Appendix C

Geotechnical Exploration

GEOTECHNICAL EXPLORATION
PROPOSED NEW FIRE TRAINING FACILITY
EL CAMINO COLLEGE
16007 CRENSHAW BOULEVARD
TORRANCE, LOS ANGELES COUNTY, CALIFORNIA

Prepared For

EL CAMINO COMMUNITY COLLEGE DISTRICT
16007 CRENSHAW BOULEVARD
TORRANCE, CA 90506-0001

Prepared By

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Project No. 10535.020

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El Camino Community College District
Facilities Planning and Services
16007 Crenshaw Boulevard
Torrance, CA 90506-0001

Attention: Mr. Jorge Gutierrez
Executive Director Facilities, Planning & Services

Subject: **Geotechnical Exploration**
Proposed New Fire Training Facility
El Camino College
16007 Crenshaw Boulevard
Torrance, Los Angeles County, California

In accordance with our March 18, 2021 proposal, officially authorized on May 12, 2021, Leighton Consulting, Inc. has completed a geotechnical exploration at El Camino College, to support design of the proposed New Fire Training Facility; to be constructed within the Lot L of the El Camino College campus in Torrance, California. The objectives of our exploration were to evaluate geotechnical conditions at the proposed new building site and provide geotechnical recommendations for planning and design as currently conceived.

This site is **not** located within a currently designated Alquist-Priolo Special Studies Zone for surface fault rupture. However, as is the case for most of southern California, strong ground shaking has and will occur at this site. Portions of the site located immediately adjacent to the Los Angeles County Flood Control District's Dominguez Channel **are** within a State of California designated liquefaction hazard zone. Our findings indicate the site has a low potential to liquefy during a major seismic event, and the expected liquefaction-induced settlement is estimated to be within design tolerances for conventional shallow spread footings. Undocumented fill soils were encountered in our exploratory borings to depths ranging from approximately 7½ feet to 10 feet below existing grade.

Based upon our geotechnical exploration and analysis, all existing fill soil and soils disturbed by demolition, within the proposed building footprint, should be excavated and recompacted to provide uniform shallow foundation support. The proposed Fire

Training Facility structures can be founded on conventional spread footings bearing solely on a zone of newly excavated and recompacted fill soils derived from onsite soils, overlying undisturbed native soil. However, to mitigate the effects of expansive soil, imported relatively low-expansive soil should be used to backfill new retaining walls (if any), and to support proposed building floor slabs.

We appreciate this opportunity to be of additional service to El Camino Community College District. If you have any questions or if we can be of further service, please contact us at your convenience at ***866-LEIGHTON***, directly at the phone extensions or e-mail addresses listed below.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

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1.0 INTRODUCTION

1.1 Site Location and Description

As depicted on Figure 1, *Site Location Map*, El Camino College is located in a portion of unincorporated Los Angeles County at 16007 Crenshaw Boulevard in the City of Torrance, California. The campus is bounded on the north by Manhattan Beach Boulevard, the east by Crenshaw Boulevard, and the south and west by the Dominguez Channel. Specifically, the proposed Fire Training Facility is currently planned in the far southwest portion of the campus (latitude N33.8812° and longitude W118.3299°) in Parking Lot L, immediately north and east of the Dominguez Channel; see:

http://www.elcamino.edu/about/maps/ECC-Campus-Map.pdf

The project site is bounded by Redondo Beach Boulevard to the north, paved parking lots to the east, and the Dominguez Channel to the south and west. Dominguez Channel is a roughly 75-foot wide, concrete-lined, channel supported by approximately 10 foot tall retaining walls on either side. Currently, the site is occupied by an active, asphalt paved, parking lot. Plate 1, *Geotechnical Map*, shows the location of the proposed Fire Training Facility.

Based on visual review of historic aerial photos (NETR, 2021) dating back to 1952, it appears the site was undeveloped through at least 1963. By 1972, it appears the site was developed with a paved parking lot, although a slightly different configuration than exists today. By 1980, the bridge connecting Lot L and the main college campus had been constructed and the site configuration appears to be similar to what exists today. Based on review of historical aerial photos, the concrete-lined Dominguez Channel was constructed prior to 1952.

As shown on the 1981 Photorevised USGS Inglewood 7.5 Minute Series Quadrangle, this campus is relatively flat with an approximate ground surface elevation ranging from 40-feet above mean sea level (msl) in the far southern extent of the campus to approximately to 50-feet mean sea level in the northern portions (NGVD29).

1.2 Proposed Fire Training Facility

Our understanding of this project is based on Perkin Eastman's March 11, 2021 e-mail and their Conceptual Site Plan for the proposed El Camino College Fire Training Facility. We understand the project includes the construction of a series of modular classroom buildings and a central fire tower. The proposed modular buildings will include spaces for classrooms, administration office, restrooms, and showers. There will be separate buildings for a Multipurpose Room (MPR) and Apparatus Bays with storage rooms. The approximate footprint areas of the buildings/structure and the exploration point depths are shown below.

Building	Square-Footage (feet)	Stories	Depths (feet)
Classrooms and Admin	3,840	1	10 to 50
Classrooms and Restroom & Shower	3,840	1	10 to 50
Apparatus Bays and Storage	5,400	(bay high)	25 to 50
Multipurpose Room	2,880	1	25 to 50
Fire Tower	1,080	≤5	50 to 75

Heights of the modular buildings and fire tower are unknown to us at this time; however, we assume modular the buildings will be single-story and the proposed fire tower will be up to five stories in height. In addition, we assume the proposed fire tower will be either a combined reinforced concrete and/or masonry structure. Additional site improvements will include new pavement, utility infrastructure and fire hydrants.

The proposed structures are assumed to be 2019 California Building Code (CBC) Building *Risk Category III*. For the purposes of establishing our preliminary foundation recommendations, based on the expected gravity loads provided by the structural engineer, anticipated column loading is assumed to be less than 300 kips (D+L, unfactored) and wall loads of up to 6 kips per lineal foot (D+L, unfactored).

1.3 Purpose and Scope of Exploration

The purpose of our exploration was to: (1) evaluate geotechnical conditions in the vicinity of this proposed Fire Training Facility (FTF), (2) identify significant geotechnical or geologic/seismic hazard issues that would impact this site, and (3) provide geotechnical recommendations for design and construction of the project as currently conceived. In accordance with our March 28, 2021 proposal, officially authorized on May 12, 2021, the scope of our exploration included the following:

- **Research**: We reviewed readily available and provided geotechnical literature, reports and aerial photographs relevant to this site. Pertinent geotechnical documents are referenced at the end of this report text (including prior geotechnical reports prepared for this campus).

  Field Exploration: On May 5 and 6, 2021, a total of seven (7) hollow-stem auger borings (B-1 through B-7) were drilled, logged and sampled to depths ranging from approximately 10- to 51½-feet below existing ground surface (bgs) at locations where a truck-mounted drill rig could access the site around existing buildings.

  In addition**,** on May 7, 2021, four (4) cone penetrometer test (CPT-1 through CPT-4) soundings were advanced to depths ranging from approximately 50- to 75-feet bgs. CPT-1 was used to measure shear wave velocities at 5-foot depth intervals.

  Approximate boring and CPT locations are depicted on Plate 1, *Geotechnical Map*. A description of our field exploration and the boring and CPT logs are presented in Appendix A, *Field Exploration*.

- **Percolation Testing:** Boring B-3 (Plate 1) was converted to temporary percolation test wells upon completion of drilling and sampling. In-situ percolation testing was performed in general accordance with the County of Los Angeles Department of Public Works (LADPW) *Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration* (LADPW, 2017). The results of the percolation testing are presented in Appendix C, *Percolation Test Data*. Discussion of the measured infiltration rate is presented in Section 2.6, *Infiltration*.

- **Geotechnical Laboratory Testing**: Geotechnical laboratory tests were conducted on select relatively undisturbed and bulk soil samples obtained during our field exploration. This laboratory testing program was designed to evaluate engineering characteristics of site soils. A description of test procedures and results are presented in Appendix B, *Geotechnical Laboratory Testing*.

- **Engineering and Geologic Analysis**: Data obtained from our borings and geotechnical laboratory testing was evaluated and analyzed to develop geotechnical conclusions and recommendations in accordance with the California Geological Survey (CGS) Note 48 (November 2019 version). Our interpretations based on our subsurface exploration are presented on Plate 2, *Geotechnical Cross Sections A-A' and B-B'*.

- **Report Preparation**: Results of our geologic hazards review and geotechnical exploration have been summarized in this report, presenting our findings, conclusions and preliminary geotechnical design recommendations.

This report does not address the potential for encountering hazardous materials in site soils nor groundwater. Important information about limitations of geotechnical reports in general, is presented in Appendix G, *GBA Important Information About This Geotechnical-Engineering Report*.

2.0 FINDINGS

2.1 Regional Geologic Setting

El Camino College is located within the Peninsular Ranges Geomorphic Province of California on the Torrance Plain. Geomorphically, the Torrance Plain is elevated and relatively flat, consisting predominately of indurated older alluvium. As regionally mapped on Figure 2, *Regional Geology Map*, older Pleistocene alluvium of the Torrance Plain in the vicinity of the campus is incised and infilled with younger alluvial valley deposits of the pre-existing Dominguez Channel valley generally consisting of soft, locally derived sandy silt and sandy clay. More specific to this campus, this is an area of predominantly old alluvium (Qoa) with younger alluvium (Qya) underlying and adjacent to the concrete-lined Dominguez Channel drainage located along the western margin of the campus and the adjacent Alondra Park pond (Roffers and Bedrossian, 2010).

Regional site topography and a limited California liquefaction susceptibility zone (depicted in **green** to the south and west of this site) are depicted on Figure 3, *Seismic Hazard Map*. Figure 4, *Regional Fault and Historical Seismicity Map*, shows this site north of the Palos Verdes Peninsula; west of the Newport-Inglewood Fault Zone and associated oil fields, and northeast of the Palos Verdes fault.

2.2 Subsurface Soil Conditions

Based on results of our research and subsurface exploration, and as interpreted on Plate 2, *Geotechnical Cross Sections A-A' and B-B'*, site soils encountered to the maximum depth explored of approximately 75 feet bgs consisted of undocumented fill soils overlying Quaternary Old Alluvial Valley deposits, described in more detail as follows:

Undocumented Fill (Afu): We are unaware of any fill placement documentation for this site (previously completed college campus with original construction possibly dating back to 1949). Therefore, all encountered fill materials have been identified as undocumented. Fill soils placed in the 1950's were not compacted to current standards. Fill depths as encountered in our current borings ranged from approximately 7.5 to 10 feet bgs. In general, the encountered artificial fill consists of a thin veneer of dark brown silty sand overlying grayish brown to dark gray lean clay and fat clay. Deeper localized fill zones may exist in areas not explored, particularly in areas directly adjacent to the Dominguez Channel.

Quaternary Old Alluvial Valley Deposits (Qoa): Beneath the mantle of undocumented fill soils, Quaternary Older Alluvial Valley deposits were encountered to the maximum depths explored of approximately 75 feet bgs. The alluvial deposits as encountered generally consist of interbedded fat clay, lean clay, and sandy clay. These native cohesive soils were predominantly found to be stiff to hard in consistency and exhibit low to high plasticity.

More detailed descriptions of subsurface soils encountered are presented on our boring logs in Appendix A.

2.3 Corrosion

Soil Resistivity: In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor for ferrous corrosivity. Based on findings of studies presented in the American Society for Testing and Materials (ASTM) STP 1013 titled "Effects of Soil Characteristics on Corrosion" (February, 1989), an approximate relationship between soil resistivity and soil corrosiveness was developed as shown in Table 1 below.

Table 1 - Soil Corrosivity as a Function of Resistivity

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

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

Table 2 - Sulfate Concentration and Exposure

Soluble Sulfate in Water (parts-per-million)	Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	ACI 318-14 Sulfate Class
0-150	0.00 - 0.10	S0 (negligible)
150-1,500	0.10 - 0.20	S1 (moderate*)
1,500-10,000	0.20 - 2.00	S2 (severe)
>10,000	>2.00	S3 (very severe)

*or seawater

Representative, near surface (0 to 5 feet bgs) soil samples were tested to evaluate corrosion potential. The chemical analysis test results for the onsite soil from our geotechnical exploration are included in Appendix B, *Geotechnical Laboratory Testing.* The results of chemical analysis are summarized in the table below.

Table 3 - Corrosivity Test Results

Test Parameter	Test Results		General Classification of Hazard
	B-5 @ 0-5'	B-7@ 1-5'	
Water-Soluble Sulfate-SO_4 in Soil (ppm)	387	95	Negligible to moderate sulfate exposure to buried concrete-S0 Exposure Class
Percent by Weight SO_4	0.0387	0.0770	
Water-Soluble Chloride in Soil (ppm)	180	120	Non-corrosive to buried concrete (per Caltrans Specifications)
Percent by Weight (Cl^-)	0.0180	0.0120	
pH	8.49	8.19	Mildly acidic to mildly alkaline
Minimum Resistivity (saturated, ohm-cm)	593	1280	**Severely Corrosive** to Corrosive to buried ferrous pipes

2.4 Expansive Soils

The Torrance area is noted for having highly expansive fat clay. To verify the potential for near-surface expansive soils, Expansion Index (EI) tests were performed on a shallow bulk soil samples (1-5 feet bgs) from borings B-1, B-3, and B-4, with test results indicating EI values of **36**, **32**, and **55**, respectively. The test results indicate that expansion potential of near-surface soils ranges from low to medium. However, previous expansion testing performed on soil samples collected from the main campus indicate an EI as high as 103, corresponding to a high potential for expansion (Leighton, 2021). Due to variation of expansion indices where tested, additional EI testing of soils upon completion of grading should be performed to confirm the actual subgrade conditions prior to construction.

Based on geotechnical laboratory testing performed on samples collected from the subsurface explorations onsite, a synopsis of geotechnical properties of the site soils is provided in Table 4 below. Geotechnical laboratory testing results are presented in Appendix B.

Table 4 – Soil Geotechnical Properties Synopsis

Parameters	Soil Properties
In-situ Moisture:	Moist to wet
Swell/Expansion Potential:	Swell/expansion potential is **low to medium.**
Collapse Potential:	Not susceptible to collapse when wetted
Strength:	Adequate to provide structural support
Corrosivity:	Negligible to moderate sulfate attack of concrete (S0 Exposure Class) and **severely corrosive** to ferrous metals.

2.5 Groundwater

Groundwater was encountered during our current field exploration at depths of approximately 24 to 28 ½ feet bgs. Specifics regarding the depth to groundwater as encountered are summarized in the following table.

Table 5 - Encountered Groundwater Depth (May 2021)

Boring*	Surface Elevation (feet)**	Depth to Groundwater (feet)	Groundwater Elevation (feet)
B-2	44	28.5	15 ½
B-4	41	24	17
B-6	44	24	20

*see Plate 1 for boring location.

**Elevations approximate based on USGS quadrangle.

The California Geological Survey (CGS) estimates (interpolates from well data), as presented in their Inglewood 7.5-minute quadrangle *Seismic Hazard Zone Report* (CGS, 1998), that historically highest groundwater at this site was on the order of 20 feet below the surface.

2.6 Infiltration

Percolation testing was performed within borings B-3 to evaluate the infiltration characteristics of subsurface soils (See Plate 1). The percolation test was conducted in general accordance with the County of Los Angeles Department of Public Works (LADPW) *Guidelines for Design, Investigation, and Reporting Low Impact Development Stormwater Infiltration* (LADPW, 2017).

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

The *Boring Percolation Test Procedure* (falling-head test method) as outlined in the County Guidelines (LADPW, 2017) was implemented at the percolation test well (B-3) location. The infiltration rate was calculated by dividing the rate of discharge by the infiltration surface area, or flow area. The volume of discharge was calculated by adding the total volume of water that dropped within the PVC pipe and within the annulus, and incorporating a porosity reduction factor to account for the porosity of the annulus material. The flow area was based on the average water height within the test well.

Detailed results of the field testing data and measured infiltration rate for the test well is presented in Appendix C, *Percolation Test Data*. The test results are summarized below:

Table 6 – Measured (Unfactored) Infiltration Rate

Test Well Designation	Approximate Depth of Test Zone (feet bgs)	Measured Infiltration Rate (inches per hour)
B-3	5 to 10	0.01

According to the *Guidelines for Design, Investigation, and Reporting Low Impact Development Stormwater Infiltration* (LADPW, 2017), subsurface materials shall have a design infiltration rate equal to or greater than 0.3 inches per hour to be considered feasible for stormwater infiltration. As shown in Table 6, infiltration is **not** considered feasible for the project. . Based on the relatively homogenous thick sections of lean and fat clay characterized below the site, infiltration is not feasible not only due to low rates but more importantly due to the low permeability clays to significant depths below the site.

2.7 Faulting and Seismicity

2.7.1 Surface Fault Rupture

Based on our review of available in-house literature, review of aerial imagery, geologic Alquist Priolo maps and as depicted on Figure 4, *Regional Fault and Historical Seismicity Map*, there are **no** currently known active or potentially active surface faults that traverse this site, and this site is **not** located within a currently designated Alquist-Priolo Earthquake Fault Zone (CGS, 1986). In addition, no known faults are known or mapped to project towards the site (Morton and Miller, 2006) and no lineaments or evidence of faulting were observed at the site or projecting towards the project site (NETR, 2021). Therefore, the potential for surface fault rupture at the site is expected to be low and a surface fault rupture hazard evaluation is not mandated for this site.

2.7.2 Seismicity (Ground Shaking) Principal seismic hazard that could affect the site is ground shaking resulting from an earthquake occurring along several major active or potentially active faults in southern California. Plotted on Figure 4, *Regional Fault and Historical Seismicity Map*, are epicenters of historic earthquakes in and around the Los Angeles Basin, color coded as a function of magnitude. As depicted on Figure 4, known regional active and potentially active faults that have and could produce the most significant ground shaking at the site include the Newport-Inglewood Fault Zone, located approximately 5.6 kilometers (3.5 miles) to the east, amongst others. Blind-thrust-faults also exist throughout the Los Angeles Basin.

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

Historical Seismicity: A search of historical earthquakes was performed using the computer program *EQSEARCH* (Blake, 2020) for the time-period between 1800 and 2020. Within that time frame 1,072 earthquakes were found within a 100-kilometer (62-mile) radius of this site. Of these earthquakes, the closest recorded earthquake was located 1.2km (0.7 miles) east of El Camino College, reported on March 11, 1933. Peak ground motion at this site was estimated to have been roughly 0.24g, resulting from this magnitude 4.9 Mw aftershock that shook the region on March 11, 1933. This was one day after the March 10, 1933 magnitude 6.3 (M_W) Long Beach Earthquake (presumably an aftershock), which was the largest historic earthquake in this southwestern Los Angeles County region. Although not precisely located (with limited 1933 technology), this aftershock epicenter (N33.8830° latitude, W-118.3170° longitude) was presumably located west of the Newport Inglewood uplift.

The first permanent building for classroom instruction at El Camino College was reportedly the Shop, which opened in 1949, after the 1933 Long Beach Earthquake. The women's gym, field house and social science building came shortly thereafter. Since construction of these buildings in 1949, approximately 610 earthquakes have occurred within a 100-km (62-mile) radius of this site. Of these the closest earthquake was located 6.1 km (3.8 miles) north of the site, occurring at a depth of 15.1 km (9.4 miles). Reported initial focal mechanism was consistent with slip on the Newport-Inglewood Fault Zone (located well to the northeast), which was the source of the damaging 1933 Long Beach earthquake. We could not find any reports of damage to the El Camino College Torrance campus following any of the ground motions mentioned above; including the destructive January 17, 1994 Northridge Earthquake.

2.8 <u>Secondary Seismic Hazards</u>

In general, secondary seismic hazards for sites in this region could include soil liquefaction, earthquake-induced settlement, slope instability and landslides, earthquake-induced seiches and tsunamis flooding. Site-specific potential for secondary seismic hazards is discussed in the following subsections:

2.8.1 Liquefaction Potential

Liquefaction is the loss of soil strength due to a buildup of excess pore-water pressure during strong and long-duration ground shaking. Liquefaction is associated primarily with loose (low density), saturated, relatively uniform fine- to medium-grained, clean cohesionless soils. As shaking action of an earthquake progresses, soil granules are rearranged and the soil densifies within a short period. This rapid densification of soil results in a buildup of pore-water pressure. When the pore-water pressure approaches the total overburden pressure, soil shear strength reduces abruptly and temporarily behaves similar to a fluid. For liquefaction to occur there must be:

(1) loose, clean granular soils,
(2) shallow groundwater, and
(3) strong, long-duration ground shaking

As shown on the State of California Seismic Hazard Zones map for the Inglewood Quadrangle (CGS, 1998), a portion of the project site is located within an area that has been identified by the State of California as being potentially susceptible to liquefaction (Figure 3, *Seismic Hazard Map*).

We performed a liquefaction analysis using the CPT data. Groundwater was assumed to be at a depth of 20 feet in our analysis. A peak ground acceleration of 0.82 g and an earthquake magnitude of 7.3 were used in our analysis. Our analysis indicates discontinuous, thin layers of liquefiable soil between depths of 22 feet and 75 feet. Based on the results of our analysis with the Liquefaction Potential Index ranging between 0.075 and 0.18, the potential for damaging liquefaction to manifest at the surface is considered low. The liquefaction analysis is presented in Appendix E, *Liquefaction Analysis*.

2.8.2 Lateral Spreading Ground Displacement

We also used the CPT data to evaluate lateral spreading using the computer software, CLiq version 3.0.3.2. The analysis is presented in Appendix E. Lateral ground displacement up to approximately 4 inches was calculated. We understand the method of analysis for lateral ground displacement employed by CLiq is as proposed by Zhang, Robertson, and Brachman in their article published in Journal of Geotechnical and Geoenvironmental Engineering entitled, *Estimating Liquefaction-Induced Lateral Displacements Using the Standard Penetration Test or Cone Penetration Test*, dated August 2004. The proposed method is based on case histories and data of liquefied sites with liquefiable clean sands or sandy soils. We encountered generally cohesive soils consisting of fat clay, sandy clay, clay, and silt from our subsurface exploration, and confirmed by our laboratory classification tests (i.e., #200 wash sieve or Atterberg Limits) of the soil samples obtained from our soil borings. Since the site is generally underlain by cohesive soils, and not by clean sands or sandy soils, which have been known to produce lateral ground displacements as a result of liquefaction, we believe the potential for damaging lateral ground displacement is of negligible risk.

2.8.3 **Seismically-Induced Settlement and Soil Bearing Loss**

During a strong seismic event seismically-induced settlement can occur within loose and dry granular soils as well as liquefied soil layers. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. Fill soils are typically highly susceptible to seismically-induced settlement. Onsite silts and clays were found to be predominantly stiff to hard. Therefore, the potential for significant seismically-induced settlement is considered negligible for dry soils (soil above the groundwater table). However, liquefaction-induced settlement (soil below the groundwater table) is estimated to be less than 0.5 inch. Differential liquefaction-induced settlement should be less than 0.25 inch over a span of 50 feet.

Our liquefaction evaluation indicates the liquefiable soil layers will be overlain by a nonliquefiable soil layer of a thickness that will preclude any surface manifestation of liquefaction. Therefore, soil bearing loss by shallow spread footing foundations is considered a negligible risk.

2.8.4 **Slope Instability and Landslides**

Based on the State of California Seismic Hazard Zones Map for the Inglewood Quadrangle (CGS, 1998), the site is not located within an area that has been identified by the State of California as being potentially susceptible to seismically-induced landslides (Figure 3, *Seismic Hazard Map*).

However, due to the adjacent, concrete-lined Dominguez Channel, we performed slope stability analyses using the computer program SLIDE (version 8.023) by Rocscience, Inc. Both static and pseudostatic conditions were considered. SLIDE calculates the factor of safety against instability of a slope by the method of slices according to simplified Janbu, Bishop or Spencer methods. The input parameters for the program include slope geometry, soil stratigraphy, soil unit weight, and soil shear strength. A uniform surcharge pressure of 500 pounds per square foot (psf) was also used as an input parameter to simulate proposed buildings. The program allows a number of random failure surfaces to be generated during search routines to assist in estimating the critical (least) factor of safety for the modeled slope conditions.

In the pseudostatic analysis, the seismic force is modeled as a horizontal force equivalent to the weight of the sliding mass times a horizontal seismic coefficient expressed as a percent of gravity (g). In effect, the dynamic effects are replaced by a static force, and the approach therefore is termed the pseudostatic method of analysis. A horizontal seismic coefficient of 0.41 was used in the analysis.

Our static and pseudostatic analyses for the global and local stability of the concrete-lined channel resulted with the critical failure surface passing through the toe of the retaining wall of the channel as shown in the figures presented in Appendix D, *Slope Stability Analysis*. The minimum factors of safety obtained from the analyses are presented in Table 7 below. Generally, factors of safety greater than or equal to 1.5 and 1.1 are acceptable for static and pseudostatic conditions, respectively.

Table 7 – Slope Stability Analysis Results

Condition	Estimated Minimum Factor of Safety
Static	2.24
Pseudostatic	1.24

2.8.5 Earthquake-Induced Seiches and Tsunamis

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are predominately ocean waves generated by undersea large magnitude fault displacement or major ground movement.

Based on separation of the site from the Alondra Aquatic Center pond by the Dominguez Channel, seiche impact at this site is highly unlikely. Also, due to site elevation at 47- to 50-feet above mean sea level and the inland location of this site relative to the Pacific Ocean (CGS, 2009) tsunami risk at this site is not a consideration.

2.8.6 Earthquake-Induced Inundation

This inundation hazard is flooding caused by failure of dams or other water-retaining structures as a result of earthquakes. Due to the absence of such structures upslope/up-gradient and near this site (see Plate 3-3 in City of Torrance General Plan Update, 2005), the potential for earthquake-induced flooding is considered to be low.

2.9 Storm-Induced Flood Hazard

According to a Federal Emergency Management Agency (FEMA) flood insurance rate map (FEMA, 2008), the site is located within a flood hazard area identified as “Zone X”, which is defined as an area of minimal flood hazard. As depicted on Figure 5, *FEMA Flood Hazard Zone Map*, El Camino College is not located near or within a “100-year” or “500-year” flood zone.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

This site is **not** located within a currently designated Alquist-Priolo Special Studies Zone for surface fault rupture. However, as is the case for most of Southern California, strong ground shaking has and will occur at this site. This site **is** within a currently designated (March 25, 1999) liquefaction hazard zone. Our findings indicate the site has a low potential to liquefy during a major seismic event, and the expected liquefaction-induced settlement is estimated to be within design tolerances for conventional shallow spread footings. We anticipate the proposed buildings can be supported on shallow spread footings, and cast-in-drilled-hole (CIDH) piles for the Fire Tower.

Tested site soils were found to have a range of expansion potential at this site, typical between low to medium (EI 32 to 55). However, testing performed on soils from previous campus explorations on the main campus have been found to be **highly expansive (EI=103)**; therefore, our recommendations should be amended if highly expansive soil is encountered during earthwork construction. Testing of site soils tested at this campus indicate they are severely corrosive for ferrous metals. Undocumented fill soils were typically encountered in each of our borings to depths on the order of approximately 7 ½ to 10 feet bgs.

3.2 Recommendations Summary

We are unaware of any fill placement documentation for this site. Therefore, based upon our geotechnical exploration and analysis, all existing fill soil within the proposed buildings' footprints should be excavated and recompacted to provide a more uniform support for concrete floor slabs and shallow spread footings. Depth of fill is anticipated to be predominantly 7.5 to 10 feet below the existing site surface, but deeper fill may be encountered in areas not explored. All existing pavements and flatwork should be demolished, and all existing fill should be excavated from within the proposed buildings' footprints before placing new properly compacted fill.

The proposed buildings of the Fire Training Facility can be founded on conventional spread footings bearing solely on at least a 2-foot-thick zone of newly excavated and recompacted fill soils derived from onsite soils, overlying undisturbed native soils. However, tested site clays were found to be expansive and highly corrosive for ferrous metals. Therefore, all footings should be embedded at least 24-inches below lowest adjacent finish grade with suitable concrete cover over rebar. Existing fill should **not** be used to support new spread footings without removal and recompaction. New compacted fill should be placed at or over optimum moisture content to reduce expansion potential. Slab-on-grade floors, concrete hardscape and pavements should be underlain by at least 24 inches of relatively low-expansive soil (Expansion Index <45, such as Silty Sand (SM) to mitigate effects of expansive soil. The low-expansive soil will likely have to be imported since the on-site soils are predominantly clayey soils. Aggregate base can be considered for this purpose.

All utilities within building footprints should be backfilled with low-permeability Controlled Low Strength Materials (CLSM - Portland cement and sand slurry). **No** sand backfill should be used within the building footprints' utility trenches to prevent water migration into and under the slab on grade. Elevator shaft walls and retaining walls should be backfilled with **imported** low-expansive (EI≤30) sands placed in a 1:1 (horizontal:vertical) wedge behind walls, extending up and behind from the toe of retaining walls. Perimeter gravity drains will be essential.

Detailed geotechnical recommendations for the proposed new buildings and Fire Tower are presented in the following subsections.

3.3 Earthwork

We understand that at a minimum, existing pavements within the footprint of the proposed structures will be demolished prior to construction of the new facility. Project earthwork is expected to include complete demolition/removal of existing improvements and complete overexcavation and recompaction of existing undocumented fill soils below the proposed new building footprints as described in the following subsections.

3.3.1 Earthwork Observation and Testing

Leighton Consulting, Inc. should observe and test all grading and earthwork, to check that the site is properly prepared, selected fill materials are satisfactory, and that placement and compaction of fills has been performed in accordance with our recommendations and DSA-approved project specifications. Sufficient notification to us prior to earthwork is essential. A bulk sample of any imported soil or aggregate material should be submitted to Leighton Consulting, Inc. geotechnical laboratory at least two working days in advance of earth material placement and compaction. Project plans and specifications should incorporate recommendations contained in this report.

Variations in site conditions are possible and may be encountered during construction. To confirm correlation between soil data obtained during our field and laboratory testing and actual subsurface conditions encountered during construction, and to observe conformance with approved plans and specifications, it is essential that we be retained to perform continuous or intermittent review during earthwork, excavation and foundation construction phases. Therefore, conclusions and recommendations presented in this report are contingent upon us performing construction observation services.

3.3.2 Surface Drainage

Drainage design should prohibit infiltration of water into building foundation soils. Water should not be allowed to pond or accumulate anywhere except in detention basins set back at least 25 feet from structures. Pad drainage should be designed to collect and direct surface water away from structures to approved drainage facilities. Hardscape drains should be installed and drain to storm water disposal systems. Drainage patterns and drainpipes approved at the time of fine grading should be maintained throughout the life of proposed structures. Irrigation and should not be allowed for at least 10 feet and 25 feet, respectively, measured horizontally around proposed new building perimeter. Infiltration or percolation is **not** feasible.

3.3.3 Site Preparation

Based on encountered site conditions, we recommend that after removal of pavements and hardscape, and complete demolition of improvements within the proposed building footprints, then all fill and native soils should be excavated from the proposed improvement footprint, down at least 2 feet below the bottoms of proposed footings or deeper to excavate the full depth of existing undocumented fill soils from within proposed building footprints. This overexcavation bottom should extend horizontally at least 5-feet beyond the outside edges of proposed perimeter footings, encompassing the entire building footprints.

Any underground obstructions encountered should be removed. Efforts should be made to locate any existing utility lines. Those lines should be removed or rerouted where interfering with proposed construction. Trees to be removed should be grubbed out.

Areas outside proposed-building footprints' limits, planned for asphalt and/or concrete pavement, should be over-excavated to a minimum depth of 24 inches below proposed pavement sections (i.e., below the bottom of any base course).

Resulting removal excavation bottom-surfaces should be observed by Leighton Consulting, Inc., prior to placement of any backfill or new construction. **It is essential that all existing fill soils be excavated from the proposed building footprint, regardless of depth.** After these over-excavations are completed, and prior to fill placement, exposed surfaces should be scarified to a minimum depth of 6 inches, moisture-conditioned to 3 percent over optimum moisture content, and recompacted to a minimum 90 percent relative compaction as determined by ASTM D1557 standard test method (modified Proctor compaction curve).

3.3.4 Reuse of Concrete and Asphalt in Fill

Pulverized demolition concrete free of rebar and other materials, and demolished asphalt pavement can be pulverized to particles no-larger-than (≤) 3-inches, and mixed with site soils for use in compacted fill. Blended pulverized concrete and asphalt should be mixed with at least 25% soils by weight. Such materials must be free of and segregated from any hazardous materials and/or organic material of any kind.

3.3.5 Wet Clays

Site clays may be already predominantly over optimum moisture content; and therefore, could be more difficult to properly compact to specified density. Disking, blending, lime treatment may be considered by the earthwork contractor to facilitate compaction. However, additional sulfate testing will be required prior to treating/mixing soils with lime, to avoid an adverse sulfate heave reaction. Lime treatment also require specialized equipment to blend plastic clay thoroughly with lime to be effective. Choice of means and methods to mitigate wet clay compaction difficulty will be at the discretion of the contractor based on weather at the time of earthwork, available materials and equipment, among other considerations specific to the contractor. However, any proposed lime treatment must be reviewed and approved by Leighton Consulting, Inc. and the District prior to implementation.

3.3.6 Fill Placement and Compaction

Onsite soils free of organics, debris and oversized material (greater-than 3-inches in largest dimension) are suitable for use as compacted structural fill. However, any soil to be placed as fill, whether onsite or imported material, should be first viewed by Leighton Consulting, Inc., and then tested if and as necessary, prior to approval for use as compacted fill. All structural fill must be free of hazardous materials.

All fill soil should be placed in thin, loose lifts, moisture-conditioned, as necessary, to within 3 percent **above** optimum moisture content, and compacted to a minimum 90% relative compaction as determined by ASTM D1557 standard test method (modified Proctor compaction curve) within the building footprint. Aggregate base for pavement sections should be compacted to a minimum of 95% relative compaction.

3.3.7 Pipeline Backfilling

Pipeline trenches should be backfilled with compacted fill in accordance with this report, and applicable *Standard Specifications for Public Works Construction* (Greenbook), 2021 Edition standards. Backfill in and above the pipe zone should be as follows:

- **Pipe Zone**: Pipe bedding zone should be backfilled with Controlled Low Strength Material (CLSM) consisting of at least one sack of Portland cement per cubic-yard of sand, conforming to Section 201-6 of the 2018 Edition of the *Standard Specifications for Public Works Construction* (Greenbook). Due to expansive clays, sand bedding for conduits should **not** be allowed on this site within the building footprint and at least 25 feet beyond the building footprints. CLSM bedding should be placed to 1-foot (0.3 m) over the top of the conduit, and vibrated. CLSM should **not** be jetted.
- **Over Pipe Zone**: Above the pipe zone, trenches can be backfilled with excavated on-site soils free of debris, organic and oversized material

greater-than (>) 3-inches in largest dimension. As an option, the whole trench can be backfilled with one-sack CLSM same as presented above for the pipe bedding zone. Oversized rock (cobbles and/or boulders) should either be removed from any backfill, or pulverized for use in backfill only above the pipe zone. Gravel larger than ¾-inch in diameter should be mixed with at least 80-percent soil by weight passing the No. 4 sieve. Native soil backfill over the pipe-bedding zone should be placed in thin lifts, moisture conditioned, as necessary, and mechanically compacted using a minimum standard of 90% relative compaction (relative to the laboratory modified Proctor maximum **dry** density), relative to the ASTM D1557 laboratory maximum dry density within the building footprint and hardscape areas, or 85% under landscape areas. Backfill above the pipe zone should **not** be jetted. In any case, backfill above the pipe zone (bedding) should be observed and tested by Leighton Consulting, Inc.

3.4 Seismic Design Parameters

We performed a ground motion hazard analysis in accordance with the 2019 CBC and ASCE 7-16 to obtain the site-specific seismic design parameters. The site-specific seismic design parameters are summarized in the table below. Details of our analysis are presented in Appendix F, *Site-Specific Ground Motion Hazard Analysis*.

Table 8 – Site-Specific 2019 CBC Seismic Design Parameters

Categorization/Coefficients	Design Value
Site Latitude	33.8812
Site Longitude	-118.3299
Site Class	D
Seismic Design Category	III
Mapped Spectral Response Acceleration at 0.2s Period, S_S	1.793
Mapped Spectral Response Acceleration at 1s Period, S_1	0.635
Short Period Site Coefficient at 0.2s Period, F_a	1
Long Period Site Coefficient at 1s Period, F_v	2.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	2.001
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	1.593
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	1.334
Design Spectral Response Acceleration at 1s Period, S_{D1}	1.062
Design Peak Ground Acceleration, PGA_M	0.824

3.5 Shallow Foundations

Based on our exploration and our experience in the region, conventional shallow spread footings/mats may be used to support proposed one- to two-story buildings. Anticipated foundation loads are assumed to be less than 300 kips (D+L, unfactored) for column loads. A wall load of 6 kips-per-lineal-foot was assumed for our preliminary foundation recommendations. Overexcavation and recompaction of footing subgrade soils should be performed as detailed in Section 3.3.

3.5.1 Minimum Embedment and Width

Based on our exploration and due to the presence of expansive clayey soils at the site, footings for proposed new buildings should have a minimum embedment of 24 inches below the lowest adjacent exterior grade or interior finished grade; whichever is deeper. Minimum square footing width should be at least 24 inches, with continuous footings at least 18-inches wide for this two-story structure.

3.5.2 Allowable Bearing Capacity

A net allowable bearing capacity of 2,500 pounds-per-square-foot (psf) may be used for design of continuous wall footings or 3,000 pounds-per-square-foot (psf) may be used for design of square column footings. These values are based on the minimum embedment depth and width in Section 3.5.1, above, and are governed by consolidation settlement. These allowable bearing values may be increased by 500 psf per foot increase in embedment-depth and/or width to a maximum allowable bearing pressure of 5,000 psf, and are for total dead load and sustained live loads, which can be increased by one-third when considering short-duration wind or seismic loads. Footing reinforcement should be designed by the project Structural Engineer.

3.5.3 Lateral Load Resistance

Soil resistance available to withstand lateral loads on a shallow foundation is a function of the frictional resistance along the base of the footing and the passive resistance that may develop as the face of the structure tends to move into the soil. The frictional resistance between the base of the foundation and the subgrade soil may be computed using a coefficient of friction of 0.30. Only the soil directly above the footing should be considered to provide the vertical overburden pressure in addition to the structural loading and the weight of the footing. The passive resistance may be computed using an equivalent fluid pressure of 250 pounds-per-cubic-foot (pcf), assuming there is constant contact between the footing and undisturbed soil. These friction and passive values have already been reduced by a factor-of-safety of 1.5, and can be increased by one-third when considering short-duration wind or seismic loads. For spread footings and slabs-on-grade bearing on properly compacted fill over undisturbed native soils, full friction and passive resistance can be combined to resist lateral loads; although some lateral displacement is required to mobilize full passive resistance.

3.5.4 Uplift Load Resistance

If required to resist seismic uplift loads, properly compacted backfill soils over spread footings can be used, modeled with both dead weight and soil shear strength resisting short term dynamic uplift forces. Properly compacted backfill soils may be assumed to have a moist unit weight of 120 pounds-per-cubic-foot (pcf). A friction angle of 25° can be used along with cohesion of 300 pounds-per-square-foot (psf), to model properly compacted backfill soil's shear strengths. A factor-of-safety has not been applied to these values, although cohesion was reduced due to potential for shrinkage and desiccation-cracking, in addition to potential for backfill soil-type variability.

3.5.5 Static Settlement Estimates

The above recommended allowable bearing capacity is generally based on a total allowable, post-construction settlement of 1 inch, for column loads and wall loads not exceeding 300 kips and 6 kips-per-foot, respectively, for dead plus sustained live loads. Differential settlement due to static loading is generally estimated at ½ inch over a horizontal distance of 50 feet; for footings bearing properly compacted fill over old alluvium. Expansive soil heave is a potential concern at this site for lightly loaded footings and flatwork. Once developed by the Structural Engineer, we should review total dead and sustained live loads for each column including plan location and span distance, to evaluate if differential settlements between dissimilarly loaded columns will be tolerable. Excessive differential settlement can be mitigated with the use of reduced bearing pressures, deeper footing embedment, possibly changing overexcavation schemes and using imported base material under spread footings, or possibly other methods.

3.6 Deep Foundations

3.6.1 Axial Pile Capacities

Recommended allowable downward and upward (uplift) axial capacities for 18- and 24-inch-diameter CIDH piles are presented on Figures 6 and 7, respectively. The computed axial capacities are for a minimum center-to-center spacing of three pile diameters. If the center-to-center spacing is less than three pile diameters, the geotechnical engineer should review the design and provide appropriate reduction factors for the allowable pile capacities. The total and differential settlements due to static loading of the deep foundation system are estimated to be less than ½ inch for both.

The recommended design capacities are based upon geotechnical considerations and do not consider the pile as a reinforced-concrete structural element. Pile reinforcement should be designed by the project structural engineer.

3.6.2 Lateral Pile Capacities

Lateral pile capacity was evaluated using the computer program, L-Pile, version 4, by Ensoft, Inc. The analysis uses a beam-column-soil-structure interaction approach in which the soil response is modeled by a stress-deflection relationship referred to as "p-y" curves. The analytical procedure involves using "real" p-y response capability without internal safety factors and design lateral loads to produce bending moment profiles. The allowable lateral resistance and maximum bending moments for a free-head condition at ¼ inch and ½ inch maximum horizontal deflection for 18- and 24-inch diameter CIDH piles are presented in Table 9 and Table 10, Free-Head Lateral Pile Capacities, for the non-liquefied and liquefied soil conditions. The plotted values for deflection, shear, and moment are presented in Figures 8 through 11.

Table 9 - Free-Head Lateral Pile Capacities

18-Inch Diameter CIDH	¼-Inch Deflection	½-Inch Deflection
Lateral Load, Kips	31.5	42.6
Maximum Negative Moment, ft-kips	--	--
Maximum Positive Moment, ft-kips	600.9	913.2
Depth to Maximum Negative Moment, ft.	--	--
Depth to Maximum Positive Moment, ft.	3	4
Depth to Zero Moment, ft.	13	14
24-inch Diameter CIDH	**¼-Inch Deflection**	**½-Inch Deflection**
Lateral Load, Kips	50.1	67.6
Maximum Negative Moment, ft-kips	--	--
Maximum Positive Moment, ft-kips	1225.9	1850.7
Depth to Maximum Negative Moment, ft.	--	--
Depth to Maximum Positive Moment, ft.	4	5
Depth to Zero Moment, ft.	17	18

Table 10 - Fixed-Head Lateral Pile Capacities

18-Inch Diameter CIDH	¼-Inch Deflection	½-Inch Deflection
Lateral Load, Kips	57.4	67.9
Maximum Negative Moment, ft-kips	1332.8	1412.0
Maximum Positive Moment, ft-kips	500.3	761.1
Depth to Maximum Negative Moment, ft.	0	0
Depth to Maximum Positive Moment, ft.	5	5
Depth to Zero Moment, ft.	14	15
24-inch Diameter CIDH	**¼-Inch Deflection**	**½-Inch Deflection**
Lateral Load, Kips	92.8	111.7
Maximum Negative Moment, ft-kips	2854.4	3201.1
Maximum Positive Moment, ft-kips	1005.9	1523.2
Depth to Maximum Negative Moment, ft.	0	0
Depth to Maximum Positive Moment, ft.	7	7
Depth to Zero Moment, ft.	19	20

3.6.3 General Construction Guidelines for CIDH Piles

Excavation: The soil types encountered during our exploration at the site should be excavatable using conventional pier excavation equipment. The use of temporary casing may be required to stabilize the sides of drilled pier excavations if sand or wet soil are encountered during construction. The use of alternative excavation methods must be subjected to review by the project geotechnical engineer for compatibility with the design assumptions. The disposal of excavated soils must be executed in accordance with local, state, and federal regulations. We recommend that final cleanout of the excavations for the CIDH piles be performed using a purpose-built, bottom-cleanout bucket. The cleanout bucket should have full radius, straight edged soil cutting blades which will trim off all disturbed soil when lowered to the excavation bottom and rotated. The cleanout bucket should have bottom closure flaps to assist in complete pickup of cuttings and to prevent loss of cuttings during bucket withdrawal.

Concrete Placement: The concrete for the piles should be placed using a down-hole tremie, or similar provision such that the falling concrete does not strike the sides of the shaft. Concrete should be placed in newly excavated piers as soon as practical. Under no circumstances should the pier excavation be allowed to remain open for more than 12 hours. The concrete must be capable of propagating between the reinforcing bars to come in contact with the soil and to avoid arching during extraction of the casing. A minimum slump of 5 inches is recommended. If casings are used, a head of 5 feet of concrete above the bottom of the casing must be maintained during casing extraction.

Prior to concrete placement, the reinforcing cage should be placed carefully in the hole in a manner such that the soil is not disturbed.

Tolerances: Quality of construction is of primary importance in the construction of drilled, CIDH piles. The timely placing of concrete and the installation within specified tolerances must be respected. The pile must remain within 2 inches of the theoretical plan location and remain within 2 percent of vertical, as measured from the as-constructed position.

Observation: Full-time observation by the geotechnical engineer or his representative is highly recommended. The observation work should provide full documentation of the pier construction.

3.7 Retaining Wall Design

3.7.1 Design Static Lateral (Horizontal) Earth Pressures

We recommend that retaining walls be backfilled with imported relatively low-expansive sands (EI≤30). For drained retaining walls with level sand backfill, the following parameters may be used for retaining wall design:

Table 11 - Retaining Wall Design Earth Pressures

Retaining Wall Condition (Level Backfill)	Equivalent Fluid Pressure (pounds-per-cubic-foot)*
Active (cantilever)	40
At-Rest (braced)	55
Passive Resistance (compacted fill)	250

*Only for level and drained properly compacted backfill

Cantilever walls that are designed to yield at least 0.001H, where H is equal to the wall height, may be designed using the active condition. Rigid walls and walls braced at the top should be designed using the at-rest condition, which is expected to be the case for vaults and elevator shafts. Passive pressure is used to compute soil resistance to lateral structural movement.

Total depth of retained earth for design of walls and for uplift resistance should be measured as the vertical height of the stem below the ground surface at the wall face for stem design, or measured at the heel of the footing for overturning and sliding. A total unit weight of 120 pounds-per-cubic-foot (pcf) may be assumed to calculate weight of compacted fill soil over wall footings, if properly compacted and drained.

3.7.2 Retaining Wall Surcharges

In addition to the above lateral forces due to retained earth, surcharge due to above grade loads on the wall backfill, such as traffic, should be considered in design of retaining walls. Vertical surcharge loads behind a retaining wall on or in backfill within a 1:1 (horizontal:vertical) plane projection up and out from the retaining wall toe, should be considered as lateral and vertical surcharge. Unrestrained (cantilever) retaining walls should be designed to resist one-third of these surcharge loads applied as a uniform horizontal pressure on the wall. Braced walls should also be designed to resist an additional uniform horizontal-pressure equivalent to one-half of uniform vertical surcharge-loads.

In areas where autos and pickup trucks will drive, we suggest assuming a uniform vertical surcharge of 300 psf, which would result in active and at-rest horizontal surcharges of 100 psf and 150 psf, respectively. This should be doubled in areas of heavy construction traffic (such as concrete trucks, heavy equipment delivery-trucks, etc.). If crane outrigger loads or other point load sources are applied as wall surcharge, this will require additional analyses based on load source and location relative to the wall.

3.7.3 Retaining Wall Incremental Seismic Loads

Seismic incremental loads need **not** be added to retaining walls with stem heights on the order of (≤) 6-feet or less, with adjacent level backfill. However, at the discretion of the project Structural Engineer (SE), incremental seismic earth pressures of 20 pounds-per-cubic-foot (pcf) may be applied for design in addition to static active earth and surcharge pressures presented above. This is based on traditional Mononobe-Okabe (1929) equations. Traditionally, this incremental seismic earth pressure has been applied as an inverted triangle (inverted equivalent fluid pressure), with largest dynamic earth pressure occurring at the top of the wall (upper ground surface). Resultant seismic earth pressure force has traditionally been applied at approximately 0.6H from the bottom of the wall, where H is the wall (stem) height (e.g. Seed and Whitman, 1970).

However, recent studies (Sitar, et. al., 2010, U.C. Berkeley) suggest a uniform pressure distribution is likely closer to actual lateral seismic loads, so a uniform pressure of 10H (psf) applied as a uniform/rectangular pressure distribution can also be considered (based on current research and observations). It is important to consider that for level backfill and in areas without shallow groundwater, both case history reviews and centrifuge test results suggest all of these approaches above are conservative, particularly for retaining walls with modest heights.

3.8 Concrete Slab-On-Grade

Concrete slabs-on-grade should be designed by the structural engineer in accordance with 2019 CBC requirements for expansive soil. More stringent requirements may be required by the structural engineer and/or architect; however, slabs-on-grade should have the following minimum recommended components:

- **Subgrade:** On-site soils are highly expansive and will shrink and swell with changes in soil moisture content. Therefore, floor slabs-on-grade and adjacent concrete flatwork should be underlain by at least 2 feet of relatively low-expansive soil (EI<45). Slab-on-grade subgrade soil should be moisture conditioned to or within 3% **over** optimum moisture content, to a minimum depth of 24 inches within building footprints, and compacted to 90% of the modified Proctor (ASTM D 1557) laboratory maximum density prior to placing either a moisture barrier, steel and/or concrete.

- **Moisture Barrier:** A moisture barrier consisting of at least 15-mil-thick Stego-wrap vapor barriers (see: http://www.stegoindustries.com/products/stego_wrap_vapor_barrier.php), or equivalent, should then be placed below slabs where moisture-sensitive floor coverings or equipment will be placed.

- **Reinforced Concrete**: A conventionally reinforced concrete slab-on-grade with a thickness of at least 6 inches should be placed in pedestrian areas without heavy loads. Reinforcing steel should be designed by the structural engineer, but as a minimum should be No. 4 rebar placed at 18-inches on-center, each direction (perpendicularly), mid-depth in the slab. A modulus of subgrade reaction (k) as a linear spring constant, of 75 pounds-per-square-inch per inch deflection (pci) can be used for design of heavily loaded slabs-on-grade, assuming a linear response up to deflections on the order of ¾-inch.

- **Slab-On-Grade Control Joints**: Slab-on-grade crack control joint locations and spacing should be designed by the project Structural Engineer (SE). However, consideration should be given to potential for differential-vertical-offset at control joints, due to potential subgrade expansion/shrinkage. Where possible, slabs-on-grade should be allowed to “float” on the subgrade to allow for differential vertical expansion/shrinkage of the subgrade. Interior full-depth joints at wall and column interfaces are recommended to allow the slab-on-grade to “float” unrestrained by vertical structural components. However, doweling is recommended at other joints in open areas of rooms to avoid trip hazards.

Minor cracking of concrete after curing due to expansion, drying and shrinkage is normal and should be expected. However, cracking is often aggravated by a high water-to-cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low-slump concrete or low water/cement ratios can reduce the potential for shrinkage cracking.

3.9 Pavement Section Design

Based on design procedures outlined in the current Caltrans *Highway Design Manual* and an assumed design R-value of 15 for expansive clay subgrade variations, preliminary flexible pavement sections were calculated for the Traffic Indices (TIs) tabulated, and are listed below:

Table 12 - Hot Mixed Asphalt (HMA) Pavement Sections

Assumed Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
4.0 (automobile parking)	3	6
5.0 (driveways and truck traffic)	4	6
6.0 (roadways and heavy truck traffic)	5	8

For fire truck (60,000-pound "apparatus") lanes, asphalt pavements designed for a TI=6.0 are recommended. However, note that undistributed apparatus outrigger loads could cause local asphalt pavement punching damage. When possible, outrigger loads should be distributed over asphalt pavements with planks and plywood. Otherwise, areas where outrigger loads are anticipated could be paved with 8-inch-thick concrete as described below.

Portland cement concrete pavement sections were calculated in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for three Traffic Indices (TIs) are presented below:

Table 13 - Portland Cement Concrete Pavement Sections

<table>
<tr><th>Assumed Traffic Index</th><th>PC Concrete (inches)</th><th>Base Course (inches)</th></tr>
<tr><td>4.0 (automobile parking)</td><td>7</td><td rowspan="3">4</td></tr>
<tr><td>5.0 (driveways and truck traffic)</td><td>7½</td></tr>
<tr><td>6.0 (roadways and heavy truck traffic)</td><td>8</td></tr>
</table>

We have assumed that this Portland cement concrete will have a compressive strength of at least 3,000 pounds-per-square-inch (psi). Prior to placement of aggregate base, subgrade soils should be scarified to a minimum depth of 8-inches, moisture-conditioned, as necessary, and recompacted to a minimum of 90 percent relative compaction, determined in accordance with ASTM D 1557 modified Proctor laboratory maximum density. Aggregate base should be placed in thin lifts; moisture conditioned, as necessary, and compacted to a minimum of 95 percent relative compaction. Field observation and periodic testing, as needed during placement of base course materials, should be undertaken to ensure that requirements of Caltrans' *Standard Specifications* (2021) and Special

Provisions are fulfilled. Consideration should be given to reinforce concrete pavements where large outrigger point loads are anticipated.

Adequate drainage (both surface and subsurface) should be provided such that the subgrade soils and aggregate base materials are not allowed to become wet. All pavement construction should be performed in accordance with the Caltrans *Standard Specifications* (2021). Recommended structural pavement materials should conform to the specified provisions in the Caltrans *Standard Specifications* (2021) including grading and quality requirements, shown below:

- **Asphalt Concrete (Hot Mixed Asphalt)** for pavement should be Type A and should conform to Section 39 of the *Standard Specifications*. Asphalt concrete specimens should be tested for surface abrasion in accordance with CT-360.

- **Portland Cement Concrete (PCC)** pavement should conform to Section 40 of the *Standard Specifications*. PCC pavement materials (pavement, structures, minor concrete) should conform to Section 90 of the *Standard Specifications*.

- **Class II Aggregate Base (AB)** should conform to Section 26 of the *Standard Specifications*.

Traffic Indices (TIs) used in our pavement design are considered reasonable values for typical parking lot areas, and should provide a pavement life of approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from the paving, will result in premature pavement failure. Traffic parameters used for design were selected based on engineering judgment and not on information furnished to us such as an equivalent wheel-load analysis or a traffic study.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 Trench Excavations

To protect workers entering excavations, excavations should be performed in accordance with OSHA and Cal-OSHA requirements, and the current edition of the California Construction Safety Orders, see:

http://www.dir.ca.gov/title8/sb4a6.html

Contractors should be advised that fill soils should be considered Type C soils as defined in the California Construction Safety Orders. As indicated in Table B-1 of Article 6, Section 1541.1, Appendix B, of the California Construction Safety Orders, excavations less-than (<) 20 feet deep within Type C soils should be sloped back no steeper than 1½:1 (horizontal:vertical), where workers are to enter the excavation. This may be impractical near adjacent existing utilities and structures; so shoring may be required depending on trench locations. Stiff undisturbed native clays will stand steeper.

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

4.2 Temporary Shoring

Temporary cantilever shoring can be designed based on the active equivalent fluid pressure of 30 pounds-per-cubic-foot (pcf) in alluvium. If excavations are braced at the top and at specific depth intervals, then braced earth pressure may be approximated by a uniform rectangular soil pressure distribution. This uniform pressure expressed in pounds-per-square-foot (psf), may be assumed to be 20 multiplied by H for design, where H is equal to the depth of the excavation being shored, in feet. These recommendations are valid only for trenches not exceeding 15 feet in depth at this site.

4.3 Geotechnical Services During Construction

Our geotechnical recommendations provided in this report are based on information available at the time the report was prepared and may change as plans are developed. Additional geotechnical exploration, testing and/or analysis may be required based on final plans. Leighton Consulting, Inc. should review site grading, foundation and shoring (if any) plans when available, to comment further on geotechnical aspects of this project and check to see general conformance of final project plans to recommendations presented in this report.

Leighton Consulting, Inc. should be retained to provide geotechnical observation and testing during excavation and all phases of earthwork. Our conclusions and recommendations should be reviewed and verified by us during construction and revised accordingly if geotechnical conditions encountered are vary from our findings and interpretations. Geotechnical observation and testing should be provided:

- During all excavation and grading activities,
- During compaction of all fill materials,
- After excavation of all footings and prior to placement of concrete,
- During utility trench backfilling and compaction,
- During pavement subgrade and base preparation, and/or
- If and when any unusual geotechnical conditions are encountered.

5.0 LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time. This exploration was performed with the understanding that this subject site is proposed for development as described in Section 1.2 of this report. Please also refer to Appendix G, GBA's *Important Information About This Geotechnical-Engineering Report*, presenting additional information and limitations regarding geotechnical engineering studies and reports.

Until reviewed and accepted by the California Geological Survey (CGS), this report may be subject to change. Changes may be required as part of the CGS review process. Leighton Consulting, Inc. assumes no risk or liability for consequential damages that may arise due to design work progressing before this report is reviewed and accepted by CGS.

This report was prepared for the El Camino Community College District based on their needs, directions and requirements at the time of our exploration, in accordance with generally accepted geotechnical engineering practices at this time in California for public schools. This report is not authorized for use by, and is not to be relied upon by, any party except the District and their design and construction management team, with whom Leighton Consulting, Inc. has contracted for this work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, and/or strict liability of Leighton Consulting, Inc.

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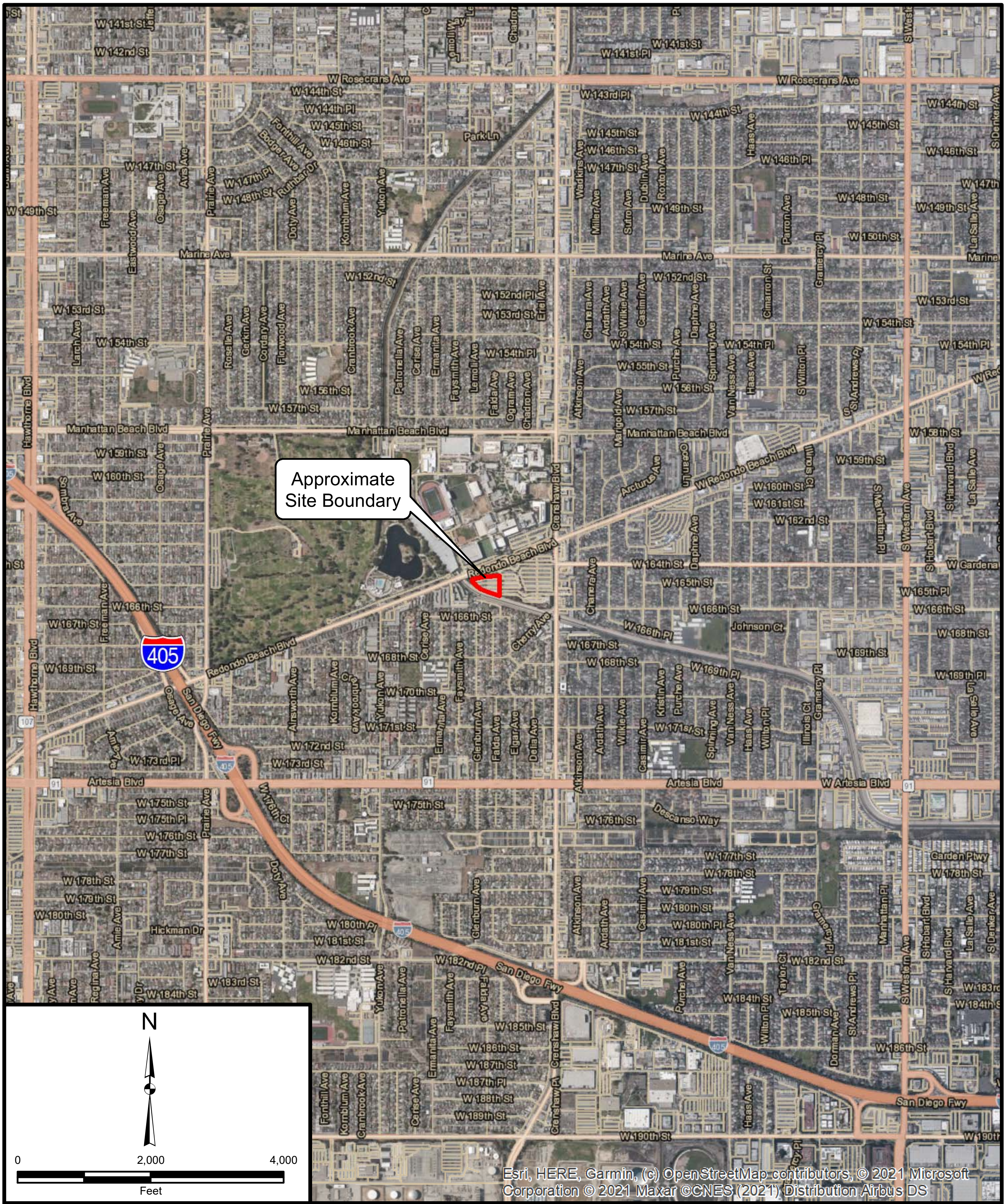

Project: 10535.020	Eng/Geol: EC/EMH
Scale:1 " = 2,000 '	Date: August 2021

Base Map: ESRI ArcGIS Online 2021
Thematic Information: Leighton
Author: Leighton Geomatics (btran)

SITE LOCATION MAP

New Fire Training Facility
El Camino College
16007 Crenshaw Boulevard
Torrance, Los Angeles County, California

FIGURE 1

Leighton

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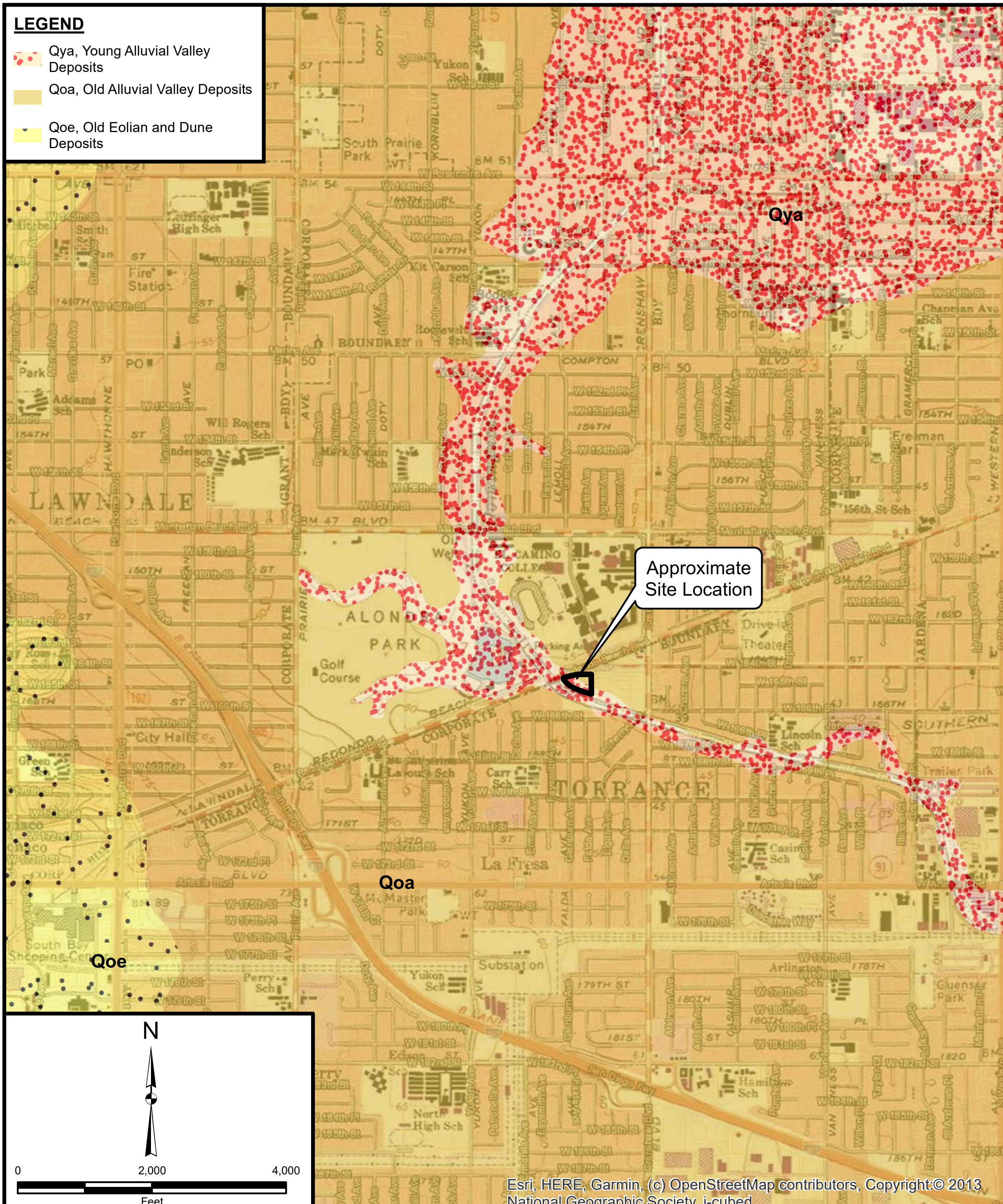

Project: 10535.020	Eng/Geol: EC/EMH	REGIONAL GEOLOGY MAP	FIGURE 2
Scale:1 " = 2,000 '	Date: August 2021	New Fire Training Facility El Camino College 16007 Crenshaw Boulevard Torrance, Los Angeles County, California	Leighton
Base Map: ESRI ArcGIS Online 2021 Thematic Information: Leighton, USGS Author: Leighton Geomatics (btran)			

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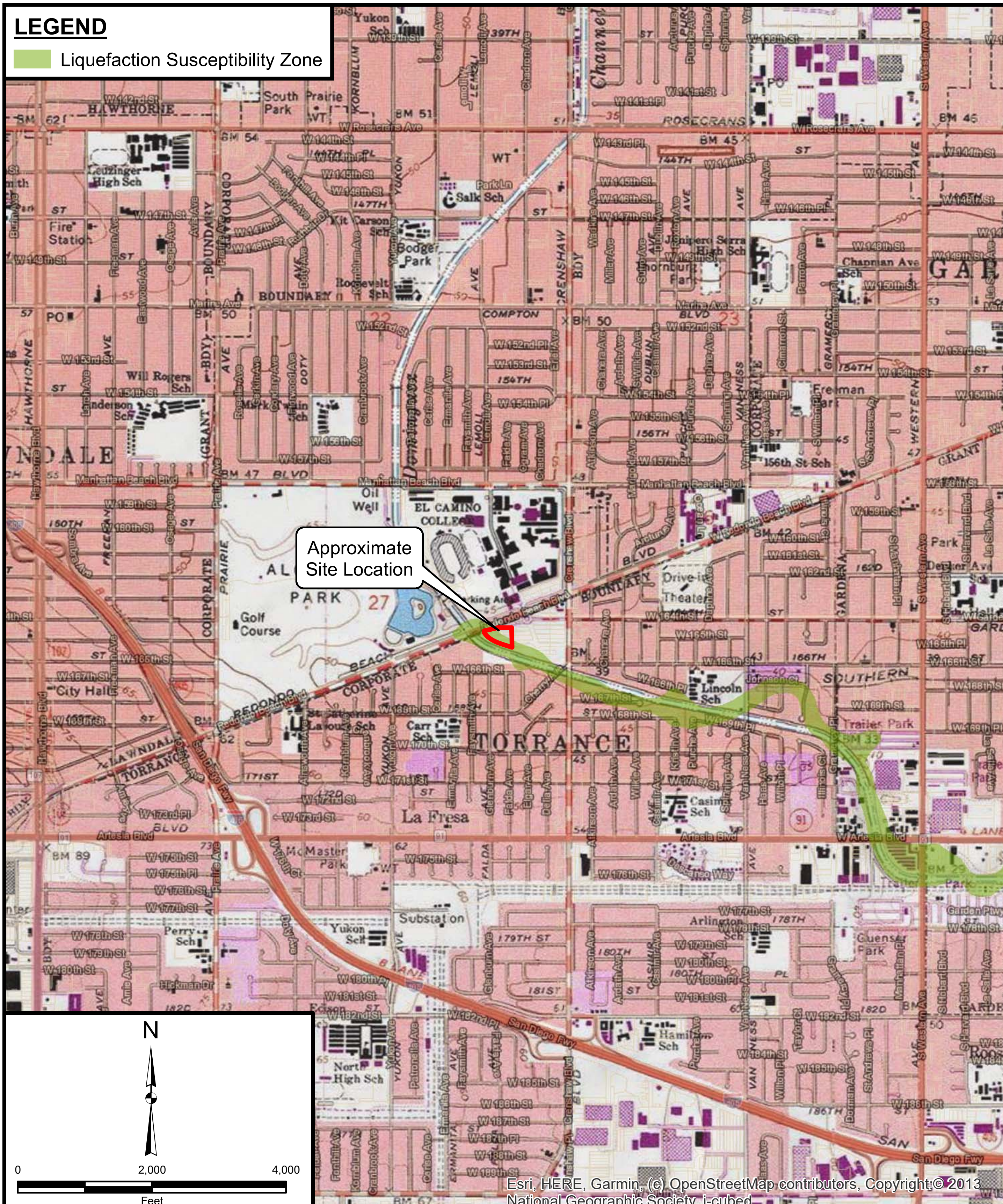

Project: 10535.020	Eng/Geol: EC/EMH
Scale:1 " = 2,000 '	Date: August 2021

Base Map: ESRI ArcGIS Online 2021
Thematic Information: Leighton, CGS
Author: Leighton Geomatics (btran)

SEISMIC HAZARD MAP

New Fire Training Facility
El Camino College
16007 Crenshaw Boulevard
Torrance, Los Angeles County, California

FIGURE 3

Leighton

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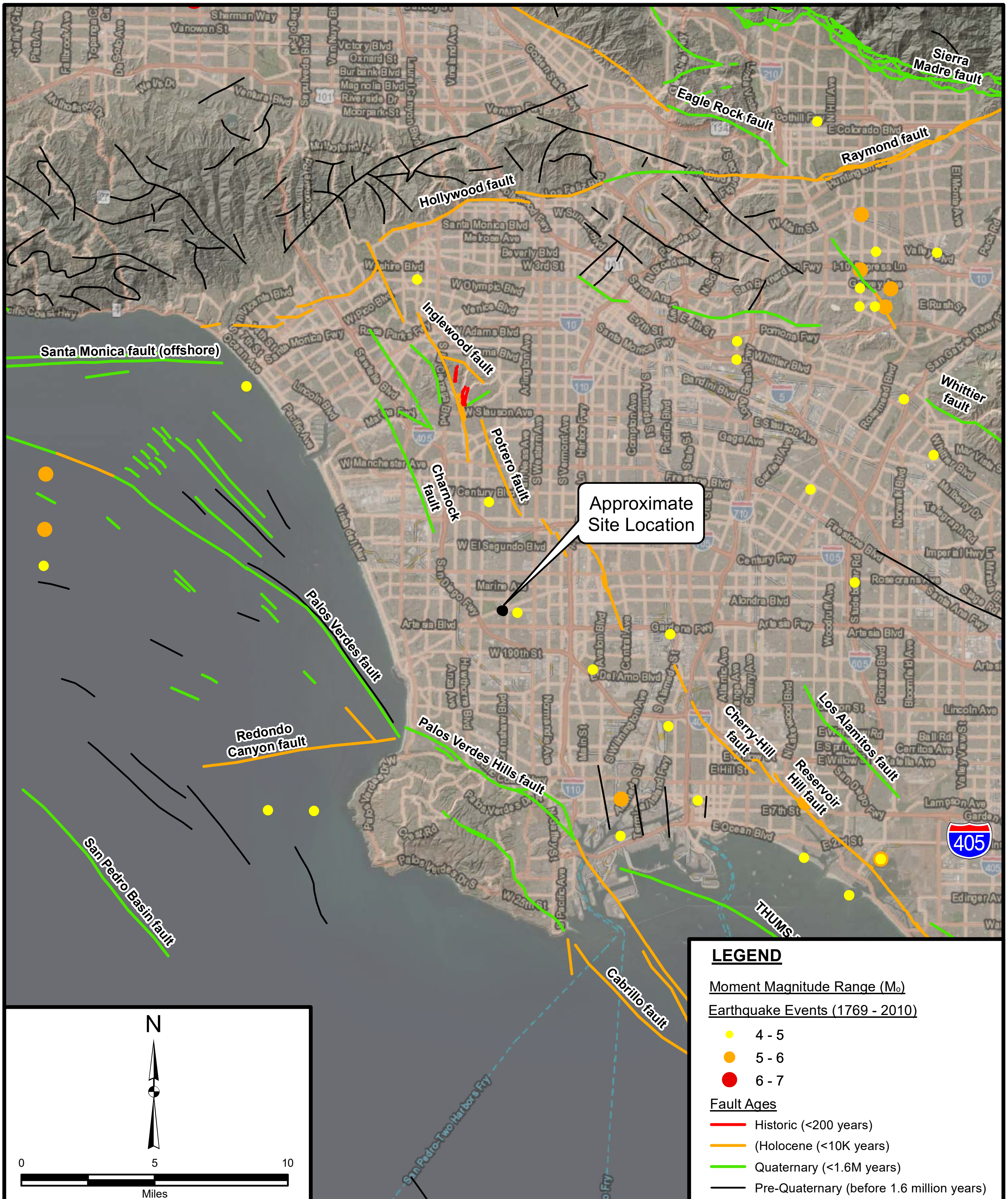

Project: 10535.020	Eng/Geol: EC/EMH	REGIONAL FAULT AND HISTORICAL SEISMICITY MAP New Fire Training Facility El Camino College 16007 Crenshaw Boulevard Torrance, Los Angeles County, California	FIGURE 4
Scale:1 " = 5 miles	Date: August 2021		Leighton

Base Map: ESRI ArcGIS Online 2021
Thematic Information: Leighton, Bryant, W. A. (compiler), 2005, Digital Database of Quaternary and Younger Faults from the Fault Activity Map of California, version 2.0: CGS, USGS, SCEC.
Author: Leighton Geomatics (btran)

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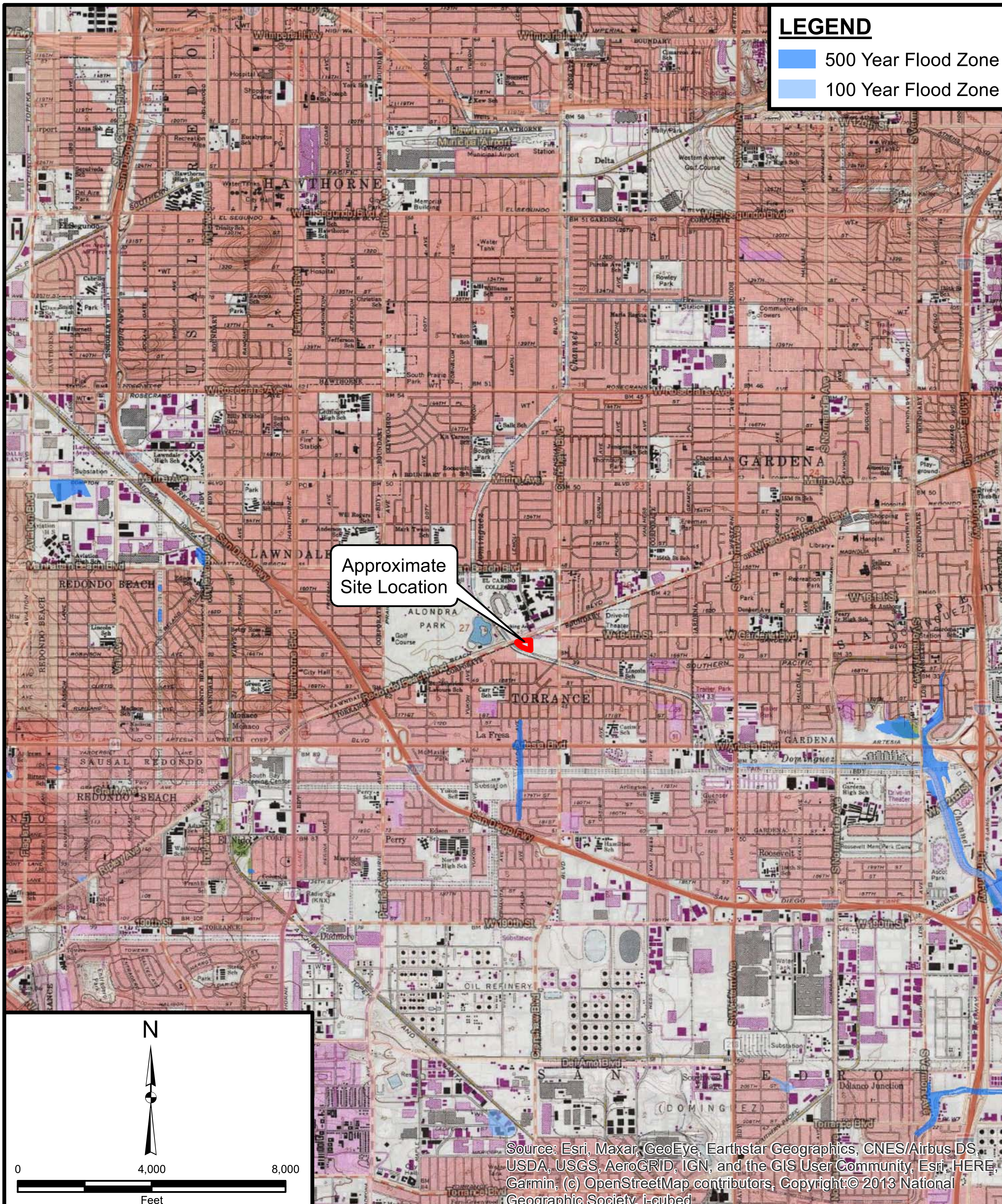

Project: 10535.020	Eng/Geol: EC/EMH	FLOOD HAZARD ZONE MAP	FIGURE 5
Scale:1 " = 4,000 '	Date: August 2021	New Fire Training Facility El Camino College 16007 Crenshaw Boulevard Torrance, Los Angeles County, California	Leighton
Base Map: ESRI ArcGIS Online 2021 Thematic Information: Leighton, CA DWR, FEMA Author: Leighton Geomatics (btran)			

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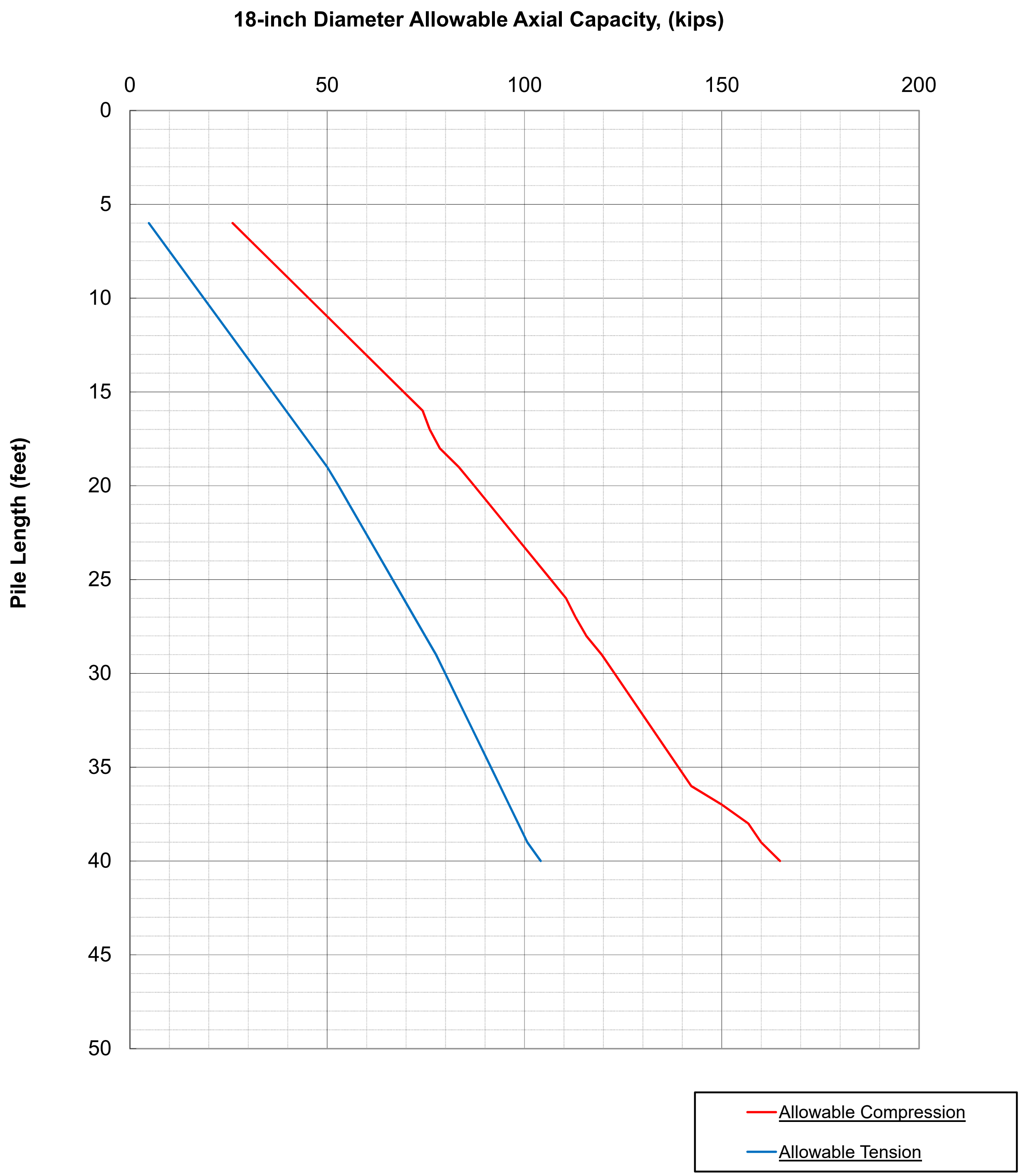
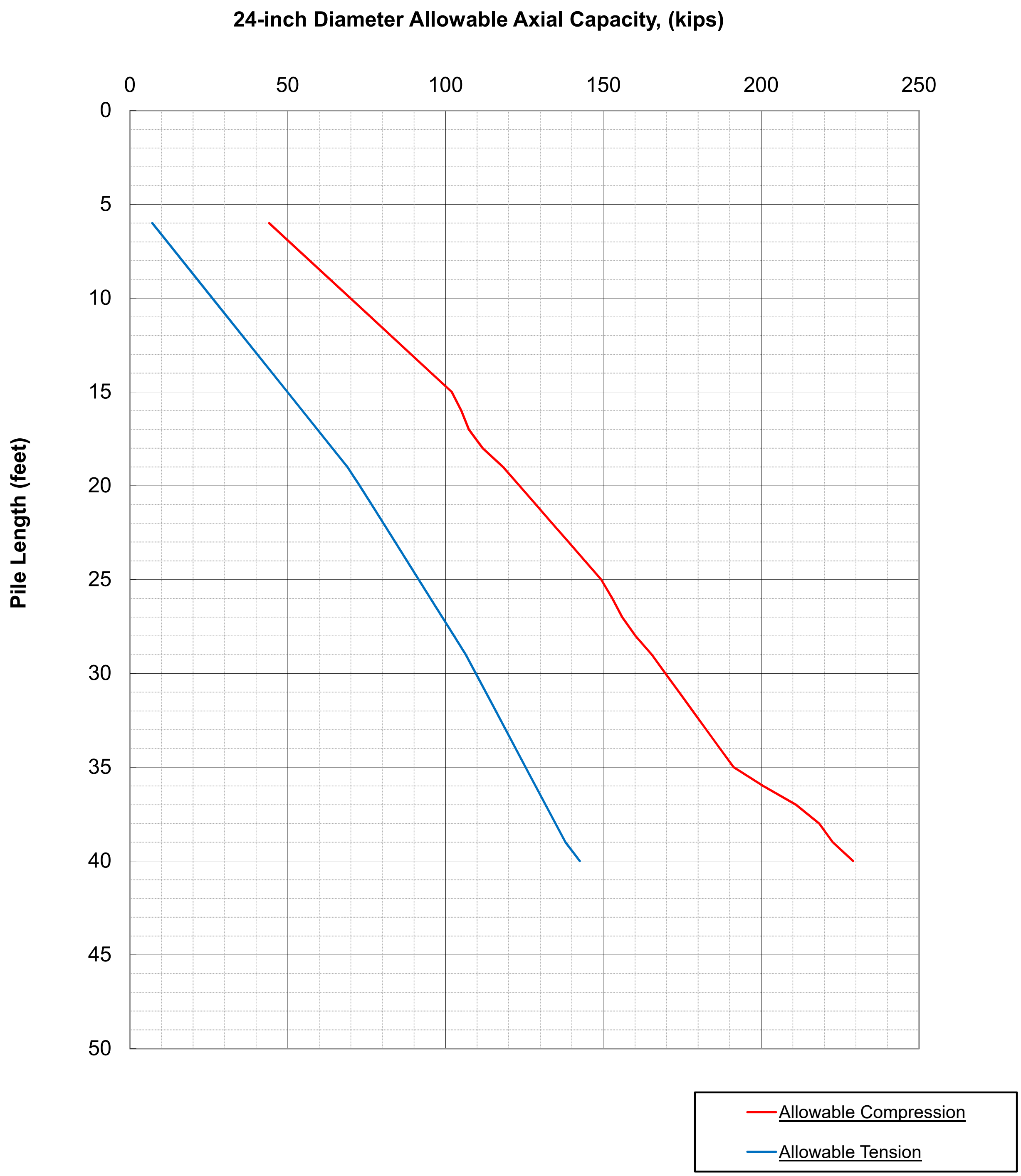


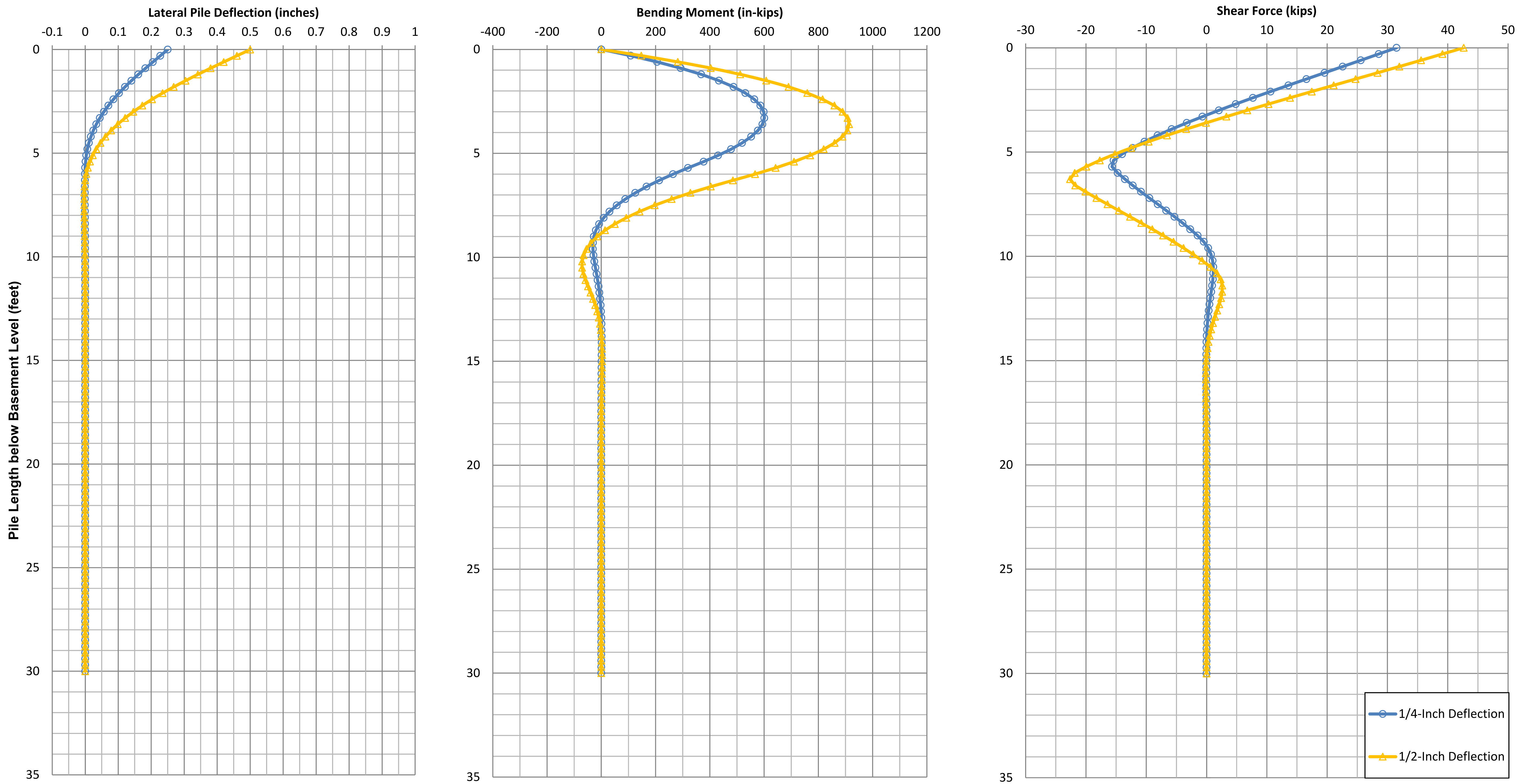
ALLOWABLE AXIAL CAPACITY 18-INCH DIAMETER DRILLED SHAFT FOUNDATIONS FIRE TRAINING FACILITY	PROJECT NAME: EL CAMINO COLLEGE PROJECT NUMBER : 10535.020 DESIGNED/CHECKED BY: SG/EC	Figure 6



ALLOWABLE AXIAL CAPACITY
24-INCH DIAMETER
DRILLED SHAFT FOUNDATIONS
FIRE TRAINING FACILITY

PROJECT NAME: EL CAMINO COLLEGE
PROJECT NUMBER : 10535.020
DESIGNED/CHECKED BY: SG/EC

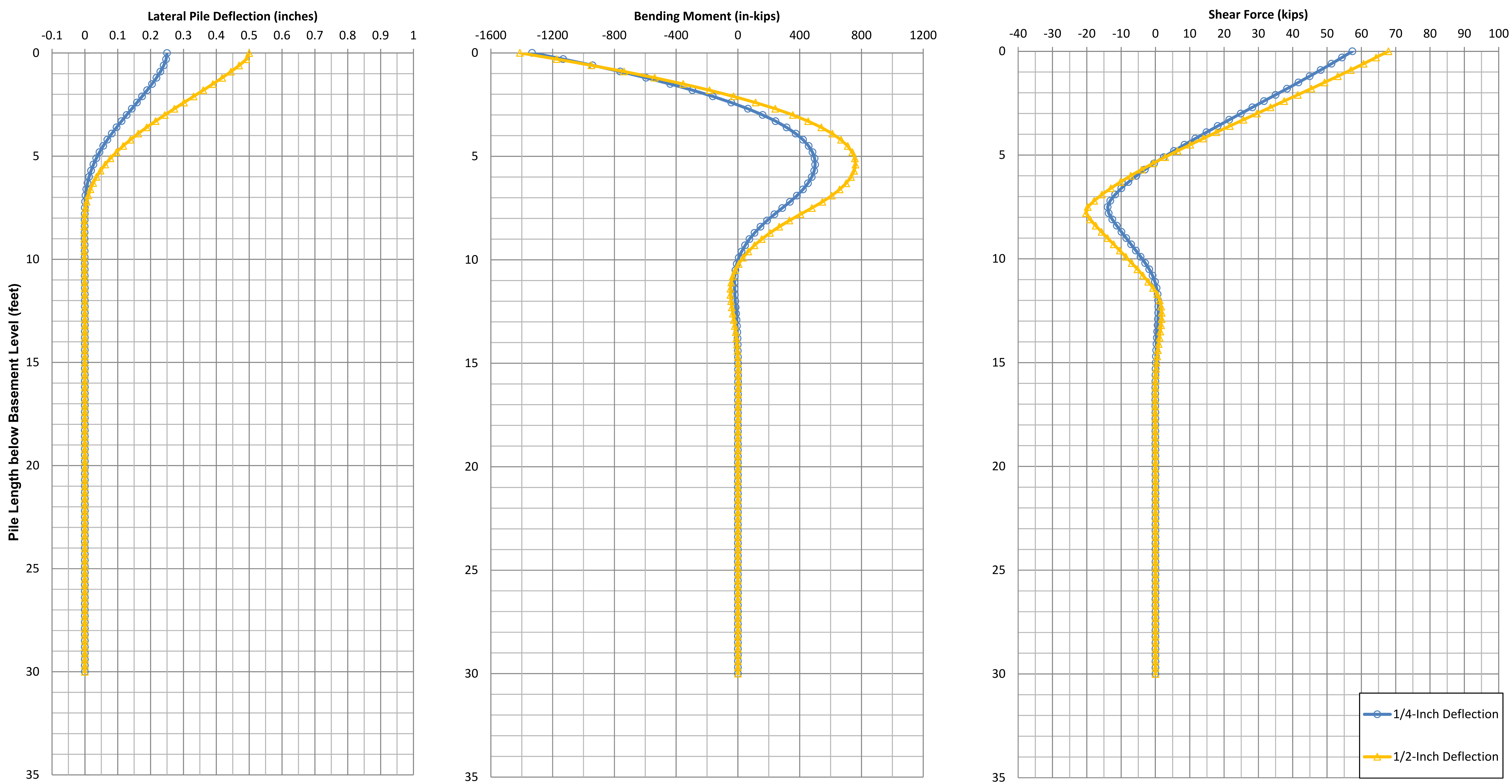
Figure 7



LATERAL PILE CAPACITY - FREE HEAD CONDITION
18-INCH DIAMETER CAST-IN-DRILLED HOLE (CIDH) PILE

PROJECT NAME:	El Camino College Fire Training Facility
PROJECT NUMBER:	10535.020
DESIGNED/CHECKED BY:	SG/EC
DATE:	07/20/2020

