LOR GEOTECHNICAL GROUP, INC.
Soil Engineering ▲ Geology ▲ Environmental

PRELIMINARY GEOTECHNICAL AND INFILTRATION FEASIBILITY INVESTIGATION PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT APN 365-30-001 LAKE ELSINORE, CALIFORNIA

PROJECT NO. 33310.1
DECEMBER 20, 2016

Prepared For:

Lake Elsinore CCR, LLC
14211 Yorba Street, Suite 200
Tustin, California 92780

Attention: Ms. Joanne Ho

LOR GEOTECHNICAL GROUP, INC.
Soil Engineering ▲ Geology ▲ Environmental

December 20, 2016

Lake Elsinore CCR, LLC
14211 Yorba Street, Suite 200
Tustin, California 92780

Project No. 33310.1

Attention: Ms. Joanne Ho

Subject: Preliminary Geotechnical and Infiltration Feasibility Investigation, Proposed Multi-Family Residential Development, APN 365-030-001, Lake Elsinore, California.

LOR Geotechnical Group, Inc., is pleased to present this report summarizing our geotechnical investigation for the above referenced project. This report was based upon a scope of services generally outlined in our Work Authorization Agreement, revised dated October 24, 2016, and other written and verbal communications with you.

In summary, it is our opinion that the proposed development is feasible from a geotechnical perspective, provided the recommendations presented in the attached report are incorporated into design and construction. The following executive summary reviews some of the important elements of the project. However, this summary should not be solely relied upon.

The project site is underlain by an approximately two foot thick layer of unengineered fill materials overlying alluvial units. The upper alluvial materials encountered were in a medium dense condition, becoming dense to very dense/hard with depth. It is our opinion that the existing surficial materials will not provide uniform and/or adequate support for the proposed structures. Thus, we recommend that all structural fills, roadways, and structures be founded entirely on engineered compacted fill. Based upon our field and laboratory data, we anticipate that removals on the order of 5 feet will be required across the site to expose competent alluvial materials upon which structural fills and structures can be placed. The actual depths of removals should be verified during the grading operation by observation and in-place density testing.

Our evaluation found that several relatively thin, alluvial soils located between depths of 9.5 and 49 feet are susceptible to liquefaction. This event would likely cause average lateral displacements on the order of 12 inches and average ground settlements of approximately 2.2 inches. Based on the data collected to date, structural mitigation should be able to mitigate the liquefaction potential to an acceptable risk along with the recommended 5-foot deep removals. This should be evaluated and verified with the project structural engineer.

Good R-value quality and a negligible sulfate content were determined for representative onsite soils. These soils also are considered to have a very low expansion potential. Import soils area proposed for the project. Import soils should possess similar engineering properties as those on-site and tested during this investigation in order for the soil design values provided within to be applicable. Prior to their use import soils for foundation and subgrade soils should be tested to verify their shear strength, expansion potential, soluble sulfate content, and R-value quality.

Our infiltration testing of the near surface soils indicated very poor percolation rates for the onsite soil materials. Based on this, the near surface soils tested are not considered conducive for infiltration.

LOR Geotechnical Group, Inc.

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INTRODUCTION

During November and December of 2016, a Preliminary Geotechnical and Infiltration Feasibility Investigation was performed by LOR Geotechnical Group, Inc., for the proposed multi-family residential development of APN 365-030-001, Lake Elsinore, California. The purpose of this investigation was to provide a technical evaluation of the geologic setting of the site and to provide geotechnical design recommendations for the proposed development. The scope of our services included:

- Review of available pertinent geotechnical literature, reports, maps, and agency information pertinent to the study area;
- Interpretation of stereo aerial photograph pairs of the site and surrounding region dated 1949 through 2010;
- Geologic field reconnaissance mapping to verify the areal distribution of earth units and significance of surficial features as compiled from documents, literature, and reports reviewed;
- A subsurface field investigation to determine the physical soil conditions pertinent to the proposed development;
- Performance of two double ring infiltration tests;
- Laboratory testing of selected soil samples obtained during the field investigation;
- Development of geotechnical recommendations for site grading and foundation design; and
- Preparation of this report summarizing our findings, and providing conclusions and recommendations for site development.

The approximate location of the site is shown on the attached Index Map, Enclosure A-1 within Appendix A.

To orient our investigation at the site, a preliminary site layout was provided for our use. The existing site boundaries and proposed development were indicated on

thisplan. A copy of this plan was utilized as a base map for our investigation shown on the enclosed Geotechnical Map, Enclosure 2 within Appendix A.

PROJECT CONSIDERATIONS

Information furnished to this firm indicates that the project will consist of the construction of four multi-family residential buildings and associated parking and drive areas and landscaping. The structures are anticipated to be from one- and up to three-stories in height and of wood frame and stucco or similar type construction. Light to moderate foundation loads are anticipated with such structures.

No precise grading plans were available at the time of this report. However, based on the current site topography and information provided, site development will likely entail fills on the order of 10 feet. Import materials will be required to achieve the proposed grades.

EXISTING SITE CONDITIONS

The subject site consists of a triangular shaped parcel of land comprising of approximately 5± acres located along the southwest side of Mission Trail, approximately 500 feet south of Hidden Trail. The topography of the site is mostly planar with a very gentle fall to the southwest. Total fall across the site is approximately 15 feet. With exception to several trees, vegetation was sparse due to discing. Minor trash and debris were scattered within the project area. A small, man-made drainage outlet is present along the central portion of the east site boundary.

Mission Trail, a partially improved roadway, bounded the site on the east followed by single family and commercial properties. The site was bounded on the north by a tract of recently developed single family residences. The property to the south was vacant land, similar to the site.

REVIEW OF PREVIOUS GEOTECHNICAL REPORTS

We contacted the County of Riverside Transportation Land Management Agency for geologic/geotechnical reports for the site and neighboring properties. Their files contained geologic/geotechnical reports for the adjacent single family residential development to the north identified as GEO 01429.

This file contained numerous reports which focused primarily on the fault rupture hazard of that site. In brief summary, through the use of literature review, aerial photograph analysis, fault trenching, geophysics, continuous borings, and cone penetrometer test soundings, these reports did not find any active faulting in the area adjacent to our site which would project into or cross our site. The liquefaction hazard at the neighboring site was considered to be low. Groundwater was encountered during the various studies at depths of approximately 15 to 40 feet.

REVIEW OF AERIAL PHOTOGRAPHS

During the course of this study, an analysis of time-sequential stereoscopic aerial photograph pairs of the site and surrounding region, on file at the Riverside County Flood Control and Water Conservation District, were reviewed. Stereoscopic aerial photograph pairs of the site and surrounding region dating from 1949 to 2010 were examined to note geologic as well as historic features. A complete list of the photographs studied is given in the references at the back of this report.

SUBSURFACE FIELD INVESTIGATION

Our subsurface field exploration program was conducted on November 9 and 11, 2016. The work consisted of advancing 3 exploratory borings with a Mobile B61 drill rig equipped with 8-inch diameter hollow stem augers, excavating 2 exploratory trenches with a John Deere 410J backhoe equipped with a 24-inch bucket, and advancing 2 cone penetrometer test (CPT's) soundings with a 25-ton CPT rig. The approximate locations of our exploratory trenches, borings, and CPT's are presented on the enclosed Geotechnical Map, Enclosure A-2, within Appendix A.

The subsurface conditions encountered in the exploratory borings were logged by a geologist from this firm. The borings were drilled to depths ranging from 31.5 to 51.5 feet below the existing ground surface. Relatively undisturbed and bulk samples were obtained at a maximum depth interval of 5 feet and returned our geotechnical laboratory in sealed containers for further testing and evaluation.

Logs of the subsurface conditions encountered in the exploratory trenches were created by a geologist from this firm. The trenches were excavated to depths ranging from approximately 14 to 15 feet below the existing ground surface.

A detailed description of the field exploration program and the Boring and Trench Logs are presented in Appendix B.

The cone exploration was performed by Middle Earth Geo Testing, Inc. under the supervision of a geologist of this firm. An electronic cone with a tip area of 10 cm2, a friction sleeve area of 150 cm2, and a piezometer element thickness of 5 mm was used for this purpose. The cone measures tip resistance, sleeve friction, and dynamic pore pressure in depth intervals of 2 cm. It was pushed using a specially designed four-wheel drive, 25-ton truck which provided the required reaction weight to push the cone assembly into the ground. All cone penetration data was processed to interpret soil types and other geotechnical parameters (Robertson et al, 1989). Details of the field and interpreted CPT data are presented in Appendix E.

LABORATORY TESTING PROGRAM

Selected soil samples obtained during the field investigation were subjected to laboratory testing to evaluate their physical and engineering properties. Laboratory testing included in-place density and moisture content, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, and soluble sulfate content. A detailed description of the laboratory testing program and the test results are presented in Appendix C.

GEOLOGIC CONDITIONS

Regional Geologic Setting

The site is situated within the Peninsular Ranges Geomorphic Province of southern California. This province incorporates several northwest trending mountain ranges, such as the Santa Ana and San Jacinto Mountains, which extend from the Transverse Ranges geomorphic province, northeast of Los Angeles, into the Baja California Peninsula. Lying in-between the larger mountain ranges are a series of valleys and basins, such as the Elsinore Valley and the Perris Plain. The Elsinore Valley is a linear, fault controlled, valley along the eastern side of the Santa Ana Mountains from Corona south to Temecula. The eastern margin of this valley is joined by a higher relatively flat plain which extends east to the San Jacinto Mountains, called the Perris Plain. The Perris Plain is composed of rocks of the Peninsular Ranges batholith, a very large mass of crystalline igneous rocks, metasedimentary, and metavolcanic rocks which pre-date

the intrusion of the batholith. The batholithic rocks actually consist of numerous separate plutonic intrusions which range in composition from gabbro to granite, with tonalite the predominate lithology. The metasedimentary rocks occur as remnant pendants within and between the plutons and are composed predominantly of schist, with lessor quartzite and gneiss. While the floor of the Perris plain is relatively flat, it is dotted with small erosional remnant hills, consisting predominately of intrusive igneous crystalline bedrock and very old metamorphic rocks. The interior of the Perris Plain is considered to be relatively stable with few known active faults. However, the Plain is bounded by active faults. These include the Elsinore fault zone on the west, the San Jacinto fault zone on the east, the Cucamonga fault zone on the north, and the Agua-Tibia fault zone on the south.

The subject site is located near the western margin of Perris Plain, along the eastern margin of the Elsinore Valley. In this area, drainage across the Perris Plain occurs towards the lower lying Elsinore Valley, creating a series of southwest trending drainage courses bordering narrow ridge lines.

As previously mentioned, the Perris Plain is bounded by active earthquake faults. In the study by the State of California (Weber, 1977), the fault along the western side of the plain was named the Glen Ivy North fault of the Elsinore fault zone, and is reported to lie 1,500 feet to the southwest. A complete listing of the distances to known active faults in relation to the site is given in the Seismic Zone section of this report.

The site and immediate surrounding region as mapped by Morton and Weber (2003) is presented as Enclosure A-3 within Appendix A.

Site Geologic Conditions

The majority of the subject site is underlain by a relatively thin layer of fill overlying alluvial materials as encountered within our subsurface exploratory borings and trenches. These units are described in further detail in the following sections:

Fill: As noted within our exploratory borings and trenches, fill materials were encountered at the surface to a maximum depth of approximately 2 feet beneath the existing ground surface. These materials typically consisted of silty sand with minor units of sandy silt and well graded sand with silt. The fill materials were typically gray,

dry, and loose. These are considered to be undocumented fill materials as a result of weed abatement practices (discing).

Alluvium: Underlying the fill within our exploratory borings and trenches, alluvial materials were encountered. The alluvium typically consisted of silty sand to sandy silt within the upper portions and lean clay with sand, sandy silt, well graded sand, and clayey sand at depth. The fine grained units were typically gray-brown to brown, damp to moist, contained some thin calcite stringers, and in a very stiff to hard state. The coarse grained units were typically white to gray, dry to wet, and in a medium dense to dense state. The notable exception to the above, was within the onsite drainage outlet, the materials were noted to consist of well graded sand with silt which was crudely stratified within the upper 2 feet and contained minor amounts of washed in trash. Beneath this depth, the materials were free of trash and massive.

A detailed description of the subsurface soil conditions as encountered within our exploratory borings and trenches is presented on the Boring and Trench Logs within Appendix B.

Groundwater Hydrology

Groundwater was encountered at depths of approximately 34 to 45 feet beneath the existing ground surface within our exploratory borings and CPT's soundings. According to information provided, the elevation of the site ranges from a low of approximately 1,255 feet above mean sea level (msl) within the southwest portion to a high of approximately 1,270 feet msl within the east portion.

Records for nearby wells which were readily available from the State of California Department of Water Resources online database and the Western Municipal Water District Cooperative Well Measurement Program (WMWD, 2016) were reviewed as a part of this investigation.

According the State of California Department for Water resources online database, the nearest well is State Well No. 06S04W22D002S. Data for this well was present from December of 2011 to October of 2016. Groundwater levels ranged from depths of approximately 105 feet to 412 feet. The most recent measurement in October of 2016 was at a depth of approximately 126 feet. A measuring point elevation of 1,295 feet above mean sea level was provided.

Groundwater well data from the Cooperative Well Measuring Program, Fall 2015 indicates the nearest well as State Well Number 06S/04W-16L01S, Summerly, located approximately 0.4 miles (0.65 kilometers) to the west-northwest (WMWD, 2015). Data for this well was available from April of 2009 to August of 2015. During that time, groundwater depths ranged from 347 feet in April of 2011 to 487 feet in August of 2015, the most recent measurement.

As previously mentioned, a review of the various geologic/geotechnical reports on file with the County of Riverside Transportation and Land Management Agency GEO 01429, reported encountering groundwater at depths of 15 to 40 feet.

Another contributing factor to the local groundwater conditions is the presence of nearby Lake Elsinore. The high shoreline for this lake actually extends into the site boundaries. The presence of Lake Elsinore certainly must influence the groundwater conditions of the project site.

Surface Runoff

Current surface runoff of precipitation waters across the site is generally from the east to the west as sheet flow.

Mass Movement

The majority of the site lies on a relatively flat surface. The occurrence of mass movement failures such as landslides, rockfalls or debris flows within such areas is generally not considered common and no evidence of mass movement was observed on the site.

Faulting

No active or potentially active faults are known to exist at the subject site. In addition, the subject site does not lie within a current State of California Earthquake Fault Zone (Hart and Bryant, 1997). No evidence of faulting projecting into or crossing the site was noted during our aerial photograph review nor published geologic maps. The site does not lie within a County of Riverside fault zone.

As previously mentioned, the closest known active fault is the Glen Ivy North fault, located approximately 1,500 feet to the southwest. In addition, other relatively close active faults include the San Jacinto fault, located approximately 31 kilometers (19 miles) to the northeast, and the San Andreas fault located approximately 52 kilometers (33 miles) to the northeast.

The Glen Ivy North fault is considered a part of the larger Elsinore fault zone. This zone constitutes a discontinuous zone of faults which strike nearly normal to the prominent northwest trend of the Elsinore trough.

The Elsinore fault zone is one of the largest in southern California. At its northern end it splays into two segments, named the Chino and Whittier faults, and at its southern end it is cut by the Yuba Wells fault. The primary sense of slip along the Elsinore fault is right lateral strike-slip. Several of the fault strands which make up the Elsinore fault zone possess their own names. It is believed that the Elsinore fault zone is capable of producing an earthquake magnitude on the order of 6.5 to 7.5.

The San Jacinto fault zone is a sub-parallel branch of the San Andreas fault zone, extending from the northwestern San Bernardino area, southward into the El Centro region. This fault has been active in recent times with several large magnitude events. It is believed that the San Jacinto fault is capable of producing an earthquake magnitude on the order of 6.5 or greater.

The San Andreas fault is considered to be the major tectonic feature of California, separating the Pacific plate and the North American plate. While estimates vary, the San Andreas fault is generally thought to have an average slip range on the order of 24 mm/yr and capable of generating large magnitude events on the order of 7.5 or greater.

Current standards of practice included a discussion of all potential earthquake sources within a 100 kilometer (62 mile) radius. However, while there are other large earthquake faults within a 100 kilometer (62 mile) radius of the site, none of these are considered as relevant to the site as the faults described above, due to their closer distance and larger anticipated magnitudes.

Historical Seismicity

In order to obtain a general perspective of the historical seismicity of the site and surrounding region a search was conducted for seismic events at and around the area within various radii. This search was conducted utilizing the historical seismic search program by EPI Software, Inc. (Reeder, 2000). This program conducts a search of a user selected cataloged seismic events database, within a specified radius and selected magnitudes, and then plots the events onto an overlay map of known faults. For this investigation the database of seismic events utilized by the EPI program was obtained from the Southern California Seismic Network (SCSN) available from the Southern California Earthquake Center. At the time of our search, the database contained data from January 1, 1932 through December 31, 2010.

In our first search the general seismicity of the region was analyzed by selecting an epicenter map listing all events of magnitude 4.0 and greater, recorded since 1932, within a 100 kilometer (62 mile)radius of the site, and in accordance with guidelines of the California Division of Mines and Geology. This map illustrates the regional seismic history of moderate to large events. As noted on Enclosure A-4, within Appendix A, the site lies within a relatively active region of southern California with numerous medium and larger sized events. Of these events, the closest was a magnitude 4.4 located approximately 19 kilometers (12 miles) to the northwest of the site.

In the second search, the micro-seismicity of the area lying within a 10 kilometer (6.2 mile) radius of the site was examined by selecting an epicenter map listing events on

the order of 0.0 and greater since 1977. In addition, only the "A" events, or most accurate events were selected. Caltech indicates the accuracy of the "A" events to be approximately 1 km. The results of this search is a map that presents the seismic history around the area of the site with much greater detail, that is not permitted on the larger map. The reason for limiting the events to the last 40 ± years on the detail map is to enhance the accuracy of the map. Events recorded prior to the mid-1970's are generally considered to be less accurate due to advancements in technology. As noted on this map, Enclosure A-5, numerous very small events are located in the general location of the Elsinore fault zone.

In summary, the historical seismicity of the site entails numerous small to medium magnitude earthquake events occurring around the subject site, predominately associated with the presence of the faults described above. Any future developments at the subject site should anticipate that moderate to large seismic events could occur very near the site.

Secondary Seismic Hazards

Other secondary seismic hazards generally associated with severe ground shaking during an earthquake include liquefaction, seiches and tsunamis, earthquake induced flooding, landsliding and rockfalls, and seismic-induced settlement.

Liquefaction: The potential for liquefaction generally occurs during strong ground shaking within granular, loose, sediments where the groundwater is usually less than 50 feet. As noted during our field investigation, the site is underlain by alluvial materials in a medium dense to dense state and very stiff to hard state. In addition, the shoreline of the nearby Lake Elsinore extends into much of the site; therefore, historic levels of groundwater in the project area are anticipated to be at or near the existing ground surface. Given that there is a potential for a strong ground motion seismic event to occur during the lifetime of the proposed development and given the conditions, the susceptibility to soil liquefaction was assessed using the CPT data collected at the site with the aid of the computer program Cliq version 1.7 (Geologismiki, 2006). The evaluation was performed in general accordance with the Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A (California Geological Survey, 2008) and the Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Liquefaction (Youd et al, 2001).

The liquefaction calculations were performed using an earthquake ground motion at the site of 0.95g caused by a 7.5 magnitude seismic event and a historic groundwater level matching the existing ground surface. The following table summarizes the results of these analyses:

SUMMARY OF LIQUEFACTION ANALYSES	
Sounding	**Approximate Depths of Liquefiable Soil Layers from the Existing Ground Surface**
CPT-1	14 to 14.5 ft, 19.5 to 21 ft, 28.5 to 30 ft, 31.5 to 34 ft, 38 to 40.5 ft, 41.5 to 42.5 ft, 43 to 44 ft, 45.5 to 46 ft, 48 to 49 ft
CPT-2	9.5 to 10 ft, 11 to 12 ft, 16 to 16.5 ft, 17 to 18.5 ft, 19.5 to 20 ft, 21.5 to 23.5 ft, 25.5 to 26 ft, 26.5 to 29 ft, 30 to 30.5 ft, 32 to 32.5 ft, 35 to 40 ft, 42.5 to 43.3 ft

The calculations suggest that liquefaction-prone soils exist at various depths ranging from 9.5 to 49 feet below the existing ground surface.

The major, probable hazards associated to soil liquefaction at the site are lateral spreads and ground settlements. These hazards were also estimated utilizing the program Cliq which implements the calibrated procedures for post-earthquake displacements (G. Zhang et al, 2002 and 2004). For the estimation of the lateral spreads, a gently slope ground condition with a value of 0.7% was used. The results of these calculations are as follows:

SUMMARY OF LIQUEFACTION-INDUCED LATERAL SPREADS AND SETTLEMENTS		
Sounding	**Lateral Spread (in)**	**Total Ground Settlement* (in)**
CPT-1	9.3	1.8
CPT-2	17.0	2.6
*Differential ground settlements are roughly one-half of the total settlements		

The results of the computer program analysis utilizing Cliq are presented in Appendix F.

Seiches/Tsunamis: The potential for the site to be affected by a tsunamis (earthquake generated wave) is considered nil due to the distance of the site to any ocean However, there is a potential for the site to be affected by a seiche from the nearby Lake Elsinore.

Considering the following factors using equations 13.52 and 13.53 per the American Water Works Association (2002), we anticipate the maximum wave height at the site related to seiching in Lake Elsinore would be on the order of 5.5 feet.

Given:

- Lake Diameter = 2.5 miles
- Lake Depth = 27 feet
- Design Earthquake Spectral Response = 0.95g (50 year event; 10% probability of exceedance).
- Seismic Importance Factor = 1.0
- Kc = Damping Scaling Factor (IE) = 1.5
- Af = Convective Design Acceleration for Sloshing
- S_{D1} = Design Earthquake Spectrum Response Acceleration

d = depth or wave height = 0.5 DA_f (Equation 13.52)

$A_f = 4KS_{D1} I_E / T_c^2$ When $T_c > 4s$ (Equation 13.53)

$A_f = 4\ (1.5)(0.99)(1.0) / 120^2 = 4.13 \times 10^{-4}$

$d = 0.5(2.5 \times 5280)(4.13 \times 10^{-4}) = 5.45$ feet

Flooding (Water Storage Facility Failure): There are no large water storage facilities located on or near the site which could possibly rupture during an earthquake and affect the site by flooding.

Rockfalls: No large, exposed, loose or unrooted boulders are present above the site that could affect the integrity of the site.

SOILS AND SEISMIC DESIGN CRITERIA (California Building Code 2016)

Section 1613 of Chapter 16 of the 2016 California Building Code (CBC) contains the procedures and definitions for the calculations of the earthquake loads on structures and non structural components that are permanently attached to structures and their supports and attachments.

It should be noted that the classification of use and occupancy of all proposed structures at the site, and thus design requirements, shall be the responsibility of the structural engineer and the building official.

CBC Earthquake Design Summary

The following earthquake design criteria have been formulated for the site utilizing the source referenced above.

However, these values should be reviewed by the building official (Risk Category) and structural engineer and the final design should be performed by a qualified structural engineer familiar with the region.

CBC 2013 SEISMIC DESIGN SUMMARY* Site Location (USGS WGS84) 33.66464, -117.2948, Risk Category III	
Site Class Definition Chapter 20 ASCE 7	D
S_s Mapped Spectral Response Acceleration at 0.2s Period, (Figure 1613.3.1(1))	2.467
S_1 Mapped Spectral Response Acceleration at 1s Period, (Figure 1613.3.3(2))	0.999
F_a Short Period Site Coefficient at 0.2s Period, (Table 1613.3.3(1))	1.0
F_v Long Period Site Coefficient at 1s Period,(Table 1613.3.3(2))	1.5
S_{MS} Adjusted Spectral Response Acceleration at 0.2s Period, (eq .16-37)	2.467
S_{M1}Adjusted Spectral Response Acceleration at 1s Period, (eq .16-38)	1.499
S_{DS} Design Spectral Response Acceleration at 0.2s Period,(eq .16-39)	1.645
S_{D1} Design Spectral Response Acceleration at 1s Period, (eq .16-40)	0.999
Seismic Design Category - Short Period (Table 1613.3.5(1))	E
Seismic Design Category - Long Period (Table 1613.3.5(2))	E
*Values obtained from U.S.G.S. online U.S. Seismic Design Maps tool	

INFILTRATION TESTING AND TEST RESULTS

Two double ring infiltration tests were conducted at the approximate locations illustrated on Enclosure A-2. Test pits were excavated to a depths of approximately 3 and 4 feet and a 12-inch diameter casing was installed within the center of the test location with a 24-inch diameter casing centered around it. Each casing was imbedded to a depth approximately 3 to 4 inches. These liners extended approximately 16 to 17-inches above the bottom of the test location. The test locations were tested

immediately after the casings were installed by filling both the inside and outside casings and maintaining a water level to a height of approximately 2.5-inches.

The testing procedure was as follows:

Both the inside and outside area of the casings were filled with water to a level of approximately 2.5-inches above the ground surface. Water was then metered to maintain this water level within both rings. The volume of water use in a given time period was recorded at various time intervals to establish the infiltration rate of the inner ring. See the attached Infiltration Test Data sheets, Enclosures D-1 and D-2 within Appendix D for the test information and measurements.

The infiltration rate is measured as the drop in water level compared to the permeability of the bottom surface area soils in the bottom of the test hole. If casing is not used, the water column in the test hole is allowed to seep into both the bottom and sidewalls of the hole, for which the drop in water level must be corrected and reduced for the volume of water seeping into the sidewall and for the diameter of the test hole. As described above, the tests described herein were conducted using a 12-inch diameter inner casing and 24-inch diameter outer casing.

The test holes were found to have the following measured clear water infiltration rates:

Infiltration Test No.	Clear Water Infiltration Rate	
	gal/sf/day	in/hr
DRI-1	1.0	0.1
DRI-2	2.5	0.7

Our exploratory trench placed near the double ring tests encountered native materials consisting of sandy silt and lean clay with sand to a depth of approximately 8 feet where slightly coarser grained materials were encountered. Groundwater was encountered during our boring and CPT soundings at depths of approximately 34 to 45 feet. Our infiltration test data generally indicates very poor infiltration rates for the soils tested.

CONCLUSIONS

General

This investigation provides a broad overview of the geotechnical and geologic factors which are expected to influence future site planning and development. On the basis of our field investigation and testing program, it is the opinion of LOR Geotechnical Group, Inc. that the proposed development is feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into design and implemented during grading and construction.

The subsurface conditions encountered in our exploratory borings, CPT soundings, and trenches are indicative of the locations explored. The subsurface conditions presented here are not to be construed as being present the same everywhere on the site. If conditions are encountered during the construction of the project which differ significantly from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided.

Foundation Support

Based upon the field investigation and test data, it is our opinion that the existing undocumented fills and upper portions of the alluvial soils will not, in their present condition, provide uniform and/or adequate support for the proposed structures. Left as is, this condition could cause unacceptable differential and/or overall settlements upon application of the anticipated foundation loads.

Furthermore, based on the results of our liquefaction analysis, it seems that there are various relatively thin, granular soil layers located between depths of 9.5 and 49 feet at the site that are susceptible to liquefaction. The most critical hazard associated with potential liquefaction at the site appears to be lateral ground spreading.

Horizontal ground displacements are estimated to range from 9 to 17 inches at the site. It should be noted that this failure mode causes fissures, scarps, and depressions to form at the ground surface. As the soils move laterally, the blocks of soil between the main cracks tend to settle and break into even smaller pieces. Thus, this can cause significant damage of the overlying buildings and roads as well as buried

utilities. In addition to substantial lateral ground movements and surface ground damage, the site could be affected by settlements of up to 2.6 inches or more.

To mitigate the effects of liquefaction, we recommend that reinforced shallow foundations and improved structural design be applied to withstand the predicted lateral and vertical ground displacements. According to the Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A (California Geological Survey, 2008), lateral displacements less than 0.5 inches may be possible to design foundations with sufficient strength to withstand the expected movements without complete failure. The use of structural design should be verified with a qualified, licenced structural engineer. In addition to the use of reinforced shallow foundations, we recommend the removal and recompaction of the upper 5 feet of the site soils to provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. The construction of this compacted fill mat will also allow for the elimination of any undocumented fill material, and the recompaction of existing loose surficial soils within building pad areas.

The predicted ground displacements can be decreased by improving the soil to greater depths, by means of excavation and recompaction, vibro-replacement and the like. Liquefaction hazards for different depths of soil improvement are summarized in the following table:

SUMMARY OF LIQUEFACTION-INDUCED HAZARDS FOR SEVERAL DEPTHS OF SOIL IMPROVEMENT

Sounding	Depth of Soil Remediation (See Notes)							
	5 feet		10 feet		20 feet		30 feet	
	Lateral Spread (in)	Total Ground Settlement (in)	Lateral Spread (in)	Total Ground Settlement (in)	Lateral Spread (in)	Total Ground Settlement (in)	Lateral Spread (in)	Total Ground Settlement (in)
CPT-1	9.3	1.8	9.3	1.8	7.0	1.6	4.0	1.3
CPT-2	17.0	2.6	16.0	2.5	12.0	2.2	6.0	1.3

Notes
1-Differential ground settlements are roughly one-half of the total settlements
2-Lateral spreads were estimated assuming a ground inclination of 0.7%, which needs to be confirmed once final development plans are available.

For design purposes, an average of the above values may be used. So for a 5 foot depth remediation, a lateral spread value of approximently 16 inches may be used and for total ground settlement, a value of approximently 2.2 inches may be used.

Soil Expansiveness

As noted by within our explorations, the majority of the site surficial soils consist of materials with a very low expansion potential. Therefore, conventional design and construction should be applicable for the project.

Careful evaluation of on-site soils and the import fill for their expansion potential should be conducted during the grading operation.

Geologic Mitigations

No other site specific geologic mitigation measures are anticipated to be required during grading of the site other than those presented within.

Seismicity

Seismic ground rupture is generally considered most likely to occur along pre-existing active faults. Since no known faults are known to exist at, or project into the site, the probability of ground surface rupture occurring at the site is considered nil.

Due to the site's close proximity to Elsinore fault zone described above, it is reasonable to expect a very strong ground motion seismic event to occur during the lifetime of the proposed development on the site. Large earthquakes could occur on other faults in the general area, but because of their lesser anticipated magnitude and/or greater distance, they are considered less significant than the Elsinore fault zone from a ground motion standpoint.

The effects of ground shaking anticipated at the subject site, should be mitigated by the seismic design requirements and procedures outlined in Chapter 16 of the California Building Code. However, it should be noted that the current building code requires the minimum design to allow a structure to remain standing after a seismic event, in order to allow for safe evacuation. A structure built to code may still sustain

damage which might ultimately result in the demolishing of the structure (Larson and Slosson, 1992).

The final design for the structures should be completed by a qualified structural engineer familiar with the region and that is aware of the seismic setting of the site.

Infiltration

Based upon our field investigation and infiltration test data, a clear water absorption rate of less than 0.1 to 0.7 inches per hour was found. This is a very poor rate. Based on these clear water rates, infiltration does not appear to be feasible.

RECOMMENDATIONS

General Site Grading

It is imperative that no clearing and/or grading operations be performed without the presence of a qualified geotechnical engineer. An on-site, pre-job meeting with the owner, the developer, the contractor, and geotechnical engineer should occur prior to all grading related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed in accordance with the following recommendations as well as applicable portions of the California Building Code, and/or applicable local ordinances.

All areas to be graded should be stripped of significant vegetation and other deleterious materials.

Any uncontrolled fills encountered during site preparation should be completely removed, cleaned of significant deleterious materials, and may be reused as compacted fill. Data collected during this study indicates that uncontrolled fills up to approximately 2 feet in thickness will be encountered.

Cavities created by removal of subsurface obstructions should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access

for construction equipment, and backfilled as recommended in the following Engineered Compacted Fill section of this report.

Import soils are proposed to be used for the project. Import soils should possess similar engineering properties as the existing on-site soils encountered and tested during this investigation in order for the soil design values provided within to be applicable. This firm should evaluate the proposed import soils prior to their use.

Initial Site Preparation

All existing uncontrolled fills and any loose alluvial soils should be removed from structural areas and areas to receive structural fills. The data developed during this investigation indicates that removals on the order of 5 feet will be required to encounter competent alluvial soils provided the lateral spread and settlement estimates can be structurally mitigated. If not, removals will need to extend to the depths shown on the table in the Foundation Support section based on the amount of lateral spread and settlement that can be structurally mitigated. Competent alluvial soils are defined as alluvial soils with an in-place density of at least 85 percent relative compaction. Removals should extend at a distance equal to the depth of the removals plus proposed fill and at least a minimum of 5 feet. The actual depths of removals should

be determined during the grading operation by observation and in-place density testing.

Preparation of Foundation Areas

All footings should rest entirely upon at least 24 inches of properly compacted fill material placed over competent alluvial soils. In areas where the required fill thickness is not accomplished by the removal of any surficial fill and any loose alluvial materials during site rough grading, the footing areas should be further subexcavated to a depth of at least 24 inches below the proposed footing base grade, with the subexcavation extending at least 5 feet beyond the footing lines.

The ratio of the maximum fill thickness to minimum fill thickness across any structural area should not exceed 3 to 1 as measured from the bottom of the footings.

Engineered Compacted Fill

The on-site soils should provide adequate quality fill material, provided they are free from organic matter and other deleterious materials. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in fills. Oversized material (more than 6 inches) may be stockpiled for landscaping purposes.

Import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. Sources for import fill should be approved by the geotechnical engineer prior to their use.

Fill should be spread in maximum 8-inch uniform, loose lifts, with each lift brought to near optimum moisture content prior to, during and/or after placement, and compacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557.

Short Term Excavations

Following the California Occupational and Safety Health Act (CAL-OSHA) requirements, excavations 5 feet deep and greater should be sloped or shored. All excavations and shoring should conform to CAL-OSHA requirements.

Short-term excavations 5-feet deep and greater shall conform to Title 8 of the California Code of Regulations, Construction Safety Orders, Section 1504 and 1539 through 1547. Based on our exploratory borings and trenches, it appears that Type C soil is the predominant type of material on the project and all short-term excavations should be based on this type of material. Deviation from the standard short-term slopes are permitted using Option 4, Design by a Registered Professional Engineer (Section 1541.1).

Short-term slope construction and maintenance are the responsibility of the contractor, and should be a consideration of his methods of operation and the actual soil conditions encountered.

Slope Construction

Preliminary data indicates that cut and fill slopes should be constructed no steeper than two horizontal to one vertical. Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction, then roll the final slopes to provide dense, erosion-resistant surfaces.

Where fills are to be placed against existing slopes steeper than five horizontal to one vertical, the existing slopes should be properly keyed and benched into competent native materials. The key, constructed across the toe of the slope, should be a minimum of 12 to 15 feet wide, a minimum of 2 feet deep at the toe, and sloped back to 2 percent. Benches should be constructed at approximately 2 to 4 foot vertical intervals.

Slope Protection

Since the native materials are susceptible to erosion by running water, measures should be provided to prevent surface water from flowing over slope faces. Slopes at the project should be planted with a deep rooted ground cover as soon as possible after completion. The use of succulent ground covers such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the irrigation system and to prevent over watering.

Foundation Design

If the site is prepared as recommended, the proposed residential structures may be founded on reinforced perimeter footings and connected grade beams, post-tensioned slabs, mat foundations or equivalent bearing on a minimum of 24 inches of engineered compacted fill. For planning purposes and assuming soil recompaction to at least 5 feet in depth will be performed, we recommend that a lateral displacement (spread) of about 12 inches and a vertical displacement (settlement) of approximately 2.2 inches be used for preliminary design of the foundations. The use of structural mitigation should be verified by a qualified, licensed structural engineer.

Foundations for one-and two-story structures should have a minimum width of 12 inches and should be established a minimum of 12 inches below lowest adjacent grade. Foundation of three-story structures should have a minimum width of 15 inches and a minimum depth of 12 inches below the lowest adjacent grade.

For the minimum width of 12 inches and depth of 12 inches, footings may be designed using a maximum soil bearing pressure of 1,800 pounds per square foot (psf) for dead plus live loads. Footings at least 15 inches wide, placed at least 18 inches below the lowest adjacent final grade, may be designed for a maximum soil bearing pressure of 2,100 psf for dead plus live loads.

The above values are net pressures; therefore, the weight of the foundations and the backfill over the foundations may be neglected when computing dead loads. The values apply to the maximum edge pressure for foundations subjected to eccentric loads or overturning. The recommended pressures apply for the total of dead plus frequently applied live loads, and incorporate a factor of safety of at least 3.0. Because some liquefiable units may exist at depths beyond the recommended 5-foot deep removals, the allowable bearing pressures should not be increased for seismic loading. The resultant of the combined vertical and lateral seismic loads should act within the middle one-third of the footing width. The maximum calculated edge pressure under the toe of foundations subjected to eccentric loads or overturning should not exceed the increased allowable pressure.

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill, passive earth pressure may be considered to be developed at a rate of 300 pounds per square foot per foot of depth.

Base friction may be computed at 0.30 times the normal load. Base friction and passive earth pressure may be combined without reduction. These values are for dead load plus live load. Because some liquefiable units may exist at depths beyond the 5-foot removals, the given values should not be increased for seismic loading.

The recommendations for foundation design provided above are minimum. A competent, licensed structural engineer experienced in seismic design and liquefaction effects should propose the most adequate foundation systems to be used at the project.

Settlements/Lateral Spreads

Total static settlement of individual foundations will vary depending on the width of the foundation and the actual load supported. Maximum static settlement of shallow foundations designed and constructed in accordance with the preceding recommendations are estimated to be on the order of 0.5 inches. Differential settlements between adjacent footings should be about one-half of the total settlement or 0.25 inches. Static settlement of all foundations is expected to occur rapidly, primarily as a result of elastic compression of supporting soils as the loads are applied, and should be essentially completed shortly after initial application of the loads.

Seismic settlement due to the compression of the liquefiable soils beyond the recommended minimum depth of soil recompaction of the upper 5 feet is expected to be on the order of 2.2 inches total and 1.1 inches differential. Lateral spreads due to soil liquefaction is estimated to be on the order of 12 inches. These are estimated values. Additional information on the liquefaction-induced hazards for greater depths of soil improvement/recompaction are given in the Foundation Support section of this report.

Building Area Slabs-On-Grade

To provide adequate support, concrete slabs-on-grade should bear on a minimum of 24 inches of compacted soil. The final pad surfaces should be rolled to provide fairly smooth, dense surfaces upon which to place the concrete.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor barrier. This barrier may consist of an impermeable membrane. Two inches of sand over and two inches of sand below the membrane will reduce punctures and aid in obtaining a satisfactory concrete cure. The sand should be moistened just prior to placing of concrete.

The slabs should be protected from rapid and excessive moisture loss which could result in slab curling. Careful attention should be given to slab curing procedures, as the site area is subject to large temperature extremes, humidity, and strong winds.

Exterior Flatwork

To provide adequate support, exterior flatwork improvements should rest on a minimum of 12 inches of soil compacted to at least 90 percent (ASTM D 1557).

Flatwork surface should be sloped a minimum of 1 percent away from buildings and slopes, to approved drainage structures.

Wall Pressures

The design of footings for retaining walls should be performed in accordance with the recommendations described earlier under Preparation of Foundation Areas and Foundation Design. For design of retaining wall footings, the resultant of the applied loads should act in the middle one-third of the footing, and the maximum edge pressure should not exceed the basic allowable value without increase.

For design of retaining walls unrestrained against movement at the top, we recommend an equivalent fluid pressure of 35 pounds per cubic foot (pcf) be used. This assumes level backfill consisting of recompacted native soils placed against the structures and within the back cut slope extending upward from the base of the stem at 35 degrees from the vertical or flatter.

Retaining structures subject to uniform surcharge loads within a horizontal distance behind the structures equal to the structural height should be designed to resist additional lateral loads equal to 0.28 times the surcharge load. Any isolated or line loads from adjacent foundations or vehicular loading will impose additional wall loads and should be considered individually.

To avoid over stressing or excessive tilting during placement of backfill behind walls, heavy compaction equipment should not be allowed within the zone delineated by a 45 degree line extending from the base of the wall to the fill surface. The backfill directly behind the walls should be compacted using light equipment such as hand operated vibrating plates and rollers. No material larger than three inches in diameter should be placed in direct contact with the wall.

Wall pressures should be verified prior to construction, when the actual backfill materials and conditions have been determined. Recommended pressures are

applicable only to level, properly drained backfill (with no additional surcharge loadings). If inclined backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters. Toe bearing pressure for non-structural walls on soils, not prepared as described earlier under Preparation of Foundation Areas, should not exceed California Building Code values, (CBC Table 18-1-A).

Preliminary Pavement Design

Testing and design for preliminary on-site pavement was conducted in accordance with the California Highway Design Manual. Based upon our preliminary sampling and testing, and upon Traffic Indices generally associated with commercial projects, it appears that the structural sections tabulated below should provide satisfactory pavements for the subject improvements:

T.I.	TYPE OF TRAFFIC	DESIGN R-VALUE	PRELIMINARY SECTION
5	Light Vehicle and Incidental Truck Traffic	50	0.25' AC/0.35' AB or 0.50' JPCP/0.35' AB
AC - Asphalt Concrete AB - Class 2 Aggregate Base JPCP - Jointed Plain Concrete Pavement with MR ≥ 625 psi			

The above structural sections are predicated upon 90 percent relative compaction (ASTM 1557) of all utility trench backfills and 95 percent relative compaction (ASTM 1557) of the upper 12 inches of street subgrade soils and of any aggregate base utilized. In addition, the aggregate base should meet Caltrans specifications for Class 2 Aggregate Base.

In areas of the pavement which will receive high abrasion loads due to start-ups and stops, or where trucks will move on a tight turning radius, consideration should be given to installing concrete pads. Such pads should be a minimum of 0.5 foot thick concrete, with a 0.35 foot thick aggregate base. Concrete pads are also recommended in areas adjacent to trash storage areas where heavier loads will occur due to operation of trucks lifting trash dumpsters.

The recommended 0.50 feet thick portland cement concrete (PCC) pavement section should have a minimum modulus of rupture (MR) of 625 pounds per square inch (psi). Transverse joints should be sawcut in the pavement at approximately 12 to 15-foot intervals within 4 to 6 hours of concrete placement, or preferably sooner. Sawcut depth should be equal to approximately one quarter of slab thickness. Construction joints should be constructed such that adjacent sections butt directly against each other and are keyed into each other. Parallel pavement sections should also be keyed into each other.

It should be noted that all of the above pavement designs were based upon the results of preliminary sampling and testing, and should be verified by additional sampling and testing during construction when the actual subgrade soils are exposed.

Sulfate Protection

The results of the soluble sulfate content tests conducted on selected subgrade soils expected to be encountered at foundation levels are presented in Appendix C.

Based on the test results, the sulfate exposure of on-site soils is considered negligible by the CBC. Therefore, no specific recommendations are given for concrete elements to be in contact with on-site soils.

Construction Monitoring

Post investigative services are an important and necessary continuation of this investigation. Project plans and specifications should be reviewed by the project geotechnical consultant prior to construction to confirm that the intent of the recommendations presented in this report have been incorporated into the design. Additional R-Value and soluble sulfate testing may be required after/during site is rough grading.

During construction, sufficient and timely geotechnical observation and testing should be provided to correlate the findings of this investigation with the actual subsurface conditions exposed during construction. Items requiring observation and testing include, but are not necessarily limited to, the following:

1. Site preparation-stripping and removals.

2. Excavations, including approval of the bottom of excavation prior to backfilling.

3. Subgrade preparation for pavements and slabs-on-grade.

4. Placement of engineered, compacted fill and backfill, including approval of fill materials and the performance of sufficient density tests to evaluate the degree of compaction being achieved.

5. Foundation excavations, including footings, prior to the installation of forms and/or reinforcing steel.

LIMITATIONS

This report contains geotechnical conclusions and recommendations developed solely for use by the Lake Elsinore CCR, LLC. and their design consultants, for the purposes described earlier. It may not contain sufficient information for other uses or the purposes of other parties. The contents should not be extrapolated to other areas or used for other facilities without consulting LOR Geotechnical Group, Inc.

The recommendations are based on interpretations of the subsurface conditions concluded from information gained from subsurface explorations, and a surficial site reconnaissance. The interpretations may differ from actual subsurface conditions, which can vary horizontally and vertically across the site. Due to possible subsurface variations, all aspects of field construction addressed in this report should be observed and tested by the project geotechnical consultant.

If parties other than LOR Geotechnical Group, Inc. provide construction monitoring services, they must be notified that they will be required to assume responsibility for the geotechnical phase of the project being completed by concurring with the recommendations provided in this report or by providing alternative recommendations.

The report was prepared using generally accepted geotechnical engineering practices under the direction of a state licensed geotechnical engineer. No warranty, expressed or implied, is made as to conclusions and professional advice included in this report. Any persons using this report for bidding or construction purposes should perform

such independent investigations as deemed necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations.

CLOSURE

It has been a pleasure to assist you with this project. We look forward to being of further assistance to you as construction begins. Should conditions be encountered during construction that appear to be different than indicated by this report, please contact this office immediately so that we might evaluate their effect.

Should you have any questions regarding this report, please contact us.

Respectfully submitted,
LOR Geotechnical Group, Inc.

Andrew A. Tardie
Staff Geologist

John P. Leuer, GE 2030
President

Robert M. Markoff, CEG 2073
Engineering Geologist

AAT:RMM:JPL:ss

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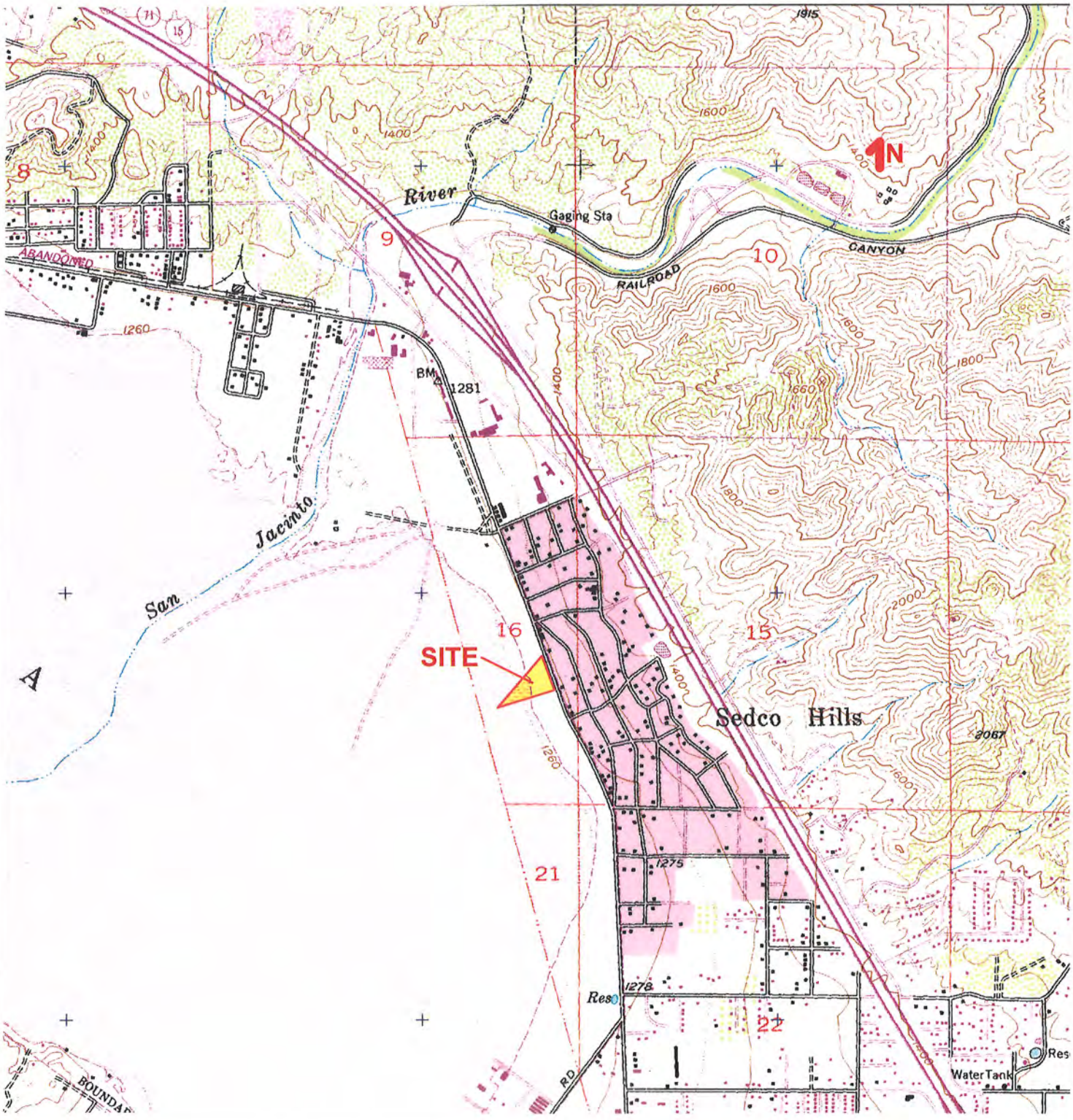
AERIAL PHOTOGRAPHS

(Riverside County Flood Control and Water Conservation District)

DATE	PHOTO NO.	SCALE
May 6, 1949	AXM-5F-132	1" = 1,000'
January 28, 1962	1-127 and 1-128	1" =2,000'
June 20, 1974	652 and 653	1" =2,000'
May 4, 1980	687 and 688	1" =2,000'
January 3, 1984	742 and 743	1" =1,600'
January 22, 1990	14-12 and 14-13	1" =1,600'
January 25, 1995	14-10 and 14-11	1" =1,600'
March 18, 2000	14-11 and 14-12	1" =1,600'
April 13, 2005	14-11 and 14-12	1" =1,600'
April 2, 2010	14-11 and 14-12	1" =1,600'

APPENDIX A

Index Map, Plate, Regional Geologic Map, and Historical Seismicity Maps



INDEX MAP

PROJECT:	**LAKE ELSINORE APARTMENTS, LAKE ELSINORE, CALIFORNIA**	**PROJECT NO.:**	**33310.1**
CLIENT:	**LAKE ELSINORE CCR, LLC**	**ENCLOSURE:**	**A-1**
LOR Geotechnical Group, Inc.		**DATE:**	**DECEMBER 2016**
		SCALE:	**1" = 2,000'**

Legend

(Locations Approximate)

Map Symbols

- **B-3** - Exploratory Boring
- **CPT-2** - Cone Penetration Test Sounding
- **T-2** - Exploratory Trench
- **DRI-2** - Double Ring Infiltrometer Test

PROJECT DATA

SITE AREA	5.37 +/- ACRES

UNIT MIX

2 BED	21
3 BED	60
TOTAL	81 (15 / ACRE)

PARKING

162 (2.0 / UNIT)

April 11, 2016

LAKE ELSINORE APARTMENTS / C&C DEVELOPMENT

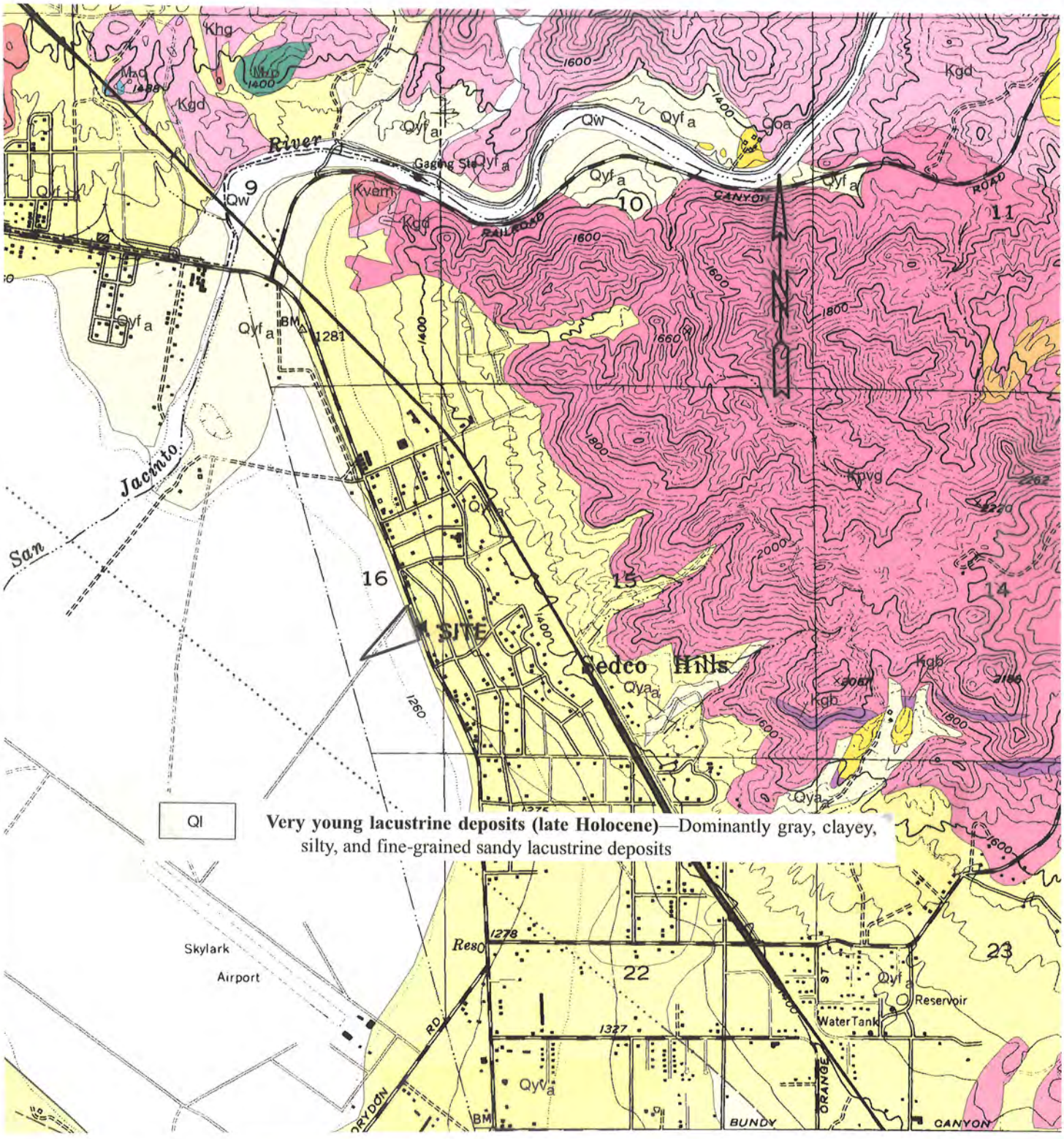
PLATE

PROJECT NO:	33310.1
ENCLOSURE:	A-2
DATE:	DECEMBER 2016
SCALE:	1" ≈ 140'

PROJECT: LAKE ELSINORE APARTMENTS, LAKE ELSINORE, CALIFORNIA

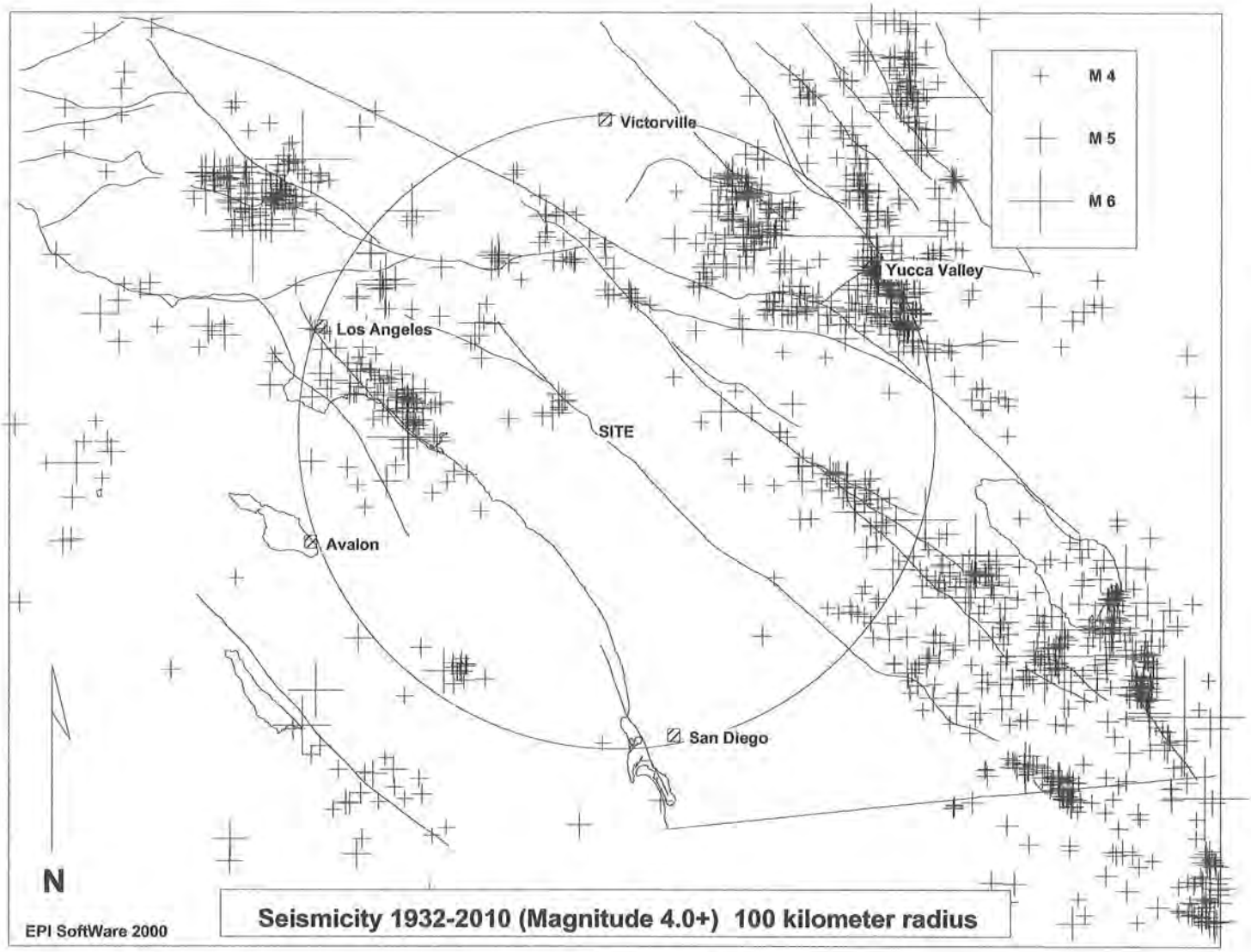
CLIENT: LAKE ELSINORE CCR, LLC

LOR Geotechnical Group, Inc.



REGIONAL GEOLOGIC MAP (MORTON AND WEBER, 2013)

PROJECT:	LAKE ELSINORE APARTMENTS, LAKE ELSINORE, CALIFORNIA	**PROJECT NO.:**	33310.1
CLIENT:	LAKE ELSINORE CCR, LLC	**ENCLOSURE:**	A-3
LOR Geotechnical Group, Inc.		**DATE:**	DECEMBER 2016
		SCALE:	1" = 2,000'



SITE LOCATION: 33.6464 LAT. -117.2948 LONG.

MINIMUM LOCATION QUALITY: C

TOTAL # OF EVENTS ON PLOT: 1413

TOTAL # OF EVENTS WITHIN SEARCH RADIUS: 551

MAGNITUDE DISTRIBUTION OF SEARCH RADIUS EVENTS:

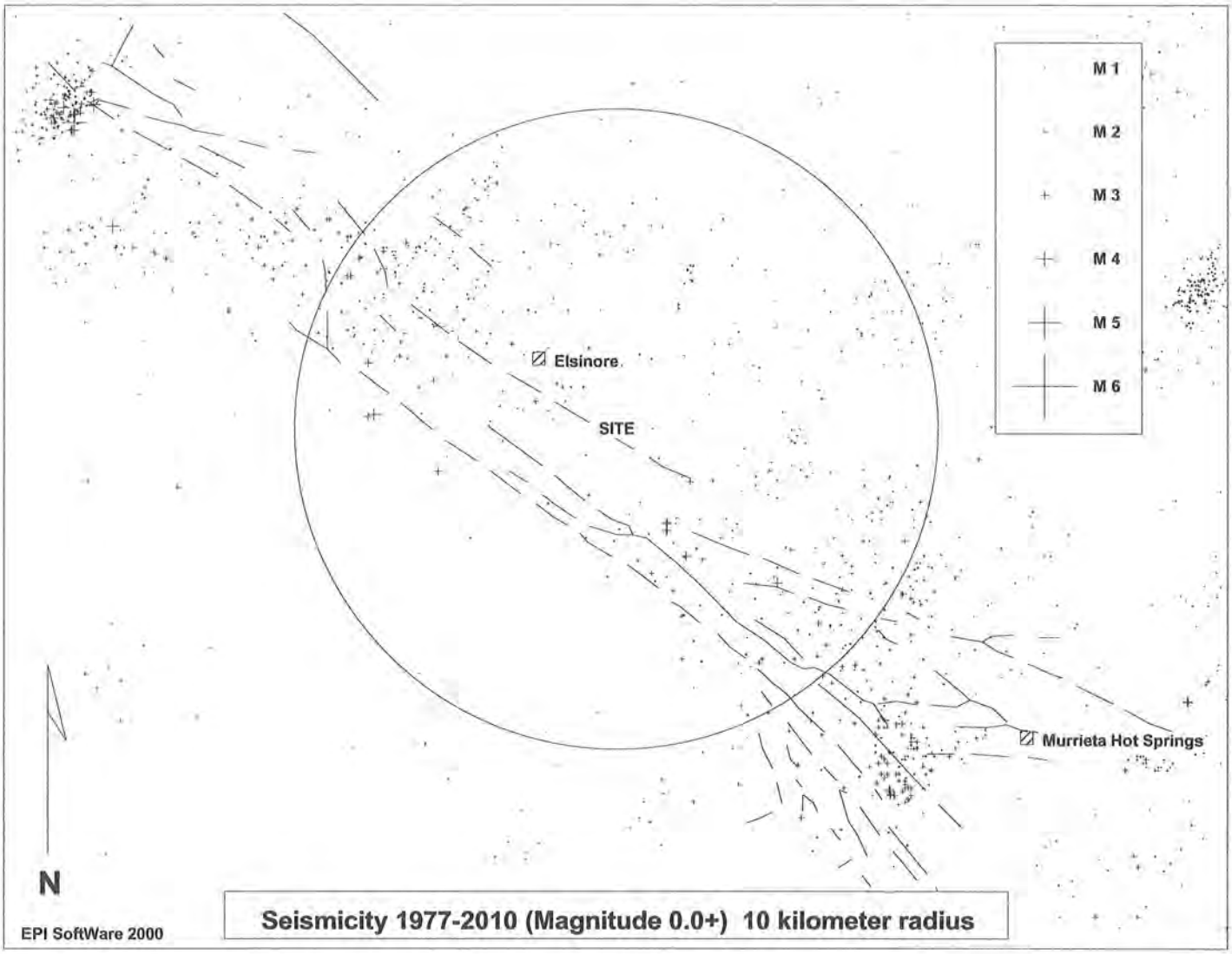
4.0- 4.9 : 497
5.0- 5.9 : 50
6.0- 6.9 : 4
7.0- 7.9 : 0
8.0- 8.9 : 0

0 50 100
KILOMETERS

CLOSEST EVENT: 4.4 ON WEDNESDAY, JUNE 19, 1935 LOCATED APPROX. 19 KILOMETERS NORTHWEST OF THE SITE

LARGEST 5 EVENTS:

6.4 ON SATURDAY, MARCH 11, 193: LOCATED APPROX. 65 KILOMETERS WEST OF THE SITE
6.3 ON SUNDAY, JUNE 28, 1992 LOCATED APPROX. 75 KILOMETERS NORTHEAST OF THE SITE
6.1 ON THURSDAY, APRIL 23, 199: LOCATED APPROX. 96 KILOMETERS NORTHEAST OF THE SITE
6.0 ON SATURDAY, DECEMBER 04, 194: LOCATED APPROX. 96 KILOMETERS NORTHEAST OF THE SITE
5.9 ON THURSDAY, OCTOBER 01, 198: LOCATED APPROX. 85 KILOMETERS NORTHWEST OF THE SITE



SITE LOCATION: 33.6464 LAT. -117.2948 LONG.

MINIMUM LOCATION QUALITY: A

TOTAL # OF EVENTS ON PLOT: 1347

TOTAL # OF EVENTS WITHIN SEARCH RADIUS: 436

0 5 10
KILOMETERS

MAGNITUDE DISTRIBUTION OF SEARCH RADIUS EVENTS:

0.0- .9 : 85
1.0- 1.9 : 308
2.0- 2.9 : 33
3.0- 3.9 : 10
4.0- 4.9 : 0
5.0- 5.9 : 0
6.0- 6.9 : 0
7.0- 7.9 : 0
8.0- 8.9 : 0

CLOSEST EVENT: .9 ON THURSDAY, MAY 25, 199[illegible] LOCATED APPROX. 0 KILOMETER OF THE SITE

LARGEST 5 EVENTS:

3.6 ON THURSDAY, JUNE 04, 1981 LOCATED APPROX. 7 KILOMETERS WEST OF THE SITE
3.4 ON THURSDAY, OCTOBER 04, 197[illegible] LOCATED APPROX. 6 KILOMETERS SOUTHEAST OF THE SITE
3.3 ON SUNDAY, DECEMBER 04, 200[illegible] LOCATED APPROX. 4 KILOMETERS SOUTHEAST OF THE SITE
3.2 ON TUESDAY, DECEMBER 31, 199[illegible] LOCATED APPROX. 3 KILOMETERS SOUTHEAST OF THE SITE
3.2 ON SUNDAY, JULY 05, 1981 LOCATED APPROX. 7 KILOMETERS WEST OF THE SITE

APPENDIX B

Field Investigation Program and Boring and Trench Logs

APPENDIX B
FIELD INVESTIGATION

Subsurface Exploration

The site was investigated on November 9 and 11, 2016 and consisted of excavating 2 exploratory trenches to depths between 14 and 15 feet below the existing ground surface, advancing 3 exploratory borings to depths ranging from 31.5 to 51.5 feet below the existing ground surface, and 2 Cone Penetration Test (CPT) soundings to an approximate maximum depth of 50 feet. The CPT soundings were conducted by our subcontractor, Middle Earth Geo Testing, Inc. The approximate locations of our trenches, borings, and CPT soundings are shown on Enclosure A-2, within Appendix A.

The trenching exploration was conducted using a John Deere 410J backhoe with a 24-inch bucket. The soils encountered were continuously logged by a geologist from this firm who visually observed the site, maintained detailed logs of the trenches, obtained disturbed soil samples for laboratory evaluation and testing, and classified the soils encountered by visual examination in accordance with the Unified Soil Classification System.

