3.0	31	26	59	39	-	-	21	2.25	16	N/A	N/A
22.80	87.9	74.0	140.8	88.0	2.2	0.6	2.5	5	silty SAND to sandy SILT	120	3.0	29	25	57	38	-	-	22	2.29	16	N/A	N/A
22.97	75.4	63.2	136.6	75.4	2.1	0.6	2.8	5	silty SAND to sandy SILT	120	3.0	25	21	52	37	-	-	25	2.36	16	N/A	N/A
23.13	59.2	49.6	140.4	59.3	2.0	0.5	3.5	4	clayy SILT to silty CLAY	115	2.0	30	25	-	-	4.1	9.9	31	2.51	15	0.23	0.6
23.30	53.8	44.9	137.1	53.8	1.9	0.5	3.6	4	clayy SILT to silty CLAY	115	2.0	27	22	-	-	3.7	9.9	33	2.55	15	0.30	0.7
23.46	61.5	51.2	126.6	61.5	1.7	0.2	2.9	4	clayy SILT to silty CLAY	115	2.0	31	26	-	-	4.2	9.9	28	2.44	15	0.65	3.2
23.62	73.8	61.4	111.6	73.8	1.4	0.0	1.9	5	silty SAND to sandy SILT	120	3.0	25	20	51	37	-	-	21	2.26	16	1.78	18.6
23.79	80.1	66.5	104.6	80.1	1.2	0.4	1.5	5	silty SAND to sandy SILT	120	3.0	27	22	54	38	-	-	18	2.16	16	2.25	28.3
23.95	81.7	67.7	106.3	81.7	1.2	0.7	1.5	5	silty SAND to sandy SILT	120	3.0	27	23	54	38	-	-	18	2.16	16	2.18	26.6
24.12	80.7	66.8	108.6	80.7	1.3	0.8	1.6	5	silty SAND to sandy SILT	120	3.0	27	22	54	38	-	-	18	2.18	16	2.04	23.9
24.28	81.4	67.3	109.0	81.4	1.3	0.7	1.6	5	silty SAND to sandy SILT	120	3.0	27	22	54	38	-	-	18	2.18	16	2.03	23.0
24.44	80.9	66.8	110.8	80.9	1.3	0.5	1.7	5	silty SAND to sandy SILT	120	3.0	27	22	54	37	-	-	19	2.20	16	1.91	20.1
24.61	74.4	61.3	106.4	74.4	1.2	0.5	1.7	5	silty SAND to sandy SILT	120	3.0	25	20	51	37	-	-	20	2.23	16	2.20	32.6
24.77	64.5	53.1	102.4	64.5	1.1	0.4	1.8	5	silty SAND to sandy SILT	120	3.0	22	18	46	36	-	-	22	2.29	16	2.29	40.8
24.94	54.0	44.3	112.4	54.0	1.3	0.4	2.5	5	silty SAND to sandy SILT	120	3.0	18	15	40	35	-	-	29	2.45	16	1.77	50.8
25.10	42.2	30.1	-	42.2	1.4	0.2	3.4	4	clayy SILT to silty CLAY	115	2.0	21	15	-	-	2.9	9.6	39	2.67	15	-	-
25.26	44.0	31.2	-	44.0	1.2	0.4	2.9	4	clayy SILT to silty CLAY	115	2.0	22	16	-	-	3.0	9.9	36	2.61	15	-	-
25.43	48.0	39.3	112.3	48.0	1.3	0.3	2.8	4	clayy SILT to silty CLAY	115	2.0	24	20	-	-	3.3	9.9	31	2.52	15	1.81	51.2
25.59	34.8	24.5	-	34.8	1.3	0.3	4.0	3	silty CLAY to CLAY	115	1.5	23	16	-	-	2.4	7.7	45	2.78	15	-	-
25.76	26.2	18.4	-	26.2	1.3	0.4	5.4	3	silty CLAY to CLAY	115	1.5	17	12	-	-	1.7	5.7	56	2.96	15	-	-
25.92	40.6	28.5	-	40.6	1.6	0.5	4.1	4	clayy SILT to silty CLAY	115	2.0	20	14	-	-	2.8	9.0	42	2.73	15	-	-
26.08	229.1	186.1	190.5	229.1	2.0	0.9	0.9	6	clean SAND to silty SAND	125	5.0	46	37	87	43	-	-	6	1.68	16	0.00	0.0
26.25	293.8	238.3	238.3	293.8	2.2	0.6	0.8	6	clean SAND to silty SAND	125	5.0	59	48	95	44	-	-	5	1.56	16	0.00	0.0
26.41	308.7	249.9	249.9	308.7	2.6	0.8	0.8	6	clean SAND to silty SAND	125	5.0	62	50	95	44	-	-	5	1.57	16	0.00	0.0
26.58	296.1	239.2	239.2	296.1	2.8	0.7	0.9	6	clean SAND to silty SAND	125	5.0	59	48	95	44	-	-	5	1.62	16	0.00	0.0
26.74	295.9	238.7	238.8	295.9	3.0	0.8	1.0	6	clean SAND to silty SAND	125	5.0	59	48	95	44	-	-	5	1.65	16	0.00	0.0
26.90	300.2	241.7	246.2	300.2	3.3	1.1	1.1	6	clean SAND to silty SAND	125	5.0	60	48	95	44	-	-	6	1.67	16	0.00	0.0
27.07	292.2	234.8	247.8	292.2	3.7	1.0	1.3	6	clean SAND to silty SAND	125	5.0	58	47	95	44	-	-	7	1.73	16	0.00	0.0
27.23	298.0	239.1	247.9	298.1	3.6	0.9	1.2	6	clean SAND to silty SAND	125	5.0	60	48	95	44	-	-	6	1.70	16	0.00	0.0
27.40	311.6	249.5	255.8	311.6	3.7	1.2	1.2	6	clean SAND to silty SAND	125	5.0	62	50	95	44	-	-	6	1.68	16	0.00	0.0
27.56	317.0	253.5	257.1	317.1	3.6	1.3	1.1	6	clean SAND to silty SAND	125	5.0	63	51	95	44	-	-	5	1.67	16	0.00	0.0
27.72	320.7	256.0	258.2	320.7	3.6	1.2	1.1	6	clean SAND to silty SAND	125	5.0	64	51	95	44	-	-	5	1.66	16	0.00	0.0
27.89	321.0	255.8	257.1	321.1	3.5	1.3	1.1	6	clean SAND to silty SAND	125	5.0	64	51	95	44	-	-	5	1.65	16	0.00	0.0
28.05	318.6	253.4	255.4	318.6	3.5	1.2	1.1	6	clean SAND to silty SAND	125	5.0	64	51	95	44	-	-	5	1.66	16	0.00	0.0
28.22	306.9	243.7	245.6	306.9	3.3	1.3	1.1	6	clean SAND to silty SAND	125	5.0	61	49	95	44	-	-	5	1.66	16	0.00	0.0
28.38	301.2	238.7	242.1	301.2	3.2	1.3	1.1	6	clean SAND to silty SAND	125	5.0	60	48	95	44	-	-	5	1.67	16	0.00	0.0
28.54	293.7	232.4	232.4	293.7	2.8	1.5	1.0	6	clean SAND to silty SAND	125	5.0	59	46	95	44	-	-	5	1.64	16	0.00	0.0
28.71	280.1	221.3	222.9	280.1	2.7	1.3	1.0	6	clean SAND to silty SAND	125	5.0	56	44	93	44	-	-	5	1.66	16	0.00	0.0
28.87	276.1	217.8	219.3	276.2	2.6	1.4	1.0	6	clean SAND to silty SAND	125	5.0	55	44	93	44	-	-	5	1.65	16	0.00	0.0
29.04	280.3	220.7	224.5	280.3	2.9	1.5	1.0	6	clean SAND to silty SAND	125	5.0	56	44	93	44	-	-	6	1.67	16	0.00	0.0
29.20	278.5	218.9	229.8	278.5	3.3	1.3	1.2	6	clean SAND to silty SAND	125	5.0	56	44	93	44	-	-	6	1.72	16	0.00	0.0
29.36	268.1	210.3	229.7	268.1	3.7	1.6	1.4	6	clean SAND to silty SAND	125	5.0	54	42	92	43	-	-	8	1.78	16	0.00	0.0
29.53	266.8	209.0	234.4	266.9	4.1	1.6	1.5	6	clean SAND to silty SAND	125	5.0	53	42	91	43	-	-	9	1.82	16	0.00	0.0
29.69	269.4	210.7	240.8	269.4	4.5	1.5	1.7	6	clean SAND to silty SAND	125	5.0	54	42	92	43	-	-	9	1.85	16	0.00	0.0
29.86	261.4	204.1	237.8	261.4	4.6	1.3	1.8	6	clean SAND to silty SAND	125	5.0	52	41	91	43	-	-	10	1.87	16	0.00	0.0
30.02	249.4	194.4	229.6	249.4	4.5	1.6	1.8	6	clean SAND to silty SAND	125	5.0	50	39	89	43	-	-	10	1.89	16	0.00	0.0
30.19	244.9	190.6	216.1	244.9	3.6	1.5	1.5	6	clean SAND to silty SAND	125	5.0	49	38	88	43	-	-	9	1.84	16	0.00	0.0
30.35	251.9	195.7	205.7	251.9	2.7	1.5	1.1	6	clean SAND to silty SAND	125	5.0	50	39	89	43	-	-	6	1.72	16	0.00	0.0
30.51	232.9	180.6	204.4	232.9	3.3	0.2	1.4	6	clean SAND to silty SAND	125	5.0	47	36	87	43	-	-	9	1.83	16	0.00	0.0
30.68	267.4	207.0	233.4	267.4	4.2	0.1	1.6	6	clean SAND to silty SAND	125	5.0	53	41	91	43	-	-	9	1.83	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

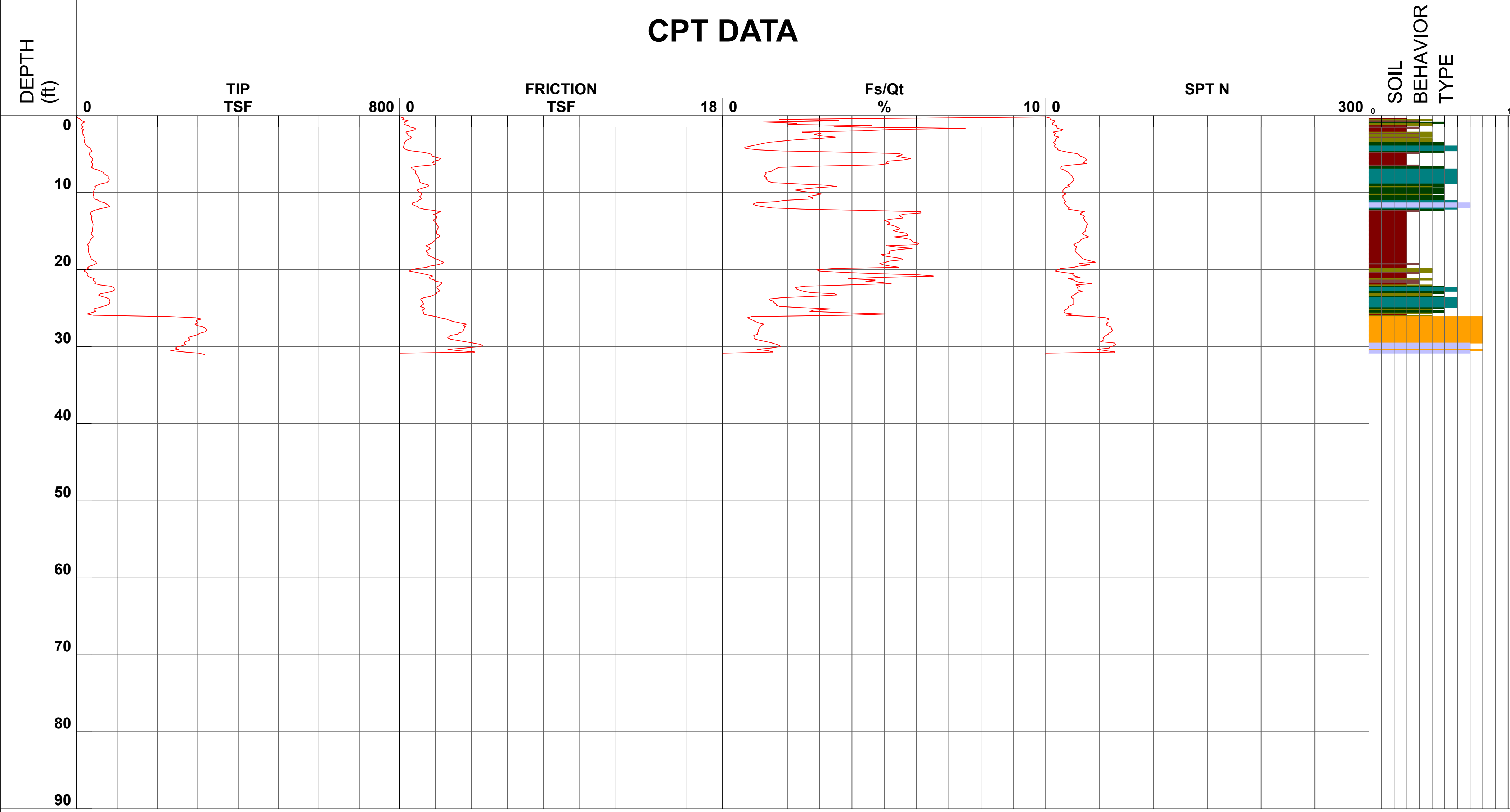
Middle Earth Geo Testing

Leighton

Middle Earth Geo Testing Inc.

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(043).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-09	Date and Time	9/29/2017 3:08:30 PM	Maximum Depth	31.00 ft
EST GW Depth During Test			23.00 ft		

Net Area Ratio .8



- 1 - sensitive fine grained
- 2 - organic material
- 3 - clay
- 4 - silty clay to clay
- 5 - clayey silt to silty clay
- 6 - sandy silt to clayey silt
- 7 - silty sand to sandy silt
- 8 - sand to silty sand
- 9 - sand
- 10 - gravelly sand to sand
- 11 - very stiff fine grained (*)
- 12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(042).cpt
CPT Date: 9/29/2017 1:22:06 PM
GW During Test: 23 ft

Sounding ID: CPT-10
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	11.5	18.4	-	11.5	0.2	0.1	1.5	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	36	2.60	15	N/A	N/A
0.49	12.1	19.4	-	12.1	0.2	0.1	1.9	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.9	9.9	38	2.65	15	N/A	N/A
0.66	13.2	21.1	-	13.2	0.6	0.1	4.6	3	silty CLAY to CLAY	115	1.5	9	14	-	-	0.9	9.9	49	2.86	15	N/A	N/A
0.82	18.1	29.0	90.7	18.1	0.4	0.1	2.4	4	clayy SILT to silty CLAY	115	2.0	9	15	-	-	1.3	9.9	34	2.57	15	N/A	N/A
0.98	13.3	21.3	-	13.3	0.4	-0.1	2.7	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	0.9	9.9	41	2.70	15	N/A	N/A
1.15	12.8	20.5	-	12.8	0.7	0.0	5.4	3	silty CLAY to CLAY	115	1.5	9	14	-	-	0.9	9.9	53	2.91	15	N/A	N/A
1.31	14.6	23.4	-	14.6	0.5	0.2	3.5	4	clayy SILT to silty CLAY	115	2.0	7	12	-	-	1.0	9.9	43	2.74	15	N/A	N/A
1.48	10.3	16.5	-	10.3	0.2	0.1	2.4	4	clayy SILT to silty CLAY	115	2.0	5	8	-	-	0.7	9.9	44	2.77	15	N/A	N/A
1.64	10.1	16.2	-	10.1	0.1	0.0	1.2	4	clayy SILT to silty CLAY	115	2.0	5	8	-	-	0.7	9.9	36	2.61	15	N/A	N/A
1.80	9.1	14.6	-	9.1	0.1	-0.1	1.2	4	clayy SILT to silty CLAY	115	2.0	5	7	-	-	0.6	9.9	38	2.66	15	N/A	N/A
1.97	9.2	14.7	-	9.2	0.1	-0.1	1.3	4	clayy SILT to silty CLAY	115	2.0	5	7	-	-	0.6	9.9	38	2.66	15	N/A	N/A
2.13	8.5	13.7	-	8.5	0.1	-0.1	1.1	4	clayy SILT to silty CLAY	115	2.0	4	7	-	-	0.6	9.9	38	2.65	15	N/A	N/A
2.30	7.3	11.7	-	7.3	0.1	-0.1	1.2	4	clayy SILT to silty CLAY	115	2.0	4	6	-	-	0.5	9.9	43	2.74	15	N/A	N/A
2.46	8.2	13.2	-	8.2	0.2	-0.1	2.0	4	clayy SILT to silty CLAY	115	2.0	4	7	-	-	0.6	9.9	46	2.80	15	N/A	N/A
2.62	8.0	12.9	-	8.0	0.1	-0.1	1.8	4	clayy SILT to silty CLAY	115	2.0	4	6	-	-	0.6	9.9	45	2.78	15	N/A	N/A
2.79	6.4	10.3	-	6.4	0.1	0.0	1.2	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	9.9	46	2.80	15	N/A	N/A
2.95	6.0	9.6	-	6.0	0.1	-0.1	1.1	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	9.9	46	2.80	15	N/A	N/A
3.12	5.3	8.5	-	5.3	0.0	-0.1	0.9	4	clayy SILT to silty CLAY	115	2.0	3	4	-	-	0.4	9.5	47	2.81	15	N/A	N/A
3.28	5.8	9.4	-	5.8	0.1	-0.1	1.2	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	9.9	48	2.83	15	N/A	N/A
3.45	5.5	8.9	-	5.5	0.1	-0.1	1.0	4	clayy SILT to silty CLAY	115	2.0	3	4	-	-	0.4	8.9	47	2.82	15	N/A	N/A
3.61	5.4	8.7	-	5.4	0.0	-0.1	0.8	4	clayy SILT to silty CLAY	115	2.0	3	4	-	-	0.4	8.3	45	2.78	15	N/A	N/A
3.77	5.6	9.0	-	5.6	0.0	-0.1	0.6	4	clayy SILT to silty CLAY	115	2.0	3	4	-	-	0.4	8.2	41	2.71	15	N/A	N/A
3.94	5.8	9.4	-	5.8	0.0	-0.1	0.6	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	8.2	41	2.70	15	N/A	N/A
4.10	5.8	9.3	-	5.8	0.0	-0.1	0.4	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	7.8	38	2.65	15	N/A	N/A
4.27	6.0	9.6	-	6.0	0.0	-0.1	0.5	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	7.8	39	2.68	15	N/A	N/A
4.43	5.5	8.9	-	5.5	0.0	0.0	0.6	4	clayy SILT to silty CLAY	115	2.0	3	4	-	-	0.4	6.9	42	2.73	15	N/A	N/A
4.59	5.9	9.4	-	5.9	0.0	-0.1	0.9	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	7.0	44	2.77	15	N/A	N/A
4.76	6.2	9.9	-	6.2	0.1	-0.1	1.2	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	7.1	46	2.80	15	N/A	N/A
4.92	7.8	12.5	-	7.8	0.2	-0.1	2.1	4	clayy SILT to silty CLAY	115	2.0	4	6	-	-	0.5	8.8	48	2.84	15	N/A	N/A
5.09	13.7	21.9	-	13.7	0.3	-0.1	2.6	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	0.9	9.9	40	2.69	15	N/A	N/A
5.25	38.5	61.7	102.5	38.5	0.6	0.0	1.6	5	silty SAND to sandy SILT	120	3.0	13	21	51	42	-	-	19	2.20	16	N/A	N/A
5.41	59.2	94.9	132.8	59.2	1.0	-0.2	1.6	5	silty SAND to sandy SILT	120	3.0	20	32	65	44	-	-	15	2.07	16	N/A	N/A
5.58	65.5	105.0	148.5	65.5	1.2	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	22	35	69	44	-	-	15	2.08	16	N/A	N/A
5.74	66.5	106.7	154.8	66.5	1.3	-0.2	2.0	5	silty SAND to sandy SILT	120	3.0	22	36	69	44	-	-	16	2.10	16	N/A	N/A
5.91	62.3	100.0	148.8	62.3	1.2	-0.3	2.0	5	silty SAND to sandy SILT	120	3.0	21	33	67	44	-	-	16	2.12	16	N/A	N/A
6.07	56.0	89.8	134.0	56.0	1.0	-0.2	1.8	5	silty SAND to sandy SILT	120	3.0	19	30	63	43	-	-	16	2.12	16	N/A	N/A
6.23	52.6	84.4	123.6	52.6	0.8	-0.1	1.6	5	silty SAND to sandy SILT	120	3.0	18	28	61	42	-	-	16	2.11	16	N/A	N/A
6.40	50.9	81.2	120.2	50.9	0.8	-0.1	1.6	5	silty SAND to sandy SILT	120	3.0	17	27	60	42	-	-	16	2.11	16	N/A	N/A
6.56	49.1	77.3	120.3	49.1	0.8	-0.1	1.7	5	silty SAND to sandy SILT	120	3.0	16	26	59	42	-	-	17	2.15	16	N/A	N/A
6.73	49.6	77.0	119.3	49.6	0.8	-0.1	1.7	5	silty SAND to sandy SILT	120	3.0	17	26	58	42	-	-	17	2.15	16	N/A	N/A
6.89	49.5	75.9	122.4	49.5	0.9	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	16	25	58	42	-	-	18	2.18	16	N/A	N/A
7.05	53.4	81.0	129.4	53.4	1.0	-0.1	1.9	5	silty SAND to sandy SILT	120	3.0	18	27	60	42	-	-	18	2.17	16	N/A	N/A
7.22	61.2	91.8	135.6	61.2	1.1	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	20	31	64	42	-	-	16	2.11	16	N/A	N/A
7.38	70.1	103.8	137.7	70.1	1.1	-0.1	1.5	6	clean SAND to silty SAND	125	5.0	14	21	68	43	-	-	13	2.02	16	N/A	N/A
7.55	76.2	111.6	138.3	76.2	1.0	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	15	22	71	43	-	-	12	1.95	16	N/A	N/A
7.71	81.5	118.0	143.2	81.5	1.0	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	16	24	72	44	-	-	11	1.93	16	N/A	N/A
7.87	88.7	126.9	151.2	88.7	1.1	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	18	25	75	44	-	-	10	1.90	16	N/A	N/A
8.04	103.6	146.7	158.6	103.6	1.0	-0.1	0.9	6	clean SAND to silty SAND	125	5.0	21	29	80	44	-	-	7	1.76	16	N/A	N/A
8.20	112.7	157.9	167.4	112.7	1.0	-0.1	0.9	6	clean SAND to silty SAND	125	5.0	23	32	82	45	-	-	7	1.73	16	N/A	N/A
8.37	110.6	153.3	161.7	110.6	0.9	-0.2	0.9	6	clean SAND to silty SAND	125	5.0	22	31	81	45	-	-	7	1.73	16	N/A	N/A
8.53	99.7	136.7	150.3	99.7	0.9	-0.1	0.9	6	clean SAND to silty SAND	125	5.0	20	27	77	44	-	-	8	1.79	16	N/A	N/A
8.69	80.6	109.4	132.6	80.6	0.9	0.0	1.2	6	clean SAND to silty SAND	125	5.0	16	22	70	43	-	-	11	1.92	16	N/A	N/A
8.86	75.1	101.0	130.3	75.1	1.0	-0.1	1.3	6	clean SAND to silty SAND	125	5.0	15	20	67	42	-	-	13	1.99	16	N/A	N/A
9.02	66.3	88.2	128.1	66.3	1.1	-0.1	1.7	5	silty SAND to sandy SILT	120	3.0	22	29	63	42	-	-	16	2.10	16	N/A	N/A
9.19	57.3	75.6	126.5	57.3	1.1	-0.1	2.0	5	silty SAND to sandy SILT	120	3.0	19	25	58	41	-	-	19	2.20	16	N/A	N/A
9.35	51.2	66.9	116.7	51.2	1.0	-0.1	1.9	5	silty SAND to sandy SILT	120	3.0	17	22	54	40	-	-	20	2.23	16	N/A	N/A
9.51	47.5	61.6	114.4	47.5	0.9	-0.1	2.0	5	silty SAND to sandy SILT	120	3.0	16	21	51	40	-	-	21	2.27	16	N/A	N/A
9.68	48.2	61.9	119.1	48.2	1.0	-0.2	2.2	5	silty SAND to sandy SILT	120	3.0	16	21	51	40	-	-	22	2.29	16	N/A	N/A
9.84	44.2	56.3	112.0	44.2	0.9	0.3	2.1	5	silty SAND to sandy SILT	120	3.0	15	19	48	39	-	-	23	2.31	16	N/A	N/A
10.01	41.3	52.1	97.0	41.3	0.7	0.4	1.6	5	silty SAND to sandy SILT	120	3.0	14	17	45	39	-	-	21	2.27	16	N/A	N/A
10.17	43.8	54.8	97.5	43.8	0.7	-0.2	1.6	5	silty SAND to sandy SILT	120	3.0	15	18	47	39	-	-	20	2.24	16	N/A	N/A
10.34	46.3	57.6	101.9	46.3	0.8	-0.2	1.7	5	silty SAND to sandy SILT	120	3.0	15	19	49	39	-	-	20	2.24	16	N/A	N/A
10.50	45.0	55.5	111.2	45.0	0.9	-0.1	2.1	5	silty SAND to sandy SILT	120	3.0	15	19	48	39	-	-	23	2.32	16	N/A	N/A
10.66	43.5	53.2	127.4	43.5	1.2	-0.3	2.8	4	clayy SILT to silty CLAY	115	2.0	22	27	-	-	3.0	9.9	27	2.42	15	N/A	N/A
10.83	44.5	54.0	129.9	44.5	1.3	-0.2	2.9	4	clayy SILT to silty CLAY	115	2.0	22	27	-	-	3.1	9.9	27	2.42	15	N/A	N/A
10.99	55.7	67.2	117.0	55.7	1.1	-0.2	1.9	5	silty SAND to sandy SILT	120	3.0	19	22	54	40	-	-	20	2.23	16	N/A	N/A
11.16	60.8	72.7	101.9	60.8	0.7	-0.2	1.2	5	silty SAND to sandy SILT	120	3.0	20	24	56	40	-	-	15	2.07	16	N/A	N/A
11.32	59.0	70.0	91.1	59.0	0.5	-0.2	0.9	6	clean SAND to silty SAND	125	5.0	12	14	55	40	-	-	13	2.00	16	N/A	N/A
11.48	58.0	68.4	94.1	58.0	0.6	-0.3	1.0	5	silty SAND to sandy SILT	120	3.0	19	23	54	40	-	-	14	2.05	16	N/A	N/A
11.65	58.7	68.7	97.4	58.7	0.7	-0.4	1.1	5	silty SAND to sandy SILT	120	3.0	20	23	55	40	-	-	15	2.08	16	N/A	N/A
11.81	57.1	66.3	105.8	57.1	0.9	-0.4	1.5	5	silty SAND to sandy SILT	120	3.0	19	22	53	39	-	-	18	2.17	16	N/A	N/A
11.98	49.7	57.4	117.3	49.7	1.1	-0.3	2.3	5	silty SAND to sandy SILT	120	3.0	17	19	49	39	-	-	24	2.33	16	N/A	N/A
12.14	42.6	48.8	148.2	42.6	1.7	-0.4	4.0	4	clayy SILT to silty CLAY	115	2.0	21	24	-	-	3.0	9.9	33	2.55	15	N/A	N/A
12.30	38.1	52.3	-	38.1	2.1	-0.4	5.6	3	silty CLAY to CLAY	115	1.5	25	35	-	-	2.6	9.9	37	2.64	15	N/A	N/A
12.47	35.5	48.2	-	35.5	2.1	-0.8	6.0	3	silty CLAY to CLAY	115	1.5	24	32	-	-	2.5	9.9	40	2.69	15	N/A	N/A
12.63	33.9	45.4	-	33.9	1.9	-0.7	5.6	3	silty CLAY to CLAY	115	1.5	23	30	-	-	2.3	9.9	40	2.68	15	N/A	N/A
12.80	34.6	45.7	-	34.5	1.8	-1.0	5.3	3	silty CLAY to CLAY	115	1.5	23	30	-	-	2.4	9.9	39	2.66	15	N/A	N/A
12.96	36.5	47.6	-	36.5	1.8	-1.0	5.1	4	clayy SILT to silty CLAY	115	2.0	18	24	-	-	2.5	9.9	37	2.64	15	N/A	N/A
13.12	38.9	50.2	-	38.9	1.9	-0.9	5.0	4	clayy SILT to silty CLAY	115	2.0	19	25	-	-	2.7	9.9	36	2.62	15	N/A	N/A
13.29	40.5	51.6	-	40.5	2.0	-0.9	5.0	4	clayy SILT to silty CLAY	115	2.0	20	26	-	-	2.8	9.9	36	2.61	15	N/A	N/A
13.45	42.1	53.0	-	42.0	2.1	-1.0	5.0	4	clayy SILT to silty CLAY	115	2.0	21	26	-	-	2.9	9.9	35	2.60	15	N/A	N/A
13.62	43.0	49.3	-	43.0	2.1	-0.9	5.0	4	clayy SILT to silty CLAY	115	2.0	22	25	-	-	3.0	9.9	37	2.62	15	N/A	N/A
13.78	43.1	53.0	-	43.1	2.2	-1.1	5.2	4	clayy SILT to silty CLAY	115	2.0	22	26	-	-	3.0	9.9	36	2.61	15	N/A	N/A
13.94	41.9	51.0	-	41.9	2.3	-1.1	5.7	3	silty CLAY to CLAY	115	1.5	28	34	-	-	2.9	9.9	38	2.65	15	N/A	N/A
14.11	42.5	51.1	-	42.5	2.3	-0.8	5.6	3	silty CLAY to CLAY	115	1.5	28	34	-	-	2.9	9.9	38	2.65	15	N/A	N/A
14.27	40.9	48.6	-	40.9	2.3	-0.7	5.7	3	silty CLAY to CLAY	115	1.5	27	32	-	-	2.8	9.9	39	2.67	15	N/A	N/A
14.44	39.9	46.9	-	39.9	2.1	-1.1	5.5	3	silty CLAY to CLAY	115	1.5	27	31	-	-	2.8	9.9	39	2.67	15	N/A	N/A
14.60	38.8	45.1	-	38.8	2.1	-1.1	5.6	3	silty CLAY to CLAY	115	1.5	26	30	-	-	2.7	9.9	40	2.68	15	N/A	N/A
14.76	37.7	43.3	-	37.6	2.2	-1.1	5.9	3	silty CLAY to CLAY	115	1.5	25	29	-	-	2.6	9.9	41	2.71	15	N/A	N/A
14.93	41.3	46.9	-	41.2	2.3	-1.3	5.7	3	silty CLAY to CLAY	115	1.5	28	31	-	-	2.9	9.9	39	2.68	15	N/A	N/A
15.09	41.4	46.6	-	41.4	2.3	-1.3	5.7	3	silty CLAY to CLAY	115	1.5	28	31	-	-	2.9	9.9	39	2.68	15	N/A	N/A
15.26	37.4	41.6	-	37.4	2.2	0.6	6.0	3	silty CLAY to CLAY	115	1.5	25	28	-	-	2.6	9.9	42	2.73	15	N/A	N/A
15.42	36.0	39.6	-	36.0	1.9	1.2	5.4	3	silty CLAY to CLAY	115	1.5	24	26	-	-	2.5	9.9	41	2.71	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(042).cpt
CPT Date: 9/29/2017 1:22:06 PM
GW During Test: 23 ft

Sounding ID: CPT-10
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	35.6	38.9	-	35.7	1.8	1.2	5.3	3	silty CLAY to CLAY	115	1.5	24	26	-	-	2.5	9.9	41	2.71	15	N/A	N/A
15.75	33.2	35.8	-	33.2	1.8	0.9	5.6	3	silty CLAY to CLAY	115	1.5	22	24	-	-	2.3	9.9	44	2.76	15	N/A	N/A
15.91	32.4	34.6	-	32.4	1.7	0.5	5.5	3	silty CLAY to CLAY	115	1.5	22	23	-	-	2.2	9.9	44	2.76	15	N/A	N/A
16.08	30.5	32.2	-	30.5	1.7	0.1	5.8	3	silty CLAY to CLAY	115	1.5	20	21	-	-	2.1	9.9	46	2.80	15	N/A	N/A
16.24	31.8	33.3	-	31.8	1.7	0.1	5.5	3	silty CLAY to CLAY	115	1.5	21	22	-	-	2.2	9.9	45	2.78	15	N/A	N/A
16.40	33.3	34.5	-	33.3	1.7	0.9	5.4	3	silty CLAY to CLAY	115	1.5	22	23	-	-	2.3	9.9	43	2.75	15	N/A	N/A
16.57	32.6	33.5	-	32.5	1.7	-5.7	5.4	3	silty CLAY to CLAY	115	1.5	22	22	-	-	2.2	9.9	44	2.76	15	N/A	N/A
16.73	32.1	32.7	-	32.0	1.7	-5.9	5.4	3	silty CLAY to CLAY	115	1.5	21	22	-	-	2.2	9.9	44	2.77	15	N/A	N/A
16.90	32.8	33.1	-	32.7	1.8	-5.7	5.5	3	silty CLAY to CLAY	115	1.5	22	22	-	-	2.2	9.9	45	2.78	15	N/A	N/A
17.06	33.1	33.1	-	33.0	1.8	-5.5	5.6	3	silty CLAY to CLAY	115	1.5	22	22	-	-	2.3	9.9	45	2.78	15	N/A	N/A
17.23	34.1	33.7	-	34.0	1.8	-5.4	5.4	3	silty CLAY to CLAY	115	1.5	23	22	-	-	2.3	9.9	44	2.76	15	N/A	N/A
17.39	34.7	34.0	-	34.6	1.8	-5.4	5.4	3	silty CLAY to CLAY	115	1.5	23	23	-	-	2.4	9.9	44	2.76	15	N/A	N/A
17.55	35.1	34.1	-	35.0	1.9	-5.3	5.6	3	silty CLAY to CLAY	115	1.5	23	23	-	-	2.4	9.9	44	2.77	15	N/A	N/A
17.72	36.2	34.8	-	36.1	1.9	-3.3	5.5	3	silty CLAY to CLAY	115	1.5	24	23	-	-	2.5	9.9	44	2.76	15	N/A	N/A
17.88	45.7	43.5	-	45.6	2.1	-1.9	4.7	4	clayy SILT to silty CLAY	115	2.0	23	22	-	-	3.2	9.9	37	2.64	15	N/A	N/A
18.05	63.9	60.4	143.6	63.9	2.0	0.4	3.2	4	clayy SILT to silty CLAY	115	2.0	32	30	-	-	4.4	9.9	27	2.42	15	N/A	N/A
18.21	87.6	82.4	127.0	87.6	1.5	0.5	1.8	5	silty SAND to sandy SILT	120	3.0	29	27	61	39	-	-	17	2.14	16	N/A	N/A
18.37	96.9	90.7	110.6	96.9	0.9	0.5	0.9	6	clean SAND to silty SAND	125	5.0	19	18	64	40	-	-	11	1.93	16	N/A	N/A
18.54	97.8	91.0	108.5	97.8	0.8	0.5	0.9	6	clean SAND to silty SAND	125	5.0	20	18	64	40	-	-	10	1.90	16	N/A	N/A
18.70	113.8	105.5	118.3	113.8	0.9	0.5	0.8	6	clean SAND to silty SAND	125	5.0	23	21	69	41	-	-	9	1.82	16	N/A	N/A
18.87	124.1	114.5	145.8	124.2	1.8	0.6	1.5	6	clean SAND to silty SAND	125	5.0	25	23	71	41	-	-	12	1.98	16	N/A	N/A
19.03	118.8	109.1	140.3	118.8	1.7	0.6	1.4	6	clean SAND to silty SAND	125	5.0	24	22	70	41	-	-	13	1.99	16	N/A	N/A
19.19	96.6	88.3	118.8	96.6	1.3	0.6	1.3	5	silty SAND to sandy SILT	120	3.0	32	29	63	40	-	-	14	2.03	16	N/A	N/A
19.36	82.3	74.9	109.7	82.3	1.1	0.6	1.4	5	silty SAND to sandy SILT	120	3.0	27	25	57	39	-	-	16	2.11	16	N/A	N/A
19.52	62.7	56.8	124.3	62.7	1.6	0.6	2.5	5	silty SAND to sandy SILT	120	3.0	21	19	48	37	-	-	25	2.37	16	N/A	N/A
19.69	48.0	43.3	137.8	48.0	1.8	0.6	3.8	4	clayy SILT to silty CLAY	115	2.0	24	22	-	-	3.3	9.9	34	2.58	15	N/A	N/A
19.85	44.9	38.5	-	45.0	1.7	0.5	3.8	4	clayy SILT to silty CLAY	115	2.0	22	19	-	-	3.1	9.9	36	2.62	15	N/A	N/A
20.01	48.2	43.1	113.0	48.2	1.2	0.2	2.6	4	clayy SILT to silty CLAY	115	2.0	24	22	-	-	3.3	9.9	29	2.47	15	N/A	N/A
20.18	47.4	42.2	100.2	47.4	1.0	0.5	2.1	5	silty SAND to sandy SILT	120	3.0	16	14	39	35	-	-	27	2.41	16	N/A	N/A
20.34	35.4	29.6	-	35.4	0.9	0.5	2.8	4	clayy SILT to silty CLAY	115	2.0	18	15	-	-	2.4	9.4	36	2.61	15	N/A	N/A
20.51	25.4	21.0	-	25.4	1.2	0.5	4.9	3	silty CLAY to CLAY	115	1.5	17	14	-	-	1.7	6.6	51	2.89	15	N/A	N/A
20.67	23.7	19.5	-	23.7	1.2	0.4	5.4	3	silty CLAY to CLAY	115	1.5	16	13	-	-	1.6	6.1	55	2.94	15	N/A	N/A
20.83	27.2	22.2	-	27.2	1.3	0.4	4.9	3	silty CLAY to CLAY	115	1.5	18	15	-	-	1.8	7.0	50	2.87	15	N/A	N/A
21.00	32.6	26.4	-	32.6	1.1	-0.2	3.6	4	clayy SILT to silty CLAY	115	2.0	16	13	-	-	2.2	8.4	42	2.72	15	N/A	N/A
21.16	42.9	37.3	112.8	42.9	1.2	0.0	2.9	4	clayy SILT to silty CLAY	115	2.0	21	19	-	-	2.9	9.9	33	2.55	15	N/A	N/A
21.33	55.1	47.8	124.3	55.1	1.6	-0.1	2.9	4	clayy SILT to silty CLAY	115	2.0	28	24	-	-	3.8	9.9	29	2.47	15	N/A	N/A
21.49	49.8	43.1	123.4	49.8	1.5	0.2	3.1	4	clayy SILT to silty CLAY	115	2.0	25	22	-	-	3.4	9.9	32	2.52	15	N/A	N/A
21.65	51.2	44.1	127.8	51.2	1.6	0.1	3.3	4	clayy SILT to silty CLAY	115	2.0	26	22	-	-	3.5	9.9	32	2.53	15	N/A	N/A
21.82	51.4	44.1	137.6	51.4	1.9	0.2	3.7	4	clayy SILT to silty CLAY	115	2.0	26	22	-	-	3.5	9.9	34	2.56	15	N/A	N/A
21.98	48.4	37.5	-	48.4	2.0	0.3	4.2	4	clayy SILT to silty CLAY	115	2.0	24	19	-	-	3.3	9.9	38	2.65	15	N/A	N/A
22.15	59.1	50.3	127.6	59.1	1.7	0.0	2.9	4	clayy SILT to silty CLAY	115	2.0	30	25	-	-	4.1	9.9	29	2.45	15	N/A	N/A
22.31	86.3	73.2	122.8	86.3	1.6	0.1	1.9	5	silty SAND to sandy SILT	120	3.0	29	24	57	38	-	-	19	2.20	16	N/A	N/A
22.47	101.2	85.6	126.4	101.2	1.7	0.3	1.7	5	silty SAND to sandy SILT	120	3.0	34	29	62	39	-	-	16	2.11	16	N/A	N/A
22.64	98.6	83.1	125.5	98.6	1.7	0.4	1.7	5	silty SAND to sandy SILT	120	3.0	33	28	61	39	-	-	17	2.13	16	N/A	N/A
22.80	88.3	74.1	120.4	88.3	1.6	0.4	1.8	5	silty SAND to sandy SILT	120	3.0	29	25	57	38	-	-	18	2.18	16	N/A	N/A
22.97	77.6	64.9	124.6	77.6	1.7	0.4	2.3	5	silty SAND to sandy SILT	120	3.0	26	22	53	37	-	-	22	2.29	16	N/A	N/A
23.13	73.3	61.2	129.9	73.3	1.9	0.4	2.6	5	silty SAND to sandy SILT	120	3.0	24	20	51	37	-	-	24	2.35	16	0.51	2.6
23.30	69.3	57.7	125.4	69.3	1.7	0.4	2.5	5	silty SAND to sandy SILT	120	3.0	23	19	49	37	-	-	25	2.36	16	0.72	4.1
23.46	53.9	44.9	121.7	53.9	1.5	0.4	2.9	4	clayy SILT to silty CLAY	115	2.0	27	22	-	-	3.7	9.9	30	2.49	15	0.97	48.8
23.62	44.5	32.5	-	44.5	1.7	0.4	4.1	4	clayy SILT to silty CLAY	115	2.0	22	16	-	-	3.0	9.9	40	2.69	15	-	-
23.79	47.5	34.6	-	47.5	1.6	0.5	3.4	4	clayy SILT to silty CLAY	115	2.0	24	17	-	-	3.3	9.9	36	2.62	15	-	-
23.95	59.2	49.0	100.4	59.2	1.1	0.4	1.9	5	silty SAND to sandy SILT	120	3.0	20	16	43	36	-	-	24	2.33	16	2.33	45.3
24.12	51.6	42.7	89.7	51.6	0.8	0.4	1.7	5	silty SAND to sandy SILT	120	3.0	17	14	39	35	-	-	24	2.34	16	2.56	51.2
24.28	44.2	36.5	103.9	44.2	1.1	0.4	2.5	4	clayy SILT to silty CLAY	115	2.0	22	18	-	-	3.0	9.9	31	2.52	15	2.26	51.2
24.44	35.7	25.6	-	35.7	1.0	0.3	2.9	4	clayy SILT to silty CLAY	115	2.0	18	13	-	-	2.4	8.1	39	2.68	15	-	-
24.61	33.4	24.0	-	33.4	0.9	-0.1	2.8	4	clayy SILT to silty CLAY	115	2.0	17	12	-	-	2.3	7.6	40	2.69	15	-	-
24.77	35.6	25.5	-	35.6	0.9	-0.3	2.7	4	clayy SILT to silty CLAY	115	2.0	18	13	-	-	2.4	8.1	38	2.66	15	-	-
24.94	32.2	23.0	-	32.2	1.1	0.0	3.6	4	clayy SILT to silty CLAY	115	2.0	16	11	-	-	2.2	7.2	45	2.78	15	-	-
25.10	33.0	23.4	-	33.0	1.2	0.1	3.7	4	clayy SILT to silty CLAY	115	2.0	16	12	-	-	2.2	7.4	44	2.77	15	-	-
25.26	33.8	23.9	-	33.8	1.1	0.4	3.3	4	clayy SILT to silty CLAY	115	2.0	17	12	-	-	2.3	7.5	43	2.74	15	-	-
25.43	40.3	28.5	-	40.3	1.1	-0.2	2.8	4	clayy SILT to silty CLAY	115	2.0	20	14	-	-	2.7	9.0	37	2.63	15	-	-
25.59	29.3	20.6	-	29.3	1.2	0.2	4.3	3	silty CLAY to CLAY	115	1.5	20	14	-	-	2.0	6.4	49	2.86	15	-	-
25.76	20.9	14.7	-	20.9	1.1	0.3	5.4	3	silty CLAY to CLAY	115	1.5	14	10	-	-	1.4	4.5	62	3.05	15	-	-
25.92	21.7	15.2	-	21.7	0.9	0.5	4.5	3	silty CLAY to CLAY	115	1.5	14	10	-	-	1.4	4.7	57	2.98	15	-	-
26.08	31.9	22.3	-	31.9	0.8	0.5	2.8	4	clayy SILT to silty CLAY	115	2.0	16	11	-	-	2.2	7.0	41	2.71	15	-	-
26.25	49.5	40.1	90.2	49.5	0.8	0.5	1.8	5	silty SAND to sandy SILT	120	3.0	17	13	37	34	-	-	26	2.38	16	2.54	51.2
26.41	64.4	52.0	90.2	64.4	0.9	0.3	1.4	5	silty SAND to sandy SILT	120	3.0	21	17	45	36	-	-	20	2.23	16	2.54	41.9
26.58	78.5	63.4	100.0	78.5	1.1	0.3	1.4	5	silty SAND to sandy SILT	120	3.0	26	21	52	37	-	-	18	2.16	16	2.34	31.9
26.74	112.7	90.9	124.1	112.8	1.6	0.4	1.4	5	silty SAND to sandy SILT	120	3.0	38	30	64	39	-	-	14	2.05	16	1.19	5.5
26.90	150.1	120.8	154.2	150.1	2.3	0.5	1.5	6	clean SAND to silty SAND	125	5.0	30	24	73	41	-	-	12	1.98	16	0.18	1.3
27.07	216.0	173.6	193.5	216.0	2.7	0.6	1.3	6	clean SAND to silty SAND	125	5.0	43	35	85	43	-	-	8	1.81	16	0.00	0.0
27.23	257.6	206.6	214.6	257.7	2.7	0.7	1.1	6	clean SAND to silty SAND	125	5.0	52	41	91	43	-	-	6	1.70	16	0.00	0.0
27.40	283.6	227.1	236.3	283.6	3.3	0.7	1.2	6	clean SAND to silty SAND	125	5.0	57	45	94	44	-	-	6	1.70	16	0.00	0.0
27.56	292.9	234.0	248.9	292.9	3.9	0.6	1.3	6	clean SAND to silty SAND	125	5.0	59	47	95	44	-	-	7	1.74	16	0.00	0.0
27.72	312.6	249.4	266.6	312.6	4.4	0.5	1.4	6	clean SAND to silty SAND	125	5.0	63	50	95	44	-	-	7	1.75	16	0.00	0.0
27.89	323.4	257.5	274.6	323.4	4.7	0.5	1.5	6	clean SAND to silty SAND	125	5.0	65	52	95	44	-	-	7	1.74	16	0.00	0.0
28.05	334.1	265.6	279.1	334.1	4.6	0.5	1.4	6	clean SAND to silty SAND	125	5.0	67	53	95	45	-	-	6	1.72	16	0.00	0.0
28.22	340.4	270.2	284.5	340.4	4.8	0.5	1.4	6	clean SAND to silty SAND	125	5.0	68	54	95	45	-	-	7	1.72	16	0.00	0.0
28.38	341.6	270.6	284.8	341.6	4.8	0.6	1.4	6	clean SAND to silty SAND	125	5.0	68	54	95	45	-	-	7	1.72	16	0.00	0.0
28.54	339.4	268.5	282.0	339.4	4.7	0.6	1.4	6	clean SAND to silty SAND	125	5.0	68	54	95	45	-	-	6	1.72	16	0.00	0.0
28.71	355.4	280.7	287.0	355.4	4.5	0.6	1.3	6	clean SAND to silty SAND	125	5.0	71	56	95	45	-	-	6	1.68	16	0.00	0.0
28.87	372.0	293.3	295.0	372.0	4.6	0.5	1.2	6	clean SAND to silty SAND	125	5.0	74	59	95	45	-	-	5	1.65	16	0.00	0.0
29.04	387.8	305.1	305.1	387.8	4.3	0.5	1.1	6	clean SAND to silty SAND	125	5.0	78	61	95	45	-	-	5	1.60	16	0.00	0.0
29.20	397.7	312.4	312.4	397.7	4.2	0.4	1.1	6	clean SAND to silty SAND	125	5.0	80	62	95	45	-	-	5	1.58	16	0.00	0.0
29.36	392.7	308.0	308.0	392.7	4.5	0.4	1.1	6	clean SAND to silty SAND	125	5.0	79	62	95	45	-	-	5	1.61	16	0.00	0.0
29.53	369.9	289.7	293.8	369.9	4.7	0.5	1.3	6	clean SAND to silty SAND	125	5.0	74	58	95	45	-	-	5	1.67	16	0.00	0.0
29.69	328.3	256.7	270.2	328.3	4.5	0.3	1.4	6	clean SAND to silty SAND	125	5.0	66	51	95	44	-	-	7	1.72	16	0.00	0.0
29.86	293.6	229.1	246.3	293.6	4.0	0.4	1.4	6	clean SAND to silty SAND	125	5.0	59	46	94	44	-	-	7	1.76	16	0.00	0.0
30.02	275.0	214.3	237.0	275.0	4.0	0.4	1.5	6	clean SAND to silty SAND	125	5.0	55	43	92	43	-	-	8	1.80	16	0.00	0.0
30.19	305.7	237.8	253.9	305.7	4.2	0.3	1.4	6	clean SAND to silty SAND	125	5.0	61	48	95	44	-	-	7	1.74	16	0.00	0.0
30.35	354.8	275.5	285.9	354.8	4.8	0.2	1.4	6	clean SAND to silty SAND	125	5.0	71	55	95	45	-	-	6	1.70	16	0.00	0.0
30.51	355.7	275.8	282.0	355.7	4.5	0.2	1.3	6	clean SAND to silty SAND	125	5.0	71	55	95	45	-	-	6	1.68	16	0.00	0.0
30.68	359.3	278.1	278.1	359.3	3.6	-0.2	1.0	6	clean SAND to silty SAND	125	5.0	72	56	95	45	-	-	5	1.59	16	0.00	0.0
30.84	322.4	249.1	249.1	322.3	2.5	-0.9	0.8	6	clean SAND to silty SAND	125	5.0	64	50	95	44	-	-	5	1.55	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
31.01	332.5	256.5	266.7	332.4	4.3	-1.1	1.3	6	clean SAND to silty SAND	125	5.0	66	51	95	44	-	-	6	1.70	16	0.00	0.0
31.17	349.2	269.0	300.4	349.2	6.4	-0.9	1.8	6	clean SAND to silty SAND	125	5.0	70	54	95	44	-	-	8	1.81	16	0.00	0.0
31.33	332.7	255.9	285.5	332.8	5.8	0.4	1.8	6	clean SAND to silty SAND	125	5.0	67	51	95	44	-	-	8	1.81	16	0.00	0.0
31.50	242.6	186.2	222.8	242.5	4.4	-1.5	1.8	6	clean SAND to silty SAND	125	5.0	49	37	88	43	-	-	11	1.91	16	0.00	0.0
31.66	247.8	190.0	196.4	247.8	2.4	-1.5	1.0	6	clean SAND to silty SAND	125	5.0	50	38	88	43	-	-	6	1.69	16	0.00	0.0
31.83	250.1	191.4	191.4	250.1	2.0	-1.5	0.8	6	clean SAND to silty SAND	125	5.0	50	38	88	43	-	-	5	1.64	16	0.00	0.0
31.99	247.3	188.9	188.9	247.2	1.7	-2.0	0.7	6	clean SAND to silty SAND	125	5.0	49	38	88	43	-	-	5	1.61	16	0.00	0.0
32.15	249.2	190.1	192.6	249.2	2.1	-2.0	0.9	6	clean SAND to silty SAND	125	5.0	50	38	88	43	-	-	5	1.66	16	0.00	0.0
32.32	266.7	203.2	203.2	266.7	2.1	-2.0	0.8	6	clean SAND to silty SAND	125	5.0	53	41	90	43	-	-	5	1.61	16	0.00	0.0
32.48	330.1	251.0	258.9	330.0	4.0	-1.3	1.2	6	clean SAND to silty SAND	125	5.0	66	50	95	44	-	-	6	1.69	16	0.00	0.0
32.65	361.8	274.7	279.3	361.8	4.4	-1.9	1.2	6	clean SAND to silty SAND	125	5.0	72	55	95	45	-	-	6	1.67	16	0.00	0.0
32.81	353.3	267.9	272.6	353.3	4.3	-1.4	1.2	6	clean SAND to silty SAND	125	5.0	71	54	95	44	-	-	6	1.67	16	0.00	0.0
32.97	300.7	227.6	243.4	300.7	4.0	-1.3	1.3	6	clean SAND to silty SAND	125	5.0	60	46	94	44	-	-	7	1.75	16	0.00	0.0
33.14	318.4	240.6	240.6	318.4	3.1	-0.7	1.0	6	clean SAND to silty SAND	125	5.0	64	48	95	44	-	-	5	1.63	16	0.00	0.0
33.30	349.9	264.0	264.0	349.9	2.9	-0.1	0.8	6	clean SAND to silty SAND	125	5.0	70	53	95	44	-	-	5	1.56	16	0.00	0.0
33.47	385.8	290.7	290.7	385.8	3.0	-0.3	0.8	6	clean SAND to silty SAND	125	5.0	77	58	95	45	-	-	5	1.50	16	0.00	0.0
33.63	393.2	295.8	295.8	393.2	4.3	-0.2	1.1	6	clean SAND to silty SAND	125	5.0	79	59	95	45	-	-	5	1.61	16	0.00	0.0
33.79	387.8	291.3	292.6	387.8	4.7	-0.3	1.2	6	clean SAND to silty SAND	125	5.0	78	58	95	45	-	-	5	1.65	16	0.00	0.0
33.96	352.9	264.6	264.6	352.9	3.5	0.2	1.0	6	clean SAND to silty SAND	125	5.0	71	53	95	44	-	-	5	1.61	16	0.00	0.0
34.12	305.5	228.7	253.6	305.5	4.8	0.3	1.6	6	clean SAND to silty SAND	125	5.0	61	46	94	44	-	-	8	1.80	16	0.00	0.0
34.29	260.5	194.8	212.7	260.5	3.3	-1.5	1.3	6	clean SAND to silty SAND	125	5.0	52	39	89	43	-	-	8	1.78	16	0.00	0.0
34.45	253.4	189.2	213.9	253.4	3.7	-1.3	1.5	6	clean SAND to silty SAND	125	5.0	51	38	88	43	-	-	9	1.83	16	0.00	0.0
34.61	275.1	205.0	224.4	275.1	3.7	-0.9	1.4	6	clean SAND to silty SAND	125	5.0	55	41	91	43	-	-	8	1.78	16	0.00	0.0
34.78	288.7	214.9	240.2	288.7	4.5	-1.1	1.6	6	clean SAND to silty SAND	125	5.0	58	43	92	43	-	-	8	1.82	16	0.00	0.0
34.94	401.0	298.0	298.0	401.0	2.8	-1.8	0.7	6	clean SAND to silty SAND	125	5.0	80	60	95	45	-	-	5	1.46	16	0.00	0.0
35.11	362.0	268.6	268.6	362.0	2.2	-1.7	0.6	6	clean SAND to silty SAND	125	5.0	72	54	95	44	-	-	5	1.45	16	0.00	0.0
35.27	281.8	208.8	227.5	281.7	3.8	-1.4	1.4	6	clean SAND to silty SAND	125	5.0	56	42	91	43	-	-	8	1.78	16	0.00	0.0
35.43	193.0	142.8	183.3	192.9	3.5	-1.5	1.8	6	clean SAND to silty SAND	125	5.0	39	29	79	41	-	-	13	1.99	16	0.00	0.0
35.60	102.0	75.4	164.6	102.0	3.3	-1.4	3.3	4	clayy SILT to silty CLAY	115	2.0	51	38	-	-	7.1	9.9	25	2.37	15	0.00	0.0
35.76	55.2	31.8	-	55.2	2.1	-1.2	3.9	4	clayy SILT to silty CLAY	115	2.0	28	16	-	-	3.8	9.9	40	2.69	15	-	-
35.93	30.1	17.3	-	30.1	1.3	-1.1	4.8	3	silty CLAY to CLAY	115	1.5	20	12	-	-	2.0	5.3	56	2.96	15	-	-
36.09	29.1	16.7	-	29.1	0.9	-0.8	3.3	3	silty CLAY to CLAY	115	1.5	19	11	-	-	1.9	5.1	50	2.86	15	-	-
36.26	29.8	17.1	-	29.8	0.9	-1.0	3.2	3	silty CLAY to CLAY	115	1.5	20	11	-	-	2.0	5.2	49	2.85	15	-	-
36.42	32.3	18.5	-	32.3	0.9	-1.0	3.0	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.2	5.7	46	2.80	15	-	-
36.58	35.8	20.4	-	35.8	0.6	-0.9	1.8	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.4	6.3	37	2.64	15	-	-
36.75	39.1	22.2	-	39.1	0.8	-0.9	2.1	4	clayy SILT to silty CLAY	115	2.0	20	11	-	-	2.6	6.9	38	2.64	15	-	-
36.91	37.3	21.2	-	37.3	0.6	-0.6	1.8	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.5	6.6	37	2.63	15	-	-
37.08	37.9	21.4	-	37.8	0.7	-0.4	1.8	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.5	6.7	37	2.62	15	-	-
37.24	35.4	20.0	-	35.4	0.7	-0.4	2.0	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.4	6.2	39	2.67	15	-	-
37.40	33.1	18.7	-	33.1	0.7	-0.4	2.2	4	clayy SILT to silty CLAY	115	2.0	17	9	-	-	2.2	5.7	42	2.73	15	-	-
37.57	32.0	18.0	-	32.0	0.7	-0.3	2.3	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.1	5.5	43	2.75	15	-	-
37.73	35.5	19.9	-	35.5	0.7	0.1	2.2	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.4	6.1	41	2.70	15	-	-
37.90	37.8	21.1	-	37.8	0.9	0.1	2.5	4	clayy SILT to silty CLAY	115	2.0	19	11	-	-	2.5	6.6	41	2.71	15	-	-
38.06	42.0	23.4	-	42.0	1.0	0.3	2.6	4	clayy SILT to silty CLAY	115	2.0	21	12	-	-	2.8	7.3	39	2.68	15	-	-
38.22	52.6	38.1	96.7	52.6	1.1	0.3	2.1	5	silty SAND to sandy SILT	120	3.0	18	13	35	33	-	-	29	2.45	16	2.40	51.2
38.39	66.8	48.3	103.1	66.8	1.3	0.4	2.0	5	silty SAND to sandy SILT	120	3.0	22	16	43	35	-	-	25	2.35	16	2.28	46.1
38.55	63.8	46.1	99.0	63.8	1.2	0.7	1.9	5	silty SAND to sandy SILT	120	3.0	21	15	41	34	-	-	25	2.36	16	2.36	48.7
38.72	45.0	24.8	-	45.0	1.0	0.9	2.3	4	clayy SILT to silty CLAY	115	2.0	23	12	-	-	3.1	7.8	36	2.62	15	-	-
38.88	35.1	19.3	-	35.1	0.9	0.9	2.8	4	clayy SILT to silty CLAY	115	2.0	18	10	-	-	2.4	6.0	44	2.77	15	-	-
39.04	50.7	27.9	-	50.7	1.4	0.9	2.8	4	clayy SILT to silty CLAY	115	2.0	25	14	-	-	3.5	8.8	37	2.64	15	-	-
39.21	72.7	52.3	126.1	72.7	1.9	0.9	2.8	5	silty SAND to sandy SILT	120	3.0	24	17	46	35	-	-	27	2.42	16	1.35	30.4
39.37	92.4	66.3	138.8	92.4	2.4	-1.2	2.7	5	silty SAND to sandy SILT	120	3.0	31	22	53	37	-	-	24	2.34	16	0.65	4.0
39.54	75.5	41.2	-	75.4	2.9	-2.8	3.9	4	clayy SILT to silty CLAY	115	2.0	38	21	-	-	5.2	9.9	36	2.61	15	-	-
39.70	63.2	34.4	-	63.2	2.9	-3.2	4.8	3	silty CLAY to CLAY	115	1.5	42	23	-	-	4.3	9.9	42	2.72	15	-	-
39.86	71.7	38.9	-	71.7	3.1	-3.1	4.5	4	clayy SILT to silty CLAY	115	2.0	36	19	-	-	4.9	9.9	39	2.67	15	-	-
40.03	96.1	68.7	158.7	96.0	3.2	-3.3	3.4	4	clayy SILT to silty CLAY	115	2.0	48	34	-	-	6.7	9.9	26	2.40	15	0.19	0.7
40.19	86.1	61.5	134.5	86.1	2.3	-3.8	2.7	5	silty SAND to sandy SILT	120	3.0	29	20	51	36	-	-	25	2.37	16	0.89	6.3
40.36	55.4	29.8	-	55.3	1.6	-4.7	3.1	4	clayy SILT to silty CLAY	115	2.0	28	15	-	-	3.8	9.4	38	2.64	15	-	-
40.52	46.5	25.0	-	46.5	1.6	-4.4	3.7	4	clayy SILT to silty CLAY	115	2.0	23	13	-	-	3.2	7.8	43	2.75	15	-	-
40.68	63.0	44.8	114.5	62.9	1.6	-4.2	2.6	5	silty SAND to sandy SILT	120	3.0	21	15	41	34	-	-	29	2.46	16	2.04	50.3
40.85	143.0	101.6	124.9	142.9	1.6	-4.1	1.1	6	clean SAND to silty SAND	125	5.0	29	20	68	39	-	-	11	1.94	16	1.60	8.4
41.01	166.4	118.0	141.2	166.3	1.9	-4.8	1.2	6	clean SAND to silty SAND	125	5.0	33	24	72	40	-	-	11	1.91	16	0.70	3.4
41.18	156.0	110.5	144.2	155.9	2.3	-6.4	1.5	6	clean SAND to silty SAND	125	5.0	31	22	70	39	-	-	13	2.00	16	0.56	2.9
41.34	125.9	89.1	161.9	125.8	3.4	-7.9	2.8	5	silty SAND to sandy SILT	120	3.0	42	30	63	38	-	-	21	2.26	16	0.00	0.0
41.50	75.0	39.7	-	74.8	3.3	-7.8	4.6	4	clayy SILT to silty CLAY	115	2.0	37	20	-	-	5.2	9.9	38	2.66	15	-	-
41.67	44.9	23.7	-	44.7	1.9	-7.8	4.4	3	silty CLAY to CLAY	115	1.5	30	16	-	-	3.0	7.4	47	2.82	15	-	-
41.83	33.6	17.7	-	33.4	1.4	-7.7	4.6	3	silty CLAY to CLAY	115	1.5	22	12	-	-	2.2	5.4	54	2.94	15	-	-
42.00	42.4	22.3	-	42.3	1.3	-7.5	3.2	4	clayy SILT to silty CLAY	115	2.0	21	11	-	-	2.9	6.9	43	2.75	15	-	-
42.16	40.1	21.0	-	39.9	1.4	-7.6	3.7	3	silty CLAY to CLAY	115	1.5	27	14	-	-	2.7	6.5	47	2.82	15	-	-
42.32	48.4	25.3	-	48.3	1.2	-7.6	2.7	4	clayy SILT to silty CLAY	115	2.0	24	13	-	-	3.3	7.9	39	2.66	15	-	-
42.49	69.1	36.1	-	69.0	2.2	-7.5	3.4	4	clayy SILT to silty CLAY	115	2.0	35	18	-	-	4.7	9.9	35	2.60	15	-	-
42.65	92.6	64.9	139.7	92.4	2.5	-7.6	2.8	5	silty SAND to sandy SILT	120	3.0	31	22	53	36	-	-	25	2.36	16	0.64	3.9
42.82	151.9	106.3	147.1	151.7	2.6	-7.5	1.7	5	silty SAND to sandy SILT	120	3.0	51	35	69	39	-	-	15	2.06	16	0.47	2.6
42.98	190.3	133.0	167.2	190.1	3.0	-7.4	1.6	6	clean SAND to silty SAND	125	5.0	38	27	76	40	-	-	12	1.96	16	0.00	0.0
43.15	202.5	141.4	174.8	202.4	3.2	-7.4	1.6	6	clean SAND to silty SAND	125	5.0	41	28	78	41	-	-	12	1.95	16	0.00	0.0
43.31	220.1	153.5	172.9	219.9	2.6	-7.4	1.2	6	clean SAND to silty SAND	125	5.0	44	31	81	41	-	-	9	1.83	16	0.00	0.0
43.47	206.8	144.0	156.4	206.7	1.9	-7.4	0.9	6	clean SAND to silty SAND	125	5.0	41	29	79	41	-	-	8	1.77	16	0.29	2.1
43.64	215.2	149.7	170.2	215.1	2.6	-7.3	1.2	6	clean SAND to silty SAND	125	5.0	43	30	80	41	-	-	9	1.84	16	0.00	0.0
43.80	250.1	173.7	192.6	249.9	3.1	-7.1	1.2	6	clean SAND to silty SAND	125	5.0	50	35	85	42	-	-	8	1.80	16	0.00	0.0
43.97	303.4	210.5	213.1	303.3	2.9	-7.1	1.0	6	clean SAND to silty SAND	125	5.0	61	42	92	43	-	-	5	1.66	16	0.00	0.0
44.13	332.8	230.6	230.6	332.7	2.4	-7.0	0.7	6	clean SAND to silty SAND	125	5.0	67	46	95	43	-	-	5	1.55	16	0.00	0.0
44.29	346.7	239.9	239.9	346.6	2.4	-7.0	0.7	6	clean SAND to silty SAND	125	5.0	69	48	95	43	-	-	5	1.53	16	0.00	0.0
44.46	343.8	237.6	237.6	343.7	2.6	-6.9	0.8	6	clean SAND to silty SAND	125	5.0	69	48	95	43	-	-	5	1.56	16	0.00	0.0
44.62	339.3	234.1	234.1	339.1	2.9	-6.7	0.9	6	clean SAND to silty SAND	125	5.0	68	47	95	43	-	-	5	1.60	16	0.00	0.0
44.79	325.1	224.1	234.3	325.0	3.8	-6.6	1.2	6	clean SAND to silty SAND	125	5.0	65	45	94	43	-	-	6	1.71	16	0.00	0.0
44.95	300.9	207.1	215.9	300.8	3.2	-6.5	1.1	6	clean SAND to silty SAND	125	5.0	60	41	91	43	-	-	6	1.71	16	0.00	0.0
45.11	267.3	183.8	190.2	267.2	2.5	-6.3	0.9	6	clean SAND to silty SAND	125	5.0	53	37	87	42	-	-	6	1.70	16	0.00	0.0
45.28	250.3	171.8	178.5	250.2	2.2	-6.3	0.9	6	clean SAND to silty SAND	125	5.0	50	34	85	42	-	-	6	1.70	16	0.00	0.0
45.44	238.8	163.7	171.5	238.7	2.1	-6.2	0.9	6	clean SAND to silty SAND	125	5.0	48	33	83	41	-	-	6	1.71	16	0.00	0.0
45.61	251.9	172.5	180.7	251.7	2.3	-6.3	0.9	6	clean SAND to silty SAND	125	5.0	50	34	85	42	-	-	6	1.71	16	0.00	0.0
45.77	269.7	184.5	199.9	269.6	3.1	-6.4	1.2	6	clean SAND to silty SAND	125	5.0	54	37	87	42	-	-	7	1.77	16	0.00	0.0
45.93	294.8	201.3	217.5	294.6	3.7	-6.4	1.3	6	clean SAND to silty SAND	125	5.0	59	40	90	42	-	-	7	1.76	16	0.00	0.0
46.10	295.9	201.9	215.1	295.8	3.5	-6.3	1.2	6	clean SAND to silty SAND	125	5.0	59	40	90	42	-	-	7	1.74	16	0.00	0.0
46.26	290.0	197.6	212.1	289.9	3.4	-6.3	1.2	6	clean SAND to silty SAND	125	5.0	58	40	89	42	-	-	7	1.75	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(042).cpt
CPT Date: 9/29/2017 1:22:06 PM
GW During Test: 23 ft

Sounding ID: CPT-10
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
46.43	291.8	198.6	215.4	291.6	3.7	-6.3	1.3	6	clean SAND to silty SAND	125	5.0	58	40	90	42	-	-	7	1.77	16	0.00	0.0
46.59	302.9	205.9	219.2	302.8	3.6	-6.2	1.2	6	clean SAND to silty SAND	125	5.0	61	41	91	43	-	-	7	1.74	16	0.00	0.0
46.75	327.0	222.0	225.2	326.9	3.3	-6.7	1.0	6	clean SAND to silty SAND	125	5.0	65	44	93	43	-	-	5	1.67	16	0.00	0.0
46.92	353.7	239.8	239.8	353.6	2.3	-7.0	0.7	6	clean SAND to silty SAND	125	5.0	71	48	95	43	-	-	5	1.51	16	0.00	0.0
47.08	353.6	239.4	239.4	353.4	1.7	-6.9	0.5	6	clean SAND to silty SAND	125	5.0	71	48	95	43	-	-	5	1.43	16	0.00	0.0
47.25	325.6	220.2	220.2	325.5	1.7	-6.9	0.5	6	clean SAND to silty SAND	125	5.0	65	44	93	43	-	-	5	1.48	16	0.00	0.0
47.41	285.7	193.0	193.0	285.6	1.6	-6.8	0.6	6	clean SAND to silty SAND	125	5.0	57	39	89	42	-	-	5	1.54	16	0.00	0.0
47.57	213.4	143.9	155.4	213.2	1.9	-6.7	0.9	6	clean SAND to silty SAND	125	5.0	43	29	79	41	-	-	7	1.76	16	0.33	2.3
47.74	134.5	90.6	134.6	134.4	2.3	-6.6	1.8	5	silty SAND to sandy SILT	120	3.0	45	30	64	38	-	-	16	2.12	16	1.06	5.6
47.90	65.2	43.9	117.5	65.1	1.7	-6.8	2.7	4	clayy SILT to silty CLAY	115	2.0	33	22	-	-	4.5	9.9	30	2.48	15	1.88	51.2
48.07	46.1	22.1	-	46.0	1.1	-6.8	2.4	4	clayy SILT to silty CLAY	115	2.0	23	11	-	-	3.1	6.8	40	2.69	15	-	-
48.23	36.5	17.4	-	36.3	0.7	-6.8	2.1	4	clayy SILT to silty CLAY	115	2.0	18	9	-	-	2.4	5.3	43	2.74	15	-	-
48.39	32.2	15.3	-	32.0	0.6	-6.8	2.0	4	clayy SILT to silty CLAY	115	2.0	16	8	-	-	2.1	4.6	45	2.78	15	-	-
48.56	29.1	13.8	-	28.9	0.6	-6.9	2.4	4	clayy SILT to silty CLAY	115	2.0	15	7	-	-	1.9	4.1	50	2.87	15	-	-
48.72	30.8	14.6	-	30.7	1.1	-6.9	3.9	3	silty CLAY to CLAY	115	1.5	21	10	-	-	2.0	4.4	56	2.96	15	-	-
48.89	47.7	22.6	-	47.6	2.4	-6.9	5.2	3	silty CLAY to CLAY	115	1.5	32	15	-	-	3.2	7.0	51	2.89	15	-	-
49.05	211.7	141.5	168.3	211.6	2.9	-6.6	1.4	6	clean SAND to silty SAND	125	5.0	42	28	78	41	-	-	10	1.90	16	0.00	0.0
49.22	194.2	129.6	174.7	194.0	3.7	-7.7	1.9	5	silty SAND to sandy SILT	120	3.0	65	43	76	40	-	-	14	2.03	16	0.00	0.0
49.38	137.2	91.5	167.0	137.1	3.8	-7.5	2.8	5	silty SAND to sandy SILT	120	3.0	46	30	64	38	-	-	21	2.26	16	0.00	0.0
49.54	125.8	83.8	179.9	125.7	4.4	-7.1	3.6	4	clayy SILT to silty CLAY	115	2.0	63	42	-	-	8.7	9.9	25	2.36	15	0.00	0.0
49.71	325.8	216.7	224.5	325.7	3.5	-7.5	1.1	6	clean SAND to silty SAND	125	5.0	65	43	93	43	-	-	6	1.70	16	0.00	0.0
49.87	296.7	197.1	202.3	296.5	2.8	-7.2	1.0	6	clean SAND to silty SAND	125	5.0	59	39	89	42	-	-	6	1.68	16	0.00	0.0
50.04	296.0	196.4	198.1	295.8	2.6	-7.0	0.9	6	clean SAND to silty SAND	125	5.0	59	39	89	42	-	-	5	1.66	16	0.00	0.0
50.20	305.8	202.7	202.7	305.7	2.2	-7.0	0.7	6	clean SAND to silty SAND	125	5.0	61	41	90	42	-	-	5	1.60	16	0.00	0.0
50.36	294.0	194.6	194.6	293.9	1.8	-6.8	0.6	6	clean SAND to silty SAND	125	5.0	59	39	89	42	-	-	5	1.56	16	0.00	0.0
50.53	297.0	196.4	196.4	296.9	1.4	-6.8	0.5	6	clean SAND to silty SAND	125	5.0	59	39	89	42	-	-	5	1.49	16	0.00	0.0
50.69	298.2	196.9	196.9	298.1	1.5	-6.7	0.5	6	clean SAND to silty SAND	125	5.0	60	39	89	42	-	-	5	1.49	16	0.00	0.0
50.86	292.8	193.2	193.2	292.7	1.5	-6.6	0.5	6	clean SAND to silty SAND	125	5.0	59	39	89	42	-	-	5	1.52	16	0.00	0.0
51.02	280.2	184.6	195.4	280.1	2.9	-6.5	1.0	6	clean SAND to silty SAND	125	5.0	56	37	87	42	-	-	7	1.73	16	0.00	0.0
51.18	286.3	188.4	197.0	286.1	2.8	-6.5	1.0	6	clean SAND to silty SAND	125	5.0	57	38	88	42	-	-	6	1.71	16	0.00	0.0
51.35	277.7	182.5	200.1	277.6	3.4	-6.1	1.2	6	clean SAND to silty SAND	125	5.0	56	37	87	42	-	-	8	1.79	16	0.00	0.0
51.51	317.1	208.2	208.2	317.0	2.1	-5.7	0.7	6	clean SAND to silty SAND	125	5.0	63	42	91	42	-	-	5	1.56	16	0.00	0.0
51.68	263.4	172.7	178.0	263.3	2.2	-5.3	0.9	6	clean SAND to silty SAND	125	5.0	53	35	85	41	-	-	6	1.69	16	0.00	0.0
51.84	263.6	172.6	172.6	263.5	1.7	-5.5	0.7	6	clean SAND to silty SAND	125	5.0	53	35	85	41	-	-	5	1.62	16	0.00	0.0
52.00	249.3	163.1	163.2	249.2	1.7	-5.9	0.7	6	clean SAND to silty SAND	125	5.0	50	33	83	41	-	-	5	1.65	16	0.00	0.0
52.17	217.9	142.4	143.2	217.8	1.3	-6.3	0.6	6	clean SAND to silty SAND	125	5.0	44	28	79	40	-	-	5	1.65	16	0.74	3.5
52.33	217.8	142.2	151.0	217.7	1.7	-6.0	0.8	6	clean SAND to silty SAND	125	5.0	44	28	79	40	-	-	7	1.74	16	0.44	2.7
52.50	185.9	121.2	154.2	185.8	2.8	-6.1	1.5	6	clean SAND to silty SAND	125	5.0	37	24	73	40	-	-	12	1.98	16	0.34	2.1
52.66	182.3	118.7	140.5	182.2	2.0	-6.1	1.1	6	clean SAND to silty SAND	125	5.0	36	24	73	39	-	-	10	1.89	16	0.83	3.8
52.82	210.7	137.1	143.9	210.6	1.5	-6.2	0.7	6	clean SAND to silty SAND	125	5.0	42	27	77	40	-	-	6	1.72	16	0.70	3.4
52.99	206.4	134.1	133.9	206.3	1.1	-6.1	0.5	6	clean SAND to silty SAND	125	5.0	41	27	77	40	-	-	5	1.64	16	1.23	5.0
53.15	197.5	128.2	145.7	197.4	2.0	-6.3	1.0	6	clean SAND to silty SAND	125	5.0	39	26	75	40	-	-	9	1.84	16	0.60	3.1
53.32	207.5	134.5	145.1	207.3	1.7	-6.4	0.8	6	clean SAND to silty SAND	125	5.0	41	27	77	40	-	-	7	1.76	16	0.63	3.2
53.48	213.9	138.5	138.5	213.7	1.0	-6.3	0.5	6	clean SAND to silty SAND	125	5.0	43	28	78	40	-	-	5	1.61	16	0.99	4.2
53.64	202.3	130.8	130.8	202.2	0.9	-6.2	0.4	6	clean SAND to silty SAND	125	5.0	40	26	76	40	-	-	5	1.61	16	1.40	5.7
53.81	207.8	134.2	134.2	207.7	1.0	-6.2	0.5	6	clean SAND to silty SAND	125	5.0	42	27	77	40	-	-	5	1.63	16	1.21	4.9
53.97	186.9	120.6	120.6	186.8	0.8	-6.0	0.4	6	clean SAND to silty SAND	125	5.0	37	24	73	39	-	-	5	1.63	16	1.91	9.1
54.14	168.0	108.3	112.9	167.9	0.8	-5.9	0.5	6	clean SAND to silty SAND	125	5.0	34	22	70	39	-	-	6	1.71	16	2.11	14.2
54.30	178.9	115.2	129.4	178.8	1.5	-5.7	0.8	6	clean SAND to silty SAND	125	5.0	36	23	72	39	-	-	9	1.82	16	1.43	6.2
54.46	201.2	129.4	137.0	201.1	1.4	-5.6	0.7	6	clean SAND to silty SAND	125	5.0	40	26	76	40	-	-	7	1.73	16	1.05	4.4
54.63	207.4	133.2	134.6	207.3	1.1	-5.5	0.6	6	clean SAND to silty SAND	125	5.0	41	27	76	40	-	-	5	1.66	16	1.19	4.8
54.79	237.2	152.2	152.2	237.1	0.8	-5.5	0.3	6	clean SAND to silty SAND	125	5.0	47	30	81	41	-	-	5	1.48	16	0.41	2.6
54.96	202.6	129.8	134.1	202.5	1.2	-5.4	0.6	6	clean SAND to silty SAND	125	5.0	41	26	76	40	-	-	6	1.69	16	1.21	5.0
55.12	108.4	69.4	133.2	108.3	2.5	-5.2	2.4	5	silty SAND to sandy SILT	120	3.0	36	23	55	36	-	-	22	2.29	16	1.04	7.3
55.28	60.6	26.3	-	60.5	2.1	-5.2	3.7	4	clayy SILT to silty CLAY	115	2.0	30	13	-	-	4.1	8.2	42	2.74	15	-	-
55.45	54.4	23.5	-	54.3	1.5	-5.0	3.0	4	clayy SILT to silty CLAY	115	2.0	27	12	-	-	3.7	7.3	41	2.72	15	-	-
55.61	154.0	98.3	114.7	153.9	1.3	-4.5	0.8	6	clean SAND to silty SAND	125	5.0	31	20	66	38	-	-	10	1.88	16	2.07	15.9
55.78	268.7	171.3	171.3	268.6	1.8	-5.1	0.7	6	clean SAND to silty SAND	125	5.0	54	34	85	41	-	-	5	1.63	16	0.00	0.0
55.94	290.0	184.7	184.7	289.9	1.4	-5.0	0.5	6	clean SAND to silty SAND	125	5.0	58	37	87	42	-	-	5	1.52	16	0.00	0.0
56.11	283.0	180.1	180.1	282.9	1.5	-4.7	0.5	6	clean SAND to silty SAND	125	5.0	57	36	86	42	-	-	5	1.54	16	0.00	0.0
56.27	301.9	191.9	192.0	301.8	2.5	-4.9	0.8	6	clean SAND to silty SAND	125	5.0	60	38	89	42	-	-	5	1.65	16	0.00	0.0
56.43	294.3	186.8	210.0	294.2	4.1	-5.0	1.4	6	clean SAND to silty SAND	125	5.0	59	37	88	42	-	-	9	1.82	16	0.00	0.0
56.60	216.7	137.4	187.7	216.6	4.5	-4.4	2.1	5	silty SAND to sandy SILT	120	3.0	72	46	77	40	-	-	14	2.05	16	0.00	0.0
56.76	222.2	140.8	185.6	222.1	4.3	-4.5	2.0	5	silty SAND to sandy SILT	120	3.0	74	47	78	40	-	-	13	2.01	16	0.00	0.0
56.93	256.2	162.2	193.1	256.1	4.0	-4.4	1.6	6	clean SAND to silty SAND	125	5.0	51	32	83	41	-	-	10	1.90	16	0.00	0.0
57.09	283.7	179.4	202.5	283.6	3.9	-4.4	1.4	6	clean SAND to silty SAND	125	5.0	57	36	86	41	-	-	9	1.83	16	0.00	0.0
57.25	294.2	185.8	193.4	294.1	2.8	-4.3	1.0	6	clean SAND to silty SAND	125	5.0	59	37	87	42	-	-	6	1.70	16	0.00	0.0
57.42	315.7	199.1	210.8	315.6	3.5	-4.3	1.1	6	clean SAND to silty SAND	125	5.0	63	40	90	42	-	-	7	1.73	16	0.00	0.0
57.58	307.4	193.7	208.5	307.3	3.6	-4.4	1.2	6	clean SAND to silty SAND	125	5.0	61	39	89	42	-	-	7	1.76	16	0.00	0.0
57.75	274.8	173.0	195.6	274.7	3.7	-4.4	1.4	6	clean SAND to silty SAND	125	5.0	55	35	85	41	-	-	9	1.83	16	0.00	0.0
57.91	232.2	146.0	174.2	232.1	3.3	-4.3	1.4	6	clean SAND to silty SAND	125	5.0	46	29	79	40	-	-	11	1.90	16	0.00	0.0
58.07	200.7	126.1	172.0	200.7	3.9	-4.3	2.0	5	silty SAND to sandy SILT	120	3.0	67	42	75	40	-	-	14	2.05	16	0.00	0.0
58.24	195.3	122.5	183.2	195.2	4.6	-4.3	2.4	5	silty SAND to sandy SILT	120	3.0	65	41	74	39	-	-	16	2.12	16	0.00	0.0
58.40	183.0	114.7	190.4	182.9	5.1	-4.2	2.9	5	silty SAND to sandy SILT	120	3.0	61	38	72	39	-	-	19	2.20	16	0.00	0.0
58.57	176.7	110.7	197.3	176.7	5.6	-4.2	3.2	5	silty SAND to sandy SILT	120	3.0	59	37	70	39	-	-	21	2.24	16	0.00	0.0
58.73	160.0	100.1	172.6	159.9	4.3	-4.1	2.7	5	silty SAND to sandy SILT	120	3.0	53	33	67	38	-	-	20	2.22	16	0.00	0.0
58.89	245.9	153.7	176.6	245.8	3.1	-4.2	1.3	6	clean SAND to silty SAND	125	5.0	49	31	81	41	-	-	9	1.86	16	0.00	0.0
59.06	268.6	167.7	184.9	268.5	3.1	-4.3	1.2	6	clean SAND to silty SAND	125	5.0	54	34	84	41	-	-	8	1.79	16	0.00	0.0
59.22	270.2	168.5	194.4	270.1	3.8	-4.3	1.4	6	clean SAND to silty SAND	125	5.0	54	34	84	41	-	-	9	1.86	16	0.00	0.0
59.39	252.2	157.1	212.8	252.1	5.8	-4.2	2.3	5	silty SAND to sandy SILT	120	3.0	84	52	82	41	-	-	14	2.04	16	0.00	0.0
59.55	221.6	138.0	208.9	221.6	6.0	-4.7	2.7	5	silty SAND to sandy SILT	120	3.0	74	46	78	40	-	-	17	2.13	16	0.00	0.0
59.71	211.4	131.4	182.0	211.3	4.4	-4.8	2.1	5	silty SAND to sandy SILT	120	3.0	70	44	76	40	-	-	15	2.06	16	0.00	0.0
59.88	267.0	165.9	180.9	266.9	2.9	-5.0	1.1	6	clean SAND to silty SAND	125	5.0	53	33	84	41	-	-	8	1.78	16	0.00	0.0
60.04	280.3	174.0	174.0	280.2	1.9	-4.9	0.7	6	clean SAND to silty SAND	125	5.0	56	35	85	41	-	-	5	1.63	16	0.00	0.0
60.21	284.5	176.4	176.4	284.4	1.5	-4.9	0.5	6	clean SAND to silty SAND	125	5.0	57	35	86	41	-	-	5	1.56	16	0.00	0.0
60.37	277.8	172.0	172.0	277.7	1.4	-4.8	0.5	6	clean SAND to silty SAND	125	5.0	56	34	85	41	-	-	5	1.55	16	0.00	0.0
60.53	266.0	164.6	164.6	265.9	1.6	-4.8	0.6	6	clean SAND to silty SAND	125	5.0	53	33	83	41	-	-	5	1.61	16	0.00	0.0
60.70	269.4	166.5	169.9	269.3	2.1	-4.7	0.8	6	clean SAND to silty SAND	125	5.0	54	33	84	41	-	-	6	1.67	16	0.00	0.0
60.86	317.7	196.1	196.1	317.6	2.3	-4.7	0.7	6	clean SAND to silty SAND	125	5.0	64	39	89	42	-	-	5	1.61	16	0.00	0.0
61.03	349.9	215.8	215.8	349.8	2.0	-4.7	0.6	6	clean SAND to silty SAND	125	5.0	70	43	92	42	-	-	5	1.50	16	0.00	0.0
61.19	347.5	214.1	214.1	347.4	1.9	-4.6	0.6	6	clean SAND to silty SAND	125	5.0	70	43	92	42	-	-	5	1.50	16	0.00	0.0
61.35	359.9	221.5	221.5	359.8	2.0	-4.6	0.6	6	clean SAND to silty SAND	125	5.0	72	44	93	42	-	-	5	1.49	16	0.00	0.0
61.52	348.4	214.2	214.2	348.4	1.6	-4.5	0.5	6	clean SAND to silty SAND	125	5.0	70	43	92	42	-	-	5	1.44	16	0.00	0.0
61.68	317.8	195.2	195.2	317.7	1.4	-4.3	0.4	6	clean SAND to silty SAND	125	5.0	64	39	89	42	-	-	5	1.47	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Project ID: Leighton Group
Data File: SDF(042).cpt
CPT Date: 9/29/2017 1:22:06 PM
GW During Test: 23 ft