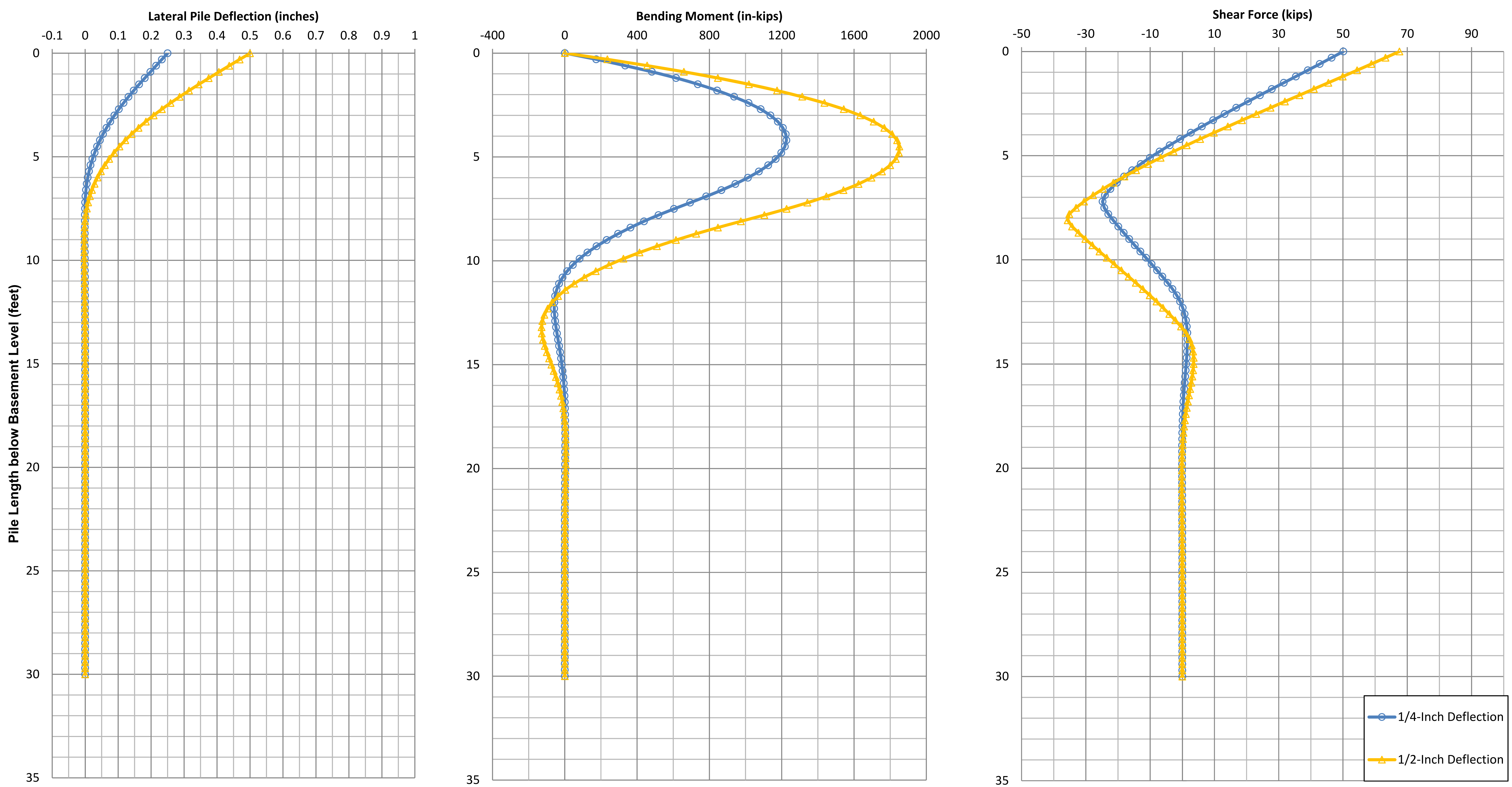
Figure 8



LATERAL PILE CAPACITY - FIXED HEAD CONDITION
18-INCH DIAMETER CAST-IN-DRILLED HOLE (CIDH) PILE

PROJECT NAME: El Camino College Fire Training Facility
PROJECT NUMBER: 10535.020
DESIGNED/CHECKED BY: SG/EC
DATE: 07/22/2020

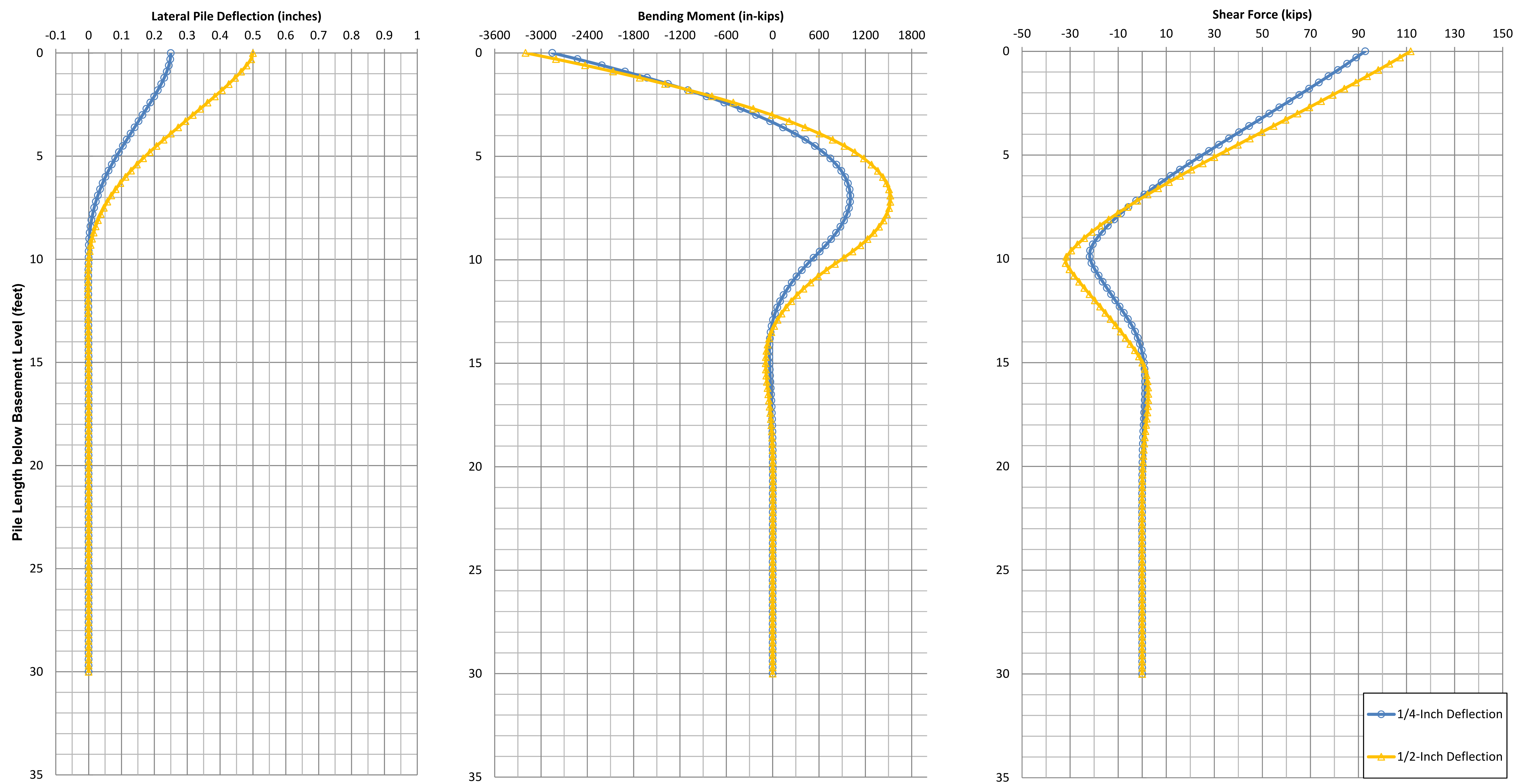
Figure 9



LATERAL PILE CAPACITY - FREE HEAD CONDITION
24-INCH DIAMETER CAST-IN-DRILLED HOLE (CIDH) PILE

PROJECT NAME: El Camino College Fire Training Facility
PROJECT NUMBER: 10535.020
DESIGNED/CHECKED BY: SG/EC
DATE: 07/20/2020

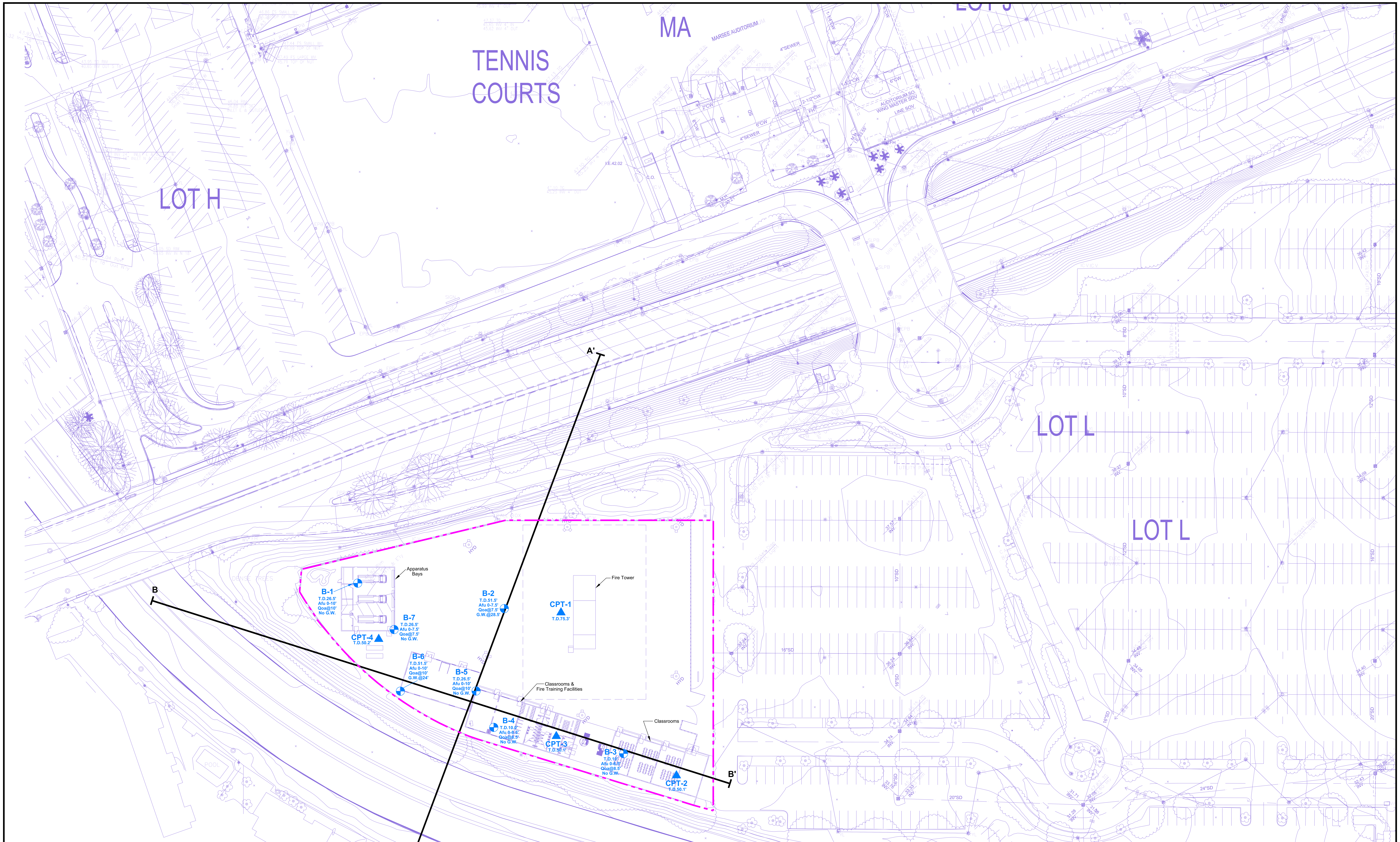
Figure 10



LATERAL PILE CAPACITY - FIXED HEAD CONDITION
24-INCH DIAMETER CAST-IN-DRILLED HOLE (CIDH) PILE

PROJECT NAME: El Camino College Fire Training Facility
PROJECT NUMBER: 10535.020
DESIGNED/CHECKED BY: SG/EC
DATE: 07/22/2020

Figure 11



LEGEND

Afu	ARTIFICIAL FILL, UNDOCUMENTED
Qoa	QUATERNARY OLD ALLUVIAL VALLEY DEPOSITS
B-7	APPROXIMATE LOCATION OF HOLLOW-STEM AUGER BORING SHOWING TOTAL DEPTH (T.D.), DEPTH TO EARTH UNITS, AND DEPTH TO GROUNDWATER (G.W.) IN FEET BELOW GROUND SURFACE.
CPT-4	APPROXIMATE LOCATION OF CONE PENETROMETER TEST SOUNDING SHOWING TOTAL DEPTH (T.D.) IN FEET BELOW GROUND SURFACE.
B B'	LOCATION OF GEOTECHNICAL CROSS-SECTION
	APPROXIMATE SITE BOUNDARY

PLATE 1	**GEOTECHNICAL MAP** New Fire Training Facility El Camino College 16007 Crenshaw Boulevard Torrance, Los Angeles County, California
Scale: 1"=30'	
Date: August 2021	
Proj: 10535.020	Leighton
Eng/Geol: JAR/TCB	

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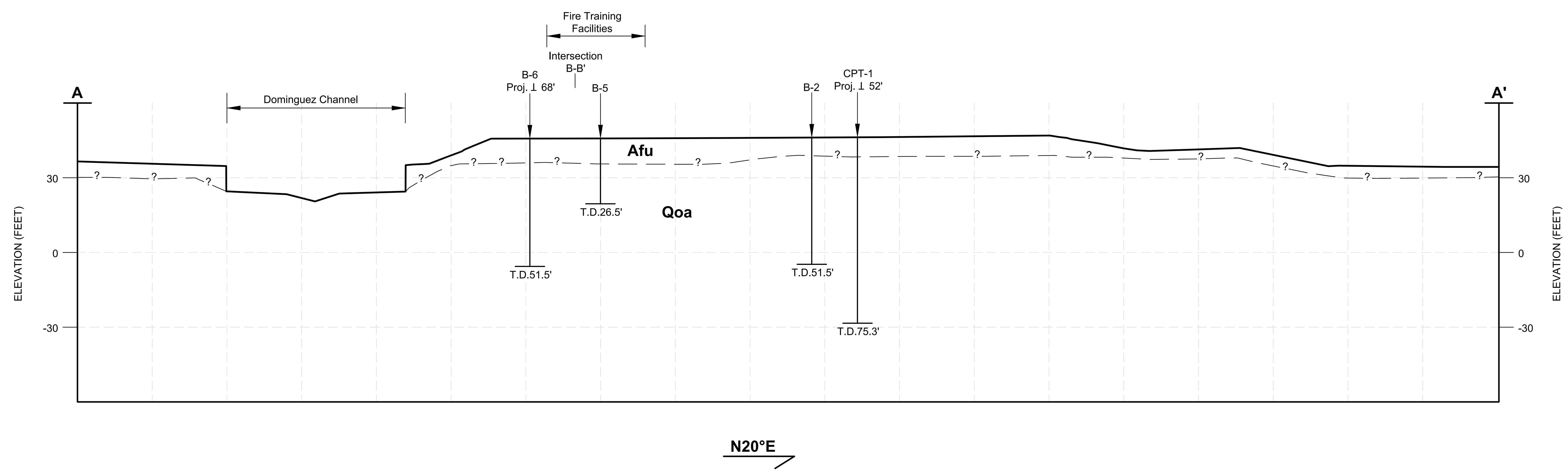

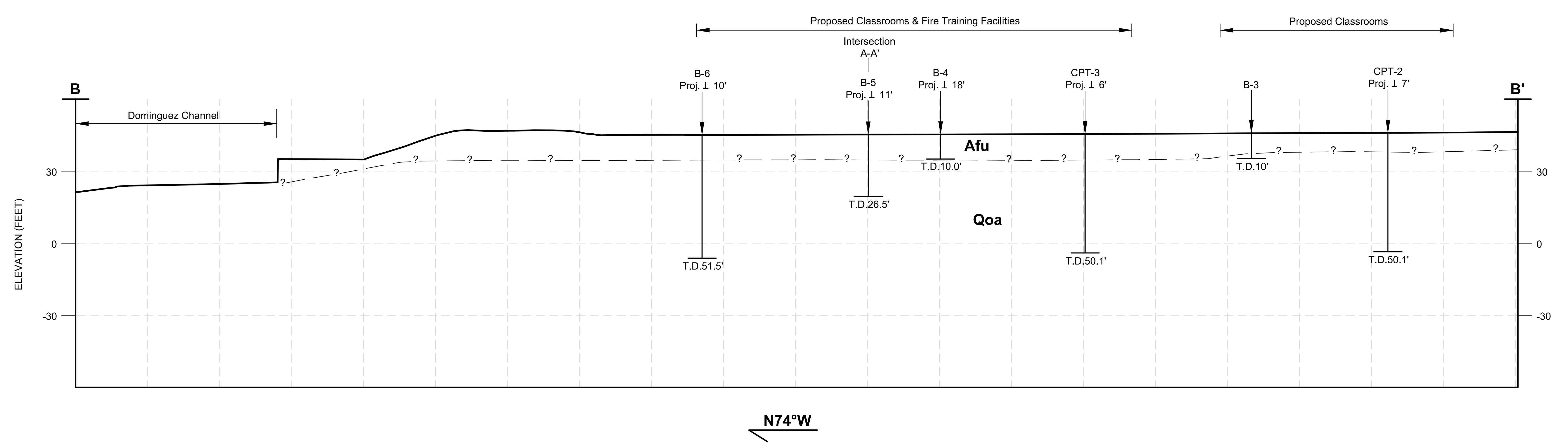

PLATE 2	**GEOTECHNICAL CROSS SECTIONS A-A' AND B-B'** New Fire Training Facility El Camino College 16007 Crenshaw Boulevard, Torrance, Los Angeles County, California
Scale: 1"=30'	
Date: August 2021	
Proj: 10535.020	Leighton
Eng/Geol: EC/EMH	

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APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Our field exploration consisted of a surface reconnaissance and subsurface exploration with seven hollow-stem auger borings (B-1 through B-7) and four Cone Penetrometer Test soundings (CPT-1 through CPT-4). These subsurface exploration locations are plotted on Plate 1, *Geotechnical Map*, and described in more detail below:

On May 5 and 6, a total of seven hollow-stem auger borings were drilled, logged and sampled to depths ranging from approximately 10- to 51½-feet below existing ground surface (bgs) at locations where a truck-mounted drill rig could access around existing buildings.

In addition**,** on May 7, 2021, four Cone Penetrometer Test (CPT-1 through CPT-4) soundings were advanced to depths ranging from approximately 50-to 75-feet bgs at accessible location near proposed improvements. CPT-1 was used to measure shear wave velocities at 5-foot depth intervals. Approximate boring and CPT locations are depicted on Plate 1.

Encountered soils were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D 2488). Relatively undisturbed California ring-lined soil samples were obtained at selected depth intervals within these hollow-stem borings. Standard Penetration Tests (SPTs) were also driven at selected intervals within these hollow-stem auger borings. Both drive samplers were driven with a 140-pound hammer falling 30-inches. Near surface bulk soil samples were collected from these borings. Boring logs, CPT sounding logs, and shear wave velocity measurements are included as part of this appendix. The boreholes were backfilled immediately after drilling, logging and sampling on the same day.

Subsurface Variations and Limitations: These attached subsurface exploration logs and related information depict subsurface conditions only at the approximate locations indicated and at the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these locations. Passage of time may result in altered subsurface conditions due to possible environmental, geologic or man made changes. In addition, any stratification lines depicted on these logs represent an approximate boundary between soil types, but these transitions can be gradual.

GEOTECHNICAL BORING LOG B-1

Project No.	10535.020	**Date Drilled**	5-5-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	46'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

SOIL DESCRIPTION

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

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								Surface: Asphalt Concrete, 4 in.	
45									Aggregate Base, 8 in.	
				B-1				SM	**Artificial Fill, undocumented (Afu)** @1.0': SILTY SAND, dark brown, moist, fine sand, low plasticity silt	EI
				R-1	6 9 10	113	13	CL	@2.0': Lean CLAY with SAND, very stiff, dark brown to brownish black, moist, medium plasticity clay, fine sand PP = 3.5 tsf	
40	5			R-2	6 8 14			CH	@5.0': Fat CLAY, hard, dark gray to grayish black, moist, high plasticity clay PP = 4.25 tsf	
				R-3	7 10 14	102	23		@7.5': Fat CLAY, hard, dark gray to grayish black, moist, high plasticity clay PP = 4.25 tsf	
35	10			S-4	8 18 25			CL	**Quaternary Older Alluvium (Qoa)** @10.0': Lean CLAY with SAND, hard, whiteish olive to olive, moist, low plasticity clay, fine sand, with carbonate pocket	
				R-5A R-5B	12 17 26	113	15		@12.5': SANDY lean CLAY, hard, olive brown, moist, low plasticity clay, fine sand PP > 4.5 tsf	
30	15			R-6	12 16 20				@15.0': SANDY lean CLAY, hard, light brown, moist, low plasticity clay, fine sand PP > 4.5 tsf	
25	20			S-7	5 5 8				@20.0': Lean CLAY, stiff, brown to light yellowish brown, moist, low plasticity clay, iron oxide staining	
20	25			R-8	6 8 12	96	29		@25.0': Lean CLAY, very stiff, brown to light yellowish brown, moist, low plasticity clay, iron oxide staining PP = 3.25 tsf	
									Boring terminated at 26.5 ft. **Groundwater not encountered.** **Backfilled with auger cuttings; paved with cold-patch asphalt concrete.**	
15	30									
	35									

SAMPLE TYPES:

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

TYPE OF TESTS:

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

GEOTECHNICAL BORING LOG B-2

Project No.	10535.020	**Date Drilled**	5-5-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	44'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0								Surface: Asphalt Concrete, 4 in.	
				B-1				SM	Aggregate Base, 8 in.	
								CL	**Artificial Fill, undocumented (Afu)** @1.0': SILTY SAND, dark brown, moist, fine sand, low plasticity silt	
40				R-1	4 6 8	102	22		@2.0': Lean CLAY with SAND, very stiff, olive brown to grayish brown, moist, low plasticity clay, fine sand PP = 3.5 tsf	
	5			R-2	4 7 12	103	22	CH	@5.0': Fat CLAY, very stiff, grayish black, moist, high plasticity clay PP = 3.75 tsf	
35				R-3	6 10 16	110	16	CL	**Quaternary Older Alluvium (Qoa)** @7.5': Lean CLAY with SAND, hard, whiteish brown to olive brown, moist, low plasticity clay, fine sand, with carbonate pocket PP > 4.5 tsf	
	10			R-4	7 12 22	113	10		@10.0': SANDY lean CLAY, hard, yellowish brown to olive brown, moist, low plasticity clay, fine sand PP > 4.5 tsf	
30	15			S-5	5 8 12				@15.0': Lean CLAY, very stiff, yellowish brown to olive brown, moist, low plasticity clay	AL
25	20			R-6	4 6 11	103	24		@20.0': Lean CLAY, very stiff, light brown to light yellowish brown, moist to wet, low plasticity clay, iron oxide staining PP = 3.25 tsf	AL CN
20	25			S-7	4 7 8				@25.0': Lean CLAY, very stiff, light brown to light yellowish brown, moist to wet, low plasticity clay, iron oxide staining	
15									@28.0': Groundwater encountered	
	30			R-8	9 20 28			CL	**Quaternary Older Alluvium (Qoa)** @30.0': Lean CLAY, hard, light brown to light yellowish brown, wet, medium plasticity clay PP = 4.5 tsf	
10	35									

SAMPLE TYPES:

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

TYPE OF TESTS:

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

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

GEOTECHNICAL BORING LOG B-2

Project No.	10535.020	**Date Drilled**	5-5-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	44'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	35			S-9	5 8 9			CH	@35.0': Fat CLAY, very stiff, light brown to light yellowish brown, wet, high plasticity clay, iron oxide staining	AL
5										
	40			R-10	8 14 18				@40.0': Fat CLAY, very stiff, light brown to light yellowish brown, wet, high plasticity clay, iron oxide staining PP = 3.75 tsf	
0										
	45			S-11	10 15 23				@45.0': Fat CLAY, hard, light brown to light yellowish brown, wet, high plasticity clay, iron oxide staining	
-5										
	50			R-12	10 14 20				@50.0': Fat CLAY, hard, light brown to light yellowish brown, wet, high plasticity clay, iron oxide staining PP > 4.5 tsf	
									Boring terminated at 51.5 ft. **Groundwater encountered at 28.5 feet during drilling; 29 feet at end of drilling.** **Backfilled with auger cuttings; paved with cold-patch asphalt concrete.**	
-10	55									
-15	60									
-20	65									
-25	70									

SAMPLE TYPES:

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

TYPE OF TESTS:

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

GEOTECHNICAL BORING LOG B-3

Project No.	10535.020	**Date Drilled**	5-5-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	43'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

SOIL DESCRIPTION

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

Elevation Feet	Depth Feet	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							Surface: Asphalt Concrete, 4 in.	
								Aggregate Base, 8 in.	
			B-1				SM	**Artificial Fill, undocumented (Afu)** @1.0': SILTY SAND, dark brown, moist, fine sand, low plasticity silt	EI RV
40			R-1	8 9 16			CL	@2.0': SANDY lean CLAY, hard, brown to dark reddish brown, moist, low plasticity clay, fine sand PP > 4.5 tsf	
	5		R-2	6 10 13	109	19	CH	@4.0': Fat CLAY, hard, grayish brown to blackish brown, moist, high plasticity clay PP > 4.5 tsf	
35			S-3	6 9 14			CL	**Quaternary Older Alluvium (Qoa)** @8.5': Lean CLAY with SAND, very stiff, whiteish brown to olive brown, moist, low plasticity clay, fine sand	
	10							**Boring terminated at 10 ft.** **Groundwater not encountered.** **Boring converted into a percolation test well, test performed on 05/06/2021; test well was then removed.** **Backfilled with auger cuttings; paved with cold-patch asphalt concrete.**	
30	15								
25	20								
20	25								
15	30								
10	35								

Graphic Log: N S

SAMPLE TYPES:

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

TYPE OF TESTS:

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

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

GEOTECHNICAL BORING LOG B-4

Project No.	10535.020	**Date Drilled**	5-5-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	41'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

SOIL DESCRIPTION

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

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								Surface: Asphalt Concrete, 4 in.	
40									Aggregate Base, 8 in.	
				B-1				SM	**Artificial Fill, undocumented (Afu)**	EI
								CL	@1.0': SILTY SAND, dark brown, moist, fine sand, low plasticity silt	
				R-1	7 10 14	111	11		@2.0': Lean CLAY with SAND, hard, gray to light brownish gray, moist, low plasticity clay, fine sand PP > 4.5 tsf	
35	5			R-2	8 14 18	116	12		@5.0': SANDY lean CLAY, hard, brownish gray with mottled whiteish gray, moist, low plasticity clay, fine to medium sand, with trash, highly processed, no structure PP > 4.5 tsf	DS
				S-3	8 11 17				**Quaternary Older Alluvium (Qoa)** @8.5': Lean CLAY, hard, dark grayish brown, moist, medium plasticity clay, with carbonate nodules	
30	10								**Boring terminated at 10 ft.** **Groundwater not encountered.** **Backfilled with auger cuttings; paved with cold-patch asphalt concrete.**	
25	15									
20	20									
15	25									
10	30									
	35									

SAMPLE TYPES:

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

TYPE OF TESTS:

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

GEOTECHNICAL BORING LOG B-5

Project No.	10535.020	**Date Drilled**	5-6-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	44'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

Elevation Feet	Depth Feet	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							Surface: Asphalt Concrete, 4 in.	
							SM	Aggregate Base, 8 in.	
							CL	**Artificial Fill, undocumented (Afu)** @1.0': SILTY SAND, dark brown, moist, fine sand, low plasticity silt	
40			R-1	6 9 11	119	12		@2.0': SANDY lean CLAY, very stiff, grayish brown, moist, low plasticity clay, fine sand PP = 3.75 tsf	
	5		R-2	5 8 14	98	20		@5.0': SANDY lean CLAY, hard, dark gray with mottled whiteish gray, moist, low plasticity clay, fine sand PP = 4.5 tsf	CR
35			R-3	5 9 14	105	22	CH	@7.5': Fat CLAY, very stiff, gray to grayish black, moist, high plasticity clay PP = 3.5 tsf	
	10		R-4	12 18 26	117	16	CL	**Quaternary Older Alluvium (Qoa)** @10.0': SANDY lean CLAY, hard, yellowish brown to olive brown, moist, low plasticity clay, fine sand, with carbonate nodules, iron oxide staining PP > 4.5 tsf	
30	15		R-5	6 12 18				@15.0': SANDY lean CLAY with GRAVEL, hard, yellowish brown to olive brown, moist, low plasticity clay, fine sand, fine subangular gravel PP > 4.5 tsf	
25	20		S-6	6 9 10				@20.0': Lean CLAY with SAND, very stiff, yellowish brown, moist, low plasticity clay, fine sand, iron oxide staining	
20	25		R-7	8 10 11	97	29		@25.0': Lean CLAY with SAND, very stiff, yellowish brown, moist, low plasticity clay, fine sand, iron oxide staining PP = 3 tsf	
15	30							**Boring terminated at 26.5 ft.** **Groundwater not encountered.** **Backfilled with auger cuttings; paved with cold-patch asphalt concrete.**	
10	35								

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

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

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

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

GEOTECHNICAL BORING LOG B-6

Project No.	10535.020	**Date Drilled**	5-6-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	41'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

SOIL DESCRIPTION

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

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0								Surface: Asphalt Concrete, 4 in.	
40									Aggregate Base, 8 in.	
				B-1				SM	**Artificial Fill, undocumented (Afu)** @1.0': SILTY SAND, dark brown, moist, fine sand, low plasticity silt	
				R-1	10 15 17	116	7	CL	@2.0': SANDY lean CLAY, hard, dark grayish brown to blackish brown, moist, low plasticity clay, fine to medium sand, with trash, highly processed PP > 4.5 tsf	
35	5			R-2	10 15 20				@5.0': Lean CLAY with SAND, hard, brown to light grayish brown, moist, low plasticity clay, fine sand PP > 4.5 tsf	
				R-3	9 12 17	108	17	CH	@7.5': Fat CLAY, hard, brownish gray, moist, high plasticity clay PP > 4.5 tsf	
30	10			R-4	7 12 20				**Quaternary Older Alluvium (Qoa)** @10.0': Fat CLAY, hard, olive brown, moist, high plasticity clay, with carbonate nodules PP > 4.5 tsf	
				R-5	7 12 18			CL	@12.5': SANDY lean CLAY, hard, yellowish brown to olive brown, moist, low plasticity clay, fine sand, with carbonate nodules PP > 4.5 tsf	
25	15			S-6	4 8 12				@15.0': SANDY lean CLAY, very stiff, yellowish brown to olive brown, moist, low plasticity clay, fine sand, iron oxide staining	
20	20			R-7	4 7 14	102	22		@20.0': Lean CLAY, very stiff, yellowish brown to olive brown, moist, low plasticity clay, iron oxide staining PP = 3 tsf	AL DS
									@24.0': Groundwater measured at completion of drilling	
15	25			S-8	3 4 6			CL	**Quaternary Older Alluvium (Qoa)** @25.0': Lean CLAY, stiff, olive brown, moist to wet, medium plasticity clay @27.0': Groundwater encountered	AL
10	30			R-9	8 15 25			CH	**Quaternary Older Alluvium (Qoa)** @30.0': Fat CLAY, hard, olive to olive brown, wet, high plasticity clay PP > 4.5 tsf	
	35									

SAMPLE TYPES:

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

TYPE OF TESTS:

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

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

GEOTECHNICAL BORING LOG B-6

Project No.	10535.020	**Date Drilled**	5-6-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	41'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	**SOIL DESCRIPTION** *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
5	35			S-10	5 9 14				@35.0': SANDY fat CLAY, very stiff, brown to yellowish, wet, high plasticity clay, fine sand	
0	40			R-11	6 11 13				@40.0': Fat CLAY, very stiff, olive brown, wet, high plasticity clay PP = 3.75 tsf	
-5	45			S-12	5 10 12			CL	@45.0': Lean CLAY with SAND, very stiff, brownish olive, wet, medium plasticity clay, fine sand	AL
-10	50			S-13	6 9 9				@50.0': Lean CLAY, very stiff, olive to reddish brown, wet, low plasticity clay, iron oxide staining	AL
									Boring terminated at 51.5 ft. **Groundwater encountered at 27 feet during drilling; 24 feet at end of drilling.** **Backfilled with auger cuttings; paved with cold-patch asphalt concrete**.	
-15	55									
-20	60									
-25	65									
	70									

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

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

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

GEOTECHNICAL BORING LOG B-7

Project No.	10535.020	**Date Drilled**	5-6-21
Project	El Camino College Fire Training Facility	**Logged By**	SG
Drilling Co.	Jet Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger; Hammer: Automatic, 140 lb, 30 in drop	**Ground Elevation**	44'
Location	See Plate 1, *Geotechnical Map*	**Sampled By**	SG

SOIL DESCRIPTION

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

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0								Surface: Asphalt Concrete, 4 in.	
				B-1				SM	Aggregate Base, 8 in.	CR RV
								CL	**Artificial Fill, undocumented (Afu)** @1.0': SILTY SAND, dark brown, moist, fine sand, low plasticity silt	
40				R-1	6 9 14				@2.0': Lean CLAY with SAND, hard, greenish black, moist, high plasticity clay, fine sand PP > 4.5 tsf	
	5			R-2	6 8 14	99	25	CH	@5.0': Fat CLAY, very stiff, black, moist, high plasticity clay PP = 3.5 tsf	
35				R-3	6 15 20	117	15	CL	**Quaternary Older Alluvium (Qoa)** @7.5': Lean CLAY with SAND, hard, whiteish olive to olive brown, moist, low plasticity clay, fine sand, with carbonate pocket PP > 4.5 tsf	DS
	10			R-4	7 15 15				@10.0': SANDY lean CLAY, hard, olive brown, moist, low plasticity clay, fine sand PP > 4.5 tsf	
30	15			R-5	8 14 16	119	11		@15.0': SANDY lean CLAY with GRAVEL, hard, brown to yellowish brown, moist, low plasticity clay, fine sand, fine subangular gravel PP > 4.5 tsf	
25	20			S-6	4 5 8				@20.0': Lean CLAY with SAND, very stiff, yellowish brown to light olive brown, moist, low plasticity clay, fine sand, iron oxide staining, interbedded with silt, low plasticity	
20	25			R-7	5 10 14				@25.0': Lean CLAY with SAND, very stiff, yellowish brown to light olive brown, moist, low plasticity clay, fine sand, iron oxide staining PP = 3.5 tsf	
15	30								**Boring terminated at 26.5 ft.** **Groundwater not encountered.** **Backfilled with auger cuttings; paved with cold-patch asphalt concrete.**	
10	35									

SAMPLE TYPES:

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

TYPE OF TESTS:

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

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

SUMMARY

OF

CONE PENETRATION TEST DATA

Project:

El Camino Fire Training Facility
Torrance, CA
May 7, 2021

Prepared for:

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Leighton Consulting
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Prepared by:

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TABLE OF CONTENTS

SUMMARY

OF

CONE PENETRATION TEST DATA

1. INTRODUCTION

This report presents the results of a Cone Penetration Test (CPT) program carried out for the El Camino Fire Training Facility project located in Torrance, California. The work was performed by Kehoe Testing & Engineering (KTE) on May 7, 2021. The scope of work was performed as directed by Leighton Consulting personnel.

2. SUMMARY OF FIELD WORK

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

LOCATION	DEPTH OF CPT (ft)	COMMENTS/NOTES:
CPT-1	75	
CPT-2	50	
CPT-3	50	
CPT-4	50	

TABLE 2.1 - Summary of CPT Soundings

3. FIELD EQUIPMENT & PROCEDURES

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

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

At location CPT-1, shear wave measurements were obtained at approximately 5-foot intervals. The shear wave is generated using an air-actuated hammer, which is located inside the front jack of the CPT rig. The cone has a triaxial geophone, which recorded the shear wave signal generated by the air hammer.

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

4. CONE PENETRATION TEST DATA & INTERPRETATION

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

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

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

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

Sincerely,

KEHOE TESTING & ENGINEERING

Steven P. Kehoe
President

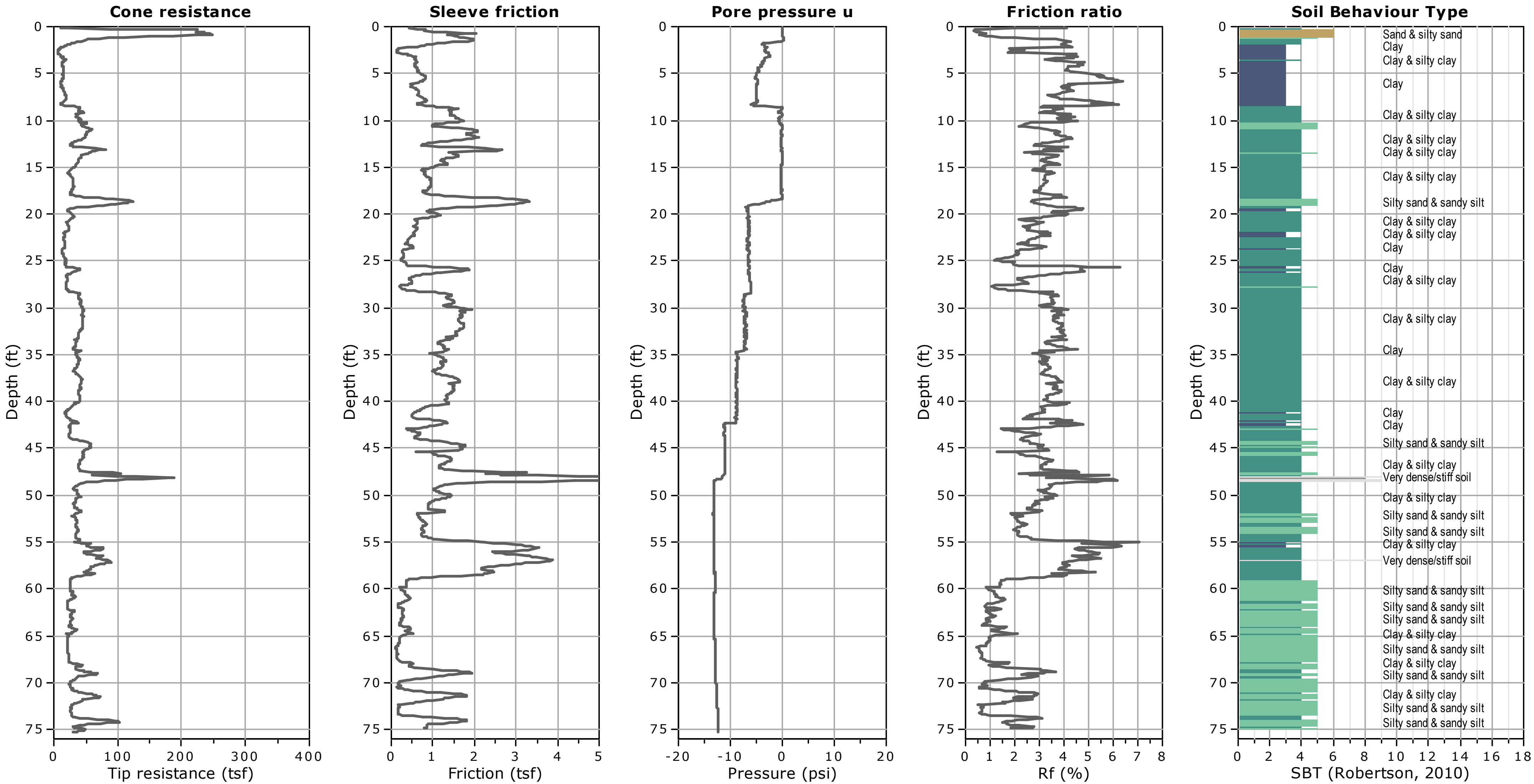
05/18/21-hh-2872

APPENDIX

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

Project: Leighton Consulting / El Camino Fire Training Facility
Location: Torrance, CA

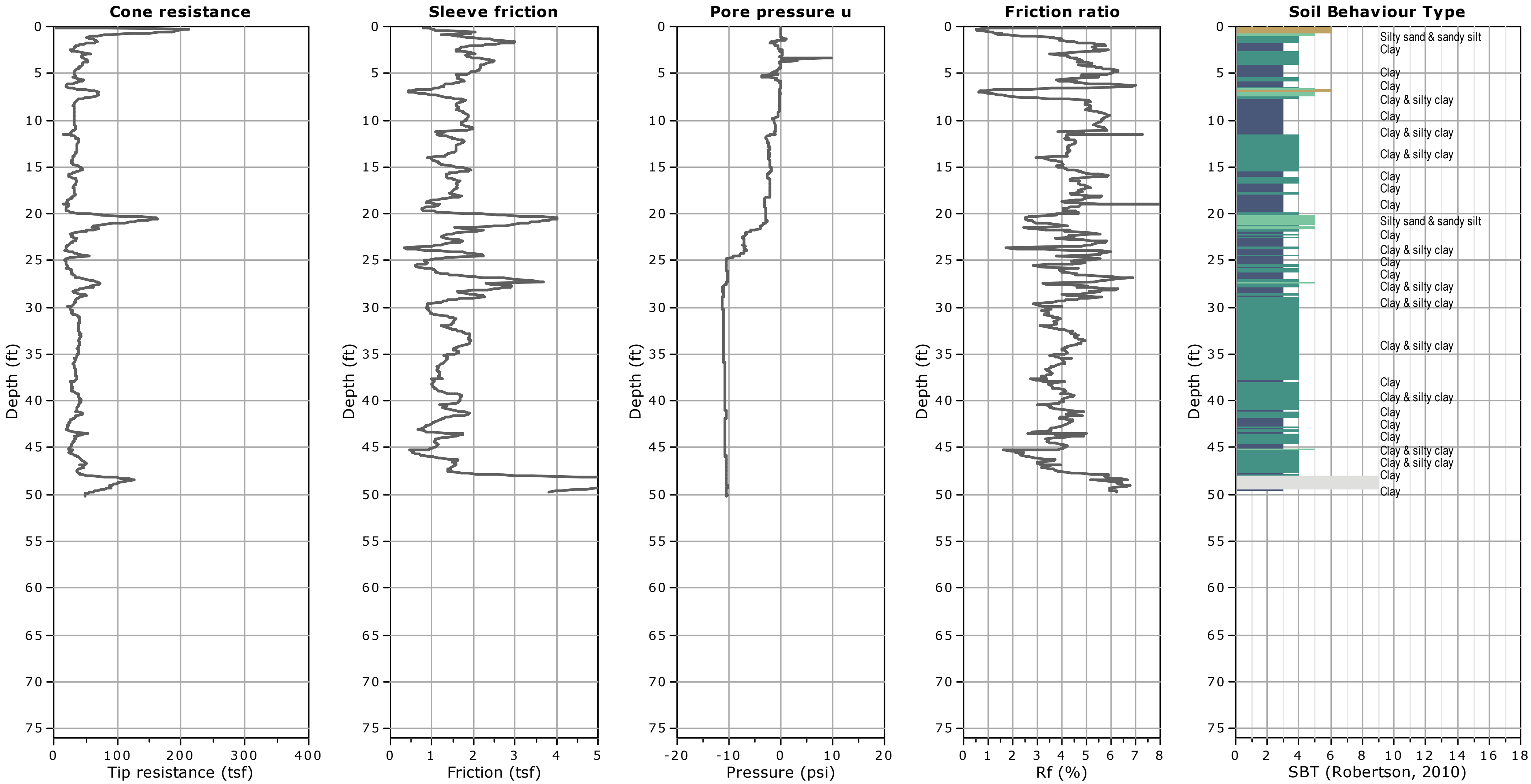
CPT-1
Total depth: 75.29 ft, Date: 5/7/2021



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

Project: Leighton Consulting / El Camino Fire Training Facility
Location: Torrance, CA

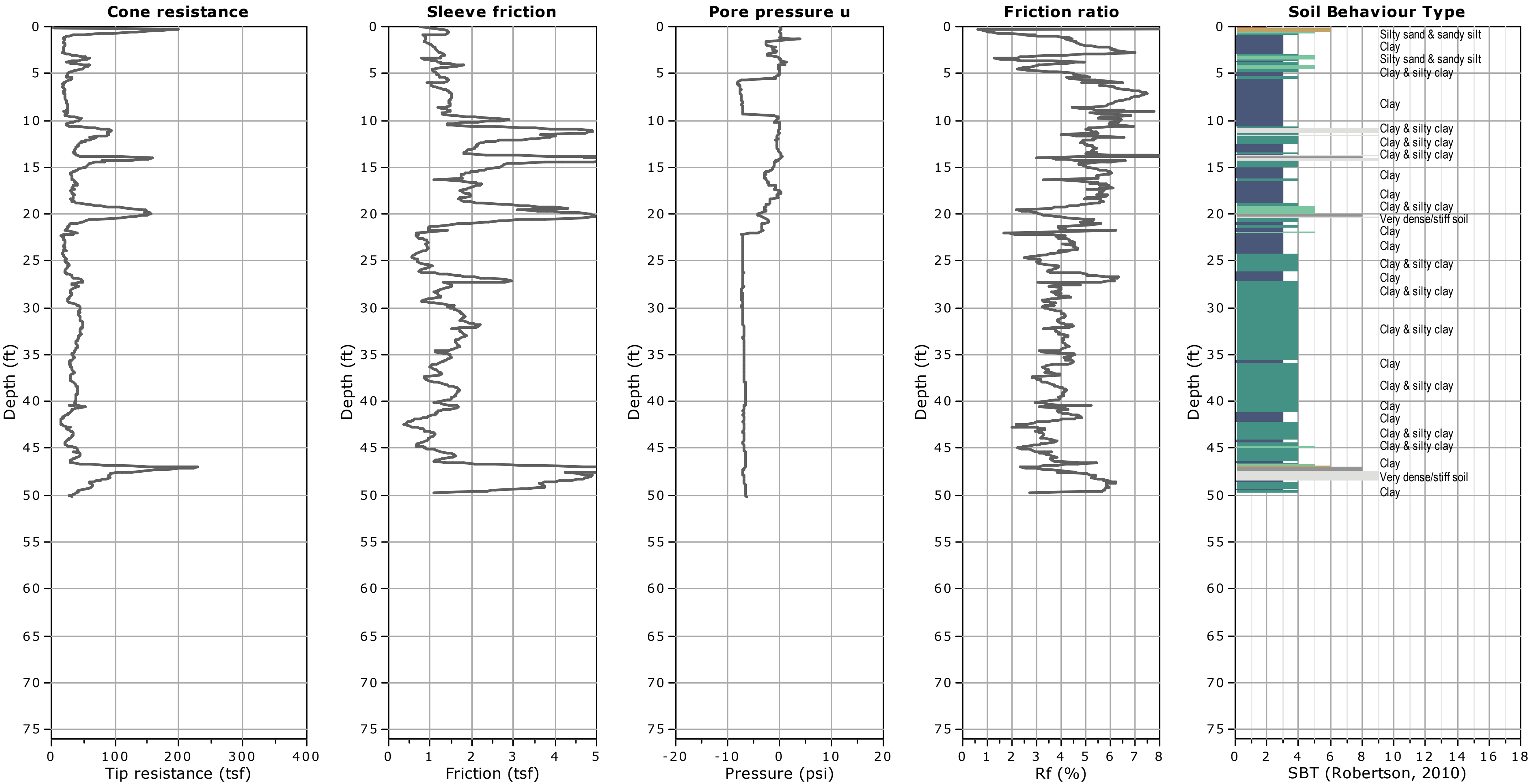
CPT-2
Total depth: 50.14 ft, Date: 5/7/2021



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

Project: Leighton Consulting / El Camino Fire Training Facility **CPT-3**

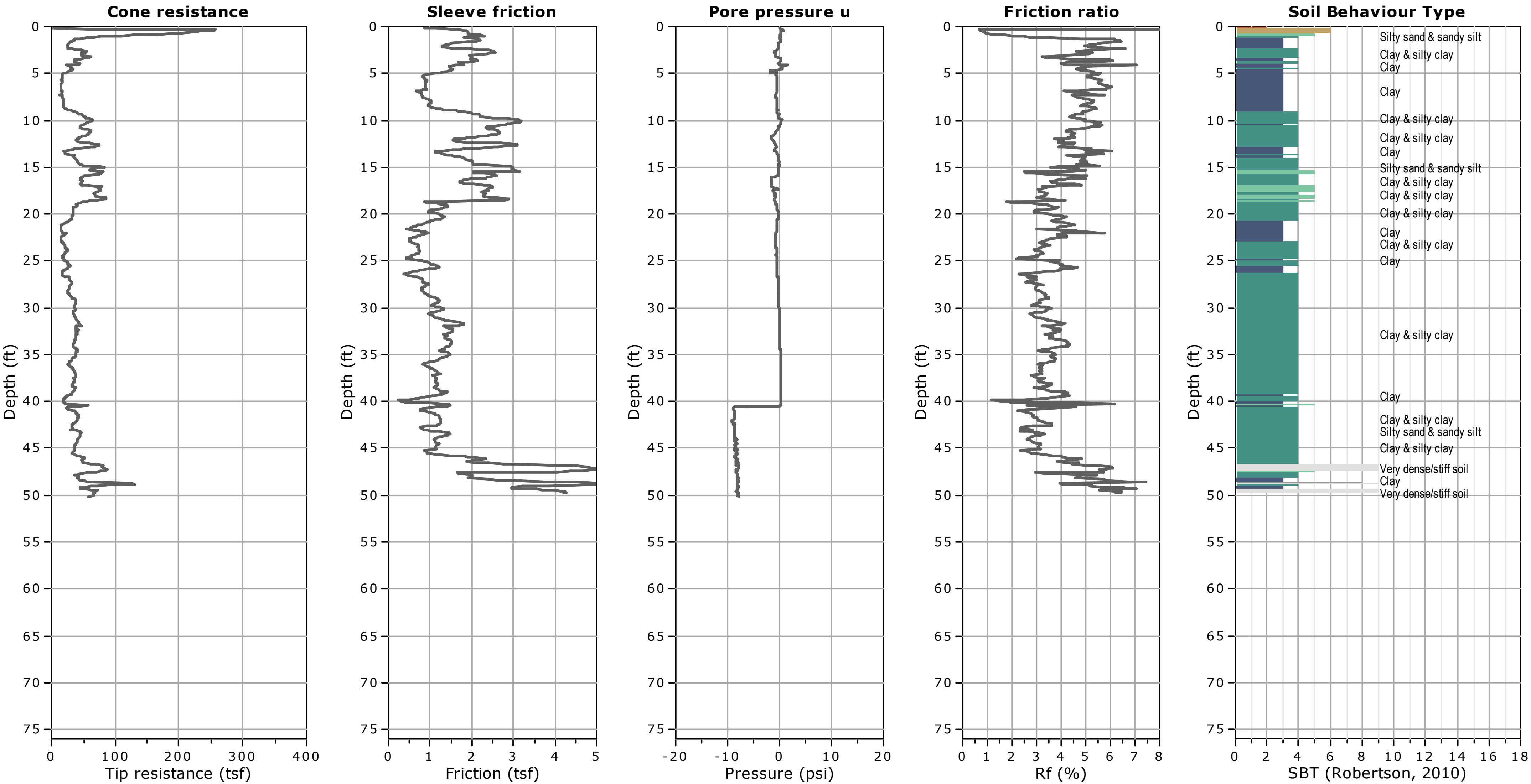
Location: Torrance, CA Total depth: 50.14 ft, Date: 5/7/2021



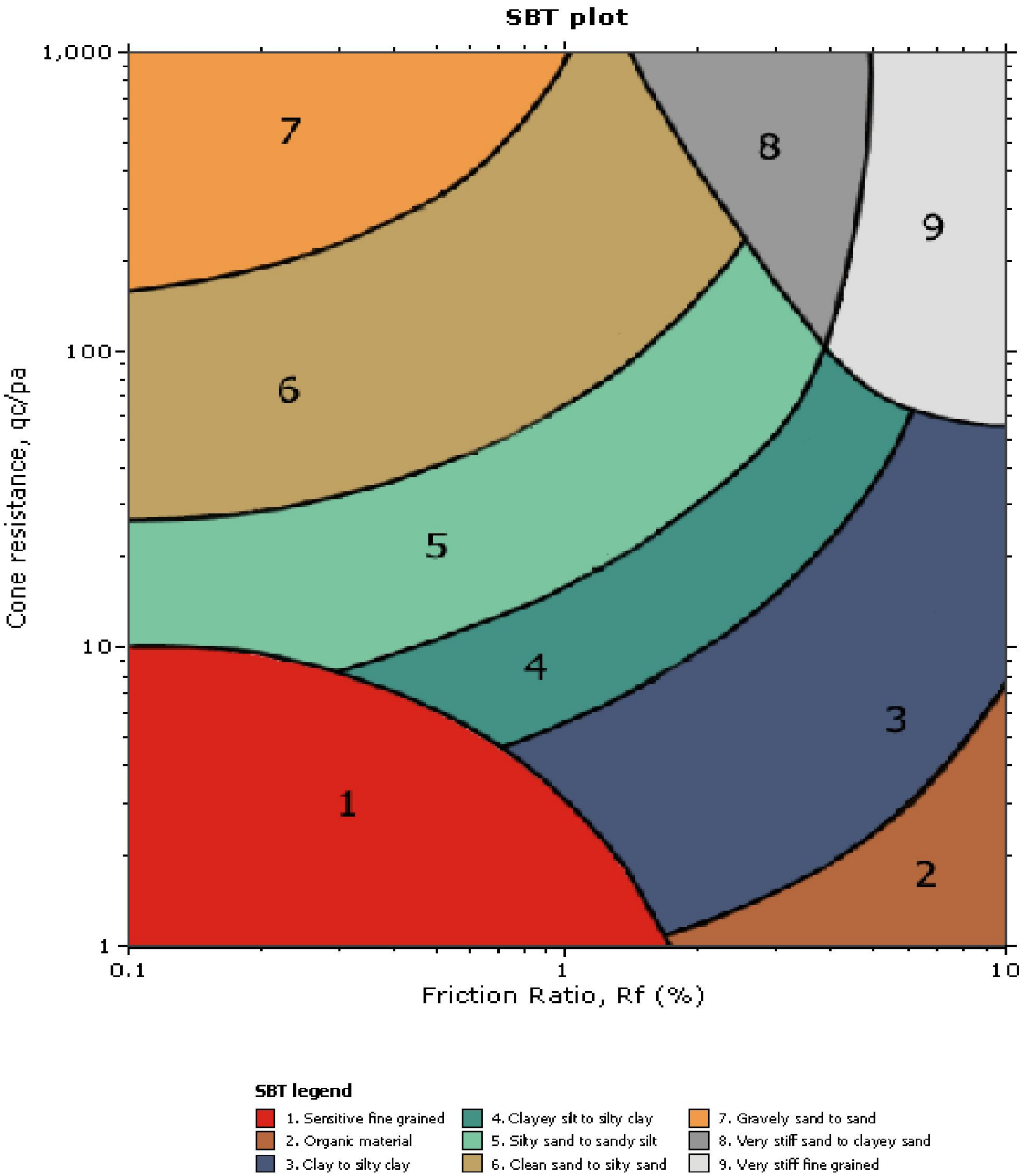
Kehoe Testing and Engineering
714-901-7270
steve@kehoetesting.com
www.kehoetesting.com

Project: Leighton Consulting / El Camino Fire Training Facility **CPT-4**

Location: Torrance, CA Total depth: 50.18 ft, Date: 5/7/2021



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



Seismic Shear Wave Velocities

Leighton Consulting
El Camino College Fire Training Facility
Torrance, CA

CPT Shear Wave Measurements

Location	Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
CPT-1	5.12	4.12	4.58	7.04	651	
	10.04	9.04	9.26	14.64	632	616
	15.09	14.09	14.23	19.68	723	987
	20.08	19.08	19.18	24.82	773	964
	25.10	24.10	24.18	30.52	792	877
	30.05	29.05	29.12	35.96	810	907
	35.17	34.17	34.23	41.12	832	990
	40.09	39.09	39.14	46.34	845	941
	45.11	44.11	44.16	51.86	851	908
	50.10	49.10	49.14	57.70	852	854
	55.12	54.12	54.16	62.52	866	1041
	60.17	59.17	59.20	68.20	868	889
	65.06	64.06	64.09	73.44	873	933
	70.11	69.11	69.14	78.36	882	1026
	75.30	74.30	74.33	83.62	889	986

Shear Wave Source Offset - 2 ft

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

APPENDIX B

GEOTECHNICAL LABORATORY TESTING

Leighton

APPENDIX B

GEOTECHNICAL LABORATORY TESTING

Our geotechnical laboratory testing program was directed toward a quantitative and qualitative evaluation of physical and mechanical properties of soils underlying proposed improvements, and to aid in verifying soil classification.

In-Situ Moisture and Density: As-sampled soil moisture content was measured (ASTM D2216) on selected samples recovered from our borings. In addition, in place dry density was measured (ASTM D2937) on selected relatively undisturbed soil samples. Results of these tests are shown on our logs at the appropriate sample depths in Appendix A.

Atterberg Limits (ASTM D4318): Liquid Limit (LL), Plastic Limit (PL) and Plasticity Index (PI) were determined for selected soil samples in accordance with ASTM D 4318. These soil samples were air-dried and passed through a No. 40 sieve and moisturized. Liquid and plastic limit tests were performed on the soil fraction passing the No. 40 sieve. Results of these Atterberg limits tests are presented in this appendix on the “Atterberg Limits” sheets.

Direct Shear: Direct shear tests were performed on three drive samples. Three different rings were cut from the soil samples then inundated with water and sheared separately at three different normal loads to establish soil friction and cohesion parameters. Results of these tests are presented in this appendix on the “*Direct Shear Test Results”* sheets.

Consolidation (ASTM D2435): A consolidation test was run on a relatively undisturbed drive sample from a boring, performed in accordance with ASTM D2435. Results are included in this appendix on the “*One-Dimensional Consolidation Properties of Soils”* sheet.

Expansion Index (EI, ASTM D4829): Expansion Index (EI) tests were performed in accordance with the ASTM D 4829 Standard Test Method, for shallow bulk soil samples from the site. EI results are included in this appendix on the “*Expansion Index of Soils*” sheets.

Pavement Subgrade R-value: For use in flexible (asphalt) pavement design, a bulk soil sample was tested for R-value in accordance with California Test Method (CTM) 301. Results are presented on the *R-value Test Results* sheets in this appendix.

Soil Corrosivity: Two bulk samples of site soil were tested for corrosivity. Tests for water-soluble sulfate, water-soluble chloride, pH and minimum resistivity were performed in accordance with California Test Methods (CTMs) 417 Part II, 422 and 532/643, respectively. Test results are presented at the end of this appendix.

ATTERBERG LIMITS

ASTM D 4318

Project Name:	El Camino College Fire Training Facility	Tested By:	Y. Nguyen	Date:	05/25/21
Project No. :	10535.020	Input By:	G. Bathala	Date:	05/28/21
Boring No.:	B-2	Checked By:	A. Santos		
Sample No.:	R-6	Depth (ft.)	20.0		
Soil Identification:	Olive brown lean clay (CL)				

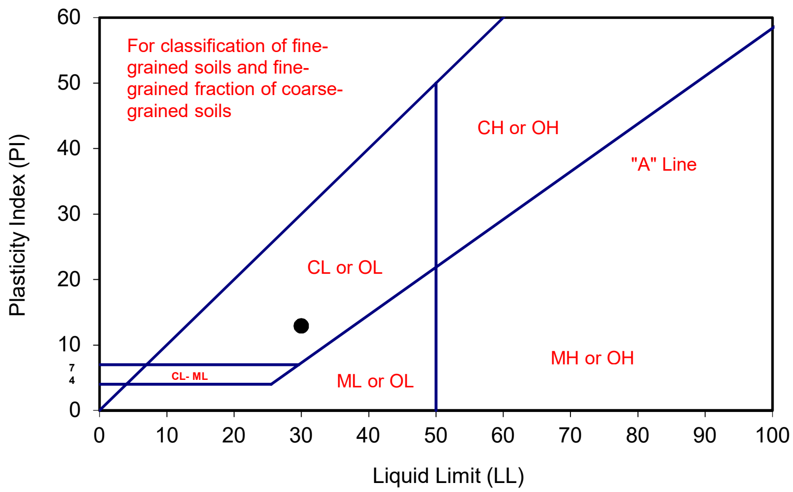
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			32	24	16	
Wet Wt. of Soil + Cont. (g)	9.31	9.25	22.20	22.22	21.85	
Dry Wt. of Soil + Cont. (g)	8.10	8.05	17.47	17.32	16.82	
Wt. of Container (g)	1.04	1.00	1.10	0.98	1.00	
Moisture Content (%) [Wn]	17.14	17.02	28.89	29.99	31.80	

Liquid Limit	**30**
Plastic Limit	**17**
Plasticity Index	**13**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) | 7.3

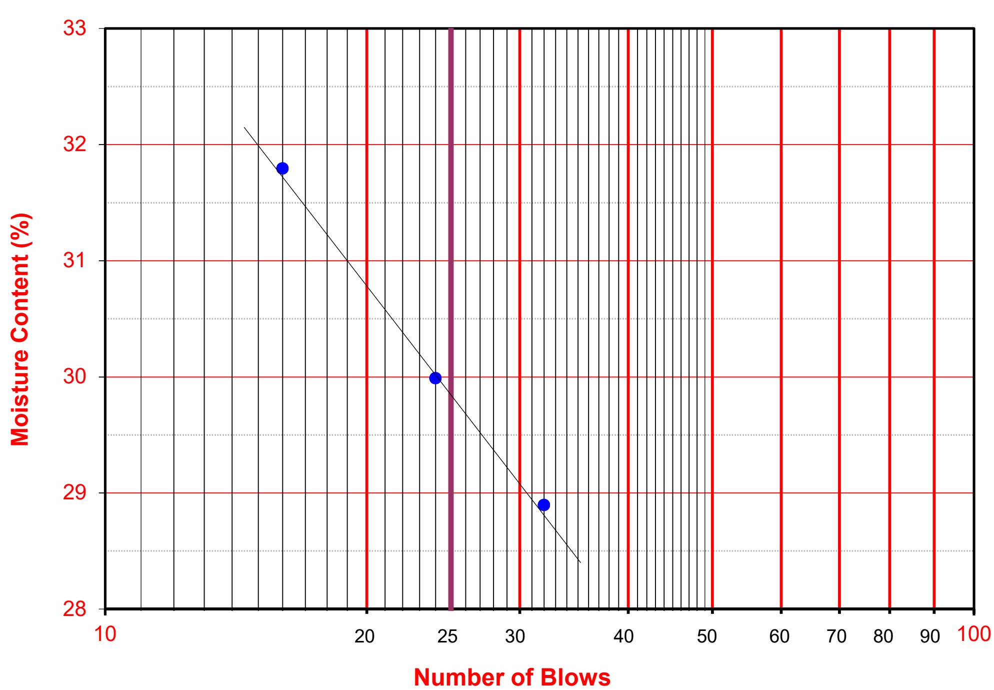
One - Point Liquid Limit Calculation

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



PROCEDURES USED

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



ATTERBERG LIMITS

ASTM D 4318

Project Name:	El Camino College Fire Training Facility	Tested By:	S. Felter	Date:	05/21/21
Project No. :	10535.020	Input By:	G. Bathala	Date:	05/28/21
Boring No.:	B-2	Checked By:	A. Santos		
Sample No.:	S-5	Depth (ft.)	15.0		
Soil Identification:	Brown lean clay (CL)				

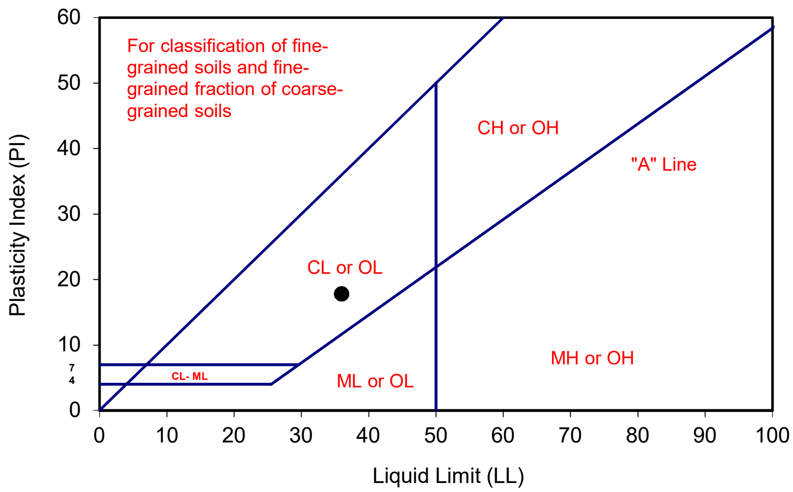
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			33	26	19	
Wet Wt. of Soil + Cont. (g)	9.16	9.18	20.01	20.88	20.90	
Dry Wt. of Soil + Cont. (g)	7.92	7.94	15.15	15.65	15.53	
Wt. of Container (g)	1.10	1.14	1.09	1.04	1.04	
Moisture Content (%) [Wn]	18.18	18.24	34.57	35.80	37.06	

Liquid Limit	**36**
Plastic Limit	**18**
Plasticity Index	**18**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) | 11.68

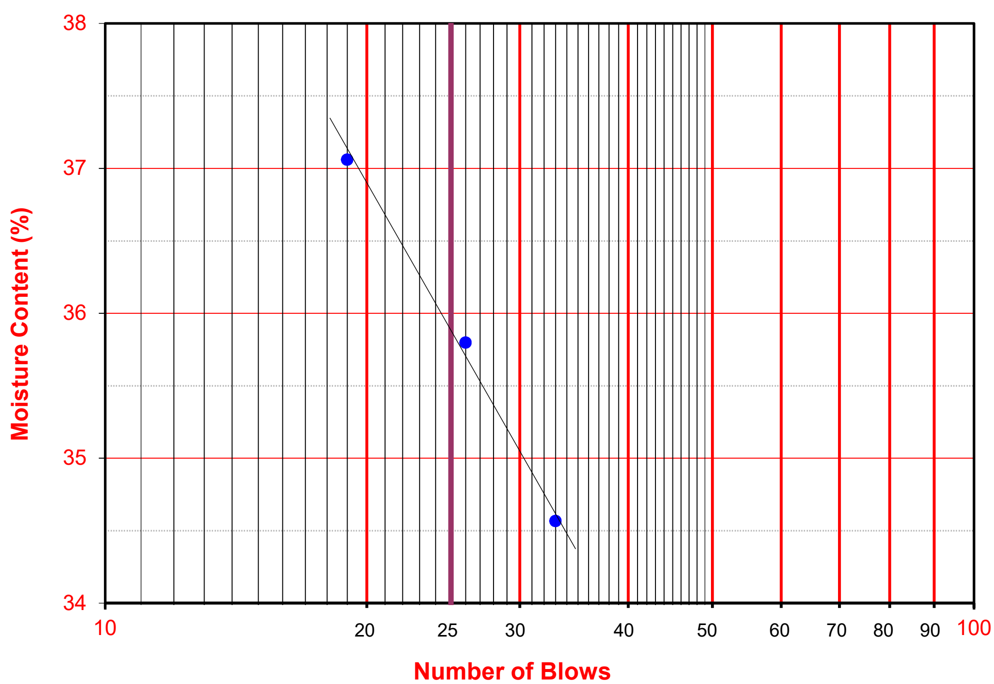
One - Point Liquid Limit Calculation

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



PROCEDURES USED

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



ATTERBERG LIMITS

ASTM D 4318

Project Name:	El Camino College Fire Training Facility	Tested By:	S. Felter	Date:	05/21/21
Project No. :	10535.020	Input By:	G. Bathala	Date:	05/28/21
Boring No.:	B-2	Checked By:	A. Santos		
Sample No.:	S-9	Depth (ft.)	35.0		
Soil Identification:	Brown fat clay (CH)				

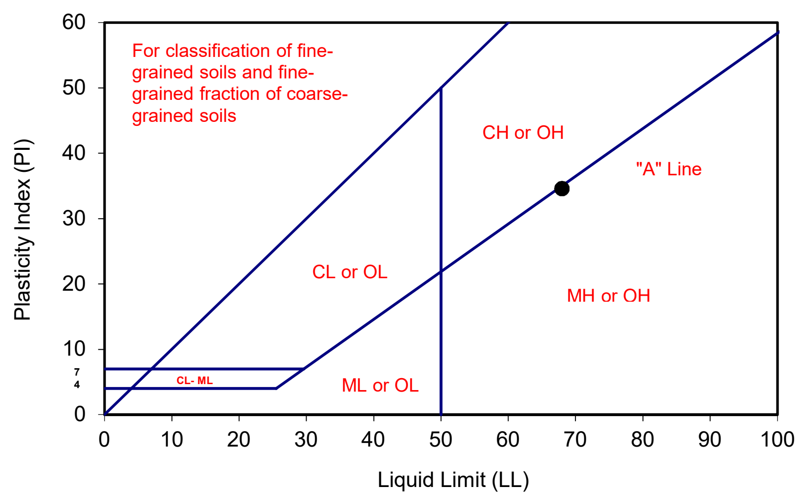
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			34	27	21	
Wet Wt. of Soil + Cont. (g)	9.74	9.90	20.20	20.15	20.27	
Dry Wt. of Soil + Cont. (g)	7.57	7.69	12.66	12.51	12.41	
Wt. of Container (g)	1.09	1.07	1.12	1.13	1.09	
Moisture Content (%) [Wn]	33.49	33.38	65.34	67.14	69.43	

Liquid Limit	**68**
Plastic Limit	**33**
Plasticity Index	**35**
Classification	**CH**

PI at "A" - Line = 0.73(LL-20) | 35.04

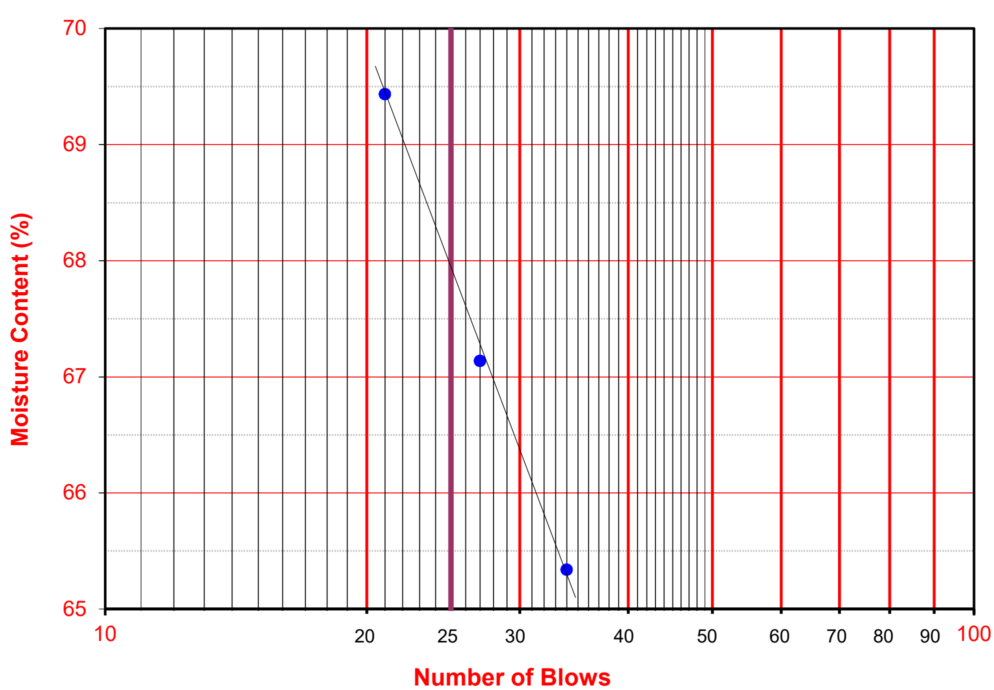
One - Point Liquid Limit Calculation

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



PROCEDURES USED

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



ATTERBERG LIMITS
ASTM D 4318

Leighton

Project Name:	El Camino College Fire Training Facility	Tested By:	S. Felter	Date:	06/01/21
Project No. :	10535.020	Input By:	G. Bathala	Date:	06/07/21
Boring No.:	B-6	Checked By:	A. Santos		
Sample No.:	R-7	Depth (ft.)	20.0		
Soil Identification:	Olive brown lean clay (CL)				

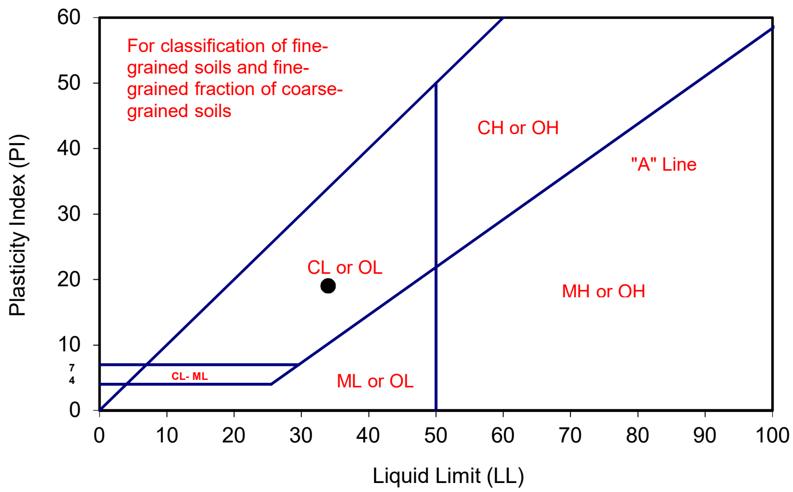
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			30	22	16	
Wet Wt. of Soil + Cont. (g)	10.23	10.74	21.17	20.86	21.49	
Dry Wt. of Soil + Cont. (g)	9.04	9.48	16.12	15.75	16.11	
Wt. of Container (g)	1.06	1.12	1.05	1.04	1.11	
Moisture Content (%) [Wn]	14.91	15.07	33.51	34.74	35.87	

Liquid Limit	**34**
Plastic Limit	**15**
Plasticity Index	**19**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) 10.22

One - Point Liquid Limit Calculation

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



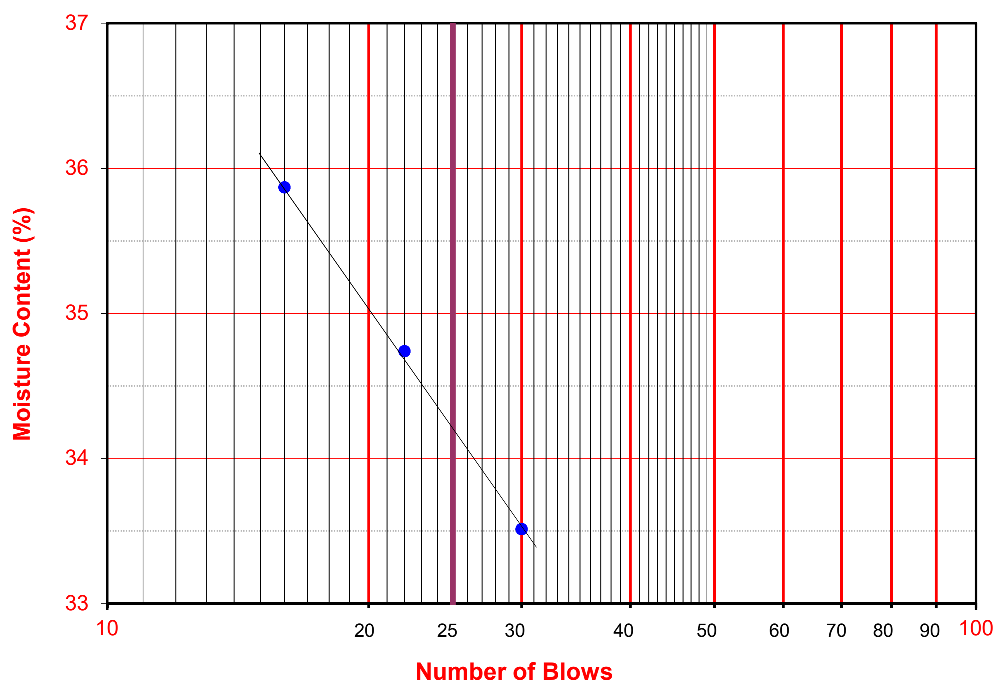
PROCEDURES USED

☐ Wet Preparation
Multipoint - Wet

☒ Dry Preparation
Multipoint - Dry

☒ Procedure A
Multipoint Test

☐ Procedure B
One-point Test



ATTERBERG LIMITS

ASTM D 4318

Leighton

Project Name:	El Camino College Fire Training Facility	Tested By:	S. Felter	Date:	05/27/21
Project No. :	10535.020	Input By:	G. Bathala	Date:	05/28/21
Boring No.:	B-6	Checked By:	A. Santos		
Sample No.:	S-8	Depth (ft.)	25.0		
Soil Identification:	Brown lean clay (CL)				

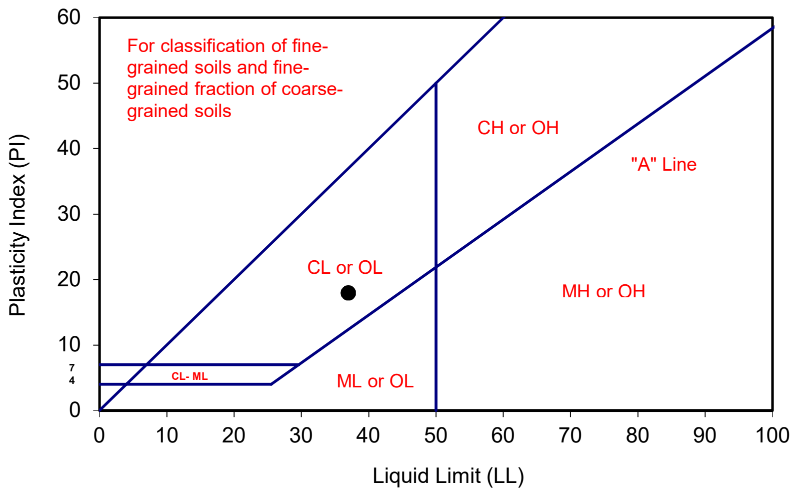
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			32	25	19	
Wet Wt. of Soil + Cont. (g)	9.36	9.17	21.88	20.43	21.28	
Dry Wt. of Soil + Cont. (g)	8.00	7.90	16.40	15.23	15.74	
Wt. of Container (g)	1.05	1.06	1.11	1.08	1.06	
Moisture Content (%) [Wn]	19.57	18.57	35.84	36.75	37.74	

Liquid Limit	**37**
Plastic Limit	**19**
Plasticity Index	**18**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) 12.41

One - Point Liquid Limit Calculation

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



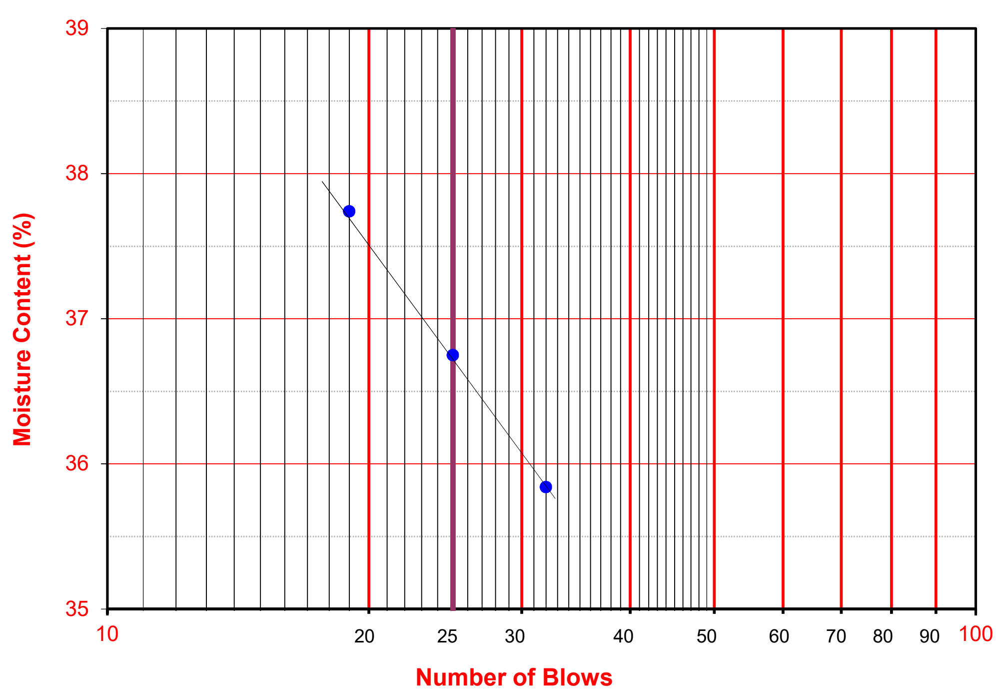
PROCEDURES USED

☐ Wet Preparation
Multipoint - Wet

X Dry Preparation
Multipoint - Dry

X Procedure A
Multipoint Test

☐ Procedure B
One-point Test



Leighton

ATTERBERG LIMITS

ASTM D 4318

Project Name:	El Camino College Fire Training Facility	Tested By:	S. Felter	Date:	05/24/21
Project No. :	10535.020	Input By:	G. Bathala	Date:	05/28/21
Boring No.:	B-6	Checked By:	A. Santos		
Sample No.:	S-12	Depth (ft.)	45.0		
Soil Identification:	Brown lean clay (CL)				

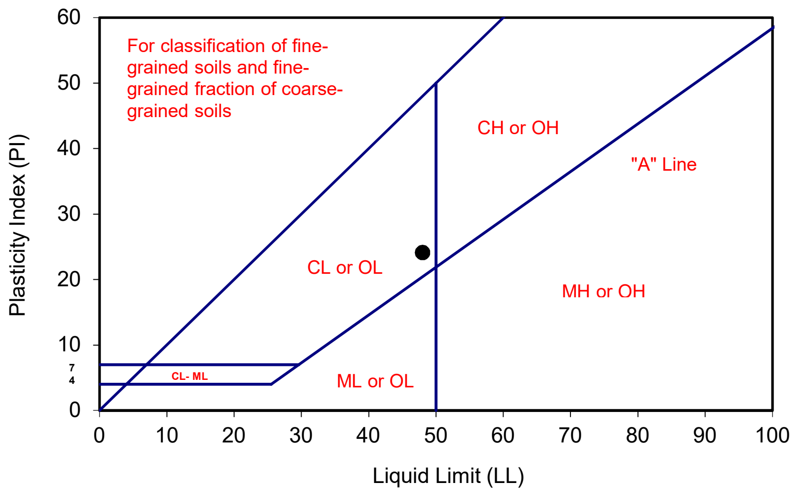
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			34	26	20	
Wet Wt. of Soil + Cont. (g)	10.25	10.31	21.01	20.64	20.51	
Dry Wt. of Soil + Cont. (g)	8.48	8.54	14.70	14.32	14.10	
Wt. of Container (g)	1.08	1.13	1.05	1.15	1.09	
Moisture Content (%) [Wn]	23.92	23.89	46.23	47.99	49.27	

Liquid Limit	**48**
Plastic Limit	**24**
Plasticity Index	**24**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) | 20.44

One - Point Liquid Limit Calculation

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



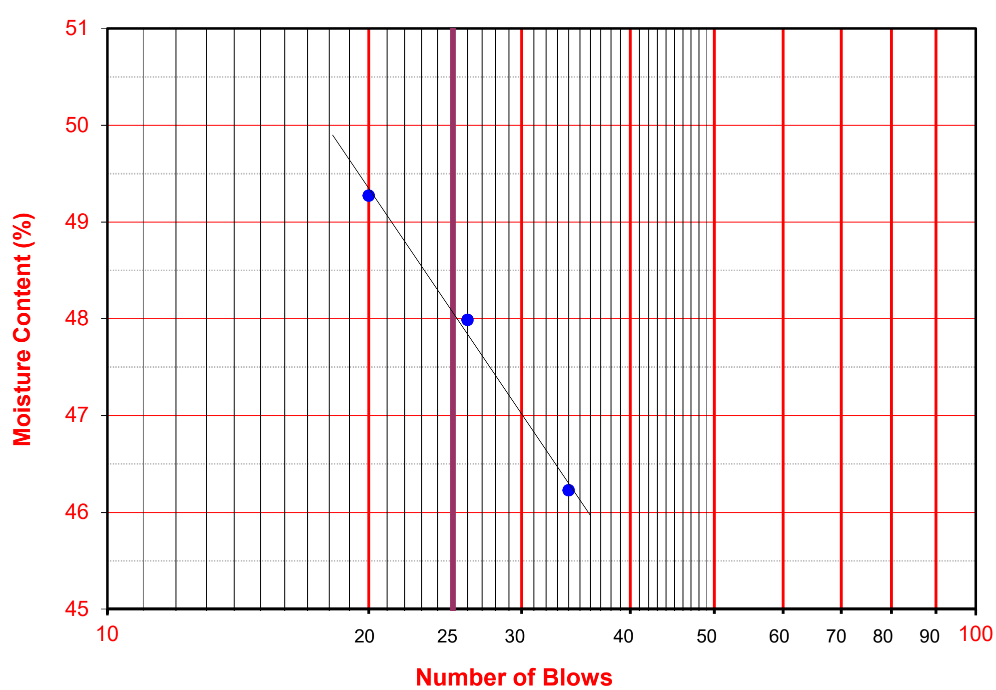
PROCEDURES USED

☐ Wet Preparation
Multipoint - Wet

☒ Dry Preparation
Multipoint - Dry

☒ Procedure A
Multipoint Test

☐ Procedure B
One-point Test



ATTERBERG LIMITS
ASTM D 4318

Leighton

Project Name:	El Camino College Fire Training Facility	Tested By:	S. Felter	Date:	05/24/21
Project No. :	10535.020	Input By:	G. Bathala	Date:	05/28/21
Boring No.:	B-6	Checked By:	A. Santos		
Sample No.:	S-13	Depth (ft.)	50.0		
Soil Identification:	Olive brown lean clay (CL)				

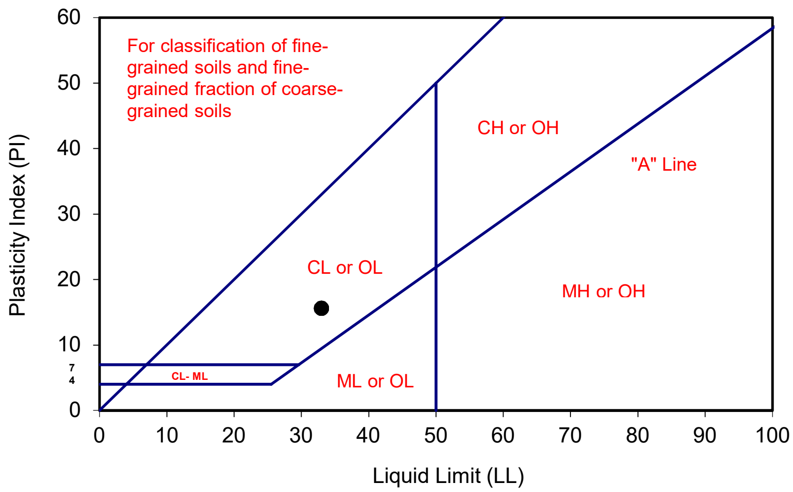
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			31	25	16	
Wet Wt. of Soil + Cont. (g)	10.20	10.26	20.88	20.46	21.64	
Dry Wt. of Soil + Cont. (g)	8.87	8.88	16.07	15.63	16.37	
Wt. of Container (g)	1.09	1.10	1.12	1.02	1.04	
Moisture Content (%) [Wn]	17.10	17.74	32.17	33.06	34.38	

Liquid Limit	**33**
Plastic Limit	**17**
Plasticity Index	**16**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) | 9.49

One - Point Liquid Limit Calculation

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



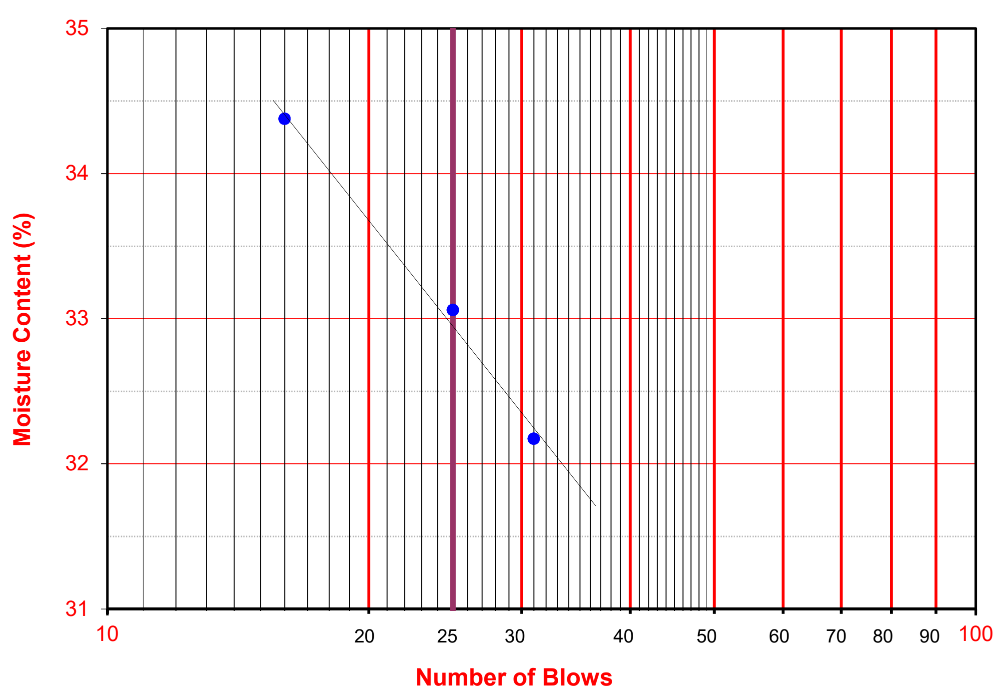
PROCEDURES USED

☐ Wet Preparation
Multipoint - Wet

☒ Dry Preparation
Multipoint - Dry

☒ Procedure A
Multipoint Test

☐ Procedure B
One-point Test

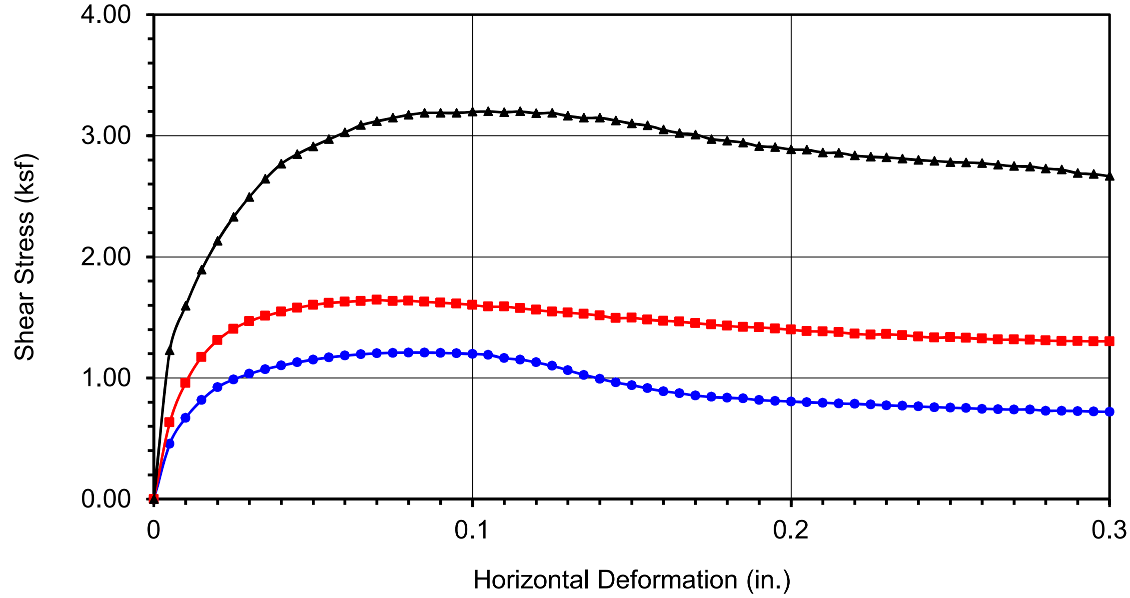


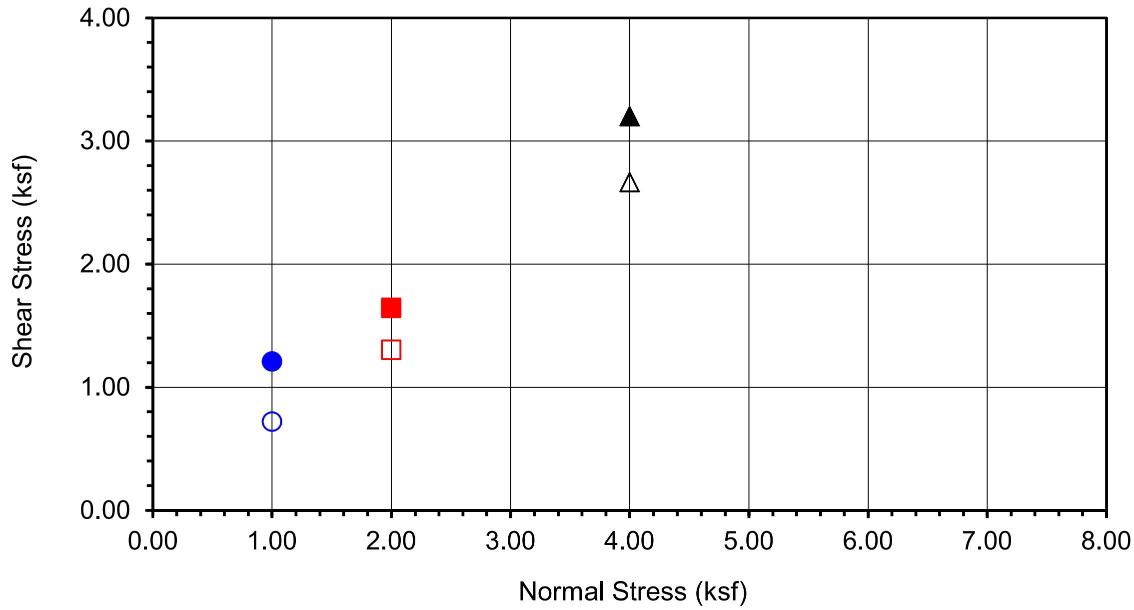
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name: El Camino College Fire Training Facility   Tested By: G. Bathala   Date: 05/26/21
Project No.: 10535.020   Checked By: A. Santos   Date: 06/11/21
Boring No.: B-4   Sample Type: Ring
Sample No.: R-2   Depth (ft.): 5.0
Soil Identification: Dark olive gray lean clay (CL)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	195.67	197.10	201.31
Weight of Ring(gm):	44.69	44.40	45.40
Before Shearing			
Weight of Wet Sample+Cont.(gm):	173.40	173.40	173.40
Weight of Dry Sample+Cont.(gm):	161.58	161.58	161.58
Weight of Container(gm):	59.81	59.81	59.81
Vertical Rdg.(in): Initial	0.0000	0.2396	0.2565
Vertical Rdg.(in): Final	0.0029	0.2475	0.2747
After Shearing			
Weight of Wet Sample+Cont.(gm):	212.53	223.93	217.59
Weight of Dry Sample+Cont.(gm):	187.30	199.26	194.34
Weight of Container(gm):	53.74	65.76	58.52
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**B-4**
Sample No.	**R-2**
Depth (ft)	**5**
Sample Type:	
Ring	
Soil Identification:	
Dark olive gray lean clay (CL)	