The boring exploration was conducted using a truck mounted Mobile B61 drill rig equipped with 8-inch diameter hollow stem augers. The soils were continuously logged by a geologist from this firm who inspected the site, created a detailed log of the borings, obtained undisturbed, as well as disturbed, soil samples for evaluation and testing, and classified the soils by visual examination in accordance with the Unified Soil Classification System.

Relatively undisturbed samples of the subsoils were obtained at a maximum interval of 5 feet. The samples were recovered by using a California split barrel sampler of 2.50 inch inside diameter and 3.25 inch outside diameter from the ground surface to the total depth explored. The samplers were driven by a 140 pound automatic trip hammer dropped from a height of 30 inches. The number of hammer blows required to drive the sampler into the ground the final 12 inches were recorded and further converted to an equivalent SPT N-value. Factors such as efficiency of the automatic trip hammer used during this investigation (80%), borehole diameter (8"), and rod length at the test depth were considered for further computing of equivalent SPT N-values corrected for field procedures (N60) which are included in the boring logs, Enclosures B-1 through B-3.

The undisturbed soil samples were retained in brass sample rings of 2.42 inches in diameter and 1.00 inch in height, and placed in sealed plastic containers. Disturbed soil samples were obtained at selected levels within the borings and placed in sealed containers for transport to our geotechnical laboratory.

All samples obtained were taken to our laboratory for storage and testing. Detailed logs of the borings and trenches are presented on the enclosed Boring and Trench Logs, Enclosures B-1 through B-5. A Boring/Trench Log Legend and Soil Classification Chart are presented on Enclosures B-i and B-ii, respectively.

The cone exploration was performed by Middle Earth Geo Testing, Inc. under the supervision of a geologist of this firm. An electronic cone with a tip area of 10 cm^2, a friction sleeve area of 150 cm^2, and a piezometer element thickness of 5 mm was used for this purpose. The cone measures tip resistance, sleeve friction, and dynamic pore pressure in depth intervals of 2 cm. It was pushed using a specially designed four-wheeled, 25-ton truck which provided the required reaction weight to push the cone assembly into the ground. All cone penetration data was processed to interpret soil types and other geotechnical parameters (Robertson et al, 1989). Details of the field and interpreted CPT data are presented in Appendix E.

CONSISTENCY OF SOIL

SANDS

SPT BLOWS	CONSISTENCY
0-4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
Over 50	Very Dense

COHESIVE SOILS

SPT BLOWS	CONSISTENCY
0-2	Very Soft
2-4	Soft
4-8	Medium
8-15	Stiff
15-30	Very Stiff
30-60	Hard
Over 60	Very Hard

SAMPLE KEY

Symbol	Description
	INDICATES CALIFORNIA SPLIT SPOON SOIL SAMPLE
	INDICATES BULK SAMPLE
	INDICATES SAND CONE OR NUCLEAR DENSITY TEST
	INDICATES STANDARD PENETRATION TEST (SPT) SOIL SAMPLE

TYPES OF LABORATORY TESTS

1. Atterberg Limits
2. Consolidation
3. Direct Shear (undisturbed or remolded)
4. Expansion Index
5. Hydrometer
6. Organic Content
7. Proctor (4", 6", or Cal216)
8. R-value
9. Sand Equivalent
10. Sieve Analysis
11. Soluble Sulfate Content
12. Swell
13. Wash 200 Sieve

BORING LOG LEGEND

PROJECT: LAKE ELSINORE APARTMENTS, LAKE ELSINORE, CALIFORNIA	PROJECT NO.: 33310.1
CLIENT: LAKE ELSINORE CCR, LLC	ENCLOSURE: B-i
LOR Geotechnical Group, Inc.	DATE: NOVEMBER 2016

SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

PARTICLE SIZE LIMITS

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" No. 4 No. 10 No. 40 200

(U.S. STANDARD SIEVE SIZE)

SOIL CLASSIFICATION CHART

PROJECT:	LAKE ELSINORE APARTMENTS, LAKE ELSINORE, CALIFORNIA	PROJECT NO.:	33310.1
CLIENT:	LAKE ELSINORE CCR, LLC	ENCLOSURE:	B-ii
LOR Geotechnical Group, Inc.		DATE:	NOVEMBER 2016

LOG OF BORING B-1

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0	53		2.5		119.3			SM	@ 0 feet, FILL: SILTY SAND, approximately 15% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 35% silty fines, gray-brown, loose, dry.
5	25		2.0		112.8				@ 2 feet, ALLUVIUM: SILTY SAND, approximately 25% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 25% silty fines, brown, dry.
10	29		2.4		114.1				@ 5 feet, becomes coarser grained, approximately 30% coarse grained sand, 30% medium grained sand, 25% fine grained sand, 15% silty fines, tan, dry.
15	21		15.1		109.5			CL	@ 15 feet, LEAN CLAY with SAND, approximately 10% coarse grained sand, 10% medium grained sand, 25% fine grained sand, 55% clayey fines of low plasticity, gray-brown, damp.
20	33		19.3		106.8				@ 20 feet, approximately 5% medium grained sand, 15% fine grained sand, 80% clayey fines of low plasticity, brown, damp.
25	22		21.0		100.8				
30	20		20.0		111.2				
35	34		19.0		111.8			SC	@ 35 feet, CLAYEY SAND, approximately 20% coarse grained sand, 20% medium grained sand, 20% fine grained sand, 40% clayey fines of low plasticity, gray-brown, moist.
40	35		20.9		104.8			ML	@ 37 feet, groundwater. @ 40 feet, SANDY SILT, approximately 30% fine grained sand, 70% silty fines with trace clay, gray-brown, damp.
45	53		10.2		119.8			SW	@ 45 feet, WELL GRADED SAND, approximately 30% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 5% silty fines, gray, wet.
50	41		27.7		94.4			ML	@ 50 feet, SANDY SILT, approximately 30% fine grained sand, 70% silty fines with trace clay, gray, moist.
55									END OF BORING Fill to 2' Groundwater @ 37' No bedrock

TEST DATA

PROJECT:	Proposed Lake Elsinore Apartments	PROJECT NUMBER:	33310.1
CLIENT:	Lake Elsinore CCR, LLC	ELEVATION:	1263
LOR GEOTECHNICAL GROUP INC.		DATE DRILLED:	November 11, 2016
		EQUIPMENT:	Mobile B61
		HOLE DIA.: 8"	ENCLOSURE: B-1

LOG OF BORING B-2

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0	48		1.7		126.1			SM	@ 0 feet, FILL: SILTY SAND, approximately 15% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 30% silty fines, gray-brown, dry, loose.
5	62 for 11"		2.7		113.1				@ 2 feet, ALLUVIUM: SILTY SAND, approximately 30% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 20% silty fines, brown, dry.
									@ 5 feet, becomes tan.
10	37		21.0		100.6			ML	@ 10 feet, SANDY SILT, approximately 10% medium grained sand, 15% fine grained sand, 75% silty fines with trace clay, brown, moist.
15	36		18.5		109.1				
20	30		1.9		105.4			SW	@ 20 feet, WELL GRADED SAND, approximately 25% coarse grained sand, 30% medium grained sand, 40% fine grained sand, 5% silty fines, white, dry.
25	18		17.3		112.1			ML	@ 25 feet, SANDY SILT, approximately 10% medium grained sand, 15% fine grained sand, 75% silty fines with trace clay, gray-brown, damp.
30	25		3.5		115.5				@ 30 feet, becomes dry.
35	25		21.0		102.7			CL	@ 35 feet, LEAN CLAY with SAND, approximately 15% coarse grained sand, 85% clayey fines of low plasticity, gray-brown, damp.
40	25		27.5		98.0				@ 40 feet, contains some thiin calcite stringers.
45	65		11.0		113.7	▽		SW	@ 45 feet, WELL GRADED SAND, approximately 30% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 5% silty fines, white, wet, groundwater.
50									@ 50 feet, sand heaved into hole 2', no sample driven.
									END OF BORING
55									Fill to 2' Groundwater @ 45' No bedrock

TEST DATA

PROJECT:	Proposed Lake Elsinore Apartments	PROJECT NUMBER:	33310.1
CLIENT:	Lake Elsinore CCR, LLC	ELEVATION:	1256
		DATE DRILLED:	November 11, 2016
LOR GEOTECHNICAL GROUP INC.		EQUIPMENT:	Mobile B61
		HOLE DIA.: 8"	ENCLOSURE: B-2

LOG OF BORING B-3

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
	TEST DATA								
0	58 for 11"		1.3		120.3			SM	@ 0 feet, FILL : SILTY SAND, approximately 25% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 25% silty fines, gray, dry, loose. @ 2 feet, ALLUVIUM :SILTY SAND, approximately 25% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, brown, dry.
5	35		1.6		115.1				
10	58 for 11"		9.0		115.0				@ 10 feet, SILTY SAND, approximately 20% coarse grained sand, 25% medium grained sand, 30% silty fines, tan, damp.
15	51		14.6		118.4			CL	@ 15 feet, LEAN CLAY with SAND, approximately 10% medium grained sand, 15% fine grained sand, 75% clayey fines of low plasticity, brown, damp.
20	38		18.3		112.1			SC	@ 25 feet, CLAYEY SAND, approximately 10% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 30% clayey fines, brown, damp.
25	24		13.3		107.6			SM	@ 25 feet, SILTY SAND, approximately 5% medium grained sand, 70% fine grained sand, 25% silty fines, brown, damp.
30	34		18.8		104.5			ML	@ 30 feet, SANDY SILT, approximately 30% fine grained sand, 65% silty fines with trace clay, brown, damp.
35									END OF BORING Fill to 2' No groundwater No bedrock
40									

PROJECT:	Proposed Lake Elsinore Apartments	PROJECT NUMBER:	33310.1
CLIENT:	Lake Elsinore CCR, LLC	ELEVATION:	1267
LOR GEOTECHNICAL GROUP INC.		DATE DRILLED:	November 11, 2016
		EQUIPMENT:	Mobile B61
		HOLE DIA.: 8"	ENCLOSURE: B-3

LOG OF TRENCH T-1

DEPTH IN FEET	TEST DATA: LABORATORY TESTS		ESTIMATED COMPACTION (%)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								ML	@ 0 feet, FILL: SANDY SILT, approximately 10% medium grained sand, 15% fine grained sand, 75% silty fines with trace clay, gray, dry, loose.
									@ 2 feet, ALLUVIUM: SANDY SILT, approximately 15% medium grained sand, 15% fine grained sand, 70% silty fines with trace clay, gray, dry, abundant pinhole porosity.
5								CL	@ 4 feet, becomes LEAN CLAY with SAND, approximately 10% medium grained sand, 15% fine grained sand, 75% clayey fines of low plasticity, brown, dry, some pinhole porosity, some thin calcite stringers.
								SM	@ 8 feet, SILTY SAND, approximately 15% coarse grained sand, 20% medium grained sand, 25% fine grained sand, 40% silty fines, gray, dry.
10								ML	@ 11 feet, SANDY SILT, approximately 5% coarse grained sand, 10% medium grained sand, 15% fine grained sand, 70% silty fines, brown, trace pinhole porosity, brown, damp.
15									END OF TRENCH Fill to 2' No caving No groundwater No bedrock

PROJECT:	Proposed Lake Elsinore Apartments	PROJECT NUMBER:	33310.1
CLIENT:	Lake Elsinore CCR, LLC	ELEVATION:	1255
LOR GEOTECHNICAL GROUP INC.		DATE EXCAVATED:	November 9, 2016
		EQUIPMENT:	John Deere 410J
		BUCKET W.: 24"	ENCLOSURE: B-4

LOG OF TRENCH T-2

DEPTH IN FEET	TEST DATA: LABORATORY TESTS		ESTIMATED COMPACTION (%)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SW SM	@ 0 feet, ALLUVIUM: **WELL GRADED SAND with SILT, approximately 30% coarse grained sand, 30% meidum grained sand, 30% fine grained sand, 10% silty fines, damp, some minor washed in trash and debris, crudely stratified in the upper 2 feet.** **@ 2 feet, becomes massive.**
5									
10								CL	**@ 10 feet, LEAN CLAY with SAND, approximately 5% coarse grained sand, 10% medium grained sand, 15% fine grained sand, 70% clayey fines of low plasticity, gray, moist.**
15									**END OF TRENCH** **No fill** **No caving** **No groundwater** **No bedrock**

PROJECT:	**Proposed Lake Elsinore Apartments**	PROJECT NUMBER:	**33310.1**
CLIENT:	**Lake Elsinore CCR, LLC**	ELEVATION:	**1260**
LOR GEOTECHNICAL GROUP INC.		DATE EXCAVATED:	**November 9, 2016**
		EQUIPMENT:	**John Deere 410J**
		BUCKET W.: **24"**	ENCLOSURE: **B-5**

APPENDIX C

Laboratory Testing Program and Test Results

APPENDIX C
LABORATORY TESTING

General

Selected soil samples obtained from the borings were tested in our laboratory to evaluate the physical properties of the soils affecting foundation design and construction procedures. The laboratory testing program performed in conjunction with our investigation included in-place moisture content and density, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, and soluble sulfate content. Descriptions of the laboratory tests are presented in the following paragraphs:

Moisture-Density Tests

The moisture content and dry density information provides an indirect measure of soil consistency for each stratum, and can also provide a correlation between soils on this site. The dry unit weight and field moisture content were determined in general accordance with ASTM D 2937 and 2216, respectively, for selected undisturbed samples, and the results are shown on the boring logs, Enclosures B-1 through B-3, for convenient correlation with the soil profile.

Laboratory Compaction Characteristics

Selected soil samples were tested in the laboratory to determine compaction characteristics using the ASTM D 1557 compaction test method. The results are presented in the following table:

LABORATORY COMPACTION				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.G.S.)**	**Maximum Dry Density (pcf)**	**Optimum Moisture Content (percent)**
B-1	0-3	(SM) Silty Sand with Gravel	134.0	7.0

Direct Shear Tests

Shear tests are performed with a direct shear machine in general accordance with ASTM D 3080 at a constant rate-of-strain (usually 0.04 inches/minute). The machine is designed to test a sample partially extruded from a sample ring in single shear.

Samples are tested at varying normal loads in order to evaluate the shear strength parameters, angle of internal friction and cohesion. Samples are tested in a remolded condition (90 percent relative compaction per ASTM D 1557) and soaked, to represented the worse case conditions expected in the field.

The results of the shear tests are presented in the following table:

DIRECT SHEAR TESTS				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.G.S.)**	**Cohesion (psf)**	**Angle of Internal Friction (degrees)**
B-1	0-3	(SM) Silty Sand	140	34

Sieve Analysis

A quantitative determination of the grain size distribution was performed for selected samples in accordance with the ASTM D 422 laboratory test procedure. The determination is performed by passing the soil through a series of sieves, and recording the weights of retained particles on each screen. The results of the sieve analyses are presented graphically on Enclosure C-1.

Sand Equivalent

The sand equivalent of selected soils were evaluated using the California Sand Equivalent Test Method, Caltrans Number 217. The results of the sand equivalent tests are presented with the grain size distribution analyses on Enclosure C-1.

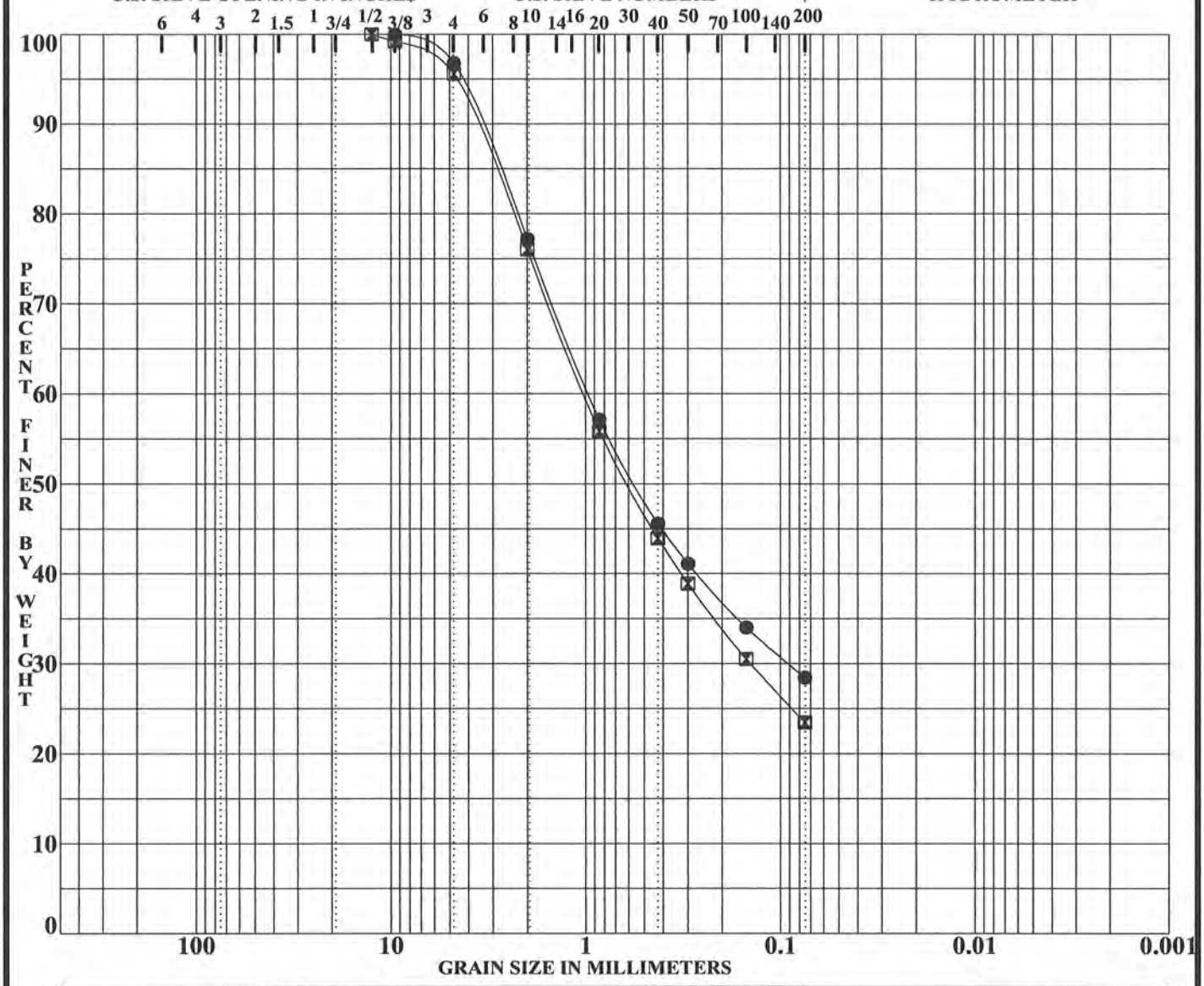
R-Value Test

Soil samples were obtained at probable pavement subgrade level and sieve analysis and sand equivalent tests were conducted. A selected soil sample was tested to determine its R-value using the California R-Value Test Method, Caltrans Number 301. The results of the sieve analysis, sand equivalent, and R-value tests are presented on Enclosure C-1.

Soluble Sulfate Content Tests

The soluble sulfate content of selected subgrade soils were evaluated. The concentration of soluble sulfates in the soils was determined by measuring the optical density of a barium sulfate precipitate. The precipitate results from a reaction of barium chloride with water extractions from the soil samples. The measured optical density is correlated with readings on precipitates of known sulfate concentrations. The test results are presented on the following table:

SOLUBLE SULFATE CONTENT TESTS			
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.G.S.)**	**Sulfate Content (percent by weight)**
B-1	0-3	(SM) Silty Sand	< 0.005
B-3	0-3	(SM) Silty Sand	< 0.005



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Soil Classification	SE	RV			Cc	Cu
●	B-1	@ 0-3 ft	(SM) Silty Sand	27	73				
⊠	B-3	@ 0-3 ft	(SM) Silty Sand	37	--				

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	@ 0-3 ft	9.50	0.96	0.091		3.2	68.3	28.4	
⊠	B-3	@ 0-3 ft	12.50	1.01	0.143		4.4	72.1	23.4	

PROJECT *Proposed Lake Elsinore Apartments*

PROJECT NO. *33310.1*

DATE *12/5/16*

GRADATION CURVES

LOR Geotechnical Group, Inc.

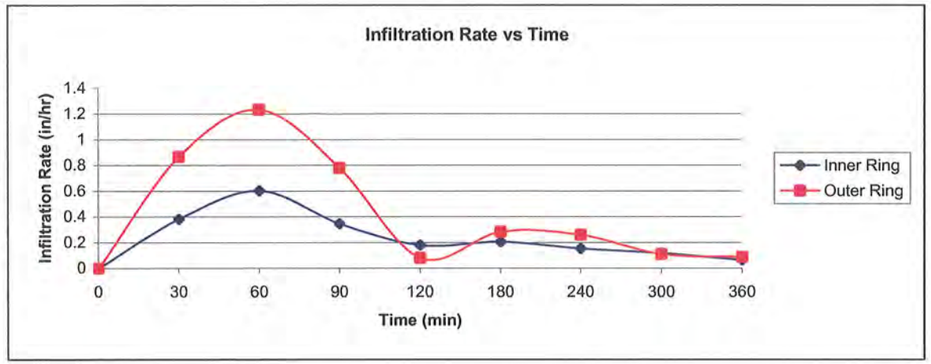
ENCLOSURE C-1

APPENDIX D

Infiltration Test Results

DOUBLE RING INFILTROMETER TEST DATA

Project:	Lake Elsinore Apartments	**Test Date:**	November 9, 2016
Project No.:	33310.1	**Test Hole No.:**	DRI-1
Soil Classification:	(ML) Sandy Silt, ~25% fine sand, 75% silty fines	**Test Hole Diameter:**	12 in. inner, 24 in. annular
Depth of Test Hole:	3 ft	**Date Excavated:**	November 9, 2016
Liquid Used:	Tap Water	**pH:**	7.8
Area of Rings:	Inner = 0.785 ft^2 , Annular 2.36 ft^2	**Depth of Water in Rings:**	2.5 in
Tested By:	R.L.	**Ring Penetration:**	3 in
Liquid Level Maintained Using:	Vacuum Seal		
Depth to Water Table:	34 ft		

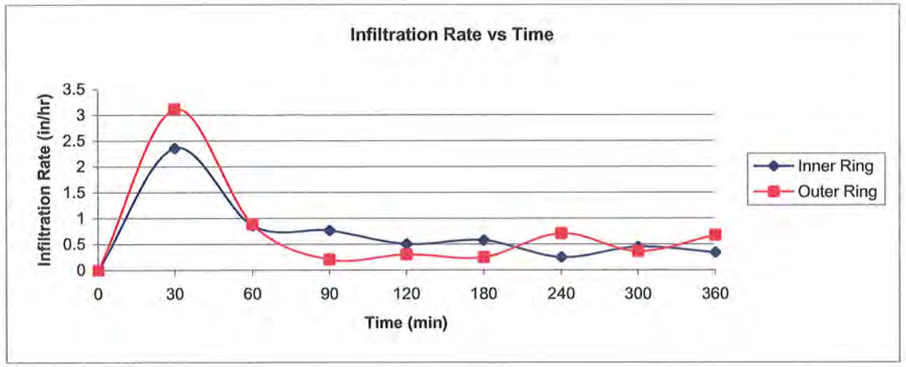


TEST PERIOD

TRIAL NO.	INNER				ANNULAR SPACE			WATER USED (lbs.)		WATER USED (gal)		INFILTRATION RATE (gal/sf.day)		INFILTRATION RATE (in/hr)		LIQUID TEMP (°F)	REMARKS
	TIME		TIME INTERVAL (minutes)	TOTAL ELASPED TIME (minutes)	TIME	TIME INTERVAL (minutes)	TOTAL ELASPED TIME (minutes)	inner	annular space	inner	annular space	inner	annular space	innner	annular space		
1	S	8:58	30	30	8:58	30	30	0.78	5.31	0.094	0.637	5.7	13.0	0.4	0.9	71	
	E	9:28			9:28												
2	S	9:28	30	60	9:28	30	60	1.23	7.56	0.148	0.908	9.0	18.5	0.6	1.2	73	
	E	9:58			9:58												
3	S	9:58	30	90	9:58	30	90	0.71	4.78	0.085	0.574	5.2	11.7	0.3	0.8	75	
	E	10:28			10:28												
4	S	10:28	30	120	10:28	30	120	0.37	0.51	0.044	0.061	2.7	1.2	0.2	0.1	75	
	E	10:58			10:58												
5	S	10:58	60	180	10:58	60	180	0.84	3.49	0.101	0.419	3.1	4.3	0.2	0.3	75	
	E	11:58			11:58												
6	S	11:58	60	240	11:58	60	240	0.63	3.20	0.076	0.384	2.3	3.9	0.2	0.3	76	
	E	12:58			12:58												
7	S	12:58	60	300	12:58	60	300	0.49	1.38	0.059	0.166	1.8	1.7	0.1	0.1	76	
	E	13:58			13:58												
8	S	13:58	60	360	13:58	60	360	0.27	1.11	0.032	0.133	1.0	1.4	0.1	0.1	77	
	E	14:58			14:58												

DOUBLE RING INFILTROMETER TEST DATA

Project:	Lake Elsinore Apartments	**Test Date:**	November 9, 2016
Project No.:	33310.1	**Test Hole No.:**	DRI-2
Soil Classification:	(ML) Sandy Silt, ~75% fine sand, 75% silty fines	**Test Hole Diameter:**	12 in. inner, 24 in. annular
Depth of Test Hole:	4 ft	**Date Excavated:**	November 9, 2016
Liquid Used:	Tap Water	**pH:**	7.8
Area of Rings:	Inner = 0.785 ft^2 , Annular 2.36 ft^2	**Depth of Water in Rings:**	2.5 in
Tested By:	R.L.	**Ring Penetration:**	4 in
Liquid Level Maintained Using:	Vacuum Seal		
Depth to Water Table:	34 ft		



TEST PERIOD

TRIAL NO.	INNER				ANNULAR SPACE			WATER USED (lbs.)		WATER USED (gal)		INFILTRATION RATE (gal/sf.day)		INFILTRATION RATE (in/hr)		LIQUID TEMP (°F)	REMARKS
	TIME		TIME INTERVAL (minutes)	TOTAL ELASPED TIME (minutes)	TIME	TIME INTERVAL (minutes)	TOTAL ELASPED TIME (minutes)	inner	annular space	inner	annular space	inner	annular space	innner	annular space		
1	S	9:15	30	30	9:15	30	30	4.80	19.06	0.576	2.288	35.2	46.5	2.4	3.1	71	
	E	9:45			9:45												
2	S	9:45	30	60	9:45	30	60	1.76	5.45	0.211	0.654	12.9	13.3	0.9	0.9	73	
	E	10:15			10:15												
3	S	10:17	30	90	10:17	30	90	1.56	1.28	0.187	0.154	11.5	3.1	0.8	0.2	75	refilled outter bottle
	E	10:47			10:47												
4	S	10:47	30	120	10:47	30	120	1.04	1.89	0.125	0.227	7.6	4.6	0.5	0.3	75	
	E	11:17			11:17												
5	S	11:17	60	180	11:17	60	180	2.38	3.14	0.286	0.377	8.7	3.8	0.6	0.3	75	
	E	12:17			12:17												
6	S	12:17	60	240	12:17	60	240	1.03	8.73	0.124	1.048	3.8	10.7	0.3	0.7	76	
	E	13:17			13:17												
7	S	13:17	60	300	13:17	60	300	1.85	4.49	0.222	0.539	6.8	5.5	0.5	0.4	76	
	E	14:17			14:17												
8	S	14:17	60	360	14:17	60	360	1.41	8.30	0.169	0.996	5.2	10.1	0.3	0.7	77	
	E	15:17			15:17												

APPENDIX E

CPT Data

Lake Elsinore Apartments

Project ID: LOR Geotechnical
Data File: SDF(292).cpt
CPT Date: 11/11/2016 8:16:13 AM
GW During Test: 34 ft

Sounding ID: CPT-01
Project No: 33310.1
Cone/Rig: DDG1350

Depth ft	qc PS tsf	qc1n PS -	qincs 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	28.3	45.4	67.1	28.3	0.2	-0.1	0.7	5	silty SAND to sandy SILT	120	3.0	9	15	41	48	-	-	16	2.11	16	N/A	N/A
0.49	78.8	126.3	126.3	78.8	0.3	-0.1	0.4	6	clean SAND to silty SAND	125	5.0	16	25	75	48	-	-	5	1.58	16	N/A	N/A
0.66	114.9	184.2	184.2	114.9	0.4	-0.1	0.4	6	clean SAND to silty SAND	125	5.0	23	37	87	48	-	-	5	1.44	16	N/A	N/A
0.82	137.7	220.8	220.8	137.7	0.6	0.0	0.4	6	clean SAND to silty SAND	125	5.0	28	44	93	48	-	-	5	1.42	16	N/A	N/A
0.98	179.4	287.8	287.8	179.4	0.8	0.0	0.4	7	grvly SAND to dense SAND	130	6.0	30	48	95	48	-	-	5	1.33	16	N/A	N/A
1.15	259.4	416.0	416.0	259.4	1.1	0.1	0.4	7	grvly SAND to dense SAND	130	6.0	43	69	95	48	-	-	5	1.19	16	N/A	N/A
1.31	333.3	534.5	534.5	333.3	1.3	0.3	0.4	7	grvly SAND to dense SAND	130	6.0	56	89	95	48	-	-	5	1.10	16	N/A	N/A
1.48	353.8	567.3	567.3	353.8	1.9	0.4	0.5	7	grvly SAND to dense SAND	130	6.0	59	95	95	48	-	-	5	1.20	16	N/A	N/A
1.64	364.3	584.3	584.3	364.4	2.1	0.8	0.6	7	grvly SAND to dense SAND	130	6.0	61	97	95	48	-	-	5	1.21	16	N/A	N/A
1.80	382.9	614.0	614.0	382.9	2.5	0.9	0.7	7	grvly SAND to dense SAND	130	6.0	64	100	95	48	-	-	5	1.24	16	N/A	N/A
1.97	360.8	578.6	578.6	360.8	2.5	0.9	0.7	7	grvly SAND to dense SAND	130	6.0	60	96	95	48	-	-	5	1.27	16	N/A	N/A
2.13	341.2	547.2	547.2	341.2	2.4	1.0	0.7	7	grvly SAND to dense SAND	130	6.0	57	91	95	48	-	-	5	1.30	16	N/A	N/A
2.30	311.1	498.9	498.9	311.1	2.2	1.1	0.7	7	grvly SAND to dense SAND	130	6.0	52	83	95	48	-	-	5	1.31	16	N/A	N/A
2.46	302.2	484.7	484.7	302.2	2.2	1.2	0.7	7	grvly SAND to dense SAND	130	6.0	50	81	95	48	-	-	5	1.33	16	N/A	N/A
2.62	308.3	494.4	494.4	308.3	2.3	1.2	0.7	6	clean SAND to silty SAND	125	5.0	62	99	95	48	-	-	5	1.34	16	N/A	N/A
2.79	295.4	473.7	473.7	295.4	2.4	1.3	0.8	6	clean SAND to silty SAND	125	5.0	59	95	95	48	-	-	5	1.38	16	N/A	N/A
2.95	295.7	474.2	474.2	295.7	2.4	1.3	0.8	6	clean SAND to silty SAND	125	5.0	59	95	95	48	-	-	5	1.39	16	N/A	N/A
3.12	278.8	447.1	447.1	278.8	2.7	1.3	1.0	6	clean SAND to silty SAND	125	5.0	56	89	95	48	-	-	5	1.46	16	N/A	N/A
3.28	273.2	438.1	438.1	273.2	2.8	1.4	1.0	6	clean SAND to silty SAND	125	5.0	55	88	95	48	-	-	5	1.48	16	N/A	N/A
3.45	272.7	437.4	437.4	272.8	2.7	1.3	1.0	6	clean SAND to silty SAND	125	5.0	55	87	95	48	-	-	5	1.47	16	N/A	N/A
3.61	280.1	449.2	449.2	280.1	2.9	1.3	1.0	6	clean SAND to silty SAND	125	5.0	56	90	95	48	-	-	5	1.48	16	N/A	N/A
3.77	265.9	426.5	426.5	266.0	3.2	1.3	1.2	6	clean SAND to silty SAND	125	5.0	53	85	95	48	-	-	5	1.54	16	N/A	N/A
3.94	252.6	405.1	405.1	252.6	3.2	1.3	1.3	6	clean SAND to silty SAND	125	5.0	51	81	95	48	-	-	5	1.58	16	N/A	N/A
4.10	250.2	401.3	401.3	250.3	3.2	1.2	1.3	6	clean SAND to silty SAND	125	5.0	50	80	95	48	-	-	5	1.59	16	N/A	N/A
4.27	242.8	389.4	389.4	242.8	3.3	1.3	1.4	6	clean SAND to silty SAND	125	5.0	49	78	95	48	-	-	5	1.62	16	N/A	N/A
4.43	237.8	381.4	381.4	237.9	3.1	1.1	1.3	6	clean SAND to silty SAND	125	5.0	48	76	95	48	-	-	5	1.61	16	N/A	N/A
4.59	227.9	365.6	365.6	228.0	2.8	1.2	1.2	6	clean SAND to silty SAND	125	5.0	46	73	95	48	-	-	5	1.59	16	N/A	N/A
4.76	219.9	352.6	352.6	219.9	2.3	1.1	1.0	6	clean SAND to silty SAND	125	5.0	44	71	95	48	-	-	5	1.54	16	N/A	N/A
4.92	208.8	334.9	334.9	208.8	1.9	1.1	0.9	6	clean SAND to silty SAND	125	5.0	42	67	95	48	-	-	5	1.51	16	N/A	N/A
5.09	201.3	322.8	322.8	201.3	1.4	1.1	0.7	6	clean SAND to silty SAND	125	5.0	40	65	95	48	-	-	5	1.42	16	N/A	N/A
5.25	202.8	325.3	325.3	202.9	1.5	1.0	0.7	6	clean SAND to silty SAND	125	5.0	41	65	95	48	-	-	5	1.45	16	N/A	N/A
5.41	186.8	299.5	299.5	186.8	1.6	0.1	0.9	6	clean SAND to silty SAND	125	5.0	37	60	95	48	-	-	5	1.53	16	N/A	N/A
5.58	212.2	340.4	340.4	212.2	1.7	0.0	0.8	6	clean SAND to silty SAND	125	5.0	42	68	95	48	-	-	5	1.47	16	N/A	N/A
5.74	211.1	338.6	338.6	211.1	1.7	-0.1	0.8	6	clean SAND to silty SAND	125	5.0	42	68	95	48	-	-	5	1.47	16	N/A	N/A
5.91	208.5	332.2	332.2	208.5	1.9	-0.1	0.9	6	clean SAND to silty SAND	125	5.0	42	66	95	48	-	-	5	1.51	16	N/A	N/A
6.07	206.8	325.1	325.1	206.8	1.7	-0.1	0.8	6	clean SAND to silty SAND	125	5.0	41	65	95	48	-	-	5	1.49	16	N/A	N/A
6.23	204.0	316.5	316.5	204.0	1.5	-0.2	0.7	6	clean SAND to silty SAND	125	5.0	41	63	95	48	-	-	5	1.46	16	N/A	N/A
6.40	210.1	321.7	321.7	210.1	1.4	-0.4	0.7	6	clean SAND to silty SAND	125	5.0	42	64	95	48	-	-	5	1.42	16	N/A	N/A
6.56	234.7	355.0	355.0	234.7	1.5	-0.4	0.7	6	clean SAND to silty SAND	125	5.0	47	71	95	48	-	-	5	1.39	16	N/A	N/A
6.73	256.2	382.7	382.7	256.2	1.7	-0.4	0.7	6	clean SAND to silty SAND	125	5.0	51	77	95	48	-	-	5	1.38	16	N/A	N/A
6.89	237.2	350.1	350.1	237.2	1.8	-0.4	0.8	6	clean SAND to silty SAND	125	5.0	47	70	95	48	-	-	5	1.44	16	N/A	N/A
7.05	232.0	338.4	338.4	232.0	1.8	-0.4	0.8	6	clean SAND to silty SAND	125	5.0	46	68	95	48	-	-	5	1.46	16	N/A	N/A
7.22	238.3	343.6	343.6	238.3	1.8	-0.4	0.7	6	clean SAND to silty SAND	125	5.0	48	69	95	48	-	-	5	1.44	16	N/A	N/A
7.38	238.8	340.5	340.5	238.8	1.7	-0.5	0.7	6	clean SAND to silty SAND	125	5.0	48	68	95	48	-	-	5	1.42	16	N/A	N/A
7.55	233.0	328.7	328.7	233.0	1.7	-0.5	0.7	6	clean SAND to silty SAND	125	5.0	47	66	95	48	-	-	5	1.45	16	N/A	N/A
7.71	297.0	414.5	414.5	297.0	3.1	-0.6	1.0	6	clean SAND to silty SAND	125	5.0	59	83	95	48	-	-	5	1.50	16	N/A	N/A
7.87	385.3	532.2	532.2	385.3	4.1	-0.7	1.1	6	clean SAND to silty SAND	125	5.0	77	100	95	48	-	-	5	1.46	16	N/A	N/A
8.04	433.6	592.8	592.8	433.6	4.8	-0.9	1.1	6	clean SAND to silty SAND	125	5.0	87	100	95	48	-	-	5	1.45	16	N/A	N/A
8.20	397.3	537.7	537.7	397.3	4.8	-0.8	1.2	6	clean SAND to silty SAND	125	5.0	79	100	95	48	-	-	5	1.50	16	N/A	N/A
8.37	366.1	490.6	490.6	366.1	4.6	-0.5	1.2	6	clean SAND to silty SAND	125	5.0	73	98	95	48	-	-	5	1.53	16	N/A	N/A
8.53	347.4	461.0	461.0	347.4	4.3	-0.5	1.2	6	clean SAND to silty SAND	125	5.0	69	92	95	48	-	-	5	1.54	16	N/A	N/A
8.69	313.0	411.5	411.5	313.0	4.0	-0.5	1.3	6	clean SAND to silty SAND	125	5.0	63	82	95	48	-	-	5	1.58	16	N/A	N/A
8.86	267.5	348.4	348.7	267.4	3.7	-0.9	1.4	6	clean SAND to silty SAND	125	5.0	53	70	95	48	-	-	5	1.65	16	N/A	N/A
9.02	270.3	348.9	348.4	270.3	3.7	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	54	70	95	48	-	-	5	1.64	16	N/A	N/A
9.19	279.1	357.0	366.0	279.1	4.3	-0.7	1.5	6	clean SAND to silty SAND	125	5.0	56	71	95	48	-	-	6	1.68	16	N/A	N/A
9.35	287.1	364.0	376.7	287.0	4.7	-0.8	1.6	6	clean SAND to silty SAND	125	5.0	57	73	95	48	-	-	6	1.70	16	N/A	N/A
9.51	283.2	355.9	387.8	283.2	5.6	-1.0	2.0	6	clean SAND to silty SAND	125	5.0	57	71	95	48	-	-	8	1.78	16	N/A	N/A
9.68	292.1	364.0	397.3	292.1	5.9	-1.0	2.0	6	clean SAND to silty SAND	125	5.0	58	73	95	48	-	-	8	1.78	16	N/A	N/A
9.84	281.1	347.4	380.0	281.1	5.6	-0.9	2.0	6	clean SAND to silty SAND	125	5.0	56	69	95	48	-	-	8	1.78	16	N/A	N/A
10.01	267.4	327.8	385.7	267.4	6.8	-0.8	2.6	8	stiff SAND to clayy SAND	115	5.0	53	66	95	47	-	-	10	1.89	16	N/A	N/A
10.17	276.0	335.7	427.3	275.9	9.1	-1.0	3.3	8	stiff SAND to clayy SAND	115	5.0	55	67	95	48	-	-	12	1.98	16	N/A	N/A
10.34	311.3	376.0	476.3	311.3	10.7	-1.4	3.5	8	stiff SAND to clayy SAND	115	5.0	62	75	95	48	-	-	12	1.97	16	N/A	N/A
10.50	334.2	400.7	477.1	334.2	9.9	-1.4	3.0	8	stiff SAND to clayy SAND	115	5.0	67	80	95	48	-	-	10	1.90	16	N/A	N/A
10.66	331.7	394.9	439.0	331.6	7.6	-1.4	2.3	8	stiff SAND to clayy SAND	115	5.0	66	79	95	48	-	-	8	1.81	16	N/A	N/A
10.83	328.0	387.8	402.4	328.0	5.6	-0.8	1.7	6	clean SAND to silty SAND	125	5.0	66	78	95	48	-	-	6	1.70	16	N/A	N/A
10.99	308.0	361.3	362.2	308.0	4.4	-0.7	1.4	6	clean SAND to silty SAND	125	5.0	62	72	95	48	-	-	5	1.65	16	N/A	N/A
11.16	314.7	366.5	366.5	314.7	4.0	-1.0	1.3	6	clean SAND to silty SAND	125	5.0	63	73	95	48	-	-	5	1.60	16	N/A	N/A
11.32	320.2	370.2	370.2	320.2	3.6	-1.1	1.1	6	clean SAND to silty SAND	125	5.0	64	74	95	48	-	-	5	1.56	16	N/A	N/A
11.48	332.8	382.0	382.0	332.8	3.6	-1.1	1.1	6	clean SAND to silty SAND	125	5.0	67	76	95	48	-	-	5	1.53	16	N/A	N/A
11.65	341.0	388.7	388.7	341.0	4.2	-1.1	1.2	6	clean SAND to silty SAND	125	5.0	68	78	95	48	-	-	5	1.58	16	N/A	N/A
11.81	327.6	370.8	370.8	327.6	4.3	-1.2	1.3	6	clean SAND to silty SAND	125	5.0	66	74	95	48	-	-	5	1.61	16	N/A	N/A
11.98	307.3	345.3	346.8	307.2	4.3	-1.7	1.4	6	clean SAND to silty SAND	125	5.0	61	69	95	47	-	-	5	1.65	16	N/A	N/A
12.14	302.7	337.9	337.4	302.6	4.0	-2.0	1.3	6	clean SAND to silty SAND	125	5.0	61	68	95	47	-	-	5	1.64	16	N/A	N/A
12.30	277.2	307.4	309.1	277.2	3.6	-1.7	1.3	6	clean SAND to silty SAND	125	5.0	55	61	95	47	-	-	5	1.65	16	N/A	N/A
12.47	215.4	237.3	258.2	215.4	3.2	-1.7	1.5	6	clean SAND to silty SAND	125	5.0	43	47	95	46	-	-	8	1.77	16	N/A	N/A
12.63	141.5	154.8	222.8	141.5	3.8	-1.8	2.7	5	silty SAND to sandy SILT	120	3.0	47	52	81	44	-	-	16	2.09	16	N/A	N/A
12.80	94.6	102.9	210.4	94.6	3.7	-1.6	3.9	9	very stiff fine SOIL	120	1.0	95	100	-	-	3.3	9.9	24	2.33	30	N/A	N/A
12.96	93.3	100.8	229.2	93.3	4.3	-1.4	4.6	9	very stiff fine SOIL	120	1.0	93	100	-	-	3.3	9.9	26	2.39	30	N/A	N/A
13.12	97.8	105.1	243.0	97.7	4.8	-3.1	4.9	9	very stiff fine SOIL	120	1.0	98	100	-	-	3.4	9.9	26	2.40	30	N/A	N/A
13.29	98.8	105.6	243.2	98.8	4.8	-2.2	4.9	9	very stiff fine SOIL	120	1.0	99	100	-	-	3.5	9.9	26	2.40	30	N/A	N/A
13.45	83.6	88.7	231.5	83.5	4.3	-1.9	5.2	9	very stiff fine SOIL	120	1.0	84	89	-	-	2.9	9.9	29	2.47	30	N/A	N/A
13.62	64.9	68.5	209.0	64.8	3.5	-2.3	5.5	4	clayy SILT to silty CLAY	115	2.0	32	34	-	-	4.5	9.9	33	2.55	15	N/A	N/A
13.78	47.5	55.4	-	47.4	2.5	-2.9	5.4	4	clayy SILT to silty CLAY	115	2.0	24	28	-	-	3.3	9.9	36	2.61	15	N/A	N/A
13.94	39.6	45.8	-	39.6	1.8	-3.1	4.6	4	clayy SILT to silty CLAY	115	2.0	20	23	-	-	2.7	9.9	36	2.62	15	N/A	N/A
14.11	37.3	40.2	-	37.2	1.4	-3.7	4.0	4	clayy SILT to silty CLAY	115	2.0	19	20	-	-	2.6	9.9	36	2.61	15	N/A	N/A
14.27	38.4	39.7	129.6	38.4	1.4	-3.6	3.6	4	clayy SILT to silty CLAY	115	2.0	19	20	-	-	2.7	9.9	35	2.59	15	N/A	N/A
14.44	46.2	47.4	136.8	46.1	1.6	-4.0	3.5	4	clayy SILT to silty CLAY	115	2.0	23	24	-	-	3.2	9.9	32	2.52	15	N/A	N/A
14.60	75.1	76.8	183.3	75.1	3.0	-3.9	4.0	4	clayy SILT to silty CLAY	115	2.0	38	38	-	-	5.2	9.9	27	2.42	15	N/A	N/A
14.76	111.0	112.8	237.2	110.9	4.9	-4.8	4.4	9	very stiff fine SOIL	120	1.0	100	100	-	-	3.9	9.9	24	2.35	30	N/A	N/A
14.93	149.0	150.7	293.9	149.0	7.1	-3.7	4.8	9	very stiff fine SOIL	120	1.0	100	100	-	-	5.2	9.9	23	2.30	30	N/A	N/A
15.09	202.5	203.6	320.1	202.4	8.0	-4.0	4.0	8	stiff SAND to clayy SAND	115	5.0	40	41	90	44	-	-	18	2.16	16	N/A	N/A
15.26	229.1	229.2	326.0	229.0	7.9	-2.9	3.5	8	stiff SAND to clayy SAND	115	5.0	46	46	94	45	-	-	15	2.08	16	N/A	N/A
15.42	225.2	224.2	314.4	225.1	7.4	-2.8	3.3	8	stiff SAND to clayy SAND	115	5.0	45	45	94	45	-	-	15	2.07	16	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

Lake Elsinore Apartments

Project ID: LOR Geotechnical
Data File: SDF(292).cpt
CPT Date: 11/11/2016 8:16:13 AM
GW During Test: 34 ft

Sounding ID: CPT-01
Project No: 33310.1
Cone/Rig: DDG1350

Depth ft	qc PS tsf	qcln PS -	qlncs 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-Nl 60*	Rel Den %	Ftn Ang deg	Und Shr tsf	OCR -	Fin Ic %	Ic SBT Indx	Nk -	Vol Strn %	Cycl SStn %
15.58	244.9	242.6	305.6	244.8	6.4	-2.5	2.6	8	stiff SAND to clayy SAND	115	5.0	49	49	95	45	-	-	12	1.97	16	N/A	N/A
15.75	260.7	257.1	295.1	260.7	5.2	-2.4	2.0	6	clean SAND to silty SAND	125	5.0	52	51	95	45	-	-	9	1.85	16	N/A	N/A
15.91	271.6	266.4	288.0	271.5	4.3	-2.4	1.6	6	clean SAND to silty SAND	125	5.0	54	53	95	46	-	-	7	1.76	16	N/A	N/A
16.08	260.6	254.2	277.4	260.5	4.1	-2.2	1.6	6	clean SAND to silty SAND	125	5.0	52	51	95	45	-	-	8	1.78	16	N/A	N/A
16.24	221.1	214.7	265.7	221.1	5.0	-2.1	2.3	6	clean SAND to silty SAND	125	5.0	44	43	92	45	-	-	12	1.95	16	N/A	N/A
16.40	188.7	182.3	280.2	188.7	6.6	-2.1	3.5	8	stiff SAND to clayy SAND	115	5.0	38	36	87	44	-	-	17	2.14	16	N/A	N/A
16.57	229.2	220.3	302.9	229.1	7.1	-2.7	3.1	8	stiff SAND to clayy SAND	115	5.0	46	44	93	45	-	-	14	2.05	16	N/A	N/A
16.73	273.3	261.5	309.1	273.2	6.1	-2.0	2.2	6	clean SAND to silty SAND	125	5.0	55	52	95	45	-	-	10	1.89	16	N/A	N/A
16.90	299.8	285.5	313.1	299.8	5.3	-2.1	1.8	6	clean SAND to silty SAND	125	5.0	60	57	95	46	-	-	8	1.79	16	N/A	N/A
17.06	307.3	291.2	308.6	307.2	4.7	-2.0	1.5	6	clean SAND to silty SAND	125	5.0	61	58	95	46	-	-	7	1.73	16	N/A	N/A
17.23	298.8	281.8	285.2	298.8	3.7	-1.9	1.2	6	clean SAND to silty SAND	125	5.0	60	56	95	46	-	-	5	1.66	16	N/A	N/A
17.39	251.6	236.2	243.0	251.6	2.9	-1.8	1.1	6	clean SAND to silty SAND	125	5.0	50	47	95	45	-	-	6	1.69	16	N/A	N/A
17.55	219.2	204.7	216.3	219.2	2.5	-1.8	1.1	6	clean SAND to silty SAND	125	5.0	44	41	91	44	-	-	7	1.73	16	N/A	N/A
17.72	214.0	198.9	217.6	214.0	2.8	-1.7	1.3	6	clean SAND to silty SAND	125	5.0	43	40	90	44	-	-	8	1.78	16	N/A	N/A
17.88	276.9	256.2	262.5	276.8	3.3	-1.9	1.2	6	clean SAND to silty SAND	125	5.0	55	51	95	45	-	-	6	1.68	16	N/A	N/A
18.05	339.8	312.9	312.9	339.8	4.2	-1.9	1.2	6	clean SAND to silty SAND	125	5.0	68	63	95	46	-	-	5	1.64	16	N/A	N/A
18.21	355.1	325.6	325.3	355.1	4.6	-1.9	1.3	6	clean SAND to silty SAND	125	5.0	71	65	95	46	-	-	5	1.64	16	N/A	N/A
18.37	351.3	320.6	320.6	351.2	4.1	-1.9	1.2	6	clean SAND to silty SAND	125	5.0	70	64	95	46	-	-	5	1.61	16	N/A	N/A
18.54	326.0	296.2	297.1	326.0	4.0	-1.8	1.2	6	clean SAND to silty SAND	125	5.0	65	59	95	46	-	-	5	1.65	16	N/A	N/A
18.70	290.7	263.0	282.1	290.7	4.4	-2.1	1.5	6	clean SAND to silty SAND	125	5.0	58	53	95	45	-	-	7	1.75	16	N/A	N/A
18.87	264.8	238.4	272.8	264.7	4.9	-2.1	1.9	6	clean SAND to silty SAND	125	5.0	53	48	95	45	-	-	9	1.85	16	N/A	N/A
19.03	220.5	197.7	258.8	220.4	5.6	-2.1	2.5	5	silty SAND to sandy SILT	120	3.0	73	66	89	44	-	-	13	2.01	16	N/A	N/A
19.19	186.1	166.2	236.4	186.1	5.1	-2.3	2.8	5	silty SAND to sandy SILT	120	3.0	62	55	84	43	-	-	15	2.08	16	N/A	N/A
19.36	168.5	149.8	219.4	168.5	4.6	-1.9	2.7	5	silty SAND to sandy SILT	120	3.0	56	50	80	42	-	-	16	2.11	16	N/A	N/A
19.52	89.4	79.2	169.2	89.4	3.0	-1.8	3.4	5	silty SAND to sandy SILT	120	3.0	30	26	59	39	-	-	25	2.35	16	N/A	N/A
19.69	49.6	40.9	-	49.6	2.0	-1.6	4.1	4	clayy SILT to silty CLAY	115	2.0	25	20	-	-	3.4	9.9	36	2.62	15	N/A	N/A
19.85	41.5	36.5	110.4	41.5	1.1	-1.9	2.8	4	clayy SILT to silty CLAY	115	2.0	21	18	-	-	2.8	9.9	33	2.55	15	N/A	N/A
20.01	34.6	30.3	92.9	34.6	0.8	-1.5	2.3	4	clayy SILT to silty CLAY	115	2.0	17	15	-	-	2.4	8.9	33	2.56	15	N/A	N/A
20.18	32.6	28.4	84.4	32.5	0.6	-1.3	2.0	4	clayy SILT to silty CLAY	115	2.0	16	14	-	-	2.2	8.3	32	2.54	15	N/A	N/A
20.34	34.1	29.6	84.6	34.0	0.6	-1.3	1.9	4	clayy SILT to silty CLAY	115	2.0	17	15	-	-	2.3	8.7	31	2.52	15	N/A	N/A
20.51	31.5	25.0	-	31.4	0.7	-1.7	2.3	4	clayy SILT to silty CLAY	115	2.0	16	12	-	-	2.1	7.9	36	2.62	15	N/A	N/A
20.67	28.0	22.0	-	27.9	0.6	-1.5	2.4	4	clayy SILT to silty CLAY	115	2.0	14	11	-	-	1.9	6.9	39	2.68	15	N/A	N/A
20.83	24.6	19.3	-	24.6	0.5	-1.5	2.3	4	clayy SILT to silty CLAY	115	2.0	12	10	-	-	1.7	6.0	42	2.72	15	N/A	N/A
21.00	22.6	17.5	-	22.5	0.5	-1.6	2.3	4	clayy SILT to silty CLAY	115	2.0	11	9	-	-	1.5	5.4	43	2.75	15	N/A	N/A
21.16	21.2	16.3	-	21.2	0.4	-1.6	2.1	4	clayy SILT to silty CLAY	115	2.0	11	8	-	-	1.4	5.1	44	2.76	15	N/A	N/A
21.33	21.4	16.4	-	21.4	0.4	-1.6	1.8	4	clayy SILT to silty CLAY	115	2.0	11	8	-	-	1.4	5.1	41	2.72	15	N/A	N/A
21.49	21.2	16.1	-	21.2	0.4	-1.7	1.8	4	clayy SILT to silty CLAY	115	2.0	11	8	-	-	1.4	5.0	42	2.72	15	N/A	N/A
21.65	20.4	15.4	-	20.4	0.4	-1.8	2.0	4	clayy SILT to silty CLAY	115	2.0	10	8	-	-	1.3	4.8	44	2.76	15	N/A	N/A
21.82	21.4	16.0	-	21.3	0.4	-1.8	2.0	4	clayy SILT to silty CLAY	115	2.0	11	8	-	-	1.4	5.0	43	2.75	15	N/A	N/A
21.98	23.7	17.6	-	23.7	0.4	-2.1	1.8	4	clayy SILT to silty CLAY	115	2.0	12	9	-	-	1.6	5.5	40	2.69	15	N/A	N/A
22.15	23.8	17.6	-	23.8	0.4	-2.1	1.8	4	clayy SILT to silty CLAY	115	2.0	12	9	-	-	1.6	5.5	40	2.69	15	N/A	N/A
22.31	23.5	17.2	-	23.5	0.4	-2.1	1.8	4	clayy SILT to silty CLAY	115	2.0	12	9	-	-	1.6	5.4	40	2.70	15	N/A	N/A
22.47	23.2	16.9	-	23.2	0.4	-2.1	1.9	4	clayy SILT to silty CLAY	115	2.0	12	8	-	-	1.5	5.2	41	2.72	15	N/A	N/A
22.64	24.1	17.4	-	24.1	0.4	-2.1	1.8	4	clayy SILT to silty CLAY	115	2.0	12	9	-	-	1.6	5.4	40	2.70	15	N/A	N/A
22.80	24.9	17.9	-	24.9	0.4	-2.1	1.8	4	clayy SILT to silty CLAY	115	2.0	12	9	-	-	1.7	5.6	39	2.68	15	N/A	N/A
22.97	25.7	18.3	-	25.6	0.5	-2.1	1.9	4	clayy SILT to silty CLAY	115	2.0	13	9	-	-	1.7	5.7	40	2.69	15	N/A	N/A
23.13	26.2	18.6	-	26.2	0.5	-2.1	1.9	4	clayy SILT to silty CLAY	115	2.0	13	9	-	-	1.8	5.8	40	2.68	15	N/A	N/A
23.30	27.6	19.4	-	27.6	0.5	-2.0	1.8	4	clayy SILT to silty CLAY	115	2.0	14	10	-	-	1.9	6.1	38	2.66	15	N/A	N/A
23.46	26.0	18.2	-	26.0	0.5	-2.0	1.9	4	clayy SILT to silty CLAY	115	2.0	13	9	-	-	1.7	5.7	40	2.69	15	N/A	N/A
23.62	24.4	17.0	-	24.4	0.5	-2.1	2.0	4	clayy SILT to silty CLAY	115	2.0	12	8	-	-	1.6	5.3	42	2.73	15	N/A	N/A
23.79	25.4	17.5	-	25.4	0.4	-2.0	1.9	4	clayy SILT to silty CLAY	115	2.0	13	9	-	-	1.7	5.5	41	2.70	15	N/A	N/A
23.95	29.2	20.0	-	29.2	0.5	-1.9	1.8	4	clayy SILT to silty CLAY	115	2.0	15	10	-	-	2.0	6.3	38	2.65	15	N/A	N/A
24.12	31.0	21.1	-	30.9	0.6	-1.8	1.9	4	clayy SILT to silty CLAY	115	2.0	15	11	-	-	2.1	6.6	37	2.64	15	N/A	N/A
24.28	33.2	22.5	-	33.2	0.8	-1.9	2.6	4	clayy SILT to silty CLAY	115	2.0	17	11	-	-	2.2	7.1	40	2.69	15	N/A	N/A
24.44	33.7	22.7	-	33.7	0.8	-1.8	2.5	4	clayy SILT to silty CLAY	115	2.0	17	11	-	-	2.3	7.2	39	2.68	15	N/A	N/A
24.61	36.9	24.7	-	36.9	0.8	-1.4	2.2	4	clayy SILT to silty CLAY	115	2.0	18	12	-	-	2.5	7.8	36	2.62	15	N/A	N/A
24.77	35.5	23.6	-	35.5	0.7	-1.4	2.1	4	clayy SILT to silty CLAY	115	2.0	18	12	-	-	2.4	7.5	36	2.62	15	N/A	N/A
24.94	34.9	23.0	-	34.9	0.7	-1.4	2.1	4	clayy SILT to silty CLAY	115	2.0	17	12	-	-	2.4	7.3	37	2.62	15	N/A	N/A
25.10	34.8	22.8	-	34.7	0.7	-1.7	2.0	4	clayy SILT to silty CLAY	115	2.0	17	11	-	-	2.3	7.2	36	2.62	15	N/A	N/A
25.26	34.2	22.3	-	34.2	0.7	-1.4	2.1	4	clayy SILT to silty CLAY	115	2.0	17	11	-	-	2.3	7.0	37	2.64	15	N/A	N/A
25.43	32.4	21.0	-	32.4	0.7	-1.5	2.2	4	clayy SILT to silty CLAY	115	2.0	16	11	-	-	2.2	6.6	39	2.68	15	N/A	N/A
25.59	29.9	19.2	-	29.9	0.6	-1.2	2.3	4	clayy SILT to silty CLAY	115	2.0	15	10	-	-	2.0	6.0	41	2.71	15	N/A	N/A
25.76	27.6	17.6	-	27.5	0.6	-0.5	2.1	4	clayy SILT to silty CLAY	115	2.0	14	9	-	-	1.8	5.5	42	2.73	15	N/A	N/A
25.92	23.9	15.2	-	24.0	0.5	1.3	2.1	4	clayy SILT to silty CLAY	115	2.0	12	8	-	-	1.6	4.7	45	2.78	15	N/A	N/A
26.08	21.9	13.9	-	22.0	0.4	1.5	2.0	4	clayy SILT to silty CLAY	115	2.0	11	7	-	-	1.4	4.3	46	2.80	15	N/A	N/A
26.25	21.7	13.7	-	21.8	0.4	1.5	1.8	4	clayy SILT to silty CLAY	115	2.0	11	7	-	-	1.4	4.2	45	2.79	15	N/A	N/A
26.41	22.2	13.9	-	22.2	0.3	1.6	1.7	4	clayy SILT to silty CLAY	115	2.0	11	7	-	-	1.5	4.2	44	2.77	15	N/A	N/A
26.58	23.0	14.3	-	23.1	0.3	1.6	1.5	4	clayy SILT to silty CLAY	115	2.0	12	7	-	-	1.5	4.4	42	2.74	15	N/A	N/A
26.74	24.4	15.1	-	24.5	0.4	1.6	1.6	4	clayy SILT to silty CLAY	115	2.0	12	8	-	-	1.6	4.7	41	2.72	15	N/A	N/A
26.90	25.3	15.6	-	25.4	0.4	1.6	1.6	4	clayy SILT to silty CLAY	115	2.0	13	8	-	-	1.7	4.8	41	2.71	15	N/A	N/A
27.07	26.6	16.3	-	26.7	0.4	1.6	1.6	4	clayy SILT to silty CLAY	115	2.0	13	8	-	-	1.8	5.0	40	2.70	15	N/A	N/A
27.23	28.5	17.3	-	28.6	0.4	1.7	1.7	4	clayy SILT to silty CLAY	115	2.0	14	9	-	-	1.9	5.4	39	2.68	15	N/A	N/A
27.40	30.0	18.1	-	30.0	0.5	1.7	1.8	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.0	5.6	39	2.68	15	N/A	N/A
27.56	30.4	18.2	-	30.4	0.6	1.8	2.0	4	clayy SILT to silty CLAY	115	2.0	15	9	-	-	2.0	5.7	41	2.70	15	N/A	N/A
27.72	31.5	18.8	-	31.6	0.6	1.8	2.2	4	clayy SILT to silty CLAY	115	2.0	16	9	-	-	2.1	5.9	41	2.71	15	N/A	N/A
27.89	34.9	20.7	-	34.9	0.7	1.8	2.2	4	clayy SILT to silty CLAY	115	2.0	17	10	-	-	2.3	6.5	39	2.68	15	N/A	N/A
28.05	36.7	21.6	-	36.7	1.1	1.9	3.1	4	clayy SILT to silty CLAY	115	2.0	18	11	-	-	2.5	6.8	43	2.75	15	N/A	N/A
28.22	41.9	24.6	-	42.0	1.5	2.0	3.7	4	clayy SILT to silty CLAY	115	2.0	21	12	-	-	2.8	7.8	43	2.75	15	N/A	N/A
28.38	52.2	30.4	-	52.2	2.4	1.0	4.7	3	silty CLAY to CLAY	115	1.5	35	20	-	-	3.6	9.7	43	2.76	15	N/A	N/A
28.54	69.7	40.5	-	69.7	3.4	0.1	5.0	3	silty CLAY to CLAY	115	1.5	46	27	-	-	4.8	9.9	39	2.68	15	N/A	N/A
28.71	95.0	70.1	187.7	95.0	4.2	0.6	4.5	4	clayy SILT to silty CLAY	115	2.0	47	35	-	-	6.6	9.9	30	2.48	15	N/A	N/A
28.87	134.5	99.0	195.2	134.4	4.7	-3.5	3.5	5	silty SAND to sandy SILT	120	3.0	45	33	67	39	-	-	23	2.31	16	N/A	N/A
29.04	115.1	84.5	190.0	114.9	4.4	-8.2	3.9	4	clayy SILT to silty CLAY	115	2.0	58	42	-	-	8.0	9.9	26	2.38	15	N/A	N/A
29.20	70.6	40.1	-	70.4	3.5	-9.0	5.1	3	silty CLAY to CLAY	115	1.5	47	27	-	-	4.9	9.9	40	2.69	15	N/A	N/A
29.36	53.3	30.1	-	53.2	3.1	-8.4	6.0	3	silty CLAY to CLAY	115	1.5	36	20	-	-	3.6	9.6	48	2.83	15	N/A	N/A
29.53	61.4	34.5	-	61.3	3.6	-8.0	6.1	3	silty CLAY to CLAY	115	1.5	41	23	-	-	4.2	9.9	46	2.79	15	N/A	N/A
29.69	98.1	54.8	-	97.9	5.3	-7.6	5.5	4	clayy SILT to silty CLAY	115	2.0	49	27	-	-	6.8	9.9	36	2.62	15	N/A	N/A
29.86	220.6	159.7	243.2	220.4	6.9	-8.3	3.1	5	silty SAND to sandy SILT	120	3.0	74	53	82	42	-	-	17	2.14	16	N/A	N/A
30.02	305.8	220.9	275.3	305.7	7.2	-9.7	2.4	6	clean SAND to silty SAND	125	5.0	61	44	93	43	-	-	12	1.96	16	N/A	N/A
30.19	325.0	234.1	282.8	324.8	7.3	-10.8	2.2	6	clean SAND to silty SAND	125	5.0	65	47	95	43	-	-	11	1.92	16	N/A	N/A
30.35	320.1	229.9	280.1	319.9	7.3	-10.5	2.3	6	clean SAND to silty SAND	125	5.0	64	46	94	43	-	-	11	1.93	16	N/A	N/A
30.51	305.6	218.9	271.1	305.5	7.1	-3.7	2.3	6	clean SAND to silty SAND	125	5.0	61	44	93	43	-	-	12	1.95	16	N/A	N/A
30.68	293.0	209.3	259.3	293.0	6.6	-1.0	2.2	6	clean SAND to silty SAND	125	5.0	59	42	91	43	-	-	12	1.95	16	N/A	N/A
30.84	289.2	206.0	254.9	289.2	6.4	-0.7	2.2	6	clean SAND to silty SAND	125	5.0	58	41	91	43	-	-	12	1.95	16	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

Lake Elsinore Apartments

Project ID: LOR Geotechnical
Data File: SDF(292).cpt
CPT Date: 11/11/2016 8:16:13 AM
GW During Test: 34 ft