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Sounding ID: CPT-10
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
61.85	288.9	177.2	177.2	288.8	1.3	-4.2	0.5	6	clean SAND to silty SAND	125	5.0	58	35	86	41	-	-	5	1.51	16	0.00	0.0
62.01	248.9	152.6	152.6	248.9	1.2	-4.2	0.5	6	clean SAND to silty SAND	125	5.0	50	31	81	40	-	-	5	1.59	16	0.39	2.5
62.17	198.6	121.6	144.1	198.5	2.3	-4.4	1.2	6	clean SAND to silty SAND	125	5.0	40	24	73	39	-	-	10	1.90	16	0.61	3.1
62.34	178.1	109.0	138.1	178.1	2.3	-4.4	1.3	6	clean SAND to silty SAND	125	5.0	36	22	70	39	-	-	12	1.97	16	0.87	4.0
62.50	214.6	131.2	151.1	214.6	2.3	-4.4	1.1	6	clean SAND to silty SAND	125	5.0	43	26	76	40	-	-	9	1.86	16	0.40	2.5
62.67	235.7	143.9	149.2	235.6	1.6	-5.0	0.7	6	clean SAND to silty SAND	125	5.0	47	29	79	40	-	-	6	1.70	16	0.48	2.8
62.83	305.0	186.0	186.0	304.9	1.4	-5.1	0.5	6	clean SAND to silty SAND	125	5.0	61	37	87	41	-	-	5	1.50	16	0.00	0.0
63.00	311.1	189.5	189.5	311.0	1.1	-5.2	0.4	6	clean SAND to silty SAND	125	5.0	62	38	88	42	-	-	5	1.43	16	0.00	0.0
63.16	305.7	186.1	186.1	305.6	1.1	-5.1	0.4	6	clean SAND to silty SAND	125	5.0	61	37	87	41	-	-	5	1.44	16	0.00	0.0
63.32	303.8	184.7	184.7	303.7	1.2	-5.1	0.4	6	clean SAND to silty SAND	125	5.0	61	37	87	41	-	-	5	1.46	16	0.00	0.0
63.49	269.9	163.9	177.1	269.8	2.7	-5.0	1.0	6	clean SAND to silty SAND	125	5.0	54	33	83	41	-	-	7	1.76	16	0.00	0.0
63.65	298.9	181.3	196.3	298.8	3.4	-5.0	1.1	6	clean SAND to silty SAND	125	5.0	60	36	87	41	-	-	7	1.77	16	0.00	0.0
63.82	345.0	209.1	216.5	344.9	3.6	-4.8	1.1	6	clean SAND to silty SAND	125	5.0	69	42	91	42	-	-	6	1.70	16	0.00	0.0
63.98	354.9	214.9	216.2	354.8	3.3	-4.9	0.9	6	clean SAND to silty SAND	125	5.0	71	43	92	42	-	-	5	1.65	16	0.00	0.0
64.14	401.9	243.1	243.1	401.8	2.4	-4.7	0.6	6	clean SAND to silty SAND	125	5.0	80	49	95	43	-	-	5	1.48	16	0.00	0.0
64.31	418.0	252.6	252.6	417.9	1.7	-4.7	0.4	6	clean SAND to silty SAND	125	5.0	84	51	95	43	-	-	5	1.36	16	0.00	0.0
64.47	403.3	243.5	243.5	403.2	1.4	-4.6	0.4	6	clean SAND to silty SAND	125	5.0	81	49	95	43	-	-	5	1.33	16	0.00	0.0
64.64	385.5	232.5	232.5	385.4	2.9	-4.5	0.8	6	clean SAND to silty SAND	125	5.0	77	46	95	43	-	-	5	1.56	16	0.00	0.0
64.80	334.3	201.4	241.1	334.2	6.4	-4.3	1.9	6	clean SAND to silty SAND	125	5.0	67	40	90	42	-	-	11	1.91	16	0.00	0.0
64.96	222.8	134.1	182.6	222.8	4.5	-3.1	2.1	5	silty SAND to sandy SILT	120	3.0	74	45	77	40	-	-	14	2.04	16	0.00	0.0
65.13	151.6	91.2	178.7	151.5	4.8	-4.5	3.2	5	silty SAND to sandy SILT	120	3.0	51	30	64	37	-	-	23	2.30	16	0.00	0.0
65.29	178.2	107.1	159.0	178.1	3.7	-4.5	2.1	5	silty SAND to sandy SILT	120	3.0	59	36	69	38	-	-	16	2.12	16	0.20	1.4
65.46	132.6	79.6	183.0	132.5	4.9	-4.9	3.8	4	clayy SILT to silty CLAY	115	2.0	66	40	-	-	9.2	9.9	26	2.40	15	0.00	0.0
65.62	93.5	35.7	-	93.4	3.0	-6.0	3.4	4	clayy SILT to silty CLAY	115	2.0	47	18	-	-	6.4	9.9	36	2.61	15	-	-
65.78	63.2	24.1	-	63.1	2.0	-5.8	3.4	4	clayy SILT to silty CLAY	115	2.0	32	12	-	-	4.3	7.4	43	2.75	15	-	-
65.95	44.2	16.8	-	44.1	1.5	-5.6	3.6	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	5.0	52	2.90	15	-	-
66.11	39.6	15.0	-	39.5	1.4	-5.8	4.0	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.5	56	2.96	15	-	-
66.28	41.9	15.9	-	41.8	1.5	-5.7	3.9	3	silty CLAY to CLAY	115	1.5	28	11	-	-	2.8	4.7	55	2.94	15	-	-
66.44	48.6	18.4	-	48.5	1.5	-5.8	3.3	3	silty CLAY to CLAY	115	1.5	32	12	-	-	3.2	5.6	48	2.84	15	-	-
66.60	52.7	19.9	-	52.6	1.8	-5.8	3.6	3	silty CLAY to CLAY	115	1.5	35	13	-	-	3.5	6.1	48	2.83	15	-	-
66.77	59.0	22.3	-	58.9	1.7	-5.8	3.1	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.0	6.8	43	2.75	15	-	-
66.93	58.3	22.0	-	58.2	1.7	-5.9	3.2	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	6.7	44	2.76	15	-	-
67.10	55.2	20.8	-	55.1	1.7	-5.8	3.3	4	clayy SILT to silty CLAY	115	2.0	28	10	-	-	3.7	6.3	45	2.79	15	-	-
67.26	50.6	19.1	-	50.5	1.6	-5.8	3.4	3	silty CLAY to CLAY	115	1.5	34	13	-	-	3.4	5.8	48	2.83	15	-	-
67.42	54.4	20.5	-	54.3	1.5	-5.7	3.0	4	clayy SILT to silty CLAY	115	2.0	27	10	-	-	3.7	6.2	45	2.77	15	-	-
67.59	53.4	20.2	-	53.3	1.5	-5.7	3.1	4	clayy SILT to silty CLAY	115	2.0	27	10	-	-	3.6	6.1	45	2.78	15	-	-
67.75	43.9	16.6	-	43.8	1.3	-5.7	3.3	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	4.9	51	2.88	15	-	-
67.92	39.5	14.9	-	39.4	1.2	-5.7	3.3	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.4	53	2.92	15	-	-
68.08	35.9	13.5	-	35.8	1.2	-5.7	3.6	3	silty CLAY to CLAY	115	1.5	24	9	-	-	2.3	3.9	57	2.98	15	-	-
68.24	38.2	14.4	-	38.1	1.6	-5.6	4.7	3	silty CLAY to CLAY	115	1.5	25	10	-	-	2.5	4.2	60	3.03	15	-	-
68.41	37.4	14.1	-	37.3	1.6	-5.7	4.8	3	silty CLAY to CLAY	115	1.5	25	9	-	-	2.5	4.1	61	3.04	15	-	-
68.57	41.6	15.7	-	41.5	1.4	-5.1	3.8	3	silty CLAY to CLAY	115	1.5	28	10	-	-	2.7	4.6	54	2.93	15	-	-
68.74	38.9	14.7	-	38.8	1.4	-5.1	4.1	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.2	57	2.98	15	-	-
68.90	50.0	18.9	-	49.9	1.5	-5.0	3.2	3	silty CLAY to CLAY	115	1.5	33	13	-	-	3.3	5.6	47	2.82	15	-	-
69.07	51.1	19.3	-	51.0	1.6	-5.0	3.4	3	silty CLAY to CLAY	115	1.5	34	13	-	-	3.4	5.7	48	2.83	15	-	-
69.23	61.9	23.4	-	61.8	1.8	-4.9	3.2	4	clayy SILT to silty CLAY	115	2.0	31	12	-	-	4.2	7.0	43	2.74	15	-	-
69.39	60.7	22.9	-	60.6	1.6	-4.9	2.9	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.1	6.9	42	2.72	15	-	-
69.56	43.1	16.3	-	43.0	1.4	-4.9	3.5	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	4.7	52	2.90	15	-	-
69.72	38.2	14.4	-	38.1	1.1	-4.8	3.3	3	silty CLAY to CLAY	115	1.5	25	10	-	-	2.5	4.1	54	2.93	15	-	-
69.89	39.9	15.1	-	39.8	1.1	-4.8	3.0	3	silty CLAY to CLAY	115	1.5	27	10	-	-	2.6	4.3	52	2.89	15	-	-
70.05	40.8	15.4	-	40.7	1.2	-4.6	3.4	3	silty CLAY to CLAY	115	1.5	27	10	-	-	2.7	4.4	53	2.92	15	-	-
70.21	40.3	15.2	-	40.3	1.9	-4.6	5.4	3	silty CLAY to CLAY	115	1.5	27	10	-	-	2.7	4.3	61	3.04	15	-	-
70.38	64.2	24.2	-	64.1	1.8	-4.5	3.1	4	clayy SILT to silty CLAY	115	2.0	32	12	-	-	4.3	7.2	41	2.72	15	-	-
70.54	62.0	23.4	-	61.9	1.7	-4.4	3.0	4	clayy SILT to silty CLAY	115	2.0	31	12	-	-	4.2	6.9	42	2.72	15	-	-
70.71	42.0	15.8	-	41.9	1.4	-4.4	3.7	3	silty CLAY to CLAY	115	1.5	28	11	-	-	2.8	4.5	54	2.93	15	-	-
70.87	38.9	14.7	-	38.8	1.3	-4.3	3.7	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.1	56	2.96	15	-	-
71.03	58.7	22.2	-	58.6	2.1	-4.3	3.9	3	silty CLAY to CLAY	115	1.5	39	15	-	-	4.0	6.5	47	2.82	15	-	-
71.20	58.9	22.2	-	58.8	1.7	-4.3	3.2	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	4.0	6.5	44	2.76	15	-	-
71.36	45.0	17.0	-	44.9	1.5	-4.0	3.8	3	silty CLAY to CLAY	115	1.5	30	11	-	-	3.0	4.8	52	2.91	15	-	-
71.53	39.6	15.0	-	39.6	1.2	-4.0	3.5	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.2	54	2.93	15	-	-
71.69	39.2	14.8	-	39.2	1.3	-3.9	3.6	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.1	55	2.95	15	-	-
71.85	41.1	15.5	-	41.0	1.3	-4.0	3.4	3	silty CLAY to CLAY	115	1.5	27	10	-	-	2.7	4.4	53	2.91	15	-	-
72.02	41.6	15.7	-	41.5	1.3	-3.9	3.5	3	silty CLAY to CLAY	115	1.5	28	10	-	-	2.7	4.4	53	2.92	15	-	-
72.18	39.2	14.8	-	39.1	1.3	-3.9	3.8	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.1	56	2.96	15	-	-
72.35	37.0	14.0	-	36.9	1.2	-3.9	3.8	3	silty CLAY to CLAY	115	1.5	25	9	-	-	2.4	3.8	57	2.98	15	-	-
72.51	34.7	13.1	-	34.6	1.1	-3.9	3.7	3	silty CLAY to CLAY	115	1.5	23	9	-	-	2.3	3.6	59	3.00	15	-	-
72.67	34.0	12.8	-	33.9	1.0	-3.9	3.4	3	silty CLAY to CLAY	115	1.5	23	9	-	-	2.2	3.5	58	2.99	15	-	-
72.84	33.5	12.6	-	33.4	1.0	-3.9	3.4	3	silty CLAY to CLAY	115	1.5	22	8	-	-	2.2	3.4	58	2.99	15	-	-
73.00	33.0	12.5	-	33.0	1.0	-3.9	3.4	3	silty CLAY to CLAY	115	1.5	22	8	-	-	2.1	3.4	58	3.00	15	-	-
73.17	32.2	12.2	-	32.1	1.0	-3.9	3.5	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.1	3.3	60	3.02	15	-	-
73.33	31.8	12.0	-	31.7	1.0	-3.9	3.5	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.0	3.2	60	3.03	15	-	-
73.49	31.5	11.9	-	31.5	0.9	-3.9	3.3	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.0	3.2	59	3.01	15	-	-
73.66	30.3	11.4	-	30.2	0.9	-3.9	3.4	3	silty CLAY to CLAY	115	1.5	20	8	-	-	1.9	3.0	61	3.04	15	-	-
73.82	30.6	11.5	-	30.5	0.9	-3.8	3.3	3	silty CLAY to CLAY	115	1.5	20	8	-	-	2.0	3.0	60	3.03	15	-	-
73.99	31.2	11.8	-	31.1	0.9	-3.7	3.4	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.0	3.1	60	3.02	15	-	-
74.15	30.6	11.5	-	30.5	0.9	-3.7	3.4	3	silty CLAY to CLAY	115	1.5	20	8	-	-	2.0	3.0	61	3.03	15	-	-
74.31	31.0	11.7	-	31.0	0.9	-3.7	3.4	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.0	3.1	60	3.03	15	-	-
74.48	31.4	11.8	-	31.3	0.9	-3.7	3.3	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.0	3.1	60	3.02	15	-	-
74.64	29.4	11.1	-	29.3	0.9	-3.7	3.6	3	silty CLAY to CLAY	115	1.5	20	7	-	-	1.9	2.9	63	3.06	15	-	-
74.81	29.0	10.9	-	28.9	0.9	-3.6	3.6	3	silty CLAY to CLAY	115	1.5	19	7	-	-	1.8	2.8	63	3.07	15	-	-
74.97	28.0	10.5	-	27.9	0.9	-3.6	4.0	3	silty CLAY to CLAY	115	1.5	19	7	-	-	1.8	2.7	66	3.11	15	-	-
75.13	30.8	11.6	-	30.8	0.9	-3.6	3.5	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.0	3.0	61	3.04	15	-	-
75.30	32.1	12.1	-	32.1	1.0	-3.6	3.8	3	silty CLAY to CLAY	115	1.5	21	8	-	-	2.1	3.2	61	3.04	15	-	-
75.46	36.2	13.6	-	36.1	0.9	-3.5	2.9	3	silty CLAY to CLAY	115	1.5	24	9	-	-	2.4	3.6	54	2.93	15	-	-
75.63	33.3	12.6	-	33.2	1.0	-3.5	3.3	3	silty CLAY to CLAY	115	1.5	22	8	-	-	2.1	3.3	58	2.99	15	-	-
75.79	35.8	13.5	-	35.7	0.9	-3.5	3.0	3	silty CLAY to CLAY	115	1.5	24	9	-	-	2.3	3.6	54	2.93	15	-	-
75.96	39.5	14.9	-	39.4	1.0	-3.4	2.8	3	silty CLAY to CLAY	115	1.5	26	10	-	-	2.6	4.0	51	2.88	15	-	-
76.12	41.6	15.7	-	41.6	1.1	-3.4	3.0	3	silty CLAY to CLAY	115	1.5	28	10	-	-	2.7	4.2	50	2.88	15	-	-
76.28	43.7	16.5	-	43.7	1.3	-3.4	3.4	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	4.5	52	2.89	15	-	-
76.45	50.0	18.9	-	49.9	1.5	-3.3	3.4	3	silty CLAY to CLAY	115	1.5	33	13	-	-	3.3	5.2	48	2.84	15	-	-
76.61	57.9	21.8	-	57.8	1.6	-3.1	2.9	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	6.0	43	2.75	15	-	-
76.78	53.8	20.3	-	53.7	1.6	-3.2	3.3	4	clayy SILT to silty CLAY	115	2.0	27	10	-	-	3.6	5.6	46	2.80	15	-	-
76.94	54.0	20.4	-	54.0	1.7	-3.1	3.4	3	silty CLAY to CLAY	115	1.5	36	14	-	-	3.6	5.6	47	2.81	15	-	-
77.10	58.9	22.2	-	58.8	1.8	-2.9	3.4	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	4.0	6.1	45	2.78	15	-	-

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(042).cpt
CPT Date: 9/29/2017 1:22:06 PM
GW During Test: 23 ft

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Sounding ID: CPT-10
Project No: 11753.001
Cone/Rig: DDG1379

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
77.27	64.1	24.2	-	64.1	1.8	-2.8	3.0	4	clayy SILT to silty CLAY	115	2.0	32	12	-	-	4.3	6.7	41	2.71	15	-	-
77.43	64.8	24.5	-	64.8	1.8	-2.9	3.0	4	clayy SILT to silty CLAY	115	2.0	32	12	-	-	4.4	6.8	41	2.71	15	-	-
77.60	62.3	23.5	-	62.2	2.0	-2.8	3.4	4	clayy SILT to silty CLAY	115	2.0	31	12	-	-	4.2	6.5	44	2.76	15	-	-
77.76	63.4	23.9	-	63.3	1.9	-2.7	3.2	4	clayy SILT to silty CLAY	115	2.0	32	12	-	-	4.3	6.6	43	2.74	15	-	-
77.92	63.0	23.8	-	62.9	1.9	-2.6	3.2	4	clayy SILT to silty CLAY	115	2.0	31	12	-	-	4.2	6.5	43	2.74	15	-	-
78.09	65.7	24.8	-	65.7	1.7	-2.7	2.8	4	clayy SILT to silty CLAY	115	2.0	33	12	-	-	4.4	6.8	40	2.69	15	-	-
78.25	62.4	23.6	-	62.4	1.7	-2.6	2.9	4	clayy SILT to silty CLAY	115	2.0	31	12	-	-	4.2	6.5	41	2.71	15	-	-
78.42	60.6	22.9	-	60.5	1.7	-2.7	3.0	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.1	6.2	43	2.74	15	-	-
78.58	58.7	22.2	-	58.7	1.7	-2.6	3.2	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	6.0	44	2.76	15	-	-
78.74	56.5	21.3	-	56.5	1.6	-2.6	3.2	4	clayy SILT to silty CLAY	115	2.0	28	11	-	-	3.8	5.8	45	2.78	15	-	-
78.91	55.2	20.8	-	55.2	1.5	-2.5	2.9	4	clayy SILT to silty CLAY	115	2.0	28	10	-	-	3.7	5.6	44	2.76	15	-	-
79.07	53.9	20.4	-	53.9	1.5	-2.6	3.1	4	clayy SILT to silty CLAY	115	2.0	27	10	-	-	3.6	5.5	45	2.79	15	-	-
79.24	55.3	20.9	-	55.2	1.6	-2.6	3.2	4	clayy SILT to silty CLAY	115	2.0	28	10	-	-	3.7	5.6	45	2.78	15	-	-
79.40	55.3	20.9	-	55.2	1.6	-2.6	3.2	4	clayy SILT to silty CLAY	115	2.0	28	10	-	-	3.7	5.6	45	2.78	15	-	-
79.56	56.1	21.2	-	56.1	1.8	-2.6	3.5	3	silty CLAY to CLAY	115	1.5	37	14	-	-	3.8	5.7	46	2.80	15	-	-
79.73	51.4	19.4	-	51.3	1.7	-2.4	3.7	3	silty CLAY to CLAY	115	1.5	34	13	-	-	3.4	5.1	49	2.86	15	-	-
79.89	58.6	22.1	-	58.6	1.6	-2.4	3.0	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	5.9	43	2.75	15	-	-
80.06	58.2	22.0	-	58.2	1.5	-2.3	2.9	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	5.9	43	2.74	15	-	-
80.22	59.0	22.3	-	59.0	1.6	-2.5	2.9	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.0	6.0	42	2.73	15	-	-
80.38	58.8	22.2	-	58.7	1.6	-2.4	2.9	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	5.9	43	2.74	15	-	-
80.55	60.8	22.9	-	60.7	1.7	-2.4	3.0	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.1	6.1	42	2.73	15	-	-
80.71	60.8	22.9	-	60.7	1.7	-2.4	3.1	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.1	6.1	43	2.74	15	-	-
80.88	60.3	22.7	-	60.2	1.7	-2.4	3.1	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.0	6.1	43	2.75	15	-	-
81.04	60.2	22.7	-	60.1	1.7	-2.4	3.0	4	clayy SILT to silty CLAY	115	2.0	30	11	-	-	4.0	6.0	43	2.74	15	-	-
81.20	58.8	22.2	-	58.7	1.6	-2.3	3.0	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	5.9	43	2.75	15	-	-
81.37	57.9	21.8	-	57.8	1.5	-2.4	2.9	4	clayy SILT to silty CLAY	115	2.0	29	11	-	-	3.9	5.8	43	2.74	15	-	-
81.53	56.4	21.3	-	56.3	1.5	-2.4	2.9	4	clayy SILT to silty CLAY	115	2.0	28	11	-	-	3.8	5.6	44	2.76	15	-	-
81.70	52.7	19.9	-	52.6	1.5	-2.4	3.1	4	clayy SILT to silty CLAY	115	2.0	26	10	-	-	3.5	5.2	46	2.80	15	-	-
81.86	50.7	19.1	-	50.6	1.4	-2.4	3.0	4	clayy SILT to silty CLAY	115	2.0	25	10	-	-	3.4	5.0	46	2.80	15	-	-
82.02	48.4	18.3	-	48.3	1.2	-2.4	2.9	4	clayy SILT to silty CLAY	115	2.0	24	9	-	-	3.2	4.7	47	2.81	15	-	-
82.19	45.6	17.2	-	45.6	1.2	-2.4	2.9	3	silty CLAY to CLAY	115	1.5	30	11	-	-	3.0	4.4	48	2.84	15	-	-
82.35	43.4	16.4	-	43.4	1.1	-2.4	2.9	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	4.2	50	2.86	15	-	-
82.52	42.6	16.1	-	42.6	1.1	-2.3	3.0	3	silty CLAY to CLAY	115	1.5	28	11	-	-	2.8	4.1	50	2.87	15	-	-
82.68	41.5	15.7	-	41.4	1.1	-2.4	3.1	3	silty CLAY to CLAY	115	1.5	28	10	-	-	2.7	3.9	52	2.89	15	-	-
82.85	41.6	15.7	-	41.5	1.2	-2.4	3.3	3	silty CLAY to CLAY	115	1.5	28	10	-	-	2.7	3.9	52	2.91	15	-	-
83.01	45.2	17.1	-	45.2	1.1	-2.4	2.8	4	clayy SILT to silty CLAY	115	2.0	23	9	-	-	3.0	4.3	48	2.83	15	-	-
83.17	44.9	16.9	-	44.8	1.1	-2.4	2.9	3	silty CLAY to CLAY	115	1.5	30	11	-	-	3.0	4.3	48	2.84	15	-	-
83.34	44.0	16.6	-	43.9	1.2	-2.2	3.0	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	4.2	49	2.86	15	-	-
83.50	42.2	15.9	-	42.2	1.1	-2.3	2.9	3	silty CLAY to CLAY	115	1.5	28	11	-	-	2.8	4.0	50	2.87	15	-	-
83.67	42.8	16.2	-	42.8	1.1	-2.0	3.0	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.8	4.0	50	2.87	15	-	-
83.83	43.7	16.5	-	43.7	1.4	-2.0	3.5	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	4.1	52	2.90	15	-	-
83.99	51.4	19.4	-	51.3	1.7	-2.1	3.6	3	silty CLAY to CLAY	115	1.5	34	13	-	-	3.4	4.9	49	2.85	15	-	-
84.16	62.0	23.4	-	62.0	2.1	-2.0	3.6	4	clayy SILT to silty CLAY	115	2.0	31	12	-	-	4.2	6.0	45	2.78	15	-	-
84.32	70.9	26.8	-	70.9	2.3	-2.0	3.4	4	clayy SILT to silty CLAY	115	2.0	35	13	-	-	4.8	7.0	41	2.72	15	-	-
84.49	66.5	25.1	-	66.5	2.5	-2.0	4.0	3	silty CLAY to CLAY	115	1.5	44	17	-	-	4.5	6.5	45	2.78	15	-	-
84.65	67.4	25.4	-	67.3	2.9	-1.9	4.7	3	silty CLAY to CLAY	115	1.5	45	17	-	-	4.5	6.6	48	2.83	15	-	-
84.81	80.7	30.4	-	80.6	2.8	-1.8	3.7	4	clayy SILT to silty CLAY	115	2.0	40	15	-	-	5.5	8.0	40	2.69	15	-	-
84.98	74.6	28.1	-	74.5	3.2	-1.9	4.6	3	silty CLAY to CLAY	115	1.5	50	19	-	-	5.0	7.3	45	2.78	15	-	-
85.14	80.4	30.3	-	80.3	2.8	-1.9	3.7	4	clayy SILT to silty CLAY	115	2.0	40	15	-	-	5.5	7.9	40	2.69	15	-	-
85.31	72.2	27.3	-	72.2	3.1	-1.8	4.6	3	silty CLAY to CLAY	115	1.5	48	18	-	-	4.9	7.1	46	2.79	15	-	-
85.47	78.5	29.6	-	78.4	3.4	-1.6	4.6	3	silty CLAY to CLAY	115	1.5	52	20	-	-	5.3	7.7	44	2.77	15	-	-
85.63	89.0	33.6	-	89.0	3.4	-1.6	4.1	4	clayy SILT to silty CLAY	115	2.0	44	17	-	-	6.1	8.8	40	2.69	15	-	-
85.80	84.2	31.8	-	84.2	4.7	-1.7	6.0	3	silty CLAY to CLAY	115	1.5	56	21	-	-	5.7	8.3	47	2.82	15	-	-
85.96	78.4	29.6	-	78.4	3.9	-1.6	5.4	3	silty CLAY to CLAY	115	1.5	52	20	-	-	5.3	7.7	47	2.81	15	-	-
86.13	92.9	35.0	-	92.8	3.2	-1.7	3.7	4	clayy SILT to silty CLAY	115	2.0	46	18	-	-	6.3	9.2	37	2.64	15	-	-
86.29	71.6	27.0	-	71.6	2.2	-1.6	3.4	4	clayy SILT to silty CLAY	115	2.0	36	14	-	-	4.8	6.9	41	2.71	15	-	-
86.45	54.7	20.6	-	54.7	1.7	-1.6	3.5	3	silty CLAY to CLAY	115	1.5	36	14	-	-	3.6	5.2	47	2.82	15	-	-
86.62	49.9	18.8	-	49.9	1.3	-1.5	3.0	4	clayy SILT to silty CLAY	115	2.0	25	9	-	-	3.3	4.7	47	2.81	15	-	-
86.78	43.8	16.5	-	43.8	1.4	-1.5	3.6	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.9	4.0	53	2.91	15	-	-
86.95	43.1	16.3	-	43.1	3.3	-1.6	8.6	3	silty CLAY to CLAY	115	1.5	29	11	-	-	2.8	3.9	70	3.16	15	-	-
87.11	85.5	32.3	-	85.5	4.1	-1.5	5.1	3	silty CLAY to CLAY	115	1.5	57	22	-	-	5.8	8.3	44	2.77	15	-	-
87.27	202.3	110.0	163.9	202.3	4.3	-1.2	2.2	5	silty SAND to sandy SILT	120	3.0	67	37	70	38	-	-	16	2.12	16	0.00	0.0
87.44	201.8	109.6	190.2	201.8	5.9	-1.2	3.0	5	silty SAND to sandy SILT	120	3.0	67	37	70	38	-	-	20	2.23	16	0.00	0.0
87.60	211.8	115.0	222.1	211.8	7.9	-1.2	3.8	8	stiff SAND to clayy SAND	115	5.0	42	23	72	38	-	-	22	2.29	16	0.00	0.0
87.77	121.9	46.0	-	121.9	7.3	-1.2	6.3	3	silty CLAY to CLAY	115	1.5	81	31	-	-	8.4	9.9	42	2.72	15	-	-
87.93	216.0	117.1	211.8	215.9	7.2	-0.8	3.4	5	silty SAND to sandy SILT	120	3.0	72	39	72	38	-	-	21	2.25	16	0.00	0.0
88.09	298.5	161.7	230.2	298.5	7.9	-1.1	2.7	5	silty SAND to sandy SILT	120	3.0	100	54	83	40	-	-	15	2.08	16	0.00	0.0
88.26	288.6	156.2	222.4	288.6	7.4	-1.1	2.6	5	silty SAND to sandy SILT	120	3.0	96	52	82	40	-	-	15	2.08	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

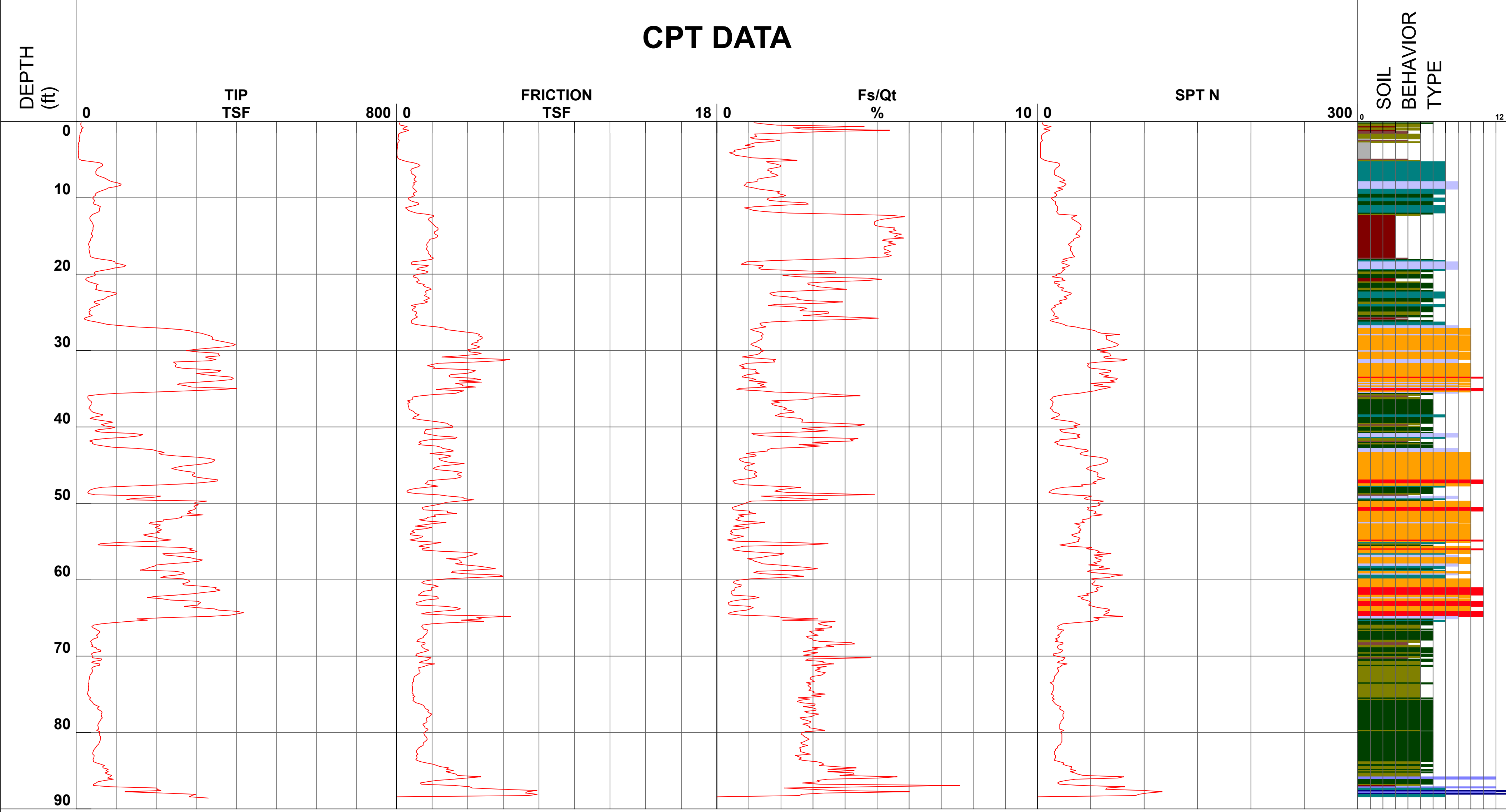
Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(042).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-10	Date and Time	9/29/2017 1:22:06 PM	Maximum Depth	88.58 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(037).cpt
CPT Date: 9/28/2017 2:04:24 PM
GW During Test: 23 ft

Sounding ID: CPT-11
Project No: 11753.001
Cone/Rig: DDG1379

. . Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	1.4	2.3	-	1.4	0.0	0.5	0.1	1	sensitive fine SOIL	115	2.0	1	1	-	-	0.1	9.9	68	3.13	15	N/A	N/A
0.49	7.2	11.5	27.8	7.2	0.0	0.8	0.1	5	silty SAND to sandy SILT	120	3.0	2	4	5	45	-	-	27	2.43	16	N/A	N/A
0.66	11.6	18.7	31.8	11.6	0.0	0.4	0.1	5	silty SAND to sandy SILT	120	3.0	4	6	12	46	-	-	20	2.22	16	N/A	N/A
0.82	19.2	30.8	40.0	19.2	0.0	0.6	0.1	6	clean SAND to silty SAND	125	5.0	4	6	28	47	-	-	13	2.00	16	N/A	N/A
0.98	18.2	29.2	38.8	18.2	0.0	0.7	0.1	6	clean SAND to silty SAND	125	5.0	4	6	26	46	-	-	14	2.02	16	N/A	N/A
1.15	16.8	26.9	37.2	16.8	0.0	0.4	0.1	5	silty SAND to sandy SILT	120	3.0	6	9	24	45	-	-	15	2.06	16	N/A	N/A
1.31	20.0	32.1	41.0	20.0	0.0	0.3	0.1	6	clean SAND to silty SAND	125	5.0	4	6	29	45	-	-	12	1.98	16	N/A	N/A
1.48	22.3	35.7	43.8	22.3	0.0	0.4	0.1	6	clean SAND to silty SAND	125	5.0	4	7	33	45	-	-	11	1.94	16	N/A	N/A
1.64	18.7	30.0	39.8	18.7	0.0	0.2	0.1	6	clean SAND to silty SAND	125	5.0	4	6	27	44	-	-	13	2.02	16	N/A	N/A
1.80	16.2	26.0	57.9	16.2	0.2	0.4	0.9	5	silty SAND to sandy SILT	120	3.0	5	9	23	43	-	-	26	2.38	16	N/A	N/A
1.97	17.3	27.8	-	17.3	0.5	0.3	2.8	4	clayy SILT to silty CLAY	115	2.0	9	14	-	-	1.2	9.9	36	2.62	15	N/A	N/A
2.13	22.8	36.6	-	22.8	0.8	0.7	3.7	4	clayy SILT to silty CLAY	115	2.0	11	18	-	-	1.6	9.9	36	2.62	15	N/A	N/A
2.30	36.5	58.5	149.8	36.5	1.3	0.6	3.5	4	clayy SILT to silty CLAY	115	2.0	18	29	-	-	2.6	9.9	29	2.46	15	N/A	N/A
2.46	45.1	72.3	152.3	45.1	1.4	0.8	3.1	5	silty SAND to sandy SILT	120	3.0	15	24	56	46	-	-	24	2.35	16	N/A	N/A
2.62	51.2	82.1	127.5	51.2	0.9	0.6	1.8	5	silty SAND to sandy SILT	120	3.0	17	27	61	46	-	-	17	2.15	16	N/A	N/A
2.79	51.4	82.4	122.0	51.4	0.8	0.4	1.6	5	silty SAND to sandy SILT	120	3.0	17	27	61	46	-	-	16	2.11	16	N/A	N/A
2.95	51.7	82.9	125.5	51.7	0.9	0.6	1.7	5	silty SAND to sandy SILT	120	3.0	17	28	61	46	-	-	17	2.13	16	N/A	N/A
3.12	50.9	81.6	138.1	50.9	1.1	0.3	2.2	5	silty SAND to sandy SILT	120	3.0	17	27	60	45	-	-	19	2.21	16	N/A	N/A
3.28	51.6	82.7	141.8	51.6	1.2	0.3	2.3	5	silty SAND to sandy SILT	120	3.0	17	28	61	45	-	-	20	2.22	16	N/A	N/A
3.45	52.8	84.7	160.8	52.8	1.5	0.3	2.9	5	silty SAND to sandy SILT	120	3.0	18	28	62	45	-	-	22	2.28	16	N/A	N/A
3.61	56.6	90.8	171.7	56.6	1.7	0.2	3.1	5	silty SAND to sandy SILT	120	3.0	19	30	64	45	-	-	22	2.28	16	N/A	N/A
3.77	61.4	98.4	168.1	61.4	1.6	-0.2	2.7	5	silty SAND to sandy SILT	120	3.0	20	33	66	45	-	-	20	2.22	16	N/A	N/A
3.94	52.0	83.3	164.2	52.0	1.6	0.2	3.1	5	silty SAND to sandy SILT	120	3.0	17	28	61	44	-	-	23	2.31	16	N/A	N/A
4.10	40.2	64.5	148.8	40.2	1.3	0.1	3.2	4	clayy SILT to silty CLAY	115	2.0	20	32	-	-	2.8	9.9	26	2.40	15	N/A	N/A
4.27	37.2	59.6	121.9	37.2	0.9	0.2	2.4	5	silty SAND to sandy SILT	120	3.0	12	20	50	42	-	-	24	2.33	16	N/A	N/A
4.43	35.1	56.2	127.9	35.1	1.0	0.2	2.7	5	silty SAND to sandy SILT	120	3.0	12	19	48	42	-	-	26	2.39	16	N/A	N/A
4.59	47.7	76.5	127.2	47.7	0.9	0.1	2.0	5	silty SAND to sandy SILT	120	3.0	16	25	58	43	-	-	19	2.20	16	N/A	N/A
4.76	69.0	110.6	147.7	69.0	1.1	0.2	1.6	5	silty SAND to sandy SILT	120	3.0	23	37	70	45	-	-	14	2.03	16	N/A	N/A
4.92	92.5	148.3	165.4	92.5	1.0	0.2	1.1	6	clean SAND to silty SAND	125	5.0	18	30	80	46	-	-	8	1.81	16	N/A	N/A
5.09	71.0	113.9	138.9	71.0	0.9	0.1	1.2	6	clean SAND to silty SAND	125	5.0	14	23	71	45	-	-	11	1.93	16	N/A	N/A
5.25	59.3	95.2	113.5	59.3	0.5	-0.3	0.9	6	clean SAND to silty SAND	125	5.0	12	19	65	44	-	-	10	1.90	16	N/A	N/A
5.41	52.6	84.4	103.1	52.6	0.5	-0.4	0.9	6	clean SAND to silty SAND	125	5.0	11	17	61	43	-	-	11	1.93	16	N/A	N/A
5.58	51.5	82.6	103.7	51.5	0.5	-0.3	1.0	6	clean SAND to silty SAND	125	5.0	10	17	61	43	-	-	12	1.96	16	N/A	N/A
5.74	43.4	69.6	100.2	43.4	0.5	-0.3	1.2	5	silty SAND to sandy SILT	120	3.0	14	23	55	42	-	-	16	2.09	16	N/A	N/A
5.91	39.8	63.9	102.8	39.8	0.6	-0.3	1.5	5	silty SAND to sandy SILT	120	3.0	13	21	52	41	-	-	18	2.18	16	N/A	N/A
6.07	48.6	78.0	116.7	48.6	0.8	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	16	26	59	42	-	-	16	2.12	16	N/A	N/A
6.23	60.1	95.3	132.6	60.1	1.0	-0.3	1.6	5	silty SAND to sandy SILT	120	3.0	20	32	65	43	-	-	15	2.06	16	N/A	N/A
6.40	59.5	93.1	139.0	59.5	1.1	-0.4	1.9	5	silty SAND to sandy SILT	120	3.0	20	31	65	43	-	-	16	2.12	16	N/A	N/A
6.56	58.9	91.0	164.6	58.9	1.6	-0.4	2.8	5	silty SAND to sandy SILT	120	3.0	20	30	64	43	-	-	21	2.25	16	N/A	N/A
6.73	63.4	96.8	183.9	63.4	2.1	-0.5	3.3	5	silty SAND to sandy SILT	120	3.0	21	32	66	43	-	-	22	2.28	16	N/A	N/A
6.89	66.6	100.5	189.1	66.6	2.2	-0.5	3.3	5	silty SAND to sandy SILT	120	3.0	22	34	67	43	-	-	22	2.28	16	N/A	N/A
7.05	74.2	110.6	178.1	74.2	1.9	-0.6	2.6	5	silty SAND to sandy SILT	120	3.0	25	37	70	43	-	-	18	2.18	16	N/A	N/A
7.22	73.9	108.9	163.0	73.9	1.6	-0.6	2.2	5	silty SAND to sandy SILT	120	3.0	25	36	70	43	-	-	16	2.12	16	N/A	N/A
7.38	72.6	105.8	155.7	72.6	1.5	-0.6	2.1	5	silty SAND to sandy SILT	120	3.0	24	35	69	43	-	-	16	2.11	16	N/A	N/A
7.55	74.9	107.9	156.5	74.9	1.5	-0.6	2.0	5	silty SAND to sandy SILT	120	3.0	25	36	70	43	-	-	16	2.10	16	N/A	N/A
7.71	78.3	111.6	161.1	78.3	1.6	-0.7	2.1	5	silty SAND to sandy SILT	120	3.0	26	37	71	43	-	-	16	2.09	16	N/A	N/A
7.87	80.9	114.2	163.8	80.9	1.7	-0.7	2.1	5	silty SAND to sandy SILT	120	3.0	27	38	71	43	-	-	15	2.09	16	N/A	N/A
8.04	78.8	110.1	163.9	78.8	1.7	-0.7	2.2	5	silty SAND to sandy SILT	120	3.0	26	37	70	43	-	-	16	2.12	16	N/A	N/A
8.20	84.3	116.6	172.9	84.3	1.9	-0.8	2.3	5	silty SAND to sandy SILT	120	3.0	28	39	72	43	-	-	16	2.12	16	N/A	N/A
8.37	91.8	125.7	177.1	91.8	2.0	-0.8	2.2	5	silty SAND to sandy SILT	120	3.0	31	42	75	44	-	-	15	2.07	16	N/A	N/A
8.53	92.3	125.2	153.8	92.3	1.3	-0.7	1.4	6	clean SAND to silty SAND	125	5.0	18	25	74	44	-	-	11	1.94	16	N/A	N/A
8.69	89.6	120.2	140.9	89.5	1.0	-0.6	1.1	6	clean SAND to silty SAND	125	5.0	18	24	73	43	-	-	10	1.88	16	N/A	N/A
8.86	102.1	135.8	150.0	102.1	1.0	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	20	27	77	44	-	-	8	1.80	16	N/A	N/A
9.02	112.8	148.6	163.0	112.8	1.1	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	23	30	80	44	-	-	8	1.79	16	N/A	N/A
9.19	126.6	165.2	177.2	126.6	1.3	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	25	33	84	45	-	-	7	1.75	16	N/A	N/A
9.35	137.3	177.5	192.6	137.2	1.6	-0.8	1.1	6	clean SAND to silty SAND	125	5.0	27	35	86	45	-	-	7	1.77	16	N/A	N/A
9.51	137.4	176.0	193.8	137.3	1.7	-0.9	1.2	6	clean SAND to silty SAND	125	5.0	27	35	86	45	-	-	8	1.79	16	N/A	N/A
9.68	130.3	165.5	192.5	130.3	1.9	-0.8	1.5	6	clean SAND to silty SAND	125	5.0	26	33	84	45	-	-	10	1.87	16	N/A	N/A
9.84	119.0	149.9	189.9	119.0	2.2	-0.8	1.9	6	clean SAND to silty SAND	125	5.0	24	30	80	44	-	-	12	1.97	16	N/A	N/A
10.01	117.5	146.7	208.1	117.5	2.9	-0.8	2.5	5	silty SAND to sandy SILT	120	3.0	39	49	80	44	-	-	15	2.08	16	N/A	N/A
10.17	113.4	140.5	216.9	113.4	3.3	-0.9	2.9	5	silty SAND to sandy SILT	120	3.0	38	47	78	44	-	-	17	2.15	16	N/A	N/A
10.34	99.6	122.3	203.7	99.6	3.0	-0.8	3.1	5	silty SAND to sandy SILT	120	3.0	33	41	74	43	-	-	19	2.20	16	N/A	N/A
10.50	77.9	94.9	171.7	77.9	2.3	-0.8	2.9	5	silty SAND to sandy SILT	120	3.0	26	32	65	42	-	-	21	2.25	16	N/A	N/A
10.66	63.9	77.3	148.5	63.9	1.7	-0.7	2.7	5	silty SAND to sandy SILT	120	3.0	21	26	59	40	-	-	22	2.29	16	N/A	N/A
10.83	70.8	85.0	145.7	70.8	1.7	-0.8	2.4	5	silty SAND to sandy SILT	120	3.0	24	28	62	41	-	-	20	2.22	16	N/A	N/A
10.99	82.8	98.7	160.2	82.8	2.0	-0.8	2.4	5	silty SAND to sandy SILT	120	3.0	28	33	67	42	-	-	18	2.18	16	N/A	N/A
11.16	88.1	104.2	187.9	88.1	2.8	-1.0	3.1	5	silty SAND to sandy SILT	120	3.0	29	35	68	42	-	-	21	2.25	16	N/A	N/A
11.32	87.5	102.8	211.5	87.5	3.4	-1.4	4.0	9	very stiff fine SOIL	120	1.0	88	100	-	-	3.1	9.9	24	2.33	30	N/A	N/A
11.48	85.0	99.2	214.8	85.0	3.5	-2.3	4.2	9	very stiff fine SOIL	120	1.0	85	99	-	-	3.0	9.9	25	2.36	30	N/A	N/A
11.65	84.0	97.2	201.3	83.9	3.2	-1.8	3.8	4	clayy SILT to silty CLAY	115	2.0	42	49	-	-	5.9	9.9	24	2.34	15	N/A	N/A
11.81	81.6	93.8	173.8	81.5	2.4	-1.4	3.0	5	silty SAND to sandy SILT	120	3.0	27	31	65	41	-	-	21	2.27	16	N/A	N/A
11.98	79.8	91.2	166.9	79.8	2.3	-1.1	2.9	5	silty SAND to sandy SILT	120	3.0	27	30	64	41	-	-	21	2.26	16	N/A	N/A
12.14	78.6	89.2	151.3	78.6	1.9	-1.3	2.4	5	silty SAND to sandy SILT	120	3.0	26	30	63	41	-	-	19	2.21	16	N/A	N/A
12.30	75.7	85.3	133.9	75.7	1.5	-1.1	1.9	5	silty SAND to sandy SILT	120	3.0	25	28	62	41	-	-	18	2.16	16	N/A	N/A
12.47	64.5	72.2	120.7	64.5	1.2	-1.0	1.9	5	silty SAND to sandy SILT	120	3.0	22	24	56	40	-	-	19	2.20	16	N/A	N/A
12.63	60.3	67.1	129.9	60.3	1.4	-1.0	2.4	5	silty SAND to sandy SILT	120	3.0	20	22	54	39	-	-	22	2.30	16	N/A	N/A
12.80	64.0	70.7	149.2	64.0	1.9	-1.0	3.0	5	silty SAND to sandy SILT	120	3.0	21	24	56	39	-	-	24	2.35	16	N/A	N/A
12.96	68.2	74.9	168.2	68.2	2.4	-1.0	3.5	4	clayy SILT to silty CLAY	115	2.0	34	37	-	-	4.8	9.9	26	2.38	15	N/A	N/A
13.12	66.5	72.6	192.1	66.4	3.0	-1.2	4.5	4	clayy SILT to silty CLAY	115	2.0	33	36	-	-	4.6	9.9	30	2.48	15	N/A	N/A
13.29	64.9	70.5	221.4	64.9	3.8	-1.0	5.9	9	very stiff fine SOIL	120	1.0	65	70	-	-	2.3	9.9	34	2.57	30	N/A	N/A
13.45	69.5	75.0	242.7	69.5	4.4	-1.3	6.5	9	very stiff fine SOIL	120	1.0	70	75	-	-	2.4	9.9	35	2.59	30	N/A	N/A
13.62	71.3	80.5	264.1	71.3	4.9	-1.4	7.0	9	very stiff fine SOIL	120	1.0	71	80	-	-	2.5	9.9	35	2.59	30	N/A	N/A
13.78	69.1	83.3	-	69.1	5.2	-1.6	7.6	9	very stiff fine SOIL	120	1.0	69	83	-	-	2.4	9.9	36	2.61	30	N/A	N/A
13.94	62.7	74.6	-	62.6	5.2	-1.9	8.4	9	very stiff fine SOIL	120	1.0	63	75	-	-	2.2	9.9	39	2.68	30	N/A	N/A
14.11	60.9	71.6	-	60.8	5.1	-2.3	8.5	9	very stiff fine SOIL	120	1.0	61	72	-	-	2.1	9.9	40	2.69	30	N/A	N/A
14.27	62.3	72.5	-	62.3	5.1	-2.4	8.2	9	very stiff fine SOIL	120	1.0	62	72	-	-	2.2	9.9	39	2.68	30	N/A	N/A
14.44	64.1	73.7	-	64.1	5.0	-2.1	8.0	9	very stiff fine SOIL	120	1.0	64	74	-	-	2.2	9.9	39	2.66	30	N/A	N/A
14.60	67.3	76.5	-	67.2	5.4	-2.1	8.1	9	very stiff fine SOIL	120	1.0	67	76	-	-	2.3	9.9	38	2.66	30	N/A	N/A
14.76	70.0	78.7	-	69.9	5.3	-2.0	7.6	9	very stiff fine SOIL	120	1.0	70	79	-	-	2.4	9.9	37	2.63	30	N/A	N/A
14.93	73.0	81.2	-	73.0	5.7	-2.8	7.9	9	very stiff fine SOIL	120	1.0	73	81	-	-	2.5	9.9	37	2.63	30	N/A	N/A
15.09	73.1	80.4	-	73.0	5.9	-3.0	8.2	9	very stiff fine SOIL	120	1.0	73	80	-	-	2.6	9.9	38	2.65	30	N/A	N/A
15.26	74.3	80.8	-	74.2	6.0	-2.8	8.2	9	very stiff fine SOIL	120	1.0	74	81	-	-	2.6	9.9	38	2.65	30	N/A	N/A
15.42	74.2	79.8	-	74.1	6.0	-2.8	8.1	9	very stiff fine SOIL	120	1.0	74	80	-	-	2.6	9.9	38	2.65	30	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(037).cpt
CPT Date: 9/28/2017 2:04:24 PM
GW During Test: 23 ft

Sounding ID: CPT-11
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	74.6	79.5	-	74.6	6.1	-2.6	8.2	9	very stiff fine SOIL	120	1.0	75	79	-	-	2.6	9.9	38	2.65	30	N/A	N/A
15.75	80.0	84.4	-	80.0	6.3	-2.5	7.9	9	very stiff fine SOIL	120	1.0	80	84	-	-	2.8	9.9	37	2.62	30	N/A	N/A
15.91	84.0	87.6	-	83.9	6.3	-3.6	7.6	9	very stiff fine SOIL	120	1.0	84	88	-	-	2.9	9.9	35	2.60	30	N/A	N/A
16.08	80.2	82.8	-	80.1	6.3	-3.4	7.9	9	very stiff fine SOIL	120	1.0	80	83	-	-	2.8	9.9	37	2.63	30	N/A	N/A
16.24	70.0	71.6	-	69.9	6.0	-3.5	8.7	9	very stiff fine SOIL	120	1.0	70	72	-	-	2.4	9.9	41	2.70	30	N/A	N/A
16.40	61.1	61.8	-	61.0	5.6	-2.8	9.4	9	very stiff fine SOIL	120	1.0	61	62	-	-	2.1	9.9	44	2.77	30	N/A	N/A
16.57	57.1	57.3	-	57.1	5.1	-2.2	9.1	3	silty CLAY to CLAY	115	1.5	38	38	-	-	4.0	9.9	45	2.78	15	N/A	N/A
16.73	53.8	53.4	-	53.7	4.7	-2.0	8.9	3	silty CLAY to CLAY	115	1.5	36	36	-	-	3.7	9.9	45	2.79	15	N/A	N/A
16.90	52.9	52.1	-	52.9	4.3	-2.3	8.4	3	silty CLAY to CLAY	115	1.5	35	35	-	-	3.7	9.9	45	2.77	15	N/A	N/A
17.06	54.1	52.7	-	54.0	4.3	-2.1	8.2	3	silty CLAY to CLAY	115	1.5	36	35	-	-	3.7	9.9	44	2.76	15	N/A	N/A
17.23	56.0	54.1	-	56.0	4.3	-2.1	7.8	3	silty CLAY to CLAY	115	1.5	37	36	-	-	3.9	9.9	43	2.74	15	N/A	N/A
17.39	55.8	53.4	-	55.8	4.3	-2.2	7.8	3	silty CLAY to CLAY	115	1.5	37	36	-	-	3.9	9.9	43	2.74	15	N/A	N/A
17.55	54.0	51.2	-	53.9	4.1	-2.3	7.7	3	silty CLAY to CLAY	115	1.5	36	34	-	-	3.7	9.9	43	2.75	15	N/A	N/A
17.72	51.6	48.5	-	51.6	3.9	-2.4	7.7	3	silty CLAY to CLAY	115	1.5	34	32	-	-	3.6	9.9	44	2.77	15	N/A	N/A
17.88	50.4	47.0	-	50.4	3.7	-2.9	7.5	3	silty CLAY to CLAY	115	1.5	34	31	-	-	3.5	9.9	44	2.77	15	N/A	N/A
18.05	52.5	48.5	-	52.4	3.2	-3.3	6.3	3	silty CLAY to CLAY	115	1.5	35	32	-	-	3.6	9.9	41	2.70	15	N/A	N/A
18.21	55.8	51.1	-	55.7	3.6	-2.2	6.5	3	silty CLAY to CLAY	115	1.5	37	34	-	-	3.9	9.9	40	2.70	15	N/A	N/A
18.37	48.8	44.3	-	48.7	3.8	-1.6	8.0	3	silty CLAY to CLAY	115	1.5	33	30	-	-	3.4	9.9	46	2.80	15	N/A	N/A
18.54	46.9	42.2	-	46.9	3.8	-2.4	8.3	3	silty CLAY to CLAY	115	1.5	31	28	-	-	3.2	9.9	48	2.83	15	N/A	N/A
18.70	50.0	44.6	-	50.0	3.8	-2.2	7.7	3	silty CLAY to CLAY	115	1.5	33	30	-	-	3.5	9.9	46	2.79	15	N/A	N/A
18.87	51.7	45.8	-	51.7	3.7	-2.1	7.4	3	silty CLAY to CLAY	115	1.5	34	31	-	-	3.6	9.9	44	2.77	15	N/A	N/A
19.03	60.5	53.1	-	60.5	3.4	-2.1	5.7	3	silty CLAY to CLAY	115	1.5	40	35	-	-	4.2	9.9	37	2.64	15	N/A	N/A
19.19	82.9	75.1	157.5	82.9	2.5	-1.3	3.1	5	silty SAND to sandy SILT	120	3.0	28	25	58	39	-	-	24	2.34	16	N/A	N/A
19.36	85.1	76.8	120.9	85.1	1.5	-0.8	1.7	5	silty SAND to sandy SILT	120	3.0	28	26	58	39	-	-	18	2.16	16	N/A	N/A
19.52	67.6	60.7	102.3	67.6	1.0	-0.6	1.6	5	silty SAND to sandy SILT	120	3.0	23	20	51	37	-	-	19	2.21	16	N/A	N/A
19.69	62.9	56.3	104.6	62.9	1.1	-0.6	1.8	5	silty SAND to sandy SILT	120	3.0	21	19	48	37	-	-	21	2.27	16	N/A	N/A
19.85	61.8	55.0	105.1	61.7	1.1	-0.7	1.9	5	silty SAND to sandy SILT	120	3.0	21	18	47	37	-	-	22	2.29	16	N/A	N/A
20.01	61.5	54.6	99.4	61.5	1.0	-0.7	1.7	5	silty SAND to sandy SILT	120	3.0	21	18	47	37	-	-	21	2.26	16	N/A	N/A
20.18	59.6	52.6	94.8	59.6	0.9	-0.6	1.5	5	silty SAND to sandy SILT	120	3.0	20	18	46	36	-	-	21	2.25	16	N/A	N/A
20.34	55.8	49.1	92.3	55.8	0.8	-0.6	1.6	5	silty SAND to sandy SILT	120	3.0	19	16	44	36	-	-	22	2.28	16	N/A	N/A
20.51	54.6	47.9	113.7	54.6	1.3	-0.6	2.5	5	silty SAND to sandy SILT	120	3.0	18	16	43	36	-	-	27	2.42	16	N/A	N/A
20.67	58.4	51.0	138.3	58.4	1.9	-0.6	3.4	4	clayy SILT to silty CLAY	115	2.0	29	26	-	-	4.0	9.9	30	2.49	15	N/A	N/A
20.83	69.5	60.4	136.0	69.4	1.9	-0.9	2.9	5	silty SAND to sandy SILT	120	3.0	23	20	50	37	-	-	26	2.38	16	N/A	N/A
21.00	82.3	71.3	113.7	82.3	1.3	-0.6	1.7	5	silty SAND to sandy SILT	120	3.0	27	24	56	38	-	-	18	2.17	16	N/A	N/A
21.16	77.3	66.7	100.6	77.3	1.0	-0.6	1.3	5	silty SAND to sandy SILT	120	3.0	26	22	54	38	-	-	17	2.13	16	N/A	N/A
21.33	64.2	55.2	111.0	64.1	1.3	-0.5	2.1	5	silty SAND to sandy SILT	120	3.0	21	18	47	37	-	-	23	2.32	16	N/A	N/A
21.49	55.2	47.3	138.2	55.2	1.9	-0.6	3.6	4	clayy SILT to silty CLAY	115	2.0	28	24	-	-	3.8	9.9	32	2.53	15	N/A	N/A
21.65	49.9	38.5	-	49.9	2.5	-0.8	5.1	3	silty CLAY to CLAY	115	1.5	33	26	-	-	3.4	9.9	41	2.70	15	N/A	N/A
21.82	50.4	38.7	-	50.4	2.6	-1.3	5.3	3	silty CLAY to CLAY	115	1.5	34	26	-	-	3.5	9.9	41	2.71	15	N/A	N/A
21.98	53.0	40.4	-	53.0	2.4	-1.1	4.7	4	clayy SILT to silty CLAY	115	2.0	27	20	-	-	3.7	9.9	39	2.66	15	N/A	N/A
22.15	59.1	49.9	153.6	59.1	2.4	-0.8	4.1	4	clayy SILT to silty CLAY	115	2.0	30	25	-	-	4.1	9.9	33	2.56	15	N/A	N/A
22.31	64.6	54.4	141.7	64.6	2.1	-0.7	3.4	4	clayy SILT to silty CLAY	115	2.0	32	27	-	-	4.5	9.9	29	2.47	15	N/A	N/A
22.47	62.1	52.1	133.9	62.1	1.9	-0.6	3.1	4	clayy SILT to silty CLAY	115	2.0	31	26	-	-	4.3	9.9	29	2.46	15	N/A	N/A
22.64	56.1	46.9	117.6	56.1	1.5	-0.5	2.7	4	clayy SILT to silty CLAY	115	2.0	28	23	-	-	3.9	9.9	28	2.45	15	N/A	N/A
22.80	55.3	46.1	114.0	55.3	1.4	-0.7	2.5	5	silty SAND to sandy SILT	120	3.0	18	15	41	35	-	-	28	2.44	16	N/A	N/A
22.97	54.5	45.2	115.0	54.5	1.4	-0.6	2.6	4	clayy SILT to silty CLAY	115	2.0	27	23	-	-	3.8	9.9	29	2.45	15	N/A	N/A
23.13	53.4	44.2	115.0	53.4	1.4	-0.7	2.7	4	clayy SILT to silty CLAY	115	2.0	27	22	-	-	3.7	9.9	29	2.47	15	1.46	50.9
23.30	51.8	42.8	116.5	51.8	1.4	-0.7	2.8	4	clayy SILT to silty CLAY	115	2.0	26	21	-	-	3.6	9.9	30	2.49	15	1.37	51.2
23.46	52.2	43.1	118.7	52.2	1.5	-0.6	2.9	4	clayy SILT to silty CLAY	115	2.0	26	22	-	-	3.6	9.9	31	2.50	15	1.22	51.2
23.62	53.8	44.4	125.2	53.8	1.6	-0.8	3.1	4	clayy SILT to silty CLAY	115	2.0	27	22	-	-	3.7	9.9	31	2.51	15	0.73	50.3
23.79	54.9	45.2	122.8	54.9	1.6	-0.9	3.0	4	clayy SILT to silty CLAY	115	2.0	27	23	-	-	3.8	9.9	30	2.49	15	0.93	47.7
23.95	61.3	50.3	116.8	61.3	1.5	-0.7	2.5	5	silty SAND to sandy SILT	120	3.0	20	17	44	36	-	-	26	2.40	16	1.41	33.9
24.12	69.3	56.9	113.0	69.3	1.4	-0.5	2.1	5	silty SAND to sandy SILT	120	3.0	23	19	48	37	-	-	23	2.31	16	1.72	23.6
24.28	70.6	57.8	121.5	70.6	1.6	-0.4	2.4	5	silty SAND to sandy SILT	120	3.0	24	19	49	37	-	-	24	2.34	16	1.12	12.3
24.44	83.9	68.6	147.6	83.9	2.5	-0.5	3.0	5	silty SAND to sandy SILT	120	3.0	28	23	55	38	-	-	25	2.36	16	0.19	0.7
24.61	96.4	78.7	164.2	96.4	3.0	-0.6	3.2	5	silty SAND to sandy SILT	120	3.0	32	26	59	38	-	-	24	2.34	16	0.00	0.0
24.77	118.3	96.4	153.5	118.2	2.6	-0.4	2.3	5	silty SAND to sandy SILT	120	3.0	39	32	66	40	-	-	18	2.17	16	0.16	0.9
24.94	113.8	92.6	137.0	113.8	2.0	-0.3	1.8	5	silty SAND to sandy SILT	120	3.0	38	31	64	39	-	-	16	2.11	16	0.41	2.1
25.10	95.0	77.1	124.7	95.0	1.7	-0.5	1.9	5	silty SAND to sandy SILT	120	3.0	32	26	58	38	-	-	18	2.18	16	1.01	5.2
25.26	87.4	70.9	124.6	87.4	1.8	-0.5	2.1	5	silty SAND to sandy SILT	120	3.0	29	24	56	38	-	-	20	2.24	16	1.01	5.7
25.43	82.5	66.8	136.9	82.5	2.1	-0.4	2.6	5	silty SAND to sandy SILT	120	3.0	27	22	54	37	-	-	24	2.33	16	0.40	1.9
25.59	75.9	61.4	162.4	75.9	2.9	-0.6	3.9	4	clayy SILT to silty CLAY	115	2.0	38	31	-	-	5.3	9.9	30	2.48	15	0.00	0.0
25.76	76.5	61.7	182.6	76.5	3.5	-0.7	4.7	4	clayy SILT to silty CLAY	115	2.0	38	31	-	-	5.3	9.9	32	2.54	15	0.00	0.0
25.92	107.1	86.3	179.6	107.1	3.7	-0.9	3.5	5	silty SAND to sandy SILT	120	3.0	36	29	62	39	-	-	24	2.34	16	0.00	0.0
26.08	196.7	158.2	190.6	196.7	3.2	-0.4	1.6	6	clean SAND to silty SAND	125	5.0	39	32	82	42	-	-	11	1.92	16	0.00	0.0
26.25	302.6	243.0	243.0	302.6	2.6	-0.2	0.8	6	clean SAND to silty SAND	125	5.0	61	49	95	44	-	-	5	1.58	16	0.00	0.0
26.41	350.9	281.3	281.3	350.9	2.3	-0.2	0.7	6	clean SAND to silty SAND	125	5.0	70	56	95	45	-	-	5	1.46	16	0.00	0.0
26.58	334.8	267.9	267.9	334.8	2.9	0.1	0.9	6	clean SAND to silty SAND	125	5.0	67	54	95	45	-	-	5	1.56	16	0.00	0.0
26.74	378.2	302.1	302.1	378.2	3.2	-0.1	0.9	6	clean SAND to silty SAND	125	5.0	76	60	95	45	-	-	5	1.52	16	0.00	0.0
26.90	372.2	296.8	296.8	372.2	3.6	0.0	1.0	6	clean SAND to silty SAND	125	5.0	74	59	95	45	-	-	5	1.56	16	0.00	0.0
27.07	365.3	290.8	290.8	365.3	3.5	0.0	0.9	6	clean SAND to silty SAND	125	5.0	73	58	95	45	-	-	5	1.57	16	0.00	0.0
27.23	348.0	276.6	276.6	348.0	3.4	0.1	1.0	6	clean SAND to silty SAND	125	5.0	70	55	95	45	-	-	5	1.59	16	0.00	0.0
27.40	315.6	250.3	262.5	315.6	4.1	0.1	1.3	6	clean SAND to silty SAND	125	5.0	63	50	95	44	-	-	6	1.72	16	0.00	0.0
27.56	311.0	246.3	256.0	310.9	3.9	0.0	1.2	6	clean SAND to silty SAND	125	5.0	62	49	95	44	-	-	6	1.70	16	0.00	0.0
27.72	329.5	260.5	262.7	329.5	3.7	-0.3	1.1	6	clean SAND to silty SAND	125	5.0	66	52	95	44	-	-	5	1.66	16	0.00	0.0
27.89	317.1	250.3	257.3	317.1	3.8	0.0	1.2	6	clean SAND to silty SAND	125	5.0	63	50	95	44	-	-	6	1.69	16	0.00	0.0
28.05	292.1	230.2	249.6	292.1	4.2	-0.4	1.4	6	clean SAND to silty SAND	125	5.0	58	46	95	44	-	-	7	1.77	16	0.00	0.0
28.22	269.5	212.0	229.4	269.5	3.6	-0.8	1.3	6	clean SAND to silty SAND	125	5.0	54	42	92	43	-	-	7	1.77	16	0.00	0.0
28.38	243.5	191.3	202.4	243.5	2.6	-1.5	1.1	6	clean SAND to silty SAND	125	5.0	49	38	88	43	-	-	7	1.73	16	0.00	0.0
28.54	223.9	175.6	179.7	223.9	1.9	-0.8	0.8	6	clean SAND to silty SAND	125	5.0	45	35	86	42	-	-	6	1.68	16	0.00	0.0
28.71	215.7	168.8	178.7	215.7	2.0	-0.6	1.0	6	clean SAND to silty SAND	125	5.0	43	34	84	42	-	-	7	1.73	16	0.00	0.0
28.87	215.6	168.5	189.7	215.6	2.8	-0.7	1.3	6	clean SAND to silty SAND	125	5.0	43	34	84	42	-	-	9	1.83	16	0.00	0.0
29.04	203.1	158.4	173.3	203.1	2.1	-1.2	1.1	6	clean SAND to silty SAND	125	5.0	41	32	82	42	-	-	8	1.78	16	0.00	0.0
29.20	219.6	171.0	186.4	219.6	2.5	-0.6	1.1	6	clean SAND to silty SAND	125	5.0	44	34	85	42	-	-	8	1.78	16	0.00	0.0
29.36	239.2	186.0	200.8	239.2	2.8	-0.7	1.2	6	clean SAND to silty SAND	125	5.0	48	37	87	43	-	-	7	1.76	16	0.00	0.0
29.53	250.3	194.3	208.5	250.3	2.9	-0.9	1.2	6	clean SAND to silty SAND	125	5.0	50	39	89	43	-	-	7	1.75	16	0.00	0.0
29.69	270.0	209.2	218.2	270.0	2.9	-1.0	1.1	6	clean SAND to silty SAND	125	5.0	54	42	91	43	-	-	6	1.71	16	0.00	0.0
29.86	279.5	216.2	218.6	279.5	2.7	-1.0	1.0	6	clean SAND to silty SAND	125	5.0	56	43	92	43	-	-	5	1.66	16	0.00	0.0
30.02	286.6	221.4	222.0	286.6	2.7	-1.1	1.0	6	clean SAND to silty SAND	125	5.0	57	44	93	44	-	-	5	1.65	16	0.00	0.0
30.19	291.3	224.7	223.9	291.3	2.7	-1.1	0.9	6	clean SAND to silty SAND	125	5.0	58	45	94	44	-	-	5	1.64	16	0.00	0.0
30.35	297.7	229.2	229.2	297.7	2.9	-1.1	1.0	6	clean SAND to silty SAND	125	5.0	60	46	94	44	-	-	5	1.64	16	0.00	0.0
30.51	293.7	225.8	227.1	293.7	2.9	-1.2	1.0	6	clean SAND to silty SAND	125	5.0	59	45	94	44	-	-	5	1.65	16	0.00	0.0
30.68	288.4	221.3	223.7	288.4	2.9	-1.2	1.0	6	clean SAND to silty SAND	125	5.0	58	44	93	44	-	-	5	1.66	16	0.00	0.0
30.84	283.5	217.2	219.9	283.5	2.8	-1.2	1.0	6	clean SAND to silty SAND	125	5.0	57	43	93	43	-	-	5	1.66	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(037).cpt
CPT Date: 9/28/2017 2:04:24 PM
GW During Test: 23 ft