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 1.210	■ 1.644	▲ 3.200
Shear Stress @ End of Test (ksf)	○ 0.720	□ 1.302	△ 2.666
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	11.61	11.61	11.61
Dry Density (pcf)	112.5	113.8	116.2
Saturation (%)	62.9	65.1	69.5
Soil Height Before Shearing (in.)	1.0029	0.9921	0.9818
Final Moisture Content (%)	18.9	18.5	17.1

Leighton

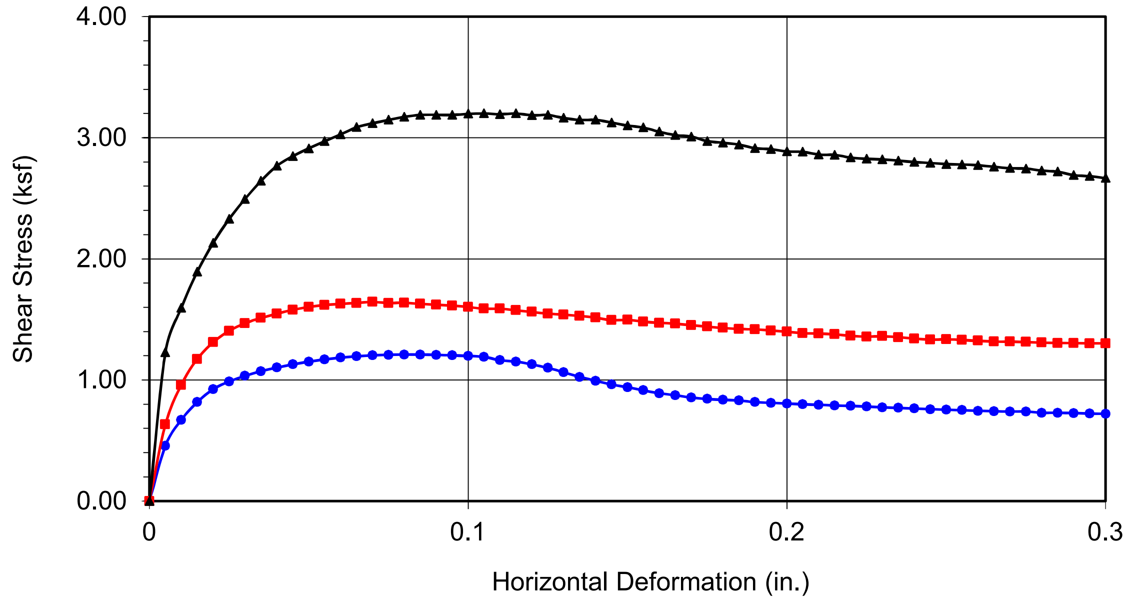
DIRECT SHEAR TEST RESULTS

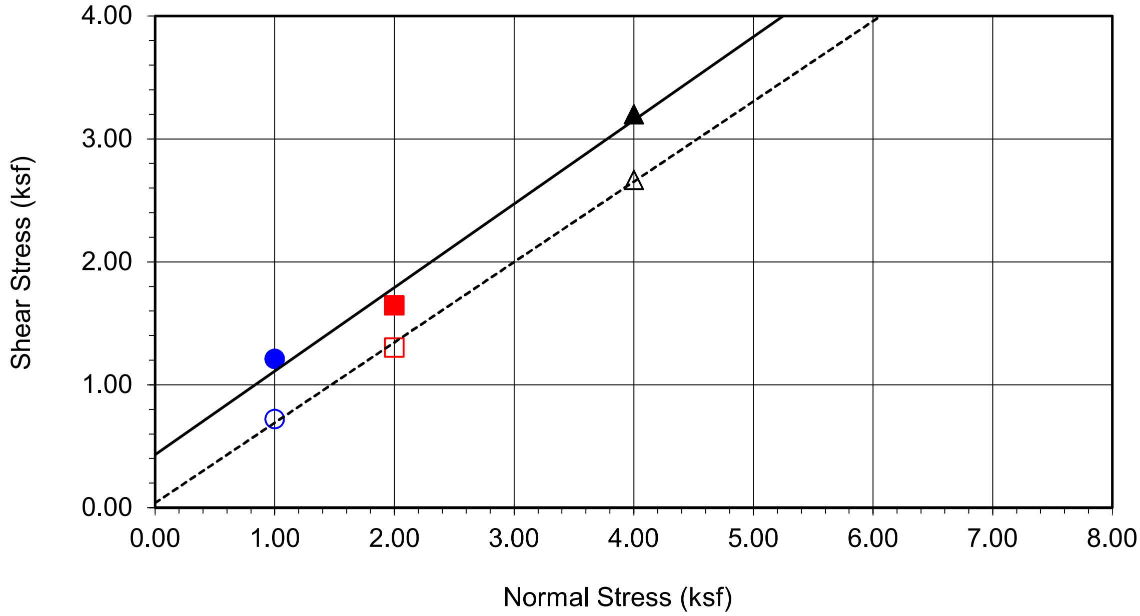
Consolidated Drained - ASTM D 3080

Project No.: 10535.020

El Camino College Fire Training Facility

05-21





Boring No.	**B-4**
Sample No.	**R-2**
Depth (ft)	**5**
Sample Type:	Ring

Soil Identification:
Dark olive gray lean clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	432	34
Ultimate	38	33

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 1.210	■ 1.644	▲ 3.200
Shear Stress @ End of Test (ksf)	○ 0.720	□ 1.302	△ 2.666
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	11.61	11.61	11.61
Dry Density (pcf)	112.5	113.8	116.2
Saturation (%)	62.9	65.1	69.5
Soil Height Before Shearing (in.)	1.0029	0.9921	0.9818
Final Moisture Content (%)	18.9	18.5	17.1

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 10535.020

El Camino College Fire Training Facility

05-21

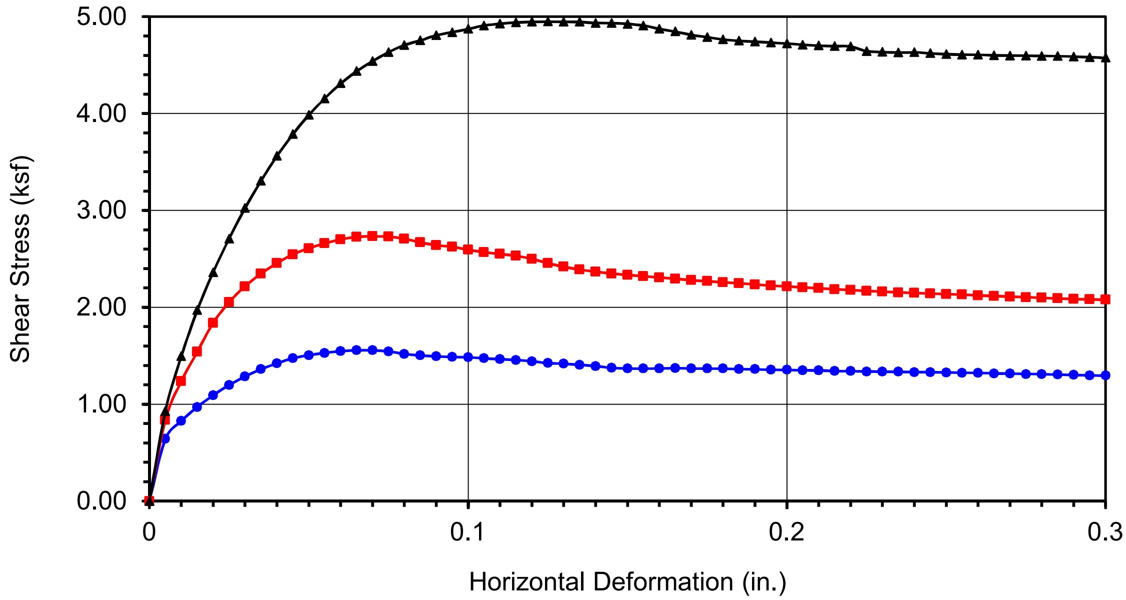
DIRECT SHEAR TEST

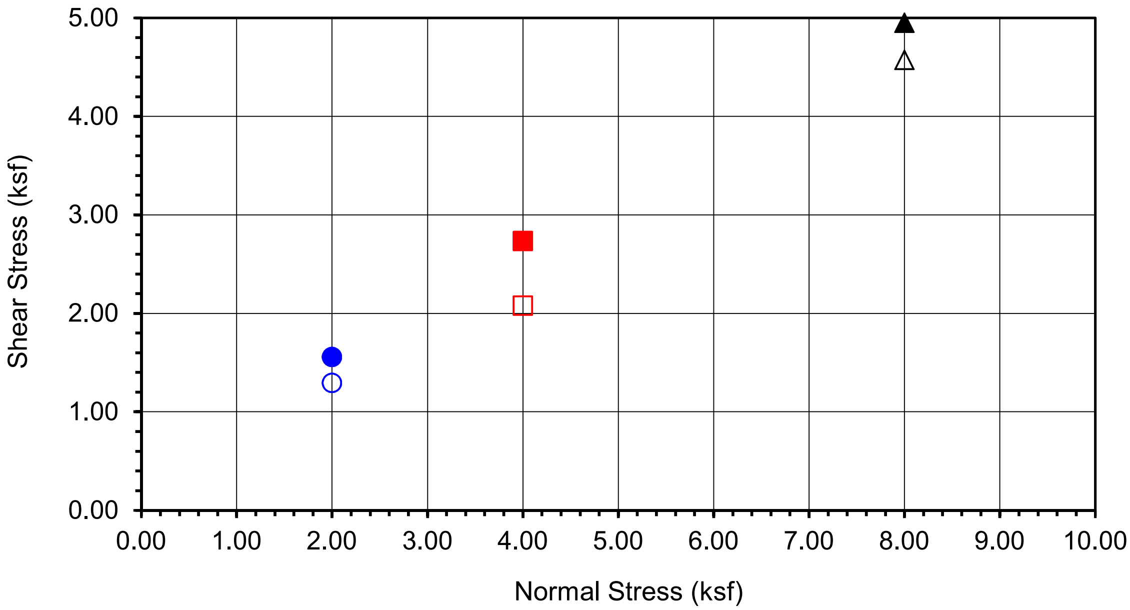
Consolidated Drained - ASTM D 3080

Leighton

Project Name:	El Camino College Fire Training Facility	Tested By:	G. Bathala	Date:	05/26/21
Project No.:	10535.020	Checked By:	A. Santos	Date:	06/11/21
Boring No.:	B-6	Sample Type:	Ring		
Sample No.:	R-7	Depth (ft.):	20.0		
Soil Identification:	Olive brown lean clay (CL)				

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	194.98	196.75	196.96
Weight of Ring(gm):	43.21	44.40	42.24
Before Shearing			
Weight of Wet Sample+Cont.(gm):	198.20	198.20	198.20
Weight of Dry Sample+Cont.(gm):	168.76	168.76	168.76
Weight of Container(gm):	37.58	37.58	37.58
Vertical Rdg.(in): Initial	0.2581	0.2494	0.0000
Vertical Rdg.(in): Final	0.2798	0.2725	-0.0486
After Shearing			
Weight of Wet Sample+Cont.(gm):	215.54	211.94	189.24
Weight of Dry Sample+Cont.(gm):	186.47	181.84	163.04
Weight of Container(gm):	64.67	61.03	39.15
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**B-6**
Sample No.	**R-7**
Depth (ft)	**20**
Sample Type: Ring	
Soil Identification: Olive brown lean clay (CL)	

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.556	■ 2.732	▲ 4.948
Shear Stress @ End of Test (ksf)	○ 1.295	□ 2.078	△ 4.574
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	22.44	22.44	22.44
Dry Density (pcf)	103.1	103.5	105.1
Saturation (%)	95.4	96.3	100.3
Soil Height Before Shearing (in.)	0.9783	0.9769	0.9514
Final Moisture Content (%)	23.9	24.9	21.1

Leighton

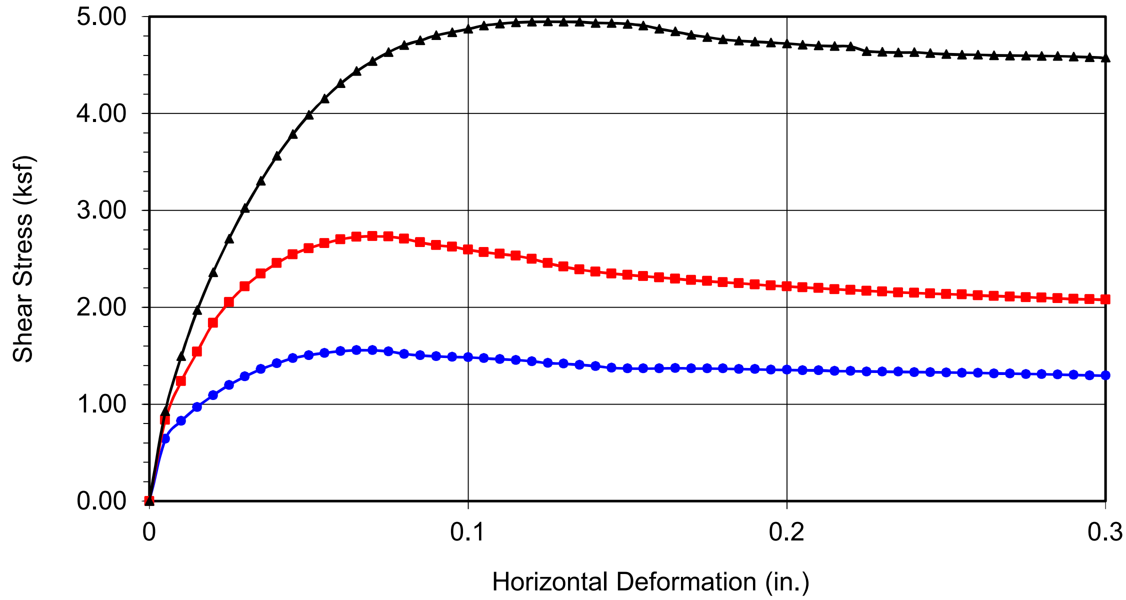
DIRECT SHEAR TEST RESULTS

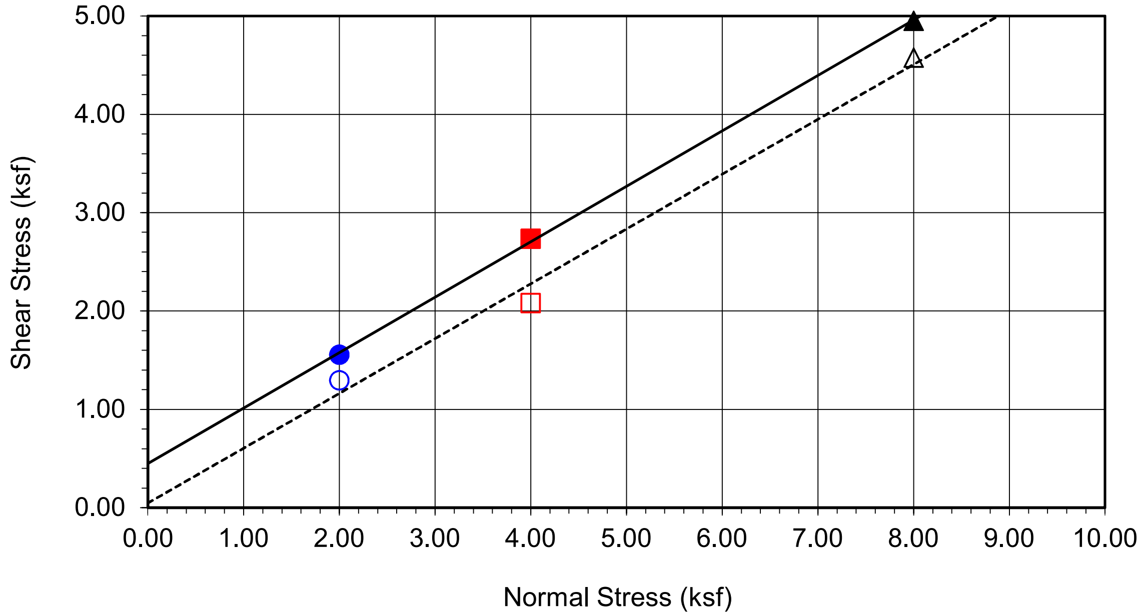
Consolidated Drained - ASTM D 3080

Project No.: 10535.020

El Camino College Fire Training Facility

05-21





Boring No.	**B-6**
Sample No.	**R-7**
Depth (ft)	**20**
Sample Type:	Ring
Soil Identification: Olive brown lean clay (CL)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	448	29
Ultimate	47	29

Normal Stress (kip/ft²)	2.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.556	■ 2.732	▲ 4.948
Shear Stress @ End of Test (ksf)	○ 1.295	□ 2.078	△ 4.574
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	22.44	22.44	22.44
Dry Density (pcf)	103.1	103.5	105.1
Saturation (%)	95.4	96.3	100.3
Soil Height Before Shearing (in.)	0.9783	0.9769	0.9514
Final Moisture Content (%)	23.9	24.9	21.1

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 10535.020

El Camino College Fire Training Facility

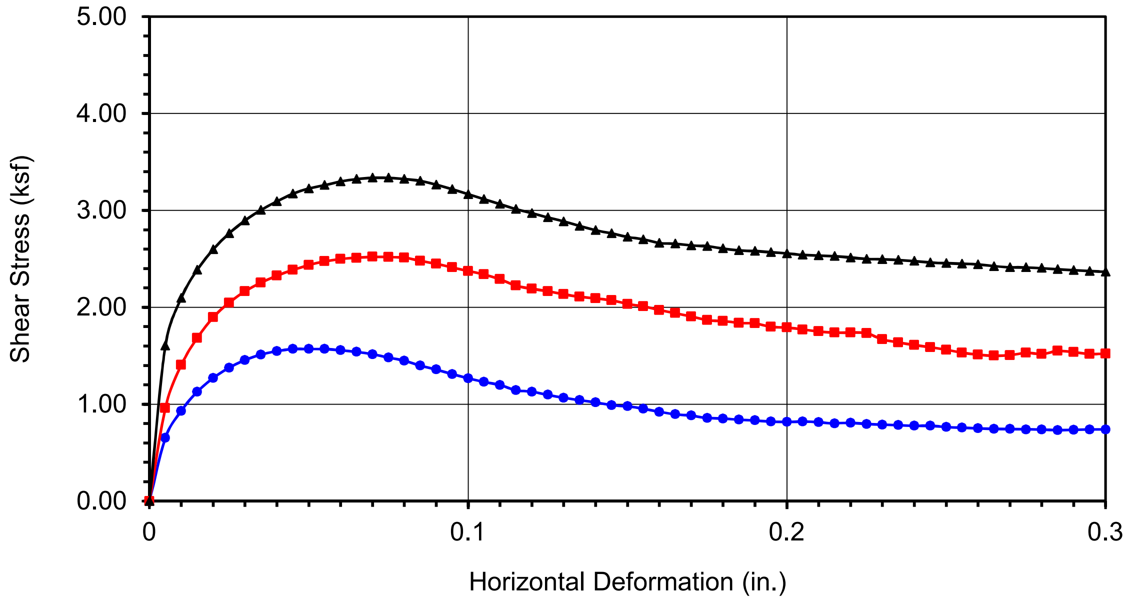
05-21

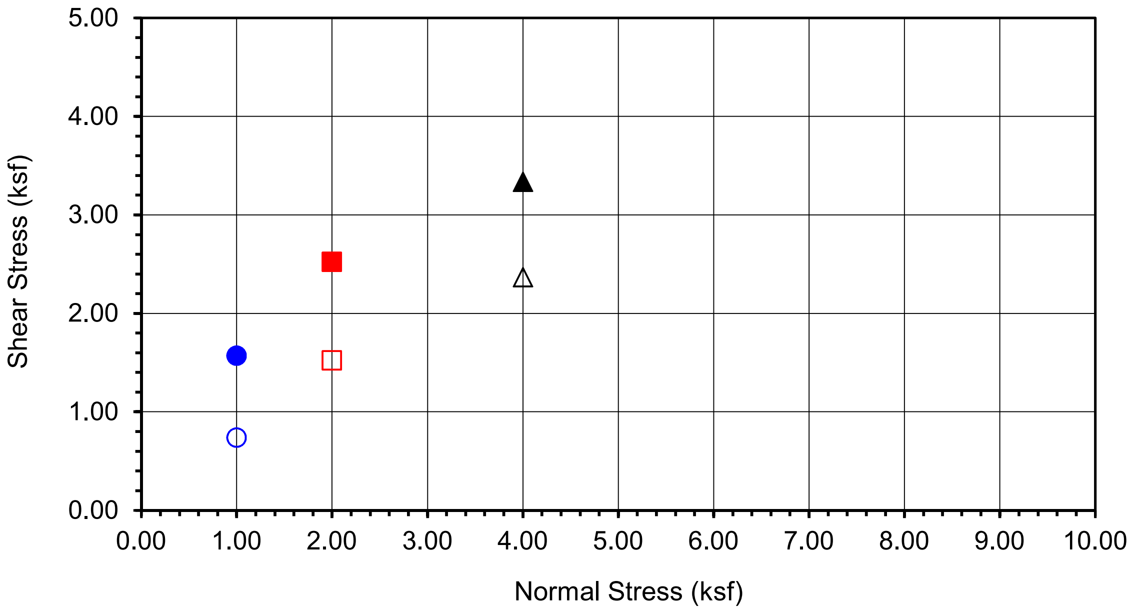
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name: El Camino College Fire Training Facility
Tested By: G. Bathala
Date: 05/27/21
Project No.: 10535.020
Checked By: A. Santos
Date: 06/11/21
Boring No.: B-7
Sample Type: Ring
Sample No.: R-3
Depth (ft.): 7.5
Soil Identification: Olive brown lean clay (CL), noted calliche

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	206.13	207.03	207.64
Weight of Ring(gm):	45.54	45.41	45.76
Before Shearing			
Weight of Wet Sample+Cont.(gm):	141.40	141.40	141.40
Weight of Dry Sample+Cont.(gm):	129.63	129.63	129.63
Weight of Container(gm):	52.54	52.54	52.54
Vertical Rdg.(in): Initial	0.0000	0.2474	0.2767
Vertical Rdg.(in): Final	0.0014	0.2458	0.2910
After Shearing			
Weight of Wet Sample+Cont.(gm):	230.11	203.30	216.41
Weight of Dry Sample+Cont.(gm):	204.14	177.26	191.58
Weight of Container(gm):	66.14	39.57	53.75
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**B-7**
Sample No.	**R-3**
Depth (ft)	**7.5**

Sample Type:

Ring

Soil Identification:
Olive brown lean clay (CL), noted calliche

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 1.569	■ 2.521	▲ 3.336
Shear Stress @ End of Test (ksf)	○ 0.739	□ 1.522	△ 2.367
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	15.27	15.27	15.27
Dry Density (pcf)	115.9	116.6	116.8
Saturation (%)	90.6	92.5	93.0
Soil Height Before Shearing (in.)	1.0014	1.0016	0.9857
Final Moisture Content (%)	18.8	18.9	18.0

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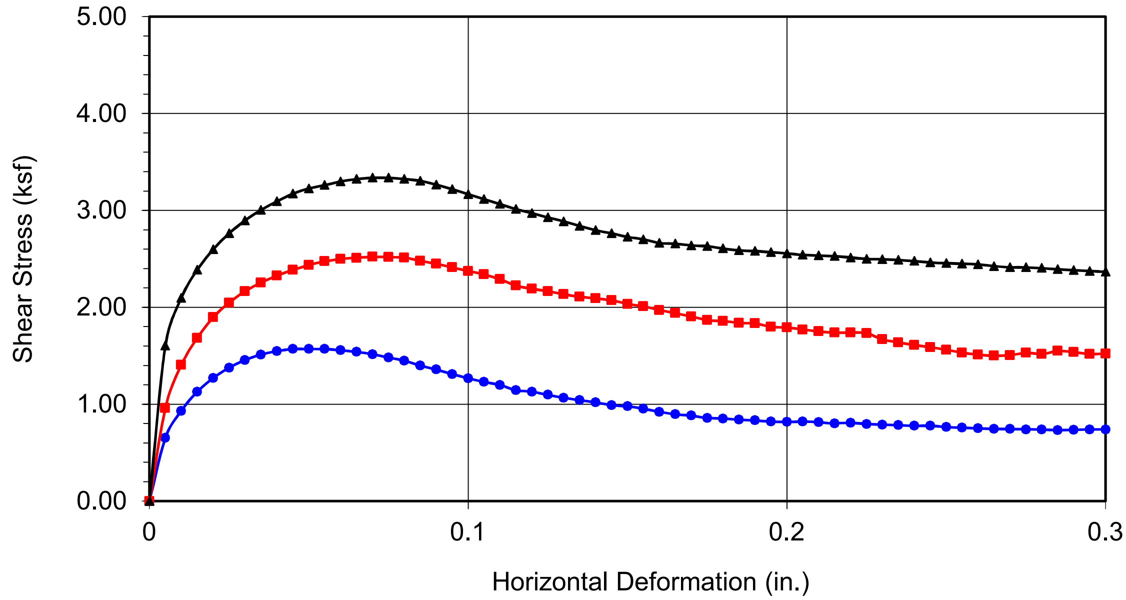
DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

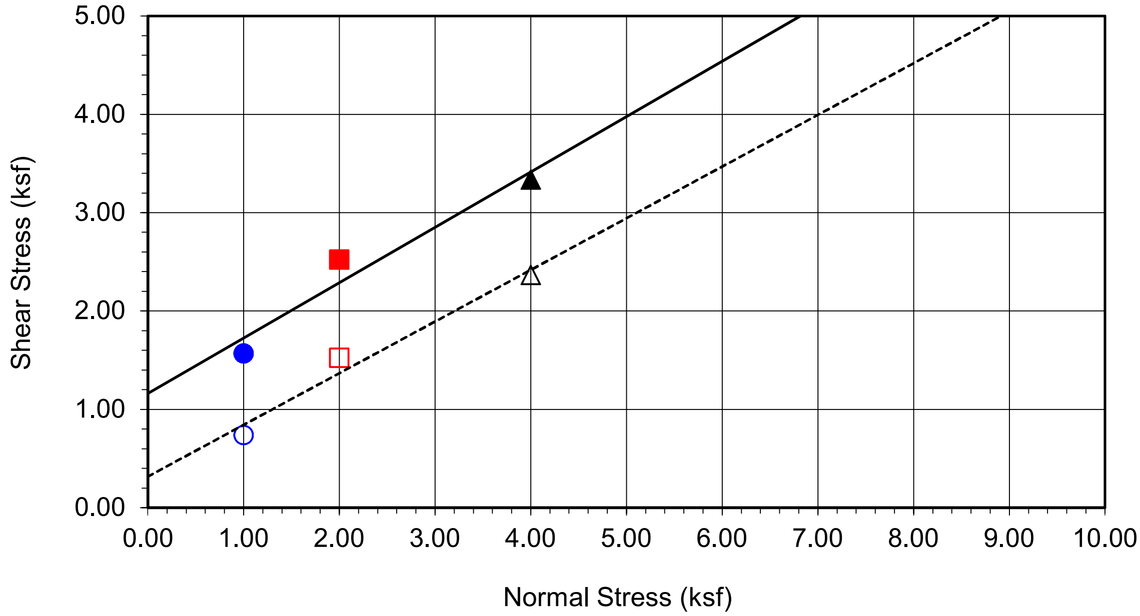
Project No.: 10535.020

El Camino College Fire Training Facility

05-21

DS B-7, R-3 @ 7.5





Boring No.	**B-7**
Sample No.	**R-3**
Depth (ft)	**7.5**
Sample Type:	Ring

Soil Identification:
Olive brown lean clay (CL), noted calliche

Strength Parameters

	C (psf)	ϕ (°)
Peak	1162	29
Ultimate	317	28

Normal Stress (kip/ft²)	1.000	2.000	4.000
Peak Shear Stress (kip/ft²)	● 1.569	■ 2.521	▲ 3.336
Shear Stress @ End of Test (ksf)	○ 0.739	□ 1.522	△ 2.367
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	15.27	15.27	15.27
Dry Density (pcf)	115.9	116.6	116.8
Saturation (%)	90.6	92.5	93.0
Soil Height Before Shearing (in.)	1.0014	1.0016	0.9857
Final Moisture Content (%)	18.8	18.9	18.0

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DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 10535.020
El Camino College Fire Training Facility
05-21

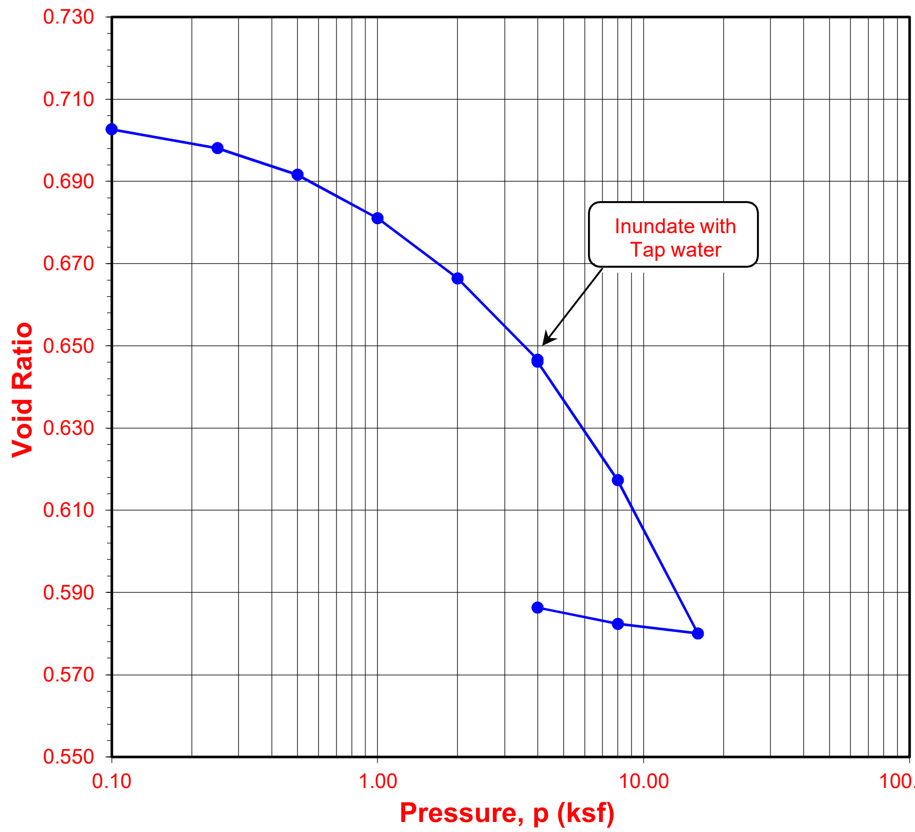
DS B-7, R-3 @ 7.5

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Leighton

Project Name:	El Camino College Fire Training Facility	Tested By:	G. Bathala	Date:	05/19/21
Project No.:	10535.020	Checked By:	A. Santos	Date:	06/11/21
Boring No.:	B-2	Depth (ft.):	20.0		
Sample No.:	R-6	Sample Type:	Ring		
Soil Identification:	Olive brown lean clay (CL)				

Sample Diameter (in.)	2.415
Sample Thickness (in.)	1.000
Wt. of Sample + Ring (g)	197.22
Weight of Ring (g)	44.74
Height after consol. (in.)	0.9313
Before Test	
Wt.Wet Sample+Cont. (g)	272.90
Wt.of Dry Sample+Cont. (g)	231.70
Weight of Container (g)	56.90
Initial Moisture Content (%)	23.6
Initial Dry Density (pcf)	102.6
Initial Saturation (%)	94
Initial Vertical Reading (in.)	0.3055
After Test	
Wt.of Wet Sample+Cont. (g)	259.49
Wt. of Dry Sample+Cont. (g)	233.51
Weight of Container (g)	65.76
Final Moisture Content (%)	21.12
Final Dry Density (pcf)	109.8
Final Saturation (%)	100
Final Vertical Reading (in.)	0.2318
Specific Gravity (assumed)	2.80
Water Density (pcf)	62.43

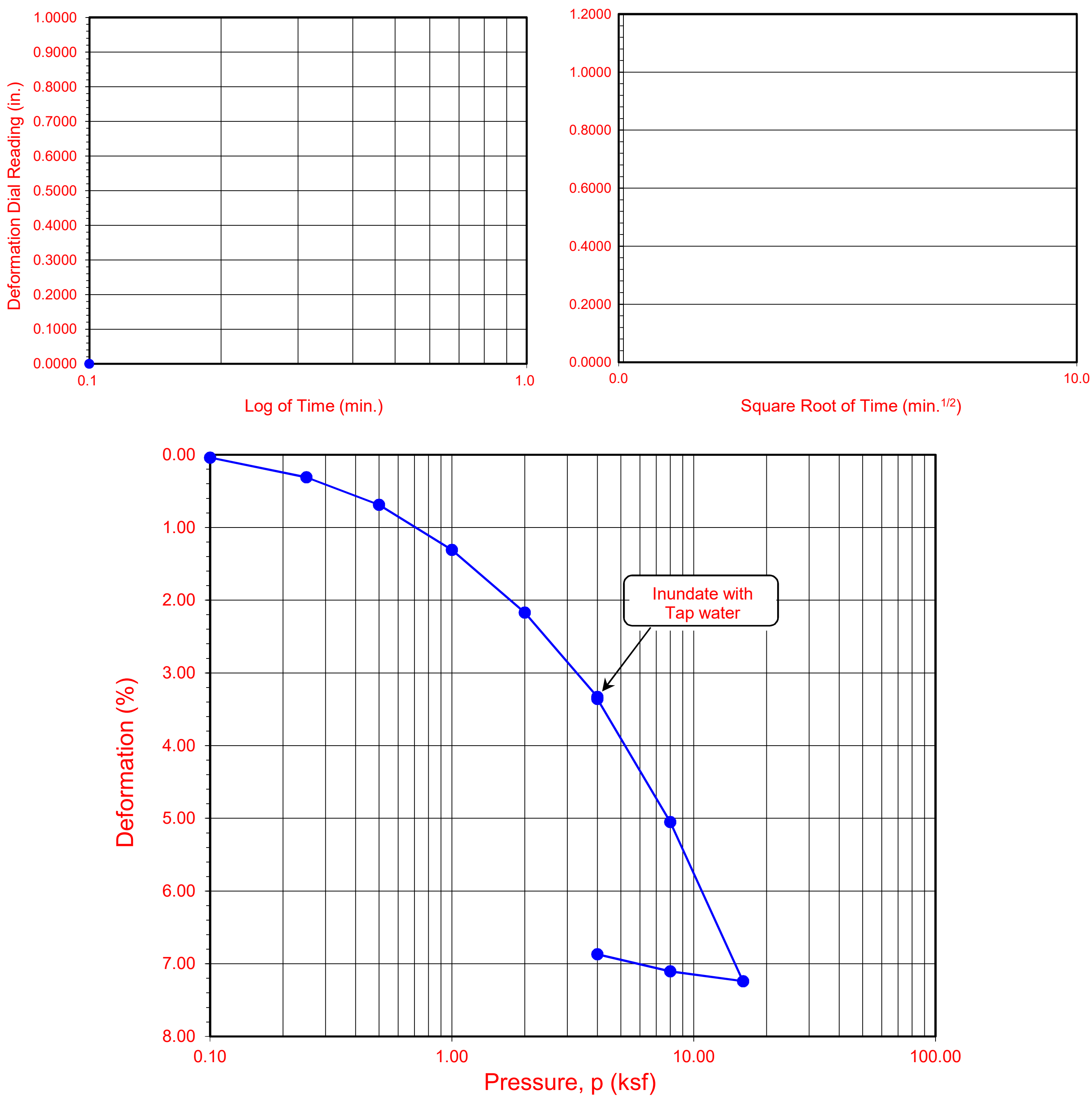


Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.3051	0.9996	0.00	0.04	0.703	0.04
0.25	0.3021	0.9966	0.03	0.34	0.698	0.31
0.50	0.2980	0.9925	0.06	0.75	0.692	0.69
1.00	0.2913	0.9858	0.11	1.42	0.681	1.31
2.00	0.2818	0.9763	0.20	2.37	0.666	2.17
4.00	0.2689	0.9634	0.33	3.66	0.647	3.33
4.00	0.2686	0.9631	0.33	3.69	0.646	3.36
8.00	0.2502	0.9447	0.48	5.53	0.617	5.05
16.00	0.2264	0.9209	0.67	7.91	0.580	7.24
8.00	0.2287	0.9232	0.58	7.69	0.582	7.11
4.00	0.2318	0.9263	0.50	7.37	0.586	6.87

Time Readings

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)

Time Readings



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
B-2	**R-6**	**20.0**	**23.6**	**21.1**	**102.6**	**109.8**	**0.703**	**0.586**	**94**	**100**

Soil Identification: Olive brown lean clay (CL)

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ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 10535.02

El Camino College Fire Training Facility

06-21

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	El Camino College Fire Training Facility	Tested By:	G. Berdy	Date:	06/01/21
Project No.:	10535.020	Checked By:	A. Santos	Date:	06/11/21
Boring No.:	B-1	Depth (ft.):	1-5		
Sample No.:	B-1				
Soil Identification:	Brown sandy lean clay s(CL)				

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

MOLDED SPECIMEN		Before Test	After Test
Specimen Diameter	(in.)	4.01	4.01
Specimen Height	(in.)	1.0000	1.0345
Wt. Comp. Soil + Mold	(g)	606.10	442.20
Wt. of Mold	(g)	190.00	0.00
Specific Gravity (Assumed)		2.70	2.70
Container No.		O	O
Wet Wt. of Soil + Cont.	(g)	831.00	632.20
Dry Wt. of Soil + Cont.	(g)	765.90	573.50
Wt. of Container	(g)	0.00	190.00
Moisture Content	(%)	8.50	15.31
Wet Density	(pcf)	125.5	128.9
Dry Density	(pcf)	115.7	111.8
Void Ratio		0.457	0.508
Total Porosity		0.314	0.337
Pore Volume	(cc)	65.0	72.1
Degree of Saturation (%) [S_{meas}]		**50.2**	81.4

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

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
06/01/21	10:28	1.0	0	0.6055
06/01/21	10:38	1.0	10	0.6045
Add Distilled Water to the Specimen				
06/01/21	11:00	1.0	22	0.6160
06/02/21	6:04	1.0	1166	0.6400
06/02/21	7:44	1.0	1266	0.6400

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**36**

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	El Camino College Fire Training Facility	Tested By:	G. Berdy	Date:	06/01/21
Project No.:	10535.020	Checked By:	A. Santos	Date:	06/11/21
Boring No.:	B-3	Depth (ft.):	1-5		
Sample No.:	B-1				
Soil Identification:	Dark brown lean clay (CL)				

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

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0310
Wt. Comp. Soil + Mold (g)	600.30	443.70
Wt. of Mold (g)	180.60	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	846.60	624.30
Dry Wt. of Soil + Cont. (g)	780.30	567.42
Wt. of Container (g)	0.00	180.60
Moisture Content (%)	8.50	14.70
Wet Density (pcf)	126.6	129.8
Dry Density (pcf)	116.7	113.2
Void Ratio	0.445	0.490
Total Porosity	0.308	0.329
Pore Volume (cc)	63.7	70.1
Degree of Saturation (%) [S_{meas}]	**51.6**	81.1

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

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
06/01/21	11:37	1.0	0	0.6420
06/01/21	11:47	1.0	10	0.6410
Add Distilled Water to the Specimen				
06/01/21	12:52	1.0	65	0.6635
06/02/21	6:03	1.0	1096	0.6730
06/02/21	7:57	1.0	1210	0.6730

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**32**

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	El Camino College Fire Training Facility	Tested By:	G. Berdy	Date:	06/01/21
Project No.:	10535.020	Checked By:	A. Santos	Date:	06/11/21
Boring No.:	B-4	Depth (ft.):	1-5		
Sample No.:	B-1				
Soil Identification:	Dark brown lean clay with sand (CL)s				

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

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0540
Wt. Comp. Soil + Mold (g)	616.90	449.30
Wt. of Mold (g)	201.30	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	831.00	650.60
Dry Wt. of Soil + Cont. (g)	765.90	584.34
Wt. of Container (g)	0.00	201.30
Moisture Content (%)	8.50	17.30
Wet Density (pcf)	125.4	128.6
Dry Density (pcf)	115.5	109.6
Void Ratio	0.459	0.538
Total Porosity	0.315	0.350
Pore Volume (cc)	65.1	76.3
Degree of Saturation (%) [S_{meas}]	**50.0**	86.8

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

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
06/01/21	11:00	1.0	0	0.5650
06/01/21	11:10	1.0	10	0.5645
Add Distilled Water to the Specimen				
06/01/21	11:35	1.0	25	0.5880
06/02/21	6:03	1.0	1133	0.6185
06/02/21	7:50	1.0	1240	0.6190

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**55**

Leighton

R-VALUE TEST RESULTS

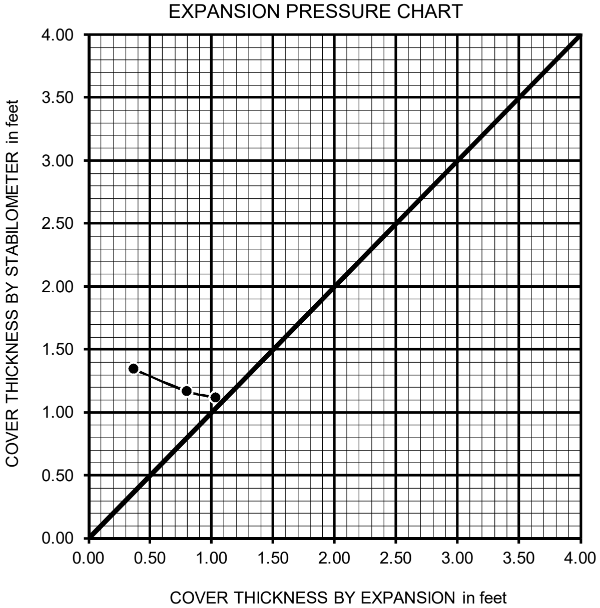
DOT CA Test 301

PROJECT NAME:	El Camino College Fire Training Facility	PROJECT NUMBER:	10535.020
BORING NUMBER:	B-3	DEPTH (FT.):	1-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	O. Figueroa
SAMPLE DESCRIPTION:	Dark brown lean clay	DATE COMPLETED:	6/3/2021

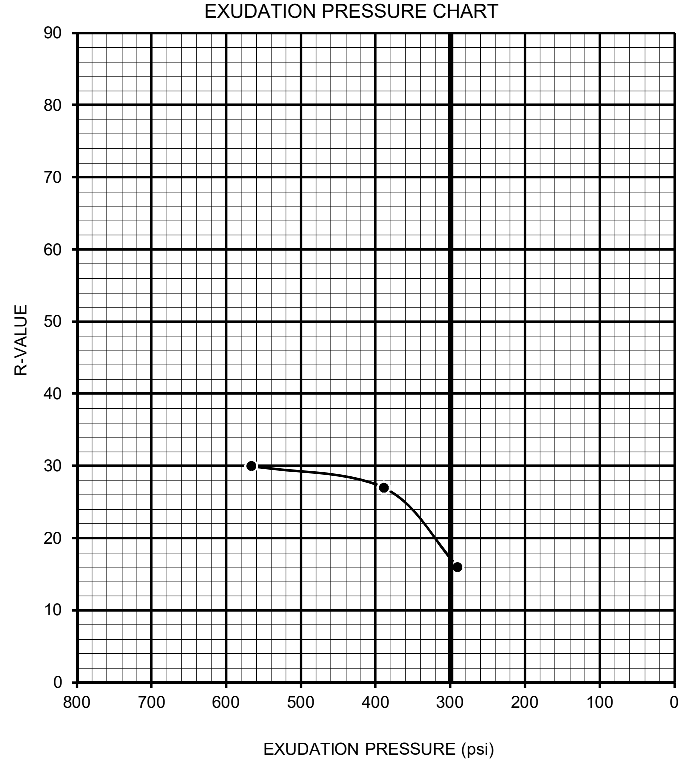
TEST SPECIMEN	**a**	**b**	**c**
MOISTURE AT COMPACTION %	12.7	13.6	14.9
HEIGHT OF SAMPLE, Inches	2.34	2.49	2.45
DRY DENSITY, pcf	123.6	123.8	118.6
COMPACTOR PRESSURE, psi	125	90	50
EXUDATION PRESSURE, psi	566	389	290
EXPANSION, Inches x 10exp-4	31	24	11
STABILITY Ph 2,000 lbs (160 psi)	95	106	124
TURNS DISPLACEMENT	3.36	3.52	3.90
R-VALUE UNCORRECTED	34	27	16
R-VALUE CORRECTED	30	27	16

DESIGN CALCULATION DATA	**a**	**b**	**c**
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	1.12	1.17	1.34
EXPANSION PRESSURE THICKNESS, ft.	1.03	0.80	0.37

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



R-VALUE BY EXPANSION:	31
R-VALUE BY EXUDATION:	17
EQUILIBRIUM R-VALUE:	17

Leighton

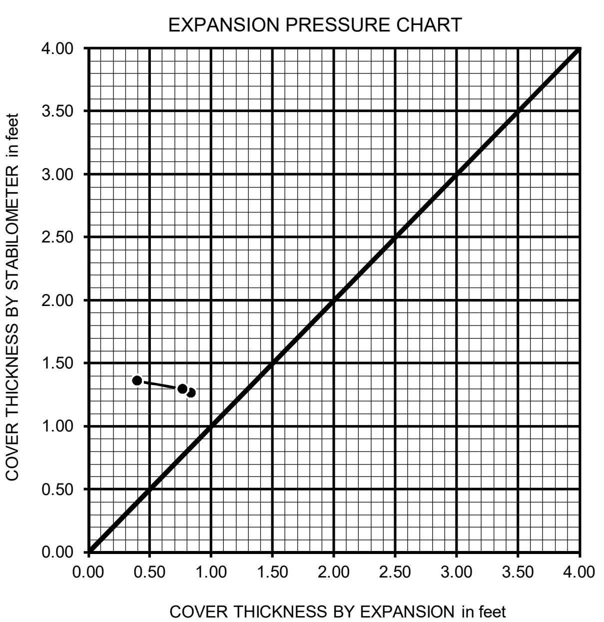
R-VALUE TEST RESULTS

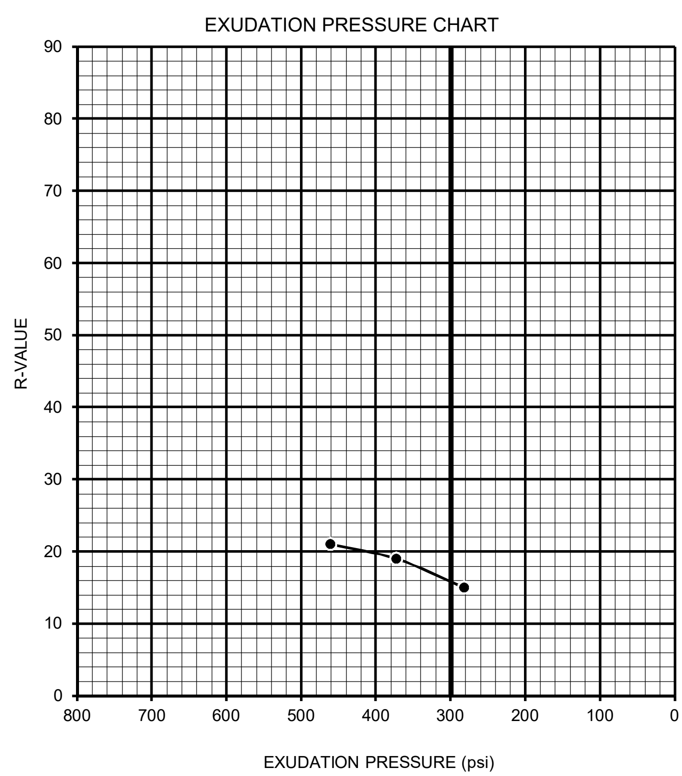
DOT CA Test 301

PROJECT NAME:	El Camino College Fire Training Facility	PROJECT NUMBER:	10535.020
BORING NUMBER:	B-7	DEPTH (FT.):	1-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	O. Figueroa
SAMPLE DESCRIPTION:	Dark brown lean clay with sand (CL)s	DATE COMPLETED:	6/3/2021

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	13.8	14.7	16.0
HEIGHT OF SAMPLE, Inches	2.47	2.50	2.51
DRY DENSITY, pcf	119.0	117.6	114.0
COMPACTOR PRESSURE, psi	100	80	65
EXUDATION PRESSURE, psi	461	372	282
EXPANSION, Inches x 10exp-4	25	23	12
STABILITY Ph 2,000 lbs (160 psi)	115	118	126
TURNS DISPLACEMENT	3.60	3.68	3.95
R-VALUE UNCORRECTED	21	19	15
R-VALUE CORRECTED	21	19	15

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	1.26	1.30	1.36
EXPANSION PRESSURE THICKNESS, ft.	0.83	0.77	0.40





R-VALUE BY EXPANSION:	25
R-VALUE BY EXUDATION:	16
EQUILIBRIUM R-VALUE:	16

Leighton

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: El Camino College Fire Training Facility   Tested By : GEB/ACS   Date: 05/27/21

Project No. : 10535.020   Checked By: A. Santos   Date: 06/11/21

Boring No.	B-5	B-7		
Sample No.	R-2	B-1		
Sample Depth (ft)	5.0	1-5		
Soil Identification:	Gray (CL)	Dark brown (CL)s		
Wet Weight of Soil + Container (g)	0.00	0.00		
Dry Weight of Soil + Container (g)	0.00	0.00		
Weight of Container (g)	1.00	1.00		
Moisture Content (%)	0.00	0.00		
Weight of Soaked Soil (g)	100.20	100.20		

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	303	61		
Crucible No.	11	11		
Furnace Temperature (°C)	860	860		
Time In / Time Out	9:00/9:45	9:00/9:45		
Duration of Combustion (min)	45	45		
Wt. of Crucible + Residue (g)	18.0304	18.0247		
Wt. of Crucible (g)	18.0210	18.0224		
Wt. of Residue (g) (A)	0.0094	0.0023		
PPM of Sulfate (A) x 41150	386.81	94.64		
PPM of Sulfate, Dry Weight Basis	**387**	**95**		

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	15	15		
ml of AgNO3 Soln. Used in Titration (C)	1.1	0.8		
PPM of Chloride (C -0.2) * 100 * 30 / B	180	120		
PPM of Chloride, Dry Wt. Basis	**180**	**120**		

pH TEST, DOT California Test 643

pH Value	**8.49**	**8.19**		
Temperature °C	22.9	22.2		

SOIL RESISTIVITY TEST
DOT CA TEST 643

Leighton

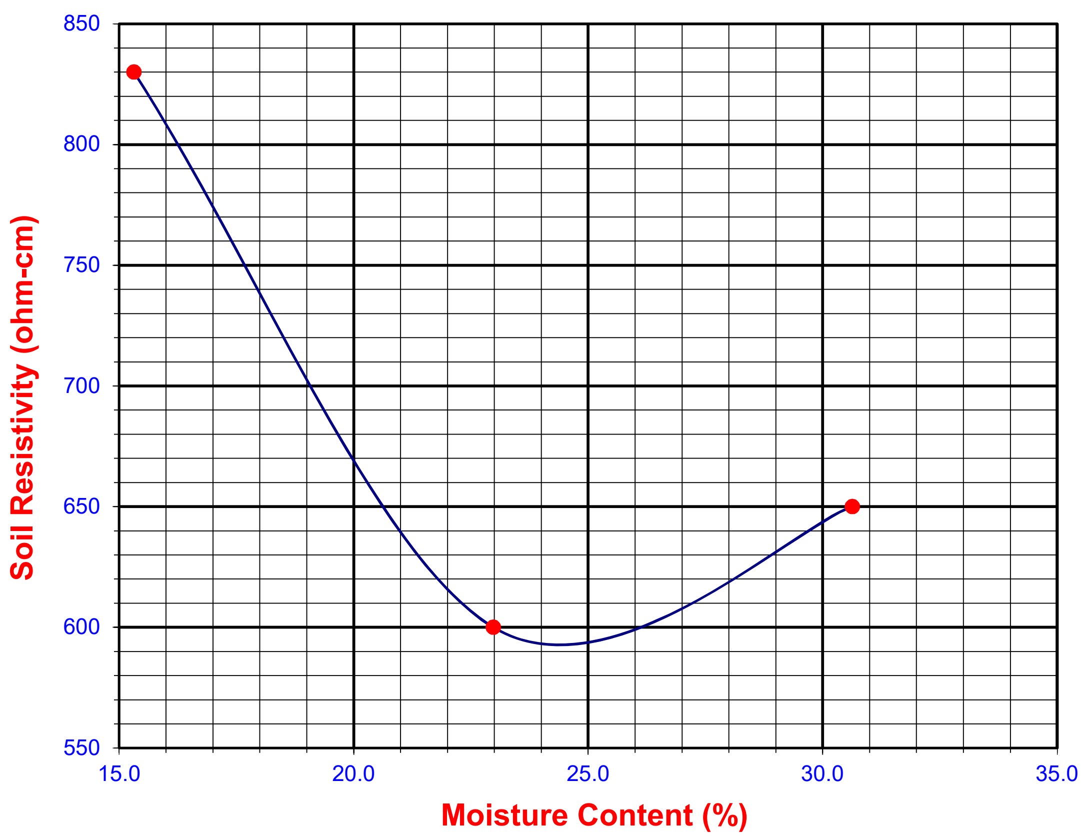
Project Name:	El Camino College Fire Training Facility	Tested By :	G. Berdy	Date:	05/27/21
Project No. :	10535.020	Checked By:	A. Santos	Date:	06/11/21
Boring No.:	B-5	Depth (ft.) :	5.0		
Sample No. :	R-2				
Soil Identification:*	Gray (CL)				

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

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	15.32	830	830
2	30	22.97	600	600
3	40	30.63	650	650
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.58
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
593	**24.4**	**387**	**180**	**8.49**	**22.9**



SOIL RESISTIVITY TEST

DOT CA TEST 643

Leighton

Project Name:	El Camino College Fire Training Facility	Tested By :	G. Berdy Date: 06/02/21
Project No. :	10535.020	Checked By:	A. Santos Date: 06/11/21
Boring No.:	B-7	Depth (ft.) :	1-5
Sample No. :	B-1		

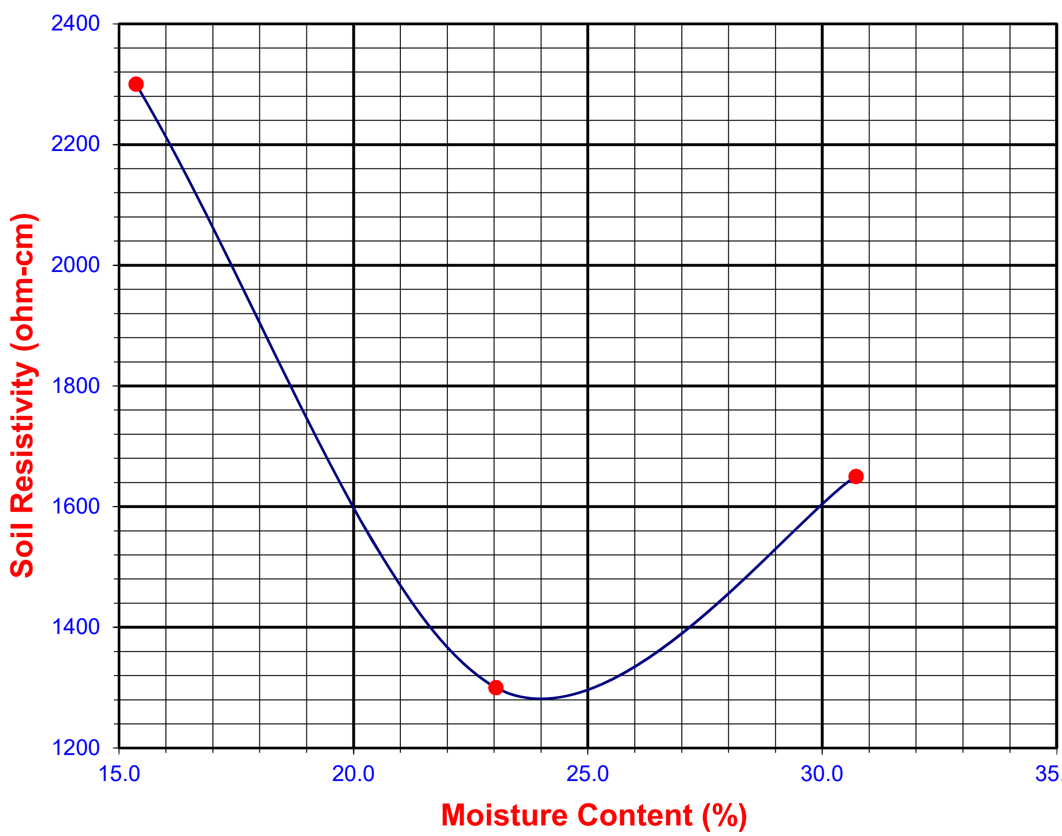
Soil Identification:* Dark brown (CL)s

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

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	15.36	2300	2300
2	30	23.04	1300	1300
3	40	30.72	1650	1650
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.20
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
1280	**24.0**	**95**	**120**	**8.19**	**22.2**



APPENDIX C

PERCOLATION TEST DATA

Boring Percolation Test Data Sheet

Project Number:	10535.020	**Test Hole Number:**	B-3
Project Name:	ECC Fire Training Facility	**Date Excavated:**	5/5/2021
Earth Description:	Alluvium; CH/CL	**Date Tested:**	5/6/2021
Liquid Description:	Tap water	**Depth of boring (ft):**	10
Tested By:	SG	**Radius of boring (in):**	4
Time Interval Standard		**Radius of casing (in):**	1
Start Time for Pre-Soak:	5/5/21 4:00 PM	**Length of slotted of casing (ft):**	5
Start Time for Standard:	5/6/21 8:00 AM	**Depth to Initial Water Depth (ft):**	N/A
Standard Time Interval		**Porosity of Annulus Material, *n* :**	0.35
Between Readings, mins:	30	**Bentonite Plug at Bottom:**	no

Field Percolation Data - Falling Head Test

Reading	Time	Time Interval, Δt (min.)	Initial/Final Depth to Water (ft.)	Initial/Final Water Height, H_0/H_f (in.)	Total Water Drop, Δd (in.)	Infiltration Rate (in./hr.)
P1	8:27	35	3.50	78.0	0.8	0.01
	9:02		3.57	77.2		
P2	9:12	38	3.45	78.6	0.8	0.01
	9:50		3.52	77.8		
1	9:54	37	3.42	79.0	0.5	0.01
	10:31		3.46	78.5		
2	10:33	34	3.35	79.8	0.6	0.01
	11:07		3.40	79.2		
3	11:10	35	3.35	79.8	0.5	0.01
	11:45		3.39	79.3		
4	12:00	35	3.32	80.2	0.7	0.01
	12:35		3.38	79.4		
5	12:40	30	3.30	80.4	0.6	0.01
	13:10		3.35	79.8		
6	13:20	30	3.31	80.3	0.6	0.01
	13:50		3.36	79.7		
7	14:00	30	3.32	80.2	0.7	0.01
	14:30		3.38	79.4		
8	14:40	30	3.32	80.2	0.7	0.01
	15:10		3.38	79.4		

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

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

Boring Percolation Test Data Sheet

Project Number:	10535.020	**Test Hole Number:**	B-4
Project Name:	ECC Fire Training Facility	**Date Excavated:**	5/5/2021
Earth Description:	Alluvium; CL	**Date Tested:**	5/6/2021
Liquid Description:	Tap water	**Depth of boring (ft):**	10
Tested By:	SG	**Radius of boring (in):**	4
Time Interval Standard		**Radius of casing (in):**	1
Start Time for Pre-Soak:	5/5/21 4:00 PM	**Length of slotted of casing (ft):**	5
Start Time for Standard:	5/6/21 8:00 AM	**Depth to Initial Water Depth (ft):**	N/A
Standard Time Interval Between Readings, mins:	30	**Porosity of Annulus Material, *n* :**	0.35
		Bentonite Plug at Bottom:	no

Field Percolation Data - Falling Head Test

Reading	Time	Time Interval, Δt (min.)	Initial/Final Depth to Water (ft.)	Initial/Final Water Height, H_0/H_f (in.)	Total Water Drop, Δd (in.)	Infiltration Rate (in./hr.)
P1	8:25	40	1.95	96.6	0.8	0.01
	9:05		2.02	95.8		
P2	9:10	38	1.94	96.7	1.4	0.02
	9:48		2.06	95.3		
1	9:56	33	1.98	96.2	0.7	0.01
	10:29		2.04	95.5		
2	10:30	40	1.95	96.6	0.6	0.01
	11:10		2.00	96.0		
3	11:17	33	1.93	96.8	0.6	0.01
	11:50		1.98	96.2		
4	12:03	29	1.94	96.7	0.5	0.01
	12:32		1.98	96.2		
5	12:35	30	1.93	96.8	0.6	0.01
	13:05		1.98	96.2		
6	13:15	30	1.94	96.7	0.5	0.01
	13:45		1.98	96.2		
7	13:55	30	1.94	96.7	0.5	0.01
	14:25		1.98	96.2		
8	14:35	30	1.93	96.8	0.6	0.01
	15:05		1.98	96.2		

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

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

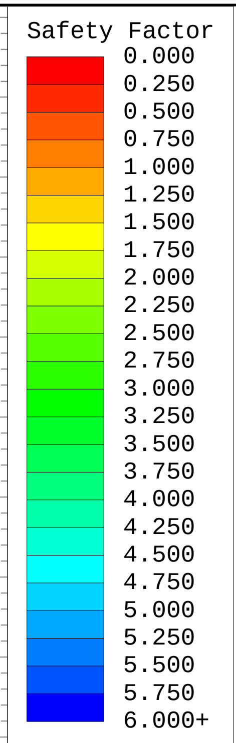
APPENDIX D

SLOPE STABILITY ANALYSIS

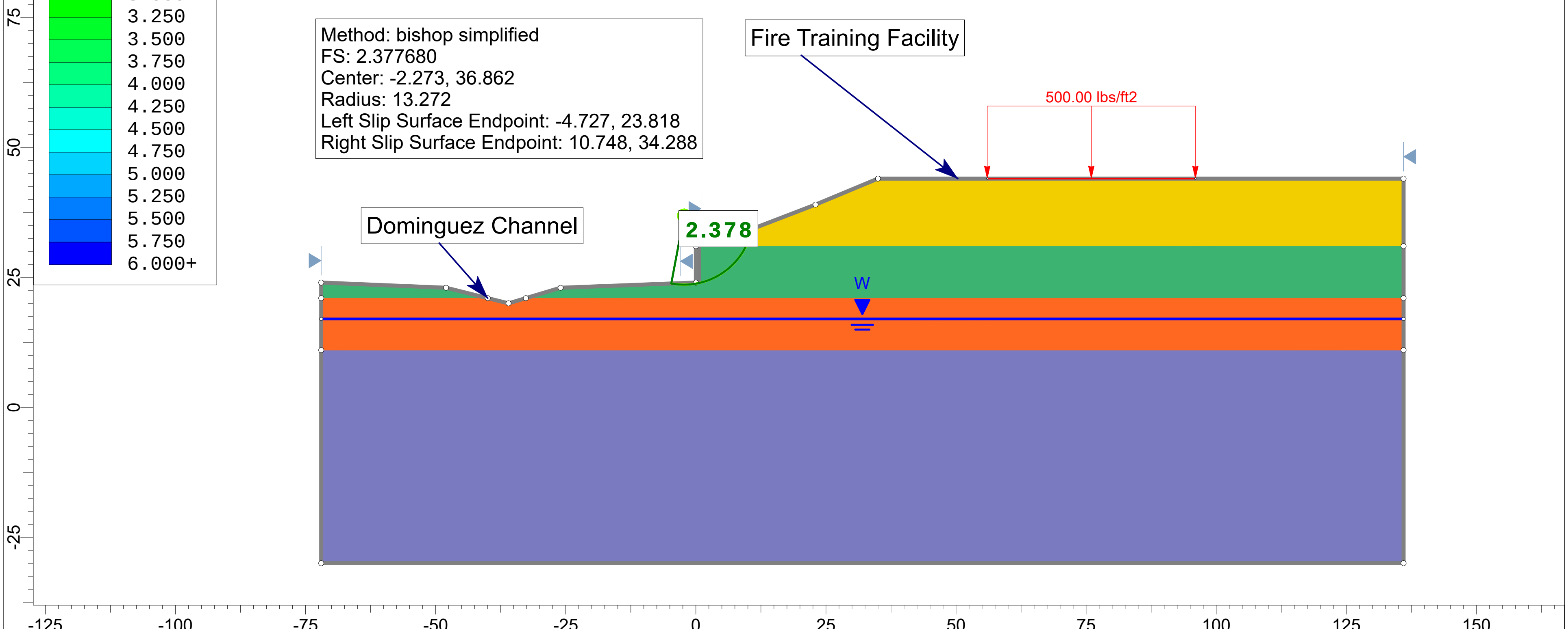
Geotechnical Cross Section A - A'

Global Stability

P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Ru
Clay 1, Artificial Fill, undocumented (Afu)		125	Mohr-Coulomb	432	34			None	0
Clay 2, Older Alluvium (Qoa)		125	Mohr-Coulomb	317	28			None	0
Clay 3, Older Alluvium (Qoa)		120	Mohr-Coulomb	448	29			None	0
Clay 4, Older Alluvium (Qoa)		130	Undrained	4000		Constant		None	0
Wall		150	Infinite strength				No	None	0



SLIDEINTERPRET 9.013

Leighton

Project	**El Camino College, Fire Training Facility, Torrance, CA**			
Analyzed By SG	*Units* feet	*Scale* 1:360	*Project No.:* **10535.020**	*File Name:* P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd
Date 8/13/2021	*Condition* **Global Static**			

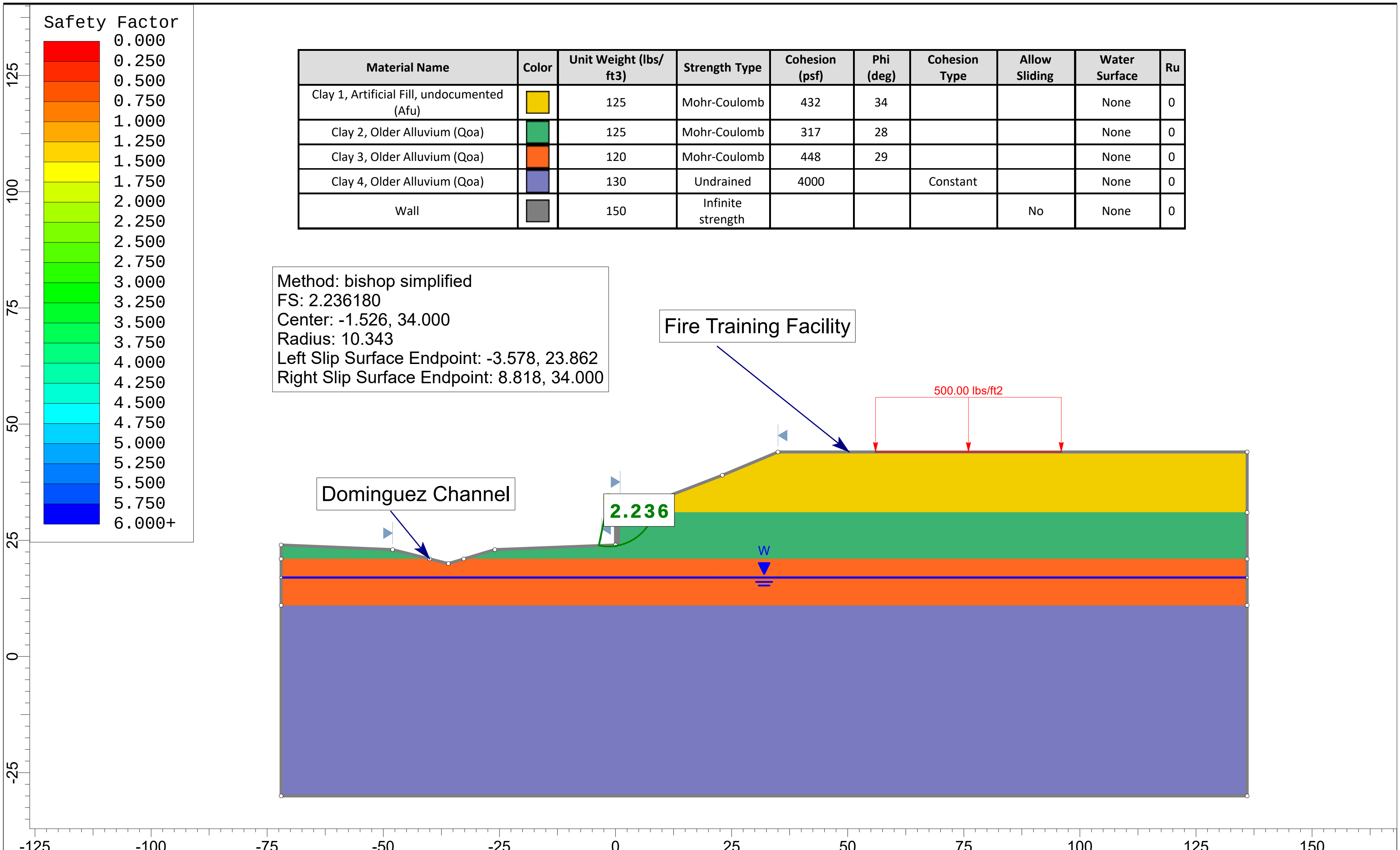
Geotechnical Cross Section A - A'

Local Stability

P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Ru
Clay 1, Artificial Fill, undocumented (Afu)		125	Mohr-Coulomb	432	34			None	0
Clay 2, Older Alluvium (Qoa)		125	Mohr-Coulomb	317	28			None	0
Clay 3, Older Alluvium (Qoa)		120	Mohr-Coulomb	448	29			None	0
Clay 4, Older Alluvium (Qoa)		130	Undrained	4000		Constant		None	0
Wall		150	Infinite strength				No	None	0

Method: bishop simplified
FS: 2.236180
Center: -1.526, 34.000
Radius: 10.343
Left Slip Surface Endpoint: -3.578, 23.862
Right Slip Surface Endpoint: 8.818, 34.000



SLIDEINTERPRET 9.013

Leighton

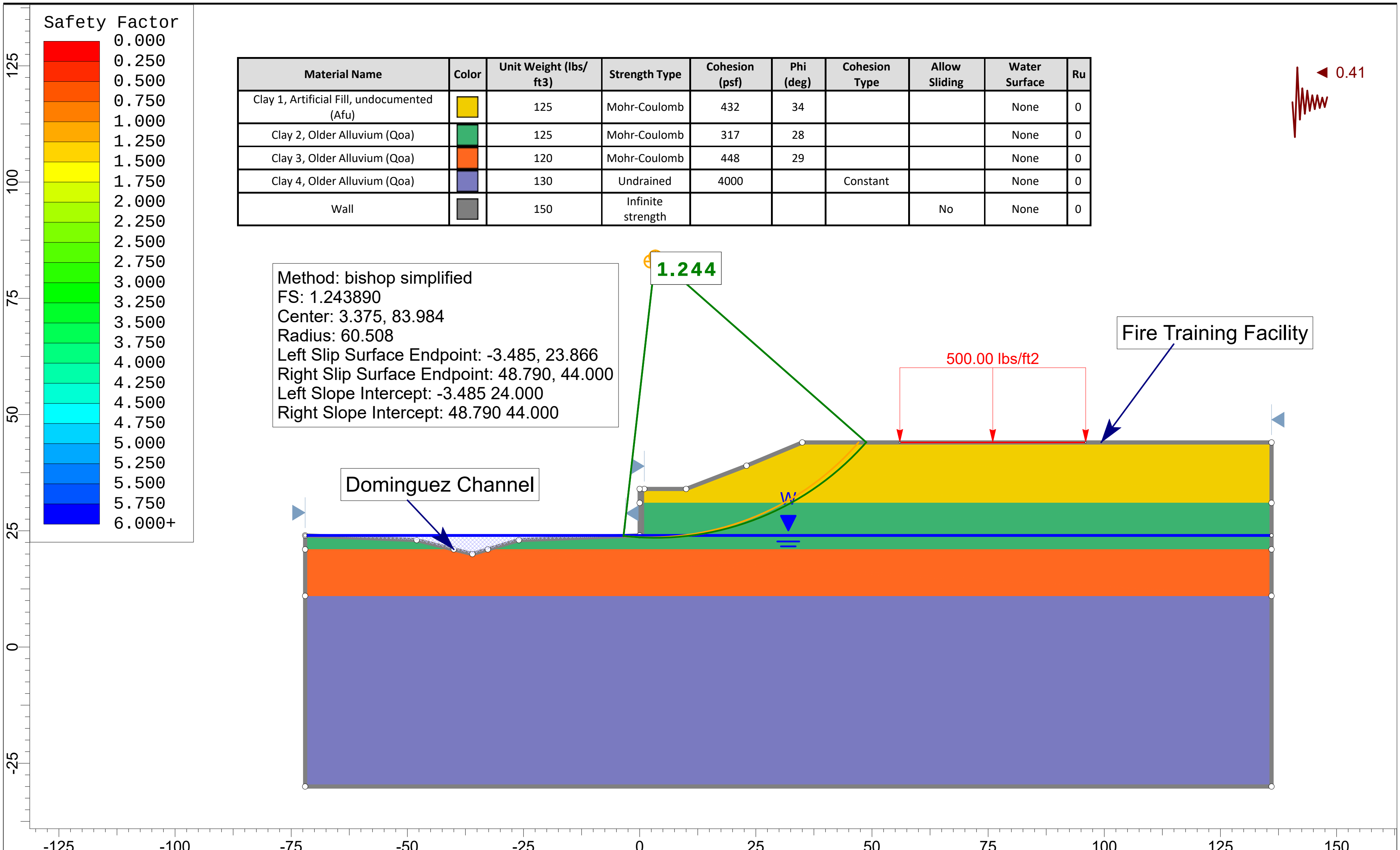
Project El Camino College, Fire Training Facility, Torrance, CA				
Analyzed By SG	*Units* feet	*Scale* 1:360	*Project No.:* 10535.020	*File Name:* P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd
Date 8/13/2021	*Condition* Local Static			

Geotechnical Cross Section A - A'

Global Stability

P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Ru
Clay 1, Artificial Fill, undocumented (Afu)		125	Mohr-Coulomb	432	34			None	0
Clay 2, Older Alluvium (Qoa)		125	Mohr-Coulomb	317	28			None	0
Clay 3, Older Alluvium (Qoa)		120	Mohr-Coulomb	448	29			None	0
Clay 4, Older Alluvium (Qoa)		130	Undrained	4000		Constant		None	0
Wall		150	Infinite strength				No	None	0



SLIDEINTERPRET 9.013

Leighton

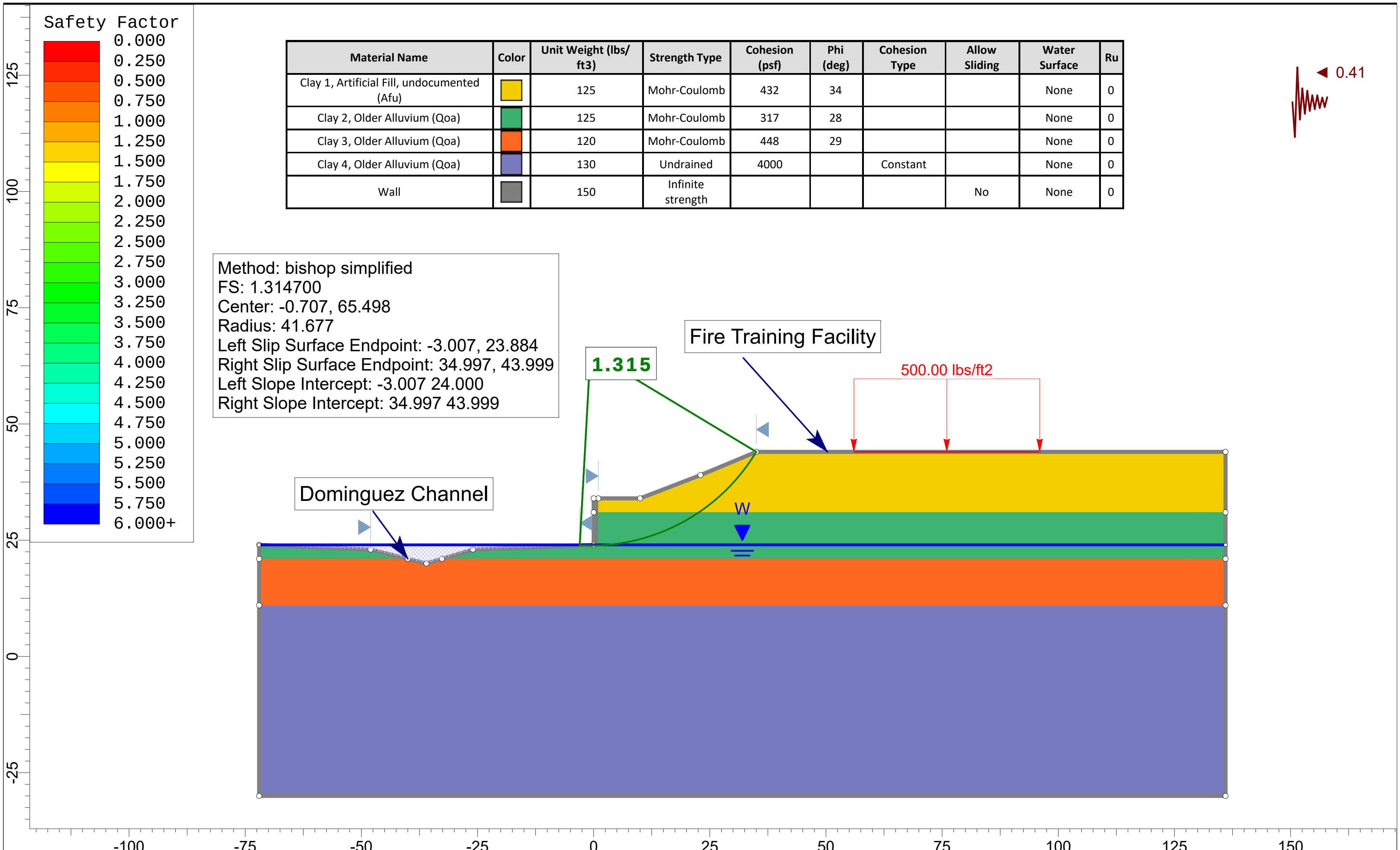
Project	**El Camino College, Fire Training Facility, Torrance, CA**		
Analyzed By SG	*Units* feet	*Scale* 1:360	*Project No.:* **10535.020**
Date 8/13/2021	*Condition* **Global Pseudo Static**		*File Name:* *P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd*

Geotechnical Cross Section A - A'

Local Stability

P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Allow Sliding	Water Surface	Ru
Clay 1, Artificial Fill, undocumented (Afu)		125	Mohr-Coulomb	432	34			None	0
Clay 2, Older Alluvium (Qoa)		125	Mohr-Coulomb	317	28			None	0
Clay 3, Older Alluvium (Qoa)		120	Mohr-Coulomb	448	29			None	0
Clay 4, Older Alluvium (Qoa)		130	Undrained	4000		Constant		None	0
Wall		150	Infinite strength				No	None	0



SLIDEINTERPRET 9.013

Leighton

Project	El Camino College, Fire Training Facility, Torrance, CA				
Analyzed By SG	*Units* feet	*Scale* 1:360		*Project No.:* 10535.020	*File Name:* P:\INFOCUS PROJECTS\10501-11000\10535 El Camino College\020 Lot L Fire Training Facility\Analyses\Slope Stability\10535.020 El Camino Fire Training Facility.slmd
Date 8/13/2021		*Condition* Local Pseudo Static			

APPENDIX E

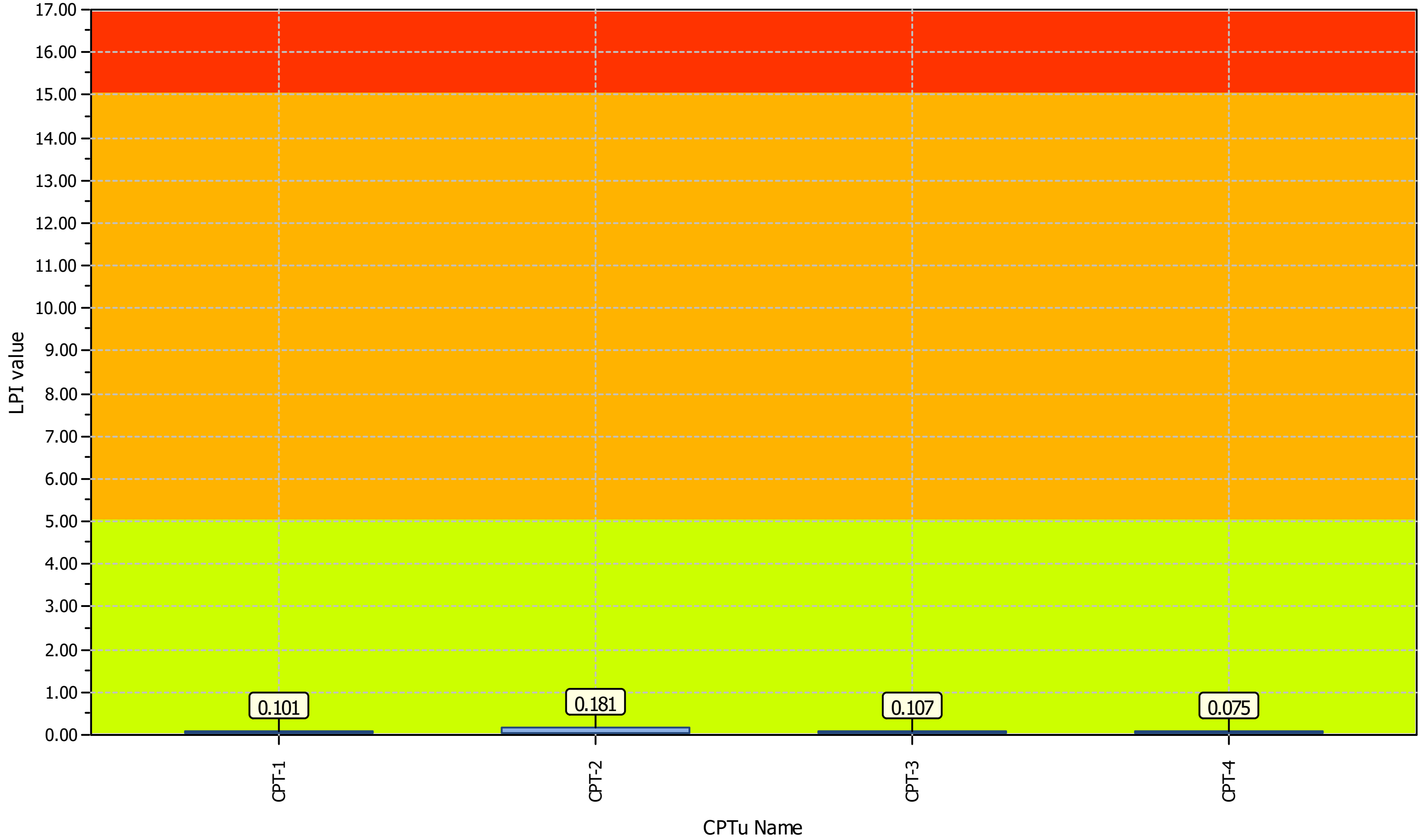
LIQUEFACTION ANALYSIS

Leighton Consulting, Inc.
17781 Cowan
Irvine, CA 92614

Project title : 10535.020 El Camino College Fire Training Facility

Location : Torrance, CA

Overall Liquefaction Potential Index report



LPI color scheme

- Very high risk
- High risk
- Low risk

Basic statistics

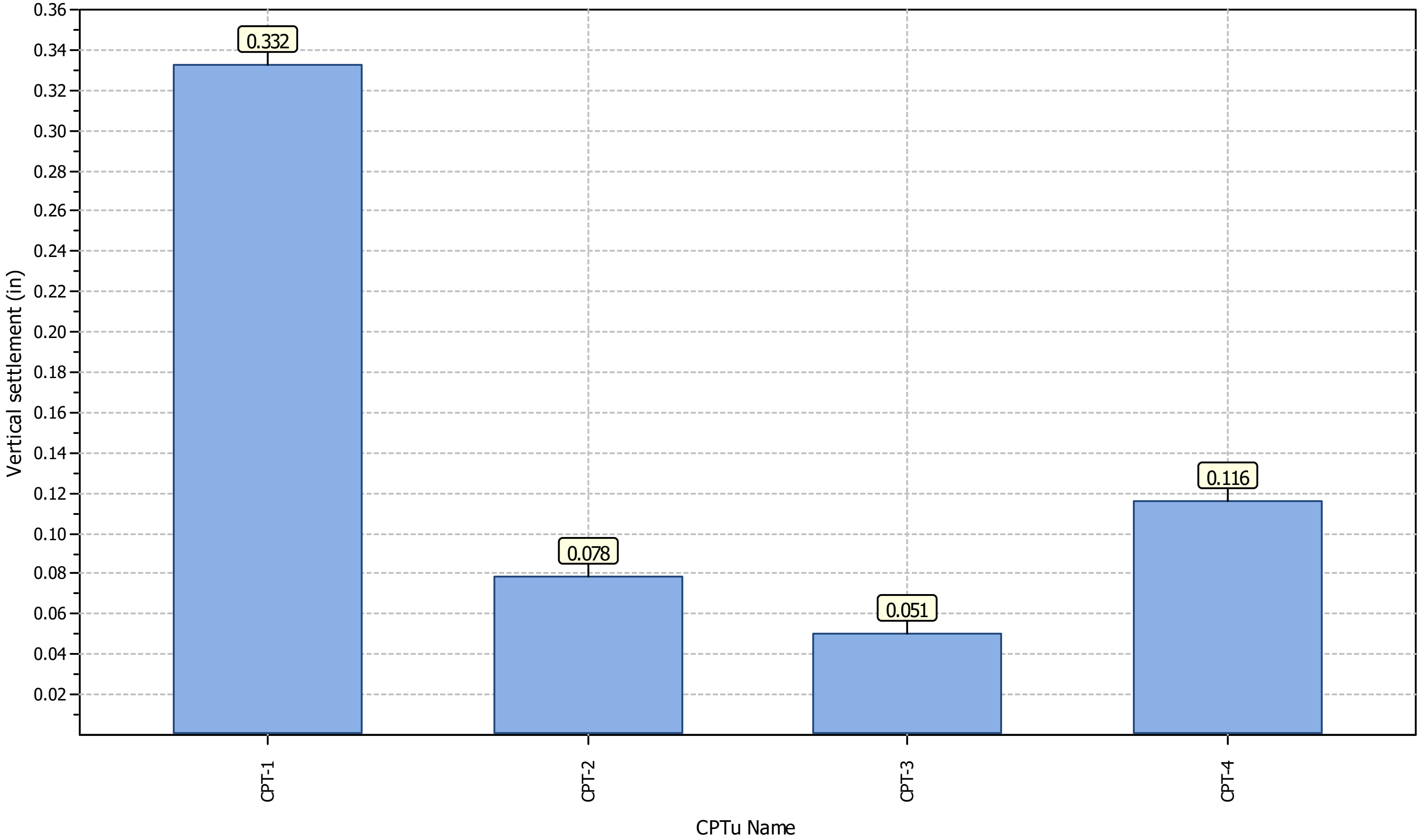
Total CPT number: 4
100% low risk
0% high risk
0% very high risk

Leighton Consulting, Inc.
17781 Cowan
Irvine, CA 92614

Project title : 10535.020 El Camino College Fire Training Facility

Location : Torrance, CA

Overall vertical settlements report

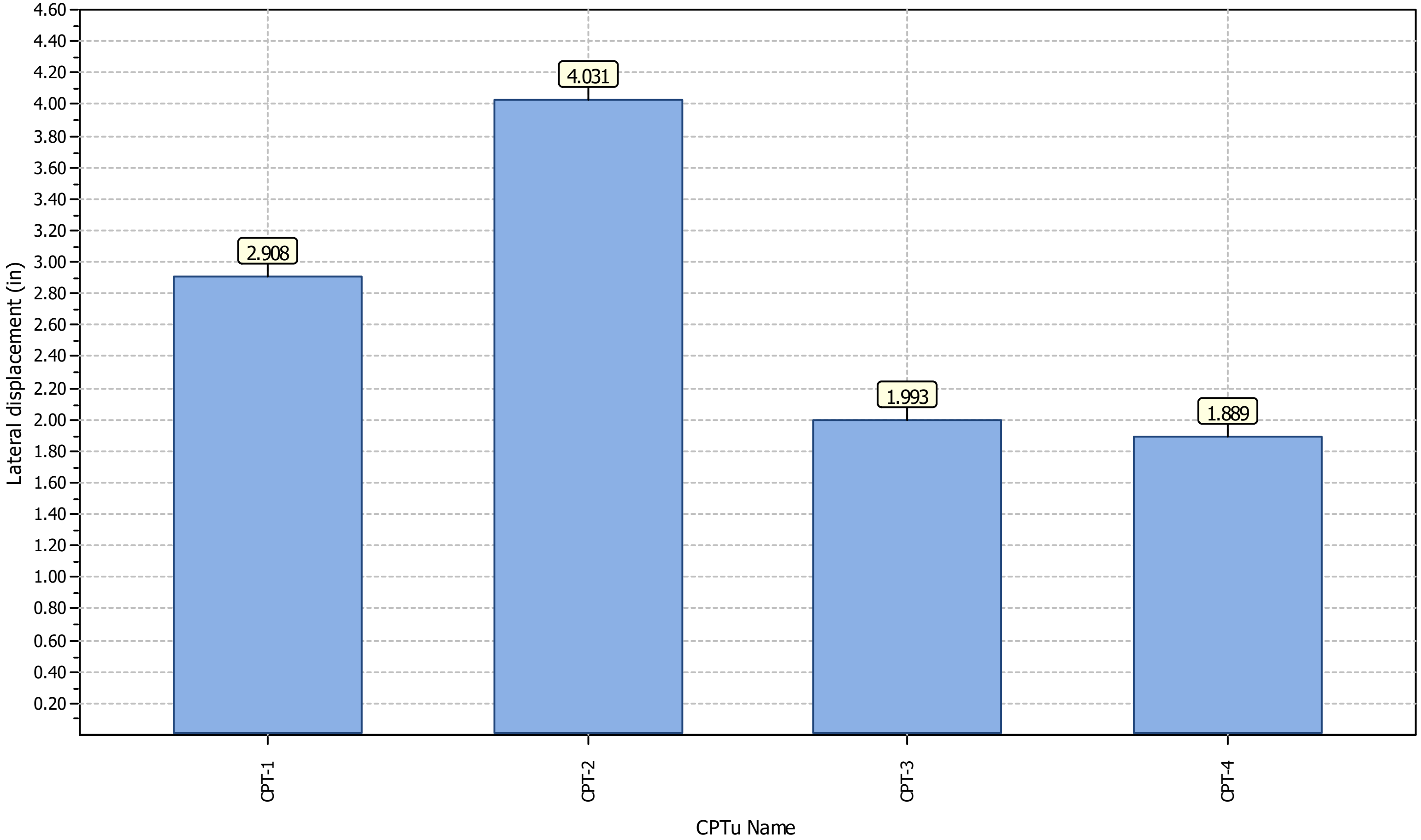


Leighton Consulting, Inc.
17781 Cowan
Irvine, CA 92614

Project title : 10535.020 El Camino College Fire Training Facility

Location : Torrance, CA

Overall lateral displacements report



Leighton Consulting, Inc.
17781 Cowan
Irvine, CA 92614

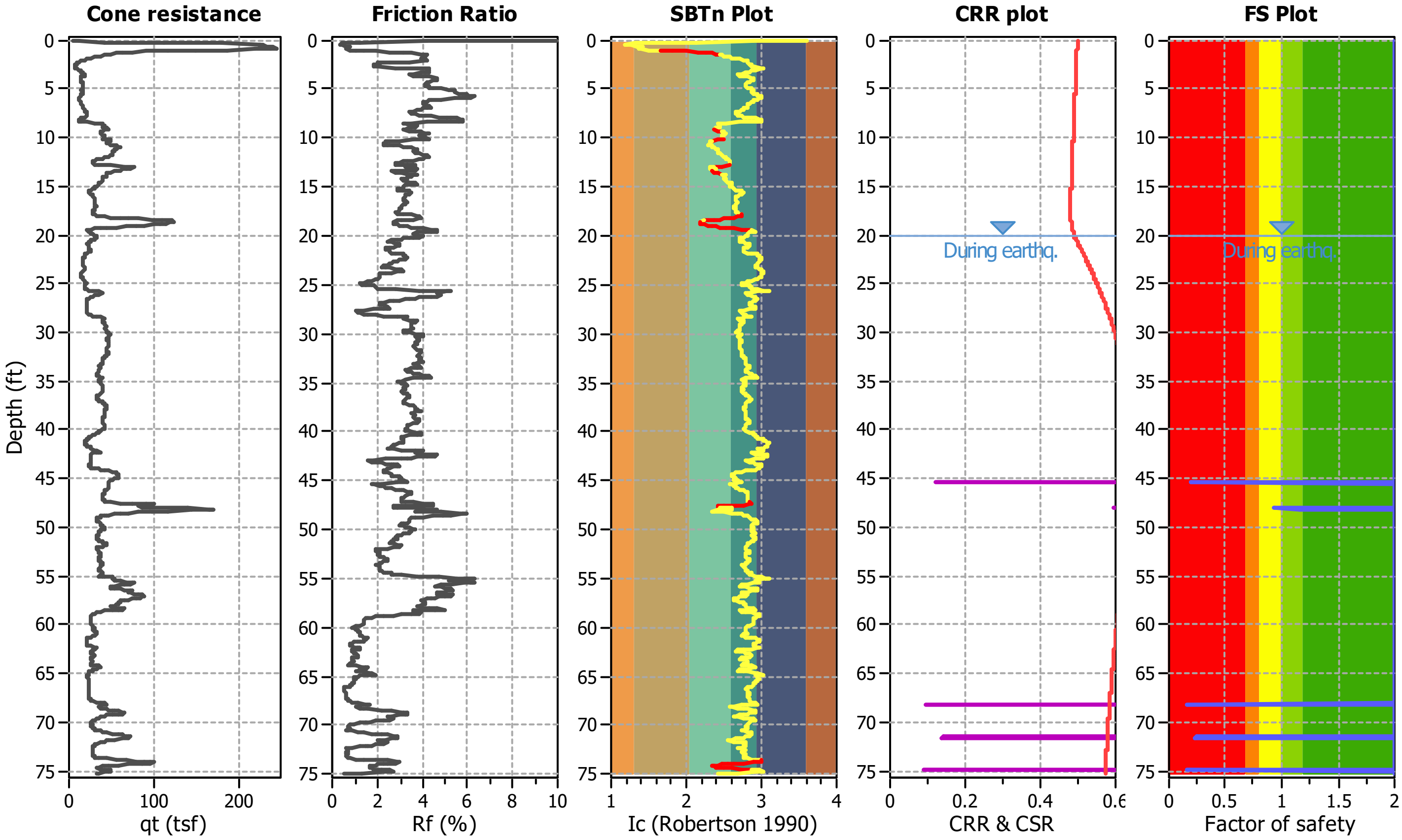
LIQUEFACTION ANALYSIS REPORT

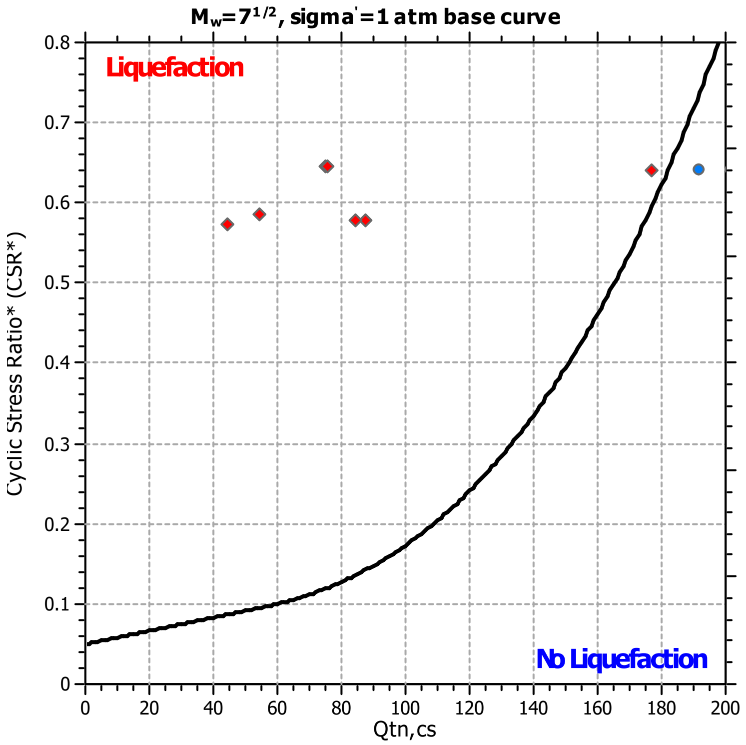
Project title : 10535.020 El Camino College Fire Training Facility **Location : Torrance, CA**