Sounding ID: CPT-01
Project No: 33310.1
Cone/Rig: DDG1350

Depth ft	qc PS tsf	qcln PS -	qincs PS -	qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Ratio %	Mat Typ Zon	Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	SPT R-Ni 60%	Rel Den %	Ftn Ang deg	Und Shr tsf	OCR -	Fin Ic %	Ic SBT Indx	Nk -	Vol Strn %	Cycl SStn %
31.01	279.5	198.6	246.4	279.5	6.0	-0.6	2.2	6	clean SAND to silty SAND	125	5.0	56	40	90	43	-	-	12	1.95	16	N/A	N/A
31.17	271.5	192.3	234.5	271.4	5.4	-0.6	2.0	6	clean SAND to silty SAND	125	5.0	54	38	89	42	-	-	11	1.93	16	N/A	N/A
31.33	264.4	186.8	212.2	264.4	3.9	-0.9	1.5	6	clean SAND to silty SAND	125	5.0	53	37	88	42	-	-	9	1.84	16	N/A	N/A
31.50	262.0	184.6	203.4	262.0	3.3	-2.1	1.3	6	clean SAND to silty SAND	125	5.0	52	37	87	42	-	-	8	1.79	16	N/A	N/A
31.66	254.6	178.9	191.5	254.5	2.7	-4.6	1.1	6	clean SAND to silty SAND	125	5.0	51	36	86	42	-	-	7	1.75	16	N/A	N/A
31.83	249.2	174.6	189.1	249.1	2.8	-6.1	1.1	6	clean SAND to silty SAND	125	5.0	50	35	85	42	-	-	7	1.77	16	N/A	N/A
31.99	239.8	167.6	181.8	239.6	2.6	-7.4	1.1	6	clean SAND to silty SAND	125	5.0	48	34	84	42	-	-	7	1.77	16	N/A	N/A
32.15	228.2	159.1	171.1	228.0	2.2	-8.8	1.0	6	clean SAND to silty SAND	125	5.0	46	32	82	41	-	-	7	1.76	16	N/A	N/A
32.32	220.4	153.2	165.0	220.2	2.1	-9.8	0.9	6	clean SAND to silty SAND	125	5.0	44	31	81	41	-	-	7	1.76	16	N/A	N/A
32.48	214.6	148.8	164.6	214.3	2.2	-11.3	1.1	6	clean SAND to silty SAND	125	5.0	43	30	80	41	-	-	8	1.80	16	N/A	N/A
32.65	217.0	150.1	170.2	216.8	2.6	-11.9	1.2	6	clean SAND to silty SAND	125	5.0	43	30	80	41	-	-	9	1.84	16	N/A	N/A
32.81	227.6	157.0	180.1	227.3	3.0	-12.6	1.3	6	clean SAND to silty SAND	125	5.0	46	31	82	41	-	-	9	1.85	16	N/A	N/A
32.97	255.0	175.5	193.7	254.8	3.1	-12.8	1.2	6	clean SAND to silty SAND	125	5.0	51	35	86	42	-	-	8	1.80	16	N/A	N/A
33.14	242.6	166.5	183.0	242.4	2.8	-12.9	1.1	6	clean SAND to silty SAND	125	5.0	49	33	84	42	-	-	8	1.79	16	N/A	N/A
33.30	223.8	153.2	178.7	223.6	3.1	-12.9	1.4	6	clean SAND to silty SAND	125	5.0	45	31	81	41	-	-	10	1.88	16	N/A	N/A
33.47	181.7	124.1	191.6	181.5	4.8	-13.0	2.6	5	silty SAND to sandy SILT	120	3.0	61	41	74	40	-	-	17	2.15	16	N/A	N/A
33.63	184.2	125.5	217.5	184.0	6.2	-12.7	3.4	5	silty SAND to sandy SILT	120	3.0	61	42	74	40	-	-	20	2.23	16	N/A	N/A
33.79	221.6	150.6	229.9	221.4	6.6	-12.7	3.0	5	silty SAND to sandy SILT	120	3.0	74	50	81	41	-	-	17	2.14	16	N/A	N/A
33.96	294.1	199.4	246.9	293.9	6.3	-13.4	2.2	6	clean SAND to silty SAND	125	5.0	59	40	90	42	-	-	12	1.95	16	N/A	N/A
34.12	325.7	220.5	267.2	325.4	7.0	-13.2	2.2	6	clean SAND to silty SAND	125	5.0	65	44	93	43	-	-	11	1.92	16	0.00	0.0
34.29	347.8	235.1	286.8	347.5	8.0	-12.8	2.3	6	clean SAND to silty SAND	125	5.0	70	47	95	43	-	-	11	1.93	16	0.00	0.0
34.45	344.4	232.6	275.4	344.1	7.1	-12.8	2.1	6	clean SAND to silty SAND	125	5.0	69	47	95	43	-	-	10	1.90	16	0.00	0.0
34.61	337.1	227.4	267.1	336.8	6.7	-12.9	2.0	6	clean SAND to silty SAND	125	5.0	67	45	94	43	-	-	10	1.88	16	0.00	0.0
34.78	307.3	207.0	249.9	307.0	6.2	-12.8	2.0	6	clean SAND to silty SAND	125	5.0	61	41	91	43	-	-	11	1.92	16	0.00	0.0
34.94	299.1	201.3	243.8	298.9	6.0	-12.6	2.0	6	clean SAND to silty SAND	125	5.0	60	40	90	42	-	-	11	1.92	16	0.00	0.0
35.11	298.3	200.5	246.5	298.1	6.3	-12.6	2.1	6	clean SAND to silty SAND	125	5.0	60	40	90	42	-	-	11	1.94	16	0.00	0.0
35.27	298.8	200.6	255.2	298.6	7.0	-12.4	2.4	5	silty SAND to sandy SILT	120	3.0	100	67	90	42	-	-	12	1.98	16	0.00	0.0
35.43	291.1	195.1	250.7	290.8	6.9	-12.3	2.4	5	silty SAND to sandy SILT	120	3.0	97	65	89	42	-	-	13	1.99	16	0.00	0.0
35.60	281.5	188.5	242.5	281.2	6.5	-12.3	2.3	5	silty SAND to sandy SILT	120	3.0	94	63	88	42	-	-	13	1.99	16	0.00	0.0
35.76	270.2	180.8	234.9	270.0	6.2	-12.1	2.3	5	silty SAND to sandy SILT	120	3.0	90	60	87	42	-	-	13	2.00	16	0.00	0.0
35.93	251.6	168.1	232.6	251.3	6.5	-12.0	2.6	5	silty SAND to sandy SILT	120	3.0	84	56	84	41	-	-	15	2.06	16	0.00	0.0
36.09	247.1	164.9	240.4	246.8	7.1	-11.9	2.9	5	silty SAND to sandy SILT	120	3.0	82	55	84	41	-	-	16	2.10	16	0.00	0.0
36.26	280.1	186.7	247.2	279.9	7.0	-12.1	2.5	5	silty SAND to sandy SILT	120	3.0	93	62	88	42	-	-	13	2.02	16	0.00	0.0
36.42	312.7	208.3	263.5	312.5	7.4	-12.1	2.4	5	silty SAND to sandy SILT	120	3.0	100	69	91	43	-	-	12	1.97	16	0.00	0.0
36.58	331.4	220.4	272.7	331.1	7.7	-12.2	2.3	6	clean SAND to silty SAND	125	5.0	66	44	93	43	-	-	12	1.95	16	0.00	0.0
36.75	323.3	214.8	280.5	323.1	8.6	-12.2	2.7	5	silty SAND to sandy SILT	120	3.0	100	72	92	43	-	-	13	2.00	16	0.00	0.0
36.91	313.0	207.7	274.2	312.7	8.4	-12.1	2.7	5	silty SAND to sandy SILT	120	3.0	100	69	91	42	-	-	13	2.02	16	0.00	0.0
37.08	307.6	203.9	264.9	307.3	7.8	-12.0	2.5	5	silty SAND to sandy SILT	120	3.0	100	68	91	42	-	-	13	2.00	16	0.00	0.0
37.24	300.3	198.9	251.9	300.1	6.9	-12.0	2.3	5	silty SAND to sandy SILT	120	3.0	100	66	90	42	-	-	12	1.97	16	0.00	0.0
37.40	300.9	199.0	245.6	300.7	6.4	-11.9	2.1	6	clean SAND to silty SAND	125	5.0	60	40	90	42	-	-	11	1.94	16	0.00	0.0
37.57	311.4	205.7	249.9	311.2	6.4	-11.8	2.1	6	clean SAND to silty SAND	125	5.0	62	41	91	42	-	-	11	1.93	16	0.00	0.0
37.73	328.2	216.6	252.8	327.9	6.1	-11.8	1.9	6	clean SAND to silty SAND	125	5.0	66	43	93	43	-	-	10	1.88	16	0.00	0.0
37.90	308.6	203.4	220.3	308.3	3.9	-12.0	1.3	6	clean SAND to silty SAND	125	5.0	62	41	90	42	-	-	7	1.77	16	0.00	0.0
38.06	287.2	189.1	204.4	287.0	3.4	-11.9	1.2	6	clean SAND to silty SAND	125	5.0	57	38	88	42	-	-	7	1.76	16	0.00	0.0
38.22	272.0	178.9	195.7	271.8	3.2	-11.7	1.2	6	clean SAND to silty SAND	125	5.0	54	36	86	42	-	-	8	1.78	16	0.00	0.0
38.39	269.5	177.0	194.1	269.3	3.2	-11.8	1.2	6	clean SAND to silty SAND	125	5.0	54	35	86	42	-	-	8	1.79	16	0.00	0.0
38.55	260.1	170.6	187.0	259.8	3.0	-11.8	1.2	6	clean SAND to silty SAND	125	5.0	52	34	85	41	-	-	8	1.78	16	0.00	0.0
38.72	254.5	166.8	182.7	254.3	2.8	-11.7	1.1	6	clean SAND to silty SAND	125	5.0	51	33	84	41	-	-	8	1.78	16	0.00	0.0
38.88	253.6	166.0	180.5	253.4	2.7	-11.7	1.1	6	clean SAND to silty SAND	125	5.0	51	33	84	41	-	-	8	1.77	16	0.00	0.0
39.04	254.7	166.5	183.1	254.4	2.9	-11.6	1.1	6	clean SAND to silty SAND	125	5.0	51	33	84	41	-	-	8	1.79	16	0.00	0.0
39.21	252.1	164.6	183.0	251.9	3.0	-11.6	1.2	6	clean SAND to silty SAND	125	5.0	50	33	83	41	-	-	8	1.81	16	0.00	0.0
39.37	294.1	191.8	204.2	293.8	3.3	-11.5	1.1	6	clean SAND to silty SAND	125	5.0	59	38	88	42	-	-	7	1.74	16	0.00	0.0
39.54	277.9	181.0	205.7	277.6	4.0	-11.5	1.4	6	clean SAND to silty SAND	125	5.0	56	36	87	42	-	-	9	1.84	16	0.00	0.0
39.70	173.2	112.7	208.8	173.0	6.0	-11.4	3.5	5	silty SAND to sandy SILT	120	3.0	58	38	71	39	-	-	21	2.27	16	0.00	0.0
39.86	121.9	79.2	214.2	121.6	6.0	-11.3	5.0	4	clayy SILT to silty CLAY	115	2.0	61	40	-	-	8.5	9.9	30	2.49	15	0.00	0.0
40.03	202.5	131.5	196.1	202.2	5.1	-11.7	2.6	5	silty SAND to sandy SILT	120	3.0	67	44	76	40	-	-	16	2.12	16	0.00	0.0
40.19	324.8	210.7	222.4	324.6	3.8	-12.0	1.2	6	clean SAND to silty SAND	125	5.0	65	42	92	42	-	-	7	1.73	16	0.00	0.0
40.36	379.5	245.9	245.9	379.2	3.0	-11.7	0.8	6	clean SAND to silty SAND	125	5.0	76	49	95	43	-	-	5	1.56	16	0.00	0.0
40.52	410.5	265.7	265.7	410.3	3.1	-11.9	0.8	6	clean SAND to silty SAND	125	5.0	82	53	95	44	-	-	5	1.52	16	0.00	0.0
40.68	404.9	261.8	261.8	404.7	3.1	-12.0	0.8	6	clean SAND to silty SAND	125	5.0	81	52	95	44	-	-	5	1.53	16	0.00	0.0
40.85	379.8	245.3	245.3	379.6	3.2	-12.2	0.8	6	clean SAND to silty SAND	125	5.0	76	49	95	43	-	-	5	1.58	16	0.00	0.0
41.01	372.7	240.4	243.5	372.5	4.0	-12.1	1.1	6	clean SAND to silty SAND	125	5.0	75	48	95	43	-	-	5	1.66	16	0.00	0.0
41.18	347.3	223.8	246.3	347.0	5.2	-12.2	1.5	6	clean SAND to silty SAND	125	5.0	69	45	94	43	-	-	8	1.79	16	0.00	0.0
41.34	317.1	204.1	224.4	316.9	4.3	-8.5	1.4	6	clean SAND to silty SAND	125	5.0	63	41	91	42	-	-	8	1.79	16	0.00	0.0
41.50	313.6	201.6	201.6	313.4	2.7	-9.9	0.9	6	clean SAND to silty SAND	125	5.0	63	40	90	42	-	-	5	1.65	16	0.00	0.0
41.67	297.7	191.2	191.2	297.5	1.5	-10.0	0.5	6	clean SAND to silty SAND	125	5.0	60	38	88	42	-	-	5	1.52	16	0.00	0.0
41.83	260.5	167.1	167.1	260.3	1.1	-10.2	0.4	6	clean SAND to silty SAND	125	5.0	52	33	84	41	-	-	5	1.51	16	0.00	0.0
42.00	196.6	125.9	155.2	196.4	2.8	-10.0	1.4	6	clean SAND to silty SAND	125	5.0	39	25	75	40	-	-	11	1.94	16	0.20	1.6
42.16	114.7	73.4	139.9	114.5	2.8	-10.0	2.5	5	silty SAND to sandy SILT	120	3.0	38	24	57	37	-	-	22	2.29	16	0.42	2.1
42.32	72.4	31.4	-	72.2	2.6	-9.4	3.8	4	clayy SILT to silty CLAY	115	2.0	36	16	-	-	4.9	9.9	39	2.68	15	-	-
42.49	61.6	26.6	-	61.4	1.5	-9.1	2.6	4	clayy SILT to silty CLAY	115	2.0	31	13	-	-	4.2	8.4	37	2.64	15	-	-
42.65	60.0	25.9	-	59.9	1.5	-9.0	2.6	4	clayy SILT to silty CLAY	115	2.0	30	13	-	-	4.1	8.2	38	2.65	15	-	-
42.82	58.8	25.3	-	58.7	2.3	-8.3	4.1	3	silty CLAY to CLAY	115	1.5	39	17	-	-	4.0	8.0	45	2.78	15	-	-
42.98	71.0	30.5	-	70.8	3.7	-8.1	5.4	3	silty CLAY to CLAY	115	1.5	47	20	-	-	4.9	9.7	46	2.79	15	-	-
43.15	95.6	41.0	-	95.5	4.9	-8.4	5.3	3	silty CLAY to CLAY	115	1.5	64	27	-	-	6.6	9.9	40	2.70	15	-	-
43.31	128.5	81.7	195.6	128.3	5.3	-8.0	4.2	4	clayy SILT to silty CLAY	115	2.0	64	41	-	-	8.9	9.9	27	2.42	15	0.00	0.0
43.47	161.0	102.2	193.5	160.8	5.3	-8.9	3.4	5	silty SAND to sandy SILT	120	3.0	54	34	68	38	-	-	22	2.28	16	0.00	0.0
43.64	149.1	94.6	191.1	148.9	5.2	-10.2	3.5	5	silty SAND to sandy SILT	120	3.0	50	32	65	38	-	-	23	2.32	16	0.00	0.0
43.80	128.5	81.4	207.9	128.3	5.9	-9.9	4.7	4	clayy SILT to silty CLAY	115	2.0	64	41	-	-	8.9	9.9	29	2.46	15	0.00	0.0
43.97	209.6	132.8	231.4	209.4	7.4	-10.1	3.6	5	silty SAND to sandy SILT	120	3.0	70	44	76	40	-	-	20	2.23	16	0.00	0.0
44.13	280.8	177.7	232.8	280.6	6.5	-10.3	2.4	5	silty SAND to sandy SILT	120	3.0	94	59	86	41	-	-	13	2.01	16	0.00	0.0
44.29	338.5	214.0	253.7	338.3	6.6	-10.5	2.0	6	clean SAND to silty SAND	125	5.0	68	43	92	42	-	-	10	1.90	16	0.00	0.0
44.46	366.0	231.1	258.0	365.8	5.9	-10.6	1.6	6	clean SAND to silty SAND	125	5.0	73	46	95	43	-	-	8	1.81	16	0.00	0.0
44.62	365.8	230.7	264.5	365.6	6.6	-11.3	1.8	6	clean SAND to silty SAND	125	5.0	73	46	95	43	-	-	9	1.85	16	0.00	0.0
44.79	383.1	241.3	289.5	382.8	8.5	-11.4	2.2	6	clean SAND to silty SAND	125	5.0	77	48	95	43	-	-	11	1.91	16	0.00	0.0
44.95	419.3	263.9	316.2	419.1	9.9	-11.4	2.4	6	clean SAND to silty SAND	125	5.0	84	53	95	43	-	-	11	1.91	16	0.00	0.0
45.11	414.3	260.5	313.9	414.1	9.9	-11.2	2.4	6	clean SAND to silty SAND	125	5.0	83	52	95	43	-	-	11	1.92	16	0.00	0.0
45.28	412.0	258.7	298.1	411.8	8.3	-11.1	2.0	6	clean SAND to silty SAND	125	5.0	82	52	95	43	-	-	9	1.86	16	0.00	0.0
45.44	370.8	232.6	263.6	370.6	6.5	-11.2	1.8	6	clean SAND to silty SAND	125	5.0	74	47	95	43	-	-	9	1.84	16	0.00	0.0
45.61	279.4	175.1	222.7	279.2	5.9	-10.9	2.1	5	silty SAND to sandy SILT	120	3.0	93	58	85	41	-	-	12	1.98	16	0.00	0.0
45.77	181.9	113.9	208.5	181.7	6.2	-10.7	3.5	5	silty SAND to sandy SILT	120	3.0	61	38	71	39	-	-	21	2.26	16	0.00	0.0
45.93	101.0	41.9	-	100.8	5.7	-10.9	5.9	3	silty CLAY to CLAY	115	1.5	67	28	-	-	7.0	9.9	42	2.72	15	-	-
46.10	93.6	38.7	-	93.3	4.1	-10.7	4.5	4	clayy SILT to silty CLAY	115	2.0	47	19	-	-	6.4	9.9	39	2.67	15	-	-
46.26	75.5	31.2	-	75.3	3.1	-10.9	4.2	4	clayy SILT to silty CLAY	115	2.0	38	16	-	-	5.2	9.9	41	2.72	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

Lake Elsinore Apartments

Project ID: LOR Geotechnical
Data File: SDF(292).cpt
CPT Date: 11/11/2016 8:16:13 AM
GW During Test: 34 ft

Sounding ID: CPT-01
Project No: 33310.1
Cone/Rig: DDG1350

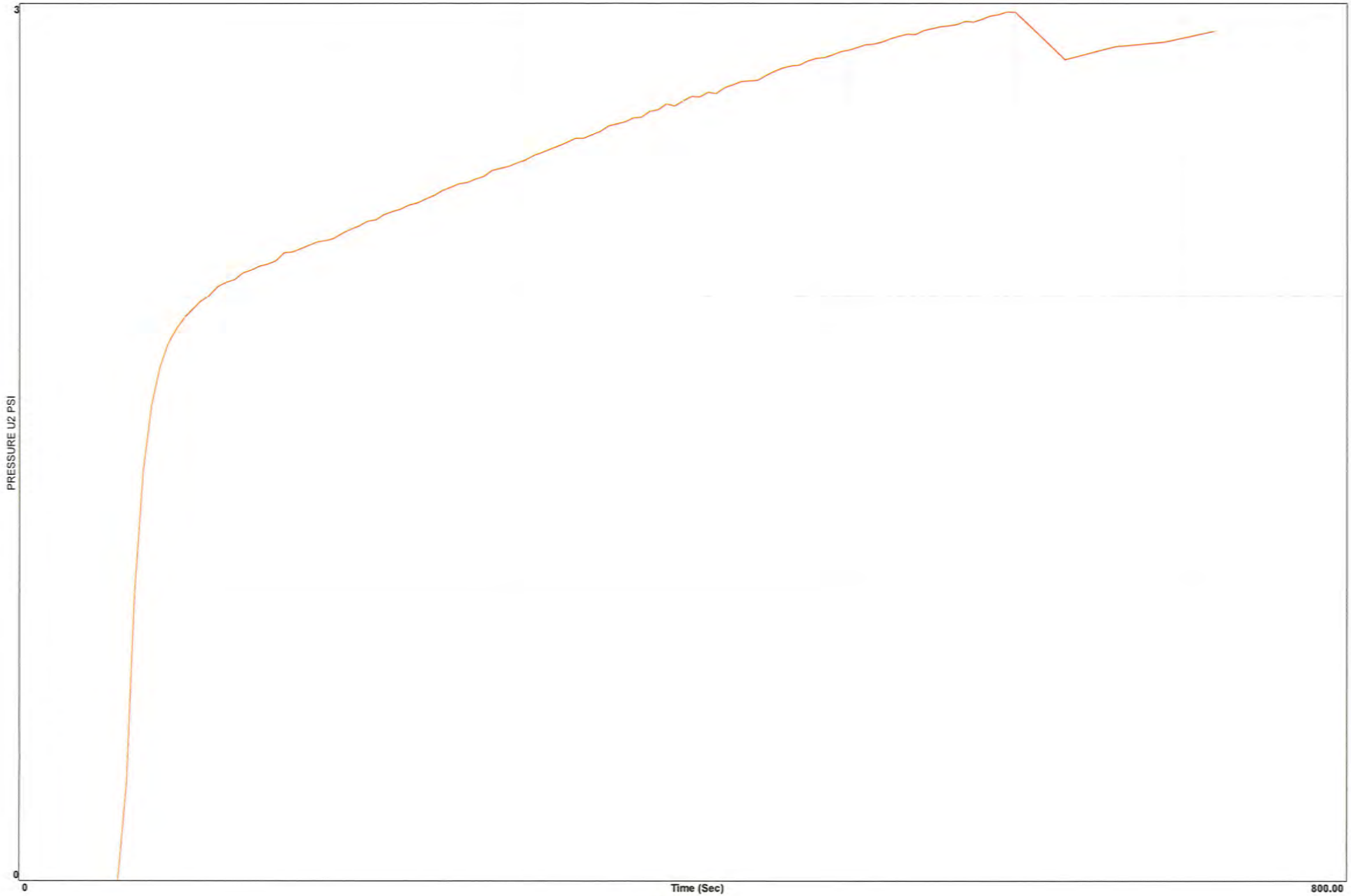
Depth ft	qc PS tsf	qcln PS -	qlncs PS -	qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Ratio %	Mat Typ Zon	Material Behavior Description	Unit Wght pcf	Qc to N	SPT R-N 60%	SPT R-N1 60%	Rel Den %	Ftn Ang deg	Und Shr tsf	OCR -	Fin Ic %	Ic SBT Indx	Nk -	Vol Strn %	Cycl SStn %
46.43	61.3	25.3	-	61.1	2.6	-10.8	4.4	3	silty CLAY to CLAY	115	1.5	41	17	-	-	4.2	8.0	46	2.80	15	-	-
46.59	56.6	23.3	-	56.3	2.1	-10.8	4.0	3	silty CLAY to CLAY	115	1.5	38	16	-	-	3.8	7.3	46	2.80	15	-	-
46.75	51.9	21.3	-	51.7	1.8	-10.9	3.7	3	silty CLAY to CLAY	115	1.5	35	14	-	-	3.5	6.7	46	2.81	15	-	-
46.92	49.6	20.4	-	49.4	1.5	-11.1	3.1	4	clayy SILT to silty CLAY	115	2.0	25	10	-	-	3.3	6.3	45	2.78	15	-	-
47.08	47.2	19.3	-	46.9	1.3	-11.3	2.8	4	clayy SILT to silty CLAY	115	2.0	24	10	-	-	3.2	6.0	44	2.77	15	-	-
47.25	43.5	17.8	-	43.2	1.1	-11.3	2.7	4	clayy SILT to silty CLAY	115	2.0	22	9	-	-	2.9	5.5	46	2.80	15	-	-
47.41	44.2	18.0	-	44.0	1.5	-11.3	3.6	3	silty CLAY to CLAY	115	1.5	29	12	-	-	3.0	5.6	50	2.86	15	-	-
47.57	65.9	26.9	-	65.7	2.4	-11.4	3.8	4	clayy SILT to silty CLAY	115	2.0	33	13	-	-	4.5	8.5	42	2.74	15	-	-
47.74	87.1	35.4	-	86.9	4.0	-11.9	4.7	3	silty CLAY to CLAY	115	1.5	58	24	-	-	6.0	9.9	41	2.71	15	-	-
47.90	70.1	28.4	-	69.8	4.8	-11.8	7.1	3	silty CLAY to CLAY	115	1.5	47	19	-	-	4.8	9.0	52	2.90	15	-	-
48.07	76.3	30.9	-	76.1	5.4	-11.8	7.4	3	silty CLAY to CLAY	115	1.5	51	21	-	-	5.2	9.8	51	2.89	15	-	-
48.23	126.8	51.0	-	125.7	6.8	-12.1	5.5	3	silty CLAY to CLAY	115	1.5	84	34	-	-	8.7	9.9	38	2.64	15	-	-
48.39	204.6	126.3	240.5	204.4	8.1	-12.3	4.0	9	very stiff fine SOIL	120	1.0	100	100	-	-	7.1	9.9	22	2.29	30	0.00	0.0
48.56	183.9	113.4	239.1	183.6	8.0	-12.1	4.4	9	very stiff fine SOIL	120	1.0	100	100	-	-	6.4	9.9	24	2.35	30	0.00	0.0
48.72	123.0	49.5	-	122.8	6.5	-12.1	5.4	3	silty CLAY to CLAY	115	1.5	82	33	-	-	8.5	9.9	38	2.65	15	-	-
48.89	94.2	37.8	-	94.0	5.0	-11.8	5.5	3	silty CLAY to CLAY	115	1.5	63	25	-	-	6.5	9.9	42	2.73	15	-	-
49.05	67.2	26.9	-	67.0	3.4	-11.9	5.3	3	silty CLAY to CLAY	115	1.5	45	18	-	-	4.6	8.5	48	2.83	15	-	-
49.22	60.1	24.0	-	59.9	2.9	-11.6	5.1	3	silty CLAY to CLAY	115	1.5	40	16	-	-	4.1	7.5	49	2.86	15	-	-
49.38	75.5	30.1	-	75.2	3.4	-11.6	4.7	3	silty CLAY to CLAY	115	1.5	50	20	-	-	5.2	9.6	44	2.76	15	-	-
49.54	81.1	32.4	-	80.9	3.2	-11.6	4.1	4	clayy SILT to silty CLAY	115	2.0	41	16	-	-	5.6	9.9	40	2.70	15	-	-
49.71	62.8	25.0	-	62.5	3.2	-11.7	5.4	3	silty CLAY to CLAY	115	1.5	42	17	-	-	4.3	7.9	50	2.86	15	-	-
49.87	67.3	26.7	-	67.0	3.5	-11.7	5.5	3	silty CLAY to CLAY	115	1.5	45	18	-	-	4.6	8.4	49	2.85	15	-	-
50.04	159.5	97.6	203.0	159.3	6.0	-12.0	3.8	4	clayy SILT to silty CLAY	115	2.0	80	49	-	-	11.1	9.9	24	2.34	15	0.00	0.0
50.20	236.4	144.5	245.2	236.1	8.4	-13.0	3.6	8	stiff SAND to clayy SAND	115	5.0	47	29	79	40	-	-	19	2.21	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

LOR Geotechnical

Location	Lake Elsinore Apartments	Operator	DG-RC	GPS
Job Number	33310.1	Cone Number	DDG1350	
Hole Number	CPT-01	Date and Time	11/11/2016 8:16:13 AM	
Equilized Pressure	2.9	EST GW Depth During Test	34.4	

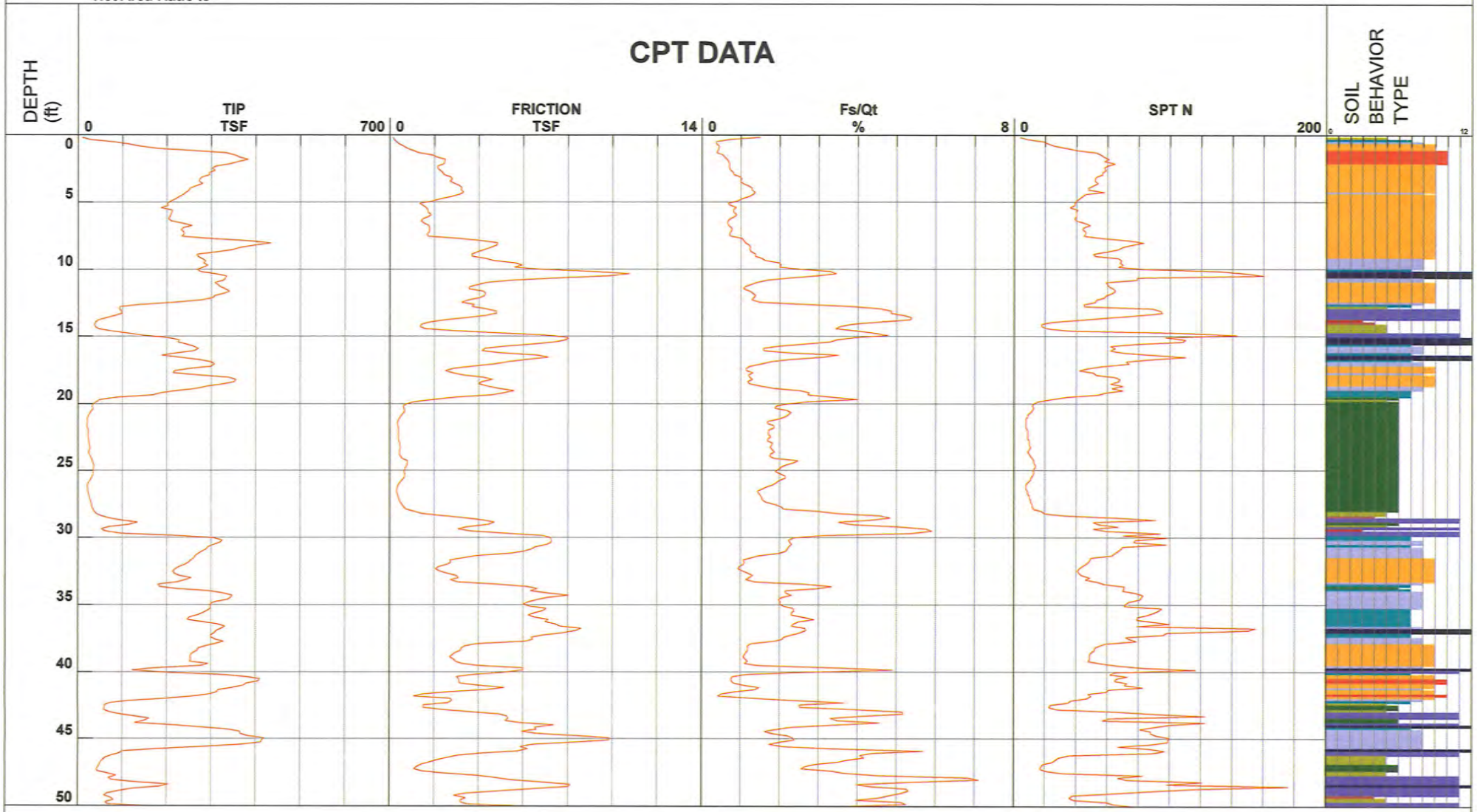


LOR Geotechnical

Project	Lake Elsinore Apartments	Operator	DG-RC	Filename	SDF(292).cpt
Job Number	33310.1	Cone Number	DDG1350	GPS	
Hole Number	CPT-01	Date and Time	11/11/2016 8:16:13 AM	Maximum Depth	50.52 ft
EST GW Depth During Test		34.40 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

Lake Elsinore Apartments

Project ID: LOR Geotechnical
Data File: SDF(293).cpt
CPT Date: 11/11/2016 9:01:05 AM
GW During Test: 34 ft

Sounding ID: CPT-02
Project No: 33310.1
Cone/Rig: DDG1350

Depth ft	qc PS tsf	qcln PS -	qlncs PS -	qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Ratio %	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	111.3	178.5	178.5	111.3	0.3	-0.1	0.3	6	clean SAND to silty SAND	125	5.0	22	36	86	48	-	-	5	1.40	16	N/A	N/A	N/A
0.49	159.3	255.4	255.4	159.3	0.5	0.1	0.3	7	grvly SAND to dense SAND	130	6.0	27	43	95	48	-	-	5	1.27	16	N/A	N/A	N/A
0.66	156.8	251.5	251.5	156.8	0.5	-0.1	0.3	7	grvly SAND to dense SAND	130	6.0	26	42	95	48	-	-	5	1.31	16	N/A	N/A	N/A
0.82	125.7	201.6	201.6	125.7	0.7	-0.1	0.5	6	clean SAND to silty SAND	125	5.0	25	40	90	48	-	-	5	1.30	16	N/A	N/A	N/A
0.98	105.7	169.5	169.5	105.7	0.7	0.0	0.7	6	clean SAND to silty SAND	125	5.0	21	34	84	48	-	-	5	1.63	16	N/A	N/A	N/A
1.15	114.5	183.6	183.6	114.5	0.9	0.0	0.8	6	clean SAND to silty SAND	125	5.0	23	37	87	48	-	-	5	1.63	16	N/A	N/A	N/A
1.31	110.6	177.3	177.5	110.6	0.8	0.0	0.8	6	clean SAND to silty SAND	125	5.0	22	35	86	48	-	-	5	1.65	16	N/A	N/A	N/A
1.48	90.3	144.8	152.9	90.3	0.7	0.1	0.8	6	clean SAND to silty SAND	125	5.0	18	29	79	48	-	-	7	1.73	16	N/A	N/A	N/A
1.64	76.5	122.7	138.2	76.5	0.7	0.0	0.9	6	clean SAND to silty SAND	125	5.0	15	25	74	48	-	-	9	1.83	16	N/A	N/A	N/A
1.80	95.4	153.0	169.1	95.4	1.0	0.0	1.1	6	clean SAND to silty SAND	125	5.0	19	31	81	48	-	-	8	1.80	16	N/A	N/A	N/A
1.97	233.2	374.0	374.0	233.2	3.1	0.0	1.3	6	clean SAND to silty SAND	125	5.0	47	75	95	48	-	-	5	1.62	16	N/A	N/A	N/A
2.13	338.1	542.2	551.3	338.1	6.4	-0.2	1.9	8	stiff SAND to clayy SAND	115	5.0	68	100	95	48	-	-	6	1.67	16	N/A	N/A	N/A
2.30	375.2	601.7	645.8	375.2	9.2	-0.2	2.5	8	stiff SAND to clayy SAND	115	5.0	75	100	95	48	-	-	7	1.75	16	N/A	N/A	N/A
2.46	382.5	613.5	695.7	382.5	11.7	-0.3	3.1	8	stiff SAND to clayy SAND	115	5.0	77	100	95	48	-	-	9	1.84	16	N/A	N/A	N/A
2.62	378.4	606.8	706.6	378.4	12.6	-0.3	3.3	8	stiff SAND to clayy SAND	115	5.0	76	100	95	48	-	-	10	1.87	16	N/A	N/A	N/A
2.79	367.5	589.3	687.9	367.5	12.2	-0.3	3.3	8	stiff SAND to clayy SAND	115	5.0	73	100	95	48	-	-	10	1.88	16	N/A	N/A	N/A
2.95	377.3	605.1	683.7	377.3	11.3	-0.2	3.0	8	stiff SAND to clayy SAND	115	5.0	75	100	95	48	-	-	9	1.83	16	N/A	N/A	N/A
3.12	391.0	627.0	698.4	391.0	11.3	-0.3	2.9	8	stiff SAND to clayy SAND	115	5.0	78	100	95	48	-	-	8	1.81	16	N/A	N/A	N/A
3.28	390.8	626.7	681.5	390.8	10.3	-0.2	2.6	8	stiff SAND to clayy SAND	115	5.0	78	100	95	48	-	-	8	1.77	16	N/A	N/A	N/A
3.45	373.1	598.3	633.7	373.1	8.7	0.0	2.3	8	stiff SAND to clayy SAND	115	5.0	75	100	95	48	-	-	7	1.73	16	N/A	N/A	N/A
3.61	330.7	530.4	563.5	330.7	7.4	0.1	2.2	8	stiff SAND to clayy SAND	115	5.0	66	100	95	48	-	-	7	1.74	16	N/A	N/A	N/A
3.77	291.2	467.0	504.7	291.2	6.5	0.0	2.2	8	stiff SAND to clayy SAND	115	5.0	58	93	95	48	-	-	7	1.76	16	N/A	N/A	N/A
3.94	242.3	388.6	446.5	242.3	6.3	0.1	2.6	8	stiff SAND to clayy SAND	115	5.0	48	78	95	48	-	-	9	1.85	16	N/A	N/A	N/A
4.10	185.3	297.2	366.1	185.3	5.2	0.2	2.8	8	stiff SAND to clayy SAND	115	5.0	37	59	95	48	-	-	11	1.94	16	N/A	N/A	N/A
4.27	150.9	242.0	324.9	150.9	4.7	0.2	3.1	8	stiff SAND to clayy SAND	115	5.0	30	48	95	48	-	-	14	2.03	16	N/A	N/A	N/A
4.43	155.9	250.1	346.1	155.9	5.4	0.0	3.4	8	stiff SAND to clayy SAND	115	5.0	31	50	95	48	-	-	15	2.06	16	N/A	N/A	N/A
4.59	161.8	259.4	355.8	161.8	5.6	-0.1	3.4	8	stiff SAND to clayy SAND	115	5.0	32	52	95	48	-	-	14	2.05	16	N/A	N/A	N/A
4.76	177.9	285.4	365.9	177.9	5.5	-0.2	3.1	8	stiff SAND to clayy SAND	115	5.0	36	57	95	48	-	-	13	1.99	16	N/A	N/A	N/A
4.92	198.1	317.7	369.9	198.1	4.8	0.0	2.4	8	stiff SAND to clayy SAND	115	5.0	40	64	95	48	-	-	10	1.87	16	N/A	N/A	N/A
5.09	243.7	390.9	437.6	243.7	5.7	-0.1	2.3	8	stiff SAND to clayy SAND	115	5.0	49	78	95	48	-	-	8	1.82	16	N/A	N/A	N/A
5.25	331.3	531.3	529.8	331.3	5.8	-0.7	1.7	6	clean SAND to silty SAND	125	5.0	66	100	95	48	-	-	5	1.64	16	N/A	N/A	N/A
5.41	353.9	567.6	567.6	353.9	5.2	-0.8	1.5	6	clean SAND to silty SAND	125	5.0	71	100	95	48	-	-	5	1.56	16	N/A	N/A	N/A
5.58	360.4	578.0	578.0	360.4	4.9	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	72	100	95	48	-	-	5	1.53	16	N/A	N/A	N/A
5.74	359.2	576.0	576.0	359.2	4.9	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	72	100	95	48	-	-	5	1.53	16	N/A	N/A	N/A
5.91	351.8	564.2	564.2	351.8	4.9	-0.6	1.4	6	clean SAND to silty SAND	125	5.0	70	100	95	48	-	-	5	1.55	16	N/A	N/A	N/A
6.07	341.8	548.2	548.2	341.8	5.1	-0.7	1.5	6	clean SAND to silty SAND	125	5.0	68	100	95	48	-	-	5	1.58	16	N/A	N/A	N/A
6.23	313.5	497.9	497.9	313.5	4.1	-0.6	1.3	6	clean SAND to silty SAND	125	5.0	63	100	95	48	-	-	5	1.55	16	N/A	N/A	N/A
6.40	263.0	412.0	412.0	263.0	3.0	-0.6	1.2	6	clean SAND to silty SAND	125	5.0	53	82	95	48	-	-	5	1.54	16	N/A	N/A	N/A
6.56	214.5	331.7	331.7	214.5	2.2	-0.5	1.0	6	clean SAND to silty SAND	125	5.0	43	66	95	48	-	-	5	1.55	16	N/A	N/A	N/A
6.73	178.9	273.1	273.1	178.9	1.5	-0.5	0.8	6	clean SAND to silty SAND	125	5.0	36	55	95	48	-	-	5	1.54	16	N/A	N/A	N/A
6.89	192.5	290.2	290.2	192.5	1.9	-0.6	1.0	6	clean SAND to silty SAND	125	5.0	39	58	95	48	-	-	5	1.58	16	N/A	N/A	N/A
7.05	268.5	399.9	399.9	268.5	2.8	-0.7	1.0	6	clean SAND to silty SAND	125	5.0	54	80	95	48	-	-	5	1.51	16	N/A	N/A	N/A
7.22	306.6	451.2	451.2	306.6	3.6	-0.8	1.2	6	clean SAND to silty SAND	125	5.0	61	90	95	48	-	-	5	1.53	16	N/A	N/A	N/A
7.38	312.2	454.1	454.1	312.2	4.5	-0.8	1.4	6	clean SAND to silty SAND	125	5.0	62	91	95	48	-	-	5	1.60	16	N/A	N/A	N/A
7.55	305.8	439.8	439.8	305.7	4.6	-0.7	1.5	6	clean SAND to silty SAND	125	5.0	61	88	95	48	-	-	5	1.63	16	N/A	N/A	N/A
7.71	259.9	369.6	375.6	259.8	4.0	-0.6	1.5	6	clean SAND to silty SAND	125	5.0	52	74	95	48	-	-	6	1.67	16	N/A	N/A	N/A
7.87	186.1	261.8	285.3	186.1	3.0	-0.5	1.6	6	clean SAND to silty SAND	125	5.0	37	52	95	47	-	-	8	1.78	16	N/A	N/A	N/A
8.04	130.5	181.6	234.1	130.4	3.0	-0.5	2.3	5	silty SAND to sandy SILT	120	3.0	43	61	87	45	-	-	13	1.99	16	N/A	N/A	N/A
8.20	103.7	142.9	240.9	103.7	3.7	-0.6	3.6	8	stiff SAND to clayy SAND	115	5.0	21	29	79	44	-	-	19	2.21	16	N/A	N/A	N/A
8.37	88.2	120.4	248.3	88.2	3.9	-0.6	4.5	9	very stiff fine SOIL	120	1.0	88	100	-	-	3.1	9.9	24	2.33	30	N/A	N/A	N/A
8.53	89.7	121.3	236.8	89.7	3.7	-0.8	4.1	9	very stiff fine SOIL	120	1.0	90	100	-	-	3.2	9.9	23	2.30	30	N/A	N/A	N/A
8.69	88.1	118.0	233.0	88.1	3.6	-0.8	4.1	9	very stiff fine SOIL	120	1.0	88	100	-	-	3.1	9.9	23	2.31	30	N/A	N/A	N/A
8.86	81.2	107.8	238.5	81.2	3.8	-1.0	4.7	9	very stiff fine SOIL	120	1.0	81	100	-	-	2.9	9.9	25	2.37	30	N/A	N/A	N/A
9.02	68.7	90.3	239.7	68.6	3.7	-1.0	5.5	9	very stiff fine SOIL	120	1.0	69	90	-	-	2.4	9.9	30	2.48	30	N/A	N/A	N/A
9.19	58.3	76.0	220.3	58.3	3.2	-1.6	5.5	9	very stiff fine SOIL	120	1.0	58	76	-	-	2.0	9.9	32	2.53	30	N/A	N/A	N/A
9.35	45.9	59.3	194.5	45.9	2.5	-1.5	5.4	4	clayy SILT to silty CLAY	115	2.0	23	30	-	-	3.2	9.9	35	2.59	15	N/A	N/A	N/A
9.51	39.6	57.4	181.2	39.6	1.9	-1.4	4.9	4	clayy SILT to silty CLAY	115	2.0	20	29	-	-	2.8	9.9	34	2.57	15	N/A	N/A	N/A
9.68	37.6	53.9	168.0	37.6	1.7	-1.5	4.6	4	clayy SILT to silty CLAY	115	2.0	19	27	-	-	2.6	9.9	34	2.56	15	N/A	N/A	N/A
9.84	36.0	51.0	164.6	36.0	1.6	-1.7	4.6	4	clayy SILT to silty CLAY	115	2.0	18	25	-	-	2.5	9.9	35	2.58	15	N/A	N/A	N/A
10.01	32.8	45.9	-	32.8	1.6	-1.8	4.8	4	clayy SILT to silty CLAY	115	2.0	16	23	-	-	2.3	9.9	37	2.63	15	N/A	N/A	N/A
10.17	28.4	45.6	-	28.4	1.3	-1.8	4.8	4	clayy SILT to silty CLAY	115	2.0	14	23	-	-	2.0	9.9	37	2.63	15	N/A	N/A	N/A
10.34	27.5	44.1	-	27.5	1.2	-1.7	4.6	4	clayy SILT to silty CLAY	115	2.0	14	22	-	-	1.9	9.9	37	2.63	15	N/A	N/A	N/A
10.50	27.4	43.5	-	27.4	1.3	-1.6	4.8	4	clayy SILT to silty CLAY	115	2.0	14	22	-	-	1.9	9.9	38	2.65	15	N/A	N/A	N/A
10.66	29.2	45.6	-	29.2	1.5	-1.7	5.1	3	silty CLAY to CLAY	115	1.5	19	30	-	-	2.0	9.9	38	2.65	15	N/A	N/A	N/A
10.83	34.3	45.6	-	34.3	1.7	-1.6	5.0	4	clayy SILT to silty CLAY	115	2.0	17	23	-	-	2.4	9.9	37	2.64	15	N/A	N/A	N/A
10.99	36.8	55.8	-	36.8	2.0	-1.7	5.5	4	clayy SILT to silty CLAY	115	2.0	18	28	-	-	2.6	9.9	36	2.61	15	N/A	N/A	N/A
11.16	38.7	57.8	-	38.7	2.1	-1.8	5.6	4	clayy SILT to silty CLAY	115	2.0	19	29	-	-	2.7	9.9	36	2.61	15	N/A	N/A	N/A
11.32	44.5	57.4	183.1	44.5	2.2	-1.5	5.0	4	clayy SILT to silty CLAY	115	2.0	22	29	-	-	3.1	9.9	34	2.58	15	N/A	N/A	N/A
11.48	53.0	62.1	184.0	53.0	2.5	-1.1	4.8	4	clayy SILT to silty CLAY	115	2.0	26	31	-	-	3.7	9.9	32	2.54	15	N/A	N/A	N/A
11.65	57.0	66.3	193.2	56.9	2.8	-1.1	4.9	4	clayy SILT to silty CLAY	115	2.0	28	33	-	-	4.0	9.9	32	2.53	15	N/A	N/A	N/A
11.81	65.8	76.0	198.2	65.8	3.0	-1.0	4.6	4	clayy SILT to silty CLAY	115	2.0	33	38	-	-	4.6	9.9	29	2.47	15	N/A	N/A	N/A
11.98	61.8	70.9	198.4	61.8	3.0	-1.1	4.9	4	clayy SILT to silty CLAY	115	2.0	31	35	-	-	4.3	9.9	31	2.51	15	N/A	N/A	N/A
12.14	51.4	58.6	192.5	51.4	2.7	-1.1	5.4	4	clayy SILT to silty CLAY	115	2.0	26	29	-	-	3.6	9.9	35	2.59	15	N/A	N/A	N/A
12.30	42.1	57.3	-	42.1	2.3	-1.4	5.6	4	clayy SILT to silty CLAY	115	2.0	21	29	-	-	2.9	9.9	36	2.61	15	N/A	N/A	N/A
12.47	35.0	47.1	-	35.0	2.0	-1.3	5.9	3	silty CLAY to CLAY	115	1.5	23	31	-	-	2.4	9.9	40	2.69	15	N/A	N/A	N/A
12.63	32.7	43.4	-	32.7	1.7	-1.2	5.4	3	silty CLAY to CLAY	115	1.5	22	29	-	-	2.3	9.9	40	2.69	15	N/A	N/A	N/A
12.80	31.6	41.3	-	31.5	1.7	-1.2	5.5	3	silty CLAY to CLAY	115	1.5	21	28	-	-	2.2	9.9	41	2.70	15	N/A	N/A	N/A
12.96	31.7	41.0	-	31.7	1.7	-1.2	5.7	3	silty CLAY to CLAY	115	1.5	21	27	-	-	2.2	9.9	41	2.72	15	N/A	N/A	N/A
13.12	33.0	42.2	-	33.0	1.8	-1.2	5.5	3	silty CLAY to CLAY	115	1.5	22	28	-	-	2.3	9.9	40	2.70	15	N/A	N/A	N/A
13.29	31.7	40.1	-	31.7	1.7	-0.8	5.5	3	silty CLAY to CLAY	115	1.5	21	27	-	-	2.2	9.9	41	2.71	15	N/A	N/A	N/A
13.45	30.7	38.3	-	30.7	1.6	-0.8	5.5	3	silty CLAY to CLAY	115	1.5	20	26	-	-	2.1	9.9	42	2.73	15	N/A	N/A	N/A
13.62	29.3	36.1	-	29.2	1.6	-0.8	5.6	3	silty CLAY to CLAY	115	1.5	20	24	-	-	2.0	9.9	43	2.75	15	N/A	N/A	N/A
13.78	27.9	34.1	-	27.9	1.6	-0.7	5.9	3	silty CLAY to CLAY	115	1.5	19	23	-	-	1.9	9.9	45	2.79	15	N/A	N/A	N/A
13.94	29.9	36.0	-	29.9	1.8	-0.6	6.1	3	silty CLAY to CLAY	115	1.5	20	24	-	-	2.1	9.9	45	2.78	15	N/A	N/A	N/A
14.11	33.0	39.4	-	33.0	1.9	-0.6	6.0	3	silty CLAY to CLAY	115	1.5	22	26	-	-	2.3	9.9	43	2.75	15	N/A	N/A	N/A
14.27	37.3	44.0	-	37.3	2.3	-0.4	6.4	3	silty CLAY to CLAY	115	1.5	25	29	-	-	2.6	9.9	42	2.74	15	N/A	N/A	N/A
14.44	43.1	50.3	-	43.1	2.4	-0.4	5.6	3	silty CLAY to CLAY	115	1.5	29	34	-	-	3.0	9.9	38	2.65	15	N/A	N/A	N/A
14.60	39.9	46.0	-	39.9	2.3	0.1	6.0	3	silty CLAY to CLAY	115	1.5	27	31	-	-	2.8	9.9	40	2.70	15	N/A	N/A	N/A
14.76	41.4	47.3	-	41.4	2.9	0.4	7.2	3	silty CLAY to CLAY	115	1.5	28	32	-	-	2.9	9.9	43	2.75	15	N/A	N/A	N/A
14.93	52.6	59.4	-	52.6	3.3	0.0	6.4	3	silty CLAY to CLAY	115	1.5	35	40	-	-	3.7	9.9	38	2.65	15	N/A	N/A	N/A
15.09	50.2	56.1	-	50.2	3.2	-0.1	6.4	3	silty CLAY to CLAY	115	1.5	33	37	-	-	3.5	9.9	39	2.66	15	N/A	N/A	N/A
15.26	39.5	43.7	-	39.5	2.5	-0.9	6.6	3	silty CLAY to CLAY	115	1.5	26	29	-	-	2.7	9.9	43	2.75	15	N/A	N/A	N/A
15.42	36.4	39.8	-	36.3	2.0	-0.5	5.7	3	silty CLAY to CLAY	115	1.5	24	27	-	-	2.5	9.9	42	2.73	15	N/A	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

Lake Elsinore Apartments

Project ID: LOR Geotechnical
Data File: SDF(293).cpt
CPT Date: 11/11/2016 9:01:05 AM
GW During Test: 34 ft

Sounding ID: CPT-02
Project No: 33310.1
Cone/Rig: DDG1350

Depth ft	qc PS tsf	qcln PS -	qlncs PS -	qt PS tsf	Slv Stss tsf	pore prss (psi)	Frct Ratio %	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	38.0	41.1	-	37.9	2.0	-0.2	5.5	3	silty CLAY to CLAY	115	1.5	25	27	-	-	2.6	9.9	41	2.71	15	N/A	N/A
15.75	41.0	43.9	-	41.0	2.4	-0.1	5.9	3	silty CLAY to CLAY	115	1.5	27	29	-	-	2.8	9.9	41	2.71	15	N/A	N/A
15.91	46.6	49.5	-	46.6	2.8	0.2	6.1	3	silty CLAY to CLAY	115	1.5	31	33	-	-	3.2	9.9	40	2.68	15	N/A	N/A
16.08	56.3	59.2	-	56.3	3.2	0.0	5.8	4	clayy SILT to silty CLAY	115	2.0	28	30	-	-	3.9	9.9	36	2.61	15	N/A	N/A
16.24	70.6	70.0	207.6	70.6	3.7	-0.8	5.3	4	clayy SILT to silty CLAY	115	2.0	35	35	-	-	4.9	9.9	32	2.54	15	N/A	N/A
16.40	78.7	77.6	211.2	78.7	3.9	-0.7	5.0	4	clayy SILT to silty CLAY	115	2.0	39	39	-	-	5.5	9.9	30	2.49	15	N/A	N/A
16.57	72.0	70.6	212.1	71.9	3.9	-0.9	5.4	4	clayy SILT to silty CLAY	115	2.0	36	35	-	-	5.0	9.9	33	2.54	15	N/A	N/A
16.73	72.1	70.4	209.2	72.1	3.8	-0.8	5.3	4	clayy SILT to silty CLAY	115	2.0	36	35	-	-	5.0	9.9	32	2.54	15	N/A	N/A
16.90	87.6	85.2	222.5	87.6	4.4	-0.6	5.1	9	very stiff fine SOIL	120	1.0	88	85	-	-	3.1	9.9	29	2.47	30	N/A	N/A
17.06	116.0	112.2	224.8	116.0	4.7	-0.7	4.1	9	very stiff fine SOIL	120	1.0	100	100	-	-	4.1	9.9	23	2.32	30	N/A	N/A
17.23	144.4	139.0	224.4	144.4	4.6	-0.7	3.2	5	silty SAND to sandy SILT	120	3.0	48	46	78	42	-	-	18	2.18	16	N/A	N/A
17.39	162.6	155.7	206.6	162.6	3.6	-0.8	2.2	5	silty SAND to sandy SILT	120	3.0	54	52	82	43	-	-	13	2.02	16	N/A	N/A
17.55	164.3	156.6	197.6	164.2	3.1	-0.8	1.9	6	clean SAND to silty SAND	125	5.0	33	31	82	43	-	-	12	1.97	16	N/A	N/A
17.72	155.6	147.6	188.0	155.6	2.9	-0.8	1.9	6	clean SAND to silty SAND	125	5.0	31	30	80	43	-	-	12	1.98	16	N/A	N/A
17.88	141.4	133.5	179.0	141.4	2.8	-0.8	2.0	5	silty SAND to sandy SILT	120	3.0	47	44	77	42	-	-	14	2.03	16	N/A	N/A
18.05	129.7	121.9	177.5	129.7	2.9	-0.8	2.3	5	silty SAND to sandy SILT	120	3.0	43	41	74	42	-	-	16	2.10	16	N/A	N/A
18.21	119.0	111.3	183.7	119.0	3.3	-0.8	2.8	5	silty SAND to sandy SILT	120	3.0	40	37	71	41	-	-	19	2.19	16	N/A	N/A
18.37	116.8	108.8	189.0	116.8	3.5	-0.8	3.0	5	silty SAND to sandy SILT	120	3.0	39	36	70	41	-	-	20	2.23	16	N/A	N/A
18.54	125.8	116.7	212.4	125.8	4.4	-0.9	3.5	5	silty SAND to sandy SILT	120	3.0	42	39	72	41	-	-	21	2.26	16	N/A	N/A
18.70	140.8	129.9	235.6	140.8	5.3	-0.8	3.8	8	stiff SAND to clayy SAND	115	5.0	28	26	76	42	-	-	21	2.26	16	N/A	N/A
18.87	181.9	167.1	243.4	181.8	5.3	-0.9	2.9	5	silty SAND to sandy SILT	120	3.0	61	56	84	43	-	-	16	2.10	16	N/A	N/A
19.03	211.6	193.5	235.7	211.5	4.2	-0.8	2.0	6	clean SAND to silty SAND	125	5.0	42	39	89	44	-	-	11	1.93	16	N/A	N/A
19.19	222.6	202.7	224.1	222.6	3.1	-0.8	1.4	6	clean SAND to silty SAND	125	5.0	45	41	90	44	-	-	8	1.80	16	N/A	N/A
19.36	220.3	199.7	218.0	220.3	2.9	-0.8	1.3	6	clean SAND to silty SAND	125	5.0	44	40	90	44	-	-	8	1.78	16	N/A	N/A
19.52	217.0	195.9	212.6	217.0	2.7	-0.9	1.3	6	clean SAND to silty SAND	125	5.0	43	39	89	44	-	-	8	1.77	16	N/A	N/A
19.69	204.2	183.5	201.4	204.2	2.5	-0.8	1.2	6	clean SAND to silty SAND	125	5.0	41	37	87	43	-	-	8	1.79	16	N/A	N/A
19.85	201.8	180.5	196.2	201.8	2.4	-0.8	1.2	6	clean SAND to silty SAND	125	5.0	40	36	86	43	-	-	8	1.77	16	N/A	N/A
20.01	210.1	187.2	207.5	210.1	2.8	-0.9	1.3	6	clean SAND to silty SAND	125	5.0	42	37	88	43	-	-	8	1.80	16	N/A	N/A
20.18	221.9	196.8	232.7	221.9	4.0	-0.9	1.8	6	clean SAND to silty SAND	125	5.0	44	39	89	44	-	-	10	1.89	16	N/A	N/A
20.34	271.0	239.4	267.7	271.0	4.6	-1.1	1.7	6	clean SAND to silty SAND	125	5.0	54	48	95	45	-	-	8	1.82	16	N/A	N/A
20.51	278.2	244.7	269.7	278.2	4.5	-1.1	1.6	6	clean SAND to silty SAND	125	5.0	56	49	95	45	-	-	8	1.79	16	N/A	N/A
20.67	287.9	252.2	273.3	287.9	4.4	-1.0	1.5	6	clean SAND to silty SAND	125	5.0	58	50	95	45	-	-	7	1.77	16	N/A	N/A
20.83	289.4	252.4	266.0	289.4	3.9	-0.9	1.4	6	clean SAND to silty SAND	125	5.0	58	50	95	45	-	-	7	1.72	16	N/A	N/A
21.00	285.8	248.2	257.8	285.8	3.6	-0.9	1.2	6	clean SAND to silty SAND	125	5.0	57	50	95	45	-	-	6	1.70	16	N/A	N/A
21.16	292.7	253.2	261.6	292.7	3.6	-0.8	1.2	6	clean SAND to silty SAND	125	5.0	59	51	95	45	-	-	6	1.69	16	N/A	N/A
21.33	273.8	235.9	243.4	273.8	3.2	-0.8	1.2	6	clean SAND to silty SAND	125	5.0	55	47	95	44	-	-	6	1.69	16	N/A	N/A
21.49	242.6	208.2	220.9	242.6	2.9	-0.9	1.2	6	clean SAND to silty SAND	125	5.0	49	42	91	44	-	-	7	1.73	16	N/A	N/A
21.65	231.7	198.0	205.8	231.7	2.4	-0.9	1.0	6	clean SAND to silty SAND	125	5.0	46	40	90	44	-	-	6	1.70	16	N/A	N/A
21.82	224.5	191.1	200.4	224.5	2.3	-0.8	1.0	6	clean SAND to silty SAND	125	5.0	45	38	88	43	-	-	6	1.72	16	N/A	N/A
21.98	170.5	144.6	176.6	170.5	2.7	-0.8	1.6	6	clean SAND to silty SAND	125	5.0	34	29	79	42	-	-	11	1.93	16	N/A	N/A
22.15	101.2	85.5	167.0	101.2	3.1	-0.6	3.1	5	silty SAND to sandy SILT	120	3.0	34	28	62	39	-	-	23	2.30	16	N/A	N/A
22.31	52.1	39.1	-	52.1	2.7	-0.5	5.3	3	silty CLAY to CLAY	115	1.5	35	26	-	-	3.6	9.9	41	2.71	15	N/A	N/A
22.47	42.6	31.8	-	42.6	2.1	-0.4	5.2	3	silty CLAY to CLAY	115	1.5	28	21	-	-	2.9	9.9	44	2.77	15	N/A	N/A
22.64	47.2	34.9	-	47.2	1.7	0.0	3.7	4	clayy SILT to silty CLAY	115	2.0	24	17	-	-	3.2	9.9	37	2.64	15	N/A	N/A
22.80	84.9	70.7	120.6	84.9	1.6	-1.1	1.9	5	silty SAND to sandy SILT	120	3.0	28	24	56	38	-	-	20	2.22	16	N/A	N/A
22.97	84.8	70.4	127.0	84.8	1.8	-0.6	2.2	5	silty SAND to sandy SILT	120	3.0	28	23	55	38	-	-	21	2.25	16	N/A	N/A
23.13	46.6	33.7	-	46.5	1.9	-0.5	4.2	4	clayy SILT to silty CLAY	115	2.0	23	17	-	-	3.2	9.9	40	2.68	15	N/A	N/A
23.30	29.9	21.5	-	29.9	1.9	-0.5	6.8	3	silty CLAY to CLAY	115	1.5	20	14	-	-	2.0	6.8	57	2.98	15	N/A	N/A
23.46	25.7	18.4	-	25.7	1.4	-0.3	5.6	3	silty CLAY to CLAY	115	1.5	17	12	-	-	1.7	5.7	57	2.97	15	N/A	N/A
23.62	19.3	13.7	-	19.3	1.1	0.0	6.0	3	silty CLAY to CLAY	115	1.5	13	9	-	-	1.3	4.2	65	3.10	15	N/A	N/A
23.79	20.5	14.5	-	20.5	0.8	-0.1	4.4	3	silty CLAY to CLAY	115	1.5	14	10	-	-	1.3	4.4	58	2.99	15	N/A	N/A
23.95	20.0	14.0	-	20.0	0.8	-0.1	4.3	3	silty CLAY to CLAY	115	1.5	13	9	-	-	1.3	4.3	58	3.00	15	N/A	N/A
24.12	20.3	14.2	-	20.3	1.0	-0.2	5.4	3	silty CLAY to CLAY	115	1.5	14	9	-	-	1.3	4.3	62	3.05	15	N/A	N/A
24.28	30.4	21.0	-	30.3	1.4	-0.3	4.8	3	silty CLAY to CLAY	115	1.5	20	14	-	-	2.0	6.6	51	2.89	15	N/A	N/A
24.44	34.4	23.6	-	34.4	1.8	-1.2	5.3	3	silty CLAY to CLAY	115	1.5	23	16	-	-	2.3	7.5	50	2.87	15	N/A	N/A
24.61	25.4	17.4	-	25.4	1.4	-1.8	5.7	3	silty CLAY to CLAY	115	1.5	17	12	-	-	1.7	5.4	58	3.00	15	N/A	N/A
24.77	19.7	13.4	-	19.7	0.8	-1.8	4.3	3	silty CLAY to CLAY	115	1.5	13	9	-	-	1.3	4.1	60	3.02	15	N/A	N/A
24.94	17.3	11.6	-	17.2	0.7	-1.7	4.3	3	silty CLAY to CLAY	115	1.5	12	8	-	-	1.1	3.5	63	3.06	15	N/A	N/A
25.10	18.4	12.3	-	18.3	0.6	-1.7	3.6	3	silty CLAY to CLAY	115	1.5	12	8	-	-	1.2	3.7	59	3.00	15	N/A	N/A
25.26	20.3	13.5	-	20.2	1.0	-1.7	5.3	3	silty CLAY to CLAY	115	1.5	14	9	-	-	1.3	4.1	63	3.07	15	N/A	N/A
25.43	31.5	20.8	-	31.4	1.6	-1.6	5.2	3	silty CLAY to CLAY	115	1.5	21	14	-	-	2.1	6.5	53	2.91	15	N/A	N/A
25.59	117.8	92.8	140.5	117.7	2.2	-3.6	1.9	5	silty SAND to sandy SILT	120	3.0	39	31	65	39	-	-	17	2.13	16	N/A	N/A
25.76	199.3	156.5	185.3	199.3	3.0	-0.9	1.5	6	clean SAND to silty SAND	125	5.0	40	31	82	42	-	-	10	1.90	16	N/A	N/A
25.92	237.0	185.4	210.7	237.0	3.5	-0.9	1.5	6	clean SAND to silty SAND	125	5.0	47	37	87	43	-	-	9	1.84	16	N/A	N/A
26.08	241.8	188.5	218.2	241.7	3.9	-0.9	1.6	6	clean SAND to silty SAND	125	5.0	48	38	88	43	-	-	10	1.87	16	N/A	N/A
26.25	244.8	190.3	224.2	244.8	4.3	-0.9	1.8	6	clean SAND to silty SAND	125	5.0	49	38	88	43	-	-	10	1.89	16	N/A	N/A
26.41	266.9	206.8	241.1	266.9	4.8	-0.9	1.8	6	clean SAND to silty SAND	125	5.0	53	41	91	43	-	-	10	1.87	16	N/A	N/A
26.58	250.8	193.6	230.8	250.8	4.6	-0.9	1.9	6	clean SAND to silty SAND	125	5.0	50	39	89	43	-	-	10	1.90	16	N/A	N/A
26.74	218.9	168.5	211.3	218.9	4.3	-0.8	2.0	6	clean SAND to silty SAND	125	5.0	44	34	84	42	-	-	12	1.96	16	N/A	N/A
26.90	196.5	150.7	206.5	196.5	4.5	-0.7	2.3	5	silty SAND to sandy SILT	120	3.0	66	50	81	42	-	-	14	2.05	16	N/A	N/A
27.07	204.6	156.5	207.8	204.6	4.5	-0.9	2.2	5	silty SAND to sandy SILT	120	3.0	68	52	82	42	-	-	14	2.02	16	N/A	N/A
27.23	197.5	150.6	195.1	197.5	3.9	-0.9	2.0	5	silty SAND to sandy SILT	120	3.0	66	50	81	42	-	-	13	2.00	16	N/A	N/A
27.40	161.8	123.0	171.7	161.8	3.3	-0.7	2.1	5	silty SAND to sandy SILT	120	3.0	54	41	74	40	-	-	15	2.07	16	N/A	N/A
27.56	118.1	89.5	161.5	118.1	3.2	-0.6	2.7	5	silty SAND to sandy SILT	120	3.0	39	30	63	39	-	-	21	2.25	16	N/A	N/A
27.72	89.2	67.4	169.5	89.2	3.4	-0.6	3.9	4	clayy SILT to silty CLAY	115	2.0	45	34	-	-	6.2	9.9	28	2.45	15	N/A	N/A
27.89	92.4	69.6	150.6	92.4	2.8	-1.3	3.0	5	silty SAND to sandy SILT	120	3.0	31	23	55	37	-	-	25	2.36	16	N/A	N/A
28.05	113.1	84.9	160.1	113.0	3.2	-3.8	2.8	5	silty SAND to sandy SILT	120	3.0	38	28	62	38	-	-	22	2.28	16	N/A	N/A
28.22	136.9	102.5	158.4	136.7	3.0	-8.9	2.2	5	silty SAND to sandy SILT	120	3.0	46	34	68	39	-	-	17	2.15	16	N/A	N/A
28.38	165.4	123.5	163.0	165.2	2.9	-11.6	1.8	5	silty SAND to sandy SILT	120	3.0	55	41	74	40	-	-	13	2.01	16	N/A	N/A
28.54	158.1	117.7	150.2	157.8	2.4	-11.7	1.5	6	clean SAND to silty SAND	125	5.0	32	24	72	40	-	-	12	1.98	16	N/A	N/A
28.71	126.1	93.6	145.4	126.0	2.6	-7.5	2.1	5	silty SAND to sandy SILT	120	3.0	42	31	65	39	-	-	17	2.15	16	N/A	N/A
28.87	99.3	73.5	150.7	99.2	2.8	-6.7	2.9	5	silty SAND to sandy SILT	120	3.0	33	25	57	37	-	-	24	2.33	16	N/A	N/A
29.04	77.6	44.8	-	77.4	3.3	-9.4	4.3	4	clayy SILT to silty CLAY	115	2.0	39	22	-	-	5.4	9.9	36	2.61	15	N/A	N/A
29.20	57.4	33.0	-	57.2	3.1	-11.2	5.5	3	silty CLAY to CLAY	115	1.5	38	22	-	-	3.9	9.9	45	2.78	15	N/A	N/A
29.36	39.0	22.3	-	38.8	2.5	-11.4	6.7	3	silty CLAY to CLAY	115	1.5	26	15	-	-	2.6	7.0	56	2.96	15	N/A	N/A
29.53	40.5	23.0	-	40.3	2.4	-11.3	6.2	3	silty CLAY to CLAY	115	1.5	27	15	-	-	2.7	7.3	54	2.93	15	N/A	N/A
29.69	63.6	35.9	-	63.3	2.2	-11.4	3.6	4	clayy SILT to silty CLAY	115	2.0	32	18	-	-	4.4	9.9	36	2.62	15	N/A	N/A
29.86	45.8	25.7	-	45.5	2.1	-11.7	4.8	3	silty CLAY to CLAY	115	1.5	31	17	-	-	3.1	8.2	47	2.82	15	N/A	N/A
30.02	28.5	15.9	-	28.3	1.9	-11.7	6.6	3	silty CLAY to CLAY	115	1.5	19	11	-	-	1.9	4.9	64	3.07	15	N/A	N/A
30.19	25.4	14.2	-	25.2	1.3	-11.7	5.5	3	silty CLAY to CLAY	115	1.5	17	9	-	-	1.7	4.3	63	3.06	15	N/A	N/A
30.35	107.0	77.3	103.1	106.8	1.1	-11.4	1.1	6	clean SAND to silty SAND	125	5.0	21	15	59	38	-	-	14	2.02	16	N/A	N/A
30.51	107.2	77.2	127.5	106.9	2.1	-11.9	2.0	5	silty SAND to sandy SILT	120	3.0	36	26	58	38	-	-	19	2.19	16	N/A	N/A
30.68	63.5	34.8	-	63.3	2.3	-11.8	3.8	4	clayy SILT to silty CLAY	115	2.0	32	17	-	-	4.4	9.9	38	2.64	15	N/A	N/A
30.84	52.0	28.3	-	51.8	2.7	-11.7	5.3	3	silty CLAY to CLAY	115	1.5	35	19	-	-	3.5	9.0	47	2.82	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