Sounding ID: CPT-11
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
31.01	263.8	201.8	204.7	263.8	2.4	-1.1	0.9	6	clean SAND to silty SAND	125	5.0	53	40	90	43	-	-	5	1.67	16	0.00	0.0
31.17	224.5	171.5	181.7	224.5	2.2	-1.1	1.0	6	clean SAND to silty SAND	125	5.0	45	34	85	42	-	-	7	1.73	16	0.00	0.0
31.33	193.6	147.6	161.2	193.5	1.9	-1.8	1.0	6	clean SAND to silty SAND	125	5.0	39	30	80	41	-	-	8	1.78	16	0.00	0.0
31.50	204.9	156.0	164.7	204.8	1.8	-1.8	0.9	6	clean SAND to silty SAND	125	5.0	41	31	82	42	-	-	7	1.73	16	0.00	0.0
31.66	185.1	140.7	161.8	185.1	2.2	-1.8	1.2	6	clean SAND to silty SAND	125	5.0	37	28	78	41	-	-	9	1.86	16	0.00	0.0
31.83	112.8	85.6	149.0	112.8	2.7	-1.8	2.4	5	silty SAND to sandy SILT	120	3.0	38	29	62	38	-	-	20	2.23	16	0.29	1.6
31.99	64.1	39.0	-	64.1	2.7	-1.5	4.4	4	clayy SILT to silty CLAY	115	2.0	32	20	-	-	4.4	9.9	38	2.66	15	-	-
32.15	47.5	28.8	-	47.5	2.1	-1.6	4.7	3	silty CLAY to CLAY	115	1.5	32	19	-	-	3.2	9.1	45	2.77	15	-	-
32.32	45.0	27.3	-	45.0	1.4	-1.4	3.2	4	clayy SILT to silty CLAY	115	2.0	23	14	-	-	3.1	8.6	40	2.69	15	-	-
32.48	44.9	27.1	-	44.8	1.3	-1.4	3.1	4	clayy SILT to silty CLAY	115	2.0	22	14	-	-	3.1	8.6	39	2.67	15	-	-
32.65	45.7	27.5	-	45.6	1.4	-1.4	3.1	4	clayy SILT to silty CLAY	115	2.0	23	14	-	-	3.1	8.7	39	2.67	15	-	-
32.81	46.7	28.0	-	46.6	1.4	-1.5	3.2	4	clayy SILT to silty CLAY	115	2.0	23	14	-	-	3.2	8.9	39	2.67	15	-	-
32.97	48.7	29.2	-	48.7	1.5	-1.5	3.2	4	clayy SILT to silty CLAY	115	2.0	24	15	-	-	3.3	9.2	38	2.66	15	-	-
33.14	53.2	31.8	-	53.2	1.7	-1.5	3.3	4	clayy SILT to silty CLAY	115	2.0	27	16	-	-	3.6	9.9	37	2.64	15	-	-
33.30	56.8	33.9	-	56.8	1.9	-1.2	3.5	4	clayy SILT to silty CLAY	115	2.0	28	17	-	-	3.9	9.9	37	2.64	15	-	-
33.47	62.0	46.4	134.0	62.0	2.0	-1.1	3.4	4	clayy SILT to silty CLAY	115	2.0	31	23	-	-	4.3	9.9	32	2.52	15	0.73	43.3
33.63	74.9	56.1	135.2	74.9	2.2	-1.0	3.0	4	clayy SILT to silty CLAY	115	2.0	37	28	-	-	5.2	9.9	27	2.42	15	0.71	14.3
33.79	76.8	57.4	146.3	76.8	2.5	-1.0	3.4	4	clayy SILT to silty CLAY	115	2.0	38	29	-	-	5.3	9.9	29	2.45	15	0.33	1.4
33.96	69.8	41.2	-	69.8	2.8	-0.6	4.1	4	clayy SILT to silty CLAY	115	2.0	35	21	-	-	4.8	9.9	36	2.62	15	-	-
34.12	64.1	37.7	-	64.0	2.6	-0.3	4.2	4	clayy SILT to silty CLAY	115	2.0	32	19	-	-	4.4	9.9	38	2.65	15	-	-
34.29	59.7	35.1	-	59.7	2.3	0.0	3.9	4	clayy SILT to silty CLAY	115	2.0	30	18	-	-	4.1	9.9	38	2.66	15	-	-
34.45	54.6	32.0	-	54.6	1.8	0.1	3.4	4	clayy SILT to silty CLAY	115	2.0	27	16	-	-	3.7	9.9	38	2.65	15	-	-
34.61	60.3	44.7	124.6	60.3	1.8	-0.1	3.0	4	clayy SILT to silty CLAY	115	2.0	30	22	-	-	4.1	9.9	31	2.50	15	1.34	49.5
34.78	70.5	52.2	138.8	70.5	2.3	-0.5	3.3	4	clayy SILT to silty CLAY	115	2.0	35	26	-	-	4.9	9.9	30	2.48	15	0.56	2.8
34.94	64.4	37.5	-	64.4	2.2	-0.7	3.6	4	clayy SILT to silty CLAY	115	2.0	32	19	-	-	4.4	9.9	36	2.61	15	-	-
35.11	59.6	34.5	-	59.5	2.5	-0.2	4.4	4	clayy SILT to silty CLAY	115	2.0	30	17	-	-	4.1	9.9	40	2.69	15	-	-
35.27	104.7	77.4	149.1	104.7	2.8	-0.1	2.7	5	silty SAND to sandy SILT	120	3.0	35	26	59	38	-	-	22	2.29	16	0.32	1.6
35.43	125.9	92.9	166.5	125.9	3.5	0.3	2.8	5	silty SAND to sandy SILT	120	3.0	42	31	65	39	-	-	21	2.25	16	0.00	0.0
35.60	130.2	95.9	176.8	130.2	3.9	0.2	3.0	5	silty SAND to sandy SILT	120	3.0	43	32	66	39	-	-	21	2.27	16	0.00	0.0
35.76	120.8	88.9	193.3	120.8	4.6	-0.4	3.8	4	clayy SILT to silty CLAY	115	2.0	60	44	-	-	8.4	9.9	25	2.37	15	0.00	0.0
35.93	104.2	76.6	204.8	104.2	4.9	-0.6	4.8	4	clayy SILT to silty CLAY	115	2.0	52	38	-	-	7.2	9.9	30	2.48	15	0.00	0.0
36.09	117.8	86.4	201.2	117.8	4.9	-0.5	4.2	4	clayy SILT to silty CLAY	115	2.0	59	43	-	-	8.2	9.9	27	2.40	15	0.00	0.0
36.26	112.2	82.3	206.2	112.2	5.0	-0.7	4.6	4	clayy SILT to silty CLAY	115	2.0	56	41	-	-	7.8	9.9	28	2.45	15	0.00	0.0
36.42	147.9	108.3	188.9	147.9	4.4	-0.4	3.0	5	silty SAND to sandy SILT	120	3.0	49	36	70	40	-	-	20	2.23	16	0.00	0.0
36.58	242.8	177.5	207.1	242.8	3.8	-0.8	1.6	6	clean SAND to silty SAND	125	5.0	49	35	86	42	-	-	10	1.88	16	0.00	0.0
36.75	316.0	230.7	239.7	316.0	3.7	-0.7	1.2	6	clean SAND to silty SAND	125	5.0	63	46	95	43	-	-	6	1.70	16	0.00	0.0
36.91	316.6	230.8	257.4	316.6	5.1	-0.6	1.6	6	clean SAND to silty SAND	125	5.0	63	46	95	43	-	-	8	1.81	16	0.00	0.0
37.08	313.6	228.3	272.5	313.6	6.6	-0.5	2.1	6	clean SAND to silty SAND	125	5.0	63	46	94	43	-	-	11	1.91	16	0.00	0.0
37.24	318.4	231.5	288.3	318.4	7.8	-0.5	2.5	6	clean SAND to silty SAND	125	5.0	64	46	95	43	-	-	12	1.96	16	0.00	0.0
37.40	359.4	260.9	302.6	359.4	7.5	-0.9	2.1	6	clean SAND to silty SAND	125	5.0	72	52	95	44	-	-	10	1.87	16	0.00	0.0
37.57	318.6	230.9	289.8	318.6	7.9	-0.6	2.5	6	clean SAND to silty SAND	125	5.0	64	46	95	43	-	-	12	1.96	16	0.00	0.0
37.73	227.0	164.3	251.8	227.0	7.3	-0.3	3.2	5	silty SAND to sandy SILT	120	3.0	76	55	83	42	-	-	17	2.14	16	0.00	0.0
37.90	137.2	99.1	233.1	137.2	6.5	0.3	4.8	9	very stiff fine SOIL	120	1.0	100	99	-	-	4.8	9.9	27	2.41	30	0.00	0.0
38.06	81.3	58.7	158.5	81.3	3.0	-0.1	3.8	4	clayy SILT to silty CLAY	115	2.0	41	29	-	-	5.6	9.9	30	2.49	15	0.18	0.5
38.22	53.3	29.4	-	53.3	2.1	0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	27	15	-	-	3.6	9.3	42	2.74	15	-	-
38.39	49.6	27.3	-	49.6	2.1	-0.1	4.3	3	silty CLAY to CLAY	115	1.5	33	18	-	-	3.4	8.6	44	2.77	15	-	-
38.55	66.1	36.2	-	66.1	3.1	0.1	4.8	3	silty CLAY to CLAY	115	1.5	44	24	-	-	4.5	9.9	41	2.71	15	-	-
38.72	74.3	40.7	-	74.3	4.4	-0.2	6.1	3	silty CLAY to CLAY	115	1.5	50	27	-	-	5.1	9.9	43	2.74	15	-	-
38.88	69.9	38.2	-	69.9	3.5	-0.1	5.2	3	silty CLAY to CLAY	115	1.5	47	25	-	-	4.8	9.9	41	2.72	15	-	-
39.04	46.0	25.1	-	46.0	3.0	0.1	6.8	3	silty CLAY to CLAY	115	1.5	31	17	-	-	3.1	7.9	54	2.93	15	-	-
39.21	80.9	57.9	151.8	80.9	2.8	0.3	3.6	4	clayy SILT to silty CLAY	115	2.0	40	29	-	-	5.6	9.9	29	2.47	15	0.26	1.0
39.37	104.0	74.4	172.1	104.0	3.7	0.3	3.6	4	clayy SILT to silty CLAY	115	2.0	52	37	-	-	7.2	9.9	26	2.40	15	0.00	0.0
39.54	76.5	41.4	-	76.5	3.7	-0.5	5.0	3	silty CLAY to CLAY	115	1.5	51	28	-	-	5.3	9.9	39	2.68	15	-	-
39.70	83.1	59.3	159.7	83.1	3.1	-0.3	3.8	4	clayy SILT to silty CLAY	115	2.0	42	30	-	-	5.7	9.9	30	2.48	15	0.18	0.5
39.86	49.8	26.8	-	49.7	2.8	-1.2	5.9	3	silty CLAY to CLAY	115	1.5	33	18	-	-	3.4	8.4	50	2.87	15	-	-
40.03	40.9	21.9	-	40.8	2.2	-1.0	5.6	3	silty CLAY to CLAY	115	1.5	27	15	-	-	2.8	6.8	53	2.92	15	-	-
40.19	41.3	22.1	-	41.3	2.5	-1.2	6.3	3	silty CLAY to CLAY	115	1.5	28	15	-	-	2.8	6.9	55	2.95	15	-	-
40.36	56.7	30.3	-	56.7	2.7	-1.2	5.0	3	silty CLAY to CLAY	115	1.5	38	20	-	-	3.9	9.6	45	2.78	15	-	-
40.52	54.9	29.3	-	54.9	2.8	-1.1	5.3	3	silty CLAY to CLAY	115	1.5	37	20	-	-	3.8	9.2	46	2.81	15	-	-
40.68	85.9	60.9	157.3	85.9	3.1	-1.1	3.7	4	clayy SILT to silty CLAY	115	2.0	43	30	-	-	5.9	9.9	29	2.46	15	0.19	0.6
40.85	78.7	55.7	148.9	78.6	2.7	-2.1	3.6	4	clayy SILT to silty CLAY	115	2.0	39	28	-	-	5.4	9.9	30	2.48	15	0.32	1.3
41.01	62.0	32.8	-	61.9	3.0	-2.0	5.1	3	silty CLAY to CLAY	115	1.5	41	22	-	-	4.2	9.9	43	2.76	15	-	-
41.18	96.0	67.8	161.2	96.0	3.3	-1.8	3.5	4	clayy SILT to silty CLAY	115	2.0	48	34	-	-	6.7	9.9	27	2.42	15	0.00	0.0
41.34	120.9	85.3	146.3	120.8	2.8	-2.1	2.3	5	silty SAND to sandy SILT	120	3.0	40	28	62	38	-	-	20	2.22	16	0.44	2.4
41.50	193.9	136.6	155.0	193.8	2.1	-2.7	1.1	6	clean SAND to silty SAND	125	5.0	39	27	77	41	-	-	9	1.84	16	0.30	2.1
41.67	245.3	172.6	172.6	245.2	1.6	-2.8	0.6	6	clean SAND to silty SAND	125	5.0	49	35	85	42	-	-	5	1.61	16	0.00	0.0
41.83	275.3	193.4	193.4	275.2	1.7	-2.6	0.6	6	clean SAND to silty SAND	125	5.0	55	39	89	42	-	-	5	1.56	16	0.00	0.0
42.00	298.5	209.5	209.5	298.5	1.7	-2.5	0.6	6	clean SAND to silty SAND	125	5.0	60	42	91	43	-	-	5	1.51	16	0.00	0.0
42.16	304.5	213.4	213.4	304.5	1.9	-2.4	0.6	6	clean SAND to silty SAND	125	5.0	61	43	92	43	-	-	5	1.53	16	0.00	0.0
42.32	284.0	198.7	198.7	284.0	2.1	-2.3	0.7	6	clean SAND to silty SAND	125	5.0	57	40	90	43	-	-	5	1.60	16	0.00	0.0
42.49	266.0	185.9	190.5	265.9	2.4	-2.7	0.9	6	clean SAND to silty SAND	125	5.0	53	37	87	42	-	-	6	1.68	16	0.00	0.0
42.65	176.6	123.3	150.1	176.6	2.3	-2.7	1.3	6	clean SAND to silty SAND	125	5.0	35	25	74	40	-	-	11	1.93	16	0.41	2.4
42.82	92.2	64.3	117.4	92.2	1.8	-2.5	2.0	5	silty SAND to sandy SILT	120	3.0	31	21	52	36	-	-	21	2.26	16	1.96	30.2
42.98	63.0	43.9	104.9	63.0	1.3	-2.4	2.2	5	silty SAND to sandy SILT	120	3.0	21	15	40	34	-	-	27	2.42	16	2.25	51.2
43.15	48.7	25.0	-	48.7	1.2	-2.3	2.7	4	clayy SILT to silty CLAY	115	2.0	24	12	-	-	3.3	7.8	39	2.66	15	-	-
43.31	47.7	24.4	-	47.6	1.2	-2.2	2.7	4	clayy SILT to silty CLAY	115	2.0	24	12	-	-	3.2	7.6	39	2.67	15	-	-
43.47	40.0	20.4	-	39.9	1.0	-2.2	2.7	4	clayy SILT to silty CLAY	115	2.0	20	10	-	-	2.7	6.3	43	2.74	15	-	-
43.64	38.5	19.6	-	38.5	1.1	-2.0	2.9	4	clayy SILT to silty CLAY	115	2.0	19	10	-	-	2.6	6.0	45	2.78	15	-	-
43.80	36.7	18.6	-	36.7	1.5	-1.9	4.3	3	silty CLAY to CLAY	115	1.5	24	12	-	-	2.5	5.7	52	2.90	15	-	-
43.97	46.7	23.7	-	46.7	2.2	-1.8	5.0	3	silty CLAY to CLAY	115	1.5	31	16	-	-	3.2	7.4	50	2.86	15	-	-
44.13	82.9	57.3	145.0	82.9	2.7	-1.8	3.3	4	clayy SILT to silty CLAY	115	2.0	41	29	-	-	5.7	9.9	29	2.45	15	0.43	2.1
44.29	48.2	24.3	-	48.1	2.1	-2.6	4.5	3	silty CLAY to CLAY	115	1.5	32	16	-	-	3.3	7.6	47	2.82	15	-	-
44.46	33.5	16.9	-	33.5	1.0	-2.4	3.3	3	silty CLAY to CLAY	115	1.5	22	11	-	-	2.2	5.1	50	2.87	15	-	-
44.62	28.8	14.5	-	28.7	0.8	-2.3	3.2	3	silty CLAY to CLAY	115	1.5	19	10	-	-	1.9	4.3	53	2.92	15	-	-
44.79	26.4	13.2	-	26.4	0.8	-2.2	3.6	3	silty CLAY to CLAY	115	1.5	18	9	-	-	1.7	3.9	57	2.98	15	-	-
44.95	27.2	13.6	-	27.2	0.9	-2.1	3.6	3	silty CLAY to CLAY	115	1.5	18	9	-	-	1.8	4.0	56	2.97	15	-	-
45.11	27.3	13.6	-	27.3	0.9	-2.1	3.7	3	silty CLAY to CLAY	115	1.5	18	9	-	-	1.8	4.1	57	2.98	15	-	-
45.28	29.8	14.8	-	29.8	0.9	-2.0	3.5	3	silty CLAY to CLAY	115	1.5	20	10	-	-	2.0	4.5	54	2.93	15	-	-
45.44	32.9	16.4	-	32.9	1.0	-2.0	3.4	3	silty CLAY to CLAY	115	1.5	22	11	-	-	2.2	5.0	51	2.88	15	-	-
45.61	31.9	15.8	-	31.9	1.0	-2.0	3.4	3	silty CLAY to CLAY	115	1.5	21	11	-	-	2.1	4.8	52	2.90	15	-	-
45.77	30.2	14.9	-	30.1	1.1	-2.0	4.1	3	silty CLAY to CLAY	115	1.5	20	10	-	-	2.0	4.5	56	2.97	15	-	-
45.93	30.2	14.9	-	30.1	1.3	-1.9	4.8	3	silty CLAY to CLAY	115	1.5	20	10	-	-	2.0	4.5	59	3.01	15	-	-
46.10	35.9	17.7	-	35.9	1.4	-1.9	4.3	3	silty CLAY to CLAY	115	1.5	24	12	-	-	2.4	5.4	53	2.92	15	-	-
46.26	34.0	16.7	-	34.0	1.2	-2.0	3.9	3	silty CLAY to CLAY	115	1.5	23	11	-	-	2.3	5.1	53	2.91	15	-	-

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(037).cpt
CPT Date: 9/28/2017 2:04:24 PM
GW During Test: 23 ft

Sounding ID: CPT-11
Project No: 11753.001
Cone/Rig: DDG1379

. Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	. SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR - -	* Fin Ic %	* Ic SBT Indx	* Nk - -	* Vol Strn %	* Cycl SStn %
46.43	26.8	13.2	-	26.8	0.9	-1.9	3.9	3	silty CLAY to CLAY	115	1.5	18	9	-	-	1.8	3.9	59	3.01	15	-	-
46.59	29.8	14.6	-	29.8	1.8	-1.8	6.8	3	silty CLAY to CLAY	115	1.5	20	10	-	-	2.0	4.4	67	3.12	15	-	-
46.75	80.3	54.5	148.9	80.2	2.8	-1.6	3.6	4	clayy SILT to silty CLAY	115	2.0	40	27	-	-	5.5	9.9	30	2.49	15	0.33	1.3
46.92	56.3	27.4	-	56.2	3.2	-2.0	6.0	3	silty CLAY to CLAY	115	1.5	38	18	-	-	3.8	8.6	50	2.87	15	-	-

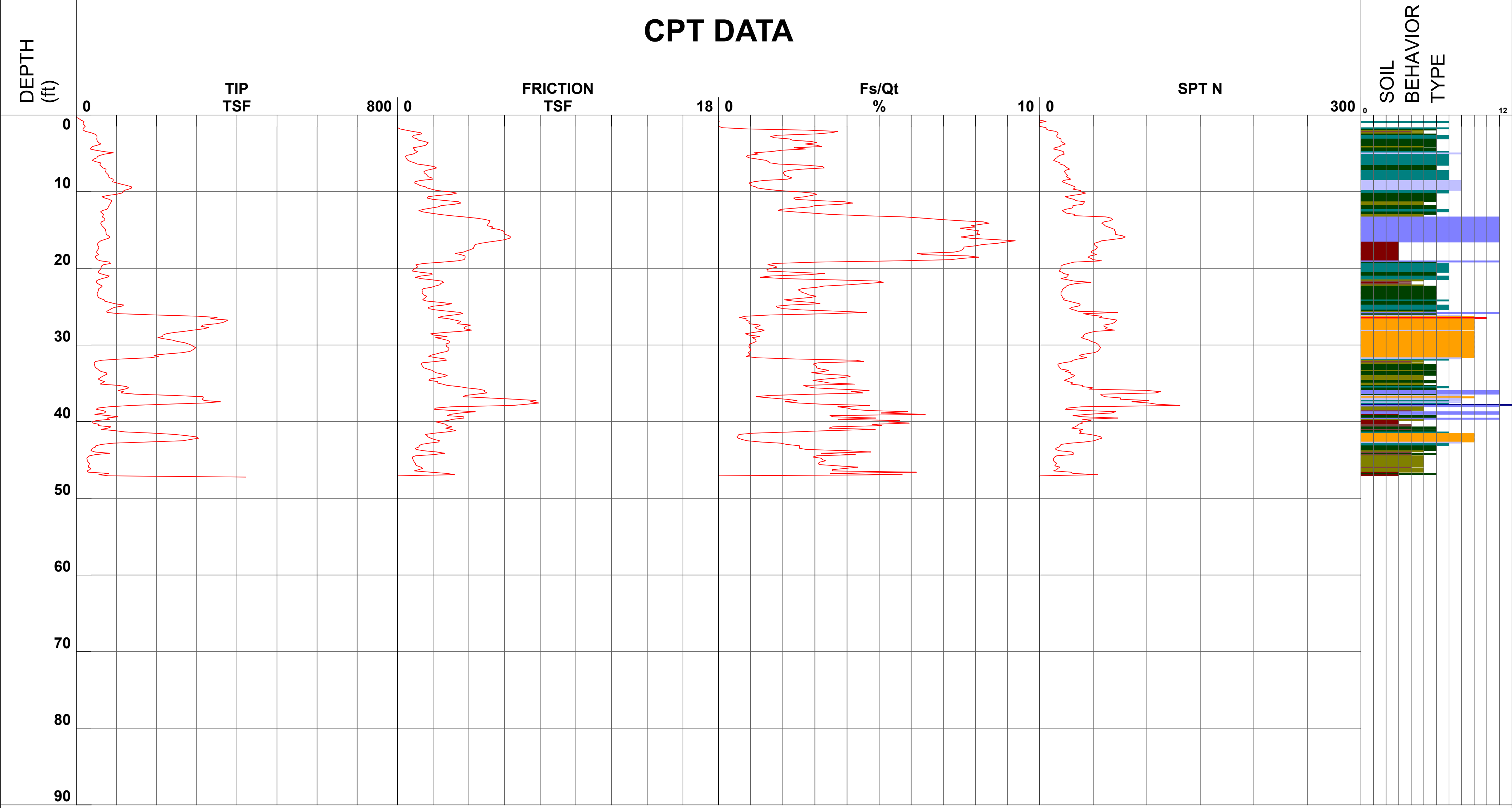
* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(037).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-11	Date and Time	9/28/2017 2:04:24 PM	Maximum Depth	47.24 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(044).cpt
CPT Date: 9/29/2017 4:39:08 PM
GW During Test: 23 ft

Page: 1
Sounding ID: CPT-12
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	1.1	0.0	-	1.1	0.0	0.0	0.1	1	sensitive fine SOIL	115	2.0	1	1	-	-	0.1	9.9	95	3.48	15	N/A	N/A
0.49	1.1	0.2	-	1.1	0.0	0.1	9.9	2	Organic SOILS - Peats	100	1.0	1	0	-	-	0.1	9.9	95	4.93	10	N/A	N/A
0.66	1.1	1.1	-	1.1	0.0	0.0	6.5	2	Organic SOILS - Peats	100	1.0	1	1	-	-	0.1	9.9	95	4.00	10	N/A	N/A
0.82	4.3	6.9	-	4.3	0.0	0.2	0.9	4	clayy SILT to silty CLAY	115	2.0	2	3	-	-	0.3	9.9	52	2.89	15	N/A	N/A
0.98	5.4	8.6	-	5.4	0.1	0.2	1.4	4	clayy SILT to silty CLAY	115	2.0	3	4	-	-	0.4	9.9	51	2.89	15	N/A	N/A
1.15	10.0	16.0	50.2	10.0	0.1	0.3	1.0	5	silty SAND to sandy SILT	120	3.0	3	5	6	43	-	-	34	2.57	16	N/A	N/A
1.31	14.7	23.6	56.6	14.7	0.1	0.2	1.0	5	silty SAND to sandy SILT	120	3.0	5	8	19	44	-	-	27	2.42	16	N/A	N/A
1.48	11.9	19.0	55.6	11.9	0.1	0.0	1.1	5	silty SAND to sandy SILT	120	3.0	4	6	12	42	-	-	32	2.53	16	N/A	N/A
1.64	8.4	13.5	-	8.4	0.1	0.1	0.9	4	clayy SILT to silty CLAY	115	2.0	4	7	-	-	0.6	9.9	36	2.62	15	N/A	N/A
1.80	8.2	13.1	39.2	8.2	0.0	0.1	0.5	5	silty SAND to sandy SILT	120	3.0	3	4	5	39	-	-	33	2.54	16	N/A	N/A
1.97	7.3	11.7	38.1	7.3	0.0	0.2	0.5	5	silty SAND to sandy SILT	120	3.0	2	4	5	38	-	-	35	2.59	16	N/A	N/A
2.13	7.2	11.6	-	7.2	0.1	0.3	1.2	4	clayy SILT to silty CLAY	115	2.0	4	6	-	-	0.5	9.9	42	2.74	15	N/A	N/A
2.30	7.6	12.2	-	7.6	0.7	0.2	9.4	3	silty CLAY to CLAY	115	1.5	5	8	-	-	0.5	9.9	76	3.24	15	N/A	N/A
2.46	13.7	22.0	-	13.7	1.3	0.2	9.4	3	silty CLAY to CLAY	115	1.5	9	15	-	-	1.0	9.9	63	3.06	15	N/A	N/A
2.62	38.3	61.4	131.6	38.3	1.0	-0.1	2.7	5	silty SAND to sandy SILT	120	3.0	13	20	51	45	-	-	25	2.36	16	N/A	N/A
2.79	22.4	35.9	90.7	22.4	0.4	0.0	2.0	5	silty SAND to sandy SILT	120	3.0	7	12	33	42	-	-	28	2.45	16	N/A	N/A
2.95	19.6	31.4	63.9	19.6	0.2	0.4	1.0	5	silty SAND to sandy SILT	120	3.0	7	10	29	41	-	-	23	2.33	16	N/A	N/A
3.12	17.8	28.5	66.0	17.8	0.2	0.4	1.2	5	silty SAND to sandy SILT	120	3.0	6	10	26	40	-	-	26	2.40	16	N/A	N/A
3.28	16.3	26.1	64.7	16.3	0.2	0.2	1.2	5	silty SAND to sandy SILT	120	3.0	5	9	23	40	-	-	28	2.44	16	N/A	N/A
3.45	18.2	29.2	62.9	18.2	0.2	0.4	1.0	5	silty SAND to sandy SILT	120	3.0	6	10	26	40	-	-	25	2.36	16	N/A	N/A
3.61	20.7	33.3	67.2	20.8	0.2	0.2	1.1	5	silty SAND to sandy SILT	120	3.0	7	11	31	40	-	-	23	2.32	16	N/A	N/A
3.77	27.2	43.6	70.4	27.2	0.2	0.3	0.9	5	silty SAND to sandy SILT	120	3.0	9	15	40	42	-	-	18	2.18	16	N/A	N/A
3.94	21.0	33.7	68.5	21.0	0.2	0.1	1.1	5	silty SAND to sandy SILT	120	3.0	7	11	31	40	-	-	23	2.32	16	N/A	N/A
4.10	17.1	27.5	58.1	17.1	0.2	0.2	0.9	5	silty SAND to sandy SILT	120	3.0	6	9	24	39	-	-	24	2.35	16	N/A	N/A
4.27	14.6	23.4	55.7	14.6	0.1	0.2	0.9	5	silty SAND to sandy SILT	120	3.0	5	8	19	38	-	-	27	2.42	16	N/A	N/A
4.43	7.5	12.0	-	7.5	0.1	0.3	1.4	4	clayy SILT to silty CLAY	115	2.0	4	6	-	-	0.5	9.2	44	2.76	15	N/A	N/A
4.59	10.9	17.5	-	10.9	0.3	0.2	3.2	3	silty CLAY to CLAY	115	1.5	7	12	-	-	0.8	9.9	47	2.82	15	N/A	N/A
4.76	13.9	22.3	-	13.9	0.3	0.3	2.1	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	37	2.63	15	N/A	N/A
4.92	10.3	16.6	-	10.3	0.4	0.2	4.4	3	silty CLAY to CLAY	115	1.5	7	11	-	-	0.7	9.9	54	2.93	15	N/A	N/A
5.09	14.8	23.7	-	14.8	0.4	0.2	2.4	4	clayy SILT to silty CLAY	115	2.0	7	12	-	-	1.0	9.9	38	2.65	15	N/A	N/A
5.25	11.0	17.6	-	11.0	0.2	0.3	2.1	4	clayy SILT to silty CLAY	115	2.0	5	9	-	-	0.8	9.9	42	2.72	15	N/A	N/A
5.41	22.6	36.2	86.0	22.6	0.4	0.2	1.8	5	silty SAND to sandy SILT	120	3.0	8	12	33	39	-	-	27	2.41	16	N/A	N/A
5.58	49.1	78.8	108.0	49.1	0.6	0.0	1.2	5	silty SAND to sandy SILT	120	3.0	16	26	59	43	-	-	14	2.05	16	N/A	N/A
5.74	63.5	101.9	125.9	63.5	0.7	0.1	1.2	6	clean SAND to silty SAND	125	5.0	13	20	68	44	-	-	12	1.95	16	N/A	N/A
5.91	65.0	104.3	131.8	65.0	0.8	0.0	1.3	6	clean SAND to silty SAND	125	5.0	13	21	68	44	-	-	12	1.97	16	N/A	N/A
6.07	67.8	108.7	148.1	67.8	1.2	-0.2	1.7	5	silty SAND to sandy SILT	120	3.0	23	36	70	44	-	-	14	2.04	16	N/A	N/A
6.23	71.8	115.2	157.1	71.8	1.3	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	24	38	72	44	-	-	14	2.05	16	N/A	N/A
6.40	71.3	113.1	152.7	71.3	1.2	0.0	1.7	5	silty SAND to sandy SILT	120	3.0	24	38	71	44	-	-	14	2.04	16	N/A	N/A
6.56	68.8	107.7	131.2	68.8	0.8	-0.1	1.2	6	clean SAND to silty SAND	125	5.0	14	22	69	43	-	-	11	1.93	16	N/A	N/A
6.73	62.2	96.1	118.7	62.2	0.7	-0.1	1.1	6	clean SAND to silty SAND	125	5.0	12	19	66	43	-	-	12	1.94	16	N/A	N/A
6.89	55.9	85.2	116.1	55.9	0.7	-0.1	1.3	5	silty SAND to sandy SILT	120	3.0	19	28	62	42	-	-	14	2.04	16	N/A	N/A
7.05	53.9	81.2	119.9	53.9	0.8	-0.1	1.6	5	silty SAND to sandy SILT	120	3.0	18	27	60	42	-	-	16	2.11	16	N/A	N/A
7.22	54.7	81.5	124.8	54.7	0.9	-0.1	1.7	5	silty SAND to sandy SILT	120	3.0	18	27	60	42	-	-	17	2.14	16	N/A	N/A
7.38	57.1	84.0	136.3	57.1	1.2	-0.1	2.1	5	silty SAND to sandy SILT	120	3.0	19	28	61	42	-	-	18	2.18	16	N/A	N/A
7.55	62.6	91.2	143.9	62.6	1.3	-0.3	2.1	5	silty SAND to sandy SILT	120	3.0	21	30	64	42	-	-	18	2.16	16	N/A	N/A
7.71	58.6	84.4	145.6	58.6	1.4	-0.3	2.4	5	silty SAND to sandy SILT	120	3.0	20	28	61	42	-	-	20	2.22	16	N/A	N/A
7.87	56.8	80.9	144.3	56.8	1.4	-0.4	2.4	5	silty SAND to sandy SILT	120	3.0	19	27	60	42	-	-	21	2.24	16	N/A	N/A
8.04	52.1	73.5	133.2	52.1	1.2	-0.2	2.3	5	silty SAND to sandy SILT	120	3.0	17	24	57	41	-	-	21	2.26	16	N/A	N/A
8.20	39.6	55.3	122.1	39.6	1.0	-0.2	2.5	5	silty SAND to sandy SILT	120	3.0	13	18	47	39	-	-	25	2.37	16	N/A	N/A
8.37	43.8	60.5	117.8	43.8	0.9	-0.4	2.2	5	silty SAND to sandy SILT	120	3.0	15	20	50	40	-	-	23	2.30	16	N/A	N/A
8.53	57.0	78.0	132.8	57.0	1.2	-0.4	2.1	5	silty SAND to sandy SILT	120	3.0	19	26	59	41	-	-	19	2.21	16	N/A	N/A
8.69	71.3	96.6	147.9	71.3	1.5	-0.5	2.1	5	silty SAND to sandy SILT	120	3.0	24	32	66	42	-	-	17	2.14	16	N/A	N/A
8.86	84.2	113.1	152.2	84.2	1.4	-0.4	1.7	5	silty SAND to sandy SILT	120	3.0	28	38	71	43	-	-	14	2.03	16	N/A	N/A
9.02	90.0	119.7	149.4	90.0	1.3	-0.4	1.4	6	clean SAND to silty SAND	125	5.0	18	24	73	43	-	-	12	1.96	16	N/A	N/A
9.19	85.6	112.7	143.1	85.6	1.2	-0.4	1.4	6	clean SAND to silty SAND	125	5.0	17	23	71	43	-	-	12	1.98	16	N/A	N/A
9.35	89.3	116.5	148.1	89.3	1.3	-0.5	1.5	6	clean SAND to silty SAND	125	5.0	18	23	72	43	-	-	12	1.98	16	N/A	N/A
9.51	93.8	121.3	154.1	93.8	1.4	-0.5	1.5	6	clean SAND to silty SAND	125	5.0	19	24	73	43	-	-	12	1.98	16	N/A	N/A
9.68	95.1	121.9	154.4	95.1	1.4	-0.5	1.5	6	clean SAND to silty SAND	125	5.0	19	24	74	43	-	-	12	1.97	16	N/A	N/A
9.84	89.0	113.0	153.5	88.9	1.6	-0.5	1.8	5	silty SAND to sandy SILT	120	3.0	30	38	71	43	-	-	14	2.04	16	N/A	N/A
10.01	88.5	111.5	165.7	88.5	1.9	-0.5	2.2	5	silty SAND to sandy SILT	120	3.0	30	37	71	43	-	-	16	2.12	16	N/A	N/A
10.17	80.5	100.5	179.9	80.5	2.4	-0.5	3.0	5	silty SAND to sandy SILT	120	3.0	27	34	67	42	-	-	21	2.25	16	N/A	N/A
10.34	78.9	97.8	195.3	78.9	2.8	-0.5	3.6	5	silty SAND to sandy SILT	120	3.0	26	33	66	42	-	-	23	2.31	16	N/A	N/A
10.50	76.0	93.4	196.9	76.0	2.9	-0.4	3.8	4	clayy SILT to silty CLAY	115	2.0	38	47	-	-	5.3	9.9	24	2.35	15	N/A	N/A
10.66	72.7	88.7	187.9	72.6	2.7	-0.5	3.7	4	clayy SILT to silty CLAY	115	2.0	36	44	-	-	5.1	9.9	24	2.35	15	N/A	N/A
10.83	74.9	90.7	181.5	74.9	2.5	-0.6	3.4	5	silty SAND to sandy SILT	120	3.0	25	30	64	41	-	-	23	2.32	16	N/A	N/A
10.99	77.4	93.0	193.0	77.4	2.8	-0.5	3.7	5	silty SAND to sandy SILT	120	3.0	26	31	65	41	-	-	24	2.34	16	N/A	N/A
11.16	71.5	85.3	224.9	71.5	3.7	-0.6	5.2	9	very stiff fine SOIL	120	1.0	71	85	-	-	2.5	9.9	30	2.47	30	N/A	N/A
11.32	63.2	74.9	228.6	63.2	3.7	-0.6	5.9	9	very stiff fine SOIL	120	1.0	63	75	-	-	2.2	9.9	33	2.55	30	N/A	N/A
11.48	57.9	74.4	245.6	57.9	3.8	-1.3	6.6	9	very stiff fine SOIL	120	1.0	58	74	-	-	2.0	9.9	35	2.60	30	N/A	N/A
11.65	57.1	72.6	236.0	57.1	3.6	-1.7	6.3	9	very stiff fine SOIL	120	1.0	57	73	-	-	2.0	9.9	35	2.59	30	N/A	N/A
11.81	55.9	70.3	-	55.8	3.6	-1.5	6.4	9	very stiff fine SOIL	120	1.0	56	70	-	-	1.9	9.9	35	2.60	30	N/A	N/A
11.98	56.1	69.9	232.0	56.0	3.5	-1.1	6.4	9	very stiff fine SOIL	120	1.0	56	70	-	-	2.0	9.9	35	2.60	30	N/A	N/A
12.14	59.3	67.8	221.7	59.3	3.5	-1.3	6.1	9	very stiff fine SOIL	120	1.0	59	68	-	-	2.1	9.9	35	2.59	30	N/A	N/A
12.30	64.8	73.6	216.3	64.8	3.5	-0.8	5.5	4	clayy SILT to silty CLAY	115	2.0	32	37	-	-	4.5	9.9	32	2.53	15	N/A	N/A
12.47	67.6	76.3	208.2	67.6	3.3	-0.8	5.0	4	clayy SILT to silty CLAY	115	2.0	34	38	-	-	4.7	9.9	30	2.49	15	N/A	N/A
12.63	72.1	80.8	205.2	72.1	3.3	-0.8	4.6	4	clayy SILT to silty CLAY	115	2.0	36	40	-	-	5.0	9.9	29	2.45	15	N/A	N/A
12.80	75.5	84.1	200.7	75.5	3.2	-0.8	4.3	4	clayy SILT to silty CLAY	115	2.0	38	42	-	-	5.3	9.9	27	2.42	15	N/A	N/A
12.96	72.8	80.6	201.6	72.7	3.2	-0.8	4.5	4	clayy SILT to silty CLAY	115	2.0	36	40	-	-	5.1	9.9	28	2.44	15	N/A	N/A
13.12	70.2	77.3	205.3	70.2	3.3	-1.4	4.8	4	clayy SILT to silty CLAY	115	2.0	35	39	-	-	4.9	9.9	30	2.48	15	N/A	N/A
13.29	66.1	72.3	208.9	66.1	3.4	-2.2	5.2	4	clayy SILT to silty CLAY	115	2.0	33	36	-	-	4.6	9.9	32	2.52	15	N/A	N/A
13.45	62.9	68.4	210.6	62.9	3.4	-2.6	5.5	4	clayy SILT to silty CLAY	115	2.0	31	34	-	-	4.4	9.9	33	2.56	15	N/A	N/A
13.62	55.8	63.8	211.7	55.8	3.2	-1.8	5.9	4	clayy SILT to silty CLAY	115	2.0	28	32	-	-	3.9	9.9	35	2.60	15	N/A	N/A
13.78	51.6	63.2	-	51.6	3.0	-1.4	6.0	4	clayy SILT to silty CLAY	115	2.0	26	32	-	-	3.6	9.9	36	2.61	15	N/A	N/A
13.94	54.2	57.9	189.7	54.2	2.8	-1.4	5.3	4	clayy SILT to silty CLAY	115	2.0	27	29	-	-	3.8	9.9	35	2.59	15	N/A	N/A
14.11	56.4	60.0	178.8	56.4	2.6	-1.4	4.7	4	clayy SILT to silty CLAY	115	2.0	28	30	-	-	3.9	9.9	33	2.54	15	N/A	N/A
14.27	57.8	61.1	178.2	57.8	2.6	-1.3	4.6	4	clayy SILT to silty CLAY	115	2.0	29	31	-	-	4.0	9.9	32	2.53	15	N/A	N/A
14.44	58.6	61.6	173.3	58.6	2.5	-1.3	4.3	4	clayy SILT to silty CLAY	115	2.0	29	31	-	-	4.1	9.9	31	2.51	15	N/A	N/A
14.60	59.1	61.8	195.0	59.1	3.1	-1.6	5.3	4	clayy SILT to silty CLAY	115	2.0	30	31	-	-	4.1	9.9	34	2.57	15	N/A	N/A
14.76	54.8	62.7	-	54.8	3.4	-1.2	6.3	3	silty CLAY to CLAY	115	1.5	37	42	-	-	3.8	9.9	37	2.63	15	N/A	N/A
14.93	51.7	58.6	-	51.7	3.6	-1.4	7.0	3	silty CLAY to CLAY	115	1.5	34	39	-	-	3.6	9.9	40	2.68	15	N/A	N/A
15.09	51.8	58.0	-	51.8	3.6	-1.0	7.1	3	silty CLAY to CLAY	115	1.5	35	39	-	-	3.6	9.9	40	2.69	15	N/A	N/A
15.26	56.3	62.5	-	56.3	4.1	-1.2	7.4	9	very stiff fine SOIL	120	1.0	56	63	-	-	2.0	9.9	39	2.68	30	N/A	N/A
15.42	56.7	62.3	-	56.7	4.2	-1.4	7.5	9	very stiff fine SOIL	120	1.0	57	62	-	-	2.0	9.9	40	2.69	30	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(044).cpt
CPT Date: 9/29/2017 4:39:08 PM
GW During Test: 23 ft

Sounding ID: CPT-12
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	55.8	60.6	-	55.8	3.8	-1.3	7.0	3	silty CLAY to CLAY	115	1.5	37	40	-	-	3.9	9.9	39	2.67	15	N/A	N/A
15.75	55.1	59.2	-	55.0	3.5	-1.2	6.5	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.8	9.9	38	2.65	15	N/A	N/A
15.91	54.5	58.0	-	54.5	3.5	-1.1	6.4	3	silty CLAY to CLAY	115	1.5	36	39	-	-	3.8	9.9	38	2.66	15	N/A	N/A
16.08	55.8	58.8	-	55.8	3.7	-1.0	6.7	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.9	9.9	39	2.67	15	N/A	N/A
16.24	59.8	62.4	-	59.8	3.9	-2.7	6.6	9	very stiff fine SOIL	120	1.0	60	62	-	-	2.1	9.9	38	2.65	30	N/A	N/A
16.40	58.2	60.1	-	58.2	4.1	-2.9	7.1	3	silty CLAY to CLAY	115	1.5	39	40	-	-	4.0	9.9	39	2.68	15	N/A	N/A
16.57	56.4	57.7	-	56.4	3.9	-2.9	7.1	3	silty CLAY to CLAY	115	1.5	38	38	-	-	3.9	9.9	40	2.69	15	N/A	N/A
16.73	50.3	51.0	-	50.3	3.4	-2.4	7.0	3	silty CLAY to CLAY	115	1.5	34	34	-	-	3.5	9.9	41	2.72	15	N/A	N/A
16.90	46.5	46.6	-	46.4	3.0	-1.5	6.7	3	silty CLAY to CLAY	115	1.5	31	31	-	-	3.2	9.9	42	2.73	15	N/A	N/A
17.06	43.0	42.8	-	43.0	2.8	-1.7	6.7	3	silty CLAY to CLAY	115	1.5	29	29	-	-	3.0	9.9	44	2.76	15	N/A	N/A
17.23	40.7	40.0	-	40.6	2.7	-1.9	6.9	3	silty CLAY to CLAY	115	1.5	27	27	-	-	2.8	9.9	45	2.79	15	N/A	N/A
17.39	41.8	40.8	-	41.8	2.5	-1.8	6.2	3	silty CLAY to CLAY	115	1.5	28	27	-	-	2.9	9.9	43	2.75	15	N/A	N/A
17.55	41.0	39.6	-	40.9	2.3	-1.5	5.6	3	silty CLAY to CLAY	115	1.5	27	26	-	-	2.8	9.9	42	2.73	15	N/A	N/A
17.72	37.8	36.2	-	37.8	2.1	-1.4	5.8	3	silty CLAY to CLAY	115	1.5	25	24	-	-	2.6	9.9	44	2.76	15	N/A	N/A
17.88	35.4	33.6	-	35.4	2.0	-1.5	5.8	3	silty CLAY to CLAY	115	1.5	24	22	-	-	2.4	9.9	45	2.78	15	N/A	N/A
18.05	33.1	31.2	-	33.1	1.8	-1.4	5.5	3	silty CLAY to CLAY	115	1.5	22	21	-	-	2.3	9.9	46	2.80	15	N/A	N/A
18.21	31.7	29.6	-	31.7	1.7	-1.4	5.5	3	silty CLAY to CLAY	115	1.5	21	20	-	-	2.2	9.4	47	2.81	15	N/A	N/A
18.37	31.5	29.1	-	31.4	1.6	-1.4	5.4	3	silty CLAY to CLAY	115	1.5	21	19	-	-	2.1	9.3	47	2.81	15	N/A	N/A
18.54	31.2	28.5	-	31.1	1.6	-1.0	5.3	3	silty CLAY to CLAY	115	1.5	21	19	-	-	2.1	9.1	47	2.81	15	N/A	N/A
18.70	31.6	28.7	-	31.6	1.5	-0.9	4.9	3	silty CLAY to CLAY	115	1.5	21	19	-	-	2.2	9.1	45	2.79	15	N/A	N/A
18.87	32.7	29.4	-	32.6	1.7	-0.9	5.5	3	silty CLAY to CLAY	115	1.5	22	20	-	-	2.2	9.4	47	2.81	15	N/A	N/A
19.03	28.5	25.5	-	28.5	1.7	-0.1	6.3	3	silty CLAY to CLAY	115	1.5	19	17	-	-	1.9	8.1	52	2.90	15	N/A	N/A
19.19	31.4	27.8	-	31.4	1.8	0.7	5.8	3	silty CLAY to CLAY	115	1.5	21	19	-	-	2.1	8.8	49	2.85	15	N/A	N/A
19.36	31.3	27.5	-	31.3	1.7	0.7	5.7	3	silty CLAY to CLAY	115	1.5	21	18	-	-	2.1	8.7	49	2.85	15	N/A	N/A
19.52	31.4	27.3	-	31.4	1.9	0.7	6.4	3	silty CLAY to CLAY	115	1.5	21	18	-	-	2.1	8.7	51	2.88	15	N/A	N/A
19.69	38.2	33.0	-	38.2	2.0	0.8	5.5	3	silty CLAY to CLAY	115	1.5	25	22	-	-	2.6	9.9	45	2.78	15	N/A	N/A
19.85	43.3	37.1	-	43.3	2.3	1.3	5.5	3	silty CLAY to CLAY	115	1.5	29	25	-	-	3.0	9.9	43	2.74	15	N/A	N/A
20.01	46.6	39.6	-	46.6	2.5	1.1	5.5	3	silty CLAY to CLAY	115	1.5	31	26	-	-	3.2	9.9	41	2.72	15	N/A	N/A
20.18	51.8	43.7	-	51.8	2.5	1.2	5.0	3	silty CLAY to CLAY	115	1.5	35	29	-	-	3.6	9.9	38	2.66	15	N/A	N/A
20.34	44.0	36.9	-	44.0	2.4	0.2	5.5	3	silty CLAY to CLAY	115	1.5	29	25	-	-	3.0	9.9	43	2.74	15	N/A	N/A
20.51	54.6	48.3	150.1	54.6	2.2	0.3	4.1	4	clayy SILT to silty CLAY	115	2.0	27	24	-	-	3.8	9.9	34	2.56	15	N/A	N/A
20.67	58.9	51.9	151.0	58.9	2.2	0.3	3.9	4	clayy SILT to silty CLAY	115	2.0	29	26	-	-	4.1	9.9	32	2.53	15	N/A	N/A
20.83	50.7	41.5	-	50.7	2.4	0.3	4.8	4	clayy SILT to silty CLAY	115	2.0	25	21	-	-	3.5	9.9	38	2.66	15	N/A	N/A
21.00	43.2	35.1	-	43.2	2.5	0.1	5.9	3	silty CLAY to CLAY	115	1.5	29	23	-	-	3.0	9.9	45	2.78	15	N/A	N/A
21.16	40.9	32.9	-	40.9	1.9	0.1	4.9	3	silty CLAY to CLAY	115	1.5	27	22	-	-	2.8	9.9	43	2.74	15	N/A	N/A
21.33	47.0	37.6	-	47.0	1.7	0.1	3.6	4	clayy SILT to silty CLAY	115	2.0	24	19	-	-	3.2	9.9	36	2.61	15	N/A	N/A
21.49	65.0	56.2	126.9	65.0	1.7	0.4	2.7	5	silty SAND to sandy SILT	120	3.0	22	19	48	37	-	-	26	2.39	16	N/A	N/A
21.65	57.9	49.9	129.1	57.9	1.7	0.4	3.0	4	clayy SILT to silty CLAY	115	2.0	29	25	-	-	4.0	9.9	29	2.46	15	N/A	N/A
21.82	44.6	34.8	-	44.6	1.9	0.3	4.4	4	clayy SILT to silty CLAY	115	2.0	22	17	-	-	3.1	9.9	40	2.69	15	N/A	N/A
21.98	34.4	26.7	-	34.4	1.9	0.4	5.7	3	silty CLAY to CLAY	115	1.5	23	18	-	-	2.3	8.5	49	2.85	15	N/A	N/A
22.15	33.7	25.9	-	33.7	1.7	0.6	5.2	3	silty CLAY to CLAY	115	1.5	22	17	-	-	2.3	8.2	48	2.84	15	N/A	N/A
22.31	32.3	24.7	-	32.3	1.6	0.8	5.0	3	silty CLAY to CLAY	115	1.5	22	16	-	-	2.2	7.8	49	2.84	15	N/A	N/A
22.47	33.8	25.7	-	33.8	1.5	0.8	4.7	3	silty CLAY to CLAY	115	1.5	23	17	-	-	2.3	8.1	47	2.81	15	N/A	N/A
22.64	43.3	32.6	-	43.3	1.7	0.6	4.1	4	clayy SILT to silty CLAY	115	2.0	22	16	-	-	3.0	9.9	40	2.69	15	N/A	N/A
22.80	61.0	51.3	129.1	61.1	1.8	0.5	3.0	4	clayy SILT to silty CLAY	115	2.0	31	26	-	-	4.2	9.9	28	2.45	15	N/A	N/A
22.97	74.8	62.7	132.4	74.9	1.9	0.4	2.6	5	silty SAND to sandy SILT	120	3.0	25	21	52	37	-	-	24	2.35	16	N/A	N/A
23.13	79.2	66.2	125.4	79.2	1.7	0.4	2.2	5	silty SAND to sandy SILT	120	3.0	26	22	53	38	-	-	22	2.28	16	0.72	4.0
23.30	68.3	57.0	123.1	68.3	1.7	0.5	2.5	5	silty SAND to sandy SILT	120	3.0	23	19	48	37	-	-	25	2.36	16	0.88	12.6
23.46	57.2	47.6	138.1	57.2	2.0	0.6	3.5	4	clayy SILT to silty CLAY	115	2.0	29	24	-	-	3.9	9.9	32	2.53	15	0.29	0.7
23.62	46.0	33.7	-	46.0	2.2	0.1	4.9	3	silty CLAY to CLAY	115	1.5	31	22	-	-	3.2	9.9	42	2.74	15	-	-
23.79	36.8	26.9	-	36.8	2.2	0.1	6.1	3	silty CLAY to CLAY	115	1.5	25	18	-	-	2.5	8.5	50	2.88	15	-	-
23.95	30.4	22.1	-	30.4	1.9	0.0	6.4	3	silty CLAY to CLAY	115	1.5	20	15	-	-	2.0	7.0	55	2.95	15	-	-
24.12	25.4	18.4	-	25.4	1.7	0.3	6.9	3	silty CLAY to CLAY	115	1.5	17	12	-	-	1.7	5.7	61	3.03	15	-	-
24.28	30.1	21.8	-	30.1	1.4	0.4	4.9	3	silty CLAY to CLAY	115	1.5	20	15	-	-	2.0	6.8	51	2.88	15	-	-
24.44	41.5	29.9	-	41.5	1.6	0.3	4.1	4	clayy SILT to silty CLAY	115	2.0	21	15	-	-	2.8	9.5	41	2.72	15	-	-
24.61	46.6	33.5	-	46.7	1.9	0.4	4.3	4	clayy SILT to silty CLAY	115	2.0	23	17	-	-	3.2	9.9	40	2.70	15	-	-
24.77	46.8	33.5	-	46.8	1.8	0.3	3.9	4	clayy SILT to silty CLAY	115	2.0	23	17	-	-	3.2	9.9	39	2.67	15	-	-
24.94	107.5	88.3	122.9	107.5	1.5	0.2	1.5	5	silty SAND to sandy SILT	120	3.0	36	29	63	39	-	-	15	2.06	16	1.13	5.2
25.10	117.7	96.5	124.2	117.7	1.5	0.6	1.3	6	clean SAND to silty SAND	125	5.0	24	19	66	40	-	-	13	1.99	16	1.06	4.6
25.26	120.7	98.8	127.6	120.8	1.6	0.6	1.3	6	clean SAND to silty SAND	125	5.0	24	20	67	40	-	-	13	1.99	16	0.83	3.7
25.43	141.4	115.4	146.6	141.4	2.0	0.6	1.5	6	clean SAND to silty SAND	125	5.0	28	23	72	41	-	-	12	1.98	16	0.22	1.6
25.59	177.7	144.9	174.0	177.7	2.6	0.7	1.5	6	clean SAND to silty SAND	125	5.0	36	29	79	42	-	-	11	1.91	16	0.00	0.0
25.76	196.7	160.0	193.7	196.7	3.3	0.6	1.7	6	clean SAND to silty SAND	125	5.0	39	32	83	42	-	-	11	1.92	16	0.00	0.0
25.92	179.5	145.8	187.1	179.5	3.3	0.7	1.9	6	clean SAND to silty SAND	125	5.0	36	29	79	42	-	-	13	1.99	16	0.00	0.0
26.08	165.0	133.8	189.4	165.0	3.8	0.8	2.3	5	silty SAND to sandy SILT	120	3.0	55	45	77	41	-	-	15	2.08	16	0.00	0.0
26.25	217.6	176.1	229.8	217.6	5.0	0.6	2.3	5	silty SAND to sandy SILT	120	3.0	73	59	86	43	-	-	13	2.00	16	0.00	0.0
26.41	284.0	229.5	269.1	284.0	5.6	0.5	2.0	6	clean SAND to silty SAND	125	5.0	57	46	94	44	-	-	10	1.88	16	0.00	0.0
26.58	418.7	337.8	354.4	418.7	6.8	0.7	1.6	6	clean SAND to silty SAND	125	5.0	84	68	95	46	-	-	6	1.72	16	0.00	0.0
26.74	513.4	413.4	413.4	513.3	6.7	-0.7	1.3	6	clean SAND to silty SAND	125	5.0	100	83	95	47	-	-	5	1.59	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

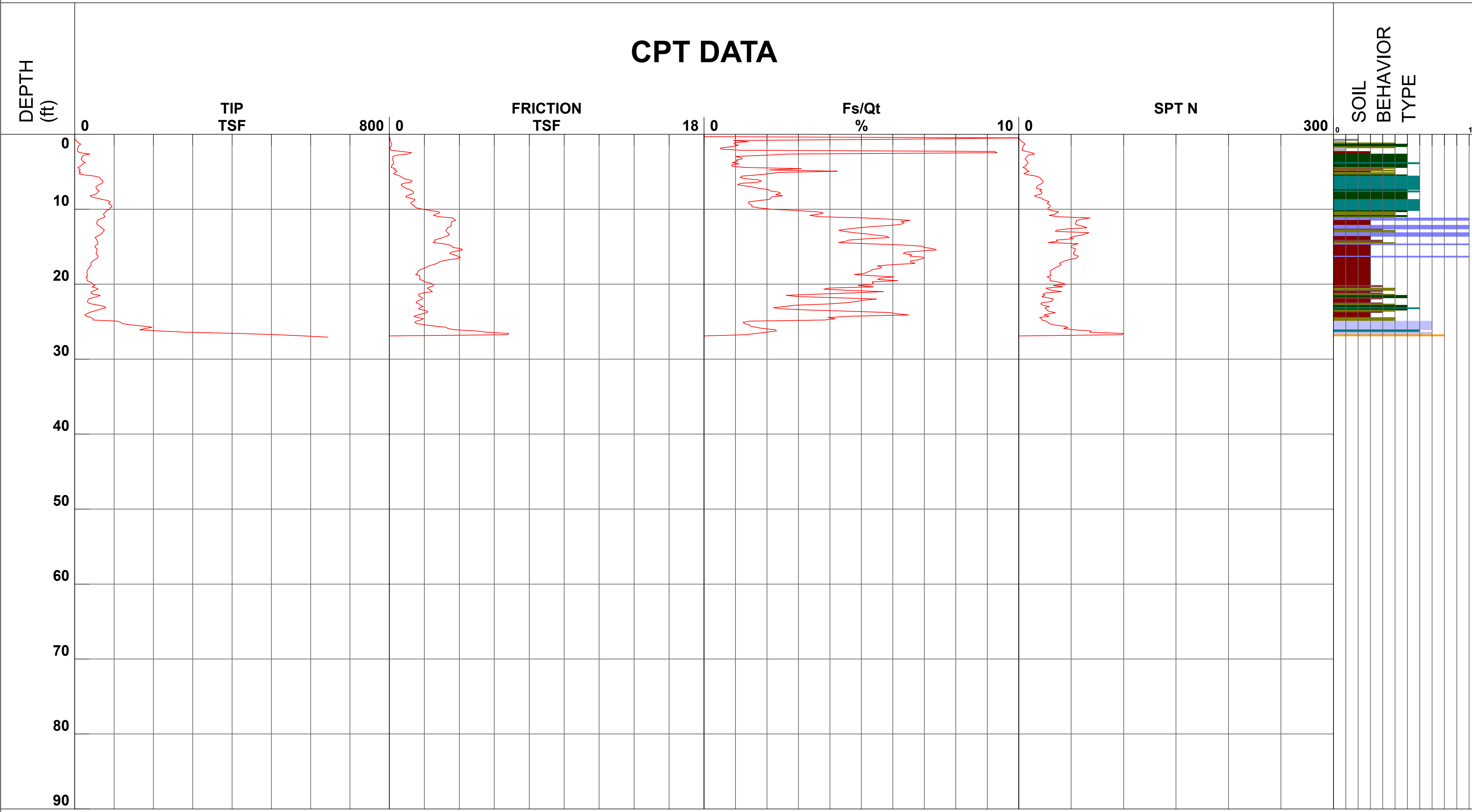
Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(044).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-12	Date and Time	9/29/2017 4:39:08 PM	Maximum Depth	27.07 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(038).cpt
CPT Date: 9/28/2017 2:49:17 PM
GW During Test: 23 ft

Sounding ID: CPT-13
Project No: 11753.001
Cone/Rig: DDG1379

. . Depth ft	. qc PS tsf	* qc1n PS -	. q1ncs PS -	* qt PS tsf	. Slv Stss tsf	. pore prss (psi)	. Frct Rato %	* Mat Typ Zon	* Material Behavior Description	. Unit Wght pcf	. Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	. Und Shr tsf	. OCR - -	* Fin %	* Ic SBT Indx	* Nk - -	* Vol Strn %	* Cycl SStn %
0.33	1.1	0.1	-	1.1	0.0	0.2	9.9	2	Organic SOILS - Peats	100	1.0	1	0	-	-	0.1	9.9	95	5.36	10	N/A	N/A
0.49	6.6	10.6	-	6.6	0.1	0.0	1.0	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.5	9.9	42	2.73	15	N/A	N/A
0.66	11.7	18.8	-	11.7	0.2	-0.1	1.9	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	38	2.66	15	N/A	N/A
0.82	13.0	20.8	-	13.0	0.3	0.0	2.6	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.9	9.9	41	2.70	15	N/A	N/A
0.98	17.5	28.1	77.0	17.5	0.3	-0.1	1.7	5	silty SAND to sandy SILT	120	3.0	6	9	25	46	-	-	30	2.49	16	N/A	N/A
1.15	16.5	26.5	67.0	16.5	0.2	-0.1	1.3	5	silty SAND to sandy SILT	120	3.0	6	9	23	45	-	-	29	2.45	16	N/A	N/A
1.31	10.5	16.8	47.3	10.5	0.1	-0.2	0.8	5	silty SAND to sandy SILT	120	3.0	3	6	8	42	-	-	31	2.51	16	N/A	N/A
1.48	5.9	9.5	-	5.9	0.1	-0.1	0.9	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.4	9.9	44	2.77	15	N/A	N/A
1.64	4.3	6.8	-	4.3	0.0	-0.1	0.9	4	clayy SILT to silty CLAY	115	2.0	2	3	-	-	0.3	9.9	52	2.90	15	N/A	N/A
1.80	4.1	6.6	-	4.1	0.0	0.1	0.7	4	clayy SILT to silty CLAY	115	2.0	2	3	-	-	0.3	9.9	49	2.86	15	N/A	N/A
1.97	3.6	5.7	-	3.6	0.0	0.0	0.7	4	clayy SILT to silty CLAY	115	2.0	2	3	-	-	0.2	9.9	55	2.94	15	N/A	N/A
2.13	3.1	4.9	-	3.1	0.0	-0.1	1.1	3	silty CLAY to CLAY	115	1.5	2	3	-	-	0.2	8.0	63	3.06	15	N/A	N/A
2.30	2.8	4.5	-	2.8	0.0	-0.1	1.0	3	silty CLAY to CLAY	115	1.5	2	3	-	-	0.2	6.7	65	3.10	15	N/A	N/A
2.46	3.5	5.6	-	3.5	0.0	0.0	1.4	3	silty CLAY to CLAY	115	1.5	2	4	-	-	0.2	7.9	63	3.06	15	N/A	N/A
2.62	4.1	6.6	-	4.1	0.1	-0.2	1.9	3	silty CLAY to CLAY	115	1.5	3	4	-	-	0.3	8.7	63	3.06	15	N/A	N/A
2.79	4.4	7.1	-	4.4	0.1	-0.2	1.9	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	8.9	61	3.03	15	N/A	N/A
2.95	4.9	7.9	-	4.9	0.1	-0.2	1.5	4	clayy SILT to silty CLAY	115	2.0	2	4	-	-	0.3	9.3	54	2.94	15	N/A	N/A
3.12	4.9	7.8	-	4.9	0.1	-0.2	1.6	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	8.7	56	2.96	15	N/A	N/A
3.28	5.5	8.9	-	5.5	0.2	-0.2	3.0	3	silty CLAY to CLAY	115	1.5	4	6	-	-	0.4	9.4	62	3.05	15	N/A	N/A
3.45	6.9	11.1	-	6.9	0.3	-0.1	3.9	3	silty CLAY to CLAY	115	1.5	5	7	-	-	0.5	9.9	61	3.04	15	N/A	N/A
3.61	12.8	20.5	-	12.8	0.3	-0.2	2.2	4	clayy SILT to silty CLAY	115	2.0	6	10	-	-	0.9	9.9	39	2.67	15	N/A	N/A
3.77	10.2	16.3	-	10.2	0.2	0.1	2.2	4	clayy SILT to silty CLAY	115	2.0	5	8	-	-	0.7	9.9	43	2.75	15	N/A	N/A
3.94	6.7	10.8	-	6.7	0.1	-0.2	1.8	4	clayy SILT to silty CLAY	115	2.0	3	5	-	-	0.5	9.5	50	2.86	15	N/A	N/A
4.10	6.0	9.6	-	6.0	0.1	-0.2	2.2	3	silty CLAY to CLAY	115	1.5	4	6	-	-	0.4	8.1	55	2.95	15	N/A	N/A
4.27	5.3	8.5	-	5.3	0.1	-0.2	2.1	3	silty CLAY to CLAY	115	1.5	4	6	-	-	0.4	6.8	58	3.00	15	N/A	N/A
4.43	4.8	7.7	-	4.8	0.1	-0.2	2.5	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	5.9	63	3.07	15	N/A	N/A
4.59	5.2	8.3	-	5.2	0.1	-0.3	2.2	3	silty CLAY to CLAY	115	1.5	3	6	-	-	0.3	6.2	59	3.01	15	N/A	N/A
4.76	4.6	7.4	-	4.6	0.1	-0.1	1.8	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	5.3	59	3.01	15	N/A	N/A
4.92	4.1	6.6	-	4.1	0.1	-0.3	1.5	3	silty CLAY to CLAY	115	1.5	3	4	-	-	0.3	4.5	60	3.02	15	N/A	N/A
5.09	4.5	7.3	-	4.5	0.1	-0.3	2.2	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	4.8	63	3.06	15	N/A	N/A
5.25	4.4	7.0	-	4.4	0.1	-0.3	3.6	3	silty CLAY to CLAY	115	1.5	3	5	-	-	0.3	4.5	72	3.19	15	N/A	N/A
5.41	6.7	10.8	-	6.7	0.2	-0.3	2.9	3	silty CLAY to CLAY	115	1.5	4	7	-	-	0.5	6.8	57	2.98	15	N/A	N/A
5.58	11.7	18.7	-	11.7	0.2	-0.4	1.8	4	clayy SILT to silty CLAY	115	2.0	6	9	-	-	0.8	9.9	38	2.66	15	N/A	N/A
5.74	14.0	22.5	69.0	14.0	0.2	-0.3	1.6	4	clayy SILT to silty CLAY	115	2.0	7	11	-	-	1.0	9.9	33	2.56	15	N/A	N/A
5.91	19.4	31.1	65.3	19.4	0.2	-0.3	1.1	5	silty SAND to sandy SILT	120	3.0	6	10	28	37	-	-	24	2.34	16	N/A	N/A
6.07	21.8	35.0	62.7	21.8	0.2	-0.3	0.8	5	silty SAND to sandy SILT	120	3.0	7	12	32	38	-	-	21	2.25	16	N/A	N/A
6.23	18.4	29.5	59.5	18.4	0.2	-0.4	0.9	5	silty SAND to sandy SILT	120	3.0	6	10	27	37	-	-	23	2.32	16	N/A	N/A
6.40	15.8	25.3	61.6	15.8	0.2	-0.4	1.1	5	silty SAND to sandy SILT	120	3.0	5	8	22	36	-	-	28	2.43	16	N/A	N/A
6.56	19.5	30.8	66.9	19.5	0.2	-0.4	1.1	5	silty SAND to sandy SILT	120	3.0	7	10	28	37	-	-	25	2.36	16	N/A	N/A
6.73	27.1	42.3	71.3	27.1	0.3	-0.4	1.0	5	silty SAND to sandy SILT	120	3.0	9	14	39	39	-	-	19	2.21	16	N/A	N/A
6.89	30.7	47.3	73.5	30.7	0.3	-0.4	0.9	5	silty SAND to sandy SILT	120	3.0	10	16	42	39	-	-	17	2.15	16	N/A	N/A
7.05	35.2	53.5	78.4	35.2	0.3	-0.4	0.9	5	silty SAND to sandy SILT	120	3.0	12	18	46	40	-	-	16	2.11	16	N/A	N/A
7.22	34.4	51.7	91.6	34.4	0.5	-0.3	1.5	5	silty SAND to sandy SILT	120	3.0	11	17	45	39	-	-	20	2.24	16	N/A	N/A
7.38	26.6	39.6	112.1	26.6	0.7	-0.4	2.8	4	clayy SILT to silty CLAY	115	2.0	13	20	-	-	1.9	9.9	31	2.51	15	N/A	N/A
7.55	19.2	30.8	-	19.2	1.1	-0.4	5.7	3	silty CLAY to CLAY	115	1.5	13	21	-	-	1.3	9.9	46	2.80	15	N/A	N/A
7.71	17.2	27.6	-	17.2	1.2	-0.2	7.3	3	silty CLAY to CLAY	115	1.5	11	18	-	-	1.2	9.9	53	2.92	15	N/A	N/A
7.87	16.8	27.0	-	16.8	1.2	-1.3	7.3	3	silty CLAY to CLAY	115	1.5	11	18	-	-	1.2	9.9	54	2.92	15	N/A	N/A
8.04	17.2	27.6	-	17.2	1.2	-1.3	7.0	3	silty CLAY to CLAY	115	1.5	11	18	-	-	1.2	9.9	52	2.90	15	N/A	N/A
8.20	18.3	29.4	-	18.3	1.2	-1.6	6.6	3	silty CLAY to CLAY	115	1.5	12	20	-	-	1.3	9.9	50	2.87	15	N/A	N/A
8.37	19.7	31.5	-	19.6	1.3	-1.8	6.8	3	silty CLAY to CLAY	115	1.5	13	21	-	-	1.4	9.9	49	2.85	15	N/A	N/A
8.53	20.0	32.1	-	20.0	1.4	-1.2	7.0	3	silty CLAY to CLAY	115	1.5	13	21	-	-	1.4	9.9	49	2.86	15	N/A	N/A
8.69	20.3	32.5	-	20.3	1.5	-1.2	7.4	3	silty CLAY to CLAY	115	1.5	14	22	-	-	1.4	9.9	50	2.87	15	N/A	N/A
8.86	20.8	33.4	-	20.8	1.5	-1.4	7.4	3	silty CLAY to CLAY	115	1.5	14	22	-	-	1.4	9.9	50	2.86	15	N/A	N/A
9.02	20.6	33.1	-	20.6	1.4	-1.1	7.0	3	silty CLAY to CLAY	115	1.5	14	22	-	-	1.4	9.9	49	2.85	15	N/A	N/A
9.19	19.6	31.5	-	19.6	1.2	-1.3	6.4	3	silty CLAY to CLAY	115	1.5	13	21	-	-	1.4	9.9	48	2.84	15	N/A	N/A
9.35	20.2	32.3	-	20.2	1.1	-0.8	5.6	3	silty CLAY to CLAY	115	1.5	13	22	-	-	1.4	9.9	45	2.78	15	N/A	N/A
9.51	19.5	31.3	-	19.5	1.0	-0.9	5.3	3	silty CLAY to CLAY	115	1.5	13	21	-	-	1.3	9.9	45	2.78	15	N/A	N/A
9.68	21.0	33.7	-	21.0	0.9	-1.0	4.5	3	silty CLAY to CLAY	115	1.5	14	22	-	-	1.4	9.9	41	2.71	15	N/A	N/A
9.84	23.9	34.9	-	23.9	0.8	-1.1	3.6	4	clayy SILT to silty CLAY	115	2.0	12	17	-	-	1.6	9.9	37	2.63	15	N/A	N/A
10.01	27.2	34.8	104.5	27.2	0.7	-0.7	2.7	4	clayy SILT to silty CLAY	115	2.0	14	17	-	-	1.9	9.9	33	2.54	15	N/A	N/A
10.17	31.4	39.8	91.3	31.4	0.6	-0.5	1.8	5	silty SAND to sandy SILT	120	3.0	10	13	37	37	-	-	26	2.40	16	N/A	N/A
10.34	33.5	42.1	79.6	33.5	0.4	-0.5	1.3	5	silty SAND to sandy SILT	120	3.0	11	14	38	37	-	-	22	2.28	16	N/A	N/A
10.50	31.0	38.7	79.8	31.0	0.4	-0.5	1.4	5	silty SAND to sandy SILT	120	3.0	10	13	36	37	-	-	24	2.33	16	N/A	N/A
10.66	27.5	34.0	84.9	27.5	0.5	-0.4	1.8	5	silty SAND to sandy SILT	120	3.0	9	11	31	36	-	-	28	2.44	16	N/A	N/A
10.83	24.7	30.3	88.5	24.7	0.5	-0.5	2.1	4	clayy SILT to silty CLAY	115	2.0	12	15	-	-	1.7	9.9	32	2.53	15	N/A	N/A
10.99	22.2	29.9	-	22.2	0.6	-0.5	2.7	4	clayy SILT to silty CLAY	115	2.0	11	15	-	-	1.5	9.9	35	2.60	15	N/A	N/A
11.16	22.3	34.5	-	22.3	0.9	-0.5	4.0	4	clayy SILT to silty CLAY	115	2.0	11	17	-	-	1.5	9.9	39	2.66	15	N/A	N/A
11.32	25.0	38.2	-	25.0	1.3	-0.8	5.3	3	silty CLAY to CLAY	115	1.5	17	25	-	-	1.7	9.9	41	2.72	15	N/A	N/A
11.48	24.7	37.2	-	24.7	1.5	-0.7	6.2	3	silty CLAY to CLAY	115	1.5	16	25	-	-	1.7	9.9	44	2.77	15	N/A	N/A
11.65	22.4	33.3	-	22.4	1.3	-0.4	6.0	3	silty CLAY to CLAY	115	1.5	15	22	-	-	1.5	9.9	46	2.80	15	N/A	N/A
11.81	23.2	34.0	-	23.2	1.3	-0.2	5.7	3	silty CLAY to CLAY	115	1.5	15	23	-	-	1.6	9.9	45	2.78	15	N/A	N/A
11.98	23.5	34.0	-	23.5	1.4	-0.2	5.9	3	silty CLAY to CLAY	115	1.5	16	23	-	-	1.6	9.9	45	2.79	15	N/A	N/A
12.14	22.3	31.8	-	22.3	1.3	0.1	6.2	3	silty CLAY to CLAY	115	1.5	15	21	-	-	1.5	9.9	47	2.82	15	N/A	N/A
12.30	22.3	31.4	-	22.3	1.2	0.2	5.7	3	silty CLAY to CLAY	115	1.5	15	21	-	-	1.5	9.9	46	2.80	15	N/A	N/A
12.47	23.2	32.2	-	23.3	1.3	0.2	5.7	3	silty CLAY to CLAY	115	1.5	15	21	-	-	1.6	9.9	46	2.79	15	N/A	N/A
12.63	24.2	33.1	-	24.2	1.4	-0.1	6.0	3	silty CLAY to CLAY	115	1.5	16	22	-	-	1.7	9.9	46	2.80	15	N/A	N/A
12.80	24.0	32.4	-	24.0	1.5	0.2	6.3	3	silty CLAY to CLAY	115	1.5	16	22	-	-	1.6	9.9	47	2.82	15	N/A	N/A
12.96	23.1	30.8	-	23.1	1.4	0.4	6.1	3	silty CLAY to CLAY	115	1.5	15	21	-	-	1.6	9.8	48	2.83	15	N/A	N/A
13.12	23.0	30.3	-	23.0	1.3	0.6	5.7	3	silty CLAY to CLAY	115	1.5	15	20	-	-	1.6	9.7	47	2.81	15	N/A	N/A
13.29	23.2	30.3	-	23.3	1.2	0.6	5.5	3	silty CLAY to CLAY	115	1.5	15	20	-	-	1.6	9.7	46	2.80	15	N/A	N/A
13.45	23.9	30.7	-	23.9	1.3	0.7	5.4	3	silty CLAY to CLAY	115	1.5	16	20	-	-	1.6	9.8	46	2.79	15	N/A	N/A
13.62	23.8	30.2	-	23.8	1.3	0.8	5.6	3	silty CLAY to CLAY	115	1.5	16	20	-	-	1.6	9.6	46	2.81	15	N/A	N/A
13.78	23.8	29.9	-	23.8	1.3	0.8	5.5	3	silty CLAY to CLAY	115	1.5	16	20	-	-	1.6	9.5	46	2.81	15	N/A	N/A
13.94	22.4	27.9	-	22.5	1.2	0.9	5.6	3	silty CLAY to CLAY	115	1.5	15	19	-	-	1.5	8.9	48	2.83	15	N/A	N/A
14.11	21.0	25.8	-	21.1	1.2	0.9	5.8	3	silty CLAY to CLAY	115	1.5	14	17	-	-	1.4	8.2	50	2.87	15	N/A	N/A
14.27	20.7	25.1	-	20.7	1.1	1.0	5.6	3	silty CLAY to CLAY	115	1.5	14	17	-	-	1.4	8.0	50	2.87	15	N/A	N/A
14.44	20.4	24.5	-	20.4	1.2	1.1	6.0	3	silty CLAY to CLAY	115	1.5	14	16	-	-	1.4	7.7	52	2.90	15	N/A	N/A
14.60	22.8	27.0	-	22.8	1.3	1.0	6.1	3	silty CLAY to CLAY	115	1.5	15	18	-	-	1.6	8.6	50	2.87	15	N/A	N/A
14.76	22.2	26.1	-	22.2	1.3	1.0	6.2	3	silty CLAY to CLAY	115	1.5	15	17	-	-	1.5	8.3	51	2.89	15	N/A	N/A
14.93	19.6	22.8	-	19.7	1.0	1.3	5.5	3	silty CLAY to CLAY	115	1.5	13	15	-	-	1.3	7.2	52	2.90	15	N/A	N/A
15.09	18.8	21.6	-	18.8	1.0	1.3	5.8	3	silty CLAY to CLAY	115	1.5	13	14	-	-	1.3	6.8	54	2.93	15	N/A	N/A
15.26	21.8	24.7	-	21.8	1.1	1.5	5.1	3	silty CLAY to CLAY	115	1.5	15	16	-	-	1.5	7.8	49	2.85	15	N/A	N/A
15.42	24.2	27.2	-	24.2	1.2	1.6	5.4	3	silty CLAY to CLAY	115	1.5	16	18	-	-	1.6	8.6	48	2.83	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(038).cpt
CPT Date: 9/28/2017 2:49:17 PM
GW During Test: 23 ft

Sounding ID: CPT-13
Project No: 11753.001
Cone/Rig: DDG1379

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	29.8	33.1	-	29.8	1.4	1.6	4.8	3	silty CLAY to CLAY	115	1.5	20	22	-	-	2.0	9.9	42	2.74	15	N/A	N/A
15.75	31.0	34.1	-	31.0	1.6	1.5	5.3	3	silty CLAY to CLAY	115	1.5	21	23	-	-	2.1	9.9	43	2.76	15	N/A	N/A
15.91	32.6	35.4	-	32.6	1.6	1.6	5.1	3	silty CLAY to CLAY	115	1.5	22	24	-	-	2.2	9.9	42	2.73	15	N/A	N/A
16.08	31.8	34.2	-	31.8	1.7	1.8	5.6	3	silty CLAY to CLAY	115	1.5	21	23	-	-	2.2	9.9	44	2.77	15	N/A	N/A
16.24	32.5	34.6	-	32.5	1.7	1.8	5.4	3	silty CLAY to CLAY	115	1.5	22	23	-	-	2.2	9.9	43	2.75	15	N/A	N/A
16.40	31.9	33.6	-	31.9	1.7	1.9	5.5	3	silty CLAY to CLAY	115	1.5	21	22	-	-	2.2	9.9	44	2.77	15	N/A	N/A
16.57	30.7	32.1	-	30.7	1.8	1.8	5.9	3	silty CLAY to CLAY	115	1.5	20	21	-	-	2.1	9.9	46	2.81	15	N/A	N/A
16.73	28.8	29.8	-	28.8	1.7	1.8	6.2	3	silty CLAY to CLAY	115	1.5	19	20	-	-	2.0	9.5	48	2.84	15	N/A	N/A
16.90	25.7	26.3	-	25.7	1.5	2.0	6.2	3	silty CLAY to CLAY	115	1.5	17	18	-	-	1.7	8.4	51	2.89	15	N/A	N/A
17.06	23.5	23.8	-	23.5	1.4	1.9	6.0	3	silty CLAY to CLAY	115	1.5	16	16	-	-	1.6	7.5	53	2.91	15	N/A	N/A
17.23	21.2	21.3	-	21.3	1.3	1.8	6.5	3	silty CLAY to CLAY	115	1.5	14	14	-	-	1.4	6.7	56	2.97	15	N/A	N/A
17.39	21.9	21.8	-	21.9	1.2	2.0	5.9	3	silty CLAY to CLAY	115	1.5	15	15	-	-	1.5	6.9	54	2.93	15	N/A	N/A
17.55	21.8	21.5	-	21.9	1.3	2.3	6.1	3	silty CLAY to CLAY	115	1.5	15	14	-	-	1.5	6.8	55	2.95	15	N/A	N/A
17.72	20.4	20.0	-	20.5	1.3	1.9	6.5	3	silty CLAY to CLAY	115	1.5	14	13	-	-	1.4	6.3	58	2.99	15	N/A	N/A
17.88	20.7	20.1	-	20.8	1.1	2.5	5.7	3	silty CLAY to CLAY	115	1.5	14	13	-	-	1.4	6.3	55	2.95	15	N/A	N/A
18.05	23.8	22.8	-	23.8	1.1	2.7	4.7	3	silty CLAY to CLAY	115	1.5	16	15	-	-	1.6	7.2	49	2.85	15	N/A	N/A
18.21	26.7	25.4	-	26.8	1.2	2.8	4.7	3	silty CLAY to CLAY	115	1.5	18	17	-	-	1.8	8.1	47	2.81	15	N/A	N/A
18.37	27.4	25.8	-	27.5	1.4	3.1	5.2	3	silty CLAY to CLAY	115	1.5	18	17	-	-	1.9	8.2	48	2.84	15	N/A	N/A
18.54	27.0	25.3	-	27.1	1.3	3.2	5.0	3	silty CLAY to CLAY	115	1.5	18	17	-	-	1.8	8.0	48	2.84	15	N/A	N/A
18.70	25.8	23.9	-	25.8	1.2	3.2	4.9	3	silty CLAY to CLAY	115	1.5	17	16	-	-	1.7	7.5	49	2.85	15	N/A	N/A
18.87	24.0	22.0	-	24.0	1.1	3.1	4.9	3	silty CLAY to CLAY	115	1.5	16	15	-	-	1.6	6.9	50	2.87	15	N/A	N/A
19.03	23.2	21.1	-	23.3	1.1	3.2	5.0	3	silty CLAY to CLAY	115	1.5	15	14	-	-	1.6	6.6	52	2.89	15	N/A	N/A
19.19	23.6	21.3	-	23.7	1.1	3.2	4.8	3	silty CLAY to CLAY	115	1.5	16	14	-	-	1.6	6.7	51	2.88	15	N/A	N/A
19.36	23.4	21.0	-	23.5	1.1	3.2	5.0	3	silty CLAY to CLAY	115	1.5	16	14	-	-	1.6	6.6	52	2.90	15	N/A	N/A
19.52	23.6	20.9	-	23.6	1.1	3.3	5.1	3	silty CLAY to CLAY	115	1.5	16	14	-	-	1.6	6.6	52	2.90	15	N/A	N/A
19.69	25.1	22.1	-	25.2	1.3	3.4	5.3	3	silty CLAY to CLAY	115	1.5	17	15	-	-	1.7	7.0	52	2.90	15	N/A	N/A
19.85	28.1	24.5	-	28.2	1.5	3.2	5.6	3	silty CLAY to CLAY	115	1.5	19	16	-	-	1.9	7.8	51	2.88	15	N/A	N/A
20.01	31.2	27.0	-	31.3	1.8	2.9	5.9	3	silty CLAY to CLAY	115	1.5	21	18	-	-	2.1	8.6	49	2.86	15	N/A	N/A
20.18	39.3	33.7	-	39.3	1.9	3.5	5.1	3	silty CLAY to CLAY	115	1.5	26	22	-	-	2.7	9.9	43	2.75	15	N/A	N/A
20.34	41.2	35.1	-	41.2	2.1	3.6	5.3	3	silty CLAY to CLAY	115	1.5	27	23	-	-	2.8	9.9	43	2.74	15	N/A	N/A
20.51	50.2	44.8	139.6	50.3	1.9	3.8	3.8	4	clayy SILT to silty CLAY	115	2.0	25	22	-	-	3.5	9.9	34	2.56	15	N/A	N/A
20.67	72.7	64.6	147.8	72.7	2.3	2.9	3.1	4	clayy SILT to silty CLAY	115	2.0	36	32	-	-	5.1	9.9	26	2.39	15	N/A	N/A
20.83	67.0	59.3	156.8	67.0	2.5	1.4	3.7	4	clayy SILT to silty CLAY	115	2.0	33	30	-	-	4.6	9.9	30	2.47	15	N/A	N/A
21.00	60.5	53.4	152.5	60.5	2.3	1.2	3.9	4	clayy SILT to silty CLAY	115	2.0	30	27	-	-	4.2	9.9	31	2.52	15	N/A	N/A
21.16	71.4	62.8	126.8	71.4	1.7	1.0	2.4	5	silty SAND to sandy SILT	120	3.0	24	21	52	38	-	-	23	2.32	16	N/A	N/A
21.33	75.0	65.7	117.0	75.0	1.4	0.5	2.0	5	silty SAND to sandy SILT	120	3.0	25	22	53	38	-	-	21	2.24	16	N/A	N/A
21.49	58.3	50.8	120.4	58.3	1.5	0.3	2.6	5	silty SAND to sandy SILT	120	3.0	19	17	45	36	-	-	27	2.41	16	N/A	N/A
21.65	43.6	34.9	-	43.6	1.9	0.2	4.5	4	clayy SILT to silty CLAY	115	2.0	22	17	-	-	3.0	9.9	40	2.70	15	N/A	N/A
21.82	42.8	34.0	-	42.8	1.9	0.0	4.6	3	silty CLAY to CLAY	115	1.5	29	23	-	-	2.9	9.9	41	2.71	15	N/A	N/A
21.98	56.7	48.9	128.0	56.7	1.7	-0.2	3.0	4	clayy SILT to silty CLAY	115	2.0	28	24	-	-	3.9	9.9	29	2.47	15	N/A	N/A
22.15	78.5	67.4	115.7	78.5	1.4	-0.1	1.8	5	silty SAND to sandy SILT	120	3.0	26	22	54	38	-	-	20	2.22	16	N/A	N/A
22.31	80.5	68.8	106.0	80.5	1.1	0.0	1.5	5	silty SAND to sandy SILT	120	3.0	27	23	55	38	-	-	17	2.14	16	N/A	N/A
22.47	66.8	56.9	97.0	66.8	1.0	0.1	1.5	5	silty SAND to sandy SILT	120	3.0	22	19	48	37	-	-	19	2.21	16	N/A	N/A
22.64	52.1	44.2	101.4	52.1	1.1	0.1	2.1	5	silty SAND to sandy SILT	120	3.0	17	15	40	35	-	-	26	2.40	16	N/A	N/A
22.80	32.2	24.4	-	32.2	1.4	0.1	4.4	3	silty CLAY to CLAY	115	1.5	21	16	-	-	2.2	7.7	47	2.81	15	N/A	N/A
22.97	24.3	18.3	-	24.3	1.4	0.0	6.2	3	silty CLAY to CLAY	115	1.5	16	12	-	-	1.6	5.7	59	3.01	15	N/A	N/A
23.13	28.9	21.7	-	28.9	1.4	0.1	5.2	3	silty CLAY to CLAY	115	1.5	19	14	-	-	2.0	6.8	52	2.90	15	-	-
23.30	28.8	21.5	-	28.7	1.4	-0.4	5.3	3	silty CLAY to CLAY	115	1.5	19	14	-	-	1.9	6.8	52	2.90	15	-	-
23.46	21.3	15.9	-	21.3	1.3	-0.1	6.6	3	silty CLAY to CLAY	115	1.5	14	11	-	-	1.4	4.9	64	3.07	15	-	-
23.62	18.9	14.0	-	18.9	1.1	0.1	6.2	3	silty CLAY to CLAY	115	1.5	13	9	-	-	1.2	4.3	65	3.10	15	-	-
23.79	24.6	18.2	-	24.6	1.2	0.0	5.1	3	silty CLAY to CLAY	115	1.5	16	12	-	-	1.6	5.7	55	2.95	15	-	-
23.95	25.6	18.9	-	25.6	1.3	0.0	5.3	3	silty CLAY to CLAY	115	1.5	17	13	-	-	1.7	5.9	55	2.95	15	-	-
24.12	20.0	14.8	-	20.0	1.2	0.1	6.4	3	silty CLAY to CLAY	115	1.5	13	10	-	-	1.3	4.5	65	3.09	15	-	-
24.28	18.4	13.5	-	18.4	1.0	0.1	5.9	3	silty CLAY to CLAY	115	1.5	12	9	-	-	1.2	4.1	65	3.10	15	-	-
24.44	17.7	13.0	-	17.7	0.7	0.2	4.4	3	silty CLAY to CLAY	115	1.5	12	9	-	-	1.2	3.9	61	3.03	15	-	-
24.61	16.1	11.7	-	16.1	0.7	0.2	5.0	3	silty CLAY to CLAY	115	1.5	11	8	-	-	1.0	3.5	66	3.11	15	-	-
24.77	18.1	13.1	-	18.1	0.8	0.3	4.7	3	silty CLAY to CLAY	115	1.5	12	9	-	-	1.2	4.0	62	3.05	15	-	-
24.94	16.1	11.7	-	16.1	0.7	0.2	4.8	3	silty CLAY to CLAY	115	1.5	11	8	-	-	1.0	3.5	65	3.09	15	-	-
25.10	15.6	11.3	-	15.6	0.7	0.3	4.7	3	silty CLAY to CLAY	115	1.5	10	8	-	-	1.0	3.4	66	3.10	15	-	-
25.26	15.5	11.1	-	15.5	0.8	0.3	5.4	3	silty CLAY to CLAY	115	1.5	10	7	-	-	1.0	3.3	69	3.14	15	-	-
25.43	19.6	14.1	-	19.6	0.9	0.4	5.0	3	silty CLAY to CLAY	115	1.5	13	9	-	-	1.3	4.3	61	3.04	15	-	-
25.59	33.6	24.0	-	33.6	0.9	0.4	2.8	4	clayy SILT to silty CLAY	115	2.0	17	12	-	-	2.3	7.6	40	2.69	15	-	-
25.76	47.8	39.3	102.1	47.8	1.1	0.4	2.3	5	silty SAND to sandy SILT	120	3.0	16	13	36	34	-	-	29	2.47	16	2.30	51.2
25.92	44.9	32.0	-	44.9	1.3	0.3	2.9	4	clayy SILT to silty CLAY	115	2.0	22	16	-	-	3.1	9.9	35	2.60	15	-	-
26.08	39.3	27.9	-	39.4	1.1	0.4	3.0	4	clayy SILT to silty CLAY	115	2.0	20	14	-	-	2.7	8.9	38	2.66	15	-	-
26.25	46.6	38.1	94.9	46.6	0.9	0.5	2.0	5	silty SAND to sandy SILT	120	3.0	16	13	35	34	-	-	28	2.44	16	2.44	51.2
26.41	49.0	39.9	91.9	49.0	0.9	0.4	1.8	5	silty SAND to sandy SILT	120	3.0	16	13	37	34	-	-	26	2.40	16	2.50	51.2
26.58	47.3	38.5	115.1	47.3	1.4	0.3	2.9	4	clayy SILT to silty CLAY	115	2.0	24	19	-	-	3.2	9.9	33	2.54	15	1.68	51.2
26.74	50.9	35.6	-	50.9	1.7	0.4	3.4	4	clayy SILT to silty CLAY	115	2.0	25	18	-	-	3.5	9.9	36	2.61	15	-	-
26.90	73.3	59.5	124.9	73.3	1.8	0.5	2.4	5	silty SAND to sandy SILT	120	3.0	24	20	50	37	-	-	24	2.34	16	1.07	8.0
27.07	148.6	120.4	146.2	148.6	1.9	0.6	1.3	6	clean SAND to silty SAND	125	5.0	30	24	73	41	-	-	11	1.93	16	0.27	1.8
27.23	159.4	128.9	153.6	159.4	2.0	0.5	1.3	6	clean SAND to silty SAND	125	5.0	32	26	75	41	-	-	10	1.90	16	0.18	1.4
27.40	173.6	140.1	172.3	173.6	2.7	0.4	1.6	6	clean SAND to silty SAND	125	5.0	35	28	78	41	-	-	11	1.94	16	0.00	0.0
27.56	216.6	174.5	194.5	216.6	2.8	0.2	1.3	6	clean SAND to silty SAND	125	5.0	43	35	85	43	-	-	8	1.81	16	0.00	0.0
27.72	297.4	239.2	259.6	297.4	4.4	-1.4	1.5	6	clean SAND to silty SAND	125	5.0	59	48	95	44	-	-	7	1.77	16	0.00	0.0
27.89	360.1	289.2	289.2	360.1	4.1	0.0	1.1	6	clean SAND to silty SAND	125	5.0	72	58	95	45	-	-	5	1.63	16	0.00	0.0
28.05	418.4	335.5	337.8	418.5	5.7	0.3	1.4	6	clean SAND to silty SAND	125	5.0	84	67	95	46	-	-	5	1.66	16	0.00	0.0
28.22	525.7	420.7	420.7	525.6	6.9	-1.0	1.3	6	clean SAND to silty SAND	125	5.0	100	84	95	47	-	-	5	1.58	16	0.00	0.0
28.38	431.5	344.8	353.1	431.6	6.4	0.2	1.5	6	clean SAND to silty SAND	125	5.0	86	69	95	46	-	-	6	1.68	16	0.00	0.0
28.54	445.8	355.5	355.5	445.8	5.4	-0.2	1.2	6	clean SAND to silty SAND	125	5.0	89	71	95	46	-	-	5	1.60	16	0.00	0.0
28.71	450.8	358.9	358.9	450.8	5.6	-0.1	1.2	6	clean SAND to silty SAND	125	5.0	90	72	95	46	-	-	5	1.60	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