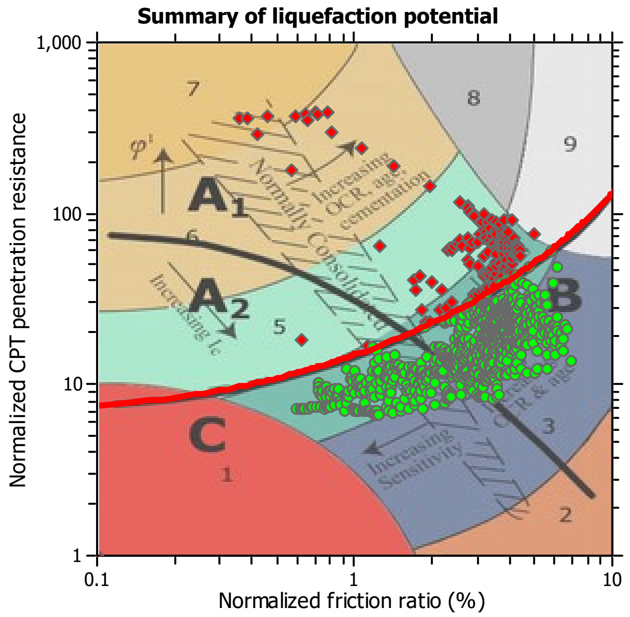
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	24.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	20.00 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:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.82	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

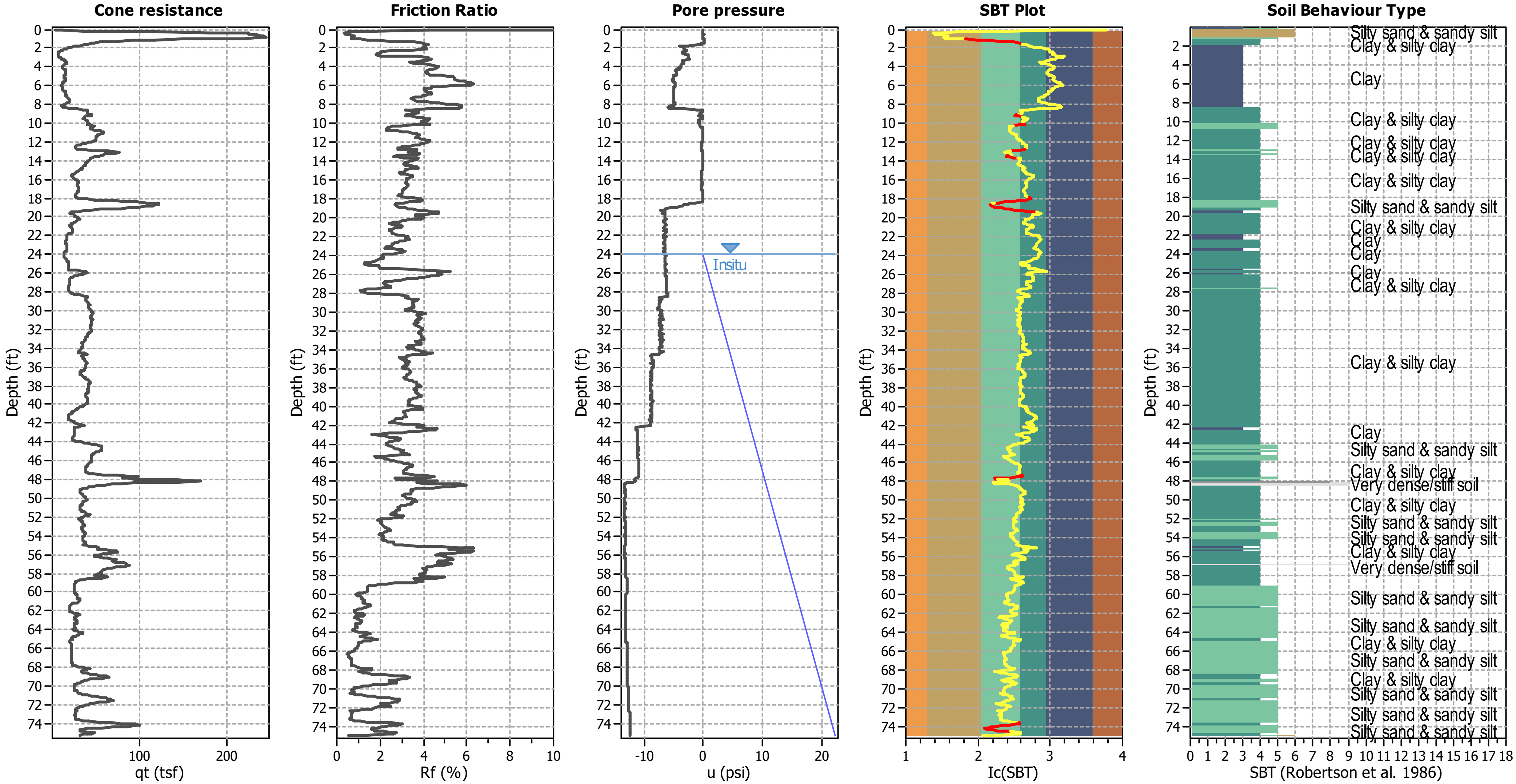






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



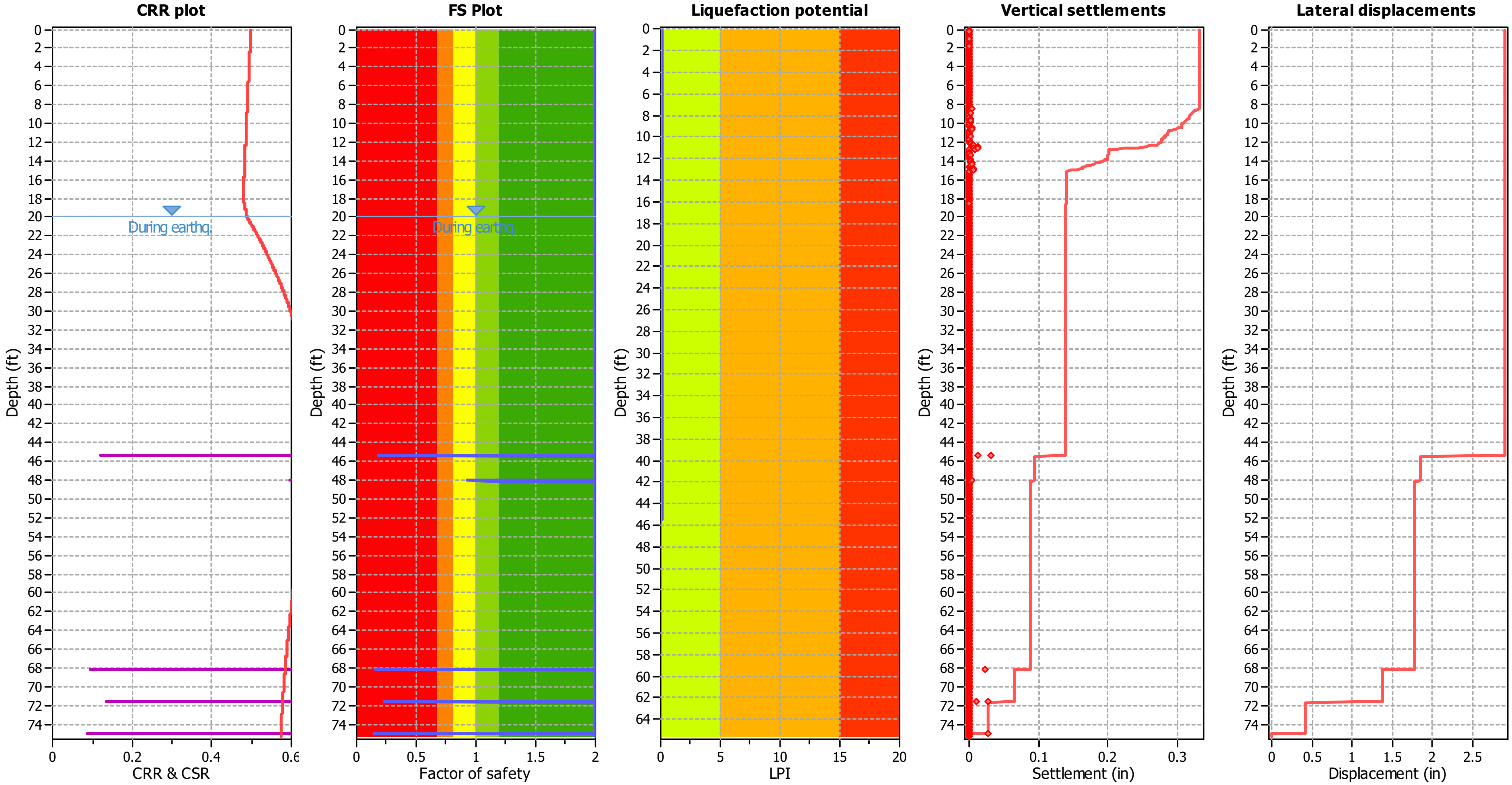
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 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 sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 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

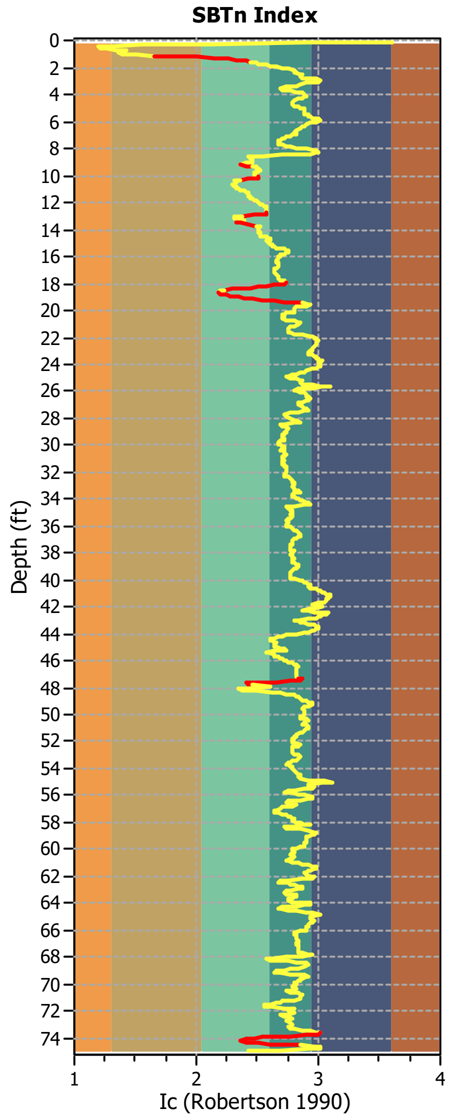
- Very high risk
- High risk
- Low risk

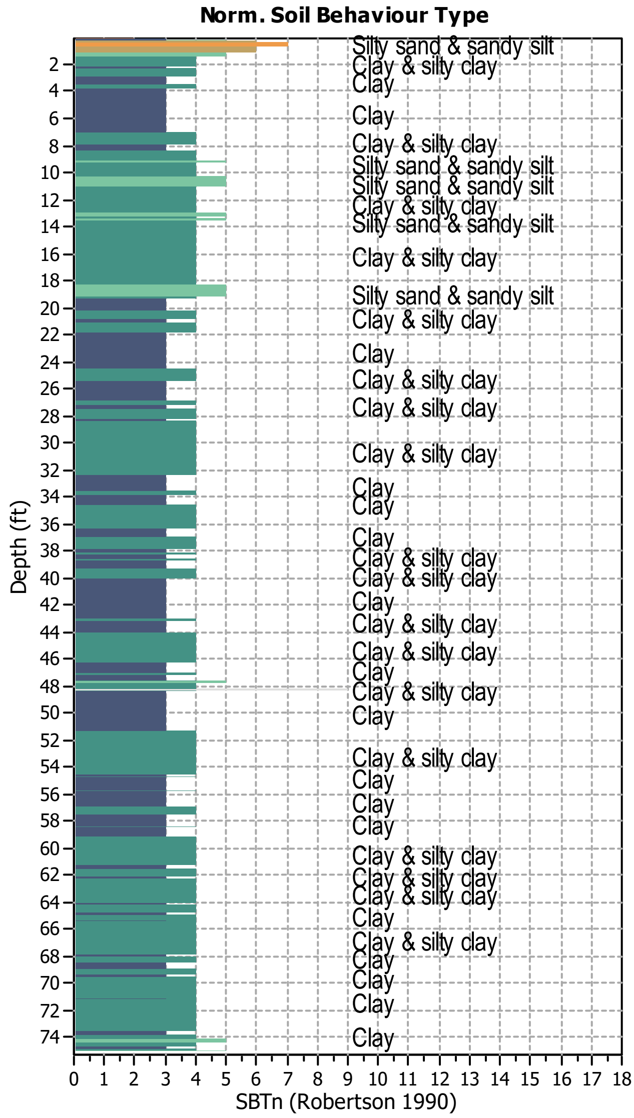
TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.





Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	1133
I_c maximum check value:	3.00	Total points excluded:	74
I_c change ratio value:	0.0250	Exclusion percentage:	6.53%
Minimum number of points in layer:	4	Number of layers detected:	11

:: 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	0.08	3.56	3.60	14.07	1.00	5.72	16.02	91.58	4.000	No	Yes	2.00
2	0.14	11.07	2.89	4.26	0.98	17.77	5.59	99.44	4.000	No	Yes	2.00
3	0.21	40.27	2.12	1.25	0.68	64.68	1.49	96.35	4.000	No	No	2.00
4	0.28	111.89	1.56	0.56	0.50	179.74	1.00	179.74	4.000	No	No	2.00
5	0.35	179.09	1.31	0.42	0.50	287.70	1.00	287.70	4.000	No	No	2.00
6	0.41	224.60	1.20	0.36	0.50	360.81	1.00	360.81	4.000	No	No	2.00
7	0.48	223.64	1.22	0.39	0.50	359.27	1.00	359.27	4.000	No	No	2.00
8	0.54	227.68	1.27	0.46	0.50	365.76	1.00	365.76	4.000	No	No	2.00
9	0.60	231.94	1.34	0.59	0.50	372.59	1.00	372.59	4.000	No	No	2.00
10	0.68	237.79	1.40	0.72	0.50	381.98	1.00	381.98	4.000	No	No	2.00
11	0.74	240.30	1.42	0.78	0.50	386.01	1.00	386.01	4.000	No	No	2.00
12	0.80	244.31	1.38	0.71	0.50	392.45	1.00	392.45	4.000	No	No	2.00
13	0.86	238.46	1.36	0.64	0.50	383.04	1.00	383.04	4.000	No	No	2.00
14	0.94	219.13	1.39	0.66	0.50	351.97	1.00	351.97	4.000	No	No	2.00
15	1.00	186.05	1.51	0.82	0.50	298.82	1.00	298.82	4.000	No	No	2.00
16	1.05	149.22	1.66	1.07	0.51	239.64	1.01	241.69	4.000	No	No	2.00
17	1.13	116.12	1.82	1.42	0.57	186.44	1.12	209.62	4.000	Yes	No	2.00
18	1.18	89.59	2.00	1.97	0.64	143.83	1.31	187.84	4.000	Yes	No	2.00
19	1.29	73.41	2.15	2.57	0.69	117.81	1.55	182.45	4.000	Yes	No	2.00
20	1.33	62.56	2.26	3.15	0.74	100.39	1.83	183.41	4.000	Yes	No	2.00
21	1.38	55.66	2.33	3.56	0.76	89.29	2.06	183.94	4.000	Yes	No	2.00
22	1.46	48.72	2.41	3.96	0.79	78.14	2.34	182.67	4.000	Yes	No	2.00
23	1.55	44.46	2.45	4.16	0.81	71.28	2.52	179.73	4.000	Yes	No	2.00
24	1.59	39.84	2.49	4.24	0.82	63.86	2.70	172.53	4.000	Yes	No	2.00
25	1.67	36.18	2.51	4.18	0.83	57.96	2.82	163.50	4.000	No	No	2.00
26	1.72	31.87	2.54	4.10	0.84	51.03	2.99	152.63	4.000	No	No	2.00
27	1.79	28.41	2.57	4.01	0.85	45.47	3.15	143.36	4.000	No	No	2.00
28	1.86	25.01	2.61	3.99	0.87	39.99	3.38	135.25	4.000	No	Yes	2.00
29	1.92	21.99	2.65	4.02	0.89	35.14	3.66	128.52	4.000	No	Yes	2.00
30	1.99	19.22	2.70	4.12	0.90	30.69	4.01	122.97	4.000	No	Yes	2.00
31	2.04	16.74	2.75	4.22	0.92	26.70	4.40	117.51	4.000	No	Yes	2.00
32	2.12	13.92	2.81	4.15	0.95	22.15	4.86	107.75	4.000	No	Yes	2.00
33	2.25	11.47	2.82	3.47	0.95	18.21	5.00	91.08	4.000	No	Yes	2.00
34	2.29	9.63	2.81	2.60	0.95	15.24	4.88	74.40	4.000	No	Yes	2.00
35	2.34	8.32	2.81	2.06	0.94	13.14	4.85	63.73	4.000	No	Yes	2.00
36	2.45	7.61	2.85	2.11	0.96	12.00	5.19	62.32	4.000	No	Yes	2.00
37	2.51	7.07	2.87	2.07	0.97	11.12	5.40	60.07	4.000	No	Yes	2.00
38	2.56	7.14	2.85	1.90	0.96	11.23	5.19	58.27	4.000	No	Yes	2.00
39	2.60	6.92	2.86	1.89	0.96	10.87	5.29	57.52	4.000	No	Yes	2.00
40	2.63	6.86	2.86	1.85	0.96	10.77	5.28	56.86	4.000	No	Yes	2.00
41	2.71	6.67	2.87	1.86	0.97	10.46	5.39	56.32	4.000	No	Yes	2.00
42	2.79	6.48	2.90	2.05	0.98	10.15	5.71	57.97	4.000	No	Yes	2.00
43	2.82	6.36	2.99	2.86	1.00	9.95	6.60	65.65	4.000	No	Yes	2.00
44	2.89	7.25	3.01	3.85	1.00	11.37	6.91	78.56	4.000	No	Yes	2.00
45	2.98	8.39	3.00	4.34	1.00	13.20	6.69	88.34	4.000	No	Yes	2.00
46	3.02	10.11	2.93	4.31	0.99	15.96	5.99	95.54	4.000	No	Yes	2.00
47	3.11	11.00	2.90	4.35	0.98	17.39	5.73	99.58	4.000	No	Yes	2.00
48	3.15	12.43	2.86	4.31	0.96	19.68	5.31	104.49	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
49	3.24	12.94	2.85	4.40	0.96	20.49	5.24	107.39	4.000	No	Yes	2.00
50	3.31	13.92	2.81	4.19	0.95	22.05	4.90	108.05	4.000	No	Yes	2.00
51	3.37	14.39	2.79	4.03	0.94	22.81	4.71	107.50	4.000	No	Yes	2.00
52	3.42	15.82	2.73	3.67	0.92	25.10	4.24	106.52	4.000	No	Yes	2.00
53	3.51	17.09	2.69	3.44	0.90	27.14	3.92	106.27	4.000	No	Yes	2.00
54	3.55	17.47	2.68	3.43	0.90	27.74	3.86	107.10	4.000	No	Yes	2.00
55	3.64	16.90	2.71	3.61	0.91	26.81	4.05	108.53	4.000	No	Yes	2.00
56	3.68	15.40	2.77	4.00	0.93	24.41	4.51	110.14	4.000	No	Yes	2.00
57	3.76	14.00	2.83	4.40	0.95	22.15	5.01	110.95	4.000	No	Yes	2.00
58	3.86	13.02	2.87	4.69	0.97	20.55	5.40	110.97	4.000	No	Yes	2.00
59	3.90	12.54	2.89	4.77	0.97	19.78	5.56	110.06	4.000	No	Yes	2.00
60	3.95	12.34	2.89	4.75	0.98	19.47	5.60	109.07	4.000	No	Yes	2.00
61	4.04	12.27	2.89	4.72	0.98	19.34	5.61	108.45	4.000	No	Yes	2.00
62	4.10	12.17	2.90	4.75	0.98	19.18	5.65	108.37	4.000	No	Yes	2.00
63	4.14	12.40	2.89	4.69	0.97	19.53	5.56	108.54	4.000	No	Yes	2.00
64	4.20	12.95	2.86	4.54	0.97	20.42	5.33	108.91	4.000	No	Yes	2.00
65	4.30	13.65	2.83	4.38	0.95	21.53	5.08	109.41	4.000	No	Yes	2.00
66	4.34	14.41	2.81	4.24	0.94	22.75	4.84	110.17	4.000	No	Yes	2.00
67	4.43	14.76	2.80	4.23	0.94	23.30	4.77	111.16	4.000	No	Yes	2.00
68	4.48	15.14	2.79	4.19	0.94	23.90	4.68	111.75	4.000	No	Yes	2.00
69	4.62	15.31	2.78	4.20	0.94	24.17	4.65	112.38	4.000	No	Yes	2.00
70	4.67	15.34	2.78	4.22	0.94	24.22	4.66	112.76	4.000	No	Yes	2.00
71	4.73	15.12	2.79	4.30	0.94	23.85	4.74	113.10	4.000	No	Yes	2.00
72	4.77	14.91	2.80	4.34	0.94	23.51	4.80	112.96	4.000	No	Yes	2.00
73	4.82	14.69	2.81	4.38	0.95	23.15	4.87	112.82	4.000	No	Yes	2.00
74	4.87	14.48	2.83	4.59	0.95	22.81	5.03	114.85	4.000	No	Yes	2.00
75	4.93	14.19	2.86	4.92	0.96	22.35	5.27	117.84	4.000	No	Yes	2.00
76	5.04	14.00	2.88	5.27	0.97	22.03	5.51	121.28	4.000	No	Yes	2.00
77	5.09	14.00	2.89	5.45	0.98	22.02	5.60	123.38	4.000	No	Yes	2.00
78	5.12	14.19	2.89	5.57	0.98	22.33	5.62	125.50	4.000	No	Yes	2.00
79	5.21	14.54	2.88	5.58	0.97	22.88	5.55	126.95	4.000	No	Yes	2.00
80	5.29	14.81	2.88	5.58	0.97	23.31	5.49	128.03	4.000	No	Yes	2.00
81	5.33	14.87	2.88	5.58	0.97	23.40	5.48	128.35	4.000	No	Yes	2.00
82	5.43	14.59	2.89	5.74	0.98	22.93	5.62	128.98	4.000	No	Yes	2.00
83	5.47	14.17	2.91	5.94	0.98	22.26	5.82	129.50	4.000	No	Yes	2.00
84	5.53	13.89	2.92	6.05	0.99	21.80	5.94	129.49	4.000	No	Yes	2.00
85	5.60	13.51	2.94	6.15	0.99	21.19	6.08	128.78	4.000	No	Yes	2.00
86	5.66	13.10	2.95	6.20	1.00	20.52	6.21	127.46	4.000	No	Yes	2.00
87	5.71	12.50	2.97	6.34	1.00	19.55	6.44	125.95	4.000	No	Yes	2.00
88	5.78	11.76	3.00	6.46	1.00	18.36	6.72	123.48	4.000	No	Yes	2.00
89	5.87	11.25	3.01	6.37	1.00	17.54	6.84	120.04	4.000	No	Yes	2.00
90	5.96	11.00	2.98	5.65	1.00	17.12	6.54	111.97	4.000	No	Yes	2.00
91	6.08	11.06	2.94	4.95	1.00	17.21	6.13	105.41	4.000	No	Yes	2.00
92	6.13	11.22	2.91	4.48	0.98	17.45	5.80	101.15	4.000	No	Yes	2.00
93	6.19	11.44	2.90	4.48	0.98	17.81	5.73	101.99	4.000	No	Yes	2.00
94	6.27	11.76	2.89	4.36	0.97	18.32	5.56	101.86	4.000	No	Yes	2.00
95	6.31	12.05	2.86	4.14	0.97	18.77	5.35	100.46	4.000	No	Yes	2.00
96	6.39	12.02	2.87	4.16	0.97	18.72	5.37	100.56	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	6.44	12.62	2.85	4.14	0.96	19.68	5.21	102.46	4.000	No	Yes	2.00
98	6.53	13.03	2.85	4.27	0.96	20.34	5.19	105.47	4.000	No	Yes	2.00
99	6.58	14.08	2.82	4.22	0.95	22.01	4.92	108.33	4.000	No	Yes	2.00
100	6.67	14.39	2.81	4.30	0.95	22.51	4.91	110.49	4.000	No	Yes	2.00
101	6.71	14.81	2.81	4.35	0.94	23.17	4.85	112.42	4.000	No	Yes	2.00
102	6.79	14.81	2.82	4.46	0.95	23.16	4.91	113.83	4.000	No	Yes	2.00
103	6.84	14.97	2.81	4.47	0.95	23.42	4.89	114.56	4.000	No	Yes	2.00
104	6.93	15.41	2.79	4.34	0.94	24.13	4.73	114.23	4.000	No	Yes	2.00
105	7.02	15.96	2.77	4.17	0.93	24.99	4.55	113.67	4.000	No	Yes	2.00
106	7.06	16.47	2.75	4.03	0.92	25.81	4.38	113.13	4.000	No	Yes	2.00
107	7.11	16.66	2.74	3.98	0.92	26.11	4.32	112.92	4.000	No	Yes	2.00
108	7.16	17.01	2.73	3.86	0.91	26.67	4.20	112.10	4.000	No	Yes	2.00
109	7.23	17.49	2.71	3.70	0.91	27.43	4.05	111.01	4.000	No	Yes	2.00
110	7.32	18.12	2.68	3.53	0.90	28.44	3.86	109.93	4.000	No	Yes	2.00
111	7.37	18.85	2.67	3.51	0.89	29.61	3.76	111.32	4.000	No	Yes	2.00
112	7.51	19.39	2.67	3.63	0.89	30.46	3.76	114.68	4.000	No	Yes	2.00
113	7.60	19.90	2.67	3.80	0.89	31.27	3.79	118.66	4.000	No	Yes	2.00
114	7.67	19.93	2.69	3.98	0.90	31.32	3.89	121.87	4.000	No	Yes	2.00
115	7.71	19.74	2.70	4.18	0.90	31.01	4.01	124.48	4.000	No	Yes	2.00
116	7.76	18.98	2.74	4.50	0.92	29.78	4.28	127.39	4.000	No	Yes	2.00
117	7.86	18.03	2.78	4.84	0.93	28.24	4.58	129.38	4.000	No	Yes	2.00
118	7.90	16.75	2.82	5.19	0.95	26.19	4.96	129.86	4.000	No	Yes	2.00
119	7.96	15.54	2.86	5.42	0.96	24.24	5.30	128.42	4.000	No	Yes	2.00
120	8.02	13.89	2.91	5.70	0.98	21.57	5.79	125.00	4.000	No	Yes	2.00
121	8.11	12.33	2.96	5.97	1.00	19.06	6.34	120.84	4.000	No	Yes	2.00
122	8.16	11.61	2.98	5.87	1.00	17.90	6.50	116.44	4.000	No	Yes	2.00
123	8.21	10.97	3.00	6.01	1.00	16.87	6.79	114.57	4.000	No	Yes	2.00
124	8.27	11.44	2.99	6.02	1.00	17.63	6.64	117.02	4.000	No	Yes	2.00
125	8.37	13.08	2.94	5.82	0.99	20.25	6.06	122.71	4.000	No	Yes	2.00
126	8.42	20.48	2.70	4.33	0.90	32.12	4.01	128.90	4.000	No	Yes	2.00
127	8.51	28.29	2.54	3.55	0.84	44.67	2.97	132.75	4.000	No	No	2.00
128	8.55	35.41	2.44	3.19	0.80	56.10	2.47	138.37	4.000	No	No	2.00
129	8.62	37.97	2.42	3.28	0.80	60.20	2.41	145.08	4.000	No	No	2.00
130	8.68	39.37	2.43	3.53	0.80	62.46	2.46	153.61	4.000	No	No	2.00
131	8.74	40.13	2.45	3.78	0.81	63.67	2.53	161.29	4.000	No	No	2.00
132	8.81	39.81	2.46	3.83	0.81	63.15	2.56	161.88	4.000	No	No	2.00
133	8.92	39.62	2.45	3.76	0.81	62.84	2.54	159.65	4.000	No	No	2.00
134	8.98	40.13	2.43	3.57	0.80	63.64	2.45	156.05	4.000	No	No	2.00
135	9.03	42.26	2.41	3.44	0.79	67.06	2.33	156.51	4.000	No	No	2.00
136	9.08	44.96	2.37	3.24	0.78	71.39	2.19	156.15	4.000	No	No	2.00
137	9.20	45.63	2.36	3.20	0.77	72.46	2.15	156.13	4.000	Yes	No	2.00
138	9.26	41.72	2.41	3.50	0.80	66.17	2.37	157.10	4.000	Yes	No	2.00
139	9.28	38.64	2.46	3.77	0.81	61.22	2.58	158.15	4.000	Yes	No	2.00
140	9.36	36.22	2.50	3.99	0.83	57.33	2.77	158.52	4.000	Yes	No	2.00
141	9.42	37.37	2.48	3.93	0.82	59.16	2.69	159.34	4.000	No	No	2.00
142	9.47	36.41	2.51	4.14	0.83	57.62	2.82	162.36	4.000	No	No	2.00
143	9.56	35.65	2.53	4.35	0.84	56.38	2.93	165.40	4.000	No	No	2.00
144	9.60	36.76	2.52	4.28	0.83	58.17	2.86	166.19	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
145	9.71	38.70	2.49	4.07	0.82	60.82	2.71	164.63	4.000	No	No	2.00
146	9.75	40.51	2.47	3.96	0.82	63.17	2.61	164.95	4.000	No	No	2.00
147	9.82	39.71	2.48	4.08	0.82	61.75	2.69	166.18	4.000	No	No	2.00
148	9.91	40.57	2.48	4.09	0.82	62.56	2.67	167.32	4.000	No	No	2.00
149	9.96	41.59	2.47	4.07	0.82	63.74	2.64	168.40	4.000	No	No	2.00
150	10.02	41.78	2.48	4.15	0.82	63.79	2.67	170.34	4.000	No	No	2.00
151	10.07	40.19	2.51	4.35	0.83	61.42	2.80	171.98	4.000	No	No	2.00
152	10.12	39.50	2.51	4.32	0.83	60.12	2.82	169.70	4.000	Yes	No	2.00
153	10.17	43.47	2.43	3.61	0.80	64.83	2.44	158.44	4.000	Yes	No	2.00
154	10.26	47.32	2.35	3.01	0.77	68.94	2.14	147.34	4.000	Yes	No	2.00
155	10.30	48.08	2.31	2.57	0.75	69.09	1.97	135.98	4.000	Yes	No	2.00
156	10.39	45.73	2.31	2.45	0.75	65.25	1.98	128.97	4.000	No	No	2.00
157	10.43	43.03	2.32	2.40	0.76	61.32	2.02	123.88	4.000	No	No	2.00
158	10.52	42.87	2.32	2.37	0.76	60.68	2.02	122.57	4.000	No	No	2.00
159	10.57	43.54	2.31	2.32	0.76	61.31	1.99	121.74	4.000	No	No	2.00
160	10.67	45.42	2.30	2.33	0.75	63.39	1.96	123.99	4.000	No	No	2.00
161	10.70	48.15	2.31	2.50	0.75	67.11	1.97	131.98	4.000	No	No	2.00
162	10.78	51.04	2.32	2.76	0.76	70.97	2.01	142.85	4.000	No	No	2.00
163	10.83	54.51	2.33	3.04	0.76	75.74	2.05	155.19	4.000	No	No	2.00
164	10.92	57.41	2.33	3.18	0.76	79.30	2.05	162.75	4.000	No	No	2.00
165	10.96	58.71	2.34	3.36	0.77	81.03	2.09	169.50	4.000	No	No	2.00
166	11.04	58.07	2.36	3.51	0.77	79.95	2.16	172.71	4.000	No	No	2.00
167	11.10	56.03	2.39	3.71	0.79	77.14	2.27	174.93	4.000	No	No	2.00
168	11.18	54.12	2.41	3.83	0.79	74.34	2.35	174.91	4.000	No	No	2.00
169	11.23	52.44	2.42	3.85	0.80	71.86	2.40	172.53	4.000	No	No	2.00
170	11.31	51.58	2.42	3.79	0.80	70.23	2.41	169.13	4.000	No	No	2.00
171	11.36	50.95	2.42	3.71	0.80	69.12	2.40	165.87	4.000	No	No	2.00
172	11.45	50.47	2.42	3.69	0.80	68.02	2.41	164.00	4.000	No	No	2.00
173	11.50	50.31	2.43	3.70	0.80	67.57	2.43	163.87	4.000	No	No	2.00
174	11.55	50.22	2.44	3.81	0.80	67.28	2.47	166.10	4.000	No	No	2.00
175	11.62	50.15	2.45	3.94	0.81	67.03	2.53	169.28	4.000	No	No	2.00
176	11.71	49.90	2.46	4.09	0.81	66.37	2.59	171.99	4.000	No	No	2.00
177	11.76	49.77	2.47	4.20	0.82	66.06	2.64	174.48	4.000	No	No	2.00
178	11.84	49.42	2.48	4.27	0.82	65.31	2.68	175.22	4.000	No	No	2.00
179	11.88	47.64	2.50	4.34	0.83	62.87	2.76	173.79	4.000	No	No	2.00
180	11.99	45.73	2.51	4.32	0.83	59.95	2.83	169.41	4.000	No	No	2.00
181	12.03	43.88	2.52	4.20	0.83	57.33	2.85	163.26	4.000	No	No	2.00
182	12.09	41.72	2.52	4.10	0.84	54.31	2.89	157.01	4.000	No	No	2.00
183	12.14	38.73	2.54	3.98	0.84	50.26	2.97	149.21	4.000	No	No	2.00
184	12.21	35.08	2.56	3.92	0.85	45.38	3.12	141.43	4.000	No	No	2.00
185	12.28	32.34	2.57	3.69	0.86	41.62	3.16	131.72	4.000	No	No	2.00
186	12.37	30.24	2.58	3.45	0.86	38.62	3.18	122.92	4.000	No	No	2.00
187	12.40	28.56	2.58	3.23	0.86	36.32	3.18	115.66	4.000	No	No	2.00
188	12.48	27.57	2.58	3.10	0.86	34.84	3.19	111.26	4.000	No	No	2.00
189	12.56	26.84	2.58	3.01	0.86	33.71	3.21	108.07	4.000	No	No	2.00
190	12.60	26.65	2.57	2.92	0.86	33.35	3.17	105.89	4.000	No	No	2.00
191	12.67	27.35	2.57	2.90	0.85	34.05	3.12	106.38	4.000	No	No	2.00
192	12.75	28.84	2.58	3.21	0.86	35.83	3.20	114.66	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
193	12.80	34.57	2.57	3.74	0.85	42.91	3.13	134.43	4.000	Yes	No	2.00
194	12.89	46.87	2.48	3.78	0.82	57.51	2.67	153.73	4.000	Yes	No	2.00
195	12.95	63.22	2.38	3.53	0.78	76.52	2.21	169.47	4.000	Yes	No	2.00
196	13.06	75.43	2.31	3.31	0.75	90.09	1.97	177.61	4.000	Yes	No	2.00
197	13.09	76.96	2.31	3.43	0.76	91.80	1.99	182.90	4.000	No	No	2.00
198	13.19	71.84	2.36	3.68	0.77	85.56	2.14	183.46	4.000	No	No	2.00
199	13.24	66.05	2.40	3.86	0.79	78.69	2.30	180.62	4.000	No	No	2.00
200	13.28	62.62	2.40	3.72	0.79	74.39	2.31	171.97	4.000	No	No	2.00
201	13.33	60.56	2.36	3.20	0.78	71.37	2.17	154.94	4.000	No	No	2.00
202	13.41	58.20	2.34	2.84	0.77	68.04	2.09	142.14	4.000	No	No	2.00
203	13.46	56.04	2.33	2.63	0.76	65.22	2.05	133.56	4.000	Yes	No	2.00
204	13.52	53.59	2.36	2.81	0.78	62.32	2.17	135.35	4.000	Yes	No	2.00
205	13.59	48.98	2.43	3.15	0.80	57.03	2.43	138.34	4.000	Yes	No	2.00
206	13.69	45.30	2.49	3.52	0.82	52.67	2.70	142.02	4.000	Yes	No	2.00
207	13.72	42.82	2.53	3.84	0.84	49.84	2.92	145.48	4.000	Yes	No	2.00
208	13.80	43.11	2.52	3.79	0.84	49.90	2.90	144.61	4.000	No	No	2.00
209	13.85	43.35	2.51	3.66	0.83	49.97	2.84	141.81	4.000	No	No	2.00
210	13.94	42.78	2.51	3.56	0.83	48.99	2.82	138.37	4.000	No	No	2.00
211	13.99	41.85	2.51	3.44	0.83	47.77	2.81	134.21	4.000	No	No	2.00
212	14.07	40.45	2.52	3.39	0.83	45.93	2.85	130.91	4.000	No	No	2.00
213	14.12	39.48	2.52	3.30	0.83	44.68	2.85	127.54	4.000	No	No	2.00
214	14.18	39.09	2.51	3.21	0.83	44.04	2.84	124.89	4.000	No	No	2.00
215	14.25	39.05	2.51	3.17	0.83	43.80	2.82	123.72	4.000	No	No	2.00
216	14.36	39.01	2.52	3.20	0.83	43.48	2.85	124.09	4.000	No	No	2.00
217	14.42	38.64	2.53	3.32	0.84	42.94	2.93	125.92	4.000	No	No	2.00
218	14.49	37.85	2.55	3.48	0.85	41.95	3.05	127.93	4.000	No	No	2.00
219	14.55	36.83	2.58	3.65	0.86	40.71	3.18	129.63	4.000	No	No	2.00
220	14.60	35.91	2.60	3.80	0.86	39.61	3.31	131.09	4.000	No	No	2.00
221	14.67	35.37	2.61	3.85	0.87	38.86	3.37	130.96	4.000	No	Yes	2.00
222	14.73	34.95	2.60	3.72	0.87	38.24	3.34	127.68	4.000	No	Yes	2.00
223	14.79	34.54	2.59	3.50	0.86	37.61	3.26	122.47	4.000	No	No	2.00
224	14.86	33.93	2.58	3.31	0.86	36.74	3.21	117.79	4.000	No	No	2.00
225	14.91	33.20	2.58	3.26	0.86	35.83	3.23	115.61	4.000	No	No	2.00
226	14.97	32.47	2.59	3.25	0.86	34.90	3.27	114.22	4.000	No	No	2.00
227	15.03	31.58	2.60	3.23	0.87	33.81	3.32	112.40	4.000	No	No	2.00
228	15.09	29.95	2.62	3.24	0.87	31.95	3.44	110.01	4.000	No	Yes	2.00
229	15.17	28.43	2.63	3.15	0.88	30.15	3.51	105.87	4.000	No	Yes	2.00
230	15.23	27.12	2.63	3.01	0.88	28.64	3.54	101.37	4.000	No	Yes	2.00
231	15.31	26.08	2.65	3.03	0.88	27.39	3.65	99.93	4.000	No	Yes	2.00
232	15.40	24.81	2.69	3.26	0.90	25.93	3.92	101.64	4.000	No	Yes	2.00
233	15.45	23.66	2.73	3.53	0.91	24.67	4.21	103.79	4.000	No	Yes	2.00
234	15.51	23.20	2.74	3.59	0.92	24.10	4.30	103.64	4.000	No	Yes	2.00
235	15.58	22.72	2.75	3.63	0.92	23.48	4.39	103.11	4.000	No	Yes	2.00
236	15.66	22.62	2.75	3.62	0.92	23.28	4.41	102.62	4.000	No	Yes	2.00
237	15.70	23.08	2.74	3.56	0.92	23.70	4.32	102.47	4.000	No	Yes	2.00
238	15.78	24.04	2.72	3.45	0.91	24.58	4.16	102.31	4.000	No	Yes	2.00
239	15.82	25.06	2.70	3.37	0.91	25.57	4.02	102.82	4.000	No	Yes	2.00
240	15.88	25.85	2.69	3.35	0.90	26.31	3.94	103.69	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
241	15.98	26.65	2.68	3.33	0.90	26.97	3.87	104.31	4.000	No	Yes	2.00
242	16.02	27.22	2.67	3.32	0.89	27.51	3.82	105.00	4.000	No	Yes	2.00
243	16.08	27.95	2.67	3.32	0.89	28.17	3.76	106.05	4.000	No	Yes	2.00
244	16.22	28.78	2.66	3.31	0.89	28.78	3.71	106.64	4.000	No	Yes	2.00
245	16.27	29.48	2.65	3.28	0.88	29.41	3.64	107.20	4.000	No	Yes	2.00
246	16.31	29.64	2.65	3.27	0.88	29.51	3.63	107.17	4.000	No	Yes	2.00
247	16.40	29.38	2.66	3.32	0.89	29.11	3.69	107.43	4.000	No	Yes	2.00
248	16.46	29.10	2.67	3.38	0.89	28.73	3.75	107.88	4.000	No	Yes	2.00
249	16.52	28.91	2.67	3.41	0.89	28.45	3.80	107.97	4.000	No	Yes	2.00
250	16.58	28.91	2.67	3.40	0.89	28.36	3.79	107.58	4.000	No	Yes	2.00
251	16.68	29.22	2.67	3.35	0.89	28.50	3.75	106.94	4.000	No	Yes	2.00
252	16.84	29.70	2.66	3.29	0.89	28.72	3.70	106.38	4.000	No	Yes	2.00
253	16.91	30.43	2.64	3.22	0.88	29.33	3.61	105.95	4.000	No	Yes	2.00
254	17.02	30.62	2.64	3.18	0.88	29.35	3.59	105.36	4.000	No	Yes	2.00
255	17.08	30.62	2.64	3.14	0.88	29.26	3.57	104.57	4.000	No	Yes	2.00
256	17.14	30.34	2.64	3.14	0.88	28.88	3.60	103.95	4.000	No	Yes	2.00
257	17.20	30.12	2.64	3.11	0.88	28.58	3.61	103.11	4.000	No	Yes	2.00
258	17.28	29.83	2.65	3.10	0.88	28.18	3.63	102.33	4.000	No	Yes	2.00
259	17.32	29.26	2.66	3.12	0.89	27.56	3.69	101.79	4.000	No	Yes	2.00
260	17.39	28.69	2.67	3.14	0.89	26.91	3.76	101.11	4.000	No	Yes	2.00
261	17.45	28.05	2.67	3.08	0.89	26.20	3.78	99.09	4.000	No	Yes	2.00
262	17.57	27.57	2.67	2.98	0.89	25.57	3.77	96.53	4.000	No	Yes	2.00
263	17.63	27.06	2.67	2.93	0.89	25.01	3.80	94.98	4.000	No	Yes	2.00
264	17.69	26.71	2.69	3.03	0.90	24.59	3.90	95.97	4.000	No	Yes	2.00
265	17.76	26.58	2.71	3.31	0.91	24.38	4.10	99.98	4.000	No	Yes	2.00
266	17.88	27.06	2.74	3.66	0.92	24.69	4.28	105.66	4.000	No	Yes	2.00
267	17.93	28.21	2.74	3.93	0.92	25.70	4.34	111.41	4.000	Yes	Yes	2.00
268	17.99	30.47	2.73	4.01	0.91	27.75	4.19	116.29	4.000	Yes	Yes	2.00
269	18.06	34.44	2.68	3.97	0.90	31.38	3.88	121.79	4.000	Yes	Yes	2.00
270	18.11	40.36	2.64	4.05	0.88	36.86	3.57	131.61	4.000	Yes	Yes	2.00
271	18.18	48.50	2.58	4.05	0.86	44.33	3.21	142.50	4.000	Yes	No	2.00
272	18.24	59.06	2.51	3.90	0.83	54.07	2.82	152.35	4.000	Yes	No	2.00
273	18.30	70.00	2.44	3.68	0.80	64.13	2.48	159.21	4.000	Yes	No	2.00
274	18.34	81.23	2.37	3.43	0.78	74.45	2.21	164.40	4.000	Yes	No	2.00
275	18.38	96.20	2.29	3.11	0.75	88.28	1.93	169.94	4.000	Yes	No	2.00
276	18.48	108.81	2.23	2.89	0.73	99.59	1.76	174.86	4.000	Yes	No	2.00
277	18.52	119.46	2.19	2.75	0.71	109.29	1.64	179.76	4.000	Yes	No	2.00
278	18.60	121.71	2.18	2.73	0.71	111.00	1.63	180.99	4.000	No	No	2.00
279	18.65	121.80	2.19	2.73	0.71	110.86	1.63	180.90	4.000	No	No	2.00
280	18.74	118.87	2.20	2.76	0.71	107.73	1.66	178.60	4.000	Yes	No	2.00
281	18.79	114.12	2.21	2.80	0.72	103.12	1.70	175.58	4.000	Yes	No	2.00
282	18.84	106.71	2.25	2.90	0.73	96.09	1.79	171.61	4.000	Yes	No	2.00
283	18.93	98.33	2.29	3.05	0.75	88.07	1.91	167.92	4.000	Yes	No	2.00
284	18.99	87.51	2.34	3.22	0.77	77.95	2.08	162.51	4.000	Yes	No	2.00
285	19.08	78.40	2.39	3.37	0.79	69.38	2.27	157.22	4.000	Yes	No	2.00
286	19.12	66.15	2.46	3.55	0.81	58.16	2.56	149.10	4.000	Yes	No	2.00
287	19.21	55.21	2.54	3.82	0.84	48.07	2.97	142.78	4.000	Yes	No	2.00
288	19.27	44.04	2.64	4.17	0.88	37.93	3.57	135.53	4.000	Yes	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	19.32	36.41	2.72	4.49	0.91	31.02	4.18	129.51	4.000	Yes	Yes	2.00
290	19.38	30.40	2.80	4.74	0.94	25.59	4.79	122.67	4.000	Yes	Yes	2.00
291	19.43	25.38	2.87	4.89	0.97	21.10	5.43	114.64	4.000	Yes	Yes	2.00
292	19.53	22.20	2.92	4.94	0.99	18.20	5.93	107.90	4.000	Yes	Yes	2.00
293	19.56	20.86	2.93	4.68	0.99	17.01	6.01	102.15	4.000	No	Yes	2.00
294	19.65	21.75	2.89	4.32	0.98	17.72	5.64	99.99	4.000	No	Yes	2.00
295	19.69	23.06	2.85	3.97	0.96	18.84	5.23	98.54	4.000	No	Yes	2.00
296	19.76	24.46	2.82	3.77	0.95	20.00	4.92	98.50	4.000	No	Yes	2.00
297	19.87	25.54	2.81	3.81	0.94	20.83	4.83	100.61	4.000	No	Yes	2.00
298	19.91	26.46	2.81	4.02	0.95	21.56	4.86	104.88	4.000	No	Yes	2.00
299	19.96	27.51	2.81	4.20	0.95	22.40	4.86	108.93	4.000	No	Yes	2.00
300	20.06	28.59	2.80	4.22	0.94	23.21	4.77	110.77	4.000	No	Yes	2.00
301	20.11	29.74	2.77	4.06	0.93	24.16	4.57	110.49	4.000	No	Yes	2.00
302	20.15	30.88	2.74	3.78	0.92	25.12	4.31	108.18	4.000	No	Yes	2.00
303	20.21	30.98	2.72	3.52	0.91	25.14	4.15	104.38	4.000	No	Yes	2.00
304	20.30	30.50	2.71	3.30	0.91	24.65	4.07	100.22	4.000	No	Yes	2.00
305	20.36	29.17	2.72	3.17	0.91	23.46	4.11	96.34	4.000	No	Yes	2.00
306	20.43	28.37	2.71	3.04	0.91	22.72	4.10	93.12	4.000	No	Yes	2.00
307	20.48	27.16	2.70	2.74	0.90	21.67	4.02	87.02	4.000	No	Yes	2.00
308	20.59	25.63	2.71	2.60	0.91	20.29	4.08	82.75	4.000	No	Yes	2.00
309	20.65	24.11	2.73	2.55	0.92	18.94	4.22	79.99	4.000	No	Yes	2.00
310	20.70	23.09	2.77	2.78	0.93	18.02	4.53	81.67	4.000	No	Yes	2.00
311	20.74	22.27	2.80	2.96	0.94	17.28	4.79	82.74	4.000	No	Yes	2.00
312	20.81	21.15	2.84	3.14	0.96	16.28	5.10	83.08	4.000	No	Yes	2.00
313	20.88	20.80	2.85	3.19	0.96	15.93	5.21	82.99	4.000	No	Yes	2.00
314	20.95	20.68	2.85	3.21	0.96	15.77	5.26	82.92	4.000	No	Yes	2.00
315	21.01	21.25	2.84	3.15	0.96	16.20	5.13	83.07	4.000	No	Yes	2.00
316	21.07	21.50	2.83	3.07	0.95	16.37	5.04	82.47	4.000	No	Yes	2.00
317	21.15	22.07	2.80	2.88	0.94	16.80	4.81	80.79	4.000	No	Yes	2.00
318	21.23	22.61	2.78	2.67	0.93	17.20	4.58	78.73	4.000	No	Yes	2.00
319	21.28	22.90	2.76	2.54	0.93	17.42	4.44	77.41	4.000	No	Yes	2.00
320	21.34	23.19	2.76	2.55	0.92	17.60	4.42	77.73	4.000	No	Yes	2.00
321	21.43	23.38	2.76	2.62	0.93	17.68	4.47	78.94	4.000	No	Yes	2.00
322	21.47	23.83	2.76	2.69	0.93	18.00	4.47	80.43	4.000	No	Yes	2.00
323	21.53	24.11	2.76	2.71	0.93	18.18	4.45	80.95	4.000	No	Yes	2.00
324	21.61	24.18	2.76	2.67	0.93	18.18	4.42	80.44	4.000	No	Yes	2.00
325	21.69	23.73	2.76	2.66	0.93	17.75	4.49	79.64	4.000	No	Yes	2.00
326	21.73	22.01	2.81	2.81	0.94	16.31	4.85	79.09	4.000	No	Yes	2.00
327	21.82	20.10	2.86	3.03	0.97	14.69	5.35	78.50	4.000	No	Yes	2.00
328	21.86	17.85	2.94	3.36	0.99	12.83	6.07	77.88	4.000	No	Yes	2.00
329	21.93	17.38	2.95	3.39	1.00	12.42	6.21	77.13	4.000	No	Yes	2.00
330	22.01	16.55	2.98	3.54	1.00	11.73	6.54	76.75	4.000	No	Yes	2.00
331	22.09	17.06	2.96	3.43	1.00	12.08	6.35	76.73	4.000	No	Yes	2.00
332	22.13	16.67	2.98	3.59	1.00	11.75	6.58	77.28	4.000	No	Yes	2.00
333	22.21	16.92	2.98	3.59	1.00	11.90	6.53	77.72	4.000	No	Yes	2.00
334	22.26	16.51	3.00	3.66	1.00	11.56	6.69	77.37	4.000	No	Yes	2.00
335	22.34	16.45	2.99	3.55	1.00	11.47	6.64	76.13	4.000	No	Yes	2.00
336	22.39	16.35	2.98	3.35	1.00	11.37	6.51	74.07	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
337	22.48	16.12	2.98	3.24	1.00	11.15	6.50	72.45	4.000	No	Yes	2.00
338	22.52	15.87	2.98	3.15	1.00	10.94	6.49	71.00	4.000	No	Yes	2.00
339	22.61	15.81	2.97	3.08	1.00	10.85	6.46	70.10	4.000	No	Yes	2.00
340	22.65	15.84	2.96	2.94	1.00	10.85	6.34	68.80	4.000	No	Yes	2.00
341	22.77	15.87	2.96	2.84	1.00	10.82	6.26	67.75	4.000	No	Yes	2.00
342	22.80	15.93	2.95	2.79	1.00	10.85	6.20	67.25	4.000	No	Yes	2.00
343	22.87	15.99	2.95	2.77	1.00	10.87	6.18	67.15	4.000	No	Yes	2.00
344	22.92	16.06	2.95	2.77	1.00	10.89	6.17	67.22	4.000	No	Yes	2.00
345	23.01	16.09	2.94	2.66	0.99	10.88	6.07	66.10	4.000	No	Yes	2.00
346	23.08	16.09	2.92	2.52	0.99	10.86	5.94	64.56	4.000	No	Yes	2.00
347	23.18	16.19	2.92	2.44	0.99	10.90	5.85	63.79	4.000	No	Yes	2.00
348	23.23	16.32	2.92	2.56	0.99	10.96	5.95	65.16	4.000	No	Yes	2.00
349	23.28	16.54	2.94	2.81	1.00	11.07	6.15	68.05	4.000	No	Yes	2.00
350	23.35	16.70	2.96	3.04	1.00	11.14	6.32	70.47	4.000	No	Yes	2.00
351	23.40	16.67	2.98	3.29	1.00	11.10	6.55	72.75	4.000	No	Yes	2.00
352	23.48	16.80	2.99	3.39	1.00	11.15	6.62	73.80	4.000	No	Yes	2.00
353	23.53	16.89	2.99	3.41	1.00	11.19	6.62	74.14	4.000	No	Yes	2.00
354	23.57	16.57	2.99	3.35	1.00	10.94	6.66	72.90	4.000	No	Yes	2.00
355	23.66	15.90	3.01	3.31	1.00	10.42	6.82	71.05	4.000	No	Yes	2.00
356	23.70	14.76	3.03	3.19	1.00	9.58	7.06	67.60	4.000	No	Yes	2.00
357	23.79	14.15	3.02	2.88	1.00	9.11	6.97	63.56	4.000	No	Yes	2.00
358	23.84	13.42	3.02	2.60	1.00	8.57	6.95	59.53	4.000	No	Yes	2.00
359	23.89	13.20	3.01	2.39	1.00	8.40	6.81	57.18	4.000	No	Yes	2.00
360	24.00	12.98	3.01	2.33	1.00	8.20	6.84	56.11	4.000	No	Yes	2.00
361	24.09	12.98	3.01	2.32	1.00	8.18	6.84	56.00	4.000	No	Yes	2.00
362	24.14	13.17	3.01	2.35	1.00	8.31	6.81	56.57	4.000	No	Yes	2.00
363	24.19	13.49	3.00	2.38	1.00	8.53	6.74	57.46	4.000	No	Yes	2.00
364	24.25	13.93	2.99	2.38	1.00	8.83	6.59	58.21	4.000	No	Yes	2.00
365	24.30	14.35	2.97	2.33	1.00	9.11	6.42	58.50	4.000	No	Yes	2.00
366	24.36	14.95	2.95	2.25	1.00	9.54	6.15	58.67	4.000	No	Yes	2.00
367	24.45	15.62	2.91	2.08	0.98	10.03	5.79	58.04	4.000	No	Yes	2.00
368	24.59	16.19	2.88	1.94	0.97	10.44	5.48	57.23	4.000	No	Yes	2.00
369	24.66	16.57	2.85	1.81	0.96	10.73	5.25	56.32	4.000	No	Yes	2.00
370	24.71	17.11	2.82	1.69	0.95	11.14	4.98	55.43	4.000	No	Yes	2.00
371	24.76	17.68	2.79	1.55	0.94	11.58	4.69	54.28	4.000	No	Yes	2.00
372	24.84	18.38	2.75	1.38	0.92	12.12	4.35	52.70	4.000	No	Yes	2.00
373	24.89	18.80	2.73	1.36	0.92	12.43	4.25	52.84	4.000	No	Yes	2.00
374	24.95	19.08	2.74	1.45	0.92	12.61	4.31	54.38	4.000	No	Yes	2.00
375	25.02	18.99	2.77	1.63	0.93	12.48	4.56	56.88	4.000	No	Yes	2.00
376	25.08	18.16	2.82	1.87	0.95	11.81	4.99	58.92	4.000	No	Yes	2.00
377	25.13	17.92	2.85	2.00	0.96	11.60	5.19	60.18	4.000	No	Yes	2.00
378	25.15	17.70	2.86	2.11	0.97	11.41	5.36	61.15	4.000	No	Yes	2.00
379	25.24	18.18	2.85	2.10	0.96	11.74	5.25	61.62	4.000	No	Yes	2.00
380	25.28	18.03	2.86	2.13	0.96	11.62	5.32	61.80	4.000	No	Yes	2.00
381	25.41	18.13	2.87	2.20	0.97	11.65	5.38	62.72	4.000	No	Yes	2.00
382	25.46	18.32	2.95	3.08	1.00	11.66	6.19	72.18	4.000	No	Yes	2.00
383	25.59	18.99	3.02	4.22	1.00	12.09	6.94	83.89	4.000	No	Yes	2.00
384	25.64	18.99	3.10	5.66	1.00	12.07	7.90	95.36	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
385	25.68	22.65	3.03	5.63	1.00	14.58	7.12	103.88	4.000	No	Yes	2.00
386	25.74	27.80	2.95	5.34	1.00	18.12	6.18	111.90	4.000	No	Yes	2.00
387	25.80	34.93	2.84	4.90	0.96	23.30	5.14	119.74	4.000	No	Yes	2.00
388	25.88	38.39	2.81	4.85	0.94	25.78	4.83	124.59	4.000	No	Yes	2.00
389	25.94	39.28	2.80	4.88	0.94	26.39	4.78	126.20	4.000	No	Yes	2.00
390	26.00	37.72	2.82	4.94	0.95	25.21	4.94	124.52	4.000	No	Yes	2.00
391	26.07	34.70	2.85	5.02	0.96	22.97	5.25	120.53	4.000	No	Yes	2.00
392	26.15	31.23	2.88	4.89	0.97	20.46	5.53	113.11	4.000	No	Yes	2.00
393	26.24	28.53	2.90	4.64	0.98	18.52	5.70	105.50	4.000	No	Yes	2.00
394	26.28	26.65	2.90	4.28	0.98	17.22	5.71	98.31	4.000	No	Yes	2.00
395	26.33	25.32	2.91	4.09	0.98	16.27	5.78	93.99	4.000	No	Yes	2.00
396	26.40	23.70	2.92	3.91	0.99	15.11	5.91	89.28	4.000	No	Yes	2.00
397	26.47	22.37	2.93	3.72	0.99	14.17	5.99	84.92	4.000	No	Yes	2.00
398	26.51	21.13	2.93	3.49	0.99	13.31	6.05	80.44	4.000	No	Yes	2.00
399	26.59	20.23	2.93	3.23	0.99	12.68	6.01	76.22	4.000	No	Yes	2.00
400	26.67	19.56	2.92	2.98	0.99	12.22	5.94	72.58	4.000	No	Yes	2.00
401	26.72	19.69	2.90	2.72	0.98	12.34	5.67	70.00	4.000	No	Yes	2.00
402	26.80	20.14	2.87	2.51	0.97	12.67	5.39	68.32	4.000	No	Yes	2.00
403	26.86	20.68	2.84	2.37	0.96	13.07	5.16	67.41	4.000	No	Yes	2.00
404	26.95	20.87	2.83	2.31	0.95	13.19	5.07	66.92	4.000	No	Yes	2.00
405	26.99	20.93	2.83	2.32	0.95	13.22	5.08	67.14	4.000	No	Yes	2.00
406	27.04	20.80	2.84	2.39	0.96	13.11	5.17	67.76	4.000	No	Yes	2.00
407	27.12	20.45	2.86	2.51	0.97	12.81	5.36	68.64	4.000	No	Yes	2.00
408	27.21	19.88	2.89	2.64	0.98	12.36	5.60	69.20	4.000	No	Yes	2.00
409	27.25	19.38	2.91	2.72	0.98	11.98	5.78	69.27	4.000	No	Yes	2.00
410	27.36	19.19	2.91	2.74	0.99	11.82	5.84	69.04	4.000	No	Yes	2.00
411	27.40	19.22	2.91	2.66	0.98	11.84	5.76	68.23	4.000	No	Yes	2.00
412	27.47	19.28	2.88	2.44	0.97	11.90	5.55	66.01	4.000	No	Yes	2.00
413	27.52	19.22	2.84	1.99	0.96	11.93	5.09	60.72	4.000	No	Yes	2.00
414	27.59	19.19	2.78	1.54	0.93	11.99	4.58	54.86	4.000	No	Yes	2.00
415	27.65	19.09	2.73	1.23	0.91	11.99	4.19	50.22	4.000	No	Yes	2.00
416	27.71	19.06	2.72	1.19	0.91	11.96	4.15	49.65	4.000	No	Yes	2.00
417	27.77	18.99	2.73	1.23	0.92	11.89	4.21	50.11	4.000	No	Yes	2.00
418	27.82	19.06	2.73	1.26	0.92	11.92	4.25	50.62	4.000	No	Yes	2.00
419	27.90	19.18	2.75	1.34	0.92	11.97	4.34	51.93	4.000	No	Yes	2.00
420	27.96	19.66	2.76	1.51	0.93	12.25	4.48	54.85	4.000	No	Yes	2.00
421	28.05	20.23	2.78	1.70	0.93	12.60	4.60	57.96	4.000	No	Yes	2.00
422	28.09	21.67	2.80	2.05	0.94	13.53	4.75	64.23	4.000	No	Yes	2.00
423	28.20	22.97	2.82	2.44	0.95	14.34	4.93	70.68	4.000	No	Yes	2.00
424	28.24	24.60	2.85	3.08	0.96	15.35	5.25	80.57	4.000	No	Yes	2.00
425	28.31	26.60	2.86	3.51	0.96	16.65	5.30	88.29	4.000	No	Yes	2.00
426	28.36	31.24	2.80	3.50	0.94	19.89	4.76	94.78	4.000	No	Yes	2.00
427	28.42	36.46	2.73	3.32	0.91	23.61	4.19	98.84	4.000	No	Yes	2.00
428	28.49	40.17	2.69	3.32	0.90	26.21	3.93	103.05	4.000	No	Yes	2.00
429	28.62	40.35	2.71	3.56	0.91	26.20	4.07	106.74	4.000	No	Yes	2.00
430	28.66	39.27	2.74	3.80	0.92	25.34	4.30	108.90	4.000	No	Yes	2.00
431	28.70	38.22	2.76	3.90	0.93	24.55	4.44	108.95	4.000	No	Yes	2.00
432	28.76	37.96	2.76	3.87	0.93	24.35	4.44	108.11	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
433	28.81	37.93	2.75	3.77	0.92	24.33	4.38	106.61	4.000	No	Yes	2.00
434	28.88	38.31	2.74	3.69	0.92	24.59	4.31	105.95	4.000	No	Yes	2.00
435	28.97	38.72	2.74	3.65	0.92	24.84	4.26	105.88	4.000	No	Yes	2.00
436	29.00	39.33	2.73	3.66	0.92	25.25	4.22	106.66	4.000	No	Yes	2.00
437	29.08	40.00	2.73	3.66	0.91	25.68	4.18	107.40	4.000	No	Yes	2.00
438	29.15	40.79	2.72	3.67	0.91	26.20	4.14	108.45	4.000	No	Yes	2.00
439	29.23	41.75	2.71	3.69	0.91	26.82	4.09	109.71	4.000	No	Yes	2.00
440	29.35	42.51	2.71	3.68	0.91	27.29	4.05	110.44	4.000	No	Yes	2.00
441	29.39	43.02	2.70	3.67	0.90	27.64	4.01	110.78	4.000	No	Yes	2.00
442	29.43	42.51	2.71	3.69	0.91	27.25	4.06	110.54	4.000	No	Yes	2.00
443	29.50	41.78	2.72	3.71	0.91	26.69	4.12	109.86	4.000	No	Yes	2.00
444	29.55	41.02	2.72	3.68	0.91	26.14	4.15	108.55	4.000	No	Yes	2.00
445	29.63	40.92	2.71	3.59	0.91	26.07	4.10	106.98	4.000	No	Yes	2.00
446	29.68	41.34	2.69	3.39	0.90	26.39	3.96	104.43	4.000	No	Yes	2.00
447	29.76	42.19	2.68	3.28	0.90	26.99	3.83	103.50	4.000	No	Yes	2.00
448	29.86	43.21	2.67	3.27	0.89	27.66	3.77	104.36	4.000	No	Yes	2.00
449	29.91	43.88	2.68	3.43	0.90	28.04	3.84	107.53	4.000	No	Yes	2.00
450	29.95	44.39	2.69	3.63	0.90	28.30	3.93	111.29	4.000	No	Yes	2.00
451	30.02	44.84	2.70	3.83	0.91	28.51	4.02	114.73	4.000	No	Yes	2.00
452	30.06	45.22	2.72	4.07	0.91	28.67	4.14	118.76	4.000	No	Yes	2.00
453	30.14	45.86	2.73	4.23	0.91	29.01	4.20	121.81	4.000	No	Yes	2.00
454	30.20	46.46	2.72	4.17	0.91	29.41	4.13	121.61	4.000	No	Yes	2.00
455	30.26	46.94	2.70	3.94	0.90	29.78	3.98	118.63	4.000	No	Yes	2.00
456	30.33	46.42	2.70	3.86	0.90	29.42	3.97	116.72	4.000	No	Yes	2.00
457	30.41	45.82	2.71	3.93	0.91	28.93	4.05	117.02	4.000	No	Yes	2.00
458	30.45	45.28	2.72	4.01	0.91	28.50	4.12	117.57	4.000	No	Yes	2.00
459	30.54	45.09	2.71	3.94	0.91	28.34	4.10	116.22	4.000	No	Yes	2.00
460	30.59	44.81	2.71	3.90	0.91	28.13	4.10	115.26	4.000	No	Yes	2.00
461	30.65	43.95	2.73	3.99	0.91	27.48	4.20	115.53	4.000	No	Yes	2.00
462	30.71	43.69	2.73	4.03	0.92	27.26	4.24	115.65	4.000	No	Yes	2.00
463	30.80	44.14	2.72	3.96	0.91	27.54	4.18	115.12	4.000	No	Yes	2.00
464	30.85	45.54	2.70	3.81	0.91	28.52	4.02	114.53	4.000	No	Yes	2.00
465	30.93	46.01	2.70	3.79	0.90	28.81	3.98	114.63	4.000	No	Yes	2.00
466	30.99	45.63	2.71	3.84	0.91	28.50	4.03	114.98	4.000	No	Yes	2.00
467	31.06	44.90	2.72	3.90	0.91	27.93	4.11	114.86	4.000	No	Yes	2.00
468	31.11	44.70	2.71	3.84	0.91	27.80	4.09	113.74	4.000	No	Yes	2.00
469	31.19	44.80	2.71	3.77	0.91	27.84	4.05	112.66	4.000	No	Yes	2.00
470	31.28	44.92	2.70	3.72	0.91	27.90	4.01	112.00	4.000	No	Yes	2.00
471	31.37	44.86	2.71	3.76	0.91	27.79	4.04	112.39	4.000	No	Yes	2.00
472	31.46	44.64	2.71	3.82	0.91	27.57	4.10	113.01	4.000	No	Yes	2.00
473	31.52	44.42	2.72	3.89	0.91	27.36	4.16	113.76	4.000	No	Yes	2.00
474	31.59	44.17	2.73	3.95	0.91	27.14	4.21	114.22	4.000	No	Yes	2.00
475	31.63	44.09	2.73	4.01	0.92	27.04	4.26	115.09	4.000	No	Yes	2.00
476	31.72	43.93	2.74	4.08	0.92	26.86	4.31	115.78	4.000	No	Yes	2.00
477	31.76	43.96	2.74	4.12	0.92	26.85	4.33	116.31	4.000	No	Yes	2.00
478	31.85	44.01	2.74	4.11	0.92	26.83	4.33	116.22	4.000	No	Yes	2.00
479	31.89	44.23	2.74	4.09	0.92	26.97	4.30	116.08	4.000	No	Yes	2.00
480	31.99	44.39	2.74	4.08	0.92	27.03	4.29	115.99	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
481	32.02	44.55	2.74	4.07	0.92	27.12	4.28	116.01	4.000	No	Yes	2.00
482	32.09	44.90	2.73	4.01	0.92	27.34	4.23	115.58	4.000	No	Yes	2.00
483	32.20	44.90	2.73	3.96	0.91	27.30	4.20	114.72	4.000	No	Yes	2.00
484	32.24	44.51	2.73	3.92	0.91	27.03	4.20	113.59	4.000	No	Yes	2.00
485	32.31	43.40	2.74	3.97	0.92	26.23	4.31	112.99	4.000	No	Yes	2.00
486	32.38	42.29	2.76	4.06	0.93	25.43	4.44	112.79	4.000	No	Yes	2.00
487	32.42	41.30	2.77	4.10	0.93	24.74	4.53	112.09	4.000	No	Yes	2.00
488	32.52	40.63	2.77	4.08	0.93	24.25	4.57	110.90	4.000	No	Yes	2.00
489	32.58	39.96	2.78	4.06	0.93	23.79	4.61	109.75	4.000	No	Yes	2.00
490	32.64	39.59	2.79	4.09	0.94	23.50	4.66	109.58	4.000	No	Yes	2.00
491	32.73	39.27	2.79	4.15	0.94	23.24	4.73	109.86	4.000	No	Yes	2.00
492	32.79	39.27	2.80	4.18	0.94	23.20	4.75	110.24	4.000	No	Yes	2.00
493	32.84	39.24	2.80	4.20	0.94	23.14	4.77	110.46	4.000	No	Yes	2.00
494	32.90	39.14	2.80	4.23	0.94	23.05	4.80	110.64	4.000	No	Yes	2.00
495	32.95	38.66	2.80	4.10	0.94	22.75	4.76	108.26	4.000	No	Yes	2.00
496	33.06	38.06	2.79	3.93	0.94	22.35	4.71	105.19	4.000	No	Yes	2.00
497	33.10	37.58	2.79	3.84	0.94	22.05	4.69	103.37	4.000	No	Yes	2.00
498	33.16	37.46	2.80	3.96	0.94	21.91	4.78	104.74	4.000	No	Yes	2.00
499	33.21	37.37	2.81	4.07	0.95	21.79	4.87	106.03	4.000	No	Yes	2.00
500	33.30	37.24	2.81	4.07	0.95	21.67	4.88	105.73	4.000	No	Yes	2.00
501	33.35	35.62	2.83	4.12	0.95	20.58	5.06	104.14	4.000	No	Yes	2.00
502	33.44	34.40	2.85	4.15	0.96	19.75	5.20	102.75	4.000	No	Yes	2.00
503	33.47	34.09	2.84	4.01	0.96	19.58	5.14	100.58	4.000	No	Yes	2.00
504	33.55	35.23	2.81	3.73	0.94	20.36	4.85	98.65	4.000	No	Yes	2.00
505	33.60	35.68	2.78	3.50	0.94	20.70	4.65	96.34	4.000	No	Yes	2.00
506	33.71	35.20	2.79	3.46	0.94	20.36	4.67	95.08	4.000	No	Yes	2.00
507	33.76	34.66	2.79	3.45	0.94	19.98	4.72	94.24	4.000	No	Yes	2.00
508	33.81	34.37	2.80	3.52	0.94	19.76	4.80	94.83	4.000	No	Yes	2.00
509	33.90	34.18	2.81	3.63	0.95	19.57	4.90	95.84	4.000	No	Yes	2.00
510	33.95	34.05	2.83	3.76	0.95	19.43	5.00	97.22	4.000	No	Yes	2.00
511	34.01	33.86	2.84	3.86	0.96	19.26	5.09	98.10	4.000	No	Yes	2.00
512	34.06	33.19	2.85	4.01	0.96	18.77	5.27	98.90	4.000	No	Yes	2.00
513	34.16	32.27	2.88	4.16	0.97	18.11	5.47	99.16	4.000	No	Yes	2.00
514	34.25	31.38	2.90	4.31	0.98	17.48	5.68	99.38	4.000	No	Yes	2.00
515	34.30	30.87	2.91	4.42	0.98	17.12	5.82	99.63	4.000	No	Yes	2.00
516	34.36	30.65	2.93	4.60	0.99	16.93	5.97	101.04	4.000	No	Yes	2.00
517	34.43	30.68	2.94	4.72	0.99	16.90	6.05	102.23	4.000	No	Yes	2.00
518	34.47	33.07	2.88	4.38	0.97	18.46	5.55	102.46	4.000	No	Yes	2.00
519	34.56	37.20	2.80	3.78	0.94	21.22	4.76	101.00	4.000	No	Yes	2.00
520	34.60	39.67	2.74	3.42	0.92	22.91	4.33	99.11	4.000	No	Yes	2.00
521	34.70	38.43	2.76	3.46	0.93	22.05	4.45	98.22	4.000	No	Yes	2.00
522	34.77	35.46	2.79	3.42	0.94	20.13	4.67	94.08	4.000	No	Yes	2.00
523	34.82	33.84	2.79	3.26	0.94	19.12	4.72	90.16	4.000	No	Yes	2.00
524	34.86	33.74	2.78	3.07	0.93	19.10	4.58	87.50	4.000	No	Yes	2.00
525	34.96	34.32	2.78	3.17	0.93	19.40	4.61	89.42	4.000	No	Yes	2.00
526	35.08	35.21	2.78	3.25	0.93	19.90	4.60	91.47	4.000	No	Yes	2.00
527	35.14	36.07	2.77	3.28	0.93	20.43	4.54	92.76	4.000	No	Yes	2.00
528	35.17	36.26	2.77	3.33	0.93	20.52	4.56	93.65	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
529	35.18	36.39	2.78	3.42	0.93	20.57	4.62	95.02	4.000	No	Yes	2.00
530	35.26	36.77	2.78	3.50	0.94	20.75	4.64	96.34	4.000	No	Yes	2.00
531	35.34	37.44	2.78	3.52	0.93	21.14	4.61	97.38	4.000	No	Yes	2.00
532	35.39	38.39	2.76	3.45	0.93	21.76	4.48	97.52	4.000	No	Yes	2.00
533	35.48	39.19	2.75	3.36	0.92	22.26	4.37	97.19	4.000	No	Yes	2.00
534	35.52	39.66	2.74	3.34	0.92	22.56	4.31	97.31	4.000	No	Yes	2.00
535	35.57	39.60	2.75	3.40	0.92	22.47	4.37	98.10	4.000	No	Yes	2.00
536	35.66	39.44	2.76	3.47	0.93	22.31	4.43	98.73	4.000	No	Yes	2.00
537	35.70	39.12	2.75	3.41	0.92	22.11	4.41	97.53	4.000	No	Yes	2.00
538	35.80	39.03	2.75	3.30	0.92	22.05	4.35	95.88	4.000	No	Yes	2.00
539	35.89	38.87	2.74	3.21	0.92	21.95	4.30	94.45	4.000	No	Yes	2.00
540	35.94	38.96	2.74	3.24	0.92	21.97	4.32	94.87	4.000	No	Yes	2.00
541	36.00	39.06	2.74	3.27	0.92	22.00	4.33	95.35	4.000	No	Yes	2.00
542	36.05	38.39	2.76	3.37	0.93	21.52	4.46	95.96	4.000	No	Yes	2.00
543	36.09	37.63	2.78	3.47	0.93	20.99	4.59	96.40	4.000	No	Yes	2.00
544	36.20	36.74	2.80	3.57	0.94	20.35	4.74	96.52	4.000	No	Yes	2.00
545	36.27	36.42	2.80	3.58	0.94	20.12	4.79	96.31	4.000	No	Yes	2.00
546	36.32	35.94	2.81	3.61	0.95	19.79	4.85	96.02	4.000	No	Yes	2.00
547	36.36	35.21	2.82	3.64	0.95	19.31	4.94	95.47	4.000	No	Yes	2.00
548	36.43	34.09	2.83	3.65	0.95	18.59	5.06	94.07	4.000	No	Yes	2.00
549	36.53	33.01	2.84	3.63	0.96	17.89	5.16	92.35	4.000	No	Yes	2.00
550	36.57	32.09	2.85	3.56	0.96	17.33	5.22	90.39	4.000	No	Yes	2.00
551	36.65	31.52	2.85	3.50	0.96	16.96	5.24	88.93	4.000	No	Yes	2.00
552	36.72	31.14	2.85	3.47	0.96	16.71	5.26	87.94	4.000	No	Yes	2.00
553	36.77	31.01	2.86	3.46	0.96	16.62	5.28	87.71	4.000	No	Yes	2.00
554	36.81	31.80	2.84	3.43	0.96	17.10	5.16	88.29	4.000	No	Yes	2.00
555	36.90	32.91	2.83	3.39	0.95	17.78	5.02	89.21	4.000	No	Yes	2.00
556	36.99	34.28	2.81	3.34	0.95	18.61	4.85	90.25	4.000	No	Yes	2.00
557	37.03	35.56	2.79	3.32	0.94	19.40	4.71	91.41	4.000	No	Yes	2.00
558	37.07	36.58	2.78	3.36	0.94	20.00	4.66	93.11	4.000	No	Yes	2.00
559	37.16	37.88	2.78	3.45	0.93	20.75	4.61	95.73	4.000	No	Yes	2.00
560	37.25	38.99	2.78	3.59	0.93	21.36	4.62	98.68	4.000	No	Yes	2.00
561	37.29	40.20	2.78	3.71	0.93	22.05	4.61	101.66	4.000	No	Yes	2.00
562	37.38	41.06	2.78	3.79	0.93	22.51	4.61	103.68	4.000	No	Yes	2.00
563	37.43	41.63	2.78	3.87	0.93	22.82	4.61	105.29	4.000	No	Yes	2.00
564	37.49	42.26	2.78	3.91	0.93	23.18	4.60	106.53	4.000	No	Yes	2.00
565	37.59	42.96	2.77	3.93	0.93	23.56	4.56	107.47	4.000	No	Yes	2.00
566	37.64	43.53	2.77	3.92	0.93	23.89	4.52	108.06	4.000	No	Yes	2.00
567	37.69	43.63	2.77	3.92	0.93	23.93	4.52	108.10	4.000	No	Yes	2.00
568	37.77	43.19	2.78	3.97	0.93	23.60	4.58	108.18	4.000	No	Yes	2.00
569	37.82	42.52	2.79	4.06	0.94	23.14	4.69	108.53	4.000	No	Yes	2.00
570	37.88	42.11	2.80	4.13	0.94	22.84	4.76	108.80	4.000	No	Yes	2.00
571	37.95	41.82	2.79	3.94	0.94	22.70	4.67	105.99	4.000	No	Yes	2.00
572	38.07	41.53	2.78	3.84	0.94	22.50	4.64	104.37	4.000	No	Yes	2.00
573	38.18	41.31	2.78	3.75	0.93	22.35	4.60	102.82	4.000	No	Yes	2.00
574	38.26	40.93	2.79	3.91	0.94	22.03	4.73	104.30	4.000	No	Yes	2.00
575	38.32	41.10	2.79	3.88	0.94	22.13	4.70	104.07	4.000	No	Yes	2.00
576	38.39	40.66	2.80	3.90	0.94	21.82	4.76	103.77	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
577	38.46	41.07	2.79	3.85	0.94	22.06	4.69	103.55	4.000	No	Yes	2.00
578	38.55	41.18	2.79	3.84	0.94	22.10	4.69	103.57	4.000	No	Yes	2.00
579	38.59	41.47	2.78	3.82	0.94	22.26	4.65	103.56	4.000	No	Yes	2.00
580	38.68	40.96	2.79	3.89	0.94	21.89	4.74	103.76	4.000	No	Yes	2.00
581	38.74	40.20	2.81	3.99	0.95	21.37	4.87	104.05	4.000	No	Yes	2.00
582	38.78	39.60	2.82	4.07	0.95	20.96	4.98	104.30	4.000	No	Yes	2.00
583	38.86	38.77	2.83	4.12	0.96	20.42	5.08	103.81	4.000	No	Yes	2.00
584	38.94	38.20	2.84	4.12	0.96	20.05	5.14	102.99	4.000	No	Yes	2.00
585	38.99	37.85	2.84	4.09	0.96	19.83	5.15	102.09	4.000	No	Yes	2.00
586	39.05	38.07	2.83	4.01	0.96	19.96	5.08	101.44	4.000	No	Yes	2.00
587	39.12	38.39	2.82	3.90	0.95	20.16	4.98	100.50	4.000	No	Yes	2.00
588	39.20	38.77	2.81	3.78	0.95	20.40	4.87	99.43	4.000	No	Yes	2.00
589	39.27	39.31	2.79	3.64	0.94	20.75	4.74	98.27	4.000	No	Yes	2.00
590	39.34	39.69	2.78	3.55	0.94	20.99	4.65	97.54	4.000	No	Yes	2.00
591	39.45	40.07	2.78	3.52	0.93	21.19	4.60	97.42	4.000	No	Yes	2.00
592	39.51	40.20	2.78	3.53	0.93	21.24	4.60	97.73	4.000	No	Yes	2.00
593	39.56	40.39	2.78	3.54	0.93	21.33	4.60	98.03	4.000	No	Yes	2.00
594	39.64	40.49	2.78	3.53	0.93	21.36	4.58	97.94	4.000	No	Yes	2.00
595	39.69	40.55	2.77	3.47	0.93	21.40	4.54	97.22	4.000	No	Yes	2.00
596	39.81	40.33	2.77	3.46	0.93	21.23	4.56	96.78	4.000	No	Yes	2.00
597	39.87	39.98	2.78	3.48	0.93	20.99	4.60	96.56	4.000	No	Yes	2.00
598	39.92	39.03	2.80	3.61	0.94	20.35	4.77	97.11	4.000	No	Yes	2.00
599	40.06	36.29	2.85	3.93	0.96	18.57	5.25	97.49	4.000	No	Yes	2.00
600	40.08	35.27	2.88	4.09	0.97	17.92	5.46	97.84	4.000	No	Yes	2.00
601	40.13	34.57	2.89	4.21	0.98	17.46	5.63	98.21	4.000	No	Yes	2.00
602	40.18	35.43	2.88	4.13	0.97	17.97	5.48	98.48	4.000	No	Yes	2.00
603	40.26	34.29	2.90	4.28	0.98	17.24	5.71	98.41	4.000	No	Yes	2.00
604	40.30	32.35	2.92	4.27	0.99	16.10	5.93	95.53	4.000	No	Yes	2.00
605	40.39	30.60	2.93	4.06	0.99	15.10	6.01	90.78	4.000	No	Yes	2.00
606	40.43	28.78	2.93	3.72	0.99	14.13	6.00	84.79	4.000	No	Yes	2.00
607	40.52	27.86	2.93	3.48	0.99	13.62	5.95	81.10	4.000	No	Yes	2.00
608	40.56	26.68	2.94	3.41	0.99	12.95	6.08	78.73	4.000	No	Yes	2.00
609	40.64	25.67	2.95	3.41	1.00	12.36	6.25	77.25	4.000	No	Yes	2.00
610	40.69	24.24	2.98	3.46	1.00	11.59	6.53	75.64	4.000	No	Yes	2.00
611	40.79	23.35	3.00	3.48	1.00	11.10	6.71	74.50	4.000	No	Yes	2.00
612	40.82	22.36	3.02	3.54	1.00	10.57	6.95	73.46	4.000	No	Yes	2.00
613	40.89	22.01	3.02	3.53	1.00	10.37	7.02	72.85	4.000	No	Yes	2.00
614	40.96	21.06	3.05	3.57	1.00	9.86	7.26	71.59	4.000	No	Yes	2.00
615	41.05	20.04	3.07	3.59	1.00	9.30	7.52	69.99	4.000	No	Yes	2.00
616	41.09	18.76	3.10	3.67	1.00	8.62	7.92	68.28	4.000	No	Yes	2.00
617	41.14	18.28	3.10	3.58	1.00	8.36	7.98	66.74	4.000	No	Yes	2.00
618	41.23	18.00	3.10	3.49	1.00	8.20	7.99	65.49	4.000	No	Yes	2.00
619	41.28	18.19	3.08	3.25	1.00	8.29	7.73	64.08	4.000	No	Yes	2.00
620	41.36	18.16	3.08	3.17	1.00	8.27	7.66	63.31	4.000	No	Yes	2.00
621	41.45	18.41	3.07	3.07	1.00	8.39	7.51	62.98	4.000	No	Yes	2.00
622	41.47	18.35	3.07	3.11	1.00	8.35	7.56	63.15	4.000	No	Yes	2.00
623	41.60	18.89	3.05	3.03	1.00	8.62	7.35	63.31	4.000	No	Yes	2.00
624	41.65	19.68	3.03	2.93	1.00	9.02	7.06	63.68	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
625	41.71	20.86	2.99	2.81	1.00	9.63	6.69	64.39	4.000	No	Yes	2.00
626	41.76	22.96	2.95	2.72	1.00	10.73	6.18	66.33	4.000	No	Yes	2.00
627	41.82	24.36	2.95	2.98	1.00	11.46	6.17	70.66	4.000	No	Yes	2.00
628	41.88	25.32	2.97	3.42	1.00	11.93	6.39	76.21	4.000	No	Yes	2.00
629	41.93	25.06	3.02	4.06	1.00	11.79	6.93	81.64	4.000	No	Yes	2.00
630	42.01	25.70	3.03	4.47	1.00	12.10	7.11	86.08	4.000	No	Yes	2.00
631	42.07	29.35	2.97	4.33	1.00	14.00	6.46	90.46	4.000	No	Yes	2.00
632	42.15	32.34	2.93	4.25	0.99	15.60	6.02	93.97	4.000	No	Yes	2.00
633	42.24	36.22	2.87	3.93	0.97	17.87	5.37	95.97	4.000	No	Yes	2.00
634	42.27	33.70	2.91	4.20	0.99	16.35	5.83	95.35	4.000	No	Yes	2.00
635	42.38	30.76	2.97	4.50	1.00	14.65	6.41	93.96	4.000	No	Yes	2.00
636	42.41	26.21	3.07	5.15	1.00	12.28	7.51	92.20	4.000	No	Yes	2.00
637	42.47	25.06	3.08	5.07	1.00	11.68	7.66	89.48	4.000	No	Yes	2.00
638	42.55	24.61	3.06	4.69	1.00	11.43	7.49	85.66	4.000	No	Yes	2.00
639	42.61	24.55	3.04	4.22	1.00	11.39	7.18	81.71	4.000	No	Yes	2.00
640	42.68	24.39	3.02	3.95	1.00	11.29	7.01	79.14	4.000	No	Yes	2.00
641	42.72	24.49	3.01	3.73	1.00	11.33	6.83	77.37	4.000	No	Yes	2.00
642	42.80	24.68	2.98	3.40	1.00	11.42	6.54	74.65	4.000	No	Yes	2.00
643	42.85	25.03	2.91	2.66	0.98	11.70	5.81	67.94	4.000	No	Yes	2.00
644	42.94	25.22	2.84	2.07	0.96	11.97	5.16	61.77	4.000	No	Yes	2.00
645	42.98	25.25	2.80	1.77	0.94	12.09	4.80	58.08	4.000	No	Yes	2.00
646	43.07	25.28	2.83	1.97	0.95	12.01	5.04	60.60	4.000	No	Yes	2.00
647	43.13	25.28	2.86	2.21	0.96	11.92	5.31	63.29	4.000	No	Yes	2.00
648	43.18	25.25	2.89	2.45	0.98	11.82	5.58	65.93	4.000	No	Yes	2.00
649	43.28	25.22	2.91	2.66	0.98	11.72	5.80	68.01	4.000	No	Yes	2.00
650	43.31	25.00	2.94	2.89	0.99	11.53	6.07	69.94	4.000	No	Yes	2.00
651	43.38	24.49	2.96	3.08	1.00	11.21	6.34	71.10	4.000	No	Yes	2.00
652	43.45	23.79	2.99	3.28	1.00	10.84	6.64	71.97	4.000	No	Yes	2.00
653	43.53	23.28	3.00	3.34	1.00	10.57	6.79	71.74	4.000	No	Yes	2.00
654	43.58	23.05	3.00	3.25	1.00	10.45	6.76	70.63	4.000	No	Yes	2.00
655	43.64	23.02	2.99	3.05	1.00	10.42	6.59	68.71	4.000	No	Yes	2.00
656	43.73	23.15	2.97	2.88	1.00	10.47	6.42	67.19	4.000	No	Yes	2.00
657	43.77	23.66	2.95	2.72	1.00	10.74	6.18	66.31	4.000	No	Yes	2.00
658	43.86	24.74	2.92	2.63	0.99	11.35	5.89	66.79	4.000	No	Yes	2.00
659	43.92	26.78	2.88	2.57	0.97	12.49	5.50	68.67	4.000	No	Yes	2.00
660	43.99	29.73	2.83	2.49	0.95	14.18	5.01	71.11	4.000	No	Yes	2.00
661	44.04	33.26	2.78	2.49	0.93	16.19	4.61	74.65	4.000	No	Yes	2.00
662	44.11	36.95	2.73	2.47	0.92	18.32	4.25	77.81	4.000	No	Yes	2.00
663	44.17	40.83	2.70	2.57	0.91	20.51	4.03	82.63	4.000	No	Yes	2.00
664	44.25	45.99	2.67	2.64	0.89	23.47	3.75	88.06	4.000	No	Yes	2.00
665	44.34	50.79	2.64	2.73	0.88	26.21	3.56	93.30	4.000	No	Yes	2.00
666	44.42	54.58	2.61	2.76	0.87	28.40	3.40	96.63	4.000	No	Yes	2.00
667	44.47	56.10	2.61	2.80	0.87	29.25	3.37	98.52	4.000	No	Yes	2.00
668	44.52	56.77	2.61	2.85	0.87	29.59	3.38	99.88	4.000	No	Yes	2.00
669	44.56	56.83	2.62	2.99	0.87	29.51	3.47	102.24	4.000	No	Yes	2.00
670	44.65	56.80	2.64	3.14	0.88	29.34	3.57	104.60	4.000	No	Yes	2.00
671	44.70	56.64	2.65	3.26	0.89	29.14	3.65	106.39	4.000	No	Yes	2.00
672	44.75	56.67	2.65	3.22	0.88	29.16	3.63	105.74	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
673	44.82	56.70	2.64	3.15	0.88	29.19	3.58	104.63	4.000	No	Yes	2.00
674	44.91	56.39	2.64	3.13	0.88	28.98	3.59	104.02	4.000	No	Yes	2.00
675	44.96	55.43	2.66	3.23	0.89	28.33	3.70	104.74	4.000	No	Yes	2.00
676	45.02	53.43	2.68	3.36	0.90	27.06	3.88	104.98	4.000	No	Yes	2.00
677	45.08	50.76	2.71	3.48	0.91	25.42	4.10	104.30	4.000	No	Yes	2.00
678	45.18	48.40	2.74	3.57	0.92	23.99	4.30	103.20	4.000	No	Yes	2.00
679	45.22	46.91	2.71	3.10	0.91	23.36	4.07	95.17	4.000	No	Yes	2.00
680	45.31	46.24	2.64	2.36	0.88	23.39	3.56	83.31	4.000	No	Yes	2.00
681	45.34	45.76	2.58	1.88	0.86	23.48	3.19	74.92	0.119	No	No	0.18
682	45.43	45.35	2.59	1.96	0.86	23.14	3.28	75.89	0.121	No	No	0.19
683	45.48	45.38	2.63	2.28	0.88	22.89	3.55	81.20	4.000	No	Yes	2.00
684	45.57	45.61	2.64	2.33	0.88	22.95	3.58	82.18	4.000	No	Yes	2.00
685	45.62	45.85	2.65	2.39	0.88	23.03	3.62	83.34	4.000	No	Yes	2.00
686	45.69	45.88	2.66	2.48	0.89	22.97	3.68	84.65	4.000	No	Yes	2.00
687	45.74	45.78	2.67	2.61	0.89	22.81	3.79	86.54	4.000	No	Yes	2.00
688	45.80	45.73	2.69	2.78	0.90	22.66	3.93	89.03	4.000	No	Yes	2.00
689	45.87	45.86	2.71	2.97	0.91	22.60	4.07	91.92	4.000	No	Yes	2.00
690	45.96	45.83	2.73	3.14	0.91	22.45	4.20	94.31	4.000	No	Yes	2.00
691	46.01	45.61	2.74	3.27	0.92	22.25	4.31	95.77	4.000	No	Yes	2.00
692	46.07	44.91	2.76	3.37	0.93	21.78	4.43	96.51	4.000	No	Yes	2.00
693	46.14	43.63	2.78	3.52	0.94	20.97	4.63	97.10	4.000	No	Yes	2.00
694	46.25	42.36	2.81	3.67	0.94	20.16	4.83	97.49	4.000	No	Yes	2.00
695	46.27	41.16	2.82	3.76	0.95	19.45	5.00	97.23	4.000	No	Yes	2.00
696	46.37	40.58	2.83	3.74	0.95	19.11	5.04	96.24	4.000	No	Yes	2.00
697	46.41	40.23	2.82	3.63	0.95	18.95	4.99	94.54	4.000	No	Yes	2.00
698	46.49	40.11	2.82	3.53	0.95	18.89	4.93	93.22	4.000	No	Yes	2.00
699	46.54	39.89	2.82	3.48	0.95	18.78	4.91	92.28	4.000	No	Yes	2.00
700	46.62	39.50	2.82	3.49	0.95	18.53	4.96	91.96	4.000	No	Yes	2.00
701	46.66	39.06	2.82	3.46	0.95	18.28	4.99	91.17	4.000	No	Yes	2.00
702	46.74	38.51	2.82	3.41	0.95	17.98	5.00	89.87	4.000	No	Yes	2.00
703	46.81	38.10	2.82	3.34	0.95	17.76	4.99	88.60	4.000	No	Yes	2.00
704	46.86	37.81	2.83	3.32	0.95	17.60	5.00	88.02	4.000	No	Yes	2.00
705	46.94	37.91	2.82	3.32	0.95	17.63	4.99	88.02	4.000	No	Yes	2.00
706	47.02	38.07	2.82	3.31	0.95	17.70	4.97	88.04	4.000	No	Yes	2.00
707	47.07	38.55	2.82	3.30	0.95	17.95	4.92	88.38	4.000	No	Yes	2.00
708	47.15	39.21	2.81	3.34	0.95	18.27	4.90	89.54	4.000	No	Yes	2.00
709	47.20	40.07	2.82	3.45	0.95	18.68	4.91	91.81	4.000	No	Yes	2.00
710	47.25	40.68	2.84	3.86	0.96	18.84	5.16	97.17	4.000	No	Yes	2.00
711	47.36	41.64	2.87	4.33	0.97	19.15	5.41	103.52	4.000	Yes	Yes	2.00
712	47.41	47.55	2.85	4.74	0.96	22.18	5.20	115.29	4.000	Yes	Yes	2.00
713	47.50	58.65	2.77	4.72	0.93	28.20	4.53	127.63	4.000	Yes	Yes	2.00
714	47.56	74.74	2.65	4.24	0.88	37.43	3.63	135.96	4.000	Yes	Yes	2.00
715	47.63	89.75	2.51	3.34	0.83	46.90	2.80	131.14	4.000	Yes	No	2.00
716	47.67	98.82	2.41	2.76	0.79	53.05	2.35	124.78	4.000	Yes	No	2.00
717	47.72	94.90	2.43	2.82	0.80	50.58	2.44	123.50	4.000	Yes	No	2.00
718	47.79	93.57	2.46	2.99	0.81	49.48	2.55	126.35	4.000	Yes	No	2.00
719	47.85	79.86	2.60	3.97	0.87	40.37	3.35	135.30	4.000	Yes	Yes	2.00
720	47.91	85.93	2.60	4.27	0.87	43.52	3.35	145.75	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
721	47.99	95.21	2.61	4.78	0.87	48.27	3.37	162.86	4.000	No	Yes	2.00
722	48.04	138.05	2.42	3.92	0.80	74.20	2.39	177.13	0.597	No	No	0.93
723	48.11	165.08	2.35	3.78	0.77	90.55	2.12	191.85	0.737	No	No	1.15
724	48.20	168.80	2.37	4.08	0.78	92.00	2.20	202.06	4.000	No	No	2.00
725	48.24	143.83	2.49	4.96	0.82	75.71	2.72	205.83	4.000	No	No	2.00
726	48.30	116.03	2.62	5.85	0.87	58.74	3.42	201.16	4.000	No	Yes	2.00
727	48.37	96.08	2.69	6.13	0.90	47.37	3.94	186.77	4.000	No	Yes	2.00
728	48.46	80.62	2.74	5.96	0.92	38.96	4.31	167.76	4.000	No	Yes	2.00
729	48.51	68.67	2.77	5.52	0.93	32.70	4.53	148.24	4.000	No	Yes	2.00
730	48.58	59.76	2.80	5.18	0.94	28.03	4.77	133.70	4.000	No	Yes	2.00
731	48.64	52.09	2.82	4.71	0.95	24.10	4.94	119.14	4.000	No	Yes	2.00
732	48.72	46.65	2.83	4.33	0.96	21.32	5.08	108.27	4.000	No	Yes	2.00
733	48.76	42.27	2.85	3.97	0.96	19.12	5.18	99.10	4.000	No	Yes	2.00
734	48.86	39.98	2.85	3.80	0.96	17.93	5.27	94.48	4.000	No	Yes	2.00
735	48.90	37.40	2.88	3.72	0.97	16.58	5.47	90.66	4.000	No	Yes	2.00
736	48.95	35.62	2.90	3.74	0.98	15.63	5.67	88.61	4.000	No	Yes	2.00
737	49.03	33.78	2.92	3.79	0.99	14.63	5.93	86.74	4.000	No	Yes	2.00
738	49.09	32.19	2.94	3.80	1.00	13.78	6.15	84.75	4.000	No	Yes	2.00
739	49.25	31.26	2.95	3.75	1.00	13.29	6.25	83.02	4.000	No	Yes	2.00
740	49.30	31.10	2.95	3.66	1.00	13.22	6.19	81.87	4.000	No	Yes	2.00
741	49.38	32.44	2.92	3.47	0.99	13.95	5.86	81.74	4.000	No	Yes	2.00
742	49.47	33.97	2.89	3.33	0.97	14.77	5.56	82.12	4.000	No	Yes	2.00
743	49.52	35.21	2.87	3.27	0.97	15.43	5.38	82.96	4.000	No	Yes	2.00
744	49.56	35.40	2.87	3.38	0.97	15.48	5.45	84.31	4.000	No	Yes	2.00
745	49.65	35.65	2.88	3.45	0.97	15.56	5.48	85.33	4.000	No	Yes	2.00
746	49.74	35.94	2.88	3.53	0.97	15.66	5.52	86.41	4.000	No	Yes	2.00
747	49.80	36.54	2.88	3.61	0.97	15.94	5.52	87.92	4.000	No	Yes	2.00
748	49.86	37.24	2.89	3.75	0.97	16.24	5.56	90.21	4.000	No	Yes	2.00
749	49.91	38.20	2.88	3.86	0.97	16.68	5.54	92.48	4.000	No	Yes	2.00
750	49.95	38.64	2.89	3.95	0.97	16.87	5.56	93.86	4.000	No	Yes	2.00
751	50.04	38.70	2.89	3.98	0.98	16.87	5.59	94.21	4.000	No	Yes	2.00
752	50.09	40.07	2.86	3.82	0.97	17.62	5.34	94.09	4.000	No	Yes	2.00
753	50.15	40.07	2.86	3.74	0.96	17.64	5.29	93.24	4.000	No	Yes	2.00
754	50.24	39.53	2.86	3.70	0.96	17.35	5.31	92.07	4.000	No	Yes	2.00
755	50.28	36.73	2.90	3.81	0.98	15.84	5.68	89.94	4.000	No	Yes	2.00
756	50.37	35.40	2.91	3.77	0.98	15.14	5.80	87.81	4.000	No	Yes	2.00
757	50.40	34.76	2.90	3.60	0.98	14.86	5.74	85.30	4.000	No	Yes	2.00
758	50.50	34.54	2.90	3.48	0.98	14.76	5.67	83.76	4.000	No	Yes	2.00
759	50.54	34.70	2.88	3.32	0.97	14.89	5.53	82.31	4.000	No	Yes	2.00
760	50.59	34.51	2.88	3.23	0.97	14.81	5.48	81.17	4.000	No	Yes	2.00
761	50.68	34.22	2.87	3.13	0.97	14.68	5.43	79.73	4.000	No	Yes	2.00
762	50.76	33.30	2.88	3.13	0.97	14.18	5.54	78.57	4.000	No	Yes	2.00
763	50.81	32.09	2.91	3.19	0.98	13.52	5.76	77.83	4.000	No	Yes	2.00
764	50.89	31.67	2.91	3.20	0.98	13.29	5.82	77.31	4.000	No	Yes	2.00
765	50.98	31.55	2.91	3.17	0.98	13.22	5.81	76.85	4.000	No	Yes	2.00
766	51.00	32.02	2.90	3.07	0.98	13.49	5.66	76.40	4.000	No	Yes	2.00
767	51.07	31.96	2.90	3.05	0.98	13.45	5.66	76.06	4.000	No	Yes	2.00
768	51.16	32.02	2.89	3.02	0.98	13.47	5.63	75.80	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
769	51.19	32.18	2.89	3.00	0.98	13.56	5.59	75.77	4.000	No	Yes	2.00
770	51.29	33.01	2.87	2.92	0.97	13.99	5.42	75.78	4.000	No	Yes	2.00
771	51.33	34.25	2.85	2.82	0.96	14.66	5.18	75.98	4.000	No	Yes	2.00
772	51.42	35.36	2.83	2.75	0.95	15.25	5.00	76.30	4.000	No	Yes	2.00
773	51.45	37.46	2.82	2.97	0.95	16.25	4.98	80.94	4.000	No	Yes	2.00
774	51.64	39.53	2.82	3.16	0.95	17.19	4.95	85.16	4.000	No	Yes	2.00
775	51.68	41.79	2.81	3.31	0.95	18.29	4.88	89.18	4.000	No	Yes	2.00
776	51.73	42.55	2.80	3.24	0.94	18.71	4.76	89.12	4.000	No	Yes	2.00
777	51.77	42.93	2.79	3.19	0.94	18.92	4.69	88.77	4.000	No	Yes	2.00
778	51.81	42.49	2.79	3.17	0.94	18.68	4.72	88.16	4.000	No	Yes	2.00
779	51.85	40.42	2.79	2.98	0.94	17.68	4.74	83.74	4.000	No	Yes	2.00
780	51.94	37.59	2.79	2.63	0.94	16.34	4.70	76.79	4.000	No	Yes	2.00
781	51.99	34.54	2.78	2.24	0.94	14.92	4.63	69.06	4.000	No	Yes	2.00
782	52.08	32.82	2.79	2.09	0.94	14.07	4.67	65.70	4.000	No	Yes	2.00
783	52.11	31.93	2.81	2.17	0.95	13.56	4.86	65.88	4.000	No	Yes	2.00
784	52.25	30.63	2.85	2.33	0.96	12.78	5.20	66.42	4.000	No	Yes	2.00
785	52.27	31.23	2.84	2.35	0.96	13.09	5.14	67.22	4.000	No	Yes	2.00
786	52.32	31.81	2.83	2.33	0.95	13.38	5.05	67.56	4.000	No	Yes	2.00
787	52.38	33.68	2.79	2.22	0.94	14.39	4.72	68.00	4.000	No	Yes	2.00
788	52.45	34.10	2.79	2.23	0.94	14.59	4.69	68.48	4.000	No	Yes	2.00
789	52.52	34.41	2.79	2.26	0.94	14.73	4.69	69.08	4.000	No	Yes	2.00
790	52.60	34.70	2.79	2.29	0.94	14.85	4.69	69.62	4.000	No	Yes	2.00
791	52.64	34.83	2.79	2.32	0.94	14.89	4.71	70.14	4.000	No	Yes	2.00
792	52.69	35.14	2.79	2.32	0.94	15.04	4.68	70.43	4.000	No	Yes	2.00
793	52.77	35.65	2.79	2.35	0.94	15.27	4.66	71.16	4.000	No	Yes	2.00
794	52.86	36.06	2.79	2.39	0.94	15.45	4.66	72.01	4.000	No	Yes	2.00
795	52.90	36.03	2.80	2.48	0.94	15.38	4.75	73.07	4.000	No	Yes	2.00
796	52.97	35.33	2.82	2.59	0.95	14.95	4.93	73.70	4.000	No	Yes	2.00
797	53.04	34.38	2.84	2.68	0.96	14.40	5.13	73.87	4.000	No	Yes	2.00
798	53.12	33.84	2.85	2.71	0.96	14.10	5.22	73.55	4.000	No	Yes	2.00
799	53.18	33.65	2.85	2.65	0.96	14.01	5.19	72.72	4.000	No	Yes	2.00
800	53.25	33.71	2.84	2.58	0.96	14.06	5.12	71.93	4.000	No	Yes	2.00
801	53.30	33.84	2.83	2.50	0.95	14.15	5.03	71.15	4.000	No	Yes	2.00
802	53.39	34.38	2.81	2.42	0.95	14.45	4.89	70.62	4.000	No	Yes	2.00
803	53.45	35.02	2.79	2.34	0.94	14.80	4.74	70.18	4.000	No	Yes	2.00
804	53.52	35.75	2.78	2.27	0.93	15.20	4.60	69.98	4.000	No	Yes	2.00
805	53.56	36.64	2.76	2.21	0.93	15.69	4.45	69.87	4.000	No	Yes	2.00
806	53.65	37.56	2.74	2.15	0.92	16.18	4.32	69.87	4.000	No	Yes	2.00
807	53.69	37.88	2.74	2.18	0.92	16.32	4.32	70.53	4.000	No	Yes	2.00
808	53.78	37.53	2.76	2.26	0.93	16.07	4.43	71.22	4.000	No	Yes	2.00
809	53.83	36.89	2.77	2.34	0.93	15.69	4.57	71.74	4.000	No	Yes	2.00
810	53.93	36.57	2.78	2.35	0.93	15.49	4.62	71.53	4.000	No	Yes	2.00
811	53.99	36.32	2.78	2.34	0.94	15.35	4.64	71.23	4.000	No	Yes	2.00
812	54.03	35.84	2.79	2.33	0.94	15.11	4.67	70.56	4.000	No	Yes	2.00
813	54.14	35.18	2.80	2.33	0.94	14.74	4.75	69.96	4.000	No	Yes	2.00
814	54.18	34.57	2.80	2.33	0.94	14.42	4.82	69.44	4.000	No	Yes	2.00
815	54.28	34.35	2.81	2.39	0.95	14.25	4.91	69.94	4.000	No	Yes	2.00
816	54.34	34.35	2.83	2.49	0.95	14.20	5.01	71.05	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
817	54.39	34.41	2.84	2.62	0.96	14.16	5.13	72.60	4.000	No	Yes	2.00
818	54.44	34.51	2.85	2.75	0.96	14.14	5.24	74.12	4.000	No	Yes	2.00
819	54.49	34.73	2.86	2.86	0.97	14.20	5.32	75.50	4.000	No	Yes	2.00
820	54.54	35.78	2.85	2.91	0.96	14.69	5.26	77.20	4.000	No	Yes	2.00
821	54.66	37.47	2.84	2.95	0.96	15.50	5.11	79.20	4.000	No	Yes	2.00
822	54.71	39.02	2.86	3.32	0.96	16.10	5.28	84.98	4.000	No	Yes	2.00
823	54.83	39.25	2.92	4.08	0.99	15.90	5.85	92.97	4.000	No	Yes	2.00
824	54.88	38.80	2.99	5.14	1.00	15.52	6.60	102.45	4.000	No	Yes	2.00
825	54.96	37.02	3.05	6.09	1.00	14.73	7.35	108.17	4.000	No	Yes	2.00
826	54.97	34.67	3.11	6.94	1.00	13.70	8.10	110.90	4.000	No	Yes	2.00
827	54.99	38.42	3.06	6.50	1.00	15.33	7.41	113.63	4.000	No	Yes	2.00
828	55.08	41.00	3.03	6.39	1.00	16.43	7.09	116.51	4.000	No	Yes	2.00
829	55.14	49.90	2.92	5.53	0.99	20.50	5.87	120.36	4.000	No	Yes	2.00
830	55.20	50.51	2.93	5.87	0.99	20.64	6.02	124.30	4.000	No	Yes	2.00
831	55.29	53.30	2.92	5.92	0.99	21.95	5.85	128.50	4.000	No	Yes	2.00
832	55.34	50.89	2.97	6.58	1.00	20.65	6.37	131.64	4.000	No	Yes	2.00
833	55.39	51.49	2.97	6.72	1.00	20.90	6.40	133.78	4.000	No	Yes	2.00
834	55.46	54.13	2.95	6.59	1.00	22.06	6.16	135.92	4.000	No	Yes	2.00
835	55.51	59.19	2.89	6.19	0.98	24.62	5.63	138.49	4.000	No	Yes	2.00
836	55.59	67.14	2.81	5.51	0.95	28.79	4.86	139.95	4.000	No	Yes	2.00
837	55.65	73.21	2.75	5.02	0.92	32.09	4.35	139.54	4.000	No	Yes	2.00
838	55.77	75.09	2.72	4.77	0.91	33.15	4.15	137.59	4.000	No	Yes	2.00
839	55.82	71.05	2.75	4.85	0.92	31.02	4.35	134.97	4.000	No	Yes	2.00
840	55.86	64.79	2.79	5.05	0.94	27.74	4.74	131.37	4.000	No	Yes	2.00
841	55.95	58.81	2.84	5.26	0.96	24.65	5.17	127.36	4.000	No	Yes	2.00
842	55.99	53.08	2.89	5.39	0.98	21.78	5.60	122.08	4.000	No	Yes	2.00
843	56.08	49.36	2.93	5.54	0.99	19.90	5.97	118.78	4.000	No	Yes	2.00
844	56.12	47.77	2.95	5.69	1.00	19.08	6.19	118.13	4.000	No	Yes	2.00
845	56.22	49.07	2.94	5.78	1.00	19.64	6.14	120.60	4.000	No	Yes	2.00
846	56.26	52.44	2.91	5.70	0.99	21.27	5.84	124.18	4.000	No	Yes	2.00
847	56.32	58.65	2.86	5.41	0.96	24.36	5.28	128.53	4.000	No	Yes	2.00
848	56.43	63.42	2.82	5.25	0.95	26.72	4.94	131.88	4.000	No	Yes	2.00
849	56.45	70.22	2.76	4.90	0.93	30.27	4.44	134.32	4.000	No	Yes	2.00
850	56.51	72.13	2.74	4.83	0.92	31.25	4.33	135.16	4.000	No	Yes	2.00
851	56.56	72.89	2.74	4.89	0.92	31.57	4.33	136.56	4.000	No	Yes	2.00
852	56.63	69.30	2.79	5.33	0.94	29.48	4.71	138.86	4.000	No	Yes	2.00
853	56.72	68.12	2.81	5.61	0.95	28.72	4.91	141.03	4.000	No	Yes	2.00
854	56.77	71.24	2.79	5.50	0.94	30.28	4.72	143.00	4.000	No	Yes	2.00
855	56.85	76.26	2.75	5.20	0.92	32.90	4.37	143.89	4.000	No	Yes	2.00
856	56.90	81.00	2.71	4.95	0.91	35.43	4.08	144.60	4.000	No	Yes	2.00
857	56.96	84.38	2.68	4.74	0.90	37.25	3.88	144.43	4.000	No	Yes	2.00
858	57.07	86.73	2.66	4.57	0.89	38.52	3.73	143.61	4.000	No	Yes	2.00
859	57.09	88.32	2.64	4.36	0.88	39.55	3.57	141.36	4.000	No	Yes	2.00
860	57.16	86.35	2.64	4.23	0.88	38.62	3.56	137.58	4.000	No	Yes	2.00
861	57.25	83.17	2.64	4.14	0.88	37.01	3.61	133.54	4.000	No	Yes	2.00
862	57.29	78.01	2.67	4.18	0.89	34.30	3.79	129.89	4.000	No	Yes	2.00
863	57.36	73.12	2.70	4.27	0.91	31.71	4.01	127.23	4.000	No	Yes	2.00
864	57.43	67.96	2.74	4.35	0.92	29.05	4.26	123.73	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
865	57.51	64.02	2.76	4.34	0.93	27.06	4.43	119.92	4.000	No	Yes	2.00
866	57.59	60.78	2.78	4.33	0.93	25.43	4.59	116.64	4.000	No	Yes	2.00
867	57.66	58.65	2.79	4.33	0.94	24.36	4.70	114.58	4.000	No	Yes	2.00
868	57.69	57.09	2.80	4.28	0.94	23.61	4.76	112.39	4.000	No	Yes	2.00
869	57.82	57.03	2.79	4.15	0.94	23.60	4.69	110.68	4.000	No	Yes	2.00
870	57.86	56.96	2.78	4.05	0.94	23.62	4.63	109.26	4.000	No	Yes	2.00
871	57.90	56.46	2.79	4.09	0.94	23.33	4.68	109.26	4.000	No	Yes	2.00
872	57.95	55.22	2.81	4.29	0.95	22.60	4.89	110.44	4.000	No	Yes	2.00
873	58.05	53.37	2.85	4.62	0.96	21.52	5.22	112.28	4.000	No	Yes	2.00
874	58.12	51.46	2.89	5.01	0.98	20.42	5.60	114.32	4.000	No	Yes	2.00
875	58.17	48.89	2.93	5.37	0.99	19.05	6.02	114.69	4.000	No	Yes	2.00
876	58.22	52.77	2.87	4.87	0.97	21.06	5.43	114.31	4.000	No	Yes	2.00
877	58.30	57.79	2.80	4.31	0.94	23.72	4.76	112.98	4.000	No	Yes	2.00
878	58.34	63.74	2.72	3.78	0.91	26.95	4.13	111.39	4.000	No	Yes	2.00
879	58.40	61.89	2.73	3.84	0.92	25.97	4.26	110.55	4.000	No	Yes	2.00
880	58.47	56.74	2.79	4.05	0.94	23.29	4.67	108.66	4.000	No	Yes	2.00
881	58.54	49.55	2.86	4.27	0.96	19.70	5.28	104.00	4.000	No	Yes	2.00
882	58.60	42.08	2.92	4.21	0.99	16.17	5.88	95.06	4.000	No	Yes	2.00
883	58.69	35.88	2.96	3.93	1.00	13.41	6.34	85.04	4.000	No	Yes	2.00
884	58.74	31.30	2.98	3.46	1.00	11.51	6.55	75.42	4.000	No	Yes	2.00
885	58.82	28.79	2.99	3.06	1.00	10.46	6.59	68.89	4.000	No	Yes	2.00
886	58.86	27.51	2.97	2.60	1.00	9.92	6.36	63.16	4.000	No	Yes	2.00
887	58.93	26.72	2.94	2.25	1.00	9.61	6.13	58.91	4.000	No	Yes	2.00
888	59.00	26.05	2.92	1.99	0.99	9.39	5.92	55.61	4.000	No	Yes	2.00
889	59.09	25.64	2.91	1.81	0.98	9.25	5.77	53.34	4.000	No	Yes	2.00
890	59.13	25.22	2.90	1.73	0.98	9.08	5.75	52.18	4.000	No	Yes	2.00
891	59.22	25.18	2.90	1.68	0.98	9.07	5.68	51.51	4.000	No	Yes	2.00
892	59.36	25.02	2.90	1.67	0.98	8.98	5.72	51.30	4.000	No	Yes	2.00
893	59.46	25.27	2.89	1.66	0.98	9.09	5.65	51.36	4.000	No	Yes	2.00
894	59.49	25.35	2.89	1.66	0.98	9.12	5.64	51.47	4.000	No	Yes	2.00
895	59.55	25.67	2.88	1.64	0.97	9.28	5.55	51.50	4.000	No	Yes	2.00
896	59.64	25.74	2.88	1.63	0.97	9.30	5.53	51.45	4.000	No	Yes	2.00
897	59.68	25.67	2.88	1.62	0.97	9.27	5.53	51.29	4.000	No	Yes	2.00
898	59.74	25.48	2.89	1.61	0.97	9.17	5.56	50.97	4.000	No	Yes	2.00
899	59.79	25.26	2.85	1.39	0.96	9.16	5.27	48.26	4.000	No	Yes	2.00
900	59.88	25.13	2.82	1.19	0.95	9.20	4.96	45.65	4.000	No	Yes	2.00
901	59.96	25.16	2.78	1.00	0.94	9.31	4.64	43.18	4.000	No	Yes	2.00
902	60.01	25.48	2.79	1.04	0.94	9.44	4.66	43.99	4.000	No	Yes	2.00
903	60.08	25.95	2.79	1.09	0.94	9.63	4.67	44.94	4.000	No	Yes	2.00
904	60.14	26.14	2.80	1.17	0.94	9.67	4.77	46.10	4.000	No	Yes	2.00
905	60.18	26.84	2.80	1.23	0.94	9.97	4.75	47.39	4.000	No	Yes	2.00
906	60.24	27.58	2.79	1.28	0.94	10.29	4.73	48.67	4.000	No	Yes	2.00
907	60.31	28.69	2.78	1.31	0.93	10.81	4.61	49.80	4.000	No	Yes	2.00
908	60.39	28.98	2.78	1.33	0.93	10.92	4.60	50.25	4.000	No	Yes	2.00
909	60.45	28.75	2.78	1.34	0.94	10.80	4.65	50.23	4.000	No	Yes	2.00
910	60.50	28.27	2.80	1.36	0.94	10.55	4.76	50.16	4.000	No	Yes	2.00
911	60.57	28.05	2.81	1.42	0.95	10.40	4.87	50.68	4.000	No	Yes	2.00
912	60.64	29.10	2.80	1.43	0.94	10.89	4.74	51.64	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
913	60.74	30.60	2.77	1.41	0.93	11.61	4.52	52.48	4.000	No	Yes	2.00
914	60.77	32.19	2.74	1.38	0.92	12.41	4.28	53.10	4.000	No	Yes	2.00
915	60.85	32.54	2.74	1.39	0.92	12.56	4.26	53.51	4.000	No	Yes	2.00
916	60.90	32.06	2.75	1.46	0.93	12.27	4.41	54.16	4.000	No	Yes	2.00
917	60.98	30.88	2.79	1.59	0.94	11.61	4.73	54.87	4.000	No	Yes	2.00
918	61.05	29.52	2.83	1.70	0.96	10.88	5.07	55.20	4.000	No	Yes	2.00
919	61.11	27.92	2.87	1.79	0.97	10.07	5.44	54.83	4.000	No	Yes	2.00
920	61.16	25.86	2.91	1.81	0.99	9.09	5.84	53.09	4.000	No	Yes	2.00
921	61.24	23.88	2.95	1.81	1.00	8.17	6.24	51.02	4.000	No	Yes	2.00
922	61.29	22.20	2.98	1.73	1.00	7.49	6.49	48.62	4.000	No	Yes	2.00
923	61.38	21.44	2.98	1.64	1.00	7.17	6.55	47.02	4.000	No	Yes	2.00
924	61.42	20.90	2.98	1.51	1.00	6.95	6.49	45.14	4.000	No	Yes	2.00
925	61.51	20.74	2.96	1.37	1.00	6.88	6.33	43.54	4.000	No	Yes	2.00
926	61.56	20.61	2.94	1.20	1.00	6.86	6.08	41.66	4.000	No	Yes	2.00
927	61.63	20.61	2.91	1.08	0.99	6.91	5.83	40.29	4.000	No	Yes	2.00
928	61.68	20.71	2.90	1.01	0.98	6.98	5.68	39.60	4.000	No	Yes	2.00
929	61.75	20.87	2.89	0.98	0.98	7.06	5.59	39.43	4.000	No	Yes	2.00
930	61.82	20.83	2.89	1.00	0.98	7.03	5.64	39.60	4.000	No	Yes	2.00
931	61.94	20.70	2.91	1.04	0.98	6.94	5.75	39.89	4.000	No	Yes	2.00
932	61.99	20.51	2.94	1.19	1.00	6.78	6.10	41.35	4.000	No	Yes	2.00
933	62.05	20.70	2.97	1.43	1.00	6.82	6.45	44.01	4.000	No	Yes	2.00
934	62.13	22.07	2.96	1.52	1.00	7.37	6.27	46.17	4.000	No	Yes	2.00
935	62.24	24.94	2.87	1.40	0.97	8.72	5.45	47.55	4.000	No	Yes	2.00
936	62.30	28.66	2.76	1.16	0.93	10.62	4.46	47.34	4.000	No	Yes	2.00
937	62.36	31.10	2.69	1.01	0.90	11.95	3.91	46.69	4.000	No	Yes	2.00
938	62.42	31.68	2.66	0.95	0.89	12.28	3.75	46.00	4.000	No	Yes	2.00
939	62.48	29.99	2.70	1.00	0.91	11.39	4.02	45.82	4.000	No	Yes	2.00
940	62.53	28.50	2.75	1.07	0.92	10.58	4.34	45.94	4.000	No	Yes	2.00
941	62.56	27.48	2.77	1.11	0.93	10.05	4.57	45.92	4.000	No	Yes	2.00
942	62.62	27.32	2.78	1.12	0.93	9.96	4.61	45.88	4.000	No	Yes	2.00
943	62.68	26.69	2.80	1.16	0.94	9.62	4.78	45.97	4.000	No	Yes	2.00
944	62.73	25.60	2.84	1.26	0.96	9.04	5.13	46.42	4.000	No	Yes	2.00
945	62.81	24.87	2.87	1.36	0.97	8.64	5.43	46.93	4.000	No	Yes	2.00
946	62.86	25.09	2.87	1.37	0.97	8.74	5.40	47.20	4.000	No	Yes	2.00
947	62.99	26.18	2.83	1.28	0.96	9.27	5.08	47.06	4.000	No	Yes	2.00
948	63.04	27.64	2.78	1.13	0.93	10.05	4.59	46.17	4.000	No	Yes	2.00
949	63.11	28.56	2.74	1.02	0.92	10.57	4.28	45.20	4.000	No	Yes	2.00
950	63.21	28.75	2.72	0.97	0.91	10.69	4.16	44.51	4.000	No	Yes	2.00
951	63.30	27.99	2.74	1.00	0.92	10.28	4.33	44.49	4.000	No	Yes	2.00
952	63.35	26.68	2.78	1.07	0.94	9.60	4.65	44.61	4.000	No	Yes	2.00
953	63.40	25.57	2.81	1.11	0.95	9.04	4.91	44.36	4.000	No	Yes	2.00
954	63.47	25.09	2.82	1.10	0.95	8.81	4.98	43.84	4.000	No	Yes	2.00
955	63.52	25.16	2.81	1.06	0.95	8.86	4.90	43.37	4.000	No	Yes	2.00
956	63.59	25.22	2.80	1.02	0.94	8.91	4.81	42.87	4.000	No	Yes	2.00
957	63.65	25.41	2.79	0.95	0.94	9.03	4.66	42.11	4.000	No	Yes	2.00
958	63.71	25.92	2.76	0.88	0.93	9.32	4.44	41.35	4.000	No	Yes	2.00
959	63.83	26.11	2.75	0.85	0.92	9.42	4.36	41.07	4.000	No	Yes	2.00
960	63.89	25.54	2.79	0.96	0.94	9.06	4.67	42.29	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
961	63.96	24.39	2.86	1.20	0.97	8.37	5.32	44.51	4.000	No	Yes	2.00
962	64.01	24.08	2.93	1.58	0.99	8.04	6.00	48.29	4.000	No	Yes	2.00
963	64.09	25.48	2.93	1.78	0.99	8.59	6.02	51.67	4.000	No	Yes	2.00
964	64.13	27.96	2.89	1.80	0.98	9.71	5.59	54.24	4.000	No	Yes	2.00
965	64.20	30.85	2.82	1.66	0.95	11.11	4.95	55.00	4.000	No	Yes	2.00
966	64.26	33.36	2.76	1.50	0.93	12.39	4.43	54.85	4.000	No	Yes	2.00
967	64.31	35.43	2.70	1.34	0.90	13.51	3.99	53.96	4.000	No	Yes	2.00
968	64.40	35.91	2.68	1.26	0.90	13.80	3.84	53.01	4.000	No	Yes	2.00
969	64.44	34.60	2.69	1.21	0.90	13.20	3.89	51.41	4.000	No	Yes	2.00
970	64.50	31.84	2.76	1.37	0.93	11.71	4.44	52.04	4.000	No	Yes	2.00
971	64.57	29.39	2.83	1.54	0.95	10.44	5.02	52.40	4.000	No	Yes	2.00
972	64.63	27.74	2.91	1.90	0.98	9.50	5.78	54.89	4.000	No	Yes	2.00
973	64.75	26.62	2.94	2.00	1.00	8.94	6.13	54.77	4.000	No	Yes	2.00
974	64.80	23.76	3.02	2.26	1.00	7.79	6.98	54.40	4.000	No	Yes	2.00
975	64.84	22.84	3.02	2.06	1.00	7.42	6.94	51.56	4.000	No	Yes	2.00
976	64.93	22.20	3.01	1.86	1.00	7.17	6.85	49.07	4.000	No	Yes	2.00
977	64.98	23.38	2.93	1.47	0.99	7.66	6.04	46.27	4.000	No	Yes	2.00
978	65.06	22.43	2.93	1.34	0.99	7.28	6.05	44.03	4.000	No	Yes	2.00
979	65.10	21.60	2.94	1.23	0.99	6.95	6.07	42.17	4.000	No	Yes	2.00
980	65.16	20.96	2.95	1.22	1.00	6.67	6.21	41.38	4.000	No	Yes	2.00
981	65.23	20.74	2.96	1.22	1.00	6.57	6.27	41.20	4.000	No	Yes	2.00
982	65.31	20.61	2.96	1.24	1.00	6.52	6.35	41.36	4.000	No	Yes	2.00
983	65.37	20.74	2.96	1.23	1.00	6.56	6.30	41.35	4.000	No	Yes	2.00
984	65.44	21.03	2.95	1.20	1.00	6.68	6.18	41.27	4.000	No	Yes	2.00
985	65.49	21.44	2.93	1.17	0.99	6.87	6.01	41.29	4.000	No	Yes	2.00
986	65.58	21.69	2.92	1.15	0.99	6.99	5.91	41.30	4.000	No	Yes	2.00
987	65.63	21.72	2.92	1.12	0.99	7.01	5.86	41.04	4.000	No	Yes	2.00
988	65.71	21.66	2.91	1.09	0.98	6.99	5.82	40.64	4.000	No	Yes	2.00
989	65.75	21.63	2.90	1.05	0.98	6.99	5.73	40.08	4.000	No	Yes	2.00
990	65.85	21.66	2.90	1.02	0.98	7.01	5.67	39.79	4.000	No	Yes	2.00
991	65.89	21.57	2.90	1.01	0.98	6.97	5.68	39.58	4.000	No	Yes	2.00
992	65.98	21.50	2.90	1.01	0.98	6.93	5.71	39.55	4.000	No	Yes	2.00
993	66.04	21.47	2.88	0.92	0.97	6.96	5.52	38.40	4.000	No	Yes	2.00
994	66.09	21.50	2.85	0.77	0.96	7.05	5.19	36.57	4.000	No	Yes	2.00
995	66.19	21.50	2.81	0.63	0.95	7.13	4.86	34.67	4.000	No	Yes	2.00
996	66.24	21.47	2.80	0.60	0.94	7.14	4.79	34.16	4.000	No	Yes	2.00
997	66.28	21.44	2.81	0.62	0.95	7.10	4.86	34.47	4.000	No	Yes	2.00
998	66.34	21.41	2.82	0.65	0.95	7.06	4.93	34.82	4.000	No	Yes	2.00
999	66.41	21.53	2.82	0.67	0.95	7.10	4.95	35.16	4.000	No	Yes	2.00
1000	66.47	21.82	2.82	0.68	0.95	7.22	4.92	35.54	4.000	No	Yes	2.00
1001	66.56	22.08	2.81	0.69	0.95	7.33	4.89	35.82	4.000	No	Yes	2.00
1002	66.60	22.17	2.82	0.72	0.95	7.35	4.93	36.25	4.000	No	Yes	2.00
1003	66.69	22.14	2.82	0.74	0.95	7.31	5.00	36.56	4.000	No	Yes	2.00
1004	66.74	22.11	2.83	0.77	0.96	7.28	5.07	36.91	4.000	No	Yes	2.00
1005	66.82	22.17	2.84	0.79	0.96	7.29	5.10	37.17	4.000	No	Yes	2.00
1006	66.91	22.24	2.84	0.80	0.96	7.30	5.12	37.37	4.000	No	Yes	2.00
1007	66.95	22.49	2.83	0.79	0.95	7.42	5.05	37.47	4.000	No	Yes	2.00
1008	67.00	22.58	2.83	0.79	0.95	7.46	5.02	37.43	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
1009	67.08	22.65	2.82	0.78	0.95	7.49	5.00	37.40	4.000	No	Yes	2.00
1010	67.13	22.52	2.83	0.79	0.95	7.42	5.04	37.37	4.000	No	Yes	2.00
1011	67.22	22.46	2.83	0.79	0.95	7.38	5.05	37.31	4.000	No	Yes	2.00
1012	67.27	22.42	2.83	0.78	0.95	7.37	5.05	37.22	4.000	No	Yes	2.00
1013	67.34	22.39	2.83	0.78	0.95	7.35	5.06	37.16	4.000	No	Yes	2.00
1014	67.40	22.46	2.84	0.81	0.96	7.36	5.11	37.56	4.000	No	Yes	2.00
1015	67.48	22.65	2.84	0.85	0.96	7.41	5.15	38.20	4.000	No	Yes	2.00
1016	67.52	23.03	2.84	0.89	0.96	7.56	5.16	39.00	4.000	No	Yes	2.00
1017	67.61	23.44	2.84	0.94	0.96	7.71	5.17	39.88	4.000	No	Yes	2.00
1018	67.67	23.79	2.87	1.10	0.97	7.77	5.42	42.13	4.000	No	Yes	2.00
1019	67.78	24.24	2.91	1.37	0.98	7.83	5.81	45.51	4.000	No	Yes	2.00
1020	67.83	25.03	2.95	1.73	1.00	8.02	6.22	49.86	4.000	No	Yes	2.00
1021	67.89	27.07	2.94	1.92	1.00	8.83	6.08	53.69	4.000	No	Yes	2.00
1022	67.96	30.63	2.87	1.84	0.97	10.44	5.37	56.12	4.000	No	Yes	2.00
1023	68.01	35.78	2.74	1.50	0.92	13.01	4.29	55.77	4.000	No	Yes	2.00
1024	68.09	40.84	2.62	1.22	0.87	15.70	3.47	54.45	4.000	No	Yes	2.00
1025	68.14	43.29	2.58	1.13	0.86	17.01	3.18	54.11	0.095	No	No	0.16
1026	68.21	42.02	2.60	1.18	0.87	16.31	3.33	54.30	4.000	No	Yes	2.00
1027	68.26	38.07	2.68	1.35	0.90	14.20	3.86	54.88	4.000	No	Yes	2.00
1028	68.32	35.04	2.76	1.56	0.93	12.57	4.46	56.03	4.000	No	Yes	2.00
1029	68.40	33.65	2.82	1.82	0.95	11.76	4.95	58.23	4.000	No	Yes	2.00
1030	68.45	33.81	2.90	2.45	0.98	11.50	5.67	65.18	4.000	No	Yes	2.00
1031	68.57	35.90	2.93	2.98	0.99	12.16	5.95	72.35	4.000	No	Yes	2.00
1032	68.63	39.70	2.92	3.42	0.99	13.63	5.90	80.47	4.000	No	Yes	2.00
1033	68.70	44.15	2.88	3.48	0.97	15.53	5.51	85.58	4.000	No	Yes	2.00
1034	68.76	46.15	2.88	3.69	0.97	16.31	5.49	89.61	4.000	No	Yes	2.00
1035	68.80	50.25	2.84	3.66	0.96	18.12	5.15	93.28	4.000	No	Yes	2.00
1036	68.85	53.40	2.81	3.64	0.95	19.53	4.91	95.83	4.000	No	Yes	2.00
1037	68.92	58.21	2.76	3.46	0.93	21.78	4.49	97.75	4.000	No	Yes	2.00
1038	68.99	61.64	2.72	3.20	0.91	23.53	4.12	96.93	4.000	No	Yes	2.00
1039	69.05	64.41	2.66	2.84	0.89	25.15	3.72	93.62	4.000	No	Yes	2.00
1040	69.14	62.98	2.64	2.60	0.88	24.67	3.61	88.99	4.000	No	Yes	2.00
1041	69.20	56.30	2.69	2.61	0.90	21.49	3.94	84.71	4.000	No	Yes	2.00
1042	69.27	49.43	2.77	2.80	0.93	18.14	4.53	82.17	4.000	No	Yes	2.00
1043	69.31	43.80	2.84	3.00	0.96	15.48	5.16	79.83	4.000	No	Yes	2.00
1044	69.36	39.89	2.89	3.07	0.98	13.72	5.61	76.90	4.000	No	Yes	2.00
1045	69.44	36.58	2.91	2.90	0.99	12.34	5.83	71.97	4.000	No	Yes	2.00
1046	69.53	35.02	2.90	2.53	0.98	11.81	5.66	66.80	4.000	No	Yes	2.00
1047	69.57	34.32	2.86	2.18	0.97	11.66	5.36	62.49	4.000	No	Yes	2.00
1048	69.63	33.11	2.85	1.93	0.96	11.25	5.22	58.72	4.000	No	Yes	2.00
1049	69.71	31.17	2.85	1.74	0.96	10.48	5.24	54.91	4.000	No	Yes	2.00
1050	69.76	28.92	2.83	1.39	0.96	9.66	5.09	49.11	4.000	No	Yes	2.00
1051	69.85	27.20	2.83	1.17	0.95	9.00	5.01	45.14	4.000	No	Yes	2.00
1052	69.92	25.77	2.81	0.94	0.95	8.50	4.84	41.16	4.000	No	Yes	2.00
1053	69.97	24.88	2.82	0.93	0.95	8.09	5.00	40.45	4.000	No	Yes	2.00
1054	70.06	24.59	2.82	0.89	0.95	7.99	4.97	39.65	4.000	No	Yes	2.00
1055	70.11	24.56	2.81	0.84	0.95	8.00	4.88	39.02	4.000	No	Yes	2.00
1056	70.15	25.16	2.79	0.82	0.94	8.28	4.72	39.08	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
1057	70.23	25.55	2.79	0.86	0.94	8.42	4.73	39.82	4.000	No	Yes	2.00
1058	70.31	25.86	2.80	0.92	0.94	8.51	4.81	40.92	4.000	No	Yes	2.00
1059	70.38	25.64	2.82	0.96	0.95	8.38	4.92	41.26	4.000	No	Yes	2.00
1060	70.43	25.77	2.79	0.86	0.94	8.50	4.70	39.99	4.000	No	Yes	2.00
1061	70.48	26.60	2.74	0.73	0.92	8.98	4.31	38.65	4.000	No	Yes	2.00
1062	70.54	27.93	2.73	0.79	0.92	9.56	4.22	40.29	4.000	No	Yes	2.00
1063	70.63	28.76	2.77	1.03	0.93	9.73	4.54	44.16	4.000	No	Yes	2.00
1064	70.69	28.95	2.83	1.33	0.95	9.60	5.03	48.27	4.000	No	Yes	2.00
1065	70.75	29.84	2.86	1.61	0.97	9.83	5.31	52.23	4.000	No	Yes	2.00
1066	70.84	32.10	2.87	1.97	0.97	10.63	5.45	57.94	4.000	No	Yes	2.00
1067	70.92	35.59	2.86	2.23	0.96	12.01	5.31	63.74	4.000	No	Yes	2.00
1068	70.97	38.17	2.85	2.46	0.96	13.01	5.26	68.48	4.000	No	Yes	2.00
1069	71.02	40.33	2.86	2.71	0.96	13.82	5.29	73.04	4.000	No	Yes	2.00
1070	71.09	44.28	2.84	3.00	0.96	15.38	5.17	79.57	4.000	No	Yes	2.00
1071	71.17	50.51	2.80	3.14	0.94	18.02	4.80	86.53	4.000	No	Yes	2.00
1072	71.24	56.81	2.75	3.14	0.93	20.81	4.40	91.57	4.000	No	Yes	2.00
1073	71.28	61.71	2.71	3.05	0.91	23.09	4.07	93.94	4.000	No	Yes	2.00
1074	71.36	63.93	2.69	3.01	0.90	24.15	3.93	94.90	4.000	No	Yes	2.00
1075	71.41	66.64	2.65	2.80	0.89	25.58	3.66	93.62	4.000	No	Yes	2.00
1076	71.50	68.96	2.61	2.56	0.87	26.91	3.39	91.25	4.000	No	Yes	2.00
1077	71.53	70.68	2.56	2.27	0.85	28.08	3.11	87.36	0.142	No	No	0.25
1078	71.61	69.06	2.56	2.15	0.85	27.43	3.08	84.37	0.136	No	No	0.24
1079	71.67	61.17	2.63	2.28	0.88	23.50	3.49	81.99	4.000	No	Yes	2.00
1080	71.76	52.87	2.73	2.58	0.91	19.32	4.19	80.91	4.000	No	Yes	2.00
1081	71.80	46.32	2.80	2.74	0.94	16.26	4.80	78.12	4.000	No	Yes	2.00
1082	71.89	44.79	2.79	2.53	0.94	15.70	4.73	74.34	4.000	No	Yes	2.00
1083	71.94	42.85	2.77	2.18	0.93	15.06	4.55	68.56	4.000	No	Yes	2.00
1084	72.05	41.23	2.76	1.94	0.93	14.49	4.43	64.23	4.000	No	Yes	2.00
1085	72.10	37.86	2.78	1.82	0.94	13.05	4.62	60.31	4.000	No	Yes	2.00
1086	72.15	35.57	2.80	1.72	0.94	12.09	4.76	57.50	4.000	No	Yes	2.00
1087	72.20	32.48	2.80	1.45	0.94	10.88	4.77	51.95	4.000	No	Yes	2.00
1088	72.29	30.92	2.75	1.05	0.92	10.46	4.35	45.49	4.000	No	Yes	2.00
1089	72.35	29.30	2.70	0.72	0.90	10.02	3.96	39.68	4.000	No	Yes	2.00
1090	72.40	28.25	2.72	0.73	0.91	9.52	4.12	39.24	4.000	No	Yes	2.00
1091	72.46	27.52	2.75	0.81	0.93	9.09	4.41	40.04	4.000	No	Yes	2.00
1092	72.56	26.53	2.79	0.87	0.94	8.59	4.68	40.23	4.000	No	Yes	2.00
1093	72.58	26.95	2.77	0.82	0.93	8.81	4.52	39.84	4.000	No	Yes	2.00
1094	72.67	27.36	2.75	0.79	0.93	9.01	4.40	39.63	4.000	No	Yes	2.00
1095	72.72	27.97	2.73	0.75	0.92	9.33	4.22	39.40	4.000	No	Yes	2.00
1096	72.80	27.36	2.75	0.76	0.92	9.03	4.34	39.18	4.000	No	Yes	2.00
1097	72.84	26.69	2.76	0.78	0.93	8.70	4.48	39.03	4.000	No	Yes	2.00
1098	72.91	26.41	2.77	0.78	0.93	8.57	4.54	38.89	4.000	No	Yes	2.00
1099	72.98	26.09	2.78	0.79	0.94	8.41	4.61	38.78	4.000	No	Yes	2.00
1100	73.05	25.93	2.78	0.79	0.94	8.33	4.64	38.68	4.000	No	Yes	2.00
1101	73.11	26.19	2.77	0.75	0.93	8.47	4.52	38.31	4.000	No	Yes	2.00
1102	73.24	26.60	2.76	0.74	0.93	8.65	4.44	38.39	4.000	No	Yes	2.00
1103	73.33	26.92	2.76	0.78	0.93	8.75	4.47	39.17	4.000	No	Yes	2.00
1104	73.38	26.92	2.81	0.96	0.94	8.62	4.83	41.61	4.000	No	Yes	2.00