Lake Elsinore Apartments

Project ID: LOR Geotechnical
Data File: SDF(293).cpt
CPT Date: 11/11/2016 9:01:05 AM
GW During Test: 34 ft

Sounding ID: CPT-02
Project No: 33310.1
Cone/Rig: DDG1350

Depth ft	qc PS tsf	qcln PS -	qlncs 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	51.0	27.6	-	50.7	2.5	-11.7	5.0	3	silty CLAY to CLAY	115	1.5	34	18	-	-	3.5	8.8	46	2.80	15	N/A	N/A
31.17	35.7	19.2	-	35.4	1.9	-11.7	5.7	3	silty CLAY to CLAY	115	1.5	24	13	-	-	2.4	6.0	56	2.96	15	N/A	N/A
31.33	34.8	18.6	-	34.5	1.7	-11.7	5.3	3	silty CLAY to CLAY	115	1.5	23	12	-	-	2.3	5.8	55	2.95	15	N/A	N/A
31.50	29.3	15.6	-	29.1	1.5	-11.7	5.5	3	silty CLAY to CLAY	115	1.5	20	10	-	-	1.9	4.8	60	3.02	15	N/A	N/A
31.66	27.7	14.7	-	27.5	1.8	-11.6	7.0	3	silty CLAY to CLAY	115	1.5	18	10	-	-	1.8	4.5	67	3.12	15	N/A	N/A
31.83	43.6	23.0	-	43.3	2.8	-11.6	6.6	3	silty CLAY to CLAY	115	1.5	29	15	-	-	2.9	7.3	55	2.95	15	N/A	N/A
31.99	84.3	59.4	165.7	84.1	3.4	-11.6	4.1	4	clayy SILT to silty CLAY	115	2.0	42	30	-	-	5.8	9.9	31	2.50	15	N/A	N/A
32.15	119.3	83.8	156.5	119.0	3.2	-11.3	2.8	5	silty SAND to sandy SILT	120	3.0	40	28	61	38	-	-	22	2.27	16	N/A	N/A
32.32	100.0	70.1	159.8	99.8	3.3	-11.9	3.4	4	clayy SILT to silty CLAY	115	2.0	50	35	-	-	6.9	9.9	26	2.39	15	N/A	N/A
32.48	58.2	30.2	-	58.0	3.5	-11.7	6.1	3	silty CLAY to CLAY	115	1.5	39	28	-	-	4.0	9.6	48	2.84	15	N/A	N/A
32.65	45.7	23.5	-	45.4	3.0	-11.6	6.8	3	silty CLAY to CLAY	115	1.5	30	16	-	-	3.1	7.4	55	2.95	15	N/A	N/A
32.81	62.7	32.2	-	62.5	2.9	-11.5	4.8	3	silty CLAY to CLAY	115	1.5	42	21	-	-	4.3	9.9	43	2.74	15	N/A	N/A
32.97	51.3	26.2	-	51.0	2.9	-11.8	5.9	3	silty CLAY to CLAY	115	1.5	34	17	-	-	3.5	8.3	50	2.87	15	N/A	N/A
33.14	47.9	24.3	-	47.7	3.0	-11.7	6.6	3	silty CLAY to CLAY	115	1.5	32	16	-	-	3.2	7.7	54	2.93	15	N/A	N/A
33.30	44.1	22.3	-	43.9	2.7	-11.8	6.4	3	silty CLAY to CLAY	115	1.5	29	15	-	-	3.0	7.0	55	2.95	15	N/A	N/A
33.47	35.3	17.8	-	35.1	2.5	-11.7	7.4	3	silty CLAY to CLAY	115	1.5	24	12	-	-	2.4	5.5	63	3.07	15	N/A	N/A
33.63	42.1	21.1	-	41.9	2.2	-11.8	5.5	3	silty CLAY to CLAY	115	1.5	28	14	-	-	2.8	6.6	53	2.92	15	N/A	N/A
33.79	34.4	17.2	-	34.2	1.8	-11.7	5.4	3	silty CLAY to CLAY	115	1.5	23	11	-	-	2.3	5.3	58	2.99	15	N/A	N/A
33.96	25.3	12.6	-	25.1	1.3	-11.7	5.4	3	silty CLAY to CLAY	115	1.5	17	8	-	-	1.6	3.8	65	3.10	15	N/A	N/A
34.12	25.2	12.5	-	24.9	1.0	-11.7	4.2	3	silty CLAY to CLAY	115	1.5	17	8	-	-	1.6	3.8	61	3.04	15	-	-
34.29	28.8	14.2	-	28.6	1.1	-11.7	4.0	3	silty CLAY to CLAY	115	1.5	19	9	-	-	1.9	4.4	57	2.97	15	-	-
34.45	33.8	16.7	-	33.6	1.6	-11.7	5.0	3	silty CLAY to CLAY	115	1.5	23	11	-	-	2.2	5.2	57	2.97	15	-	-
34.61	33.4	16.4	-	33.2	1.5	-11.7	4.9	3	silty CLAY to CLAY	115	1.5	22	11	-	-	2.2	5.1	57	2.98	15	-	-
34.78	37.7	18.5	-	37.5	1.6	-11.6	4.4	3	silty CLAY to CLAY	115	1.5	25	12	-	-	2.5	5.8	52	2.90	15	-	-
34.94	51.3	25.1	-	51.1	2.1	-11.6	4.3	3	silty CLAY to CLAY	115	1.5	34	17	-	-	3.5	8.0	45	2.79	15	-	-
35.11	77.0	52.3	134.0	76.8	2.3	-11.5	3.1	4	clayy SILT to silty CLAY	115	2.0	39	26	-	-	5.3	9.9	29	2.46	15	0.44	1.8
35.27	160.6	108.9	157.9	160.4	3.2	-11.8	2.0	5	silty SAND to sandy SILT	120	3.0	54	36	70	39	-	-	16	2.10	16	0.15	1.0
35.43	201.5	136.5	167.3	201.3	3.0	-12.0	1.5	6	clean SAND to silty SAND	125	5.0	40	27	77	40	-	-	11	1.94	16	0.00	0.0
35.60	225.0	152.2	174.0	224.7	2.8	-12.3	1.3	6	clean SAND to silty SAND	125	5.0	45	30	81	41	-	-	9	1.85	16	0.00	0.0
35.76	225.7	152.5	169.3	225.5	2.5	-12.3	1.1	6	clean SAND to silty SAND	125	5.0	45	31	81	41	-	-	8	1.80	16	0.00	0.0
35.93	233.7	157.8	169.4	233.5	2.2	-12.5	1.0	6	clean SAND to silty SAND	125	5.0	47	32	82	41	-	-	7	1.75	16	0.00	0.0
36.09	253.5	170.9	175.2	253.2	2.1	-12.6	0.8	6	clean SAND to silty SAND	125	5.0	51	34	85	42	-	-	6	1.68	16	0.00	0.0
36.26	275.8	185.7	185.3	275.6	2.2	-12.5	0.8	6	clean SAND to silty SAND	125	5.0	55	37	87	42	-	-	5	1.64	16	0.00	0.0
36.42	278.5	187.3	186.8	278.2	2.2	-12.5	0.8	6	clean SAND to silty SAND	125	5.0	56	37	88	42	-	-	5	1.64	16	0.00	0.0
36.58	272.8	183.2	183.2	272.5	2.0	-12.5	0.8	6	clean SAND to silty SAND	125	5.0	55	37	87	42	-	-	5	1.63	16	0.00	0.0
36.75	268.3	180.0	180.0	268.1	1.2	-12.4	0.5	6	clean SAND to silty SAND	125	5.0	54	36	86	42	-	-	5	1.61	16	0.00	0.0
36.91	244.5	163.8	164.5	244.3	1.7	-12.3	0.7	6	clean SAND to silty SAND	125	5.0	49	33	83	41	-	-	5	1.65	16	0.00	0.0
37.08	299.9	200.7	200.7	299.7	1.8	-10.3	0.6	6	clean SAND to silty SAND	125	5.0	60	40	90	42	-	-	5	1.54	16	0.00	0.0
37.24	262.7	175.6	175.6	262.5	1.7	-10.3	0.7	6	clean SAND to silty SAND	125	5.0	53	35	86	42	-	-	5	1.61	16	0.00	0.0
37.40	250.0	166.9	166.9	249.8	1.7	-10.3	0.7	6	clean SAND to silty SAND	125	5.0	50	33	84	41	-	-	5	1.64	16	0.00	0.0
37.57	245.8	163.9	163.9	245.6	1.4	-10.3	0.6	6	clean SAND to silty SAND	125	5.0	49	33	83	41	-	-	5	1.60	16	0.00	0.0
37.73	250.7	166.9	166.9	250.5	1.5	-10.3	0.6	6	clean SAND to silty SAND	125	5.0	50	33	84	41	-	-	5	1.60	16	0.00	0.0
37.90	250.3	166.5	166.5	250.1	1.5	-10.2	0.6	6	clean SAND to silty SAND	125	5.0	50	33	84	41	-	-	5	1.61	16	0.00	0.0
38.06	253.8	168.6	168.6	253.6	1.8	-10.1	0.7	6	clean SAND to silty SAND	125	5.0	51	34	84	41	-	-	5	1.64	16	0.00	0.0
38.22	256.0	169.9	169.9	255.8	1.8	-9.0	0.7	6	clean SAND to silty SAND	125	5.0	51	34	84	41	-	-	5	1.64	16	0.00	0.0
38.39	251.6	166.7	166.7	251.4	1.7	-9.1	0.7	6	clean SAND to silty SAND	125	5.0	50	33	84	41	-	-	5	1.63	16	0.00	0.0
38.55	249.4	165.1	174.7	249.2	2.3	-9.0	0.9	6	clean SAND to silty SAND	125	5.0	50	33	84	41	-	-	7	1.73	16	0.00	0.0
38.72	248.4	164.2	191.9	248.2	3.7	-9.0	1.5	6	clean SAND to silty SAND	125	5.0	50	33	83	41	-	-	10	1.88	16	0.00	0.0
38.88	257.3	169.9	206.9	257.1	4.6	-9.1	1.8	6	clean SAND to silty SAND	125	5.0	51	34	84	41	-	-	11	1.93	16	0.00	0.0
39.04	235.9	155.6	198.4	235.7	4.5	-9.3	1.9	6	clean SAND to silty SAND	125	5.0	47	31	82	41	-	-	12	1.98	16	0.00	0.0
39.21	174.9	115.3	190.3	174.7	4.9	-9.4	2.9	5	silty SAND to sandy SILT	120	3.0	58	38	72	39	-	-	19	2.19	16	0.00	0.0
39.37	164.3	108.2	202.4	164.2	5.6	-9.4	3.5	5	silty SAND to sandy SILT	120	3.0	55	36	70	39	-	-	22	2.28	16	0.00	0.0
39.54	160.6	105.6	201.2	160.4	5.6	-9.4	3.5	5	silty SAND to sandy SILT	120	3.0	54	35	69	39	-	-	22	2.29	16	0.00	0.0
39.70	113.9	74.8	154.6	113.7	3.3	-9.3	3.0	5	silty SAND to sandy SILT	120	3.0	38	25	57	37	-	-	24	2.34	16	0.17	0.6
39.86	84.0	55.1	140.2	83.8	2.6	-9.3	3.2	4	clayy SILT to silty CLAY	115	2.0	42	28	-	-	5.8	9.9	29	2.45	15	0.34	1.3
40.03	55.5	25.3	-	55.3	2.4	-9.2	4.4	3	silty CLAY to CLAY	115	1.5	37	17	-	-	3.8	8.0	46	2.80	15	-	-
40.19	49.4	22.5	-	49.3	2.0	-9.1	4.2	3	silty CLAY to CLAY	115	1.5	33	15	-	-	3.3	7.1	47	2.82	15	-	-
40.36	44.5	20.2	-	44.4	1.6	-9.1	3.9	3	silty CLAY to CLAY	115	1.5	30	13	-	-	3.0	6.3	48	2.84	15	-	-
40.52	34.7	15.7	-	34.5	1.4	-9.1	4.3	3	silty CLAY to CLAY	115	1.5	23	10	-	-	2.3	4.8	56	2.96	15	-	-
40.68	30.7	13.9	-	30.5	1.1	-9.1	3.7	3	silty CLAY to CLAY	115	1.5	20	9	-	-	2.0	4.2	56	2.97	15	-	-
40.85	27.0	12.2	-	26.8	0.8	-9.1	3.4	3	silty CLAY to CLAY	115	1.5	18	8	-	-	1.8	3.7	58	3.00	15	-	-
41.01	24.8	11.1	-	24.6	0.7	-9.1	3.3	3	silty CLAY to CLAY	115	1.5	17	7	-	-	1.6	3.3	60	3.02	15	-	-
41.18	24.4	11.0	-	24.2	0.6	-9.1	2.8	3	silty CLAY to CLAY	115	1.5	16	7	-	-	1.6	3.3	58	2.99	15	-	-
41.34	24.8	11.1	-	24.6	0.7	-9.2	3.2	3	silty CLAY to CLAY	115	1.5	17	7	-	-	1.6	3.3	59	3.01	15	-	-
41.50	27.9	12.5	-	27.7	0.7	-9.5	2.8	3	silty CLAY to CLAY	115	1.5	19	8	-	-	1.8	3.7	54	2.93	15	-	-
41.67	25.2	11.2	-	25.0	0.7	-9.5	3.0	3	silty CLAY to CLAY	115	1.5	17	7	-	-	1.6	3.3	58	2.99	15	-	-
41.83	23.9	10.6	-	23.7	0.7	-9.5	3.2	3	silty CLAY to CLAY	115	1.5	16	7	-	-	1.5	3.1	61	3.03	15	-	-
42.00	25.7	11.4	-	25.5	1.1	-9.5	4.9	3	silty CLAY to CLAY	115	1.5	17	8	-	-	1.7	3.4	67	3.11	15	-	-
42.16	47.7	21.2	-	47.5	1.4	-9.5	3.2	4	clayy SILT to silty CLAY	115	2.0	24	11	-	-	3.2	6.6	44	2.77	15	-	-
42.32	54.8	24.3	-	54.7	2.5	-9.6	4.8	3	silty CLAY to CLAY	115	1.5	37	16	-	-	3.7	7.7	48	2.84	15	-	-
42.49	52.1	23.0	-	51.9	3.5	-9.6	7.1	3	silty CLAY to CLAY	115	1.5	35	15	-	-	3.5	7.2	57	2.97	15	-	-
42.65	70.4	31.1	-	70.3	3.9	-9.6	5.8	3	silty CLAY to CLAY	115	1.5	47	21	-	-	4.8	9.9	47	2.81	15	-	-
42.82	110.5	71.2	189.2	110.3	4.8	-9.8	4.4	4	clayy SILT to silty CLAY	115	2.0	55	36	-	-	7.6	9.9	30	2.48	15	0.00	0.0
42.98	127.2	81.9	209.2	127.0	5.9	-9.8	4.7	4	clayy SILT to silty CLAY	115	2.0	64	41	-	-	8.8	9.9	29	2.46	15	0.00	0.0
43.15	167.4	107.7	214.5	167.2	6.4	-9.8	3.9	5	silty SAND to sandy SILT	120	3.0	56	36	69	39	-	-	23	2.31	16	0.00	0.0
43.31	259.0	166.5	236.1	258.8	7.1	-10.0	2.8	5	silty SAND to sandy SILT	120	3.0	86	55	84	41	-	-	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.

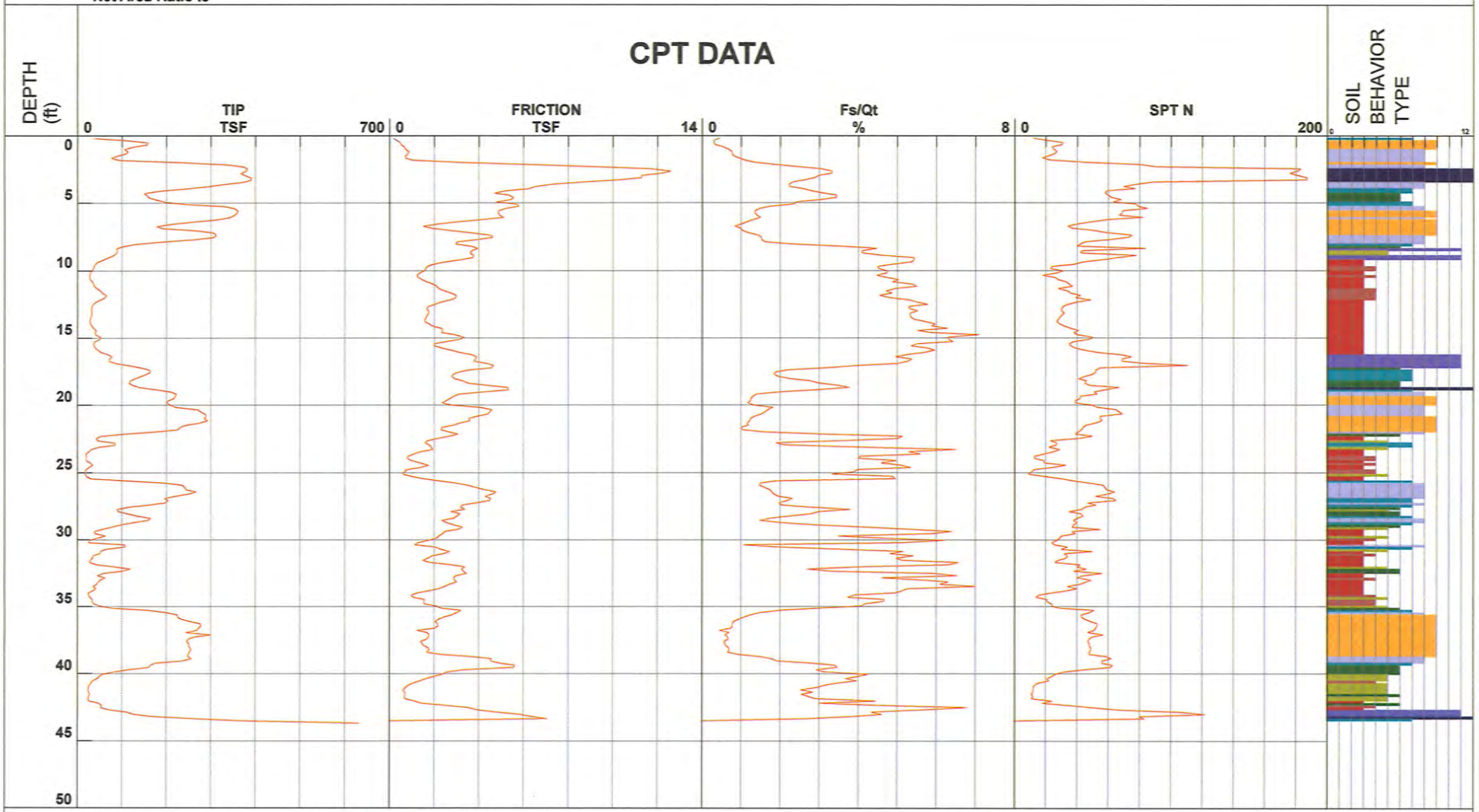
Middle Earth Geo Testing

LOR Geotechnical

Project	Lake Elsinore Apartments	Operator	DG-RC	Filename	SDF(293).cpt
Job Number	33310.1	Cone Number	DDG1350	GPS	
Hole Number	CPT-02	Date and Time	11/11/2016 9:01:05 AM	Maximum Depth	43.63 ft
EST GW Depth During Test		34.00 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

APPENDIX F

Results of CLIQ

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

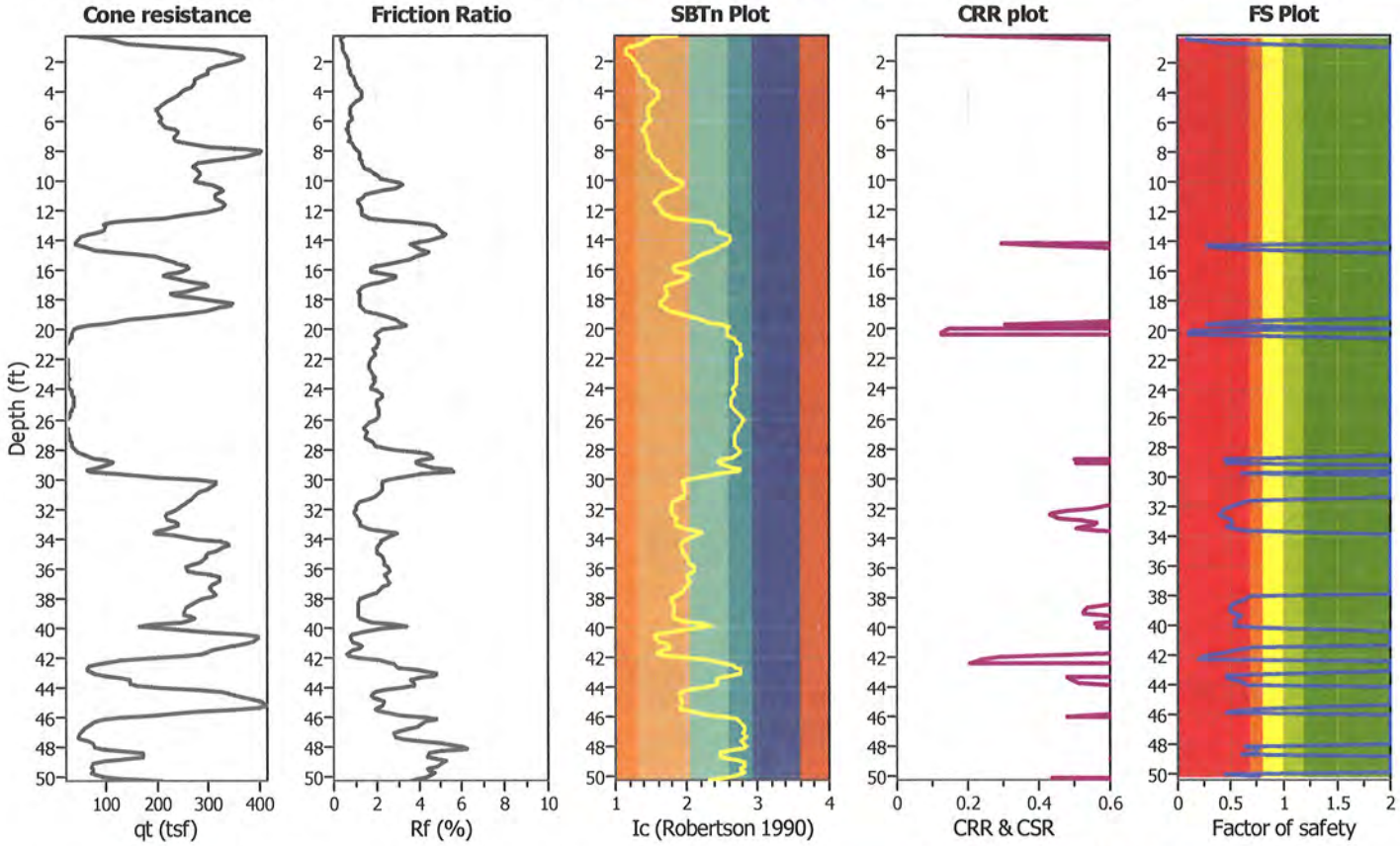
LIQUEFACTION ANALYSIS REPORT

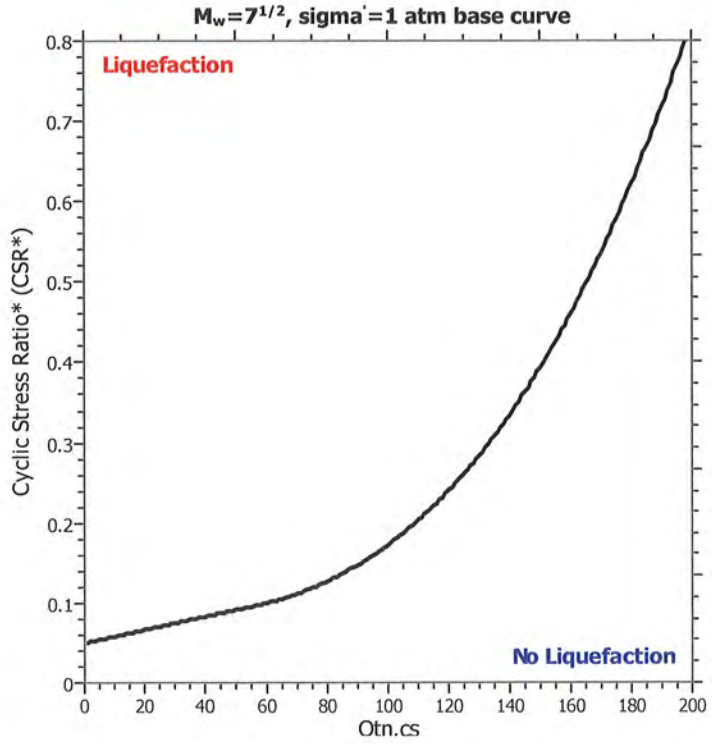
Project title : Lake Elsinore Apartments **Location : Lake Elsinore, CA**

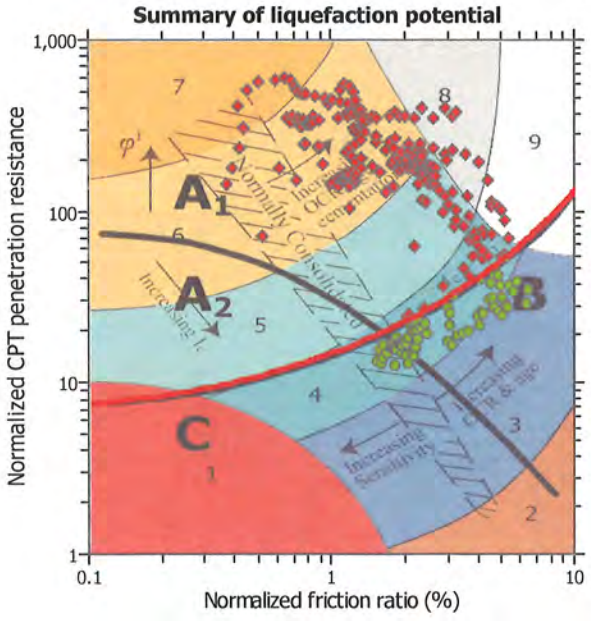
CPT file : CPT-01

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	34.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	0.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.95	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

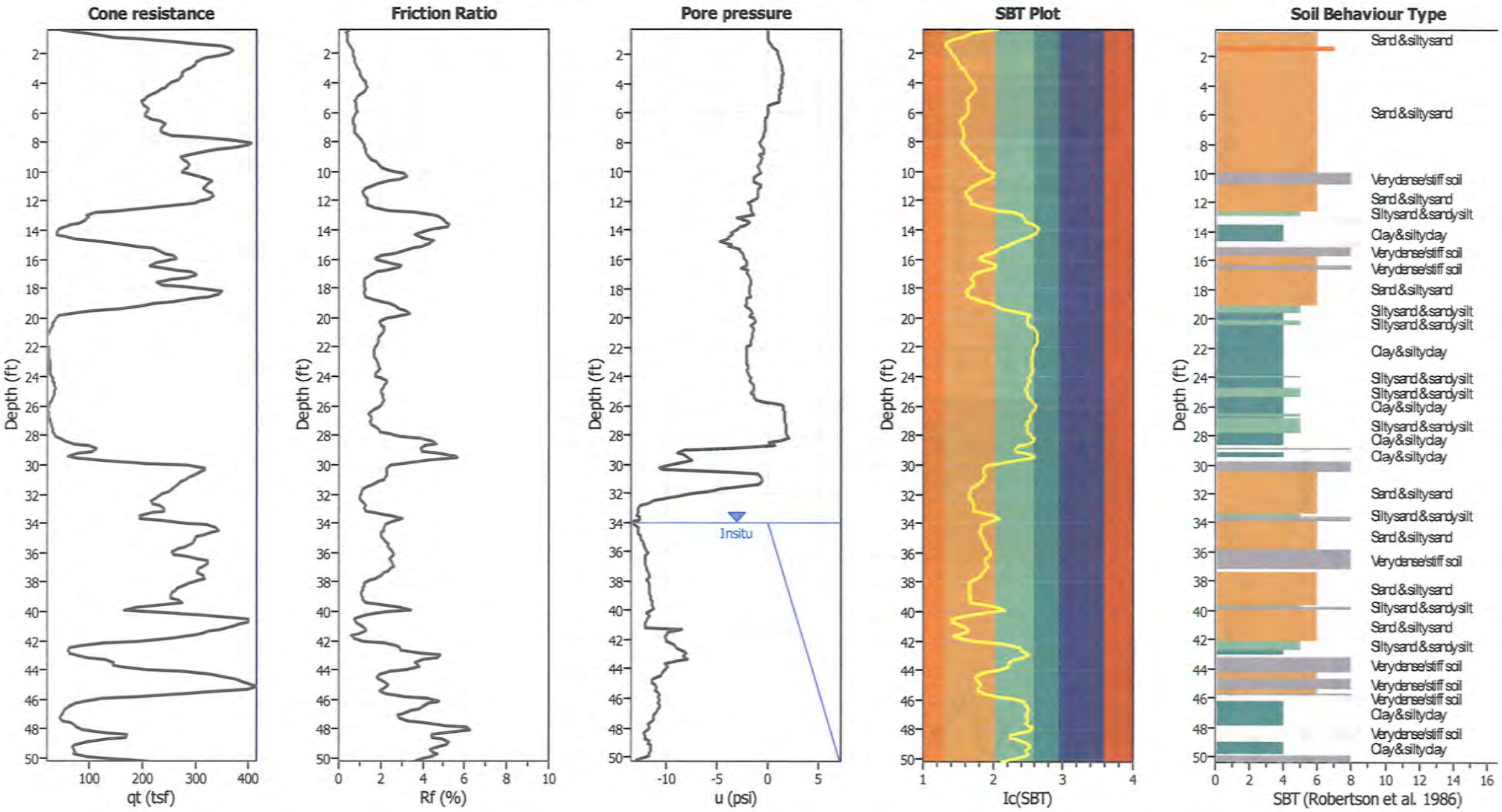






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



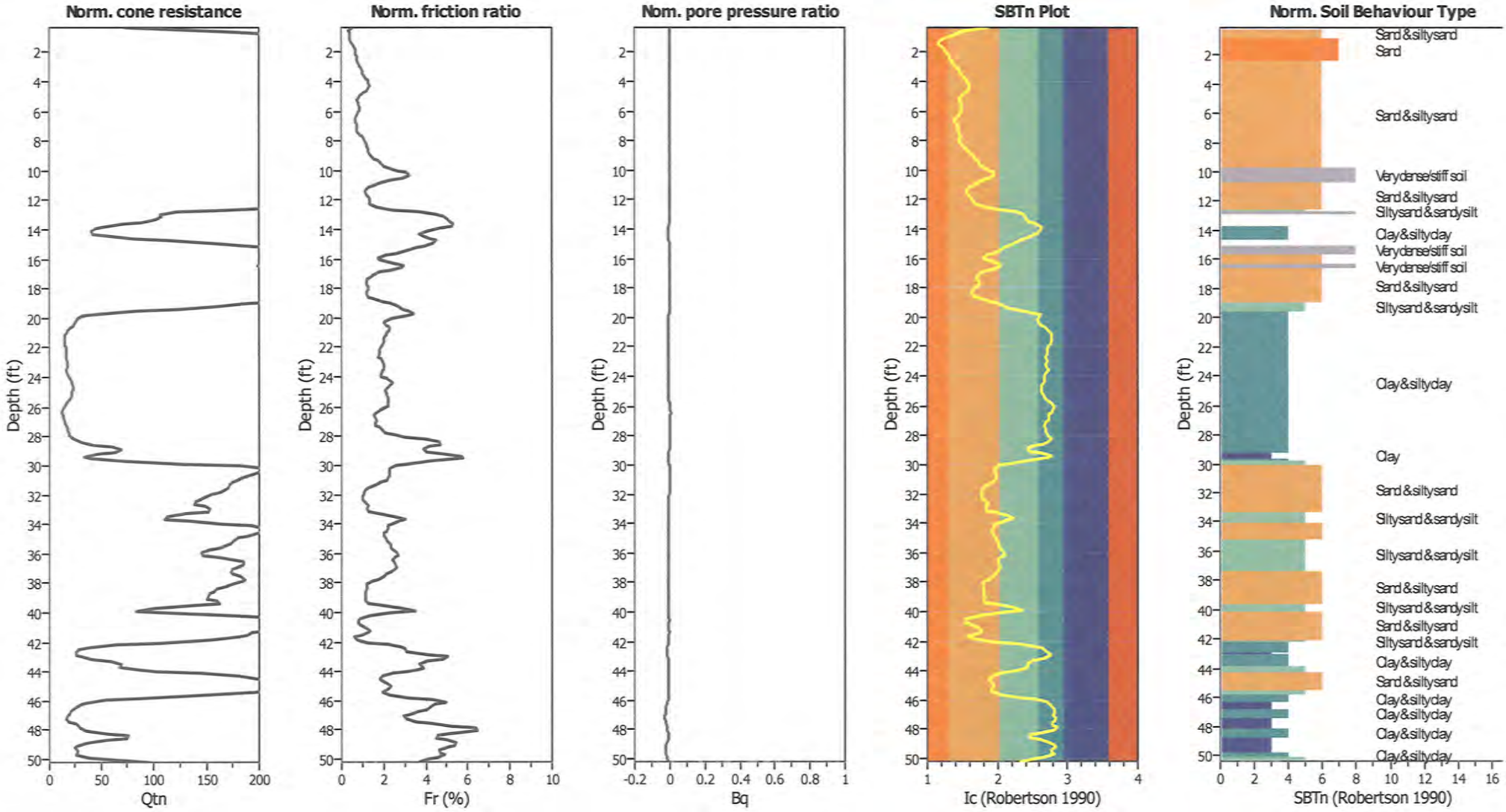
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

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

CPT basic interpretation plots (normalized)



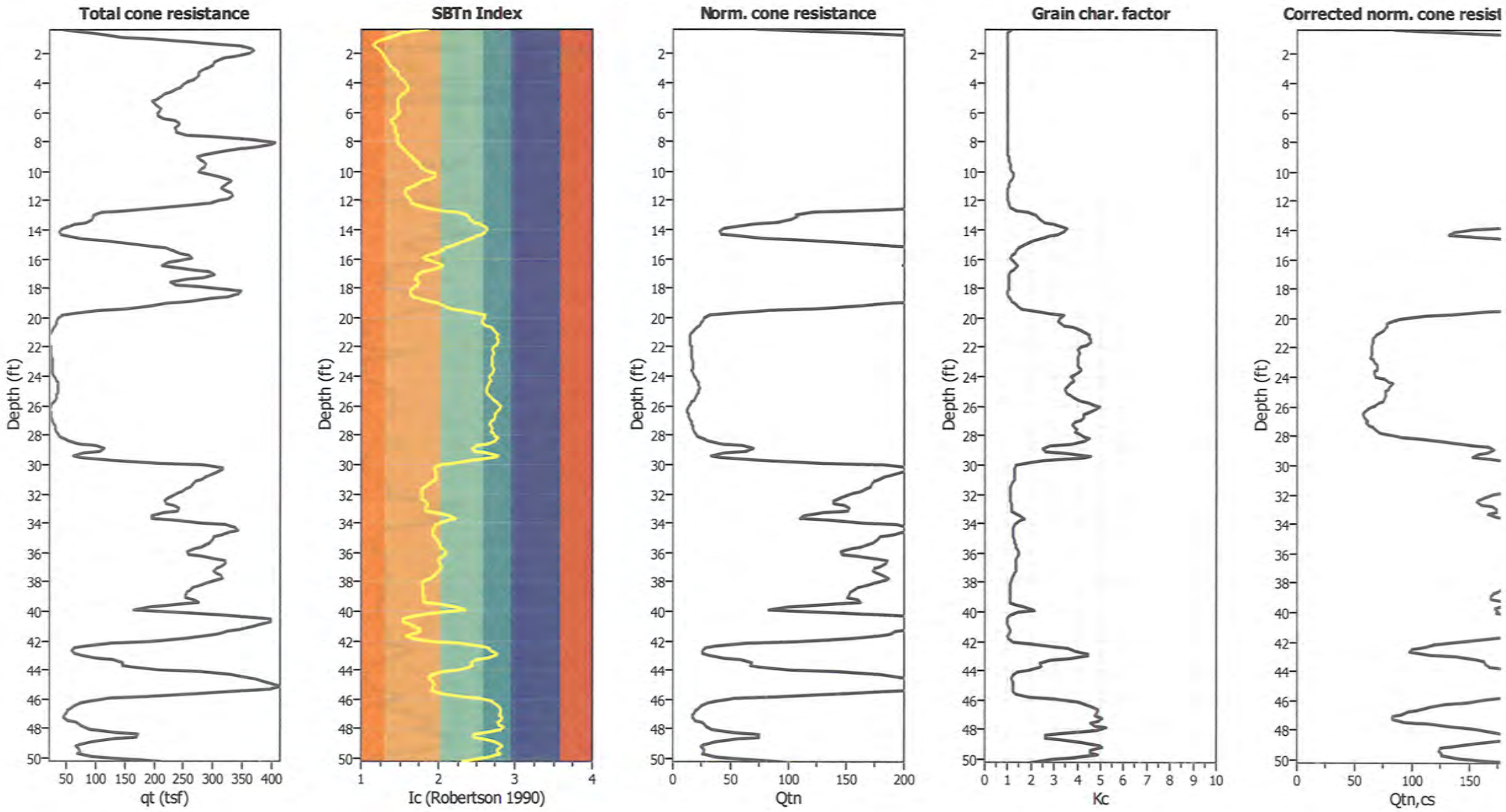
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

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

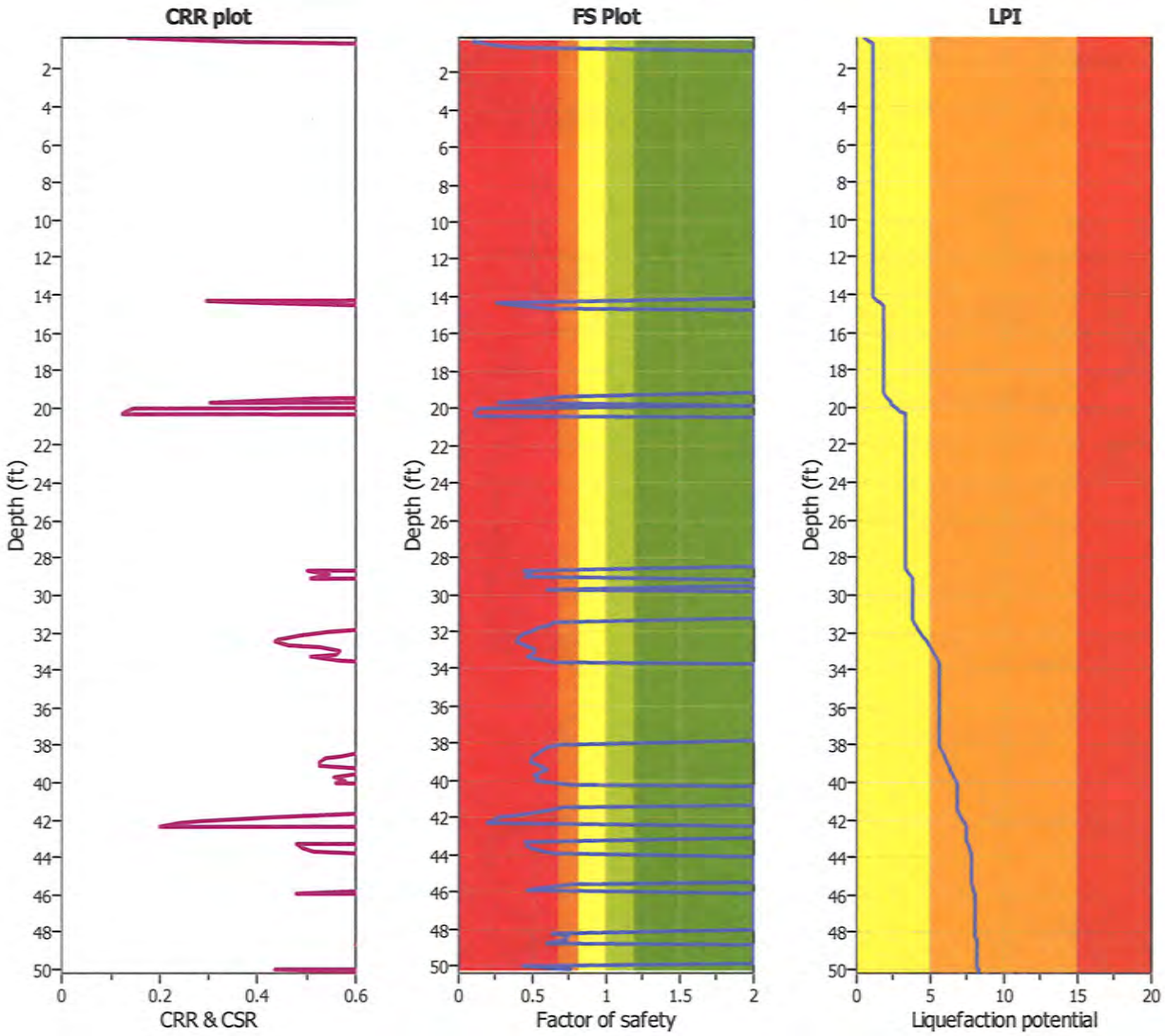
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

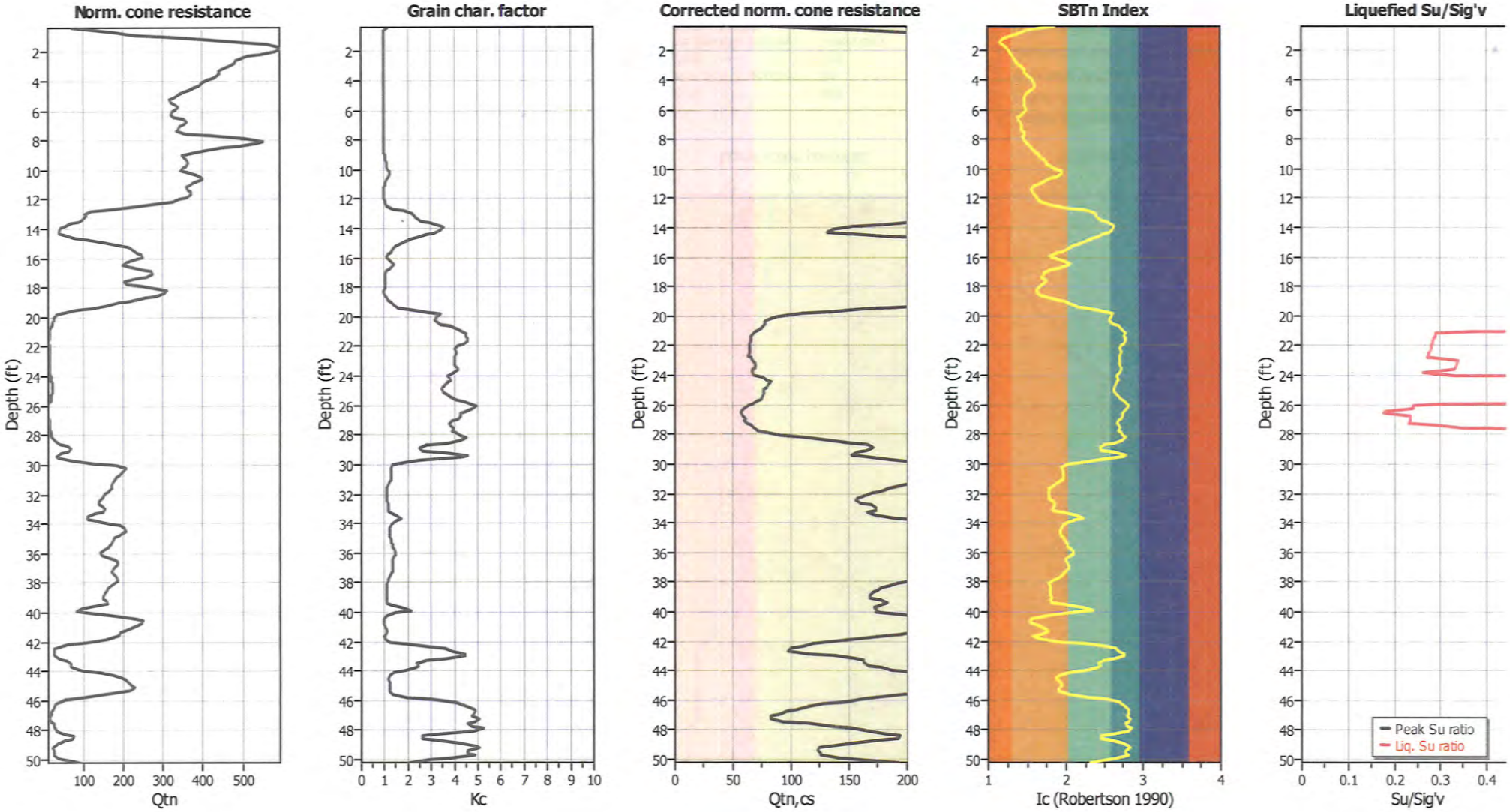
F.S. color scheme

- 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

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data ::

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1	0.33	0.02	0.01	0.01	1.00	1.447	1.00	1.447	1.00	1.00	1.447	No
2	0.49	0.03	0.02	0.01	1.00	1.422	1.00	1.423	1.00	1.00	1.423	No
3	0.66	0.04	0.02	0.02	1.00	1.400	1.00	1.400	1.00	1.00	1.400	No
4	0.82	0.05	0.03	0.02	1.00	1.378	1.00	1.379	1.00	1.00	1.379	No
5	0.98	0.06	0.03	0.03	1.00	1.357	1.00	1.357	1.00	1.00	1.357	No
6	1.15	0.07	0.04	0.03	1.00	1.336	1.00	1.337	1.00	1.00	1.337	No
7	1.31	0.08	0.04	0.04	1.00	1.318	1.00	1.319	1.00	1.00	1.319	No
8	1.48	0.09	0.05	0.04	1.00	1.301	1.00	1.302	1.00	1.00	1.302	No
9	1.64	0.10	0.05	0.05	1.00	1.287	1.00	1.288	1.00	1.00	1.288	No
10	1.80	0.11	0.06	0.05	1.00	1.275	1.00	1.276	1.00	1.00	1.276	No
11	1.97	0.12	0.06	0.06	1.00	1.265	1.00	1.265	1.00	1.00	1.265	No
12	2.13	0.13	0.07	0.06	1.00	1.257	1.00	1.257	1.00	1.00	1.257	No
13	2.30	0.14	0.07	0.07	1.00	1.250	1.00	1.250	1.00	1.00	1.250	No
14	2.46	0.15	0.08	0.08	1.00	1.245	1.00	1.245	1.00	1.00	1.245	No
15	2.62	0.16	0.08	0.08	1.00	1.240	1.00	1.240	1.00	1.00	1.240	No
16	2.79	0.17	0.09	0.09	1.00	1.235	1.00	1.236	1.00	1.00	1.236	No
17	2.95	0.18	0.09	0.09	1.00	1.231	1.00	1.232	1.00	1.00	1.232	No
18	3.12	0.19	0.10	0.10	0.99	1.227	1.00	1.228	1.00	1.00	1.228	No
19	3.28	0.21	0.10	0.10	0.99	1.224	1.00	1.224	1.00	1.00	1.224	No
20	3.45	0.22	0.11	0.11	0.99	1.220	1.00	1.221	1.00	1.00	1.221	No
21	3.61	0.23	0.11	0.11	0.99	1.217	1.00	1.217	1.00	1.00	1.217	No
22	3.77	0.24	0.12	0.12	0.99	1.214	1.00	1.214	1.00	1.00	1.214	No
23	3.94	0.25	0.12	0.13	0.99	1.211	1.00	1.211	1.00	1.00	1.211	No
24	4.10	0.26	0.13	0.13	0.99	1.208	1.00	1.209	1.00	1.00	1.209	No
25	4.27	0.27	0.13	0.14	0.99	1.206	1.00	1.206	1.00	1.00	1.206	No
26	4.43	0.28	0.14	0.14	0.99	1.204	1.00	1.204	1.00	1.00	1.204	No
27	4.59	0.29	0.14	0.15	0.99	1.202	1.00	1.202	1.00	1.00	1.202	No
28	4.76	0.30	0.15	0.15	0.99	1.201	1.00	1.201	1.00	1.00	1.201	No
29	4.92	0.31	0.15	0.16	0.99	1.200	1.00	1.201	1.00	1.00	1.201	No
30	5.09	0.32	0.16	0.16	0.99	1.200	1.00	1.200	1.00	1.00	1.200	No
31	5.25	0.33	0.16	0.17	0.99	1.200	1.00	1.200	1.00	1.00	1.200	No
32	5.41	0.34	0.17	0.18	0.99	1.199	1.00	1.200	1.00	1.00	1.200	No
33	5.58	0.35	0.17	0.18	0.99	1.199	1.00	1.199	1.00	1.00	1.199	No
34	5.74	0.36	0.18	0.19	0.99	1.198	1.00	1.199	1.00	1.00	1.199	No
35	5.91	0.38	0.18	0.19	0.99	1.198	1.00	1.198	1.00	1.00	1.198	No
36	6.07	0.39	0.19	0.20	0.99	1.197	1.00	1.198	1.00	1.00	1.198	No
37	6.23	0.40	0.19	0.20	0.99	1.197	1.00	1.198	1.00	1.00	1.198	No
38	6.40	0.41	0.20	0.21	0.99	1.197	1.00	1.197	1.00	1.00	1.197	No
39	6.56	0.42	0.20	0.21	0.99	1.197	1.00	1.197	1.00	1.00	1.197	No
40	6.73	0.43	0.21	0.22	0.99	1.196	1.00	1.197	1.00	1.00	1.197	No
41	6.89	0.44	0.21	0.22	0.99	1.196	1.00	1.196	1.00	1.00	1.196	No
42	7.05	0.45	0.22	0.23	0.99	1.195	1.00	1.195	1.00	1.00	1.195	No
43	7.22	0.46	0.23	0.23	0.99	1.194	1.00	1.195	1.00	1.00	1.195	No
44	7.38	0.47	0.23	0.24	0.98	1.194	1.00	1.194	1.00	1.00	1.194	No
45	7.55	0.48	0.24	0.24	0.98	1.193	1.00	1.193	1.00	1.00	1.193	No
46	7.71	0.49	0.24	0.25	0.98	1.192	1.00	1.192	1.00	1.00	1.192	No
47	7.87	0.50	0.25	0.26	0.98	1.190	1.00	1.190	1.00	1.00	1.190	No
48	8.04	0.51	0.25	0.26	0.98	1.188	1.00	1.188	1.00	1.00	1.188	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR*	Belongs to transition
49	8.20	0.52	0.26	0.27	0.98	1.186	1.00	1.186	1.00	1.00	1.186	No
50	8.37	0.54	0.26	0.27	0.98	1.184	1.00	1.184	1.00	1.00	1.184	No
51	8.53	0.55	0.27	0.28	0.98	1.182	1.00	1.183	1.00	1.00	1.183	No
52	8.69	0.56	0.27	0.29	0.98	1.181	1.00	1.181	1.00	1.00	1.181	No
53	8.86	0.57	0.28	0.29	0.98	1.180	1.00	1.180	1.00	1.00	1.180	No
54	9.02	0.58	0.28	0.30	0.98	1.178	1.00	1.179	1.00	1.00	1.179	No
55	9.19	0.59	0.29	0.30	0.98	1.177	1.00	1.177	1.00	1.00	1.177	No
56	9.35	0.60	0.29	0.31	0.98	1.175	1.00	1.176	1.00	1.00	1.176	No
57	9.51	0.61	0.30	0.32	0.98	1.174	1.00	1.174	1.00	1.00	1.174	No
58	9.68	0.62	0.30	0.32	0.98	1.172	1.00	1.173	1.00	1.00	1.173	No
59	9.84	0.64	0.31	0.33	0.98	1.171	1.00	1.171	1.00	1.00	1.171	No
60	10.01	0.65	0.31	0.33	0.98	1.169	1.00	1.169	1.00	1.00	1.169	No
61	10.17	0.66	0.32	0.34	0.98	1.168	1.00	1.168	1.00	1.00	1.168	No
62	10.34	0.67	0.32	0.35	0.98	1.166	1.00	1.166	1.00	1.00	1.166	No
63	10.50	0.68	0.33	0.35	0.98	1.165	1.00	1.165	1.00	1.00	1.165	No
64	10.66	0.69	0.33	0.36	0.98	1.163	1.00	1.164	1.00	1.00	1.164	No
65	10.83	0.70	0.34	0.37	0.98	1.162	1.00	1.162	1.00	1.00	1.162	No
66	10.99	0.71	0.34	0.37	0.98	1.161	1.00	1.161	1.00	1.00	1.161	No
67	11.16	0.73	0.35	0.38	0.98	1.160	1.00	1.160	1.00	1.00	1.160	No
68	11.32	0.74	0.35	0.38	0.98	1.159	1.00	1.159	1.00	1.00	1.159	No
69	11.48	0.75	0.36	0.39	0.98	1.158	1.00	1.158	1.00	1.00	1.158	No
70	11.65	0.76	0.36	0.39	0.98	1.157	1.00	1.158	1.00	1.00	1.158	No
71	11.81	0.77	0.37	0.40	0.98	1.156	1.00	1.157	1.00	1.00	1.157	No
72	11.98	0.78	0.37	0.41	0.97	1.155	1.00	1.156	1.00	1.00	1.156	No
73	12.14	0.79	0.38	0.41	0.97	1.154	1.00	1.155	1.00	1.00	1.155	No
74	12.30	0.80	0.38	0.42	0.97	1.154	1.00	1.154	1.00	1.00	1.154	No
75	12.47	0.81	0.39	0.42	0.97	1.153	1.00	1.153	1.00	1.00	1.153	No
76	12.63	0.82	0.39	0.43	0.97	1.153	1.00	1.153	1.00	1.00	1.153	No
77	12.80	0.83	0.40	0.44	0.97	1.152	1.00	1.152	1.00	1.00	1.152	No
78	12.96	0.85	0.40	0.44	0.97	1.151	1.00	1.152	1.00	1.00	1.152	No
79	13.12	0.86	0.41	0.45	0.97	1.151	1.00	1.151	1.00	1.00	1.151	No
80	13.29	0.87	0.41	0.45	0.97	1.150	1.00	1.151	1.00	1.00	1.151	No
81	13.45	0.88	0.42	0.46	0.97	1.150	1.00	1.150	1.00	1.00	1.150	No
82	13.62	0.89	0.42	0.46	0.97	1.149	1.00	1.150	1.00	1.00	1.150	No
83	13.78	0.90	0.43	0.47	0.97	1.149	1.00	1.150	1.00	1.00	1.150	No
84	13.94	0.91	0.43	0.47	0.97	1.149	1.00	1.150	1.00	1.00	1.150	No
85	14.11	0.92	0.44	0.48	0.97	1.150	1.00	1.150	1.00	1.00	1.150	No
86	14.27	0.93	0.45	0.48	0.97	1.150	1.00	1.151	1.00	1.00	1.151	No
87	14.44	0.94	0.45	0.49	0.97	1.150	1.00	1.151	1.00	1.00	1.151	No
88	14.60	0.95	0.46	0.49	0.97	1.150	1.00	1.150	1.00	1.00	1.150	No
89	14.76	0.96	0.46	0.50	0.97	1.149	1.00	1.150	1.00	1.00	1.150	No
90	14.93	0.97	0.47	0.51	0.97	1.148	1.00	1.149	1.00	1.00	1.149	No
91	15.09	0.98	0.47	0.51	0.97	1.147	1.00	1.148	1.00	1.00	1.148	No
92	15.26	1.00	0.48	0.52	0.97	1.146	1.00	1.147	1.00	1.00	1.147	No
93	15.42	1.01	0.48	0.52	0.97	1.145	1.00	1.146	1.00	1.00	1.146	No
94	15.58	1.02	0.49	0.53	0.97	1.144	1.00	1.145	1.00	1.00	1.145	No
95	15.75	1.03	0.49	0.54	0.97	1.143	1.00	1.144	1.00	1.00	1.144	No
96	15.91	1.04	0.50	0.54	0.97	1.142	1.00	1.143	1.00	1.00	1.143	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_α	User FS	CSR^*	Belongs to transition
97	16.08	1.05	0.50	0.55	0.97	1.142	1.00	1.142	1.00	1.00	1.142	No
98	16.24	1.06	0.51	0.55	0.97	1.141	1.00	1.141	1.00	1.00	1.141	No
99	16.40	1.07	0.51	0.56	0.97	1.140	1.00	1.140	1.00	1.00	1.140	No
100	16.57	1.08	0.52	0.57	0.97	1.139	1.00	1.139	1.00	1.00	1.139	No
101	16.73	1.10	0.52	0.57	0.96	1.138	1.00	1.139	1.00	1.00	1.139	No
102	16.90	1.11	0.53	0.58	0.96	1.137	1.00	1.138	1.00	1.00	1.138	No
103	17.06	1.12	0.53	0.59	0.96	1.137	1.00	1.137	1.00	1.00	1.137	No
104	17.23	1.13	0.54	0.59	0.96	1.136	1.00	1.136	1.00	1.00	1.136	No
105	17.39	1.14	0.54	0.60	0.96	1.135	1.00	1.136	1.00	1.00	1.136	No
106	17.55	1.15	0.55	0.60	0.96	1.135	1.00	1.135	1.00	1.00	1.135	No
107	17.72	1.16	0.55	0.61	0.96	1.134	1.00	1.135	1.00	1.00	1.135	No
108	17.88	1.17	0.56	0.61	0.96	1.134	1.00	1.134	1.00	1.00	1.134	No
109	18.05	1.18	0.56	0.62	0.96	1.133	1.00	1.134	1.00	1.00	1.134	No
110	18.21	1.19	0.57	0.63	0.96	1.132	1.00	1.133	1.00	1.00	1.133	No
111	18.37	1.20	0.57	0.63	0.96	1.132	1.00	1.132	1.00	1.00	1.132	No
112	18.54	1.22	0.58	0.64	0.96	1.131	1.00	1.131	1.00	1.00	1.131	No
113	18.70	1.23	0.58	0.64	0.96	1.130	1.00	1.131	1.00	1.00	1.131	No
114	18.87	1.24	0.59	0.65	0.96	1.129	1.00	1.130	1.00	1.00	1.130	No
115	19.03	1.25	0.59	0.66	0.96	1.129	1.00	1.129	1.00	1.00	1.129	No
116	19.19	1.26	0.60	0.66	0.96	1.128	1.00	1.128	1.00	1.00	1.128	No
117	19.36	1.27	0.60	0.67	0.96	1.127	1.00	1.128	1.00	1.00	1.128	No
118	19.52	1.28	0.61	0.67	0.96	1.127	1.00	1.127	1.00	1.00	1.127	No
119	19.69	1.29	0.61	0.68	0.96	1.127	1.00	1.127	1.00	1.00	1.127	No
120	19.85	1.30	0.62	0.68	0.96	1.127	1.00	1.127	1.00	1.00	1.127	No
121	20.01	1.31	0.62	0.69	0.96	1.127	1.00	1.128	1.00	1.00	1.128	No
122	20.18	1.32	0.63	0.69	0.96	1.128	1.00	1.128	1.00	1.00	1.128	No
123	20.34	1.33	0.63	0.70	0.96	1.128	1.00	1.129	1.00	1.00	1.129	No
124	20.51	1.34	0.64	0.70	0.96	1.129	1.00	1.129	1.00	1.00	1.129	No
125	20.67	1.35	0.64	0.71	0.96	1.129	1.00	1.130	1.00	1.00	1.130	No
126	20.83	1.36	0.65	0.71	0.95	1.130	1.00	1.130	1.00	1.00	1.130	No
127	21.00	1.37	0.66	0.71	0.95	1.130	1.00	1.131	1.00	1.00	1.131	No
128	21.16	1.38	0.66	0.72	0.95	1.131	1.00	1.131	1.00	1.00	1.131	No
129	21.33	1.39	0.67	0.72	0.95	1.132	1.00	1.132	1.00	1.00	1.132	No
130	21.49	1.40	0.67	0.73	0.95	1.132	1.00	1.133	1.00	1.00	1.133	No
131	21.65	1.40	0.68	0.73	0.95	1.133	1.00	1.133	1.00	1.00	1.133	No
132	21.82	1.41	0.68	0.73	0.95	1.134	1.00	1.134	1.00	1.00	1.134	No
133	21.98	1.42	0.69	0.74	0.95	1.134	1.00	1.134	1.00	1.00	1.134	No
134	22.15	1.43	0.69	0.74	0.95	1.135	1.00	1.135	1.00	1.00	1.135	No
135	22.31	1.44	0.70	0.75	0.95	1.135	1.00	1.136	1.00	1.00	1.136	No
136	22.47	1.45	0.70	0.75	0.95	1.136	1.00	1.136	1.00	1.00	1.136	No
137	22.64	1.46	0.71	0.75	0.95	1.136	1.00	1.137	1.00	1.00	1.137	No
138	22.80	1.47	0.71	0.76	0.95	1.136	1.00	1.137	1.00	1.00	1.137	No
139	22.97	1.48	0.72	0.76	0.95	1.137	1.00	1.137	1.00	1.00	1.137	No
140	23.13	1.49	0.72	0.77	0.95	1.137	1.00	1.138	1.00	1.00	1.138	No
141	23.30	1.50	0.73	0.77	0.95	1.137	1.00	1.138	1.00	1.00	1.138	No
142	23.46	1.51	0.73	0.77	0.95	1.138	1.00	1.138	1.00	1.00	1.138	No
143	23.62	1.52	0.74	0.78	0.95	1.138	1.00	1.138	1.00	1.00	1.138	No
144	23.79	1.52	0.74	0.78	0.95	1.138	1.00	1.139	1.00	1.00	1.139	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
145	23.95	1.53	0.75	0.79	0.95	1.139	1.00	1.139	1.00	1.00	1.139	No
146	24.12	1.54	0.75	0.79	0.94	1.139	1.00	1.139	1.00	1.00	1.139	No
147	24.28	1.55	0.76	0.80	0.94	1.139	1.00	1.139	1.00	1.00	1.139	No
148	24.44	1.56	0.76	0.80	0.94	1.139	1.00	1.139	1.00	1.00	1.139	No
149	24.61	1.57	0.77	0.80	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
150	24.77	1.58	0.77	0.81	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
151	24.94	1.59	0.78	0.81	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
152	25.10	1.60	0.78	0.82	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
153	25.26	1.61	0.79	0.82	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
154	25.43	1.62	0.79	0.83	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
155	25.59	1.63	0.80	0.83	0.94	1.138	1.00	1.138	1.00	1.00	1.138	No
156	25.76	1.64	0.80	0.83	0.94	1.138	1.00	1.138	1.00	1.00	1.138	No
157	25.92	1.65	0.81	0.84	0.94	1.138	1.00	1.138	1.00	1.00	1.138	No
158	26.08	1.66	0.81	0.84	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
159	26.25	1.67	0.82	0.85	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
160	26.41	1.67	0.82	0.85	0.94	1.138	1.00	1.139	1.00	1.00	1.139	No
161	26.58	1.68	0.83	0.85	0.94	1.139	1.00	1.139	1.00	1.00	1.139	No
162	26.74	1.69	0.83	0.86	0.94	1.139	1.00	1.139	1.00	1.00	1.139	No
163	26.90	1.70	0.84	0.86	0.93	1.139	1.00	1.139	1.00	1.00	1.139	No
164	27.07	1.71	0.84	0.87	0.93	1.139	1.00	1.139	1.00	1.00	1.139	No
165	27.23	1.72	0.85	0.87	0.93	1.139	1.00	1.139	1.00	1.00	1.139	No
166	27.40	1.73	0.85	0.88	0.93	1.138	1.00	1.139	1.00	1.00	1.139	No
167	27.56	1.74	0.86	0.88	0.93	1.138	1.00	1.139	1.00	1.00	1.139	No
168	27.72	1.75	0.86	0.88	0.93	1.138	1.00	1.138	1.00	1.00	1.138	No
169	27.89	1.76	0.87	0.89	0.93	1.137	1.00	1.138	1.00	1.00	1.138	No
170	28.05	1.77	0.88	0.89	0.93	1.137	1.00	1.137	1.00	1.00	1.137	No
171	28.22	1.78	0.88	0.90	0.93	1.136	1.00	1.137	1.00	1.00	1.137	No
172	28.38	1.79	0.89	0.90	0.93	1.135	1.00	1.136	1.00	1.00	1.136	No
173	28.54	1.80	0.89	0.91	0.93	1.134	1.00	1.135	1.00	1.00	1.135	No
174	28.71	1.81	0.90	0.91	0.93	1.133	1.00	1.133	1.00	1.00	1.133	No
175	28.87	1.82	0.90	0.92	0.93	1.132	1.00	1.132	1.00	1.00	1.132	No
176	29.04	1.83	0.91	0.93	0.93	1.130	1.00	1.131	1.00	1.00	1.131	No
177	29.20	1.84	0.91	0.93	0.92	1.129	1.00	1.130	1.00	1.00	1.130	No
178	29.36	1.85	0.92	0.94	0.92	1.128	1.00	1.129	1.00	1.00	1.129	No
179	29.53	1.86	0.92	0.94	0.92	1.127	1.00	1.127	1.00	1.00	1.127	No
180	29.69	1.87	0.93	0.95	0.92	1.126	1.00	1.126	1.00	1.00	1.126	No
181	29.86	1.89	0.93	0.95	0.92	1.124	1.00	1.124	1.00	1.00	1.124	No
182	30.02	1.90	0.94	0.96	0.92	1.123	1.00	1.123	1.00	1.00	1.123	No
183	30.19	1.91	0.94	0.97	0.92	1.121	1.00	1.121	1.00	1.00	1.121	No
184	30.35	1.92	0.95	0.97	0.92	1.119	1.00	1.120	1.00	1.00	1.120	No
185	30.51	1.93	0.95	0.98	0.92	1.118	1.00	1.118	1.00	1.00	1.118	No
186	30.68	1.94	0.96	0.99	0.92	1.116	1.00	1.117	1.00	1.00	1.117	No
187	30.84	1.95	0.96	0.99	0.92	1.115	1.00	1.115	1.00	1.00	1.115	No
188	31.01	1.97	0.97	1.00	0.92	1.113	1.00	1.114	1.00	1.00	1.114	No
189	31.17	1.98	0.97	1.00	0.91	1.112	1.00	1.112	1.00	1.00	1.112	No
190	31.33	1.99	0.98	1.01	0.91	1.110	1.00	1.111	1.00	1.00	1.111	No
191	31.50	2.00	0.98	1.02	0.91	1.109	1.00	1.109	1.00	1.00	1.109	No
192	31.66	2.01	0.99	1.02	0.91	1.108	1.00	1.108	1.00	1.00	1.108	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
193	31.83	2.02	0.99	1.03	0.91	1.106	1.00	1.107	1.00	1.00	1.107	No
194	31.99	2.03	1.00	1.03	0.91	1.105	1.00	1.105	1.00	1.00	1.105	No
195	32.15	2.04	1.00	1.04	0.91	1.104	1.00	1.104	1.00	1.00	1.104	No
196	32.32	2.05	1.01	1.04	0.91	1.103	1.00	1.103	1.00	1.00	1.103	No
197	32.48	2.06	1.01	1.05	0.91	1.101	1.00	1.102	1.00	1.00	1.102	No
198	32.65	2.07	1.02	1.05	0.91	1.100	1.00	1.100	1.00	1.00	1.100	No
199	32.81	2.08	1.02	1.06	0.90	1.099	1.00	1.099	1.00	1.00	1.099	No
200	32.97	2.09	1.03	1.07	0.90	1.097	1.00	1.098	1.00	1.00	1.099	No
201	33.14	2.11	1.03	1.07	0.90	1.096	1.00	1.096	1.00	1.00	1.099	No
202	33.30	2.12	1.04	1.08	0.90	1.094	1.00	1.095	1.00	1.00	1.099	No
203	33.47	2.13	1.04	1.08	0.90	1.093	1.00	1.093	0.99	1.00	1.099	No
204	33.63	2.14	1.05	1.09	0.90	1.091	1.00	1.091	0.99	1.00	1.099	No
205	33.79	2.15	1.05	1.09	0.90	1.089	1.00	1.090	0.99	1.00	1.098	No
206	33.96	2.16	1.06	1.10	0.90	1.088	1.00	1.088	0.99	1.00	1.098	No
207	34.12	2.17	1.06	1.11	0.90	1.086	1.00	1.086	0.99	1.00	1.098	No
208	34.29	2.18	1.07	1.11	0.90	1.084	1.00	1.085	0.99	1.00	1.097	No
209	34.45	2.19	1.07	1.12	0.89	1.082	1.00	1.083	0.99	1.00	1.097	No
210	34.61	2.21	1.08	1.13	0.89	1.081	1.00	1.081	0.99	1.00	1.097	No
211	34.78	2.22	1.09	1.13	0.89	1.079	1.00	1.079	0.98	1.00	1.096	No
212	34.94	2.23	1.09	1.14	0.89	1.077	1.00	1.078	0.98	1.00	1.096	No
213	35.11	2.24	1.10	1.14	0.89	1.075	1.00	1.076	0.98	1.00	1.095	No
214	35.27	2.25	1.10	1.15	0.89	1.074	1.00	1.074	0.98	1.00	1.095	No
215	35.43	2.26	1.11	1.16	0.89	1.072	1.00	1.072	0.98	1.00	1.095	No
216	35.60	2.27	1.11	1.16	0.89	1.070	1.00	1.071	0.98	1.00	1.094	No
217	35.76	2.28	1.12	1.17	0.89	1.068	1.00	1.069	0.98	1.00	1.094	No
218	35.93	2.30	1.12	1.18	0.88	1.067	1.00	1.067	0.98	1.00	1.093	No
219	36.09	2.31	1.13	1.18	0.88	1.065	1.00	1.065	0.98	1.00	1.093	No
220	36.26	2.32	1.13	1.19	0.88	1.063	1.00	1.063	0.97	1.00	1.092	No
221	36.42	2.33	1.14	1.19	0.88	1.061	1.00	1.062	0.97	1.00	1.091	No
222	36.58	2.34	1.14	1.20	0.88	1.059	1.00	1.060	0.97	1.00	1.091	No
223	36.75	2.35	1.15	1.21	0.88	1.058	1.00	1.058	0.97	1.00	1.090	No
224	36.91	2.36	1.15	1.21	0.88	1.056	1.00	1.056	0.97	1.00	1.090	No
225	37.08	2.37	1.16	1.22	0.88	1.054	1.00	1.054	0.97	1.00	1.089	No
226	37.24	2.39	1.16	1.22	0.87	1.052	1.00	1.052	0.97	1.00	1.088	No
227	37.40	2.40	1.17	1.23	0.87	1.050	1.00	1.051	0.97	1.00	1.088	No
228	37.57	2.41	1.17	1.24	0.87	1.048	1.00	1.049	0.96	1.00	1.087	No
229	37.73	2.42	1.18	1.24	0.87	1.046	1.00	1.047	0.96	1.00	1.086	No
230	37.90	2.43	1.18	1.25	0.87	1.045	1.00	1.045	0.96	1.00	1.085	No
231	38.06	2.44	1.19	1.25	0.87	1.043	1.00	1.043	0.96	1.00	1.085	No
232	38.22	2.45	1.19	1.26	0.87	1.041	1.00	1.042	0.96	1.00	1.084	No
233	38.39	2.46	1.20	1.27	0.86	1.039	1.00	1.040	0.96	1.00	1.083	No
234	38.55	2.47	1.20	1.27	0.86	1.038	1.00	1.038	0.96	1.00	1.083	No
235	38.72	2.49	1.21	1.28	0.86	1.036	1.00	1.036	0.96	1.00	1.082	No
236	38.88	2.50	1.21	1.28	0.86	1.034	1.00	1.034	0.96	1.00	1.081	No
237	39.04	2.51	1.22	1.29	0.86	1.032	1.00	1.033	0.96	1.00	1.081	No
238	39.21	2.52	1.22	1.29	0.86	1.031	1.00	1.031	0.95	1.00	1.080	No
239	39.37	2.53	1.23	1.30	0.86	1.029	1.00	1.029	0.95	1.00	1.079	No
240	39.54	2.54	1.23	1.31	0.86	1.027	1.00	1.027	0.95	1.00	1.078	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
241	39.70	2.55	1.24	1.31	0.85	1.025	1.00	1.025	0.95	1.00	1.077	No
242	39.86	2.56	1.24	1.32	0.85	1.023	1.00	1.023	0.95	1.00	1.076	No
243	40.03	2.57	1.25	1.32	0.85	1.021	1.00	1.021	0.95	1.00	1.075	No
244	40.19	2.58	1.25	1.33	0.85	1.019	1.00	1.019	0.95	1.00	1.074	No
245	40.36	2.59	1.26	1.34	0.85	1.017	1.00	1.018	0.95	1.00	1.074	No
246	40.52	2.61	1.26	1.34	0.85	1.015	1.00	1.016	0.95	1.00	1.073	No
247	40.68	2.62	1.27	1.35	0.84	1.013	1.00	1.014	0.95	1.00	1.072	No
248	40.85	2.63	1.27	1.35	0.84	1.011	1.00	1.012	0.95	1.00	1.071	No
249	41.01	2.64	1.28	1.36	0.84	1.010	1.00	1.010	0.94	1.00	1.070	No
250	41.18	2.65	1.28	1.37	0.84	1.007	1.00	1.008	0.94	1.00	1.069	No
251	41.34	2.66	1.29	1.37	0.84	1.005	1.00	1.006	0.94	1.00	1.068	No
252	41.50	2.67	1.29	1.38	0.84	1.004	1.00	1.004	0.94	1.00	1.067	No
253	41.67	2.68	1.30	1.38	0.84	1.002	1.00	1.002	0.94	1.00	1.066	No
254	41.83	2.69	1.31	1.39	0.83	1.000	1.00	1.000	0.94	1.00	1.065	No
255	42.00	2.70	1.31	1.39	0.83	0.998	1.00	0.998	0.94	1.00	1.064	No
256	42.16	2.71	1.32	1.40	0.83	0.996	1.00	0.997	0.94	1.00	1.063	No
257	42.32	2.72	1.32	1.40	0.83	0.994	1.00	0.995	0.94	1.00	1.062	No
258	42.49	2.73	1.33	1.41	0.83	0.993	1.00	0.993	0.94	1.00	1.061	No
259	42.65	2.74	1.33	1.41	0.83	0.991	1.00	0.991	0.94	1.00	1.060	No
260	42.82	2.76	1.34	1.42	0.83	0.989	1.00	0.989	0.93	1.00	1.059	No
261	42.98	2.77	1.34	1.42	0.82	0.987	1.00	0.988	0.93	1.00	1.057	No
262	43.15	2.78	1.35	1.43	0.82	0.985	1.00	0.985	0.93	1.00	1.056	No
263	43.31	2.79	1.35	1.44	0.82	0.983	1.00	0.983	0.93	1.00	1.055	No
264	43.47	2.80	1.36	1.44	0.82	0.981	1.00	0.981	0.93	1.00	1.054	No
265	43.64	2.81	1.36	1.45	0.82	0.979	1.00	0.979	0.93	1.00	1.053	No
266	43.80	2.82	1.37	1.45	0.82	0.977	1.00	0.977	0.93	1.00	1.051	No
267	43.97	2.83	1.37	1.46	0.81	0.975	1.00	0.975	0.93	1.00	1.050	No
268	44.13	2.84	1.38	1.47	0.81	0.972	1.00	0.973	0.93	1.00	1.049	No
269	44.29	2.85	1.38	1.47	0.81	0.970	1.00	0.971	0.93	1.00	1.047	No
270	44.46	2.87	1.39	1.48	0.81	0.968	1.00	0.969	0.93	1.00	1.046	No
271	44.62	2.88	1.39	1.48	0.81	0.966	1.00	0.966	0.93	1.00	1.045	No
272	44.79	2.89	1.40	1.49	0.81	0.964	1.00	0.964	0.92	1.00	1.043	No
273	44.95	2.90	1.40	1.50	0.80	0.962	1.00	0.962	0.92	1.00	1.042	No
274	45.11	2.91	1.41	1.50	0.80	0.960	1.00	0.960	0.92	1.00	1.041	No
275	45.28	2.92	1.41	1.51	0.80	0.957	1.00	0.958	0.92	1.00	1.039	No
276	45.44	2.93	1.42	1.52	0.80	0.955	1.00	0.956	0.92	1.00	1.038	No
277	45.61	2.94	1.42	1.52	0.80	0.953	1.00	0.953	0.92	1.00	1.036	No
278	45.77	2.96	1.43	1.53	0.80	0.951	1.00	0.951	0.92	1.00	1.035	No
279	45.93	2.97	1.43	1.53	0.79	0.949	1.00	0.949	0.92	1.00	1.034	No
280	46.10	2.98	1.44	1.54	0.79	0.947	1.00	0.947	0.92	1.00	1.032	No
281	46.26	2.99	1.44	1.54	0.79	0.945	1.00	0.945	0.92	1.00	1.031	No
282	46.43	3.00	1.45	1.55	0.79	0.943	1.00	0.943	0.92	1.00	1.030	No
283	46.59	3.01	1.45	1.56	0.79	0.941	1.00	0.941	0.92	1.00	1.028	No
284	46.75	3.02	1.46	1.56	0.79	0.939	1.00	0.939	0.91	1.00	1.027	No
285	46.92	3.03	1.46	1.57	0.78	0.937	1.00	0.937	0.91	1.00	1.026	No
286	47.08	3.04	1.47	1.57	0.78	0.935	1.00	0.936	0.91	1.00	1.025	No
287	47.25	3.05	1.47	1.58	0.78	0.933	1.00	0.934	0.91	1.00	1.023	No
288	47.41	3.06	1.48	1.58	0.78	0.932	1.00	0.932	0.91	1.00	1.022	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
289	47.57	3.07	1.48	1.59	0.78	0.930	1.00	0.930	0.91	1.00	1.021	No
290	47.74	3.08	1.49	1.59	0.78	0.928	1.00	0.928	0.91	1.00	1.019	No
291	47.90	3.09	1.49	1.60	0.77	0.926	1.00	0.926	0.91	1.00	1.018	No
292	48.07	3.10	1.50	1.60	0.77	0.923	1.00	0.924	0.91	1.00	1.016	No
293	48.23	3.11	1.50	1.61	0.77	0.921	1.00	0.922	0.91	1.00	1.015	No
294	48.39	3.12	1.51	1.61	0.77	0.919	1.00	0.919	0.91	1.00	1.013	No
295	48.56	3.14	1.52	1.62	0.77	0.917	1.00	0.917	0.91	1.00	1.012	No
296	48.72	3.15	1.52	1.63	0.77	0.915	1.00	0.915	0.91	1.00	1.010	No
297	48.89	3.16	1.53	1.63	0.76	0.913	1.00	0.913	0.91	1.00	1.009	No
298	49.05	3.17	1.53	1.64	0.76	0.911	1.00	0.911	0.90	1.00	1.007	No
299	49.22	3.18	1.54	1.64	0.76	0.908	1.00	0.909	0.90	1.00	1.006	No
300	49.38	3.19	1.54	1.65	0.76	0.907	1.00	0.907	0.90	1.00	1.004	No
301	49.54	3.20	1.55	1.65	0.76	0.905	1.00	0.905	0.90	1.00	1.003	No
302	49.71	3.21	1.55	1.66	0.76	0.902	1.00	0.903	0.90	1.00	1.001	No
303	49.87	3.22	1.56	1.67	0.75	0.900	1.00	0.901	0.90	1.00	1.000	No
304	50.04	3.23	1.56	1.67	0.75	0.898	1.00	0.899	0.90	1.00	0.998	No
305	50.20	3.24	1.57	1.68	0.75	0.896	1.00	0.897	0.90	1.00	0.997	No