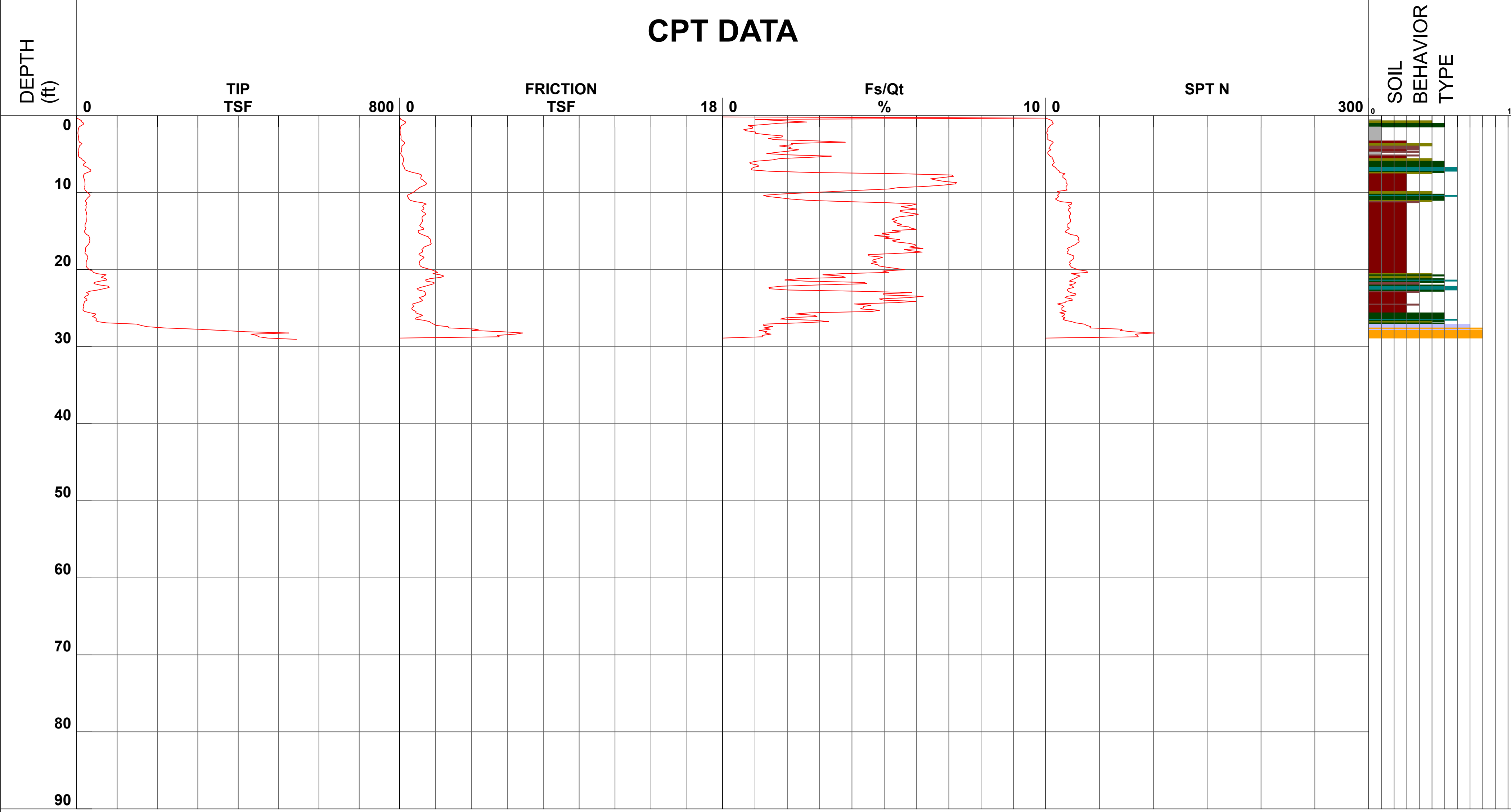
Middle Earth Geo Testing

Leighton

Project	Hoag Hospital Irvine	Operator	RC AS	Filename	SDF(038).cpt
Job Number	11753.001	Cone Number	DDG1379	GPS	
Hole Number	CPT-13	Date and Time	9/28/2017 2:49:17 PM	Maximum Depth	29.04 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Hoag Hospital Irvine

Project ID: Leighton Group
Data File: SDF(004).cpt
CPT Date: 9/28/2017 10:22:29 AM
GW During Test: 23 ft

Sounding ID: CPT-14
Project No: 11753.001
Cone/Rig: DDG1333

Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
0.33	41.0	65.7	111.4	41.0	0.7	0.1	1.8	5	silty SAND to sandy SILT	120	3.0	14	22	53	48	-	-	19	2.21	16	N/A	N/A
0.49	34.6	55.5	92.6	34.6	0.5	0.0	1.4	5	silty SAND to sandy SILT	120	3.0	12	19	48	48	-	-	19	2.20	16	N/A	N/A
0.66	40.6	65.1	109.6	40.6	0.7	0.1	1.7	5	silty SAND to sandy SILT	120	3.0	14	22	53	48	-	-	19	2.21	16	N/A	N/A
0.82	49.2	78.9	137.3	49.2	1.1	0.1	2.3	5	silty SAND to sandy SILT	120	3.0	16	26	59	48	-	-	20	2.23	16	N/A	N/A
0.98	39.1	62.7	126.8	39.1	1.0	0.4	2.5	5	silty SAND to sandy SILT	120	3.0	13	21	52	48	-	-	23	2.32	16	N/A	N/A
1.15	23.4	37.5	108.2	23.4	0.6	0.1	2.8	4	clayy SILT to silty CLAY	115	2.0	12	19	-	-	1.6	9.9	32	2.52	15	N/A	N/A
1.31	21.0	33.7	90.9	21.0	0.4	0.0	2.1	5	silty SAND to sandy SILT	120	3.0	7	11	31	45	-	-	30	2.49	16	N/A	N/A
1.48	19.1	30.6	92.1	19.1	0.4	0.0	2.4	4	clayy SILT to silty CLAY	115	2.0	10	15	-	-	1.3	9.9	33	2.54	15	N/A	N/A
1.64	21.6	34.6	98.9	21.6	0.5	0.2	2.5	4	clayy SILT to silty CLAY	115	2.0	11	17	-	-	1.5	9.9	31	2.52	15	N/A	N/A
1.80	30.4	48.7	91.1	30.4	0.5	0.1	1.6	5	silty SAND to sandy SILT	120	3.0	10	16	43	46	-	-	22	2.27	16	N/A	N/A
1.97	26.7	42.8	79.4	26.7	0.3	0.0	1.3	5	silty SAND to sandy SILT	120	3.0	9	14	39	45	-	-	21	2.27	16	N/A	N/A
2.13	21.8	35.0	80.9	21.8	0.4	0.0	1.6	5	silty SAND to sandy SILT	120	3.0	7	12	32	43	-	-	26	2.40	16	N/A	N/A
2.30	25.2	40.4	68.4	25.2	0.2	0.0	0.9	5	silty SAND to sandy SILT	120	3.0	8	13	37	44	-	-	19	2.21	16	N/A	N/A
2.46	29.2	46.9	75.5	29.2	0.3	0.0	1.0	5	silty SAND to sandy SILT	120	3.0	10	16	42	44	-	-	18	2.18	16	N/A	N/A
2.62	46.1	73.9	92.4	46.1	0.4	0.1	0.8	6	clean SAND to silty SAND	125	5.0	9	15	57	46	-	-	12	1.96	16	N/A	N/A
2.79	46.6	74.8	98.0	46.6	0.5	0.1	1.0	6	clean SAND to silty SAND	125	5.0	9	15	57	46	-	-	13	2.01	16	N/A	N/A
2.95	44.4	71.2	94.1	44.4	0.4	0.1	1.0	6	clean SAND to silty SAND	125	5.0	9	14	56	45	-	-	13	2.02	16	N/A	N/A
3.12	36.1	57.9	94.7	36.1	0.5	0.1	1.4	5	silty SAND to sandy SILT	120	3.0	12	19	49	44	-	-	19	2.19	16	N/A	N/A
3.28	30.8	49.4	92.3	30.8	0.5	0.1	1.6	5	silty SAND to sandy SILT	120	3.0	10	16	44	43	-	-	22	2.27	16	N/A	N/A
3.45	26.9	43.2	95.0	26.9	0.5	0.1	1.9	5	silty SAND to sandy SILT	120	3.0	9	14	39	42	-	-	25	2.37	16	N/A	N/A
3.61	25.3	40.5	103.3	25.3	0.6	0.1	2.4	5	silty SAND to sandy SILT	120	3.0	8	14	37	41	-	-	29	2.46	16	N/A	N/A
3.77	22.1	35.4	95.7	22.1	0.5	0.1	2.3	4	clayy SILT to silty CLAY	115	2.0	11	18	-	-	1.5	9.9	30	2.49	15	N/A	N/A
3.94	16.3	26.1	83.0	16.3	0.3	0.1	2.1	4	clayy SILT to silty CLAY	115	2.0	8	13	-	-	1.1	9.9	34	2.57	15	N/A	N/A
4.10	19.8	31.8	83.3	19.8	0.4	0.1	1.8	5	silty SAND to sandy SILT	120	3.0	7	11	29	39	-	-	29	2.47	16	N/A	N/A
4.27	34.5	55.3	128.6	34.5	1.0	0.2	2.8	5	silty SAND to sandy SILT	120	3.0	12	18	47	42	-	-	27	2.40	16	N/A	N/A
4.43	37.2	59.7	130.4	37.2	1.0	0.2	2.7	5	silty SAND to sandy SILT	120	3.0	12	20	50	42	-	-	25	2.37	16	N/A	N/A
4.59	28.4	45.5	98.0	28.4	0.5	0.1	1.9	5	silty SAND to sandy SILT	120	3.0	9	15	41	41	-	-	25	2.36	16	N/A	N/A
4.76	27.6	44.3	93.6	27.6	0.5	0.1	1.8	5	silty SAND to sandy SILT	120	3.0	9	15	40	40	-	-	24	2.35	16	N/A	N/A
4.92	52.1	83.6	118.3	52.2	0.8	0.2	1.5	5	silty SAND to sandy SILT	120	3.0	17	28	61	43	-	-	15	2.08	16	N/A	N/A
5.09	88.7	142.3	155.5	88.7	0.8	0.3	0.9	6	clean SAND to silty SAND	125	5.0	18	28	79	46	-	-	8	1.78	16	N/A	N/A
5.25	92.1	147.8	157.4	92.1	0.8	0.3	0.9	6	clean SAND to silty SAND	125	5.0	18	30	80	46	-	-	7	1.74	16	N/A	N/A
5.41	76.0	121.9	136.5	76.0	0.7	0.4	0.9	6	clean SAND to silty SAND	125	5.0	15	24	74	45	-	-	8	1.82	16	N/A	N/A
5.58	56.8	91.1	111.1	56.8	0.5	0.3	1.0	6	clean SAND to silty SAND	125	5.0	11	18	64	43	-	-	11	1.93	16	N/A	N/A
5.74	39.6	63.5	89.3	39.6	0.4	0.2	1.0	5	silty SAND to sandy SILT	120	3.0	13	21	52	41	-	-	15	2.07	16	N/A	N/A
5.91	35.9	57.7	102.8	36.0	0.6	0.2	1.7	5	silty SAND to sandy SILT	120	3.0	12	19	49	41	-	-	21	2.24	16	N/A	N/A
6.07	44.0	70.6	127.1	44.0	0.9	0.2	2.2	5	silty SAND to sandy SILT	120	3.0	15	24	56	42	-	-	21	2.25	16	N/A	N/A
6.23	46.9	74.5	135.8	46.9	1.1	0.2	2.4	5	silty SAND to sandy SILT	120	3.0	16	25	57	42	-	-	21	2.26	16	N/A	N/A
6.40	46.0	72.1	139.7	46.0	1.2	0.2	2.6	5	silty SAND to sandy SILT	120	3.0	15	24	56	41	-	-	22	2.30	16	N/A	N/A
6.56	44.7	69.1	147.4	44.7	1.3	0.2	3.0	5	silty SAND to sandy SILT	120	3.0	15	23	55	41	-	-	25	2.35	16	N/A	N/A
6.73	44.0	67.2	152.5	44.0	1.4	0.2	3.2	4	clayy SILT to silty CLAY	115	2.0	22	34	-	-	3.1	9.9	26	2.39	15	N/A	N/A
6.89	42.2	63.7	160.4	42.2	1.5	0.1	3.7	4	clayy SILT to silty CLAY	115	2.0	21	32	-	-	3.0	9.9	28	2.45	15	N/A	N/A
7.05	46.2	69.1	166.4	46.2	1.7	0.1	3.7	4	clayy SILT to silty CLAY	115	2.0	23	35	-	-	3.2	9.9	27	2.42	15	N/A	N/A
7.22	43.7	64.5	170.9	43.7	1.8	0.1	4.1	4	clayy SILT to silty CLAY	115	2.0	22	32	-	-	3.1	9.9	30	2.48	15	N/A	N/A
7.38	41.8	61.0	169.9	41.8	1.8	0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	21	31	-	-	2.9	9.9	31	2.50	15	N/A	N/A
7.55	44.2	64.0	164.9	44.2	1.7	0.1	3.9	4	clayy SILT to silty CLAY	115	2.0	22	32	-	-	3.1	9.9	29	2.46	15	N/A	N/A
7.71	46.2	66.1	168.0	46.2	1.8	0.1	3.9	4	clayy SILT to silty CLAY	115	2.0	23	33	-	-	3.2	9.9	29	2.45	15	N/A	N/A
7.87	46.7	66.2	179.5	46.7	2.0	0.1	4.4	4	clayy SILT to silty CLAY	115	2.0	23	33	-	-	3.3	9.9	30	2.49	15	N/A	N/A
8.04	46.9	65.8	181.1	46.9	2.1	0.1	4.5	4	clayy SILT to silty CLAY	115	2.0	23	33	-	-	3.3	9.9	31	2.50	15	N/A	N/A
8.20	48.7	67.7	178.1	48.7	2.0	0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	24	34	-	-	3.4	9.9	29	2.47	15	N/A	N/A
8.37	47.9	65.8	168.7	47.9	1.9	0.0	3.9	4	clayy SILT to silty CLAY	115	2.0	24	33	-	-	3.3	9.9	29	2.46	15	N/A	N/A
8.53	49.4	67.4	153.0	49.4	1.6	0.0	3.3	4	clayy SILT to silty CLAY	115	2.0	25	34	-	-	3.5	9.9	26	2.39	15	N/A	N/A
8.69	52.7	71.1	156.3	52.7	1.7	0.0	3.2	4	clayy SILT to silty CLAY	115	2.0	26	36	-	-	3.7	9.9	25	2.37	15	N/A	N/A
8.86	54.2	72.5	161.7	54.2	1.8	0.0	3.4	4	clayy SILT to silty CLAY	115	2.0	27	36	-	-	3.8	9.9	26	2.38	15	N/A	N/A
9.02	60.1	79.7	162.3	60.1	1.9	0.0	3.1	5	silty SAND to sandy SILT	120	3.0	20	27	60	41	-	-	24	2.33	16	N/A	N/A
9.19	65.4	86.0	169.3	65.4	2.0	0.0	3.1	5	silty SAND to sandy SILT	120	3.0	22	29	62	41	-	-	23	2.31	16	N/A	N/A
9.35	76.4	99.6	169.6	76.4	2.1	0.0	2.7	5	silty SAND to sandy SILT	120	3.0	25	33	67	42	-	-	19	2.21	16	N/A	N/A
9.51	79.9	103.1	175.0	79.9	2.2	0.0	2.8	5	silty SAND to sandy SILT	120	3.0	27	34	68	42	-	-	19	2.21	16	N/A	N/A
9.68	94.9	121.5	183.1	94.9	2.3	0.2	2.5	5	silty SAND to sandy SILT	120	3.0	32	41	73	43	-	-	17	2.13	16	N/A	N/A
9.84	92.7	117.7	188.2	92.7	2.5	0.2	2.7	5	silty SAND to sandy SILT	120	3.0	31	39	72	43	-	-	18	2.17	16	N/A	N/A
10.01	95.8	120.6	201.7	95.8	2.9	0.3	3.1	5	silty SAND to sandy SILT	120	3.0	32	40	73	43	-	-	19	2.20	16	N/A	N/A
10.17	87.2	108.9	209.5	87.2	3.2	0.4	3.7	5	silty SAND to sandy SILT	120	3.0	29	36	70	42	-	-	22	2.29	16	N/A	N/A
10.34	76.0	94.1	218.5	76.0	3.4	0.4	4.5	9	very stiff fine SOIL	120	1.0	76	94	-	-	2.7	9.9	26	2.40	30	N/A	N/A
10.50	69.5	85.4	240.4	69.5	4.0	0.3	5.7	9	very stiff fine SOIL	120	1.0	70	85	-	-	2.4	9.9	31	2.51	30	N/A	N/A
10.66	66.3	80.9	253.7	66.3	4.3	0.0	6.5	9	very stiff fine SOIL	120	1.0	66	81	-	-	2.3	9.9	34	2.57	30	N/A	N/A
10.83	63.5	76.8	252.5	63.5	4.2	-0.1	6.8	9	very stiff fine SOIL	120	1.0	63	77	-	-	2.2	9.9	35	2.59	30	N/A	N/A
10.99	64.3	77.2	244.8	64.3	4.1	0.1	6.4	9	very stiff fine SOIL	120	1.0	64	77	-	-	2.2	9.9	34	2.57	30	N/A	N/A
11.16	66.7	79.5	248.6	66.7	4.2	0.2	6.4	9	very stiff fine SOIL	120	1.0	67	80	-	-	2.3	9.9	34	2.57	30	N/A	N/A
11.32	68.7	81.3	251.1	68.7	4.4	-0.5	6.4	9	very stiff fine SOIL	120	1.0	69	81	-	-	2.4	9.9	33	2.56	30	N/A	N/A
11.48	71.6	84.1	241.8	71.6	4.2	-0.4	5.9	9	very stiff fine SOIL	120	1.0	72	84	-	-	2.5	9.9	32	2.52	30	N/A	N/A
11.65	68.9	80.3	204.2	68.9	3.2	-0.3	4.6	4	clayy SILT to silty CLAY	115	2.0	34	40	-	-	4.8	9.9	29	2.45	15	N/A	N/A
11.81	72.0	83.5	201.8	72.0	3.1	-0.2	4.4	4	clayy SILT to silty CLAY	115	2.0	36	42	-	-	5.0	9.9	27	2.43	15	N/A	N/A
11.98	68.3	78.6	195.2	68.3	3.0	-0.3	4.4	4	clayy SILT to silty CLAY	115	2.0	34	39	-	-	4.8	9.9	28	2.44	15	N/A	N/A
12.14	61.4	70.2	174.4	61.4	2.4	-0.2	4.0	4	clayy SILT to silty CLAY	115	2.0	31	35	-	-	4.3	9.9	28	2.44	15	N/A	N/A
12.30	59.6	67.7	176.7	59.6	2.5	-0.1	4.2	4	clayy SILT to silty CLAY	115	2.0	30	34	-	-	4.2	9.9	29	2.47	15	N/A	N/A
12.47	56.2	63.4	175.4	56.2	2.4	-0.2	4.3	4	clayy SILT to silty CLAY	115	2.0	28	32	-	-	3.9	9.9	31	2.50	15	N/A	N/A
12.63	54.8	61.4	177.3	54.8	2.4	-0.2	4.5	4	clayy SILT to silty CLAY	115	2.0	27	31	-	-	3.8	9.9	32	2.52	15	N/A	N/A
12.80	55.6	62.0	183.1	55.6	2.6	-0.2	4.7	4	clayy SILT to silty CLAY	115	2.0	28	31	-	-	3.9	9.9	32	2.54	15	N/A	N/A
12.96	54.4	60.3	183.6	54.4	2.6	-0.2	4.9	4	clayy SILT to silty CLAY	115	2.0	27	30	-	-	3.8	9.9	33	2.55	15	N/A	N/A
13.12	53.0	58.4	186.6	53.0	2.7	-0.3	5.1	4	clayy SILT to silty CLAY	115	2.0	27	29	-	-	3.7	9.9	34	2.58	15	N/A	N/A
13.29	56.1	61.4	182.0	56.1	2.6	-0.2	4.7	4	clayy SILT to silty CLAY	115	2.0	28	31	-	-	3.9	9.9	32	2.54	15	N/A	N/A
13.45	61.4	66.8	186.1	61.4	2.8	-0.2	4.6	4	clayy SILT to silty CLAY	115	2.0	31	33	-	-	4.3	9.9	31	2.50	15	N/A	N/A
13.62	66.8	72.2	193.2	66.8	3.0	-0.2	4.6	4	clayy SILT to silty CLAY	115	2.0	33	36	-	-	4.7	9.9	30	2.48	15	N/A	N/A
13.78	68.9	74.1	207.9	68.9	3.5	-0.3	5.1	4	clayy SILT to silty CLAY	115	2.0	34	37	-	-	4.8	9.9	31	2.51	15	N/A	N/A
13.94	68.8	73.5	217.8	68.8	3.7	-0.2	5.5	4	clayy SILT to silty CLAY	115	2.0	34	37	-	-	4.8	9.9	32	2.54	15	N/A	N/A
14.11	67.7	72.0	219.0	67.7	3.8	-0.3	5.7	9	very stiff fine SOIL	120	1.0	68	72	-	-	2.4	9.9	33	2.55	30	N/A	N/A
14.27	63.4	67.0	222.1	63.4	3.8	-0.3	6.1	9	very stiff fine SOIL	120	1.0	63	67	-	-	2.2	9.9	35	2.60	30	N/A	N/A
14.44	63.0	69.1	-	63.0	4.0	-0.3	6.5	9	very stiff fine SOIL	120	1.0	63	69	-	-	2.2	9.9	36	2.61	30	N/A	N/A
14.60	62.0	71.8	-	62.0	4.2	-0.7	6.9	9	very stiff fine SOIL	120	1.0	62	72	-	-	2.2	9.9	36	2.62	30	N/A	N/A
14.76	59.2	67.7	-	59.2	3.8	-0.5	6.5	9	very stiff fine SOIL	120	1.0	59	68	-	-	2.1	9.9	36	2.61	30	N/A	N/A
14.93	58.2	65.8	-	58.2	3.5	-0.2	6.1	9	very stiff fine SOIL	120	1.0	58	66	-	-	2.0	9.9	35	2.60	30	N/A	N/A
15.09	68.0	69.9	209.3	68.0	3.6	-0.1	5.4	4	clayy SILT to silty CLAY	115	2.0	34	35	-	-	4.7	9.9	33	2.54	15	N/A	N/A
15.26	55.6	61.6	-	55.6	3.7	-0.3	6.8	3	silty CLAY to CLAY	115	1.5	37	41	-	-	3.9	9.9	38	2.66	15	N/A	N/A
15.42	48.2	52.9	-	48.3	3.7	0.1	7.9	3	silty CLAY to CLAY	115	1.5	32	35	-	-	3.3	9.9	43	2.75	15	N/A	N/A

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Middle Earth Geo Testing

Project ID: Leighton Group
Data File: SDF(004).cpt
CPT Date: 9/28/2017 10:22:29 AM
GW During Test: 23 ft

Sounding ID: CPT-14
Project No: 11753.001
Cone/Rig: DDG1333

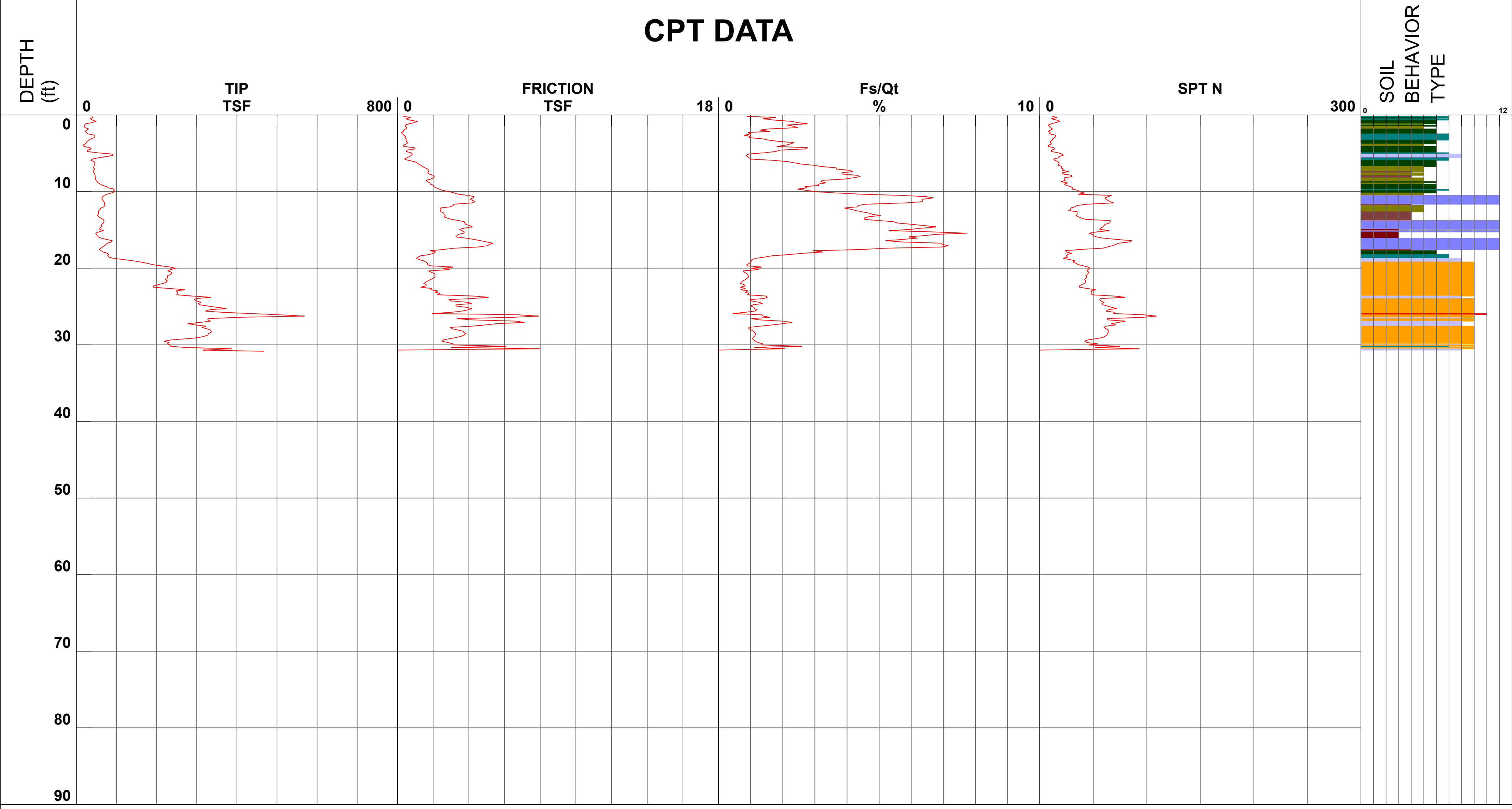
Depth ft	qc PS tsf	* qc1n PS -	q1ncs PS -	* qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Rato %	* Mat Typ Zon	* Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	* SPT R-N1 60%	* Rel Den %	* Ftn Ang deg	Und Shr tsf	OCR -	* Fin Ic %	* Ic SBT Indx	* Nk -	* Vol Strn %	* Cycl SStn %
15.58	50.7	55.0	-	50.7	3.4	0.9	6.9	3	silty CLAY to CLAY	115	1.5	34	37	-	-	3.5	9.9	40	2.69	15	N/A	N/A
15.75	52.2	56.1	-	52.2	3.3	-1.9	6.5	3	silty CLAY to CLAY	115	1.5	35	37	-	-	3.6	9.9	39	2.67	15	N/A	N/A
15.91	55.2	58.7	-	55.2	3.3	-2.1	6.0	3	silty CLAY to CLAY	115	1.5	37	39	-	-	3.8	9.9	37	2.63	15	N/A	N/A
16.08	62.1	65.4	-	62.1	3.8	-2.1	6.3	9	very stiff fine SOIL	120	1.0	62	65	-	-	2.2	9.9	36	2.61	30	N/A	N/A
16.24	75.8	75.2	226.6	75.8	4.3	-2.2	5.8	9	very stiff fine SOIL	120	1.0	76	75	-	-	2.6	9.9	33	2.55	30	N/A	N/A
16.40	89.6	88.4	231.8	89.6	4.7	-0.1	5.3	9	very stiff fine SOIL	120	1.0	90	88	-	-	3.1	9.9	29	2.47	30	N/A	N/A
16.57	87.8	86.2	242.0	87.8	5.0	0.1	5.8	9	very stiff fine SOIL	120	1.0	88	86	-	-	3.1	9.9	31	2.51	30	N/A	N/A
16.73	77.2	78.0	-	77.3	5.4	0.4	7.0	9	very stiff fine SOIL	120	1.0	77	78	-	-	2.7	9.9	36	2.60	30	N/A	N/A
16.90	73.9	73.9	-	73.9	5.2	0.2	7.1	9	very stiff fine SOIL	120	1.0	74	74	-	-	2.6	9.9	36	2.62	30	N/A	N/A
17.06	70.6	69.9	-	70.6	5.1	-0.1	7.3	9	very stiff fine SOIL	120	1.0	71	70	-	-	2.5	9.9	38	2.64	30	N/A	N/A
17.23	65.4	64.1	-	65.3	4.6	-0.8	7.1	9	very stiff fine SOIL	120	1.0	65	64	-	-	2.3	9.9	38	2.66	30	N/A	N/A
17.39	61.4	58.8	190.9	61.4	3.2	-0.7	5.3	4	clayy SILT to silty CLAY	115	2.0	31	29	-	-	4.3	9.9	35	2.59	15	N/A	N/A
17.55	57.3	54.6	169.0	57.3	2.6	-0.8	4.6	4	clayy SILT to silty CLAY	115	2.0	29	27	-	-	4.0	9.9	33	2.56	15	N/A	N/A
17.72	62.3	59.1	138.0	62.3	1.8	-0.1	3.0	4	clayy SILT to silty CLAY	115	2.0	31	30	-	-	4.3	9.9	27	2.41	15	N/A	N/A
17.88	66.2	62.5	149.0	66.2	2.1	-0.1	3.3	4	clayy SILT to silty CLAY	115	2.0	33	31	-	-	4.6	9.9	27	2.42	15	N/A	N/A
18.05	77.7	73.1	143.6	77.7	2.1	0.0	2.7	5	silty SAND to sandy SILT	120	3.0	26	24	57	39	-	-	23	2.31	16	N/A	N/A
18.21	80.5	75.3	133.6	80.5	1.8	0.0	2.2	5	silty SAND to sandy SILT	120	3.0	27	25	58	39	-	-	20	2.24	16	N/A	N/A
18.37	78.3	73.0	116.1	78.3	1.3	0.0	1.7	5	silty SAND to sandy SILT	120	3.0	26	24	57	39	-	-	18	2.17	16	N/A	N/A
18.54	81.0	75.1	111.4	81.0	1.2	0.0	1.5	5	silty SAND to sandy SILT	120	3.0	27	25	58	39	-	-	16	2.12	16	N/A	N/A
18.70	92.4	85.3	112.1	92.4	1.1	0.1	1.2	6	clean SAND to silty SAND	125	5.0	18	17	62	40	-	-	13	2.01	16	N/A	N/A
18.87	117.7	108.2	128.7	117.7	1.2	0.1	1.0	6	clean SAND to silty SAND	125	5.0	24	22	70	41	-	-	10	1.90	16	N/A	N/A
19.03	139.8	127.9	145.8	139.8	1.4	0.3	1.0	6	clean SAND to silty SAND	125	5.0	28	26	75	42	-	-	9	1.84	16	N/A	N/A
19.19	159.7	145.4	160.1	159.7	1.6	0.4	1.0	6	clean SAND to silty SAND	125	5.0	32	29	79	42	-	-	8	1.79	16	N/A	N/A
19.36	177.6	161.0	172.2	177.6	1.7	0.5	1.0	6	clean SAND to silty SAND	125	5.0	36	32	83	43	-	-	7	1.75	16	N/A	N/A
19.52	189.2	170.8	177.6	189.3	1.7	0.6	0.9	6	clean SAND to silty SAND	125	5.0	38	34	85	43	-	-	6	1.70	16	N/A	N/A
19.69	212.1	190.6	193.8	212.1	1.9	0.7	0.9	6	clean SAND to silty SAND	125	5.0	42	38	88	44	-	-	6	1.67	16	N/A	N/A
19.85	233.2	208.7	226.8	233.3	3.1	0.8	1.3	6	clean SAND to silty SAND	125	5.0	47	42	91	44	-	-	8	1.77	16	N/A	N/A
20.01	247.3	220.3	224.7	247.3	2.6	0.8	1.0	6	clean SAND to silty SAND	125	5.0	49	44	93	44	-	-	6	1.67	16	N/A	N/A
20.18	235.1	208.6	223.5	235.2	2.9	1.2	1.2	6	clean SAND to silty SAND	125	5.0	47	42	91	44	-	-	7	1.75	16	N/A	N/A
20.34	227.9	201.4	201.4	228.0	1.7	1.4	0.8	6	clean SAND to silty SAND	125	5.0	46	40	90	44	-	-	5	1.61	16	N/A	N/A
20.51	237.6	209.0	209.0	237.6	1.9	1.4	0.8	6	clean SAND to silty SAND	125	5.0	48	42	91	44	-	-	5	1.61	16	N/A	N/A
20.67	237.1	207.7	207.7	237.1	2.1	1.6	0.9	6	clean SAND to silty SAND	125	5.0	47	42	91	44	-	-	5	1.64	16	N/A	N/A
20.83	234.8	204.8	206.0	234.8	2.1	1.7	0.9	6	clean SAND to silty SAND	125	5.0	47	41	91	44	-	-	5	1.65	16	N/A	N/A
21.00	226.0	196.3	200.5	226.0	2.1	1.7	0.9	6	clean SAND to silty SAND	125	5.0	45	39	89	44	-	-	6	1.68	16	N/A	N/A
21.16	227.4	196.8	201.0	227.5	2.1	1.8	0.9	6	clean SAND to silty SAND	125	5.0	45	39	89	44	-	-	6	1.68	16	N/A	N/A
21.33	226.1	194.8	197.2	226.2	2.0	1.8	0.9	6	clean SAND to silty SAND	125	5.0	45	39	89	43	-	-	5	1.66	16	N/A	N/A
21.49	221.6	190.2	191.2	221.6	1.8	1.9	0.8	6	clean SAND to silty SAND	125	5.0	44	38	88	43	-	-	5	1.65	16	N/A	N/A
21.65	226.9	193.9	193.9	226.9	1.7	1.9	0.8	6	clean SAND to silty SAND	125	5.0	45	39	89	43	-	-	5	1.62	16	N/A	N/A
21.82	224.0	190.7	190.7	224.0	1.6	2.0	0.7	6	clean SAND to silty SAND	125	5.0	45	38	88	43	-	-	5	1.60	16	N/A	N/A
21.98	216.7	183.8	183.8	216.8	1.5	2.0	0.7	6	clean SAND to silty SAND	125	5.0	43	37	87	43	-	-	5	1.61	16	N/A	N/A
22.15	204.3	172.6	175.3	204.3	1.6	2.0	0.8	6	clean SAND to silty SAND	125	5.0	41	35	85	43	-	-	6	1.67	16	N/A	N/A
22.31	192.6	162.1	168.5	192.6	1.6	2.0	0.8	6	clean SAND to silty SAND	125	5.0	39	32	83	42	-	-	6	1.70	16	N/A	N/A
22.47	192.2	161.2	161.6	192.3	1.3	2.1	0.7	6	clean SAND to silty SAND	125	5.0	38	32	83	42	-	-	5	1.65	16	N/A	N/A
22.64	230.3	192.3	192.7	230.4	1.9	2.2	0.8	6	clean SAND to silty SAND	125	5.0	46	38	89	43	-	-	5	1.65	16	N/A	N/A
22.80	270.0	224.7	224.7	270.1	1.9	2.2	0.7	6	clean SAND to silty SAND	125	5.0	54	45	94	44	-	-	5	1.55	16	N/A	N/A
22.97	248.0	205.6	207.3	248.1	2.3	2.6	0.9	6	clean SAND to silty SAND	125	5.0	50	41	91	44	-	-	5	1.66	16	N/A	N/A
23.13	253.4	209.6	209.6	253.4	2.1	2.6	0.8	6	clean SAND to silty SAND	125	5.0	51	42	91	44	-	-	5	1.62	16	0.00	0.0
23.30	251.6	207.8	210.4	251.7	2.4	2.4	0.9	6	clean SAND to silty SAND	125	5.0	50	42	91	44	-	-	5	1.66	16	0.00	0.0
23.46	250.3	206.3	207.0	250.4	2.2	2.5	0.9	6	clean SAND to silty SAND	125	5.0	50	41	91	44	-	-	5	1.65	16	0.00	0.0
23.62	287.7	236.7	257.0	287.8	4.2	2.6	1.5	6	clean SAND to silty SAND	125	5.0	58	47	95	44	-	-	8	1.77	16	0.00	0.0
23.79	335.4	275.4	293.6	335.4	5.1	1.8	1.5	6	clean SAND to silty SAND	125	5.0	67	55	95	45	-	-	7	1.74	16	0.00	0.0
23.95	298.5	244.7	261.8	298.6	4.2	1.8	1.4	6	clean SAND to silty SAND	125	5.0	60	49	95	44	-	-	7	1.75	16	0.00	0.0
24.12	293.9	240.5	240.5	294.0	2.9	2.6	1.0	6	clean SAND to silty SAND	125	5.0	59	48	95	44	-	-	5	1.63	16	0.00	0.0
24.28	300.0	245.0	245.0	300.0	3.0	1.5	1.0	6	clean SAND to silty SAND	125	5.0	60	49	95	44	-	-	5	1.63	16	0.00	0.0
24.44	310.7	253.3	263.1	310.7	3.9	1.6	1.3	6	clean SAND to silty SAND	125	5.0	62	51	95	44	-	-	6	1.70	16	0.00	0.0
24.61	304.1	247.5	262.5	304.2	4.2	2.2	1.4	6	clean SAND to silty SAND	125	5.0	61	49	95	44	-	-	7	1.73	16	0.00	0.0
24.77	308.5	250.6	251.0	308.6	3.3	2.0	1.1	6	clean SAND to silty SAND	125	5.0	62	50	95	44	-	-	5	1.65	16	0.00	0.0
24.94	327.4	265.5	265.5	327.4	3.3	2.1	1.0	6	clean SAND to silty SAND	125	5.0	65	53	95	45	-	-	5	1.61	16	0.00	0.0
25.10	348.9	282.4	282.4	349.0	3.8	2.3	1.1	6	clean SAND to silty SAND	125	5.0	70	56	95	45	-	-	5	1.62	16	0.00	0.0
25.26	373.6	301.8	301.8	373.6	4.2	2.4	1.1	6	clean SAND to silty SAND	125	5.0	75	60	95	45	-	-	5	1.61	16	0.00	0.0
25.43	332.2	268.0	272.2	332.3	4.0	2.4	1.2	6	clean SAND to silty SAND	125	5.0	66	54	95	45	-	-	6	1.67	16	0.00	0.0
25.59	321.7	259.0	260.6	321.8	3.6	2.8	1.1	6	clean SAND to silty SAND	125	5.0	64	52	95	45	-	-	5	1.65	16	0.00	0.0
25.76	363.5	292.2	292.2	363.5	3.0	3.0	0.8	6	clean SAND to silty SAND	125	5.0	73	58	95	45	-	-	5	1.52	16	0.00	0.0
25.92	434.2	348.4	348.4	434.3	2.0	3.1	0.5	7	grvly SAND to dense SAND	130	6.0	72	58	95	46	-	-	5	1.28	16	0.00	0.0
26.08	506.3	405.4	405.4	506.3	6.8	3.4	1.3	6	clean SAND to silty SAND	125	5.0	100	81	95	47	-	-	5	1.60	16	0.00	0.0
26.25	568.3	454.3	454.3	568.3	7.9	2.7	1.4	6	clean SAND to silty SAND	125	5.0	100	91	95	47	-	-	5	1.59	16	0.00	0.0
26.41	405.2	323.3	340.0	405.2	6.5	1.6	1.6	6	clean SAND to silty SAND	125	5.0	81	65	95	45	-	-	7	1.72	16	0.00	0.0
26.58	328.4	261.6	261.6	328.4	3.4	1.9	1.0	6	clean SAND to silty SAND	125	5.0	66	52	95	45	-	-	5	1.62	16	0.00	0.0
26.74	327.8	260.7	268.9	327.8	4.1	2.3	1.3	6	clean SAND to silty SAND	125	5.0	66	52	95	44	-	-	6	1.69	16	0.00	0.0
26.90	334.1	265.2	303.0	334.1	6.6	1.9	2.0	6	clean SAND to silty SAND	125	5.0	67	53	95	45	-	-	9	1.85	16	0.00	0.0
27.07	310.8	246.4	296.7	310.9	7.1	2.9	2.3	6	clean SAND to silty SAND	125	5.0	62	49	95	44	-	-	11	1.92	16	0.00	0.0
27.23	278.0	220.0	261.3	278.1	5.6	2.8	2.0	6	clean SAND to silty SAND	125	5.0	56	44	93	44	-	-	10	1.90	16	0.00	0.0
27.40	295.1	233.1	261.5	295.1	4.9	2.6	1.7	6	clean SAND to silty SAND	125	5.0	59	47	95	44	-	-	9	1.82	16	0.00	0.0
27.56	323.3	254.9	266.0	323.3	4.2	3.0	1.3	6	clean SAND to silty SAND	125	5.0	65	51	95	44	-	-	6	1.71	16	0.00	0.0
27.72	313.1	246.5	246.5	313.2	3.0	3.1	1.0	6	clean SAND to silty SAND	125	5.0	63	49	95	44	-	-	5	1.61	16	0.00	0.0
27.89	324.0	254.6	254.6	324.0	3.0	3.0	0.9	6	clean SAND to silty SAND	125	5.0	65	51	95	44	-	-	5	1.60	16	0.00	0.0
28.05	334.5	262.4	262.4	334.5	3.4	2.0	1.0	6	clean SAND to silty SAND	125	5.0	67	52	95	44	-	-	5	1.62	16	0.00	0.0
28.22	336.3	263.4	262.7	336.3	3.7	2.0	1.1	6	clean SAND to silty SAND	125	5.0	67	53	95	44	-	-	5	1.64	16	0.00	0.0
28.38	335.5	262.4	262.8	335.6	3.7	2.0	1.1	6	clean SAND to silty SAND	125	5.0	67	52	95	44	-	-	5	1.65	16	0.00	0.0
28.54	328.9	256.7	261.2	328.9	3.8	1.9	1.2	6	clean SAND to silty SAND	125	5.0	66	51	95	44	-	-	6	1.67	16	0.00	0.0
28.71	328.1	255.7	259.0	328.2	3.7	1.8	1.1	6	clean SAND to silty SAND	125	5.0	66	51	95	44	-	-	5	1.66	16	0.00	0.0
28.87	319.3	248.5	252.2	319.4	3.6	1.9	1.1	6	clean SAND to silty SAND	125	5.0	64	50	95	44	-	-	6	1.67	16	0.00	0.0
29.04	306.6	238.2	241.7	306.7	3.3	1.8	1.1	6	clean SAND to silty SAND	125	5.0	61	48	95	44	-	-	5	1.67	16	0.00	0.0
29.20	279.0	216.3	222.8	279.0	3.0	1.6	1.1	6	clean SAND to silty SAND	125	5.0	56	43	92	43	-	-	6	1.69	16	0.00	0.0
29.36	236.8	183.3	196.1	236.8	2.6	1.5	1.1	6	clean SAND to silty SAND	125	5.0	47	37	87	43	-	-	7	1.75	16	0.00	0.0
29.53	219.0	169.3	185.7	219.1	2.5	1.3	1.2	6	clean SAND to silty SAND	125	5.0	44	34	84	42	-	-	8	1.79	16	0.00	0.0
29.69	230.5	177.9	196.0	230.5	2.8	1.7	1.2	6	clean SAND to silty SAND	125	5.0	46	36	86	42	-	-	8	1.79	16	0.00	0.0
29.86	227.1	175.0	198.2	227.1	3.1	1.5	1.4	6	clean SAND to silty SAND	125	5.0	45	35	85	42	-	-	9	1.83	16	0.00	0.0
30.02	233.8	179.8	201.5	233.8	3.1	1.3	1.3	6	clean SAND to silty SAND	125	5.0	47	36	86	43	-	-	9	1.82	16	0.00	0.0
30.19	235.1	180.5	244.6	235.1	6.1	1.6	2.6	5	silty SAND to sandy SILT	120	3.0	78	60	86	43	-	-	14	2.04	16	0.00	0.0
30.35	269.5	206.7	217.1	269.6	3.0	1.7	1.1	6	clean SAND to silty SAND	125	5.0	54	41	91	43	-	-	6	1.72	16	0.00	0.0
30.51	386.7	296.1	335.3	386.7	8.0	2.9	2.1	6	clean SAND to silty SAND	125	5.0	77	59	95	45	-	-	9	1.83	16	0.00	0.0

* Indicates the parameter was calculated using the normalized point stress.
The parameters listed above were determined using empirical correlations.
A Professional Engineer must determine their suitability for analysis and design.

Leighton

Project	Hoag Hospital Irvine	Operator	KK RB	Filename	SDF(004).cpt
Job Number	11753.001	Cone Number	DDG1333	GPS	
Hole Number	CPT-14	Date and Time	9/28/2017 10:22:29 AM	Maximum Depth	30.84 ft
EST GW Depth During Test		23.00 ft			

Net Area Ratio .8



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Boring No.	LB-2	LB-2	LB-2	LB-2				
Sample No.	SPT-4	SPT-5b	SPT-6	SPT-8b				
Depth (ft.)	35.0	41.0	45.0	56.0				
Sample Type	SPT	SPT	SPT	SPT				
Soil Identification	Brown sandy lean clay s(CL)	Brown lean clay (CL)	Light brown silty sand (SM)	Grayish brown sandy lean clay s(CL)				
Moisture Correction								
Wet Weight of Soil + Container (g)	0.00	0.00	0.00	0.00				
Dry Weight of Soil + Container (g)	0.00	0.00	0.00	0.00				
Weight of Container (g)	1.00	1.00	1.00	1.00				
Moisture Content (%)	0.00	0.00	0.00	0.00				
Sample Dry Weight Determination								
Weight of Sample + Container (g)	812.7	549.0	868.3	781.7				
Weight of Container (g)	247.1	221.6	251.2	249.3				
Weight of Dry Sample (g)	565.6	327.4	617.1	532.4				
Container No.:								
After Wash								
Method (A or B)	B	B	B	B				
Dry Weight of Sample + Cont. (g)	523.5	261.7	664.1	480.3				
Weight of Container (g)	247.1	221.6	251.2	249.3				
Dry Weight of Sample (g)	276.4	40.1	412.9	231.0				
% Passing No. 200 Sieve	**51.1**	**87.8**	**33.1**	**56.6**				
% Retained No. 200 Sieve	48.9	12.2	66.9	43.4				

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: Hoag Hospital
Project No.: 10572.001
Client Name: Hoag Memorial Hospital Presbyterian
Tested By: S. Felter Date: 06/04/14

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Hoag Hospital	Tested By:	G. Bathala	Date:	06/12/14
Project No. :	10572.001	Input By:	J. Ward	Date:	06/16/14
Boring No.:	LB-1	Checked By:	J. Ward		
Sample No.:	SPT-4	Depth (ft.)	35.0		
Soil Identification:	Dark yellowish brown lean clay (CL)				

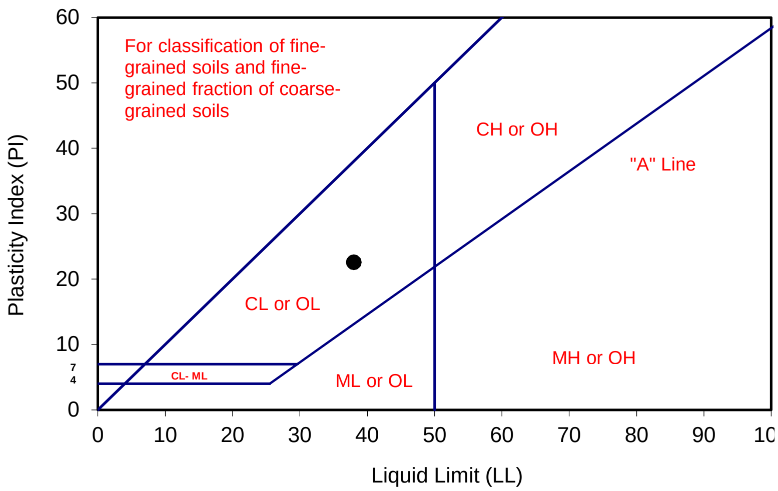
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			32	25	17	
Wet Wt. of Soil + Cont. (g)	23.96	23.93	27.33	27.36	27.67	
Dry Wt. of Soil + Cont. (g)	22.57	22.55	23.66	23.49	23.58	
Wt. of Container (g)	13.54	13.64	13.63	13.52	13.50	
Moisture Content (%) [Wn]	15.39	15.49	36.59	38.82	40.58	

Liquid Limit	**38**
Plastic Limit	**15**
Plasticity Index	**23**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) 13.14

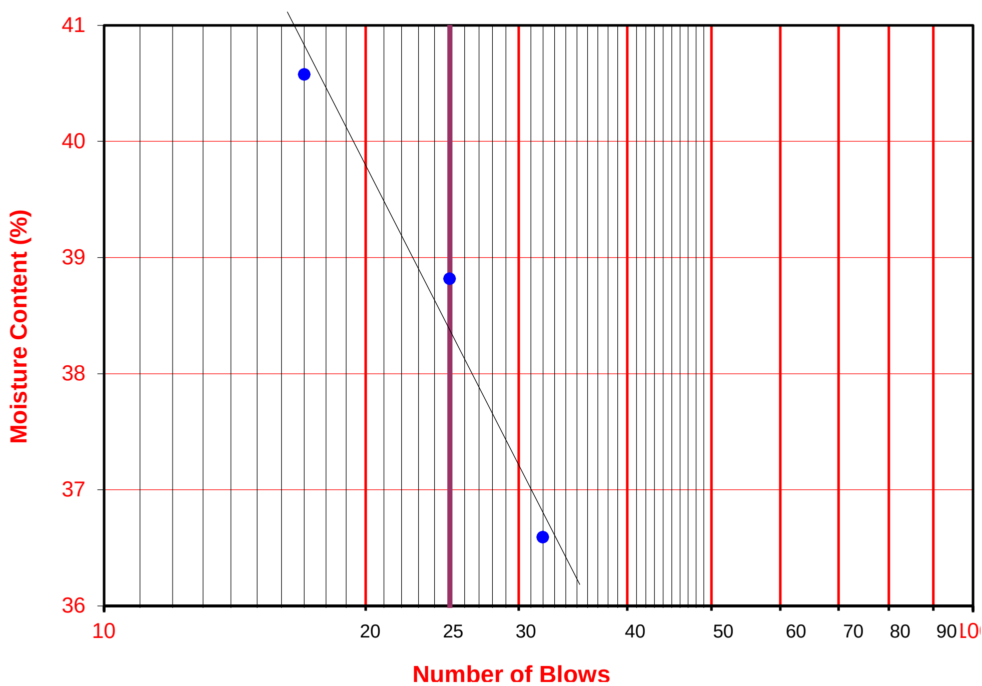
One - Point Liquid Limit Calculation

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



PROCEDURES USED

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



ATTERBERG LIMITS

ASTM D 4318

Leighton

Project Name:	Hoag Hospital	Tested By:	G. Bathala	Date:	06/06/14
Project No. :	10572.001	Input By:	J. Ward	Date:	06/16/14
Boring No.:	LB-2	Checked By:	J. Ward		
Sample No.:	R-2	Depth (ft.)	5.0		
Soil Identification:	Very dark brown lean clay with sand (CL)s				

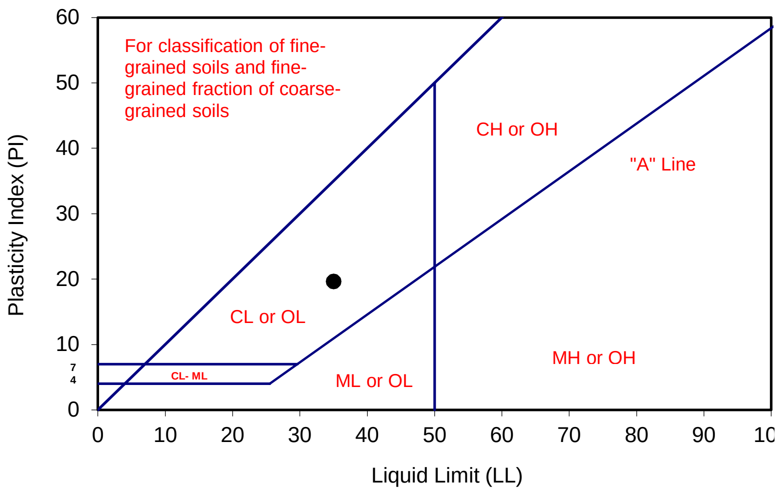
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			33	28	23	17
Wet Wt. of Soil + Cont. (g)	25.66	25.75	56.87	51.25	26.43	26.29
Dry Wt. of Soil + Cont. (g)	24.05	24.12	53.24	47.27	22.53	22.38
Wt. of Container (g)	13.54	13.54	42.40	35.71	11.50	11.65
Moisture Content (%) [Wn]	15.32	15.41	33.49	34.43	35.36	36.44

Liquid Limit	**35**
Plastic Limit	**15**
Plasticity Index	**20**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) | 10.95

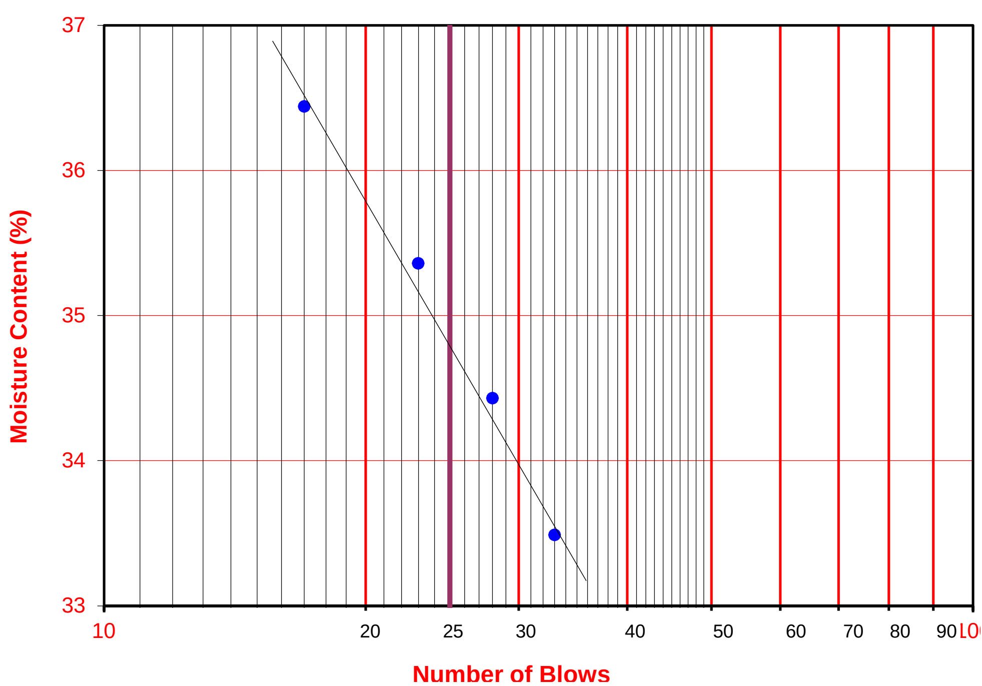
One - Point Liquid Limit Calculation

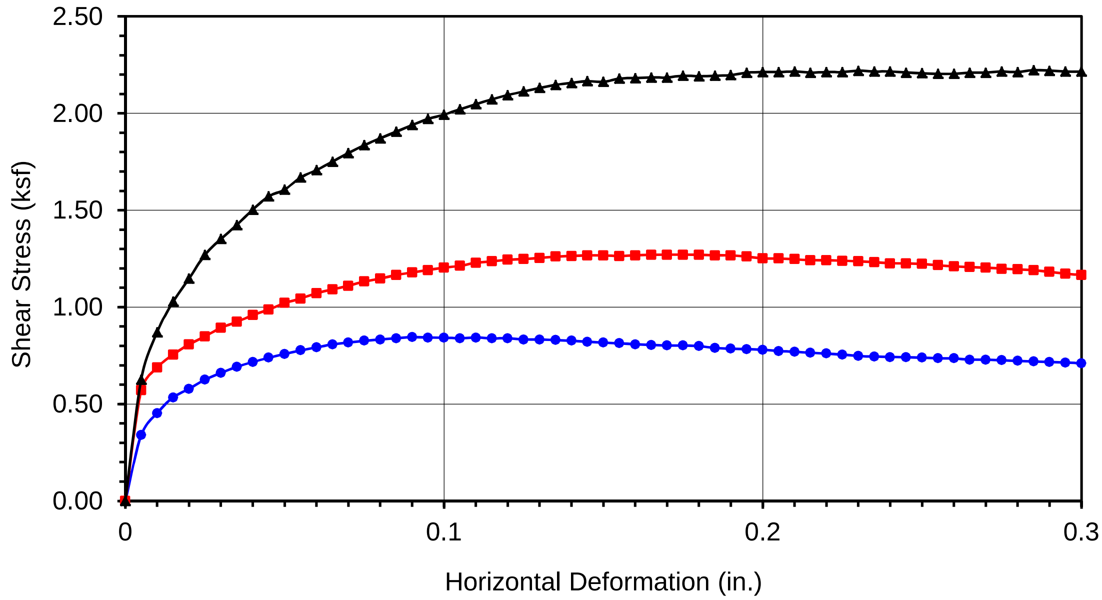
$LL = Wn(N/25)^{0.121}$

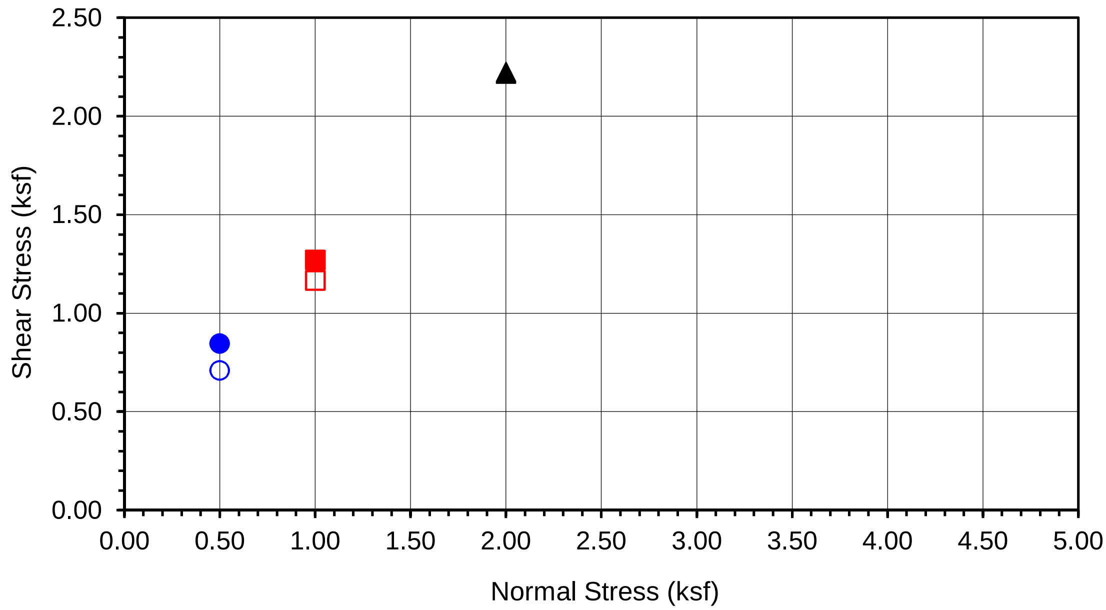


PROCEDURES USED

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







Boring No.	**LB-1**
Sample No.	**R-2**
Depth (ft)	**5**
Sample Type: Ring	
Soil Identification: Olive brown sandy lean clay s(CL)	

Normal Stress (kip/ft²)	0.500	1.000	2.000
Peak Shear Stress (kip/ft²)	● 0.846	■ 1.270	▲ 2.223
Shear Stress @ End of Test (ksf)	○ 0.710	□ 1.166	△ 2.216
Deformation Rate (in./min.)	0.0500	0.0500	0.0500
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	15.61	16.15	16.03
Dry Density (pcf)	109.0	110.8	112.4
Saturation (%)	77.2	83.7	86.6
Soil Height Before Shearing (in.)	0.9973	0.9948	0.9819
Final Moisture Content (%)	15.4	15.3	14.5

Leighton

DIRECT SHEAR TEST RESULTS

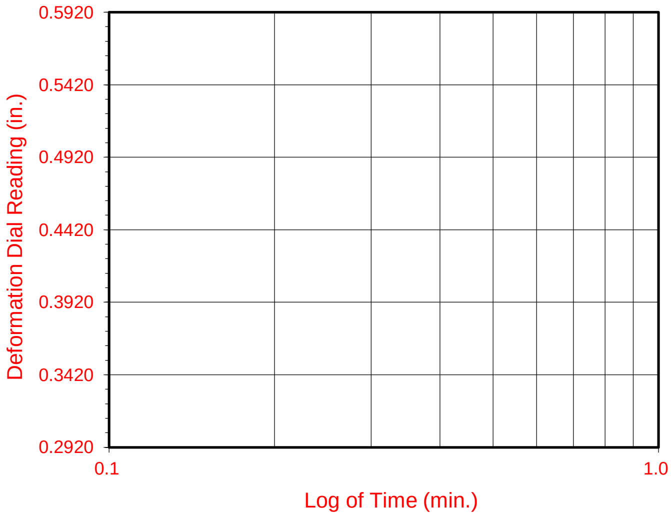
Consolidated Undrained

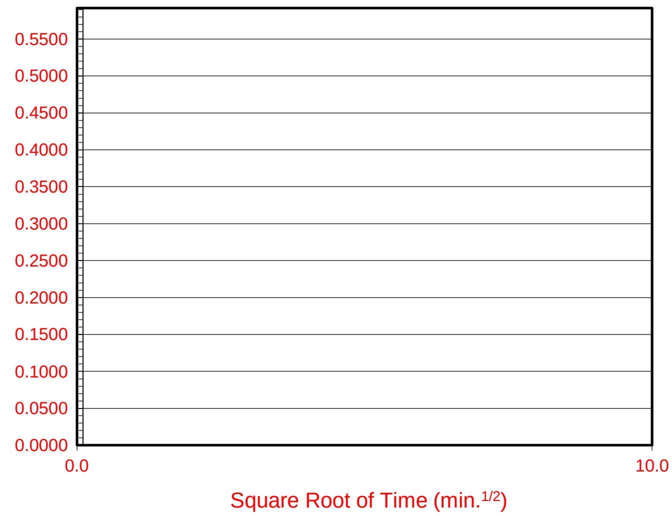
Project No.: 10572.001

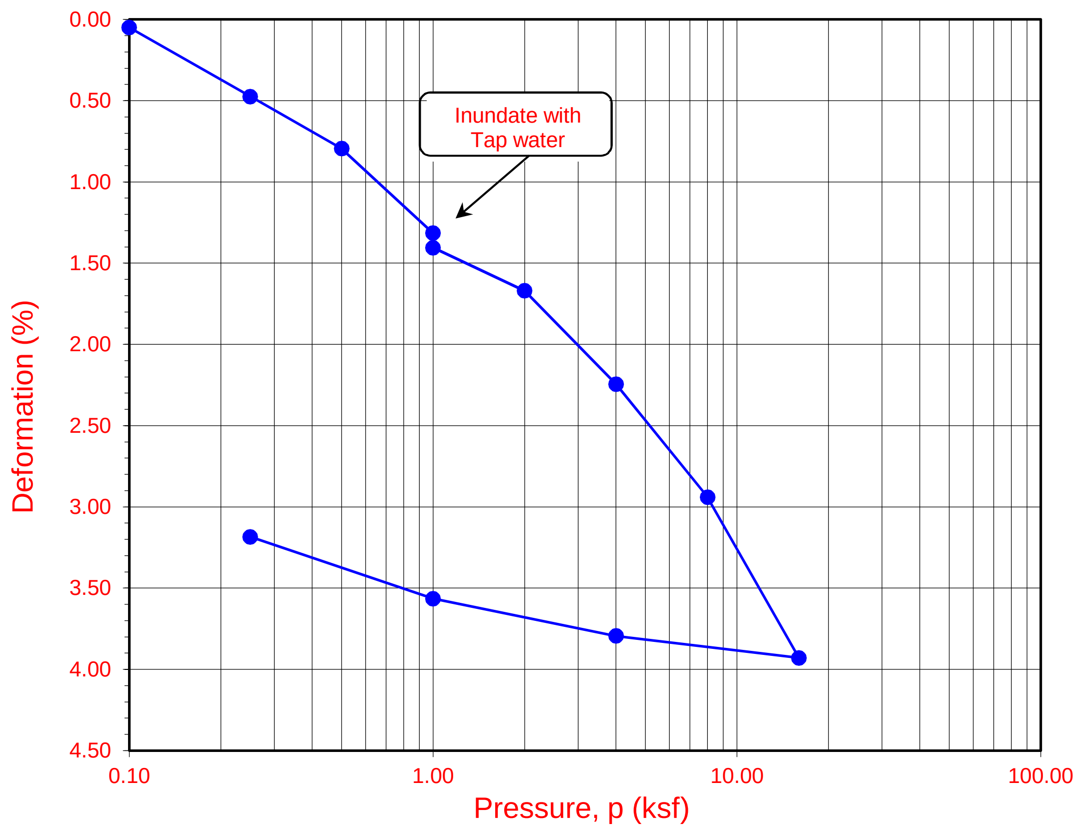
Hoag Hospital

06-14

No Time Readings







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	**R-3**	**7.0**	**6.5**	**12.3**	**122.1**	**120.8**	**0.380**	**0.336**	**46**	**84**

Soil Identification: Yellowish brown clayey sand (SC)

Leighton

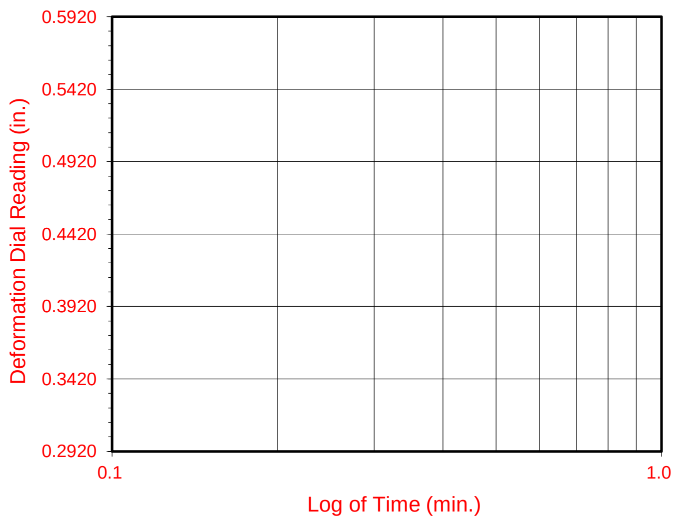
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

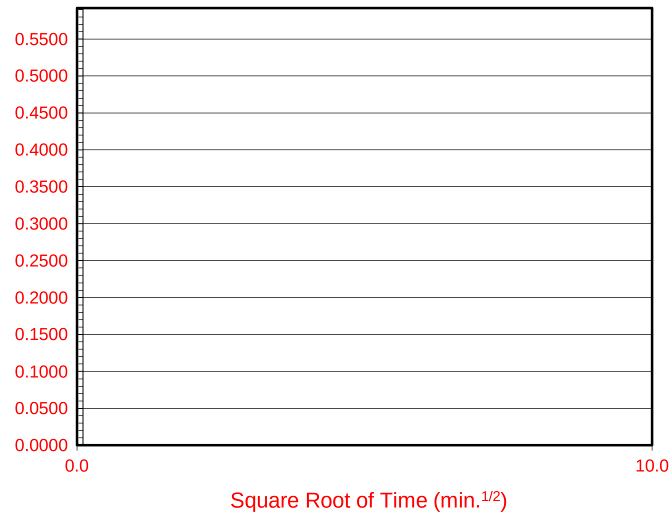
Project No.: 10572.001

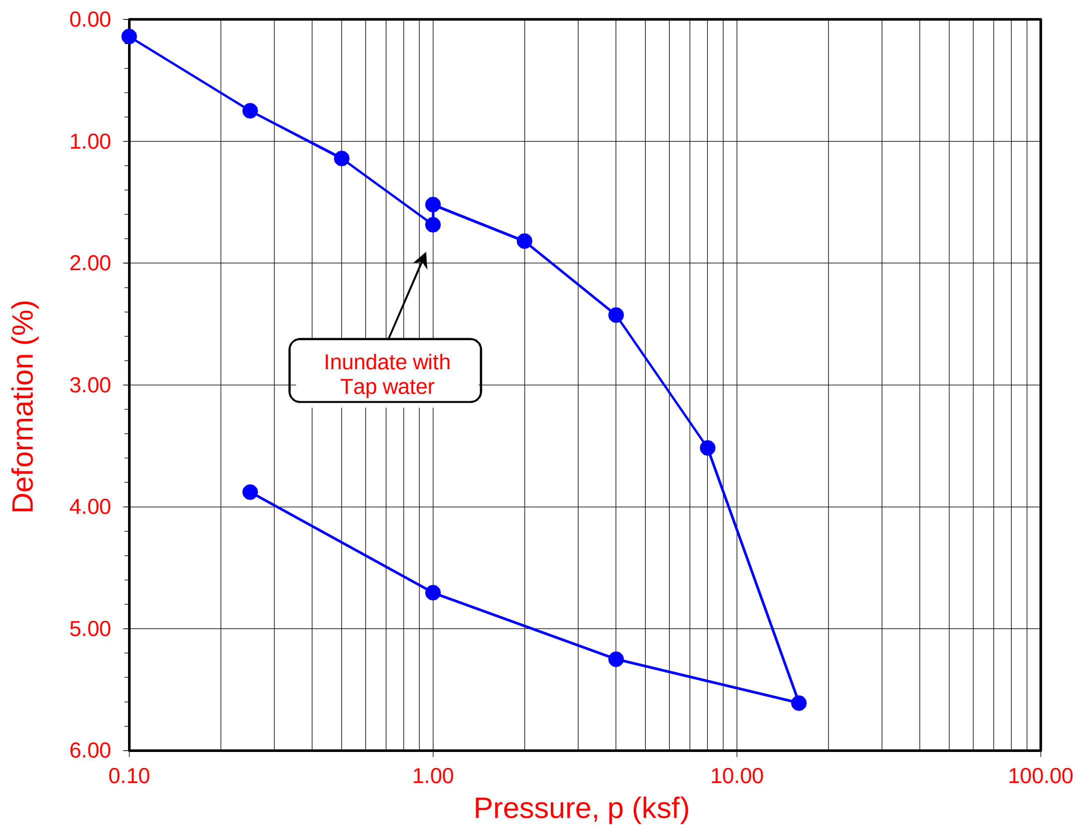
Hoag Hospital

06-14

No Time Readings







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-2	**R-2**	**5.0**	**15.5**	**15.5**	**112.4**	**116.5**	**0.500**	**0.442**	**84**	**94**

Soil Identification: Very dark brown lean clay with sand (CL)s

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 10572.001

Hoag Hospital

06-14

SOIL RESISTIVITY TEST

DOT CA TEST 532 / 643

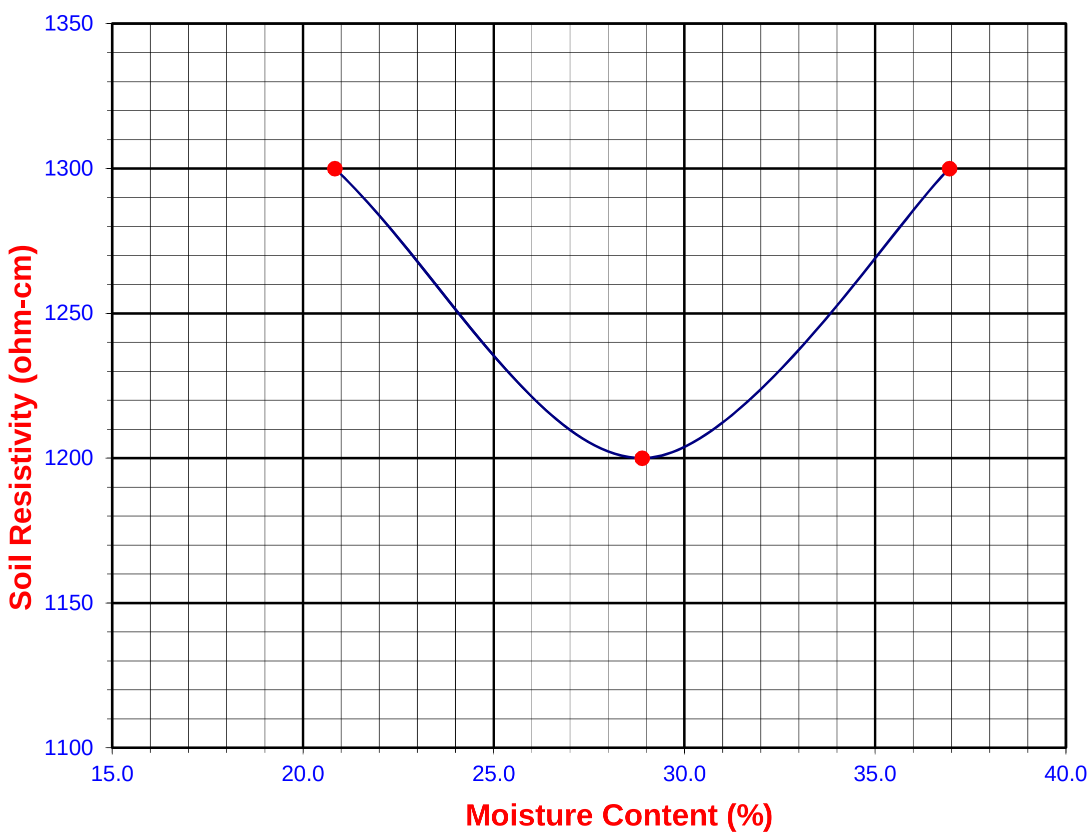
Project Name:	Hoag Hospital	Tested By :	G. Bathala	Date: 06/03/14
Project No. :	10572.001	Data Input By:	J. Ward	Date: 06/16/14
Boring No.:	LB-1	Depth (ft.) :	0-5	
Sample No. :	B-1			
Soil Identification:*	Dark brown s(CL)			

*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	20.84	1300	1300
2	30	28.89	1200	1200
3	40	36.95	1300	1300
4				
5				