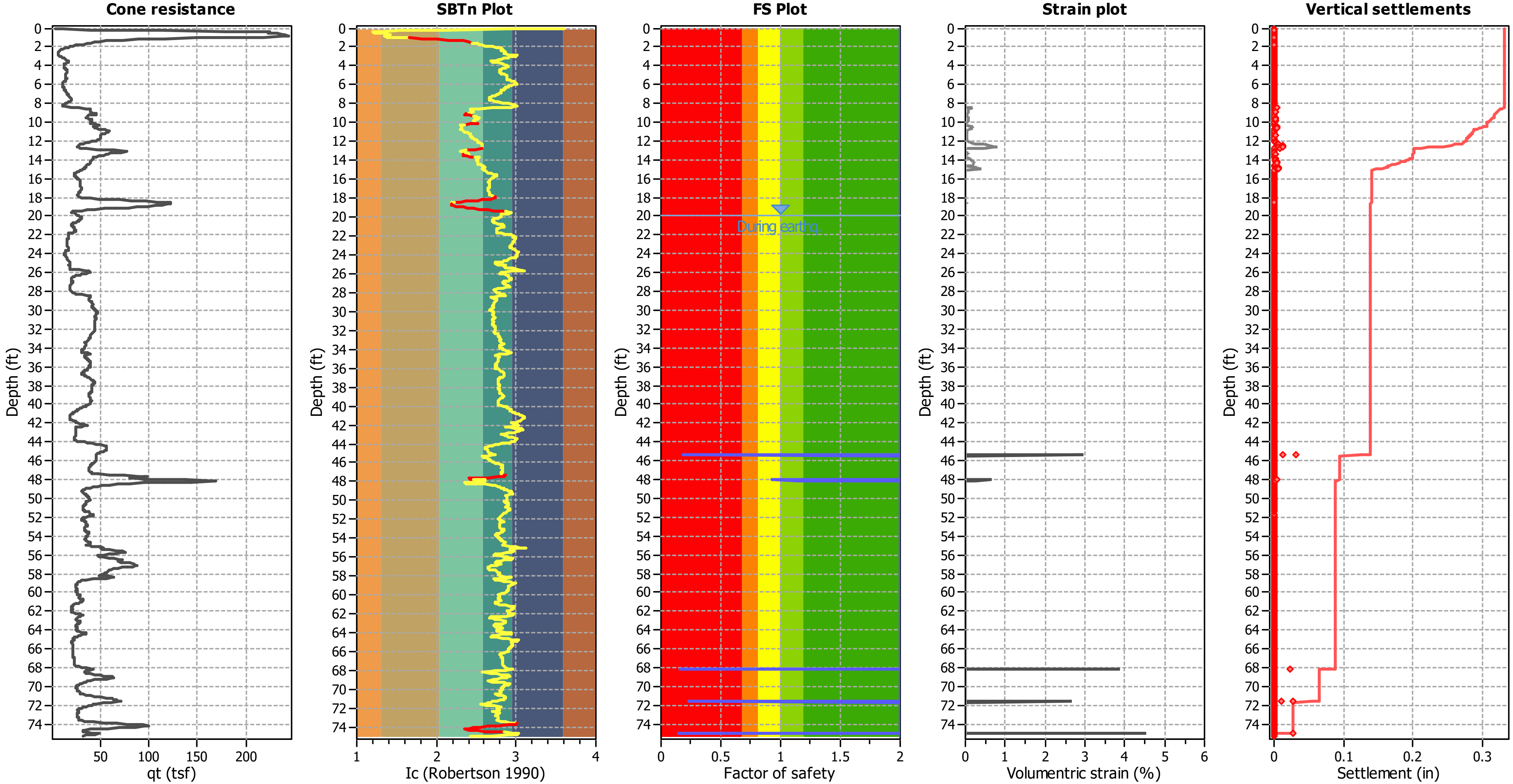
:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

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
1105	73.46	27.07	2.87	1.27	0.97	8.48	5.38	45.59	4.000	No	Yes	2.00
1106	73.52	27.49	2.93	1.70	0.99	8.43	5.98	50.40	4.000	No	Yes	2.00
1107	73.57	28.38	2.99	2.31	1.00	8.68	6.58	57.15	4.000	No	Yes	2.00
1108	73.63	30.06	3.01	2.86	1.00	9.28	6.88	63.87	4.000	No	Yes	2.00
1109	73.69	34.36	2.99	3.30	1.00	10.82	6.66	72.07	4.000	Yes	Yes	2.00
1110	73.77	42.31	2.91	3.33	0.98	13.90	5.77	80.23	4.000	Yes	Yes	2.00
1111	73.85	53.92	2.78	3.05	0.93	19.02	4.58	87.14	4.000	Yes	Yes	2.00
1112	73.91	67.02	2.64	2.67	0.88	25.25	3.60	90.94	4.000	Yes	Yes	2.00
1113	73.98	77.83	2.55	2.38	0.85	30.66	3.01	92.36	4.000	Yes	No	2.00
1114	74.03	87.40	2.47	2.16	0.82	35.63	2.62	93.26	4.000	Yes	No	2.00
1115	74.11	94.21	2.41	1.98	0.79	39.34	2.36	92.86	4.000	Yes	No	2.00
1116	74.15	99.78	2.36	1.78	0.77	42.64	2.14	91.19	4.000	Yes	No	2.00
1117	74.22	95.58	2.36	1.71	0.78	40.65	2.16	87.84	4.000	Yes	No	2.00
1118	74.30	86.10	2.41	1.72	0.79	35.78	2.34	83.80	4.000	Yes	No	2.00
1119	74.35	69.63	2.51	1.82	0.83	27.46	2.84	77.86	4.000	Yes	No	2.00
1120	74.45	57.16	2.61	1.89	0.87	21.41	3.40	72.70	4.000	Yes	Yes	2.00
1121	74.49	46.25	2.73	2.07	0.92	16.21	4.24	68.76	4.000	Yes	Yes	2.00
1122	74.55	39.29	2.86	2.45	0.96	12.91	5.27	68.11	4.000	Yes	Yes	2.00
1123	74.64	34.17	2.97	2.88	1.00	10.62	6.36	67.62	4.000	Yes	Yes	2.00
1124	74.69	31.53	3.02	3.16	1.00	9.68	6.99	67.61	4.000	No	Yes	2.00
1125	74.77	31.91	3.01	3.07	1.00	9.80	6.85	67.14	4.000	No	Yes	2.00
1126	74.82	35.89	2.92	2.60	0.99	11.36	5.86	66.59	4.000	No	Yes	2.00
1127	74.90	41.77	2.68	1.43	0.90	14.70	3.87	56.88	4.000	No	Yes	2.00
1128	74.95	47.02	2.43	0.62	0.80	18.43	2.42	44.58	0.087	No	No	0.15
1129	75.04	48.13	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
1130	75.08	44.63	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
1131	75.16	39.99	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
1132	75.20	34.55	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
1133	75.29	31.56	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00

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

Estimation of post-earthquake settlements

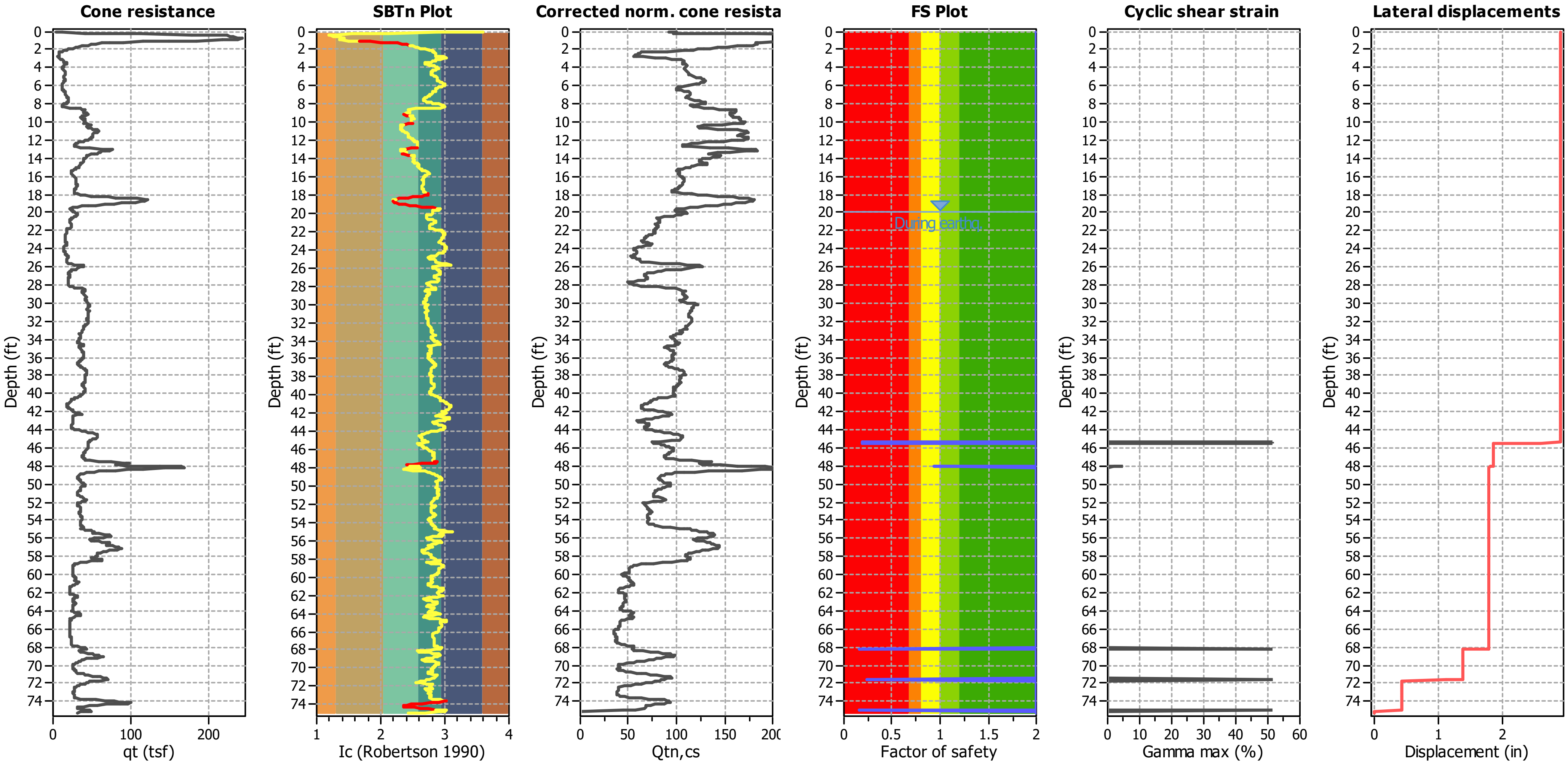


Abbreviations

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

Estimation of post-earthquake lateral Displacements

Geometric parameters: Level ground (or gently sloping) with free face (L: 130.00 ft - H: 20.00 ft)

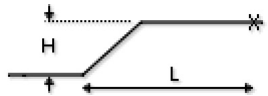


Abbreviations

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)
20.06	28.59	23.21	4.04	110.77	2.00	18.80	0.00	0.00
20.11	29.74	24.16	3.90	110.49	2.00	20.11	0.00	0.00
20.15	30.88	25.12	3.63	108.18	2.00	21.40	0.00	0.00
20.21	30.98	25.14	3.38	104.38	2.00	21.43	0.00	0.00
20.30	30.50	24.65	3.17	100.22	2.00	20.77	0.00	0.00
20.36	29.17	23.46	3.04	96.34	2.00	19.15	0.00	0.00
20.43	28.37	22.72	2.91	93.12	2.00	18.08	0.00	0.00
20.48	27.16	21.67	2.62	87.02	2.00	16.52	0.00	0.00
20.59	25.63	20.29	2.48	82.75	2.00	14.35	0.00	0.00
20.65	24.11	18.94	2.42	79.99	2.00	12.08	0.00	0.00
20.70	23.09	18.02	2.63	81.67	2.00	10.45	0.00	0.00
20.74	22.27	17.28	2.79	82.74	2.00	9.06	0.00	0.00
20.81	21.15	16.28	2.95	83.08	2.00	7.08	0.00	0.00
20.88	20.80	15.93	3.00	82.99	2.00	6.37	0.00	0.00
20.95	20.68	15.77	3.02	82.92	2.00	6.03	0.00	0.00
21.01	21.25	16.20	2.96	83.07	2.00	6.92	0.00	0.00
21.07	21.50	16.37	2.89	82.47	2.00	7.26	0.00	0.00
21.15	22.07	16.80	2.71	80.79	2.00	8.12	0.00	0.00
21.23	22.61	17.20	2.52	78.73	2.00	8.90	0.00	0.00
21.28	22.90	17.42	2.40	77.41	2.00	9.31	0.00	0.00
21.34	23.19	17.60	2.41	77.73	2.00	9.66	0.00	0.00
21.43	23.38	17.68	2.48	78.94	2.00	9.80	0.00	0.00
21.47	23.83	18.00	2.55	80.43	2.00	10.40	0.00	0.00
21.53	24.11	18.18	2.56	80.95	2.00	10.73	0.00	0.00
21.61	24.18	18.18	2.53	80.44	2.00	10.73	0.00	0.00
21.69	23.73	17.75	2.52	79.64	2.00	9.94	0.00	0.00
21.73	22.01	16.31	2.65	79.09	2.00	7.14	0.00	0.00
21.82	20.10	14.69	2.83	78.50	2.00	3.68	0.00	0.00
21.86	17.85	12.83	3.11	77.88	2.00	0.00	0.00	0.00
21.93	17.38	12.42	3.13	77.13	2.00	0.00	0.00	0.00
22.01	16.55	11.73	3.26	76.75	2.00	0.00	0.00	0.00
22.09	17.06	12.08	3.17	76.73	2.00	0.00	0.00	0.00
22.13	16.67	11.75	3.31	77.28	2.00	0.00	0.00	0.00
22.21	16.92	11.90	3.31	77.72	2.00	0.00	0.00	0.00
22.26	16.51	11.56	3.36	77.37	2.00	0.00	0.00	0.00
22.34	16.45	11.47	3.26	76.13	2.00	0.00	0.00	0.00
22.39	16.35	11.37	3.08	74.07	2.00	0.00	0.00	0.00
22.48	16.12	11.15	2.98	72.45	2.00	0.00	0.00	0.00
22.52	15.87	10.94	2.88	71.00	2.00	0.00	0.00	0.00
22.61	15.81	10.85	2.82	70.10	2.00	0.00	0.00	0.00
22.65	15.84	10.85	2.69	68.80	2.00	0.00	0.00	0.00
22.77	15.87	10.82	2.60	67.75	2.00	0.00	0.00	0.00
22.80	15.93	10.85	2.55	67.25	2.00	0.00	0.00	0.00
22.87	15.99	10.87	2.54	67.15	2.00	0.00	0.00	0.00
22.92	16.06	10.89	2.54	67.22	2.00	0.00	0.00	0.00
23.01	16.09	10.88	2.44	66.10	2.00	0.00	0.00	0.00
23.08	16.09	10.86	2.31	64.56	2.00	0.00	0.00	0.00
23.18	16.19	10.90	2.23	63.79	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)
23.23	16.32	10.96	2.34	65.16	2.00	0.00	0.00	0.00
23.28	16.54	11.07	2.58	68.05	2.00	0.00	0.00	0.00
23.35	16.70	11.14	2.79	70.47	2.00	0.00	0.00	0.00
23.40	16.67	11.10	3.02	72.75	2.00	0.00	0.00	0.00
23.48	16.80	11.15	3.11	73.80	2.00	0.00	0.00	0.00
23.53	16.89	11.19	3.13	74.14	2.00	0.00	0.00	0.00
23.57	16.57	10.94	3.07	72.90	2.00	0.00	0.00	0.00
23.66	15.90	10.42	3.02	71.05	2.00	0.00	0.00	0.00
23.70	14.76	9.58	2.89	67.60	2.00	0.00	0.00	0.00
23.79	14.15	9.11	2.60	63.56	2.00	0.00	0.00	0.00
23.84	13.42	8.57	2.33	59.53	2.00	0.00	0.00	0.00
23.89	13.20	8.40	2.13	57.18	2.00	0.00	0.00	0.00
24.00	12.98	8.20	2.08	56.11	2.00	0.00	0.00	0.00
24.09	12.98	8.18	2.07	56.00	2.00	0.00	0.00	0.00
24.14	13.17	8.31	2.09	56.57	2.00	0.00	0.00	0.00
24.19	13.49	8.53	2.13	57.46	2.00	0.00	0.00	0.00
24.25	13.93	8.83	2.13	58.21	2.00	0.00	0.00	0.00
24.30	14.35	9.11	2.10	58.50	2.00	0.00	0.00	0.00
24.36	14.95	9.54	2.03	58.67	2.00	0.00	0.00	0.00
24.45	15.62	10.03	1.89	58.04	2.00	0.00	0.00	0.00
24.59	16.19	10.44	1.76	57.23	2.00	0.00	0.00	0.00
24.66	16.57	10.73	1.66	56.32	2.00	0.00	0.00	0.00
24.71	17.11	11.14	1.54	55.43	2.00	0.00	0.00	0.00
24.76	17.68	11.58	1.42	54.28	2.00	0.00	0.00	0.00
24.84	18.38	12.12	1.27	52.70	2.00	0.00	0.00	0.00
24.89	18.80	12.43	1.25	52.84	2.00	0.00	0.00	0.00
24.95	19.08	12.61	1.34	54.38	2.00	0.00	0.00	0.00
25.02	18.99	12.48	1.51	56.88	2.00	0.00	0.00	0.00
25.08	18.16	11.81	1.72	58.92	2.00	0.00	0.00	0.00
25.13	17.92	11.60	1.83	60.18	2.00	0.00	0.00	0.00
25.15	17.70	11.41	1.93	61.15	2.00	0.00	0.00	0.00
25.24	18.18	11.74	1.93	61.62	2.00	0.00	0.00	0.00
25.28	18.03	11.62	1.96	61.80	2.00	0.00	0.00	0.00
25.41	18.13	11.65	2.02	62.72	2.00	0.00	0.00	0.00
25.46	18.32	11.66	2.83	72.18	2.00	0.00	0.00	0.00
25.59	18.99	12.09	3.89	83.89	2.00	0.00	0.00	0.00
25.64	18.99	12.07	5.22	95.36	2.00	0.00	0.00	0.00
25.68	22.65	14.58	5.26	103.88	2.00	3.45	0.00	0.00
25.74	27.80	18.12	5.05	111.90	2.00	10.62	0.00	0.00
25.80	34.93	23.30	4.68	119.74	2.00	18.92	0.00	0.00
25.88	38.39	25.78	4.66	124.59	2.00	22.26	0.00	0.00
25.94	39.28	26.39	4.69	126.20	2.00	23.03	0.00	0.00
26.00	37.72	25.21	4.74	124.52	2.00	21.52	0.00	0.00
26.07	34.70	22.97	4.80	120.53	2.00	18.45	0.00	0.00
26.15	31.23	20.46	4.65	113.11	2.00	14.63	0.00	0.00
26.24	28.53	18.52	4.39	105.50	2.00	11.34	0.00	0.00
26.28	26.65	17.22	4.03	98.31	2.00	8.93	0.00	0.00
26.33	25.32	16.27	3.84	93.99	2.00	7.06	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)
26.40	23.70	15.11	3.66	89.28	2.00	4.63	0.00	0.00
26.47	22.37	14.17	3.46	84.92	2.00	2.51	0.00	0.00
26.51	21.13	13.31	3.24	80.44	2.00	0.43	0.00	0.00
26.59	20.23	12.68	2.98	76.22	2.00	0.00	0.00	0.00
26.67	19.56	12.22	2.75	72.58	2.00	0.00	0.00	0.00
26.72	19.69	12.34	2.50	70.00	2.00	0.00	0.00	0.00
26.80	20.14	12.67	2.31	68.32	2.00	0.00	0.00	0.00
26.86	20.68	13.07	2.19	67.41	2.00	0.00	0.00	0.00
26.95	20.87	13.19	2.13	66.92	2.00	0.15	0.00	0.00
26.99	20.93	13.22	2.14	67.14	2.00	0.22	0.00	0.00
27.04	20.80	13.11	2.21	67.76	2.00	0.00	0.00	0.00
27.12	20.45	12.81	2.32	68.64	2.00	0.00	0.00	0.00
27.21	19.88	12.36	2.43	69.20	2.00	0.00	0.00	0.00
27.25	19.38	11.98	2.50	69.27	2.00	0.00	0.00	0.00
27.36	19.19	11.82	2.51	69.04	2.00	0.00	0.00	0.00
27.40	19.22	11.84	2.43	68.23	2.00	0.00	0.00	0.00
27.47	19.28	11.90	2.24	66.01	2.00	0.00	0.00	0.00
27.52	19.22	11.93	1.83	60.72	2.00	0.00	0.00	0.00
27.59	19.19	11.99	1.41	54.86	2.00	0.00	0.00	0.00
27.65	19.09	11.99	1.12	50.22	2.00	0.00	0.00	0.00
27.71	19.06	11.96	1.09	49.65	2.00	0.00	0.00	0.00
27.77	18.99	11.89	1.12	50.11	2.00	0.00	0.00	0.00
27.82	19.06	11.92	1.15	50.62	2.00	0.00	0.00	0.00
27.90	19.18	11.97	1.23	51.93	2.00	0.00	0.00	0.00
27.96	19.66	12.25	1.39	54.85	2.00	0.00	0.00	0.00
28.05	20.23	12.60	1.56	57.96	2.00	0.00	0.00	0.00
28.09	21.67	13.53	1.89	64.23	2.00	0.97	0.00	0.00
28.20	22.97	14.34	2.26	70.68	2.00	2.90	0.00	0.00
28.24	24.60	15.35	2.88	80.57	2.00	5.13	0.00	0.00
28.31	26.60	16.65	3.29	88.29	2.00	7.82	0.00	0.00
28.36	31.24	19.89	3.32	94.78	2.00	13.70	0.00	0.00
28.42	36.46	23.61	3.17	98.84	2.00	19.35	0.00	0.00
28.49	40.17	26.21	3.19	103.05	2.00	22.81	0.00	0.00
28.62	40.35	26.20	3.41	106.74	2.00	22.80	0.00	0.00
28.66	39.27	25.34	3.64	108.90	2.00	21.69	0.00	0.00
28.70	38.22	24.55	3.73	108.95	2.00	20.65	0.00	0.00
28.76	37.96	24.35	3.70	108.11	2.00	20.37	0.00	0.00
28.81	37.93	24.33	3.60	106.61	2.00	20.35	0.00	0.00
28.88	38.31	24.59	3.53	105.95	2.00	20.69	0.00	0.00
28.97	38.72	24.84	3.49	105.88	2.00	21.04	0.00	0.00
29.00	39.33	25.25	3.50	106.66	2.00	21.57	0.00	0.00
29.08	40.00	25.68	3.50	107.40	2.00	22.13	0.00	0.00
29.15	40.79	26.20	3.52	108.45	2.00	22.79	0.00	0.00
29.23	41.75	26.82	3.53	109.71	2.00	23.56	0.00	0.00
29.35	42.51	27.29	3.53	110.44	2.00	24.14	0.00	0.00
29.39	43.02	27.64	3.52	110.78	2.00	24.55	0.00	0.00
29.43	42.51	27.25	3.54	110.54	2.00	24.09	0.00	0.00
29.50	41.78	26.69	3.56	109.86	2.00	23.40	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)
29.55	41.02	26.14	3.53	108.55	2.00	22.72	0.00	0.00
29.63	40.92	26.07	3.44	106.98	2.00	22.62	0.00	0.00
29.68	41.34	26.39	3.25	104.43	2.00	23.03	0.00	0.00
29.76	42.19	26.99	3.14	103.50	2.00	23.77	0.00	0.00
29.86	43.21	27.66	3.14	104.36	2.00	24.58	0.00	0.00
29.91	43.88	28.04	3.29	107.53	2.00	25.03	0.00	0.00
29.95	44.39	28.30	3.49	111.29	2.00	25.33	0.00	0.00
30.02	44.84	28.51	3.68	114.73	2.00	25.58	0.00	0.00
30.06	45.22	28.67	3.91	118.76	2.00	25.76	0.00	0.00
30.14	45.86	29.01	4.07	121.81	2.00	26.15	0.00	0.00
30.20	46.46	29.41	4.01	121.61	2.00	26.61	0.00	0.00
30.26	46.94	29.78	3.79	118.63	2.00	27.02	0.00	0.00
30.33	46.42	29.42	3.71	116.72	2.00	26.61	0.00	0.00
30.41	45.82	28.93	3.78	117.02	2.00	26.06	0.00	0.00
30.45	45.28	28.50	3.85	117.57	2.00	25.57	0.00	0.00
30.54	45.09	28.34	3.78	116.22	2.00	25.39	0.00	0.00
30.59	44.81	28.13	3.75	115.26	2.00	25.14	0.00	0.00
30.65	43.95	27.48	3.83	115.53	2.00	24.37	0.00	0.00
30.71	43.69	27.26	3.86	115.65	2.00	24.10	0.00	0.00
30.80	44.14	27.54	3.80	115.12	2.00	24.44	0.00	0.00
30.85	45.54	28.52	3.66	114.53	2.00	25.59	0.00	0.00
30.93	46.01	28.81	3.64	114.63	2.00	25.93	0.00	0.00
30.99	45.63	28.50	3.69	114.98	2.00	25.57	0.00	0.00
31.06	44.90	27.93	3.74	114.86	2.00	24.91	0.00	0.00
31.11	44.70	27.80	3.68	113.74	2.00	24.75	0.00	0.00
31.19	44.80	27.84	3.61	112.66	2.00	24.80	0.00	0.00
31.28	44.92	27.90	3.57	112.00	2.00	24.86	0.00	0.00
31.37	44.86	27.79	3.60	112.39	2.00	24.73	0.00	0.00
31.46	44.64	27.57	3.66	113.01	2.00	24.48	0.00	0.00
31.52	44.42	27.36	3.73	113.76	2.00	24.23	0.00	0.00
31.59	44.17	27.14	3.78	114.22	2.00	23.95	0.00	0.00
31.63	44.09	27.04	3.85	115.09	2.00	23.83	0.00	0.00
31.72	43.93	26.86	3.91	115.78	2.00	23.61	0.00	0.00
31.76	43.96	26.85	3.94	116.31	2.00	23.60	0.00	0.00
31.85	44.01	26.83	3.94	116.22	2.00	23.58	0.00	0.00
31.89	44.23	26.97	3.92	116.08	2.00	23.75	0.00	0.00
31.99	44.39	27.03	3.90	115.99	2.00	23.82	0.00	0.00
32.02	44.55	27.12	3.89	116.01	2.00	23.93	0.00	0.00
32.09	44.90	27.34	3.84	115.58	2.00	24.20	0.00	0.00
32.20	44.90	27.30	3.79	114.72	2.00	24.14	0.00	0.00
32.24	44.51	27.03	3.75	113.59	2.00	23.82	0.00	0.00
32.31	43.40	26.23	3.80	112.99	2.00	22.83	0.00	0.00
32.38	42.29	25.43	3.87	112.79	2.00	21.81	0.00	0.00
32.42	41.30	24.74	3.91	112.09	2.00	20.90	0.00	0.00
32.52	40.63	24.25	3.89	110.90	2.00	20.24	0.00	0.00
32.58	39.96	23.79	3.86	109.75	2.00	19.60	0.00	0.00
32.64	39.59	23.50	3.89	109.58	2.00	19.21	0.00	0.00
32.73	39.27	23.24	3.94	109.86	2.00	18.83	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)
32.79	39.27	23.20	3.97	110.24	2.00	18.78	0.00	0.00
32.84	39.24	23.14	4.00	110.46	2.00	18.70	0.00	0.00
32.90	39.14	23.05	4.02	110.64	2.00	18.56	0.00	0.00
32.95	38.66	22.75	3.89	108.26	2.00	18.13	0.00	0.00
33.06	38.06	22.35	3.73	105.19	2.00	17.55	0.00	0.00
33.10	37.58	22.05	3.64	103.37	2.00	17.10	0.00	0.00
33.16	37.46	21.91	3.75	104.74	2.00	16.88	0.00	0.00
33.21	37.37	21.79	3.86	106.03	2.00	16.71	0.00	0.00
33.30	37.24	21.67	3.86	105.73	2.00	16.53	0.00	0.00
33.35	35.62	20.58	3.90	104.14	2.00	14.83	0.00	0.00
33.44	34.40	19.75	3.92	102.75	2.00	13.47	0.00	0.00
33.47	34.09	19.58	3.78	100.58	2.00	13.17	0.00	0.00
33.55	35.23	20.36	3.52	98.65	2.00	14.47	0.00	0.00
33.60	35.68	20.70	3.31	96.34	2.00	15.01	0.00	0.00
33.71	35.20	20.36	3.26	95.08	2.00	14.46	0.00	0.00
33.76	34.66	19.98	3.25	94.24	2.00	13.85	0.00	0.00
33.81	34.37	19.76	3.32	94.83	2.00	13.48	0.00	0.00
33.90	34.18	19.57	3.42	95.84	2.00	13.16	0.00	0.00
33.95	34.05	19.43	3.54	97.22	2.00	12.93	0.00	0.00
34.01	33.86	19.26	3.63	98.10	2.00	12.63	0.00	0.00
34.06	33.19	18.77	3.77	98.90	2.00	11.79	0.00	0.00
34.16	32.27	18.11	3.90	99.16	2.00	10.61	0.00	0.00
34.25	31.38	17.48	4.04	99.38	2.00	9.44	0.00	0.00
34.30	30.87	17.12	4.13	99.63	2.00	8.75	0.00	0.00
34.36	30.65	16.93	4.30	101.04	2.00	8.37	0.00	0.00
34.43	30.68	16.90	4.41	102.23	2.00	8.32	0.00	0.00
34.47	33.07	18.46	4.11	102.46	2.00	11.23	0.00	0.00
34.56	37.20	21.22	3.57	101.00	2.00	15.83	0.00	0.00
34.60	39.67	22.91	3.24	99.11	2.00	18.37	0.00	0.00
34.70	38.43	22.05	3.28	98.22	2.00	17.10	0.00	0.00
34.77	35.46	20.13	3.22	94.08	2.00	14.09	0.00	0.00
34.82	33.84	19.12	3.06	90.16	2.00	12.39	0.00	0.00
34.86	33.74	19.10	2.88	87.50	2.00	12.37	0.00	0.00
34.96	34.32	19.40	2.98	89.42	2.00	12.88	0.00	0.00
35.08	35.21	19.90	3.06	91.47	2.00	13.72	0.00	0.00
35.14	36.07	20.43	3.09	92.76	2.00	14.57	0.00	0.00
35.17	36.26	20.52	3.14	93.65	2.00	14.73	0.00	0.00
35.18	36.39	20.57	3.23	95.02	2.00	14.80	0.00	0.00
35.26	36.77	20.75	3.30	96.34	2.00	15.10	0.00	0.00
35.34	37.44	21.14	3.32	97.38	2.00	15.71	0.00	0.00
35.39	38.39	21.76	3.26	97.52	2.00	16.66	0.00	0.00
35.48	39.19	22.26	3.18	97.19	2.00	17.41	0.00	0.00
35.52	39.66	22.56	3.16	97.31	2.00	17.85	0.00	0.00
35.57	39.60	22.47	3.22	98.10	2.00	17.72	0.00	0.00
35.66	39.44	22.31	3.28	98.73	2.00	17.48	0.00	0.00
35.70	39.12	22.11	3.22	97.53	2.00	17.19	0.00	0.00
35.80	39.03	22.05	3.12	95.88	2.00	17.10	0.00	0.00
35.89	38.87	21.95	3.04	94.45	2.00	16.94	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)
35.94	38.96	21.97	3.06	94.87	2.00	16.98	0.00	0.00
36.00	39.06	22.00	3.09	95.35	2.00	17.02	0.00	0.00
36.05	38.39	21.52	3.18	95.96	2.00	16.30	0.00	0.00
36.09	37.63	20.99	3.27	96.40	2.00	15.47	0.00	0.00
36.20	36.74	20.35	3.36	96.52	2.00	14.45	0.00	0.00
36.27	36.42	20.12	3.37	96.31	2.00	14.08	0.00	0.00
36.32	35.94	19.79	3.40	96.02	2.00	13.54	0.00	0.00
36.36	35.21	19.31	3.42	95.47	2.00	12.73	0.00	0.00
36.43	34.09	18.59	3.42	94.07	2.00	11.46	0.00	0.00
36.53	33.01	17.89	3.39	92.35	2.00	10.20	0.00	0.00
36.57	32.09	17.33	3.32	90.39	2.00	9.14	0.00	0.00
36.65	31.52	16.96	3.26	88.93	2.00	8.44	0.00	0.00
36.72	31.14	16.71	3.22	87.94	2.00	7.95	0.00	0.00
36.77	31.01	16.62	3.22	87.71	2.00	7.76	0.00	0.00
36.81	31.80	17.10	3.19	88.29	2.00	8.72	0.00	0.00
36.90	32.91	17.78	3.17	89.21	2.00	9.99	0.00	0.00
36.99	34.28	18.61	3.13	90.25	2.00	11.50	0.00	0.00
37.03	35.56	19.40	3.11	91.41	2.00	12.87	0.00	0.00
37.07	36.58	20.00	3.16	93.11	2.00	13.88	0.00	0.00
37.16	37.88	20.75	3.25	95.73	2.00	15.09	0.00	0.00
37.25	38.99	21.36	3.38	98.68	2.00	16.05	0.00	0.00
37.29	40.20	22.05	3.51	101.66	2.00	17.10	0.00	0.00
37.38	41.06	22.51	3.59	103.68	2.00	17.79	0.00	0.00
37.43	41.63	22.82	3.66	105.29	2.00	18.24	0.00	0.00
37.49	42.26	23.18	3.71	106.53	2.00	18.75	0.00	0.00
37.59	42.96	23.56	3.72	107.47	2.00	19.28	0.00	0.00
37.64	43.53	23.89	3.72	108.06	2.00	19.74	0.00	0.00
37.69	43.63	23.93	3.72	108.10	2.00	19.80	0.00	0.00
37.77	43.19	23.60	3.77	108.18	2.00	19.34	0.00	0.00
37.82	42.52	23.14	3.85	108.53	2.00	18.69	0.00	0.00
37.88	42.11	22.84	3.91	108.80	2.00	18.25	0.00	0.00
37.95	41.82	22.70	3.73	105.99	2.00	18.05	0.00	0.00
38.07	41.53	22.50	3.64	104.37	2.00	17.77	0.00	0.00
38.18	41.31	22.35	3.55	102.82	2.00	17.55	0.00	0.00
38.26	40.93	22.03	3.69	104.30	2.00	17.08	0.00	0.00
38.32	41.10	22.13	3.66	104.07	2.00	17.22	0.00	0.00
38.39	40.66	21.82	3.68	103.77	2.00	16.75	0.00	0.00
38.46	41.07	22.06	3.63	103.55	2.00	17.11	0.00	0.00
38.55	41.18	22.10	3.63	103.57	2.00	17.17	0.00	0.00
38.59	41.47	22.26	3.61	103.56	2.00	17.41	0.00	0.00
38.68	40.96	21.89	3.67	103.76	2.00	16.86	0.00	0.00
38.74	40.20	21.37	3.76	104.05	2.00	16.07	0.00	0.00
38.78	39.60	20.96	3.84	104.30	2.00	15.43	0.00	0.00
38.86	38.77	20.42	3.88	103.81	2.00	14.57	0.00	0.00
38.94	38.20	20.05	3.87	102.99	2.00	13.95	0.00	0.00
38.99	37.85	19.83	3.84	102.09	2.00	13.59	0.00	0.00
39.05	38.07	19.96	3.77	101.44	2.00	13.82	0.00	0.00
39.12	38.39	20.16	3.67	100.50	2.00	14.15	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)
39.20	38.77	20.40	3.56	99.43	2.00	14.53	0.00	0.00
39.27	39.31	20.75	3.43	98.27	2.00	15.09	0.00	0.00
39.34	39.69	20.99	3.35	97.54	2.00	15.47	0.00	0.00
39.45	40.07	21.19	3.31	97.42	2.00	15.79	0.00	0.00
39.51	40.20	21.24	3.33	97.73	2.00	15.86	0.00	0.00
39.56	40.39	21.33	3.34	98.03	2.00	16.01	0.00	0.00
39.64	40.49	21.36	3.33	97.94	2.00	16.05	0.00	0.00
39.69	40.55	21.40	3.27	97.22	2.00	16.12	0.00	0.00
39.81	40.33	21.23	3.26	96.78	2.00	15.84	0.00	0.00
39.87	39.98	20.99	3.28	96.56	2.00	15.48	0.00	0.00
39.92	39.03	20.35	3.39	97.11	2.00	14.45	0.00	0.00
40.06	36.29	18.57	3.67	97.49	2.00	11.44	0.00	0.00
40.08	35.27	17.92	3.81	97.84	2.00	10.25	0.00	0.00
40.13	34.57	17.46	3.92	98.21	2.00	9.39	0.00	0.00
40.18	35.43	17.97	3.85	98.48	2.00	10.34	0.00	0.00
40.26	34.29	17.24	3.98	98.41	2.00	8.97	0.00	0.00
40.30	32.35	16.10	3.96	95.53	2.00	6.72	0.00	0.00
40.39	30.60	15.10	3.74	90.78	2.00	4.61	0.00	0.00
40.43	28.78	14.13	3.41	84.79	2.00	2.40	0.00	0.00
40.52	27.86	13.62	3.18	81.10	2.00	1.21	0.00	0.00
40.56	26.68	12.95	3.10	78.73	2.00	0.00	0.00	0.00
40.64	25.67	12.36	3.09	77.25	2.00	0.00	0.00	0.00
40.69	24.24	11.59	3.11	75.64	2.00	0.00	0.00	0.00
40.79	23.35	11.10	3.12	74.50	2.00	0.00	0.00	0.00
40.82	22.36	10.57	3.15	73.46	2.00	0.00	0.00	0.00
40.89	22.01	10.37	3.14	72.85	2.00	0.00	0.00	0.00
40.96	21.06	9.86	3.16	71.59	2.00	0.00	0.00	0.00
41.05	20.04	9.30	3.16	69.99	2.00	0.00	0.00	0.00
41.09	18.76	8.62	3.19	68.28	2.00	0.00	0.00	0.00
41.14	18.28	8.36	3.10	66.74	2.00	0.00	0.00	0.00
41.23	18.00	8.20	3.01	65.49	2.00	0.00	0.00	0.00
41.28	18.19	8.29	2.82	64.08	2.00	0.00	0.00	0.00
41.36	18.16	8.27	2.74	63.31	2.00	0.00	0.00	0.00
41.45	18.41	8.39	2.67	62.98	2.00	0.00	0.00	0.00
41.47	18.35	8.35	2.70	63.15	2.00	0.00	0.00	0.00
41.60	18.89	8.62	2.63	63.31	2.00	0.00	0.00	0.00
41.65	19.68	9.02	2.56	63.68	2.00	0.00	0.00	0.00
41.71	20.86	9.63	2.48	64.39	2.00	0.00	0.00	0.00
41.76	22.96	10.73	2.43	66.33	2.00	0.00	0.00	0.00
41.82	24.36	11.46	2.68	70.66	2.00	0.00	0.00	0.00
41.88	25.32	11.93	3.09	76.21	2.00	0.00	0.00	0.00
41.93	25.06	11.79	3.66	81.64	2.00	0.00	0.00	0.00
42.01	25.70	12.10	4.04	86.08	2.00	0.00	0.00	0.00
42.07	29.35	14.00	3.96	90.46	2.00	2.10	0.00	0.00
42.15	32.34	15.60	3.92	93.97	2.00	5.67	0.00	0.00
42.24	36.22	17.87	3.66	95.97	2.00	10.16	0.00	0.00
42.27	33.70	16.35	3.89	95.35	2.00	7.22	0.00	0.00
42.38	30.76	14.65	4.14	93.96	2.00	3.61	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)
42.41	26.21	12.28	4.66	92.20	2.00	0.00	0.00	0.00
42.47	25.06	11.68	4.56	89.48	2.00	0.00	0.00	0.00
42.55	24.61	11.43	4.21	85.66	2.00	0.00	0.00	0.00
42.61	24.55	11.39	3.78	81.71	2.00	0.00	0.00	0.00
42.68	24.39	11.29	3.54	79.14	2.00	0.00	0.00	0.00
42.72	24.49	11.33	3.34	77.37	2.00	0.00	0.00	0.00
42.80	24.68	11.42	3.05	74.65	2.00	0.00	0.00	0.00
42.85	25.03	11.70	2.39	67.94	2.00	0.00	0.00	0.00
42.94	25.22	11.97	1.86	61.77	2.00	0.00	0.00	0.00
42.98	25.25	12.09	1.59	58.08	2.00	0.00	0.00	0.00
43.07	25.28	12.01	1.77	60.60	2.00	0.00	0.00	0.00
43.13	25.28	11.92	1.98	63.29	2.00	0.00	0.00	0.00
43.18	25.25	11.82	2.21	65.93	2.00	0.00	0.00	0.00
43.28	25.22	11.72	2.39	68.01	2.00	0.00	0.00	0.00
43.31	25.00	11.53	2.59	69.94	2.00	0.00	0.00	0.00
43.38	24.49	11.21	2.76	71.10	2.00	0.00	0.00	0.00
43.45	23.79	10.84	2.93	71.97	2.00	0.00	0.00	0.00
43.53	23.28	10.57	2.97	71.74	2.00	0.00	0.00	0.00
43.58	23.05	10.45	2.89	70.63	2.00	0.00	0.00	0.00
43.64	23.02	10.42	2.71	68.71	2.00	0.00	0.00	0.00
43.73	23.15	10.47	2.56	67.19	2.00	0.00	0.00	0.00
43.77	23.66	10.74	2.42	66.31	2.00	0.00	0.00	0.00
43.86	24.74	11.35	2.35	66.79	2.00	0.00	0.00	0.00
43.92	26.78	12.49	2.32	68.67	2.00	0.00	0.00	0.00
43.99	29.73	14.18	2.28	71.11	2.00	2.53	0.00	0.00
44.04	33.26	16.19	2.30	74.65	2.00	6.91	0.00	0.00
44.11	36.95	18.32	2.30	77.81	2.00	10.98	0.00	0.00
44.17	40.83	20.51	2.41	82.63	2.00	14.71	0.00	0.00
44.25	45.99	23.47	2.49	88.06	2.00	19.15	0.00	0.00
44.34	50.79	26.21	2.59	93.30	2.00	22.80	0.00	0.00
44.42	54.58	28.40	2.62	96.63	2.00	25.45	0.00	0.00
44.47	56.10	29.25	2.67	98.52	2.00	26.43	0.00	0.00
44.52	56.77	29.59	2.72	99.88	2.00	26.80	0.00	0.00
44.56	56.83	29.51	2.85	102.24	2.00	26.71	0.00	0.00
44.65	56.80	29.34	2.99	104.60	2.00	26.53	0.00	0.00
44.70	56.64	29.14	3.11	106.39	2.00	26.30	0.00	0.00
44.75	56.67	29.16	3.07	105.74	2.00	26.32	0.00	0.00
44.82	56.70	29.19	3.00	104.63	2.00	26.36	0.00	0.00
44.91	56.39	28.98	2.99	104.02	2.00	26.12	0.00	0.00
44.96	55.43	28.33	3.08	104.74	2.00	25.37	0.00	0.00
45.02	53.43	27.06	3.19	104.98	2.00	23.85	0.00	0.00
45.08	50.76	25.42	3.30	104.30	2.00	21.79	0.00	0.00
45.18	48.40	23.99	3.38	103.20	2.00	19.88	0.00	0.00
45.22	46.91	23.36	2.93	95.17	2.00	19.01	0.00	0.00
45.31	46.24	23.39	2.23	83.31	2.00	19.05	0.00	0.00
45.34	45.76	23.48	1.77	74.92	0.18	19.17	51.20	0.31
45.43	45.35	23.14	1.84	75.89	0.19	18.69	51.20	0.74
45.48	45.38	22.89	2.14	81.20	2.00	18.33	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)
45.57	45.61	22.95	2.19	82.18	2.00	18.43	0.00	0.00
45.62	45.85	23.03	2.25	83.34	2.00	18.54	0.00	0.00
45.69	45.88	22.97	2.33	84.65	2.00	18.45	0.00	0.00
45.74	45.78	22.81	2.45	86.54	2.00	18.22	0.00	0.00
45.80	45.73	22.66	2.61	89.03	2.00	18.00	0.00	0.00
45.87	45.86	22.60	2.79	91.92	2.00	17.91	0.00	0.00
45.96	45.83	22.45	2.96	94.31	2.00	17.70	0.00	0.00
46.01	45.61	22.25	3.07	95.77	2.00	17.39	0.00	0.00
46.07	44.91	21.78	3.17	96.51	2.00	16.69	0.00	0.00
46.14	43.63	20.97	3.30	97.10	2.00	15.44	0.00	0.00
46.25	42.36	20.16	3.43	97.49	2.00	14.15	0.00	0.00
46.27	41.16	19.45	3.51	97.23	2.00	12.96	0.00	0.00
46.37	40.58	19.11	3.48	96.24	2.00	12.38	0.00	0.00
46.41	40.23	18.95	3.38	94.54	2.00	12.10	0.00	0.00
46.49	40.11	18.89	3.29	93.22	2.00	11.99	0.00	0.00
46.54	39.89	18.78	3.24	92.28	2.00	11.79	0.00	0.00
46.62	39.50	18.53	3.24	91.96	2.00	11.37	0.00	0.00
46.66	39.06	18.28	3.22	91.17	2.00	10.92	0.00	0.00
46.74	38.51	17.98	3.16	89.87	2.00	10.37	0.00	0.00
46.81	38.10	17.76	3.10	88.60	2.00	9.96	0.00	0.00
46.86	37.81	17.60	3.08	88.02	2.00	9.66	0.00	0.00
46.94	37.91	17.63	3.07	88.02	2.00	9.71	0.00	0.00
47.02	38.07	17.70	3.07	88.04	2.00	9.84	0.00	0.00
47.07	38.55	17.95	3.06	88.38	2.00	10.31	0.00	0.00
47.15	39.21	18.27	3.10	89.54	2.00	10.90	0.00	0.00
47.20	40.07	18.68	3.21	91.81	2.00	11.63	0.00	0.00
47.25	40.68	18.84	3.59	97.17	2.00	11.91	0.00	0.00
47.36	41.64	19.15	4.04	103.52	2.00	12.45	0.00	0.00
47.41	47.55	22.18	4.46	115.29	2.00	17.29	0.00	0.00
47.50	58.65	28.20	4.50	127.63	2.00	25.21	0.00	0.00
47.56	74.74	37.43	4.08	135.96	2.00	34.56	0.00	0.00
47.63	89.75	46.90	3.24	131.14	2.00	42.01	0.00	0.00
47.67	98.82	53.05	2.68	124.78	2.00	46.08	0.00	0.00
47.72	94.90	50.58	2.73	123.50	2.00	44.50	0.00	0.00
47.79	93.57	49.48	2.90	126.35	2.00	43.78	0.00	0.00
47.85	79.86	40.37	3.83	135.30	2.00	37.06	0.00	0.00
47.91	85.93	43.52	4.13	145.75	2.00	39.54	0.00	0.00
47.99	95.21	48.27	4.64	162.86	2.00	42.96	0.00	0.00
48.04	138.05	74.20	3.84	177.13	0.93	57.15	4.89	0.04
48.11	165.08	90.55	3.72	191.85	1.15	63.72	1.93	0.02
48.20	168.80	92.00	4.01	202.06	2.00	64.25	0.00	0.00
48.24	143.83	75.71	4.86	205.83	2.00	57.82	0.00	0.00
48.30	116.03	58.74	5.71	201.16	2.00	49.44	0.00	0.00
48.37	96.08	47.37	5.95	186.77	2.00	42.34	0.00	0.00
48.46	80.62	38.96	5.75	167.76	2.00	35.89	0.00	0.00
48.51	68.67	32.70	5.29	148.24	2.00	30.10	0.00	0.00
48.58	59.76	28.03	4.93	133.70	2.00	25.02	0.00	0.00
48.64	52.09	24.10	4.45	119.14	2.00	20.04	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)
48.72	46.65	21.32	4.06	108.27	2.00	15.99	0.00	0.00
48.76	42.27	19.12	3.70	99.10	2.00	12.39	0.00	0.00
48.86	39.98	17.93	3.52	94.48	2.00	10.28	0.00	0.00
48.90	37.40	16.58	3.43	90.66	2.00	7.70	0.00	0.00
48.95	35.62	15.63	3.43	88.61	2.00	5.74	0.00	0.00
49.03	33.78	14.63	3.46	86.74	2.00	3.56	0.00	0.00
49.09	32.19	13.78	3.46	84.75	2.00	1.59	0.00	0.00
49.25	31.26	13.29	3.40	83.02	2.00	0.39	0.00	0.00
49.30	31.10	13.22	3.31	81.87	2.00	0.21	0.00	0.00
49.38	32.44	13.95	3.15	81.74	2.00	1.98	0.00	0.00
49.47	33.97	14.77	3.04	82.12	2.00	3.87	0.00	0.00
49.52	35.21	15.43	3.00	82.96	2.00	5.31	0.00	0.00
49.56	35.40	15.48	3.10	84.31	2.00	5.42	0.00	0.00
49.65	35.65	15.56	3.17	85.33	2.00	5.60	0.00	0.00
49.74	35.94	15.66	3.24	86.41	2.00	5.81	0.00	0.00
49.80	36.54	15.94	3.32	87.92	2.00	6.38	0.00	0.00
49.86	37.24	16.24	3.45	90.21	2.00	7.00	0.00	0.00
49.91	38.20	16.68	3.56	92.48	2.00	7.89	0.00	0.00
49.95	38.64	16.87	3.64	93.86	2.00	8.26	0.00	0.00
50.04	38.70	16.87	3.67	94.21	2.00	8.26	0.00	0.00
50.09	40.07	17.62	3.54	94.09	2.00	9.70	0.00	0.00
50.15	40.07	17.64	3.47	93.24	2.00	9.73	0.00	0.00
50.24	39.53	17.35	3.42	92.07	2.00	9.18	0.00	0.00
50.28	36.73	15.84	3.50	89.94	2.00	6.18	0.00	0.00
50.37	35.40	15.14	3.45	87.81	2.00	4.69	0.00	0.00
50.40	34.76	14.86	3.29	85.30	2.00	4.08	0.00	0.00
50.50	34.54	14.76	3.17	83.76	2.00	3.86	0.00	0.00
50.54	34.70	14.89	3.03	82.31	2.00	4.14	0.00	0.00
50.59	34.51	14.81	2.95	81.17	2.00	3.96	0.00	0.00
50.68	34.22	14.68	2.86	79.73	2.00	3.66	0.00	0.00
50.76	33.30	14.18	2.84	78.57	2.00	2.53	0.00	0.00
50.81	32.09	13.52	2.89	77.83	2.00	0.96	0.00	0.00
50.89	31.67	13.29	2.89	77.31	2.00	0.39	0.00	0.00
50.98	31.55	13.22	2.86	76.85	2.00	0.21	0.00	0.00
51.00	32.02	13.49	2.78	76.40	2.00	0.88	0.00	0.00
51.07	31.96	13.45	2.76	76.06	2.00	0.78	0.00	0.00
51.16	32.02	13.47	2.73	75.80	2.00	0.84	0.00	0.00
51.19	32.18	13.56	2.72	75.77	2.00	1.04	0.00	0.00
51.29	33.01	13.99	2.65	75.78	2.00	2.08	0.00	0.00
51.33	34.25	14.66	2.57	75.98	2.00	3.63	0.00	0.00
51.42	35.36	15.25	2.51	76.30	2.00	4.93	0.00	0.00
51.45	37.46	16.25	2.73	80.94	2.00	7.02	0.00	0.00
51.64	39.53	17.19	2.91	85.16	2.00	8.88	0.00	0.00
51.68	41.79	18.29	3.06	89.18	2.00	10.93	0.00	0.00
51.73	42.55	18.71	3.01	89.12	2.00	11.67	0.00	0.00
51.77	42.93	18.92	2.96	88.77	2.00	12.04	0.00	0.00
51.81	42.49	18.68	2.94	88.16	2.00	11.62	0.00	0.00
51.85	40.42	17.68	2.75	83.74	2.00	9.81	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)
51.94	37.59	16.34	2.42	76.79	2.00	7.21	0.00	0.00
51.99	34.54	14.92	2.04	69.06	2.00	4.21	0.00	0.00
52.08	32.82	14.07	1.90	65.70	2.00	2.27	0.00	0.00
52.11	31.93	13.56	1.96	65.88	2.00	1.05	0.00	0.00
52.25	30.63	12.78	2.09	66.42	2.00	0.00	0.00	0.00
52.27	31.23	13.09	2.11	67.22	2.00	0.00	0.00	0.00
52.32	31.81	13.38	2.10	67.56	2.00	0.61	0.00	0.00
52.38	33.68	14.39	2.02	68.00	2.00	3.02	0.00	0.00
52.45	34.10	14.59	2.03	68.48	2.00	3.47	0.00	0.00
52.52	34.41	14.73	2.06	69.08	2.00	3.78	0.00	0.00
52.60	34.70	14.85	2.08	69.62	2.00	4.05	0.00	0.00
52.64	34.83	14.89	2.11	70.14	2.00	4.14	0.00	0.00
52.69	35.14	15.04	2.12	70.43	2.00	4.47	0.00	0.00
52.77	35.65	15.27	2.14	71.16	2.00	4.98	0.00	0.00
52.86	36.06	15.45	2.18	72.01	2.00	5.36	0.00	0.00
52.90	36.03	15.38	2.26	73.07	2.00	5.21	0.00	0.00
52.97	35.33	14.95	2.36	73.70	2.00	4.27	0.00	0.00
53.04	34.38	14.40	2.44	73.87	2.00	3.04	0.00	0.00
53.12	33.84	14.10	2.46	73.55	2.00	2.34	0.00	0.00
53.18	33.65	14.01	2.40	72.72	2.00	2.14	0.00	0.00
53.25	33.71	14.06	2.34	71.93	2.00	2.25	0.00	0.00
53.30	33.84	14.15	2.27	71.15	2.00	2.46	0.00	0.00
53.39	34.38	14.45	2.19	70.62	2.00	3.14	0.00	0.00
53.45	35.02	14.80	2.12	70.18	2.00	3.94	0.00	0.00
53.52	35.75	15.20	2.07	69.98	2.00	4.81	0.00	0.00
53.56	36.64	15.69	2.01	69.87	2.00	5.86	0.00	0.00
53.65	37.56	16.18	1.97	69.87	2.00	6.88	0.00	0.00
53.69	37.88	16.32	2.00	70.53	2.00	7.17	0.00	0.00
53.78	37.53	16.07	2.07	71.22	2.00	6.66	0.00	0.00
53.83	36.89	15.69	2.14	71.74	2.00	5.86	0.00	0.00
53.93	36.57	15.49	2.14	71.53	2.00	5.45	0.00	0.00
53.99	36.32	15.35	2.14	71.23	2.00	5.15	0.00	0.00
54.03	35.84	15.11	2.12	70.56	2.00	4.61	0.00	0.00
54.14	35.18	14.74	2.11	69.96	2.00	3.80	0.00	0.00
54.18	34.57	14.42	2.11	69.44	2.00	3.08	0.00	0.00
54.28	34.35	14.25	2.17	69.94	2.00	2.70	0.00	0.00
54.34	34.35	14.20	2.25	71.05	2.00	2.56	0.00	0.00
54.39	34.41	14.16	2.37	72.60	2.00	2.48	0.00	0.00
54.44	34.51	14.14	2.49	74.12	2.00	2.44	0.00	0.00
54.49	34.73	14.20	2.59	75.50	2.00	2.57	0.00	0.00
54.54	35.78	14.69	2.65	77.20	2.00	3.69	0.00	0.00
54.66	37.47	15.50	2.69	79.20	2.00	5.46	0.00	0.00
54.71	39.02	16.10	3.05	84.98	2.00	6.73	0.00	0.00
54.83	39.25	15.90	3.74	92.97	2.00	6.31	0.00	0.00
54.88	38.80	15.52	4.71	102.45	2.00	5.51	0.00	0.00
54.96	37.02	14.73	5.55	108.17	2.00	3.78	0.00	0.00
54.97	34.67	13.70	6.29	110.90	2.00	1.39	0.00	0.00
54.99	38.42	15.33	5.95	113.63	2.00	5.10	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)
55.08	41.00	16.43	5.88	116.51	2.00	7.39	0.00	0.00
55.14	49.90	20.50	5.17	120.36	2.00	14.69	0.00	0.00
55.20	50.51	20.64	5.49	124.30	2.00	14.92	0.00	0.00
55.29	53.30	21.95	5.56	128.50	2.00	16.96	0.00	0.00
55.34	50.89	20.65	6.15	131.64	2.00	14.94	0.00	0.00
55.39	51.49	20.90	6.29	133.78	2.00	15.33	0.00	0.00
55.46	54.13	22.06	6.19	135.92	2.00	17.11	0.00	0.00
55.51	59.19	24.62	5.84	138.49	2.00	20.74	0.00	0.00
55.59	67.14	28.79	5.24	139.95	2.00	25.90	0.00	0.00
55.65	73.21	32.09	4.79	139.54	2.00	29.49	0.00	0.00
55.77	75.09	33.15	4.55	137.59	2.00	30.55	0.00	0.00
55.82	71.05	31.02	4.62	134.97	2.00	28.37	0.00	0.00
55.86	64.79	27.74	4.79	131.37	2.00	24.68	0.00	0.00
55.95	58.81	24.65	4.96	127.36	2.00	20.77	0.00	0.00
55.99	53.08	21.78	5.05	122.08	2.00	16.70	0.00	0.00
56.08	49.36	19.90	5.16	118.78	2.00	13.71	0.00	0.00
56.12	47.77	19.08	5.29	118.13	2.00	12.33	0.00	0.00
56.22	49.07	19.64	5.39	120.60	2.00	13.28	0.00	0.00
56.26	52.44	21.27	5.34	124.18	2.00	15.90	0.00	0.00
56.32	58.65	24.36	5.10	128.53	2.00	20.38	0.00	0.00
56.43	63.42	26.72	4.97	131.88	2.00	23.44	0.00	0.00
56.45	70.22	30.27	4.67	134.32	2.00	27.56	0.00	0.00
56.51	72.13	31.25	4.61	135.16	2.00	28.60	0.00	0.00
56.56	72.89	31.57	4.66	136.56	2.00	28.94	0.00	0.00
56.63	69.30	29.48	5.07	138.86	2.00	26.69	0.00	0.00
56.72	68.12	28.72	5.33	141.03	2.00	25.82	0.00	0.00
56.77	71.24	30.28	5.24	143.00	2.00	27.56	0.00	0.00
56.85	76.26	32.90	4.97	143.89	2.00	30.31	0.00	0.00
56.90	81.00	35.43	4.74	144.60	2.00	32.75	0.00	0.00
56.96	84.38	37.25	4.55	144.43	2.00	34.41	0.00	0.00
57.07	86.73	38.52	4.40	143.61	2.00	35.51	0.00	0.00
57.09	88.32	39.55	4.19	141.36	2.00	36.38	0.00	0.00
57.16	86.35	38.62	4.06	137.58	2.00	35.59	0.00	0.00
57.25	83.17	37.01	3.97	133.54	2.00	34.19	0.00	0.00
57.29	78.01	34.30	3.99	129.89	2.00	31.68	0.00	0.00
57.36	73.12	31.71	4.07	127.23	2.00	29.09	0.00	0.00
57.43	67.96	29.05	4.13	123.73	2.00	26.19	0.00	0.00
57.51	64.02	27.06	4.11	119.92	2.00	23.85	0.00	0.00
57.59	60.78	25.43	4.08	116.64	2.00	21.81	0.00	0.00
57.66	58.65	24.36	4.08	114.58	2.00	20.38	0.00	0.00
57.69	57.09	23.61	4.02	112.39	2.00	19.36	0.00	0.00
57.82	57.03	23.60	3.90	110.68	2.00	19.35	0.00	0.00
57.86	56.96	23.62	3.80	109.26	2.00	19.36	0.00	0.00
57.90	56.46	23.33	3.84	109.26	2.00	18.96	0.00	0.00
57.95	55.22	22.60	4.02	110.44	2.00	17.92	0.00	0.00
58.05	53.37	21.52	4.32	112.28	2.00	16.29	0.00	0.00
58.12	51.46	20.42	4.67	114.32	2.00	14.56	0.00	0.00
58.17	48.89	19.05	4.99	114.69	2.00	12.27	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)
58.22	52.77	21.06	4.55	114.31	2.00	15.58	0.00	0.00
58.30	57.79	23.72	4.05	112.98	2.00	19.51	0.00	0.00
58.34	63.74	26.95	3.57	111.39	2.00	23.73	0.00	0.00
58.40	61.89	25.97	3.62	110.55	2.00	22.51	0.00	0.00
58.47	56.74	23.29	3.80	108.66	2.00	18.90	0.00	0.00
58.54	49.55	19.70	3.97	104.00	2.00	13.37	0.00	0.00
58.60	42.08	16.17	3.86	95.06	2.00	6.86	0.00	0.00
58.69	35.88	13.41	3.55	85.04	2.00	0.69	0.00	0.00
58.74	31.30	11.51	3.07	75.42	2.00	0.00	0.00	0.00
58.82	28.79	10.46	2.69	68.89	2.00	0.00	0.00	0.00
58.86	27.51	9.92	2.27	63.16	2.00	0.00	0.00	0.00
58.93	26.72	9.61	1.96	58.91	2.00	0.00	0.00	0.00
59.00	26.05	9.39	1.72	55.61	2.00	0.00	0.00	0.00
59.09	25.64	9.25	1.56	53.34	2.00	0.00	0.00	0.00
59.13	25.22	9.08	1.49	52.18	2.00	0.00	0.00	0.00
59.22	25.18	9.07	1.44	51.51	2.00	0.00	0.00	0.00
59.36	25.02	8.98	1.44	51.30	2.00	0.00	0.00	0.00
59.46	25.27	9.09	1.43	51.36	2.00	0.00	0.00	0.00
59.49	25.35	9.12	1.43	51.47	2.00	0.00	0.00	0.00
59.55	25.67	9.28	1.41	51.50	2.00	0.00	0.00	0.00
59.64	25.74	9.30	1.41	51.45	2.00	0.00	0.00	0.00
59.68	25.67	9.27	1.40	51.29	2.00	0.00	0.00	0.00
59.74	25.48	9.17	1.39	50.97	2.00	0.00	0.00	0.00
59.79	25.26	9.16	1.19	48.26	2.00	0.00	0.00	0.00
59.88	25.13	9.20	1.02	45.65	2.00	0.00	0.00	0.00
59.96	25.16	9.31	0.86	43.18	2.00	0.00	0.00	0.00
60.01	25.48	9.44	0.90	43.99	2.00	0.00	0.00	0.00
60.08	25.95	9.63	0.94	44.94	2.00	0.00	0.00	0.00
60.14	26.14	9.67	1.01	46.10	2.00	0.00	0.00	0.00
60.18	26.84	9.97	1.06	47.39	2.00	0.00	0.00	0.00
60.24	27.58	10.29	1.12	48.67	2.00	0.00	0.00	0.00
60.31	28.69	10.81	1.15	49.80	2.00	0.00	0.00	0.00
60.39	28.98	10.92	1.16	50.25	2.00	0.00	0.00	0.00
60.45	28.75	10.80	1.17	50.23	2.00	0.00	0.00	0.00
60.50	28.27	10.55	1.19	50.16	2.00	0.00	0.00	0.00
60.57	28.05	10.40	1.24	50.68	2.00	0.00	0.00	0.00
60.64	29.10	10.89	1.25	51.64	2.00	0.00	0.00	0.00
60.74	30.60	11.61	1.25	52.48	2.00	0.00	0.00	0.00
60.77	32.19	12.41	1.22	53.10	2.00	0.00	0.00	0.00
60.85	32.54	12.56	1.24	53.51	2.00	0.00	0.00	0.00
60.90	32.06	12.27	1.30	54.16	2.00	0.00	0.00	0.00
60.98	30.88	11.61	1.40	54.87	2.00	0.00	0.00	0.00
61.05	29.52	10.88	1.49	55.20	2.00	0.00	0.00	0.00
61.11	27.92	10.07	1.56	54.83	2.00	0.00	0.00	0.00
61.16	25.86	9.09	1.56	53.09	2.00	0.00	0.00	0.00
61.24	23.88	8.17	1.53	51.02	2.00	0.00	0.00	0.00
61.29	22.20	7.49	1.45	48.62	2.00	0.00	0.00	0.00
61.38	21.44	7.17	1.37	47.02	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)
61.42	20.90	6.95	1.25	45.14	2.00	0.00	0.00	0.00
61.51	20.74	6.88	1.13	43.54	2.00	0.00	0.00	0.00
61.56	20.61	6.86	0.99	41.66	2.00	0.00	0.00	0.00
61.63	20.61	6.91	0.89	40.29	2.00	0.00	0.00	0.00
61.68	20.71	6.98	0.83	39.60	2.00	0.00	0.00	0.00
61.75	20.87	7.06	0.81	39.43	2.00	0.00	0.00	0.00
61.82	20.83	7.03	0.83	39.60	2.00	0.00	0.00	0.00
61.94	20.70	6.94	0.85	39.89	2.00	0.00	0.00	0.00
61.99	20.51	6.78	0.98	41.35	2.00	0.00	0.00	0.00
62.05	20.70	6.82	1.18	44.01	2.00	0.00	0.00	0.00
62.13	22.07	7.37	1.26	46.17	2.00	0.00	0.00	0.00
62.24	24.94	8.72	1.19	47.55	2.00	0.00	0.00	0.00
62.30	28.66	10.62	1.01	47.34	2.00	0.00	0.00	0.00
62.36	31.10	11.95	0.89	46.69	2.00	0.00	0.00	0.00
62.42	31.68	12.28	0.84	46.00	2.00	0.00	0.00	0.00
62.48	29.99	11.39	0.87	45.82	2.00	0.00	0.00	0.00
62.53	28.50	10.58	0.93	45.94	2.00	0.00	0.00	0.00
62.56	27.48	10.05	0.96	45.92	2.00	0.00	0.00	0.00
62.62	27.32	9.96	0.97	45.88	2.00	0.00	0.00	0.00
62.68	26.69	9.62	1.00	45.97	2.00	0.00	0.00	0.00
62.73	25.60	9.04	1.08	46.42	2.00	0.00	0.00	0.00
62.81	24.87	8.64	1.16	46.93	2.00	0.00	0.00	0.00
62.86	25.09	8.74	1.16	47.20	2.00	0.00	0.00	0.00
62.99	26.18	9.27	1.10	47.06	2.00	0.00	0.00	0.00
63.04	27.64	10.05	0.98	46.17	2.00	0.00	0.00	0.00
63.11	28.56	10.57	0.89	45.20	2.00	0.00	0.00	0.00
63.21	28.75	10.69	0.84	44.51	2.00	0.00	0.00	0.00
63.30	27.99	10.28	0.87	44.49	2.00	0.00	0.00	0.00
63.35	26.68	9.60	0.92	44.61	2.00	0.00	0.00	0.00
63.40	25.57	9.04	0.95	44.36	2.00	0.00	0.00	0.00
63.47	25.09	8.81	0.93	43.84	2.00	0.00	0.00	0.00
63.52	25.16	8.86	0.90	43.37	2.00	0.00	0.00	0.00
63.59	25.22	8.91	0.87	42.87	2.00	0.00	0.00	0.00
63.65	25.41	9.03	0.81	42.11	2.00	0.00	0.00	0.00
63.71	25.92	9.32	0.75	41.35	2.00	0.00	0.00	0.00
63.83	26.11	9.42	0.73	41.07	2.00	0.00	0.00	0.00
63.89	25.54	9.06	0.82	42.29	2.00	0.00	0.00	0.00
63.96	24.39	8.37	1.02	44.51	2.00	0.00	0.00	0.00
64.01	24.08	8.04	1.33	48.29	2.00	0.00	0.00	0.00
64.09	25.48	8.59	1.52	51.67	2.00	0.00	0.00	0.00
64.13	27.96	9.71	1.56	54.24	2.00	0.00	0.00	0.00
64.20	30.85	11.11	1.45	55.00	2.00	0.00	0.00	0.00
64.26	33.36	12.39	1.33	54.85	2.00	0.00	0.00	0.00
64.31	35.43	13.51	1.20	53.96	2.00	0.93	0.00	0.00
64.40	35.91	13.80	1.13	53.01	2.00	1.64	0.00	0.00
64.44	34.60	13.20	1.07	51.41	2.00	0.17	0.00	0.00
64.50	31.84	11.71	1.21	52.04	2.00	0.00	0.00	0.00
64.57	29.39	10.44	1.34	52.40	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)
64.63	27.74	9.50	1.64	54.89	2.00	0.00	0.00	0.00
64.75	26.62	8.94	1.71	54.77	2.00	0.00	0.00	0.00
64.80	23.76	7.79	1.90	54.40	2.00	0.00	0.00	0.00
64.84	22.84	7.42	1.71	51.56	2.00	0.00	0.00	0.00
64.93	22.20	7.17	1.54	49.07	2.00	0.00	0.00	0.00
64.98	23.38	7.66	1.23	46.27	2.00	0.00	0.00	0.00
65.06	22.43	7.28	1.11	44.03	2.00	0.00	0.00	0.00
65.10	21.60	6.95	1.01	42.17	2.00	0.00	0.00	0.00
65.16	20.96	6.67	0.99	41.38	2.00	0.00	0.00	0.00
65.23	20.74	6.57	0.99	41.20	2.00	0.00	0.00	0.00
65.31	20.61	6.52	1.01	41.36	2.00	0.00	0.00	0.00
65.37	20.74	6.56	1.00	41.35	2.00	0.00	0.00	0.00
65.44	21.03	6.68	0.98	41.27	2.00	0.00	0.00	0.00
65.49	21.44	6.87	0.96	41.29	2.00	0.00	0.00	0.00
65.58	21.69	6.99	0.94	41.30	2.00	0.00	0.00	0.00
65.63	21.72	7.01	0.92	41.04	2.00	0.00	0.00	0.00
65.71	21.66	6.99	0.90	40.64	2.00	0.00	0.00	0.00
65.75	21.63	6.99	0.86	40.08	2.00	0.00	0.00	0.00
65.85	21.66	7.01	0.84	39.79	2.00	0.00	0.00	0.00
65.89	21.57	6.97	0.83	39.58	2.00	0.00	0.00	0.00
65.98	21.50	6.93	0.83	39.55	2.00	0.00	0.00	0.00
66.04	21.47	6.96	0.75	38.40	2.00	0.00	0.00	0.00
66.09	21.50	7.05	0.63	36.57	2.00	0.00	0.00	0.00
66.19	21.50	7.13	0.52	34.67	2.00	0.00	0.00	0.00
66.24	21.47	7.14	0.49	34.16	2.00	0.00	0.00	0.00
66.28	21.44	7.10	0.51	34.47	2.00	0.00	0.00	0.00
66.34	21.41	7.06	0.53	34.82	2.00	0.00	0.00	0.00
66.41	21.53	7.10	0.55	35.16	2.00	0.00	0.00	0.00
66.47	21.82	7.22	0.56	35.54	2.00	0.00	0.00	0.00
66.56	22.08	7.33	0.57	35.82	2.00	0.00	0.00	0.00
66.60	22.17	7.35	0.59	36.25	2.00	0.00	0.00	0.00
66.69	22.14	7.31	0.61	36.56	2.00	0.00	0.00	0.00
66.74	22.11	7.28	0.63	36.91	2.00	0.00	0.00	0.00
66.82	22.17	7.29	0.65	37.17	2.00	0.00	0.00	0.00
66.91	22.24	7.30	0.66	37.37	2.00	0.00	0.00	0.00
66.95	22.49	7.42	0.65	37.47	2.00	0.00	0.00	0.00
67.00	22.58	7.46	0.65	37.43	2.00	0.00	0.00	0.00
67.08	22.65	7.49	0.65	37.40	2.00	0.00	0.00	0.00
67.13	22.52	7.42	0.65	37.37	2.00	0.00	0.00	0.00
67.22	22.46	7.38	0.65	37.31	2.00	0.00	0.00	0.00
67.27	22.42	7.37	0.64	37.22	2.00	0.00	0.00	0.00
67.34	22.39	7.35	0.64	37.16	2.00	0.00	0.00	0.00
67.40	22.46	7.36	0.66	37.56	2.00	0.00	0.00	0.00
67.48	22.65	7.41	0.70	38.20	2.00	0.00	0.00	0.00
67.52	23.03	7.56	0.73	39.00	2.00	0.00	0.00	0.00
67.61	23.44	7.71	0.78	39.88	2.00	0.00	0.00	0.00
67.67	23.79	7.77	0.91	42.13	2.00	0.00	0.00	0.00
67.78	24.24	7.83	1.14	45.51	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)
67.83	25.03	8.02	1.45	49.86	2.00	0.00	0.00	0.00
67.89	27.07	8.83	1.64	53.69	2.00	0.00	0.00	0.00
67.96	30.63	10.44	1.60	56.12	2.00	0.00	0.00	0.00
68.01	35.78	13.01	1.33	55.77	2.00	0.00	0.00	0.00
68.09	40.84	15.70	1.10	54.45	2.00	5.88	0.00	0.00
68.14	43.29	17.01	1.02	54.11	0.16	8.53	51.20	0.40
68.21	42.02	16.31	1.06	54.30	2.00	7.14	0.00	0.00
68.26	38.07	14.20	1.20	54.88	2.00	2.58	0.00	0.00
68.32	35.04	12.57	1.38	56.03	2.00	0.00	0.00	0.00
68.40	33.65	11.76	1.60	58.23	2.00	0.00	0.00	0.00
68.45	33.81	11.50	2.15	65.18	2.00	0.00	0.00	0.00
68.57	35.90	12.16	2.64	72.35	2.00	0.00	0.00	0.00
68.63	39.70	13.63	3.07	80.47	2.00	1.23	0.00	0.00
68.70	44.15	15.53	3.16	85.58	2.00	5.54	0.00	0.00
68.76	46.15	16.31	3.36	89.61	2.00	7.14	0.00	0.00
68.80	50.25	18.12	3.37	93.28	2.00	10.62	0.00	0.00
68.85	53.40	19.53	3.36	95.83	2.00	13.09	0.00	0.00
68.92	58.21	21.78	3.22	97.75	2.00	16.70	0.00	0.00
68.99	61.64	23.53	2.99	96.93	2.00	19.24	0.00	0.00
69.05	64.41	25.15	2.66	93.62	2.00	21.44	0.00	0.00
69.14	62.98	24.67	2.43	88.99	2.00	20.81	0.00	0.00
69.20	56.30	21.49	2.42	84.71	2.00	16.25	0.00	0.00
69.27	49.43	18.14	2.57	82.17	2.00	10.66	0.00	0.00
69.31	43.80	15.48	2.72	79.83	2.00	5.43	0.00	0.00
69.36	39.89	13.72	2.75	76.90	2.00	1.43	0.00	0.00
69.44	36.58	12.34	2.58	71.97	2.00	0.00	0.00	0.00
69.53	35.02	11.81	2.24	66.80	2.00	0.00	0.00	0.00
69.57	34.32	11.66	1.92	62.49	2.00	0.00	0.00	0.00
69.63	33.11	11.25	1.69	58.72	2.00	0.00	0.00	0.00
69.71	31.17	10.48	1.51	54.91	2.00	0.00	0.00	0.00
69.76	28.92	9.66	1.19	49.11	2.00	0.00	0.00	0.00
69.85	27.20	9.00	0.99	45.14	2.00	0.00	0.00	0.00
69.92	25.77	8.50	0.79	41.16	2.00	0.00	0.00	0.00
69.97	24.88	8.09	0.78	40.45	2.00	0.00	0.00	0.00
70.06	24.59	7.99	0.74	39.65	2.00	0.00	0.00	0.00
70.11	24.56	8.00	0.70	39.02	2.00	0.00	0.00	0.00
70.15	25.16	8.28	0.68	39.08	2.00	0.00	0.00	0.00
70.23	25.55	8.42	0.72	39.82	2.00	0.00	0.00	0.00
70.31	25.86	8.51	0.77	40.92	2.00	0.00	0.00	0.00
70.38	25.64	8.38	0.80	41.26	2.00	0.00	0.00	0.00
70.43	25.77	8.50	0.72	39.99	2.00	0.00	0.00	0.00
70.48	26.60	8.98	0.62	38.65	2.00	0.00	0.00	0.00
70.54	27.93	9.56	0.67	40.29	2.00	0.00	0.00	0.00
70.63	28.76	9.73	0.88	44.16	2.00	0.00	0.00	0.00
70.69	28.95	9.60	1.14	48.27	2.00	0.00	0.00	0.00
70.75	29.84	9.83	1.39	52.23	2.00	0.00	0.00	0.00
70.84	32.10	10.63	1.71	57.94	2.00	0.00	0.00	0.00
70.92	35.59	12.01	1.97	63.74	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)
70.97	38.17	13.01	2.19	68.48	2.00	0.00	0.00	0.00
71.02	40.33	13.82	2.43	73.04	2.00	1.68	0.00	0.00
71.09	44.28	15.38	2.71	79.57	2.00	5.21	0.00	0.00
71.17	50.51	18.02	2.88	86.53	2.00	10.44	0.00	0.00
71.24	56.81	20.81	2.91	91.57	2.00	15.19	0.00	0.00
71.28	61.71	23.09	2.85	93.94	2.00	18.62	0.00	0.00
71.36	63.93	24.15	2.81	94.90	2.00	20.10	0.00	0.00
71.41	66.64	25.58	2.63	93.62	2.00	22.01	0.00	0.00
71.50	68.96	26.91	2.41	91.25	2.00	23.67	0.00	0.00
71.53	70.68	28.08	2.14	87.36	0.25	25.08	51.20	0.26
71.61	69.06	27.43	2.02	84.37	0.24	24.31	51.20	0.71
71.67	61.17	23.50	2.12	81.99	2.00	19.19	0.00	0.00
71.76	52.87	19.32	2.37	80.91	2.00	12.74	0.00	0.00
71.80	46.32	16.26	2.49	78.12	2.00	7.05	0.00	0.00
71.89	44.79	15.70	2.29	74.34	2.00	5.90	0.00	0.00
71.94	42.85	15.06	1.97	68.56	2.00	4.52	0.00	0.00
72.05	41.23	14.49	1.74	64.23	2.00	3.24	0.00	0.00
72.10	37.86	13.05	1.61	60.31	2.00	0.00	0.00	0.00
72.15	35.57	12.09	1.52	57.50	2.00	0.00	0.00	0.00
72.20	32.48	10.88	1.26	51.95	2.00	0.00	0.00	0.00
72.29	30.92	10.46	0.90	45.49	2.00	0.00	0.00	0.00
72.35	29.30	10.02	0.62	39.68	2.00	0.00	0.00	0.00
72.40	28.25	9.52	0.62	39.24	2.00	0.00	0.00	0.00
72.46	27.52	9.09	0.69	40.04	2.00	0.00	0.00	0.00
72.56	26.53	8.59	0.73	40.23	2.00	0.00	0.00	0.00
72.58	26.95	8.81	0.69	39.84	2.00	0.00	0.00	0.00
72.67	27.36	9.01	0.67	39.63	2.00	0.00	0.00	0.00
72.72	27.97	9.33	0.64	39.40	2.00	0.00	0.00	0.00
72.80	27.36	9.03	0.64	39.18	2.00	0.00	0.00	0.00
72.84	26.69	8.70	0.65	39.03	2.00	0.00	0.00	0.00
72.91	26.41	8.57	0.65	38.89	2.00	0.00	0.00	0.00
72.98	26.09	8.41	0.66	38.78	2.00	0.00	0.00	0.00
73.05	25.93	8.33	0.66	38.68	2.00	0.00	0.00	0.00
73.11	26.19	8.47	0.63	38.31	2.00	0.00	0.00	0.00
73.24	26.60	8.65	0.62	38.39	2.00	0.00	0.00	0.00
73.33	26.92	8.75	0.66	39.17	2.00	0.00	0.00	0.00
73.38	26.92	8.62	0.81	41.61	2.00	0.00	0.00	0.00
73.46	27.07	8.48	1.07	45.59	2.00	0.00	0.00	0.00
73.52	27.49	8.43	1.43	50.40	2.00	0.00	0.00	0.00
73.57	28.38	8.68	1.95	57.15	2.00	0.00	0.00	0.00
73.63	30.06	9.28	2.45	63.87	2.00	0.00	0.00	0.00
73.69	34.36	10.82	2.88	72.07	2.00	0.00	0.00	0.00
73.77	42.31	13.90	2.99	80.23	2.00	1.87	0.00	0.00
73.85	53.92	19.02	2.81	87.14	2.00	12.22	0.00	0.00
73.91	67.02	25.25	2.50	90.94	2.00	21.57	0.00	0.00
73.98	77.83	30.66	2.25	92.36	2.00	27.98	0.00	0.00
74.03	87.40	35.63	2.05	93.26	2.00	32.93	0.00	0.00
74.11	94.21	39.34	1.89	92.86	2.00	36.21	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)
74.15	99.78	42.64	1.70	91.19	2.00	38.87	0.00	0.00
74.22	95.58	40.65	1.63	87.84	2.00	37.29	0.00	0.00
74.30	86.10	35.78	1.64	83.80	2.00	33.08	0.00	0.00
74.35	69.63	27.46	1.70	77.86	2.00	24.35	0.00	0.00
74.45	57.16	21.41	1.75	72.70	2.00	16.12	0.00	0.00
74.49	46.25	16.21	1.88	68.76	2.00	6.94	0.00	0.00
74.55	39.29	12.91	2.18	68.11	2.00	0.00	0.00	0.00
74.64	34.17	10.62	2.51	67.62	2.00	0.00	0.00	0.00
74.69	31.53	9.68	2.72	67.61	2.00	0.00	0.00	0.00
74.77	31.91	9.80	2.64	67.14	2.00	0.00	0.00	0.00
74.82	35.89	11.36	2.29	66.59	2.00	0.00	0.00	0.00
74.90	41.77	14.70	1.28	56.88	2.00	3.71	0.00	0.00
74.95	47.02	18.43	0.56	44.58	0.15	11.19	51.20	0.42
75.04	48.13	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
75.08	44.63	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
75.16	39.99	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
75.20	34.55	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
75.29	31.56	N/A	0.00	-1.00	2.00	0.00	0.00	0.00