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
σ_v: Total overburden pressure at test point (tsf)
u_0: Water pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio
MSF: Magnitude Scaling Factor
CSR_{eq}: CSR adjusted for M=7.5
K_σ: Effective overburden stress factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) calculation data ::

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1	0.33	45.13	1.86	0.52	0.58	72.48	1.15	83.65	0.134	No	No	0.09
2	0.49	90.83	1.52	0.37	0.50	145.89	1.00	145.89	0.369	No	No	0.26
3	0.66	110.47	1.47	0.39	0.50	177.42	1.00	177.42	0.599	No	No	0.43
4	0.82	144.00	1.39	0.42	0.50	231.28	1.00	231.28	4.000	No	No	2.00
5	0.98	192.17	1.30	0.43	0.50	308.65	1.00	308.65	4.000	No	No	2.00
6	1.15	257.37	1.20	0.41	0.50	413.39	1.00	413.39	4.000	No	No	2.00
7	1.31	315.50	1.16	0.45	0.50	506.78	1.00	506.78	4.000	No	No	2.00
8	1.48	350.47	1.17	0.50	0.50	562.94	1.00	562.94	4.000	No	No	2.00
9	1.64	367.01	1.21	0.59	0.50	589.50	1.00	589.50	4.000	No	No	2.00
10	1.80	369.35	1.24	0.64	0.50	593.23	1.00	593.23	4.000	No	No	2.00
11	1.97	361.65	1.27	0.68	0.50	580.84	1.00	580.84	4.000	No	No	2.00
12	2.13	337.71	1.30	0.70	0.50	542.38	1.00	542.38	4.000	No	No	2.00
13	2.30	318.18	1.32	0.71	0.50	510.98	1.00	510.98	4.000	No	No	2.00
14	2.46	307.22	1.33	0.73	0.50	493.34	1.00	493.34	4.000	No	No	2.00
15	2.62	301.98	1.35	0.76	0.50	484.92	1.00	484.92	4.000	No	No	2.00
16	2.79	299.82	1.37	0.79	0.50	481.42	1.00	481.42	4.000	No	No	2.00
17	2.95	289.99	1.41	0.86	0.50	465.61	1.00	465.61	4.000	No	No	2.00
18	3.12	282.59	1.44	0.93	0.50	453.70	1.00	453.70	4.000	No	No	2.00
19	3.28	274.92	1.47	0.99	0.50	441.37	1.00	441.37	4.000	No	No	2.00
20	3.45	275.35	1.48	1.02	0.50	442.04	1.00	442.04	4.000	No	No	2.00
21	3.61	272.92	1.50	1.08	0.50	438.12	1.00	438.12	4.000	No	No	2.00
22	3.77	266.22	1.54	1.17	0.50	427.34	1.00	427.34	4.000	No	No	2.00
23	3.94	256.25	1.57	1.25	0.50	411.30	1.00	411.30	4.000	No	No	2.00
24	4.10	248.55	1.59	1.30	0.50	398.92	1.00	398.92	4.000	No	No	2.00
25	4.27	243.62	1.60	1.31	0.50	390.97	1.00	390.97	4.000	No	No	2.00
26	4.43	236.18	1.60	1.30	0.50	379.01	1.00	379.01	4.000	No	No	2.00
27	4.59	228.55	1.58	1.20	0.50	366.73	1.00	366.73	4.000	No	No	2.00
28	4.76	218.88	1.55	1.07	0.50	351.18	1.00	351.18	4.000	No	No	2.00
29	4.92	210.02	1.50	0.89	0.50	336.92	1.00	336.92	4.000	No	No	2.00
30	5.09	204.32	1.47	0.78	0.50	327.74	1.00	327.74	4.000	No	No	2.00
31	5.25	196.98	1.47	0.76	0.50	315.94	1.00	315.94	4.000	No	No	2.00
32	5.41	200.61	1.48	0.80	0.50	321.75	1.00	321.75	4.000	No	No	2.00
33	5.58	203.37	1.48	0.82	0.50	326.17	1.00	326.17	4.000	No	No	2.00
34	5.74	210.60	1.48	0.84	0.50	337.77	1.00	337.77	4.000	No	No	2.00
35	5.91	208.80	1.49	0.85	0.50	330.51	1.00	330.51	4.000	No	No	2.00
36	6.07	206.43	1.49	0.83	0.50	322.40	1.00	322.40	4.000	No	No	2.00
37	6.23	206.96	1.46	0.74	0.50	319.07	1.00	319.07	4.000	No	No	2.00
38	6.40	216.26	1.42	0.68	0.50	328.99	1.00	328.99	4.000	No	No	2.00
39	6.56	233.66	1.39	0.66	0.50	351.15	1.00	351.15	4.000	No	No	2.00
40	6.73	242.69	1.40	0.69	0.50	360.08	1.00	360.08	4.000	No	No	2.00
41	6.89	241.79	1.42	0.73	0.50	354.52	1.00	354.52	4.000	No	No	2.00
42	7.05	235.83	1.45	0.76	0.50	341.77	1.00	341.77	4.000	No	No	2.00
43	7.22	236.36	1.44	0.75	0.50	338.45	1.00	338.45	4.000	No	No	2.00
44	7.38	236.69	1.44	0.73	0.50	335.21	1.00	335.21	4.000	No	No	2.00
45	7.55	256.26	1.47	0.85	0.50	358.78	1.00	358.78	4.000	No	No	2.00
46	7.71	305.09	1.47	0.97	0.50	422.63	1.00	422.63	4.000	No	No	2.00
47	7.87	371.96	1.47	1.08	0.50	509.82	1.00	509.82	4.000	No	No	2.00
48	8.04	405.39	1.47	1.13	0.50	549.39	1.00	549.39	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
49	8.20	398.99	1.49	1.19	0.50	535.05	1.00	535.05	4.000	No	No	2.00
50	8.37	370.26	1.53	1.24	0.50	491.07	1.00	491.07	4.000	No	No	2.00
51	8.53	342.16	1.55	1.26	0.50	449.23	1.00	449.23	4.000	No	No	2.00
52	8.69	309.29	1.59	1.30	0.50	402.05	1.00	402.05	4.000	No	No	2.00
53	8.86	283.59	1.63	1.34	0.50	364.86	1.00	364.86	4.000	No	No	2.00
54	9.02	272.29	1.66	1.44	0.51	348.74	1.01	352.42	4.000	No	No	2.00
55	9.19	278.82	1.68	1.52	0.51	354.81	1.02	362.72	4.000	No	No	2.00
56	9.35	283.12	1.72	1.72	0.53	360.15	1.05	378.39	4.000	No	No	2.00
57	9.51	287.45	1.75	1.88	0.54	364.47	1.07	390.34	4.000	No	No	2.00
58	9.68	285.45	1.77	2.00	0.55	360.08	1.09	391.95	4.000	No	No	2.00
59	9.84	280.19	1.81	2.18	0.57	352.56	1.12	393.15	4.000	No	No	2.00
60	10.01	274.82	1.88	2.61	0.59	346.85	1.17	406.91	4.000	No	No	2.00
61	10.17	284.88	1.94	3.12	0.62	359.86	1.23	443.23	4.000	No	No	2.00
62	10.34	307.15	1.94	3.23	0.62	383.89	1.23	472.99	4.000	No	No	2.00
63	10.50	325.71	1.89	2.89	0.60	399.65	1.18	472.22	4.000	No	No	2.00
64	10.66	331.28	1.81	2.33	0.56	397.32	1.11	442.74	4.000	No	No	2.00
65	10.83	322.55	1.73	1.82	0.53	378.33	1.06	399.97	4.000	No	No	2.00
66	10.99	316.89	1.66	1.48	0.51	364.87	1.01	368.52	4.000	No	No	2.00
67	11.16	314.29	1.61	1.28	0.50	357.91	1.00	357.91	4.000	No	No	2.00
68	11.32	322.55	1.57	1.16	0.50	364.64	1.00	364.64	4.000	No	No	2.00
69	11.48	331.32	1.56	1.15	0.50	371.86	1.00	371.86	4.000	No	No	2.00
70	11.65	333.78	1.58	1.21	0.50	371.78	1.00	371.78	4.000	No	No	2.00
71	11.81	325.28	1.62	1.31	0.50	359.73	1.00	359.73	4.000	No	No	2.00
72	11.98	312.51	1.64	1.35	0.50	343.07	1.00	342.13	4.000	No	No	2.00
73	12.14	295.71	1.66	1.35	0.51	322.89	1.01	325.35	4.000	No	No	2.00
74	12.30	265.07	1.69	1.36	0.52	288.39	1.03	297.24	4.000	No	No	2.00
75	12.47	211.34	1.82	1.68	0.57	231.08	1.12	259.11	4.000	No	No	2.00
76	12.63	150.48	2.03	2.38	0.65	166.34	1.34	222.51	4.000	No	No	2.00
77	12.80	109.78	2.25	3.61	0.73	122.48	1.80	220.79	4.000	No	No	2.00
78	12.96	95.20	2.37	4.52	0.78	106.15	2.18	231.65	4.000	No	No	2.00
79	13.12	96.60	2.39	4.84	0.79	106.86	2.27	242.17	4.000	No	No	2.00
80	13.29	93.37	2.41	5.01	0.79	102.36	2.36	241.69	4.000	No	No	2.00
81	13.45	82.40	2.46	5.15	0.81	89.64	2.56	229.38	4.000	No	No	2.00
82	13.62	65.30	2.53	5.33	0.84	70.47	2.95	207.60	4.000	No	No	2.00
83	13.78	50.63	2.60	5.23	0.87	54.12	3.34	180.89	4.000	No	Yes	2.00
84	13.94	41.42	2.63	4.69	0.88	43.75	3.52	154.06	4.000	No	Yes	2.00
85	14.11	38.38	2.62	4.09	0.87	40.02	3.43	137.18	4.000	No	Yes	2.00
86	14.27	40.58	2.57	3.70	0.85	41.88	3.16	132.18	0.295	No	No	0.26
87	14.44	53.18	2.50	3.83	0.83	54.46	2.78	151.18	0.401	No	No	0.35
88	14.60	77.37	2.42	4.14	0.80	78.69	2.39	188.35	0.701	No	No	0.61
89	14.76	111.64	2.35	4.52	0.77	112.67	2.12	239.18	4.000	No	No	2.00
90	14.93	154.11	2.26	4.35	0.74	154.00	1.82	280.58	4.000	No	No	2.00
91	15.09	193.48	2.17	3.98	0.70	191.54	1.60	307.25	4.000	No	No	2.00
92	15.26	218.89	2.11	3.56	0.68	214.68	1.47	314.68	4.000	No	No	2.00
93	15.42	233.03	2.04	3.12	0.65	226.64	1.36	308.80	4.000	No	No	2.00
94	15.58	243.56	1.97	2.61	0.63	234.98	1.26	297.14	4.000	No	No	2.00
95	15.75	259.03	1.87	2.05	0.59	247.93	1.16	288.58	4.000	No	No	2.00
96	15.91	264.27	1.81	1.72	0.56	251.29	1.11	279.35	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
97	16.08	251.07	1.83	1.79	0.57	237.22	1.13	268.71	4.000	No	No	2.00
98	16.24	223.44	1.96	2.35	0.62	209.72	1.25	263.03	4.000	No	No	2.00
99	16.40	212.97	2.06	2.94	0.66	198.47	1.38	273.86	4.000	No	No	2.00
100	16.57	230.37	2.03	2.88	0.65	213.28	1.34	286.11	4.000	No	No	2.00
101	16.73	267.40	1.92	2.32	0.61	246.48	1.20	297.00	4.000	No	No	2.00
102	16.90	293.44	1.81	1.84	0.57	269.33	1.12	300.40	4.000	No	No	2.00
103	17.06	301.94	1.74	1.52	0.54	276.05	1.06	293.67	4.000	No	No	2.00
104	17.23	285.87	1.71	1.32	0.53	260.08	1.04	271.09	4.000	No	No	2.00
105	17.39	256.51	1.70	1.19	0.52	232.15	1.04	241.20	4.000	No	No	2.00
106	17.55	228.24	1.74	1.20	0.54	205.20	1.07	218.67	4.000	No	No	2.00
107	17.72	236.67	1.74	1.22	0.54	211.74	1.06	224.87	4.000	No	No	2.00
108	17.88	276.87	1.70	1.25	0.52	247.01	1.04	256.38	4.000	No	No	2.00
109	18.05	323.91	1.66	1.25	0.51	288.17	1.01	291.12	4.000	No	No	2.00
110	18.21	348.71	1.64	1.24	0.50	309.16	1.00	309.16	4.000	No	No	2.00
111	18.37	344.11	1.64	1.23	0.50	303.65	1.00	302.88	4.000	No	No	2.00
112	18.54	322.64	1.68	1.30	0.51	282.75	1.02	289.11	4.000	No	No	2.00
113	18.70	293.80	1.76	1.52	0.55	255.04	1.08	274.77	4.000	No	No	2.00
114	18.87	258.64	1.88	1.93	0.59	221.62	1.17	259.23	4.000	No	No	2.00
115	19.03	223.77	1.99	2.34	0.63	189.31	1.28	242.87	4.000	No	No	2.00
116	19.19	191.67	2.08	2.68	0.67	160.14	1.42	226.73	4.000	No	No	2.00
117	19.36	147.97	2.18	2.89	0.70	121.79	1.61	196.39	0.784	No	No	0.70
118	19.52	102.47	2.32	3.16	0.76	82.68	2.00	165.76	0.504	No	No	0.45
119	19.69	60.14	2.51	3.46	0.83	47.07	2.84	133.79	0.303	No	No	0.27
120	19.85	41.88	2.62	3.20	0.87	31.99	3.42	109.44	4.000	No	Yes	2.00
121	20.01	36.21	2.59	2.39	0.86	27.41	3.24	88.73	0.145	No	No	0.13
122	20.18	33.75	2.57	2.06	0.86	25.33	3.16	80.18	0.128	No	No	0.11
123	20.34	32.71	2.58	2.02	0.86	24.35	3.22	78.36	0.125	No	No	0.11
124	20.51	31.18	2.62	2.12	0.87	22.94	3.42	78.57	4.000	No	Yes	2.00
125	20.67	28.01	2.67	2.25	0.89	20.27	3.81	77.27	4.000	No	Yes	2.00
126	20.83	25.04	2.72	2.25	0.91	17.82	4.14	73.81	4.000	No	Yes	2.00
127	21.00	22.78	2.75	2.18	0.92	15.95	4.38	69.94	4.000	No	Yes	2.00
128	21.16	21.71	2.77	2.13	0.93	15.04	4.51	67.81	4.000	No	Yes	2.00
129	21.33	21.24	2.76	2.01	0.93	14.60	4.49	65.48	4.000	No	Yes	2.00
130	21.49	20.98	2.77	2.04	0.93	14.29	4.58	65.39	4.000	No	Yes	2.00
131	21.65	20.97	2.78	2.04	0.93	14.20	4.60	65.25	4.000	No	Yes	2.00
132	21.82	21.81	2.75	1.96	0.92	14.74	4.41	64.96	4.000	No	Yes	2.00
133	21.98	22.94	2.72	1.86	0.91	15.52	4.16	64.61	4.000	No	Yes	2.00
134	22.15	23.64	2.71	1.80	0.91	15.95	4.03	64.33	4.000	No	Yes	2.00
135	22.31	23.47	2.71	1.82	0.91	15.72	4.09	64.24	4.000	No	Yes	2.00
136	22.47	23.57	2.71	1.81	0.91	15.70	4.08	64.10	4.000	No	Yes	2.00
137	22.64	24.04	2.70	1.77	0.90	15.95	4.01	63.88	4.000	No	Yes	2.00
138	22.80	24.87	2.70	1.85	0.90	16.44	4.00	65.78	4.000	No	Yes	2.00
139	22.97	25.57	2.70	1.94	0.91	16.82	4.02	67.62	4.000	No	Yes	2.00
140	23.13	26.47	2.70	2.00	0.90	17.35	4.00	69.35	4.000	No	Yes	2.00
141	23.30	26.57	2.70	1.99	0.90	17.32	4.00	69.18	4.000	No	Yes	2.00
142	23.46	25.97	2.72	2.04	0.91	16.76	4.13	69.16	4.000	No	Yes	2.00
143	23.62	25.24	2.72	1.97	0.91	16.16	4.16	67.14	4.000	No	Yes	2.00
144	23.79	26.30	2.70	1.88	0.90	16.84	3.97	66.82	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
145	23.95	28.51	2.66	1.85	0.89	18.32	3.73	68.28	4.000	No	Yes	2.00
146	24.12	31.11	2.67	2.14	0.89	19.95	3.76	75.10	4.000	No	Yes	2.00
147	24.28	32.61	2.68	2.36	0.90	20.82	3.83	79.80	4.000	No	Yes	2.00
148	24.44	34.58	2.66	2.42	0.89	22.06	3.74	82.50	4.000	No	Yes	2.00
149	24.61	35.34	2.64	2.27	0.88	22.52	3.58	80.57	4.000	No	Yes	2.00
150	24.77	35.75	2.62	2.15	0.87	22.72	3.46	78.71	4.000	No	Yes	2.00
151	24.94	35.05	2.62	2.09	0.88	22.12	3.48	77.03	4.000	No	Yes	2.00
152	25.10	34.61	2.64	2.12	0.88	21.68	3.55	76.97	4.000	No	Yes	2.00
153	25.26	33.78	2.65	2.18	0.89	20.95	3.67	76.97	4.000	No	Yes	2.00
154	25.43	32.15	2.68	2.18	0.90	19.71	3.83	75.44	4.000	No	Yes	2.00
155	25.59	29.95	2.71	2.24	0.91	18.08	4.09	73.97	4.000	No	Yes	2.00
156	25.76	27.13	2.75	2.22	0.92	16.08	4.40	70.74	4.000	No	Yes	2.00
157	25.92	24.48	2.79	2.19	0.94	14.23	4.73	67.28	4.000	No	Yes	2.00
158	26.08	22.52	2.82	2.08	0.95	12.89	4.93	63.48	4.000	No	Yes	2.00
159	26.25	21.96	2.79	1.81	0.94	12.51	4.74	59.32	4.000	No	Yes	2.00
160	26.41	22.32	2.76	1.61	0.93	12.74	4.47	57.01	4.000	No	Yes	2.00
161	26.58	23.22	2.74	1.55	0.92	13.28	4.28	56.82	4.000	No	Yes	2.00
162	26.74	24.26	2.73	1.63	0.92	13.86	4.24	58.78	4.000	No	Yes	2.00
163	26.90	25.46	2.72	1.68	0.91	14.55	4.17	60.62	4.000	No	Yes	2.00
164	27.07	26.82	2.69	1.59	0.90	15.39	3.92	60.34	4.000	No	Yes	2.00
165	27.23	28.39	2.67	1.62	0.89	16.32	3.80	62.03	4.000	No	Yes	2.00
166	27.40	29.66	2.68	1.79	0.90	16.98	3.86	65.54	4.000	No	Yes	2.00
167	27.56	30.66	2.69	1.96	0.90	17.46	3.94	68.85	4.000	No	Yes	2.00
168	27.72	32.29	2.69	2.07	0.90	18.37	3.91	71.87	4.000	No	Yes	2.00
169	27.89	34.39	2.71	2.45	0.91	19.44	4.07	79.23	4.000	No	Yes	2.00
170	28.05	37.86	2.74	3.05	0.92	21.29	4.27	90.97	4.000	No	Yes	2.00
171	28.22	43.62	2.77	3.98	0.93	24.41	4.50	109.87	4.000	No	Yes	2.00
172	28.38	54.61	2.73	4.61	0.92	30.85	4.24	130.94	4.000	No	Yes	2.00
173	28.54	72.31	2.65	4.73	0.88	41.67	3.63	151.46	4.000	No	Yes	2.00
174	28.71	99.72	2.50	4.19	0.83	59.26	2.79	165.46	0.501	No	No	0.44
175	28.87	114.81	2.44	3.92	0.80	69.00	2.48	171.12	0.546	No	No	0.48
176	29.04	106.63	2.47	4.01	0.82	63.26	2.63	166.25	0.507	No	No	0.45
177	29.20	79.54	2.62	4.72	0.88	45.20	3.47	156.88	4.000	No	Yes	2.00
178	29.36	61.64	2.77	5.69	0.93	33.54	4.55	152.48	4.000	No	Yes	2.00
179	29.53	70.82	2.73	5.80	0.92	38.77	4.25	164.77	4.000	No	Yes	2.00
180	29.69	126.59	2.44	4.22	0.81	74.35	2.49	185.21	0.671	No	No	0.60
181	29.86	208.04	2.19	3.14	0.71	129.30	1.64	212.07	4.000	No	No	2.00
182	30.02	283.66	2.02	2.53	0.65	182.58	1.33	243.27	4.000	No	No	2.00
183	30.19	316.82	1.96	2.31	0.62	206.18	1.25	257.98	4.000	No	No	2.00
184	30.35	316.78	1.96	2.30	0.62	205.44	1.25	256.91	4.000	No	No	2.00
185	30.51	306.16	1.97	2.30	0.63	197.31	1.26	249.25	4.000	No	No	2.00
186	30.68	295.91	1.98	2.28	0.63	189.62	1.27	241.14	4.000	No	No	2.00
187	30.84	287.22	1.98	2.22	0.63	183.37	1.27	233.14	4.000	No	No	2.00
188	31.01	280.06	1.97	2.13	0.63	178.35	1.26	225.43	4.000	No	No	2.00
189	31.17	271.79	1.94	1.89	0.61	173.85	1.23	213.10	4.000	No	No	2.00
190	31.33	265.95	1.88	1.59	0.59	171.71	1.17	201.51	4.000	No	No	2.00
191	31.50	260.30	1.81	1.28	0.57	170.25	1.12	190.30	0.721	No	No	0.65
192	31.66	255.21	1.79	1.16	0.56	167.44	1.10	184.00	0.659	No	No	0.60

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
193	31.83	247.78	1.78	1.10	0.55	162.30	1.09	177.55	0.601	No	No	0.54
194	31.99	238.96	1.79	1.07	0.56	155.86	1.10	170.97	0.545	No	No	0.49
195	32.15	229.34	1.78	1.01	0.55	149.21	1.09	163.36	0.485	No	No	0.44
196	32.32	220.92	1.79	0.99	0.56	143.00	1.10	157.27	0.442	No	No	0.40
197	32.48	217.17	1.82	1.07	0.57	139.02	1.12	156.16	0.434	No	No	0.39
198	32.65	219.56	1.86	1.20	0.58	138.92	1.15	159.77	0.459	No	No	0.42
199	32.81	233.02	1.85	1.26	0.58	147.18	1.15	168.94	0.528	No	No	0.48
200	32.97	241.55	1.84	1.24	0.58	152.78	1.14	173.45	0.565	No	No	0.51
201	33.14	240.28	1.85	1.26	0.58	151.16	1.14	172.63	0.558	No	No	0.51
202	33.30	215.85	1.98	1.67	0.63	130.62	1.27	166.24	0.507	No	No	0.46
203	33.47	196.38	2.14	2.42	0.69	113.37	1.53	173.46	0.565	No	No	0.51
204	33.63	195.65	2.22	3.03	0.72	110.07	1.72	189.49	0.713	No	No	0.65
205	33.79	233.11	2.14	2.76	0.69	133.97	1.52	204.02	4.000	No	No	2.00
206	33.96	280.28	2.03	2.39	0.65	165.43	1.34	221.71	4.000	No	No	2.00
207	34.12	322.34	1.96	2.22	0.62	193.53	1.25	242.72	4.000	No	No	2.00
208	34.29	339.11	1.94	2.19	0.62	204.35	1.23	251.93	4.000	No	No	2.00
209	34.45	342.92	1.93	2.13	0.61	206.98	1.22	252.55	4.000	No	No	2.00
210	34.61	329.42	1.93	2.04	0.61	198.73	1.21	241.41	4.000	No	No	2.00
211	34.78	314.32	1.94	2.02	0.61	188.65	1.23	231.26	4.000	No	No	2.00
212	34.94	301.38	1.96	2.06	0.62	179.50	1.25	224.08	4.000	No	No	2.00
213	35.11	298.55	1.98	2.17	0.63	176.36	1.27	224.82	4.000	No	No	2.00
214	35.27	295.89	2.00	2.29	0.64	173.33	1.30	226.09	4.000	No	No	2.00
215	35.43	290.29	2.02	2.36	0.65	168.92	1.33	224.21	4.000	No	No	2.00
216	35.60	280.76	2.03	2.35	0.65	162.66	1.34	217.73	4.000	No	No	2.00
217	35.76	267.59	2.05	2.41	0.66	153.60	1.38	211.34	4.000	No	No	2.00
218	35.93	256.13	2.09	2.60	0.67	144.97	1.44	209.41	4.000	No	No	2.00
219	36.09	259.43	2.10	2.67	0.68	146.31	1.46	213.07	4.000	No	No	2.00
220	36.26	279.79	2.07	2.58	0.66	159.13	1.40	222.45	4.000	No	No	2.00
221	36.42	307.89	2.01	2.41	0.64	177.61	1.32	234.25	4.000	No	No	2.00
222	36.58	322.29	2.01	2.47	0.64	185.85	1.31	244.21	4.000	No	No	2.00
223	36.75	322.39	2.03	2.57	0.65	184.71	1.34	246.80	4.000	No	No	2.00
224	36.91	314.46	2.04	2.65	0.65	178.86	1.36	243.84	4.000	No	No	2.00
225	37.08	306.79	2.04	2.53	0.65	174.64	1.35	235.53	4.000	No	No	2.00
226	37.24	302.76	2.01	2.34	0.64	173.26	1.31	227.69	4.000	No	No	2.00
227	37.40	304.03	1.98	2.18	0.63	175.12	1.28	223.84	4.000	No	No	2.00
228	37.57	313.33	1.95	2.03	0.62	182.06	1.24	225.32	4.000	No	No	2.00
229	37.73	315.90	1.89	1.74	0.60	186.39	1.18	220.00	4.000	No	No	2.00
230	37.90	307.83	1.84	1.46	0.57	184.30	1.13	208.91	4.000	No	No	2.00
231	38.06	289.10	1.79	1.22	0.56	174.97	1.10	192.68	0.745	No	No	0.69
232	38.22	276.06	1.80	1.19	0.56	166.38	1.11	184.19	0.661	No	No	0.61
233	38.39	267.03	1.81	1.18	0.56	160.22	1.11	178.42	0.608	No	No	0.56
234	38.55	261.20	1.81	1.16	0.57	156.43	1.11	174.29	0.572	No	No	0.53
235	38.72	255.90	1.81	1.12	0.56	153.23	1.11	170.17	0.538	No	No	0.50
236	38.88	254.10	1.81	1.11	0.56	151.87	1.11	168.81	0.527	No	No	0.49
237	39.04	253.30	1.82	1.14	0.57	150.69	1.12	168.69	0.526	No	No	0.49
238	39.21	266.80	1.81	1.16	0.56	159.16	1.11	176.73	0.593	No	No	0.55
239	39.37	274.53	1.82	1.26	0.57	162.61	1.13	182.97	0.650	No	No	0.60
240	39.54	248.23	1.98	1.80	0.63	139.70	1.28	178.70	0.611	No	No	0.57

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
241	39.70	190.84	2.23	2.83	0.72	99.12	1.74	172.55	0.558	No	No	0.52
242	39.86	165.70	2.35	3.49	0.77	82.60	2.12	175.00	0.578	No	No	0.54
243	40.03	216.23	2.12	2.32	0.68	115.93	1.49	172.90	0.561	No	No	0.52
244	40.19	302.10	1.81	1.32	0.57	178.46	1.12	199.15	0.815	No	No	0.76
245	40.36	371.43	1.61	0.89	0.50	231.63	1.00	231.63	4.000	No	No	2.00
246	40.52	398.13	1.55	0.78	0.50	248.09	1.00	248.09	4.000	No	No	2.00
247	40.68	398.23	1.55	0.79	0.50	247.86	1.00	247.86	4.000	No	No	2.00
248	40.85	385.63	1.60	0.90	0.50	239.65	1.00	239.65	4.000	No	No	2.00
249	41.01	366.42	1.70	1.14	0.52	223.15	1.04	231.35	4.000	No	No	2.00
250	41.18	345.54	1.77	1.31	0.55	205.41	1.08	222.82	4.000	No	No	2.00
251	41.34	325.85	1.77	1.26	0.55	193.11	1.09	210.01	4.000	No	No	2.00
252	41.50	309.33	1.68	0.92	0.52	188.27	1.03	193.29	0.752	No	No	0.70
253	41.67	290.46	1.58	0.61	0.50	179.00	1.00	179.00	0.613	No	No	0.58
254	41.83	251.46	1.68	0.72	0.52	152.56	1.02	156.20	0.434	No	No	0.41
255	42.00	190.46	1.94	1.19	0.62	105.77	1.23	130.11	0.285	No	No	0.27
256	42.16	127.76	2.29	2.19	0.75	62.99	1.90	119.88	0.240	No	No	0.23
257	42.32	82.76	2.54	2.87	0.84	37.15	2.95	109.69	0.203	No	No	0.19
258	42.49	64.53	2.65	3.02	0.88	27.62	3.63	100.16	4.000	No	Yes	2.00
259	42.65	60.01	2.68	3.09	0.90	25.23	3.87	97.74	4.000	No	Yes	2.00
260	42.82	63.14	2.76	4.14	0.93	25.93	4.43	114.92	4.000	No	Yes	2.00
261	42.98	75.01	2.76	5.03	0.93	30.94	4.44	137.49	4.000	No	Yes	2.00
262	43.15	98.25	2.65	4.85	0.89	42.26	3.66	154.71	4.000	No	Yes	2.00
263	43.31	128.25	2.50	4.12	0.83	58.15	2.79	162.45	0.479	No	No	0.45
264	43.47	146.07	2.42	3.68	0.80	68.11	2.40	163.79	0.489	No	No	0.46
265	43.64	146.06	2.44	3.82	0.80	67.65	2.47	166.81	0.512	No	No	0.49
266	43.80	162.26	2.41	3.87	0.79	75.87	2.34	177.70	0.602	No	No	0.57
267	43.97	206.15	2.27	3.25	0.74	101.11	1.85	187.11	0.689	No	No	0.66
268	44.13	276.15	2.08	2.50	0.67	144.30	1.42	205.41	4.000	No	No	2.00
269	44.29	328.28	1.94	1.95	0.61	180.01	1.23	220.71	4.000	No	No	2.00
270	44.46	356.61	1.88	1.80	0.59	198.89	1.17	233.48	4.000	No	No	2.00
271	44.62	371.47	1.89	1.90	0.60	206.37	1.18	243.85	4.000	No	No	2.00
272	44.79	389.24	1.93	2.16	0.61	213.44	1.22	259.55	4.000	No	No	2.00
273	44.95	405.40	1.95	2.34	0.62	220.49	1.24	273.04	4.000	No	No	2.00
274	45.11	415.04	1.93	2.27	0.61	226.81	1.22	276.50	4.000	No	No	2.00
275	45.28	398.87	1.91	2.08	0.60	219.25	1.20	262.30	4.000	No	No	2.00
276	45.44	353.91	1.92	1.97	0.61	193.16	1.21	233.72	4.000	No	No	2.00
277	45.61	277.21	2.05	2.26	0.66	144.37	1.37	197.57	0.797	No	No	0.77
278	45.77	187.28	2.30	3.22	0.75	88.86	1.96	173.74	0.568	No	No	0.55
279	45.93	125.34	2.54	4.36	0.84	54.24	3.00	162.63	0.480	No	No	0.46
280	46.10	89.88	2.70	4.95	0.91	36.36	4.02	146.32	4.000	No	Yes	2.00
281	46.26	76.64	2.73	4.44	0.91	30.54	4.18	127.72	4.000	No	Yes	2.00
282	46.43	64.31	2.78	4.24	0.93	24.92	4.59	114.46	4.000	No	Yes	2.00
283	46.59	56.44	2.81	4.05	0.95	21.41	4.90	105.00	4.000	No	Yes	2.00
284	46.75	52.54	2.81	3.63	0.95	19.84	4.86	96.43	4.000	No	Yes	2.00
285	46.92	49.41	2.81	3.31	0.94	18.57	4.83	89.70	4.000	No	Yes	2.00
286	47.08	46.60	2.80	2.98	0.94	17.45	4.78	83.41	4.000	No	Yes	2.00
287	47.25	44.80	2.83	3.11	0.95	16.52	5.04	83.29	4.000	No	Yes	2.00
288	47.41	51.04	2.81	3.47	0.95	19.08	4.87	92.86	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
289	47.57	65.57	2.77	4.21	0.93	25.13	4.56	114.48	4.000	No	Yes	2.00
290	47.74	74.20	2.80	5.25	0.94	28.27	4.78	135.22	4.000	No	Yes	2.00
291	47.90	77.66	2.85	6.35	0.96	29.09	5.21	151.69	4.000	No	Yes	2.00
292	48.07	90.63	2.80	6.47	0.94	34.62	4.80	166.33	4.000	No	Yes	2.00
293	48.23	135.46	2.58	5.11	0.86	56.46	3.22	182.06	0.641	No	No	0.63
294	48.39	171.32	2.46	4.54	0.81	74.69	2.59	193.74	0.756	No	No	0.75
295	48.56	170.32	2.46	4.51	0.81	74.10	2.59	192.17	0.740	No	No	0.73
296	48.72	133.53	2.58	4.99	0.86	55.35	3.21	177.68	0.602	No	No	0.60
297	48.89	94.63	2.73	5.43	0.92	36.73	4.22	154.85	4.000	No	Yes	2.00
298	49.05	73.66	2.81	5.34	0.95	27.42	4.91	134.64	4.000	No	Yes	2.00
299	49.22	67.43	2.83	5.03	0.95	24.82	5.03	124.85	4.000	No	Yes	2.00
300	49.38	72.07	2.77	4.60	0.93	27.07	4.57	123.65	4.000	No	Yes	2.00
301	49.54	72.97	2.78	4.68	0.93	27.35	4.59	125.40	4.000	No	Yes	2.00
302	49.71	70.23	2.81	4.92	0.95	25.93	4.85	125.82	4.000	No	Yes	2.00
303	49.87	96.36	2.67	4.55	0.89	37.88	3.75	142.05	4.000	No	Yes	2.00
304	50.04	128.60	2.53	4.12	0.84	53.42	2.93	156.36	0.436	No	No	0.44
305	50.20	210.58	2.33	3.67	0.76	94.97	2.04	193.27	0.751	No	No	0.75

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
q_t: Total cone resistance
I_c: Soil behavior type index
Fr: Normalized friction ratio (%)
n: Stress exponent
Q_{tn}: Normalized cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Normalized and adjusted cone resistance
$CRR_{7.5}$: Cyclic resistance ratio for M_w=7.5
FS: Factor of safety against soil liquefaction

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.33	0.09	0.91	9.95	0.16	0.44	0.49	0.26	0.74	9.93	0.16	0.36
0.66	0.43	0.57	9.90	0.17	0.29	0.82	2.00	0.00	9.88	0.16	0.00
0.98	2.00	0.00	9.85	0.16	0.00	1.15	2.00	0.00	9.82	0.17	0.00
1.31	2.00	0.00	9.80	0.16	0.00	1.48	2.00	0.00	9.77	0.17	0.00
1.64	2.00	0.00	9.75	0.16	0.00	1.80	2.00	0.00	9.73	0.16	0.00
1.97	2.00	0.00	9.70	0.17	0.00	2.13	2.00	0.00	9.68	0.16	0.00
2.30	2.00	0.00	9.65	0.17	0.00	2.46	2.00	0.00	9.63	0.16	0.00
2.62	2.00	0.00	9.60	0.16	0.00	2.79	2.00	0.00	9.57	0.17	0.00
2.95	2.00	0.00	9.55	0.16	0.00	3.12	2.00	0.00	9.52	0.17	0.00
3.28	2.00	0.00	9.50	0.16	0.00	3.45	2.00	0.00	9.47	0.17	0.00
3.61	2.00	0.00	9.45	0.16	0.00	3.77	2.00	0.00	9.43	0.16	0.00
3.94	2.00	0.00	9.40	0.17	0.00	4.10	2.00	0.00	9.38	0.16	0.00
4.27	2.00	0.00	9.35	0.17	0.00	4.43	2.00	0.00	9.32	0.16	0.00
4.59	2.00	0.00	9.30	0.16	0.00	4.76	2.00	0.00	9.27	0.17	0.00
4.92	2.00	0.00	9.25	0.16	0.00	5.09	2.00	0.00	9.22	0.17	0.00
5.25	2.00	0.00	9.20	0.16	0.00	5.41	2.00	0.00	9.18	0.16	0.00
5.58	2.00	0.00	9.15	0.17	0.00	5.74	2.00	0.00	9.13	0.16	0.00
5.91	2.00	0.00	9.10	0.17	0.00	6.07	2.00	0.00	9.07	0.16	0.00
6.23	2.00	0.00	9.05	0.16	0.00	6.40	2.00	0.00	9.02	0.17	0.00
6.56	2.00	0.00	9.00	0.16	0.00	6.73	2.00	0.00	8.97	0.17	0.00
6.89	2.00	0.00	8.95	0.16	0.00	7.05	2.00	0.00	8.93	0.16	0.00
7.22	2.00	0.00	8.90	0.17	0.00	7.38	2.00	0.00	8.88	0.16	0.00
7.55	2.00	0.00	8.85	0.17	0.00	7.71	2.00	0.00	8.82	0.16	0.00
7.87	2.00	0.00	8.80	0.16	0.00	8.04	2.00	0.00	8.77	0.17	0.00
8.20	2.00	0.00	8.75	0.16	0.00	8.37	2.00	0.00	8.72	0.17	0.00
8.53	2.00	0.00	8.70	0.16	0.00	8.69	2.00	0.00	8.68	0.16	0.00
8.86	2.00	0.00	8.65	0.17	0.00	9.02	2.00	0.00	8.63	0.16	0.00
9.19	2.00	0.00	8.60	0.17	0.00	9.35	2.00	0.00	8.58	0.16	0.00
9.51	2.00	0.00	8.55	0.16	0.00	9.68	2.00	0.00	8.52	0.17	0.00
9.84	2.00	0.00	8.50	0.16	0.00	10.01	2.00	0.00	8.47	0.17	0.00
10.17	2.00	0.00	8.45	0.16	0.00	10.34	2.00	0.00	8.42	0.17	0.00
10.50	2.00	0.00	8.40	0.16	0.00	10.66	2.00	0.00	8.38	0.16	0.00
10.83	2.00	0.00	8.35	0.17	0.00	10.99	2.00	0.00	8.33	0.16	0.00
11.16	2.00	0.00	8.30	0.17	0.00	11.32	2.00	0.00	8.27	0.16	0.00
11.48	2.00	0.00	8.25	0.16	0.00	11.65	2.00	0.00	8.22	0.17	0.00
11.81	2.00	0.00	8.20	0.16	0.00	11.98	2.00	0.00	8.17	0.17	0.00
12.14	2.00	0.00	8.15	0.16	0.00	12.30	2.00	0.00	8.13	0.16	0.00
12.47	2.00	0.00	8.10	0.17	0.00	12.63	2.00	0.00	8.08	0.16	0.00
12.80	2.00	0.00	8.05	0.17	0.00	12.96	2.00	0.00	8.02	0.16	0.00
13.12	2.00	0.00	8.00	0.16	0.00	13.29	2.00	0.00	7.97	0.17	0.00
13.45	2.00	0.00	7.95	0.16	0.00	13.62	2.00	0.00	7.92	0.17	0.00
13.78	2.00	0.00	7.90	0.16	0.00	13.94	2.00	0.00	7.88	0.16	0.00
14.11	2.00	0.00	7.85	0.17	0.00	14.27	0.26	0.74	7.83	0.16	0.28
14.44	0.35	0.65	7.80	0.17	0.26	14.60	0.61	0.39	7.77	0.16	0.15
14.76	2.00	0.00	7.75	0.16	0.00	14.93	2.00	0.00	7.72	0.17	0.00
15.09	2.00	0.00	7.70	0.16	0.00	15.26	2.00	0.00	7.67	0.17	0.00
15.42	2.00	0.00	7.65	0.16	0.00	15.58	2.00	0.00	7.63	0.16	0.00
15.75	2.00	0.00	7.60	0.17	0.00	15.91	2.00	0.00	7.58	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
16.08	2.00	0.00	7.55	0.17	0.00	16.24	2.00	0.00	7.53	0.16	0.00
16.40	2.00	0.00	7.50	0.16	0.00	16.57	2.00	0.00	7.47	0.17	0.00
16.73	2.00	0.00	7.45	0.16	0.00	16.90	2.00	0.00	7.42	0.17	0.00
17.06	2.00	0.00	7.40	0.16	0.00	17.23	2.00	0.00	7.37	0.17	0.00
17.39	2.00	0.00	7.35	0.16	0.00	17.55	2.00	0.00	7.33	0.16	0.00
17.72	2.00	0.00	7.30	0.17	0.00	17.88	2.00	0.00	7.28	0.16	0.00
18.05	2.00	0.00	7.25	0.17	0.00	18.21	2.00	0.00	7.22	0.16	0.00
18.37	2.00	0.00	7.20	0.16	0.00	18.54	2.00	0.00	7.17	0.17	0.00
18.70	2.00	0.00	7.15	0.16	0.00	18.87	2.00	0.00	7.12	0.17	0.00
19.03	2.00	0.00	7.10	0.16	0.00	19.19	2.00	0.00	7.08	0.16	0.00
19.36	0.70	0.30	7.05	0.17	0.11	19.52	0.45	0.55	7.03	0.16	0.19
19.69	0.27	0.73	7.00	0.17	0.27	19.85	2.00	0.00	6.97	0.16	0.00
20.01	0.13	0.87	6.95	0.16	0.30	20.18	0.11	0.89	6.92	0.17	0.32
20.34	0.11	0.89	6.90	0.16	0.30	20.51	2.00	0.00	6.87	0.17	0.00
20.67	2.00	0.00	6.85	0.16	0.00	20.83	2.00	0.00	6.83	0.16	0.00
21.00	2.00	0.00	6.80	0.17	0.00	21.16	2.00	0.00	6.78	0.16	0.00
21.33	2.00	0.00	6.75	0.17	0.00	21.49	2.00	0.00	6.72	0.16	0.00
21.65	2.00	0.00	6.70	0.16	0.00	21.82	2.00	0.00	6.67	0.17	0.00
21.98	2.00	0.00	6.65	0.16	0.00	22.15	2.00	0.00	6.62	0.17	0.00
22.31	2.00	0.00	6.60	0.16	0.00	22.47	2.00	0.00	6.58	0.16	0.00
22.64	2.00	0.00	6.55	0.17	0.00	22.80	2.00	0.00	6.53	0.16	0.00
22.97	2.00	0.00	6.50	0.17	0.00	23.13	2.00	0.00	6.47	0.16	0.00
23.30	2.00	0.00	6.45	0.17	0.00	23.46	2.00	0.00	6.42	0.16	0.00
23.62	2.00	0.00	6.40	0.16	0.00	23.79	2.00	0.00	6.37	0.17	0.00
23.95	2.00	0.00	6.35	0.16	0.00	24.12	2.00	0.00	6.32	0.17	0.00
24.28	2.00	0.00	6.30	0.16	0.00	24.44	2.00	0.00	6.28	0.16	0.00
24.61	2.00	0.00	6.25	0.17	0.00	24.77	2.00	0.00	6.23	0.16	0.00
24.94	2.00	0.00	6.20	0.17	0.00	25.10	2.00	0.00	6.17	0.16	0.00
25.26	2.00	0.00	6.15	0.16	0.00	25.43	2.00	0.00	6.12	0.17	0.00
25.59	2.00	0.00	6.10	0.16	0.00	25.76	2.00	0.00	6.07	0.17	0.00
25.92	2.00	0.00	6.05	0.16	0.00	26.08	2.00	0.00	6.03	0.16	0.00
26.25	2.00	0.00	6.00	0.17	0.00	26.41	2.00	0.00	5.98	0.16	0.00
26.58	2.00	0.00	5.95	0.17	0.00	26.74	2.00	0.00	5.92	0.16	0.00
26.90	2.00	0.00	5.90	0.16	0.00	27.07	2.00	0.00	5.87	0.17	0.00
27.23	2.00	0.00	5.85	0.16	0.00	27.40	2.00	0.00	5.82	0.17	0.00
27.56	2.00	0.00	5.80	0.16	0.00	27.72	2.00	0.00	5.78	0.16	0.00
27.89	2.00	0.00	5.75	0.17	0.00	28.05	2.00	0.00	5.73	0.16	0.00
28.22	2.00	0.00	5.70	0.17	0.00	28.38	2.00	0.00	5.67	0.16	0.00
28.54	2.00	0.00	5.65	0.16	0.00	28.71	0.44	0.56	5.62	0.17	0.16
28.87	0.48	0.52	5.60	0.16	0.14	29.04	0.45	0.55	5.57	0.17	0.16
29.20	2.00	0.00	5.55	0.16	0.00	29.36	2.00	0.00	5.53	0.16	0.00
29.53	2.00	0.00	5.50	0.17	0.00	29.69	0.60	0.40	5.48	0.16	0.11
29.86	2.00	0.00	5.45	0.17	0.00	30.02	2.00	0.00	5.42	0.16	0.00
30.19	2.00	0.00	5.40	0.17	0.00	30.35	2.00	0.00	5.37	0.16	0.00
30.51	2.00	0.00	5.35	0.16	0.00	30.68	2.00	0.00	5.32	0.17	0.00
30.84	2.00	0.00	5.30	0.16	0.00	31.01	2.00	0.00	5.27	0.17	0.00
31.17	2.00	0.00	5.25	0.16	0.00	31.33	2.00	0.00	5.23	0.16	0.00
31.50	0.65	0.35	5.20	0.17	0.09	31.66	0.60	0.40	5.18	0.16	0.10

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.83	0.54	0.46	5.15	0.17	0.12	31.99	0.49	0.51	5.12	0.16	0.13
32.15	0.44	0.56	5.10	0.16	0.14	32.32	0.40	0.60	5.07	0.17	0.16
32.48	0.39	0.61	5.05	0.16	0.15	32.65	0.42	0.58	5.02	0.17	0.15
32.81	0.48	0.52	5.00	0.16	0.13	32.97	0.51	0.49	4.98	0.16	0.12
33.14	0.51	0.49	4.95	0.17	0.13	33.30	0.46	0.54	4.93	0.16	0.13
33.47	0.51	0.49	4.90	0.17	0.12	33.63	0.65	0.35	4.87	0.16	0.08
33.79	2.00	0.00	4.85	0.16	0.00	33.96	2.00	0.00	4.82	0.17	0.00
34.12	2.00	0.00	4.80	0.16	0.00	34.29	2.00	0.00	4.77	0.17	0.00
34.45	2.00	0.00	4.75	0.16	0.00	34.61	2.00	0.00	4.73	0.16	0.00
34.78	2.00	0.00	4.70	0.17	0.00	34.94	2.00	0.00	4.68	0.16	0.00
35.11	2.00	0.00	4.65	0.17	0.00	35.27	2.00	0.00	4.62	0.16	0.00
35.43	2.00	0.00	4.60	0.16	0.00	35.60	2.00	0.00	4.57	0.17	0.00
35.76	2.00	0.00	4.55	0.16	0.00	35.93	2.00	0.00	4.52	0.17	0.00
36.09	2.00	0.00	4.50	0.16	0.00	36.26	2.00	0.00	4.47	0.17	0.00
36.42	2.00	0.00	4.45	0.16	0.00	36.58	2.00	0.00	4.43	0.16	0.00
36.75	2.00	0.00	4.40	0.17	0.00	36.91	2.00	0.00	4.37	0.16	0.00
37.08	2.00	0.00	4.35	0.17	0.00	37.24	2.00	0.00	4.32	0.16	0.00
37.40	2.00	0.00	4.30	0.16	0.00	37.57	2.00	0.00	4.27	0.17	0.00
37.73	2.00	0.00	4.25	0.16	0.00	37.90	2.00	0.00	4.22	0.17	0.00
38.06	0.69	0.31	4.20	0.16	0.06	38.22	0.61	0.39	4.18	0.16	0.08
38.39	0.56	0.44	4.15	0.17	0.09	38.55	0.53	0.47	4.12	0.16	0.09
38.72	0.50	0.50	4.10	0.17	0.11	38.88	0.49	0.51	4.07	0.16	0.10
39.04	0.49	0.51	4.05	0.16	0.10	39.21	0.55	0.45	4.02	0.17	0.09
39.37	0.60	0.40	4.00	0.16	0.08	39.54	0.57	0.43	3.97	0.17	0.09
39.70	0.52	0.48	3.95	0.16	0.09	39.86	0.54	0.46	3.93	0.16	0.09
40.03	0.52	0.48	3.90	0.17	0.10	40.19	0.76	0.24	3.88	0.16	0.05
40.36	2.00	0.00	3.85	0.17	0.00	40.52	2.00	0.00	3.82	0.16	0.00
40.68	2.00	0.00	3.80	0.16	0.00	40.85	2.00	0.00	3.77	0.17	0.00
41.01	2.00	0.00	3.75	0.16	0.00	41.18	2.00	0.00	3.72	0.17	0.00
41.34	2.00	0.00	3.70	0.16	0.00	41.50	0.70	0.30	3.68	0.16	0.05
41.67	0.58	0.42	3.65	0.17	0.08	41.83	0.41	0.59	3.63	0.16	0.10
42.00	0.27	0.73	3.60	0.17	0.14	42.16	0.23	0.77	3.57	0.16	0.13
42.32	0.19	0.81	3.55	0.16	0.14	42.49	2.00	0.00	3.52	0.17	0.00
42.65	2.00	0.00	3.50	0.16	0.00	42.82	2.00	0.00	3.47	0.17	0.00
42.98	2.00	0.00	3.45	0.16	0.00	43.15	2.00	0.00	3.42	0.17	0.00
43.31	0.45	0.55	3.40	0.16	0.09	43.47	0.46	0.54	3.38	0.16	0.09
43.64	0.49	0.51	3.35	0.17	0.09	43.80	0.57	0.43	3.32	0.16	0.07
43.97	0.66	0.34	3.30	0.17	0.06	44.13	2.00	0.00	3.27	0.16	0.00
44.29	2.00	0.00	3.25	0.16	0.00	44.46	2.00	0.00	3.22	0.17	0.00
44.62	2.00	0.00	3.20	0.16	0.00	44.79	2.00	0.00	3.17	0.17	0.00
44.95	2.00	0.00	3.15	0.16	0.00	45.11	2.00	0.00	3.13	0.16	0.00
45.28	2.00	0.00	3.10	0.17	0.00	45.44	2.00	0.00	3.07	0.16	0.00
45.61	0.77	0.23	3.05	0.17	0.04	45.77	0.55	0.45	3.02	0.16	0.07
45.93	0.46	0.54	3.00	0.16	0.08	46.10	2.00	0.00	2.97	0.17	0.00
46.26	2.00	0.00	2.95	0.16	0.00	46.43	2.00	0.00	2.92	0.17	0.00
46.59	2.00	0.00	2.90	0.16	0.00	46.75	2.00	0.00	2.88	0.16	0.00
46.92	2.00	0.00	2.85	0.17	0.00	47.08	2.00	0.00	2.83	0.16	0.00
47.25	2.00	0.00	2.80	0.17	0.00	47.41	2.00	0.00	2.77	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI
47.57	2.00	0.00	2.75	0.16	0.00
47.90	2.00	0.00	2.70	0.16	0.00
48.23	0.63	0.37	2.65	0.16	0.05
48.56	0.73	0.27	2.60	0.17	0.04
48.89	2.00	0.00	2.55	0.17	0.00
49.22	2.00	0.00	2.50	0.17	0.00
49.54	2.00	0.00	2.45	0.16	0.00
49.87	2.00	0.00	2.40	0.16	0.00
50.20	0.75	0.25	2.35	0.16	0.03
47.74	2.00	0.00	2.72	0.17	0.00
48.07	2.00	0.00	2.67	0.17	0.00
48.39	0.75	0.25	2.63	0.16	0.03
48.72	0.60	0.40	2.58	0.16	0.05
49.05	2.00	0.00	2.52	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00
49.71	2.00	0.00	2.42	0.17	0.00
50.04	0.44	0.56	2.37	0.17	0.07