Moisture Content (%) (MCi)	4.73
Wet Wt. of Soil + Cont. (g)	220.17
Dry Wt. of Soil + Cont. (g)	212.56
Wt. of Container (g)	51.52
Container No.	
Initial Soil Wt. (g) (Wt)	130.00
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 532 / 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 532 / 643	
1200	**28.9**	**112**	**84**	**7.90**	**21.9**



EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Hoag Hospital	Tested By:	G. Berdy	Date:	06/03/14
Project No.:	10572.001	Checked By:	J. Ward	Date:	06/16/14
Boring No.:	LB-2	Depth (ft.):	0-5		
Sample No.:	B-1				
Soil Identification:	Dark brown sandy lean clay s(CL)				

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	1.0490
Wt. Comp. Soil + Mold	(g)	581.20	434.47
Wt. of Mold	(g)	190.50	0.00
Specific Gravity (Assumed)		2.70	2.70
Container No.		O	O
Wet Wt. of Soil + Cont.	(g)	787.90	624.97
Dry Wt. of Soil + Cont.	(g)	713.10	544.08
Wt. of Container	(g)	0.00	190.50
Moisture Content	(%)	10.49	22.88
Wet Density	(pcf)	117.9	124.9
Dry Density	(pcf)	106.7	101.7
Void Ratio		0.581	0.658
Total Porosity		0.367	0.397
Pore Volume	(cc)	76.0	86.2
Degree of Saturation (%) [S_{meas}]		**48.8**	93.9

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.)
06/03/14	12:50	1.0	0	0.0980
06/03/14	13:00	1.0	10	0.0975
Add Distilled Water to the Specimen				
06/03/14	13:38	1.0	38	0.1360
06/04/14	8:08	1.0	1148	0.1470
06/04/14	9:32	1.0	1232	0.1470

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**50**

Boring No.	LB-4	LB-4						
Sample No.	S-1	R-2						
Depth (ft.)	5.0	20.0						
Sample Type	SPT	Ring						
Soil Identification	Grayish brown silty sand (SM)	Grayish brown silty, clayey sand (SC-SM)						
Moisture Correction								
Wet Weight of Soil + Container (g)	0.0	0.0						
Dry Weight of Soil + Container (g)	0.0	0.0						
Weight of Container (g)	1.0	1.0						
Moisture Content (%)	0.0	0.0						
Sample Dry Weight Determination								
Weight of Sample + Container (g)	652.7	897.6						
Weight of Container (g)	249.3	221.6						
Weight of Dry Sample (g)	403.4	676.0						
Container No.:								
After Wash								
Method (A or B)	B	B						
Dry Weight of Sample + Cont. (g)	567.9	681.6						
Weight of Container (g)	249.3	221.6						
Dry Weight of Sample (g)	318.6	460.0						
% Passing No. 200 Sieve	**21.0**	**32.0**						
% Retained No. 200 Sieve	79.0	68.0						

Leighton

PERCENT PASSING
No. 200 SIEVE
ASTM D 1140

Project Name: Hoag Hospital ED Expansion
Project No.: 10572.004
Client Name: Hoag Memorial Hospital Presbyterian
Tested By: S. Felter Date: 01/26/16

ATTERBERG LIMITS

ASTM D 4318

Project Name:	Hoag Hospital ED Expansion	Tested By:	A. Santos	Date:	02/02/16
Project No. :	10572.004	Input By:	J. Ward	Date:	02/04/16
Boring No.:	LB-5	Checked By:	J. Ward		
Sample No.:	R-1	Depth (ft.)	5.0		
Soil Identification:	Dark grayish brown lean clay with sand (CL)s				

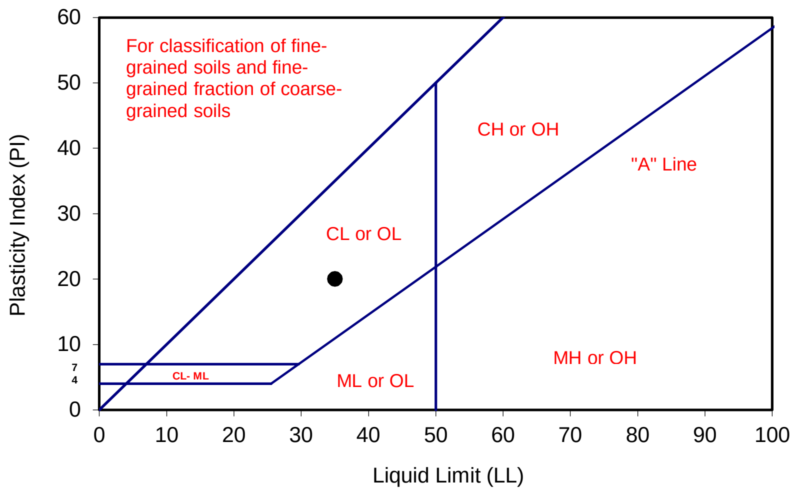
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			33	26	21	
Wet Wt. of Soil + Cont. (g)	9.47	9.90	20.08	21.65	21.48	
Dry Wt. of Soil + Cont. (g)	8.38	8.75	15.27	16.33	16.07	
Wt. of Container (g)	1.08	1.09	1.04	1.05	1.06	
Moisture Content (%) [Wn]	14.93	15.01	33.80	34.82	36.04	

Liquid Limit	**35**
Plastic Limit	**15**
Plasticity Index	**20**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) 10.95

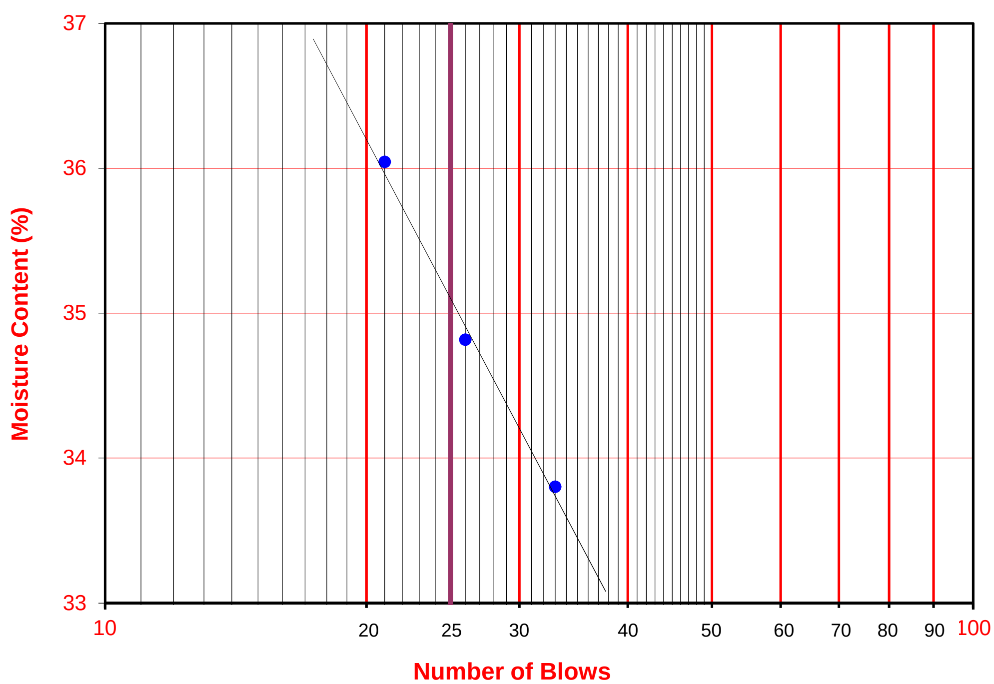
One - Point Liquid Limit Calculation

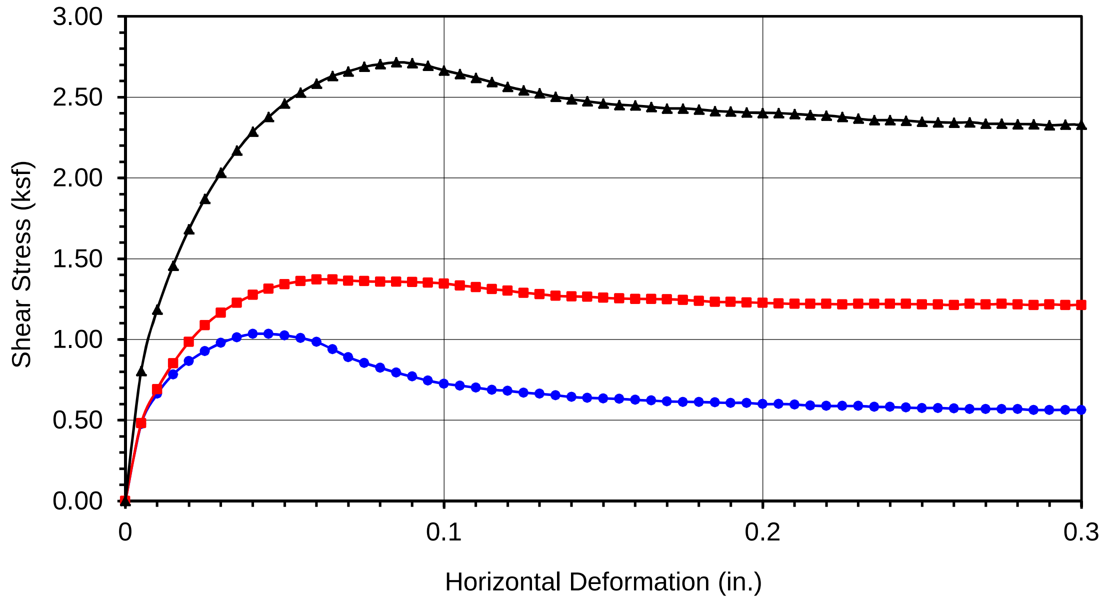
$LL = Wn(N/25)^{0.121}$

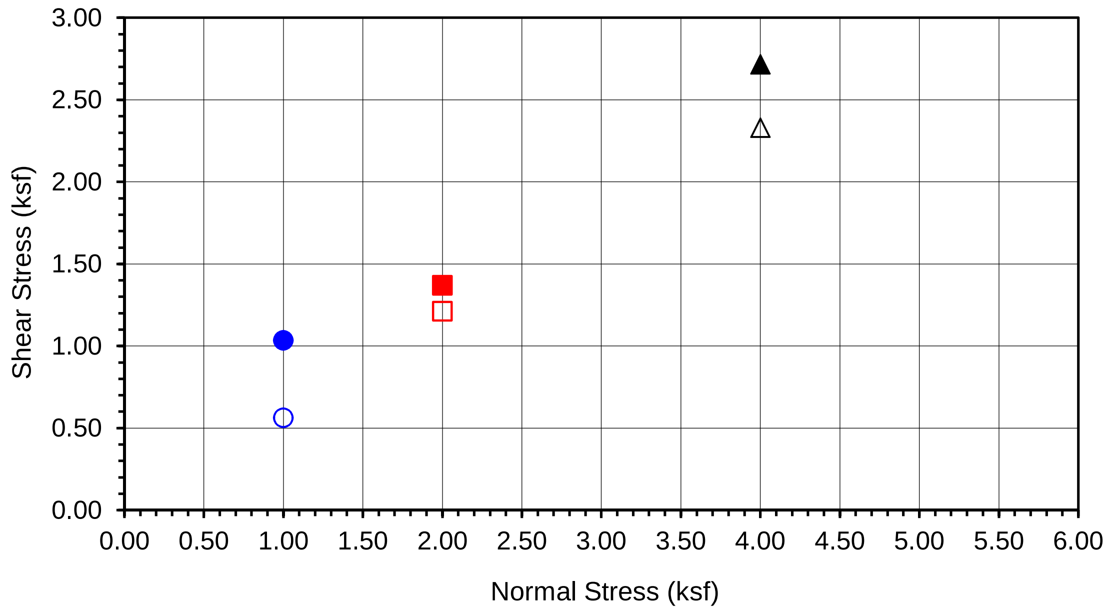


PROCEDURES USED

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







Boring No.	**LB-4**
Sample No.	**R-1**
Depth (ft)	**10**
Sample Type:	
Ring	
Soil Identification:	
Brown lean clay (CL)	

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 1.034	■ 1.371	▲ 2.716
Shear Stress @ End of Test (ksf)	○ 0.563	□ 1.213	△ 2.330
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 (%)	16.18	16.18	16.18
Dry Density (pcf)	108.5	108.2	110.9
Saturation (%)	79.0	78.3	84.0
Soil Height Before Shearing (in.)	0.9960	0.9901	0.9748
Final Moisture Content (%)	22.7	16.5	17.4

Leighton

DIRECT SHEAR TEST RESULTS

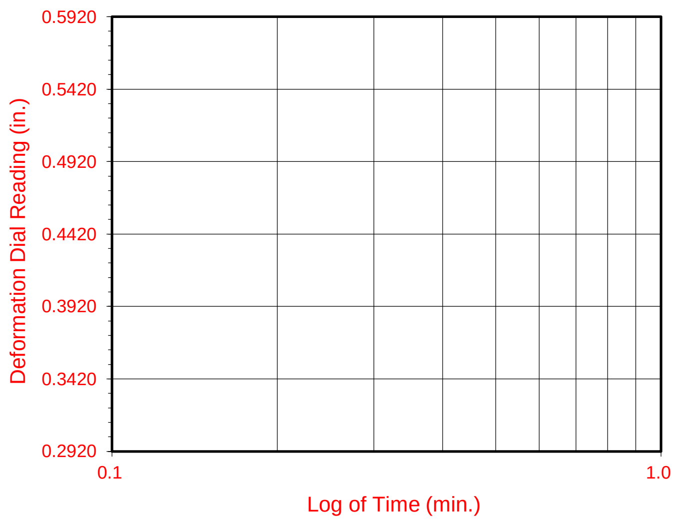
Consolidated Drained - ASTM D 3080

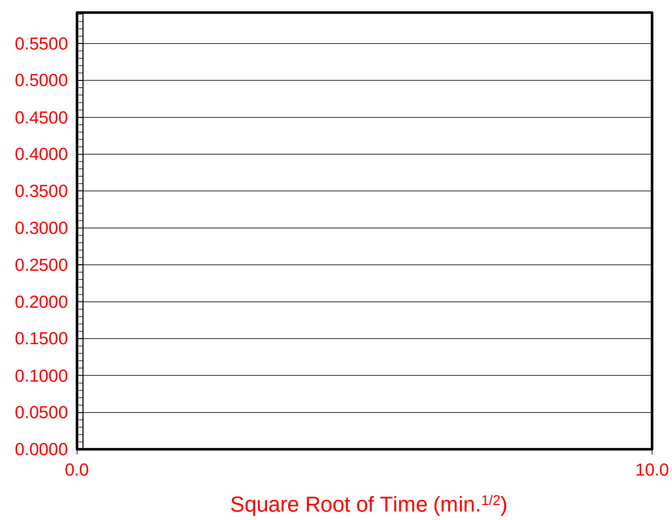
Project No.: 10572.004

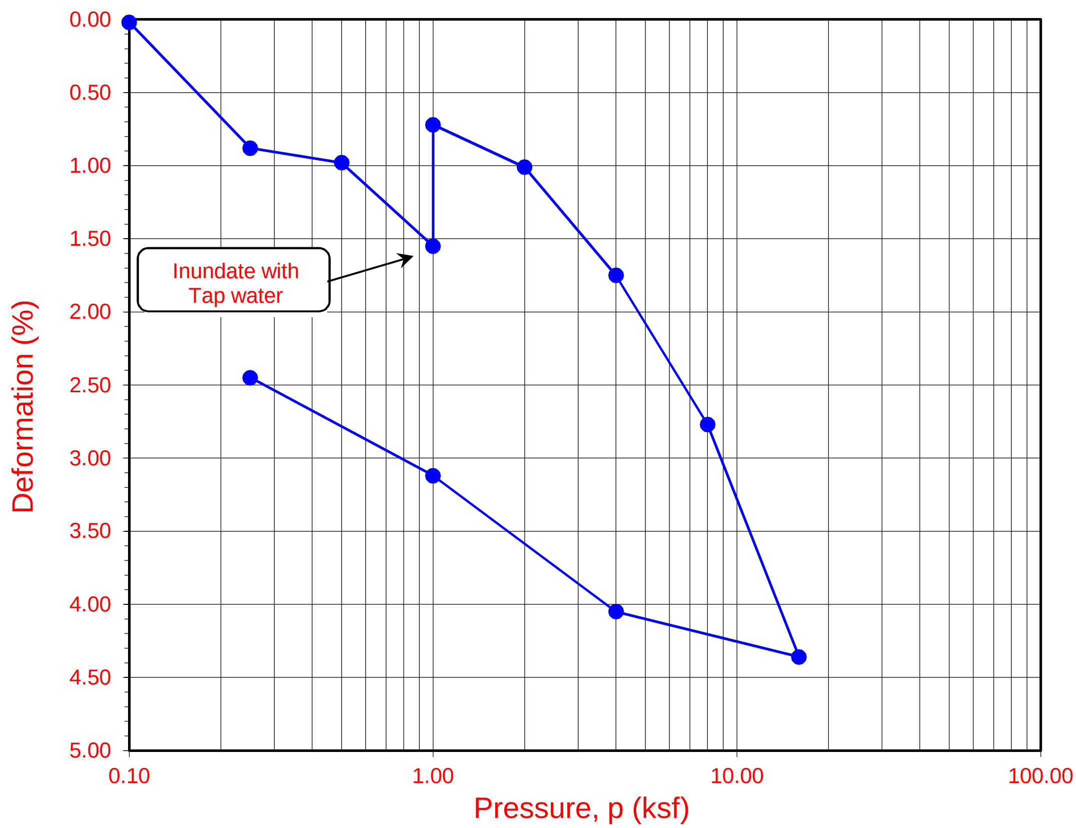
Hoag Hospital ED Expansion

01-16

No Time Readings







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**	**5.0**	**12.8**	**14.1**	**117.3**	**121.1**	**0.437**	**0.401**	**79**	**97**

Soil Identification: Dark brown lean clay with sand (CL)s

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 10572.004

Hoag Hospital ED Expansion

02-16

SOIL RESISTIVITY TEST

DOT CA TEST 643

Leighton

Project Name:	Hoag Hospital ED Expansion	Tested By :	G. Berdy	Date:	02/02/16
Project No. :	10572.004	Data Input By:	J. Ward	Date:	02/04/16
Boring No.:	LB-4	Depth (ft.) :	1-5		
Sample No. :	BB-1				
Soil Identification:*	Brown SC				

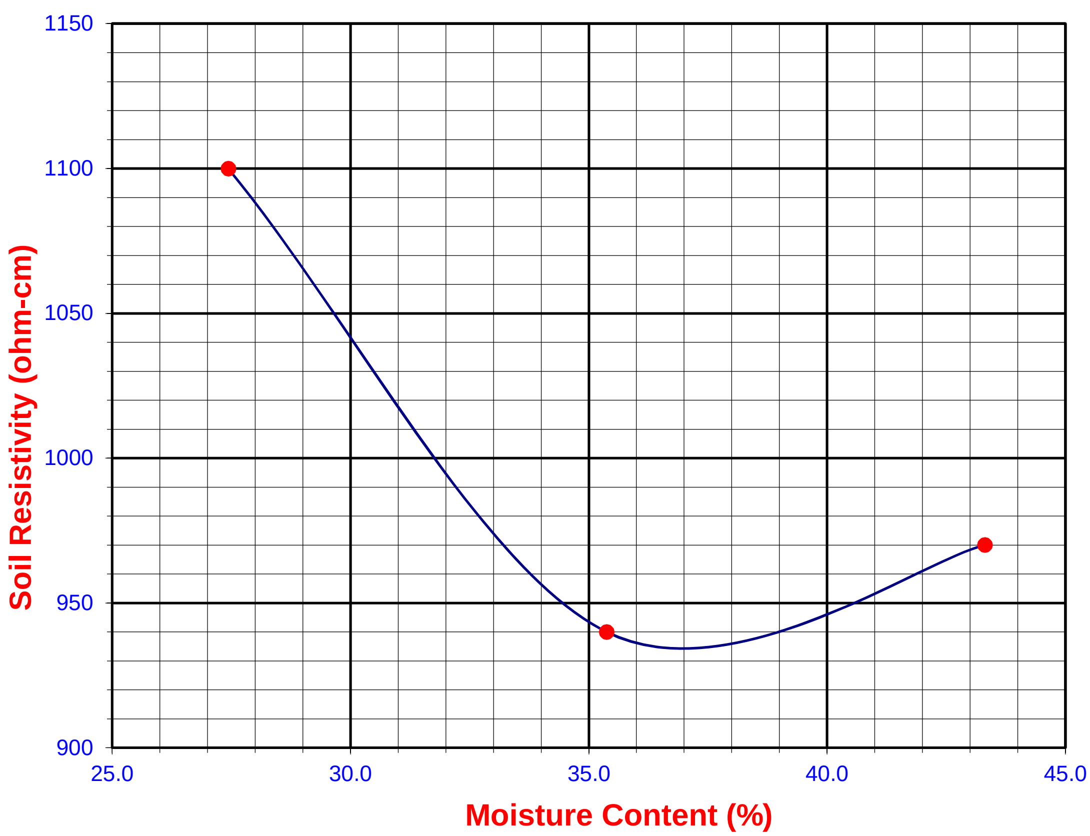
*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	30	27.44	1100	1100
2	40	35.38	940	940
3	50	43.31	970	970
4				
5				

Moisture Content (%) (MCi)	3.63
Wet Wt. of Soil + Cont. (g)	205.03
Dry Wt. of Soil + Cont. (g)	199.96
Wt. of Container (g)	60.27
Container No.	
Initial Soil Wt. (g) (Wt)	130.57
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	
934	**37.0**	**120**	**83**	**7.80**	**19.2**



Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Hoag Hospital ED Expansion	Tested By:	S. Felter	Date:	01/28/16
Project No.:	10572.004	Checked By:	J. Ward	Date:	02/04/16
Boring No.:	LB-4	Depth (ft.):	1-5		
Sample No.:	BB-1				
Soil Identification:	Brown clayey sand (SC)				

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	1.0370
Wt. Comp. Soil + Mold (g)	580.80	442.23
Wt. of Mold (g)	166.30	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	819.60	608.53
Dry Wt. of Soil + Cont. (g)	751.90	546.61
Wt. of Container (g)	0.00	166.30
Moisture Content (%)	9.00	16.28
Wet Density (pcf)	125.0	128.6
Dry Density (pcf)	114.7	110.6
Void Ratio	0.470	0.524
Total Porosity	0.320	0.344
Pore Volume (cc)	66.2	73.8
Degree of Saturation (%) [S_{meas}]	**51.8**	83.9

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.)
01/28/16	10:26	1.0	0	0.1420
01/28/16	10:36	1.0	10	0.1420
Add Distilled Water to the Specimen				
01/28/16	13:58	1.0	202	0.1760
01/29/16	6:46	1.0	1210	0.1790
01/29/16	7:50	1.0	1274	0.1790

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**37**

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Hoag Hospital ED Expansion	Tested By:	S. Felter	Date:	01/28/16
Project No.:	10572.004	Checked By:	J. Ward	Date:	02/04/16
Boring No.:	LB-5	Depth (ft.):	1-5		
Sample No.:	BB-1				
Soil Identification:	Brown clayey sand (SC)				

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	1.0335
Wt. Comp. Soil + Mold	(g)	577.20	443.57
Wt. of Mold	(g)	163.70	0.00
Specific Gravity (Assumed)		2.70	2.70
Container No.		O	O
Wet Wt. of Soil + Cont.	(g)	831.00	607.27
Dry Wt. of Soil + Cont.	(g)	765.90	544.84
Wt. of Container	(g)	0.00	163.70
Moisture Content	(%)	8.50	16.38
Wet Density	(pcf)	124.7	129.5
Dry Density	(pcf)	115.0	111.2
Void Ratio		0.466	0.515
Total Porosity		0.318	0.340
Pore Volume	(cc)	65.8	72.8
Degree of Saturation (%) [S_{meas}]		**49.2**	85.8

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.)
01/28/16	10:50	1.0	0	0.1000
01/28/16	11:00	1.0	10	0.1000
Add Distilled Water to the Specimen				
01/28/16	13:56	1.0	176	0.1335
01/29/16	6:45	1.0	1185	0.1335
01/29/16	7:50	1.0	1250	0.1335

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**34**

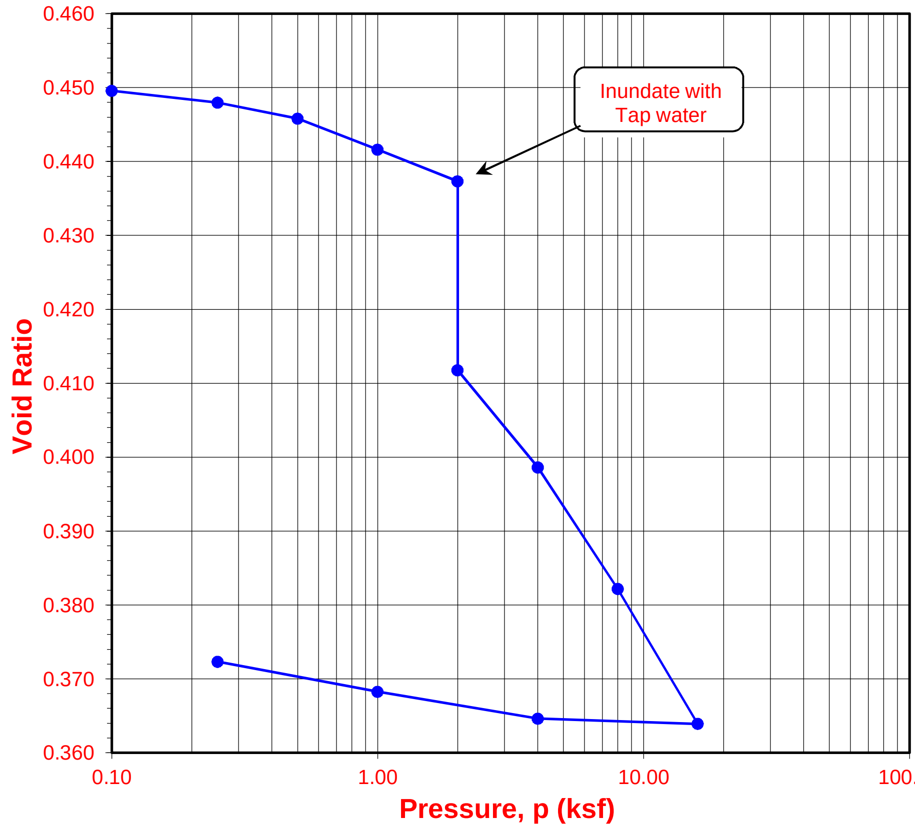
Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name: Hoag Hospital Irvine
Tested By: G. Bathala Date: 09/14/17
Project No.: 11753.001
Checked By: J. Ward Date: 09/28/17
Boring No.: LB-2
Depth (ft.): 20.0
Sample No.: R2
Sample Type: Ring
Soil Identification: Grayish brown silty, clayey sand (SC-SM)

Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	187.26
Weight of Ring (g)	42.94
Height after consol. (in.)	0.9468
Before Test	
Wt.Wet Sample+Cont. (g)	223.13
Wt.of Dry Sample+Cont. (g)	218.01
Weight of Container (g)	58.67
Initial Moisture Content (%)	3.2
Initial Dry Density (pcf)	116.3
Initial Saturation (%)	19
Initial Vertical Reading (in.)	0.3008
After Test	
Wt.of Wet Sample+Cont. (g)	257.24
Wt. of Dry Sample+Cont. (g)	241.28
Weight of Container (g)	58.51
Final Moisture Content (%)	11.41
Final Dry Density (pcf)	122.8
Final Saturation (%)	83
Final Vertical Reading (in.)	0.2455
Specific Gravity (assumed)	2.70
Water Density (pcf)	62.43

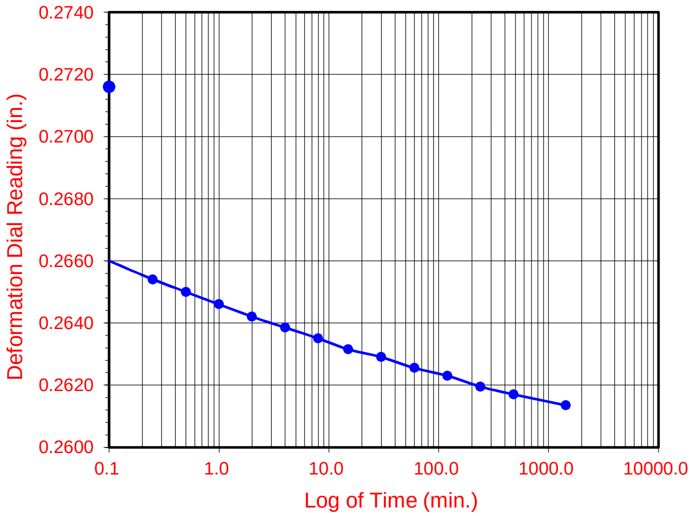


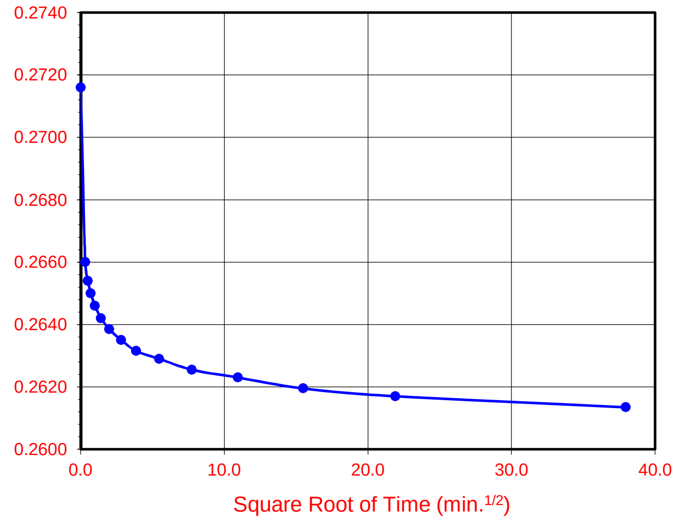
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.3008	1.0001	0.00	0.00	0.450	0.00
0.25	0.2990	0.9983	0.07	0.18	0.448	0.11
0.50	0.2969	0.9962	0.13	0.39	0.446	0.26
1.00	0.2932	0.9925	0.21	0.75	0.442	0.54
2.00	0.2893	0.9885	0.31	1.15	0.437	0.84
2.00	0.2716	0.9709	0.31	2.92	0.412	2.61
4.00	0.2614	0.9606	0.43	3.94	0.399	3.51
8.00	0.2483	0.9476	0.60	5.25	0.382	4.65
16.00	0.2331	0.9324	0.86	6.77	0.364	5.91
4.00	0.2369	0.9362	0.53	6.39	0.365	5.86
1.00	0.2411	0.9404	0.36	5.97	0.368	5.61
0.25	0.2455	0.9448	0.20	5.53	0.372	5.33

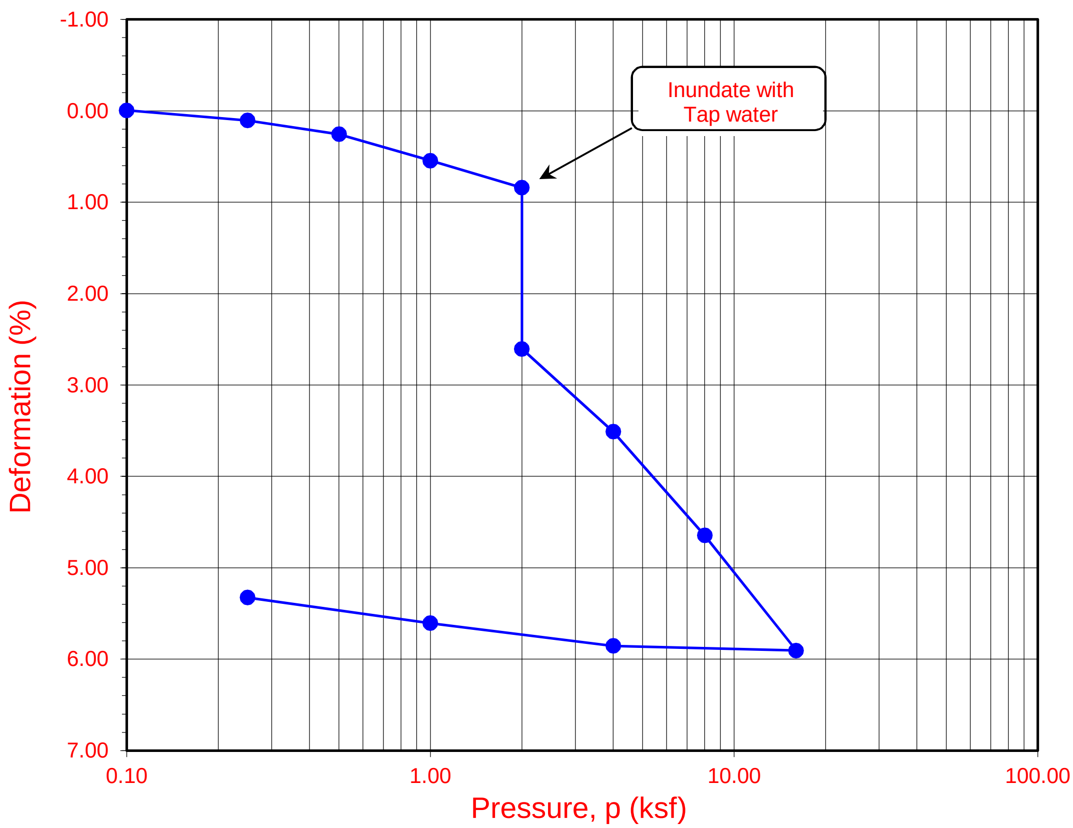
Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
9/18/17	8:05:00	0.0	0.0	0.2716
9/18/17	8:05:06	0.1	0.3	0.2660
9/18/17	8:05:15	0.2	0.5	0.2654
9/18/17	8:05:30	0.5	0.7	0.2650
9/18/17	8:06:00	1.0	1.0	0.2646
9/18/17	8:07:00	2.0	1.4	0.2642
9/18/17	8:09:00	4.0	2.0	0.2639
9/18/17	8:13:00	8.0	2.8	0.2635
9/18/17	8:20:00	15.0	3.9	0.2632
9/18/17	8:35:00	30.0	5.5	0.2629
9/18/17	9:05:00	60.0	7.7	0.2626
9/18/17	10:05:00	120.0	11.0	0.2623
9/18/17	12:05:00	240.0	15.5	0.2620
9/18/17	16:05:00	480.0	21.9	0.2617
9/19/17	8:05:00	1440.0	37.9	0.2614

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-2	**R2**	**20.0**	**3.2**	**11.4**	**116.3**	**122.8**	**0.450**	**0.372**	**19**	**83**

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

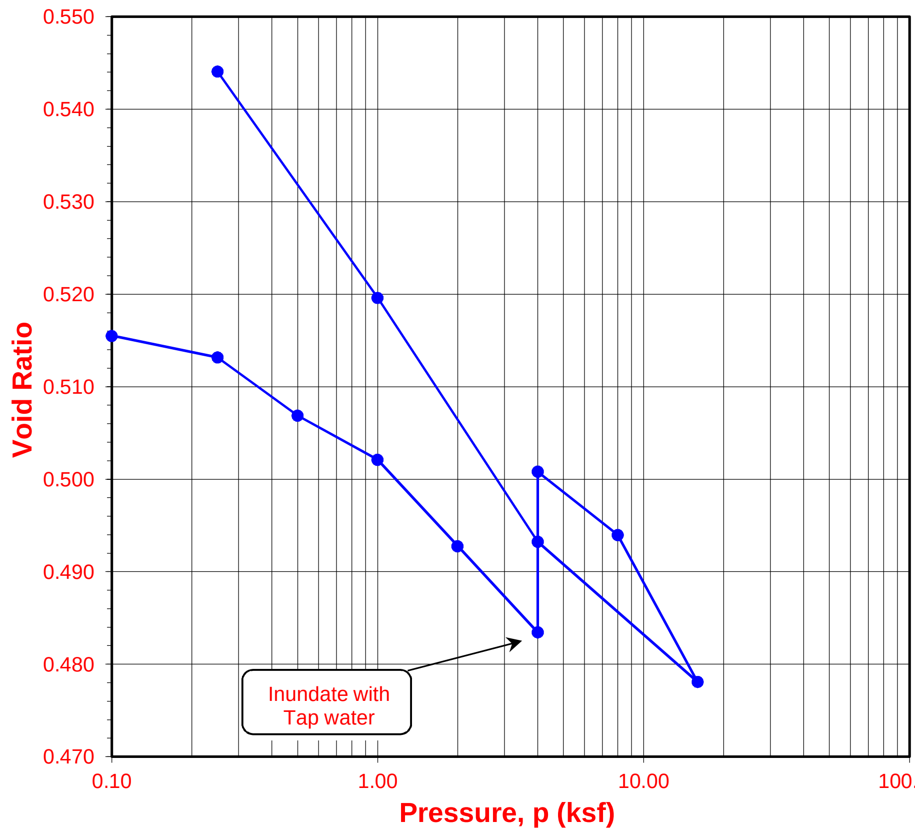
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Hoag Hospital Irvine	Tested By: G. Bathala	Date: 09/14/17
Project No.:	11753.001	Checked By: J. Ward	Date: 09/28/17
Boring No.:	LB-2	Depth (ft.): 30.0	
Sample No.:	R3	Sample Type: Ring	
Soil Identification:	Olive lean clay (CL)		

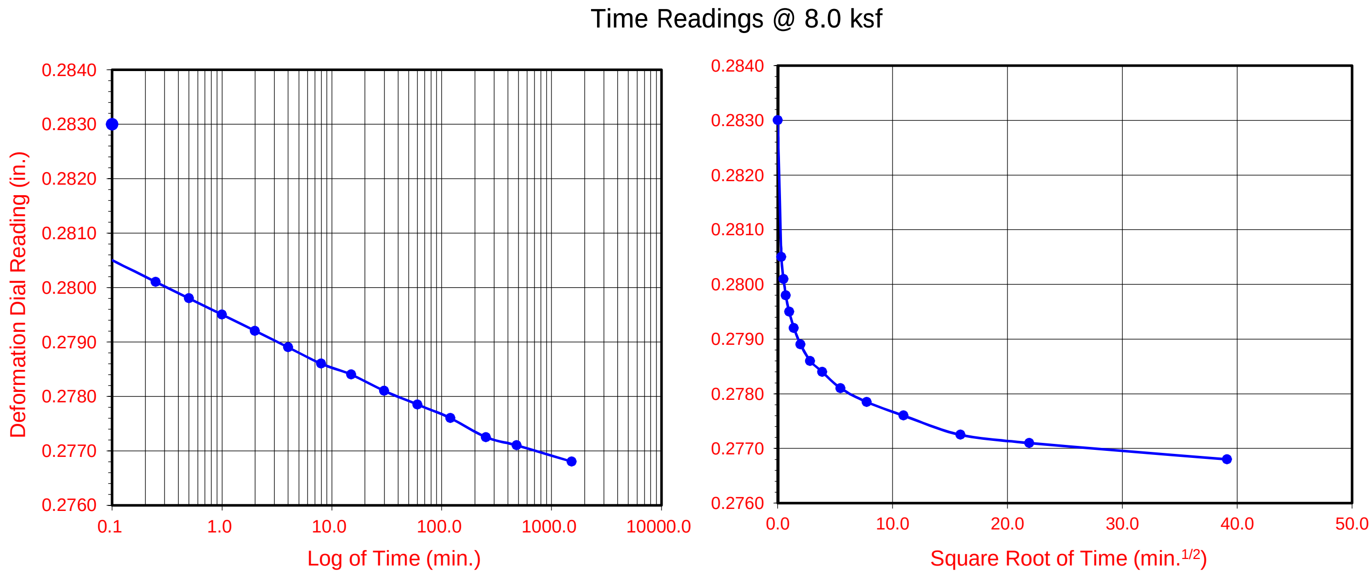
Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	202.24
Weight of Ring (g)	42.76
Height after consol. (in.)	1.0187
Before Test	
Wt.Wet Sample+Cont. (g)	213.04
Wt.of Dry Sample+Cont. (g)	190.10
Weight of Container (g)	59.25
Initial Moisture Content (%)	17.5
Initial Dry Density (pcf)	112.8
Initial Saturation (%)	93
Initial Vertical Reading (in.)	0.2993
After Test	
Wt.of Wet Sample+Cont. (g)	275.49
Wt. of Dry Sample+Cont. (g)	248.31
Weight of Container (g)	70.34
Final Moisture Content (%)	20.10
Final Dry Density (pcf)	110.4
Final Saturation (%)	100
Final Vertical Reading (in.)	0.3148
Specific Gravity (assumed)	2.74
Water Density (pcf)	62.43

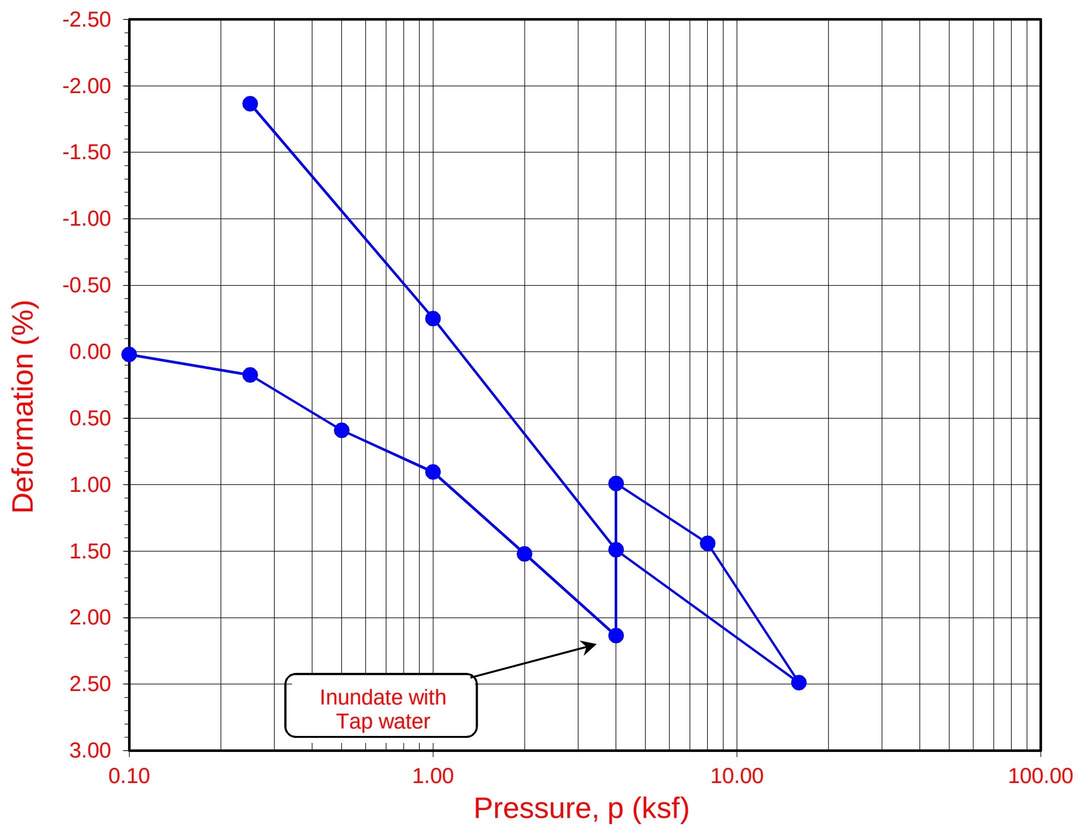


Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.2991	0.9998	0.00	0.02	0.516	0.02
0.25	0.2970	0.9977	0.06	0.24	0.513	0.18
0.50	0.2918	0.9925	0.16	0.75	0.507	0.59
1.00	0.2872	0.9879	0.31	1.22	0.502	0.90
2.00	0.2794	0.9801	0.47	1.99	0.493	1.52
4.00	0.2716	0.9723	0.64	2.77	0.483	2.13
4.00	0.2830	0.9837	0.64	1.63	0.501	0.99
8.00	0.2768	0.9775	0.81	2.25	0.494	1.44
16.00	0.2644	0.9651	1.00	3.49	0.478	2.49
4.00	0.2765	0.9772	0.79	2.28	0.493	1.49
1.00	0.2963	0.9970	0.55	0.30	0.520	-0.25
0.25	0.3148	1.0155	0.32	-1.55	0.544	-1.87

Time Readings @ 8.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
9/18/17	7:55:00	0.0	0.0	0.2830
9/18/17	7:55:06	0.1	0.3	0.2805
9/18/17	7:55:15	0.2	0.5	0.2801
9/18/17	7:55:30	0.5	0.7	0.2798
9/18/17	7:56:00	1.0	1.0	0.2795
9/18/17	7:57:00	2.0	1.4	0.2792
9/18/17	7:59:00	4.0	2.0	0.2789
9/18/17	8:03:00	8.0	2.8	0.2786
9/18/17	8:10:00	15.0	3.9	0.2784
9/18/17	8:25:00	30.0	5.5	0.2781
9/18/17	8:55:00	60.0	7.7	0.2779
9/18/17	9:55:00	120.0	11.0	0.2776
9/18/17	12:08:00	253.0	15.9	0.2773
9/18/17	15:55:00	480.0	21.9	0.2771
9/19/17	9:24:00	1529.0	39.1	0.2768





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-2	**R3**	**30.0**	**17.5**	**20.1**	**112.8**	**110.4**	**0.516**	**0.544**	**93**	**100**

Soil Identification: Olive lean clay (CL)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11753.001

Hoag Hospital Irvine

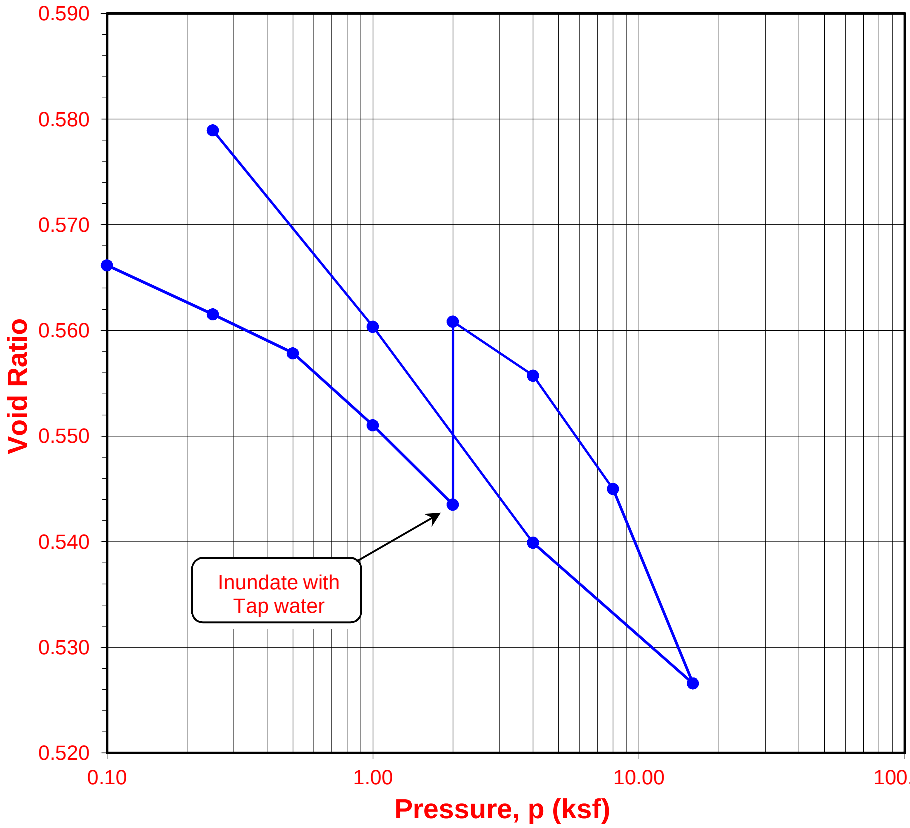
09-17

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Leighton

Project Name:	Hoag Hospital Irvine	Tested By: G. Bathala	Date:	09/14/17
Project No.:	11753.001	Checked By: J. Ward	Date:	09/28/17
Boring No.:	LB-3	Depth (ft.): 15.0		
Sample No.:	R2	Sample Type:	Ring	
Soil Identification:	Olive brown lean clay (CL)			

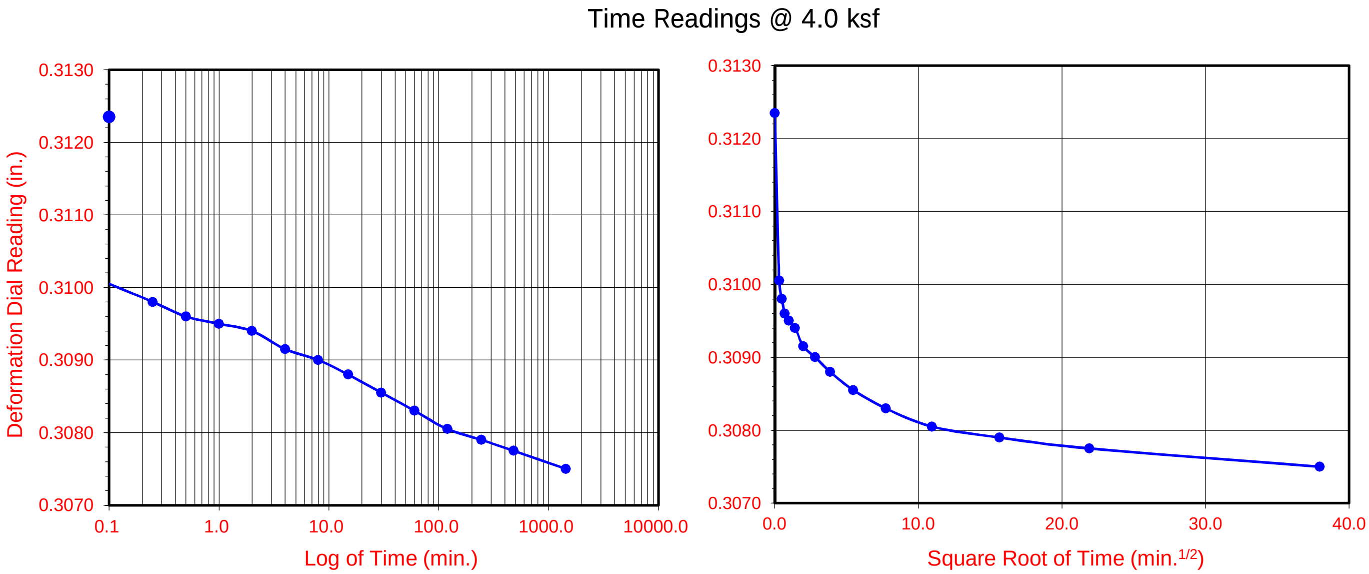
Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	191.82
Weight of Ring (g)	41.55
Height after consol. (in.)	1.0073
Before Test	
Wt.Wet Sample+Cont. (g)	203.79
Wt.of Dry Sample+Cont. (g)	180.82
Weight of Container (g)	39.17
Initial Moisture Content (%)	16.2
Initial Dry Density (pcf)	107.5
Initial Saturation (%)	77
Initial Vertical Reading (in.)	0.3203
After Test	
Wt.of Wet Sample+Cont. (g)	250.60
Wt. of Dry Sample+Cont. (g)	223.35
Weight of Container (g)	54.47
Final Moisture Content (%)	21.40
Final Dry Density (pcf)	105.1
Final Saturation (%)	96
Final Vertical Reading (in.)	0.3246
Specific Gravity (assumed)	2.70
Water Density (pcf)	62.43

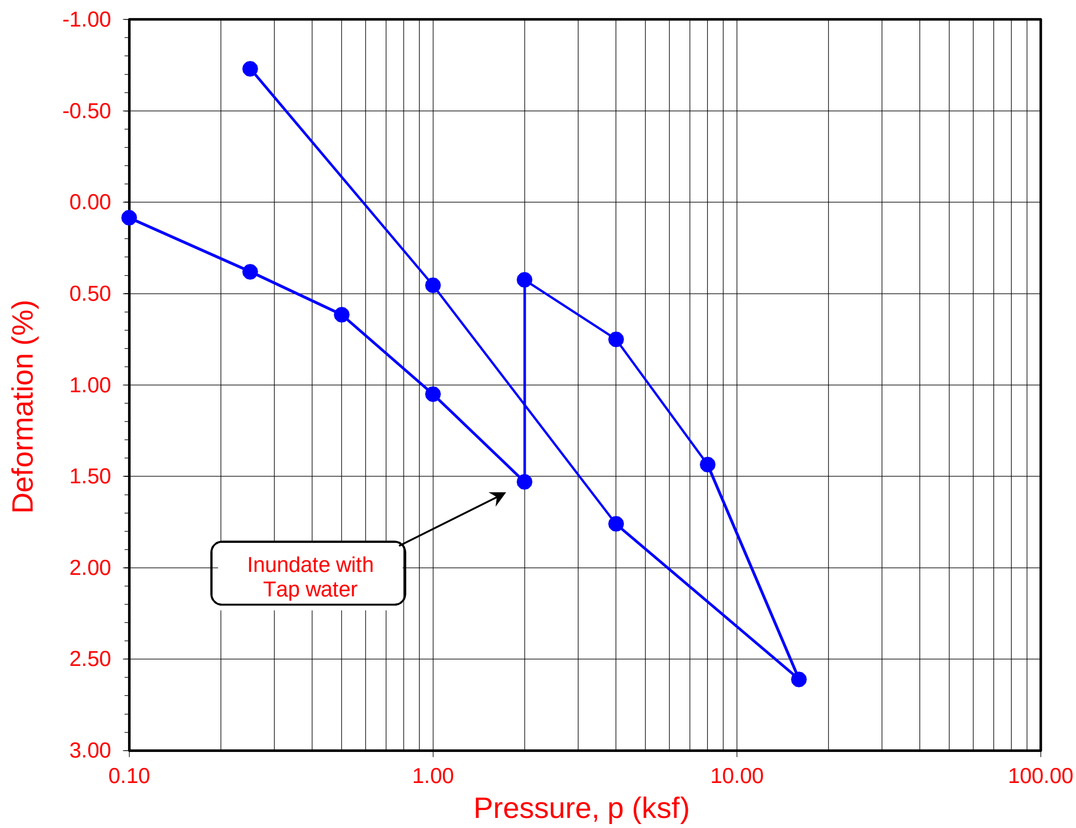


Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.3195	0.9992	0.00	0.09	0.566	0.09
0.25	0.3162	0.9959	0.03	0.41	0.562	0.38
0.50	0.3130	0.9927	0.12	0.73	0.558	0.61
1.00	0.3074	0.9871	0.24	1.29	0.551	1.05
2.00	0.3013	0.9810	0.37	1.90	0.544	1.53
2.00	0.3124	0.9921	0.37	0.79	0.561	0.42
4.00	0.3075	0.9872	0.53	1.28	0.556	0.75
8.00	0.2987	0.9784	0.73	2.16	0.545	1.43
16.00	0.2850	0.9647	0.92	3.53	0.527	2.61
4.00	0.2958	0.9755	0.69	2.45	0.540	1.76
1.00	0.3111	0.9908	0.47	0.92	0.560	0.45
0.25	0.3246	1.0043	0.30	-0.43	0.579	-0.73

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
9/18/17	8:17:00	0.0	0.0	0.3124
9/18/17	8:17:06	0.1	0.3	0.3101
9/18/17	8:17:15	0.2	0.5	0.3098
9/18/17	8:17:30	0.5	0.7	0.3096
9/18/17	8:18:00	1.0	1.0	0.3095
9/18/17	8:19:00	2.0	1.4	0.3094
9/18/17	8:21:00	4.0	2.0	0.3092
9/18/17	8:25:00	8.0	2.8	0.3090
9/18/17	8:32:00	15.0	3.9	0.3088
9/18/17	8:47:00	30.0	5.5	0.3086
9/18/17	9:17:00	60.0	7.7	0.3083
9/18/17	10:17:00	120.0	11.0	0.3081
9/18/17	12:22:00	245.0	15.7	0.3079
9/18/17	16:17:00	480.0	21.9	0.3078
9/19/17	8:17:00	1440.0	37.9	0.3075





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	**R2**	**15.0**	**16.2**	**21.4**	**107.5**	**105.1**	**0.567**	**0.579**	**77**	**96**

Soil Identification: Olive brown lean clay (CL)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11753.001

Hoag Hospital Irvine

09-17

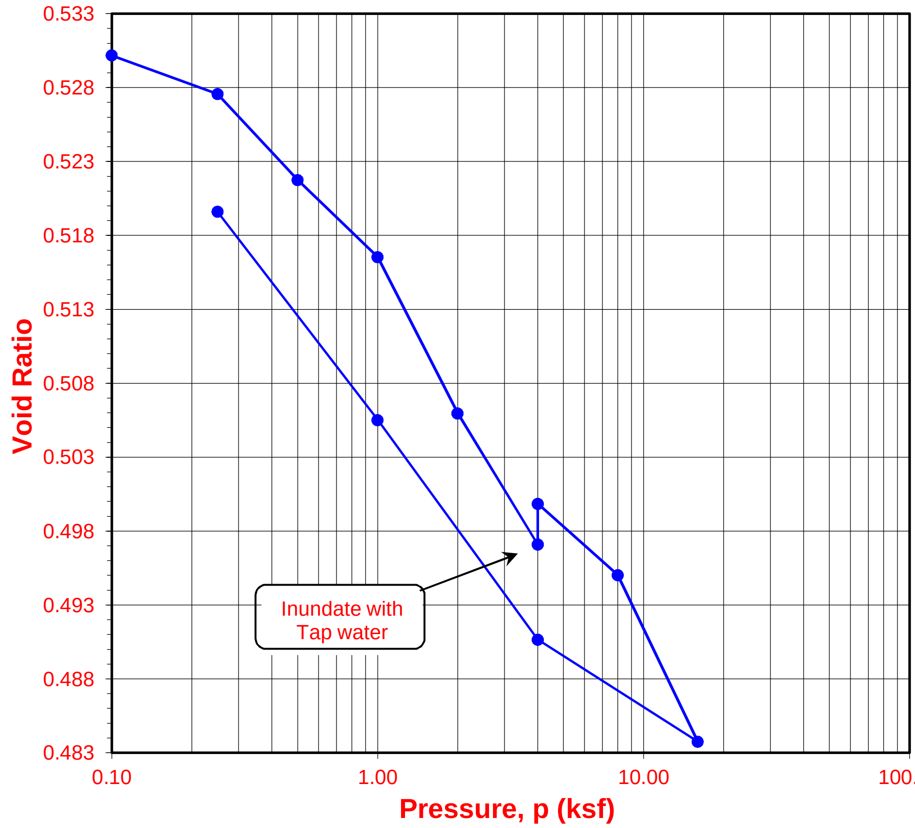
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Hoag Hospital Irvine	Tested By: G. Bathala	Date: 09/14/17
Project No.:	11753.001	Checked By: J. Ward	Date: 09/28/17
Boring No.:	LB-3	Depth (ft.): 25.0	
Sample No.:	R3	Sample Type: Ring	
Soil Identification:	Olive brown silty clay (CL-ML)		

Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	197.52
Weight of Ring (g)	42.10
Height after consol. (in.)	0.9920
Before Test	
Wt.Wet Sample+Cont. (g)	140.35
Wt.of Dry Sample+Cont. (g)	127.58
Weight of Container (g)	54.47
Initial Moisture Content (%)	17.5
Initial Dry Density (pcf)	110.0
Initial Saturation (%)	89
Initial Vertical Reading (in.)	0.2700
After Test	
Wt.of Wet Sample+Cont. (g)	257.41
Wt. of Dry Sample+Cont. (g)	233.74
Weight of Container (g)	58.65
Final Moisture Content (%)	17.80
Final Dry Density (pcf)	111.5
Final Saturation (%)	94
Final Vertical Reading (in.)	0.2580
Specific Gravity (assumed)	2.70
Water Density (pcf)	62.43

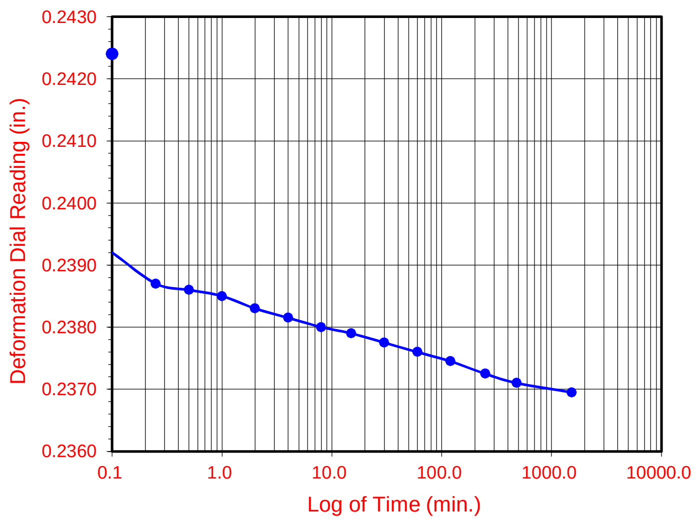


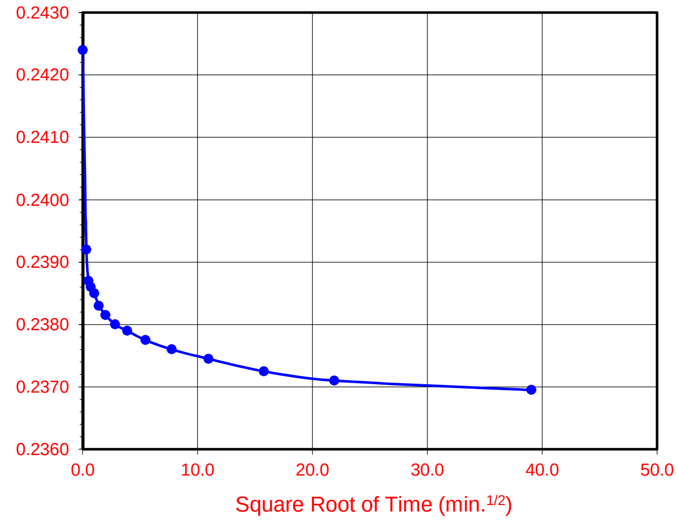
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.2689	0.9989	0.00	0.11	0.530	0.11
0.25	0.2668	0.9968	0.04	0.32	0.528	0.28
0.50	0.2620	0.9920	0.14	0.80	0.522	0.66
1.00	0.2572	0.9872	0.28	1.28	0.517	1.00
2.00	0.2484	0.9784	0.47	2.16	0.506	1.69
4.00	0.2406	0.9706	0.67	2.94	0.497	2.27
4.00	0.2424	0.9724	0.67	2.76	0.500	2.09
8.00	0.2370	0.9670	0.90	3.31	0.495	2.41
16.00	0.2268	0.9568	1.18	4.32	0.484	3.14
4.00	0.2343	0.9643	0.88	3.57	0.491	2.69
1.00	0.2465	0.9765	0.63	2.35	0.506	1.72
0.25	0.2580	0.9880	0.40	1.20	0.520	0.80

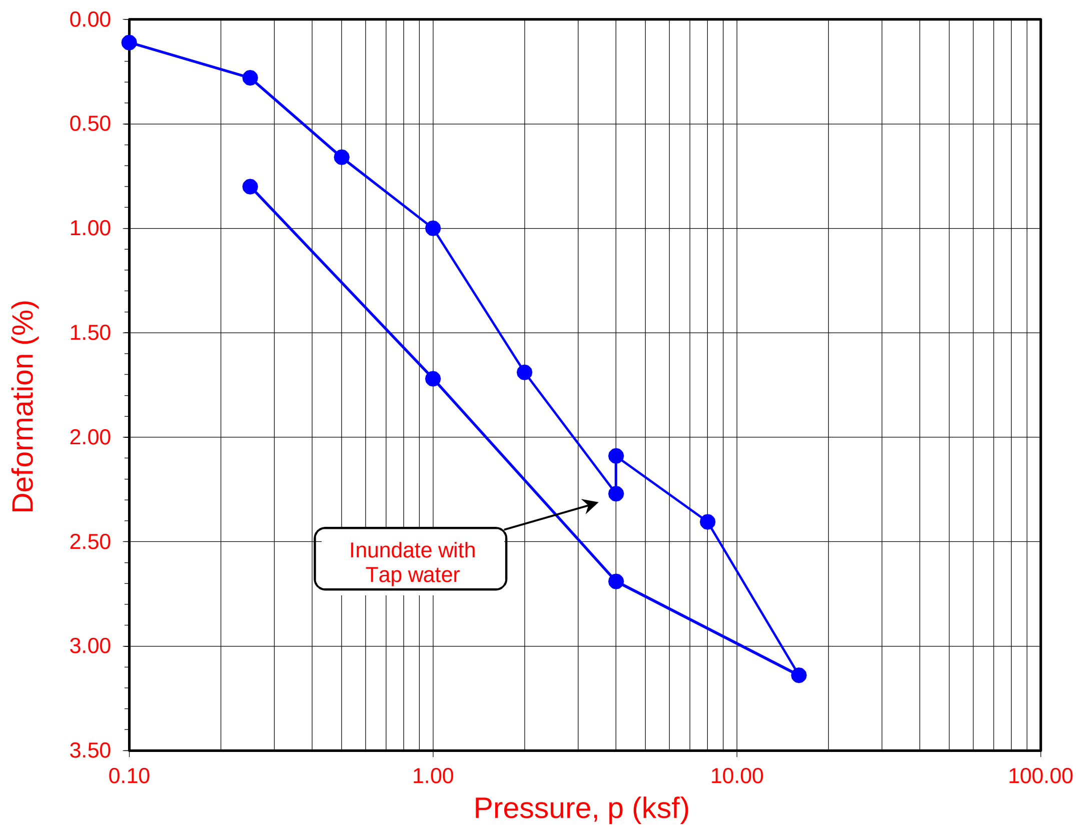
Time Readings @ 8.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
9/18/17	8:00:00	0.0	0.0	0.2424
9/18/17	8:00:06	0.1	0.3	0.2392
9/18/17	8:00:15	0.2	0.5	0.2387
9/18/17	8:00:30	0.5	0.7	0.2386
9/18/17	8:01:00	1.0	1.0	0.2385
9/18/17	8:02:00	2.0	1.4	0.2383
9/18/17	8:04:00	4.0	2.0	0.2382
9/18/17	8:08:00	8.0	2.8	0.2380
9/18/17	8:15:00	15.0	3.9	0.2379
9/18/17	8:30:00	30.0	5.5	0.2378
9/18/17	9:00:00	60.0	7.7	0.2376
9/18/17	10:00:00	120.0	11.0	0.2375
9/18/17	12:09:00	249.0	15.8	0.2373
9/18/17	16:00:00	480.0	21.9	0.2371
9/19/17	9:26:00	1526.0	39.1	0.2370

Time Readings @ 8.0 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	**R3**	**25.0**	**17.5**	**17.8**	**110.0**	**111.5**	**0.532**	**0.520**	**89**	**94**

Soil Identification: Olive brown silty clay (CL-ML)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11753.001

Hoag Hospital Irvine

09-17

TESTS for SULFATE CONTENT
CHLORIDE CONTENT and pH of SOILS

Project Name:	Hoag Hospital Irvine	Tested By :	G. Berdy	Date:	09/15/17
Project No. :	11753.001	Data Input By:	G. Bathala	Date:	09/27/17

Boring No.	LB-1	LB-2	LB-3	
Sample No.	BB-1	BB-1	BB-1	
Sample Depth (ft)	0-5	0-5	0-5	
Soil Identification:	Dark brown s(CL)	Grayish brown s(CL)	Very dark brown s(CL)	
Wet Weight of Soil + Container (g)	183.82	220.44	196.79	
Dry Weight of Soil + Container (g)	174.51	215.50	191.69	
Weight of Container (g)	54.34	66.79	64.17	
Moisture Content (%)	7.75	3.32	4.00	
Weight of Soaked Soil (g)	100.04	100.16	100.34	

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	95	302	94	
Crucible No.	9	6	24	
Furnace Temperature (°C)	860	860	860	
Time In / Time Out	8:45/9:30	8:45/9:30	8:45/9:30	
Duration of Combustion (min)	45	45	45	
Wt. of Crucible + Residue (g)	21.2008	23.3566	17.0870	
Wt. of Crucible (g)	21.1962	23.3518	17.0818	
Wt. of Residue (g) (A)	0.0046	0.0048	0.0052	
PPM of Sulfate (A) x 41150	189.29	197.52	213.98	
PPM of Sulfate, Dry Weight Basis	**205**	**204**	**223**	

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	30	15	
ml of AgNO3 Soln. Used in Titration (C)	1.0	1.3	0.7	
PPM of Chloride (C -0.2) * 100 * 30 / B	80	110	100	
PPM of Chloride, Dry Wt. Basis	**87**	**114**	**104**	

pH TEST, DOT California Test 643

pH Value	**7.52**	**7.61**	**7.25**	
Temperature °C	20.7	20.6	20.6	

SOIL RESISTIVITY TEST

DOT CA TEST 643

Leighton

Project Name:	Hoag Hospital Irvine	Tested By :	G. Berdy	Date:	09/15/17
Project No. :	11753.001	Data Input By:	G. Bathala	Date:	09/27/17
Boring No.:	LB-1	Depth (ft.) :	0-5		
Sample No. :	BB-1				

Soil Identification:* Dark brown s(CL)

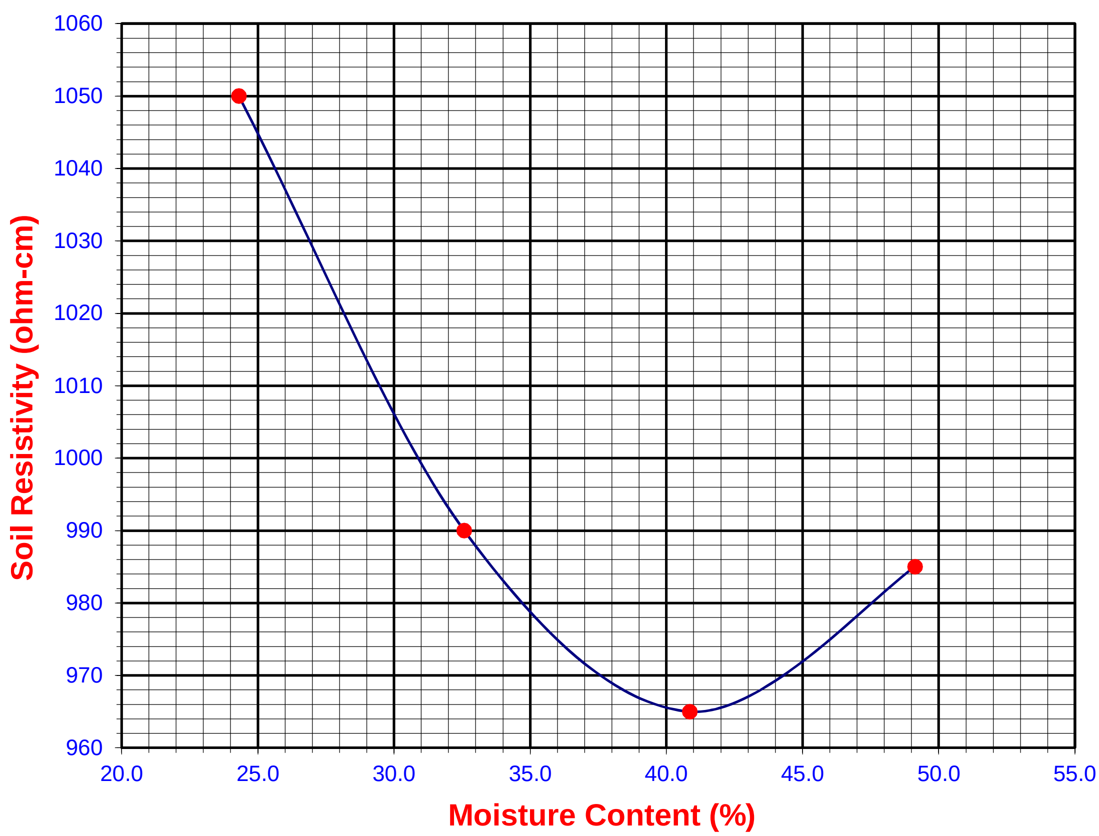
*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	24.30	1050	1050
2	30	32.58	990	990
3	40	40.86	965	965
4	50	49.13	985	985
5				

Moisture Content (%) (MCi)	7.75
Wet Wt. of Soil + Cont. (g)	183.82
Dry Wt. of Soil + Cont. (g)	174.51
Wt. of Container (g)	54.34
Container No.	
Initial Soil Wt. (g) (Wt)	130.17
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	
965	**41.0**	**205**	**87**	**7.52**	**20.7**



SOIL RESISTIVITY TEST
DOT CA TEST 643

Leighton

Project Name:	Hoag Hospital Irvine	Tested By :	G. Berdy	Date:	09/15/17
Project No. :	11753.001	Data Input By:	G. Bathala	Date:	09/27/17
Boring No.:	LB-2	Depth (ft.) :	0-5		
Sample No. :	BB-1				

Soil Identification:* Grayish brown s(CL)

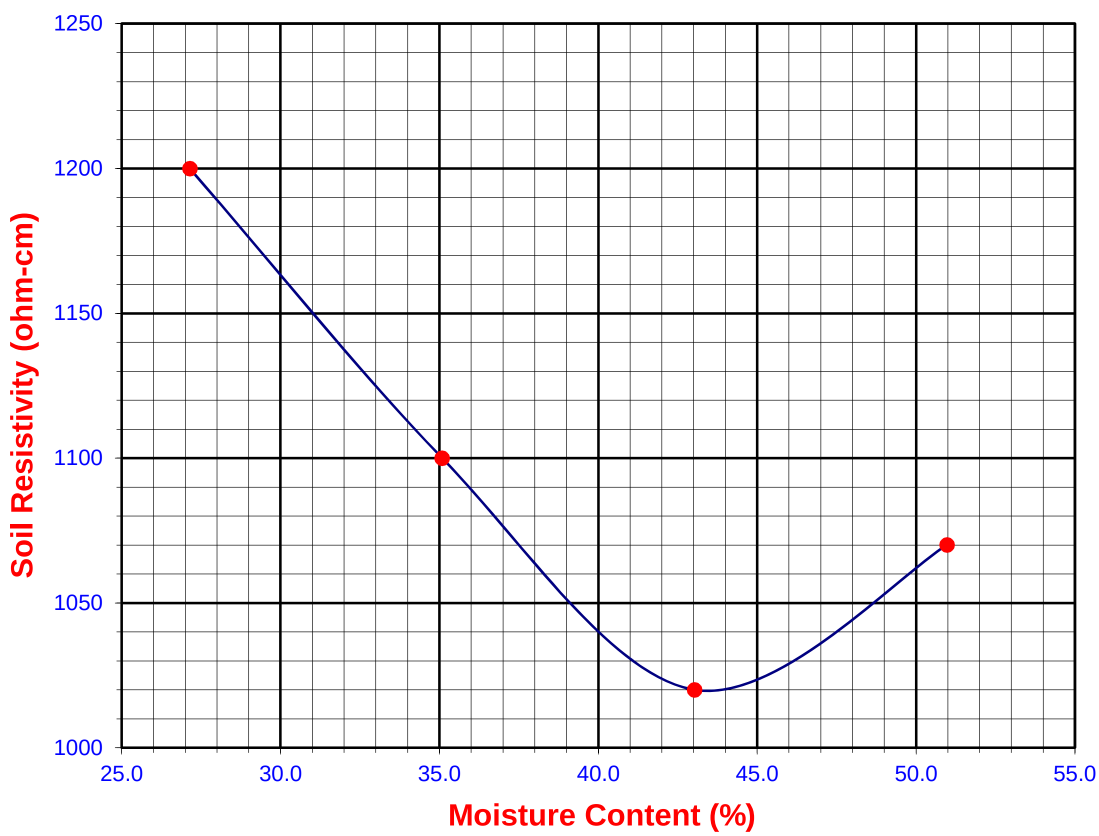
*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	30	27.15	1200	1200
2	40	35.09	1100	1100
3	50	43.03	1020	1020
4	60	50.97	1070	1070
5				

Moisture Content (%) (MCi)	3.32
Wet Wt. of Soil + Cont. (g)	220.44
Dry Wt. of Soil + Cont. (g)	215.50
Wt. of Container (g)	66.79
Container No.	
Initial Soil Wt. (g) (Wt)	130.10
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	
1020	**43.4**	**204**	**114**	**7.61**	**20.6**



SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	Hoag Hospital Irvine	Tested By :	G. Berdy Date: 09/15/17
Project No. :	11753.001	Data Input By:	G. Bathala Date: 09/27/17
Boring No.:	LB-3	Depth (ft.) :	0-5
Sample No. :	BB-1		

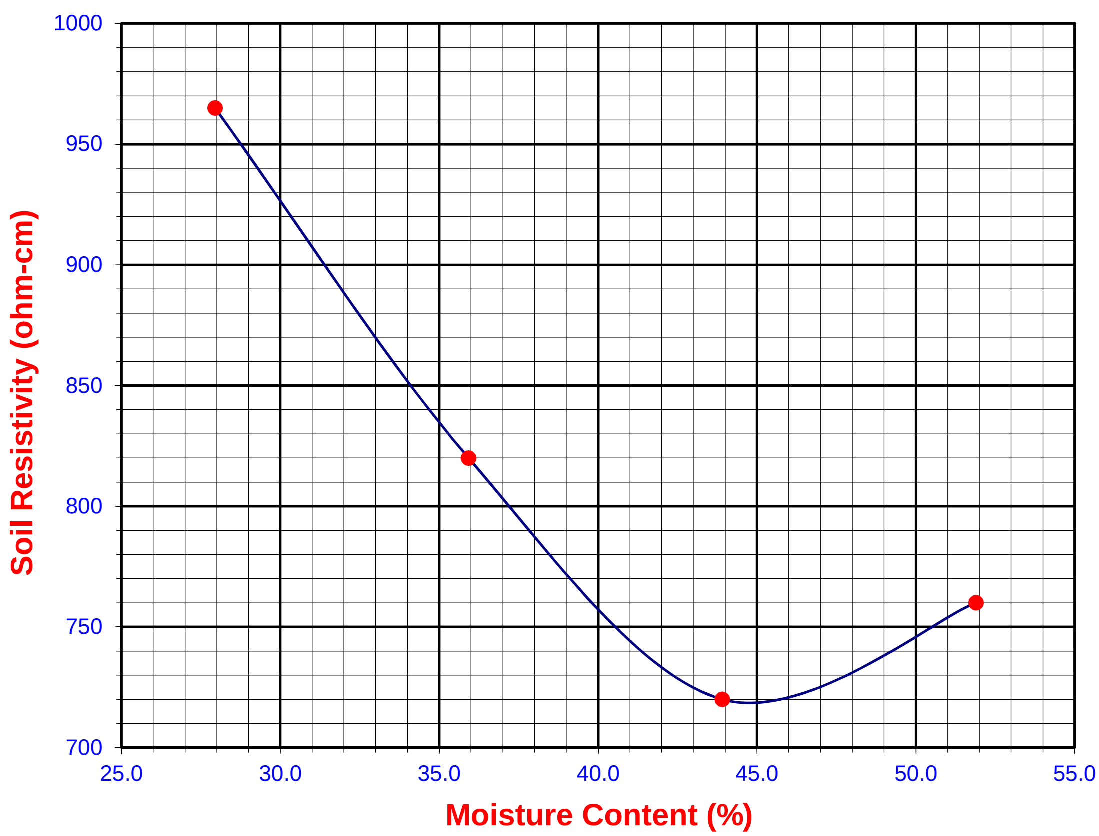
Soil Identification:* Very dark brown s(CL)

*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	27.94	965	965
2	40	35.93	820	820
3	50	43.91	720	720
4	60	51.89	760	760
5				

Moisture Content (%) (MCi)	4.00
Wet Wt. of Soil + Cont. (g)	196.79
Dry Wt. of Soil + Cont. (g)	191.69
Wt. of Container (g)	64.17
Container No.	
Initial Soil Wt. (g) (Wt)	130.30
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	
718	**44.8**	**223**	**104**	**7.25**	**20.6**