Total estimated displacement: 2.91

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

:: Strength loss calculation (Robertson (2009) ::

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
0.08	3.56	5.72	16.02	91.58	3.60	N/A	N/A
0.14	11.07	17.77	5.59	99.44	2.89	N/A	N/A
0.21	40.27	64.68	1.49	96.35	2.12	N/A	N/A
0.28	111.89	179.74	1.00	179.74	1.56	N/A	N/A
0.35	179.09	287.70	1.00	287.70	1.31	N/A	N/A
0.41	224.60	360.81	1.00	360.81	1.20	N/A	N/A
0.48	223.64	359.27	1.00	359.27	1.22	N/A	N/A
0.54	227.68	365.76	1.00	365.76	1.27	N/A	N/A
0.60	231.94	372.59	1.00	372.59	1.34	N/A	N/A
0.68	237.79	381.98	1.00	381.98	1.40	N/A	N/A
0.74	240.30	386.01	1.00	386.01	1.42	N/A	N/A
0.80	244.31	392.45	1.00	392.45	1.38	N/A	N/A
0.86	238.46	383.04	1.00	383.04	1.36	N/A	N/A
0.94	219.13	351.97	1.00	351.97	1.39	N/A	N/A
1.00	186.05	298.82	1.00	298.82	1.51	N/A	N/A
1.05	149.22	239.64	1.01	241.69	1.66	N/A	N/A
1.13	116.12	186.44	1.12	209.62	1.82	N/A	N/A
1.18	89.59	143.83	1.31	187.84	2.00	N/A	N/A
1.29	73.41	117.81	1.55	182.45	2.15	N/A	N/A
1.33	62.56	100.39	1.83	183.41	2.26	N/A	N/A
1.38	55.66	89.29	2.06	183.94	2.33	N/A	N/A
1.46	48.72	78.14	2.34	182.67	2.41	N/A	N/A
1.55	44.46	71.28	2.52	179.73	2.45	N/A	N/A
1.59	39.84	63.86	2.70	172.53	2.49	N/A	N/A
1.67	36.18	57.96	2.82	163.50	2.51	N/A	N/A
1.72	31.87	51.03	2.99	152.63	2.54	N/A	N/A
1.79	28.41	45.47	3.15	143.36	2.57	N/A	N/A
1.86	25.01	39.99	3.38	135.25	2.61	N/A	N/A
1.92	21.99	35.14	3.66	128.52	2.65	N/A	N/A
1.99	19.22	30.69	4.01	122.97	2.70	N/A	N/A
2.04	16.74	26.70	4.40	117.51	2.75	N/A	N/A
2.12	13.92	22.15	4.86	107.75	2.81	N/A	N/A
2.25	11.47	18.21	5.00	91.08	2.82	N/A	N/A
2.29	9.63	15.24	4.88	74.40	2.81	N/A	N/A
2.34	8.32	13.14	4.85	63.73	2.81	N/A	N/A
2.45	7.61	12.00	5.19	62.32	2.85	N/A	N/A
2.51	7.07	11.12	5.40	60.07	2.87	N/A	N/A
2.56	7.14	11.23	5.19	58.27	2.85	N/A	N/A
2.60	6.92	10.87	5.29	57.52	2.86	N/A	N/A
2.63	6.86	10.77	5.28	56.86	2.86	N/A	N/A
2.71	6.67	10.46	5.39	56.32	2.87	N/A	N/A
2.79	6.48	10.15	5.71	57.97	2.90	N/A	N/A
2.82	6.36	9.95	6.60	65.65	2.99	N/A	N/A
2.89	7.25	11.37	6.91	78.56	3.01	N/A	N/A
2.98	8.39	13.20	6.69	88.34	3.00	N/A	N/A
3.02	10.11	15.96	5.99	95.54	2.93	N/A	N/A
3.11	11.00	17.39	5.73	99.58	2.90	N/A	N/A
3.15	12.43	19.68	5.31	104.49	2.86	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
3.24	12.94	20.49	5.24	107.39	2.85	N/A	N/A
3.31	13.92	22.05	4.90	108.05	2.81	N/A	N/A
3.37	14.39	22.81	4.71	107.50	2.79	N/A	N/A
3.42	15.82	25.10	4.24	106.52	2.73	N/A	N/A
3.51	17.09	27.14	3.92	106.27	2.69	N/A	N/A
3.55	17.47	27.74	3.86	107.10	2.68	N/A	N/A
3.64	16.90	26.81	4.05	108.53	2.71	N/A	N/A
3.68	15.40	24.41	4.51	110.14	2.77	N/A	N/A
3.76	14.00	22.15	5.01	110.95	2.83	N/A	N/A
3.86	13.02	20.55	5.40	110.97	2.87	N/A	N/A
3.90	12.54	19.78	5.56	110.06	2.89	N/A	N/A
3.95	12.34	19.47	5.60	109.07	2.89	N/A	N/A
4.04	12.27	19.34	5.61	108.45	2.89	N/A	N/A
4.10	12.17	19.18	5.65	108.37	2.90	N/A	N/A
4.14	12.40	19.53	5.56	108.54	2.89	N/A	N/A
4.20	12.95	20.42	5.33	108.91	2.86	N/A	N/A
4.30	13.65	21.53	5.08	109.41	2.83	N/A	N/A
4.34	14.41	22.75	4.84	110.17	2.81	N/A	N/A
4.43	14.76	23.30	4.77	111.16	2.80	N/A	N/A
4.48	15.14	23.90	4.68	111.75	2.79	N/A	N/A
4.62	15.31	24.17	4.65	112.38	2.78	N/A	N/A
4.67	15.34	24.22	4.66	112.76	2.78	N/A	N/A
4.73	15.12	23.85	4.74	113.10	2.79	N/A	N/A
4.77	14.91	23.51	4.80	112.96	2.80	N/A	N/A
4.82	14.69	23.15	4.87	112.82	2.81	N/A	N/A
4.87	14.48	22.81	5.03	114.85	2.83	N/A	N/A
4.93	14.19	22.35	5.27	117.84	2.86	N/A	N/A
5.04	14.00	22.03	5.51	121.28	2.88	N/A	N/A
5.09	14.00	22.02	5.60	123.38	2.89	N/A	N/A
5.12	14.19	22.33	5.62	125.50	2.89	N/A	N/A
5.21	14.54	22.88	5.55	126.95	2.88	N/A	N/A
5.29	14.81	23.31	5.49	128.03	2.88	N/A	N/A
5.33	14.87	23.40	5.48	128.35	2.88	N/A	N/A
5.43	14.59	22.93	5.62	128.98	2.89	N/A	N/A
5.47	14.17	22.26	5.82	129.50	2.91	N/A	N/A
5.53	13.89	21.80	5.94	129.49	2.92	N/A	N/A
5.60	13.51	21.19	6.08	128.78	2.94	N/A	N/A
5.66	13.10	20.52	6.21	127.46	2.95	N/A	N/A
5.71	12.50	19.55	6.44	125.95	2.97	N/A	N/A
5.78	11.76	18.36	6.72	123.48	3.00	N/A	N/A
5.87	11.25	17.54	6.84	120.04	3.01	N/A	N/A
5.96	11.00	17.12	6.54	111.97	2.98	N/A	N/A
6.08	11.06	17.21	6.13	105.41	2.94	N/A	N/A
6.13	11.22	17.45	5.80	101.15	2.91	N/A	N/A
6.19	11.44	17.81	5.73	101.99	2.90	N/A	N/A
6.27	11.76	18.32	5.56	101.86	2.89	N/A	N/A
6.31	12.05	18.77	5.35	100.46	2.86	N/A	N/A
6.39	12.02	18.72	5.37	100.56	2.87	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
6.44	12.62	19.68	5.21	102.46	2.85	N/A	N/A
6.53	13.03	20.34	5.19	105.47	2.85	N/A	N/A
6.58	14.08	22.01	4.92	108.33	2.82	N/A	N/A
6.67	14.39	22.51	4.91	110.49	2.81	N/A	N/A
6.71	14.81	23.17	4.85	112.42	2.81	N/A	N/A
6.79	14.81	23.16	4.91	113.83	2.82	N/A	N/A
6.84	14.97	23.42	4.89	114.56	2.81	N/A	N/A
6.93	15.41	24.13	4.73	114.23	2.79	N/A	N/A
7.02	15.96	24.99	4.55	113.67	2.77	N/A	N/A
7.06	16.47	25.81	4.38	113.13	2.75	N/A	N/A
7.11	16.66	26.11	4.32	112.92	2.74	N/A	N/A
7.16	17.01	26.67	4.20	112.10	2.73	N/A	N/A
7.23	17.49	27.43	4.05	111.01	2.71	N/A	N/A
7.32	18.12	28.44	3.86	109.93	2.68	N/A	N/A
7.37	18.85	29.61	3.76	111.32	2.67	N/A	N/A
7.51	19.39	30.46	3.76	114.68	2.67	N/A	N/A
7.60	19.90	31.27	3.79	118.66	2.67	N/A	N/A
7.67	19.93	31.32	3.89	121.87	2.69	N/A	N/A
7.71	19.74	31.01	4.01	124.48	2.70	N/A	N/A
7.76	18.98	29.78	4.28	127.39	2.74	N/A	N/A
7.86	18.03	28.24	4.58	129.38	2.78	N/A	N/A
7.90	16.75	26.19	4.96	129.86	2.82	N/A	N/A
7.96	15.54	24.24	5.30	128.42	2.86	N/A	N/A
8.02	13.89	21.57	5.79	125.00	2.91	N/A	N/A
8.11	12.33	19.06	6.34	120.84	2.96	N/A	N/A
8.16	11.61	17.90	6.50	116.44	2.98	N/A	N/A
8.21	10.97	16.87	6.79	114.57	3.00	N/A	N/A
8.27	11.44	17.63	6.64	117.02	2.99	N/A	N/A
8.37	13.08	20.25	6.06	122.71	2.94	N/A	N/A
8.42	20.48	32.12	4.01	128.90	2.70	N/A	N/A
8.51	28.29	44.67	2.97	132.75	2.54	N/A	N/A
8.55	35.41	56.10	2.47	138.37	2.44	N/A	N/A
8.62	37.97	60.20	2.41	145.08	2.42	N/A	N/A
8.68	39.37	62.46	2.46	153.61	2.43	N/A	N/A
8.74	40.13	63.67	2.53	161.29	2.45	N/A	N/A
8.81	39.81	63.15	2.56	161.88	2.46	N/A	N/A
8.92	39.62	62.84	2.54	159.65	2.45	N/A	N/A
8.98	40.13	63.64	2.45	156.05	2.43	N/A	N/A
9.03	42.26	67.06	2.33	156.51	2.41	N/A	N/A
9.08	44.96	71.39	2.19	156.15	2.37	N/A	N/A
9.20	45.63	72.46	2.15	156.13	2.36	N/A	N/A
9.26	41.72	66.17	2.37	157.10	2.41	N/A	N/A
9.28	38.64	61.22	2.58	158.15	2.46	N/A	N/A
9.36	36.22	57.33	2.77	158.52	2.50	N/A	N/A
9.42	37.37	59.16	2.69	159.34	2.48	N/A	N/A
9.47	36.41	57.62	2.82	162.36	2.51	N/A	N/A
9.56	35.65	56.38	2.93	165.40	2.53	N/A	N/A
9.60	36.76	58.17	2.86	166.19	2.52	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
9.71	38.70	60.82	2.71	164.63	2.49	N/A	N/A
9.75	40.51	63.17	2.61	164.95	2.47	N/A	N/A
9.82	39.71	61.75	2.69	166.18	2.48	N/A	N/A
9.91	40.57	62.56	2.67	167.32	2.48	N/A	N/A
9.96	41.59	63.74	2.64	168.40	2.47	N/A	N/A
10.02	41.78	63.79	2.67	170.34	2.48	N/A	N/A
10.07	40.19	61.42	2.80	171.98	2.51	N/A	N/A
10.12	39.50	60.12	2.82	169.70	2.51	N/A	N/A
10.17	43.47	64.83	2.44	158.44	2.43	N/A	N/A
10.26	47.32	68.94	2.14	147.34	2.35	N/A	N/A
10.30	48.08	69.09	1.97	135.98	2.31	N/A	N/A
10.39	45.73	65.25	1.98	128.97	2.31	N/A	N/A
10.43	43.03	61.32	2.02	123.88	2.32	N/A	N/A
10.52	42.87	60.68	2.02	122.57	2.32	N/A	N/A
10.57	43.54	61.31	1.99	121.74	2.31	N/A	N/A
10.67	45.42	63.39	1.96	123.99	2.30	N/A	N/A
10.70	48.15	67.11	1.97	131.98	2.31	N/A	N/A
10.78	51.04	70.97	2.01	142.85	2.32	N/A	N/A
10.83	54.51	75.74	2.05	155.19	2.33	N/A	N/A
10.92	57.41	79.30	2.05	162.75	2.33	N/A	N/A
10.96	58.71	81.03	2.09	169.50	2.34	N/A	N/A
11.04	58.07	79.95	2.16	172.71	2.36	N/A	N/A
11.10	56.03	77.14	2.27	174.93	2.39	N/A	N/A
11.18	54.12	74.34	2.35	174.91	2.41	N/A	N/A
11.23	52.44	71.86	2.40	172.53	2.42	N/A	N/A
11.31	51.58	70.23	2.41	169.13	2.42	N/A	N/A
11.36	50.95	69.12	2.40	165.87	2.42	N/A	N/A
11.45	50.47	68.02	2.41	164.00	2.42	N/A	N/A
11.50	50.31	67.57	2.43	163.87	2.43	N/A	N/A
11.55	50.22	67.28	2.47	166.10	2.44	N/A	N/A
11.62	50.15	67.03	2.53	169.28	2.45	N/A	N/A
11.71	49.90	66.37	2.59	171.99	2.46	N/A	N/A
11.76	49.77	66.06	2.64	174.48	2.47	N/A	N/A
11.84	49.42	65.31	2.68	175.22	2.48	N/A	N/A
11.88	47.64	62.87	2.76	173.79	2.50	N/A	N/A
11.99	45.73	59.95	2.83	169.41	2.51	N/A	N/A
12.03	43.88	57.33	2.85	163.26	2.52	N/A	N/A
12.09	41.72	54.31	2.89	157.01	2.52	N/A	N/A
12.14	38.73	50.26	2.97	149.21	2.54	N/A	N/A
12.21	35.08	45.38	3.12	141.43	2.56	N/A	N/A
12.28	32.34	41.62	3.16	131.72	2.57	N/A	N/A
12.37	30.24	38.62	3.18	122.92	2.58	N/A	N/A
12.40	28.56	36.32	3.18	115.66	2.58	N/A	N/A
12.48	27.57	34.84	3.19	111.26	2.58	N/A	N/A
12.56	26.84	33.71	3.21	108.07	2.58	N/A	N/A
12.60	26.65	33.35	3.17	105.89	2.57	N/A	N/A
12.67	27.35	34.05	3.12	106.38	2.57	N/A	N/A
12.75	28.84	35.83	3.20	114.66	2.58	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
12.80	34.57	42.91	3.13	134.43	2.57	N/A	N/A
12.89	46.87	57.51	2.67	153.73	2.48	N/A	N/A
12.95	63.22	76.52	2.21	169.47	2.38	N/A	N/A
13.06	75.43	90.09	1.97	177.61	2.31	N/A	N/A
13.09	76.96	91.80	1.99	182.90	2.31	N/A	N/A
13.19	71.84	85.56	2.14	183.46	2.36	N/A	N/A
13.24	66.05	78.69	2.30	180.62	2.40	N/A	N/A
13.28	62.62	74.39	2.31	171.97	2.40	N/A	N/A
13.33	60.56	71.37	2.17	154.94	2.36	N/A	N/A
13.41	58.20	68.04	2.09	142.14	2.34	N/A	N/A
13.46	56.04	65.22	2.05	133.56	2.33	N/A	N/A
13.52	53.59	62.32	2.17	135.35	2.36	N/A	N/A
13.59	48.98	57.03	2.43	138.34	2.43	N/A	N/A
13.69	45.30	52.67	2.70	142.02	2.49	N/A	N/A
13.72	42.82	49.84	2.92	145.48	2.53	N/A	N/A
13.80	43.11	49.90	2.90	144.61	2.52	N/A	N/A
13.85	43.35	49.97	2.84	141.81	2.51	N/A	N/A
13.94	42.78	48.99	2.82	138.37	2.51	N/A	N/A
13.99	41.85	47.77	2.81	134.21	2.51	N/A	N/A
14.07	40.45	45.93	2.85	130.91	2.52	N/A	N/A
14.12	39.48	44.68	2.85	127.54	2.52	N/A	N/A
14.18	39.09	44.04	2.84	124.89	2.51	N/A	N/A
14.25	39.05	43.80	2.82	123.72	2.51	N/A	N/A
14.36	39.01	43.48	2.85	124.09	2.52	N/A	N/A
14.42	38.64	42.94	2.93	125.92	2.53	N/A	N/A
14.49	37.85	41.95	3.05	127.93	2.55	N/A	N/A
14.55	36.83	40.71	3.18	129.63	2.58	N/A	N/A
14.60	35.91	39.61	3.31	131.09	2.60	N/A	N/A
14.67	35.37	38.86	3.37	130.96	2.61	N/A	N/A
14.73	34.95	38.24	3.34	127.68	2.60	N/A	N/A
14.79	34.54	37.61	3.26	122.47	2.59	N/A	N/A
14.86	33.93	36.74	3.21	117.79	2.58	N/A	N/A
14.91	33.20	35.83	3.23	115.61	2.58	N/A	N/A
14.97	32.47	34.90	3.27	114.22	2.59	N/A	N/A
15.03	31.58	33.81	3.32	112.40	2.60	N/A	N/A
15.09	29.95	31.95	3.44	110.01	2.62	N/A	N/A
15.17	28.43	30.15	3.51	105.87	2.63	N/A	N/A
15.23	27.12	28.64	3.54	101.37	2.63	N/A	N/A
15.31	26.08	27.39	3.65	99.93	2.65	N/A	N/A
15.40	24.81	25.93	3.92	101.64	2.69	N/A	N/A
15.45	23.66	24.67	4.21	103.79	2.73	N/A	N/A
15.51	23.20	24.10	4.30	103.64	2.74	N/A	N/A
15.58	22.72	23.48	4.39	103.11	2.75	N/A	N/A
15.66	22.62	23.28	4.41	102.62	2.75	N/A	N/A
15.70	23.08	23.70	4.32	102.47	2.74	N/A	N/A
15.78	24.04	24.58	4.16	102.31	2.72	N/A	N/A
15.82	25.06	25.57	4.02	102.82	2.70	N/A	N/A
15.88	25.85	26.31	3.94	103.69	2.69	N/A	N/A

::Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
15.98	26.65	26.97	3.87	104.31	2.68	N/A	N/A
16.02	27.22	27.51	3.82	105.00	2.67	N/A	N/A
16.08	27.95	28.17	3.76	106.05	2.67	N/A	N/A
16.22	28.78	28.78	3.71	106.64	2.66	N/A	N/A
16.27	29.48	29.41	3.64	107.20	2.65	N/A	N/A
16.31	29.64	29.51	3.63	107.17	2.65	N/A	N/A
16.40	29.38	29.11	3.69	107.43	2.66	N/A	N/A
16.46	29.10	28.73	3.75	107.88	2.67	N/A	N/A
16.52	28.91	28.45	3.80	107.97	2.67	N/A	N/A
16.58	28.91	28.36	3.79	107.58	2.67	N/A	N/A
16.68	29.22	28.50	3.75	106.94	2.67	N/A	N/A
16.84	29.70	28.72	3.70	106.38	2.66	N/A	N/A
16.91	30.43	29.33	3.61	105.95	2.64	N/A	N/A
17.02	30.62	29.35	3.59	105.36	2.64	N/A	N/A
17.08	30.62	29.26	3.57	104.57	2.64	N/A	N/A
17.14	30.34	28.88	3.60	103.95	2.64	N/A	N/A
17.20	30.12	28.58	3.61	103.11	2.64	N/A	N/A
17.28	29.83	28.18	3.63	102.33	2.65	N/A	N/A
17.32	29.26	27.56	3.69	101.79	2.66	N/A	N/A
17.39	28.69	26.91	3.76	101.11	2.67	N/A	N/A
17.45	28.05	26.20	3.78	99.09	2.67	N/A	N/A
17.57	27.57	25.57	3.77	96.53	2.67	N/A	N/A
17.63	27.06	25.01	3.80	94.98	2.67	N/A	N/A
17.69	26.71	24.59	3.90	95.97	2.69	N/A	N/A
17.76	26.58	24.38	4.10	99.98	2.71	N/A	N/A
17.88	27.06	24.69	4.28	105.66	2.74	N/A	N/A
17.93	28.21	25.70	4.34	111.41	2.74	N/A	N/A
17.99	30.47	27.75	4.19	116.29	2.73	N/A	N/A
18.06	34.44	31.38	3.88	121.79	2.68	N/A	N/A
18.11	40.36	36.86	3.57	131.61	2.64	N/A	N/A
18.18	48.50	44.33	3.21	142.50	2.58	N/A	N/A
18.24	59.06	54.07	2.82	152.35	2.51	N/A	N/A
18.30	70.00	64.13	2.48	159.21	2.44	N/A	N/A
18.34	81.23	74.45	2.21	164.40	2.37	N/A	N/A
18.38	96.20	88.28	1.93	169.94	2.29	N/A	N/A
18.48	108.81	99.59	1.76	174.86	2.23	N/A	N/A
18.52	119.46	109.29	1.64	179.76	2.19	N/A	N/A
18.60	121.71	111.00	1.63	180.99	2.18	N/A	N/A
18.65	121.80	110.86	1.63	180.90	2.19	N/A	N/A
18.74	118.87	107.73	1.66	178.60	2.20	N/A	N/A
18.79	114.12	103.12	1.70	175.58	2.21	N/A	N/A
18.84	106.71	96.09	1.79	171.61	2.25	N/A	N/A
18.93	98.33	88.07	1.91	167.92	2.29	N/A	N/A
18.99	87.51	77.95	2.08	162.51	2.34	N/A	N/A
19.08	78.40	69.38	2.27	157.22	2.39	N/A	N/A
19.12	66.15	58.16	2.56	149.10	2.46	N/A	N/A
19.21	55.21	48.07	2.97	142.78	2.54	N/A	N/A
19.27	44.04	37.93	3.57	135.53	2.64	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
19.32	36.41	31.02	4.18	129.51	2.72	N/A	N/A
19.38	30.40	25.59	4.79	122.67	2.80	N/A	N/A
19.43	25.38	21.10	5.43	114.64	2.87	N/A	N/A
19.53	22.20	18.20	5.93	107.90	2.92	N/A	N/A
19.56	20.86	17.01	6.01	102.15	2.93	N/A	N/A
19.65	21.75	17.72	5.64	99.99	2.89	N/A	N/A
19.69	23.06	18.84	5.23	98.54	2.85	N/A	N/A
19.76	24.46	20.00	4.92	98.50	2.82	N/A	N/A
19.87	25.54	20.83	4.83	100.61	2.81	N/A	N/A
19.91	26.46	21.56	4.86	104.88	2.81	N/A	N/A
19.96	27.51	22.40	4.86	108.93	2.81	N/A	N/A
20.06	28.59	23.21	4.77	110.77	2.80	1.65	1.65
20.11	29.74	24.16	4.57	110.49	2.77	1.71	1.71
20.15	30.88	25.12	4.31	108.18	2.74	1.78	1.78
20.21	30.98	25.14	4.15	104.38	2.72	1.78	1.78
20.30	30.50	24.65	4.07	100.22	2.71	1.74	1.74
20.36	29.17	23.46	4.11	96.34	2.72	1.66	1.66
20.43	28.37	22.72	4.10	93.12	2.71	1.60	1.60
20.48	27.16	21.67	4.02	87.02	2.70	1.53	1.53
20.59	25.63	20.29	4.08	82.75	2.71	1.43	1.43
20.65	24.11	18.94	4.22	79.99	2.73	1.34	1.34
20.70	23.09	18.02	4.53	81.67	2.77	1.27	1.27
20.74	22.27	17.28	4.79	82.74	2.80	1.22	1.22
20.81	21.15	16.28	5.10	83.08	2.84	1.15	1.15
20.88	20.80	15.93	5.21	82.99	2.85	1.13	1.13
20.95	20.68	15.77	5.26	82.92	2.85	1.12	1.12
21.01	21.25	16.20	5.13	83.07	2.84	1.15	1.15
21.07	21.50	16.37	5.04	82.47	2.83	1.16	1.16
21.15	22.07	16.80	4.81	80.79	2.80	1.19	1.19
21.23	22.61	17.20	4.58	78.73	2.78	1.21	1.21
21.28	22.90	17.42	4.44	77.41	2.76	1.23	1.23
21.34	23.19	17.60	4.42	77.73	2.76	1.24	1.24
21.43	23.38	17.68	4.47	78.94	2.76	1.25	1.25
21.47	23.83	18.00	4.47	80.43	2.76	1.27	1.27
21.53	24.11	18.18	4.45	80.95	2.76	1.28	1.28
21.61	24.18	18.18	4.42	80.44	2.76	1.28	1.28
21.69	23.73	17.75	4.49	79.64	2.76	1.25	1.25
21.73	22.01	16.31	4.85	79.09	2.81	1.15	1.15
21.82	20.10	14.69	5.35	78.50	2.86	1.04	1.04
21.86	17.85	12.83	6.07	77.88	2.94	0.92	0.92
21.93	17.38	12.42	6.21	77.13	2.95	0.89	0.89
22.01	16.55	11.73	6.54	76.75	2.98	0.84	0.84
22.09	17.06	12.08	6.35	76.73	2.96	0.86	0.86
22.13	16.67	11.75	6.58	77.28	2.98	0.84	0.84
22.21	16.92	11.90	6.53	77.72	2.98	0.85	0.85
22.26	16.51	11.56	6.69	77.37	3.00	0.83	0.83
22.34	16.45	11.47	6.64	76.13	2.99	0.82	0.82
22.39	16.35	11.37	6.51	74.07	2.98	0.81	0.81

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
22.48	16.12	11.15	6.50	72.45	2.98	0.80	0.80
22.52	15.87	10.94	6.49	71.00	2.98	0.78	0.78
22.61	15.81	10.85	6.46	70.10	2.97	0.77	0.77
22.65	15.84	10.85	6.34	68.80	2.96	0.32	0.78
22.77	15.87	10.82	6.26	67.75	2.96	0.30	0.77
22.80	15.93	10.85	6.20	67.25	2.95	0.30	0.77
22.87	15.99	10.87	6.18	67.15	2.95	0.30	0.78
22.92	16.06	10.89	6.17	67.22	2.95	0.30	0.78
23.01	16.09	10.88	6.07	66.10	2.94	0.30	0.78
23.08	16.09	10.86	5.94	64.56	2.92	0.27	0.77
23.18	16.19	10.90	5.85	63.79	2.92	0.25	0.78
23.23	16.32	10.96	5.95	65.16	2.92	0.28	0.78
23.28	16.54	11.07	6.15	68.05	2.94	0.31	0.79
23.35	16.70	11.14	6.32	70.47	2.96	0.80	0.80
23.40	16.67	11.10	6.55	72.75	2.98	0.79	0.79
23.48	16.80	11.15	6.62	73.80	2.99	0.80	0.80
23.53	16.89	11.19	6.62	74.14	2.99	0.80	0.80
23.57	16.57	10.94	6.66	72.90	2.99	0.78	0.78
23.66	15.90	10.42	6.82	71.05	3.01	0.74	0.74
23.70	14.76	9.58	7.06	67.60	3.03	0.32	0.68
23.79	14.15	9.11	6.97	63.56	3.02	0.25	0.65
23.84	13.42	8.57	6.95	59.53	3.02	0.22	0.61
23.89	13.20	8.40	6.81	57.18	3.01	0.20	0.60
24.00	12.98	8.20	6.84	56.11	3.01	0.19	0.59
24.09	12.98	8.18	6.84	56.00	3.01	0.19	0.58
24.14	13.17	8.31	6.81	56.57	3.01	0.20	0.59
24.19	13.49	8.53	6.74	57.46	3.00	0.20	0.61
24.25	13.93	8.83	6.59	58.21	2.99	0.21	0.63
24.30	14.35	9.11	6.42	58.50	2.97	0.22	0.65
24.36	14.95	9.54	6.15	58.67	2.95	0.21	0.68
24.45	15.62	10.03	5.79	58.04	2.91	0.22	0.71
24.59	16.19	10.44	5.48	57.23	2.88	0.20	0.74
24.66	16.57	10.73	5.25	56.32	2.85	0.19	0.76
24.71	17.11	11.14	4.98	55.43	2.82	0.19	0.78
24.76	17.68	11.58	4.69	54.28	2.79	0.17	0.81
24.84	18.38	12.12	4.35	52.70	2.75	0.16	0.85
24.89	18.80	12.43	4.25	52.84	2.73	0.15	0.87
24.95	19.08	12.61	4.31	54.38	2.74	0.18	0.88
25.02	18.99	12.48	4.56	56.88	2.77	0.20	0.87
25.08	18.16	11.81	4.99	58.92	2.82	0.22	0.83
25.13	17.92	11.60	5.19	60.18	2.85	0.23	0.82
25.15	17.70	11.41	5.36	61.15	2.86	0.24	0.81
25.24	18.18	11.74	5.25	61.62	2.85	0.25	0.83
25.28	18.03	11.62	5.32	61.80	2.86	0.25	0.82
25.41	18.13	11.65	5.38	62.72	2.87	0.24	0.82
25.46	18.32	11.66	6.19	72.18	2.95	0.83	0.83
25.59	18.99	12.09	6.94	83.89	3.02	0.86	0.86
25.64	18.99	12.07	7.90	95.36	3.10	0.86	0.86

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
25.68	22.65	14.58	7.12	103.88	3.03	1.04	1.04
25.74	27.80	18.12	6.18	111.90	2.95	1.29	1.29
25.80	34.93	23.30	5.14	119.74	2.84	1.64	1.64
25.88	38.39	25.78	4.83	124.59	2.81	1.81	1.81
25.94	39.28	26.39	4.78	126.20	2.80	1.85	1.85
26.00	37.72	25.21	4.94	124.52	2.82	1.77	1.77
26.07	34.70	22.97	5.25	120.53	2.85	1.62	1.62
26.15	31.23	20.46	5.53	113.11	2.88	1.45	1.45
26.24	28.53	18.52	5.70	105.50	2.90	1.31	1.31
26.28	26.65	17.22	5.71	98.31	2.90	1.22	1.22
26.33	25.32	16.27	5.78	93.99	2.91	1.16	1.16
26.40	23.70	15.11	5.91	89.28	2.92	1.08	1.08
26.47	22.37	14.17	5.99	84.92	2.93	1.01	1.01
26.51	21.13	13.31	6.05	80.44	2.93	0.95	0.95
26.59	20.23	12.68	6.01	76.22	2.93	0.90	0.90
26.67	19.56	12.22	5.94	72.58	2.92	0.87	0.87
26.72	19.69	12.34	5.67	70.00	2.90	0.33	0.88
26.80	20.14	12.67	5.39	68.32	2.87	0.31	0.90
26.86	20.68	13.07	5.16	67.41	2.84	0.30	0.92
26.95	20.87	13.19	5.07	66.92	2.83	0.30	0.93
26.99	20.93	13.22	5.08	67.14	2.83	0.30	0.93
27.04	20.80	13.11	5.17	67.76	2.84	0.31	0.92
27.12	20.45	12.81	5.36	68.64	2.86	0.32	0.90
27.21	19.88	12.36	5.60	69.20	2.89	0.32	0.88
27.25	19.38	11.98	5.78	69.27	2.91	0.32	0.85
27.36	19.19	11.82	5.84	69.04	2.91	0.33	0.84
27.40	19.22	11.84	5.76	68.23	2.91	0.32	0.84
27.47	19.28	11.90	5.55	66.01	2.88	0.30	0.84
27.52	19.22	11.93	5.09	60.72	2.84	0.25	0.84
27.59	19.19	11.99	4.58	54.86	2.78	0.15	0.84
27.65	19.09	11.99	4.19	50.22	2.73	0.14	0.83
27.71	19.06	11.96	4.15	49.65	2.72	0.14	0.83
27.77	18.99	11.89	4.21	50.11	2.73	0.14	0.82
27.82	19.06	11.92	4.25	50.62	2.73	0.15	0.83
27.90	19.18	11.97	4.34	51.93	2.75	0.15	0.83
27.96	19.66	12.25	4.48	54.85	2.76	0.17	0.85
28.05	20.23	12.60	4.60	57.96	2.78	0.22	0.88
28.09	21.67	13.53	4.75	64.23	2.80	0.24	0.95
28.20	22.97	14.34	4.93	70.68	2.82	1.01	1.01
28.24	24.60	15.35	5.25	80.57	2.85	1.08	1.08
28.31	26.60	16.65	5.30	88.29	2.86	1.17	1.17
28.36	31.24	19.89	4.76	94.78	2.80	1.39	1.39
28.42	36.46	23.61	4.19	98.84	2.73	1.63	1.63
28.49	40.17	26.21	3.93	103.05	2.69	1.81	1.81
28.62	40.35	26.20	4.07	106.74	2.71	1.81	1.81
28.66	39.27	25.34	4.30	108.90	2.74	1.76	1.76
28.70	38.22	24.55	4.44	108.95	2.76	1.71	1.71
28.76	37.96	24.35	4.44	108.11	2.76	1.69	1.69

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
28.81	37.93	24.33	4.38	106.61	2.75	1.69	1.69
28.88	38.31	24.59	4.31	105.95	2.74	1.70	1.70
28.97	38.72	24.84	4.26	105.88	2.74	1.72	1.72
29.00	39.33	25.25	4.22	106.66	2.73	1.75	1.75
29.08	40.00	25.68	4.18	107.40	2.73	1.78	1.78
29.15	40.79	26.20	4.14	108.45	2.72	1.81	1.81
29.23	41.75	26.82	4.09	109.71	2.71	1.85	1.85
29.35	42.51	27.29	4.05	110.44	2.71	1.88	1.88
29.39	43.02	27.64	4.01	110.78	2.70	1.90	1.90
29.43	42.51	27.25	4.06	110.54	2.71	1.88	1.88
29.50	41.78	26.69	4.12	109.86	2.72	1.84	1.84
29.55	41.02	26.14	4.15	108.55	2.72	1.81	1.81
29.63	40.92	26.07	4.10	106.98	2.71	1.80	1.80
29.68	41.34	26.39	3.96	104.43	2.69	1.82	1.82
29.76	42.19	26.99	3.83	103.50	2.68	1.85	1.85
29.86	43.21	27.66	3.77	104.36	2.67	1.89	1.89
29.91	43.88	28.04	3.84	107.53	2.68	1.92	1.92
29.95	44.39	28.30	3.93	111.29	2.69	1.94	1.94
30.02	44.84	28.51	4.02	114.73	2.70	1.96	1.96
30.06	45.22	28.67	4.14	118.76	2.72	1.98	1.98
30.14	45.86	29.01	4.20	121.81	2.73	2.00	2.00
30.20	46.46	29.41	4.13	121.61	2.72	2.03	2.03
30.26	46.94	29.78	3.98	118.63	2.70	2.05	2.05
30.33	46.42	29.42	3.97	116.72	2.70	2.02	2.02
30.41	45.82	28.93	4.05	117.02	2.71	1.99	1.99
30.45	45.28	28.50	4.12	117.57	2.72	1.96	1.96
30.54	45.09	28.34	4.10	116.22	2.71	1.95	1.95
30.59	44.81	28.13	4.10	115.26	2.71	1.94	1.94
30.65	43.95	27.48	4.20	115.53	2.73	1.90	1.90
30.71	43.69	27.26	4.24	115.65	2.73	1.88	1.88
30.80	44.14	27.54	4.18	115.12	2.72	1.90	1.90
30.85	45.54	28.52	4.02	114.53	2.70	1.96	1.96
30.93	46.01	28.81	3.98	114.63	2.70	1.98	1.98
30.99	45.63	28.50	4.03	114.98	2.71	1.96	1.96
31.06	44.90	27.93	4.11	114.86	2.72	1.92	1.92
31.11	44.70	27.80	4.09	113.74	2.71	1.91	1.91
31.19	44.80	27.84	4.05	112.66	2.71	1.91	1.91
31.28	44.92	27.90	4.01	112.00	2.70	1.92	1.92
31.37	44.86	27.79	4.04	112.39	2.71	1.91	1.91
31.46	44.64	27.57	4.10	113.01	2.71	1.90	1.90
31.52	44.42	27.36	4.16	113.76	2.72	1.88	1.88
31.59	44.17	27.14	4.21	114.22	2.73	1.87	1.87
31.63	44.09	27.04	4.26	115.09	2.73	1.86	1.86
31.72	43.93	26.86	4.31	115.78	2.74	1.85	1.85
31.76	43.96	26.85	4.33	116.31	2.74	1.85	1.85
31.85	44.01	26.83	4.33	116.22	2.74	1.85	1.85
31.89	44.23	26.97	4.30	116.08	2.74	1.86	1.86
31.99	44.39	27.03	4.29	115.99	2.74	1.86	1.86

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
32.02	44.55	27.12	4.28	116.01	2.74	1.87	1.87
32.09	44.90	27.34	4.23	115.58	2.73	1.88	1.88
32.20	44.90	27.30	4.20	114.72	2.73	1.88	1.88
32.24	44.51	27.03	4.20	113.59	2.73	1.86	1.86
32.31	43.40	26.23	4.31	112.99	2.74	1.81	1.81
32.38	42.29	25.43	4.44	112.79	2.76	1.76	1.76
32.42	41.30	24.74	4.53	112.09	2.77	1.71	1.71
32.52	40.63	24.25	4.57	110.90	2.77	1.68	1.68
32.58	39.96	23.79	4.61	109.75	2.78	1.65	1.65
32.64	39.59	23.50	4.66	109.58	2.79	1.63	1.63
32.73	39.27	23.24	4.73	109.86	2.79	1.62	1.62
32.79	39.27	23.20	4.75	110.24	2.80	1.61	1.61
32.84	39.24	23.14	4.77	110.46	2.80	1.61	1.61
32.90	39.14	23.05	4.80	110.64	2.80	1.60	1.60
32.95	38.66	22.75	4.76	108.26	2.80	1.58	1.58
33.06	38.06	22.35	4.71	105.19	2.79	1.55	1.55
33.10	37.58	22.05	4.69	103.37	2.79	1.53	1.53
33.16	37.46	21.91	4.78	104.74	2.80	1.52	1.52
33.21	37.37	21.79	4.87	106.03	2.81	1.52	1.52
33.30	37.24	21.67	4.88	105.73	2.81	1.51	1.51
33.35	35.62	20.58	5.06	104.14	2.83	1.44	1.44
33.44	34.40	19.75	5.20	102.75	2.85	1.39	1.39
33.47	34.09	19.58	5.14	100.58	2.84	1.37	1.37
33.55	35.23	20.36	4.85	98.65	2.81	1.42	1.42
33.60	35.68	20.70	4.65	96.34	2.78	1.44	1.44
33.71	35.20	20.36	4.67	95.08	2.79	1.41	1.41
33.76	34.66	19.98	4.72	94.24	2.79	1.39	1.39
33.81	34.37	19.76	4.80	94.83	2.80	1.37	1.37
33.90	34.18	19.57	4.90	95.84	2.81	1.36	1.36
33.95	34.05	19.43	5.00	97.22	2.83	1.36	1.36
34.01	33.86	19.26	5.09	98.10	2.84	1.35	1.35
34.06	33.19	18.77	5.27	98.90	2.85	1.32	1.32
34.16	32.27	18.11	5.47	99.16	2.88	1.28	1.28
34.25	31.38	17.48	5.68	99.38	2.90	1.24	1.24
34.30	30.87	17.12	5.82	99.63	2.91	1.21	1.21
34.36	30.65	16.93	5.97	101.04	2.93	1.20	1.20
34.43	30.68	16.90	6.05	102.23	2.94	1.20	1.20
34.47	33.07	18.46	5.55	102.46	2.88	1.30	1.30
34.56	37.20	21.22	4.76	101.00	2.80	1.47	1.47
34.60	39.67	22.91	4.33	99.11	2.74	1.58	1.58
34.70	38.43	22.05	4.45	98.22	2.76	1.52	1.52
34.77	35.46	20.13	4.67	94.08	2.79	1.40	1.40
34.82	33.84	19.12	4.72	90.16	2.79	1.33	1.33
34.86	33.74	19.10	4.58	87.50	2.78	1.32	1.32
34.96	34.32	19.40	4.61	89.42	2.78	1.34	1.34
35.08	35.21	19.90	4.60	91.47	2.78	1.38	1.38
35.14	36.07	20.43	4.54	92.76	2.77	1.41	1.41
35.17	36.26	20.52	4.56	93.65	2.77	1.42	1.42

::Strength loss calculation (Robertson (2009) ::(continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
35.18	36.39	20.57	4.62	95.02	2.78	1.42	1.42
35.26	36.77	20.75	4.64	96.34	2.78	1.44	1.44
35.34	37.44	21.14	4.61	97.38	2.78	1.46	1.46
35.39	38.39	21.76	4.48	97.52	2.76	1.50	1.50
35.48	39.19	22.26	4.37	97.19	2.75	1.53	1.53
35.52	39.66	22.56	4.31	97.31	2.74	1.55	1.55
35.57	39.60	22.47	4.37	98.10	2.75	1.55	1.55
35.66	39.44	22.31	4.43	98.73	2.76	1.54	1.54
35.70	39.12	22.11	4.41	97.53	2.75	1.52	1.52
35.80	39.03	22.05	4.35	95.88	2.75	1.52	1.52
35.89	38.87	21.95	4.30	94.45	2.74	1.51	1.51
35.94	38.96	21.97	4.32	94.87	2.74	1.51	1.51
36.00	39.06	22.00	4.33	95.35	2.74	1.51	1.51
36.05	38.39	21.52	4.46	95.96	2.76	1.48	1.48
36.09	37.63	20.99	4.59	96.40	2.78	1.45	1.45
36.20	36.74	20.35	4.74	96.52	2.80	1.41	1.41
36.27	36.42	20.12	4.79	96.31	2.80	1.40	1.40
36.32	35.94	19.79	4.85	96.02	2.81	1.38	1.38
36.36	35.21	19.31	4.94	95.47	2.82	1.34	1.34
36.43	34.09	18.59	5.06	94.07	2.83	1.30	1.30
36.53	33.01	17.89	5.16	92.35	2.84	1.25	1.25
36.57	32.09	17.33	5.22	90.39	2.85	1.21	1.21
36.65	31.52	16.96	5.24	88.93	2.85	1.19	1.19
36.72	31.14	16.71	5.26	87.94	2.85	1.17	1.17
36.77	31.01	16.62	5.28	87.71	2.86	1.16	1.16
36.81	31.80	17.10	5.16	88.29	2.84	1.20	1.20
36.90	32.91	17.78	5.02	89.21	2.83	1.24	1.24
36.99	34.28	18.61	4.85	90.25	2.81	1.29	1.29
37.03	35.56	19.40	4.71	91.41	2.79	1.34	1.34
37.07	36.58	20.00	4.66	93.11	2.78	1.38	1.38
37.16	37.88	20.75	4.61	95.73	2.78	1.43	1.43
37.25	38.99	21.36	4.62	98.68	2.78	1.47	1.47
37.29	40.20	22.05	4.61	101.66	2.78	1.52	1.52
37.38	41.06	22.51	4.61	103.68	2.78	1.55	1.55
37.43	41.63	22.82	4.61	105.29	2.78	1.58	1.58
37.49	42.26	23.18	4.60	106.53	2.78	1.60	1.60
37.59	42.96	23.56	4.56	107.47	2.77	1.62	1.62
37.64	43.53	23.89	4.52	108.06	2.77	1.64	1.64
37.69	43.63	23.93	4.52	108.10	2.77	1.65	1.65
37.77	43.19	23.60	4.58	108.18	2.78	1.63	1.63
37.82	42.52	23.14	4.69	108.53	2.79	1.60	1.60
37.88	42.11	22.84	4.76	108.80	2.80	1.58	1.58
37.95	41.82	22.70	4.67	105.99	2.79	1.57	1.57
38.07	41.53	22.50	4.64	104.37	2.78	1.55	1.55
38.18	41.31	22.35	4.60	102.82	2.78	1.54	1.54
38.26	40.93	22.03	4.73	104.30	2.79	1.52	1.52
38.32	41.10	22.13	4.70	104.07	2.79	1.53	1.53
38.39	40.66	21.82	4.76	103.77	2.80	1.51	1.51

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
38.46	41.07	22.06	4.69	103.55	2.79	1.52	1.52
38.55	41.18	22.10	4.69	103.57	2.79	1.53	1.53
38.59	41.47	22.26	4.65	103.56	2.78	1.54	1.54
38.68	40.96	21.89	4.74	103.76	2.79	1.51	1.51
38.74	40.20	21.37	4.87	104.05	2.81	1.48	1.48
38.78	39.60	20.96	4.98	104.30	2.82	1.46	1.46
38.86	38.77	20.42	5.08	103.81	2.83	1.42	1.42
38.94	38.20	20.05	5.14	102.99	2.84	1.40	1.40
38.99	37.85	19.83	5.15	102.09	2.84	1.38	1.38
39.05	38.07	19.96	5.08	101.44	2.83	1.39	1.39
39.12	38.39	20.16	4.98	100.50	2.82	1.40	1.40
39.20	38.77	20.40	4.87	99.43	2.81	1.41	1.41
39.27	39.31	20.75	4.74	98.27	2.79	1.43	1.43
39.34	39.69	20.99	4.65	97.54	2.78	1.45	1.45
39.45	40.07	21.19	4.60	97.42	2.78	1.46	1.46
39.51	40.20	21.24	4.60	97.73	2.78	1.46	1.46
39.56	40.39	21.33	4.60	98.03	2.78	1.47	1.47
39.64	40.49	21.36	4.58	97.94	2.78	1.47	1.47
39.69	40.55	21.40	4.54	97.22	2.77	1.47	1.47
39.81	40.33	21.23	4.56	96.78	2.77	1.46	1.46
39.87	39.98	20.99	4.60	96.56	2.78	1.44	1.44
39.92	39.03	20.35	4.77	97.11	2.80	1.41	1.41
40.06	36.29	18.57	5.25	97.49	2.85	1.30	1.30
40.08	35.27	17.92	5.46	97.84	2.88	1.26	1.26
40.13	34.57	17.46	5.63	98.21	2.89	1.23	1.23
40.18	35.43	17.97	5.48	98.48	2.88	1.26	1.26
40.26	34.29	17.24	5.71	98.41	2.90	1.22	1.22
40.30	32.35	16.10	5.93	95.53	2.92	1.14	1.14
40.39	30.60	15.10	6.01	90.78	2.93	1.07	1.07
40.43	28.78	14.13	6.00	84.79	2.93	1.00	1.00
40.52	27.86	13.62	5.95	81.10	2.93	0.97	0.97
40.56	26.68	12.95	6.08	78.73	2.94	0.92	0.92
40.64	25.67	12.36	6.25	77.25	2.95	0.88	0.88
40.69	24.24	11.59	6.53	75.64	2.98	0.83	0.83
40.79	23.35	11.10	6.71	74.50	3.00	0.79	0.79
40.82	22.36	10.57	6.95	73.46	3.02	0.76	0.76
40.89	22.01	10.37	7.02	72.85	3.02	0.74	0.74
40.96	21.06	9.86	7.26	71.59	3.05	0.70	0.70
41.05	20.04	9.30	7.52	69.99	3.07	0.33	0.66
41.09	18.76	8.62	7.92	68.28	3.10	0.31	0.62
41.14	18.28	8.36	7.98	66.74	3.10	0.30	0.60
41.23	18.00	8.20	7.99	65.49	3.10	0.28	0.59
41.28	18.19	8.29	7.73	64.08	3.08	0.27	0.59
41.36	18.16	8.27	7.66	63.31	3.08	0.25	0.59
41.45	18.41	8.39	7.51	62.98	3.07	0.26	0.60
41.47	18.35	8.35	7.56	63.15	3.07	0.26	0.60
41.60	18.89	8.62	7.35	63.31	3.05	0.26	0.62
41.65	19.68	9.02	7.06	63.68	3.03	0.26	0.64

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
41.71	20.86	9.63	6.69	64.39	2.99	0.27	0.69
41.76	22.96	10.73	6.18	66.33	2.95	0.28	0.77
41.82	24.36	11.46	6.17	70.66	2.95	0.82	0.82
41.88	25.32	11.93	6.39	76.21	2.97	0.85	0.85
41.93	25.06	11.79	6.93	81.64	3.02	0.84	0.84
42.01	25.70	12.10	7.11	86.08	3.03	0.86	0.86
42.07	29.35	14.00	6.46	90.46	2.97	1.00	1.00
42.15	32.34	15.60	6.02	93.97	2.93	1.11	1.11
42.24	36.22	17.87	5.37	95.97	2.87	1.25	1.25
42.27	33.70	16.35	5.83	95.35	2.91	1.16	1.16
42.38	30.76	14.65	6.41	93.96	2.97	1.05	1.05
42.41	26.21	12.28	7.51	92.20	3.07	0.88	0.88
42.47	25.06	11.68	7.66	89.48	3.08	0.83	0.83
42.55	24.61	11.43	7.49	85.66	3.06	0.82	0.82
42.61	24.55	11.39	7.18	81.71	3.04	0.81	0.81
42.68	24.39	11.29	7.01	79.14	3.02	0.81	0.81
42.72	24.49	11.33	6.83	77.37	3.01	0.81	0.81
42.80	24.68	11.42	6.54	74.65	2.98	0.82	0.82
42.85	25.03	11.70	5.81	67.94	2.91	0.34	0.83
42.94	25.22	11.97	5.16	61.77	2.84	0.19	0.83
42.98	25.25	12.09	4.80	58.08	2.80	0.20	0.83
43.07	25.28	12.01	5.04	60.60	2.83	0.23	0.83
43.13	25.28	11.92	5.31	63.29	2.86	0.26	0.83
43.18	25.25	11.82	5.58	65.93	2.89	0.28	0.83
43.28	25.22	11.72	5.80	68.01	2.91	0.32	0.83
43.31	25.00	11.53	6.07	69.94	2.94	0.33	0.82
43.38	24.49	11.21	6.34	71.10	2.96	0.80	0.80
43.45	23.79	10.84	6.64	71.97	2.99	0.77	0.77
43.53	23.28	10.57	6.79	71.74	3.00	0.75	0.75
43.58	23.05	10.45	6.76	70.63	3.00	0.75	0.75
43.64	23.02	10.42	6.59	68.71	2.99	0.32	0.74
43.73	23.15	10.47	6.42	67.19	2.97	0.29	0.75
43.77	23.66	10.74	6.18	66.31	2.95	0.29	0.77
43.86	24.74	11.35	5.89	66.79	2.92	0.29	0.80
43.92	26.78	12.49	5.50	68.67	2.88	0.30	0.88
43.99	29.73	14.18	5.01	71.11	2.83	0.98	0.98
44.04	33.26	16.19	4.61	74.65	2.78	1.11	1.11
44.11	36.95	18.32	4.25	77.81	2.73	1.24	1.24
44.17	40.83	20.51	4.03	82.63	2.70	1.38	1.38
44.25	45.99	23.47	3.75	88.06	2.67	1.57	1.57
44.34	50.79	26.21	3.56	93.30	2.64	1.74	1.74
44.42	54.58	28.40	3.40	96.63	2.61	1.87	1.87
44.47	56.10	29.25	3.37	98.52	2.61	1.92	1.92
44.52	56.77	29.59	3.38	99.88	2.61	1.95	1.95
44.56	56.83	29.51	3.47	102.24	2.62	1.95	1.95
44.65	56.80	29.34	3.57	104.60	2.64	1.94	1.94
44.70	56.64	29.14	3.65	106.39	2.65	1.94	1.94
44.75	56.67	29.16	3.63	105.74	2.65	1.94	1.94

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
44.82	56.70	29.19	3.58	104.63	2.64	1.93	1.93
44.91	56.39	28.98	3.59	104.02	2.64	1.92	1.92
44.96	55.43	28.33	3.70	104.74	2.66	1.88	1.88
45.02	53.43	27.06	3.88	104.98	2.68	1.81	1.81
45.08	50.76	25.42	4.10	104.30	2.71	1.71	1.71
45.18	48.40	23.99	4.30	103.20	2.74	1.63	1.63
45.22	46.91	23.36	4.07	95.17	2.71	1.57	1.57
45.31	46.24	23.39	3.56	83.31	2.64	1.55	1.55
45.34	45.76	23.48	3.19	74.92	2.58	0.64	0.64
45.43	45.35	23.14	3.28	75.89	2.59	0.64	0.64
45.48	45.38	22.89	3.55	81.20	2.63	1.51	1.51
45.57	45.61	22.95	3.58	82.18	2.64	1.52	1.52
45.62	45.85	23.03	3.62	83.34	2.65	1.53	1.53
45.69	45.88	22.97	3.68	84.65	2.66	1.53	1.53
45.74	45.78	22.81	3.79	86.54	2.67	1.52	1.52
45.80	45.73	22.66	3.93	89.03	2.69	1.52	1.52
45.87	45.86	22.60	4.07	91.92	2.71	1.52	1.52
45.96	45.83	22.45	4.20	94.31	2.73	1.52	1.52
46.01	45.61	22.25	4.31	95.77	2.74	1.51	1.51
46.07	44.91	21.78	4.43	96.51	2.76	1.48	1.48
46.14	43.63	20.97	4.63	97.10	2.78	1.44	1.44
46.25	42.36	20.16	4.83	97.49	2.81	1.39	1.39
46.27	41.16	19.45	5.00	97.23	2.82	1.35	1.35
46.37	40.58	19.11	5.04	96.24	2.83	1.32	1.32
46.41	40.23	18.95	4.99	94.54	2.82	1.31	1.31
46.49	40.11	18.89	4.93	93.22	2.82	1.30	1.30
46.54	39.89	18.78	4.91	92.28	2.82	1.30	1.30
46.62	39.50	18.53	4.96	91.96	2.82	1.28	1.28
46.66	39.06	18.28	4.99	91.17	2.82	1.26	1.26
46.74	38.51	17.98	5.00	89.87	2.82	1.24	1.24
46.81	38.10	17.76	4.99	88.60	2.82	1.23	1.23
46.86	37.81	17.60	5.00	88.02	2.83	1.22	1.22
46.94	37.91	17.63	4.99	88.02	2.82	1.22	1.22
47.02	38.07	17.70	4.97	88.04	2.82	1.22	1.22
47.07	38.55	17.95	4.92	88.38	2.82	1.24	1.24
47.15	39.21	18.27	4.90	89.54	2.81	1.26	1.26
47.20	40.07	18.68	4.91	91.81	2.82	1.29	1.29
47.25	40.68	18.84	5.16	97.17	2.84	1.31	1.31
47.36	41.64	19.15	5.41	103.52	2.87	1.34	1.34
47.41	47.55	22.18	5.20	115.29	2.85	1.54	1.54
47.50	58.65	28.20	4.53	127.63	2.77	1.92	1.92
47.56	74.74	37.43	3.63	135.96	2.65	2.47	2.47
47.63	89.75	46.90	2.80	131.14	2.51	0.73	0.73
47.67	98.82	53.05	2.35	124.78	2.41	0.74	0.74
47.72	94.90	50.58	2.44	123.50	2.43	0.74	0.74
47.79	93.57	49.48	2.55	126.35	2.46	0.73	0.73
47.85	79.86	40.37	3.35	135.30	2.60	2.64	2.64
47.91	85.93	43.52	3.35	145.75	2.60	2.84	2.84

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
47.99	95.21	48.27	3.37	162.86	2.61	3.15	3.15
48.04	138.05	74.20	2.39	177.13	2.42	0.79	0.79
48.11	165.08	90.55	2.12	191.85	2.35	0.81	0.81
48.20	168.80	92.00	2.20	202.06	2.37	0.82	0.82
48.24	143.83	75.71	2.72	205.83	2.49	0.79	0.79
48.30	116.03	58.74	3.42	201.16	2.62	3.84	3.84
48.37	96.08	47.37	3.94	186.77	2.69	3.16	3.16
48.46	80.62	38.96	4.31	167.76	2.74	2.63	2.63
48.51	68.67	32.70	4.53	148.24	2.77	2.23	2.23
48.58	59.76	28.03	4.77	133.70	2.80	1.92	1.92
48.64	52.09	24.10	4.94	119.14	2.82	1.66	1.66
48.72	46.65	21.32	5.08	108.27	2.83	1.48	1.48
48.76	42.27	19.12	5.18	99.10	2.85	1.33	1.33
48.86	39.98	17.93	5.27	94.48	2.85	1.25	1.25
48.90	37.40	16.58	5.47	90.66	2.88	1.16	1.16
48.95	35.62	15.63	5.67	88.61	2.90	1.10	1.10
49.03	33.78	14.63	5.93	86.74	2.92	1.04	1.04
49.09	32.19	13.78	6.15	84.75	2.94	0.98	0.98
49.25	31.26	13.29	6.25	83.02	2.95	0.95	0.95
49.30	31.10	13.22	6.19	81.87	2.95	0.94	0.94
49.38	32.44	13.95	5.86	81.74	2.92	0.99	0.99
49.47	33.97	14.77	5.56	82.12	2.89	1.04	1.04
49.52	35.21	15.43	5.38	82.96	2.87	1.08	1.08
49.56	35.40	15.48	5.45	84.31	2.87	1.08	1.08
49.65	35.65	15.56	5.48	85.33	2.88	1.09	1.09
49.74	35.94	15.66	5.52	86.41	2.88	1.10	1.10
49.80	36.54	15.94	5.52	87.92	2.88	1.12	1.12
49.86	37.24	16.24	5.56	90.21	2.89	1.14	1.14
49.91	38.20	16.68	5.54	92.48	2.88	1.17	1.17
49.95	38.64	16.87	5.56	93.86	2.89	1.18	1.18
50.04	38.70	16.87	5.59	94.21	2.89	1.18	1.18
50.09	40.07	17.62	5.34	94.09	2.86	1.23	1.23
50.15	40.07	17.64	5.29	93.24	2.86	1.23	1.23
50.24	39.53	17.35	5.31	92.07	2.86	1.21	1.21
50.28	36.73	15.84	5.68	89.94	2.90	1.11	1.11
50.37	35.40	15.14	5.80	87.81	2.91	1.07	1.07
50.40	34.76	14.86	5.74	85.30	2.90	1.05	1.05
50.50	34.54	14.76	5.67	83.76	2.90	1.04	1.04
50.54	34.70	14.89	5.53	82.31	2.88	1.04	1.04
50.59	34.51	14.81	5.48	81.17	2.88	1.04	1.04
50.68	34.22	14.68	5.43	79.73	2.87	1.03	1.03
50.76	33.30	14.18	5.54	78.57	2.88	0.99	0.99
50.81	32.09	13.52	5.76	77.83	2.91	0.95	0.95
50.89	31.67	13.29	5.82	77.31	2.91	0.94	0.94
50.98	31.55	13.22	5.81	76.85	2.91	0.93	0.93
51.00	32.02	13.49	5.66	76.40	2.90	0.95	0.95
51.07	31.96	13.45	5.66	76.06	2.90	0.95	0.95
51.16	32.02	13.47	5.63	75.80	2.89	0.95	0.95

::Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
51.19	32.18	13.56	5.59	75.77	2.89	0.95	0.95
51.29	33.01	13.99	5.42	75.78	2.87	0.98	0.98
51.33	34.25	14.66	5.18	75.98	2.85	1.02	1.02
51.42	35.36	15.25	5.00	76.30	2.83	1.05	1.05
51.45	37.46	16.25	4.98	80.94	2.82	1.12	1.12
51.64	39.53	17.19	4.95	85.16	2.82	1.18	1.18
51.68	41.79	18.29	4.88	89.18	2.81	1.26	1.26
51.73	42.55	18.71	4.76	89.12	2.80	1.28	1.28
51.77	42.93	18.92	4.69	88.77	2.79	1.29	1.29
51.81	42.49	18.68	4.72	88.16	2.79	1.28	1.28
51.85	40.42	17.68	4.74	83.74	2.79	1.21	1.21
51.94	37.59	16.34	4.70	76.79	2.79	1.12	1.12
51.99	34.54	14.92	4.63	69.06	2.78	0.29	1.02
52.08	32.82	14.07	4.67	65.70	2.79	0.28	0.96
52.11	31.93	13.56	4.86	65.88	2.81	0.28	0.93
52.25	30.63	12.78	5.20	66.42	2.85	0.29	0.89
52.27	31.23	13.09	5.14	67.22	2.84	0.30	0.91
52.32	31.81	13.38	5.05	67.56	2.83	0.30	0.92
52.38	33.68	14.39	4.72	68.00	2.79	0.31	0.98
52.45	34.10	14.59	4.69	68.48	2.79	0.31	1.00
52.52	34.41	14.73	4.69	69.08	2.79	0.32	1.00
52.60	34.70	14.85	4.69	69.62	2.79	0.33	1.01
52.64	34.83	14.89	4.71	70.14	2.79	1.02	1.02
52.69	35.14	15.04	4.68	70.43	2.79	1.03	1.03
52.77	35.65	15.27	4.66	71.16	2.79	1.04	1.04
52.86	36.06	15.45	4.66	72.01	2.79	1.05	1.05
52.90	36.03	15.38	4.75	73.07	2.80	1.05	1.05
52.97	35.33	14.95	4.93	73.70	2.82	1.03	1.03
53.04	34.38	14.40	5.13	73.87	2.84	1.00	1.00
53.12	33.84	14.10	5.22	73.55	2.85	0.98	0.98
53.18	33.65	14.01	5.19	72.72	2.85	0.97	0.97
53.25	33.71	14.06	5.12	71.93	2.84	0.97	0.97
53.30	33.84	14.15	5.03	71.15	2.83	0.98	0.98
53.39	34.38	14.45	4.89	70.62	2.81	0.99	0.99
53.45	35.02	14.80	4.74	70.18	2.79	1.01	1.01
53.52	35.75	15.20	4.60	69.98	2.78	0.33	1.03
53.56	36.64	15.69	4.45	69.87	2.76	0.33	1.06
53.65	37.56	16.18	4.32	69.87	2.74	0.33	1.09
53.69	37.88	16.32	4.32	70.53	2.74	1.10	1.10
53.78	37.53	16.07	4.43	71.22	2.76	1.09	1.09
53.83	36.89	15.69	4.57	71.74	2.77	1.06	1.06
53.93	36.57	15.49	4.62	71.53	2.78	1.05	1.05
53.99	36.32	15.35	4.64	71.23	2.78	1.04	1.04
54.03	35.84	15.11	4.67	70.56	2.79	1.03	1.03
54.14	35.18	14.74	4.75	69.96	2.80	0.32	1.01
54.18	34.57	14.42	4.82	69.44	2.80	0.32	0.99
54.28	34.35	14.25	4.91	69.94	2.81	0.32	0.98
54.34	34.35	14.20	5.01	71.05	2.83	0.98	0.98

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
54.39	34.41	14.16	5.13	72.60	2.84	0.98	0.98
54.44	34.51	14.14	5.24	74.12	2.85	0.98	0.98
54.49	34.73	14.20	5.32	75.50	2.86	0.99	0.99
54.54	35.78	14.69	5.26	77.20	2.85	1.02	1.02
54.66	37.47	15.50	5.11	79.20	2.84	1.07	1.07
54.71	39.02	16.10	5.28	84.98	2.86	1.12	1.12
54.83	39.25	15.90	5.85	92.97	2.92	1.12	1.12
54.88	38.80	15.52	6.60	102.45	2.99	1.11	1.11
54.96	37.02	14.73	7.35	108.17	3.05	1.05	1.05
54.97	34.67	13.70	8.10	110.90	3.11	0.98	0.98
54.99	38.42	15.33	7.41	113.63	3.06	1.09	1.09
55.08	41.00	16.43	7.09	116.51	3.03	1.17	1.17
55.14	49.90	20.50	5.87	120.36	2.92	1.45	1.45
55.20	50.51	20.64	6.02	124.30	2.93	1.47	1.47
55.29	53.30	21.95	5.85	128.50	2.92	1.55	1.55
55.34	50.89	20.65	6.37	131.64	2.97	1.48	1.48
55.39	51.49	20.90	6.40	133.78	2.97	1.49	1.49
55.46	54.13	22.06	6.16	135.92	2.95	1.57	1.57
55.51	59.19	24.62	5.63	138.49	2.89	1.73	1.73
55.59	67.14	28.79	4.86	139.95	2.81	1.97	1.97
55.65	73.21	32.09	4.35	139.54	2.75	2.16	2.16
55.77	75.09	33.15	4.15	137.59	2.72	2.21	2.21
55.82	71.05	31.02	4.35	134.97	2.75	2.08	2.08
55.86	64.79	27.74	4.74	131.37	2.79	1.89	1.89
55.95	58.81	24.65	5.17	127.36	2.84	1.70	1.70
55.99	53.08	21.78	5.60	122.08	2.89	1.53	1.53
56.08	49.36	19.90	5.97	118.78	2.93	1.41	1.41
56.12	47.77	19.08	6.19	118.13	2.95	1.36	1.36
56.22	49.07	19.64	6.14	120.60	2.94	1.40	1.40
56.26	52.44	21.27	5.84	124.18	2.91	1.50	1.50
56.32	58.65	24.36	5.28	128.53	2.86	1.69	1.69
56.43	63.42	26.72	4.94	131.88	2.82	1.83	1.83
56.45	70.22	30.27	4.44	134.32	2.76	2.04	2.04
56.51	72.13	31.25	4.33	135.16	2.74	2.10	2.10
56.56	72.89	31.57	4.33	136.56	2.74	2.12	2.12
56.63	69.30	29.48	4.71	138.86	2.79	2.01	2.01
56.72	68.12	28.72	4.91	141.03	2.81	1.97	1.97
56.77	71.24	30.28	4.72	143.00	2.79	2.06	2.06
56.85	76.26	32.90	4.37	143.89	2.75	2.21	2.21
56.90	81.00	35.43	4.08	144.60	2.71	2.35	2.35
56.96	84.38	37.25	3.88	144.43	2.68	2.45	2.45
57.07	86.73	38.52	3.73	143.61	2.66	2.52	2.52
57.09	88.32	39.55	3.57	141.36	2.64	2.57	2.57
57.16	86.35	38.62	3.56	137.58	2.64	2.50	2.50
57.25	83.17	37.01	3.61	133.54	2.64	2.41	2.41
57.29	78.01	34.30	3.79	129.89	2.67	2.25	2.25
57.36	73.12	31.71	4.01	127.23	2.70	2.10	2.10
57.43	67.96	29.05	4.26	123.73	2.74	1.94	1.94

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
57.51	64.02	27.06	4.43	119.92	2.76	1.82	1.82
57.59	60.78	25.43	4.59	116.64	2.78	1.72	1.72
57.66	58.65	24.36	4.70	114.58	2.79	1.66	1.66
57.69	57.09	23.61	4.76	112.39	2.80	1.61	1.61
57.82	57.03	23.60	4.69	110.68	2.79	1.60	1.60
57.86	56.96	23.62	4.63	109.26	2.78	1.60	1.60
57.90	56.46	23.33	4.68	109.26	2.79	1.58	1.58
57.95	55.22	22.60	4.89	110.44	2.81	1.55	1.55
58.05	53.37	21.52	5.22	112.28	2.85	1.49	1.49
58.12	51.46	20.42	5.60	114.32	2.89	1.43	1.43
58.17	48.89	19.05	6.02	114.69	2.93	1.35	1.35
58.22	52.77	21.06	5.43	114.31	2.87	1.47	1.47
58.30	57.79	23.72	4.76	112.98	2.80	1.62	1.62
58.34	63.74	26.95	4.13	111.39	2.72	1.79	1.79
58.40	61.89	25.97	4.26	110.55	2.73	1.73	1.73
58.47	56.74	23.29	4.67	108.66	2.79	1.58	1.58
58.54	49.55	19.70	5.28	104.00	2.86	1.37	1.37
58.60	42.08	16.17	5.88	95.06	2.92	1.14	1.14
58.69	35.88	13.41	6.34	85.04	2.96	0.96	0.96
58.74	31.30	11.51	6.55	75.42	2.98	0.82	0.82
58.82	28.79	10.46	6.59	68.89	2.99	0.30	0.75
58.86	27.51	9.92	6.36	63.16	2.97	0.26	0.71
58.93	26.72	9.61	6.13	58.91	2.94	0.21	0.68
59.00	26.05	9.39	5.92	55.61	2.92	0.18	0.66
59.09	25.64	9.25	5.77	53.34	2.91	0.16	0.65
59.13	25.22	9.08	5.75	52.18	2.90	0.15	0.64
59.22	25.18	9.07	5.68	51.51	2.90	0.15	0.64
59.36	25.02	8.98	5.72	51.30	2.90	0.15	0.63
59.46	25.27	9.09	5.65	51.36	2.89	0.15	0.64
59.49	25.35	9.12	5.64	51.47	2.89	0.15	0.64
59.55	25.67	9.28	5.55	51.50	2.88	0.15	0.65
59.64	25.74	9.30	5.53	51.45	2.88	0.15	0.65
59.68	25.67	9.27	5.53	51.29	2.88	0.15	0.65
59.74	25.48	9.17	5.56	50.97	2.89	0.15	0.64
59.79	25.26	9.16	5.27	48.26	2.85	0.14	0.63
59.88	25.13	9.20	4.96	45.65	2.82	0.08	0.63
59.96	25.16	9.31	4.64	43.18	2.78	0.09	0.63
60.01	25.48	9.44	4.66	43.99	2.79	0.09	0.64
60.08	25.95	9.63	4.67	44.94	2.79	0.10	0.65
60.14	26.14	9.67	4.77	46.10	2.80	0.11	0.66
60.18	26.84	9.97	4.75	47.39	2.80	0.12	0.68
60.24	27.58	10.29	4.73	48.67	2.79	0.13	0.70
60.31	28.69	10.81	4.61	49.80	2.78	0.13	0.73
60.39	28.98	10.92	4.60	50.25	2.78	0.14	0.74
60.45	28.75	10.80	4.65	50.23	2.78	0.14	0.73
60.50	28.27	10.55	4.76	50.16	2.80	0.13	0.72
60.57	28.05	10.40	4.87	50.68	2.81	0.14	0.71
60.64	29.10	10.89	4.74	51.64	2.80	0.15	0.74

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
60.74	30.60	11.61	4.52	52.48	2.77	0.16	0.78
60.77	32.19	12.41	4.28	53.10	2.74	0.16	0.83
60.85	32.54	12.56	4.26	53.51	2.74	0.16	0.84
60.90	32.06	12.27	4.41	54.16	2.75	0.17	0.82
60.98	30.88	11.61	4.73	54.87	2.79	0.18	0.79
61.05	29.52	10.88	5.07	55.20	2.83	0.18	0.75
61.11	27.92	10.07	5.44	54.83	2.87	0.18	0.70
61.16	25.86	9.09	5.84	53.09	2.91	0.17	0.64
61.24	23.88	8.17	6.24	51.02	2.95	0.14	0.58
61.29	22.20	7.49	6.49	48.62	2.98	0.13	0.54
61.38	21.44	7.17	6.55	47.02	2.98	0.11	0.51
61.42	20.90	6.95	6.49	45.14	2.98	0.11	0.50
61.51	20.74	6.88	6.33	43.54	2.96	0.09	0.49
61.56	20.61	6.86	6.08	41.66	2.94	0.08	0.49
61.63	20.61	6.91	5.83	40.29	2.91	0.07	0.49
61.68	20.71	6.98	5.68	39.60	2.90	0.07	0.49
61.75	20.87	7.06	5.59	39.43	2.89	0.07	0.49
61.82	20.83	7.03	5.64	39.60	2.89	0.07	0.49
61.94	20.70	6.94	5.75	39.89	2.91	0.07	0.49
61.99	20.51	6.78	6.10	41.35	2.94	0.07	0.48
62.05	20.70	6.82	6.45	44.01	2.97	0.10	0.49
62.13	22.07	7.37	6.27	46.17	2.96	0.12	0.53
62.24	24.94	8.72	5.45	47.55	2.87	0.12	0.61
62.30	28.66	10.62	4.46	47.34	2.76	0.12	0.71
62.36	31.10	11.95	3.91	46.69	2.69	0.11	0.78
62.42	31.68	12.28	3.75	46.00	2.66	0.10	0.80
62.48	29.99	11.39	4.02	45.82	2.70	0.10	0.75
62.53	28.50	10.58	4.34	45.94	2.75	0.11	0.71
62.56	27.48	10.05	4.57	45.92	2.77	0.11	0.68
62.62	27.32	9.96	4.61	45.88	2.78	0.10	0.67
62.68	26.69	9.62	4.78	45.97	2.80	0.11	0.65
62.73	25.60	9.04	5.13	46.42	2.84	0.11	0.62
62.81	24.87	8.64	5.43	46.93	2.87	0.11	0.60
62.86	25.09	8.74	5.40	47.20	2.87	0.12	0.61
62.99	26.18	9.27	5.08	47.06	2.83	0.11	0.64
63.04	27.64	10.05	4.59	46.17	2.78	0.11	0.68
63.11	28.56	10.57	4.28	45.20	2.74	0.10	0.70
63.21	28.75	10.69	4.16	44.51	2.72	0.09	0.71
63.30	27.99	10.28	4.33	44.49	2.74	0.10	0.69
63.35	26.68	9.60	4.65	44.61	2.78	0.10	0.65
63.40	25.57	9.04	4.91	44.36	2.81	0.10	0.62
63.47	25.09	8.81	4.98	43.84	2.82	0.09	0.60
63.52	25.16	8.86	4.90	43.37	2.81	0.09	0.60
63.59	25.22	8.91	4.81	42.87	2.80	0.09	0.61
63.65	25.41	9.03	4.66	42.11	2.79	0.08	0.61
63.71	25.92	9.32	4.44	41.35	2.76	0.07	0.62
63.83	26.11	9.42	4.36	41.07	2.75	0.07	0.63
63.89	25.54	9.06	4.67	42.29	2.79	0.08	0.61

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
63.96	24.39	8.37	5.32	44.51	2.86	0.10	0.58
64.01	24.08	8.04	6.00	48.29	2.93	0.12	0.57
64.09	25.48	8.59	6.02	51.67	2.93	0.16	0.61
64.13	27.96	9.71	5.59	54.24	2.89	0.18	0.68
64.20	30.85	11.11	4.95	55.00	2.82	0.18	0.76
64.26	33.36	12.39	4.43	54.85	2.76	0.18	0.83
64.31	35.43	13.51	3.99	53.96	2.70	0.17	0.89
64.40	35.91	13.80	3.84	53.01	2.68	0.15	0.90
64.44	34.60	13.20	3.89	51.41	2.69	0.15	0.86
64.50	31.84	11.71	4.44	52.04	2.76	0.13	0.78
64.57	29.39	10.44	5.02	52.40	2.83	0.17	0.72
64.63	27.74	9.50	5.78	54.89	2.91	0.16	0.67
64.75	26.62	8.94	6.13	54.77	2.94	0.20	0.64
64.80	23.76	7.79	6.98	54.40	3.02	0.17	0.56
64.84	22.84	7.42	6.94	51.56	3.02	0.16	0.53
64.93	22.20	7.17	6.85	49.07	3.01	0.13	0.51
64.98	23.38	7.66	6.04	46.27	2.93	0.11	0.54
65.06	22.43	7.28	6.05	44.03	2.93	0.09	0.52
65.10	21.60	6.95	6.07	42.17	2.94	0.08	0.49
65.16	20.96	6.67	6.21	41.38	2.95	0.08	0.48
65.23	20.74	6.57	6.27	41.20	2.96	0.08	0.47
65.31	20.61	6.52	6.35	41.36	2.96	0.08	0.47
65.37	20.74	6.56	6.30	41.35	2.96	0.08	0.47
65.44	21.03	6.68	6.18	41.27	2.95	0.08	0.48
65.49	21.44	6.87	6.01	41.29	2.93	0.08	0.49
65.58	21.69	6.99	5.91	41.30	2.92	0.08	0.49
65.63	21.72	7.01	5.86	41.04	2.92	0.08	0.49
65.71	21.66	6.99	5.82	40.64	2.91	0.07	0.49
65.75	21.63	6.99	5.73	40.08	2.90	0.07	0.49
65.85	21.66	7.01	5.67	39.79	2.90	0.07	0.49
65.89	21.57	6.97	5.68	39.58	2.90	0.07	0.49
65.98	21.50	6.93	5.71	39.55	2.90	0.07	0.49
66.04	21.47	6.96	5.52	38.40	2.88	0.07	0.49
66.09	21.50	7.05	5.19	36.57	2.85	0.05	0.49
66.19	21.50	7.13	4.86	34.67	2.81	0.04	0.49
66.24	21.47	7.14	4.79	34.16	2.80	0.04	0.48
66.28	21.44	7.10	4.86	34.47	2.81	0.04	0.48
66.34	21.41	7.06	4.93	34.82	2.82	0.04	0.48
66.41	21.53	7.10	4.95	35.16	2.82	0.05	0.49
66.47	21.82	7.22	4.92	35.54	2.82	0.05	0.49
66.56	22.08	7.33	4.89	35.82	2.81	0.05	0.50
66.60	22.17	7.35	4.93	36.25	2.82	0.05	0.50
66.69	22.14	7.31	5.00	36.56	2.82	0.05	0.50
66.74	22.11	7.28	5.07	36.91	2.83	0.05	0.50
66.82	22.17	7.29	5.10	37.17	2.84	0.06	0.50
66.91	22.24	7.30	5.12	37.37	2.84	0.06	0.50
66.95	22.49	7.42	5.05	37.47	2.83	0.06	0.51
67.00	22.58	7.46	5.02	37.43	2.83	0.06	0.51

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
67.08	22.65	7.49	5.00	37.40	2.82	0.06	0.51
67.13	22.52	7.42	5.04	37.37	2.83	0.06	0.51
67.22	22.46	7.38	5.05	37.31	2.83	0.06	0.51
67.27	22.42	7.37	5.05	37.22	2.83	0.06	0.51
67.34	22.39	7.35	5.06	37.16	2.83	0.05	0.50
67.40	22.46	7.36	5.11	37.56	2.84	0.06	0.51
67.48	22.65	7.41	5.15	38.20	2.84	0.06	0.51
67.52	23.03	7.56	5.16	39.00	2.84	0.06	0.52
67.61	23.44	7.71	5.17	39.88	2.84	0.07	0.53
67.67	23.79	7.77	5.42	42.13	2.87	0.08	0.54
67.78	24.24	7.83	5.81	45.51	2.91	0.11	0.55
67.83	25.03	8.02	6.22	49.86	2.95	0.14	0.57
67.89	27.07	8.83	6.08	53.69	2.94	0.18	0.63
67.96	30.63	10.44	5.37	56.12	2.87	0.20	0.72
68.01	35.78	13.01	4.29	55.77	2.74	0.19	0.86
68.09	40.84	15.70	3.47	54.45	2.62	0.16	1.00
68.14	43.29	17.01	3.18	54.11	2.58	0.07	0.60
68.21	42.02	16.31	3.33	54.30	2.60	0.18	1.03
68.26	38.07	14.20	3.86	54.88	2.68	0.16	0.92
68.32	35.04	12.57	4.46	56.03	2.76	0.18	0.84
68.40	33.65	11.76	4.95	58.23	2.82	0.21	0.80
68.45	33.81	11.50	5.67	65.18	2.90	0.23	0.81
68.57	35.90	12.16	5.95	72.35	2.93	0.86	0.86
68.63	39.70	13.63	5.90	80.47	2.92	0.96	0.96
68.70	44.15	15.53	5.51	85.58	2.88	1.08	1.08
68.76	46.15	16.31	5.49	89.61	2.88	1.14	1.14
68.80	50.25	18.12	5.15	93.28	2.84	1.25	1.25
68.85	53.40	19.53	4.91	95.83	2.81	1.33	1.33
68.92	58.21	21.78	4.49	97.75	2.76	1.46	1.46
68.99	61.64	23.53	4.12	96.93	2.72	1.55	1.55
69.05	64.41	25.15	3.72	93.62	2.66	1.62	1.62
69.14	62.98	24.67	3.61	88.99	2.64	1.58	1.58
69.20	56.30	21.49	3.94	84.71	2.69	1.40	1.40
69.27	49.43	18.14	4.53	82.17	2.77	1.22	1.22
69.31	43.80	15.48	5.16	79.83	2.84	1.06	1.06
69.36	39.89	13.72	5.61	76.90	2.89	0.96	0.96
69.44	36.58	12.34	5.83	71.97	2.91	0.87	0.87
69.53	35.02	11.81	5.66	66.80	2.90	0.27	0.83
69.57	34.32	11.66	5.36	62.49	2.86	0.25	0.81
69.63	33.11	11.25	5.22	58.72	2.85	0.22	0.78
69.71	31.17	10.48	5.24	54.91	2.85	0.16	0.72
69.76	28.92	9.66	5.09	49.11	2.83	0.15	0.66
69.85	27.20	9.00	5.01	45.14	2.83	0.08	0.62
69.92	25.77	8.50	4.84	41.16	2.81	0.08	0.58
69.97	24.88	8.09	5.00	40.45	2.82	0.07	0.55
70.06	24.59	7.99	4.97	39.65	2.82	0.07	0.54
70.11	24.56	8.00	4.88	39.02	2.81	0.06	0.54
70.15	25.16	8.28	4.72	39.08	2.79	0.06	0.56

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
70.23	25.55	8.42	4.73	39.82	2.79	0.07	0.57
70.31	25.86	8.51	4.81	40.92	2.80	0.08	0.58
70.38	25.64	8.38	4.92	41.26	2.82	0.08	0.57
70.43	25.77	8.50	4.70	39.99	2.79	0.07	0.57
70.48	26.60	8.98	4.31	38.65	2.74	0.05	0.60
70.54	27.93	9.56	4.22	40.29	2.73	0.06	0.63
70.63	28.76	9.73	4.54	44.16	2.77	0.10	0.65
70.69	28.95	9.60	5.03	48.27	2.83	0.12	0.66
70.75	29.84	9.83	5.31	52.23	2.86	0.15	0.68
70.84	32.10	10.63	5.45	57.94	2.87	0.19	0.74
70.92	35.59	12.01	5.31	63.74	2.86	0.27	0.83
70.97	38.17	13.01	5.26	68.48	2.85	0.31	0.90
71.02	40.33	13.82	5.29	73.04	2.86	0.95	0.95
71.09	44.28	15.38	5.17	79.57	2.84	1.06	1.06
71.17	50.51	18.02	4.80	86.53	2.80	1.22	1.22
71.24	56.81	20.81	4.40	91.57	2.75	1.39	1.39
71.28	61.71	23.09	4.07	93.94	2.71	1.51	1.51
71.36	63.93	24.15	3.93	94.90	2.69	1.57	1.57
71.41	66.64	25.58	3.66	93.62	2.65	1.64	1.64
71.50	68.96	26.91	3.39	91.25	2.61	1.70	1.70
71.53	70.68	28.08	3.11	87.36	2.56	0.66	0.66
71.61	69.06	27.43	3.08	84.37	2.56	0.66	0.66
71.67	61.17	23.50	3.49	81.99	2.63	1.49	1.49
71.76	52.87	19.32	4.19	80.91	2.73	1.27	1.27
71.80	46.32	16.26	4.80	78.12	2.80	1.10	1.10
71.89	44.79	15.70	4.73	74.34	2.79	1.06	1.06
71.94	42.85	15.06	4.55	68.56	2.77	0.31	1.01
72.05	41.23	14.49	4.43	64.23	2.76	0.25	0.97
72.10	37.86	13.05	4.62	60.31	2.78	0.22	0.88
72.15	35.57	12.09	4.76	57.50	2.80	0.20	0.82
72.20	32.48	10.88	4.77	51.95	2.80	0.17	0.74
72.29	30.92	10.46	4.35	45.49	2.75	0.08	0.69
72.35	29.30	10.02	3.96	39.68	2.70	0.05	0.65
72.40	28.25	9.52	4.12	39.24	2.72	0.06	0.62
72.46	27.52	9.09	4.41	40.04	2.75	0.07	0.60
72.56	26.53	8.59	4.68	40.23	2.79	0.07	0.58
72.58	26.95	8.81	4.52	39.84	2.77	0.07	0.59
72.67	27.36	9.01	4.40	39.63	2.75	0.07	0.60
72.72	27.97	9.33	4.22	39.40	2.73	0.06	0.61
72.80	27.36	9.03	4.34	39.18	2.75	0.06	0.60
72.84	26.69	8.70	4.48	39.03	2.76	0.06	0.58
72.91	26.41	8.57	4.54	38.89	2.77	0.06	0.57
72.98	26.09	8.41	4.61	38.78	2.78	0.06	0.56
73.05	25.93	8.33	4.64	38.68	2.78	0.06	0.56
73.11	26.19	8.47	4.52	38.31	2.77	0.06	0.57
73.24	26.60	8.65	4.44	38.39	2.76	0.06	0.58
73.33	26.92	8.75	4.47	39.17	2.76	0.06	0.58
73.38	26.92	8.62	4.83	41.61	2.81	0.07	0.58

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
73.46	27.07	8.48	5.38	45.59	2.87	0.10	0.59
73.52	27.49	8.43	5.98	50.40	2.93	0.14	0.60
73.57	28.38	8.68	6.58	57.15	2.99	0.19	0.62
73.63	30.06	9.28	6.88	63.87	3.01	0.27	0.66
73.69	34.36	10.82	6.66	72.07	2.99	0.77	0.77
73.77	42.31	13.90	5.77	80.23	2.91	0.98	0.98
73.85	53.92	19.02	4.58	87.14	2.78	1.27	1.27
73.91	67.02	25.25	3.60	90.94	2.64	1.61	1.61
73.98	77.83	30.66	3.01	92.36	2.55	0.67	0.67
74.03	87.40	35.63	2.62	93.26	2.47	0.69	0.69
74.11	94.21	39.34	2.36	92.86	2.41	0.70	0.70
74.15	99.78	42.64	2.14	91.19	2.36	0.71	0.71
74.22	95.58	40.65	2.16	87.84	2.36	0.71	0.71
74.30	86.10	35.78	2.34	83.80	2.41	0.69	0.69
74.35	69.63	27.46	2.84	77.86	2.51	0.66	0.66
74.45	57.16	21.41	3.40	72.70	2.61	1.35	1.35
74.49	46.25	16.21	4.24	68.76	2.73	0.30	1.07
74.55	39.29	12.91	5.27	68.11	2.86	0.31	0.89
74.64	34.17	10.62	6.36	67.62	2.97	0.31	0.76
74.69	31.53	9.68	6.99	67.61	3.02	0.31	0.69
74.77	31.91	9.80	6.85	67.14	3.01	0.30	0.70
74.82	35.89	11.36	5.86	66.59	2.92	0.29	0.80
74.90	41.77	14.70	3.87	56.88	2.68	0.28	0.95
74.95	47.02	18.43	2.42	44.58	2.43	0.05	0.61
75.04	48.13	-1.00	1.00	-1.00	-1.00	N/A	N/A
75.08	44.63	-1.00	1.00	-1.00	-1.00	N/A	N/A
75.16	39.99	-1.00	1.00	-1.00	-1.00	N/A	N/A
75.20	34.55	-1.00	1.00	-1.00	-1.00	N/A	N/A
75.29	31.56	-1.00	1.00	-1.00	-1.00	N/A	N/A

Abbreviations

q_t: Total cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Adjusted and corrected cone resistance due to fines
I_c: Soil behavior type index
$S_{u(liq)}/\sigma'_v$: Calculated liquefied undrained strength ratio
$S_{u(peak)}/\sigma'_v$: Calculated peak undrained strength ratio

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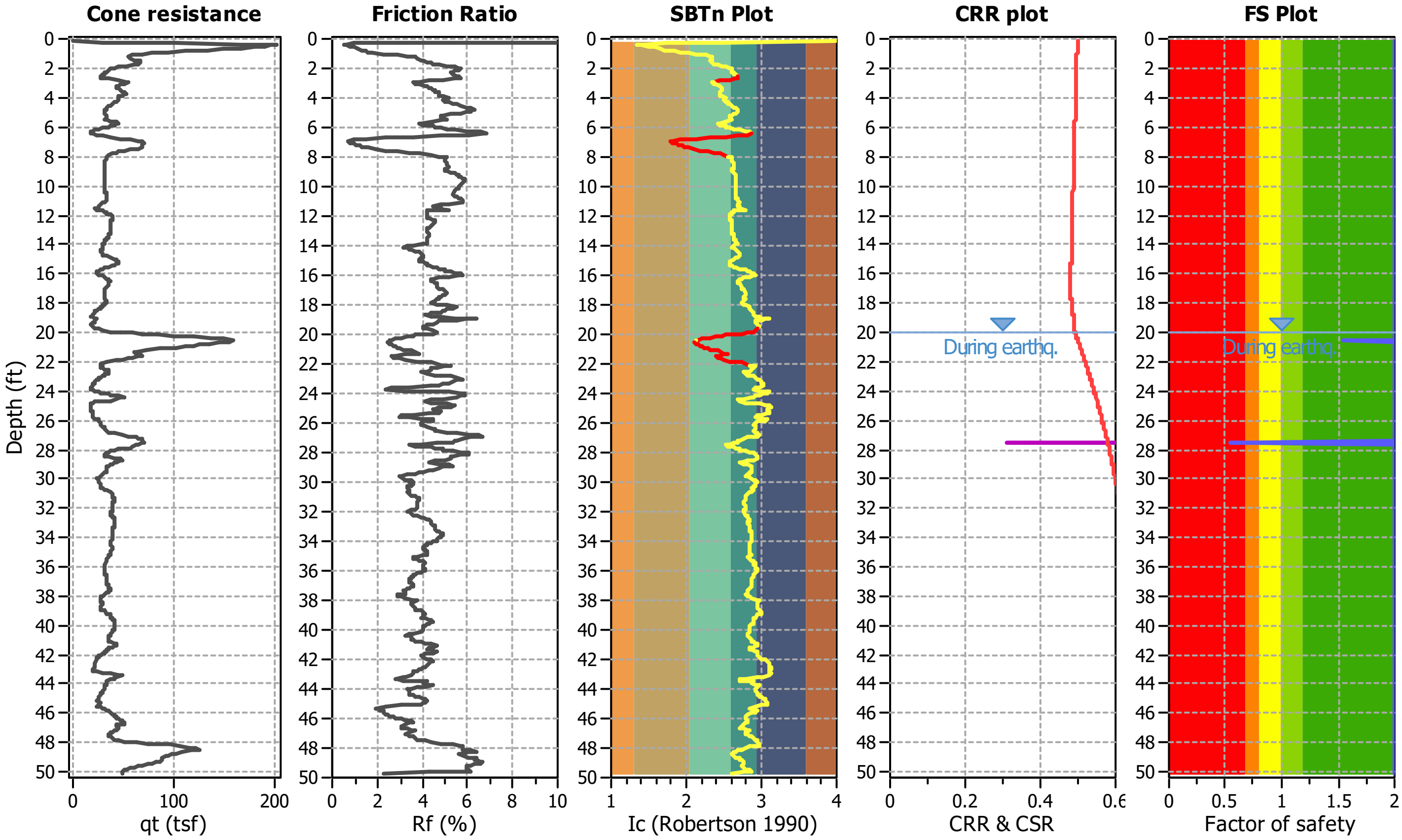
LIQUEFACTION ANALYSIS REPORT

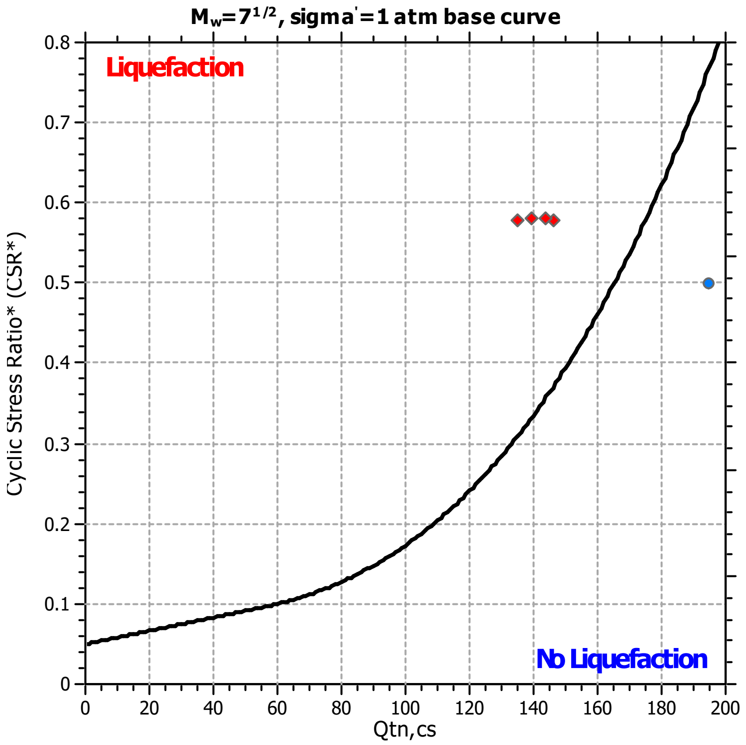
Project title : 10535.020 El Camino College Fire Training Facility **Location : Torrance, CA**

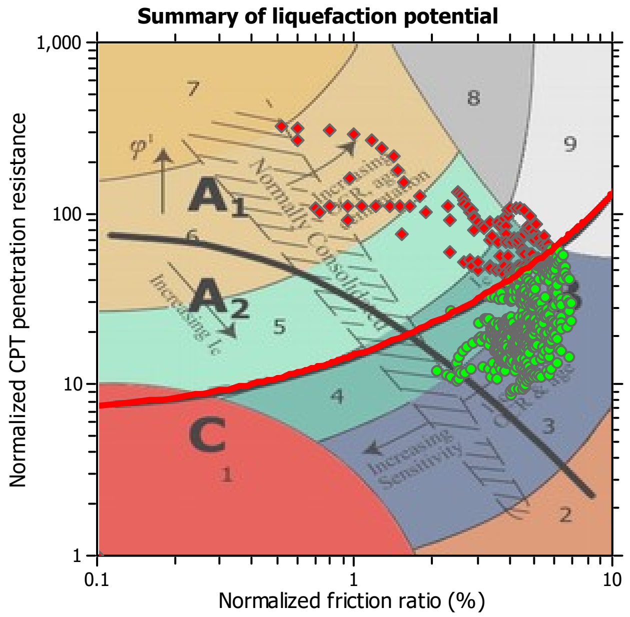
CPT file : CPT-2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	24.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	20.00 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:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.82	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

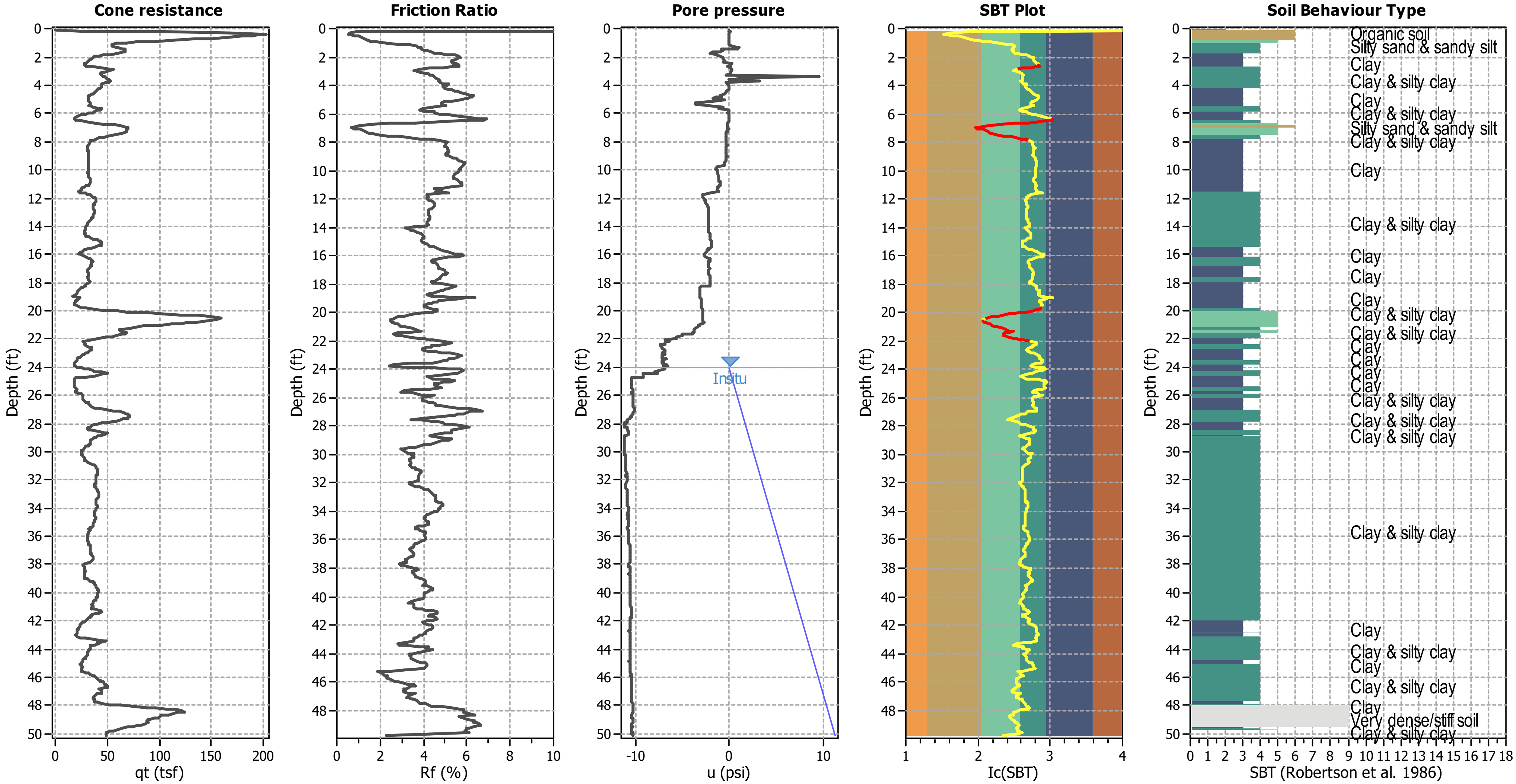






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



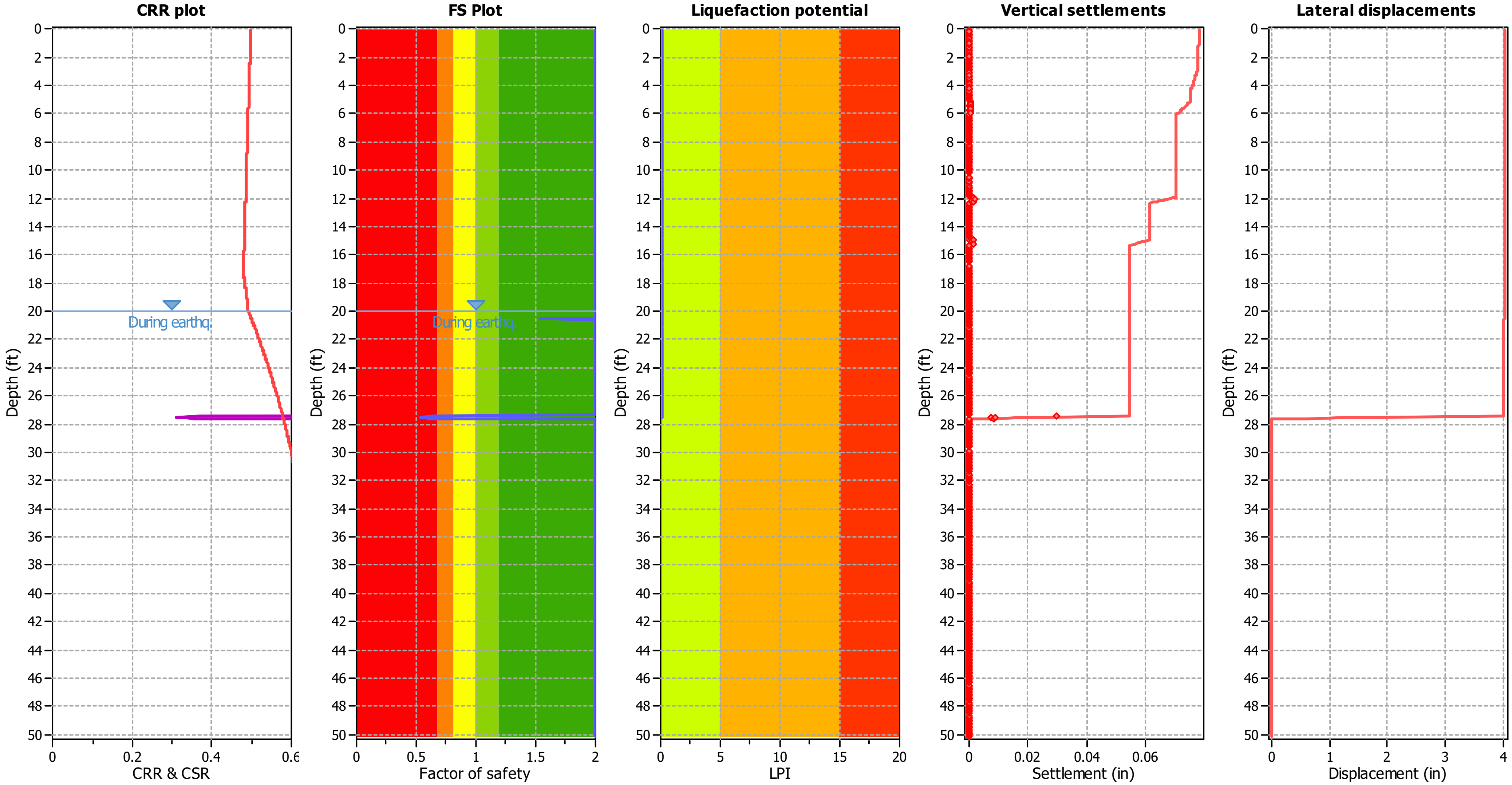
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 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 sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 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

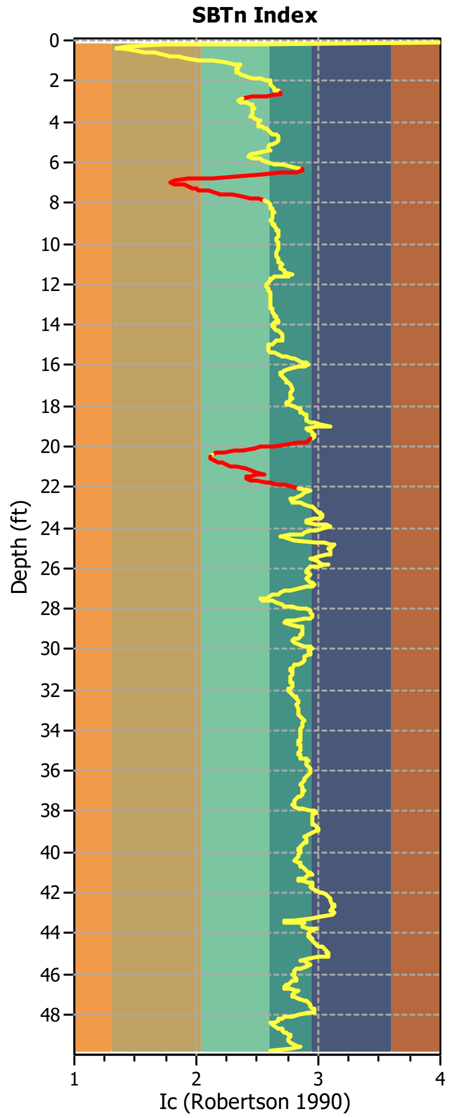
- Very high risk
- High risk
- Low risk

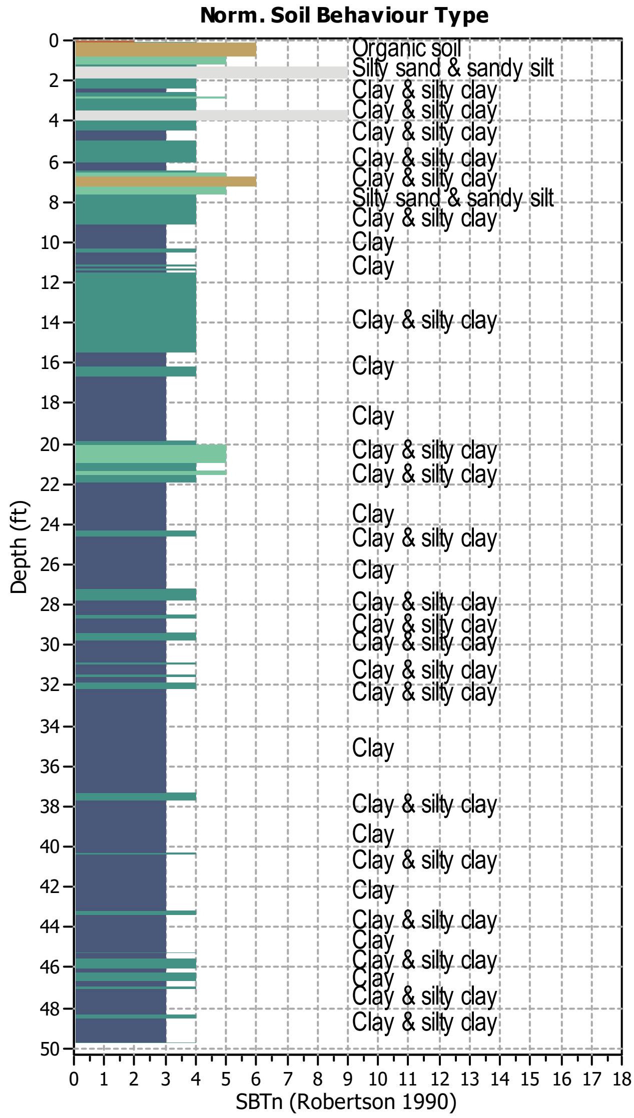
TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.





Transition layer algorithm properties	
I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0250
Minimum number of points in layer:	4

General statistics	
Total points in CPT file:	745
Total points excluded:	67
Exclusion percentage:	8.99%
Number of layers detected:	7

:: 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	0.08	0.22	4.06	381.40	1.00	0.35	26.61	9.37	4.000	No	Yes	2.00
2	0.17	29.09	2.48	3.01	0.82	46.72	2.65	123.69	4.000	No	No	2.00
3	0.22	99.65	1.74	0.95	0.54	160.09	1.07	170.70	4.000	No	No	2.00
4	0.31	167.13	1.44	0.60	0.50	268.48	1.00	268.48	4.000	No	No	2.00
5	0.35	202.27	1.34	0.52	0.50	324.94	1.00	324.94	4.000	No	No	2.00
6	0.39	195.64	1.40	0.60	0.50	314.29	1.00	314.29	4.000	No	No	2.00
7	0.46	189.75	1.49	0.79	0.50	304.81	1.00	304.81	4.000	No	No	2.00
8	0.53	180.57	1.58	0.98	0.50	290.06	1.00	290.06	4.000	No	No	2.00
9	0.61	166.65	1.66	1.17	0.51	267.68	1.01	269.73	4.000	No	No	2.00
10	0.68	149.13	1.72	1.28	0.53	239.53	1.05	251.61	4.000	No	No	2.00
11	0.75	133.49	1.78	1.41	0.55	214.39	1.09	234.39	4.000	No	No	2.00
12	0.79	112.40	1.84	1.48	0.58	180.50	1.14	205.89	4.000	No	No	2.00
13	0.88	94.97	1.91	1.56	0.60	152.50	1.20	183.01	4.000	No	No	2.00
14	0.92	78.34	2.01	1.80	0.64	125.77	1.32	165.74	4.000	No	No	2.00
15	1.01	68.62	2.13	2.29	0.69	110.15	1.51	166.34	4.000	No	No	2.00
16	1.06	58.81	2.25	2.91	0.73	94.38	1.80	170.31	4.000	No	No	2.00
17	1.14	55.08	2.32	3.34	0.76	88.39	2.00	176.73	4.000	No	No	2.00
18	1.18	54.32	2.35	3.70	0.77	87.16	2.13	185.89	4.000	No	No	2.00
19	1.27	58.09	2.34	3.78	0.77	93.20	2.09	194.76	4.000	No	No	2.00
20	1.36	60.67	2.34	3.91	0.77	97.34	2.09	203.12	4.000	No	No	2.00
21	1.40	64.49	2.32	3.92	0.76	103.47	2.03	210.14	4.000	No	No	2.00
22	1.47	66.49	2.33	4.03	0.76	106.67	2.04	217.25	4.000	No	No	2.00
23	1.54	67.69	2.34	4.20	0.76	108.60	2.07	224.42	4.000	No	No	2.00
24	1.58	67.46	2.35	4.37	0.77	108.23	2.12	229.31	4.000	No	No	2.00
25	1.67	65.89	2.37	4.51	0.78	105.70	2.18	230.80	4.000	No	No	2.00
26	1.71	60.13	2.41	4.77	0.79	96.43	2.36	227.39	4.000	No	No	2.00
27	1.81	53.66	2.46	5.07	0.81	86.03	2.59	222.49	4.000	No	No	2.00
28	1.85	45.89	2.53	5.46	0.84	73.55	2.93	215.26	4.000	No	No	2.00
29	1.94	41.62	2.57	5.64	0.85	66.68	3.14	209.28	4.000	No	No	2.00
30	1.98	37.74	2.60	5.74	0.87	60.44	3.34	201.70	4.000	No	Yes	2.00
31	2.06	35.93	2.61	5.68	0.87	57.51	3.40	195.55	4.000	No	Yes	2.00
32	2.10	34.56	2.61	5.49	0.87	55.31	3.40	188.23	4.000	No	Yes	2.00
33	2.18	33.73	2.61	5.36	0.87	53.97	3.40	183.32	4.000	No	Yes	2.00
34	2.25	32.58	2.62	5.31	0.87	52.12	3.44	179.39	4.000	No	Yes	2.00
35	2.33	31.21	2.63	5.34	0.88	49.92	3.53	176.38	4.000	No	Yes	2.00
36	2.41	30.04	2.65	5.37	0.88	48.02	3.62	173.90	4.000	No	Yes	2.00
37	2.46	28.48	2.67	5.54	0.89	45.51	3.79	172.66	4.000	No	Yes	2.00
38	2.50	27.94	2.68	5.64	0.90	44.64	3.87	172.93	4.000	No	Yes	2.00
39	2.60	27.72	2.69	5.69	0.90	44.28	3.91	173.31	4.000	Yes	Yes	2.00
40	2.64	30.08	2.65	5.43	0.88	48.06	3.64	175.02	4.000	Yes	Yes	2.00
41	2.69	35.75	2.57	4.92	0.85	57.16	3.13	178.98	4.000	Yes	No	2.00
42	2.78	44.63	2.46	4.29	0.81	71.43	2.57	183.27	4.000	Yes	No	2.00
43	2.86	52.60	2.38	3.84	0.78	84.22	2.21	186.43	4.000	Yes	No	2.00
44	2.91	55.28	2.34	3.60	0.77	88.52	2.08	184.44	4.000	Yes	No	2.00
45	2.99	52.12	2.36	3.66	0.78	83.44	2.16	180.65	4.000	No	No	2.00
46	3.07	47.60	2.41	3.87	0.79	76.17	2.34	178.12	4.000	No	No	2.00
47	3.12	44.41	2.45	4.15	0.81	71.04	2.52	179.21	4.000	No	No	2.00
48	3.17	44.01	2.46	4.26	0.81	70.40	2.57	181.25	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	3.27	44.20	2.46	4.33	0.81	70.69	2.59	183.31	4.000	No	No	2.00
50	3.30	44.82	2.47	4.44	0.82	71.68	2.62	187.52	4.000	No	No	2.00
51	3.37	45.96	2.47	4.51	0.81	73.51	2.60	191.41	4.000	No	No	2.00
52	3.42	47.81	2.46	4.58	0.81	76.48	2.58	197.08	4.000	No	No	2.00
53	3.51	49.51	2.45	4.61	0.81	79.19	2.54	201.34	4.000	No	No	2.00
54	3.55	50.52	2.46	4.75	0.81	80.81	2.56	206.97	4.000	No	No	2.00
55	3.64	51.42	2.46	4.78	0.81	82.25	2.55	209.84	4.000	No	No	2.00
56	3.69	52.55	2.45	4.75	0.81	84.05	2.51	211.21	4.000	No	No	2.00
57	3.77	51.56	2.46	4.80	0.81	82.45	2.55	210.37	4.000	No	No	2.00
58	3.83	48.80	2.48	4.94	0.82	78.02	2.67	208.35	4.000	No	No	2.00
59	3.91	45.46	2.51	5.16	0.83	72.64	2.84	206.62	4.000	No	No	2.00
60	3.95	44.38	2.52	5.16	0.84	70.90	2.88	204.15	4.000	No	No	2.00
61	4.01	44.89	2.51	4.99	0.83	71.71	2.80	201.01	4.000	No	No	2.00
62	4.10	44.79	2.50	4.91	0.83	71.55	2.78	198.95	4.000	No	No	2.00
63	4.20	43.74	2.51	4.99	0.83	69.85	2.84	198.54	4.000	No	No	2.00
64	4.25	42.02	2.54	5.21	0.84	67.09	2.98	199.98	4.000	No	No	2.00
65	4.30	41.03	2.56	5.35	0.85	65.50	3.07	200.80	4.000	No	No	2.00
66	4.35	39.98	2.57	5.48	0.85	63.80	3.15	201.22	4.000	No	No	2.00
67	4.41	38.99	2.58	5.59	0.86	62.21	3.23	201.06	4.000	No	No	2.00
68	4.47	37.46	2.61	5.77	0.87	59.74	3.37	201.12	4.000	No	Yes	2.00
69	4.57	35.93	2.63	5.99	0.88	57.27	3.52	201.59	4.000	No	Yes	2.00
70	4.66	34.46	2.66	6.22	0.89	54.90	3.68	202.07	4.000	No	Yes	2.00
71	4.70	33.28	2.67	6.34	0.89	53.00	3.79	201.09	4.000	No	Yes	2.00
72	4.75	32.73	2.67	6.27	0.89	52.12	3.80	198.10	4.000	No	Yes	2.00
73	4.83	32.16	2.67	6.21	0.89	51.18	3.81	195.19	4.000	No	Yes	2.00
74	4.87	31.87	2.67	6.13	0.89	50.71	3.80	192.93	4.000	No	Yes	2.00
75	4.92	31.65	2.67	6.06	0.89	50.35	3.79	190.88	4.000	No	Yes	2.00
76	5.04	31.68	2.65	5.75	0.89	50.40	3.67	185.16	4.000	No	Yes	2.00
77	5.08	32.16	2.62	5.33	0.88	51.17	3.48	178.16	4.000	No	Yes	2.00
78	5.14	32.73	2.60	5.00	0.87	52.06	3.32	173.00	4.000	No	No	2.00
79	5.20	33.44	2.58	4.87	0.86	53.21	3.23	171.98	4.000	No	No	2.00
80	5.27	33.68	2.58	4.86	0.86	53.59	3.22	172.53	4.000	No	No	2.00
81	5.33	33.47	2.58	4.88	0.86	53.24	3.24	172.26	4.000	No	No	2.00
82	5.39	32.04	2.61	5.10	0.87	50.94	3.40	173.30	4.000	No	Yes	2.00
83	5.45	32.98	2.59	4.93	0.86	52.44	3.28	172.16	4.000	No	No	2.00
84	5.53	36.96	2.53	4.50	0.84	58.84	2.92	171.98	4.000	No	No	2.00
85	5.63	42.55	2.45	3.99	0.81	67.79	2.53	171.38	4.000	No	No	2.00
86	5.68	45.45	2.42	3.86	0.80	72.45	2.39	173.50	4.000	No	No	2.00
87	5.77	43.19	2.45	4.09	0.81	68.82	2.55	175.17	4.000	No	No	2.00
88	5.80	41.07	2.48	4.29	0.82	65.40	2.69	175.81	4.000	No	No	2.00
89	5.85	37.88	2.53	4.54	0.84	60.27	2.90	174.93	4.000	No	No	2.00
90	5.94	36.51	2.54	4.57	0.84	58.06	2.97	172.52	4.000	No	No	2.00
91	5.98	32.87	2.59	4.84	0.86	52.22	3.26	170.03	4.000	No	No	2.00
92	6.06	29.72	2.64	5.14	0.88	47.15	3.56	168.05	4.000	No	Yes	2.00
93	6.10	25.80	2.71	5.56	0.91	40.85	4.03	164.74	4.000	No	Yes	2.00
94	6.20	22.43	2.78	6.11	0.93	35.41	4.60	162.77	4.000	No	Yes	2.00
95	6.29	19.82	2.84	6.69	0.96	31.21	5.17	161.26	4.000	No	Yes	2.00
96	6.33	18.80	2.88	7.03	0.97	29.57	5.46	161.50	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	6.39	18.73	2.87	6.92	0.97	29.46	5.43	159.87	4.000	Yes	Yes	2.00
98	6.46	20.23	2.81	6.18	0.95	31.86	4.90	156.00	4.000	Yes	Yes	2.00
99	6.51	23.64	2.69	4.91	0.90	37.33	3.95	147.41	4.000	Yes	Yes	2.00
100	6.59	29.31	2.54	3.67	0.84	46.43	2.96	137.56	4.000	Yes	No	2.00
101	6.64	37.88	2.32	2.35	0.76	60.20	2.02	121.65	4.000	Yes	No	2.00
102	6.77	47.12	2.12	1.52	0.68	75.03	1.50	112.48	4.000	Yes	No	2.00
103	6.82	56.77	1.93	0.94	0.61	90.53	1.22	110.14	4.000	Yes	No	2.00
104	6.90	64.00	1.82	0.73	0.57	100.95	1.12	113.48	4.000	Yes	No	2.00
105	6.95	68.78	1.79	0.70	0.56	106.95	1.10	117.70	4.000	Yes	No	2.00
106	7.03	70.31	1.82	0.80	0.57	109.62	1.12	122.77	4.000	Yes	No	2.00
107	7.08	69.65	1.86	0.94	0.58	109.77	1.16	126.79	4.000	Yes	No	2.00
108	7.10	69.08	1.90	1.07	0.60	110.07	1.19	130.69	4.000	Yes	No	2.00
109	7.16	68.41	1.94	1.21	0.61	109.20	1.23	133.80	4.000	Yes	No	2.00
110	7.27	68.81	1.97	1.36	0.63	109.83	1.26	138.56	4.000	Yes	No	2.00
111	7.31	69.13	1.99	1.49	0.64	110.34	1.29	142.68	4.000	Yes	No	2.00
112	7.35	68.87	2.02	1.62	0.65	109.93	1.33	146.20	4.000	Yes	No	2.00
113	7.42	64.22	2.09	1.90	0.67	102.44	1.44	147.68	4.000	Yes	No	2.00
114	7.53	57.37	2.19	2.35	0.71	91.43	1.65	150.65	4.000	Yes	No	2.00
115	7.61	50.36	2.30	2.91	0.75	80.16	1.95	156.04	4.000	Yes	No	2.00
116	7.67	45.93	2.38	3.42	0.78	73.04	2.23	162.58	4.000	Yes	No	2.00
117	7.74	42.49	2.44	3.89	0.81	67.51	2.49	168.39	4.000	Yes	No	2.00
118	7.78	39.08	2.51	4.45	0.83	62.03	2.82	175.13	4.000	Yes	No	2.00
119	7.91	36.38	2.56	4.83	0.85	57.66	3.08	177.72	4.000	Yes	No	2.00
120	7.97	34.31	2.60	5.16	0.86	54.33	3.31	179.76	4.000	Yes	No	2.00
121	8.04	33.42	2.60	5.10	0.87	52.90	3.33	176.28	4.000	No	Yes	2.00
122	8.22	32.69	2.61	5.11	0.87	51.70	3.38	174.64	4.000	No	Yes	2.00
123	8.27	32.05	2.61	5.05	0.87	50.67	3.39	171.92	4.000	No	Yes	2.00
124	8.30	31.34	2.62	5.13	0.87	49.54	3.47	171.67	4.000	No	Yes	2.00
125	8.40	30.96	2.63	5.18	0.88	48.91	3.51	171.74	4.000	No	Yes	2.00
126	8.43	30.90	2.63	5.21	0.88	48.80	3.53	172.05	4.000	No	Yes	2.00
127	8.50	31.22	2.63	5.21	0.88	49.31	3.51	172.91	4.000	No	Yes	2.00
128	8.64	31.50	2.63	5.23	0.88	49.76	3.50	173.97	4.000	No	Yes	2.00
129	8.67	31.73	2.63	5.25	0.88	50.11	3.49	174.88	4.000	No	Yes	2.00
130	8.73	31.95	2.62	5.21	0.87	50.47	3.46	174.69	4.000	No	Yes	2.00
131	8.78	32.14	2.62	5.13	0.87	50.77	3.42	173.63	4.000	No	Yes	2.00
132	8.88	32.30	2.61	5.09	0.87	51.01	3.40	173.23	4.000	No	Yes	2.00
133	8.92	32.33	2.62	5.16	0.87	51.06	3.42	174.65	4.000	No	Yes	2.00
134	9.01	32.27	2.63	5.33	0.88	50.95	3.49	177.80	4.000	No	Yes	2.00
135	9.07	32.04	2.64	5.49	0.88	50.58	3.57	180.48	4.000	No	Yes	2.00
136	9.13	31.83	2.65	5.60	0.88	50.24	3.62	182.07	4.000	No	Yes	2.00
137	9.21	31.67	2.65	5.67	0.89	49.98	3.66	182.98	4.000	No	Yes	2.00
138	9.26	31.64	2.66	5.76	0.89	49.92	3.70	184.48	4.000	No	Yes	2.00
139	9.35	31.72	2.66	5.83	0.89	50.04	3.72	185.95	4.000	No	Yes	2.00
140	9.39	31.75	2.66	5.92	0.89	50.09	3.75	187.75	4.000	No	Yes	2.00
141	9.45	31.75	2.67	5.99	0.89	50.08	3.78	189.11	4.000	No	Yes	2.00
142	9.52	31.82	2.67	6.01	0.89	50.04	3.79	189.47	4.000	No	Yes	2.00
143	9.66	32.13	2.67	5.94	0.89	49.87	3.76	187.73	4.000	No	Yes	2.00
144	9.77	32.45	2.66	5.84	0.89	49.78	3.73	185.84	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	9.83	32.54	2.66	5.79	0.89	49.63	3.72	184.62	4.000	No	Yes	2.00
146	9.89	32.41	2.66	5.78	0.89	49.19	3.73	183.61	4.000	No	Yes	2.00
147	9.97	32.25	2.66	5.76	0.89	48.61	3.75	182.23	4.000	No	Yes	2.00
148	10.01	32.06	2.67	5.74	0.89	48.15	3.76	180.95	4.000	No	Yes	2.00
149	10.09	31.81	2.67	5.70	0.89	47.43	3.78	179.05	4.000	No	Yes	2.00
150	10.14	31.52	2.67	5.66	0.89	46.80	3.79	177.22	4.000	No	Yes	2.00
151	10.19	31.68	2.66	5.55	0.89	46.79	3.74	175.19	4.000	No	Yes	2.00
152	10.45	32.09	2.66	5.49	0.89	46.32	3.74	173.18	4.000	No	Yes	2.00
153	10.50	32.80	2.66	5.47	0.89	47.10	3.70	174.22	4.000	No	Yes	2.00
154	10.58	33.28	2.66	5.55	0.89	47.49	3.71	176.32	4.000	No	Yes	2.00
155	10.63	33.79	2.66	5.66	0.89	48.06	3.73	179.38	4.000	No	Yes	2.00
156	10.76	34.10	2.67	5.75	0.89	48.02	3.77	180.99	4.000	No	Yes	2.00
157	10.83	34.17	2.67	5.84	0.89	47.89	3.81	182.47	4.000	No	Yes	2.00
158	10.89	33.92	2.68	5.88	0.90	47.33	3.85	182.24	4.000	No	Yes	2.00
159	10.95	32.99	2.69	5.92	0.90	45.86	3.93	180.18	4.000	No	Yes	2.00
160	11.07	31.62	2.70	5.88	0.91	43.57	4.02	175.29	4.000	No	Yes	2.00
161	11.15	29.83	2.69	5.26	0.90	40.70	3.91	159.29	4.000	No	Yes	2.00
162	11.20	28.27	2.69	4.93	0.90	38.34	3.90	149.50	4.000	No	Yes	2.00
163	11.25	26.93	2.68	4.61	0.90	36.30	3.87	140.52	4.000	No	Yes	2.00
164	11.33	25.85	2.72	4.93	0.91	34.77	4.12	143.21	4.000	No	Yes	2.00
165	11.40	25.18	2.72	4.83	0.91	33.69	4.15	139.66	4.000	No	Yes	2.00
166	11.47	25.02	2.72	4.72	0.91	33.27	4.12	137.12	4.000	No	Yes	2.00
167	11.51	21.90	2.79	5.35	0.94	29.25	4.74	138.63	4.000	No	Yes	2.00
168	11.52	22.70	2.77	5.17	0.93	30.23	4.57	138.21	4.000	No	Yes	2.00
169	11.59	23.84	2.75	5.02	0.92	31.51	4.39	138.46	4.000	No	Yes	2.00
170	11.63	29.37	2.64	4.29	0.88	38.30	3.61	138.22	4.000	No	Yes	2.00
171	11.72	31.41	2.62	4.28	0.88	40.63	3.48	141.51	4.000	No	Yes	2.00
172	11.76	33.51	2.61	4.28	0.87	43.15	3.37	145.35	4.000	No	Yes	2.00
173	11.86	34.46	2.60	4.31	0.87	44.08	3.34	147.36	4.000	No	Yes	2.00
174	11.90	35.90	2.59	4.27	0.86	45.71	3.26	148.80	4.000	No	No	2.00
175	11.97	37.27	2.58	4.25	0.86	47.18	3.19	150.62	4.000	No	No	2.00
176	12.05	38.77	2.57	4.28	0.85	48.76	3.14	153.33	4.000	No	No	2.00
177	12.12	39.31	2.58	4.41	0.86	49.27	3.18	156.70	4.000	No	No	2.00
178	12.17	39.18	2.59	4.54	0.86	48.97	3.25	159.04	4.000	No	No	2.00
179	12.25	38.92	2.60	4.62	0.86	48.44	3.30	159.77	4.000	No	No	2.00
180	12.30	38.73	2.60	4.62	0.87	48.03	3.31	159.20	4.000	No	No	2.00
181	12.38	38.32	2.60	4.62	0.87	47.26	3.34	158.06	4.000	No	Yes	2.00
182	12.44	37.72	2.61	4.61	0.87	46.36	3.38	156.60	4.000	No	Yes	2.00
183	12.51	37.11	2.61	4.61	0.87	45.38	3.42	155.04	4.000	No	Yes	2.00
184	12.57	36.79	2.61	4.53	0.87	44.81	3.41	152.71	4.000	No	Yes	2.00
185	12.64	36.70	2.61	4.45	0.87	44.43	3.39	150.61	4.000	No	Yes	2.00
186	12.71	36.79	2.61	4.38	0.87	44.32	3.36	148.92	4.000	No	Yes	2.00
187	12.78	37.02	2.60	4.33	0.87	44.35	3.34	148.14	4.000	No	Yes	2.00
188	12.83	37.21	2.60	4.32	0.87	44.42	3.33	148.03	4.000	No	Yes	2.00
189	12.91	37.24	2.60	4.33	0.87	44.23	3.34	147.89	4.000	No	Yes	2.00
190	12.96	37.27	2.60	4.33	0.87	44.13	3.35	147.74	4.000	No	Yes	2.00
191	13.04	37.27	2.60	4.32	0.87	43.89	3.35	147.13	4.000	No	Yes	2.00
192	13.09	37.21	2.61	4.32	0.87	43.67	3.36	146.92	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
193	13.16	36.95	2.61	4.37	0.87	43.18	3.41	147.02	4.000	No	Yes	2.00
194	13.22	36.63	2.62	4.41	0.87	42.66	3.45	147.16	4.000	No	Yes	2.00
195	13.27	36.38	2.62	4.41	0.87	42.25	3.47	146.53	4.000	No	Yes	2.00
196	13.35	36.09	2.63	4.39	0.88	41.67	3.49	145.22	4.000	No	Yes	2.00
197	13.41	35.61	2.63	4.35	0.88	40.95	3.50	143.40	4.000	No	Yes	2.00
198	13.49	34.82	2.64	4.34	0.88	39.84	3.55	141.53	4.000	No	Yes	2.00
199	13.55	33.96	2.64	4.31	0.88	38.71	3.60	139.26	4.000	No	Yes	2.00
200	13.62	33.19	2.65	4.30	0.88	37.67	3.65	137.31	4.000	No	Yes	2.00
201	13.67	32.56	2.66	4.28	0.89	36.82	3.68	135.67	4.000	No	Yes	2.00
202	13.75	31.98	2.66	4.29	0.89	35.99	3.74	134.56	4.000	No	Yes	2.00
203	13.80	31.38	2.67	4.32	0.89	35.20	3.80	133.72	4.000	No	Yes	2.00
204	13.88	30.87	2.67	4.16	0.89	34.42	3.77	129.83	4.000	No	Yes	2.00
205	13.93	30.42	2.64	3.74	0.88	33.73	3.60	121.44	4.000	No	Yes	2.00
206	13.99	30.11	2.62	3.39	0.87	33.17	3.45	114.51	4.000	No	Yes	2.00
207	14.06	29.72	2.62	3.28	0.87	32.59	3.42	111.61	4.000	No	Yes	2.00
208	14.13	29.44	2.63	3.43	0.88	32.18	3.54	113.82	4.000	No	Yes	2.00
209	14.19	29.15	2.65	3.54	0.88	31.76	3.62	115.04	4.000	No	Yes	2.00
210	14.26	28.98	2.66	3.66	0.89	31.47	3.71	116.68	4.000	No	Yes	2.00
211	14.32	28.72	2.68	3.83	0.89	31.09	3.83	118.96	4.000	No	Yes	2.00
212	14.40	28.63	2.69	3.98	0.90	30.86	3.92	121.07	4.000	No	Yes	2.00
213	14.51	28.58	2.70	4.09	0.90	30.62	4.00	122.36	4.000	No	Yes	2.00
214	14.55	28.80	2.70	4.12	0.90	30.79	4.00	123.17	4.000	No	Yes	2.00
215	14.59	29.02	2.70	4.14	0.90	30.95	4.00	123.72	4.000	No	Yes	2.00
216	14.64	29.34	2.70	4.15	0.90	31.21	3.99	124.44	4.000	No	Yes	2.00
217	14.73	29.73	2.70	4.17	0.90	31.45	3.98	125.07	4.000	No	Yes	2.00
218	14.77	32.88	2.66	4.06	0.89	34.73	3.70	128.55	4.000	No	Yes	2.00
219	14.94	36.67	2.62	3.98	0.87	38.36	3.46	132.69	4.000	No	Yes	2.00
220	14.99	40.68	2.59	3.96	0.86	42.46	3.25	138.05	4.000	No	No	2.00
221	15.02	42.09	2.58	4.05	0.86	43.86	3.23	141.82	4.000	No	No	2.00
222	15.07	42.98	2.59	4.14	0.86	44.70	3.24	144.82	4.000	No	No	2.00
223	15.11	43.65	2.59	4.21	0.86	45.30	3.25	147.18	4.000	No	No	2.00
224	15.16	44.58	2.59	4.26	0.86	46.14	3.24	149.37	4.000	No	No	2.00
225	15.25	44.99	2.59	4.30	0.86	46.33	3.25	150.45	4.000	No	No	2.00
226	15.32	44.26	2.60	4.42	0.87	45.40	3.33	151.34	4.000	No	Yes	2.00
227	15.38	41.96	2.63	4.61	0.88	42.91	3.52	151.19	4.000	No	Yes	2.00
228	15.44	38.94	2.67	4.76	0.89	39.66	3.75	148.73	4.000	No	Yes	2.00
229	15.52	35.59	2.70	4.89	0.91	36.05	4.02	144.87	4.000	No	Yes	2.00
230	15.56	32.34	2.74	4.94	0.92	32.62	4.27	139.35	4.000	No	Yes	2.00
231	15.63	29.43	2.78	5.14	0.93	29.54	4.61	136.31	4.000	No	Yes	2.00
232	15.70	27.78	2.80	5.20	0.94	27.73	4.81	133.43	4.000	No	Yes	2.00
233	15.77	26.21	2.84	5.42	0.96	26.02	5.09	132.55	4.000	No	Yes	2.00
234	15.82	24.72	2.87	5.67	0.97	24.43	5.40	131.88	4.000	No	Yes	2.00
235	15.88	23.35	2.90	5.99	0.98	22.95	5.75	131.91	4.000	No	Yes	2.00
236	15.98	23.06	2.91	6.07	0.99	22.53	5.84	131.63	4.000	No	Yes	2.00
237	16.02	24.01	2.89	5.82	0.98	23.43	5.60	131.24	4.000	No	Yes	2.00
238	16.08	26.18	2.84	5.36	0.96	25.50	5.12	130.60	4.000	No	Yes	2.00
239	16.14	29.43	2.78	4.90	0.93	28.63	4.58	131.10	4.000	No	Yes	2.00
240	16.26	32.46	2.73	4.60	0.91	31.43	4.20	131.96	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
241	16.30	34.16	2.71	4.53	0.91	33.03	4.05	133.66	4.000	No	Yes	2.00
242	16.34	35.43	2.69	4.51	0.90	34.21	3.95	135.28	4.000	No	Yes	2.00
243	16.44	36.23	2.69	4.57	0.90	34.80	3.94	137.29	4.000	No	Yes	2.00
244	16.49	36.64	2.70	4.66	0.90	35.11	3.97	139.40	4.000	No	Yes	2.00
245	16.54	35.62	2.71	4.77	0.91	34.03	4.09	139.25	4.000	No	Yes	2.00
246	16.78	34.60	2.73	4.82	0.92	32.58	4.22	137.48	4.000	No	Yes	2.00
247	16.84	33.83	2.74	4.84	0.92	31.74	4.29	136.17	4.000	No	Yes	2.00
248	16.89	33.42	2.75	4.93	0.92	31.25	4.37	136.64	4.000	No	Yes	2.00
249	16.97	32.37	2.77	5.11	0.93	30.10	4.55	136.98	4.000	No	Yes	2.00
250	17.16	31.57	2.79	5.24	0.94	29.04	4.71	136.66	4.000	No	Yes	2.00
251	17.20	31.41	2.79	5.26	0.94	28.81	4.74	136.46	4.000	No	Yes	2.00
252	17.28	31.83	2.79	5.18	0.94	29.08	4.67	135.93	4.000	No	Yes	2.00
253	17.33	32.18	2.78	5.08	0.93	29.32	4.61	135.03	4.000	No	Yes	2.00
254	17.39	32.27	2.77	4.98	0.93	29.32	4.56	133.63	4.000	No	Yes	2.00
255	17.46	32.21	2.77	4.92	0.93	29.15	4.54	132.36	4.000	No	Yes	2.00
256	17.52	31.83	2.78	4.91	0.93	28.70	4.58	131.40	4.000	No	Yes	2.00
257	17.59	31.35	2.78	4.95	0.94	28.13	4.65	130.74	4.000	No	Yes	2.00
258	17.64	31.48	2.78	4.85	0.93	28.18	4.59	129.41	4.000	No	Yes	2.00
259	17.77	32.08	2.76	4.68	0.93	28.54	4.47	127.72	4.000	No	Yes	2.00
260	17.82	32.94	2.75	4.54	0.92	29.26	4.34	127.02	4.000	No	Yes	2.00
261	17.90	33.61	2.74	4.56	0.92	29.75	4.31	128.22	4.000	No	Yes	2.00
262	17.95	33.64	2.76	4.83	0.93	29.69	4.45	132.13	4.000	No	Yes	2.00
263	18.03	32.56	2.80	5.25	0.94	28.56	4.76	135.87	4.000	No	Yes	2.00
264	18.08	31.09	2.83	5.63	0.95	27.14	5.08	137.77	4.000	No	Yes	2.00
265	18.16	30.04	2.85	5.70	0.96	26.06	5.22	136.15	4.000	No	Yes	2.00
266	18.21	29.40	2.85	5.54	0.96	25.42	5.22	132.70	4.000	No	Yes	2.00
267	18.28	28.44	2.85	5.32	0.96	24.47	5.22	127.77	4.000	No	Yes	2.00
268	18.35	26.91	2.86	5.23	0.97	23.00	5.35	123.12	4.000	No	Yes	2.00
269	18.39	25.18	2.88	5.12	0.97	21.41	5.51	118.02	4.000	No	Yes	2.00
270	18.47	23.85	2.90	5.05	0.98	20.12	5.67	114.05	4.000	No	Yes	2.00
271	18.52	22.86	2.90	4.91	0.98	19.19	5.74	110.13	4.000	No	Yes	2.00
272	18.58	22.32	2.90	4.63	0.98	18.66	5.67	105.80	4.000	No	Yes	2.00
273	18.66	21.78	2.90	4.54	0.98	18.11	5.71	103.42	4.000	No	Yes	2.00
274	18.70	21.27	2.90	4.39	0.98	17.61	5.71	100.55	4.000	No	Yes	2.00
275	18.79	20.72	2.93	4.64	0.99	17.05	5.97	101.73	4.000	No	Yes	2.00
276	18.83	20.12	2.96	5.04	1.00	16.47	6.33	104.23	4.000	No	Yes	2.00
277	18.91	19.55	3.01	5.73	1.00	15.91	6.86	109.06	4.000	No	Yes	2.00
278	18.97	17.60	3.10	6.84	1.00	14.18	7.90	112.04	4.000	No	Yes	2.00
279	18.98	19.29	3.05	6.38	1.00	15.62	7.28	113.67	4.000	No	Yes	2.00
280	19.03	21.04	2.99	5.82	1.00	17.09	6.64	113.50	4.000	No	Yes	2.00
281	19.12	23.56	2.91	4.98	0.98	19.19	5.78	110.88	4.000	No	Yes	2.00
282	19.22	22.42	2.92	4.88	0.99	18.11	5.91	107.03	4.000	No	Yes	2.00
283	19.26	21.05	2.94	4.75	0.99	16.89	6.07	102.55	4.000	No	Yes	2.00
284	19.31	19.96	2.95	4.60	1.00	15.92	6.18	98.41	4.000	No	Yes	2.00
285	19.37	19.07	2.96	4.48	1.00	15.12	6.29	95.06	4.000	No	Yes	2.00
286	19.43	18.58	2.96	4.38	1.00	14.65	6.34	92.80	4.000	No	Yes	2.00
287	19.49	18.55	2.96	4.33	1.00	14.58	6.32	92.09	4.000	No	Yes	2.00
288	19.58	18.93	2.95	4.33	1.00	14.83	6.25	92.73	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	19.62	20.31	2.94	4.52	1.00	15.96	6.12	97.69	4.000	No	Yes	2.00
290	19.73	22.32	2.92	4.69	0.99	17.56	5.90	103.67	4.000	Yes	Yes	2.00
291	19.79	24.84	2.89	4.85	0.98	19.62	5.64	110.58	4.000	Yes	Yes	2.00
292	19.83	29.97	2.83	4.84	0.95	23.91	5.03	120.33	4.000	Yes	Yes	2.00
293	19.93	37.36	2.74	4.60	0.92	30.04	4.31	129.34	4.000	Yes	Yes	2.00
294	19.97	47.17	2.64	4.27	0.88	38.32	3.60	137.80	4.000	Yes	Yes	2.00
295	20.02	59.92	2.53	3.80	0.84	49.15	2.92	143.71	4.000	Yes	No	2.00
296	20.11	68.71	2.48	3.70	0.82	56.45	2.67	150.58	4.000	Yes	No	2.00
297	20.15	84.99	2.38	3.36	0.78	70.33	2.25	158.24	4.000	Yes	No	2.00
298	20.24	100.41	2.31	3.10	0.75	83.32	1.98	164.78	4.000	Yes	No	2.00
299	20.30	120.67	2.22	2.82	0.72	100.66	1.72	173.56	4.000	Yes	No	2.00
300	20.35	137.04	2.17	2.68	0.70	114.61	1.59	182.71	4.000	Yes	No	2.00
301	20.44	149.72	2.13	2.59	0.69	125.15	1.52	190.20	4.000	Yes	No	2.00
302	20.49	159.06	2.11	2.53	0.68	133.01	1.47	195.55	4.000	Yes	No	2.00
303	20.54	158.99	2.11	2.52	0.68	132.70	1.47	194.93	0.769	No	No	1.54
304	20.64	154.60	2.12	2.55	0.68	128.43	1.49	191.94	4.000	Yes	No	2.00
305	20.68	145.11	2.15	2.64	0.69	120.04	1.56	186.78	4.000	Yes	No	2.00
306	20.77	135.90	2.18	2.74	0.71	111.72	1.63	181.97	4.000	Yes	No	2.00
307	20.83	126.66	2.22	2.83	0.72	103.62	1.71	176.86	4.000	Yes	No	2.00
308	20.90	119.52	2.24	2.90	0.73	97.26	1.78	172.80	4.000	Yes	No	2.00
309	20.95	111.30	2.28	3.01	0.74	90.11	1.88	168.98	4.000	Yes	No	2.00
310	21.02	101.93	2.32	3.20	0.76	81.92	2.03	166.05	4.000	Yes	No	2.00
311	21.08	86.28	2.41	3.57	0.79	68.58	2.36	161.69	4.000	Yes	No	2.00
312	21.27	72.71	2.50	3.92	0.83	56.80	2.75	156.12	4.000	Yes	No	2.00
313	21.34	62.36	2.55	3.98	0.85	48.20	3.04	146.38	4.000	Yes	No	2.00
314	21.39	61.72	2.50	3.34	0.83	47.80	2.77	132.22	4.000	Yes	No	2.00
315	21.44	63.56	2.44	2.87	0.81	49.39	2.50	123.32	4.000	Yes	No	2.00
316	21.52	66.49	2.41	2.67	0.79	51.71	2.34	121.23	4.000	Yes	No	2.00
317	21.58	68.88	2.41	2.82	0.79	53.45	2.37	126.48	4.000	Yes	No	2.00
318	21.65	67.13	2.44	3.03	0.81	51.78	2.50	129.64	4.000	Yes	No	2.00
319	21.67	64.42	2.49	3.34	0.82	49.42	2.71	134.02	4.000	Yes	No	2.00
320	21.79	58.10	2.57	3.83	0.85	43.95	3.13	137.59	4.000	Yes	No	2.00
321	21.80	54.46	2.61	4.10	0.87	40.96	3.39	138.70	4.000	Yes	Yes	2.00
322	21.88	49.33	2.66	4.35	0.89	36.71	3.73	136.76	4.000	Yes	Yes	2.00
323	21.92	42.54	2.73	4.56	0.91	31.28	4.19	130.96	4.000	Yes	Yes	2.00
324	22.06	34.47	2.83	5.07	0.95	24.76	5.06	125.17	4.000	Yes	Yes	2.00
325	22.15	28.10	2.93	5.54	0.99	19.73	6.00	118.36	4.000	Yes	Yes	2.00
326	22.19	27.27	2.93	5.31	0.99	19.08	5.98	114.13	4.000	No	Yes	2.00
327	22.27	28.35	2.89	4.85	0.98	19.88	5.60	111.23	4.000	No	Yes	2.00
328	22.33	28.95	2.86	4.56	0.97	20.32	5.36	108.92	4.000	No	Yes	2.00
329	22.41	28.54	2.87	4.57	0.97	19.92	5.43	108.14	4.000	No	Yes	2.00
330	22.47	30.06	2.84	4.37	0.96	21.06	5.14	108.21	4.000	No	Yes	2.00
331	22.57	32.45	2.80	4.14	0.94	22.81	4.78	108.98	4.000	No	Yes	2.00
332	22.59	35.04	2.77	4.12	0.93	24.75	4.54	112.38	4.000	No	Yes	2.00
333	22.71	35.19	2.79	4.39	0.94	24.69	4.70	116.06	4.000	No	Yes	2.00
334	22.77	34.72	2.82	4.78	0.95	24.21	4.97	120.25	4.000	No	Yes	2.00
335	22.80	34.05	2.85	5.07	0.96	23.62	5.19	122.65	4.000	No	Yes	2.00
336	22.85	32.46	2.89	5.48	0.98	22.32	5.58	124.50	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
337	22.94	30.70	2.93	5.84	0.99	20.88	5.97	124.64	4.000	No	Yes	2.00
338	23.01	29.02	2.96	6.05	1.00	19.57	6.29	123.20	4.000	No	Yes	2.00
339	23.06	28.06	2.97	5.97	1.00	18.85	6.38	120.28	4.000	No	Yes	2.00
340	23.12	26.59	2.98	5.86	1.00	17.76	6.53	115.92	4.000	No	Yes	2.00
341	23.23	25.10	2.99	5.69	1.00	16.63	6.67	110.94	4.000	No	Yes	2.00
342	23.29	23.50	3.01	5.54	1.00	15.47	6.85	105.90	4.000	No	Yes	2.00
343	23.34	22.42	3.02	5.43	1.00	14.67	6.98	102.46	4.000	No	Yes	2.00
344	23.38	21.53	3.03	5.31	1.00	14.03	7.08	99.31	4.000	No	Yes	2.00
345	23.44	20.92	3.03	5.10	1.00	13.57	7.08	96.09	4.000	No	Yes	2.00
346	23.51	20.45	3.02	4.74	1.00	13.19	6.96	91.80	4.000	No	Yes	2.00
347	23.56	19.81	2.96	3.70	1.00	12.72	6.36	80.95	4.000	No	Yes	2.00
348	23.66	19.23	2.91	2.85	0.98	12.34	5.79	71.48	4.000	No	Yes	2.00
349	23.72	18.76	2.89	2.58	0.98	12.00	5.65	67.78	4.000	No	Yes	2.00
350	23.82	18.66	2.98	3.53	1.00	11.80	6.52	76.91	4.000	No	Yes	2.00
351	23.89	18.25	3.07	4.76	1.00	11.48	7.52	86.39	4.000	No	Yes	2.00
352	23.92	19.05	3.10	5.59	1.00	12.01	7.88	94.59	4.000	No	Yes	2.00
353	23.98	20.83	3.09	6.16	1.00	13.20	7.82	103.22	4.000	No	Yes	2.00
354	24.04	24.75	3.03	6.22	1.00	15.84	7.14	113.07	4.000	No	Yes	2.00
355	24.11	28.63	2.98	6.15	1.00	18.45	6.55	120.81	4.000	No	Yes	2.00
356	24.15	32.62	2.93	5.95	0.99	21.20	5.98	126.69	4.000	No	Yes	2.00
357	24.22	35.86	2.89	5.81	0.98	23.49	5.58	131.20	4.000	No	Yes	2.00
358	24.31	38.37	2.86	5.74	0.97	25.24	5.34	134.76	4.000	No	Yes	2.00
359	24.35	44.65	2.78	5.12	0.93	29.84	4.58	136.57	4.000	No	Yes	2.00
360	24.44	50.47	2.69	4.49	0.90	34.16	3.95	134.87	4.000	No	Yes	2.00
361	24.48	47.09	2.70	4.30	0.91	31.73	4.02	127.60	4.000	No	Yes	2.00
362	24.67	37.69	2.80	4.58	0.94	24.77	4.80	118.82	4.000	No	Yes	2.00
363	24.70	26.15	2.98	5.45	1.00	16.53	6.55	108.34	4.000	No	Yes	2.00
364	24.75	22.63	3.05	5.73	1.00	14.16	7.30	103.31	4.000	No	Yes	2.00
365	24.79	19.76	3.10	5.88	1.00	12.22	7.98	97.48	4.000	No	Yes	2.00
366	24.88	18.35	3.12	5.73	1.00	11.26	8.24	92.74	4.000	No	Yes	2.00
367	24.91	17.88	3.12	5.38	1.00	10.93	8.14	89.04	4.000	No	Yes	2.00
368	24.97	17.81	3.11	5.15	1.00	10.88	8.02	87.19	4.000	No	Yes	2.00
369	25.01	18.07	3.09	4.94	1.00	11.04	7.81	86.24	4.000	No	Yes	2.00
370	25.08	18.20	3.09	4.93	1.00	11.11	7.78	86.40	4.000	No	Yes	2.00
371	25.15	18.39	3.09	5.05	1.00	11.22	7.82	87.71	4.000	No	Yes	2.00
372	25.24	18.29	3.10	5.26	1.00	11.13	7.99	88.88	4.000	No	Yes	2.00
373	25.28	18.42	3.10	5.21	1.00	11.21	7.93	88.84	4.000	No	Yes	2.00
374	25.36	18.67	3.07	4.67	1.00	11.36	7.51	85.27	4.000	No	Yes	2.00
375	25.42	19.37	3.00	3.89	1.00	11.80	6.79	80.14	4.000	No	Yes	2.00
376	25.50	19.95	2.95	3.33	1.00	12.17	6.24	75.97	4.000	No	Yes	2.00
377	25.57	20.49	2.93	3.20	0.99	12.54	6.02	75.55	4.000	No	Yes	2.00
378	25.63	20.02	2.98	3.73	1.00	12.18	6.55	79.77	4.000	No	Yes	2.00
379	25.77	19.54	3.03	4.27	1.00	11.83	7.06	83.54	4.000	No	Yes	2.00
380	25.78	19.06	3.07	4.90	1.00	11.51	7.61	87.56	4.000	No	Yes	2.00
381	25.82	20.46	3.04	4.81	1.00	12.42	7.24	89.93	4.000	No	Yes	2.00
382	25.88	22.56	3.00	4.63	1.00	13.79	6.72	92.62	4.000	No	Yes	2.00
383	25.93	25.18	2.94	4.33	1.00	15.52	6.09	94.56	4.000	No	Yes	2.00
384	26.00	26.61	2.91	4.20	0.98	16.51	5.80	95.74	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
385	26.13	27.19	2.90	4.18	0.98	16.86	5.72	96.35	4.000	No	Yes	2.00
386	26.18	27.19	2.91	4.23	0.98	16.83	5.75	96.85	4.000	No	Yes	2.00
387	26.20	27.09	2.91	4.32	0.99	16.75	5.83	97.60	4.000	No	Yes	2.00
388	26.27	27.09	2.93	4.52	0.99	16.69	5.97	99.57	4.000	No	Yes	2.00
389	26.35	27.95	2.93	4.73	0.99	17.22	5.99	103.15	4.000	No	Yes	2.00
390	26.45	29.19	2.92	4.84	0.99	18.01	5.91	106.41	4.000	No	Yes	2.00
391	26.48	30.72	2.90	4.82	0.98	19.05	5.71	108.87	4.000	No	Yes	2.00
392	26.53	31.74	2.90	4.93	0.98	19.71	5.66	111.68	4.000	No	Yes	2.00
393	26.61	32.47	2.91	5.34	0.99	20.11	5.83	117.22	4.000	No	Yes	2.00
394	26.71	33.01	2.94	5.85	0.99	20.35	6.06	123.29	4.000	No	Yes	2.00
395	26.75	33.49	2.96	6.36	1.00	20.59	6.28	129.31	4.000	No	Yes	2.00
396	26.79	35.08	2.96	6.78	1.00	21.60	6.32	136.59	4.000	No	Yes	2.00
397	26.88	37.57	2.95	7.00	1.00	23.18	6.19	143.50	4.000	No	Yes	2.00
398	26.91	42.32	2.90	6.82	0.98	26.41	5.70	150.63	4.000	No	Yes	2.00
399	26.98	49.10	2.83	6.35	0.95	31.09	5.04	156.57	4.000	No	Yes	2.00
400	27.11	55.82	2.77	5.99	0.93	35.71	4.53	161.61	4.000	No	Yes	2.00
401	27.15	62.04	2.72	5.71	0.91	40.06	4.14	165.82	4.000	No	Yes	2.00
402	27.24	65.32	2.69	5.57	0.90	42.31	3.96	167.48	4.000	No	Yes	2.00
403	27.28	68.06	2.68	5.46	0.89	44.22	3.82	169.03	4.000	No	Yes	2.00
404	27.33	69.59	2.62	4.72	0.87	45.57	3.46	157.46	4.000	No	Yes	2.00
405	27.47	70.67	2.57	4.07	0.85	46.53	3.14	145.95	0.369	No	No	0.64
406	27.51	71.18	2.52	3.52	0.84	47.19	2.87	135.28	0.310	No	No	0.54
407	27.55	70.57	2.54	3.75	0.84	46.58	2.99	139.41	0.332	No	No	0.57
408	27.59	69.55	2.57	4.02	0.85	45.67	3.15	143.72	0.356	No	No	0.61
409	27.63	65.34	2.62	4.46	0.88	42.45	3.48	147.81	4.000	No	Yes	2.00
410	27.69	62.89	2.66	4.73	0.89	40.57	3.69	149.69	4.000	No	Yes	2.00
411	27.79	58.65	2.70	5.03	0.90	37.43	4.00	149.58	4.000	No	Yes	2.00
412	27.87	56.42	2.72	5.09	0.91	35.82	4.12	147.74	4.000	No	Yes	2.00
413	27.90	50.56	2.78	5.52	0.93	31.65	4.61	146.08	4.000	No	Yes	2.00
414	27.97	45.37	2.84	5.97	0.96	27.98	5.15	144.15	4.000	No	Yes	2.00
415	28.02	40.78	2.90	6.34	0.98	24.80	5.68	140.78	4.000	No	Yes	2.00
416	28.10	37.47	2.93	6.34	0.99	22.55	5.97	134.69	4.000	No	Yes	2.00
417	28.17	35.17	2.93	5.99	0.99	21.06	6.02	126.75	4.000	No	Yes	2.00
418	28.23	33.07	2.94	5.62	0.99	19.70	6.05	119.16	4.000	No	Yes	2.00
419	28.28	31.70	2.95	5.60	1.00	18.78	6.19	116.31	4.000	No	Yes	2.00
420	28.35	31.25	2.96	5.61	1.00	18.47	6.26	115.61	4.000	No	Yes	2.00
421	28.45	32.31	2.94	5.58	1.00	19.11	6.13	117.08	4.000	No	Yes	2.00
422	28.49	35.46	2.89	5.25	0.98	21.24	5.61	119.10	4.000	No	Yes	2.00
423	28.56	41.55	2.80	4.75	0.94	25.38	4.82	122.33	4.000	No	Yes	2.00
424	28.62	47.18	2.74	4.46	0.92	29.24	4.30	125.81	4.000	No	Yes	2.00
425	28.72	49.89	2.72	4.44	0.91	31.02	4.15	128.66	4.000	No	Yes	2.00
426	28.76	47.37	2.77	4.88	0.93	29.15	4.52	131.79	4.000	No	Yes	2.00
427	28.83	43.58	2.83	5.38	0.95	26.44	5.03	132.93	4.000	No	Yes	2.00
428	28.90	40.49	2.87	5.58	0.97	24.31	5.37	130.47	4.000	No	Yes	2.00
429	28.98	39.18	2.87	5.42	0.97	23.43	5.40	126.44	4.000	No	Yes	2.00
430	29.01	37.65	2.87	5.12	0.97	22.47	5.36	120.56	4.000	No	Yes	2.00
431	29.10	35.96	2.87	4.98	0.97	21.35	5.44	116.21	4.000	No	Yes	2.00
432	29.14	34.28	2.88	4.74	0.97	20.27	5.47	110.84	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
433	29.25	33.48	2.87	4.53	0.97	19.75	5.43	107.19	4.000	No	Yes	2.00
434	29.29	33.16	2.86	4.26	0.96	19.58	5.30	103.67	4.000	No	Yes	2.00
435	29.38	33.13	2.85	4.07	0.96	19.56	5.18	101.33	4.000	No	Yes	2.00
436	29.45	33.06	2.83	3.87	0.95	19.54	5.05	98.76	4.000	No	Yes	2.00
437	29.51	32.71	2.81	3.52	0.95	19.38	4.85	94.00	4.000	No	Yes	2.00
438	29.56	31.98	2.79	3.24	0.94	18.94	4.73	89.54	4.000	No	Yes	2.00
439	29.64	30.17	2.81	3.14	0.94	17.74	4.84	85.94	4.000	No	Yes	2.00
440	29.87	26.85	2.89	3.52	0.98	15.39	5.57	85.74	4.000	No	Yes	2.00
441	29.89	25.10	2.93	3.79	0.99	14.20	6.03	85.68	4.000	No	Yes	2.00
442	29.95	24.62	2.95	3.84	1.00	13.86	6.16	85.38	4.000	No	Yes	2.00
443	30.03	25.74	2.92	3.70	0.99	14.59	5.88	85.72	4.000	No	Yes	2.00
444	30.10	25.61	2.93	3.77	0.99	14.47	5.96	86.16	4.000	No	Yes	2.00
445	30.12	25.45	2.93	3.84	0.99	14.34	6.04	86.63	4.000	No	Yes	2.00
446	30.21	25.71	2.93	3.80	0.99	14.49	5.97	86.52	4.000	No	Yes	2.00
447	30.26	26.12	2.92	3.74	0.99	14.76	5.87	86.61	4.000	No	Yes	2.00
448	30.32	27.37	2.89	3.59	0.98	15.58	5.57	86.84	4.000	No	Yes	2.00
449	30.39	27.68	2.88	3.59	0.97	15.76	5.54	87.32	4.000	No	Yes	2.00
450	30.45	28.06	2.88	3.59	0.97	15.99	5.49	87.83	4.000	No	Yes	2.00
451	30.56	27.68	2.89	3.69	0.98	15.68	5.63	88.25	4.000	No	Yes	2.00
452	30.60	28.25	2.88	3.68	0.97	16.05	5.54	88.92	4.000	No	Yes	2.00
453	30.65	29.15	2.87	3.67	0.97	16.61	5.43	90.15	4.000	No	Yes	2.00
454	30.74	31.06	2.84	3.59	0.96	17.84	5.15	91.79	4.000	No	Yes	2.00
455	30.79	34.06	2.81	3.62	0.95	19.76	4.86	96.12	4.000	No	Yes	2.00
456	30.93	36.73	2.79	3.67	0.94	21.44	4.66	99.99	4.000	No	Yes	2.00
457	30.98	38.49	2.78	3.79	0.93	22.53	4.60	103.64	4.000	No	Yes	2.00
458	31.01	38.96	2.78	3.83	0.93	22.81	4.59	104.78	4.000	No	Yes	2.00
459	31.05	39.28	2.78	3.92	0.93	22.97	4.63	106.25	4.000	No	Yes	2.00
460	31.13	39.47	2.79	4.02	0.94	23.03	4.68	107.77	4.000	No	Yes	2.00
461	31.18	39.82	2.79	4.09	0.94	23.21	4.70	109.04	4.000	No	Yes	2.00
462	31.27	40.14	2.79	4.09	0.94	23.38	4.68	109.36	4.000	No	Yes	2.00
463	31.33	40.68	2.78	4.00	0.93	23.73	4.59	108.84	4.000	No	Yes	2.00
464	31.54	40.62	2.77	3.96	0.93	23.61	4.57	107.99	4.000	No	Yes	2.00
465	31.61	40.27	2.78	3.94	0.93	23.35	4.59	107.24	4.000	No	Yes	2.00
466	31.67	39.60	2.79	3.97	0.94	22.89	4.67	106.80	4.000	No	Yes	2.00
467	31.76	39.28	2.79	3.97	0.94	22.64	4.70	106.39	4.000	No	Yes	2.00
468	31.80	39.22	2.79	3.96	0.94	22.59	4.70	106.06	4.000	No	Yes	2.00
469	31.85	39.22	2.78	3.88	0.94	22.59	4.65	105.03	4.000	No	Yes	2.00
470	31.93	39.25	2.77	3.65	0.93	22.65	4.50	101.99	4.000	No	Yes	2.00
471	31.98	39.25	2.76	3.52	0.93	22.67	4.42	100.21	4.000	No	Yes	2.00
472	32.06	39.06	2.76	3.57	0.93	22.50	4.47	100.51	4.000	No	Yes	2.00
473	32.24	38.64	2.79	3.80	0.94	22.08	4.66	102.95	4.000	No	Yes	2.00
474	32.29	38.16	2.80	3.95	0.94	21.70	4.80	104.27	4.000	No	Yes	2.00
475	32.31	37.99	2.81	4.02	0.95	21.57	4.86	104.88	4.000	No	Yes	2.00
476	32.36	38.02	2.82	4.14	0.95	21.53	4.94	106.37	4.000	No	Yes	2.00
477	32.45	38.31	2.83	4.28	0.95	21.63	5.01	108.36	4.000	No	Yes	2.00
478	32.50	38.58	2.84	4.47	0.96	21.73	5.11	111.01	4.000	No	Yes	2.00
479	32.56	39.31	2.84	4.55	0.96	22.15	5.10	112.85	4.000	No	Yes	2.00
480	32.67	39.98	2.83	4.59	0.95	22.51	5.07	114.18	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
481	32.69	40.81	2.82	4.58	0.95	23.03	5.00	115.11	4.000	No	Yes	2.00
482	32.76	41.32	2.83	4.65	0.95	23.30	5.00	116.56	4.000	No	Yes	2.00
483	32.89	41.60	2.83	4.73	0.95	23.39	5.04	117.83	4.000	No	Yes	2.00
484	32.90	41.76	2.83	4.78	0.95	23.47	5.05	118.62	4.000	No	Yes	2.00
485	32.96	41.41	2.84	4.82	0.96	23.22	5.11	118.57	4.000	No	Yes	2.00
486	33.02	41.54	2.84	4.80	0.96	23.27	5.09	118.49	4.000	No	Yes	2.00
487	33.12	41.54	2.84	4.80	0.96	23.23	5.10	118.41	4.000	No	Yes	2.00
488	33.16	41.70	2.83	4.77	0.95	23.32	5.07	118.23	4.000	No	Yes	2.00
489	33.24	41.35	2.84	4.80	0.96	23.05	5.12	118.03	4.000	No	Yes	2.00
490	33.32	40.84	2.85	4.85	0.96	22.68	5.19	117.84	4.000	No	Yes	2.00
491	33.34	40.27	2.86	4.95	0.96	22.29	5.30	118.07	4.000	No	Yes	2.00
492	33.42	39.73	2.87	5.06	0.97	21.89	5.41	118.48	4.000	No	Yes	2.00
493	33.51	39.38	2.88	5.14	0.97	21.62	5.49	118.73	4.000	No	Yes	2.00
494	33.55	39.22	2.88	5.15	0.97	21.50	5.52	118.62	4.000	No	Yes	2.00
495	33.60	39.41	2.88	5.10	0.97	21.61	5.47	118.27	4.000	No	Yes	2.00
496	33.73	39.60	2.87	5.06	0.97	21.68	5.44	117.97	4.000	No	Yes	2.00
497	33.78	40.08	2.87	5.00	0.97	21.97	5.37	117.91	4.000	No	Yes	2.00
498	33.82	40.33	2.86	4.96	0.97	22.12	5.33	117.88	4.000	No	Yes	2.00
499	33.86	40.33	2.86	4.92	0.96	22.11	5.31	117.33	4.000	No	Yes	2.00
500	33.95	40.08	2.86	4.88	0.96	21.93	5.31	116.41	4.000	No	Yes	2.00
501	33.99	39.54	2.86	4.75	0.96	21.61	5.28	114.14	4.000	No	Yes	2.00
502	34.13	39.19	2.85	4.62	0.96	21.38	5.24	111.96	4.000	No	Yes	2.00
503	34.17	38.68	2.85	4.49	0.96	21.08	5.21	109.77	4.000	No	Yes	2.00
504	34.23	38.39	2.85	4.42	0.96	20.90	5.19	108.55	4.000	No	Yes	2.00
505	34.28	37.85	2.85	4.36	0.96	20.56	5.20	107.01	4.000	No	Yes	2.00
506	34.39	37.50	2.85	4.30	0.96	20.32	5.21	105.80	4.000	No	Yes	2.00
507	34.44	37.34	2.85	4.27	0.96	20.21	5.20	105.14	4.000	No	Yes	2.00
508	34.48	37.56	2.84	4.26	0.96	20.34	5.18	105.29	4.000	No	Yes	2.00
509	34.53	37.91	2.84	4.28	0.96	20.53	5.16	105.95	4.000	No	Yes	2.00
510	34.59	38.39	2.84	4.33	0.96	20.78	5.16	107.18	4.000	No	Yes	2.00
511	34.70	38.84	2.84	4.39	0.96	21.00	5.16	108.33	4.000	No	Yes	2.00
512	34.75	38.97	2.85	4.44	0.96	21.04	5.18	109.08	4.000	No	Yes	2.00
513	34.80	38.74	2.85	4.46	0.96	20.88	5.22	108.93	4.000	No	Yes	2.00
514	34.88	38.33	2.85	4.47	0.96	20.59	5.27	108.43	4.000	No	Yes	2.00
515	34.91	37.91	2.86	4.43	0.96	20.34	5.28	107.35	4.000	No	Yes	2.00
516	35.01	37.34	2.85	4.27	0.96	19.99	5.24	104.71	4.000	No	Yes	2.00
517	35.07	36.93	2.84	4.02	0.96	19.79	5.11	101.16	4.000	No	Yes	2.00
518	35.14	36.64	2.83	3.85	0.95	19.64	5.03	98.77	4.000	No	Yes	2.00
519	35.18	36.45	2.83	3.85	0.95	19.51	5.05	98.47	4.000	No	Yes	2.00
520	35.24	36.03	2.85	3.99	0.96	19.20	5.18	99.50	4.000	No	Yes	2.00
521	35.34	35.49	2.86	4.09	0.96	18.80	5.31	99.87	4.000	No	Yes	2.00
522	35.41	33.84	2.89	4.33	0.98	17.72	5.65	100.11	4.000	No	Yes	2.00
523	35.45	33.29	2.91	4.38	0.98	17.37	5.75	99.83	4.000	No	Yes	2.00
524	35.51	32.81	2.91	4.41	0.99	17.05	5.83	99.39	4.000	No	Yes	2.00
525	35.60	33.52	2.90	4.27	0.98	17.48	5.66	98.93	4.000	No	Yes	2.00
526	35.64	32.75	2.91	4.32	0.98	17.00	5.78	98.27	4.000	No	Yes	2.00
527	35.82	32.05	2.92	4.36	0.99	16.51	5.90	97.47	4.000	No	Yes	2.00
528	35.88	31.38	2.93	4.39	0.99	16.09	6.01	96.65	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
529	35.91	31.13	2.93	4.39	0.99	15.93	6.05	96.32	4.000	No	Yes	2.00
530	35.99	30.87	2.94	4.40	1.00	15.75	6.09	95.96	4.000	No	Yes	2.00
531	36.03	30.71	2.94	4.37	1.00	15.65	6.09	95.34	4.000	No	Yes	2.00
532	36.10	30.74	2.93	4.26	0.99	15.67	6.02	94.27	4.000	No	Yes	2.00
533	36.17	30.90	2.92	4.10	0.99	15.78	5.89	92.94	4.000	No	Yes	2.00
534	36.26	31.13	2.91	3.97	0.98	15.92	5.77	91.83	4.000	No	Yes	2.00
535	36.30	31.48	2.90	3.87	0.98	16.14	5.66	91.31	4.000	No	Yes	2.00
536	36.36	31.86	2.89	3.83	0.98	16.36	5.58	91.37	4.000	No	Yes	2.00
537	36.48	32.24	2.88	3.80	0.97	16.56	5.52	91.47	4.000	No	Yes	2.00
538	36.53	32.59	2.87	3.75	0.97	16.77	5.45	91.43	4.000	No	Yes	2.00
539	36.57	32.91	2.87	3.68	0.97	16.97	5.37	91.03	4.000	No	Yes	2.00
540	36.65	33.17	2.86	3.63	0.96	17.10	5.31	90.74	4.000	No	Yes	2.00
541	36.70	33.30	2.86	3.63	0.96	17.17	5.29	90.89	4.000	No	Yes	2.00
542	36.78	33.30	2.86	3.68	0.97	17.13	5.33	91.33	4.000	No	Yes	2.00
543	36.83	33.27	2.87	3.73	0.97	17.08	5.37	91.80	4.000	No	Yes	2.00
544	36.88	33.20	2.87	3.78	0.97	17.02	5.42	92.23	4.000	No	Yes	2.00
545	36.96	33.20	2.87	3.81	0.97	16.98	5.45	92.57	4.000	No	Yes	2.00
546	37.01	33.20	2.88	3.85	0.97	16.95	5.48	92.89	4.000	No	Yes	2.00
547	37.10	33.27	2.88	3.84	0.97	16.96	5.48	92.91	4.000	No	Yes	2.00
548	37.14	33.65	2.87	3.78	0.97	17.19	5.39	92.63	4.000	No	Yes	2.00
549	37.23	34.12	2.85	3.68	0.96	17.48	5.27	92.07	4.000	No	Yes	2.00
550	37.28	35.01	2.83	3.53	0.95	18.03	5.08	91.53	4.000	No	Yes	2.00
551	37.38	35.75	2.82	3.44	0.95	18.47	4.94	91.22	4.000	No	Yes	2.00
552	37.42	36.48	2.81	3.38	0.94	18.91	4.83	91.36	4.000	No	Yes	2.00
553	37.47	36.74	2.81	3.45	0.95	19.02	4.86	92.48	4.000	No	Yes	2.00
554	37.58	36.77	2.81	3.43	0.95	19.01	4.85	92.19	4.000	No	Yes	2.00
555	37.63	36.51	2.80	3.28	0.94	18.90	4.76	89.96	4.000	No	Yes	2.00
556	37.67	35.78	2.79	3.12	0.94	18.51	4.71	87.13	4.000	No	Yes	2.00
557	37.76	34.73	2.80	3.14	0.94	17.84	4.83	86.12	4.000	No	Yes	2.00
558	37.81	33.48	2.84	3.33	0.96	17.03	5.11	86.96	4.000	No	Yes	2.00
559	37.87	32.02	2.87	3.53	0.97	16.09	5.43	87.36	4.000	No	Yes	2.00
560	37.97	29.34	2.93	3.87	0.99	14.41	6.04	87.10	4.000	No	Yes	2.00
561	37.99	27.88	2.97	4.06	1.00	13.58	6.39	86.76	4.000	No	Yes	2.00
562	38.07	27.14	2.98	4.12	1.00	13.17	6.54	86.15	4.000	No	Yes	2.00
563	38.16	27.94	2.96	3.91	1.00	13.57	6.28	85.29	4.000	No	Yes	2.00
564	38.21	28.01	2.95	3.84	1.00	13.59	6.23	84.66	4.000	No	Yes	2.00
565	38.28	28.14	2.95	3.83	1.00	13.64	6.21	84.69	4.000	No	Yes	2.00
566	38.33	28.39	2.95	3.86	1.00	13.78	6.19	85.32	4.000	No	Yes	2.00
567	38.44	28.61	2.95	3.90	1.00	13.87	6.20	85.99	4.000	No	Yes	2.00
568	38.47	28.87	2.95	3.92	1.00	14.00	6.18	86.49	4.000	No	Yes	2.00
569	38.60	28.71	2.95	3.97	1.00	13.87	6.25	86.63	4.000	No	Yes	2.00
570	38.64	28.42	2.96	4.05	1.00	13.71	6.35	87.01	4.000	No	Yes	2.00
571	38.68	28.09	2.97	4.14	1.00	13.53	6.46	87.41	4.000	No	Yes	2.00
572	38.72	27.80	2.99	4.28	1.00	13.37	6.60	88.19	4.000	No	Yes	2.00
573	38.82	27.90	2.99	4.38	1.00	13.40	6.66	89.23	4.000	No	Yes	2.00
574	38.91	28.07	3.00	4.48	1.00	13.47	6.71	90.37	4.000	No	Yes	2.00
575	38.95	28.74	2.99	4.50	1.00	13.81	6.63	91.48	4.000	No	Yes	2.00
576	38.99	31.10	2.95	4.40	1.00	15.03	6.26	94.03	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
577	39.17	33.55	2.92	4.31	0.99	16.38	5.90	96.64	4.000	No	Yes	2.00
578	39.20	36.04	2.89	4.24	0.98	17.81	5.58	99.38	4.000	No	Yes	2.00
579	39.23	36.64	2.89	4.32	0.98	18.12	5.57	100.93	4.000	No	Yes	2.00
580	39.27	37.12	2.89	4.44	0.98	18.35	5.61	102.87	4.000	No	Yes	2.00
581	39.31	37.66	2.90	4.59	0.98	18.60	5.65	105.14	4.000	No	Yes	2.00
582	39.40	38.05	2.90	4.70	0.98	18.76	5.69	106.81	4.000	No	Yes	2.00
583	39.44	38.36	2.90	4.75	0.98	18.91	5.70	107.74	4.000	No	Yes	2.00
584	39.53	38.62	2.90	4.72	0.98	19.03	5.66	107.64	4.000	No	Yes	2.00
585	39.57	39.16	2.88	4.60	0.97	19.36	5.53	107.13	4.000	No	Yes	2.00
586	39.66	39.89	2.87	4.48	0.97	19.78	5.39	106.69	4.000	No	Yes	2.00
587	39.70	40.59	2.85	4.38	0.96	20.20	5.27	106.46	4.000	No	Yes	2.00
588	39.79	41.23	2.84	4.31	0.96	20.55	5.18	106.37	4.000	No	Yes	2.00
589	39.85	41.55	2.84	4.27	0.96	20.73	5.13	106.27	4.000	No	Yes	2.00
590	39.90	41.49	2.84	4.26	0.96	20.68	5.13	106.06	4.000	No	Yes	2.00
591	39.97	41.04	2.85	4.29	0.96	20.39	5.19	105.76	4.000	No	Yes	2.00
592	40.07	40.78	2.85	4.29	0.96	20.20	5.22	105.39	4.000	No	Yes	2.00
593	40.13	41.07	2.84	4.24	0.96	20.36	5.16	105.10	4.000	No	Yes	2.00
594	40.18	41.01	2.84	4.19	0.96	20.32	5.14	104.40	4.000	No	Yes	2.00
595	40.28	40.53	2.82	3.85	0.95	20.13	4.95	99.74	4.000	No	Yes	2.00
596	40.37	39.64	2.81	3.66	0.95	19.67	4.90	96.34	4.000	No	Yes	2.00
597	40.42	39.10	2.81	3.50	0.94	19.40	4.84	93.86	4.000	No	Yes	2.00
598	40.50	38.59	2.83	3.71	0.95	19.00	5.03	95.66	4.000	No	Yes	2.00
599	40.54	37.66	2.85	3.79	0.96	18.43	5.18	95.50	4.000	No	Yes	2.00
600	40.68	36.77	2.86	3.83	0.96	17.87	5.30	94.79	4.000	No	Yes	2.00
601	40.68	36.18	2.86	3.82	0.97	17.54	5.35	93.89	4.000	No	Yes	2.00
602	40.72	35.86	2.87	3.80	0.97	17.35	5.38	93.32	4.000	No	Yes	2.00
603	40.76	35.80	2.87	3.85	0.97	17.29	5.42	93.75	4.000	No	Yes	2.00
604	40.85	35.75	2.88	3.96	0.97	17.20	5.51	94.75	4.000	No	Yes	2.00
605	40.89	35.75	2.90	4.23	0.98	17.11	5.70	97.57	4.000	No	Yes	2.00
606	40.98	35.85	2.91	4.42	0.99	17.08	5.83	99.53	4.000	No	Yes	2.00
607	41.02	35.50	2.94	4.76	1.00	16.78	6.10	102.31	4.000	No	Yes	2.00
608	41.11	35.62	2.95	4.98	1.00	16.78	6.23	104.55	4.000	No	Yes	2.00
609	41.16	38.24	2.92	4.95	0.99	18.21	5.93	108.03	4.000	No	Yes	2.00
610	41.28	41.36	2.88	4.75	0.97	19.95	5.53	110.25	4.000	No	Yes	2.00
611	41.30	44.07	2.84	4.53	0.96	21.53	5.17	111.26	4.000	No	Yes	2.00
612	41.38	44.29	2.84	4.48	0.96	21.64	5.12	110.91	4.000	No	Yes	2.00
613	41.42	41.74	2.87	4.67	0.97	20.14	5.45	109.74	4.000	No	Yes	2.00
614	41.50	38.87	2.91	4.87	0.99	18.46	5.84	107.88	4.000	No	Yes	2.00
615	41.55	35.50	2.96	5.02	1.00	16.58	6.29	104.34	4.000	No	Yes	2.00
616	41.64	34.57	2.96	4.78	1.00	16.09	6.26	100.70	4.000	No	Yes	2.00
617	41.68	33.93	2.94	4.49	1.00	15.79	6.14	96.98	4.000	No	Yes	2.00
618	41.75	33.42	2.94	4.32	1.00	15.54	6.09	94.58	4.000	No	Yes	2.00
619	41.81	32.37	2.95	4.30	1.00	14.95	6.21	92.77	4.000	No	Yes	2.00
620	41.90	30.75	2.98	4.41	1.00	14.11	6.49	91.54	4.000	No	Yes	2.00
621	41.99	29.00	3.01	4.61	1.00	13.21	6.87	90.74	4.000	No	Yes	2.00
622	42.04	27.60	3.04	4.77	1.00	12.50	7.19	89.91	4.000	No	Yes	2.00
623	42.08	26.39	3.06	4.89	1.00	11.89	7.47	88.83	4.000	No	Yes	2.00
624	42.17	25.40	3.08	4.94	1.00	11.38	7.68	87.43	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
625	42.22	24.73	3.09	4.91	1.00	11.04	7.79	86.03	4.000	No	Yes	2.00
626	42.26	24.25	3.09	4.85	1.00	10.79	7.85	84.69	4.000	No	Yes	2.00
627	42.35	23.87	3.10	4.79	1.00	10.59	7.89	83.50	4.000	No	Yes	2.00
628	42.39	23.26	3.10	4.72	1.00	10.28	7.96	81.84	4.000	No	Yes	2.00
629	42.54	22.66	3.11	4.65	1.00	9.95	8.05	80.16	4.000	No	Yes	2.00
630	42.58	21.89	3.12	4.61	1.00	9.57	8.20	78.43	4.000	No	Yes	2.00
631	42.62	21.42	3.13	4.57	1.00	9.32	8.29	77.27	4.000	No	Yes	2.00
632	42.67	21.27	3.13	4.52	1.00	9.25	8.29	76.63	4.000	No	Yes	2.00
633	42.72	21.37	3.12	4.36	1.00	9.29	8.15	75.69	4.000	No	Yes	2.00
634	42.83	21.40	3.11	4.25	1.00	9.28	8.07	74.89	4.000	No	Yes	2.00
635	42.88	21.57	3.10	4.13	1.00	9.36	7.93	74.26	4.000	No	Yes	2.00
636	42.92	20.84	3.11	4.10	1.00	8.99	8.09	72.76	4.000	No	Yes	2.00
637	43.02	20.04	3.13	4.09	1.00	8.59	8.29	71.16	4.000	No	Yes	2.00
638	43.10	20.59	3.12	4.06	1.00	8.84	8.13	71.90	4.000	No	Yes	2.00
639	43.20	24.44	3.02	3.62	1.00	10.72	6.96	74.65	4.000	No	Yes	2.00
640	43.27	29.19	2.94	3.46	0.99	13.09	6.08	79.54	4.000	No	Yes	2.00
641	43.33	38.36	2.79	3.04	0.94	18.26	4.69	85.62	4.000	No	Yes	2.00
642	43.40	45.82	2.72	3.04	0.91	22.44	4.13	92.68	4.000	No	Yes	2.00
643	43.45	48.81	2.72	3.33	0.91	23.96	4.15	99.48	4.000	No	Yes	2.00
644	43.51	43.59	2.83	4.10	0.95	20.67	5.03	104.00	4.000	No	Yes	2.00
645	43.52	41.04	2.88	4.55	0.97	19.12	5.54	105.91	4.000	No	Yes	2.00
646	43.61	42.12	2.86	4.39	0.97	19.73	5.35	105.52	4.000	No	Yes	2.00
647	43.65	41.07	2.87	4.35	0.97	19.15	5.42	103.77	4.000	No	Yes	2.00
648	43.74	37.69	2.92	4.59	0.99	17.23	5.90	101.70	4.000	No	Yes	2.00
649	43.78	33.71	2.98	4.83	1.00	15.14	6.50	98.40	4.000	No	Yes	2.00
650	43.87	34.16	2.95	4.43	1.00	15.34	6.20	95.12	4.000	No	Yes	2.00
651	43.92	33.26	2.94	4.07	0.99	14.94	6.05	90.46	4.000	No	Yes	2.00
652	44.05	33.10	2.92	3.80	0.99	14.91	5.87	87.56	4.000	No	Yes	2.00
653	44.08	32.72	2.91	3.66	0.98	14.73	5.81	85.62	4.000	No	Yes	2.00
654	44.13	32.31	2.92	3.69	0.99	14.49	5.89	85.40	4.000	No	Yes	2.00
655	44.18	31.67	2.93	3.74	0.99	14.12	6.02	85.00	4.000	No	Yes	2.00
656	44.26	31.23	2.94	3.76	1.00	13.86	6.10	84.54	4.000	No	Yes	2.00
657	44.31	30.88	2.95	3.76	1.00	13.66	6.15	84.07	4.000	No	Yes	2.00
658	44.39	30.72	2.95	3.79	1.00	13.54	6.20	84.03	4.000	No	Yes	2.00
659	44.44	30.33	2.96	3.91	1.00	13.35	6.34	84.65	4.000	No	Yes	2.00
660	44.53	29.73	2.98	4.09	1.00	13.04	6.56	85.54	4.000	No	Yes	2.00
661	44.62	29.00	3.01	4.29	1.00	12.67	6.81	86.25	4.000	No	Yes	2.00
662	44.66	28.39	3.02	4.43	1.00	12.36	7.00	86.55	4.000	No	Yes	2.00
663	44.69	27.85	3.04	4.51	1.00	12.10	7.14	86.44	4.000	No	Yes	2.00
664	44.75	27.24	3.05	4.61	1.00	11.80	7.31	86.25	4.000	No	Yes	2.00
665	44.84	26.51	3.06	4.67	1.00	11.43	7.48	85.52	4.000	No	Yes	2.00
666	44.91	26.03	3.07	4.65	1.00	11.18	7.56	84.53	4.000	No	Yes	2.00
667	44.95	25.40	3.08	4.60	1.00	10.87	7.64	83.05	4.000	No	Yes	2.00
668	45.03	24.79	3.08	4.53	1.00	10.57	7.71	81.51	4.000	No	Yes	2.00
669	45.11	24.35	3.09	4.46	1.00	10.34	7.75	80.16	4.000	No	Yes	2.00
670	45.16	25.72	3.00	3.42	1.00	10.99	6.70	73.64	4.000	No	Yes	2.00
671	45.27	26.64	2.92	2.68	0.99	11.51	5.89	67.77	4.000	No	Yes	2.00
672	45.32	27.08	2.85	2.11	0.96	11.93	5.22	62.21	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
673	45.37	25.90	2.89	2.32	0.98	11.21	5.63	63.18	4.000	No	Yes	2.00
674	45.47	25.62	2.91	2.39	0.98	11.02	5.76	63.51	4.000	No	Yes	2.00
675	45.55	24.69	2.94	2.50	0.99	10.48	6.06	63.50	4.000	No	Yes	2.00
676	45.56	25.14	2.93	2.55	0.99	10.70	6.02	64.46	4.000	No	Yes	2.00
677	45.62	26.77	2.91	2.59	0.98	11.54	5.79	66.87	4.000	No	Yes	2.00
678	45.71	29.79	2.86	2.52	0.96	13.16	5.28	69.51	4.000	No	Yes	2.00
679	45.74	32.25	2.82	2.55	0.95	14.47	5.00	72.30	4.000	No	Yes	2.00
680	45.80	34.03	2.81	2.63	0.95	15.38	4.88	75.09	4.000	No	Yes	2.00
681	45.89	35.94	2.80	2.75	0.94	16.35	4.79	78.32	4.000	No	Yes	2.00
682	45.95	37.95	2.80	2.91	0.94	17.35	4.74	82.32	4.000	No	Yes	2.00
683	46.03	39.57	2.79	3.06	0.94	18.14	4.72	85.65	4.000	No	Yes	2.00
684	46.07	41.10	2.80	3.30	0.94	18.85	4.78	90.10	4.000	No	Yes	2.00
685	46.17	42.02	2.81	3.52	0.95	19.22	4.88	93.74	4.000	No	Yes	2.00
686	46.21	42.82	2.82	3.78	0.95	19.53	5.00	97.61	4.000	No	Yes	2.00
687	46.31	43.52	2.83	3.88	0.95	19.83	5.02	99.49	4.000	No	Yes	2.00
688	46.35	45.56	2.79	3.67	0.94	21.00	4.72	99.08	4.000	No	Yes	2.00
689	46.51	47.48	2.76	3.45	0.93	22.09	4.44	98.05	4.000	No	Yes	2.00
690	46.55	49.10	2.73	3.30	0.92	23.04	4.24	97.59	4.000	No	Yes	2.00
691	46.61	49.93	2.73	3.32	0.91	23.46	4.20	98.54	4.000	No	Yes	2.00
692	46.65	50.91	2.72	3.27	0.91	24.01	4.11	98.73	4.000	No	Yes	2.00
693	46.72	50.95	2.71	3.25	0.91	24.01	4.10	98.44	4.000	No	Yes	2.00
694	46.77	47.00	2.77	3.53	0.93	21.69	4.54	98.59	4.000	No	Yes	2.00
695	46.79	44.10	2.82	3.79	0.95	20.02	4.93	98.75	4.000	No	Yes	2.00
696	46.87	42.47	2.84	3.92	0.96	19.08	5.16	98.41	4.000	No	Yes	2.00
697	46.94	44.61	2.80	3.64	0.94	20.31	4.80	97.38	4.000	No	Yes	2.00
698	47.05	45.28	2.78	3.49	0.94	20.70	4.64	96.10	4.000	No	Yes	2.00
699	47.10	45.05	2.78	3.43	0.94	20.59	4.62	95.19	4.000	No	Yes	2.00
700	47.16	43.40	2.81	3.55	0.94	19.63	4.83	94.90	4.000	No	Yes	2.00
701	47.19	40.98	2.84	3.72	0.96	18.26	5.16	94.33	4.000	No	Yes	2.00
702	47.27	38.84	2.88	3.88	0.97	17.06	5.48	93.51	4.000	No	Yes	2.00
703	47.32	37.57	2.90	3.97	0.98	16.36	5.68	92.88	4.000	No	Yes	2.00
704	47.46	36.58	2.92	4.10	0.99	15.77	5.89	92.81	4.000	No	Yes	2.00
705	47.49	36.39	2.93	4.17	0.99	15.63	5.97	93.27	4.000	No	Yes	2.00
706	47.54	36.29	2.94	4.28	0.99	15.54	6.06	94.12	4.000	No	Yes	2.00
707	47.58	37.54	2.93	4.43	0.99	16.12	6.03	97.19	4.000	No	Yes	2.00
708	47.71	38.52	2.94	4.75	1.00	16.50	6.15	101.40	4.000	No	Yes	2.00
709	47.76	39.48	2.96	5.18	1.00	16.89	6.33	106.84	4.000	No	Yes	2.00
710	47.81	41.20	2.97	5.71	1.00	17.67	6.46	114.24	4.000	No	Yes	2.00
711	47.90	44.90	2.96	6.08	1.00	19.35	6.35	122.84	4.000	No	Yes	2.00
712	47.94	51.62	2.92	6.15	0.99	22.65	5.87	132.89	4.000	No	Yes	2.00
713	47.98	62.90	2.84	6.10	0.96	28.44	5.17	146.98	4.000	No	Yes	2.00
714	48.08	75.29	2.78	6.05	0.93	34.87	4.61	160.67	4.000	No	Yes	2.00
715	48.13	87.74	2.73	6.03	0.91	41.43	4.19	173.78	4.000	No	Yes	2.00
716	48.17	96.98	2.70	6.08	0.90	46.29	3.97	183.89	4.000	No	Yes	2.00
717	48.23	106.96	2.68	6.27	0.90	51.44	3.83	196.89	4.000	No	Yes	2.00
718	48.32	115.59	2.67	6.56	0.89	55.75	3.77	210.30	4.000	No	Yes	2.00
719	48.37	122.09	2.63	6.23	0.88	59.50	3.53	210.27	4.000	No	Yes	2.00
720	48.45	124.83	2.61	5.87	0.87	61.25	3.36	205.77	4.000	No	Yes	2.00