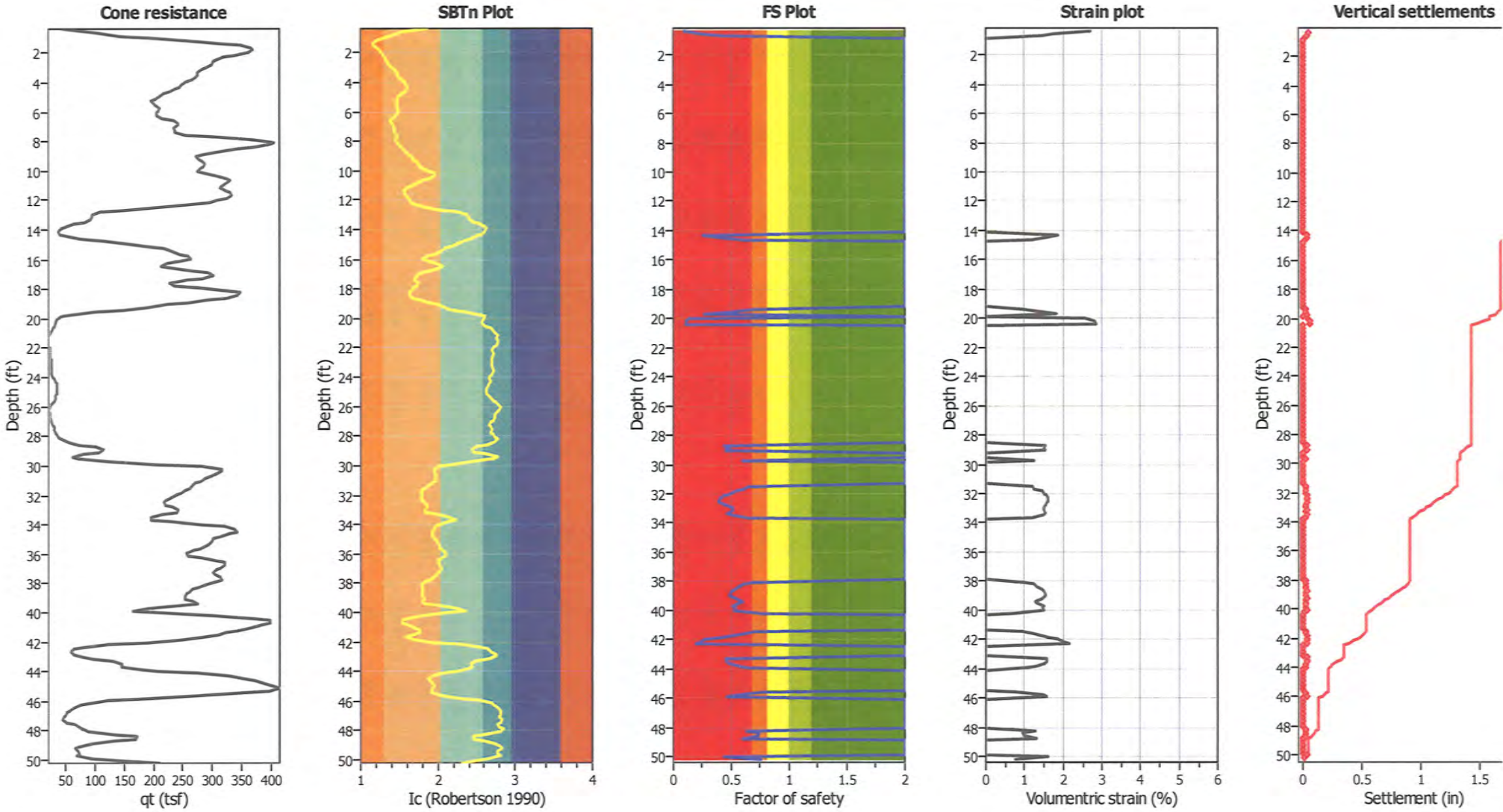
Overall liquefaction potential: 8.31

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
0.33	83.65	0.09	2.70	1.00	0.05	0.49	145.89	0.26	1.71	1.00	0.03
0.66	177.42	0.43	1.46	1.00	0.03	0.82	231.28	2.00	0.00	1.00	0.00
0.98	308.65	2.00	0.00	1.00	0.00	1.15	413.39	2.00	0.00	1.00	0.00
1.31	506.78	2.00	0.00	1.00	0.00	1.48	562.94	2.00	0.00	1.00	0.00
1.64	589.50	2.00	0.00	1.00	0.00	1.80	593.23	2.00	0.00	1.00	0.00
1.97	580.84	2.00	0.00	1.00	0.00	2.13	542.38	2.00	0.00	1.00	0.00
2.30	510.98	2.00	0.00	1.00	0.00	2.46	493.34	2.00	0.00	1.00	0.00
2.62	484.92	2.00	0.00	1.00	0.00	2.79	481.42	2.00	0.00	1.00	0.00
2.95	465.61	2.00	0.00	1.00	0.00	3.12	453.70	2.00	0.00	1.00	0.00
3.28	441.37	2.00	0.00	1.00	0.00	3.45	442.04	2.00	0.00	1.00	0.00
3.61	438.12	2.00	0.00	1.00	0.00	3.77	427.34	2.00	0.00	1.00	0.00
3.94	411.30	2.00	0.00	1.00	0.00	4.10	398.92	2.00	0.00	1.00	0.00
4.27	390.97	2.00	0.00	1.00	0.00	4.43	379.01	2.00	0.00	1.00	0.00
4.59	366.73	2.00	0.00	1.00	0.00	4.76	351.18	2.00	0.00	1.00	0.00
4.92	336.92	2.00	0.00	1.00	0.00	5.09	327.74	2.00	0.00	1.00	0.00
5.25	315.94	2.00	0.00	1.00	0.00	5.41	321.75	2.00	0.00	1.00	0.00
5.58	326.17	2.00	0.00	1.00	0.00	5.74	337.77	2.00	0.00	1.00	0.00
5.91	330.51	2.00	0.00	1.00	0.00	6.07	322.40	2.00	0.00	1.00	0.00
6.23	319.07	2.00	0.00	1.00	0.00	6.40	328.99	2.00	0.00	1.00	0.00
6.56	351.15	2.00	0.00	1.00	0.00	6.73	360.08	2.00	0.00	1.00	0.00
6.89	354.52	2.00	0.00	1.00	0.00	7.05	341.77	2.00	0.00	1.00	0.00
7.22	338.45	2.00	0.00	1.00	0.00	7.38	335.21	2.00	0.00	1.00	0.00
7.55	358.78	2.00	0.00	1.00	0.00	7.71	422.63	2.00	0.00	1.00	0.00
7.87	509.82	2.00	0.00	1.00	0.00	8.04	549.39	2.00	0.00	1.00	0.00
8.20	535.05	2.00	0.00	1.00	0.00	8.37	491.07	2.00	0.00	1.00	0.00
8.53	449.23	2.00	0.00	1.00	0.00	8.69	402.05	2.00	0.00	1.00	0.00
8.86	364.86	2.00	0.00	1.00	0.00	9.02	352.42	2.00	0.00	1.00	0.00
9.19	362.72	2.00	0.00	1.00	0.00	9.35	378.39	2.00	0.00	1.00	0.00
9.51	390.34	2.00	0.00	1.00	0.00	9.68	391.95	2.00	0.00	1.00	0.00
9.84	393.15	2.00	0.00	1.00	0.00	10.01	406.91	2.00	0.00	1.00	0.00
10.17	443.23	2.00	0.00	1.00	0.00	10.34	472.99	2.00	0.00	1.00	0.00
10.50	472.22	2.00	0.00	1.00	0.00	10.66	442.74	2.00	0.00	1.00	0.00
10.83	399.97	2.00	0.00	1.00	0.00	10.99	368.52	2.00	0.00	1.00	0.00
11.16	357.91	2.00	0.00	1.00	0.00	11.32	364.64	2.00	0.00	1.00	0.00
11.48	371.86	2.00	0.00	1.00	0.00	11.65	371.78	2.00	0.00	1.00	0.00
11.81	359.73	2.00	0.00	1.00	0.00	11.98	342.13	2.00	0.00	1.00	0.00
12.14	325.35	2.00	0.00	1.00	0.00	12.30	297.24	2.00	0.00	1.00	0.00
12.47	259.11	2.00	0.00	1.00	0.00	12.63	222.51	2.00	0.00	1.00	0.00
12.80	220.79	2.00	0.00	1.00	0.00	12.96	231.65	2.00	0.00	1.00	0.00
13.12	242.17	2.00	0.00	1.00	0.00	13.29	241.69	2.00	0.00	1.00	0.00
13.45	229.38	2.00	0.00	1.00	0.00	13.62	207.60	2.00	0.00	1.00	0.00
13.78	180.89	2.00	0.00	1.00	0.00	13.94	154.06	2.00	0.00	1.00	0.00
14.11	137.18	2.00	0.00	1.00	0.00	14.27	132.18	0.26	1.86	1.00	0.04
14.44	151.18	0.35	1.66	1.00	0.03	14.60	188.35	0.61	1.21	1.00	0.02
14.76	239.18	2.00	0.00	1.00	0.00	14.93	280.58	2.00	0.00	1.00	0.00
15.09	307.25	2.00	0.00	1.00	0.00	15.26	314.68	2.00	0.00	1.00	0.00
15.42	308.80	2.00	0.00	1.00	0.00	15.58	297.14	2.00	0.00	1.00	0.00
15.75	288.58	2.00	0.00	1.00	0.00	15.91	279.35	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
16.08	268.71	2.00	0.00	1.00	0.00	16.24	263.03	2.00	0.00	1.00	0.00
16.40	273.86	2.00	0.00	1.00	0.00	16.57	286.11	2.00	0.00	1.00	0.00
16.73	297.00	2.00	0.00	1.00	0.00	16.90	300.40	2.00	0.00	1.00	0.00
17.06	293.67	2.00	0.00	1.00	0.00	17.23	271.09	2.00	0.00	1.00	0.00
17.39	241.20	2.00	0.00	1.00	0.00	17.55	218.67	2.00	0.00	1.00	0.00
17.72	224.87	2.00	0.00	1.00	0.00	17.88	256.38	2.00	0.00	1.00	0.00
18.05	291.12	2.00	0.00	1.00	0.00	18.21	309.16	2.00	0.00	1.00	0.00
18.37	302.88	2.00	0.00	1.00	0.00	18.54	289.11	2.00	0.00	1.00	0.00
18.70	274.77	2.00	0.00	1.00	0.00	18.87	259.23	2.00	0.00	1.00	0.00
19.03	242.87	2.00	0.00	1.00	0.00	19.19	226.73	2.00	0.00	1.00	0.00
19.36	196.39	0.70	0.94	1.00	0.02	19.52	165.76	0.45	1.54	1.00	0.03
19.69	133.79	0.27	1.84	1.00	0.04	19.85	109.44	2.00	0.00	1.00	0.00
20.01	88.73	0.13	2.58	1.00	0.05	20.18	80.18	0.11	2.80	1.00	0.06
20.34	78.36	0.11	2.85	1.00	0.05	20.51	78.57	2.00	0.00	1.00	0.00
20.67	77.27	2.00	0.00	1.00	0.00	20.83	73.81	2.00	0.00	1.00	0.00
21.00	69.94	2.00	0.00	1.00	0.00	21.16	67.81	2.00	0.00	1.00	0.00
21.33	65.48	2.00	0.00	1.00	0.00	21.49	65.39	2.00	0.00	1.00	0.00
21.65	65.25	2.00	0.00	1.00	0.00	21.82	64.96	2.00	0.00	1.00	0.00
21.98	64.61	2.00	0.00	1.00	0.00	22.15	64.33	2.00	0.00	1.00	0.00
22.31	64.24	2.00	0.00	1.00	0.00	22.47	64.10	2.00	0.00	1.00	0.00
22.64	63.88	2.00	0.00	1.00	0.00	22.80	65.78	2.00	0.00	1.00	0.00
22.97	67.62	2.00	0.00	1.00	0.00	23.13	69.35	2.00	0.00	1.00	0.00
23.30	69.18	2.00	0.00	1.00	0.00	23.46	69.16	2.00	0.00	1.00	0.00
23.62	67.14	2.00	0.00	1.00	0.00	23.79	66.82	2.00	0.00	1.00	0.00
23.95	68.28	2.00	0.00	1.00	0.00	24.12	75.10	2.00	0.00	1.00	0.00
24.28	79.80	2.00	0.00	1.00	0.00	24.44	82.50	2.00	0.00	1.00	0.00
24.61	80.57	2.00	0.00	1.00	0.00	24.77	78.71	2.00	0.00	1.00	0.00
24.94	77.03	2.00	0.00	1.00	0.00	25.10	76.97	2.00	0.00	1.00	0.00
25.26	76.97	2.00	0.00	1.00	0.00	25.43	75.44	2.00	0.00	1.00	0.00
25.59	73.97	2.00	0.00	1.00	0.00	25.76	70.74	2.00	0.00	1.00	0.00
25.92	67.28	2.00	0.00	1.00	0.00	26.08	63.48	2.00	0.00	1.00	0.00
26.25	59.32	2.00	0.00	1.00	0.00	26.41	57.01	2.00	0.00	1.00	0.00
26.58	56.82	2.00	0.00	1.00	0.00	26.74	58.78	2.00	0.00	1.00	0.00
26.90	60.62	2.00	0.00	1.00	0.00	27.07	60.34	2.00	0.00	1.00	0.00
27.23	62.03	2.00	0.00	1.00	0.00	27.40	65.54	2.00	0.00	1.00	0.00
27.56	68.85	2.00	0.00	1.00	0.00	27.72	71.87	2.00	0.00	1.00	0.00
27.89	79.23	2.00	0.00	1.00	0.00	28.05	90.97	2.00	0.00	1.00	0.00
28.22	109.87	2.00	0.00	1.00	0.00	28.38	130.94	2.00	0.00	1.00	0.00
28.54	151.46	2.00	0.00	1.00	0.00	28.71	165.46	0.44	1.55	1.00	0.03
28.87	171.12	0.48	1.50	1.00	0.03	29.04	166.25	0.45	1.54	1.00	0.03
29.20	156.88	2.00	0.00	1.00	0.00	29.36	152.48	2.00	0.00	1.00	0.00
29.53	164.77	2.00	0.00	1.00	0.00	29.69	185.21	0.60	1.24	1.00	0.02
29.86	212.07	2.00	0.00	1.00	0.00	30.02	243.27	2.00	0.00	1.00	0.00
30.19	257.98	2.00	0.00	1.00	0.00	30.35	256.91	2.00	0.00	1.00	0.00
30.51	249.25	2.00	0.00	1.00	0.00	30.68	241.14	2.00	0.00	1.00	0.00
30.84	233.14	2.00	0.00	1.00	0.00	31.01	225.43	2.00	0.00	1.00	0.00
31.17	213.10	2.00	0.00	1.00	0.00	31.33	201.51	2.00	0.00	1.00	0.00
31.50	190.30	0.65	1.19	1.00	0.02	31.66	184.00	0.60	1.25	1.00	0.02

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
31.83	177.55	0.54	1.46	1.00	0.03	31.99	170.97	0.49	1.51	1.00	0.03
32.15	163.36	0.44	1.56	1.00	0.03	32.32	157.27	0.40	1.61	1.00	0.03
32.48	156.16	0.39	1.62	1.00	0.03	32.65	159.77	0.42	1.59	1.00	0.03
32.81	168.94	0.48	1.52	1.00	0.03	32.97	173.45	0.51	1.49	1.00	0.03
33.14	172.63	0.51	1.49	1.00	0.03	33.30	166.24	0.46	1.54	1.00	0.03
33.47	173.46	0.51	1.49	1.00	0.03	33.63	189.49	0.65	1.20	1.00	0.02
33.79	204.02	2.00	0.00	1.00	0.00	33.96	221.71	2.00	0.00	1.00	0.00
34.12	242.72	2.00	0.00	1.00	0.00	34.29	251.93	2.00	0.00	1.00	0.00
34.45	252.55	2.00	0.00	1.00	0.00	34.61	241.41	2.00	0.00	1.00	0.00
34.78	231.26	2.00	0.00	1.00	0.00	34.94	224.08	2.00	0.00	1.00	0.00
35.11	224.82	2.00	0.00	1.00	0.00	35.27	226.09	2.00	0.00	1.00	0.00
35.43	224.21	2.00	0.00	1.00	0.00	35.60	217.73	2.00	0.00	1.00	0.00
35.76	211.34	2.00	0.00	1.00	0.00	35.93	209.41	2.00	0.00	1.00	0.00
36.09	213.07	2.00	0.00	1.00	0.00	36.26	222.45	2.00	0.00	1.00	0.00
36.42	234.25	2.00	0.00	1.00	0.00	36.58	244.21	2.00	0.00	1.00	0.00
36.75	246.80	2.00	0.00	1.00	0.00	36.91	243.84	2.00	0.00	1.00	0.00
37.08	235.53	2.00	0.00	1.00	0.00	37.24	227.69	2.00	0.00	1.00	0.00
37.40	223.84	2.00	0.00	1.00	0.00	37.57	225.32	2.00	0.00	1.00	0.00
37.73	220.00	2.00	0.00	1.00	0.00	37.90	208.91	2.00	0.00	1.00	0.00
38.06	192.68	0.69	0.97	1.00	0.02	38.22	184.19	0.61	1.25	1.00	0.02
38.39	178.42	0.56	1.31	1.00	0.03	38.55	174.29	0.53	1.48	1.00	0.03
38.72	170.17	0.50	1.51	1.00	0.03	38.88	168.81	0.49	1.52	1.00	0.03
39.04	168.69	0.49	1.52	1.00	0.03	39.21	176.73	0.55	1.46	1.00	0.03
39.37	182.97	0.60	1.26	1.00	0.02	39.54	178.70	0.57	1.31	1.00	0.03
39.70	172.55	0.52	1.49	1.00	0.03	39.86	175.00	0.54	1.48	1.00	0.03
40.03	172.90	0.52	1.49	1.00	0.03	40.19	199.15	0.76	0.74	1.00	0.01
40.36	231.63	2.00	0.00	1.00	0.00	40.52	248.09	2.00	0.00	1.00	0.00
40.68	247.86	2.00	0.00	1.00	0.00	40.85	239.65	2.00	0.00	1.00	0.00
41.01	231.35	2.00	0.00	1.00	0.00	41.18	222.82	2.00	0.00	1.00	0.00
41.34	210.01	2.00	0.00	1.00	0.00	41.50	193.29	0.70	0.96	1.00	0.02
41.67	179.00	0.58	1.30	1.00	0.03	41.83	156.20	0.41	1.62	1.00	0.03
42.00	130.11	0.27	1.88	1.00	0.04	42.16	119.88	0.23	2.01	1.00	0.04
42.32	109.69	0.19	2.17	1.00	0.04	42.49	100.16	2.00	0.00	1.00	0.00
42.65	97.74	2.00	0.00	1.00	0.00	42.82	114.92	2.00	0.00	1.00	0.00
42.98	137.49	2.00	0.00	1.00	0.00	43.15	154.71	2.00	0.00	1.00	0.00
43.31	162.45	0.45	1.57	1.00	0.03	43.47	163.79	0.46	1.56	1.00	0.03
43.64	166.81	0.49	1.54	1.00	0.03	43.80	177.70	0.57	1.32	1.00	0.03
43.97	187.11	0.66	1.01	1.00	0.02	44.13	205.41	2.00	0.00	1.00	0.00
44.29	220.71	2.00	0.00	1.00	0.00	44.46	233.48	2.00	0.00	1.00	0.00
44.62	243.85	2.00	0.00	1.00	0.00	44.79	259.55	2.00	0.00	1.00	0.00
44.95	273.04	2.00	0.00	1.00	0.00	45.11	276.50	2.00	0.00	1.00	0.00
45.28	262.30	2.00	0.00	1.00	0.00	45.44	233.72	2.00	0.00	1.00	0.00
45.61	197.57	0.77	0.75	1.00	0.02	45.77	173.74	0.55	1.49	1.00	0.03
45.93	162.63	0.46	1.57	1.00	0.03	46.10	146.32	2.00	0.00	1.00	0.00
46.26	127.72	2.00	0.00	1.00	0.00	46.43	114.46	2.00	0.00	1.00	0.00
46.59	105.00	2.00	0.00	1.00	0.00	46.75	96.43	2.00	0.00	1.00	0.00
46.92	89.70	2.00	0.00	1.00	0.00	47.08	83.41	2.00	0.00	1.00	0.00
47.25	83.29	2.00	0.00	1.00	0.00	47.41	92.86	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
47.57	114.48	2.00	0.00	1.00	0.00	47.74	135.22	2.00	0.00	1.00	0.00
47.90	151.69	2.00	0.00	1.00	0.00	48.07	166.33	2.00	0.00	1.00	0.00
48.23	182.06	0.63	1.27	1.00	0.02	48.39	193.74	0.75	0.96	1.00	0.02
48.56	192.17	0.73	0.97	1.00	0.02	48.72	177.68	0.60	1.32	1.00	0.03
48.89	154.85	2.00	0.00	1.00	0.00	49.05	134.64	2.00	0.00	1.00	0.00
49.22	124.85	2.00	0.00	1.00	0.00	49.38	123.65	2.00	0.00	1.00	0.00
49.54	125.40	2.00	0.00	1.00	0.00	49.71	125.82	2.00	0.00	1.00	0.00
49.87	142.05	2.00	0.00	1.00	0.00	50.04	156.36	0.44	1.62	1.00	0.03
50.20	193.27	0.75	0.78	1.00	0.01						

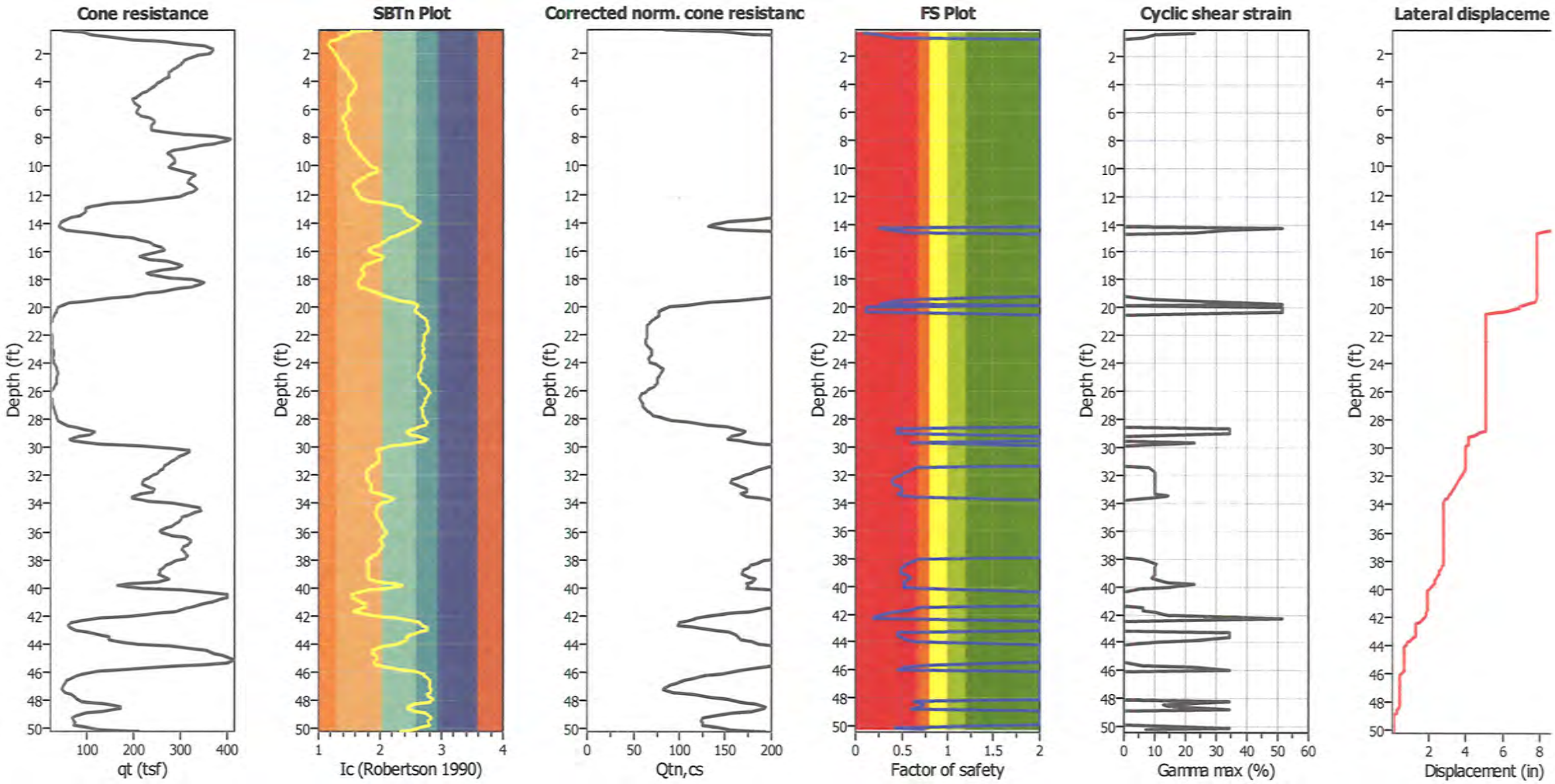
Total estimated settlement: 1.89

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

Estimation of post-earthquake lateral Displacements

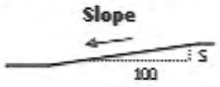
Geometric parameters: Gently sloping ground without free face (Slope 0.70 %)



Abbreviations

q_t: Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c: Soil Behaviour Type Index
$Q_{tn,cs}$: Equivalent clean sand normalized CPT total cone resistance
F.S.: Factor of safety
γ_{max}: Maximum cyclic shear strain
LDI: Lateral displacement index

Surface condition



:: Lateral displacement index calculation ::

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
0.33	45.13	72.48	0.52	83.65	0.09	56.38	22.70	0.39
0.49	90.83	145.89	0.37	145.89	0.26	79.47	10.00	0.17
0.66	110.47	177.42	0.39	177.42	0.43	85.92	6.20	0.11
0.82	144.00	231.28	0.42	231.28	2.00	94.67	0.00	0.00
0.98	192.17	308.65	0.43	308.65	2.00	100.00	0.00	0.00
1.15	257.37	413.39	0.41	413.39	2.00	100.00	0.00	0.00
1.31	315.50	506.78	0.45	506.78	2.00	100.00	0.00	0.00
1.48	350.47	562.94	0.50	562.94	2.00	100.00	0.00	0.00
1.64	367.01	589.50	0.59	589.50	2.00	100.00	0.00	0.00
1.80	369.35	593.23	0.64	593.23	2.00	100.00	0.00	0.00
1.97	361.65	580.84	0.68	580.84	2.00	100.00	0.00	0.00
2.13	337.71	542.38	0.70	542.38	2.00	100.00	0.00	0.00
2.30	318.18	510.98	0.71	510.98	2.00	100.00	0.00	0.00
2.46	307.22	493.34	0.73	493.34	2.00	100.00	0.00	0.00
2.62	301.98	484.92	0.76	484.92	2.00	100.00	0.00	0.00
2.79	299.82	481.42	0.79	481.42	2.00	100.00	0.00	0.00
2.95	289.99	465.61	0.86	465.61	2.00	100.00	0.00	0.00
3.12	282.59	453.70	0.93	453.70	2.00	100.00	0.00	0.00
3.28	274.92	441.37	0.99	441.37	2.00	100.00	0.00	0.00
3.45	275.35	442.04	1.02	442.04	2.00	100.00	0.00	0.00
3.61	272.92	438.12	1.07	438.12	2.00	100.00	0.00	0.00
3.77	266.22	427.34	1.16	427.34	2.00	100.00	0.00	0.00
3.94	256.25	411.30	1.25	411.30	2.00	100.00	0.00	0.00
4.10	248.55	398.92	1.30	398.92	2.00	100.00	0.00	0.00
4.27	243.62	390.97	1.31	390.97	2.00	100.00	0.00	0.00
4.43	236.18	379.01	1.30	379.01	2.00	100.00	0.00	0.00
4.59	228.55	366.73	1.20	366.73	2.00	100.00	0.00	0.00
4.76	218.88	351.18	1.07	351.18	2.00	100.00	0.00	0.00
4.92	210.02	336.92	0.89	336.92	2.00	100.00	0.00	0.00
5.09	204.32	327.74	0.78	327.74	2.00	100.00	0.00	0.00
5.25	196.98	315.94	0.76	315.94	2.00	100.00	0.00	0.00
5.41	200.61	321.75	0.80	321.75	2.00	100.00	0.00	0.00
5.58	203.37	326.17	0.82	326.17	2.00	100.00	0.00	0.00
5.74	210.60	337.77	0.84	337.77	2.00	100.00	0.00	0.00
5.91	208.80	330.51	0.85	330.51	2.00	100.00	0.00	0.00
6.07	206.43	322.40	0.82	322.40	2.00	100.00	0.00	0.00
6.23	206.96	319.07	0.74	319.07	2.00	100.00	0.00	0.00
6.40	216.26	328.99	0.68	328.99	2.00	100.00	0.00	0.00
6.56	233.66	351.15	0.66	351.15	2.00	100.00	0.00	0.00
6.73	242.69	360.08	0.69	360.08	2.00	100.00	0.00	0.00
6.89	241.79	354.52	0.73	354.52	2.00	100.00	0.00	0.00
7.05	235.83	341.77	0.76	341.77	2.00	100.00	0.00	0.00
7.22	236.36	338.45	0.75	338.45	2.00	100.00	0.00	0.00
7.38	236.69	335.21	0.73	335.21	2.00	100.00	0.00	0.00
7.55	256.26	358.78	0.85	358.78	2.00	100.00	0.00	0.00
7.71	305.09	422.63	0.97	422.63	2.00	100.00	0.00	0.00
7.87	371.96	509.82	1.08	509.82	2.00	100.00	0.00	0.00
8.04	405.39	549.39	1.13	549.39	2.00	100.00	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
8.20	398.99	535.05	1.19	535.05	2.00	100.00	0.00	0.00
8.37	370.26	491.07	1.23	491.07	2.00	100.00	0.00	0.00
8.53	342.16	449.23	1.26	449.23	2.00	100.00	0.00	0.00
8.69	309.29	402.05	1.29	402.05	2.00	100.00	0.00	0.00
8.86	283.59	364.86	1.34	364.86	2.00	100.00	0.00	0.00
9.02	272.29	348.74	1.43	352.42	2.00	100.00	0.00	0.00
9.19	278.82	354.81	1.52	362.72	2.00	100.00	0.00	0.00
9.35	283.12	360.15	1.72	378.39	2.00	100.00	0.00	0.00
9.51	287.45	364.47	1.88	390.34	2.00	100.00	0.00	0.00
9.68	285.45	360.08	2.00	391.95	2.00	100.00	0.00	0.00
9.84	280.19	352.56	2.18	393.15	2.00	100.00	0.00	0.00
10.01	274.82	346.85	2.61	406.91	2.00	100.00	0.00	0.00
10.17	284.88	359.86	3.11	443.23	2.00	100.00	0.00	0.00
10.34	307.15	383.89	3.22	472.99	2.00	100.00	0.00	0.00
10.50	325.71	399.65	2.89	472.22	2.00	100.00	0.00	0.00
10.66	331.28	397.32	2.32	442.74	2.00	100.00	0.00	0.00
10.83	322.55	378.33	1.82	399.97	2.00	100.00	0.00	0.00
10.99	316.89	364.87	1.47	368.52	2.00	100.00	0.00	0.00
11.16	314.29	357.91	1.27	357.91	2.00	100.00	0.00	0.00
11.32	322.55	364.64	1.16	364.64	2.00	100.00	0.00	0.00
11.48	331.32	371.86	1.15	371.86	2.00	100.00	0.00	0.00
11.65	333.78	371.78	1.21	371.78	2.00	100.00	0.00	0.00
11.81	325.28	359.73	1.31	359.73	2.00	100.00	0.00	0.00
11.98	312.51	343.07	1.34	342.13	2.00	100.00	0.00	0.00
12.14	295.71	322.89	1.34	325.35	2.00	100.00	0.00	0.00
12.30	265.07	288.39	1.36	297.24	2.00	100.00	0.00	0.00
12.47	211.34	231.08	1.67	259.11	2.00	94.65	0.00	0.00
12.63	150.48	166.34	2.37	222.51	2.00	83.80	0.00	0.00
12.80	109.78	122.48	3.58	220.79	2.00	73.69	0.00	0.00
12.96	95.20	106.15	4.48	231.65	2.00	68.97	0.00	0.00
13.12	96.60	106.86	4.80	242.17	2.00	69.19	0.00	0.00
13.29	93.37	102.36	4.96	241.69	2.00	67.77	0.00	0.00
13.45	82.40	89.64	5.10	229.38	2.00	63.39	0.00	0.00
13.62	65.30	70.47	5.26	207.60	2.00	55.45	0.00	0.00
13.78	50.63	54.12	5.14	180.89	2.00	46.74	0.00	0.00
13.94	41.42	43.75	4.59	154.06	2.00	39.71	0.00	0.00
14.11	38.38	40.02	3.99	137.18	2.00	36.77	0.00	0.00
14.27	40.58	41.88	3.61	132.18	0.26	38.27	51.20	0.67
14.44	53.18	54.46	3.76	151.18	0.35	46.94	34.10	0.47
14.60	77.37	78.69	4.09	188.35	0.61	59.09	22.70	0.30
14.76	111.64	112.67	4.48	239.18	2.00	70.94	0.00	0.00
14.93	154.11	154.00	4.33	280.58	2.00	81.25	0.00	0.00
15.09	193.48	191.54	3.96	307.25	2.00	88.45	0.00	0.00
15.26	218.89	214.68	3.55	314.68	2.00	92.22	0.00	0.00
15.42	233.03	226.64	3.10	308.80	2.00	94.00	0.00	0.00
15.58	243.56	234.98	2.60	297.14	2.00	95.20	0.00	0.00
15.75	259.03	247.93	2.05	288.58	2.00	96.97	0.00	0.00
15.91	264.27	251.29	1.72	279.35	2.00	97.41	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
16.08	251.07	237.22	1.78	268.71	2.00	95.51	0.00	0.00
16.24	223.44	209.72	2.34	263.03	2.00	91.44	0.00	0.00
16.40	212.97	198.47	2.93	273.86	2.00	89.62	0.00	0.00
16.57	230.37	213.28	2.86	286.11	2.00	92.00	0.00	0.00
16.73	267.40	246.48	2.31	297.00	2.00	96.77	0.00	0.00
16.90	293.44	269.33	1.83	300.40	2.00	99.70	0.00	0.00
17.06	301.94	276.05	1.51	293.67	2.00	100.00	0.00	0.00
17.23	285.87	260.08	1.32	271.09	2.00	98.55	0.00	0.00
17.39	256.51	232.15	1.18	241.20	2.00	94.80	0.00	0.00
17.55	228.24	205.20	1.20	218.67	2.00	90.73	0.00	0.00
17.72	236.67	211.74	1.21	224.87	2.00	91.76	0.00	0.00
17.88	276.87	247.01	1.24	256.38	2.00	96.85	0.00	0.00
18.05	323.91	288.17	1.25	291.12	2.00	100.00	0.00	0.00
18.21	348.71	309.16	1.23	309.16	2.00	100.00	0.00	0.00
18.37	344.11	303.65	1.23	302.88	2.00	100.00	0.00	0.00
18.54	322.64	282.75	1.29	289.11	2.00	100.00	0.00	0.00
18.70	293.80	255.04	1.51	274.77	2.00	97.90	0.00	0.00
18.87	258.64	221.62	1.92	259.23	2.00	93.27	0.00	0.00
19.03	223.77	189.31	2.32	242.87	2.00	88.07	0.00	0.00
19.19	191.67	160.14	2.66	226.73	2.00	82.54	0.00	0.00
19.36	147.97	121.79	2.86	196.39	0.70	73.51	9.14	0.11
19.52	102.47	82.68	3.12	165.76	0.45	60.72	22.70	0.26
19.69	60.14	47.07	3.38	133.79	0.27	42.13	51.20	0.63
19.85	41.88	31.99	3.10	109.44	2.00	29.38	0.00	0.00
20.01	36.21	27.41	2.30	88.73	0.13	24.29	51.20	0.58
20.18	33.75	25.33	1.98	80.18	0.11	21.68	51.20	0.62
20.34	32.71	24.35	1.94	78.36	0.11	20.38	51.20	0.58
20.51	31.18	22.94	2.03	78.57	2.00	18.40	0.00	0.00
20.67	28.01	20.27	2.14	77.27	2.00	14.31	0.00	0.00
20.83	25.04	17.82	2.13	73.81	2.00	10.07	0.00	0.00
21.00	22.78	15.95	2.05	69.94	2.00	6.42	0.00	0.00
21.16	21.71	15.04	2.00	67.81	2.00	4.47	0.00	0.00
21.33	21.24	14.60	1.88	65.48	2.00	3.48	0.00	0.00
21.49	20.98	14.29	1.91	65.39	2.00	2.79	0.00	0.00
21.65	20.97	14.20	1.91	65.25	2.00	2.57	0.00	0.00
21.82	21.81	14.74	1.83	64.96	2.00	3.80	0.00	0.00
21.98	22.94	15.52	1.74	64.61	2.00	5.50	0.00	0.00
22.15	23.64	15.95	1.69	64.33	2.00	6.41	0.00	0.00
22.31	23.47	15.72	1.70	64.24	2.00	5.93	0.00	0.00
22.47	23.57	15.70	1.70	64.10	2.00	5.88	0.00	0.00
22.64	24.04	15.95	1.66	63.88	2.00	6.41	0.00	0.00
22.80	24.87	16.44	1.74	65.78	2.00	7.41	0.00	0.00
22.97	25.57	16.82	1.83	67.62	2.00	8.17	0.00	0.00
23.13	26.47	17.35	1.89	69.35	2.00	9.20	0.00	0.00
23.30	26.57	17.32	1.88	69.18	2.00	9.12	0.00	0.00
23.46	25.97	16.76	1.93	69.16	2.00	8.05	0.00	0.00
23.62	25.24	16.16	1.85	67.14	2.00	6.84	0.00	0.00
23.79	26.30	16.84	1.77	66.82	2.00	8.21	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
23.95	28.51	18.32	1.75	68.28	2.00	10.99	0.00	0.00
24.12	31.11	19.95	2.04	75.10	2.00	13.80	0.00	0.00
24.28	32.61	20.82	2.25	79.80	2.00	15.20	0.00	0.00
24.44	34.58	22.06	2.31	82.50	2.00	17.11	0.00	0.00
24.61	35.34	22.52	2.17	80.57	2.00	17.79	0.00	0.00
24.77	35.75	22.72	2.05	78.71	2.00	18.09	0.00	0.00
24.94	35.05	22.12	2.00	77.03	2.00	17.20	0.00	0.00
25.10	34.61	21.68	2.02	76.97	2.00	16.54	0.00	0.00
25.26	33.78	20.95	2.07	76.97	2.00	15.42	0.00	0.00
25.43	32.15	19.71	2.07	75.44	2.00	13.39	0.00	0.00
25.59	29.95	18.08	2.11	73.97	2.00	10.55	0.00	0.00
25.76	27.13	16.08	2.09	70.74	2.00	6.68	0.00	0.00
25.92	24.48	14.23	2.04	67.28	2.00	2.65	0.00	0.00
26.08	22.52	12.89	1.92	63.48	2.00	0.00	0.00	0.00
26.25	21.96	12.51	1.67	59.32	2.00	0.00	0.00	0.00
26.41	22.32	12.74	1.49	57.01	2.00	0.00	0.00	0.00
26.58	23.22	13.28	1.44	56.82	2.00	0.37	0.00	0.00
26.74	24.26	13.86	1.51	58.78	2.00	1.77	0.00	0.00
26.90	25.46	14.55	1.57	60.62	2.00	3.37	0.00	0.00
27.07	26.82	15.39	1.49	60.34	2.00	5.24	0.00	0.00
27.23	28.39	16.32	1.53	62.03	2.00	7.17	0.00	0.00
27.40	29.66	16.98	1.69	65.54	2.00	8.48	0.00	0.00
27.56	30.66	17.46	1.85	68.85	2.00	9.40	0.00	0.00
27.72	32.29	18.37	1.96	71.87	2.00	11.07	0.00	0.00
27.89	34.39	19.44	2.33	79.23	2.00	12.95	0.00	0.00
28.05	37.86	21.29	2.91	90.97	2.00	15.94	0.00	0.00
28.22	43.62	24.41	3.82	109.87	2.00	20.45	0.00	0.00
28.38	54.61	30.85	4.46	130.94	2.00	28.19	0.00	0.00
28.54	72.31	41.67	4.61	151.46	2.00	38.11	0.00	0.00
28.71	99.72	59.26	4.11	165.46	0.44	49.73	34.10	0.32
28.87	114.81	69.00	3.86	171.12	0.48	54.75	34.10	0.30
29.04	106.63	63.26	3.94	166.25	0.45	51.88	34.10	0.32
29.20	79.54	45.20	4.61	156.88	2.00	40.79	0.00	0.00
29.36	61.64	33.54	5.52	152.48	2.00	30.94	0.00	0.00
29.53	70.82	38.77	5.65	164.77	2.00	35.73	0.00	0.00
29.69	126.59	74.35	4.16	185.21	0.60	57.22	22.70	0.19
29.86	208.04	129.30	3.11	212.07	2.00	75.48	0.00	0.00
30.02	283.66	182.58	2.51	243.27	2.00	86.87	0.00	0.00
30.19	316.82	206.18	2.29	257.98	2.00	90.88	0.00	0.00
30.35	316.78	205.44	2.28	256.91	2.00	90.76	0.00	0.00
30.51	306.16	197.31	2.29	249.25	2.00	89.43	0.00	0.00
30.68	295.91	189.62	2.26	241.14	2.00	88.12	0.00	0.00
30.84	287.22	183.37	2.21	233.14	2.00	87.01	0.00	0.00
31.01	280.06	178.35	2.12	225.43	2.00	86.10	0.00	0.00
31.17	271.79	173.85	1.88	213.10	2.00	85.25	0.00	0.00
31.33	265.95	171.71	1.58	201.51	2.00	84.84	0.00	0.00
31.50	260.30	170.25	1.27	190.30	0.65	84.56	7.89	0.07
31.66	255.21	167.44	1.15	184.00	0.60	84.01	9.48	0.08

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
31.83	247.78	162.30	1.09	177.55	0.54	82.98	10.00	0.08
31.99	238.96	155.86	1.06	170.97	0.49	81.65	10.00	0.08
32.15	229.34	149.21	1.00	163.36	0.44	80.21	10.00	0.08
32.32	220.92	143.00	0.98	157.27	0.40	78.80	10.00	0.08
32.48	217.17	139.02	1.06	156.16	0.39	77.87	10.00	0.08
32.65	219.56	138.92	1.18	159.77	0.42	77.85	10.00	0.08
32.81	233.02	147.18	1.24	168.94	0.48	79.76	10.00	0.08
32.97	241.55	152.78	1.23	173.45	0.51	80.99	10.00	0.08
33.14	240.28	151.16	1.25	172.63	0.51	80.64	10.00	0.08
33.30	215.85	130.62	1.65	166.24	0.46	75.82	10.00	0.08
33.47	196.38	113.37	2.39	173.46	0.51	71.14	14.50	0.12
33.63	195.65	110.07	3.00	189.49	0.65	70.17	11.17	0.08
33.79	233.11	133.97	2.73	204.02	2.00	76.65	0.00	0.00
33.96	280.28	165.43	2.37	221.71	2.00	83.62	0.00	0.00
34.12	322.34	193.53	2.20	242.72	2.00	88.79	0.00	0.00
34.29	339.11	204.35	2.17	251.93	2.00	90.59	0.00	0.00
34.45	342.92	206.98	2.12	252.55	2.00	91.01	0.00	0.00
34.61	329.42	198.73	2.02	241.41	2.00	89.67	0.00	0.00
34.78	314.32	188.65	2.00	231.26	2.00	87.95	0.00	0.00
34.94	301.38	179.50	2.05	224.08	2.00	86.31	0.00	0.00
35.11	298.55	176.36	2.15	224.82	2.00	85.73	0.00	0.00
35.27	295.89	173.33	2.28	226.09	2.00	85.16	0.00	0.00
35.43	290.29	168.92	2.34	224.21	2.00	84.30	0.00	0.00
35.60	280.76	162.66	2.33	217.73	2.00	83.06	0.00	0.00
35.76	267.59	153.60	2.39	211.34	2.00	81.17	0.00	0.00
35.93	256.13	144.97	2.58	209.41	2.00	79.26	0.00	0.00
36.09	259.43	146.31	2.65	213.07	2.00	79.56	0.00	0.00
36.26	279.79	159.13	2.56	222.45	2.00	82.33	0.00	0.00
36.42	307.89	177.61	2.39	234.25	2.00	85.96	0.00	0.00
36.58	322.29	185.85	2.45	244.21	2.00	87.46	0.00	0.00
36.75	322.39	184.71	2.55	246.80	2.00	87.25	0.00	0.00
36.91	314.46	178.86	2.63	243.84	2.00	86.19	0.00	0.00
37.08	306.79	174.64	2.51	235.53	2.00	85.40	0.00	0.00
37.24	302.76	173.26	2.32	227.69	2.00	85.14	0.00	0.00
37.40	304.03	175.12	2.16	223.84	2.00	85.49	0.00	0.00
37.57	313.33	182.06	2.01	225.32	2.00	86.78	0.00	0.00
37.73	315.90	186.39	1.73	220.00	2.00	87.55	0.00	0.00
37.90	307.83	184.30	1.45	208.91	2.00	87.18	0.00	0.00
38.06	289.10	174.97	1.21	192.68	0.69	85.46	6.20	0.04
38.22	276.06	166.38	1.18	184.19	0.61	83.80	9.01	0.05
38.39	267.03	160.22	1.17	178.42	0.56	82.56	10.70	0.07
38.55	261.20	156.43	1.15	174.29	0.53	81.77	10.00	0.06
38.72	255.90	153.23	1.11	170.17	0.50	81.09	10.00	0.06
38.88	254.10	151.87	1.10	168.81	0.49	80.79	10.00	0.06
39.04	253.30	150.69	1.13	168.69	0.49	80.54	10.00	0.06
39.21	266.80	159.16	1.15	176.73	0.55	82.34	10.00	0.06
39.37	274.53	162.61	1.25	182.97	0.60	83.05	9.25	0.05
39.54	248.23	139.70	1.79	178.70	0.57	78.04	10.50	0.06

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
39.70	190.84	99.12	2.79	172.55	0.52	66.71	14.50	0.08
39.86	165.70	82.60	3.44	175.00	0.54	60.69	22.70	0.13
40.03	216.23	115.93	2.30	172.90	0.52	71.88	14.50	0.09
40.19	302.10	178.46	1.31	199.15	0.76	86.12	5.37	0.03
40.36	371.43	231.63	0.89	231.63	2.00	94.72	0.00	0.00
40.52	398.13	248.09	0.77	248.09	2.00	96.99	0.00	0.00
40.68	398.23	247.86	0.79	247.86	2.00	96.96	0.00	0.00
40.85	385.63	239.65	0.89	239.65	2.00	95.85	0.00	0.00
41.01	366.42	223.15	1.13	231.35	2.00	93.49	0.00	0.00
41.18	345.54	205.41	1.30	222.82	2.00	90.76	0.00	0.00
41.34	325.85	193.11	1.25	210.01	2.00	88.72	0.00	0.00
41.50	309.33	188.27	0.92	193.29	0.70	87.88	6.12	0.03
41.67	290.46	179.00	0.61	179.00	0.58	86.22	6.20	0.03
41.83	251.46	152.56	0.72	156.20	0.41	80.94	10.00	0.05
42.00	190.46	105.77	1.17	130.11	0.27	68.85	14.50	0.08
42.16	127.76	62.99	2.14	119.88	0.23	51.74	34.10	0.17
42.32	82.76	37.15	2.78	109.69	0.19	34.31	51.20	0.25
42.49	64.53	27.62	2.89	100.16	2.00	24.53	0.00	0.00
42.65	60.01	25.23	2.94	97.74	2.00	21.54	0.00	0.00
42.82	63.14	25.93	3.96	114.92	2.00	22.44	0.00	0.00
42.98	75.01	30.94	4.84	137.49	2.00	28.28	0.00	0.00
43.15	98.25	42.26	4.72	154.71	2.00	38.57	0.00	0.00
43.31	128.25	58.15	4.03	162.45	0.45	49.11	34.10	0.16
43.47	146.07	68.11	3.61	163.79	0.46	54.32	34.10	0.16
43.64	146.06	67.65	3.74	166.81	0.49	54.10	34.10	0.16
43.80	162.26	75.87	3.80	177.70	0.57	57.89	22.70	0.10
43.97	206.15	101.11	3.20	187.11	0.66	67.36	10.80	0.05
44.13	276.15	144.30	2.47	205.41	2.00	79.10	0.00	0.00
44.29	328.28	180.01	1.93	220.71	2.00	86.40	0.00	0.00
44.46	356.61	198.89	1.79	233.48	2.00	89.70	0.00	0.00
44.62	371.47	206.37	1.88	243.85	2.00	90.91	0.00	0.00
44.79	389.24	213.44	2.14	259.55	2.00	92.03	0.00	0.00
44.95	405.40	220.49	2.33	273.04	2.00	93.10	0.00	0.00
45.11	415.04	226.81	2.26	276.50	2.00	94.03	0.00	0.00
45.28	398.87	219.25	2.06	262.30	2.00	92.91	0.00	0.00
45.44	353.91	193.16	1.95	233.72	2.00	88.73	0.00	0.00
45.61	277.21	144.37	2.24	197.57	0.77	79.12	5.56	0.02
45.77	187.28	88.86	3.17	173.74	0.55	63.10	22.70	0.09
45.93	125.34	54.24	4.25	162.63	0.46	46.81	34.10	0.13
46.10	89.88	36.36	4.78	146.32	2.00	33.61	0.00	0.00
46.26	76.64	30.54	4.26	127.72	2.00	27.85	0.00	0.00
46.43	64.31	24.92	4.04	114.46	2.00	21.14	0.00	0.00
46.59	56.44	21.41	3.84	105.00	2.00	16.13	0.00	0.00
46.75	52.54	19.84	3.43	96.43	2.00	13.62	0.00	0.00
46.92	49.41	18.57	3.10	89.70	2.00	11.43	0.00	0.00
47.08	46.60	17.45	2.79	83.41	2.00	9.37	0.00	0.00
47.25	44.80	16.52	2.90	83.29	2.00	7.57	0.00	0.00
47.41	51.04	19.08	3.27	92.86	2.00	12.33	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
47.57	65.57	25.13	4.02	114.48	2.00	21.42	0.00	0.00
47.74	74.20	28.27	5.03	135.22	2.00	25.30	0.00	0.00
47.90	77.66	29.09	6.09	151.69	2.00	26.24	0.00	0.00
48.07	90.63	34.62	6.25	166.33	2.00	31.99	0.00	0.00
48.23	135.46	56.46	5.00	182.06	0.63	48.13	34.10	0.11
48.39	171.32	74.69	4.46	193.74	0.75	57.37	13.04	0.04
48.56	170.32	74.10	4.42	192.17	0.73	57.11	14.26	0.05
48.72	133.53	55.35	4.87	177.68	0.60	47.48	34.10	0.10
48.89	94.63	36.73	5.25	154.85	2.00	33.94	0.00	0.00
49.05	73.66	27.42	5.11	134.64	2.00	24.29	0.00	0.00
49.22	67.43	24.82	4.79	124.85	2.00	21.00	0.00	0.00
49.38	72.07	27.07	4.39	123.65	2.00	23.87	0.00	0.00
49.54	72.97	27.35	4.48	125.40	2.00	24.21	0.00	0.00
49.71	70.23	25.93	4.70	125.82	2.00	22.44	0.00	0.00
49.87	96.36	37.88	4.39	142.05	2.00	34.96	0.00	0.00
50.04	128.60	53.42	4.02	156.36	0.44	46.31	34.10	0.10
50.20	210.58	94.97	3.61	193.27	0.75	65.30	7.24	0.02

Total estimated displacement: 9.96

Abbreviations

q_t:	Total cone resistance
Q_{tn}:	Adjusted cone resistance to an effective overburden stress of 1 atm
R_f:	Friction ration
$Q_{tn,cs}$:	Adjusted and corrected cone resistance due to fines
FS:	Calculated factor of safety against liquefaction
D_r:	Calculated relative density
$Gamma_{max}$:	Calculated maximum cyclic shear strain
Lat. disp.:	Lateral displacement

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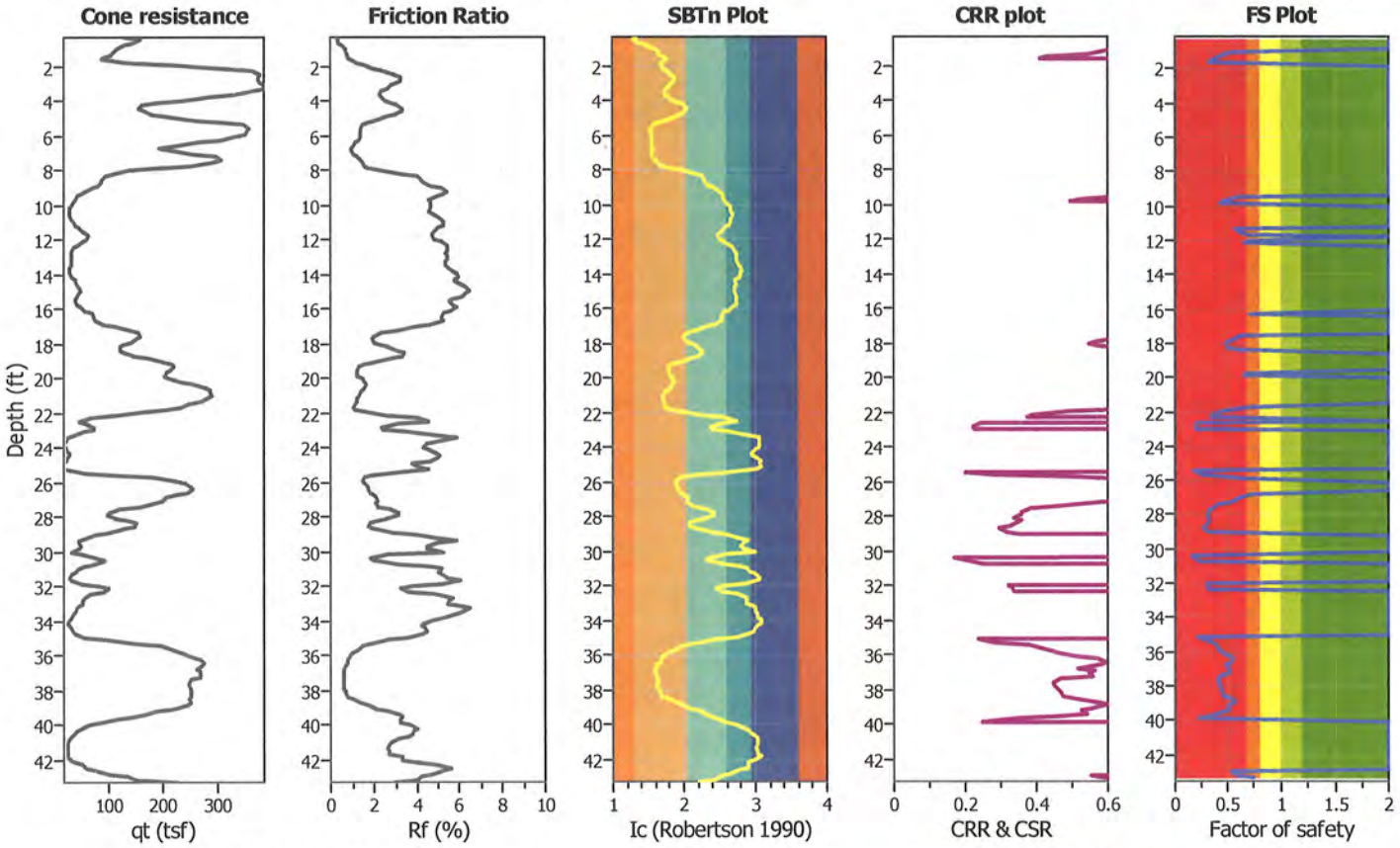
LIQUEFACTION ANALYSIS REPORT

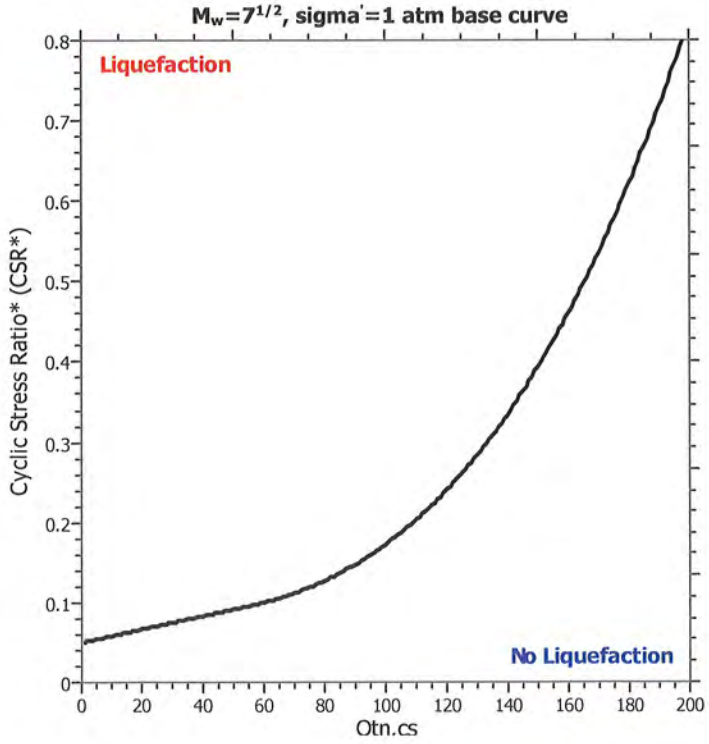
Project title : Lake Elsinore Apartments **Location : Lake Elsinore, CA**

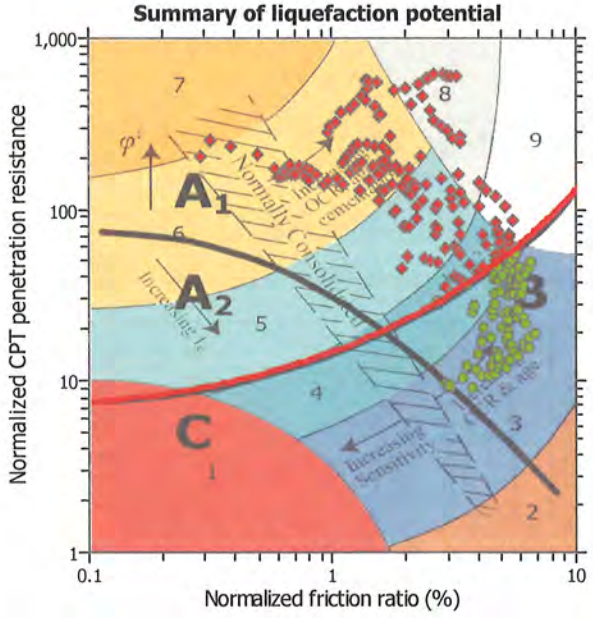
CPT file : CPT-02

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	34.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	0.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.95	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

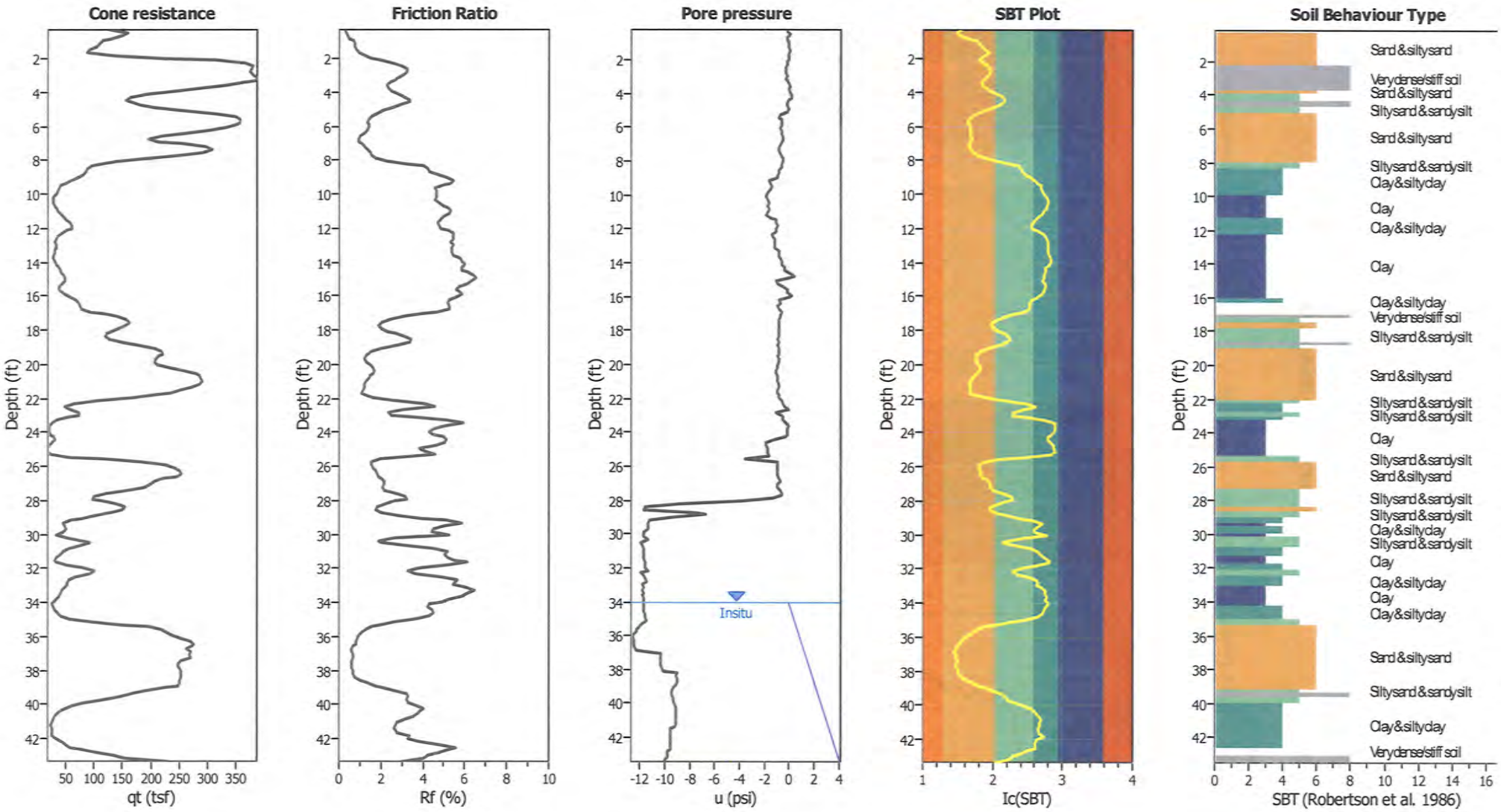






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



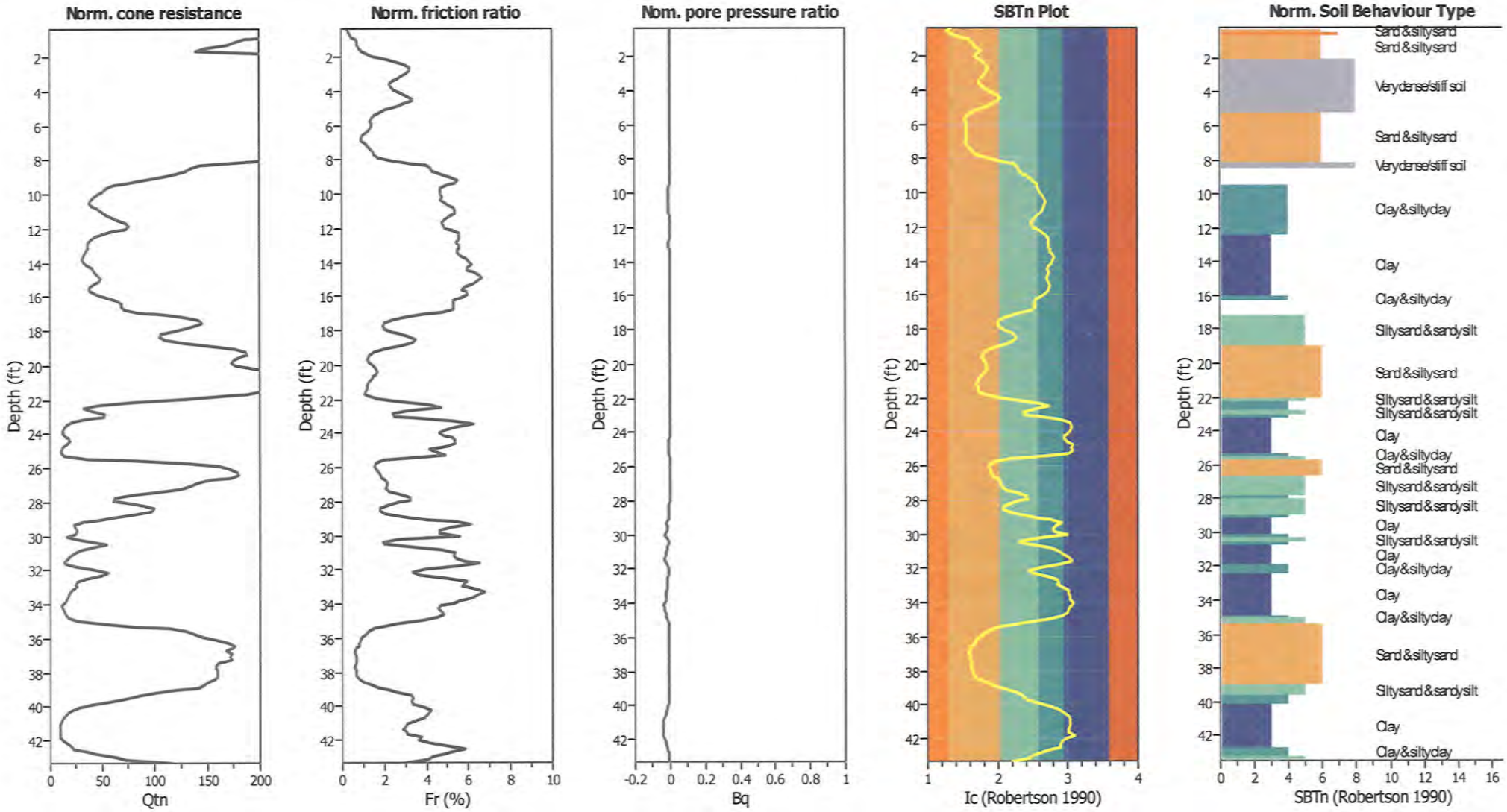
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