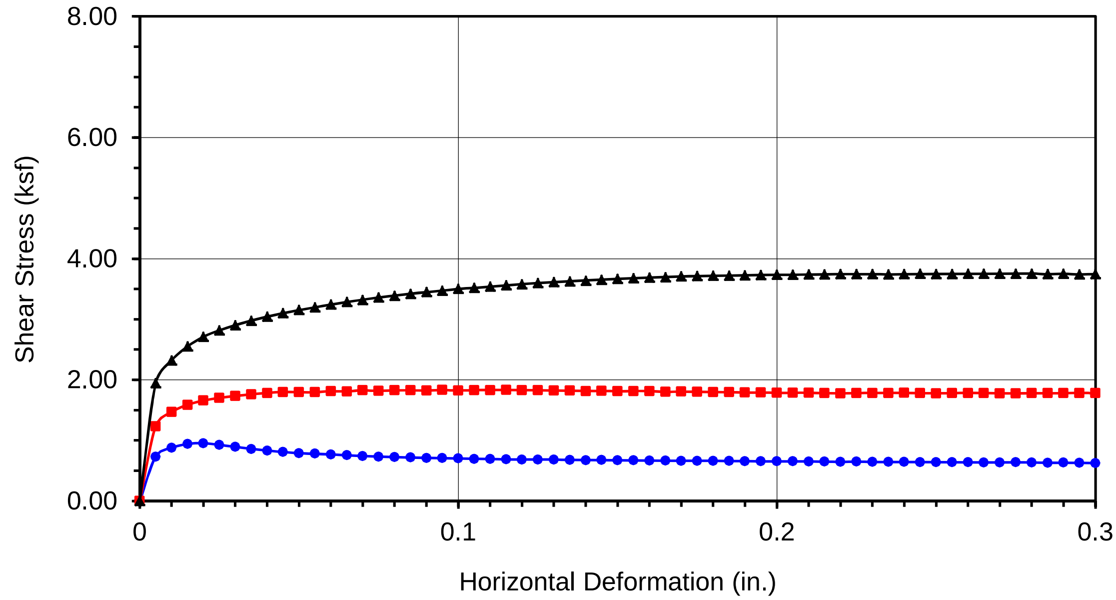
DIRECT SHEAR TEST

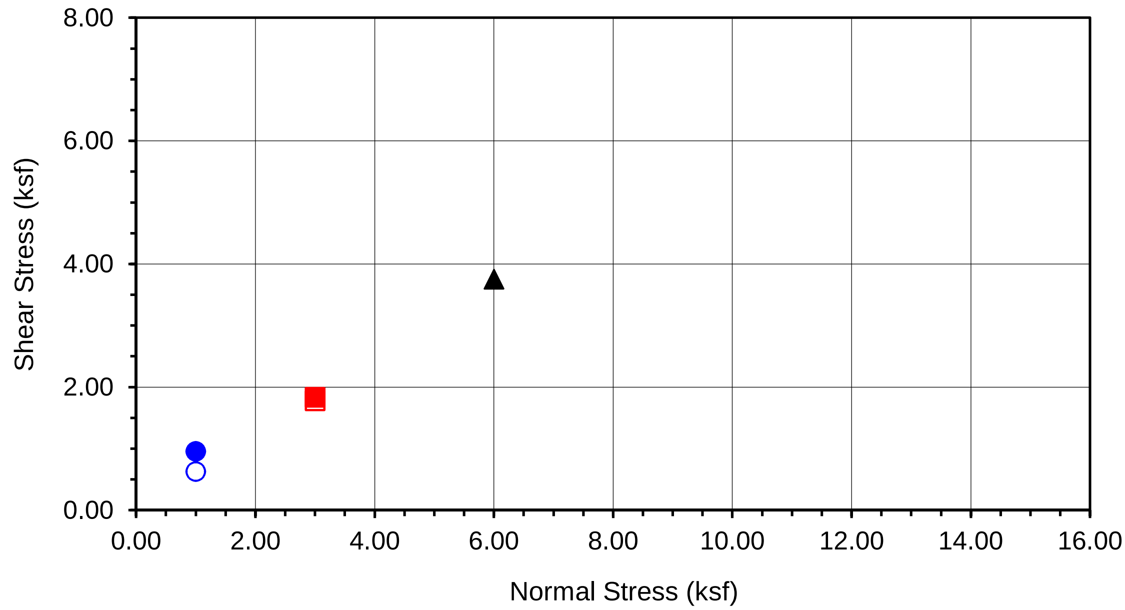
Consolidated Drained - ASTM D 3080

Project Name: Hoag Hospital Irvine
Project No.: 11753.001
Boring No.: LB-2
Sample No.: BB-1
Soil Identification: Grayish brown sandy lean clay s(CL)

Tested By: G.Bathala — Date: 09/19/17
Checked By: J. Ward — Date: 09/28/17
Sample Type: 95% Remold
Depth (ft.): 0-5

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	201.32	197.81	197.18
Weight of Ring(gm):	46.08	43.43	43.24
Before Shearing			
Weight of Wet Sample+Cont.(gm):	183.67	183.67	183.67
Weight of Dry Sample+Cont.(gm):	173.02	173.02	173.02
Weight of Container(gm):	57.17	57.17	57.17
Vertical Rdg.(in): Initial	0.2855	0.0000	0.0000
Vertical Rdg.(in): Final	0.2540	0.0092	-0.0046
After Shearing			
Weight of Wet Sample+Cont.(gm):	205.07	220.60	231.87
Weight of Dry Sample+Cont.(gm):	180.48	198.45	211.19
Weight of Container(gm):	40.04	58.66	71.79
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-2**
Sample No.	**BB-1**
Depth (ft)	**0-5**

Sample Type:

95% Remold

Soil Identification:
Grayish brown sandy lean clay s(CL)

Normal Stress (kip/ft²)	1.000	3.000	6.000
Peak Shear Stress (kip/ft²)	● 0.953	■ 1.836	▲ 3.754
Shear Stress @ End of Test (ksf)	○ 0.626	□ 1.779	△ 3.747
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 (%)	9.19	9.19	9.19
Dry Density (pcf)	118.2	117.6	117.2
Saturation (%)	58.3	57.2	56.7
Soil Height Before Shearing (in.)	1.0315	1.0092	0.9954
Final Moisture Content (%)	17.5	15.8	14.8

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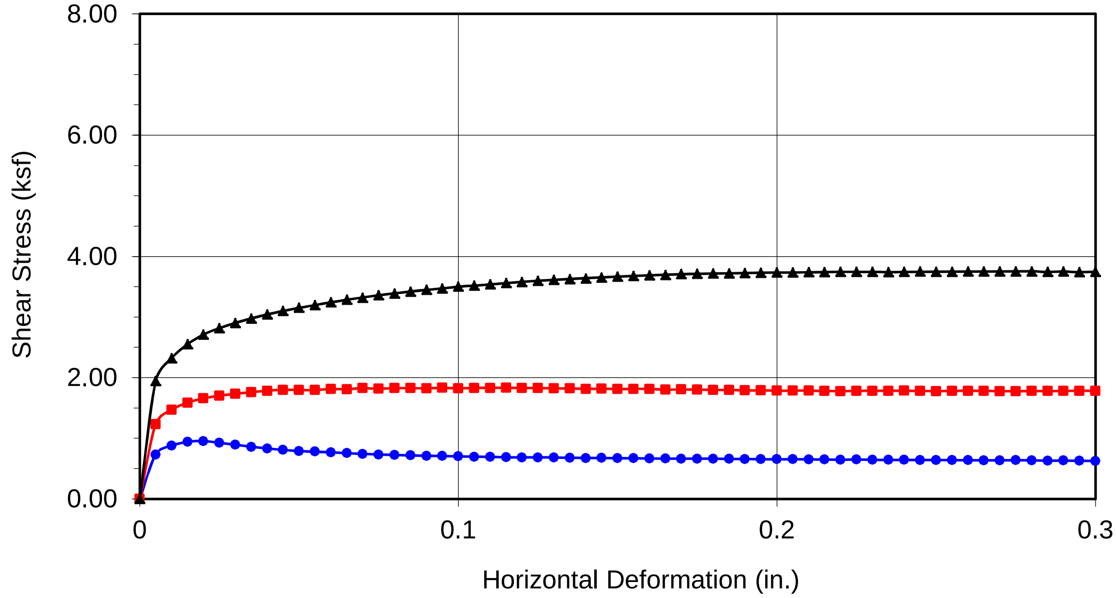
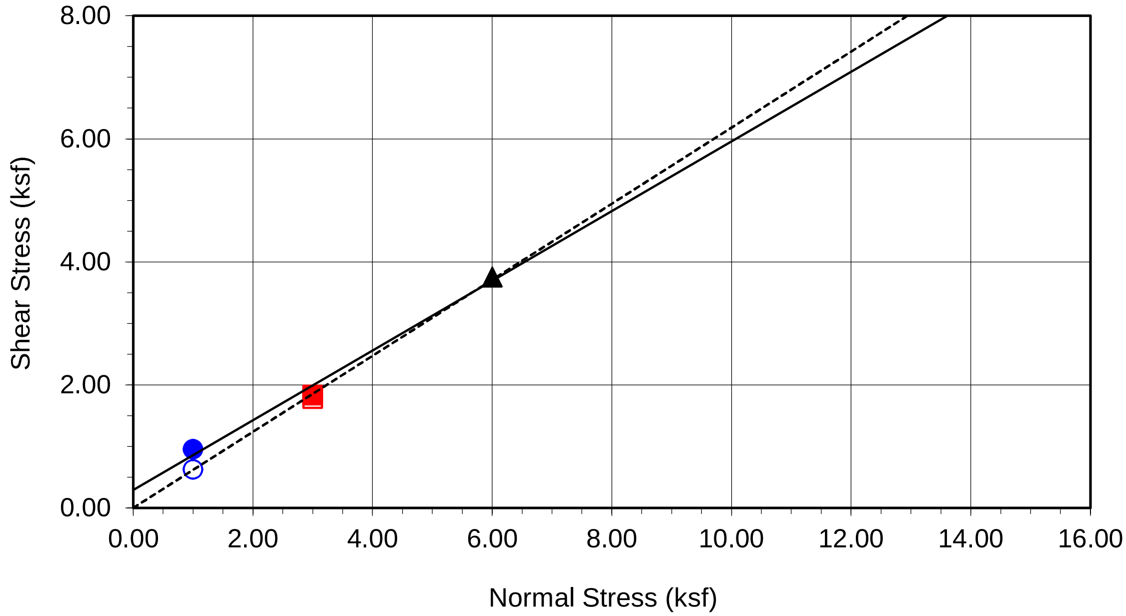
DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

09-17





Boring No.	**LB-2**
Sample No.	**BB-1**
Depth (ft)	**0-5**
Sample Type:	95% Remold

Soil Identification:
Grayish brown sandy lean clay s(CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	293	30
Ultimate	0	32

Normal Stress (kip/ft²)	1.000	3.000	6.000
Peak Shear Stress (kip/ft²)	● 0.953	■ 1.836	▲ 3.754
Shear Stress @ End of Test (ksf)	○ 0.626	□ 1.779	△ 3.747
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 (%)	9.19	9.19	9.19
Dry Density (pcf)	118.2	117.6	117.2
Saturation (%)	58.3	57.2	56.7
Soil Height Before Shearing (in.)	1.0315	1.0092	0.9954
Final Moisture Content (%)	17.5	15.8	14.8

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

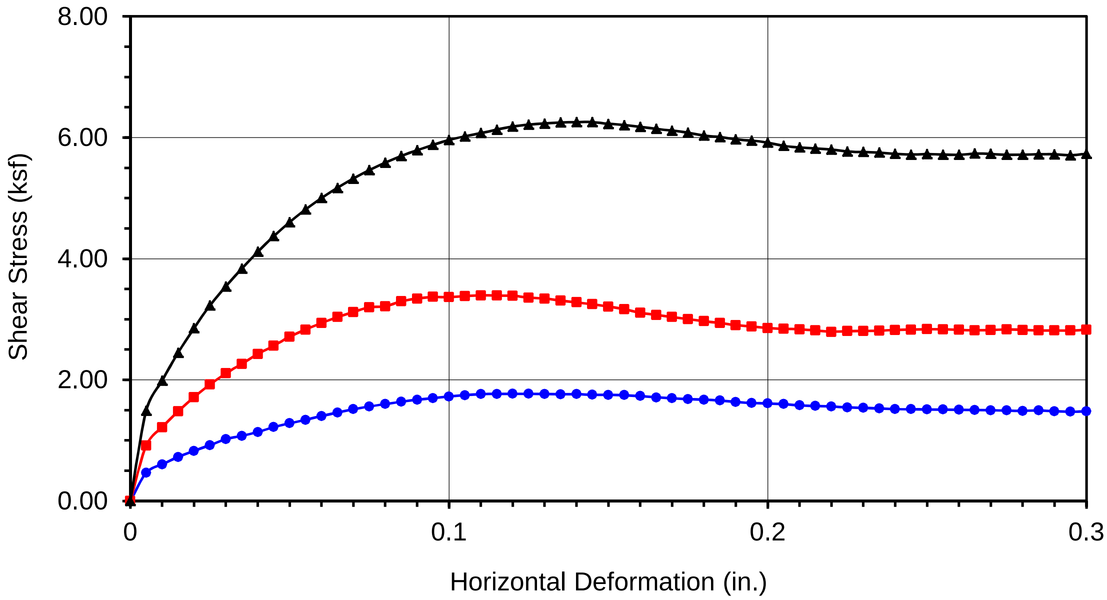
09-17

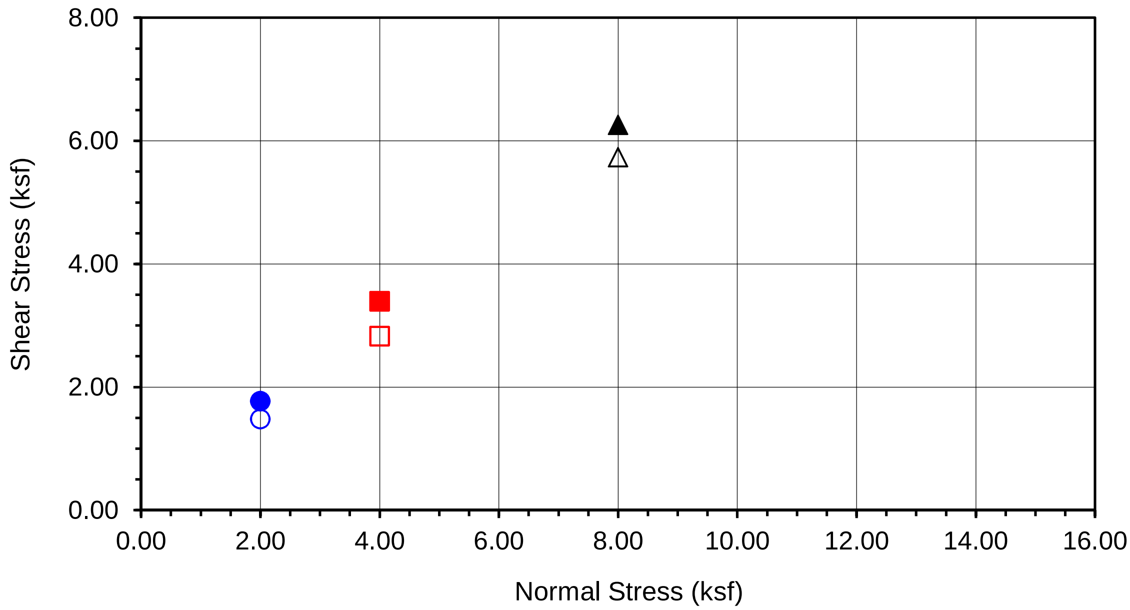
DIRECT SHEAR TEST
Consolidated Drained - ASTM D 3080

Leighton

Project Name: Hoag Hospital Irvine | Tested By: G. Bathala | Date: 09/17/17
Project No.: 11753.001 | Checked By: J. Ward | Date: 09/28/17
Boring No.: LB-2 | Sample Type: Ring
Sample No.: R2 | Depth (ft.): 20.0
Soil Identification: Grayish 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):	181.60	186.64	187.66
Weight of Ring(gm):	42.17	45.21	44.52
Before Shearing			
Weight of Wet Sample+Cont.(gm):	223.13	223.13	223.13
Weight of Dry Sample+Cont.(gm):	218.01	218.01	218.01
Weight of Container(gm):	58.67	58.67	58.67
Vertical Rdg.(in): Initial	0.2852	0.0000	0.0000
Vertical Rdg.(in): Final	0.3302	-0.0456	-0.0560
After Shearing			
Weight of Wet Sample+Cont.(gm):	220.78	207.85	204.65
Weight of Dry Sample+Cont.(gm):	204.82	192.50	189.78
Weight of Container(gm):	71.78	57.17	53.31
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-2**
Sample No.	**R2**
Depth (ft)	**20**

Sample Type:

Ring

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

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.770	■ 3.395	▲ 6.256
Shear Stress @ End of Test (ksf)	○ 1.478	□ 2.826	△ 5.731
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 (%)	3.21	3.21	3.21
Dry Density (pcf)	112.3	114.0	115.3
Saturation (%)	17.3	18.1	18.8
Soil Height Before Shearing (in.)	0.9550	0.9544	0.9440
Final Moisture Content (%)	12.0	11.3	10.9

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DIRECT SHEAR TEST RESULTS

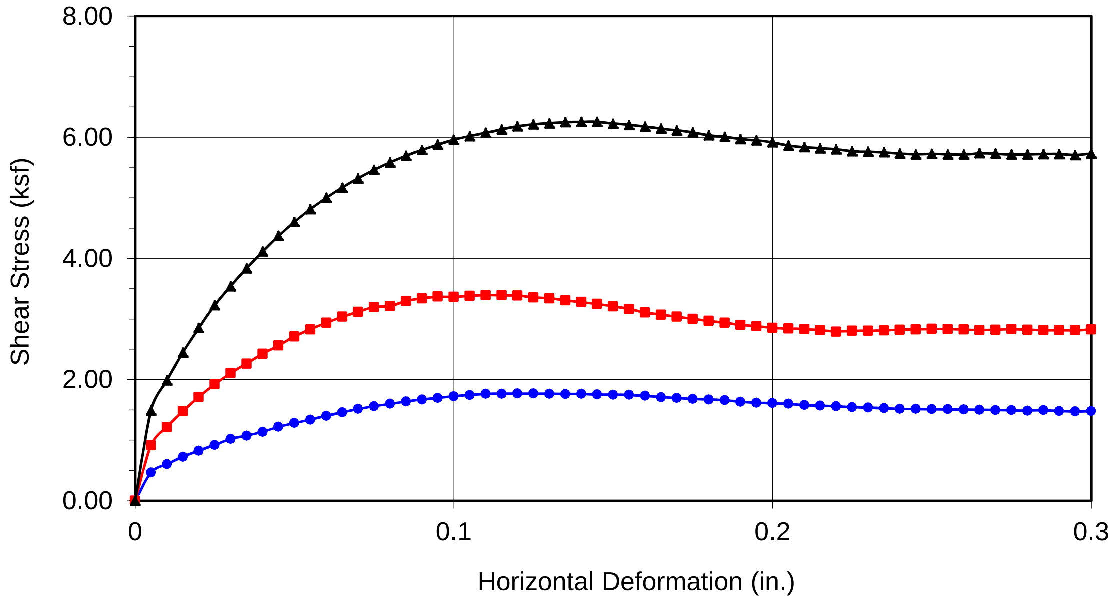
Consolidated Drained - ASTM D 3080

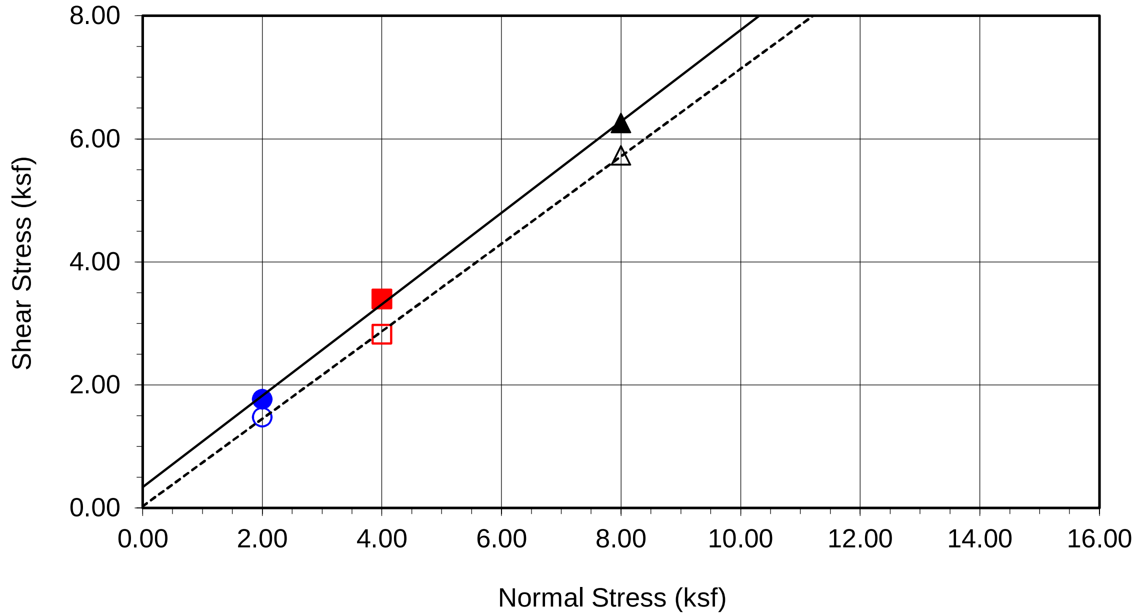
Project No.: 11753.001

Hoag Hospital Irvine

09-17

DS LB-2, R2 @ 20





Boring No.	**LB-2**
Sample No.	**R2**
Depth (ft)	**20**
Sample Type:	Ring

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

Strength Parameters

	C (psf)	ϕ (°)
Peak	340	37
Ultimate	25	35

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.770	■ 3.395	▲ 6.256
Shear Stress @ End of Test (ksf)	○ 1.478	□ 2.826	△ 5.731
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 (%)	3.21	3.21	3.21
Dry Density (pcf)	112.3	114.0	115.3
Saturation (%)	17.3	18.1	18.8
Soil Height Before Shearing (in.)	0.9550	0.9544	0.9440
Final Moisture Content (%)	12.0	11.3	10.9

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

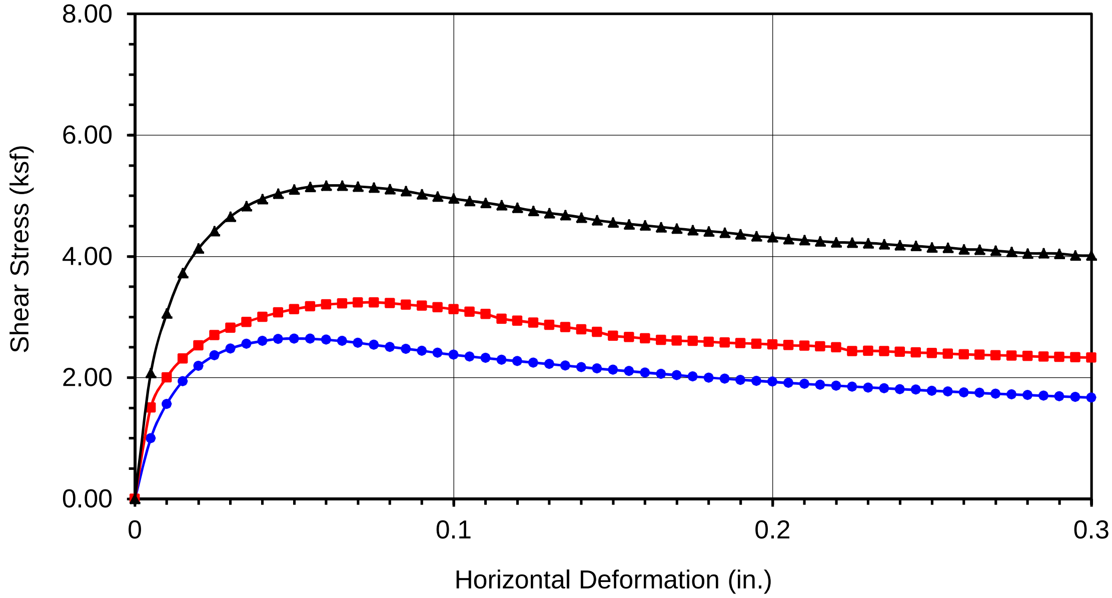
09-17

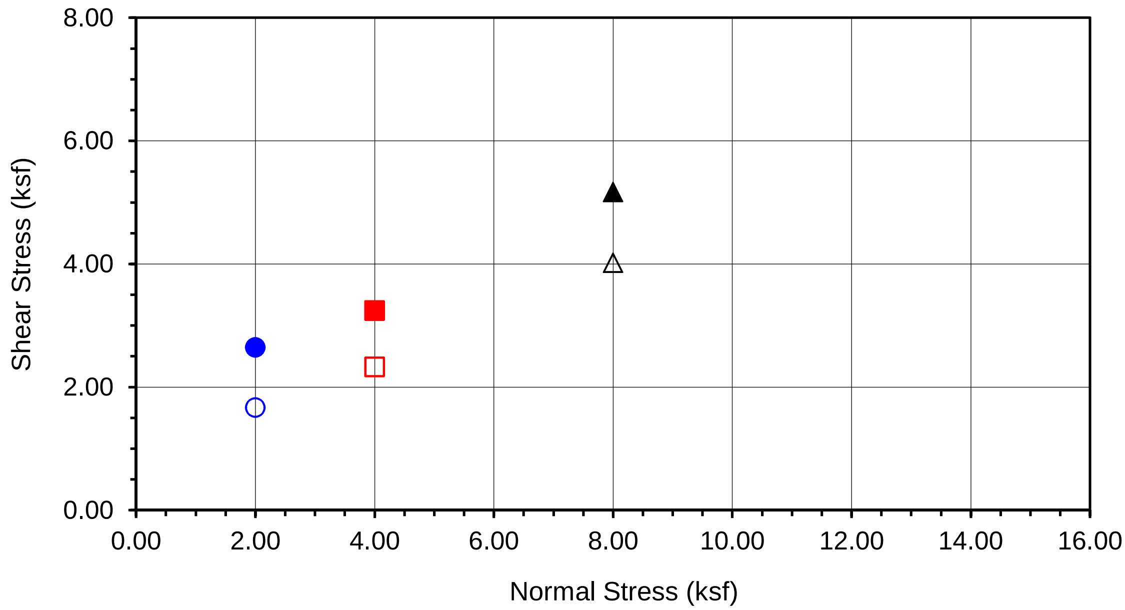
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name:	Hoag Hospital Irvine	Tested By:	G. Bathala	Date:	09/17/17
Project No.:	11753.001	Checked By:	J. Ward	Date:	09/28/17
Boring No.:	LB-2	Sample Type:	Ring		
Sample No.:	R3	Depth (ft.):	30.0		
Soil Identification:	Olive 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):	193.23	198.05	199.22
Weight of Ring(gm):	41.08	43.81	43.95
Before Shearing			
Weight of Wet Sample+Cont.(gm):	213.04	213.04	213.04
Weight of Dry Sample+Cont.(gm):	190.10	190.10	190.10
Weight of Container(gm):	59.25	59.25	59.25
Vertical Rdg.(in): Initial	0.2908	0.2715	0.0000
Vertical Rdg.(in): Final	0.2814	0.2757	-0.0193
After Shearing			
Weight of Wet Sample+Cont.(gm):	211.11	195.30	213.62
Weight of Dry Sample+Cont.(gm):	177.84	166.25	185.97
Weight of Container(gm):	56.37	40.05	57.90
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-2**
Sample No.	**R3**
Depth (ft)	**30**

Sample Type:

Ring

Soil Identification:
Olive lean clay (CL)

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 2.644	■ 3.241	▲ 5.168
Shear Stress @ End of Test (ksf)	○ 1.669	□ 2.330	△ 4.015
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 (%)	17.53	17.53	17.53
Dry Density (pcf)	107.7	109.1	109.9
Saturation (%)	83.7	86.9	88.6
Soil Height Before Shearing (in.)	1.0094	0.9958	0.9807
Final Moisture Content (%)	27.4	23.0	21.6

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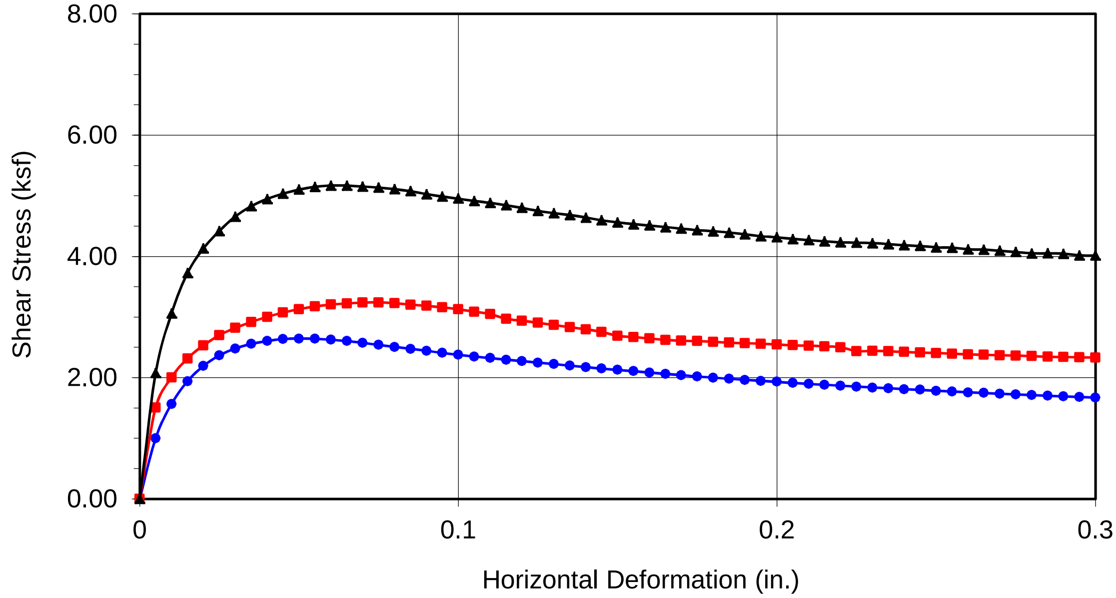
DIRECT SHEAR TEST RESULTS

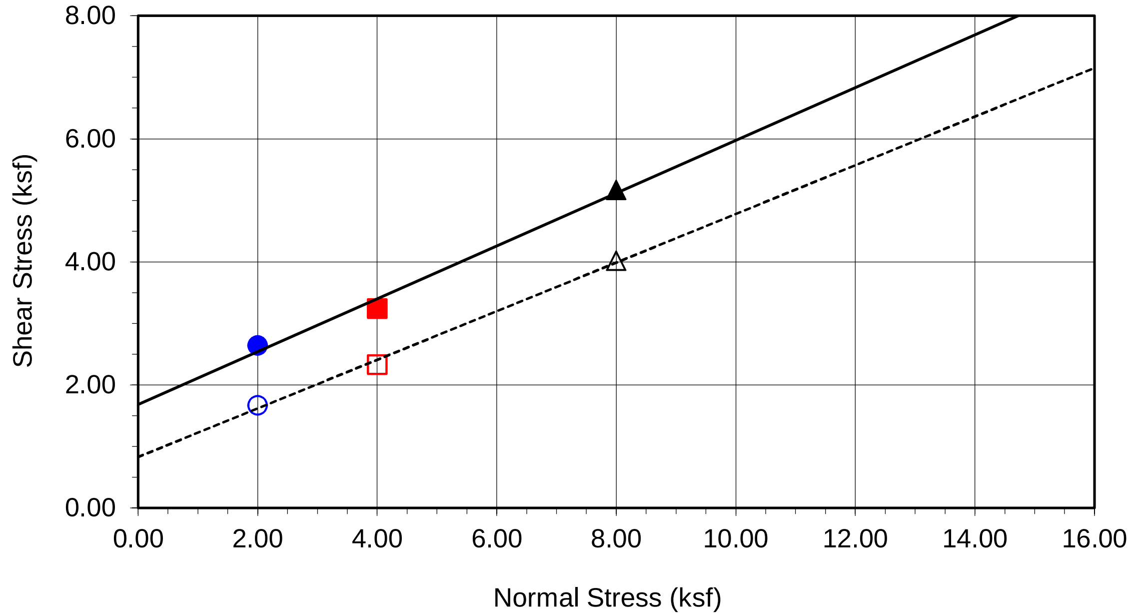
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

09-17





Boring No.	**LB-2**
Sample No.	**R3**
Depth (ft)	**30**
Sample Type:	Ring

Soil Identification:
Olive lean clay (CL)

Strength Parameters

	C (psf)	ϕ (^{o})
Peak	1681	23
Ultimate	827	22

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 2.644	■ 3.241	▲ 5.168
Shear Stress @ End of Test (ksf)	○ 1.669	□ 2.330	△ 4.015
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 (%)	17.53	17.53	17.53
Dry Density (pcf)	107.7	109.1	109.9
Saturation (%)	83.7	86.9	88.6
Soil Height Before Shearing (in.)	1.0094	0.9958	0.9807
Final Moisture Content (%)	27.4	23.0	21.6

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

09-17

DS LB-2, R3 @ 30

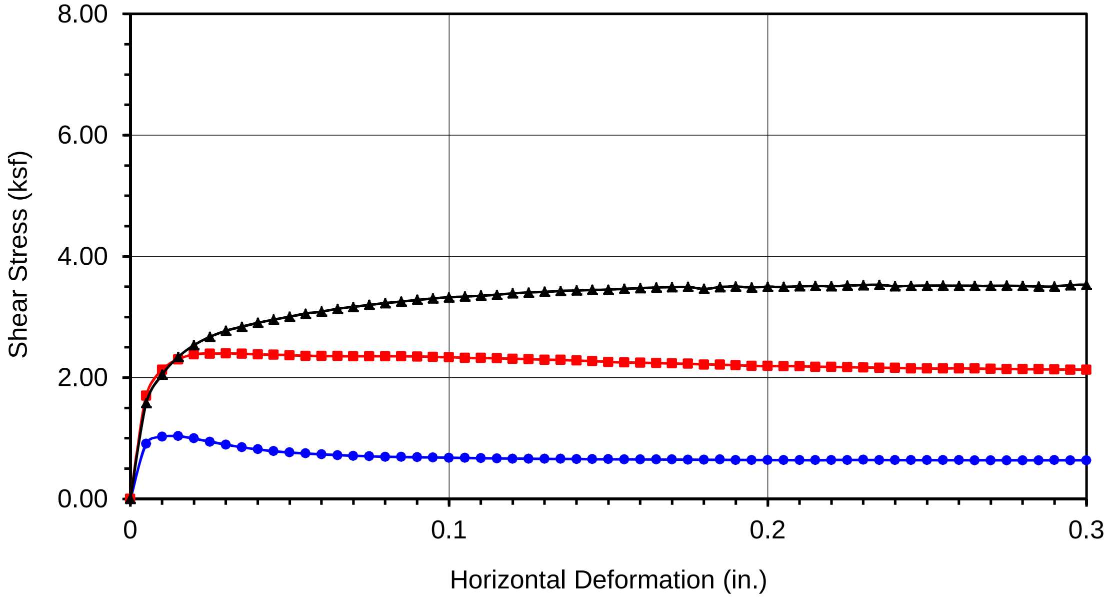
DIRECT SHEAR TEST

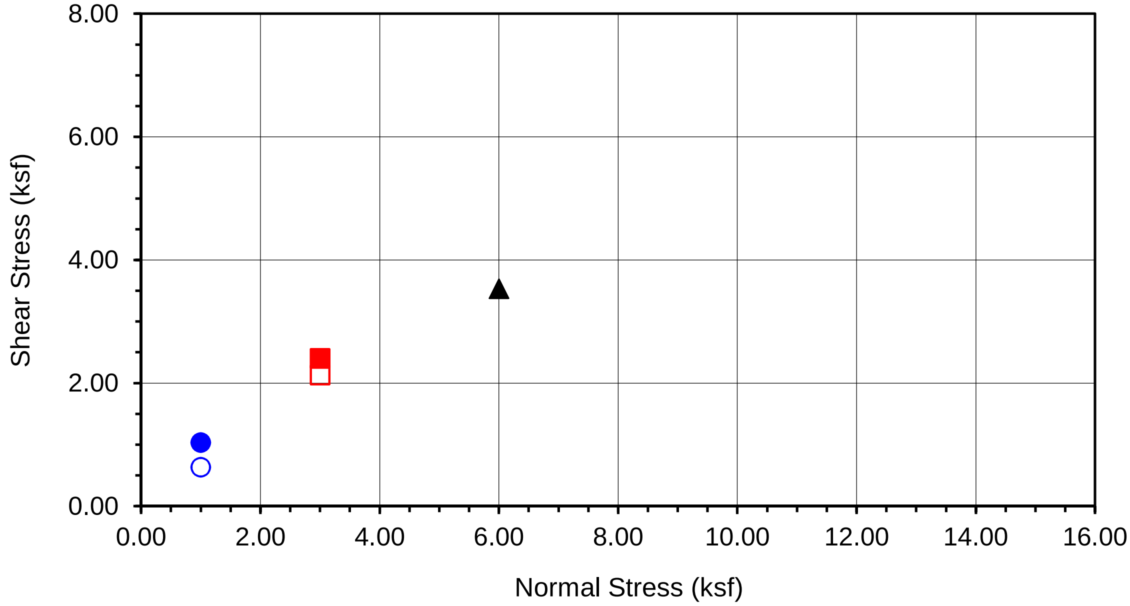
Consolidated Drained - ASTM D 3080

Project Name:	Hoag Hospital Irvine	Tested By:	G. Bathala	Date:	09/20/17
Project No.:	11753.001	Checked By:	J. Ward	Date:	09/28/17
Boring No.:	LB-3	Sample Type:	95% Remold		
Sample No.:	BB-1	Depth (ft.):	0-5		

Soil Identification: Very dark brown sandy lean clay s(CL)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	202.48	202.35	204.90
Weight of Ring(gm):	43.43	43.24	45.91
Before Shearing			
Weight of Wet Sample+Cont.(gm):	158.44	158.44	158.44
Weight of Dry Sample+Cont.(gm):	147.82	147.82	147.82
Weight of Container(gm):	39.34	39.34	39.34
Vertical Rdg.(in): Initial	0.0000	0.0000	0.0000
Vertical Rdg.(in): Final	0.0184	0.0026	-0.0132
After Shearing			
Weight of Wet Sample+Cont.(gm):	220.73	204.74	220.85
Weight of Dry Sample+Cont.(gm):	198.32	183.77	201.46
Weight of Container(gm):	54.51	40.05	58.65
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-3**
Sample No.	**BB-1**
Depth (ft)	**0-5**

Sample Type:

95% Remold

Soil Identification:

Very dark brown sandy lean clay s(CL)

Normal Stress (kip/ft²)	1.000	3.000	6.000
Peak Shear Stress (kip/ft²)	● 1.034	■ 2.399	▲ 3.530
Shear Stress @ End of Test (ksf)	○ 0.635	□ 2.131	△ 3.530
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 (%)	9.79	9.79	9.79
Dry Density (pcf)	120.5	120.5	120.4
Saturation (%)	66.2	66.3	66.1
Soil Height Before Shearing (in.)	1.0184	1.0026	0.9868
Final Moisture Content (%)	15.6	14.6	13.6

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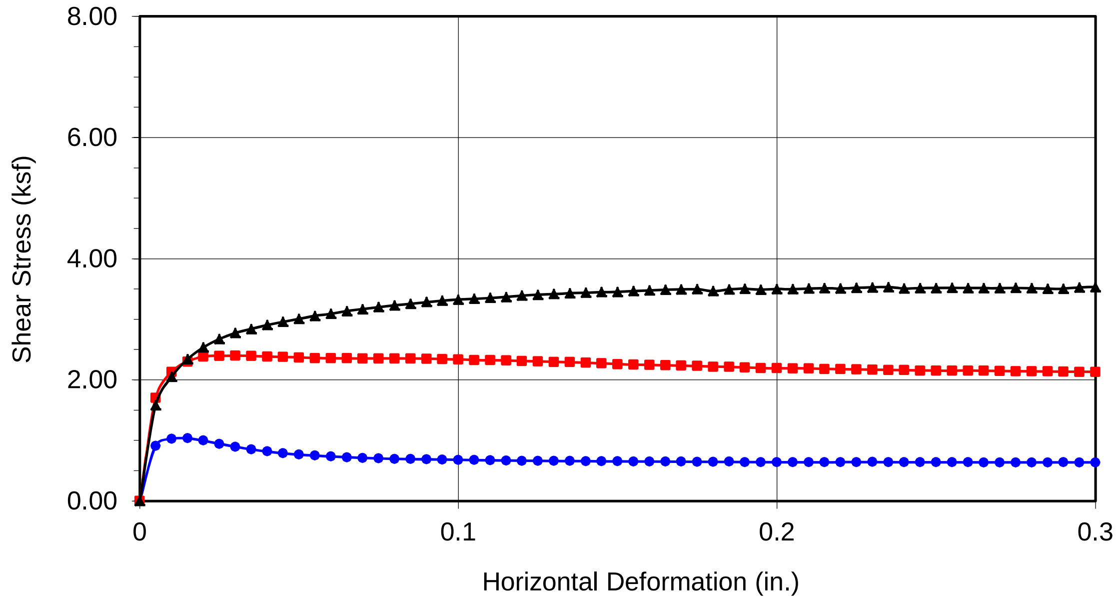
DIRECT SHEAR TEST RESULTS

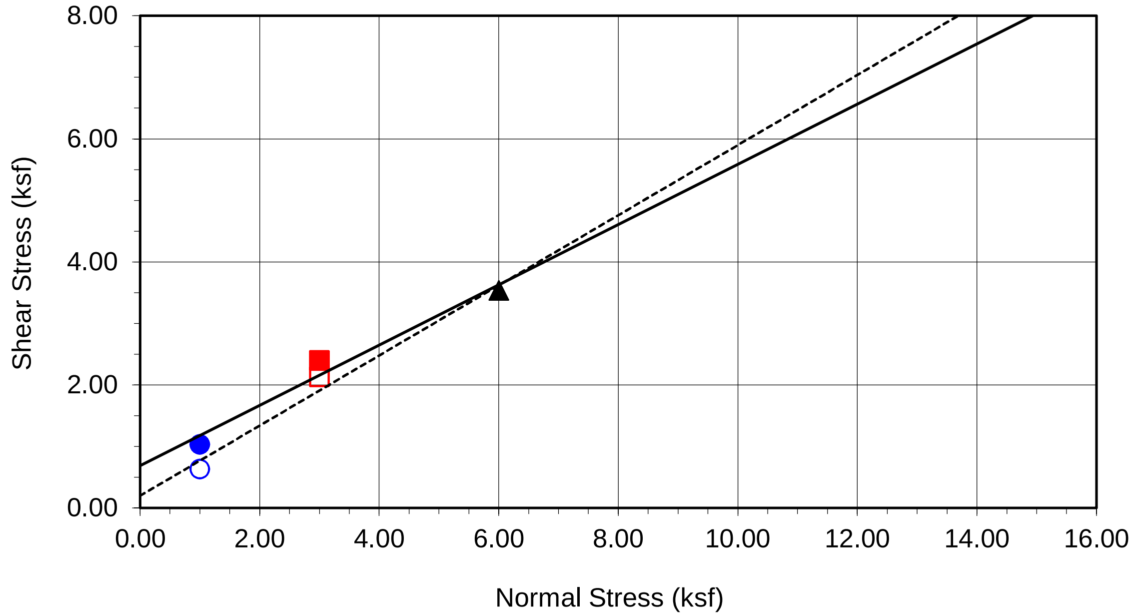
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

09-17





Boring No.	**LB-3**
Sample No.	**BB-1**
Depth (ft)	**0-5**
Sample Type: 95% Remold	
Soil Identification: Very dark brown sandy lean clay s(CL)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	689	26
Ultimate	198	30

Normal Stress (kip/ft²)	1.000	3.000	6.000
Peak Shear Stress (kip/ft²)	● 1.034	■ 2.399	▲ 3.530
Shear Stress @ End of Test (ksf)	○ 0.635	□ 2.131	△ 3.530
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 (%)	9.79	9.79	9.79
Dry Density (pcf)	120.5	120.5	120.4
Saturation (%)	66.2	66.3	66.1
Soil Height Before Shearing (in.)	1.0184	1.0026	0.9868
Final Moisture Content (%)	15.6	14.6	13.6

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DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

09-17

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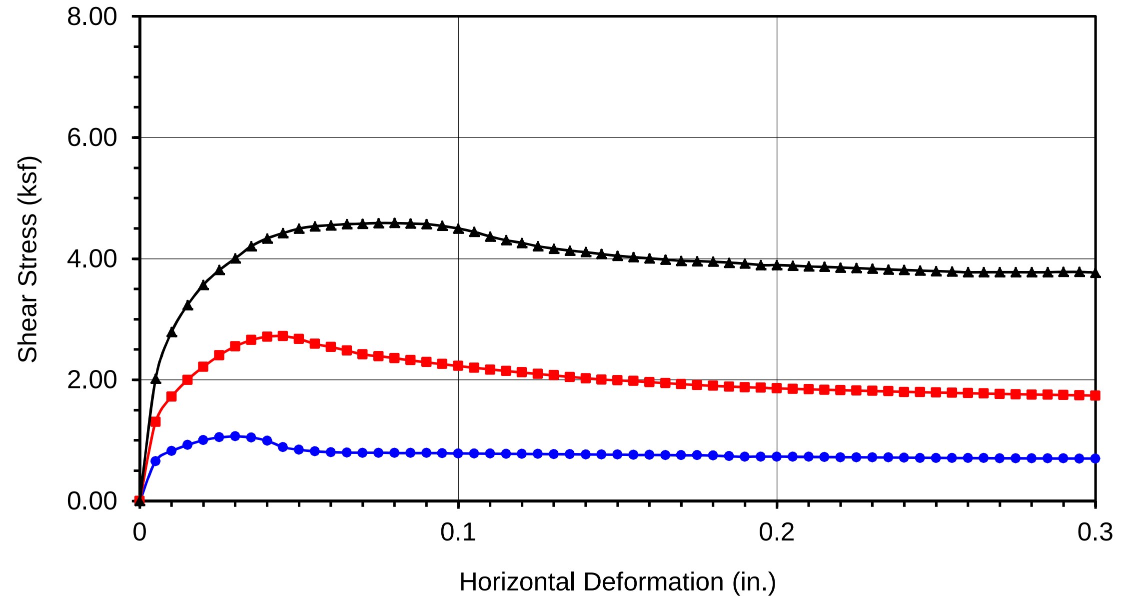
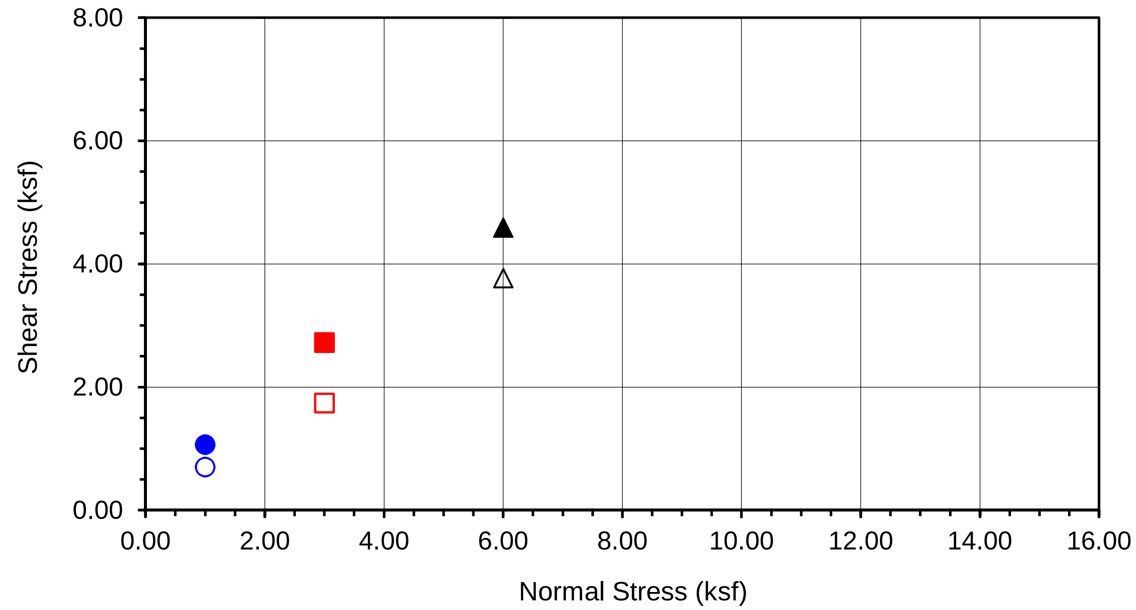
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name: Hoag Hospital Irvine
Tested By: G. Bathala
Date: 09/18/17
Project No.: 11753.001
Checked By: J. Ward
Date: 09/28/17
Boring No.: LB-3
Sample Type: Ring
Sample No.: R2
Depth (ft.): 15.0
Soil Identification: 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):	190.32	195.01	199.18
Weight of Ring(gm):	45.18	41.03	43.00
Before Shearing			
Weight of Wet Sample+Cont.(gm):	203.79	203.79	203.79
Weight of Dry Sample+Cont.(gm):	180.82	180.82	180.82
Weight of Container(gm):	39.17	39.17	39.17
Vertical Rdg.(in): Initial	0.0000	0.2927	0.2941
Vertical Rdg.(in): Final	0.0013	0.3048	0.3108
After Shearing			
Weight of Wet Sample+Cont.(gm):	209.59	216.44	197.95
Weight of Dry Sample+Cont.(gm):	181.89	190.21	172.98
Weight of Container(gm):	58.49	59.20	40.06
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-3**
Sample No.	**R2**
Depth (ft)	**15**
Sample Type:	
Ring	
Soil Identification:	
Olive brown lean clay (CL)	

Normal Stress (kip/ft²)	1.000	3.000	6.000
Peak Shear Stress (kip/ft²)	● 1.066	■ 2.723	▲ 4.590
Shear Stress @ End of Test (ksf)	○ 0.698	□ 1.739	△ 3.769
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 (%)	16.22	16.22	16.22
Dry Density (pcf)	103.9	110.2	111.8
Saturation (%)	70.3	82.7	86.2
Soil Height Before Shearing (in.)	1.0013	0.9879	0.9833
Final Moisture Content (%)	22.4	20.0	18.8

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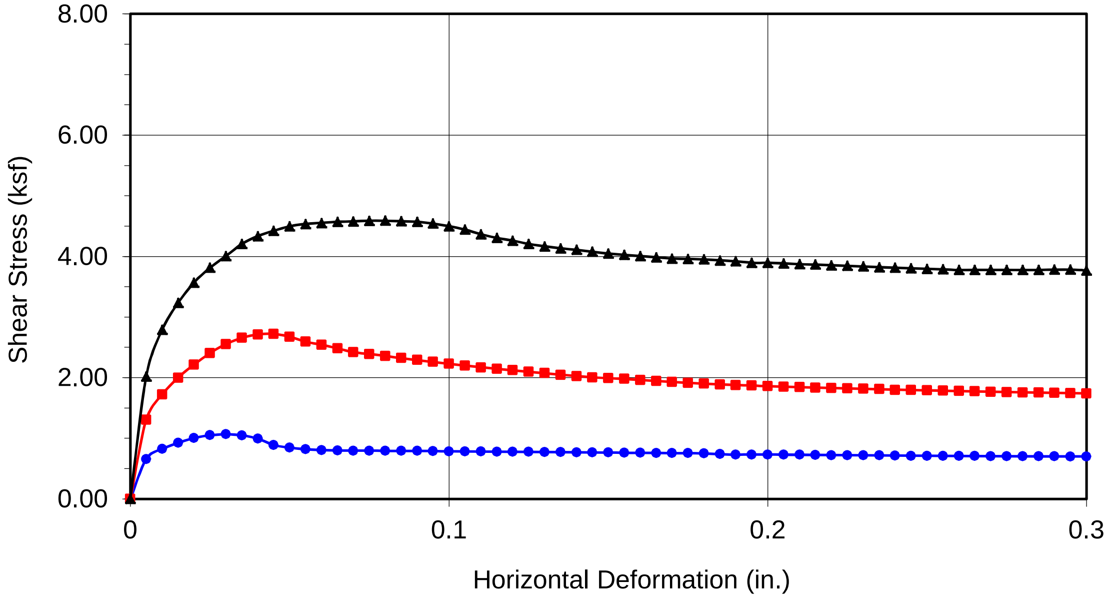
DIRECT SHEAR TEST RESULTS

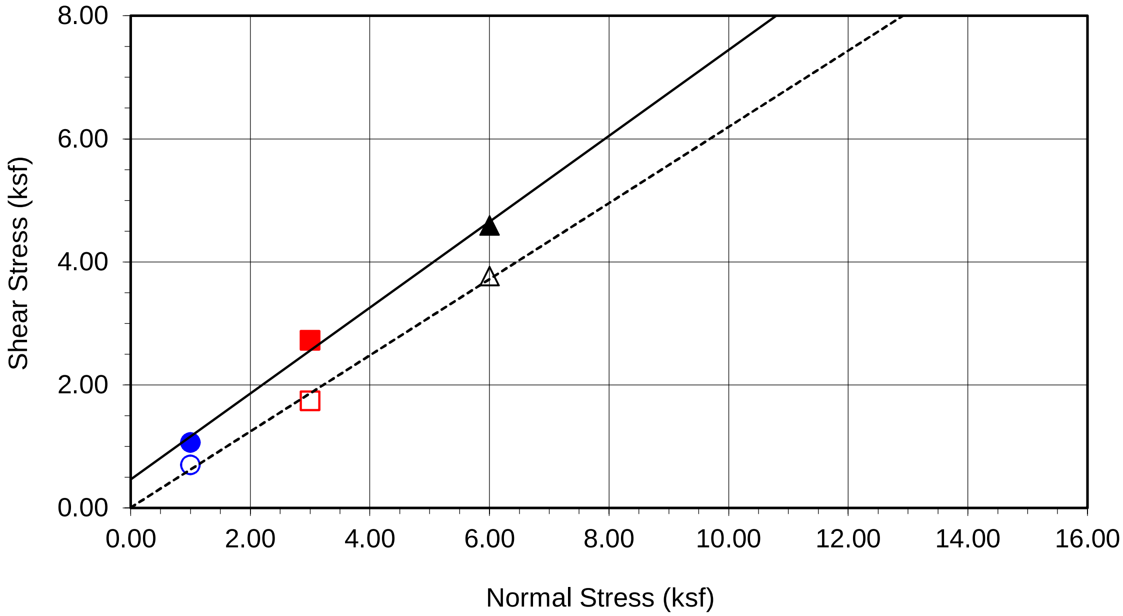
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

09-17





Boring No.	**LB-3**
Sample No.	**R2**
Depth (ft)	**15**
Sample Type:	Ring

Soil Identification:
Olive brown lean clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	465	35
Ultimate	5	32

Normal Stress (kip/ft²)	1.000	3.000	6.000
Peak Shear Stress (kip/ft²)	● 1.066	■ 2.723	▲ 4.590
Shear Stress @ End of Test (ksf)	○ 0.698	□ 1.739	△ 3.769
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 (%)	16.22	16.22	16.22
Dry Density (pcf)	103.9	110.2	111.8
Saturation (%)	70.3	82.7	86.2
Soil Height Before Shearing (in.)	1.0013	0.9879	0.9833
Final Moisture Content (%)	22.4	20.0	18.8

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.001

Hoag Hospital Irvine

09-17

DS LB-3, R2 @ 15

DIRECT SHEAR TEST

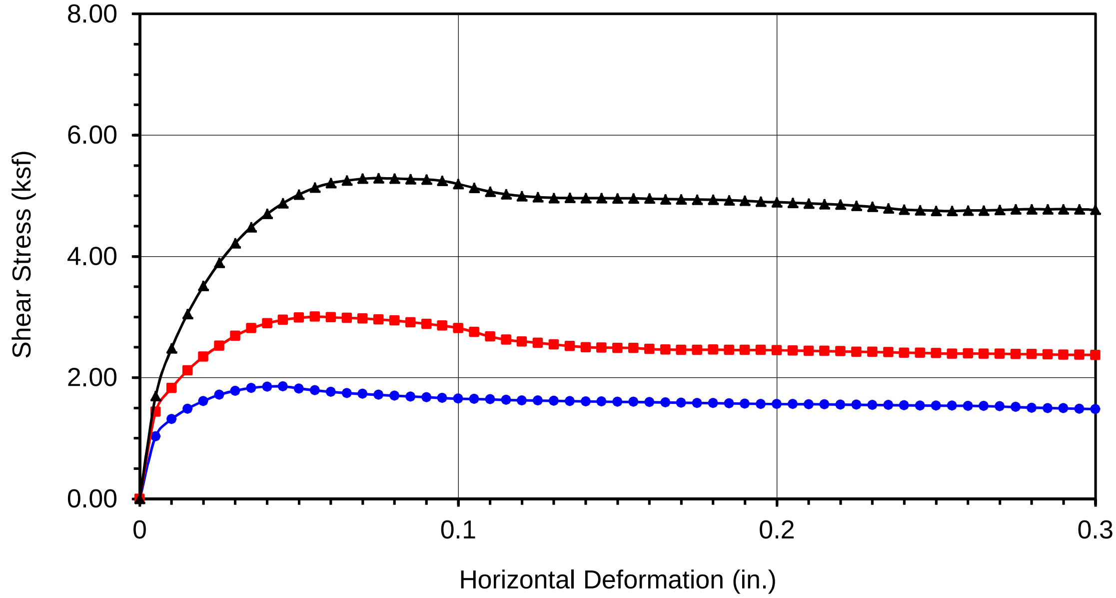
Consolidated Drained - ASTM D 3080

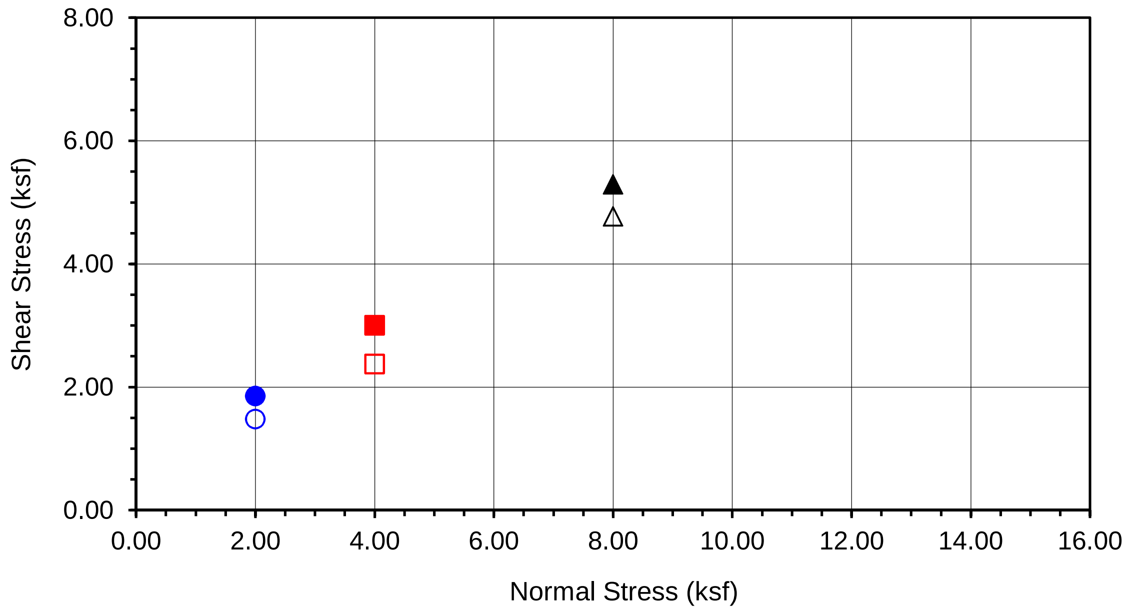
Leighton

Project Name:	Hoag Hospital Irvine	Tested By:	G. Bathala	Date:	09/18/17
Project No.:	11753.001	Checked By:	J. Ward	Date:	09/28/17
Boring No.:	LB-3	Sample Type:	Ring		
Sample No.:	R3	Depth (ft.):	25.0		

Soil Identification: 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):	196.56	200.60	203.67
Weight of Ring(gm):	43.22	44.00	44.97
Before Shearing			
Weight of Wet Sample+Cont.(gm):	140.35	140.35	140.35
Weight of Dry Sample+Cont.(gm):	127.58	127.58	127.58
Weight of Container(gm):	54.47	54.47	54.47
Vertical Rdg.(in): Initial	0.0000	0.0000	0.2936
Vertical Rdg.(in): Final	-0.0099	-0.0176	0.3171
After Shearing			
Weight of Wet Sample+Cont.(gm):	212.81	214.51	230.35
Weight of Dry Sample+Cont.(gm):	184.53	190.15	207.48
Weight of Container(gm):	58.65	57.90	71.80
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-3**
Sample No.	**R3**
Depth (ft)	**25**

Sample Type:

Ring

Soil Identification:

Olive brown silty clay (CL-ML)

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.855	■ 3.005	▲ 5.291
Shear Stress @ End of Test (ksf)	○ 1.481	□ 2.374	△ 4.769
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 (%)	17.47	17.47	17.47
Dry Density (pcf)	108.6	110.9	112.4
Saturation (%)	85.3	90.6	94.3
Soil Height Before Shearing (in.)	0.9901	0.9824	0.9765
Final Moisture Content (%)	22.5	18.4	16.9

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DIRECT SHEAR TEST RESULTS

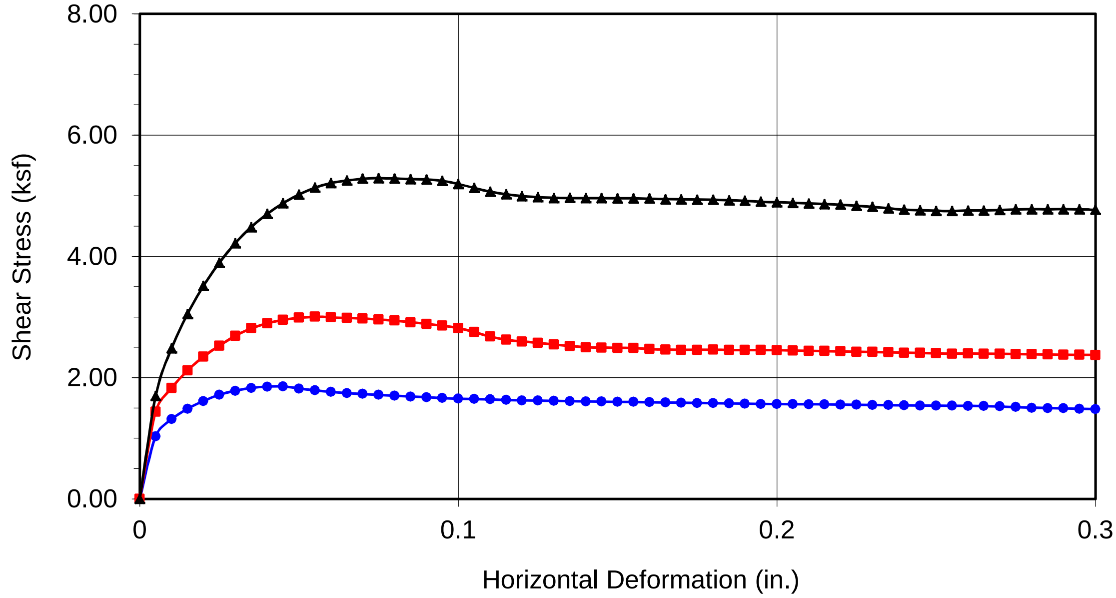
Consolidated Drained - ASTM D 3080

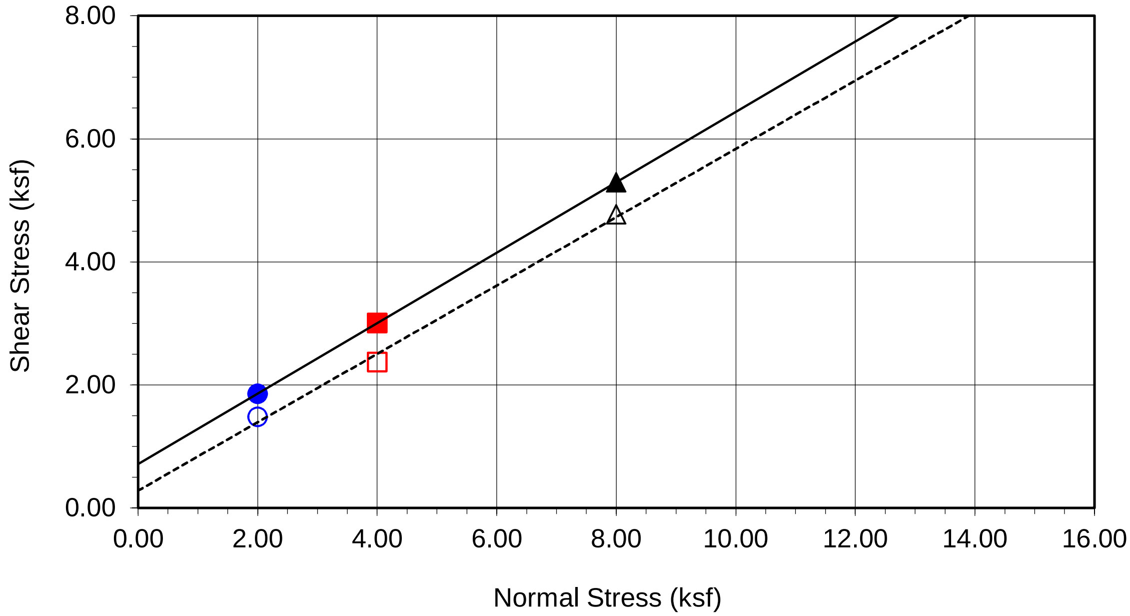
Project No.: 11753.001

Hoag Hospital Irvine

09-17

DS LB-3, R3 @ 25





Boring No.	**LB-3**
Sample No.	**R3**
Depth (ft)	**25**
Sample Type:	Ring

Soil Identification:
Olive brown silty clay (CL-ML)

Strength Parameters

	C (psf)	ϕ (°)
Peak	712	30
Ultimate	284	29

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.855	■ 3.005	▲ 5.291
Shear Stress @ End of Test (ksf)	○ 1.481	□ 2.374	△ 4.769
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 (%)	17.47	17.47	17.47
Dry Density (pcf)	108.6	110.9	112.4
Saturation (%)	85.3	90.6	94.3
Soil Height Before Shearing (in.)	0.9901	0.9824	0.9765
Final Moisture Content (%)	22.5	18.4	16.9

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11753.001
Hoag Hospital Irvine
09-17

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Hoag Hospital Irvine	Tested By:	G. Berdy	Date:	09/18/17
Project No.:	11753.001	Checked By:	G. Bathala	Date:	09/27/17
Location:	LB-1	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Dark brown sandy lean clay s(CL)				

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	1.0695
Wt. Comp. Soil + Mold	(g)	562.00	443.17
Wt. of Mold	(g)	163.60	0.00
Specific Gravity (Assumed)		2.70	2.70
Container No.		O	O
Wet Wt. of Soil + Cont.	(g)	798.10	606.77
Dry Wt. of Soil + Cont.	(g)	725.50	525.75
Wt. of Container	(g)	0.00	163.60
Moisture Content	(%)	10.01	22.37
Wet Density	(pcf)	120.2	125.0
Dry Density	(pcf)	109.2	102.1
Void Ratio		0.543	0.650
Total Porosity		0.352	0.394
Pore Volume	(cc)	72.9	87.3
Degree of Saturation (%) [S_{meas}]		**49.7**	92.9

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.)
09/18/17	10:22	1.0	0	0.1950
09/18/17	10:32	1.0	10	0.1945
Add Distilled Water to the Specimen				
09/18/17	10:47	1.0	15	0.2460
09/19/17	7:03	1.0	1231	0.2645
09/19/17	8:20	1.0	1308	0.2645

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**70**

EXPANSION INDEX of SOILS

ASTM D 4829

Leighton

Project Name:	Hoag Hospital Irvine	Tested By:	G. Berdy	Date:	09/18/17
Project No.:	11753.001	Checked By:	G. Bathala	Date:	09/27/17
Location:	LB-2	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Grayish brown sandy lean clay s(CL)				

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	1.0660
Wt. Comp. Soil + Mold (g)	577.50	441.09
Wt. of Mold (g)	180.90	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	800.20	621.99
Dry Wt. of Soil + Cont. (g)	728.10	541.75
Wt. of Container (g)	0.00	180.90
Moisture Content (%)	9.90	22.24
Wet Density (pcf)	119.6	124.8
Dry Density (pcf)	108.9	102.1
Void Ratio	0.549	0.651
Total Porosity	0.354	0.394
Pore Volume (cc)	73.3	87.0
Degree of Saturation (%) [S_{meas}]	**48.7**	92.2

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.)
09/18/17	9:45	1.0	0	0.1440
09/18/17	9:55	1.0	10	0.1430
Add Distilled Water to the Specimen				
09/18/17	10:22	1.0	27	0.1985
09/19/17	7:05	1.0	1270	0.2100
09/19/17	8:16	1.0	1341	0.2100

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**67**

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Hoag Hospital Irvine	Tested By:	G. Berdy	Date:	09/18/17
Project No.:	11753.001	Checked By:	G. Bathala	Date:	09/27/17
Location:	LB-3	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Very dark brown sandy lean clay s(CL)				

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	1.0520
Wt. Comp. Soil + Mold	(g)	595.10	446.89
Wt. of Mold	(g)	188.10	0.00
Specific Gravity (Assumed)		2.70	2.70
Container No.		O	O
Wet Wt. of Soil + Cont.	(g)	819.60	634.99
Dry Wt. of Soil + Cont.	(g)	751.90	561.52
Wt. of Container	(g)	0.00	188.10
Moisture Content	(%)	9.00	19.67
Wet Density	(pcf)	122.8	128.1
Dry Density	(pcf)	112.6	107.1
Void Ratio		0.497	0.574
Total Porosity		0.332	0.365
Pore Volume	(cc)	68.7	79.5
Degree of Saturation (%) [S_{meas}]		**48.9**	92.5

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.)
09/18/17	9:05	1.0	0	0.2285
09/18/17	9:15	1.0	10	0.2275
Add Distilled Water to the Specimen				
09/18/17	9:44	1.0	29	0.2740
09/19/17	7:08	1.0	1313	0.2805
09/19/17	8:10	1.0	1375	0.2805

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**53**

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MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name: Hoag Hospital Irvine
Tested By: O. Figueroa
Date: 09/20/17

Project No.: 11753.001
Input By: G. Bathala
Date: 09/27/17

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

Sample No.: BB-1

Soil Identification: Dark brown sandy lean clay s(CL)

Preparation Method: [X] Moist [ ] Dry

[X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03330

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

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3797	3935	3946			
Weight of Mold (g)	1857	1857	1857			
Net Weight of Soil (g)	1940	2078	2089			
Wet Weight of Soil + Cont. (g)	430.6	423.5	433.4			
Dry Weight of Soil + Cont. (g)	404.6	389.5	389.5			
Weight of Container (g)	39.6	39.5	38.8			
Moisture Content (%)	7.12	9.71	12.52			
Wet Density (pcf)	128.4	137.6	138.3			
Dry Density (pcf)	119.9	125.4	122.9			

Maximum Dry Density (pcf) 125.5 **Optimum Moisture Content (%)** 10.5

PROCEDURE USED

[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diamete
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) diamete
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

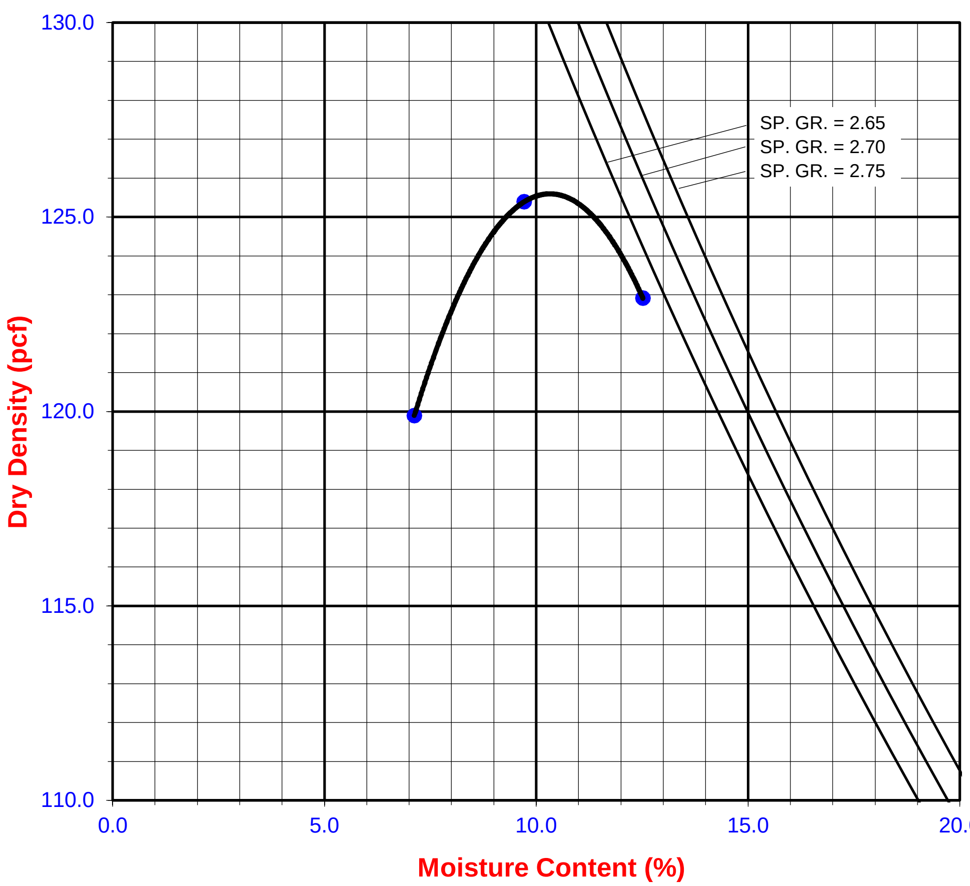
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Siev
Mold : 6 in. (152.4 mm) diamete
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in is <30%

Particle-Size Distribution

GR:SA:FI

Atterberg Limits:

LL,PL,PI



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	Hoag Hospital Irvine	Tested By:	R. Manning	Date:	09/19/17
Project No.:	11753.001	Input By:	J. Ward	Date:	09/19/17
Boring No.:	LB-2	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Grayish brown sandy lean clay s(CL)				

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

Mold Volume (ft³) 0.03330 — *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3773	3926	3904	3850		
Weight of Mold (g)	1857	1857	1857	1857		
Net Weight of Soil (g)	1916	2069	2047	1993		
Wet Weight of Soil + Cont. (g)	703.9	702.2	522.5	577.1		
Dry Weight of Soil + Cont. (g)	665.8	651.1	473.3	511.9		
Weight of Container (g)	74.5	77.0	76.3	75.0		
Moisture Content (%)	6.44	8.90	12.39	14.92		
Wet Density (pcf)	126.8	137.0	135.5	131.9		
Dry Density (pcf)	119.2	125.8	120.6	114.8		

Maximum Dry Density (pcf) 126.0 **Optimum Moisture Content (%)** 9.0

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

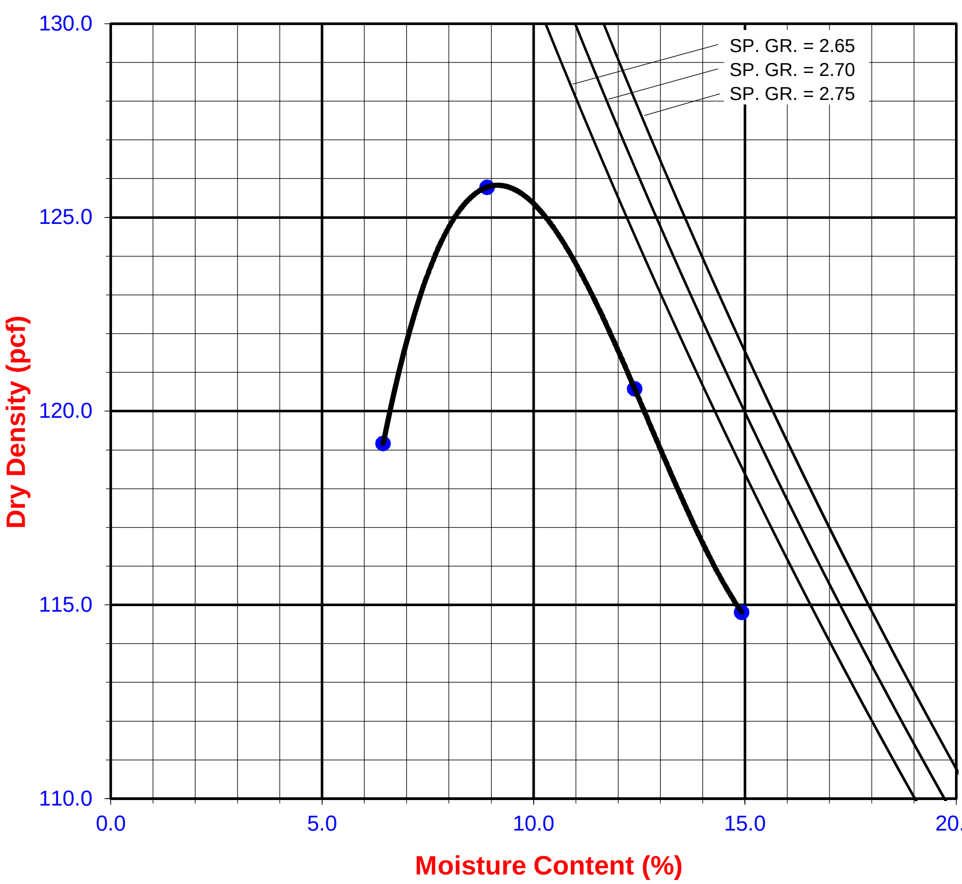
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	Hoag Hospital Irvine	Tested By:	R. Manning	Date:	09/19/17
Project No.:	11753.001	Input By:	J. Ward	Date:	09/20/17
Boring No.:	LB-3	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Very dark brown sandy lean clay s(CL)				

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

Mold Volume (ft³) 0.03330 — *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3753	3937	3959	3860		
Weight of Mold (g)	1857	1857	1857	1857		
Net Weight of Soil (g)	1896	2080	2102	2003		
Wet Weight of Soil + Cont. (g)	686.1	788.8	838.9	850.2		
Dry Weight of Soil + Cont. (g)	653.4	731.8	764.2	787.1		
Weight of Container (g)	77.0	75.0	76.4	310.0		
Moisture Content (%)	5.67	8.68	10.86	13.23		
Wet Density (pcf)	125.5	137.7	139.2	132.6		
Dry Density (pcf)	118.8	126.7	125.5	117.1		

Maximum Dry Density (pcf) 127.0 **Optimum Moisture Content (%)** 9.5

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

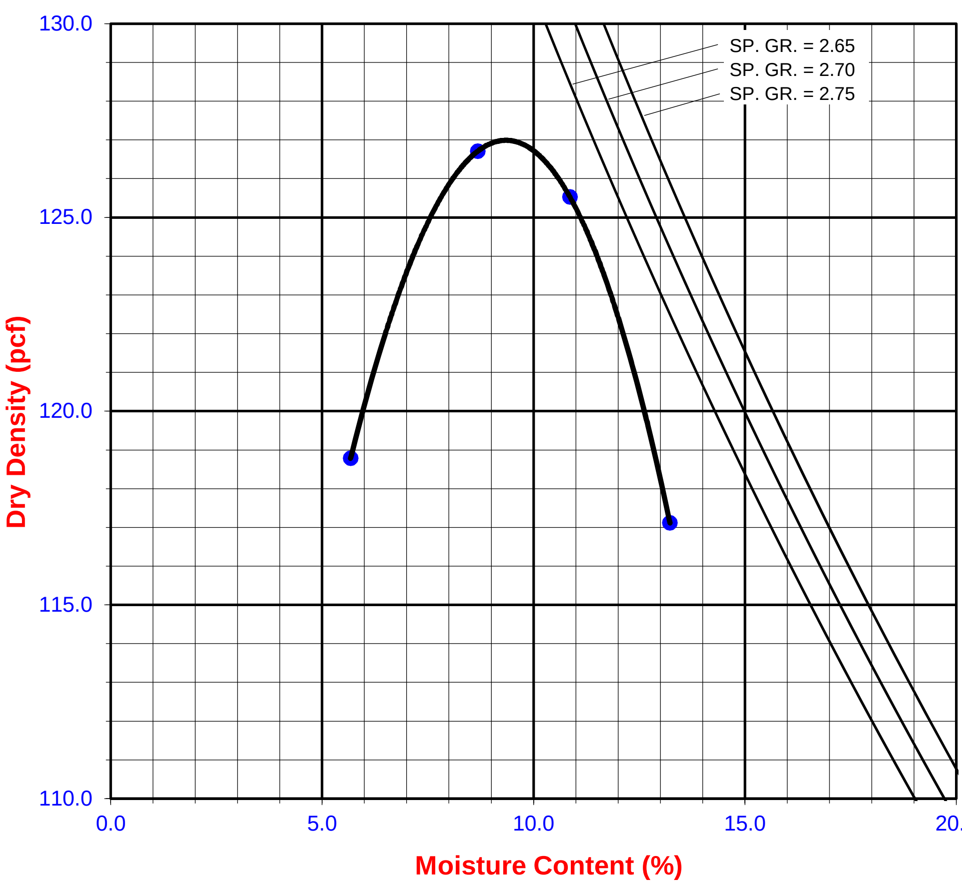
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