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

CPT basic interpretation plots (normalized)



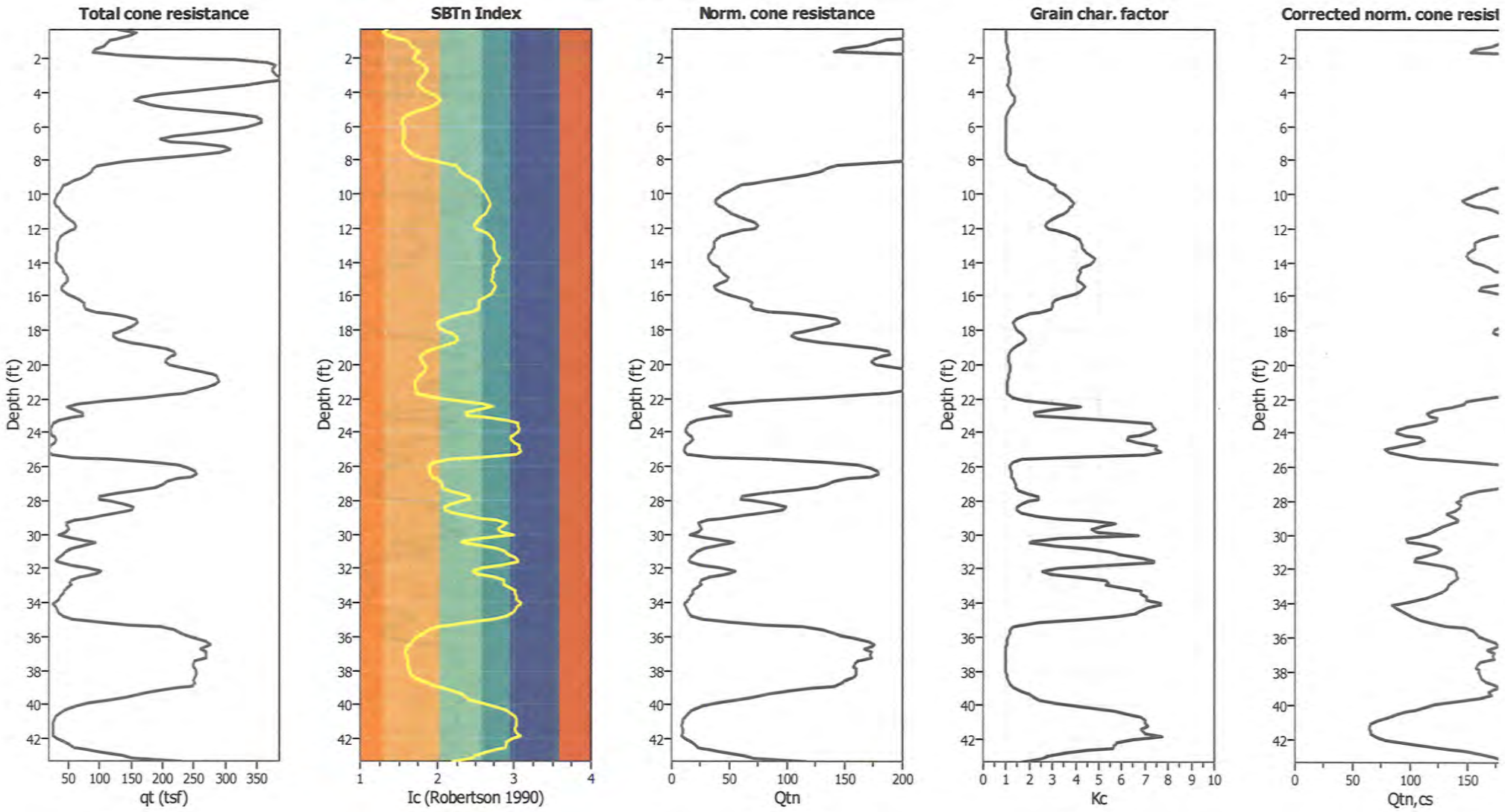
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

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

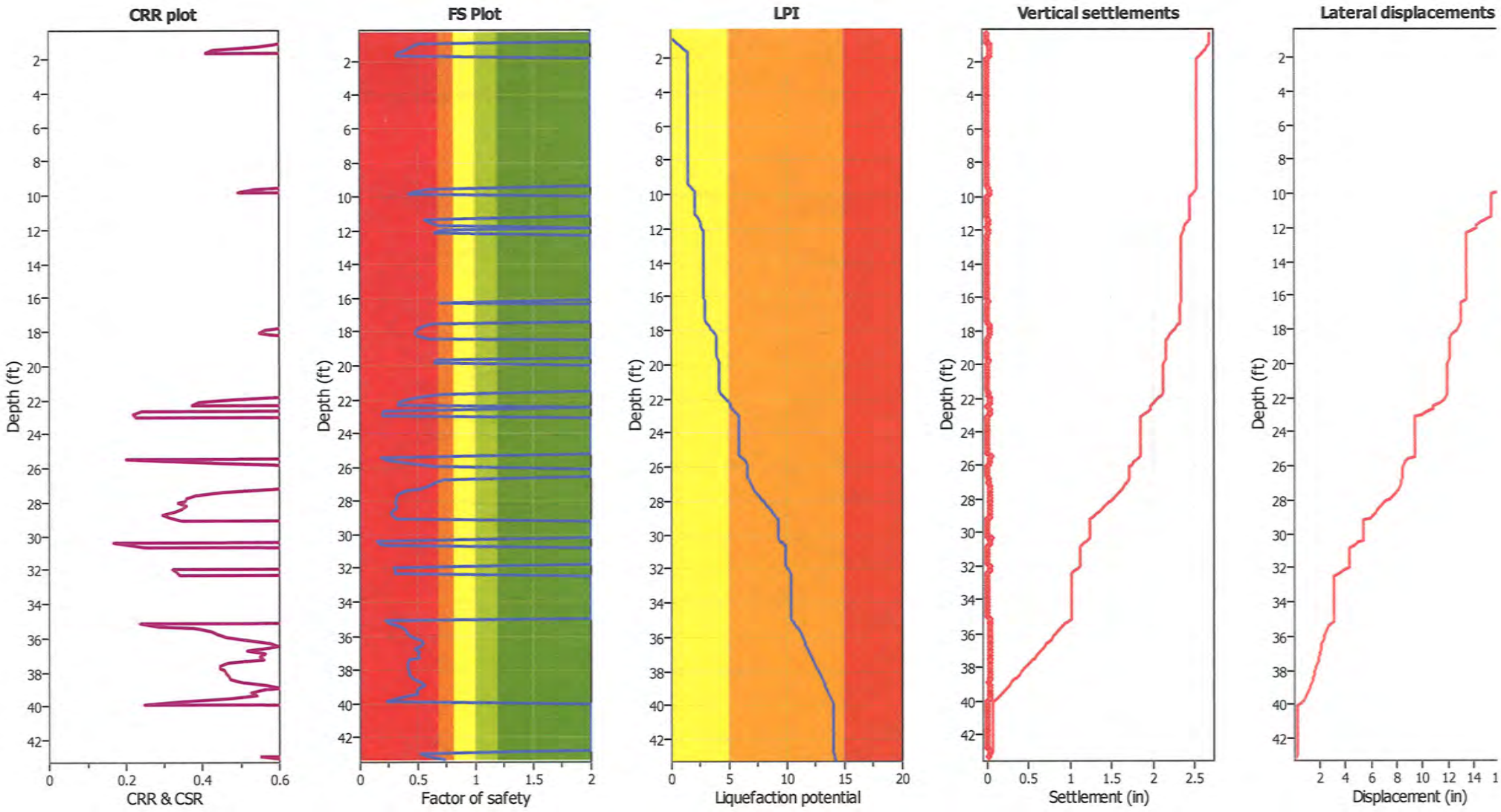
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

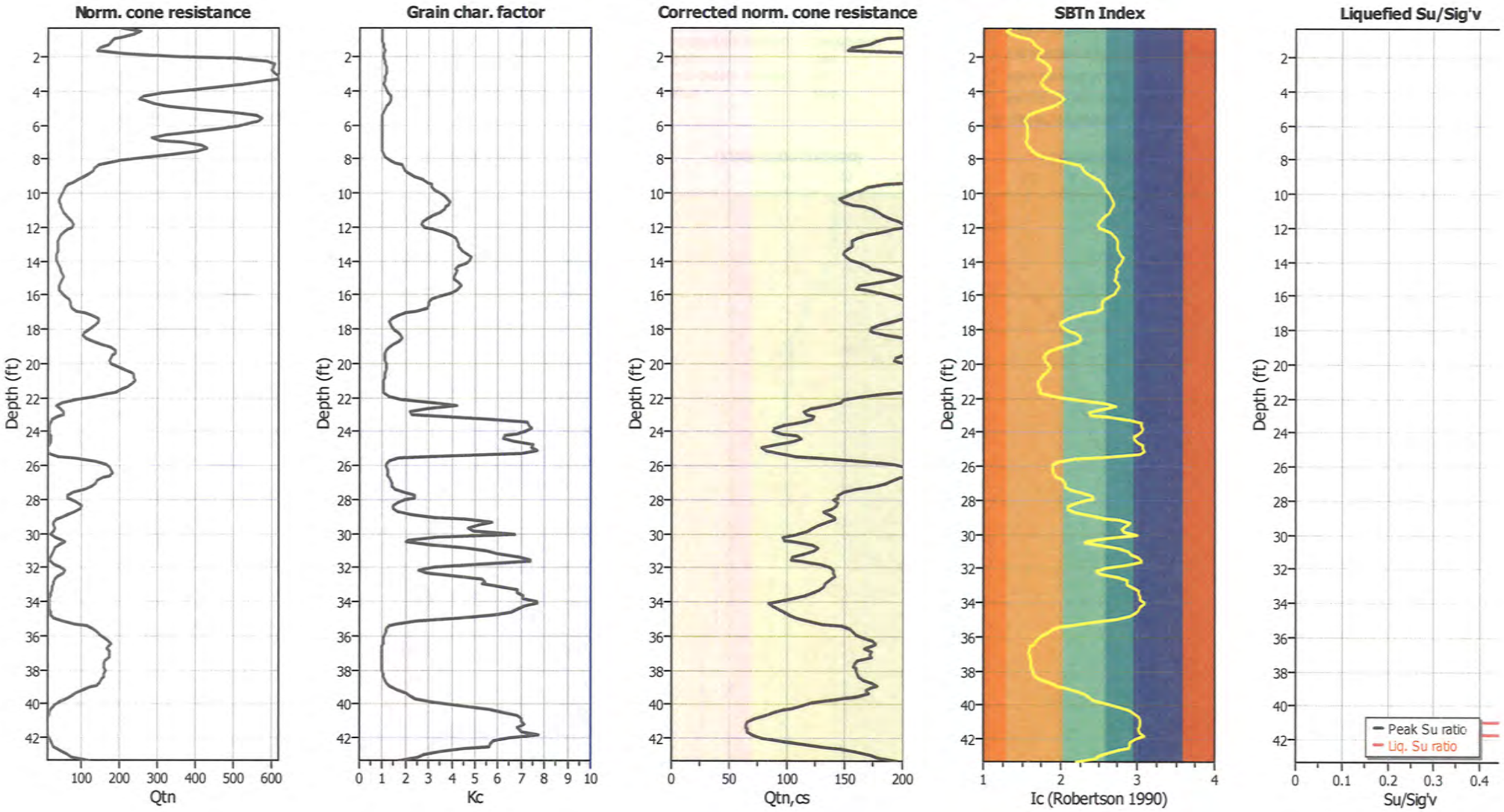
F.S. color scheme

- 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

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	0.00 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:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.95	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	34.00 ft	Fill height:	N/A	Limit depth:	N/A

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data ::

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1	0.33	0.02	0.01	0.01	1.00	1.354	1.00	1.355	1.00	1.00	1.355	No
2	0.49	0.03	0.02	0.01	1.00	1.342	1.00	1.342	1.00	1.00	1.342	No
3	0.66	0.04	0.02	0.02	1.00	1.332	1.00	1.333	1.00	1.00	1.333	No
4	0.82	0.05	0.03	0.02	1.00	1.325	1.00	1.326	1.00	1.00	1.326	No
5	0.98	0.06	0.03	0.03	1.00	1.319	1.00	1.319	1.00	1.00	1.319	No
6	1.15	0.07	0.04	0.03	1.00	1.313	1.00	1.313	1.00	1.00	1.313	No
7	1.31	0.08	0.04	0.04	1.00	1.309	1.00	1.309	1.00	1.00	1.309	No
8	1.48	0.09	0.05	0.04	1.00	1.307	1.00	1.307	1.00	1.00	1.307	No
9	1.64	0.10	0.05	0.05	1.00	1.305	1.00	1.305	1.00	1.00	1.305	No
10	1.80	0.11	0.06	0.05	1.00	1.296	1.00	1.297	1.00	1.00	1.297	No
11	1.97	0.12	0.06	0.06	1.00	1.282	1.00	1.282	1.00	1.00	1.282	No
12	2.13	0.13	0.07	0.06	1.00	1.267	1.00	1.267	1.00	1.00	1.267	No
13	2.30	0.14	0.07	0.07	1.00	1.254	1.00	1.254	1.00	1.00	1.254	No
14	2.46	0.15	0.08	0.08	1.00	1.243	1.00	1.244	1.00	1.00	1.244	No
15	2.62	0.16	0.08	0.08	1.00	1.234	1.00	1.235	1.00	1.00	1.235	No
16	2.79	0.17	0.09	0.09	1.00	1.226	1.00	1.226	1.00	1.00	1.226	No
17	2.95	0.19	0.09	0.09	1.00	1.219	1.00	1.220	1.00	1.00	1.220	No
18	3.12	0.20	0.10	0.10	0.99	1.213	1.00	1.213	1.00	1.00	1.213	No
19	3.28	0.21	0.10	0.11	0.99	1.207	1.00	1.208	1.00	1.00	1.208	No
20	3.45	0.22	0.11	0.11	0.99	1.202	1.00	1.203	1.00	1.00	1.203	No
21	3.61	0.23	0.11	0.12	0.99	1.198	1.00	1.198	1.00	1.00	1.198	No
22	3.77	0.24	0.12	0.12	0.99	1.194	1.00	1.194	1.00	1.00	1.194	No
23	3.94	0.25	0.12	0.13	0.99	1.190	1.00	1.191	1.00	1.00	1.191	No
24	4.10	0.26	0.13	0.14	0.99	1.187	1.00	1.188	1.00	1.00	1.188	No
25	4.27	0.28	0.13	0.14	0.99	1.185	1.00	1.185	1.00	1.00	1.185	No
26	4.43	0.29	0.14	0.15	0.99	1.183	1.00	1.183	1.00	1.00	1.183	No
27	4.59	0.30	0.14	0.15	0.99	1.181	1.00	1.181	1.00	1.00	1.181	No
28	4.76	0.31	0.15	0.16	0.99	1.179	1.00	1.179	1.00	1.00	1.179	No
29	4.92	0.32	0.15	0.17	0.99	1.177	1.00	1.177	1.00	1.00	1.177	No
30	5.09	0.33	0.16	0.17	0.99	1.174	1.00	1.175	1.00	1.00	1.175	No
31	5.25	0.34	0.16	0.18	0.99	1.172	1.00	1.173	1.00	1.00	1.173	No
32	5.41	0.35	0.17	0.18	0.99	1.170	1.00	1.171	1.00	1.00	1.171	No
33	5.58	0.36	0.17	0.19	0.99	1.168	1.00	1.169	1.00	1.00	1.169	No
34	5.74	0.38	0.18	0.20	0.99	1.167	1.00	1.167	1.00	1.00	1.167	No
35	5.91	0.39	0.18	0.20	0.99	1.165	1.00	1.165	1.00	1.00	1.165	No
36	6.07	0.40	0.19	0.21	0.99	1.163	1.00	1.164	1.00	1.00	1.164	No
37	6.23	0.41	0.19	0.21	0.99	1.162	1.00	1.163	1.00	1.00	1.163	No
38	6.40	0.42	0.20	0.22	0.99	1.162	1.00	1.162	1.00	1.00	1.162	No
39	6.56	0.43	0.20	0.23	0.99	1.162	1.00	1.162	1.00	1.00	1.162	No
40	6.73	0.44	0.21	0.23	0.99	1.162	1.00	1.162	1.00	1.00	1.162	No
41	6.89	0.45	0.21	0.24	0.99	1.162	1.00	1.162	1.00	1.00	1.162	No
42	7.05	0.46	0.22	0.24	0.99	1.162	1.00	1.162	1.00	1.00	1.162	No
43	7.22	0.47	0.23	0.25	0.99	1.161	1.00	1.161	1.00	1.00	1.161	No
44	7.38	0.48	0.23	0.25	0.98	1.160	1.00	1.160	1.00	1.00	1.160	No
45	7.55	0.50	0.24	0.26	0.98	1.158	1.00	1.159	1.00	1.00	1.159	No
46	7.71	0.51	0.24	0.27	0.98	1.158	1.00	1.158	1.00	1.00	1.158	No
47	7.87	0.52	0.25	0.27	0.98	1.157	1.00	1.158	1.00	1.00	1.158	No
48	8.04	0.53	0.25	0.28	0.98	1.157	1.00	1.157	1.00	1.00	1.157	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
49	8.20	0.54	0.26	0.28	0.98	1.156	1.00	1.157	1.00	1.00	1.157	No
50	8.37	0.55	0.26	0.29	0.98	1.156	1.00	1.156	1.00	1.00	1.156	No
51	8.53	0.56	0.27	0.29	0.98	1.156	1.00	1.156	1.00	1.00	1.156	No
52	8.69	0.57	0.27	0.30	0.98	1.155	1.00	1.156	1.00	1.00	1.156	No
53	8.86	0.58	0.28	0.31	0.98	1.155	1.00	1.155	1.00	1.00	1.155	No
54	9.02	0.59	0.28	0.31	0.98	1.155	1.00	1.155	1.00	1.00	1.155	No
55	9.19	0.60	0.29	0.32	0.98	1.155	1.00	1.155	1.00	1.00	1.155	No
56	9.35	0.61	0.29	0.32	0.98	1.155	1.00	1.155	1.00	1.00	1.155	No
57	9.51	0.62	0.30	0.33	0.98	1.156	1.00	1.156	1.00	1.00	1.156	No
58	9.68	0.63	0.30	0.33	0.98	1.156	1.00	1.157	1.00	1.00	1.157	No
59	9.84	0.64	0.31	0.34	0.98	1.157	1.00	1.157	1.00	1.00	1.157	No
60	10.01	0.65	0.31	0.34	0.98	1.158	1.00	1.158	1.00	1.00	1.158	No
61	10.17	0.66	0.32	0.35	0.98	1.159	1.00	1.159	1.00	1.00	1.159	No
62	10.34	0.67	0.32	0.35	0.98	1.160	1.00	1.160	1.00	1.00	1.160	No
63	10.50	0.68	0.33	0.36	0.98	1.160	1.00	1.161	1.00	1.00	1.161	No
64	10.66	0.69	0.33	0.36	0.98	1.161	1.00	1.161	1.00	1.00	1.161	No
65	10.83	0.70	0.34	0.37	0.98	1.162	1.00	1.162	1.00	1.00	1.162	No
66	10.99	0.71	0.34	0.37	0.98	1.162	1.00	1.162	1.00	1.00	1.162	No
67	11.16	0.72	0.35	0.38	0.98	1.162	1.00	1.162	1.00	1.00	1.162	No
68	11.32	0.73	0.35	0.38	0.98	1.162	1.00	1.163	1.00	1.00	1.163	No
69	11.48	0.74	0.36	0.39	0.98	1.162	1.00	1.163	1.00	1.00	1.163	No
70	11.65	0.75	0.36	0.39	0.98	1.162	1.00	1.162	1.00	1.00	1.162	No
71	11.81	0.77	0.37	0.40	0.98	1.162	1.00	1.162	1.00	1.00	1.162	No
72	11.98	0.78	0.37	0.40	0.97	1.161	1.00	1.162	1.00	1.00	1.162	No
73	12.14	0.79	0.38	0.41	0.97	1.161	1.00	1.162	1.00	1.00	1.162	No
74	12.30	0.80	0.38	0.41	0.97	1.161	1.00	1.162	1.00	1.00	1.162	No
75	12.47	0.81	0.39	0.42	0.97	1.162	1.00	1.162	1.00	1.00	1.162	No
76	12.63	0.82	0.39	0.42	0.97	1.162	1.00	1.162	1.00	1.00	1.162	No
77	12.80	0.83	0.40	0.43	0.97	1.162	1.00	1.163	1.00	1.00	1.163	No
78	12.96	0.84	0.40	0.43	0.97	1.162	1.00	1.163	1.00	1.00	1.163	No
79	13.12	0.85	0.41	0.44	0.97	1.163	1.00	1.163	1.00	1.00	1.163	No
80	13.29	0.86	0.41	0.44	0.97	1.163	1.00	1.163	1.00	1.00	1.163	No
81	13.45	0.87	0.42	0.45	0.97	1.163	1.00	1.164	1.00	1.00	1.164	No
82	13.62	0.88	0.42	0.45	0.97	1.163	1.00	1.164	1.00	1.00	1.164	No
83	13.78	0.89	0.43	0.46	0.97	1.164	1.00	1.164	1.00	1.00	1.164	No
84	13.94	0.90	0.43	0.46	0.97	1.164	1.00	1.164	1.00	1.00	1.164	No
85	14.11	0.91	0.44	0.47	0.97	1.164	1.00	1.164	1.00	1.00	1.164	No
86	14.27	0.92	0.45	0.47	0.97	1.164	1.00	1.164	1.00	1.00	1.164	No
87	14.44	0.93	0.45	0.48	0.97	1.164	1.00	1.164	1.00	1.00	1.164	No
88	14.60	0.94	0.46	0.48	0.97	1.164	1.00	1.164	1.00	1.00	1.164	No
89	14.76	0.95	0.46	0.49	0.97	1.163	1.00	1.164	1.00	1.00	1.164	No
90	14.93	0.96	0.47	0.49	0.97	1.163	1.00	1.163	1.00	1.00	1.163	No
91	15.09	0.97	0.47	0.50	0.97	1.163	1.00	1.163	1.00	1.00	1.163	No
92	15.26	0.98	0.48	0.50	0.97	1.162	1.00	1.163	1.00	1.00	1.163	No
93	15.42	0.99	0.48	0.51	0.97	1.162	1.00	1.163	1.00	1.00	1.163	No
94	15.58	1.00	0.49	0.51	0.97	1.162	1.00	1.163	1.00	1.00	1.163	No
95	15.75	1.01	0.49	0.52	0.97	1.162	1.00	1.162	1.00	1.00	1.162	No
96	15.91	1.02	0.50	0.52	0.97	1.162	1.00	1.162	1.00	1.00	1.162	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR*	Belongs to transition
97	16.08	1.03	0.50	0.53	0.97	1.161	1.00	1.162	1.00	1.00	1.162	No
98	16.24	1.04	0.51	0.54	0.97	1.161	1.00	1.161	1.00	1.00	1.161	No
99	16.40	1.05	0.51	0.54	0.97	1.160	1.00	1.160	1.00	1.00	1.160	No
100	16.57	1.06	0.52	0.55	0.97	1.159	1.00	1.160	1.00	1.00	1.160	No
101	16.73	1.07	0.52	0.55	0.96	1.159	1.00	1.159	1.00	1.00	1.159	No
102	16.90	1.09	0.53	0.56	0.96	1.158	1.00	1.158	1.00	1.00	1.158	No
103	17.06	1.10	0.53	0.56	0.96	1.157	1.00	1.158	1.00	1.00	1.158	No
104	17.23	1.11	0.54	0.57	0.96	1.156	1.00	1.157	1.00	1.00	1.157	No
105	17.39	1.12	0.54	0.58	0.96	1.156	1.00	1.156	1.00	1.00	1.156	No
106	17.55	1.13	0.55	0.58	0.96	1.155	1.00	1.155	1.00	1.00	1.155	No
107	17.72	1.14	0.55	0.59	0.96	1.154	1.00	1.155	1.00	1.00	1.155	No
108	17.88	1.15	0.56	0.59	0.96	1.154	1.00	1.154	1.00	1.00	1.154	No
109	18.05	1.16	0.56	0.60	0.96	1.153	1.00	1.154	1.00	1.00	1.154	No
110	18.21	1.17	0.57	0.60	0.96	1.152	1.00	1.153	1.00	1.00	1.153	No
111	18.37	1.18	0.57	0.61	0.96	1.152	1.00	1.152	1.00	1.00	1.152	No
112	18.54	1.19	0.58	0.62	0.96	1.151	1.00	1.151	1.00	1.00	1.151	No
113	18.70	1.20	0.58	0.62	0.96	1.150	1.00	1.151	1.00	1.00	1.151	No
114	18.87	1.22	0.59	0.63	0.96	1.149	1.00	1.150	1.00	1.00	1.150	No
115	19.03	1.23	0.59	0.63	0.96	1.148	1.00	1.149	1.00	1.00	1.149	No
116	19.19	1.24	0.60	0.64	0.96	1.148	1.00	1.148	1.00	1.00	1.148	No
117	19.36	1.25	0.60	0.64	0.96	1.147	1.00	1.147	1.00	1.00	1.147	No
118	19.52	1.26	0.61	0.65	0.96	1.146	1.00	1.147	1.00	1.00	1.147	No
119	19.69	1.27	0.61	0.66	0.96	1.146	1.00	1.146	1.00	1.00	1.146	No
120	19.85	1.28	0.62	0.66	0.96	1.145	1.00	1.146	1.00	1.00	1.146	No
121	20.01	1.29	0.62	0.67	0.96	1.145	1.00	1.145	1.00	1.00	1.145	No
122	20.18	1.30	0.63	0.67	0.96	1.144	1.00	1.144	1.00	1.00	1.144	No
123	20.34	1.31	0.63	0.68	0.96	1.143	1.00	1.143	1.00	1.00	1.143	No
124	20.51	1.32	0.64	0.68	0.96	1.142	1.00	1.142	1.00	1.00	1.142	No
125	20.67	1.33	0.64	0.69	0.96	1.141	1.00	1.141	1.00	1.00	1.141	No
126	20.83	1.35	0.65	0.70	0.95	1.140	1.00	1.141	1.00	1.00	1.141	No
127	21.00	1.36	0.66	0.70	0.95	1.139	1.00	1.140	1.00	1.00	1.140	No
128	21.16	1.37	0.66	0.71	0.95	1.139	1.00	1.139	1.00	1.00	1.139	No
129	21.33	1.38	0.67	0.71	0.95	1.138	1.00	1.138	1.00	1.00	1.138	No
130	21.49	1.39	0.67	0.72	0.95	1.137	1.00	1.138	1.00	1.00	1.138	No
131	21.65	1.40	0.68	0.72	0.95	1.137	1.00	1.137	1.00	1.00	1.137	No
132	21.82	1.41	0.68	0.73	0.95	1.136	1.00	1.136	1.00	1.00	1.136	No
133	21.98	1.42	0.69	0.74	0.95	1.135	1.00	1.136	1.00	1.00	1.136	No
134	22.15	1.43	0.69	0.74	0.95	1.135	1.00	1.135	1.00	1.00	1.135	No
135	22.31	1.44	0.70	0.75	0.95	1.134	1.00	1.135	1.00	1.00	1.135	No
136	22.47	1.45	0.70	0.75	0.95	1.134	1.00	1.134	1.00	1.00	1.134	No
137	22.64	1.46	0.71	0.76	0.95	1.134	1.00	1.134	1.00	1.00	1.134	No
138	22.80	1.47	0.71	0.76	0.95	1.133	1.00	1.134	1.00	1.00	1.134	No
139	22.97	1.48	0.72	0.77	0.95	1.133	1.00	1.133	1.00	1.00	1.133	No
140	23.13	1.49	0.72	0.77	0.95	1.133	1.00	1.133	1.00	1.00	1.133	No
141	23.30	1.50	0.73	0.78	0.95	1.132	1.00	1.133	1.00	1.00	1.133	No
142	23.46	1.51	0.73	0.78	0.95	1.132	1.00	1.133	1.00	1.00	1.133	No
143	23.62	1.52	0.74	0.79	0.95	1.132	1.00	1.133	1.00	1.00	1.133	No
144	23.79	1.53	0.74	0.79	0.95	1.132	1.00	1.133	1.00	1.00	1.133	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
145	23.95	1.54	0.75	0.80	0.95	1.132	1.00	1.133	1.00	1.00	1.133	No
146	24.12	1.55	0.75	0.80	0.94	1.132	1.00	1.133	1.00	1.00	1.133	No
147	24.28	1.56	0.76	0.80	0.94	1.132	1.00	1.132	1.00	1.00	1.132	No
148	24.44	1.57	0.76	0.81	0.94	1.132	1.00	1.132	1.00	1.00	1.132	No
149	24.61	1.58	0.77	0.81	0.94	1.132	1.00	1.132	1.00	1.00	1.132	No
150	24.77	1.59	0.77	0.82	0.94	1.132	1.00	1.132	1.00	1.00	1.132	No
151	24.94	1.60	0.78	0.82	0.94	1.132	1.00	1.132	1.00	1.00	1.132	No
152	25.10	1.61	0.78	0.83	0.94	1.132	1.00	1.132	1.00	1.00	1.132	No
153	25.26	1.62	0.79	0.83	0.94	1.131	1.00	1.132	1.00	1.00	1.132	No
154	25.43	1.63	0.79	0.84	0.94	1.131	1.00	1.131	1.00	1.00	1.131	No
155	25.59	1.64	0.80	0.84	0.94	1.130	1.00	1.131	1.00	1.00	1.131	No
156	25.76	1.65	0.80	0.85	0.94	1.129	1.00	1.130	1.00	1.00	1.130	No
157	25.92	1.66	0.81	0.85	0.94	1.128	1.00	1.129	1.00	1.00	1.129	No
158	26.08	1.67	0.81	0.86	0.94	1.127	1.00	1.128	1.00	1.00	1.128	No
159	26.25	1.68	0.82	0.87	0.94	1.126	1.00	1.127	1.00	1.00	1.127	No
160	26.41	1.70	0.82	0.87	0.94	1.125	1.00	1.126	1.00	1.00	1.126	No
161	26.58	1.71	0.83	0.88	0.94	1.124	1.00	1.124	1.00	1.00	1.124	No
162	26.74	1.72	0.83	0.88	0.94	1.123	1.00	1.123	1.00	1.00	1.123	No
163	26.90	1.73	0.84	0.89	0.93	1.122	1.00	1.122	1.00	1.00	1.122	No
164	27.07	1.74	0.84	0.90	0.93	1.121	1.00	1.121	1.00	1.00	1.121	No
165	27.23	1.75	0.85	0.90	0.93	1.120	1.00	1.120	1.00	1.00	1.120	No
166	27.40	1.76	0.85	0.91	0.93	1.119	1.00	1.119	1.00	1.00	1.119	No
167	27.56	1.77	0.86	0.91	0.93	1.118	1.00	1.118	1.00	1.00	1.118	No
168	27.72	1.78	0.86	0.92	0.93	1.117	1.00	1.117	1.00	1.00	1.117	No
169	27.89	1.79	0.87	0.92	0.93	1.116	1.00	1.117	1.00	1.00	1.117	No
170	28.05	1.80	0.88	0.93	0.93	1.115	1.00	1.116	1.00	1.00	1.116	No
171	28.22	1.81	0.88	0.93	0.93	1.114	1.00	1.115	1.00	1.00	1.115	No
172	28.38	1.83	0.89	0.94	0.93	1.113	1.00	1.114	1.00	1.00	1.114	No
173	28.54	1.84	0.89	0.95	0.93	1.112	1.00	1.113	1.00	1.00	1.113	No
174	28.71	1.85	0.90	0.95	0.93	1.111	1.00	1.112	1.00	1.00	1.112	No
175	28.87	1.86	0.90	0.96	0.93	1.110	1.00	1.111	1.00	1.00	1.111	No
176	29.04	1.87	0.91	0.96	0.93	1.110	1.00	1.110	1.00	1.00	1.110	No
177	29.20	1.88	0.91	0.97	0.92	1.109	1.00	1.109	1.00	1.00	1.109	No
178	29.36	1.89	0.92	0.97	0.92	1.108	1.00	1.108	1.00	1.00	1.108	No
179	29.53	1.90	0.92	0.98	0.92	1.107	1.00	1.107	1.00	1.00	1.107	No
180	29.69	1.91	0.93	0.98	0.92	1.106	1.00	1.107	1.00	1.00	1.107	No
181	29.86	1.92	0.93	0.99	0.92	1.105	1.00	1.106	1.00	1.00	1.106	No
182	30.02	1.93	0.94	0.99	0.92	1.105	1.00	1.105	1.00	1.00	1.105	No
183	30.19	1.94	0.94	1.00	0.92	1.104	1.00	1.104	1.00	1.00	1.104	No
184	30.35	1.95	0.95	1.00	0.92	1.103	1.00	1.103	1.00	1.00	1.103	No
185	30.51	1.96	0.95	1.01	0.92	1.102	1.00	1.103	1.00	1.00	1.103	No
186	30.68	1.97	0.96	1.01	0.92	1.101	1.00	1.102	1.00	1.00	1.102	No
187	30.84	1.98	0.96	1.02	0.92	1.100	1.00	1.101	1.00	1.00	1.101	No
188	31.01	1.99	0.97	1.02	0.92	1.099	1.00	1.100	1.00	1.00	1.100	No
189	31.17	2.00	0.97	1.03	0.91	1.098	1.00	1.099	1.00	1.00	1.099	No
190	31.33	2.01	0.98	1.03	0.91	1.097	1.00	1.098	1.00	1.00	1.098	No
191	31.50	2.02	0.98	1.04	0.91	1.097	1.00	1.097	1.00	1.00	1.097	No
192	31.66	2.03	0.99	1.04	0.91	1.096	1.00	1.096	1.00	1.00	1.096	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR*	Belongs to transition
193	31.83	2.04	0.99	1.05	0.91	1.095	1.00	1.095	1.00	1.00	1.095	No
194	31.99	2.05	1.00	1.05	0.91	1.093	1.00	1.094	1.00	1.00	1.094	No
195	32.15	2.06	1.00	1.06	0.91	1.092	1.00	1.093	1.00	1.00	1.093	No
196	32.32	2.07	1.01	1.07	0.91	1.091	1.00	1.091	1.00	1.00	1.093	No
197	32.48	2.08	1.01	1.07	0.91	1.090	1.00	1.090	1.00	1.00	1.093	No
198	32.65	2.10	1.02	1.08	0.91	1.089	1.00	1.089	1.00	1.00	1.093	No
199	32.81	2.11	1.02	1.08	0.90	1.087	1.00	1.088	0.99	1.00	1.093	No
200	32.97	2.12	1.03	1.09	0.90	1.086	1.00	1.087	0.99	1.00	1.093	No
201	33.14	2.13	1.03	1.09	0.90	1.085	1.00	1.085	0.99	1.00	1.094	No
202	33.30	2.14	1.04	1.10	0.90	1.084	1.00	1.084	0.99	1.00	1.094	No
203	33.47	2.15	1.04	1.10	0.90	1.083	1.00	1.083	0.99	1.00	1.094	No
204	33.63	2.16	1.05	1.11	0.90	1.082	1.00	1.082	0.99	1.00	1.094	No
205	33.79	2.17	1.05	1.11	0.90	1.081	1.00	1.081	0.99	1.00	1.094	No
206	33.96	2.18	1.06	1.12	0.90	1.080	1.00	1.080	0.99	1.00	1.094	No
207	34.12	2.19	1.06	1.12	0.90	1.079	1.00	1.079	0.99	1.00	1.094	No
208	34.29	2.20	1.07	1.13	0.90	1.078	1.00	1.078	0.99	1.00	1.094	No
209	34.45	2.21	1.07	1.13	0.89	1.077	1.00	1.077	0.98	1.00	1.094	No
210	34.61	2.22	1.08	1.14	0.89	1.075	1.00	1.076	0.98	1.00	1.094	No
211	34.78	2.23	1.09	1.14	0.89	1.074	1.00	1.075	0.98	1.00	1.094	No
212	34.94	2.24	1.09	1.15	0.89	1.073	1.00	1.073	0.98	1.00	1.094	No
213	35.11	2.25	1.10	1.15	0.89	1.072	1.00	1.072	0.98	1.00	1.093	No
214	35.27	2.26	1.10	1.16	0.89	1.070	1.00	1.071	0.98	1.00	1.093	No
215	35.43	2.27	1.11	1.16	0.89	1.069	1.00	1.069	0.98	1.00	1.093	No
216	35.60	2.28	1.11	1.17	0.89	1.067	1.00	1.067	0.98	1.00	1.092	No
217	35.76	2.29	1.12	1.18	0.89	1.066	1.00	1.066	0.98	1.00	1.092	No
218	35.93	2.30	1.12	1.18	0.88	1.064	1.00	1.064	0.98	1.00	1.092	No
219	36.09	2.31	1.13	1.19	0.88	1.063	1.00	1.063	0.97	1.00	1.091	No
220	36.26	2.32	1.13	1.19	0.88	1.061	1.00	1.061	0.97	1.00	1.091	No
221	36.42	2.33	1.14	1.20	0.88	1.060	1.00	1.060	0.97	1.00	1.090	No
222	36.58	2.34	1.14	1.20	0.88	1.058	1.00	1.058	0.97	1.00	1.090	No
223	36.75	2.35	1.15	1.21	0.88	1.057	1.00	1.057	0.97	1.00	1.090	No
224	36.91	2.36	1.15	1.21	0.88	1.055	1.00	1.055	0.97	1.00	1.089	No
225	37.08	2.38	1.16	1.22	0.88	1.054	1.00	1.054	0.97	1.00	1.089	No
226	37.24	2.39	1.16	1.22	0.87	1.052	1.00	1.052	0.97	1.00	1.088	No
227	37.40	2.40	1.17	1.23	0.87	1.051	1.00	1.051	0.97	1.00	1.088	No
228	37.57	2.41	1.17	1.23	0.87	1.049	1.00	1.049	0.97	1.00	1.087	No
229	37.73	2.42	1.18	1.24	0.87	1.047	1.00	1.048	0.96	1.00	1.087	No
230	37.90	2.43	1.18	1.25	0.87	1.046	1.00	1.046	0.96	1.00	1.086	No
231	38.06	2.44	1.19	1.25	0.87	1.044	1.00	1.045	0.96	1.00	1.086	No
232	38.22	2.45	1.19	1.26	0.87	1.043	1.00	1.043	0.96	1.00	1.085	No
233	38.39	2.46	1.20	1.26	0.86	1.041	1.00	1.041	0.96	1.00	1.084	No
234	38.55	2.47	1.20	1.27	0.86	1.039	1.00	1.040	0.96	1.00	1.084	No
235	38.72	2.48	1.21	1.27	0.86	1.038	1.00	1.038	0.96	1.00	1.083	No
236	38.88	2.49	1.21	1.28	0.86	1.036	1.00	1.036	0.96	1.00	1.082	No
237	39.04	2.50	1.22	1.28	0.86	1.034	1.00	1.034	0.96	1.00	1.081	No
238	39.21	2.51	1.22	1.29	0.86	1.032	1.00	1.032	0.96	1.00	1.081	No
239	39.37	2.52	1.23	1.30	0.86	1.030	1.00	1.030	0.95	1.00	1.080	No
240	39.54	2.54	1.23	1.30	0.86	1.028	1.00	1.028	0.95	1.00	1.079	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
241	39.70	2.55	1.24	1.31	0.85	1.026	1.00	1.027	0.95	1.00	1.078	No
242	39.86	2.56	1.24	1.31	0.85	1.025	1.00	1.025	0.95	1.00	1.077	No
243	40.03	2.57	1.25	1.32	0.85	1.023	1.00	1.023	0.95	1.00	1.076	No
244	40.19	2.58	1.25	1.32	0.85	1.021	1.00	1.022	0.95	1.00	1.076	No
245	40.36	2.59	1.26	1.33	0.85	1.020	1.00	1.020	0.95	1.00	1.075	No
246	40.52	2.60	1.26	1.33	0.85	1.018	1.00	1.018	0.95	1.00	1.074	No
247	40.68	2.61	1.27	1.34	0.84	1.017	1.00	1.017	0.95	1.00	1.073	No
248	40.85	2.62	1.27	1.34	0.84	1.015	1.00	1.015	0.95	1.00	1.073	No
249	41.01	2.63	1.28	1.35	0.84	1.014	1.00	1.014	0.95	1.00	1.072	No
250	41.18	2.64	1.28	1.35	0.84	1.012	1.00	1.013	0.95	1.00	1.071	No
251	41.34	2.65	1.29	1.36	0.84	1.011	1.00	1.011	0.94	1.00	1.071	No
252	41.50	2.65	1.29	1.36	0.84	1.009	1.00	1.010	0.94	1.00	1.070	No
253	41.67	2.66	1.30	1.36	0.84	1.008	1.00	1.008	0.94	1.00	1.069	No
254	41.83	2.67	1.31	1.37	0.83	1.006	1.00	1.007	0.94	1.00	1.068	No
255	42.00	2.68	1.31	1.37	0.83	1.005	1.00	1.005	0.94	1.00	1.067	No
256	42.16	2.69	1.32	1.38	0.83	1.003	1.00	1.003	0.94	1.00	1.066	No
257	42.32	2.70	1.32	1.38	0.83	1.001	1.00	1.002	0.94	1.00	1.065	No
258	42.49	2.72	1.33	1.39	0.83	0.999	1.00	1.000	0.94	1.00	1.064	No
259	42.65	2.73	1.33	1.39	0.83	0.997	1.00	0.998	0.94	1.00	1.063	No
260	42.82	2.74	1.34	1.40	0.83	0.995	1.00	0.996	0.94	1.00	1.062	No
261	42.98	2.75	1.34	1.41	0.82	0.993	1.00	0.994	0.94	1.00	1.061	No
262	43.15	2.76	1.35	1.41	0.82	0.991	1.00	0.991	0.94	1.00	1.060	No
263	43.31	2.77	1.35	1.42	0.82	0.989	1.00	0.989	0.93	1.00	1.058	No

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
σ_v: Total overburden pressure at test point (tsf)
u_0: Water pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio
MSF: Magnitude Scaling Factor
CSR_{eq}: CSR adjusted for M=7.5
K_σ: Effective overburden stress factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) calculation data ::

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1	0.33	127.30	1.34	0.29	0.50	204.49	1.00	204.49	4.000	No	No	2.00
2	0.49	158.47	1.28	0.32	0.50	254.55	1.00	254.55	4.000	No	No	2.00
3	0.66	147.27	1.36	0.38	0.50	236.54	1.00	236.54	4.000	No	No	2.00
4	0.82	129.40	1.47	0.49	0.50	207.82	1.00	207.82	4.000	No	No	2.00
5	0.98	115.30	1.59	0.67	0.50	185.15	1.00	185.15	0.670	No	No	0.51
6	1.15	110.27	1.63	0.73	0.50	177.05	1.00	177.05	0.596	No	No	0.45
7	1.31	105.13	1.66	0.76	0.51	168.79	1.01	170.63	0.542	No	No	0.41
8	1.48	92.47	1.71	0.79	0.53	148.42	1.05	155.50	0.430	No	No	0.33
9	1.64	87.40	1.77	0.92	0.55	140.27	1.09	152.65	0.411	No	No	0.31
10	1.80	135.03	1.72	1.19	0.53	216.78	1.05	227.99	4.000	No	No	2.00
11	1.97	222.23	1.69	1.58	0.52	356.86	1.03	367.59	4.000	No	No	2.00
12	2.13	315.50	1.70	1.98	0.52	506.68	1.04	525.22	4.000	No	No	2.00
13	2.30	365.26	1.76	2.49	0.55	586.62	1.08	633.56	4.000	No	No	2.00
14	2.46	378.70	1.82	2.95	0.57	608.18	1.12	683.81	4.000	No	No	2.00
15	2.62	376.13	1.86	3.24	0.58	604.04	1.16	697.76	4.000	No	No	2.00
16	2.79	374.40	1.86	3.22	0.58	601.24	1.15	693.60	4.000	No	No	2.00
17	2.95	378.60	1.84	3.07	0.58	607.97	1.14	690.92	4.000	No	No	2.00
18	3.12	386.36	1.81	2.84	0.56	620.43	1.11	688.96	4.000	No	No	2.00
19	3.28	384.96	1.77	2.63	0.55	618.16	1.09	672.72	4.000	No	No	2.00
20	3.45	364.87	1.75	2.41	0.54	585.86	1.07	627.68	4.000	No	No	2.00
21	3.61	331.67	1.74	2.27	0.54	532.50	1.07	568.16	4.000	No	No	2.00
22	3.77	288.07	1.78	2.34	0.55	462.43	1.09	505.57	4.000	No	No	2.00
23	3.94	239.60	1.85	2.51	0.58	384.55	1.14	438.85	4.000	No	No	2.00
24	4.10	192.84	1.93	2.80	0.61	309.39	1.22	378.32	4.000	No	No	2.00
25	4.27	164.04	2.01	3.11	0.64	263.10	1.31	345.33	4.000	No	No	2.00
26	4.43	156.20	2.05	3.36	0.66	250.50	1.37	342.80	4.000	No	No	2.00
27	4.59	165.20	2.03	3.34	0.65	264.94	1.35	356.62	4.000	No	No	2.00
28	4.76	179.27	1.97	2.96	0.63	287.52	1.26	363.33	4.000	No	No	2.00
29	4.92	206.57	1.89	2.59	0.59	331.36	1.18	390.49	4.000	No	No	2.00
30	5.09	257.70	1.76	2.11	0.55	413.49	1.08	447.26	4.000	No	No	2.00
31	5.25	309.63	1.67	1.80	0.51	496.91	1.01	504.10	4.000	No	No	2.00
32	5.41	348.52	1.58	1.52	0.50	559.38	1.00	559.38	4.000	No	No	2.00
33	5.58	357.82	1.54	1.40	0.50	574.31	1.00	574.31	4.000	No	No	2.00
34	5.74	357.12	1.54	1.37	0.50	565.87	1.00	565.87	4.000	No	No	2.00
35	5.91	350.92	1.55	1.42	0.50	547.63	1.00	547.63	4.000	No	No	2.00
36	6.07	335.69	1.56	1.40	0.50	516.62	1.00	516.62	4.000	No	No	2.00
37	6.23	306.09	1.57	1.33	0.50	464.76	1.00	464.76	4.000	No	No	2.00
38	6.40	263.66	1.56	1.18	0.50	394.84	1.00	394.84	4.000	No	No	2.00
39	6.56	218.79	1.56	1.02	0.50	323.57	1.00	323.57	4.000	No	No	2.00
40	6.73	195.29	1.57	0.96	0.50	285.16	1.00	285.16	4.000	No	No	2.00
41	6.89	213.29	1.56	0.97	0.50	307.91	1.00	307.91	4.000	No	No	2.00
42	7.05	255.86	1.55	1.08	0.50	365.25	1.00	365.25	4.000	No	No	2.00
43	7.22	295.76	1.56	1.23	0.50	417.20	1.00	417.20	4.000	No	No	2.00
44	7.38	308.19	1.60	1.38	0.50	429.89	1.00	429.89	4.000	No	No	2.00
45	7.55	292.62	1.64	1.49	0.50	403.46	1.00	402.09	4.000	No	No	2.00
46	7.71	250.59	1.69	1.55	0.52	346.35	1.03	356.81	4.000	No	No	2.00
47	7.87	192.16	1.79	1.74	0.56	270.09	1.10	297.33	4.000	No	No	2.00
48	8.04	140.09	1.96	2.32	0.62	203.48	1.26	255.73	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
49	8.20	107.46	2.15	3.30	0.69	161.50	1.55	250.32	4.000	No	No	2.00
50	8.37	93.86	2.25	4.04	0.73	142.53	1.80	256.66	4.000	No	No	2.00
51	8.53	88.66	2.28	4.24	0.75	133.79	1.90	254.04	4.000	No	No	2.00
52	8.69	86.32	2.30	4.31	0.75	128.93	1.95	251.21	4.000	No	No	2.00
53	8.86	79.32	2.35	4.70	0.77	118.09	2.13	251.32	4.000	No	No	2.00
54	9.02	69.38	2.42	5.18	0.80	103.33	2.40	248.12	4.000	No	No	2.00
55	9.19	57.61	2.49	5.50	0.82	85.67	2.72	233.27	4.000	No	No	2.00
56	9.35	47.91	2.53	5.36	0.84	70.74	2.95	208.60	4.000	No	No	2.00
57	9.51	41.01	2.56	5.03	0.85	59.92	3.10	185.49	0.673	No	No	0.58
58	9.68	37.71	2.57	4.67	0.85	54.28	3.12	169.52	0.533	No	No	0.46
59	9.84	35.44	2.59	4.69	0.86	50.50	3.26	164.40	0.493	No	No	0.43
60	10.01	32.37	2.62	4.73	0.87	45.67	3.46	157.80	4.000	No	Yes	2.00
61	10.17	29.54	2.65	4.73	0.89	41.27	3.66	150.91	4.000	No	Yes	2.00
62	10.34	27.74	2.67	4.68	0.89	38.29	3.79	145.08	4.000	No	Yes	2.00
63	10.50	28.01	2.68	4.88	0.90	38.25	3.88	148.47	4.000	No	Yes	2.00
64	10.66	30.28	2.68	5.07	0.90	40.84	3.83	156.22	4.000	No	Yes	2.00
65	10.83	33.41	2.66	5.30	0.89	44.47	3.75	166.54	4.000	No	Yes	2.00
66	10.99	36.58	2.65	5.39	0.88	48.03	3.63	174.27	4.000	No	Yes	2.00
67	11.16	39.98	2.62	5.35	0.87	51.71	3.47	179.52	4.000	No	Yes	2.00
68	11.32	45.38	2.57	5.08	0.86	57.71	3.17	183.17	0.652	No	No	0.56
69	11.48	51.48	2.53	4.93	0.84	64.47	2.94	189.58	0.714	No	No	0.61
70	11.65	58.58	2.49	4.78	0.82	72.20	2.72	196.70	0.788	No	No	0.68
71	11.81	61.52	2.48	4.83	0.82	74.94	2.69	201.44	4.000	No	No	2.00
72	11.98	59.65	2.50	4.93	0.83	71.94	2.78	199.84	0.822	No	No	0.71
73	12.14	51.75	2.56	5.23	0.85	62.03	3.11	193.00	0.749	No	No	0.64
74	12.30	42.82	2.64	5.55	0.88	51.01	3.58	182.38	4.000	No	Yes	2.00
75	12.47	36.58	2.69	5.59	0.90	43.16	3.93	169.45	4.000	No	Yes	2.00
76	12.63	33.08	2.72	5.58	0.91	38.62	4.16	160.86	4.000	No	Yes	2.00
77	12.80	31.98	2.73	5.46	0.92	36.89	4.22	155.58	4.000	No	Yes	2.00
78	12.96	32.08	2.74	5.55	0.92	36.62	4.27	156.52	4.000	No	Yes	2.00
79	13.12	32.12	2.74	5.54	0.92	36.27	4.29	155.77	4.000	No	Yes	2.00
80	13.29	31.79	2.74	5.50	0.92	35.49	4.33	153.50	4.000	No	Yes	2.00
81	13.45	30.56	2.76	5.50	0.93	33.75	4.45	150.14	4.000	No	Yes	2.00
82	13.62	29.29	2.78	5.63	0.94	32.00	4.64	148.47	4.000	No	Yes	2.00
83	13.78	29.02	2.80	5.92	0.94	31.40	4.82	151.35	4.000	No	Yes	2.00
84	13.94	30.26	2.80	6.02	0.94	32.42	4.78	154.91	4.000	No	Yes	2.00
85	14.11	33.39	2.78	6.16	0.93	35.44	4.61	163.48	4.000	No	Yes	2.00
86	14.27	37.79	2.74	5.97	0.92	39.73	4.26	169.31	4.000	No	Yes	2.00
87	14.44	40.10	2.72	5.96	0.91	41.72	4.15	173.06	4.000	No	Yes	2.00
88	14.60	41.47	2.73	6.25	0.91	42.76	4.21	180.01	4.000	No	Yes	2.00
89	14.76	44.64	2.72	6.49	0.91	45.63	4.16	189.66	4.000	No	Yes	2.00
90	14.93	48.06	2.71	6.65	0.91	48.67	4.08	198.56	4.000	No	Yes	2.00
91	15.09	47.42	2.71	6.46	0.91	47.53	4.06	192.91	4.000	No	Yes	2.00
92	15.26	42.02	2.74	6.25	0.92	41.61	4.27	177.77	4.000	No	Yes	2.00
93	15.42	37.96	2.75	5.86	0.92	37.15	4.37	162.50	4.000	No	Yes	2.00
94	15.58	38.46	2.74	5.69	0.92	37.29	4.30	160.15	4.000	No	Yes	2.00
95	15.75	41.87	2.73	5.87	0.91	40.26	4.19	168.86	4.000	No	Yes	2.00
96	15.91	47.97	2.69	5.96	0.90	45.82	3.95	180.92	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
97	16.08	57.83	2.63	5.69	0.88	54.87	3.49	191.56	4.000	No	Yes	2.00
98	16.24	68.53	2.56	5.33	0.85	64.60	3.08	199.10	0.814	No	No	0.70
99	16.40	73.76	2.54	5.27	0.84	69.00	2.96	204.11	4.000	No	No	2.00
100	16.57	74.26	2.54	5.28	0.84	68.85	2.96	204.14	4.000	No	No	2.00
101	16.73	77.22	2.53	5.30	0.84	71.05	2.92	207.62	4.000	No	No	2.00
102	16.90	91.89	2.45	4.74	0.81	84.06	2.51	210.82	4.000	No	No	2.00
103	17.06	115.99	2.32	3.97	0.76	105.70	2.03	214.34	4.000	No	No	2.00
104	17.23	140.99	2.18	3.07	0.71	128.00	1.63	208.69	4.000	No	No	2.00
105	17.39	157.09	2.07	2.41	0.67	142.09	1.41	200.48	4.000	No	No	2.00
106	17.55	160.82	2.01	2.00	0.64	144.82	1.31	189.70	0.715	No	No	0.62
107	17.72	153.76	2.01	1.92	0.64	137.53	1.31	180.36	0.626	No	No	0.54
108	17.88	142.22	2.05	2.03	0.66	126.22	1.37	173.33	0.564	No	No	0.49
109	18.05	130.02	2.12	2.33	0.68	114.28	1.50	171.46	0.549	No	No	0.48
110	18.21	121.82	2.19	2.68	0.71	106.06	1.65	174.60	0.575	No	No	0.50
111	18.37	120.55	2.25	3.13	0.73	104.03	1.79	186.43	0.683	No	No	0.59
112	18.54	127.82	2.27	3.47	0.74	109.48	1.85	202.83	4.000	No	No	2.00
113	18.70	149.52	2.22	3.37	0.72	127.71	1.71	218.28	4.000	No	No	2.00
114	18.87	178.09	2.11	2.79	0.68	152.16	1.46	222.81	4.000	No	No	2.00
115	19.03	205.35	1.96	2.06	0.62	175.98	1.25	220.63	4.000	No	No	2.00
116	19.19	218.16	1.85	1.57	0.58	187.21	1.15	214.98	4.000	No	No	2.00
117	19.36	219.95	1.80	1.33	0.56	188.44	1.10	208.16	4.000	No	No	2.00
118	19.52	213.82	1.79	1.27	0.56	182.34	1.10	200.86	4.000	No	No	2.00
119	19.69	207.65	1.79	1.23	0.56	176.19	1.10	193.98	0.759	No	No	0.66
120	19.85	205.35	1.80	1.26	0.56	173.26	1.11	192.36	0.742	No	No	0.65
121	20.01	211.25	1.85	1.46	0.58	176.88	1.14	202.10	4.000	No	No	2.00
122	20.18	234.32	1.86	1.63	0.58	195.18	1.15	224.39	4.000	No	No	2.00
123	20.34	257.02	1.85	1.71	0.58	213.31	1.14	243.73	4.000	No	No	2.00
124	20.51	279.02	1.81	1.62	0.56	231.26	1.11	257.19	4.000	No	No	2.00
125	20.67	285.15	1.78	1.50	0.55	235.94	1.09	257.13	4.000	No	No	2.00
126	20.83	287.69	1.75	1.39	0.54	237.64	1.07	254.11	4.000	No	No	2.00
127	21.00	289.29	1.72	1.29	0.53	238.47	1.05	250.77	4.000	No	No	2.00
128	21.16	284.09	1.71	1.23	0.53	233.40	1.05	243.92	4.000	No	No	2.00
129	21.33	269.69	1.72	1.21	0.53	220.32	1.05	231.81	4.000	No	No	2.00
130	21.49	249.35	1.73	1.14	0.53	202.65	1.06	214.15	4.000	No	No	2.00
131	21.65	232.92	1.74	1.09	0.54	188.30	1.06	199.99	0.824	No	No	0.72
132	21.82	208.89	1.80	1.19	0.56	166.89	1.11	184.48	0.664	No	No	0.58
133	21.98	165.39	1.98	1.65	0.63	128.71	1.27	163.84	0.489	No	No	0.43
134	22.15	107.92	2.27	2.66	0.74	80.43	1.86	149.34	0.390	No	No	0.34
135	22.31	65.29	2.57	4.12	0.86	46.28	3.17	146.75	0.374	No	No	0.33
136	22.47	47.30	2.73	4.73	0.91	32.44	4.18	135.69	4.000	No	Yes	2.00
137	22.64	58.23	2.53	3.17	0.84	40.85	2.94	120.21	0.242	No	No	0.21
138	22.80	72.29	2.38	2.40	0.78	51.69	2.22	114.65	0.220	No	No	0.19
139	22.97	72.09	2.39	2.50	0.79	51.15	2.28	116.57	0.227	No	No	0.20
140	23.13	53.76	2.60	3.57	0.87	36.63	3.35	122.57	4.000	No	Yes	2.00
141	23.30	34.06	2.89	5.32	0.97	21.84	5.56	121.45	4.000	No	Yes	2.00
142	23.46	24.96	3.04	6.25	1.00	15.49	7.24	112.18	4.000	No	Yes	2.00
143	23.62	21.83	3.05	5.42	1.00	13.33	7.34	97.93	4.000	No	Yes	2.00
144	23.79	19.93	3.06	4.89	1.00	12.00	7.43	89.21	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
145	23.95	20.26	3.04	4.63	1.00	12.14	7.21	87.53	4.000	No	Yes	2.00
146	24.12	23.56	3.00	4.85	1.00	14.18	6.75	95.76	4.000	No	Yes	2.00
147	24.28	28.36	2.96	5.22	1.00	17.15	6.30	108.00	4.000	No	Yes	2.00
148	24.44	30.05	2.95	5.38	1.00	18.12	6.20	112.33	4.000	No	Yes	2.00
149	24.61	26.48	2.99	5.36	1.00	15.73	6.68	105.10	4.000	No	Yes	2.00
150	24.77	20.77	3.07	5.04	1.00	12.05	7.51	90.55	4.000	No	Yes	2.00
151	24.94	18.44	3.06	4.16	1.00	10.52	7.46	78.43	4.000	No	Yes	2.00
152	25.10	18.64	3.08	4.50	1.00	10.57	7.69	81.30	4.000	No	Yes	2.00
153	25.26	23.38	3.02	4.90	1.00	13.43	7.00	93.95	4.000	No	Yes	2.00
154	25.43	56.50	2.55	2.92	0.85	35.95	3.03	109.10	0.201	No	No	0.18
155	25.59	116.17	2.18	1.98	0.71	79.38	1.63	129.08	0.280	No	No	0.25
156	25.76	184.67	1.96	1.58	0.62	131.10	1.25	164.15	0.491	No	No	0.43
157	25.92	226.02	1.89	1.55	0.60	162.02	1.18	191.18	0.730	No	No	0.65
158	26.08	241.19	1.89	1.63	0.60	172.32	1.18	203.25	4.000	No	No	2.00
159	26.25	251.15	1.90	1.74	0.60	178.39	1.19	212.34	4.000	No	No	2.00
160	26.41	254.15	1.91	1.81	0.60	179.45	1.20	215.67	4.000	No	No	2.00
161	26.58	245.52	1.94	1.87	0.61	171.86	1.23	210.69	4.000	No	No	2.00
162	26.74	222.06	2.00	2.03	0.64	153.05	1.29	198.12	0.803	No	No	0.72
163	26.90	206.66	2.04	2.16	0.65	140.58	1.36	190.86	0.727	No	No	0.65
164	27.07	199.52	2.05	2.17	0.66	134.76	1.38	185.75	0.676	No	No	0.60
165	27.23	187.95	2.06	2.09	0.66	126.20	1.39	175.27	0.581	No	No	0.52
166	27.40	159.12	2.13	2.20	0.69	104.76	1.52	158.76	0.452	No	No	0.40
167	27.56	123.02	2.29	2.72	0.75	77.99	1.91	148.67	0.386	No	No	0.34
168	27.72	99.89	2.41	3.19	0.79	61.31	2.35	144.09	0.358	No	No	0.32
169	27.89	98.21	2.42	3.25	0.80	59.80	2.40	143.82	0.357	No	No	0.32
170	28.05	114.07	2.31	2.67	0.76	70.92	1.98	140.41	0.337	No	No	0.30
171	28.22	138.35	2.19	2.22	0.71	88.05	1.63	143.91	0.357	No	No	0.32
172	28.38	153.31	2.09	1.83	0.67	99.29	1.44	142.54	0.349	No	No	0.31
173	28.54	149.72	2.09	1.78	0.67	96.54	1.44	138.74	0.328	No	No	0.30
174	28.71	127.71	2.19	2.07	0.71	80.06	1.65	132.15	0.295	No	No	0.26
175	28.87	100.89	2.39	2.93	0.79	60.18	2.26	136.26	0.315	No	No	0.28
176	29.04	77.97	2.58	4.03	0.86	44.13	3.21	141.85	0.345	No	No	0.31
177	29.20	57.85	2.77	5.30	0.93	30.98	4.57	141.56	4.000	No	Yes	2.00
178	29.36	45.47	2.91	6.12	0.98	23.31	5.76	134.30	4.000	No	Yes	2.00
179	29.53	47.54	2.84	5.19	0.96	24.64	5.13	126.41	4.000	No	Yes	2.00
180	29.69	49.80	2.79	4.66	0.94	26.01	4.71	122.46	4.000	No	Yes	2.00
181	29.86	45.80	2.82	4.63	0.95	23.54	4.97	116.94	4.000	No	Yes	2.00
182	30.02	33.06	3.00	5.57	1.00	16.14	6.71	108.26	4.000	No	Yes	2.00
183	30.19	53.47	2.60	2.72	0.87	28.77	3.35	96.41	4.000	No	Yes	2.00
184	30.35	79.70	2.35	1.93	0.77	45.84	2.13	97.71	0.167	No	No	0.15
185	30.51	92.40	2.32	2.03	0.76	53.58	2.00	107.17	0.194	No	No	0.18
186	30.68	74.06	2.55	3.28	0.85	40.26	3.02	121.75	0.248	No	No	0.22
187	30.84	55.33	2.77	4.69	0.93	28.14	4.51	127.02	4.000	No	Yes	2.00
188	31.01	46.06	2.88	5.37	0.97	22.53	5.49	123.67	4.000	No	Yes	2.00
189	31.17	40.33	2.93	5.30	0.99	19.27	5.95	114.62	4.000	No	Yes	2.00
190	31.33	33.10	3.01	5.47	1.00	15.46	6.81	105.26	4.000	No	Yes	2.00
191	31.50	30.43	3.06	5.87	1.00	14.05	7.40	104.03	4.000	No	Yes	2.00
192	31.66	33.37	3.06	6.49	1.00	15.42	7.38	113.88	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
193	31.83	51.70	2.85	5.37	0.96	24.97	5.19	129.49	4.000	No	Yes	2.00
194	31.99	82.23	2.58	3.91	0.86	42.90	3.21	137.72	0.323	No	No	0.30
195	32.15	101.03	2.46	3.33	0.81	54.38	2.57	139.74	0.334	No	No	0.31
196	32.32	92.33	2.53	3.69	0.84	48.55	2.90	140.75	0.339	No	No	0.31
197	32.48	67.80	2.73	4.97	0.92	33.36	4.23	141.23	4.000	No	Yes	2.00
198	32.65	55.37	2.86	5.88	0.96	26.04	5.32	138.41	4.000	No	Yes	2.00
199	32.81	53.07	2.87	5.76	0.97	24.73	5.41	133.68	4.000	No	Yes	2.00
200	32.97	53.80	2.86	5.68	0.97	25.01	5.33	133.39	4.000	No	Yes	2.00
201	33.14	47.60	2.94	6.30	1.00	21.43	6.12	131.15	4.000	No	Yes	2.00
202	33.30	42.26	3.01	6.81	1.00	18.78	6.82	128.03	4.000	No	Yes	2.00
203	33.47	40.33	3.01	6.46	1.00	17.78	6.84	121.58	4.000	No	Yes	2.00
204	33.63	37.10	3.03	6.20	1.00	16.19	7.05	114.09	4.000	No	Yes	2.00
205	33.79	33.76	3.03	5.59	1.00	14.58	7.10	103.53	4.000	No	Yes	2.00
206	33.96	28.13	3.08	5.27	1.00	11.92	7.71	91.83	4.000	No	Yes	2.00
207	34.12	26.26	3.08	4.71	1.00	11.03	7.66	84.43	4.000	No	Yes	2.00
208	34.29	29.10	3.03	4.58	1.00	12.29	7.13	87.66	4.000	No	Yes	2.00
209	34.45	31.83	3.01	4.73	1.00	13.51	6.86	92.65	4.000	No	Yes	2.00
210	34.61	34.80	2.98	4.81	1.00	14.82	6.57	97.33	4.000	No	Yes	2.00
211	34.78	40.63	2.91	4.51	0.98	17.65	5.78	101.96	4.000	No	Yes	2.00
212	34.94	55.17	2.74	3.78	0.92	25.45	4.27	108.78	4.000	No	Yes	2.00
213	35.11	96.13	2.43	2.70	0.80	49.16	2.42	119.20	0.237	No	No	0.22
214	35.27	146.20	2.18	1.97	0.70	80.73	1.61	130.00	0.284	No	No	0.26
215	35.43	195.53	2.00	1.55	0.64	113.82	1.30	147.58	0.379	No	No	0.35
216	35.60	217.22	1.90	1.29	0.60	129.95	1.19	154.40	0.422	No	No	0.39
217	35.76	227.96	1.83	1.11	0.57	138.82	1.13	157.11	0.441	No	No	0.40
218	35.93	237.45	1.77	0.96	0.55	146.91	1.09	159.86	0.460	No	No	0.42
219	36.09	254.15	1.71	0.86	0.53	159.87	1.05	167.39	0.516	No	No	0.47
220	36.26	269.09	1.68	0.81	0.51	171.00	1.02	174.58	0.575	No	No	0.53
221	36.42	275.52	1.65	0.78	0.51	175.95	1.01	177.10	0.597	No	No	0.55
222	36.58	273.02	1.61	0.67	0.50	174.91	1.00	174.91	0.578	No	No	0.53
223	36.75	261.69	1.61	0.63	0.50	167.38	1.00	167.38	0.516	No	No	0.47
224	36.91	270.73	1.58	0.58	0.50	173.01	1.00	173.01	0.562	No	No	0.52
225	37.08	268.88	1.61	0.65	0.50	171.59	1.00	171.59	0.550	No	No	0.51
226	37.24	270.72	1.61	0.65	0.50	172.58	1.00	172.58	0.558	No	No	0.51
227	37.40	252.69	1.63	0.64	0.50	160.79	1.00	160.79	0.467	No	No	0.43
228	37.57	248.69	1.63	0.62	0.50	158.02	1.00	158.02	0.447	No	No	0.41
229	37.73	248.79	1.61	0.60	0.50	157.90	1.00	157.90	0.446	No	No	0.41
230	37.90	251.45	1.63	0.64	0.50	159.42	1.00	159.42	0.457	No	No	0.42
231	38.06	253.23	1.65	0.68	0.50	160.06	1.00	160.05	0.461	No	No	0.42
232	38.22	253.66	1.66	0.70	0.51	159.61	1.01	160.88	0.467	No	No	0.43
233	38.39	252.20	1.69	0.77	0.52	156.94	1.03	161.73	0.473	No	No	0.44
234	38.55	249.67	1.79	1.04	0.56	150.61	1.10	165.41	0.501	No	No	0.46
235	38.72	251.57	1.89	1.42	0.60	146.89	1.18	173.54	0.566	No	No	0.52
236	38.88	247.07	1.97	1.74	0.63	140.63	1.26	177.71	0.602	No	No	0.56
237	39.04	222.57	2.07	2.12	0.67	122.45	1.41	172.60	0.558	No	No	0.52
238	39.21	191.57	2.20	2.64	0.71	101.03	1.67	168.69	0.526	No	No	0.49
239	39.37	166.46	2.32	3.27	0.76	84.27	2.02	170.56	0.541	No	No	0.50
240	39.54	146.13	2.38	3.37	0.78	72.49	2.22	160.60	0.465	No	No	0.43

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
241	39.70	119.37	2.44	3.28	0.80	57.79	2.46	142.35	0.348	No	No	0.32
242	39.86	84.33	2.57	3.38	0.85	38.75	3.14	121.82	0.248	No	No	0.23
243	40.03	62.83	2.72	3.87	0.91	27.17	4.16	113.16	4.000	No	Yes	2.00
244	40.19	49.67	2.84	4.25	0.96	20.42	5.16	105.35	4.000	No	Yes	2.00
245	40.36	42.74	2.90	4.15	0.98	17.10	5.65	96.66	4.000	No	Yes	2.00
246	40.52	36.50	2.95	4.03	1.00	14.16	6.22	88.03	4.000	No	Yes	2.00
247	40.68	30.67	3.01	3.92	1.00	11.70	6.85	80.13	4.000	No	Yes	2.00
248	40.85	27.37	3.03	3.50	1.00	10.30	7.03	72.36	4.000	No	Yes	2.00
249	41.01	25.27	3.03	3.09	1.00	9.40	7.04	66.21	4.000	No	Yes	2.00
250	41.18	24.54	3.04	3.04	1.00	9.08	7.14	64.85	4.000	No	Yes	2.00
251	41.34	25.57	3.01	2.91	1.00	9.48	6.84	64.84	4.000	No	Yes	2.00
252	41.50	25.83	3.01	3.02	1.00	9.57	6.90	66.08	4.000	No	Yes	2.00
253	41.67	25.53	3.02	3.06	1.00	9.43	7.00	66.02	4.000	No	Yes	2.00
254	41.83	24.80	3.09	3.77	1.00	9.10	7.76	70.69	4.000	No	Yes	2.00
255	42.00	32.30	2.97	3.60	1.00	12.16	6.46	78.55	4.000	No	Yes	2.00
256	42.16	42.60	2.91	4.18	0.98	16.59	5.77	95.72	4.000	No	Yes	2.00
257	42.32	51.40	2.90	5.07	0.98	20.28	5.65	114.63	4.000	No	Yes	2.00
258	42.49	58.96	2.89	5.87	0.98	23.39	5.63	131.64	4.000	No	Yes	2.00
259	42.65	77.53	2.77	5.44	0.93	32.29	4.53	146.22	4.000	No	Yes	2.00
260	42.82	102.56	2.64	4.88	0.88	44.90	3.55	159.38	4.000	No	Yes	2.00
261	42.98	134.89	2.50	4.31	0.83	61.93	2.77	171.86	0.552	No	No	0.52
262	43.15	153.86	2.44	4.13	0.81	72.01	2.50	179.85	0.621	No	No	0.59
263	43.31	228.32	2.21	3.04	0.72	115.75	1.69	195.54	0.775	No	No	0.73

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
q_t: Total cone resistance
I_c: Soil behavior type index
Fr: Normalized friction ratio (%)
n: Stress exponent
Q_{tn}: Normalized cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Normalized and adjusted cone resistance
$CRR_{7.5}$: Cyclic resistance ratio for M_w=7.5
FS: Factor of safety against soil liquefaction

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.33	2.00	0.00	9.95	0.16	0.00	0.49	2.00	0.00	9.93	0.16	0.00
0.66	2.00	0.00	9.90	0.17	0.00	0.82	2.00	0.00	9.88	0.16	0.00
0.98	0.51	0.49	9.85	0.16	0.24	1.15	0.45	0.55	9.82	0.17	0.28
1.31	0.41	0.59	9.80	0.16	0.28	1.48	0.33	0.67	9.77	0.17	0.34
1.64	0.31	0.69	9.75	0.16	0.33	1.80	2.00	0.00	9.73	0.16	0.00
1.97	2.00	0.00	9.70	0.17	0.00	2.13	2.00	0.00	9.68	0.16	0.00
2.30	2.00	0.00	9.65	0.17	0.00	2.46	2.00	0.00	9.63	0.16	0.00
2.62	2.00	0.00	9.60	0.16	0.00	2.79	2.00	0.00	9.57	0.17	0.00
2.95	2.00	0.00	9.55	0.16	0.00	3.12	2.00	0.00	9.52	0.17	0.00
3.28	2.00	0.00	9.50	0.16	0.00	3.45	2.00	0.00	9.47	0.17	0.00
3.61	2.00	0.00	9.45	0.16	0.00	3.77	2.00	0.00	9.43	0.16	0.00
3.94	2.00	0.00	9.40	0.17	0.00	4.10	2.00	0.00	9.38	0.16	0.00
4.27	2.00	0.00	9.35	0.17	0.00	4.43	2.00	0.00	9.32	0.16	0.00
4.59	2.00	0.00	9.30	0.16	0.00	4.76	2.00	0.00	9.27	0.17	0.00
4.92	2.00	0.00	9.25	0.16	0.00	5.09	2.00	0.00	9.22	0.17	0.00
5.25	2.00	0.00	9.20	0.16	0.00	5.41	2.00	0.00	9.18	0.16	0.00
5.58	2.00	0.00	9.15	0.17	0.00	5.74	2.00	0.00	9.13	0.16	0.00
5.91	2.00	0.00	9.10	0.17	0.00	6.07	2.00	0.00	9.07	0.16	0.00
6.23	2.00	0.00	9.05	0.16	0.00	6.40	2.00	0.00	9.02	0.17	0.00
6.56	2.00	0.00	9.00	0.16	0.00	6.73	2.00	0.00	8.97	0.17	0.00
6.89	2.00	0.00	8.95	0.16	0.00	7.05	2.00	0.00	8.93	0.16	0.00
7.22	2.00	0.00	8.90	0.17	0.00	7.38	2.00	0.00	8.88	0.16	0.00
7.55	2.00	0.00	8.85	0.17	0.00	7.71	2.00	0.00	8.82	0.16	0.00
7.87	2.00	0.00	8.80	0.16	0.00	8.04	2.00	0.00	8.77	0.17	0.00
8.20	2.00	0.00	8.75	0.16	0.00	8.37	2.00	0.00	8.72	0.17	0.00
8.53	2.00	0.00	8.70	0.16	0.00	8.69	2.00	0.00	8.68	0.16	0.00
8.86	2.00	0.00	8.65	0.17	0.00	9.02	2.00	0.00	8.63	0.16	0.00
9.19	2.00	0.00	8.60	0.17	0.00	9.35	2.00	0.00	8.58	0.16	0.00
9.51	0.58	0.42	8.55	0.16	0.17	9.68	0.46	0.54	8.52	0.17	0.24
9.84	0.43	0.57	8.50	0.16	0.24	10.01	2.00	0.00	8.47	0.17	0.00
10.17	2.00	0.00	8.45	0.16	0.00	10.34	2.00	0.00	8.42	0.17	0.00
10.50	2.00	0.00	8.40	0.16	0.00	10.66	2.00	0.00	8.38	0.16	0.00
10.83	2.00	0.00	8.35	0.17	0.00	10.99	2.00	0.00	8.33	0.16	0.00
11.16	2.00	0.00	8.30	0.17	0.00	11.32	0.56	0.44	8.27	0.16	0.18
11.48	0.61	0.39	8.25	0.16	0.16	11.65	0.68	0.32	8.22	0.17	0.14
11.81	2.00	0.00	8.20	0.16	0.00	11.98	0.71	0.29	8.17	0.17	0.12
12.14	0.64	0.36	8.15	0.16	0.14	12.30	2.00	0.00	8.13	0.16	0.00
12.47	2.00	0.00	8.10	0.17	0.00	12.63	2.00	0.00	8.08	0.16	0.00
12.80	2.00	0.00	8.05	0.17	0.00	12.96	2.00	0.00	8.02	0.16	0.00
13.12	2.00	0.00	8.00	0.16	0.00	13.29	2.00	0.00	7.97	0.17	0.00
13.45	2.00	0.00	7.95	0.16	0.00	13.62	2.00	0.00	7.92	0.17	0.00
13.78	2.00	0.00	7.90	0.16	0.00	13.94	2.00	0.00	7.88	0.16	0.00
14.11	2.00	0.00	7.85	0.17	0.00	14.27	2.00	0.00	7.83	0.16	0.00
14.44	2.00	0.00	7.80	0.17	0.00	14.60	2.00	0.00	7.77	0.16	0.00
14.76	2.00	0.00	7.75	0.16	0.00	14.93	2.00	0.00	7.72	0.17	0.00
15.09	2.00	0.00	7.70	0.16	0.00	15.26	2.00	0.00	7.67	0.17	0.00
15.42	2.00	0.00	7.65	0.16	0.00	15.58	2.00	0.00	7.63	0.16	0.00
15.75	2.00	0.00	7.60	0.17	0.00	15.91	2.00	0.00	7.58	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
16.08	2.00	0.00	7.55	0.17	0.00	16.24	0.70	0.30	7.53	0.16	0.11
16.40	2.00	0.00	7.50	0.16	0.00	16.57	2.00	0.00	7.47	0.17	0.00
16.73	2.00	0.00	7.45	0.16	0.00	16.90	2.00	0.00	7.42	0.17	0.00
17.06	2.00	0.00	7.40	0.16	0.00	17.23	2.00	0.00	7.37	0.17	0.00
17.39	2.00	0.00	7.35	0.16	0.00	17.55	0.62	0.38	7.33	0.16	0.14
17.72	0.54	0.46	7.30	0.17	0.17	17.88	0.49	0.51	7.28	0.16	0.18
18.05	0.48	0.52	7.25	0.17	0.20	18.21	0.50	0.50	7.22	0.16	0.18
18.37	0.59	0.41	7.20	0.16	0.14	18.54	2.00	0.00	7.17	0.17	0.00
18.70	2.00	0.00	7.15	0.16	0.00	18.87	2.00	0.00	7.12	0.17	0.00
19.03	2.00	0.00	7.10	0.16	0.00	19.19	2.00	0.00	7.08	0.16	0.00
19.36	2.00	0.00	7.05	0.17	0.00	19.52	2.00	0.00	7.03	0.16	0.00
19.69	0.66	0.34	7.00	0.17	0.12	19.85	0.65	0.35	6.97	0.16	0.12
20.01	2.00	0.00	6.95	0.16	0.00	20.18	2.00	0.00	6.92	0.17	0.00
20.34	2.00	0.00	6.90	0.16	0.00	20.51	2.00	0.00	6.87	0.17	0.00
20.67	2.00	0.00	6.85	0.16	0.00	20.83	2.00	0.00	6.83	0.16	0.00
21.00	2.00	0.00	6.80	0.17	0.00	21.16	2.00	0.00	6.78	0.16	0.00
21.33	2.00	0.00	6.75	0.17	0.00	21.49	2.00	0.00	6.72	0.16	0.00
21.65	0.72	0.28	6.70	0.16	0.09	21.82	0.58	0.42	6.67	0.17	0.14
21.98	0.43	0.57	6.65	0.16	0.18	22.15	0.34	0.66	6.62	0.17	0.23
22.31	0.33	0.67	6.60	0.16	0.22	22.47	2.00	0.00	6.58	0.16	0.00
22.64	0.21	0.79	6.55	0.17	0.27	22.80	0.19	0.81	6.53	0.16	0.26
22.97	0.20	0.80	6.50	0.17	0.27	23.13	2.00	0.00	6.47	0.16	0.00
23.30	2.00	0.00	6.45	0.17	0.00	23.46	2.00	0.00	6.42	0.16	0.00
23.62	2.00	0.00	6.40	0.16	0.00	23.79	2.00	0.00	6.37	0.17	0.00
23.95	2.00	0.00	6.35	0.16	0.00	24.12	2.00	0.00	6.32	0.17	0.00
24.28	2.00	0.00	6.30	0.16	0.00	24.44	2.00	0.00	6.28	0.16	0.00
24.61	2.00	0.00	6.25	0.17	0.00	24.77	2.00	0.00	6.23	0.16	0.00
24.94	2.00	0.00	6.20	0.17	0.00	25.10	2.00	0.00	6.17	0.16	0.00
25.26	2.00	0.00	6.15	0.16	0.00	25.43	0.18	0.82	6.12	0.17	0.26
25.59	0.25	0.75	6.10	0.16	0.22	25.76	0.43	0.57	6.07	0.17	0.18
25.92	0.65	0.35	6.05	0.16	0.10	26.08	2.00	0.00	6.03	0.16	0.00
26.25	2.00	0.00	6.00	0.17	0.00	26.41	2.00	0.00	5.98	0.16	0.00
26.58	2.00	0.00	5.95	0.17	0.00	26.74	0.72	0.28	5.92	0.16	0.08
26.90	0.65	0.35	5.90	0.16	0.10	27.07	0.60	0.40	5.87	0.17	0.12
27.23	0.52	0.48	5.85	0.16	0.14	27.40	0.40	0.60	5.82	0.17	0.18
27.56	0.34	0.66	5.80	0.16	0.19	27.72	0.32	0.68	5.78	0.16	0.19
27.89	0.32	0.68	5.75	0.17	0.20	28.05	0.30	0.70	5.73	0.16	0.19
28.22	0.32	0.68	5.70	0.17	0.20	28.38	0.31	0.69	5.67	0.16	0.19
28.54	0.30	0.70	5.65	0.16	0.19	28.71	0.26	0.74	5.62	0.17	0.21
28.87	0.28	0.72	5.60	0.16	0.20	29.04	0.31	0.69	5.57	0.17	0.20
29.20	2.00	0.00	5.55	0.16	0.00	29.36	2.00	0.00	5.53	0.16	0.00
29.53	2.00	0.00	5.50	0.17	0.00	29.69	2.00	0.00	5.48	0.16	0.00
29.86	2.00	0.00	5.45	0.17	0.00	30.02	2.00	0.00	5.42	0.16	0.00
30.19	2.00	0.00	5.40	0.17	0.00	30.35	0.15	0.85	5.37	0.16	0.22
30.51	0.18	0.82	5.35	0.16	0.21	30.68	0.22	0.78	5.32	0.17	0.21
30.84	2.00	0.00	5.30	0.16	0.00	31.01	2.00	0.00	5.27	0.17	0.00
31.17	2.00	0.00	5.25	0.16	0.00	31.33	2.00	0.00	5.23	0.16	0.00
31.50	2.00	0.00	5.20	0.17	0.00	31.66	2.00	0.00	5.18	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.83	2.00	0.00	5.15	0.17	0.00	31.99	0.30	0.70	5.12	0.16	0.18
32.15	0.31	0.69	5.10	0.16	0.17	32.32	0.31	0.69	5.07	0.17	0.18
32.48	2.00	0.00	5.05	0.16	0.00	32.65	2.00	0.00	5.02	0.17	0.00
32.81	2.00	0.00	5.00	0.16	0.00	32.97	2.00	0.00	4.98	0.16	0.00
33.14	2.00	0.00	4.95	0.17	0.00	33.30	2.00	0.00	4.93	0.16	0.00
33.47	2.00	0.00	4.90	0.17	0.00	33.63	2.00	0.00	4.87	0.16	0.00
33.79	2.00	0.00	4.85	0.16	0.00	33.96	2.00	0.00	4.82	0.17	0.00
34.12	2.00	0.00	4.80	0.16	0.00	34.29	2.00	0.00	4.77	0.17	0.00
34.45	2.00	0.00	4.75	0.16	0.00	34.61	2.00	0.00	4.73	0.16	0.00
34.78	2.00	0.00	4.70	0.17	0.00	34.94	2.00	0.00	4.68	0.16	0.00
35.11	0.22	0.78	4.65	0.17	0.19	35.27	0.26	0.74	4.62	0.16	0.17
35.43	0.35	0.65	4.60	0.16	0.15	35.60	0.39	0.61	4.57	0.17	0.15
35.76	0.40	0.60	4.55	0.16	0.13	35.93	0.42	0.58	4.52	0.17	0.14
36.09	0.47	0.53	4.50	0.16	0.12	36.26	0.53	0.47	4.47	0.17	0.11
36.42	0.55	0.45	4.45	0.16	0.10	36.58	0.53	0.47	4.43	0.16	0.10
36.75	0.47	0.53	4.40	0.17	0.12	36.91	0.52	0.48	4.37	0.16	0.10
37.08	0.51	0.49	4.35	0.17	0.11	37.24	0.51	0.49	4.32	0.16	0.10
37.40	0.43	0.57	4.30	0.16	0.12	37.57	0.41	0.59	4.27	0.17	0.13
37.73	0.41	0.59	4.25	0.16	0.12	37.90	0.42	0.58	4.22	0.17	0.13
38.06	0.42	0.58	4.20	0.16	0.12	38.22	0.43	0.57	4.18	0.16	0.12
38.39	0.44	0.56	4.15	0.17	0.12	38.55	0.46	0.54	4.12	0.16	0.11
38.72	0.52	0.48	4.10	0.17	0.10	38.88	0.56	0.44	4.07	0.16	0.09
39.04	0.52	0.48	4.05	0.16	0.10	39.21	0.49	0.51	4.02	0.17	0.11
39.37	0.50	0.50	4.00	0.16	0.10	39.54	0.43	0.57	3.97	0.17	0.12
39.70	0.32	0.68	3.95	0.16	0.13	39.86	0.23	0.77	3.93	0.16	0.15
40.03	2.00	0.00	3.90	0.17	0.00	40.19	2.00	0.00	3.88	0.16	0.00
40.36	2.00	0.00	3.85	0.17	0.00	40.52	2.00	0.00	3.82	0.16	0.00
40.68	2.00	0.00	3.80	0.16	0.00	40.85	2.00	0.00	3.77	0.17	0.00
41.01	2.00	0.00	3.75	0.16	0.00	41.18	2.00	0.00	3.72	0.17	0.00
41.34	2.00	0.00	3.70	0.16	0.00	41.50	2.00	0.00	3.68	0.16	0.00
41.67	2.00	0.00	3.65	0.17	0.00	41.83	2.00	0.00	3.63	0.16	0.00
42.00	2.00	0.00	3.60	0.17	0.00	42.16	2.00	0.00	3.57	0.16	0.00
42.32	2.00	0.00	3.55	0.16	0.00	42.49	2.00	0.00	3.52	0.17	0.00
42.65	2.00	0.00	3.50	0.16	0.00	42.82	2.00	0.00	3.47	0.17	0.00
42.98	0.52	0.48	3.45	0.16	0.08	43.15	0.59	0.41	3.42	0.17	0.07
43.31	0.73	0.27	3.40	0.16	0.04						

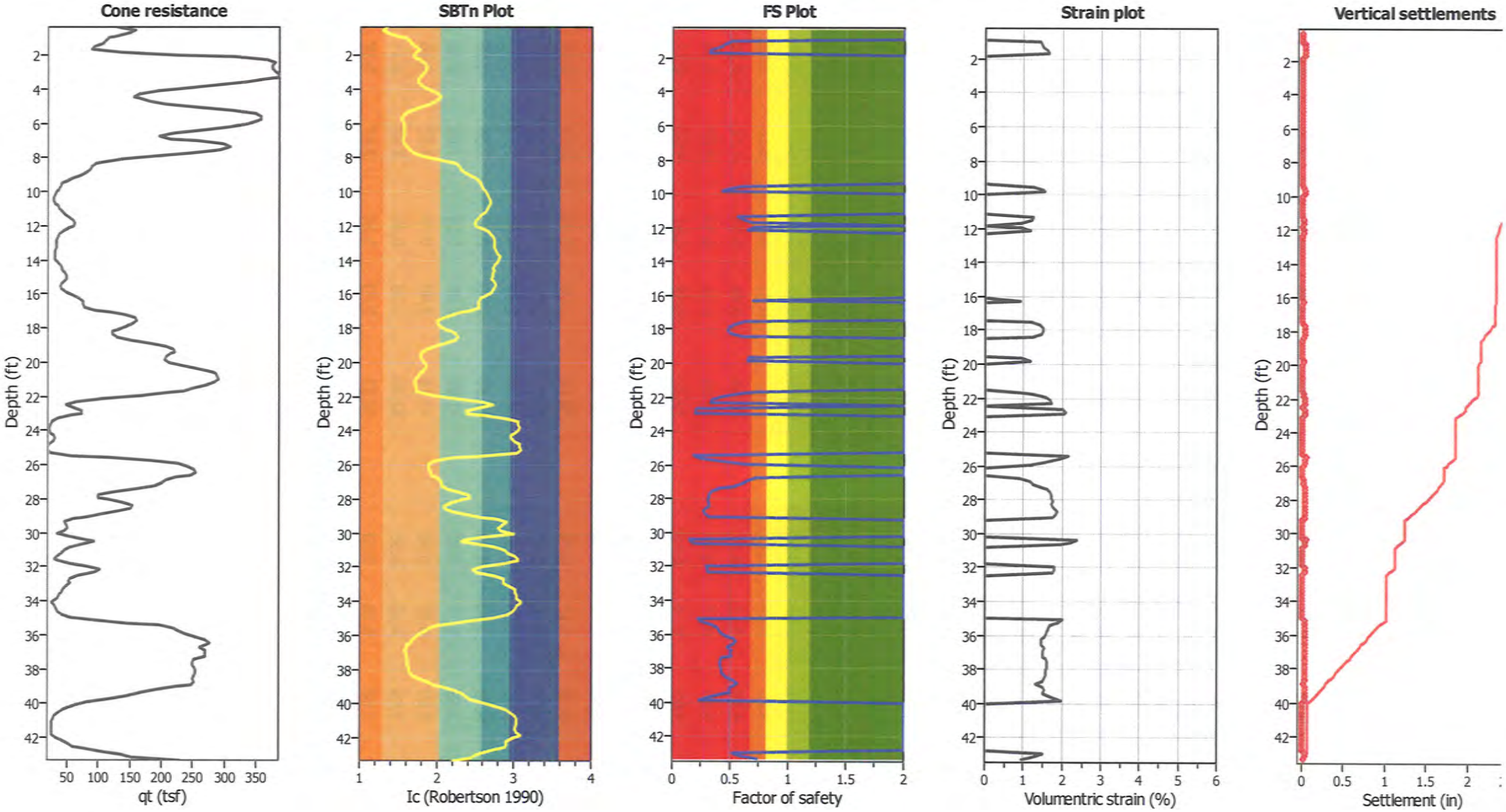
Overall liquefaction potential: 14.22

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
0.33	204.49	2.00	0.00	1.00	0.00	0.49	254.55	2.00	0.00	1.00	0.00
0.66	236.54	2.00	0.00	1.00	0.00	0.82	207.82	2.00	0.00	1.00	0.00
0.98	185.15	0.51	1.41	1.00	0.03	1.15	177.05	0.45	1.46	1.00	0.03
1.31	170.63	0.41	1.51	1.00	0.03	1.48	155.50	0.33	1.63	1.00	0.03
1.64	152.65	0.31	1.65	1.00	0.03	1.80	227.99	2.00	0.00	1.00	0.00
1.97	367.59	2.00	0.00	1.00	0.00	2.13	525.22	2.00	0.00	1.00	0.00
2.30	633.56	2.00	0.00	1.00	0.00	2.46	683.81	2.00	0.00	1.00	0.00
2.62	697.76	2.00	0.00	1.00	0.00	2.79	693.60	2.00	0.00	1.00	0.00
2.95	690.92	2.00	0.00	1.00	0.00	3.12	688.96	2.00	0.00	1.00	0.00
3.28	672.72	2.00	0.00	1.00	0.00	3.45	627.68	2.00	0.00	1.00	0.00
3.61	568.16	2.00	0.00	1.00	0.00	3.77	505.57	2.00	0.00	1.00	0.00
3.94	438.85	2.00	0.00	1.00	0.00	4.10	378.32	2.00	0.00	1.00	0.00
4.27	345.33	2.00	0.00	1.00	0.00	4.43	342.80	2.00	0.00	1.00	0.00
4.59	356.62	2.00	0.00	1.00	0.00	4.76	363.33	2.00	0.00	1.00	0.00
4.92	390.49	2.00	0.00	1.00	0.00	5.09	447.26	2.00	0.00	1.00	0.00
5.25	504.10	2.00	0.00	1.00	0.00	5.41	559.38	2.00	0.00	1.00	0.00
5.58	574.31	2.00	0.00	1.00	0.00	5.74	565.87	2.00	0.00	1.00	0.00
5.91	547.63	2.00	0.00	1.00	0.00	6.07	516.62	2.00	0.00	1.00	0.00
6.23	464.76	2.00	0.00	1.00	0.00	6.40	394.84	2.00	0.00	1.00	0.00
6.56	323.57	2.00	0.00	1.00	0.00	6.73	285.16	2.00	0.00	1.00	0.00
6.89	307.91	2.00	0.00	1.00	0.00	7.05	365.25	2.00	0.00	1.00	0.00
7.22	417.20	2.00	0.00	1.00	0.00	7.38	429.89	2.00	0.00	1.00	0.00
7.55	402.09	2.00	0.00	1.00	0.00	7.71	356.81	2.00	0.00	1.00	0.00
7.87	297.33	2.00	0.00	1.00	0.00	8.04	255.73	2.00	0.00	1.00	0.00
8.20	250.32	2.00	0.00	1.00	0.00	8.37	256.66	2.00	0.00	1.00	0.00
8.53	254.04	2.00	0.00	1.00	0.00	8.69	251.21	2.00	0.00	1.00	0.00
8.86	251.32	2.00	0.00	1.00	0.00	9.02	248.12	2.00	0.00	1.00	0.00
9.19	233.27	2.00	0.00	1.00	0.00	9.35	208.60	2.00	0.00	1.00	0.00
9.51	185.49	0.58	1.24	1.00	0.02	9.68	169.52	0.46	1.52	1.00	0.03
9.84	164.40	0.43	1.55	1.00	0.03	10.01	157.80	2.00	0.00	1.00	0.00
10.17	150.91	2.00	0.00	1.00	0.00	10.34	145.08	2.00	0.00	1.00	0.00
10.50	148.47	2.00	0.00	1.00	0.00	10.66	156.22	2.00	0.00	1.00	0.00
10.83	166.54	2.00	0.00	1.00	0.00	10.99	174.27	2.00	0.00	1.00	0.00
11.16	179.52	2.00	0.00	1.00	0.00	11.32	183.17	0.56	1.26	1.00	0.02
11.48	189.58	0.61	1.20	1.00	0.02	11.65	196.70	0.68	0.94	1.00	0.02
11.81	201.44	2.00	0.00	1.00	0.00	11.98	199.84	0.71	0.92	1.00	0.02
12.14	193.00	0.64	1.17	1.00	0.02	12.30	182.38	2.00	0.00	1.00	0.00
12.47	169.45	2.00	0.00	1.00	0.00	12.63	160.86	2.00	0.00	1.00	0.00
12.80	155.58	2.00	0.00	1.00	0.00	12.96	156.52	2.00	0.00	1.00	0.00
13.12	155.77	2.00	0.00	1.00	0.00	13.29	153.50	2.00	0.00	1.00	0.00
13.45	150.14	2.00	0.00	1.00	0.00	13.62	148.47	2.00	0.00	1.00	0.00
13.78	151.35	2.00	0.00	1.00	0.00	13.94	154.91	2.00	0.00	1.00	0.00
14.11	163.48	2.00	0.00	1.00	0.00	14.27	169.31	2.00	0.00	1.00	0.00
14.44	173.06	2.00	0.00	1.00	0.00	14.60	180.01	2.00	0.00	1.00	0.00
14.76	189.66	2.00	0.00	1.00	0.00	14.93	198.56	2.00	0.00	1.00	0.00
15.09	192.91	2.00	0.00	1.00	0.00	15.26	177.77	2.00	0.00	1.00	0.00
15.42	162.50	2.00	0.00	1.00	0.00	15.58	160.15	2.00	0.00	1.00	0.00
15.75	168.86	2.00	0.00	1.00	0.00	15.91	180.92	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
16.08	191.56	2.00	0.00	1.00	0.00	16.24	199.10	0.70	0.92	1.00	0.02
16.40	204.11	2.00	0.00	1.00	0.00	16.57	204.14	2.00	0.00	1.00	0.00
16.73	207.62	2.00	0.00	1.00	0.00	16.90	210.82	2.00	0.00	1.00	0.00
17.06	214.34	2.00	0.00	1.00	0.00	17.23	208.69	2.00	0.00	1.00	0.00
17.39	200.48	2.00	0.00	1.00	0.00	17.55	189.70	0.62	1.20	1.00	0.02
17.72	180.36	0.54	1.44	1.00	0.03	17.88	173.33	0.49	1.49	1.00	0.03
18.05	171.46	0.48	1.50	1.00	0.03	18.21	174.60	0.50	1.48	1.00	0.03
18.37	186.43	0.59	1.23	1.00	0.02	18.54	202.83	2.00	0.00	1.00	0.00
18.70	218.28	2.00	0.00	1.00	0.00	18.87	222.81	2.00	0.00	1.00	0.00
19.03	220.63	2.00	0.00	1.00	0.00	19.19	214.98	2.00	0.00	1.00	0.00
19.36	208.16	2.00	0.00	1.00	0.00	19.52	200.86	2.00	0.00	1.00	0.00
19.69	193.98	0.66	0.96	1.00	0.02	19.85	192.36	0.65	1.18	1.00	0.02
20.01	202.10	2.00	0.00	1.00	0.00	20.18	224.39	2.00	0.00	1.00	0.00
20.34	243.73	2.00	0.00	1.00	0.00	20.51	257.19	2.00	0.00	1.00	0.00
20.67	257.13	2.00	0.00	1.00	0.00	20.83	254.11	2.00	0.00	1.00	0.00
21.00	250.77	2.00	0.00	1.00	0.00	21.16	243.92	2.00	0.00	1.00	0.00
21.33	231.81	2.00	0.00	1.00	0.00	21.49	214.15	2.00	0.00	1.00	0.00
21.65	199.99	0.72	0.92	1.00	0.02	21.82	184.48	0.58	1.25	1.00	0.03
21.98	163.84	0.43	1.56	1.00	0.03	22.15	149.34	0.34	1.68	1.00	0.03
22.31	146.75	0.33	1.71	1.00	0.03	22.47	135.69	2.00	0.00	1.00	0.00
22.64	120.21	0.21	2.01	1.00	0.04	22.80	114.65	0.19	2.09	1.00	0.04
22.97	116.57	0.20	2.06	1.00	0.04	23.13	122.57	2.00	0.00	1.00	0.00
23.30	121.45	2.00	0.00	1.00	0.00	23.46	112.18	2.00	0.00	1.00	0.00
23.62	97.93	2.00	0.00	1.00	0.00	23.79	89.21	2.00	0.00	1.00	0.00
23.95	87.53	2.00	0.00	1.00	0.00	24.12	95.76	2.00	0.00	1.00	0.00
24.28	108.00	2.00	0.00	1.00	0.00	24.44	112.33	2.00	0.00	1.00	0.00
24.61	105.10	2.00	0.00	1.00	0.00	24.77	90.55	2.00	0.00	1.00	0.00
24.94	78.43	2.00	0.00	1.00	0.00	25.10	81.30	2.00	0.00	1.00	0.00
25.26	93.95	2.00	0.00	1.00	0.00	25.43	109.10	0.18	2.18	1.00	0.04
25.59	129.08	0.25	1.90	1.00	0.04	25.76	164.15	0.43	1.56	1.00	0.03
25.92	191.18	0.65	1.19	1.00	0.02	26.08	203.25	2.00	0.00	1.00	0.00
26.25	212.34	2.00	0.00	1.00	0.00	26.41	215.67	2.00	0.00	1.00	0.00
26.58	210.69	2.00	0.00	1.00	0.00	26.74	198.12	0.72	0.93	1.00	0.02
26.90	190.86	0.65	1.19	1.00	0.02	27.07	185.75	0.60	1.24	1.00	0.03
27.23	175.27	0.52	1.47	1.00	0.03	27.40	158.76	0.40	1.60	1.00	0.03
27.56	148.67	0.34	1.69	1.00	0.03	27.72	144.09	0.32	1.73	1.00	0.03
27.89	143.82	0.32	1.73	1.00	0.04	28.05	140.41	0.30	1.77	1.00	0.03
28.22	143.91	0.32	1.73	1.00	0.04	28.38	142.54	0.31	1.75	1.00	0.03
28.54	138.74	0.30	1.79	1.00	0.03	28.71	132.15	0.26	1.86	1.00	0.04
28.87	136.26	0.28	1.81	1.00	0.03	29.04	141.85	0.31	1.75	1.00	0.04
29.20	141.56	2.00	0.00	1.00	0.00	29.36	134.30	2.00	0.00	1.00	0.00
29.53	126.41	2.00	0.00	1.00	0.00	29.69	122.46	2.00	0.00	1.00	0.00
29.86	116.94	2.00	0.00	1.00	0.00	30.02	108.26	2.00	0.00	1.00	0.00
30.19	96.41	2.00	0.00	1.00	0.00	30.35	97.71	0.15	2.38	1.00	0.05
30.51	107.17	0.18	2.21	1.00	0.04	30.68	121.75	0.22	1.99	1.00	0.04
30.84	127.02	2.00	0.00	1.00	0.00	31.01	123.67	2.00	0.00	1.00	0.00
31.17	114.62	2.00	0.00	1.00	0.00	31.33	105.26	2.00	0.00	1.00	0.00
31.50	104.03	2.00	0.00	1.00	0.00	31.66	113.88	2.00	0.00	1.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
31.83	129.49	2.00	0.00	1.00	0.00	31.99	137.72	0.30	1.80	1.00	0.03
32.15	139.74	0.31	1.78	1.00	0.03	32.32	140.75	0.31	1.77	1.00	0.04
32.48	141.23	2.00	0.00	1.00	0.00	32.65	138.41	2.00	0.00	1.00	0.00
32.81	133.68	2.00	0.00	1.00	0.00	32.97	133.39	2.00	0.00	1.00	0.00
33.14	131.15	2.00	0.00	1.00	0.00	33.30	128.03	2.00	0.00	1.00	0.00
33.47	121.58	2.00	0.00	1.00	0.00	33.63	114.09	2.00	0.00	1.00	0.00
33.79	103.53	2.00	0.00	1.00	0.00	33.96	91.83	2.00	0.00	1.00	0.00
34.12	84.43	2.00	0.00	1.00	0.00	34.29	87.66	2.00	0.00	1.00	0.00
34.45	92.65	2.00	0.00	1.00	0.00	34.61	97.33	2.00	0.00	1.00	0.00
34.78	101.96	2.00	0.00	1.00	0.00	34.94	108.78	2.00	0.00	1.00	0.00
35.11	119.20	0.22	2.02	1.00	0.04	35.27	130.00	0.26	1.88	1.00	0.04
35.43	147.58	0.35	1.70	1.00	0.03	35.60	154.40	0.39	1.64	1.00	0.03
35.76	157.11	0.40	1.61	1.00	0.03	35.93	159.86	0.42	1.59	1.00	0.03
36.09	167.39	0.47	1.53	1.00	0.03	36.26	174.58	0.53	1.48	1.00	0.03
36.42	177.10	0.55	1.46	1.00	0.03	36.58	174.91	0.53	1.48	1.00	0.03
36.75	167.38	0.47	1.53	1.00	0.03	36.91	173.01	0.52	1.49	1.00	0.03
37.08	171.59	0.51	1.50	1.00	0.03	37.24	172.58	0.51	1.49	1.00	0.03
37.40	160.79	0.43	1.58	1.00	0.03	37.57	158.02	0.41	1.61	1.00	0.03
37.73	157.90	0.41	1.61	1.00	0.03	37.90	159.42	0.42	1.59	1.00	0.03
38.06	160.05	0.42	1.59	1.00	0.03	38.22	160.88	0.43	1.58	1.00	0.03
38.39	161.73	0.44	1.58	1.00	0.03	38.55	165.41	0.46	1.55	1.00	0.03
38.72	173.54	0.52	1.49	1.00	0.03	38.88	177.71	0.56	1.32	1.00	0.03
39.04	172.60	0.52	1.49	1.00	0.03	39.21	168.69	0.49	1.52	1.00	0.03
39.37	170.56	0.50	1.51	1.00	0.03	39.54	160.60	0.43	1.58	1.00	0.03
39.70	142.35	0.32	1.75	1.00	0.03	39.86	121.82	0.23	1.99	1.00	0.04
40.03	113.16	2.00	0.00	1.00	0.00	40.19	105.35	2.00	0.00	1.00	0.00
40.36	96.66	2.00	0.00	1.00	0.00	40.52	88.03	2.00	0.00	1.00	0.00
40.68	80.13	2.00	0.00	1.00	0.00	40.85	72.36	2.00	0.00	1.00	0.00
41.01	66.21	2.00	0.00	1.00	0.00	41.18	64.85	2.00	0.00	1.00	0.00
41.34	64.84	2.00	0.00	1.00	0.00	41.50	66.08	2.00	0.00	1.00	0.00
41.67	66.02	2.00	0.00	1.00	0.00	41.83	70.69	2.00	0.00	1.00	0.00
42.00	78.55	2.00	0.00	1.00	0.00	42.16	95.72	2.00	0.00	1.00	0.00
42.32	114.63	2.00	0.00	1.00	0.00	42.49	131.64	2.00	0.00	1.00	0.00
42.65	146.22	2.00	0.00	1.00	0.00	42.82	159.38	2.00	0.00	1.00	0.00
42.98	171.86	0.52	1.50	1.00	0.03	43.15	179.85	0.59	1.30	1.00	0.03
43.31	195.54	0.73	0.95	1.00	0.02						

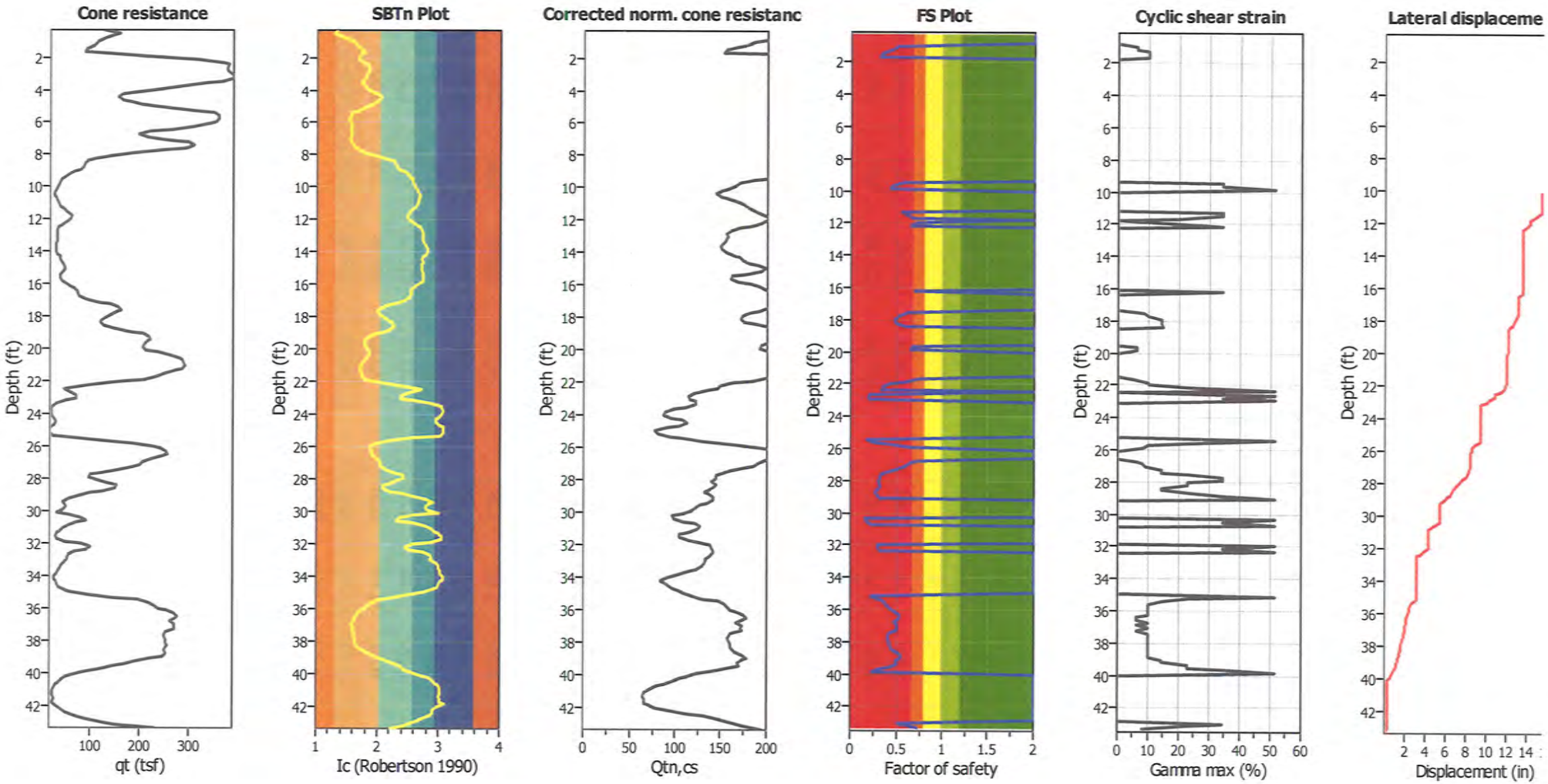
Total estimated settlement: 2.69

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

Estimation of post-earthquake lateral Displacements

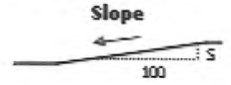
Geometric parameters: Gently sloping ground without free face (Slope 0.70 %)



Abbreviations

q_t: Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c: Soil Behaviour Type Index
$Q_{tn,cs}$: Equivalent clean sand normalized CPT total cone resistance
F.S.: Factor of safety
γ_{max}: Maximum cyclic shear strain
LDI: Lateral displacement index

Surface condition



:: Lateral displacement index calculation ::

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
0.33	127.30	204.49	0.29	204.49	2.00	90.61	0.00	0.00
0.49	158.47	254.55	0.32	254.55	2.00	97.84	0.00	0.00
0.66	147.27	236.54	0.38	236.54	2.00	95.42	0.00	0.00
0.82	129.40	207.82	0.49	207.82	2.00	91.14	0.00	0.00
0.98	115.30	185.15	0.66	185.15	0.51	87.33	6.20	0.11
1.15	110.27	177.05	0.73	177.05	0.45	85.86	6.20	0.11
1.31	105.13	168.79	0.76	170.63	0.41	84.28	10.00	0.17
1.48	92.47	148.42	0.79	155.50	0.33	80.03	10.00	0.18
1.64	87.40	140.27	0.92	152.65	0.31	78.17	10.00	0.17
1.80	135.03	216.78	1.18	227.99	2.00	92.54	0.00	0.00
1.97	222.23	356.86	1.57	367.59	2.00	100.00	0.00	0.00
2.13	315.50	506.68	1.98	525.22	2.00	100.00	0.00	0.00
2.30	365.26	586.62	2.49	633.56	2.00	100.00	0.00	0.00
2.46	378.70	608.18	2.95	683.81	2.00	100.00	0.00	0.00
2.62	376.13	604.04	3.23	697.76	2.00	100.00	0.00	0.00
2.79	374.40	601.24	3.21	693.60	2.00	100.00	0.00	0.00
2.95	378.60	607.97	3.06	690.92	2.00	100.00	0.00	0.00
3.12	386.36	620.43	2.84	688.96	2.00	100.00	0.00	0.00
3.28	384.96	618.16	2.62	672.72	2.00	100.00	0.00	0.00
3.45	364.87	585.86	2.41	627.68	2.00	100.00	0.00	0.00
3.61	331.67	532.50	2.27	568.16	2.00	100.00	0.00	0.00
3.77	288.07	462.43	2.34	505.57	2.00	100.00	0.00	0.00
3.94	239.60	384.55	2.50	438.85	2.00	100.00	0.00	0.00
4.10	192.84	309.39	2.80	378.32	2.00	100.00	0.00	0.00
4.27	164.04	263.10	3.11	345.33	2.00	98.93	0.00	0.00
4.43	156.20	250.50	3.35	342.80	2.00	97.31	0.00	0.00
4.59	165.20	264.94	3.33	356.62	2.00	99.16	0.00	0.00
4.76	179.27	287.52	2.96	363.33	2.00	100.00	0.00	0.00
4.92	206.57	331.36	2.58	390.49	2.00	100.00	0.00	0.00
5.09	257.70	413.49	2.11	447.26	2.00	100.00	0.00	0.00
5.25	309.63	496.91	1.80	504.10	2.00	100.00	0.00	0.00
5.41	348.52	559.38	1.52	559.38	2.00	100.00	0.00	0.00
5.58	357.82	574.31	1.40	574.31	2.00	100.00	0.00	0.00
5.74	357.12	565.87	1.37	565.87	2.00	100.00	0.00	0.00
5.91	350.92	547.63	1.42	547.63	2.00	100.00	0.00	0.00
6.07	335.69	516.62	1.40	516.62	2.00	100.00	0.00	0.00
6.23	306.09	464.76	1.33	464.76	2.00	100.00	0.00	0.00
6.40	263.66	394.84	1.18	394.84	2.00	100.00	0.00	0.00
6.56	218.79	323.57	1.02	323.57	2.00	100.00	0.00	0.00
6.73	195.29	285.16	0.96	285.16	2.00	100.00	0.00	0.00
6.89	213.29	307.91	0.97	307.91	2.00	100.00	0.00	0.00
7.05	255.86	365.25	1.08	365.25	2.00	100.00	0.00	0.00
7.22	295.76	417.20	1.23	417.20	2.00	100.00	0.00	0.00
7.38	308.19	429.89	1.37	429.89	2.00	100.00	0.00	0.00
7.55	292.62	403.46	1.49	402.09	2.00	100.00	0.00	0.00
7.71	250.59	346.35	1.54	356.81	2.00	100.00	0.00	0.00
7.87	192.16	270.09	1.73	297.33	2.00	99.79	0.00	0.00
8.04	140.09	203.48	2.31	255.73	2.00	90.45	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
8.20	107.46	161.50	3.29	250.32	2.00	82.82	0.00	0.00
8.37	93.86	142.53	4.01	256.66	2.00	78.70	0.00	0.00
8.53	88.66	133.79	4.21	254.04	2.00	76.61	0.00	0.00
8.69	86.32	128.93	4.29	251.21	2.00	75.39	0.00	0.00
8.86	79.32	118.09	4.66	251.32	2.00	72.49	0.00	0.00
9.02	69.38	103.33	5.14	248.12	2.00	68.08	0.00	0.00
9.19	57.61	85.67	5.44	233.27	2.00	61.89	0.00	0.00
9.35	47.91	70.74	5.29	208.60	2.00	55.58	0.00	0.00
9.51	41.01	59.92	4.96	185.49	0.58	50.09	34.10	0.49
9.68	37.71	54.28	4.60	169.52	0.46	46.83	34.10	0.52
9.84	35.44	50.50	4.61	164.40	0.43	44.45	51.20	0.74
10.01	32.37	45.67	4.63	157.80	2.00	41.13	0.00	0.00
10.17	29.54	41.27	4.63	150.91	2.00	37.79	0.00	0.00
10.34	27.74	38.29	4.57	145.08	2.00	35.32	0.00	0.00
10.50	28.01	38.25	4.76	148.47	2.00	35.28	0.00	0.00
10.66	30.28	40.84	4.95	156.22	2.00	37.44	0.00	0.00
10.83	33.41	44.47	5.19	166.54	2.00	40.25	0.00	0.00
10.99	36.58	48.03	5.29	174.27	2.00	42.79	0.00	0.00
11.16	39.98	51.71	5.25	179.52	2.00	45.23	0.00	0.00
11.32	45.38	57.71	4.99	183.17	0.56	48.86	34.10	0.48
11.48	51.48	64.47	4.86	189.58	0.61	52.51	34.10	0.47
11.65	58.58	72.20	4.72	196.70	0.68	56.25	19.98	0.29
11.81	61.52	74.94	4.77	201.44	2.00	57.48	0.00	0.00
11.98	59.65	71.94	4.86	199.84	0.71	56.13	16.50	0.24
12.14	51.75	62.03	5.15	193.00	0.64	51.24	34.10	0.47
12.30	42.82	51.01	5.45	182.38	2.00	44.78	0.00	0.00
12.47	36.58	43.16	5.47	169.45	2.00	39.26	0.00	0.00
12.63	33.08	38.62	5.44	160.86	2.00	35.60	0.00	0.00
12.80	31.98	36.89	5.32	155.58	2.00	34.09	0.00	0.00
12.96	32.08	36.62	5.40	156.52	2.00	33.85	0.00	0.00
13.12	32.12	36.27	5.40	155.77	2.00	33.53	0.00	0.00
13.29	31.79	35.49	5.35	153.50	2.00	32.80	0.00	0.00
13.45	30.56	33.75	5.35	150.14	2.00	31.15	0.00	0.00
13.62	29.29	32.00	5.46	148.47	2.00	29.39	0.00	0.00
13.78	29.02	31.40	5.74	151.35	2.00	28.77	0.00	0.00
13.94	30.26	32.42	5.84	154.91	2.00	29.82	0.00	0.00
14.11	33.39	35.44	5.99	163.48	2.00	32.76	0.00	0.00
14.27	37.79	39.73	5.82	169.31	2.00	36.53	0.00	0.00
14.44	40.10	41.72	5.82	173.06	2.00	38.15	0.00	0.00
14.60	41.47	42.76	6.11	180.01	2.00	38.96	0.00	0.00
14.76	44.64	45.63	6.35	189.66	2.00	41.10	0.00	0.00
14.93	48.06	48.67	6.52	198.56	2.00	43.23	0.00	0.00
15.09	47.42	47.53	6.33	192.91	2.00	42.45	0.00	0.00
15.26	42.02	41.61	6.11	177.77	2.00	38.06	0.00	0.00
15.42	37.96	37.15	5.71	162.50	2.00	34.31	0.00	0.00
15.58	38.46	37.29	5.55	160.15	2.00	34.44	0.00	0.00
15.75	41.87	40.26	5.73	168.86	2.00	36.97	0.00	0.00
15.91	47.97	45.82	5.84	180.92	2.00	41.24	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
16.08	57.83	54.87	5.59	191.56	2.00	47.19	0.00	0.00
16.24	68.53	64.60	5.25	199.10	0.70	52.58	34.10	0.43
16.40	73.76	69.00	5.20	204.11	2.00	54.75	0.00	0.00
16.57	74.26	68.85	5.21	204.14	2.00	54.68	0.00	0.00
16.73	77.22	71.05	5.22	207.62	2.00	55.72	0.00	0.00
16.90	91.89	84.06	4.68	210.82	2.00	61.27	0.00	0.00
17.06	115.99	105.70	3.94	214.34	2.00	68.83	0.00	0.00
17.23	140.99	128.00	3.05	208.69	2.00	75.15	0.00	0.00
17.39	157.09	142.09	2.40	200.48	2.00	78.59	0.00	0.00
17.55	160.82	144.82	1.99	189.70	0.62	79.22	8.74	0.11
17.72	153.76	137.53	1.91	180.36	0.54	77.52	10.00	0.13
17.88	142.22	126.22	2.02	173.33	0.49	74.69	14.50	0.17
18.05	130.02	114.28	2.31	171.46	0.48	71.40	14.50	0.18
18.21	121.82	106.06	2.65	174.60	0.50	68.94	14.50	0.17
18.37	120.55	104.03	3.10	186.43	0.59	68.30	14.53	0.17
18.54	127.82	109.48	3.44	202.83	2.00	69.99	0.00	0.00
18.70	149.52	127.71	3.34	218.28	2.00	75.07	0.00	0.00
18.87	178.09	152.16	2.77	222.81	2.00	80.86	0.00	0.00
19.03	205.35	175.98	2.05	220.63	2.00	85.65	0.00	0.00
19.19	218.16	187.21	1.56	214.98	2.00	87.70	0.00	0.00
19.36	219.95	188.44	1.32	208.16	2.00	87.91	0.00	0.00
19.52	213.82	182.34	1.26	200.86	2.00	86.83	0.00	0.00
19.69	207.65	176.19	1.22	193.98	0.66	85.69	6.20	0.08
19.85	205.35	173.26	1.25	192.36	0.65	85.14	6.20	0.07
20.01	211.25	176.88	1.45	202.10	2.00	85.82	0.00	0.00
20.18	234.32	195.18	1.62	224.39	2.00	89.07	0.00	0.00
20.34	257.02	213.31	1.70	243.73	2.00	92.00	0.00	0.00
20.51	279.02	231.26	1.61	257.19	2.00	94.67	0.00	0.00
20.67	285.15	235.94	1.50	257.13	2.00	95.33	0.00	0.00
20.83	287.69	237.64	1.38	254.11	2.00	95.57	0.00	0.00
21.00	289.29	238.47	1.28	250.77	2.00	95.68	0.00	0.00
21.16	284.09	233.40	1.22	243.92	2.00	94.98	0.00	0.00
21.33	269.69	220.32	1.20	231.81	2.00	93.07	0.00	0.00
21.49	249.35	202.65	1.14	214.15	2.00	90.31	0.00	0.00
21.65	232.92	188.30	1.09	199.99	0.72	87.89	5.82	0.06
21.82	208.89	166.89	1.18	184.48	0.58	83.90	9.85	0.11
21.98	165.39	128.71	1.63	163.84	0.43	75.33	10.00	0.11
22.15	107.92	80.43	2.63	149.34	0.34	59.81	22.70	0.26
22.31	65.29	46.28	4.03	146.75	0.33	41.57	51.20	0.55
22.47	47.30	32.44	4.58	135.69	2.00	29.84	0.00	0.00
22.64	58.23	40.85	3.09	120.21	0.21	37.45	51.20	0.58
22.80	72.29	51.69	2.35	114.65	0.19	45.22	34.10	0.36
22.97	72.09	51.15	2.45	116.57	0.20	44.87	51.20	0.57
23.13	53.76	36.63	3.47	122.57	2.00	33.85	0.00	0.00
23.30	34.06	21.84	5.09	121.45	2.00	16.78	0.00	0.00
23.46	24.96	15.49	5.88	112.18	2.00	5.45	0.00	0.00
23.62	21.83	13.33	5.04	97.93	2.00	0.49	0.00	0.00
23.79	19.93	12.00	4.52	89.21	2.00	0.00	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
23.95	20.26	12.14	4.28	87.53	2.00	0.00	0.00	0.00
24.12	23.56	14.18	4.53	95.76	2.00	2.52	0.00	0.00
24.28	28.36	17.15	4.94	108.00	2.00	8.81	0.00	0.00
24.44	30.05	18.12	5.10	112.33	2.00	10.63	0.00	0.00
24.61	26.48	15.73	5.04	105.10	2.00	5.96	0.00	0.00
24.77	20.77	12.05	4.65	90.55	2.00	0.00	0.00	0.00
24.94	18.44	10.52	3.80	78.43	2.00	0.00	0.00	0.00
25.10	18.64	10.57	4.11	81.30	2.00	0.00	0.00	0.00
25.26	23.38	13.43	4.56	93.95	2.00	0.73	0.00	0.00
25.43	56.50	35.95	2.83	109.10	0.18	33.23	51.20	0.53
25.59	116.17	79.38	1.95	129.08	0.25	59.38	22.70	0.22
25.76	184.67	131.10	1.57	164.15	0.43	75.94	10.00	0.10
25.92	226.02	162.02	1.53	191.18	0.65	82.93	7.98	0.08
26.08	241.19	172.32	1.62	203.25	2.00	84.96	0.00	0.00
26.25	251.15	178.39	1.73	212.34	2.00	86.10	0.00	0.00
26.41	254.15	179.45	1.80	215.67	2.00	86.30	0.00	0.00
26.58	245.52	171.86	1.86	210.69	2.00	84.87	0.00	0.00
26.74	222.06	153.05	2.01	198.12	0.72	81.05	6.47	0.06
26.90	206.66	140.58	2.15	190.86	0.65	78.24	7.96	0.07
27.07	199.52	134.76	2.16	185.75	0.60	76.85	9.22	0.09
27.23	187.95	126.20	2.07	175.27	0.52	74.68	14.50	0.13
27.40	159.12	104.76	2.18	158.76	0.40	68.53	14.50	0.14
27.56	123.02	77.99	2.68	148.67	0.34	58.79	22.70	0.21
27.72	99.89	61.31	3.14	144.09	0.32	50.85	34.10	0.31
27.89	98.21	59.80	3.19	143.82	0.32	50.03	34.10	0.33
28.05	114.07	70.92	2.63	140.41	0.30	55.66	22.70	0.21
28.22	138.35	88.05	2.19	143.91	0.32	62.80	22.70	0.22
28.38	153.31	99.29	1.80	142.54	0.31	66.76	14.50	0.13
28.54	149.72	96.54	1.76	138.74	0.30	65.84	14.50	0.13
28.71	127.71	80.06	2.04	132.15	0.26	59.66	22.70	0.21
28.87	100.89	60.18	2.87	136.26	0.28	50.24	34.10	0.30
29.04	77.97	44.13	3.93	141.85	0.31	40.00	51.20	0.48
29.20	57.85	30.98	5.13	141.56	2.00	28.32	0.00	0.00
29.36	45.47	23.31	5.86	134.30	2.00	18.94	0.00	0.00
29.53	47.54	24.64	4.98	126.41	2.00	20.76	0.00	0.00
29.69	49.80	26.01	4.48	122.46	2.00	22.55	0.00	0.00
29.86	45.80	23.54	4.44	116.94	2.00	19.26	0.00	0.00
30.02	33.06	16.14	5.24	108.26	2.00	6.79	0.00	0.00
30.19	53.47	28.77	2.62	96.41	2.00	25.88	0.00	0.00
30.35	79.70	45.84	1.88	97.71	0.15	41.26	51.20	0.43
30.51	92.40	53.58	1.98	107.17	0.18	46.41	34.10	0.28
30.68	74.06	40.26	3.20	121.75	0.22	36.97	51.20	0.45
30.84	55.33	28.14	4.52	127.02	2.00	25.15	0.00	0.00
31.01	46.06	22.53	5.14	123.67	2.00	17.80	0.00	0.00
31.17	40.33	19.27	5.04	114.62	2.00	12.65	0.00	0.00
31.33	33.10	15.46	5.14	105.26	2.00	5.37	0.00	0.00
31.50	30.43	14.05	5.48	104.03	2.00	2.23	0.00	0.00
31.66	33.37	15.42	6.09	113.88	2.00	5.30	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
31.83	51.70	24.97	5.16	129.49	2.00	21.20	0.00	0.00
31.99	82.23	42.90	3.81	137.72	0.30	39.07	51.20	0.41
32.15	101.03	54.38	3.27	139.74	0.31	46.89	34.10	0.27
32.32	92.33	48.55	3.61	140.75	0.31	43.15	51.20	0.43
32.48	67.80	33.36	4.82	141.23	2.00	30.76	0.00	0.00
32.65	55.37	26.04	5.66	138.41	2.00	22.58	0.00	0.00
32.81	53.07	24.73	5.53	133.68	2.00	20.88	0.00	0.00
32.97	53.80	25.01	5.45	133.39	2.00	21.26	0.00	0.00
33.14	47.60	21.43	6.02	131.15	2.00	16.17	0.00	0.00
33.30	42.26	18.78	6.47	128.03	2.00	11.80	0.00	0.00
33.47	40.33	17.78	6.12	121.58	2.00	9.99	0.00	0.00
33.63	37.10	16.19	5.84	114.09	2.00	6.91	0.00	0.00
33.79	33.76	14.58	5.23	103.53	2.00	3.44	0.00	0.00
33.96	28.13	11.92	4.86	91.83	2.00	0.00	0.00	0.00
34.12	26.26	11.03	4.32	84.43	2.00	0.00	0.00	0.00
34.29	29.10	12.29	4.24	87.66	2.00	0.00	0.00	0.00
34.45	31.83	13.51	4.40	92.65	2.00	0.92	0.00	0.00
34.61	34.80	14.82	4.50	97.33	2.00	3.99	0.00	0.00
34.78	40.63	17.65	4.27	101.96	2.00	9.75	0.00	0.00
34.94	55.17	25.45	3.63	108.78	2.00	21.83	0.00	0.00
35.11	96.13	49.16	2.64	119.20	0.22	43.56	51.20	0.38
35.27	146.20	80.73	1.94	130.00	0.26	59.94	22.70	0.16
35.43	195.53	113.82	1.53	147.58	0.35	71.27	14.50	0.10
35.60	217.22	129.95	1.27	154.40	0.39	75.65	10.00	0.07
35.76	227.96	138.82	1.10	157.11	0.40	77.83	10.00	0.07
35.93	237.45	146.91	0.95	159.86	0.42	79.70	10.00	0.07
36.09	254.15	159.87	0.85	167.39	0.47	82.49	10.00	0.07
36.26	269.09	171.00	0.81	174.58	0.53	84.71	10.00	0.07
36.42	275.52	175.95	0.77	177.10	0.55	85.65	6.20	0.04
36.58	273.02	174.91	0.66	174.91	0.53	85.45	6.20	0.04
36.75	261.69	167.38	0.62	167.38	0.47	84.00	10.00	0.07
36.91	270.73	173.01	0.58	173.01	0.52	85.09	6.20	0.04
37.08	268.88	171.59	0.64	171.59	0.51	84.82	10.00	0.07
37.24	270.72	172.58	0.64	172.58	0.51	85.01	6.20	0.04
37.40	252.69	160.79	0.63	160.79	0.43	82.68	10.00	0.06
37.57	248.69	158.02	0.62	158.02	0.41	82.10	10.00	0.07
37.73	248.79	157.90	0.59	157.90	0.41	82.08	10.00	0.06
37.90	251.45	159.42	0.64	159.42	0.42	82.39	10.00	0.07
38.06	253.23	160.06	0.67	160.05	0.42	82.52	10.00	0.06
38.22	253.66	159.61	0.70	160.88	0.43	82.43	10.00	0.06
38.39	252.20	156.94	0.77	161.73	0.44	81.88	10.00	0.06
38.55	249.67	150.61	1.03	165.41	0.46	80.52	10.00	0.06
38.72	251.57	146.89	1.40	173.54	0.52	79.69	10.00	0.06
38.88	247.07	140.63	1.73	177.71	0.56	78.25	10.00	0.06
39.04	222.57	122.45	2.10	172.60	0.52	73.68	14.50	0.08
39.21	191.57	101.03	2.61	168.69	0.49	67.34	14.50	0.09
39.37	166.46	84.27	3.22	170.56	0.50	61.35	22.70	0.13
39.54	146.13	72.49	3.31	160.60	0.43	56.38	22.70	0.14

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
39.70	119.37	57.79	3.21	142.35	0.32	48.90	34.10	0.19
39.86	84.33	38.75	3.28	121.82	0.23	35.71	51.20	0.29
40.03	62.83	27.17	3.71	113.16	2.00	23.99	0.00	0.00
40.19	49.67	20.42	4.03	105.35	2.00	14.57	0.00	0.00
40.36	42.74	17.10	3.90	96.66	2.00	8.70	0.00	0.00
40.52	36.50	14.16	3.74	88.03	2.00	2.48	0.00	0.00
40.68	30.67	11.70	3.59	80.13	2.00	0.00	0.00	0.00
40.85	27.37	10.30	3.17	72.36	2.00	0.00	0.00	0.00
41.01	25.27	9.40	2.77	66.21	2.00	0.00	0.00	0.00
41.18	24.54	9.08	2.72	64.85	2.00	0.00	0.00	0.00
41.34	25.57	9.48	2.61	64.84	2.00	0.00	0.00	0.00
41.50	25.83	9.57	2.71	66.08	2.00	0.00	0.00	0.00
41.67	25.53	9.43	2.74	66.02	2.00	0.00	0.00	0.00
41.83	24.80	9.10	3.36	70.69	2.00	0.00	0.00	0.00
42.00	32.30	12.16	3.30	78.55	2.00	0.00	0.00	0.00
42.16	42.60	16.59	3.91	95.72	2.00	7.71	0.00	0.00
42.32	51.40	20.28	4.80	114.63	2.00	14.34	0.00	0.00
42.49	58.96	23.39	5.60	131.64	2.00	19.05	0.00	0.00
42.65	77.53	32.29	5.25	146.22	2.00	29.68	0.00	0.00
42.82	102.56	44.90	4.75	159.38	2.00	40.57	0.00	0.00
42.98	134.89	61.93	4.23	171.86	0.52	51.19	34.10	0.16
43.15	153.86	72.01	4.05	179.85	0.59	56.16	22.70	0.11
43.31	228.32	115.75	3.01	195.54	0.73	71.83	7.87	0.04

Total estimated displacement: 17.94

Abbreviations

q_t: Total cone resistance
Q_{tn}: Adjusted cone resistance to an effective overburden stress of 1 atm
R_f: Friction ration
$Q_{tn,cs}$: Adjusted and corrected cone resistance due to fines
FS: Calculated factor of safety against liquefaction
D_r: Calculated relative density
$Gamma_{max}$: Calculated maximum cyclic shear strain
Lat. disp.: Lateral displacement