R-VALUE TEST RESULTS

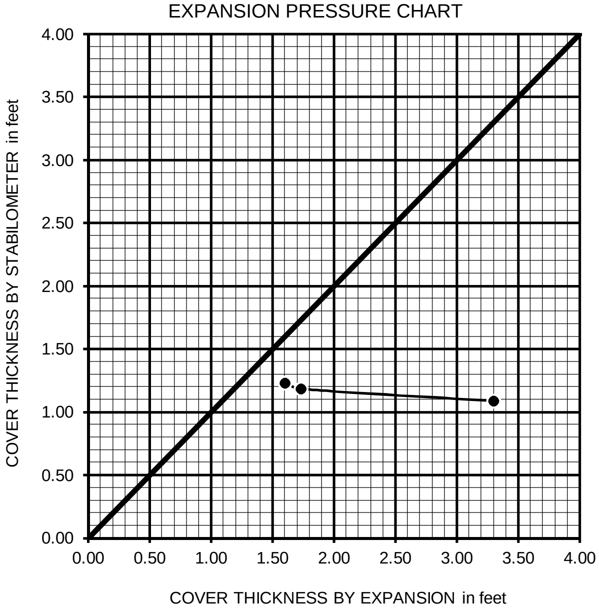
DOT CA Test 301

PROJECT NAME:	Hoag Hospital Irvine	PROJECT NUMBER:	11753.001
BORING NUMBER:	LB-1	DEPTH (FT.):	0-5
SAMPLE NUMBER:	BB-1	TECHNICIAN:	S. Felter
SAMPLE DESCRIPTION:	Dark brown sandy lean clay s(CL)	DATE COMPLETED:	9/29/2017

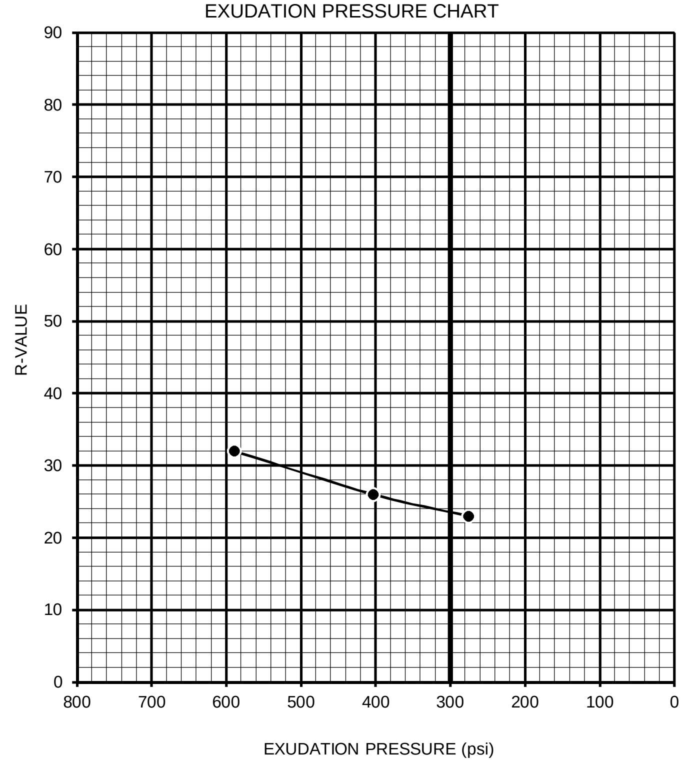
TEST SPECIMEN	**a**	**b**	**c**
MOISTURE AT COMPACTION %	14.2	15.1	15.6
HEIGHT OF SAMPLE, Inches	2.31	2.32	2.44
DRY DENSITY, pcf	121.9	117.9	116.6
COMPACTOR PRESSURE, psi	250	150	90
EXUDATION PRESSURE, psi	590	403	276
EXPANSION, Inches x 10exp-4	99	52	48
STABILITY Ph 2,000 lbs (160 psi)	89	100	110
TURNS DISPLACEMENT	3.60	3.75	3.61
R-VALUE UNCORRECTED	36	29	24
R-VALUE CORRECTED	32	26	23

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.	1.09	1.18	1.23
EXPANSION PRESSURE THICKNESS, ft.	3.30	1.73	1.60

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	17
R-VALUE BY EXUDATION:	23
EQUILIBRIUM R-VALUE:	17

Leighton

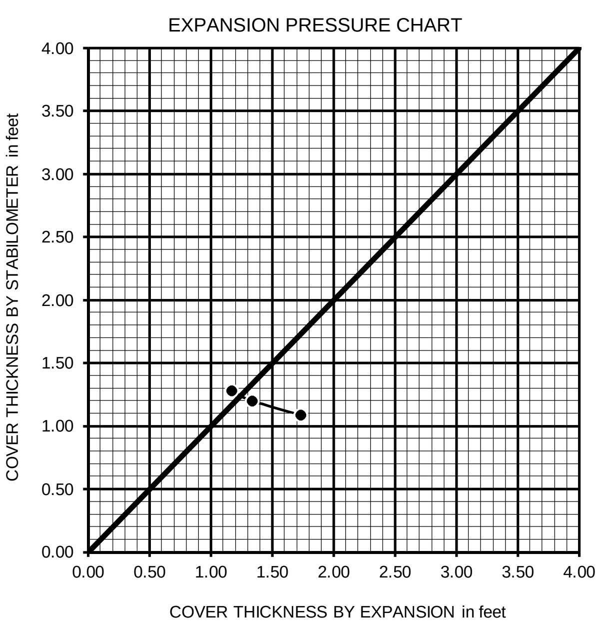
R-VALUE TEST RESULTS

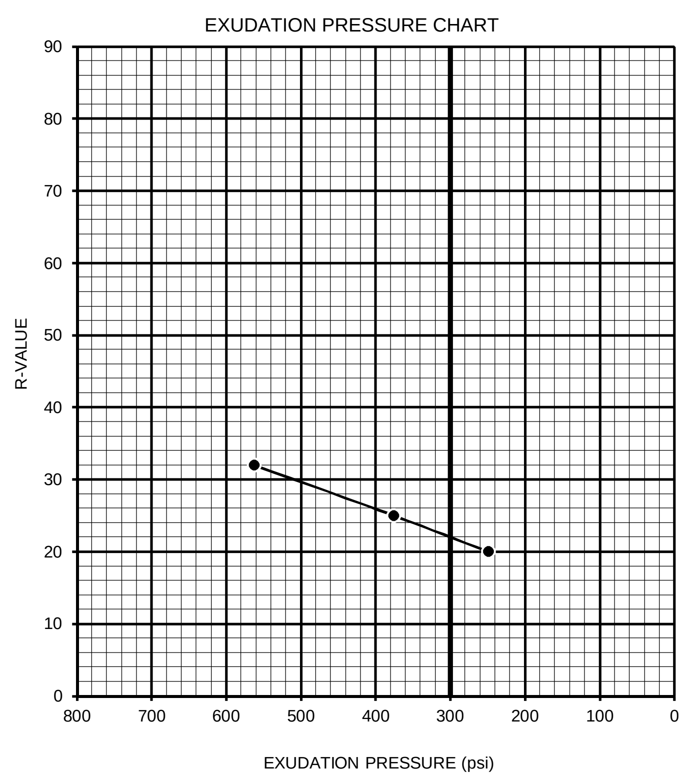
DOT CA Test 301

PROJECT NAME:	Hoag Hospital Irvine	PROJECT NUMBER:	11753.001
BORING NUMBER:	LB-2	DEPTH (FT.):	0-5
SAMPLE NUMBER:	BB-1	TECHNICIAN:	S. Felter
SAMPLE DESCRIPTION:	Grayish brown sandy lean clay s(CL)	DATE COMPLETED:	9/29/2017

TEST SPECIMEN	**a**	**b**	**c**
MOISTURE AT COMPACTION %	13.5	14.4	14.9
HEIGHT OF SAMPLE, Inches	2.49	2.44	2.35
DRY DENSITY, pcf	118.6	115.2	117.6
COMPACTOR PRESSURE, psi	225	125	75
EXUDATION PRESSURE, psi	563	376	249
EXPANSION, Inches x 10exp-4	52	40	35
STABILITY Ph 2,000 lbs (160 psi)	99	108	112
TURNS DISPLACEMENT	3.33	3.50	3.74
R-VALUE UNCORRECTED	32	26	22
R-VALUE CORRECTED	32	25	20

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.	1.09	1.20	1.28
EXPANSION PRESSURE THICKNESS, ft.	1.73	1.33	1.17





R-VALUE BY EXPANSION:	23
R-VALUE BY EXUDATION:	22
EQUILIBRIUM R-VALUE:	22

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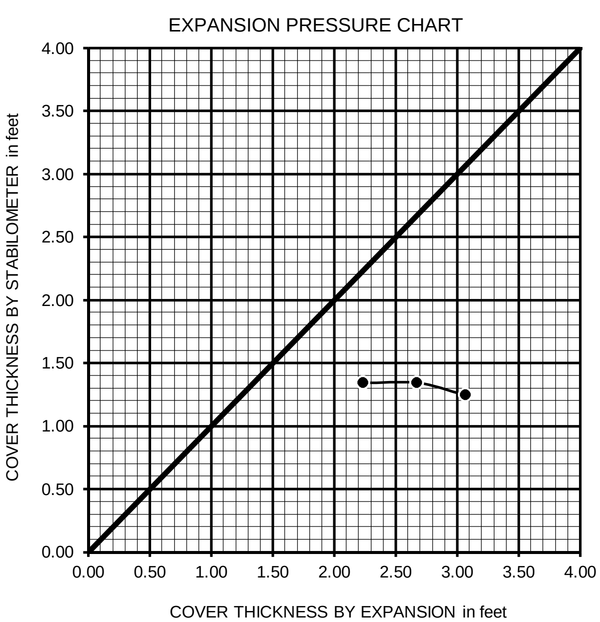
R-VALUE TEST RESULTS

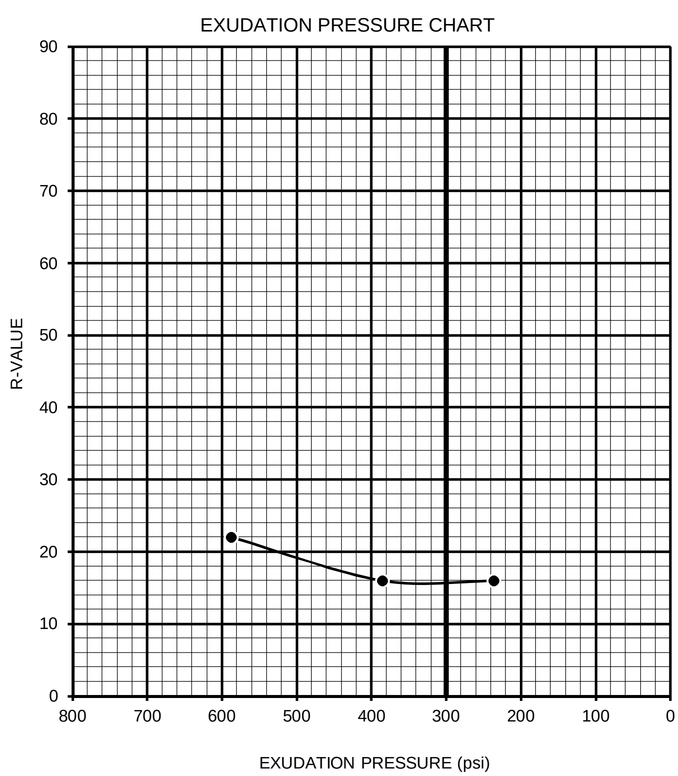
DOT CA Test 301

PROJECT NAME:	Hoag Hospital Irvine	PROJECT NUMBER:	11753.001
BORING NUMBER:	LB-3	DEPTH (FT.):	0-5
SAMPLE NUMBER:	BB-1	TECHNICIAN:	S. Felter
SAMPLE DESCRIPTION:	Very dark brown sandy lean clay s(CL)	DATE COMPLETED:	9/29/2017

TEST SPECIMEN	**a**	**b**	**c**
MOISTURE AT COMPACTION %	14.2	15.1	15.5
HEIGHT OF SAMPLE, Inches	2.46	2.51	2.53
DRY DENSITY, pcf	121.6	116.6	117.6
COMPACTOR PRESSURE, psi	150	50	50
EXUDATION PRESSURE, psi	588	385	236
EXPANSION, Inches x 10exp-4	92	80	67
STABILITY Ph 2,000 lbs (160 psi)	114	124	124
TURNS DISPLACEMENT	3.66	3.79	3.93
R-VALUE UNCORRECTED	22	16	16
R-VALUE CORRECTED	22	16	16

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.	1.25	1.34	1.34
EXPANSION PRESSURE THICKNESS, ft.	3.07	2.67	2.23





R-VALUE BY EXPANSION:	16
R-VALUE BY EXUDATION:	16
EQUILIBRIUM R-VALUE:	16

Boring Percolation Test Data Sheet

Project Number:	11753.001	**Test Hole Number:**	PB-1
Project Name:	HHI	**Date Excavated:**	9/7/2017
Earth Description:	Alluvium	**Date Tested:**	9/8/2017
Liquid Description:	Tap water	**Depth of boring (ft):**	10
Tested By:	SAM	**Diameter of boring (in):**	8
Time Interval Standard		**Diameter of casing (in):**	2
Start Time for Pre-Soak:	11:50:00 AM	**Length of slotted of casing (ft):**	5
Start Time for Standard:	8:00:00 AM	**Depth to Initial Water Depth (ft):**	
Standard Time Interval Between Readings, mins:	30	**Porosity of Annulus Material, *n* :**	0.35
		Bentonite Plug at Bottom:	No

Percolation Data

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.)	Percolation Rate (min./in.)	Infiltration Rate (in./hr.)
1	8:00	30	4.31	68.3	0.2	125.00	0.01
	8:30		4.33	68.0			
2	8:30	30	4.33	68.0	0.4	83.33	0.01
	9:00		4.36	67.7			
3	9:00	30	4.36	67.7	0.4	83.33	0.01
	9:30		4.39	67.3			
4	9:30	30	4.39	67.3	0.4	83.33	0.01
	10:00		4.42	67.0			
5	10:00	30	4.42	67.0	0.4	83.33	0.01
	10:30		4.45	66.6			
6	10:30	30	4.45	66.6	0.4	83.33	0.01
	11:00		4.48	66.2			
7	11:00	30	4.48	66.2	0.4	83.33	0.01
	11:30		4.51	65.9			
8	11:30	30	4.51	65.9	0.2	125.00	0.01
	12:00		4.53	65.6			
9	12:00	30	4.53	65.6	0.4	83.33	0.01
	12:30		4.56	65.3			
10	12:30	30	4.56	65.3	0.4	83.33	0.01
	13:00		4.59	64.9			
11	13:00	30	4.59	64.9	0.4	83.33	0.01
	13:30		4.62	64.6			
12	13:30	30	4.62	64.6	0.4	83.33	0.01
	14:00		4.65	64.2			

Infiltration Rate (I) = Flow Volume/Flow Area/Δt

Infiltration Rate, I (Last Reading) = $\boxed{0.01}$ **in./hr.**

APPENDIX E

Seismicity Data

APPENDIX E

Seismic Design

Leighton

APPENDIX E

Seismic Design

Code-based seismic design parameters derived from the USGS online tool are appended at the end of this appendix.

Leighton performed a site-specific ground motion study using the computer program Hazard Spectrum Application (OpenSHA, 2019), in accordance with the requirements of the 2019 California Building Code (CBC) and ASCE 7-16. A site-specific seismic hazard analysis was performed and the results processed in accordance with the procedures of ASCE 7-16.

E.1 Attenuation Relationships

Attenuation relationships (Ground Motion Prediction Equations or GMPEs) describe the relation of ground motion levels with earthquake magnitude and distance (distance between the site and seismic source), site geology, and subsurface characterization. These relationships can be used to describe the variation of peak ground acceleration and response spectral acceleration with earthquake magnitude and distance, and to also incorporate the local geological conditions and near-source effects.

We used three GMPEs: Boore et. al. (2014) NGA West 2, Campbell and Bozorgnia (2014) NGA West 2, and Chiou and Youngs (2014) NGA West 2. These GMPEs are based on the median rotated direction (RotD50) of horizontal ground motion. Site Class D and the measured Vs_{30} of 290 ft/s (270 m/s) were used with the selected GMPEs.

E.2 Design Criteria

The earthquake ground motions considered include the Risk-Targeted Maximum Considered Earthquake (MCE_R) and the Design Earthquake (DE). The MCE_R is defined as the maximum component of horizontal ground motion with a 2% probability of exceedance in 50 years (2,475-year average return interval) adjusted for targeted risk (ASCE 7-16). The DE ground motions are defined as 2/3 of MCE_R ground motions (ASCE 7-16).

E.3 Methodology

The 2019 CBC requires the procedures of Chapter 21, Site-Specific Ground Motion Procedures for Seismic Design, of ASCE 7-16 be used to determine site-specific seismic response spectra and design parameters. We performed both deterministic and probabilistic seismic hazard analyses (DSHA and PSHA) and process the results in accordance with the procedures in Chapter 21 of ASCE 7-16.

E.4 Probabilistic Seismic Hazard Analysis

A PSHA is a mathematical process based on probability and statistics that is used to estimate the mean number of events per year in which the level of some ground motion parameter, Z (peak ground acceleration and/or spectral response acceleration in this study), exceeds a specified value z at the project site. This mean number of events per year, also referred to as "annual frequency of exceedance," is designated as "$v(Z \geq z)$." The inverse of this number is called the "average return period (ARP)," which is expressed in terms of years. Having the annual frequency of exceedance of a certain level of acceleration or spectral response acceleration, $v(Z \geq z)$, the probability of exceeding that level $Pr(Z \geq z)$, within any time period of interest, t, is then obtained assuming a Poisson Distribution as follows:

$$\Pr(Z \geq z) = 1 - e^{-v(Z \geq z)t}$$

PSHA procedures require the specification of probability functions to describe the uncertainty in both the time and location of future earthquake occurrences and the uncertainty in the ground motion level that will be produced at the site.

The basic key elements of a PSHA are:

- Defining the location, geometry, and characteristics of earthquake sources relative the site;
- Specifying an earthquake recurrence relationship for various magnitudes on each source up to the maximum magnitude;
- Selecting appropriate attenuation relationships, which relate the variation of the earthquake ground motion parameter with earthquake distance, directivity, magnitude, site geology, and subsurface characterization; and

- Determining the probability of exceedance of peak ground accelerations and/or response spectral levels (i.e., seismic hazards) utilizing the above input parameters.

The frequencies of exceedance of peak ground accelerations and spectral response accelerations at the site were calculated by evaluating the following:

- The annual frequency of earthquakes of various magnitudes on a fault obtained from the fault recurrence relationships;
- Given an earthquake of a certain magnitude on a certain fault, the probability distribution of the location of the earthquake on the fault was obtained using the selected rupture area versus magnitude relationship and assuming equal likelihood of rupture along the length and some prescribed probabilities along the depth of the fault; and
- Given an earthquake of a certain magnitude occurring at a certain distance from the site, the probability distribution of ground motion at the site was obtained from the selected attenuation relationships.

The above process is repeated a sufficient number of times to cover all the sources, then summed to obtain the total seismic hazard at the site. This process results in a relationship between ground motion level and the probability of being exceeded.

The computer program Hazard Spectrum Application (OpenSHA, 2019) was used to perform the seismic hazard analysis.

E.5 Deterministic Seismic Hazard Analysis

The DSHA consists of a four-step process (Reiter, 1990):

- Defining the location, geometry, and characteristics of earthquake sources relative to the site;
- Determination of the site-to-source distance for each earthquake source defined relative to the site;
- Selection of the controlling earthquake relative to the site as defined by some ground motion parameter. The controlling earthquake is defined by the

seismic scenario based on the above two steps that produces the largest magnitude of the ground motion parameter being used; and

- Using the controlling earthquake, the deterministic ground motions at the site is obtained from the selected attenuation relationships.
- Deterministic ground motions represent the 84^{th} percentile average horizontal component and modified using Shahi and Baker (2014) to represent the maximum component horizontal ground motions.

The NGA-West2 deterministic spreadsheet by the Pacific Earthquake Engineering Research Center (PEER, 2015) was used for the DSHA.

E.6 Code-Based General Seismic Response Spectra and Design Parameters

Seismic response spectra and design parameters were computed as determined by Chapter 11 of ASCE 7-16. These values are used to process the site-specific design response spectrum to ensure the site-specific DE and MCE_R response spectra meet or exceed minimum requirements. The Seismic Design Map Tool by the United States Geological Survey (USGS) was used to determine the code-specific seismic response spectra and design parameters.

The code-based parameters determined from the referenced USGS program are attached at the end of this appendix.

E.7 Site-Specific Response Spectra

The site-specific MCE_R and DE response spectra were developed per the methodology prescribed in Chapter 21 of ASCE 7-16. Site-specific response spectra for MCE_R and DE were computed for a structural damping ratio of 5 percent of critical damping. Targeted risk coefficients were determined from mapped values in ASCE 7-16 to calculate MCE_R.

We used the Shahi and Baker (2014) $Sa_{RotD100}/Sa_{RotD50}$ factors to develop the maximum component of horizontal ground motion as required in the definition of ground motion in the current building codes (2019 CBC and ASCE 7-16). These factors enabled us to estimate the maximum horizontal component of ground motion.

Figure E.1 presents a graph and table with ordinates of the RotD50 and the maximum component MCE response spectra from the PSHA. The maximum component (MC) factors from Shahi and Baker (2014) are also presented on Figure E.1.

Figure E.2 presents plots and tables with ordinates of the MCE_R response spectra from the DSHA.

Per Chapter 21.2.3 of ASCE 7-16, the deterministic and probabilistic spectra were compared to establish site-specific maximum component MCE spectra. This step is shown on Figure E.3.

Figure E.4 shows a comparison of site-specific vs. general code-based spectra for the MCE_R spectrum.

The DE spectrum is shown on Figure E.5, which also includes the 80% of the general code-based spectrum floor stipulated in Chapter 21.3 of ASCE 7-16.

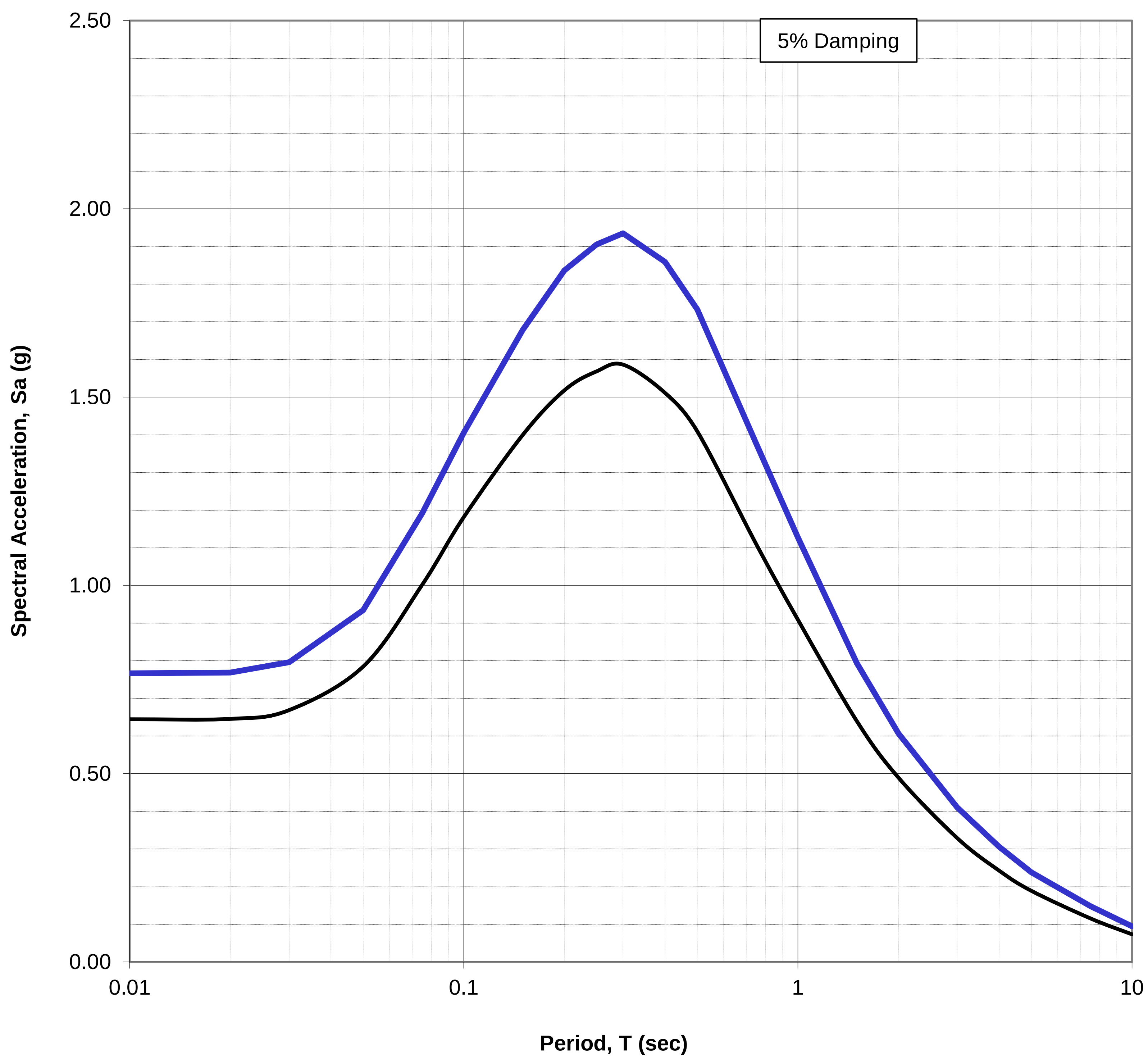
MCE SPECTRA (2,475-YEAR AVERAGE RETURN INTERVAL)

Project: Proposed Hospital Expansion Project

Project Number: 11753.004

Location: 16200 Sand Canyon Avenue, Irvine, California

Deaggregated Probabilistic PGA Magnitude
Mw = 6.9



Period T (s)	MCE GEOMEAN Sa (g)	Maximum Component Factor	MCE MAX COMP Site-Specific Sa (g)
0.01	0.645	1.19	0.767
0.02	0.646	1.19	0.768
0.03	0.669	1.19	0.796
0.05	0.785	1.19	0.934
0.075	1.001	1.19	1.191
0.10	1.181	1.19	1.406
0.15	1.399	1.20	1.679
0.20	1.518	1.21	1.837
0.25	1.569	1.22	1.906
0.30	1.586	1.22	1.935
0.40	1.511	1.23	1.859
0.50	1.409	1.23	1.733
0.75	1.110	1.24	1.376
1.00	0.909	1.24	1.127
1.50	0.640	1.24	0.794
2.00	0.489	1.24	0.607
3.00	0.329	1.25	0.411
4.00	0.243	1.26	0.306
5.00	0.189	1.26	0.238
7.50	0.116	1.28	0.148
10.00	0.073	1.29	0.095

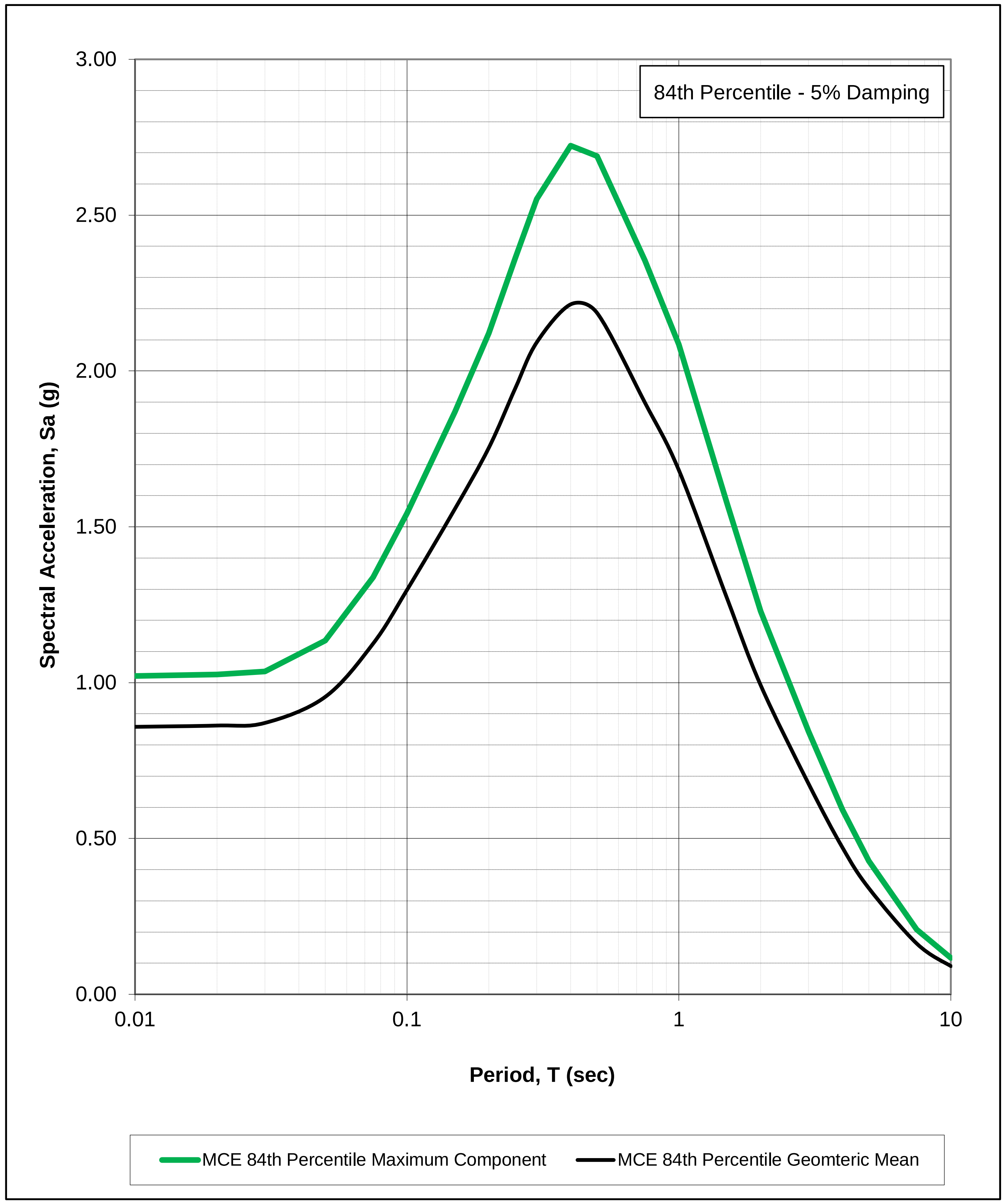
Figure E.1

MCE DETERMINISTIC SPECTRA

Project: Proposed Hospital Expansion Project

Project Number: 11753.004

Location: 16200 Sand Canyon Avenue, Irvine, California



DETERMINISTIC PGA MAGNITUDE				Mw = 6.9
MC FACTOR		DSHA - 84TH PERCENTILE		
Period T (s)	Maximum Component Factor	Period T (s)	MCE GEOMEAN Sa (g)	MCE MAX COMP Sa (g)
0.01	1.19	0.01	0.858	1.021
0.02	1.19	0.02	0.862	1.026
0.03	1.19	0.03	0.871	1.036
0.05	1.19	0.05	0.954	1.135
0.075	1.19	0.075	1.125	1.338
0.10	1.19	0.10	1.297	1.544
0.15	1.20	0.15	1.557	1.869
0.20	1.21	0.20	1.754	2.122
0.25	1.22	0.25	1.944	2.362
0.30	1.22	0.30	2.092	2.552
0.40	1.23	0.40	2.214	2.723
0.50	1.23	0.50	2.186	2.689
0.75	1.24	0.75	1.899	2.354
1.00	1.24	1.00	1.681	2.085
1.50	1.24	1.50	1.273	1.578
2.00	1.24	2.00	0.991	1.229
3.00	1.25	3.00	0.675	0.844
4.00	1.26	4.00	0.470	0.592
5.00	1.26	5.00	0.340	0.428
7.50	1.28	7.50	0.163	0.208
10.00	1.29	10.00	0.091	0.117

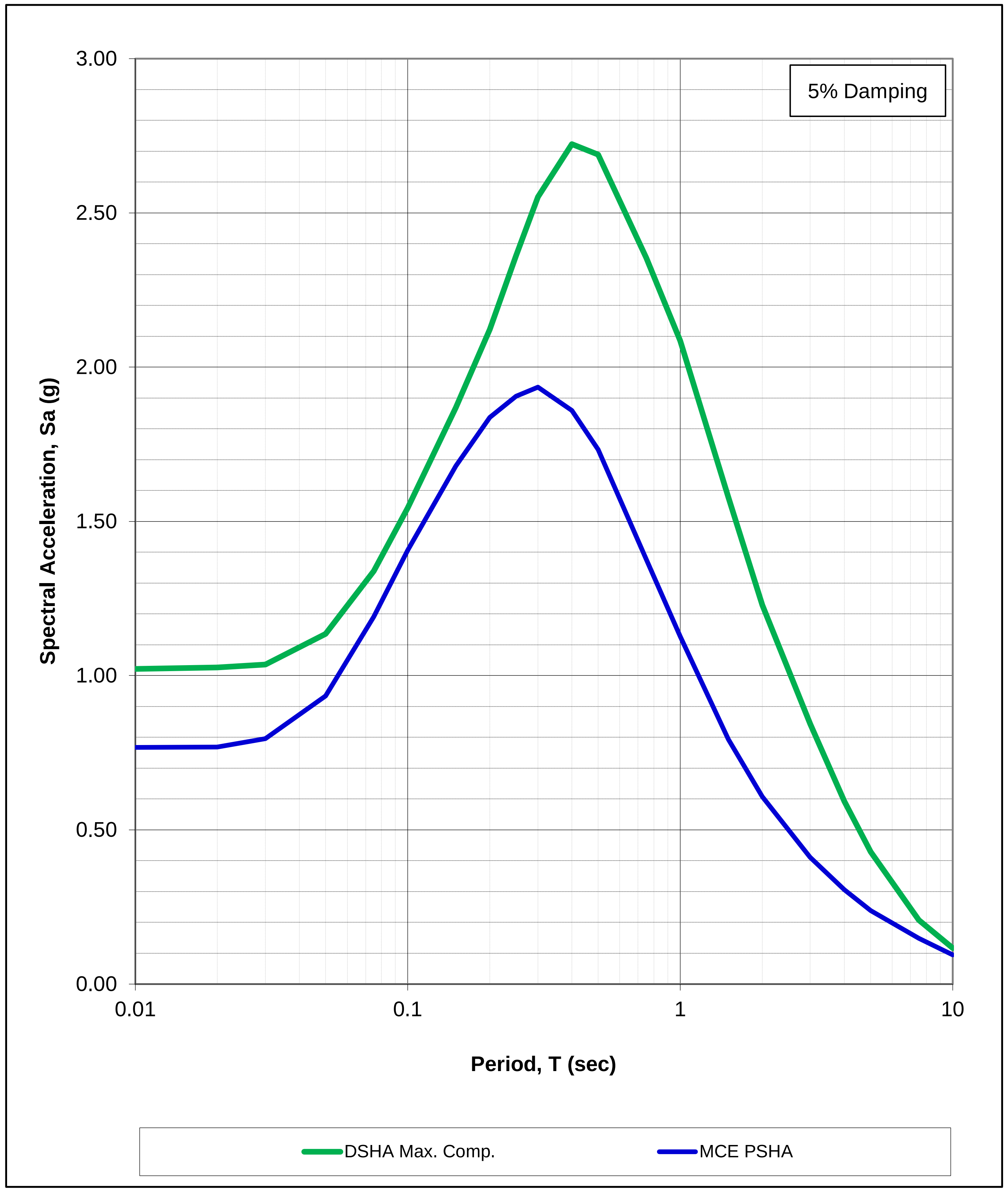
Figure E.2

MCE DETERMINISTIC SPECTRA COMPARISON - MAXIMUM HORIZONTAL COMPONENT

Project: Proposed Hospital Expansion Project

Project Number: 11753.004

Location: 16200 Sand Canyon Avenue, Irvine, California



DETERMINISTIC PGA MAGNITUDE					Mw = 6.9
DSHA		DETERMINISTIC LOWER LIMIT		PSHA	
Period T (s)	UPPER ENVELOPE Sa (g)	Period T (s)	DLL CURVE Sa (g)	Period T (s)	MCE MAX COMP. Sa (g)
0.01	1.021	0.01	0.600	0.01	0.767
0.02	1.026	0.02	0.649	0.02	0.768
0.03	1.036	0.03	0.699	0.03	0.796
0.05	1.135	0.05	0.798	0.05	0.934
0.075	1.338	0.075	0.921	0.075	1.191
0.10	1.544	0.10	1.045	0.10	1.406
0.15	1.869	0.15	1.500	0.15	1.679
0.20	2.122	0.20	1.500	0.20	1.837
0.25	2.362	0.25	1.500	0.25	1.906
0.30	2.552	0.30	1.500	0.30	1.935
0.40	2.723	0.40	1.500	0.40	1.859
0.50	2.689	0.50	1.500	0.50	1.733
0.75	2.354	0.75	1.920	0.75	1.376
1.00	2.085	1.00	1.440	1.00	1.127
1.50	1.578	1.50	0.960	1.50	0.794
2.00	1.229	2.00	0.720	2.00	0.607
3.00	0.844	3.00	0.480	3.00	0.411
4.00	0.592	4.00	0.360	4.00	0.306
5.00	0.428	5.00	0.288	5.00	0.238
7.50	0.208	7.50	0.192	7.50	0.148
10.00	0.117	10.00	0.144	10.00	0.095

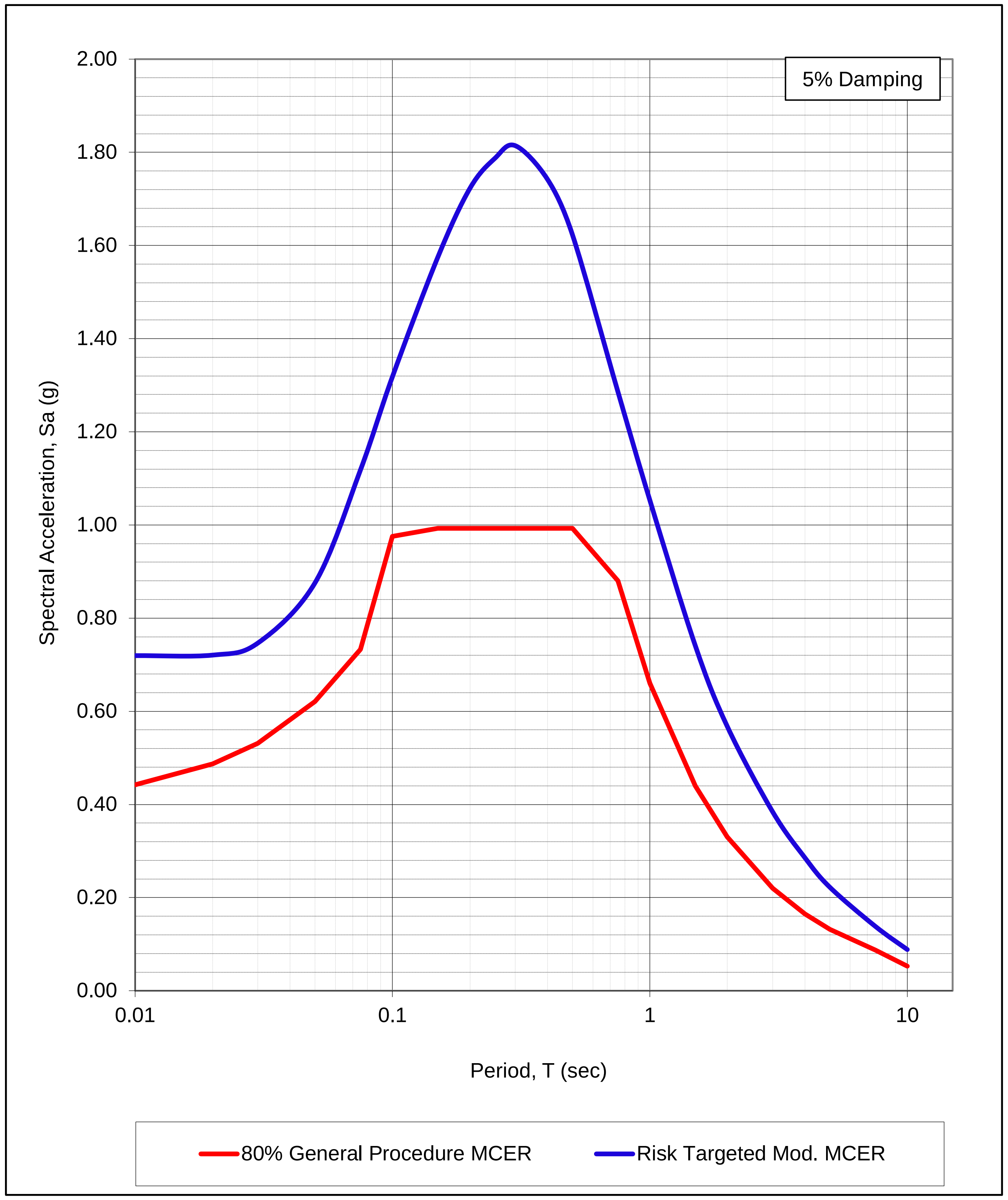
Figure E.3

RISK TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE_R) RESPONSE SPECTRUM

Project: Proposed Hospital Expansion Project

Project Number: 11753.004

Location: 16200 Sand Canyon Avenue, Irvine, California



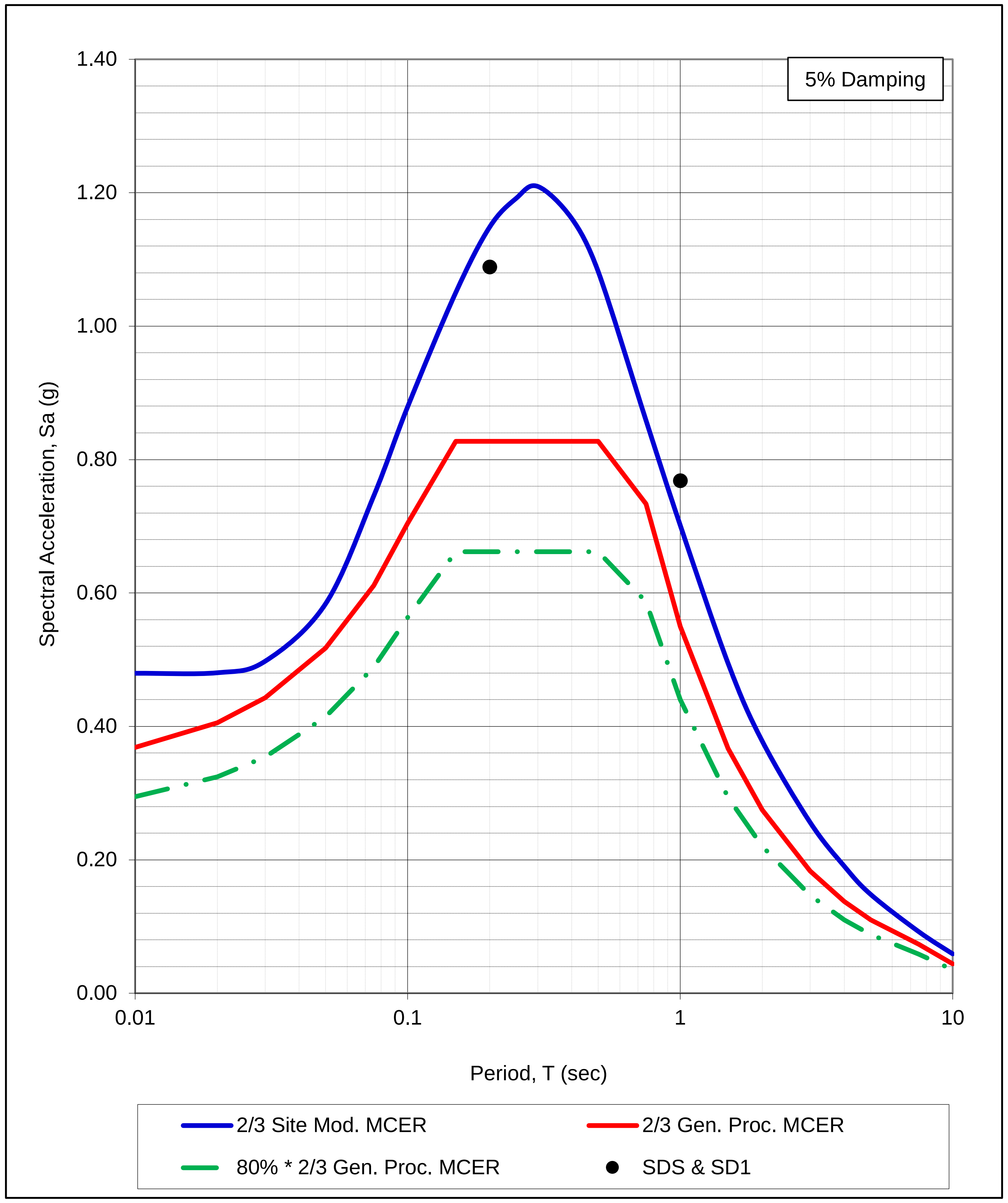
SITE MODIFIED MCE and SITE MODIFIED MCE_R

Period T (s)	Site Risk Coefficient (C_R)	MCE MAX COMP Sa (g)	Site Modified MCE_R Sa (g)	**Risk TGT MCE_R Sa (g)**	80% General Procedure Sa (g)
0.01	0.938	0.767	0.719	**0.719**	0.442
0.02	0.938	0.768	0.721	**0.721**	0.487
0.03	0.938	0.796	0.747	**0.747**	0.532
0.05	0.938	0.934	0.876	**0.876**	0.621
0.075	0.938	1.191	1.118	**1.118**	0.733
0.10	0.938	1.406	1.319	**1.319**	0.975
0.15	0.938	1.679	1.575	**1.575**	0.993
0.20	0.938	1.837	1.723	**1.723**	0.993
0.25	0.938	1.906	1.787	**1.787**	0.993
0.30	0.938	1.935	1.814	**1.814**	0.993
0.40	0.937	1.859	1.742	**1.742**	0.993
0.50	0.937	1.733	1.623	**1.623**	0.993
0.75	0.935	1.376	1.287	**1.287**	0.880
1.00	0.934	1.127	1.053	**1.053**	0.660
1.50	0.934	0.794	0.741	**0.741**	0.440
2.00	0.934	0.607	0.567	**0.567**	0.330
3.00	0.934	0.411	0.384	**0.384**	0.220
4.00	0.934	0.306	0.286	**0.286**	0.165
5.00	0.934	0.238	0.222	**0.222**	0.132
7.50	0.934	0.148	0.139	**0.139**	0.088
10.00	0.934	0.095	0.088	**0.088**	0.053

Figure E.4

DESIGN RESPONSE SPECTRUM AND SITE-SPECIFIC S_{DS} AND S_{D1}

Project: Proposed Hospital Expansion Project
Project Number: 11753.004
Location: 16200 Sand Canyon Avenue, Irvine, California



DESIGN RESPONSE SPECTRUM

Period T (s)	2/3*MCE_R CURVE Sa (g)
0.01	0.480
0.02	0.480
0.03	0.498
0.05	0.584
0.075	0.745
0.10	0.879
0.15	1.050
0.20	1.149
0.25	1.192
0.30	1.209
0.40	1.161
0.50	1.082
0.75	0.858
1.00	0.702
1.50	0.494
2.00	0.378
3.00	0.256
4.00	0.190
5.00	0.148
7.50	0.092
10.00	0.059

CODE BASED GENERAL PROCEDURE SPECTRUM

GENERAL PROC. MCER CURVE Sa (g)	2/3 GENERAL PROC. MCER CURVE Sa (g)	80% * 2/3 GENERAL PROC. MCER CURVE Sa (g)
0.552	0.368	0.295
0.608	0.406	0.324
0.664	0.443	0.354
0.776	0.518	0.414
0.916	0.611	0.489
1.056	0.704	0.563
1.241	0.827	0.662
1.241	0.827	0.662
1.241	0.827	0.662
1.241	0.827	0.662
1.241	0.827	0.662
1.241	0.827	0.662
1.100	0.733	0.587
0.825	0.550	0.440
0.550	0.367	0.293
0.413	0.275	0.220
0.275	0.183	0.147
0.206	0.138	0.110
0.165	0.110	0.088
0.110	0.073	0.059
0.066	0.044	0.035

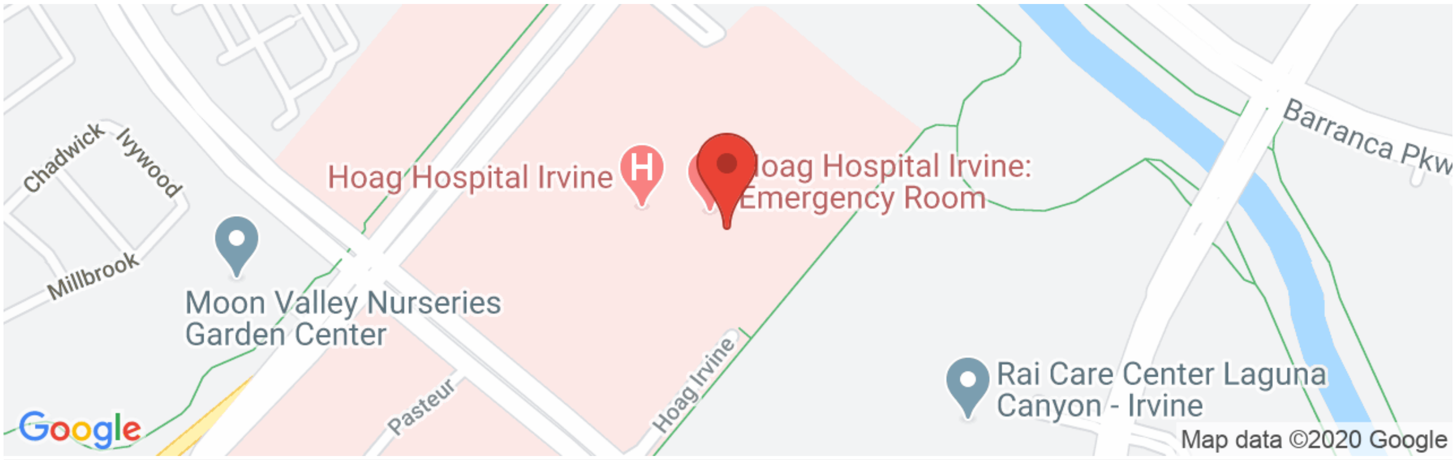
S_{DS} = 1.089g
S_{D1} = 0.768g

Note: Based on ASCE 7-16 Section 21.4, the parameter S_{DS} shall be taken as 90% of the maximum spectral acceleration, Sa, obtained from the site-specific spectrum, at any period within the range from 0.2 to 5 s, inclusive. The parameter S_{D1} shall be taken as the maximum value of the product, TSa, for periods from 1 to 2 s for sites with Vs_{30} > 1,200 ft/s (Vs_{30} > 365.76 m/s) and for periods from 1 to 5 s for sites with Vs_{30} ≤ 1,200 ft/s (Vs_{30} ≤ 365.76 m/s).

Figure E.5

11753.004

Latitude, Longitude: 33.6606, -117.7719



Date	2/27/2020, 10:35:35 AM
Design Code Reference Document	ASCE7-16
Risk Category	IV
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.241	MCE_R ground motion. (for 0.2 second period)
S_1	0.445	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.245	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	0.83	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.004	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.52	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.572	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.241	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.323	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.072	Factored deterministic acceleration value. (0.2 second)
S1RT	0.445	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.476	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.715	Factored deterministic acceleration value. (1.0 second)
PGAd	0.851	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.938	Mapped value of the risk coefficient at short periods
C_{R1}	0.934	Mapped value of the risk coefficient at a period of 1 s

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*    E Q S E A R C H   *
*                      *
*     Version 3.00     *
*                      *
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       ESTIMATION OF
  PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS
```

JOB NUMBER: 11753.004

DATE: 02-26-2020

JOB NAME: Hoag Irvine

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
MINIMUM MAGNITUDE: 4.00
MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
SITE LATITUDE: 33.6606
SITE LONGITUDE: 117.7719

SEARCH DATES:
START DATE: 1800
END DATE: 2018

SEARCH RADIUS:
62.0 mi
99.8 km

ATTENUATION RELATION: 3) Boore et al. (1997) Horiz. - NEHRP D (250)
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
SCOND: 0 Depth Source: A
Basement Depth: 5.00 km Campbell SSR: Campbell SHR:
COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 0.0

EARTHQUAKE SEARCH RESULTS

Page 1

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.7670	117.8170	08/22/1936	521 0.0	0.0	4.00	0.077	VII	7.8(12.5)
MGI	33.7000	117.9000	07/08/1902	945 0.0	0.0	4.00	0.076	VII	7.8(12.6)
GSP	33.6200	117.9000	04/07/1989	200730.2	13.0	4.50	0.099	VII	7.9(12.7)
DMG	33.5450	117.8070	10/27/1969	1316 2.3	6.5	4.50	0.096	VII	8.2(13.2)
MGI	33.8000	117.8000	05/19/1917	635 0.0	0.0	4.00	0.066	VI	9.8(15.7)
MGI	33.8000	117.8000	11/07/1926	1948 0.0	0.0	4.60	0.090	VII	9.8(15.7)
MGI	33.8000	117.8000	11/10/1926	1723 0.0	0.0	4.60	0.090	VII	9.8(15.7)
MGI	33.8000	117.8000	11/04/1926	2238 0.0	0.0	4.60	0.090	VII	9.8(15.7)
MGI	33.8000	117.8000	05/19/1917	719 0.0	0.0	4.00	0.066	VI	9.8(15.7)
MGI	33.8000	117.8000	05/20/1917	945 0.0	0.0	4.00	0.066	VI	9.8(15.7)
MGI	33.8000	117.8000	11/09/1926	1535 0.0	0.0	4.60	0.090	VII	9.8(15.7)
GSP	33.8060	117.7150	03/07/2000	002028.2	11.0	4.00	0.062	VI	10.6(17.0)
DMG	33.6170	117.9670	03/11/1933	154 7.8	0.0	6.30	0.196	VIII	11.6(18.7)
DMG	33.6650	117.9790	10/20/1961	214240.7	7.2	4.00	0.057	VI	11.9(19.2)
DMG	33.6590	117.9810	10/20/1961	20 714.5	6.1	4.00	0.057	VI	12.0(19.3)
MGI	33.8000	117.9000	05/22/1902	740 0.0	0.0	4.30	0.066	VI	12.1(19.5)
DMG	33.6820	117.5530	07/05/1938	18 655.7	10.0	4.50	0.071	VI	12.7(20.4)

DMG	33.6540	117.9940	10/20/1961	194950.5	4.6	4.30	0.064	VI	12.8(20.5)
DMG	33.6800	117.9930	11/20/1961	85334.7	4.4	4.00	0.054	VI	12.8(20.6)
DMG	33.8540	117.7520	10/04/1961	22131.6	4.3	4.10	0.055	VI	13.4(21.6)
DMG	33.5750	117.9830	03/11/1933	518 4.0	0.0	5.20	0.098	VII	13.5(21.7)
DMG	33.5670	117.9830	07/07/1937	1112 0.0	0.0	4.00	0.052	VI	13.7(22.1)
DMG	33.5670	117.9830	04/17/1934	1833 0.0	0.0	4.00	0.052	VI	13.7(22.1)
DMG	33.6000	118.0000	03/11/1933	217 0.0	0.0	4.50	0.067	VI	13.8(22.1)
DMG	33.6000	118.0000	03/11/1933	231 0.0	0.0	4.40	0.064	VI	13.8(22.1)
MGI	33.8000	117.6000	04/22/1918	2115 0.0	0.0	5.00	0.087	VII	13.8(22.2)
DMG	33.8000	117.6000	09/16/1903	1210 0.0	0.0	4.00	0.051	VI	13.8(22.2)
DMG	33.6710	118.0120	10/20/1961	223534.2	5.6	4.10	0.054	VI	13.8(22.2)
DMG	33.6170	118.0170	10/02/1933	1326 1.0	0.0	4.00	0.050	VI	14.4(23.2)
DMG	33.6170	118.0170	03/14/1933	19 150.0	0.0	5.10	0.089	VII	14.4(23.2)
DMG	33.6170	118.0170	03/15/1933	111332.0	0.0	4.90	0.080	VII	14.4(23.2)
DMG	33.7500	118.0000	11/16/1934	2126 0.0	0.0	4.00	0.050	VI	14.5(23.3)
DMG	33.6000	118.0170	12/25/1935	1715 0.0	0.0	4.50	0.064	VI	14.7(23.6)
DMG	33.7170	117.5170	06/19/1935	1117 0.0	0.0	4.00	0.048	VI	15.1(24.4)
DMG	33.6990	117.5110	05/31/1938	83455.4	10.0	5.50	0.105	VII	15.2(24.5)
DMG	33.6170	118.0330	05/21/1938	944 0.0	0.0	4.00	0.048	VI	15.3(24.6)
DMG	33.7170	117.5070	08/06/1938	22 056.0	10.0	4.00	0.047	VI	15.7(25.3)
DMG	33.6830	118.0500	03/11/1933	1250 0.0	0.0	4.40	0.057	VI	16.0(25.8)
DMG	33.6830	118.0500	03/11/1933	658 3.0	0.0	5.50	0.101	VII	16.0(25.8)
DMG	33.8000	118.0000	10/21/1913	938 0.0	0.0	4.00	0.046	VI	16.2(26.1)
DMG	33.7250	117.4980	01/03/1956	02548.9	13.7	4.70	0.066	VI	16.3(26.3)
GSP	33.9040	117.7910	08/08/2012	163322.1	10.0	4.50	0.058	VI	16.8(27.1)
GSP	33.9050	117.7920	08/08/2012	062334.1	10.0	4.50	0.058	VI	16.9(27.2)
GSP	33.9070	117.7880	08/29/2012	203100.3	9.0	4.10	0.046	VI	17.0(27.4)
DMG	33.7000	118.0670	07/20/1940	4 113.0	0.0	4.00	0.044	VI	17.2(27.6)
DMG	33.7000	118.0670	02/08/1940	165617.0	0.0	4.00	0.044	VI	17.2(27.6)
DMG	33.7000	118.0670	03/11/1933	85457.0	0.0	5.10	0.078	VII	17.2(27.6)
DMG	33.7000	118.0670	03/11/1933	51022.0	0.0	5.10	0.078	VII	17.2(27.6)
GSP	33.9090	117.7920	06/14/2012	031715.7	9.0	4.00	0.044	VI	17.2(27.7)
GSP	33.9170	117.7760	09/03/2002	070851.9	12.0	4.80	0.065	VI	17.7(28.5)
DMG	33.5610	118.0580	01/15/1937	183547.0	10.0	4.00	0.042	VI	17.8(28.7)
DMG	33.7480	117.4790	06/22/1971	104119.0	8.0	4.20	0.047	VI	17.9(28.8)
DMG	33.7330	117.4670	10/26/1954	162226.0	0.0	4.10	0.044	VI	18.2(29.3)

EARTHQUAKE SEARCH RESULTS

Page 2

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]

GSP	33.7330	117.4660	09/02/2007	172914.0	2.0	4.70	0.060	VI	18.3(29.4)
DMG	33.7500	118.0830	03/11/1933	555 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1045 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	618 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	911 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	323 0.0	0.0	5.00	0.069	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1547 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1653 0.0	0.0	4.80	0.062	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1944 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1129 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	311 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	259 0.0	0.0	4.60	0.056	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1025 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	3 9 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	740 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	835 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	257 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	22 0 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	347 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	6 1 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	439 0.0	0.0	4.90	0.065	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	440 0.0	0.0	4.70	0.059	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	23 5 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	11 0 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	034 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	258 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	910 0.0	0.0	5.10	0.073	VII	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	524 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	616 0.0	0.0	4.60	0.056	VI	18.9(30.4)
DMG	33.7500	118.0830	03/14/1933	1219 0.0	0.0	4.50	0.053	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	611 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/14/1933	2242 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	1651 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	635 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1138 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1141 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1147 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	8 8 0.0	0.0	4.50	0.053	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	252 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	837 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	448 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	546 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/20/1933	1358 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/21/1933	326 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/23/1933	840 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/23/1933	1831 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/25/1933	1346 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/30/1933	1225 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/31/1933	1049 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	1825 0.0	0.0	4.10	0.043	VI	18.9(30.4)

DMG	33.7500	118.0830	03/12/1933	2128 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	2354 0.0	0.0	4.50	0.053	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	230 0.0	0.0	5.10	0.073	VII	18.9(30.4)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.7500	118.0830	03/12/1933	027 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	515 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/18/1933	2052 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/19/1933	2123 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	521 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/14/1933	036 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	2 5 0.0	0.0	4.30	0.048	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	2 9 0.0	0.0	5.00	0.069	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	210 0.0	0.0	4.60	0.056	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1956 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	216 0.0	0.0	4.80	0.062	VI	18.9(30.4)
DMG	33.7500	118.0830	04/01/1933	642 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	04/02/1933	8 0 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	04/02/1933	1536 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	2240 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/16/1933	1530 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	832 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/17/1933	1651 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/13/1933	131828.0	0.0	5.30	0.081	VII	18.9(30.4)
DMG	33.7500	118.0830	03/13/1933	1532 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	3 5 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	926 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	227 0.0	0.0	4.60	0.056	VI	18.9(30.4)
DMG	33.7500	118.0830	03/16/1933	1529 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	336 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	339 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	1738 0.0	0.0	4.50	0.053	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	436 0.0	0.0	4.60	0.056	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	759 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	553 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	2 4 0.0	0.0	4.90	0.065	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	513 0.0	0.0	4.70	0.059	VI	18.9(30.4)
DMG	33.7500	118.0830	03/13/1933	617 0.0	0.0	4.00	0.041	V	18.9(30.4)

DMG	33.7500	118.0830	03/15/1933	2 8 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	2231 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	2232 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/16/1933	1456 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	751 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/13/1933	343 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7500	118.0830	03/12/1933	15 2 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	1357 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	211 0.0	0.0	4.40	0.050	VI	18.9(30.4)
DMG	33.7500	118.0830	03/13/1933	1929 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/11/1933	222 0.0	0.0	4.00	0.041	V	18.9(30.4)
DMG	33.7500	118.0830	03/15/1933	540 0.0	0.0	4.20	0.045	VI	18.9(30.4)
DMG	33.7500	118.0830	03/13/1933	432 0.0	0.0	4.70	0.059	VI	18.9(30.4)
DMG	33.7500	118.0830	03/15/1933	432 0.0	0.0	4.10	0.043	VI	18.9(30.4)
DMG	33.7330	118.1000	03/11/1933	15 9 0.0	0.0	4.40	0.049	VI	19.5(31.4)
DMG	33.7330	118.1000	03/11/1933	1447 0.0	0.0	4.40	0.049	VI	19.5(31.4)
DMG	33.7330	118.1000	03/11/1933	1350 0.0	0.0	4.40	0.049	VI	19.5(31.4)
DMG	33.6170	118.1170	01/20/1934	2117 0.0	0.0	4.50	0.051	VI	20.1(32.3)
PAS	33.5080	118.0710	11/20/1988	53928.7	6.0	4.50	0.050	VI	20.2(32.5)
GSG	33.9530	117.7610	07/29/2008	184215.7	14.0	5.30	0.077	VII	20.2(32.5)

EARTHQUAKE SEARCH RESULTS

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FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	33.9510	117.7090	01/05/1998	181406.5	11.0	4.30	0.045	VI	20.4(32.8)
GSP	33.9550	117.7460	12/14/2001	120135.5	13.0	4.00	0.038	V	20.4(32.8)
GSP	33.9325	117.9158	03/29/2014	040942.2	5.1	5.10	0.068	VI	20.5(33.0)
DMG	33.7670	118.1170	11/04/1939	2141 0.0	0.0	4.00	0.037	V	21.1(34.0)
PAS	33.4710	118.0610	02/27/1984	101815.0	6.0	4.00	0.037	V	21.2(34.1)
DMG	33.5170	118.1000	03/22/1941	82240.0	0.0	4.00	0.037	V	21.3(34.3)
DMG	33.7000	117.4000	05/15/1910	1547 0.0	0.0	6.00	0.106	VII	21.5(34.7)
DMG	33.7000	117.4000	04/11/1910	757 0.0	0.0	5.00	0.062	VI	21.5(34.7)
DMG	33.7000	117.4000	05/13/1910	620 0.0	0.0	5.00	0.062	VI	21.5(34.7)
DMG	33.7500	118.1330	03/11/1933	11 4 0.0	0.0	4.60	0.050	VI	21.6(34.8)
GSP	33.9613	117.8923	03/29/2014	213245.9	9.3	4.14	0.039	V	21.9(35.2)
PAS	33.9650	117.8860	01/01/1976	172012.9	6.2	4.20	0.040	V	22.0(35.4)
DMG	33.7830	118.1330	01/13/1940	749 7.0	0.0	4.00	0.036	V	22.4(36.0)
DMG	33.7830	118.1330	10/02/1933	91017.6	0.0	5.40	0.075	VII	22.4(36.0)
DMG	33.7830	118.1330	11/20/1933	1032 0.0	0.0	4.00	0.036	V	22.4(36.0)
DMG	33.9500	117.5830	04/11/1941	12024.0	0.0	4.00	0.035	V	22.7(36.6)

DMG	33.7500	118.1670	05/16/1933	205855.0	0.0	4.00	0.034	V	23.5(37.8)
MGI	34.0000	117.7000	12/03/1929	9 5 0.0	0.0	4.00	0.034	V	23.8(38.3)
PAS	34.0060	117.7390	02/18/1989	717 4.8	3.3	4.30	0.040	V	23.9(38.5)
DMG	33.7500	118.1830	08/04/1933	41748.0	0.0	4.00	0.033	V	24.4(39.3)
DMG	33.8330	117.4000	06/05/1940	82727.0	0.0	4.00	0.033	V	24.4(39.3)
DMG	33.6330	118.2000	11/01/1940	20 046.0	0.0	4.00	0.033	V	24.7(39.7)
DMG	33.6300	118.2000	09/13/1929	132338.2	0.0	4.00	0.033	V	24.7(39.7)
DMG	33.9000	118.1000	07/08/1929	1646 6.7	13.0	4.70	0.047	VI	25.1(40.3)
DMG	33.9960	117.9750	06/15/1967	458 5.5	10.0	4.10	0.034	V	25.9(41.7)
DMG	33.7830	118.2000	12/27/1939	192849.0	0.0	4.70	0.046	VI	26.0(41.8)
PAS	33.5380	118.2070	05/25/1982	134430.3	13.7	4.10	0.033	V	26.4(42.5)
DMG	33.9670	118.0500	01/30/1941	13446.9	0.0	4.10	0.033	V	26.5(42.6)
MGI	34.0000	118.0000	12/25/1903	1745 0.0	0.0	5.00	0.053	VI	26.8(43.2)
MGI	34.0000	118.0000	05/05/1929	735 0.0	0.0	4.00	0.031	V	26.8(43.2)
MGI	34.0000	118.0000	05/05/1929	1 7 0.0	0.0	4.60	0.043	VI	26.8(43.2)
DMG	33.8170	118.2170	10/22/1941	65718.5	0.0	4.90	0.049	VI	27.7(44.6)
MGI	34.0000	117.5000	12/16/1858	10 0 0.0	0.0	7.00	0.146	VIII	28.1(45.3)
DMG	34.0000	117.5000	07/03/1908	1255 0.0	0.0	4.00	0.030	V	28.1(45.3)
DMG	33.8670	118.2000	11/13/1933	2128 0.0	0.0	4.00	0.030	V	28.4(45.7)
DMG	33.7590	118.2530	08/31/1938	31814.2	10.0	4.50	0.039	V	28.5(45.8)
DMG	33.7830	118.2500	11/14/1941	84136.3	0.0	5.40	0.062	VI	28.7(46.2)
DMG	33.9500	118.1330	10/25/1933	7 046.0	0.0	4.30	0.035	V	28.8(46.3)
GSP	33.9920	118.0820	03/16/2010	110400.2	18.0	4.40	0.036	V	29.0(46.6)
DMG	33.8670	118.2170	06/19/1944	3 6 7.0	0.0	4.40	0.036	V	29.2(47.1)
DMG	33.8670	118.2170	06/19/1944	0 333.0	0.0	4.50	0.038	V	29.2(47.1)
MGI	33.9000	118.2000	10/08/1927	1914 0.0	0.0	4.60	0.040	V	29.6(47.6)
DMG	33.5000	118.2500	06/18/1920	10 8 0.0	0.0	4.50	0.038	V	29.6(47.7)
DMG	33.3670	118.1500	04/16/1942	72833.0	0.0	4.00	0.029	V	29.7(47.9)
DMG	33.9330	117.3670	10/24/1943	02921.0	0.0	4.00	0.029	V	29.9(48.1)
DMG	34.1000	117.8000	03/31/1931	2033 0.0	0.0	4.00	0.028	V	30.4(48.9)
DMG	34.1000	117.6830	01/18/1934	214 0.0	0.0	4.00	0.028	V	30.8(49.5)
DMG	34.1000	117.6830	01/09/1934	1410 0.0	0.0	4.50	0.037	V	30.8(49.5)
T-A	34.0000	117.4200	09/10/1920	1415 0.0	0.0	4.30	0.033	V	30.9(49.8)
T-A	34.0000	117.4200	04/12/1888	1315 0.0	0.0	4.30	0.033	V	30.9(49.8)
GSP	34.1100	117.7200	04/17/1990	223227.2	4.0	4.60	0.038	V	31.2(50.2)
DMG	33.8500	118.2670	03/11/1933	629 0.0	0.0	4.40	0.034	V	31.3(50.3)
DMG	33.8500	118.2670	03/11/1933	1425 0.0	0.0	5.00	0.047	VI	31.3(50.3)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]

DMG	33.9390	118.2050	01/11/1950	214135.0	0.4	4.10	0.029	V	31.4(50.5)
MGI	34.0000	117.4000	05/22/1907	652 0.0	0.0	4.60	0.038	V	31.7(51.0)
MGI	33.8000	118.3000	12/31/1928	1045 0.0	0.0	4.00	0.027	V	31.8(51.2)
DMG	33.8000	118.3000	11/03/1931	16 5 0.0	0.0	4.00	0.027	V	31.8(51.2)
PAS	34.0500	118.0870	10/01/1987	155953.5	10.4	4.00	0.027	V	32.4(52.1)
PAS	34.0520	118.0900	10/01/1987	151231.8	10.8	4.70	0.039	V	32.6(52.5)
GSP	34.1300	117.7000	03/01/1990	003457.1	4.0	4.00	0.027	V	32.7(52.6)
PAS	34.0610	118.0790	10/01/1987	144220.0	9.5	5.90	0.073	VII	32.8(52.7)
PAS	34.0490	118.1010	10/01/1987	144541.5	13.6	4.70	0.039	V	32.8(52.8)
PAS	34.0770	118.0470	02/11/1988	152555.7	12.5	4.70	0.039	V	32.8(52.8)
PAS	34.1360	117.7090	06/26/1988	15 458.5	7.9	4.60	0.036	V	33.0(53.1)
MGI	34.1000	118.0000	01/27/1930	2026 0.0	0.0	4.60	0.036	V	33.0(53.2)
GSP	34.1400	117.7000	02/28/1990	234336.6	5.0	5.20	0.050	VI	33.4(53.7)
PAS	34.0600	118.1000	10/01/1987	1449 5.9	11.7	4.70	0.038	V	33.4(53.7)
GSP	34.1400	117.6900	03/02/1990	172625.4	6.0	4.60	0.036	V	33.4(53.8)
DMG	33.5430	118.3400	09/14/1963	35116.2	2.2	4.20	0.029	V	33.7(54.2)
GSP	33.9220	118.2700	10/28/2001	162745.6	21.0	4.00	0.026	V	33.8(54.4)
GSP	34.1500	117.7200	03/01/1990	032303.0	11.0	4.70	0.038	V	33.9(54.6)
MGI	34.0000	118.2000	06/26/1917	2115 0.0	0.0	4.60	0.036	V	33.9(54.6)
MGI	34.0000	118.2000	06/26/1917	2130 0.0	0.0	4.60	0.036	V	33.9(54.6)
MGI	34.0000	118.2000	06/26/1917	2120 0.0	0.0	4.60	0.036	V	33.9(54.6)
MGI	34.0000	118.2000	02/13/1917	13 5 0.0	0.0	4.60	0.036	V	33.9(54.6)
MGI	34.0000	118.2000	06/26/1917	424 0.0	0.0	4.00	0.026	V	33.9(54.6)
PAS	34.0760	118.0900	10/01/1987	1448 3.1	11.7	4.10	0.027	V	34.0(54.7)
DMG	33.7380	117.1870	04/27/1962	91232.1	5.7	4.10	0.027	V	34.0(54.7)
PAS	34.0730	118.0980	10/04/1987	105938.2	8.2	5.30	0.051	VI	34.1(54.8)
GSP	34.0200	118.1800	06/12/1989	172225.5	16.0	4.10	0.027	V	34.1(54.9)
GSP	33.6583	118.3722	05/15/2013	200006.2	1.1	4.08	0.027	V	34.5(55.5)
GSP	34.0300	118.1800	06/12/1989	165718.4	16.0	4.40	0.032	V	34.6(55.7)
DMG	33.8830	118.3170	03/11/1933	1457 0.0	0.0	4.90	0.041	V	34.8(56.1)
DMG	34.1270	117.5210	12/27/1938	10 928.6	10.0	4.00	0.025	V	35.3(56.7)
DMG	34.0330	117.3500	04/18/1940	184343.9	0.0	4.40	0.031	V	35.3(56.8)
MGI	34.1000	118.1000	07/11/1855	415 0.0	0.0	6.30	0.084	VII	35.7(57.4)
DMG	34.1160	117.4750	06/28/1960	20 048.0	12.0	4.10	0.026	V	35.7(57.5)
T-A	34.0000	118.2500	01/10/1856	0 0 0.0	0.0	5.00	0.042	VI	36.1(58.0)
T-A	34.0000	118.2500	05/02/1856	810 0.0	0.0	4.30	0.029	V	36.1(58.0)
T-A	34.0000	118.2500	09/23/1827	0 0 0.0	0.0	5.00	0.042	VI	36.1(58.0)
T-A	34.0000	118.2500	03/26/1860	0 0 0.0	0.0	5.00	0.042	VI	36.1(58.0)
T-A	34.0000	118.2500	01/17/1857	1 0 0.0	0.0	4.30	0.029	V	36.1(58.0)
T-A	34.0000	118.2500	03/21/1880	1425 0.0	0.0	4.30	0.029	V	36.1(58.0)
T-A	34.0000	118.2500	05/04/1857	6 0 0.0	0.0	4.30	0.029	V	36.1(58.0)
DMG	34.1240	117.4800	05/15/1955	17 326.0	7.6	4.00	0.025	V	36.1(58.1)
DMG	33.6330	118.4000	10/17/1934	938 0.0	0.0	4.00	0.025	V	36.1(58.2)
DMG	34.1400	117.5150	01/01/1965	8 418.0	5.9	4.40	0.031	V	36.2(58.3)
DMG	34.0000	117.2830	11/07/1939	1852 8.4	0.0	4.70	0.036	V	36.5(58.8)
DMG	34.0330	117.3170	09/03/1935	647 0.0	0.0	4.50	0.032	V	36.6(58.9)
DMG	33.9000	117.2000	12/19/1880	0 0 0.0	0.0	6.00	0.070	VI	36.7(59.1)
DMG	33.6630	118.4130	01/08/1967	738 5.3	17.7	4.00	0.024	V	36.8(59.3)
DMG	34.1120	117.4260	03/19/1937	12338.4	10.0	4.00	0.024	V	36.9(59.4)

DMG	33.9960	117.2700	02/17/1952	123658.3	16.0	4.50	0.032	V	36.9(59.4)
GSP	34.1250	117.4380	01/06/2005	143527.7	4.0	4.40	0.030	V	37.3(60.1)
GSP	34.1390	117.4650	03/09/2008	092232.1	3.0	4.00	0.024	V	37.4(60.2)
DMG	34.1670	117.5330	03/01/1948	81213.0	0.0	4.70	0.035	V	37.5(60.4)

EARTHQUAKE SEARCH RESULTS

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FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.9830	118.3000	02/11/1940	192410.0	0.0	4.00	0.024	V	37.6(60.5)
GSP	33.9380	118.3360	05/18/2009	033936.3	13.0	4.70	0.035	V	37.6(60.5)
PAS	34.1350	117.4480	01/08/1983	71930.4	4.6	4.10	0.025	V	37.6(60.6)
DMG	34.1830	117.5830	10/03/1948	24628.0	0.0	4.00	0.024	V	37.7(60.6)
DMG	34.2000	117.9000	08/28/1889	215 0.0	0.0	5.50	0.053	VI	38.0(61.1)
DMG	34.2000	117.9000	07/13/1935	105416.5	0.0	4.70	0.035	V	38.0(61.1)
DMG	33.7830	118.4170	11/01/1940	725 3.0	0.0	4.00	0.024	IV	38.0(61.1)
DMG	33.7830	118.4170	10/14/1940	205111.0	0.0	4.00	0.024	IV	38.0(61.1)
DMG	33.7830	118.4170	10/12/1940	024 0.0	0.0	4.00	0.024	IV	38.0(61.1)
DMG	33.7830	118.4170	11/02/1940	25826.0	0.0	4.00	0.024	IV	38.0(61.1)
DMG	34.0000	117.2500	07/23/1923	73026.0	0.0	6.25	0.078	VII	38.0(61.2)
DMG	34.0000	117.2500	11/01/1932	445 0.0	0.0	4.00	0.024	IV	38.0(61.2)
DMG	34.1320	117.4260	04/15/1965	20 833.3	5.5	4.50	0.031	V	38.1(61.3)
DMG	34.1830	117.5480	09/01/1937	163533.5	10.0	4.50	0.031	V	38.3(61.6)
GSP	34.1430	117.4425	01/15/2014	093518.9	2.9	4.43	0.030	V	38.3(61.6)
MGI	34.0000	118.3000	06/30/1920	350 0.0	0.0	4.00	0.024	IV	38.3(61.6)
MGI	34.0000	118.3000	06/22/1920	2035 0.0	0.0	4.00	0.024	IV	38.3(61.6)
MGI	34.0000	118.3000	09/03/1905	540 0.0	0.0	5.30	0.047	VI	38.3(61.6)
DMG	33.7000	117.1000	06/11/1902	245 0.0	0.0	4.50	0.031	V	38.7(62.3)
MGI	34.1000	118.2000	01/27/1860	830 0.0	0.0	4.30	0.027	V	39.0(62.8)
MGI	34.1000	118.2000	05/02/1916	1432 0.0	0.0	4.00	0.023	IV	39.0(62.8)
MGI	34.1000	118.2000	04/21/1921	1538 0.0	0.0	4.00	0.023	IV	39.0(62.8)
PAS	34.0230	117.2450	10/02/1985	234412.4	15.2	4.80	0.035	V	39.2(63.1)
MGI	34.2000	118.0000	01/09/1921	530 0.0	0.0	4.60	0.032	V	39.5(63.5)
PAS	34.1490	118.1350	12/03/1988	113826.4	13.3	4.90	0.037	V	39.6(63.8)
DMG	33.7670	118.4500	10/11/1940	55712.3	0.0	4.70	0.033	V	39.6(63.8)
USG	34.1390	117.3860	02/21/1987	231530.1	2.6	4.07	0.024	IV	39.7(64.0)
GSP	34.0470	117.2550	02/21/2000	134943.1	15.0	4.50	0.030	V	39.9(64.2)
GSP	34.0240	117.2300	03/11/1998	121851.8	14.0	4.50	0.030	V	39.9(64.3)
DMG	33.6320	118.4670	01/08/1967	73730.4	11.4	4.00	0.023	IV	40.0(64.4)
DMG	34.1180	117.3410	09/22/1951	82239.1	11.9	4.30	0.027	V	40.1(64.5)
MGI	34.0800	118.2600	07/16/1920	18 8 0.0	0.0	5.00	0.039	V	40.3(64.8)

DMG	34.2000	117.5000	06/14/1892	1325 0.0	0.0	4.90	0.037	V	40.4(65.0)
PAS	34.2110	117.5300	10/19/1979	122237.8	4.9	4.10	0.024	V	40.4(65.1)
DMG	34.2110	117.5300	09/01/1937	1348 8.2	10.0	4.50	0.030	V	40.4(65.1)
MGI	34.1000	117.3000	11/22/1911	257 0.0	0.0	4.00	0.023	IV	40.6(65.4)
MGI	34.1000	117.3000	07/15/1905	2041 0.0	0.0	5.30	0.045	VI	40.6(65.4)
MGI	34.1000	117.3000	12/27/1901	11 0 0.0	0.0	4.60	0.031	V	40.6(65.4)
DMG	34.1000	117.3000	02/16/1931	1327 0.0	0.0	4.00	0.023	IV	40.6(65.4)
DMG	34.1270	117.3380	02/23/1936	222042.7	10.0	4.50	0.029	V	40.7(65.5)
GSP	34.1070	117.3040	01/09/2009	034946.3	14.0	4.50	0.029	V	40.9(65.7)
DMG	34.0430	117.2280	04/03/1939	25044.7	10.0	4.00	0.023	IV	40.9(65.8)
DMG	33.9030	118.4310	11/29/1938	192115.8	10.0	4.00	0.022	IV	41.4(66.6)
DMG	33.7700	118.4800	04/24/1931	182754.8	0.0	4.40	0.028	V	41.4(66.6)
DMG	34.1400	117.3390	02/26/1936	93327.6	10.0	4.00	0.022	IV	41.4(66.6)
GSP	34.0050	117.1800	02/13/2010	213906.6	8.0	4.10	0.024	IV	41.4(66.7)
T-A	34.0800	117.2500	10/07/1869	0 0 0.0	0.0	4.30	0.026	V	41.6(67.0)
T-A	33.5000	117.0700	12/29/1880	7 0 0.0	0.0	4.30	0.026	V	41.9(67.4)
T-A	34.1700	118.1700	03/07/1888	1554 0.0	0.0	4.30	0.026	V	41.9(67.5)
GSP	34.1910	117.4132	12/30/2015	014857.3	7.0	4.40	0.027	V	42.0(67.6)
DMG	34.2170	117.4670	03/25/1941	234341.0	0.0	4.00	0.022	IV	42.2(67.9)
GSP	34.2500	117.9900	06/28/1991	170055.5	9.0	4.30	0.026	V	42.6(68.5)
GSP	34.1900	117.3900	12/28/1989	094108.1	15.0	4.50	0.028	V	42.6(68.5)

EARTHQUAKE SEARCH RESULTS

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FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
MGI	34.1000	118.3000	07/16/1920	2022 0.0	0.0	4.60	0.030	V	42.9(69.0)
MGI	34.1000	118.3000	07/26/1920	1215 0.0	0.0	4.00	0.022	IV	42.9(69.0)
MGI	34.1000	118.3000	07/16/1920	2127 0.0	0.0	4.60	0.030	V	42.9(69.0)
MGI	34.1000	118.3000	07/16/1920	2130 0.0	0.0	4.60	0.030	V	42.9(69.0)
MGI	33.8000	118.5000	06/18/1915	15 5 0.0	0.0	4.00	0.022	IV	42.9(69.0)
DMG	34.2000	117.4000	07/22/1899	046 0.0	0.0	5.50	0.048	VI	42.9(69.0)
MGI	34.0000	118.4000	02/07/1927	429 0.0	0.0	4.60	0.030	V	43.0(69.2)
MGI	34.0000	118.4000	10/01/1930	040 0.0	0.0	4.60	0.030	V	43.0(69.2)
MGI	34.0000	118.4000	02/22/1920	1610 0.0	0.0	4.60	0.030	V	43.0(69.2)
MGI	34.0000	118.4000	01/29/1927	2324 0.0	0.0	4.00	0.022	IV	43.0(69.2)
GSP	34.1680	117.3370	06/28/1997	214525.1	9.0	4.20	0.024	V	43.0(69.2)
GSP	34.2620	118.0020	06/28/1991	144354.5	11.0	5.40	0.045	VI	43.6(70.1)
T-A	34.1700	117.3200	12/02/1859	2210 0.0	0.0	4.30	0.025	V	43.7(70.3)
DMG	34.0000	118.4170	12/07/1938	338 0.0	0.0	4.00	0.021	IV	43.8(70.5)
DMG	34.2700	117.5400	09/12/1970	143053.0	8.0	5.40	0.044	VI	44.1(71.0)

DMG	34.2670	117.5180	09/12/1970	141011.2	8.0	4.10	0.022	IV	44.3(71.3)
PAS	33.0330	117.9440	02/22/1983	21830.4	10.0	4.30	0.025	V	44.5(71.5)
USG	33.0170	117.8170	07/16/1986	1247 3.7	10.0	4.11	0.022	IV	44.5(71.6)
USG	33.0170	117.8170	07/14/1986	11112.6	10.0	4.12	0.022	IV	44.5(71.6)
DMG	34.2810	117.5520	09/13/1970	44748.6	8.0	4.40	0.026	V	44.6(71.8)
MGI	34.1000	117.2000	04/23/1923	2113 0.0	0.0	4.00	0.021	IV	44.7(71.9)
GSP	34.0590	118.3870	09/09/2001	235918.0	4.0	4.20	0.023	IV	44.7(72.0)
GSP	33.9530	117.0760	09/14/2011	144451.0	16.0	4.10	0.022	IV	44.7(72.0)
DMG	33.7500	117.0000	06/06/1918	2232 0.0	0.0	5.00	0.036	V	44.8(72.0)
DMG	33.7500	117.0000	04/21/1918	223225.0	0.0	6.80	0.092	VII	44.8(72.0)
DMG	34.3000	117.6000	07/30/1894	512 0.0	0.0	6.00	0.060	VI	45.2(72.8)
DMG	33.8000	117.0000	12/25/1899	1225 0.0	0.0	6.40	0.074	VII	45.4(73.0)
DMG	33.5000	117.0000	08/08/1925	1013 0.0	0.0	4.50	0.027	V	45.8(73.6)
DMG	34.3040	117.5700	05/05/1969	16 2 9.6	8.8	4.40	0.025	V	45.9(73.9)
MGI	34.2000	117.3000	04/13/1913	1045 0.0	0.0	4.00	0.021	IV	46.0(74.1)
PAS	32.9900	117.8490	07/13/1986	14 133.0	12.0	4.60	0.028	V	46.5(74.8)
GSP	32.9850	117.8180	06/21/1995	211736.2	6.0	4.30	0.024	IV	46.7(75.2)
PAS	32.9860	117.8440	10/01/1986	201218.6	6.0	4.00	0.020	IV	46.8(75.2)
DMG	34.3000	117.5000	07/22/1899	2032 0.0	0.0	6.50	0.076	VII	46.8(75.3)
GSP	33.9320	117.0230	01/16/2010	120325.7	13.0	4.30	0.024	IV	46.9(75.4)
PAS	32.9700	117.8030	07/14/1986	03246.2	10.0	4.00	0.020	IV	47.7(76.8)
GSP	32.9700	117.8100	04/04/1990	085439.3	6.0	4.00	0.020	IV	47.7(76.8)
MGI	34.0000	118.5000	11/19/1918	2018 0.0	0.0	5.00	0.034	V	47.9(77.1)
DMG	34.0000	118.5000	11/08/1914	1140 0.0	0.0	4.50	0.026	V	47.9(77.1)
DMG	34.0000	118.5000	08/04/1927	1224 0.0	0.0	5.00	0.034	V	47.9(77.1)
DMG	34.0000	118.5000	03/06/1918	1820 0.0	0.0	4.00	0.020	IV	47.9(77.1)
DMG	34.0000	118.5000	06/22/1920	248 0.0	0.0	4.90	0.032	V	47.9(77.1)
MGI	34.0000	118.5000	06/23/1920	1220 0.0	0.0	4.00	0.020	IV	47.9(77.1)
MGI	34.0000	118.5000	03/08/1918	1230 0.0	0.0	4.00	0.020	IV	47.9(77.1)
PAS	32.9710	117.8700	07/13/1986	1347 8.2	6.0	5.30	0.040	V	47.9(77.2)
DMG	34.0170	117.0500	02/19/1940	12 655.7	0.0	4.60	0.027	V	48.2(77.5)
DMG	33.7100	116.9250	09/23/1963	144152.6	16.5	5.00	0.033	V	48.8(78.5)
PAS	32.9470	117.7360	01/15/1989	153955.2	6.0	4.20	0.022	IV	49.3(79.4)
PAS	32.9450	117.8060	09/07/1984	11 313.4	6.0	4.30	0.023	IV	49.4(79.6)
DMG	34.3700	117.6500	12/08/1812	15 0 0.0	0.0	7.00	0.094	VII	49.5(79.6)
PAS	32.9450	117.8310	07/29/1986	81741.8	10.0	4.10	0.020	IV	49.5(79.7)
GSP	34.3740	117.6490	08/20/1998	234958.4	9.0	4.40	0.024	IV	49.8(80.1)
DMG	34.0000	117.0000	06/30/1923	022 0.0	0.0	4.50	0.025	V	50.1(80.6)

EARTHQUAKE SEARCH RESULTS

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FILE	LAT.	LONG.	DATE	TIME (UTC)	DEPTH	QUAKE	SITE ACC.	SITE MM	APPROX. DISTANCE

CODE	NORTH	WEST		H M Sec	(km)	MAG.	g	INT.	mi [km]
PAS	32.9330	117.8410	07/29/1986	81741.6	10.0	4.30	0.022	IV	50.4(81.1)
DMG	33.5000	116.9170	11/04/1935	355 0.0	0.0	4.50	0.025	V	50.4(81.1)
GSP	34.0540	117.0300	06/27/2005	221733.6	12.0	4.00	0.019	IV	50.5(81.2)
GSP	34.3850	117.6350	10/16/2007	085344.1	8.0	4.20	0.021	IV	50.6(81.5)
MGI	33.8000	116.9000	06/14/1918	1024 0.0	0.0	4.00	0.019	IV	51.0(82.0)
MGI	33.8000	116.9000	04/23/1918	1415 0.0	0.0	4.00	0.019	IV	51.0(82.0)
MGI	33.8000	116.9000	12/18/1920	1726 0.0	0.0	4.00	0.019	IV	51.0(82.0)
MGI	33.8000	116.9000	04/29/1918	2 0 0.0	0.0	4.00	0.019	IV	51.0(82.0)
GSP	34.0958	118.4912	06/02/2014	023643.9	4.3	4.16	0.021	IV	51.0(82.1)
DMG	34.4000	117.8000	02/24/1946	6 752.0	0.0	4.10	0.020	IV	51.1(82.2)
DMG	33.2670	117.0170	06/07/1935	1633 0.0	0.0	4.00	0.019	IV	51.3(82.5)
GSP	34.0580	117.0100	06/16/2005	205326.0	11.0	4.90	0.030	V	51.6(83.0)
PAS	33.9190	118.6270	01/19/1989	65328.8	11.9	5.00	0.032	V	52.2(84.0)
DMG	33.4540	116.8980	07/29/1936	142252.8	10.0	4.00	0.019	IV	52.3(84.1)
DMG	33.4560	116.8960	06/16/1938	55916.9	10.0	4.00	0.019	IV	52.3(84.2)
GSP	34.1340	118.4862	03/17/2014	132536.9	9.2	4.39	0.023	IV	52.4(84.3)
DMG	33.0000	117.3000	11/22/1800	2130 0.0	0.0	6.50	0.069	VI	53.1(85.5)
DMG	33.9500	118.6320	08/31/1930	04036.0	0.0	5.20	0.035	V	53.2(85.7)
GSP	34.1920	117.0950	04/06/1994	190104.1	7.0	4.80	0.028	V	53.4(85.9)
GSP	33.5000	116.8620	11/17/2008	123542.0	12.0	4.10	0.019	IV	53.5(86.1)
DMG	34.2000	117.1000	09/20/1907	154 0.0	0.0	6.00	0.052	VI	53.6(86.2)
GSP	34.0850	116.9890	06/30/1992	214900.3	3.0	4.40	0.023	IV	53.6(86.2)
GSP	34.0970	116.9960	12/05/1997	170438.9	4.0	4.10	0.019	IV	53.7(86.4)
PAS	33.7010	116.8370	08/22/1979	2 136.3	5.0	4.10	0.019	IV	53.8(86.6)
GSP	32.9000	118.0070	06/20/2009	010030.6	14.0	4.10	0.019	IV	54.2(87.3)
GSP	34.1200	116.9980	06/29/1992	144126.0	4.0	4.40	0.022	IV	54.5(87.7)
GSP	34.0840	116.9680	10/02/2008	094149.3	12.0	4.10	0.019	IV	54.6(87.8)
MGI	33.2000	117.0000	07/20/1923	7 0 0.0	0.0	4.00	0.018	IV	54.7(88.0)
GSP	33.9585	116.8883	01/06/2016	144234.9	16.7	4.39	0.022	IV	54.7(88.0)
PAS	33.9330	118.6690	10/17/1979	205237.3	5.5	4.20	0.020	IV	54.8(88.2)
DMG	33.9680	116.8820	06/27/1959	162211.1	13.8	4.00	0.018	IV	55.3(89.0)
GSP	33.9660	116.8760	01/12/2010	023608.4	10.0	4.30	0.021	IV	55.5(89.4)
PAS	33.9440	118.6810	01/01/1979	231438.9	11.3	5.00	0.030	V	55.7(89.6)
GSP	34.1800	117.0200	12/04/1991	081703.5	11.0	4.00	0.018	IV	56.0(90.2)
GSP	34.2930	118.3890	12/06/1994	034834.5	9.0	4.50	0.023	IV	56.2(90.4)
GSP	34.2840	118.4040	01/14/2001	022614.1	8.0	4.30	0.021	IV	56.2(90.5)
GSP	34.2310	118.4750	03/20/1994	212012.3	13.0	5.30	0.035	V	56.3(90.6)
GSP	34.2890	118.4030	01/14/2001	025053.7	8.0	4.00	0.018	IV	56.5(90.9)
DMG	34.3350	118.3310	02/09/1971	155820.7	14.2	4.80	0.027	V	56.5(90.9)
DMG	33.9500	116.8500	09/28/1946	719 9.0	0.0	5.00	0.030	V	56.5(91.0)
DMG	34.3390	118.3320	02/09/1971	141612.9	11.1	4.10	0.018	IV	56.8(91.3)
GSP	34.2450	118.4710	01/18/1994	155144.9	12.0	4.00	0.017	IV	56.8(91.5)
DMG	34.2680	118.4450	08/30/1964	225737.1	15.4	4.00	0.017	IV	57.0(91.7)
PAS	34.1510	116.9720	11/20/1978	655 9.5	6.1	4.30	0.020	IV	57.0(91.7)
MGI	33.5000	116.8000	06/02/1917	435 0.0	0.0	4.00	0.017	IV	57.0(91.7)
MGI	33.5000	116.8000	05/31/1917	435 0.0	0.0	4.00	0.017	IV	57.0(91.7)
MGI	33.5000	116.8000	11/26/1916	17 5 0.0	0.0	4.00	0.017	IV	57.0(91.7)
MGI	33.5000	116.8000	03/30/1918	16 5 0.0	0.0	4.60	0.024	V	57.0(91.7)

GSP	34.2150	118.5100	01/19/1994	140914.8	17.0	4.50	0.023	IV	57.0(91.8)
GSP	34.1570	116.9760	12/19/2007	121409.0	7.0	4.00	0.017	IV	57.0(91.8)
GSP	33.4772	116.8033	08/15/2018	012426.3	1.9	4.43	0.022	IV	57.1(92.0)
DMG	34.1670	116.9830	10/16/1951	1241 5.0	0.0	4.00	0.017	IV	57.1(92.0)
DMG	34.3610	118.3060	02/09/1971	141021.5	5.0	4.70	0.025	V	57.2(92.1)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	34.1330	116.9500	06/10/1938	1440 0.0	0.0	4.00	0.017	IV	57.3(92.2)
GSP	34.3120	118.3930	05/25/1994	125657.1	7.0	4.40	0.021	IV	57.3(92.3)
GSP	34.3110	118.3980	06/15/1994	055948.6	7.0	4.20	0.019	IV	57.5(92.5)
DMG	34.3700	118.3020	02/10/1971	31212.0	0.8	4.00	0.017	IV	57.6(92.7)
DMG	34.3680	118.3140	04/25/1971	1448 6.5	-2.0	4.00	0.017	IV	57.9(93.1)
GSP	34.1210	116.9280	08/16/1998	133440.2	6.0	4.70	0.025	V	57.9(93.1)
GSB	34.2990	118.4280	01/23/1994	085508.7	6.0	4.20	0.019	IV	57.9(93.2)
GSP	34.1120	116.9200	10/01/1998	181816.0	4.0	4.70	0.025	V	57.9(93.2)
GSP	34.2130	118.5370	01/17/1994	123055.4	18.0	6.70	0.071	VI	58.1(93.5)
GSP	34.2990	118.4390	02/03/1994	162335.4	8.0	4.20	0.019	IV	58.3(93.9)
DMG	32.8500	117.4830	02/23/1943	92112.0	0.0	4.00	0.017	IV	58.4(94.0)
DMG	33.4880	116.7770	06/12/1959	11 313.0	5.7	4.00	0.017	IV	58.5(94.1)
DMG	33.6500	116.7500	09/05/1950	191956.0	0.0	4.80	0.026	V	58.7(94.5)
GSP	34.2870	118.4660	01/19/1994	071406.2	11.0	4.00	0.017	IV	58.7(94.5)
GSP	34.3010	118.4520	01/21/1994	185244.2	7.0	4.30	0.020	IV	58.9(94.8)
GSP	34.2970	118.4580	01/21/1994	185344.6	7.0	4.30	0.020	IV	58.9(94.8)
GSP	34.2920	118.4660	01/19/1994	144635.2	6.0	4.00	0.017	IV	59.0(94.9)
DMG	34.2960	118.4640	03/30/1971	85443.3	2.6	4.10	0.018	IV	59.1(95.1)
DMG	34.1000	116.8830	10/24/1935	1527 0.0	0.0	4.00	0.017	IV	59.3(95.4)
DMG	34.1000	116.8830	10/24/1935	1452 0.0	0.0	4.50	0.022	IV	59.3(95.4)
DMG	34.1000	116.8830	10/24/1935	1451 0.0	0.0	4.50	0.022	IV	59.3(95.4)
GSP	33.6500	116.7400	12/02/1989	231647.8	14.0	4.20	0.019	IV	59.3(95.4)
GSP	34.2910	118.4760	02/06/1994	131926.9	11.0	4.10	0.018	IV	59.3(95.5)
DMG	34.3080	118.4540	02/09/1971	144346.7	6.2	5.20	0.032	V	59.4(95.5)
GSB	34.3000	118.4660	01/21/1994	183915.3	10.0	4.70	0.024	V	59.4(95.6)
DMG	32.8000	117.8330	01/24/1942	214148.0	0.0	4.00	0.017	IV	59.5(95.8)
PAS	34.1980	116.9590	04/01/1978	105227.4	8.0	4.00	0.017	IV	59.5(95.8)
GSP	34.3110	118.4560	01/17/1994	193534.3	2.0	4.00	0.017	IV	59.6(95.9)
DMG	33.9670	116.8000	09/07/1945	153424.0	0.0	4.30	0.020	IV	59.6(96.0)
GSP	34.3170	118.4550	01/17/1994	132644.7	2.0	4.70	0.024	V	59.9(96.3)
GSP	34.3040	118.4730	01/17/1994	150703.2	2.0	4.20	0.019	IV	59.9(96.3)

GSP	34.3310	118.4420	01/17/1994	141430.3	1.0	4.50	0.022	IV	60.1(96.7)
GSP	34.2610	118.5340	01/17/1994	123939.8	14.0	4.50	0.022	IV	60.2(96.9)
GSB	34.3100	118.4740	01/21/1994	184228.8	7.0	4.20	0.019	IV	60.2(96.9)
DMG	34.3570	118.4060	02/09/1971	141950.2	11.8	4.00	0.017	IV	60.2(96.9)
GSP	34.2540	118.5450	01/17/1994	130627.9	0.0	4.60	0.023	IV	60.3(97.1)
GSP	34.2280	118.5730	01/17/1994	175608.2	19.0	4.60	0.023	IV	60.3(97.1)
GSP	34.1780	116.9220	06/28/1992	170131.9	13.0	4.70	0.024	V	60.4(97.2)
GSP	34.2823	117.0267	07/05/2014	165934.1	7.3	4.58	0.023	IV	60.5(97.4)
DMG	34.3870	118.3640	02/09/1971	143917.8	-1.6	4.00	0.017	IV	60.5(97.4)
GSP	33.6320	116.7190	07/19/1999	220927.5	14.0	4.20	0.018	IV	60.5(97.4)
DMG	34.1800	116.9200	01/16/1930	034 3.6	0.0	5.10	0.030	V	60.6(97.5)
DMG	34.1800	116.9200	01/16/1930	02433.9	0.0	5.20	0.031	V	60.6(97.5)
DMG	34.2860	118.5150	03/31/1971	145222.5	2.1	4.60	0.023	IV	60.6(97.5)
DMG	34.2730	118.5320	06/21/1971	16 1 8.5	4.1	4.00	0.017	IV	60.7(97.6)
DMG	34.4110	118.3290	02/10/1971	5 636.0	4.7	4.30	0.019	IV	60.8(97.9)
DMG	34.2840	118.5280	04/02/1971	54025.0	3.0	4.00	0.017	IV	61.0(98.2)
DMG	34.3960	118.3660	02/10/1971	173855.1	6.2	4.20	0.018	IV	61.1(98.3)
DMG	33.9760	116.7750	10/17/1965	94519.0	17.0	4.90	0.026	V	61.2(98.5)
DMG	33.9170	116.7500	01/25/1933	1444 0.0	0.0	4.00	0.016	IV	61.2(98.6)
DMG	32.8670	118.2500	02/13/1952	151337.0	0.0	4.70	0.024	IV	61.3(98.7)
GSP	34.2180	118.6070	01/18/1994	113509.9	12.0	4.20	0.018	IV	61.4(98.8)
DMG	33.9730	116.7690	06/10/1944	111531.9	10.0	4.00	0.016	IV	61.4(98.9)

EARTHQUAKE SEARCH RESULTS

Page 10

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.9330	116.7500	08/06/1938	228 0.0	0.0	4.00	0.016	IV	61.6(99.1)
DMG	33.9330	116.7500	10/28/1944	183016.0	0.0	4.40	0.020	IV	61.6(99.1)
GSP	34.3390	118.4750	09/01/2011	204708.0	7.0	4.20	0.018	IV	61.8(99.4)
DMG	34.3530	118.4560	03/07/1971	13340.5	3.3	4.50	0.021	IV	61.8(99.4)
GSG	34.3340	118.4840	01/17/1994	223152.1	10.0	4.20	0.018	IV	61.8(99.5)
GSP	34.1372	116.8580	09/16/2015	161047.3	9.6	4.00	0.016	IV	61.9(99.5)
DMG	34.0290	116.7870	04/30/1954	03623.9	11.1	4.20	0.018	IV	61.9(99.7)
GSP	34.0160	116.7798	05/08/2018	114934.0	12.9	4.49	0.021	IV	62.0(99.7)

****

-END OF SEARCH- 485 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2018

LENGTH OF SEARCH TIME: 219 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 7.8 MILES (12.5 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.0

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.196 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:

a-value= 3.532
b-value= 0.809
beta-value= 1.863

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	485	2.22477
4.5	176	0.80734
5.0	60	0.27523
5.5	19	0.08716
6.0	14	0.06422
6.5	6	0.02752
7.0	2	0.00917

APPENDIX F

Liquefaction Analysis

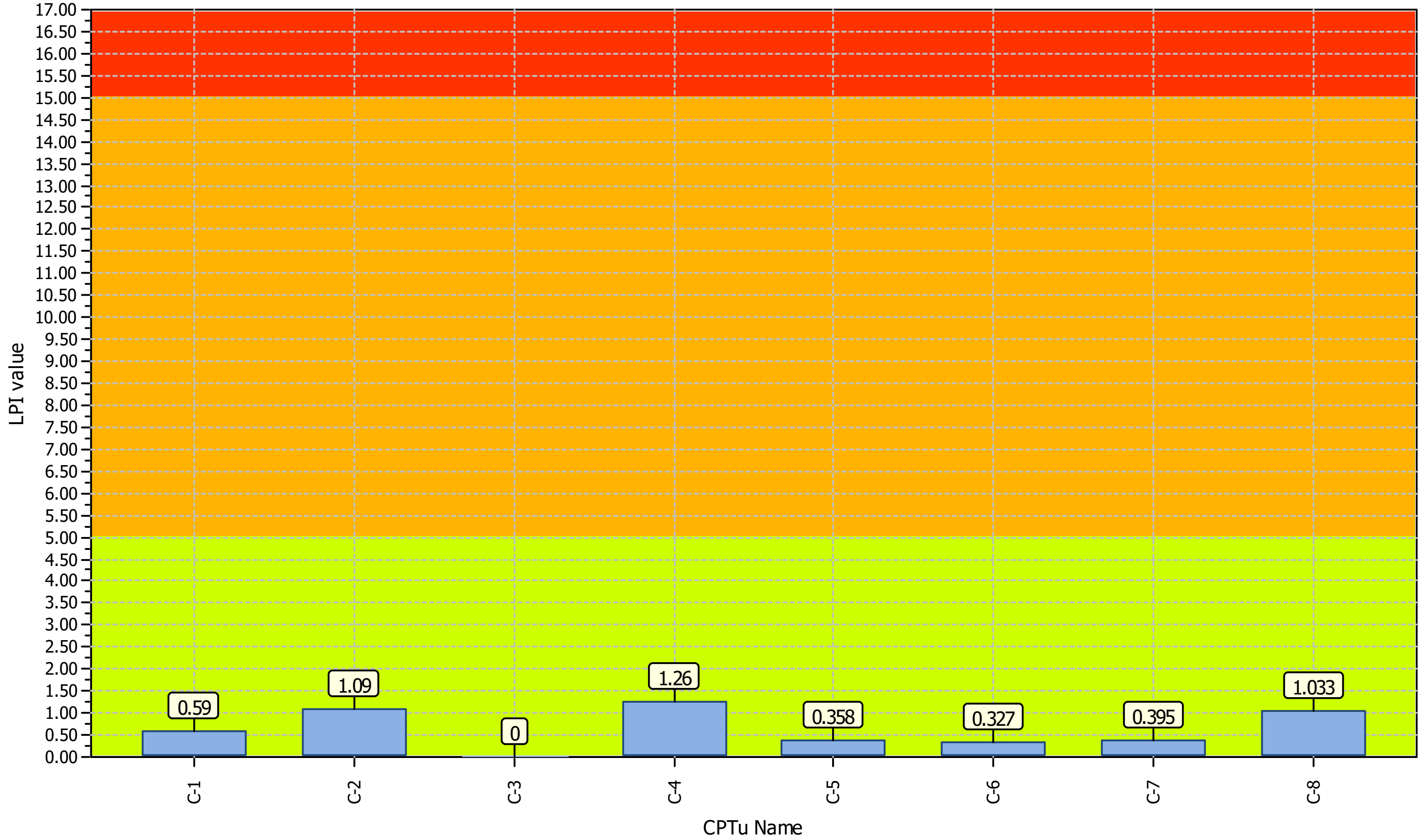
Leighton

Leighton Consulting, Inc.
17781 Cowan, Irvine, CA 92614

Project title : 11753.004 Hoag Irvine

Location : 16200 Sand Canyon Ave., Irvine, CA

Overall Liquefaction Potential Index report



LPI color scheme

- Very high risk
- High risk
- Low risk

Basic statistics

Total CPT number: 8

100% low risk

0% high risk

0% very high risk

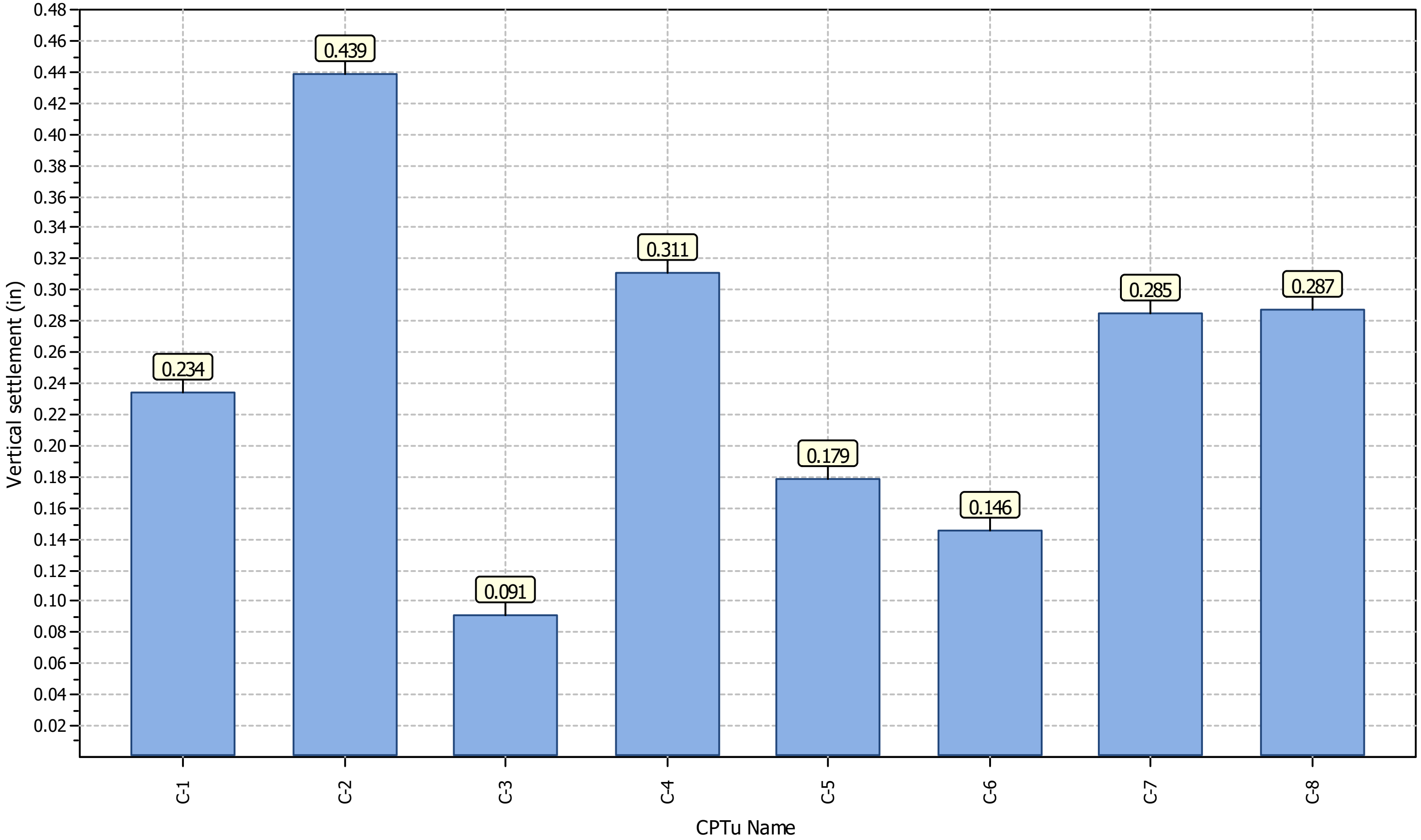
Leighton

Leighton Consulting, Inc.
17781 Cowan, Irvine, CA 92614

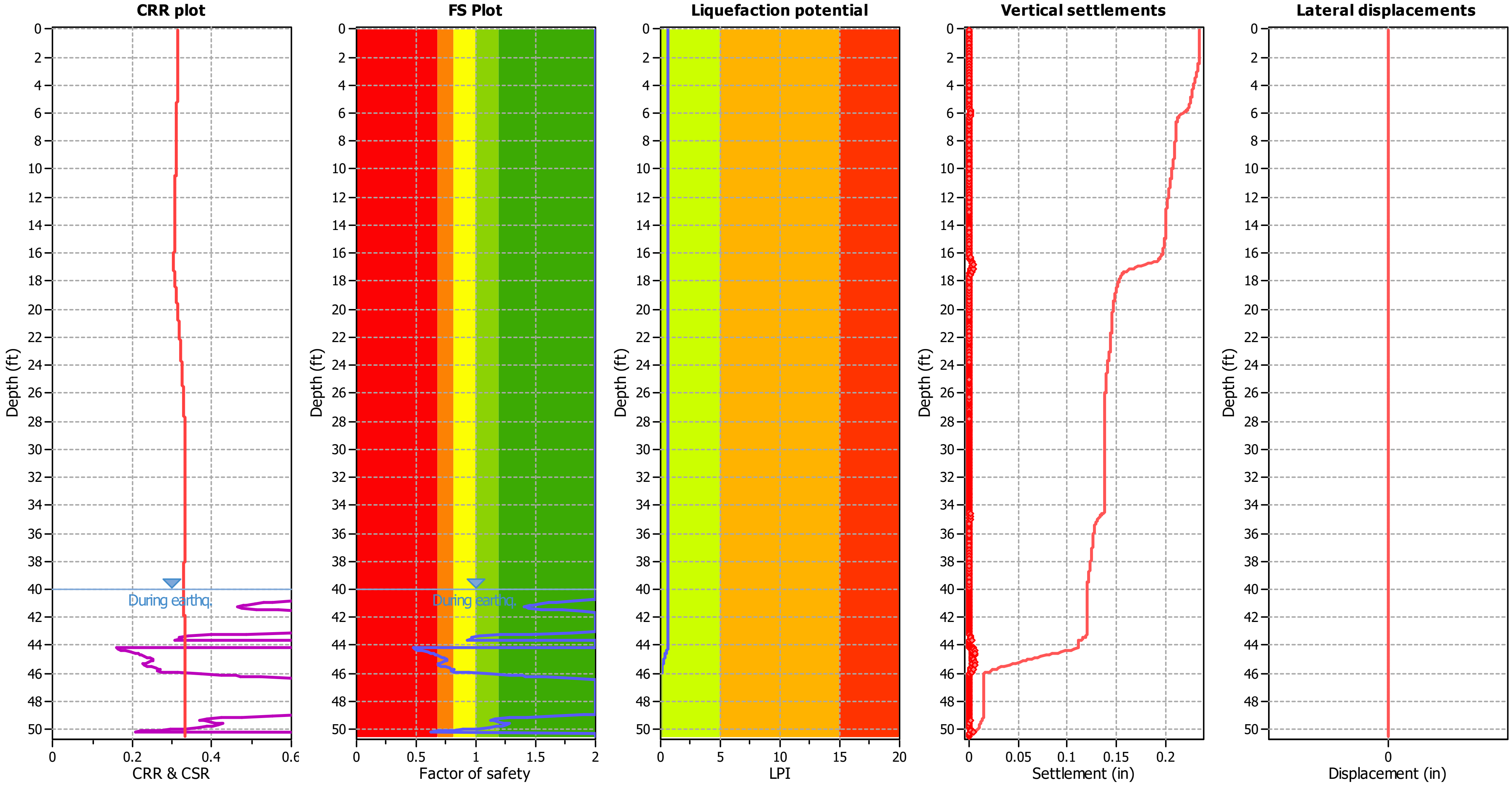
Project title : 11753.004 Hoag Irvine

Location : 16200 Sand Canyon Ave., Irvine, CA

Overall vertical settlements report



Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.58	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	40.00 ft	Fill height:	N/A	Limit depth:	N/A

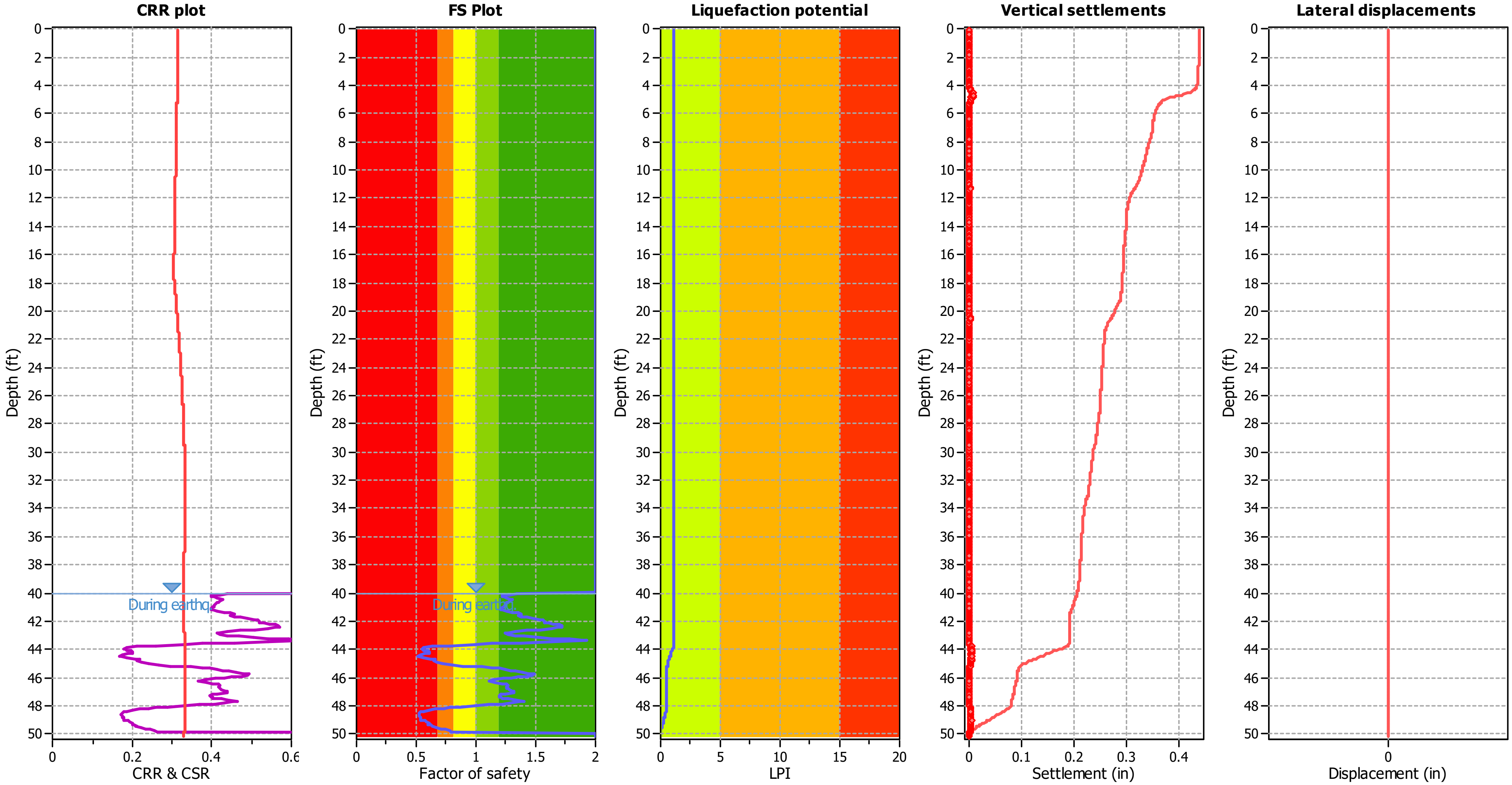
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
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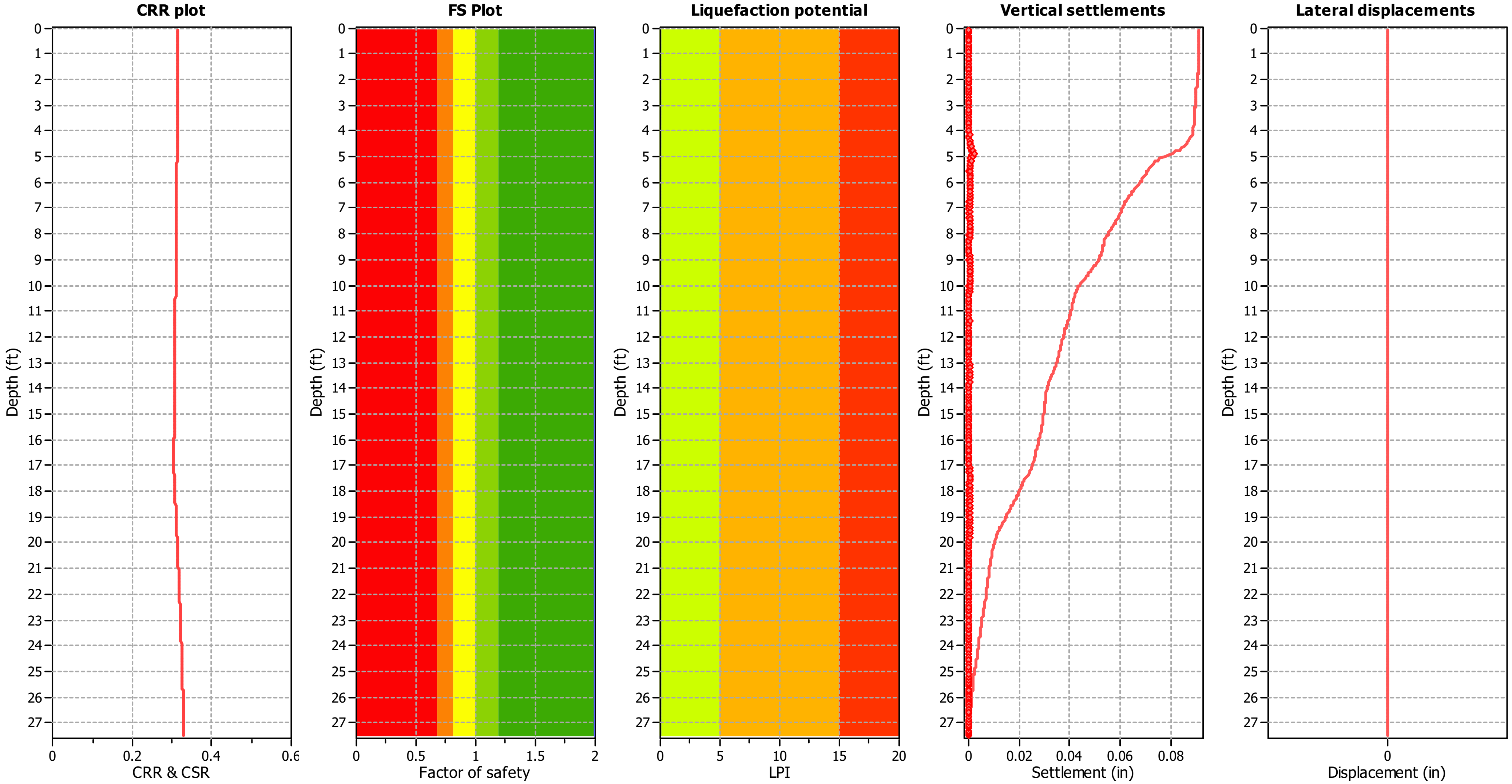
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
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Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.58	Use fill:	No	Limit depth applied:	No
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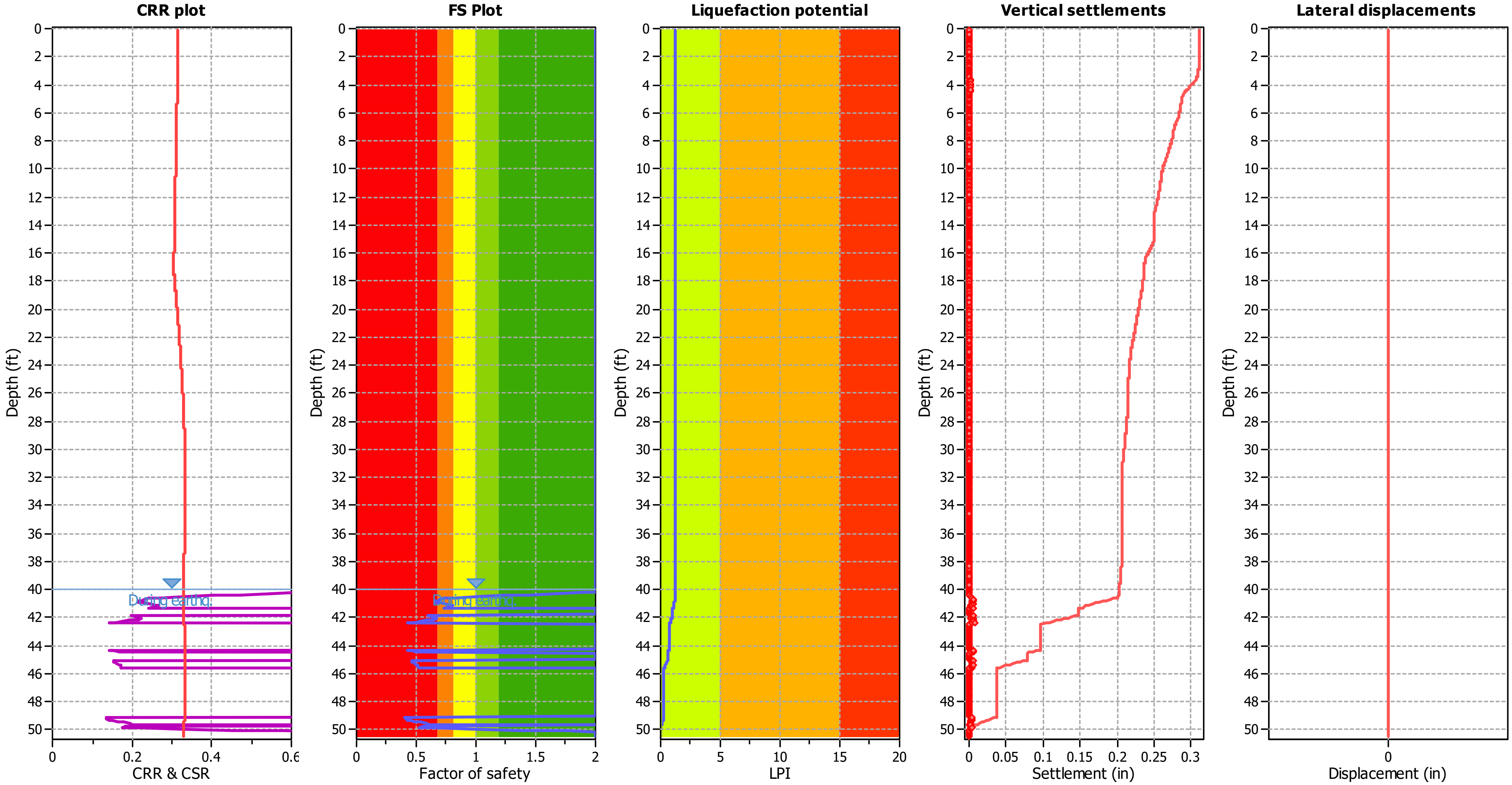
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.58	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	40.00 ft	Fill height:	N/A	Limit depth:	N/A

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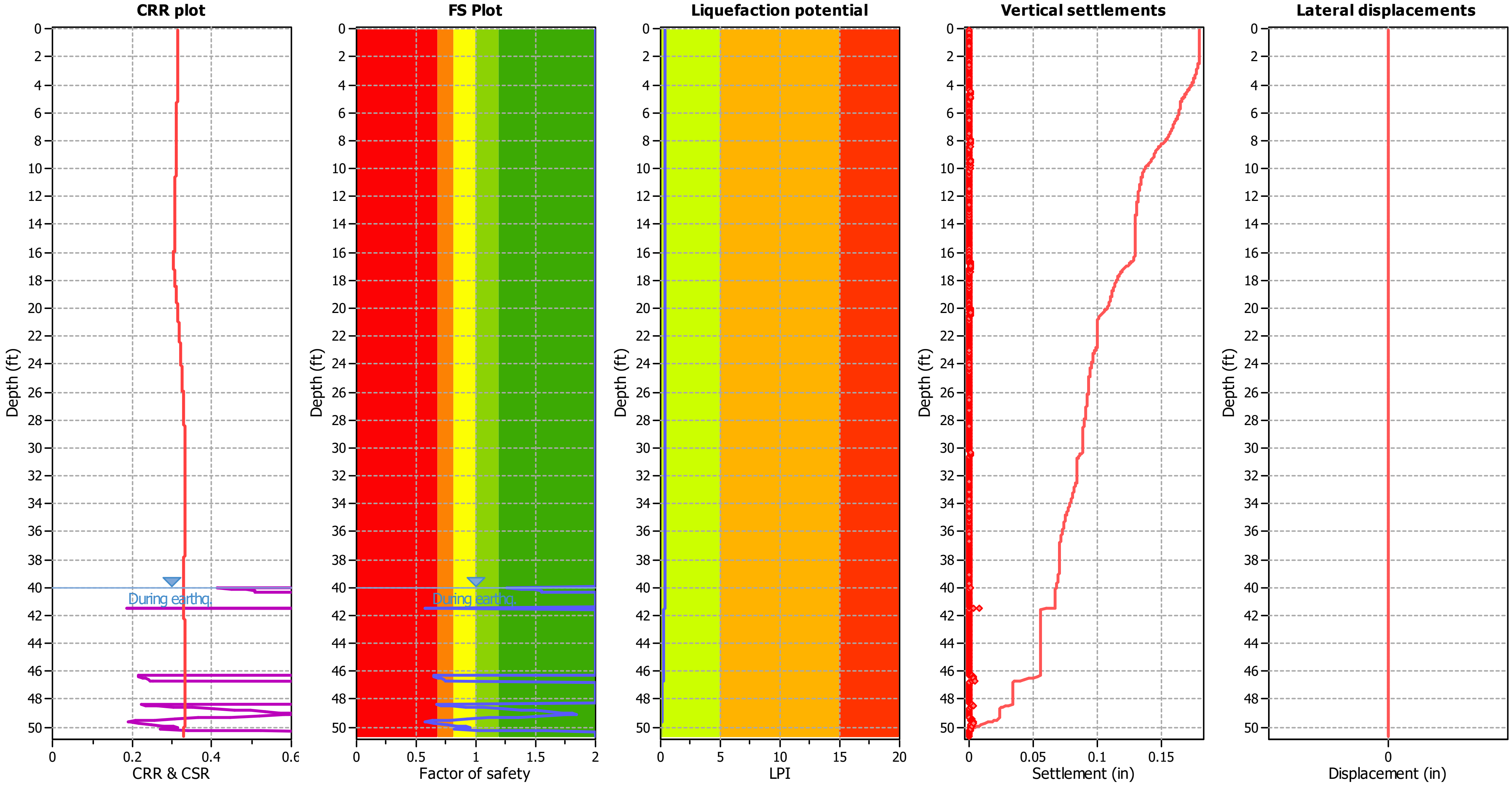
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.58	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	40.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

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LPI color scheme

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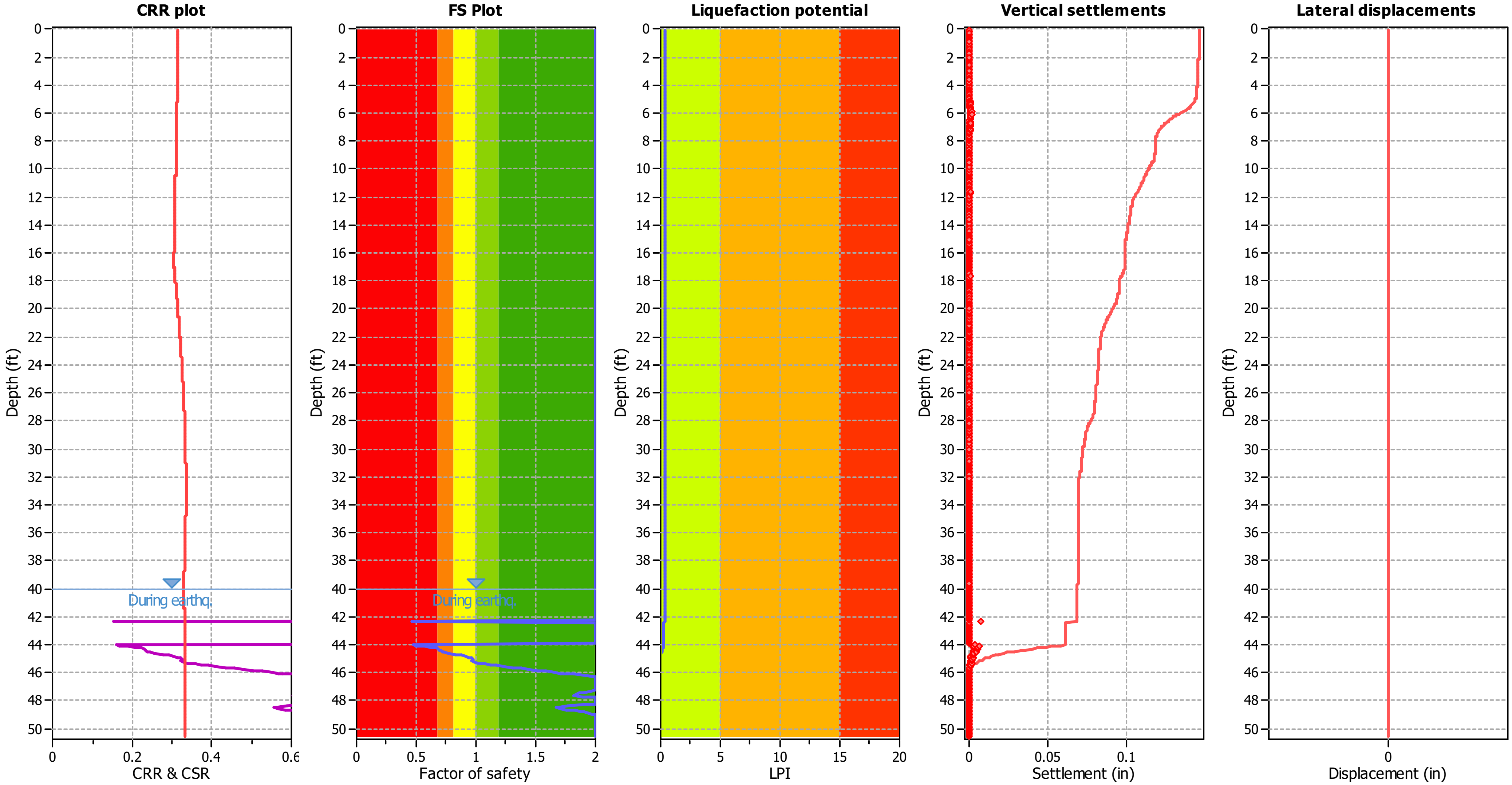
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.58	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	40.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

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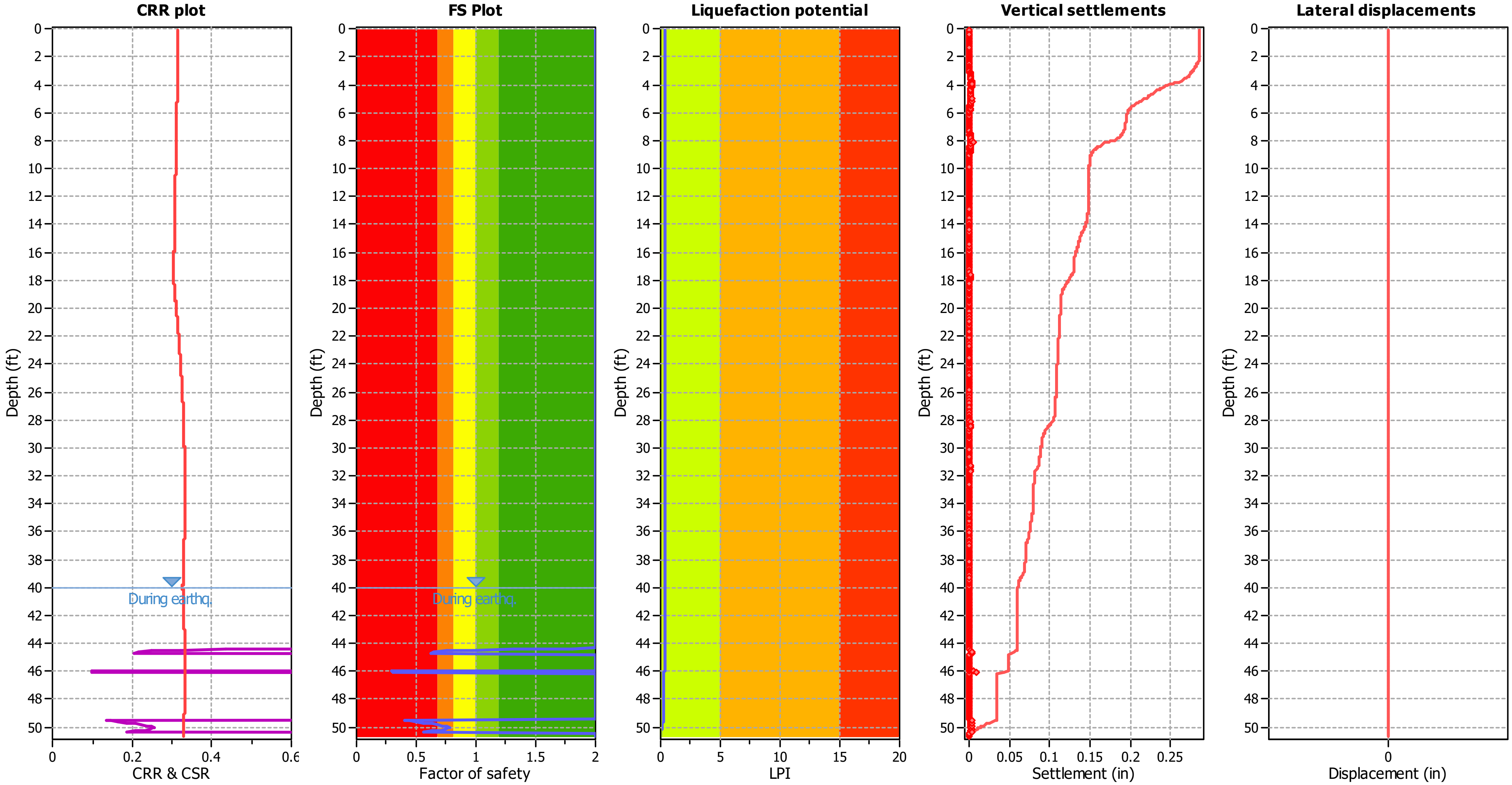
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.58	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	40.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

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LPI color scheme

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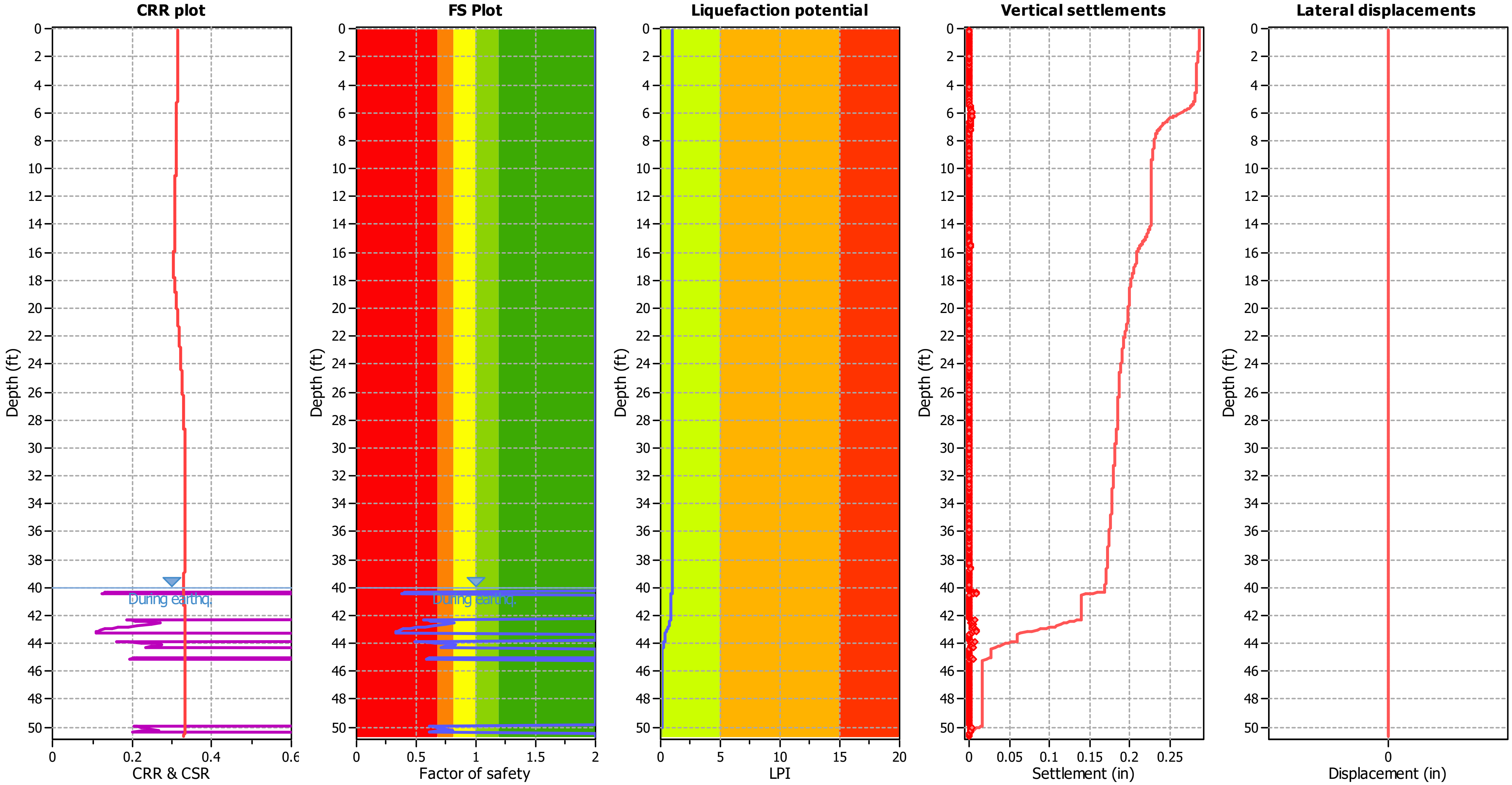
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	40.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.58	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	40.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

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LPI color scheme

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APPENDIX G

General Earthwork and Grading Recommendations

Leighton

APPENDIX G

LEIGHTON CONSULTING, INC.
EARTHWORK AND GRADING GUIDE SPECIFICATIONS

TABLE OF CONTENTS

G-1.0 GENERAL

G-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).

G-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.

G-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.

G-2.0 PREPARATION OF AREAS TO BE FILLED

G-2.1 Clearing and Grubbing

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.

G-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 G-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.

G-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

G-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.

G-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.

G-3.0 FILL MATERIAL

G-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.

G-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.

G-3.3 Import

If importing of fill material is required for grading, proposed import material shall meet the requirements of Section G-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.

G-4.0 FILL PLACEMENT AND COMPACTION

G-4.1 Fill Layers

Approved fill material shall be placed in areas prepared to receive fill, as described in Section G-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.

G-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.

G-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.

G-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.

G-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).

G-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.

G-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..

G-6.0 TRENCH BACKFILLS

G-6.1 Safety

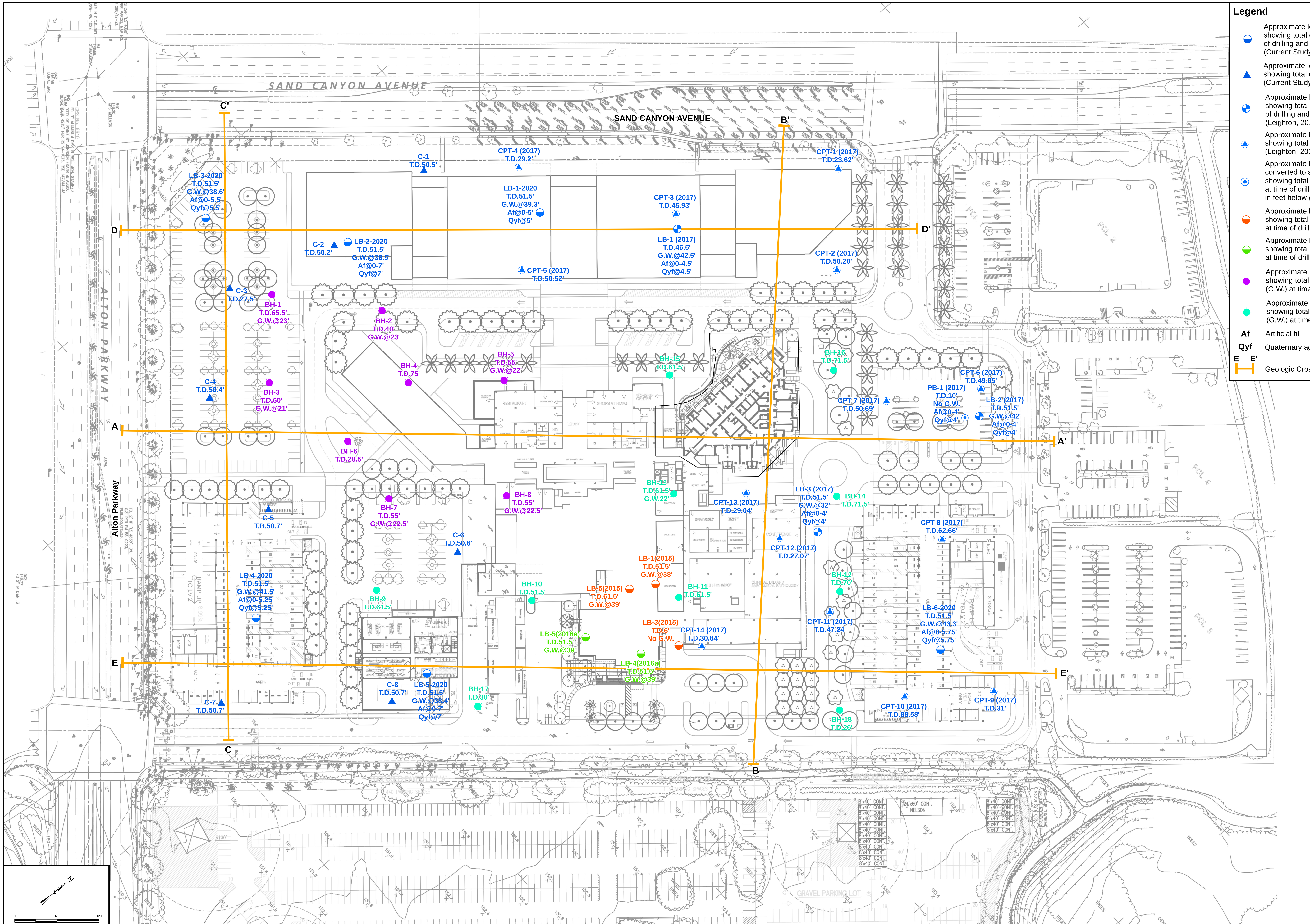
The Contractor shall follow all OSHA and Cal/OSHA requirements for safety of trench excavations. Work should be performed in accordance with Article 6 of the *California Construction Safety Orders*, 2009 Edition or more current (see also: http://www.dir.ca.gov/title8/sb4a6.html).

G-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..

G-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.



Legend

- Approximate location of hollow stem auger boring showing total depth (T.D.), depth to groundwater (G.W.) at time of drilling and depth to earth units in feet below ground surface (Current Study)
- Approximate location of cone penetrometer test (CPT) showing total depth (T.D.) in feet below ground surface (Current Study)
- Approximate location of hollow stem auger boring showing total depth (T.D.), depth to groundwater (G.W.) at time of drilling and depth to earth units in feet below ground surface (Leighton, 2017)
- Approximate location of cone penetrometer test (CPT) showing total depth (T.D.) in feet below ground surface (Leighton, 2017)
- Approximate location of hollow stem auger boring converted to a temporary percolation test well showing total depth (T.D.), depth to groundwater (G.W.) at time of drilling, depth to earth units and testing screen interval in feet below ground surface (Leighton, 2017)
- Approximate location of hollow stem auger boring showing total depth (T.D.) and depth to groundwater (G.W.) at time of drilling, (Leighton, 2015)
- Approximate location of hollow stem auger boring showing total depth (T.D.) and depth to groundwater (G.W.) at time of drilling, (Leighton, 2016a)
- Approximate location of rotary wash boring showing total depth (T.D.) and depth to groundwater (G.W.) at time of drilling if indicated (Converse, 1984)
- Approximate location of rotary wash boring showing total depth (T.D.) and depth to groundwater (G.W.) at time of drilling if indicated (Converse, 1985)
- **Af** Artificial fill
- **Qyf** Quaternary age young alluvial fan deposits
- **E E'** Geologic Cross Section, see Plate 2

HHIX 3.0 SITE PLAN

Developed for

Job Number	1918511
Date Published	02/17/2020
Checked By	JKP
Scale	1" = 50'

SITE PLAN

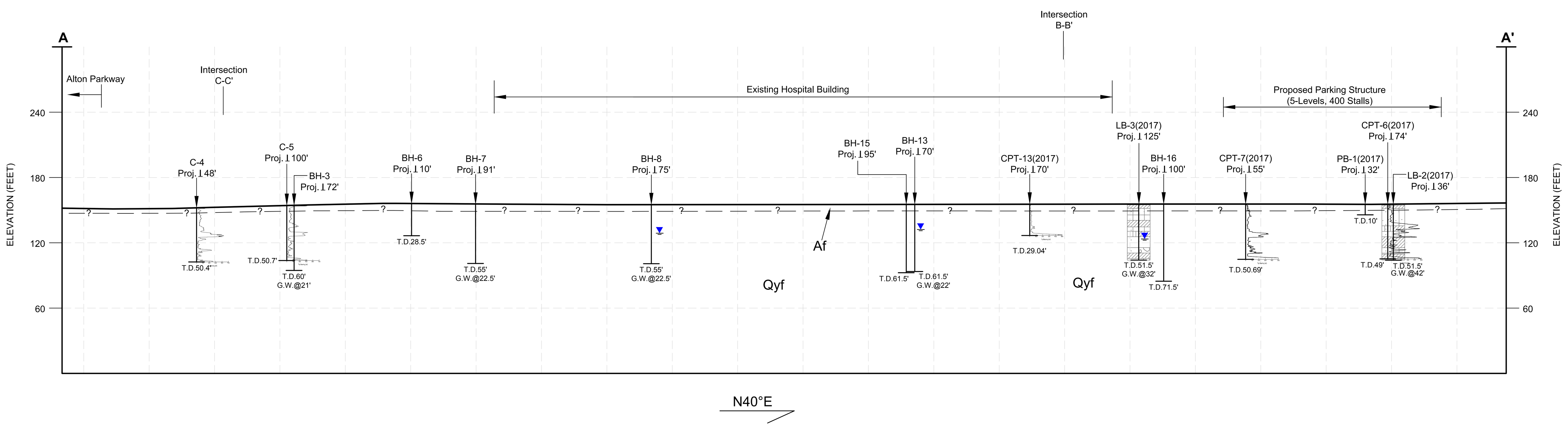
Plate 1	Project: 11753.004	Eng/Geol: CCK/JMP
	Scale: 1" = 60 feet	Date: February 2020

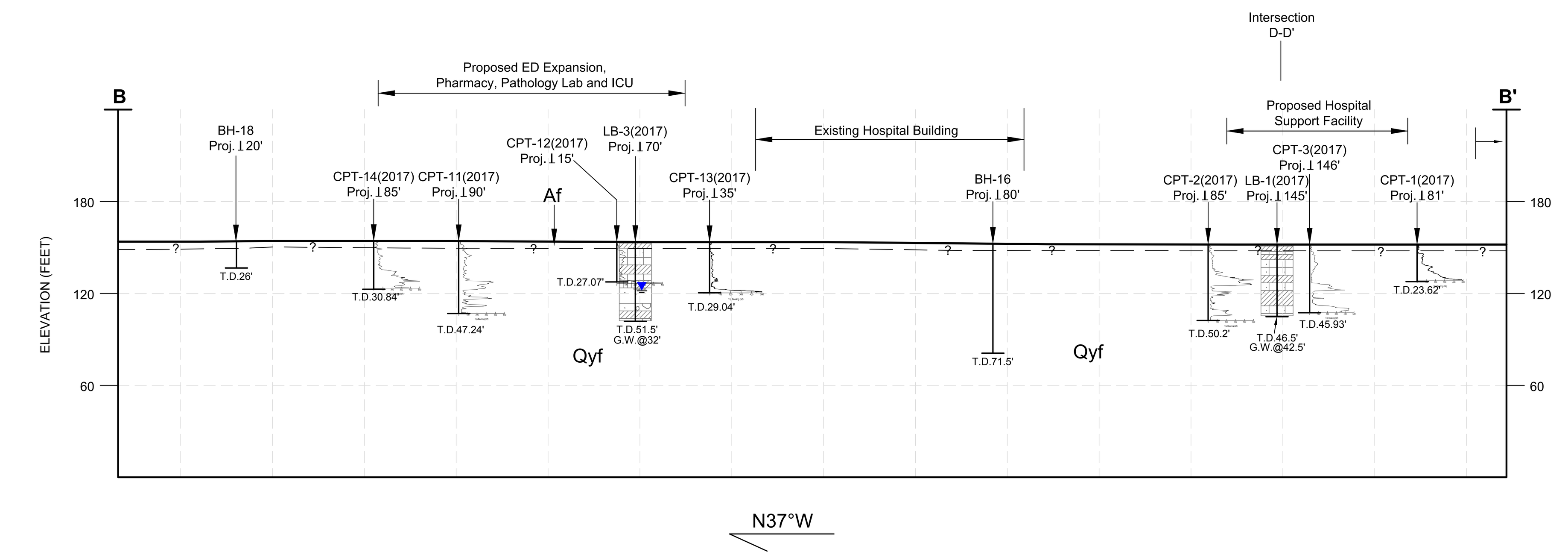
Base Map: ESRI ArcGIS Online 2020
Thematic Information: Leighton
Author: Leighton Geomatics (btran)

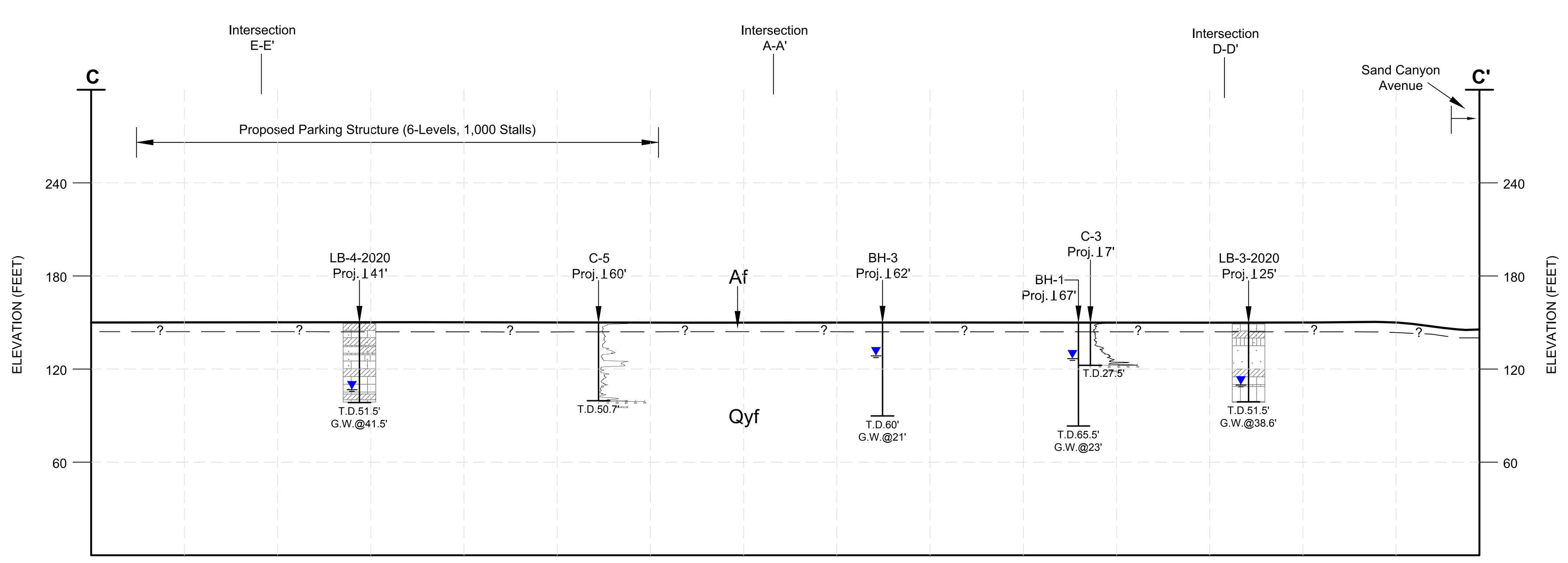
Leighton

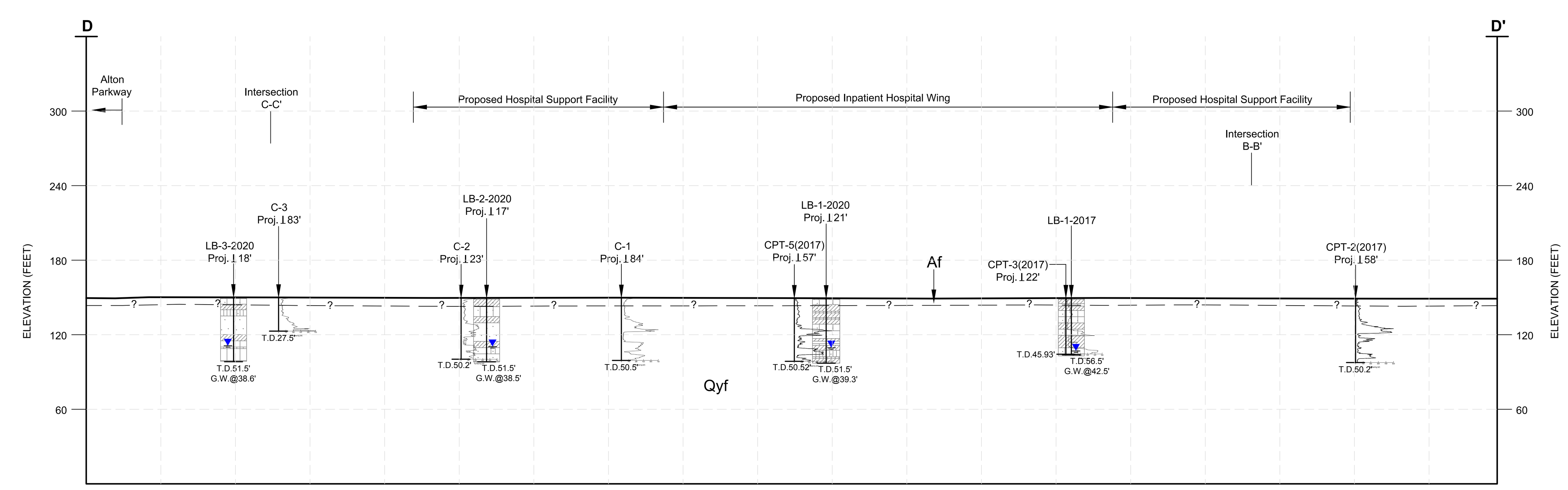
EXPLORATION LOCATION MAP

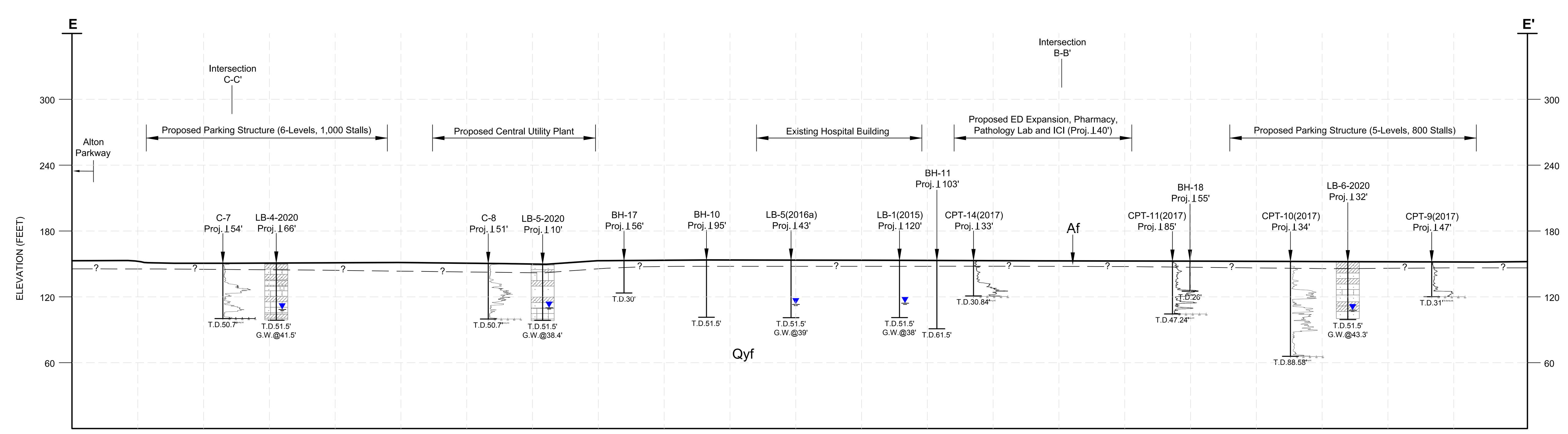
Hoag Hospital Irvine Expansion Project
16200 Sand Canyon Avenue
Irvine, California











LEGEND

USCS Boring Graphics

- Gravelly SAND (SP-GP)
- SAND (SP)
- Silty SAND (SM)
- Sandy SILT to Silty SAND (SM-ML)
- SILT (ML)
- Silty CLAY (CL-ML)
- CLAY (CL) to Sandy CLAY (CLs)

Af	Artificial fill
Qyf	Quaternary young alluvial fan deposits
Tsf	Tons per square foot

GEOLOGIC CROSS SECTIONS
A-A' THROUGH E-E'
Hoag Hospital Irvine Expansion Project
16200 Sand Canyon Avenue
Irvine, California

Plate 2

Proj: 11753.004	Eng/Geol: CCK/JMP
Scale: 1"=60'	Date: February 2020

Leighton

Drafted By: BQT | Checked By: BQT | V:\DRAFTING\11753\004\CAD\2020-02-13\11753-004_P02_CS_2020-02-28.DWG (02-28-20 9:10:58AM) Plotted by: btran