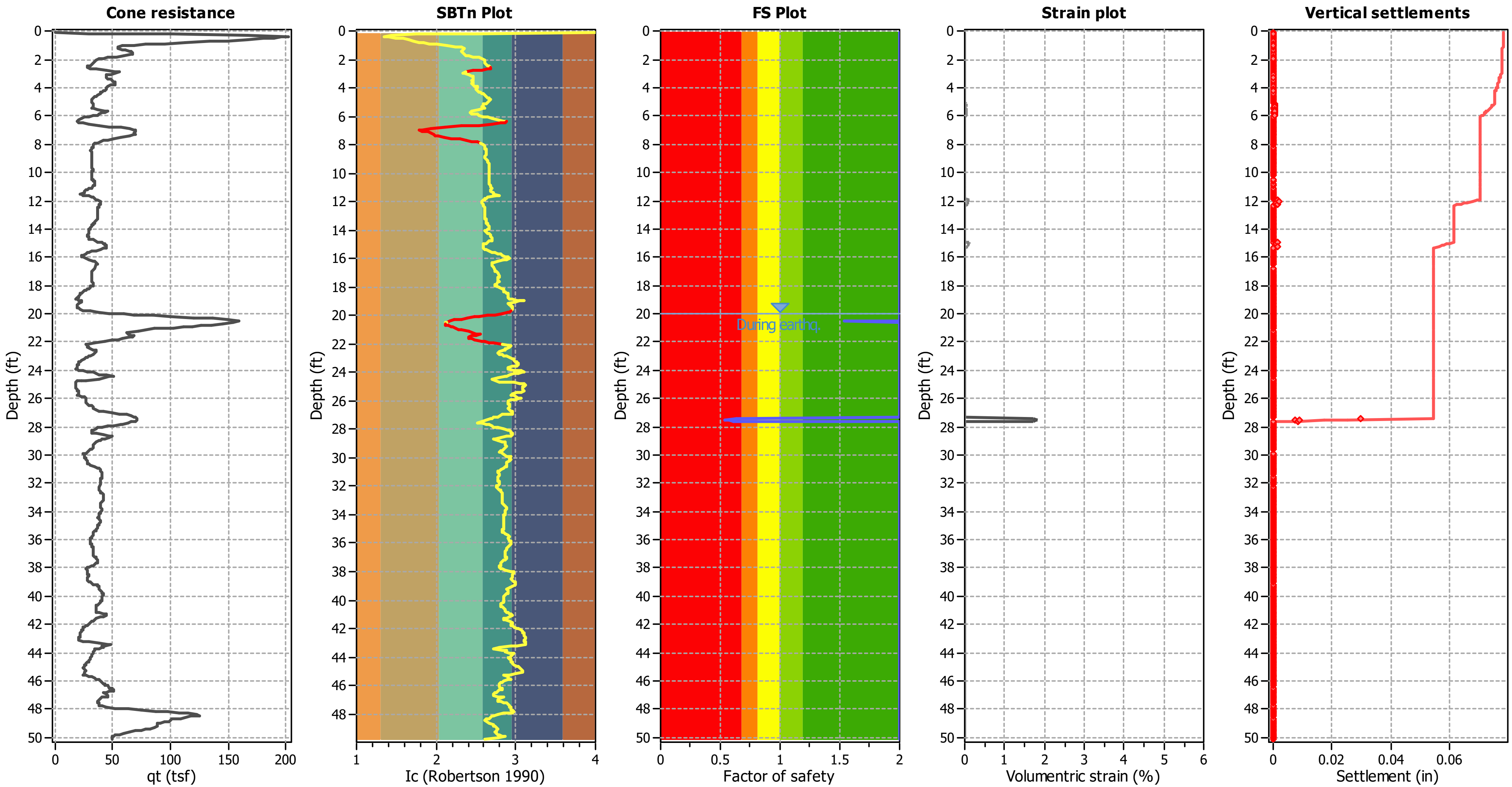
:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

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
721	48.50	117.47	2.62	5.75	0.87	57.33	3.43	196.75	4.000	No	Yes	2.00
722	48.69	109.06	2.67	6.20	0.89	52.21	3.77	196.91	4.000	No	Yes	2.00
723	48.74	101.29	2.71	6.57	0.91	47.76	4.09	195.34	4.000	No	Yes	2.00
724	48.77	100.52	2.71	6.53	0.91	47.36	4.09	193.77	4.000	No	Yes	2.00
725	48.85	98.77	2.72	6.51	0.91	46.39	4.13	191.51	4.000	No	Yes	2.00
726	48.91	94.98	2.74	6.62	0.92	44.28	4.28	189.30	4.000	No	Yes	2.00
727	48.99	91.48	2.76	6.80	0.93	42.28	4.45	188.04	4.000	No	Yes	2.00
728	49.03	89.12	2.77	6.88	0.93	40.98	4.55	186.48	4.000	No	Yes	2.00
729	49.12	88.13	2.77	6.83	0.93	40.43	4.56	184.49	4.000	No	Yes	2.00
730	49.16	88.93	2.75	6.52	0.93	41.00	4.41	180.90	4.000	No	Yes	2.00
731	49.25	88.35	2.75	6.35	0.92	40.74	4.36	177.62	4.000	No	Yes	2.00
732	49.30	86.54	2.75	6.19	0.92	39.86	4.35	173.27	4.000	No	Yes	2.00
733	49.38	82.71	2.76	6.20	0.93	37.82	4.47	169.23	4.000	No	Yes	2.00
734	49.43	78.98	2.78	6.16	0.93	35.88	4.58	164.51	4.000	No	Yes	2.00
735	49.49	74.27	2.80	6.19	0.94	33.41	4.78	159.57	4.000	No	Yes	2.00
736	49.56	69.24	2.83	6.30	0.95	30.75	5.04	155.04	4.000	No	Yes	2.00
737	49.61	64.78	2.86	6.43	0.97	28.41	5.32	151.04	4.000	No	Yes	2.00
738	49.68	60.09	2.77	4.55	0.93	26.87	4.56	122.64	4.000	No	Yes	2.00
739	49.79	56.17	2.60	2.40	0.87	26.26	3.33	87.47	4.000	No	Yes	2.00
740	49.86	52.38	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
741	49.92	50.54	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
742	49.96	49.64	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
743	50.02	49.42	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
744	50.08	49.29	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
745	50.14	49.07	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00

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

Estimation of post-earthquake settlements

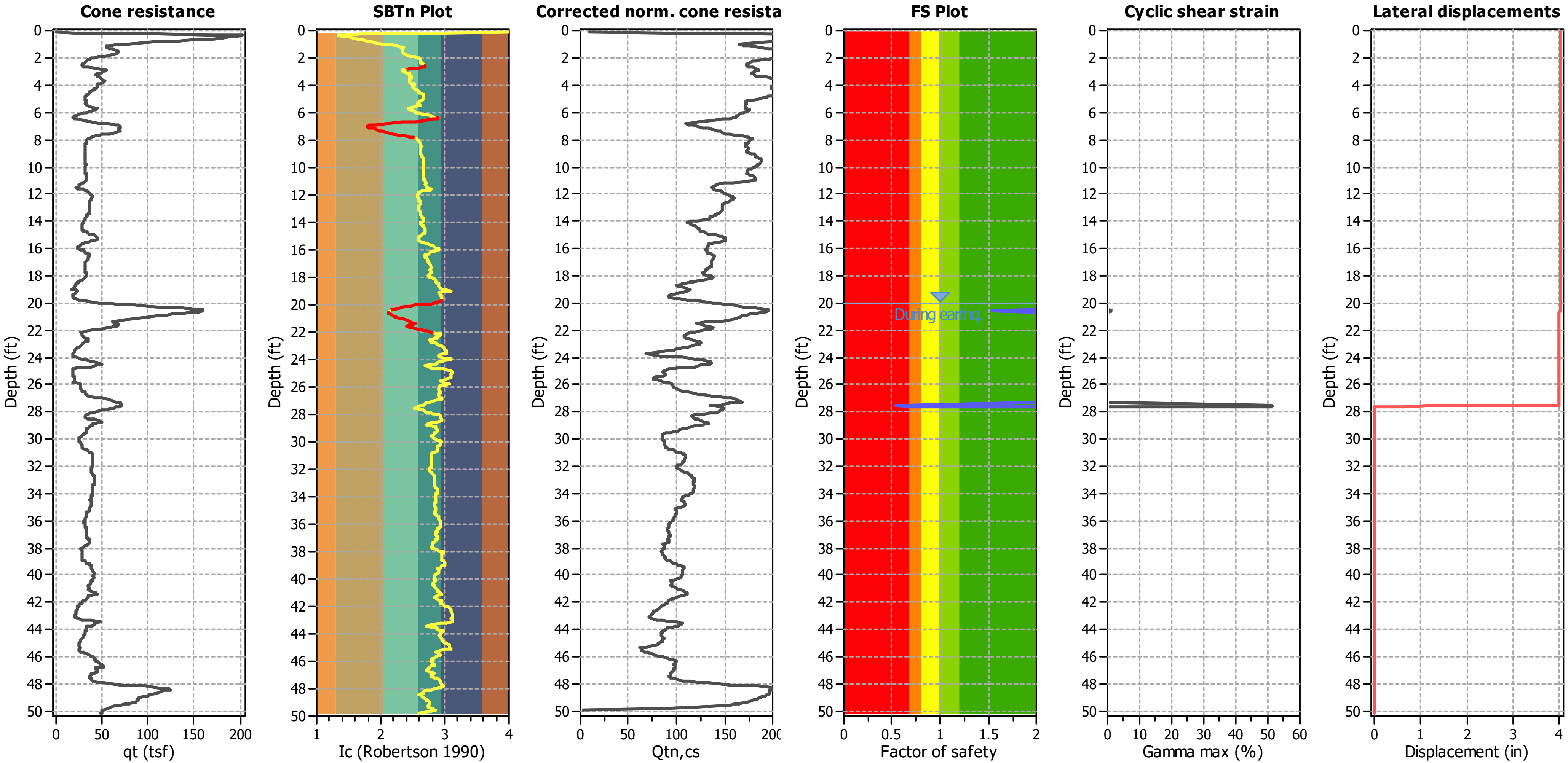


Abbreviations

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

Estimation of post-earthquake lateral Displacements

Geometric parameters: Level ground (or gently sloping) with free face (L: 60.00 ft - H: 20.00 ft)

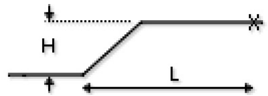


Abbreviations

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)
20.02	59.92	49.15	3.72	143.71	2.00	43.55	0.00	0.00
20.11	68.71	56.45	3.63	150.58	2.00	48.13	0.00	0.00
20.15	84.99	70.33	3.32	158.24	2.00	55.38	0.00	0.00
20.24	100.41	83.32	3.07	164.78	2.00	60.98	0.00	0.00
20.30	120.67	100.66	2.79	173.56	2.00	67.22	0.00	0.00
20.35	137.04	114.61	2.65	182.71	2.00	71.50	0.00	0.00
20.44	149.72	125.15	2.57	190.20	2.00	74.41	0.00	0.00
20.49	159.06	133.01	2.51	195.55	2.00	76.41	0.00	0.00
20.54	158.99	132.70	2.50	194.93	1.54	76.34	1.31	0.02
20.64	154.60	128.43	2.53	191.94	2.00	75.26	0.00	0.00
20.68	145.11	120.04	2.62	186.78	2.00	73.03	0.00	0.00
20.77	135.90	111.72	2.72	181.97	2.00	70.66	0.00	0.00
20.83	126.66	103.62	2.80	176.86	2.00	68.17	0.00	0.00
20.90	119.52	97.26	2.87	172.80	2.00	66.08	0.00	0.00
20.95	111.30	90.11	2.98	168.98	2.00	63.56	0.00	0.00
21.02	101.93	81.92	3.16	166.05	2.00	60.42	0.00	0.00
21.08	86.28	68.58	3.52	161.69	2.00	54.55	0.00	0.00
21.27	72.71	56.80	3.85	156.12	2.00	48.33	0.00	0.00
21.34	62.36	48.20	3.90	146.38	2.00	42.91	0.00	0.00
21.39	61.72	47.80	3.27	132.22	2.00	42.64	0.00	0.00
21.44	63.56	49.39	2.81	123.32	2.00	43.72	0.00	0.00
21.52	66.49	51.71	2.62	121.23	2.00	45.23	0.00	0.00
21.58	68.88	53.45	2.76	126.48	2.00	46.33	0.00	0.00
21.65	67.13	51.78	2.97	129.64	2.00	45.28	0.00	0.00
21.67	64.42	49.42	3.27	134.02	2.00	43.74	0.00	0.00
21.79	58.10	43.95	3.74	137.59	2.00	39.86	0.00	0.00
21.80	54.46	40.96	4.00	138.70	2.00	37.54	0.00	0.00
21.88	49.33	36.71	4.23	136.76	2.00	33.92	0.00	0.00
21.92	42.54	31.28	4.41	130.96	2.00	28.64	0.00	0.00
22.06	34.47	24.76	4.87	125.17	2.00	20.92	0.00	0.00
22.15	28.10	19.73	5.27	118.36	2.00	13.43	0.00	0.00
22.19	27.27	19.08	5.04	114.13	2.00	12.33	0.00	0.00
22.27	28.35	19.88	4.62	111.23	2.00	13.67	0.00	0.00
22.33	28.95	20.32	4.35	108.92	2.00	14.40	0.00	0.00
22.41	28.54	19.92	4.35	108.14	2.00	13.75	0.00	0.00
22.47	30.06	21.06	4.17	108.21	2.00	15.58	0.00	0.00
22.57	32.45	22.81	3.97	108.98	2.00	18.22	0.00	0.00
22.59	35.04	24.75	3.95	112.38	2.00	20.92	0.00	0.00
22.71	35.19	24.69	4.22	116.06	2.00	20.83	0.00	0.00
22.77	34.72	24.21	4.59	120.25	2.00	20.18	0.00	0.00
22.80	34.05	23.62	4.86	122.65	2.00	19.37	0.00	0.00
22.85	32.46	22.32	5.25	124.50	2.00	17.51	0.00	0.00
22.94	30.70	20.88	5.57	124.64	2.00	15.30	0.00	0.00
23.01	29.02	19.57	5.76	123.20	2.00	13.17	0.00	0.00
23.06	28.06	18.85	5.67	120.28	2.00	11.92	0.00	0.00
23.12	26.59	17.76	5.54	115.92	2.00	9.97	0.00	0.00
23.23	25.10	16.63	5.37	110.94	2.00	7.78	0.00	0.00
23.29	23.50	15.47	5.20	105.90	2.00	5.39	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)
23.34	22.42	14.67	5.08	102.46	2.00	3.66	0.00	0.00
23.38	21.53	14.03	4.95	99.31	2.00	2.17	0.00	0.00
23.44	20.92	13.57	4.75	96.09	2.00	1.06	0.00	0.00
23.51	20.45	13.19	4.40	91.80	2.00	0.15	0.00	0.00
23.56	19.81	12.72	3.43	80.95	2.00	0.00	0.00	0.00
23.66	19.23	12.34	2.64	71.48	2.00	0.00	0.00	0.00
23.72	18.76	12.00	2.38	67.78	2.00	0.00	0.00	0.00
23.82	18.66	11.80	3.26	76.91	2.00	0.00	0.00	0.00
23.89	18.25	11.48	4.38	86.39	2.00	0.00	0.00	0.00
23.92	19.05	12.01	5.16	94.59	2.00	0.00	0.00	0.00
23.98	20.83	13.20	5.72	103.22	2.00	0.15	0.00	0.00
24.04	24.75	15.84	5.85	113.07	2.00	6.18	0.00	0.00
24.11	28.63	18.45	5.83	120.81	2.00	11.22	0.00	0.00
24.15	32.62	21.20	5.68	126.69	2.00	15.80	0.00	0.00
24.22	35.86	23.49	5.57	131.20	2.00	19.19	0.00	0.00
24.31	38.37	25.24	5.52	134.76	2.00	21.56	0.00	0.00
24.35	44.65	29.84	4.94	136.57	2.00	27.08	0.00	0.00
24.44	50.47	34.16	4.35	134.87	2.00	31.55	0.00	0.00
24.48	47.09	31.73	4.16	127.60	2.00	29.11	0.00	0.00
24.67	37.69	24.77	4.40	118.82	2.00	20.94	0.00	0.00
24.70	26.15	16.53	5.13	108.34	2.00	7.59	0.00	0.00
24.75	22.63	14.16	5.35	103.31	2.00	2.48	0.00	0.00
24.79	19.76	12.22	5.43	97.48	2.00	0.00	0.00	0.00
24.88	18.35	11.26	5.25	92.74	2.00	0.00	0.00	0.00
24.91	17.88	10.93	4.92	89.04	2.00	0.00	0.00	0.00
24.97	17.81	10.88	4.71	87.19	2.00	0.00	0.00	0.00
25.01	18.07	11.04	4.52	86.24	2.00	0.00	0.00	0.00
25.08	18.20	11.11	4.51	86.40	2.00	0.00	0.00	0.00
25.15	18.39	11.22	4.63	87.71	2.00	0.00	0.00	0.00
25.24	18.29	11.13	4.81	88.88	2.00	0.00	0.00	0.00
25.28	18.42	11.21	4.77	88.84	2.00	0.00	0.00	0.00
25.36	18.67	11.36	4.28	85.27	2.00	0.00	0.00	0.00
25.42	19.37	11.80	3.57	80.14	2.00	0.00	0.00	0.00
25.50	19.95	12.17	3.07	75.97	2.00	0.00	0.00	0.00
25.57	20.49	12.54	2.95	75.55	2.00	0.00	0.00	0.00
25.63	20.02	12.18	3.44	79.77	2.00	0.00	0.00	0.00
25.77	19.54	11.83	3.93	83.54	2.00	0.00	0.00	0.00
25.78	19.06	11.51	4.49	87.56	2.00	0.00	0.00	0.00
25.82	20.46	12.42	4.44	89.93	2.00	0.00	0.00	0.00
25.88	22.56	13.79	4.30	92.62	2.00	1.61	0.00	0.00
25.93	25.18	15.52	4.05	94.56	2.00	5.50	0.00	0.00
26.00	26.61	16.51	3.95	95.74	2.00	7.54	0.00	0.00
26.13	27.19	16.86	3.93	96.35	2.00	8.24	0.00	0.00
26.18	27.19	16.83	3.98	96.85	2.00	8.19	0.00	0.00
26.20	27.09	16.75	4.06	97.60	2.00	8.02	0.00	0.00
26.27	27.09	16.69	4.25	99.57	2.00	7.90	0.00	0.00
26.35	27.95	17.22	4.46	103.15	2.00	8.93	0.00	0.00
26.45	29.19	18.01	4.57	106.41	2.00	10.42	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)
26.48	30.72	19.05	4.57	108.87	2.00	12.27	0.00	0.00
26.53	31.74	19.71	4.68	111.68	2.00	13.40	0.00	0.00
26.61	32.47	20.11	5.07	117.22	2.00	14.06	0.00	0.00
26.71	33.01	20.35	5.56	123.29	2.00	14.45	0.00	0.00
26.75	33.49	20.59	6.05	129.31	2.00	14.84	0.00	0.00
26.79	35.08	21.60	6.47	136.59	2.00	16.42	0.00	0.00
26.88	37.57	23.18	6.69	143.50	2.00	18.74	0.00	0.00
26.91	42.32	26.41	6.56	150.63	2.00	23.05	0.00	0.00
26.98	49.10	31.09	6.14	156.57	2.00	28.44	0.00	0.00
27.11	55.82	35.71	5.82	161.61	2.00	33.01	0.00	0.00
27.15	62.04	40.06	5.56	165.82	2.00	36.81	0.00	0.00
27.24	65.32	42.31	5.42	167.48	2.00	38.61	0.00	0.00
27.28	68.06	44.22	5.33	169.03	2.00	40.07	0.00	0.00
27.33	69.59	45.57	4.61	157.46	2.00	41.06	0.00	0.00
27.47	70.67	46.53	3.97	145.95	0.64	41.75	51.20	2.20
27.51	71.18	47.19	3.43	135.28	0.54	42.21	51.20	0.54
27.55	70.57	46.58	3.66	139.41	0.57	41.78	51.20	0.64
27.59	69.55	45.67	3.92	143.72	0.61	41.13	51.20	0.63
27.63	65.34	42.45	4.35	147.81	2.00	38.72	0.00	0.00
27.69	62.89	40.57	4.60	149.69	2.00	37.22	0.00	0.00
27.79	58.65	37.43	4.88	149.58	2.00	34.57	0.00	0.00
27.87	56.42	35.82	4.94	147.74	2.00	33.11	0.00	0.00
27.90	50.56	31.65	5.33	146.08	2.00	29.03	0.00	0.00
27.97	45.37	27.98	5.74	144.15	2.00	24.97	0.00	0.00
28.02	40.78	24.80	6.07	140.78	2.00	20.98	0.00	0.00
28.10	37.47	22.55	6.05	134.69	2.00	17.84	0.00	0.00
28.17	35.17	21.06	5.69	126.75	2.00	15.58	0.00	0.00
28.23	33.07	19.70	5.33	119.16	2.00	13.38	0.00	0.00
28.28	31.70	18.78	5.29	116.31	2.00	11.80	0.00	0.00
28.35	31.25	18.47	5.30	115.61	2.00	11.24	0.00	0.00
28.45	32.31	19.11	5.28	117.08	2.00	12.38	0.00	0.00
28.49	35.46	21.24	4.99	119.10	2.00	15.87	0.00	0.00
28.56	41.55	25.38	4.55	122.33	2.00	21.75	0.00	0.00
28.62	47.18	29.24	4.30	125.81	2.00	26.41	0.00	0.00
28.72	49.89	31.02	4.28	128.66	2.00	28.37	0.00	0.00
28.76	47.37	29.15	4.70	131.79	2.00	26.32	0.00	0.00
28.83	43.58	26.44	5.16	132.93	2.00	23.09	0.00	0.00
28.90	40.49	24.31	5.33	130.47	2.00	20.31	0.00	0.00
28.98	39.18	23.43	5.17	126.44	2.00	19.11	0.00	0.00
29.01	37.65	22.47	4.88	120.56	2.00	17.73	0.00	0.00
29.10	35.96	21.35	4.73	116.21	2.00	16.04	0.00	0.00
29.14	34.28	20.27	4.49	110.84	2.00	14.32	0.00	0.00
29.25	33.48	19.75	4.29	107.19	2.00	13.46	0.00	0.00
29.29	33.16	19.58	4.03	103.67	2.00	13.17	0.00	0.00
29.38	33.13	19.56	3.85	101.33	2.00	13.15	0.00	0.00
29.45	33.06	19.54	3.66	98.76	2.00	13.11	0.00	0.00
29.51	32.71	19.38	3.32	94.00	2.00	12.83	0.00	0.00
29.56	31.98	18.94	3.06	89.54	2.00	12.09	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)
29.64	30.17	17.74	2.95	85.94	2.00	9.92	0.00	0.00
29.87	26.85	15.39	3.28	85.74	2.00	5.24	0.00	0.00
29.89	25.10	14.20	3.51	85.68	2.00	2.57	0.00	0.00
29.95	24.62	13.86	3.56	85.38	2.00	1.78	0.00	0.00
30.03	25.74	14.59	3.43	85.72	2.00	3.46	0.00	0.00
30.10	25.61	14.47	3.50	86.16	2.00	3.19	0.00	0.00
30.12	25.45	14.34	3.57	86.63	2.00	2.91	0.00	0.00
30.21	25.71	14.49	3.52	86.52	2.00	3.24	0.00	0.00
30.26	26.12	14.76	3.48	86.61	2.00	3.85	0.00	0.00
30.32	27.37	15.58	3.34	86.84	2.00	5.63	0.00	0.00
30.39	27.68	15.76	3.35	87.32	2.00	6.02	0.00	0.00
30.45	28.06	15.99	3.35	87.83	2.00	6.49	0.00	0.00
30.56	27.68	15.68	3.44	88.25	2.00	5.85	0.00	0.00
30.60	28.25	16.05	3.43	88.92	2.00	6.61	0.00	0.00
30.65	29.15	16.61	3.44	90.15	2.00	7.74	0.00	0.00
30.74	31.06	17.84	3.37	91.79	2.00	10.10	0.00	0.00
30.79	34.06	19.76	3.42	96.12	2.00	13.48	0.00	0.00
30.93	36.73	21.44	3.48	99.99	2.00	16.17	0.00	0.00
30.98	38.49	22.53	3.60	103.64	2.00	17.80	0.00	0.00
31.01	38.96	22.81	3.65	104.78	2.00	18.21	0.00	0.00
31.05	39.28	22.97	3.73	106.25	2.00	18.45	0.00	0.00
31.13	39.47	23.03	3.83	107.77	2.00	18.53	0.00	0.00
31.18	39.82	23.21	3.89	109.04	2.00	18.80	0.00	0.00
31.27	40.14	23.38	3.89	109.36	2.00	19.03	0.00	0.00
31.33	40.68	23.73	3.81	108.84	2.00	19.52	0.00	0.00
31.54	40.62	23.61	3.77	107.99	2.00	19.35	0.00	0.00
31.61	40.27	23.35	3.75	107.24	2.00	19.00	0.00	0.00
31.67	39.60	22.89	3.78	106.80	2.00	18.33	0.00	0.00
31.76	39.28	22.64	3.78	106.39	2.00	17.98	0.00	0.00
31.80	39.22	22.59	3.76	106.06	2.00	17.89	0.00	0.00
31.85	39.22	22.59	3.69	105.03	2.00	17.90	0.00	0.00
31.93	39.25	22.65	3.47	101.99	2.00	17.98	0.00	0.00
31.98	39.25	22.67	3.35	100.21	2.00	18.02	0.00	0.00
32.06	39.06	22.50	3.39	100.51	2.00	17.76	0.00	0.00
32.24	38.64	22.08	3.61	102.95	2.00	17.14	0.00	0.00
32.29	38.16	21.70	3.75	104.27	2.00	16.58	0.00	0.00
32.31	37.99	21.57	3.81	104.88	2.00	16.37	0.00	0.00
32.36	38.02	21.53	3.93	106.37	2.00	16.31	0.00	0.00
32.45	38.31	21.63	4.06	108.36	2.00	16.47	0.00	0.00
32.50	38.58	21.73	4.24	111.01	2.00	16.62	0.00	0.00
32.56	39.31	22.15	4.32	112.85	2.00	17.25	0.00	0.00
32.67	39.98	22.51	4.36	114.18	2.00	17.78	0.00	0.00
32.69	40.81	23.03	4.35	115.11	2.00	18.53	0.00	0.00
32.76	41.32	23.30	4.42	116.56	2.00	18.91	0.00	0.00
32.89	41.60	23.39	4.50	117.83	2.00	19.05	0.00	0.00
32.90	41.76	23.47	4.55	118.62	2.00	19.17	0.00	0.00
32.96	41.41	23.22	4.58	118.57	2.00	18.80	0.00	0.00
33.02	41.54	23.27	4.57	118.49	2.00	18.88	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)
33.12	41.54	23.23	4.57	118.41	2.00	18.82	0.00	0.00
33.16	41.70	23.32	4.54	118.23	2.00	18.95	0.00	0.00
33.24	41.35	23.05	4.57	118.03	2.00	18.57	0.00	0.00
33.32	40.84	22.68	4.61	117.84	2.00	18.04	0.00	0.00
33.34	40.27	22.29	4.70	118.07	2.00	17.46	0.00	0.00
33.42	39.73	21.89	4.80	118.48	2.00	16.86	0.00	0.00
33.51	39.38	21.62	4.87	118.73	2.00	16.45	0.00	0.00
33.55	39.22	21.50	4.88	118.62	2.00	16.26	0.00	0.00
33.60	39.41	21.61	4.83	118.27	2.00	16.44	0.00	0.00
33.73	39.60	21.68	4.79	117.97	2.00	16.55	0.00	0.00
33.78	40.08	21.97	4.74	117.91	2.00	16.98	0.00	0.00
33.82	40.33	22.12	4.71	117.88	2.00	17.20	0.00	0.00
33.86	40.33	22.11	4.67	117.33	2.00	17.19	0.00	0.00
33.95	40.08	21.93	4.63	116.41	2.00	16.92	0.00	0.00
33.99	39.54	21.61	4.50	114.14	2.00	16.44	0.00	0.00
34.13	39.19	21.38	4.37	111.96	2.00	16.08	0.00	0.00
34.17	38.68	21.08	4.25	109.77	2.00	15.61	0.00	0.00
34.23	38.39	20.90	4.18	108.55	2.00	15.33	0.00	0.00
34.28	37.85	20.56	4.12	107.01	2.00	14.79	0.00	0.00
34.39	37.50	20.32	4.06	105.80	2.00	14.41	0.00	0.00
34.44	37.34	20.21	4.03	105.14	2.00	14.23	0.00	0.00
34.48	37.56	20.34	4.02	105.29	2.00	14.43	0.00	0.00
34.53	37.91	20.53	4.04	105.95	2.00	14.74	0.00	0.00
34.59	38.39	20.78	4.09	107.18	2.00	15.15	0.00	0.00
34.70	38.84	21.00	4.15	108.33	2.00	15.48	0.00	0.00
34.75	38.97	21.04	4.20	109.08	2.00	15.55	0.00	0.00
34.80	38.74	20.88	4.21	108.93	2.00	15.30	0.00	0.00
34.88	38.33	20.59	4.22	108.43	2.00	14.84	0.00	0.00
34.91	37.91	20.34	4.18	107.35	2.00	14.43	0.00	0.00
35.01	37.34	19.99	4.03	104.71	2.00	13.87	0.00	0.00
35.07	36.93	19.79	3.78	101.16	2.00	13.53	0.00	0.00
35.14	36.64	19.64	3.62	98.77	2.00	13.28	0.00	0.00
35.18	36.45	19.51	3.62	98.47	2.00	13.06	0.00	0.00
35.24	36.03	19.20	3.75	99.50	2.00	12.53	0.00	0.00
35.34	35.49	18.80	3.84	99.87	2.00	11.84	0.00	0.00
35.41	33.84	17.72	4.05	100.11	2.00	9.88	0.00	0.00
35.45	33.29	17.37	4.10	99.83	2.00	9.22	0.00	0.00
35.51	32.81	17.05	4.12	99.39	2.00	8.62	0.00	0.00
35.60	33.52	17.48	4.00	98.93	2.00	9.43	0.00	0.00
35.64	32.75	17.00	4.03	98.27	2.00	8.51	0.00	0.00
35.82	32.05	16.51	4.06	97.47	2.00	7.56	0.00	0.00
35.88	31.38	16.09	4.08	96.65	2.00	6.70	0.00	0.00
35.91	31.13	15.93	4.08	96.32	2.00	6.36	0.00	0.00
35.99	30.87	15.75	4.09	95.96	2.00	5.99	0.00	0.00
36.03	30.71	15.65	4.06	95.34	2.00	5.78	0.00	0.00
36.10	30.74	15.67	3.95	94.27	2.00	5.82	0.00	0.00
36.17	30.90	15.78	3.81	92.94	2.00	6.06	0.00	0.00
36.26	31.13	15.92	3.68	91.83	2.00	6.35	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)
36.30	31.48	16.14	3.60	91.31	2.00	6.81	0.00	0.00
36.36	31.86	16.36	3.56	91.37	2.00	7.25	0.00	0.00
36.48	32.24	16.56	3.54	91.47	2.00	7.65	0.00	0.00
36.53	32.59	16.77	3.50	91.43	2.00	8.06	0.00	0.00
36.57	32.91	16.97	3.43	91.03	2.00	8.45	0.00	0.00
36.65	33.17	17.10	3.39	90.74	2.00	8.72	0.00	0.00
36.70	33.30	17.17	3.39	90.89	2.00	8.84	0.00	0.00
36.78	33.30	17.13	3.43	91.33	2.00	8.76	0.00	0.00
36.83	33.27	17.08	3.47	91.80	2.00	8.67	0.00	0.00
36.88	33.20	17.02	3.52	92.23	2.00	8.54	0.00	0.00
36.96	33.20	16.98	3.55	92.57	2.00	8.47	0.00	0.00
37.01	33.20	16.95	3.58	92.89	2.00	8.42	0.00	0.00
37.10	33.27	16.96	3.58	92.91	2.00	8.44	0.00	0.00
37.14	33.65	17.19	3.52	92.63	2.00	8.89	0.00	0.00
37.23	34.12	17.48	3.43	92.07	2.00	9.43	0.00	0.00
37.28	35.01	18.03	3.30	91.53	2.00	10.46	0.00	0.00
37.38	35.75	18.47	3.22	91.22	2.00	11.25	0.00	0.00
37.42	36.48	18.91	3.17	91.36	2.00	12.03	0.00	0.00
37.47	36.74	19.02	3.24	92.48	2.00	12.22	0.00	0.00
37.58	36.77	19.01	3.22	92.19	2.00	12.20	0.00	0.00
37.63	36.51	18.90	3.07	89.96	2.00	12.01	0.00	0.00
37.67	35.78	18.51	2.92	87.13	2.00	11.32	0.00	0.00
37.76	34.73	17.84	2.93	86.12	2.00	10.11	0.00	0.00
37.81	33.48	17.03	3.10	86.96	2.00	8.57	0.00	0.00
37.87	32.02	16.09	3.28	87.36	2.00	6.69	0.00	0.00
37.97	29.34	14.41	3.57	87.10	2.00	3.06	0.00	0.00
37.99	27.88	13.58	3.72	86.76	2.00	1.09	0.00	0.00
38.07	27.14	13.17	3.76	86.15	2.00	0.08	0.00	0.00
38.16	27.94	13.57	3.58	85.29	2.00	1.08	0.00	0.00
38.21	28.01	13.59	3.52	84.66	2.00	1.13	0.00	0.00
38.28	28.14	13.64	3.51	84.69	2.00	1.26	0.00	0.00
38.33	28.39	13.78	3.54	85.32	2.00	1.58	0.00	0.00
38.44	28.61	13.87	3.58	85.99	2.00	1.79	0.00	0.00
38.47	28.87	14.00	3.60	86.49	2.00	2.11	0.00	0.00
38.60	28.71	13.87	3.64	86.63	2.00	1.80	0.00	0.00
38.64	28.42	13.71	3.71	87.01	2.00	1.42	0.00	0.00
38.68	28.09	13.53	3.80	87.41	2.00	0.97	0.00	0.00
38.72	27.80	13.37	3.91	88.19	2.00	0.58	0.00	0.00
38.82	27.90	13.40	4.01	89.23	2.00	0.65	0.00	0.00
38.91	28.07	13.47	4.11	90.37	2.00	0.82	0.00	0.00
38.95	28.74	13.81	4.12	91.48	2.00	1.65	0.00	0.00
38.99	31.10	15.03	4.07	94.03	2.00	4.45	0.00	0.00
39.17	33.55	16.38	4.01	96.64	2.00	7.29	0.00	0.00
39.20	36.04	17.81	3.96	99.38	2.00	10.05	0.00	0.00
39.23	36.64	18.12	4.03	100.93	2.00	10.62	0.00	0.00
39.27	37.12	18.35	4.15	102.87	2.00	11.03	0.00	0.00
39.31	37.66	18.60	4.30	105.14	2.00	11.49	0.00	0.00
39.40	38.05	18.76	4.41	106.81	2.00	11.76	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)
39.44	38.36	18.91	4.46	107.74	2.00	12.03	0.00	0.00
39.53	38.62	19.03	4.42	107.64	2.00	12.24	0.00	0.00
39.57	39.16	19.36	4.32	107.13	2.00	12.80	0.00	0.00
39.66	39.89	19.78	4.21	106.69	2.00	13.52	0.00	0.00
39.70	40.59	20.20	4.12	106.46	2.00	14.20	0.00	0.00
39.79	41.23	20.55	4.05	106.37	2.00	14.78	0.00	0.00
39.85	41.55	20.73	4.02	106.27	2.00	15.06	0.00	0.00
39.90	41.49	20.68	4.01	106.06	2.00	14.98	0.00	0.00
39.97	41.04	20.39	4.03	105.76	2.00	14.51	0.00	0.00
40.07	40.78	20.20	4.03	105.39	2.00	14.21	0.00	0.00
40.13	41.07	20.36	3.99	105.10	2.00	14.47	0.00	0.00
40.18	41.01	20.32	3.94	104.40	2.00	14.41	0.00	0.00
40.28	40.53	20.13	3.61	99.74	2.00	14.10	0.00	0.00
40.37	39.64	19.67	3.43	96.34	2.00	13.32	0.00	0.00
40.42	39.10	19.40	3.28	93.86	2.00	12.87	0.00	0.00
40.50	38.59	19.00	3.47	95.66	2.00	12.19	0.00	0.00
40.54	37.66	18.43	3.54	95.50	2.00	11.18	0.00	0.00
40.68	36.77	17.87	3.57	94.79	2.00	10.16	0.00	0.00
40.68	36.18	17.54	3.56	93.89	2.00	9.54	0.00	0.00
40.72	35.86	17.35	3.54	93.32	2.00	9.19	0.00	0.00
40.76	35.80	17.29	3.59	93.75	2.00	9.07	0.00	0.00
40.85	35.75	17.20	3.68	94.75	2.00	8.90	0.00	0.00
40.89	35.75	17.11	3.94	97.57	2.00	8.73	0.00	0.00
40.98	35.85	17.08	4.11	99.53	2.00	8.68	0.00	0.00
41.02	35.50	16.78	4.42	102.31	2.00	8.09	0.00	0.00
41.11	35.62	16.78	4.63	104.55	2.00	8.08	0.00	0.00
41.16	38.24	18.21	4.62	108.03	2.00	10.78	0.00	0.00
41.28	41.36	19.95	4.46	110.25	2.00	13.80	0.00	0.00
41.30	44.07	21.53	4.27	111.26	2.00	16.32	0.00	0.00
41.38	44.29	21.64	4.23	110.91	2.00	16.49	0.00	0.00
41.42	41.74	20.14	4.39	109.74	2.00	14.11	0.00	0.00
41.50	38.87	18.46	4.55	107.88	2.00	11.24	0.00	0.00
41.55	35.50	16.58	4.66	104.34	2.00	7.69	0.00	0.00
41.64	34.57	16.09	4.43	100.70	2.00	6.70	0.00	0.00
41.68	33.93	15.79	4.16	96.98	2.00	6.08	0.00	0.00
41.75	33.42	15.54	3.99	94.58	2.00	5.54	0.00	0.00
41.81	32.37	14.95	3.96	92.77	2.00	4.26	0.00	0.00
41.90	30.75	14.11	4.04	91.54	2.00	2.37	0.00	0.00
41.99	29.00	13.21	4.20	90.74	2.00	0.20	0.00	0.00
42.04	27.60	12.50	4.33	89.91	2.00	0.00	0.00	0.00
42.08	26.39	11.89	4.42	88.83	2.00	0.00	0.00	0.00
42.17	25.40	11.38	4.44	87.43	2.00	0.00	0.00	0.00
42.22	24.73	11.04	4.40	86.03	2.00	0.00	0.00	0.00
42.26	24.25	10.79	4.34	84.69	2.00	0.00	0.00	0.00
42.35	23.87	10.59	4.27	83.50	2.00	0.00	0.00	0.00
42.39	23.26	10.28	4.19	81.84	2.00	0.00	0.00	0.00
42.54	22.66	9.95	4.12	80.16	2.00	0.00	0.00	0.00
42.58	21.89	9.57	4.06	78.43	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)
42.62	21.42	9.32	4.02	77.27	2.00	0.00	0.00	0.00
42.67	21.27	9.25	3.97	76.63	2.00	0.00	0.00	0.00
42.72	21.37	9.29	3.83	75.69	2.00	0.00	0.00	0.00
42.83	21.40	9.28	3.73	74.89	2.00	0.00	0.00	0.00
42.88	21.57	9.36	3.63	74.26	2.00	0.00	0.00	0.00
42.92	20.84	8.99	3.59	72.76	2.00	0.00	0.00	0.00
43.02	20.04	8.59	3.55	71.16	2.00	0.00	0.00	0.00
43.10	20.59	8.84	3.54	71.90	2.00	0.00	0.00	0.00
43.20	24.44	10.72	3.23	74.65	2.00	0.00	0.00	0.00
43.27	29.19	13.09	3.14	79.54	2.00	0.00	0.00	0.00
43.33	38.36	18.26	2.83	85.62	2.00	10.88	0.00	0.00
43.40	45.82	22.44	2.86	92.68	2.00	17.67	0.00	0.00
43.45	48.81	23.96	3.15	99.48	2.00	19.84	0.00	0.00
43.51	43.59	20.67	3.85	104.00	2.00	14.97	0.00	0.00
43.52	41.04	19.12	4.25	105.91	2.00	12.38	0.00	0.00
43.61	42.12	19.73	4.11	105.52	2.00	13.42	0.00	0.00
43.65	41.07	19.15	4.07	103.77	2.00	12.45	0.00	0.00
43.74	37.69	17.23	4.26	101.70	2.00	8.95	0.00	0.00
43.78	33.71	15.14	4.44	98.40	2.00	4.68	0.00	0.00
43.87	34.16	15.34	4.08	95.12	2.00	5.13	0.00	0.00
43.92	33.26	14.94	3.74	90.46	2.00	4.26	0.00	0.00
44.05	33.10	14.91	3.49	87.56	2.00	4.18	0.00	0.00
44.08	32.72	14.73	3.36	85.62	2.00	3.79	0.00	0.00
44.13	32.31	14.49	3.38	85.40	2.00	3.24	0.00	0.00
44.18	31.67	14.12	3.42	85.00	2.00	2.38	0.00	0.00
44.26	31.23	13.86	3.43	84.54	2.00	1.77	0.00	0.00
44.31	30.88	13.66	3.43	84.07	2.00	1.30	0.00	0.00
44.39	30.72	13.54	3.46	84.03	2.00	1.01	0.00	0.00
44.44	30.33	13.35	3.56	84.65	2.00	0.53	0.00	0.00
44.53	29.73	13.04	3.72	85.54	2.00	0.00	0.00	0.00
44.62	29.00	12.67	3.89	86.25	2.00	0.00	0.00	0.00
44.66	28.39	12.36	4.00	86.55	2.00	0.00	0.00	0.00
44.69	27.85	12.10	4.07	86.44	2.00	0.00	0.00	0.00
44.75	27.24	11.80	4.15	86.25	2.00	0.00	0.00	0.00
44.84	26.51	11.43	4.19	85.52	2.00	0.00	0.00	0.00
44.91	26.03	11.18	4.16	84.53	2.00	0.00	0.00	0.00
44.95	25.40	10.87	4.10	83.05	2.00	0.00	0.00	0.00
45.03	24.79	10.57	4.03	81.51	2.00	0.00	0.00	0.00
45.11	24.35	10.34	3.96	80.16	2.00	0.00	0.00	0.00
45.16	25.72	10.99	3.05	73.64	2.00	0.00	0.00	0.00
45.27	26.64	11.51	2.41	67.77	2.00	0.00	0.00	0.00
45.32	27.08	11.93	1.90	62.21	2.00	0.00	0.00	0.00
45.37	25.90	11.21	2.07	63.18	2.00	0.00	0.00	0.00
45.47	25.62	11.02	2.13	63.51	2.00	0.00	0.00	0.00
45.55	24.69	10.48	2.22	63.50	2.00	0.00	0.00	0.00
45.56	25.14	10.70	2.26	64.46	2.00	0.00	0.00	0.00
45.62	26.77	11.54	2.32	66.87	2.00	0.00	0.00	0.00
45.71	29.79	13.16	2.29	69.51	2.00	0.07	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)
45.74	32.25	14.47	2.33	72.30	2.00	3.19	0.00	0.00
45.80	34.03	15.38	2.42	75.09	2.00	5.22	0.00	0.00
45.89	35.94	16.35	2.53	78.32	2.00	7.23	0.00	0.00
45.95	37.95	17.35	2.70	82.32	2.00	9.19	0.00	0.00
46.03	39.57	18.14	2.84	85.65	2.00	10.66	0.00	0.00
46.07	41.10	18.85	3.07	90.10	2.00	11.93	0.00	0.00
46.17	42.02	19.22	3.29	93.74	2.00	12.57	0.00	0.00
46.21	42.82	19.53	3.53	97.61	2.00	13.09	0.00	0.00
46.31	43.52	19.83	3.63	99.49	2.00	13.60	0.00	0.00
46.35	45.56	21.00	3.44	99.08	2.00	15.49	0.00	0.00
46.51	47.48	22.09	3.24	98.05	2.00	17.16	0.00	0.00
46.55	49.10	23.04	3.11	97.59	2.00	18.54	0.00	0.00
46.61	49.93	23.46	3.13	98.54	2.00	19.14	0.00	0.00
46.65	50.91	24.01	3.09	98.73	2.00	19.91	0.00	0.00
46.72	50.95	24.01	3.07	98.44	2.00	19.91	0.00	0.00
46.77	47.00	21.69	3.32	98.59	2.00	16.56	0.00	0.00
46.79	44.10	20.02	3.54	98.75	2.00	13.91	0.00	0.00
46.87	42.47	19.08	3.65	98.41	2.00	12.32	0.00	0.00
46.94	44.61	20.31	3.41	97.38	2.00	14.38	0.00	0.00
47.05	45.28	20.70	3.27	96.10	2.00	15.01	0.00	0.00
47.10	45.05	20.59	3.22	95.19	2.00	14.83	0.00	0.00
47.16	43.40	19.63	3.31	94.90	2.00	13.26	0.00	0.00
47.19	40.98	18.26	3.46	94.33	2.00	10.88	0.00	0.00
47.27	38.84	17.06	3.59	93.51	2.00	8.64	0.00	0.00
47.32	37.57	16.36	3.66	92.88	2.00	7.24	0.00	0.00
47.46	36.58	15.77	3.77	92.81	2.00	6.03	0.00	0.00
47.49	36.39	15.63	3.84	93.27	2.00	5.73	0.00	0.00
47.54	36.29	15.54	3.94	94.12	2.00	5.55	0.00	0.00
47.58	37.54	16.12	4.09	97.19	2.00	6.75	0.00	0.00
47.71	38.52	16.50	4.39	101.40	2.00	7.52	0.00	0.00
47.76	39.48	16.89	4.80	106.84	2.00	8.30	0.00	0.00
47.81	41.20	17.67	5.31	114.24	2.00	9.80	0.00	0.00
47.90	44.90	19.35	5.69	122.84	2.00	12.79	0.00	0.00
47.94	51.62	22.65	5.80	132.89	2.00	17.99	0.00	0.00
47.98	62.90	28.44	5.82	146.98	2.00	25.50	0.00	0.00
48.08	75.29	34.87	5.81	160.67	2.00	32.23	0.00	0.00
48.13	87.74	41.43	5.83	173.78	2.00	37.92	0.00	0.00
48.17	96.98	46.29	5.90	183.89	2.00	41.58	0.00	0.00
48.23	106.96	51.44	6.10	196.89	2.00	45.06	0.00	0.00
48.32	115.59	55.75	6.39	210.30	2.00	47.71	0.00	0.00
48.37	122.09	59.50	6.08	210.27	2.00	49.86	0.00	0.00
48.45	124.83	61.25	5.73	205.77	2.00	50.82	0.00	0.00
48.50	117.47	57.33	5.60	196.75	2.00	48.63	0.00	0.00
48.69	109.06	52.21	6.03	196.91	2.00	45.55	0.00	0.00
48.74	101.29	47.76	6.38	195.34	2.00	42.61	0.00	0.00
48.77	100.52	47.36	6.33	193.77	2.00	42.33	0.00	0.00
48.85	98.77	46.39	6.31	191.51	2.00	41.65	0.00	0.00
48.91	94.98	44.28	6.42	189.30	2.00	40.11	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)
48.99	91.48	42.28	6.58	188.04	2.00	38.58	0.00	0.00
49.03	89.12	40.98	6.65	186.48	2.00	37.55	0.00	0.00
49.12	88.13	40.43	6.60	184.49	2.00	37.11	0.00	0.00
49.16	88.93	41.00	6.30	180.90	2.00	37.57	0.00	0.00
49.25	88.35	40.74	6.14	177.62	2.00	37.36	0.00	0.00
49.30	86.54	39.86	5.98	173.27	2.00	36.64	0.00	0.00
49.38	82.71	37.82	5.98	169.23	2.00	34.91	0.00	0.00
49.43	78.98	35.88	5.93	164.51	2.00	33.17	0.00	0.00
49.49	74.27	33.41	5.94	159.57	2.00	30.81	0.00	0.00
49.56	69.24	30.75	6.03	155.04	2.00	28.07	0.00	0.00
49.61	64.78	28.41	6.13	151.04	2.00	25.46	0.00	0.00
49.68	60.09	26.87	4.32	122.64	2.00	23.63	0.00	0.00
49.79	56.17	26.26	2.27	87.47	2.00	22.87	0.00	0.00
49.86	52.38	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
49.92	50.54	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
49.96	49.64	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.02	49.42	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.08	49.29	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.14	49.07	N/A	0.00	-1.00	2.00	0.00	0.00	0.00

Total estimated displacement: 4.03

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

:: Strength loss calculation (Robertson (2009) ::

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
0.08	0.22	0.35	26.61	9.37	4.06	N/A	N/A
0.17	29.09	46.72	2.65	123.69	2.48	N/A	N/A
0.22	99.65	160.09	1.07	170.70	1.74	N/A	N/A
0.31	167.13	268.48	1.00	268.48	1.44	N/A	N/A
0.35	202.27	324.94	1.00	324.94	1.34	N/A	N/A
0.39	195.64	314.29	1.00	314.29	1.40	N/A	N/A
0.46	189.75	304.81	1.00	304.81	1.49	N/A	N/A
0.53	180.57	290.06	1.00	290.06	1.58	N/A	N/A
0.61	166.65	267.68	1.01	269.73	1.66	N/A	N/A
0.68	149.13	239.53	1.05	251.61	1.72	N/A	N/A
0.75	133.49	214.39	1.09	234.39	1.78	N/A	N/A
0.79	112.40	180.50	1.14	205.89	1.84	N/A	N/A
0.88	94.97	152.50	1.20	183.01	1.91	N/A	N/A
0.92	78.34	125.77	1.32	165.74	2.01	N/A	N/A
1.01	68.62	110.15	1.51	166.34	2.13	N/A	N/A
1.06	58.81	94.38	1.80	170.31	2.25	N/A	N/A
1.14	55.08	88.39	2.00	176.73	2.32	N/A	N/A
1.18	54.32	87.16	2.13	185.89	2.35	N/A	N/A
1.27	58.09	93.20	2.09	194.76	2.34	N/A	N/A
1.36	60.67	97.34	2.09	203.12	2.34	N/A	N/A
1.40	64.49	103.47	2.03	210.14	2.32	N/A	N/A
1.47	66.49	106.67	2.04	217.25	2.33	N/A	N/A
1.54	67.69	108.60	2.07	224.42	2.34	N/A	N/A
1.58	67.46	108.23	2.12	229.31	2.35	N/A	N/A
1.67	65.89	105.70	2.18	230.80	2.37	N/A	N/A
1.71	60.13	96.43	2.36	227.39	2.41	N/A	N/A
1.81	53.66	86.03	2.59	222.49	2.46	N/A	N/A
1.85	45.89	73.55	2.93	215.26	2.53	N/A	N/A
1.94	41.62	66.68	3.14	209.28	2.57	N/A	N/A
1.98	37.74	60.44	3.34	201.70	2.60	N/A	N/A
2.06	35.93	57.51	3.40	195.55	2.61	N/A	N/A
2.10	34.56	55.31	3.40	188.23	2.61	N/A	N/A
2.18	33.73	53.97	3.40	183.32	2.61	N/A	N/A
2.25	32.58	52.12	3.44	179.39	2.62	N/A	N/A
2.33	31.21	49.92	3.53	176.38	2.63	N/A	N/A
2.41	30.04	48.02	3.62	173.90	2.65	N/A	N/A
2.46	28.48	45.51	3.79	172.66	2.67	N/A	N/A
2.50	27.94	44.64	3.87	172.93	2.68	N/A	N/A
2.60	27.72	44.28	3.91	173.31	2.69	N/A	N/A
2.64	30.08	48.06	3.64	175.02	2.65	N/A	N/A
2.69	35.75	57.16	3.13	178.98	2.57	N/A	N/A
2.78	44.63	71.43	2.57	183.27	2.46	N/A	N/A
2.86	52.60	84.22	2.21	186.43	2.38	N/A	N/A
2.91	55.28	88.52	2.08	184.44	2.34	N/A	N/A
2.99	52.12	83.44	2.16	180.65	2.36	N/A	N/A
3.07	47.60	76.17	2.34	178.12	2.41	N/A	N/A
3.12	44.41	71.04	2.52	179.21	2.45	N/A	N/A
3.17	44.01	70.40	2.57	181.25	2.46	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
3.27	44.20	70.69	2.59	183.31	2.46	N/A	N/A
3.30	44.82	71.68	2.62	187.52	2.47	N/A	N/A
3.37	45.96	73.51	2.60	191.41	2.47	N/A	N/A
3.42	47.81	76.48	2.58	197.08	2.46	N/A	N/A
3.51	49.51	79.19	2.54	201.34	2.45	N/A	N/A
3.55	50.52	80.81	2.56	206.97	2.46	N/A	N/A
3.64	51.42	82.25	2.55	209.84	2.46	N/A	N/A
3.69	52.55	84.05	2.51	211.21	2.45	N/A	N/A
3.77	51.56	82.45	2.55	210.37	2.46	N/A	N/A
3.83	48.80	78.02	2.67	208.35	2.48	N/A	N/A
3.91	45.46	72.64	2.84	206.62	2.51	N/A	N/A
3.95	44.38	70.90	2.88	204.15	2.52	N/A	N/A
4.01	44.89	71.71	2.80	201.01	2.51	N/A	N/A
4.10	44.79	71.55	2.78	198.95	2.50	N/A	N/A
4.20	43.74	69.85	2.84	198.54	2.51	N/A	N/A
4.25	42.02	67.09	2.98	199.98	2.54	N/A	N/A
4.30	41.03	65.50	3.07	200.80	2.56	N/A	N/A
4.35	39.98	63.80	3.15	201.22	2.57	N/A	N/A
4.41	38.99	62.21	3.23	201.06	2.58	N/A	N/A
4.47	37.46	59.74	3.37	201.12	2.61	N/A	N/A
4.57	35.93	57.27	3.52	201.59	2.63	N/A	N/A
4.66	34.46	54.90	3.68	202.07	2.66	N/A	N/A
4.70	33.28	53.00	3.79	201.09	2.67	N/A	N/A
4.75	32.73	52.12	3.80	198.10	2.67	N/A	N/A
4.83	32.16	51.18	3.81	195.19	2.67	N/A	N/A
4.87	31.87	50.71	3.80	192.93	2.67	N/A	N/A
4.92	31.65	50.35	3.79	190.88	2.67	N/A	N/A
5.04	31.68	50.40	3.67	185.16	2.65	N/A	N/A
5.08	32.16	51.17	3.48	178.16	2.62	N/A	N/A
5.14	32.73	52.06	3.32	173.00	2.60	N/A	N/A
5.20	33.44	53.21	3.23	171.98	2.58	N/A	N/A
5.27	33.68	53.59	3.22	172.53	2.58	N/A	N/A
5.33	33.47	53.24	3.24	172.26	2.58	N/A	N/A
5.39	32.04	50.94	3.40	173.30	2.61	N/A	N/A
5.45	32.98	52.44	3.28	172.16	2.59	N/A	N/A
5.53	36.96	58.84	2.92	171.98	2.53	N/A	N/A
5.63	42.55	67.79	2.53	171.38	2.45	N/A	N/A
5.68	45.45	72.45	2.39	173.50	2.42	N/A	N/A
5.77	43.19	68.82	2.55	175.17	2.45	N/A	N/A
5.80	41.07	65.40	2.69	175.81	2.48	N/A	N/A
5.85	37.88	60.27	2.90	174.93	2.53	N/A	N/A
5.94	36.51	58.06	2.97	172.52	2.54	N/A	N/A
5.98	32.87	52.22	3.26	170.03	2.59	N/A	N/A
6.06	29.72	47.15	3.56	168.05	2.64	N/A	N/A
6.10	25.80	40.85	4.03	164.74	2.71	N/A	N/A
6.20	22.43	35.41	4.60	162.77	2.78	N/A	N/A
6.29	19.82	31.21	5.17	161.26	2.84	N/A	N/A
6.33	18.80	29.57	5.46	161.50	2.88	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
6.39	18.73	29.46	5.43	159.87	2.87	N/A	N/A
6.46	20.23	31.86	4.90	156.00	2.81	N/A	N/A
6.51	23.64	37.33	3.95	147.41	2.69	N/A	N/A
6.59	29.31	46.43	2.96	137.56	2.54	N/A	N/A
6.64	37.88	60.20	2.02	121.65	2.32	N/A	N/A
6.77	47.12	75.03	1.50	112.48	2.12	N/A	N/A
6.82	56.77	90.53	1.22	110.14	1.93	N/A	N/A
6.90	64.00	100.95	1.12	113.48	1.82	N/A	N/A
6.95	68.78	106.95	1.10	117.70	1.79	N/A	N/A
7.03	70.31	109.62	1.12	122.77	1.82	N/A	N/A
7.08	69.65	109.77	1.16	126.79	1.86	N/A	N/A
7.10	69.08	110.07	1.19	130.69	1.90	N/A	N/A
7.16	68.41	109.20	1.23	133.80	1.94	N/A	N/A
7.27	68.81	109.83	1.26	138.56	1.97	N/A	N/A
7.31	69.13	110.34	1.29	142.68	1.99	N/A	N/A
7.35	68.87	109.93	1.33	146.20	2.02	N/A	N/A
7.42	64.22	102.44	1.44	147.68	2.09	N/A	N/A
7.53	57.37	91.43	1.65	150.65	2.19	N/A	N/A
7.61	50.36	80.16	1.95	156.04	2.30	N/A	N/A
7.67	45.93	73.04	2.23	162.58	2.38	N/A	N/A
7.74	42.49	67.51	2.49	168.39	2.44	N/A	N/A
7.78	39.08	62.03	2.82	175.13	2.51	N/A	N/A
7.91	36.38	57.66	3.08	177.72	2.56	N/A	N/A
7.97	34.31	54.33	3.31	179.76	2.60	N/A	N/A
8.04	33.42	52.90	3.33	176.28	2.60	N/A	N/A
8.22	32.69	51.70	3.38	174.64	2.61	N/A	N/A
8.27	32.05	50.67	3.39	171.92	2.61	N/A	N/A
8.30	31.34	49.54	3.47	171.67	2.62	N/A	N/A
8.40	30.96	48.91	3.51	171.74	2.63	N/A	N/A
8.43	30.90	48.80	3.53	172.05	2.63	N/A	N/A
8.50	31.22	49.31	3.51	172.91	2.63	N/A	N/A
8.64	31.50	49.76	3.50	173.97	2.63	N/A	N/A
8.67	31.73	50.11	3.49	174.88	2.63	N/A	N/A
8.73	31.95	50.47	3.46	174.69	2.62	N/A	N/A
8.78	32.14	50.77	3.42	173.63	2.62	N/A	N/A
8.88	32.30	51.01	3.40	173.23	2.61	N/A	N/A
8.92	32.33	51.06	3.42	174.65	2.62	N/A	N/A
9.01	32.27	50.95	3.49	177.80	2.63	N/A	N/A
9.07	32.04	50.58	3.57	180.48	2.64	N/A	N/A
9.13	31.83	50.24	3.62	182.07	2.65	N/A	N/A
9.21	31.67	49.98	3.66	182.98	2.65	N/A	N/A
9.26	31.64	49.92	3.70	184.48	2.66	N/A	N/A
9.35	31.72	50.04	3.72	185.95	2.66	N/A	N/A
9.39	31.75	50.09	3.75	187.75	2.66	N/A	N/A
9.45	31.75	50.08	3.78	189.11	2.67	N/A	N/A
9.52	31.82	50.04	3.79	189.47	2.67	N/A	N/A
9.66	32.13	49.87	3.76	187.73	2.67	N/A	N/A
9.77	32.45	49.78	3.73	185.84	2.66	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
9.83	32.54	49.63	3.72	184.62	2.66	N/A	N/A
9.89	32.41	49.19	3.73	183.61	2.66	N/A	N/A
9.97	32.25	48.61	3.75	182.23	2.66	N/A	N/A
10.01	32.06	48.15	3.76	180.95	2.67	N/A	N/A
10.09	31.81	47.43	3.78	179.05	2.67	N/A	N/A
10.14	31.52	46.80	3.79	177.22	2.67	N/A	N/A
10.19	31.68	46.79	3.74	175.19	2.66	N/A	N/A
10.45	32.09	46.32	3.74	173.18	2.66	N/A	N/A
10.50	32.80	47.10	3.70	174.22	2.66	N/A	N/A
10.58	33.28	47.49	3.71	176.32	2.66	N/A	N/A
10.63	33.79	48.06	3.73	179.38	2.66	N/A	N/A
10.76	34.10	48.02	3.77	180.99	2.67	N/A	N/A
10.83	34.17	47.89	3.81	182.47	2.67	N/A	N/A
10.89	33.92	47.33	3.85	182.24	2.68	N/A	N/A
10.95	32.99	45.86	3.93	180.18	2.69	N/A	N/A
11.07	31.62	43.57	4.02	175.29	2.70	N/A	N/A
11.15	29.83	40.70	3.91	159.29	2.69	N/A	N/A
11.20	28.27	38.34	3.90	149.50	2.69	N/A	N/A
11.25	26.93	36.30	3.87	140.52	2.68	N/A	N/A
11.33	25.85	34.77	4.12	143.21	2.72	N/A	N/A
11.40	25.18	33.69	4.15	139.66	2.72	N/A	N/A
11.47	25.02	33.27	4.12	137.12	2.72	N/A	N/A
11.51	21.90	29.25	4.74	138.63	2.79	N/A	N/A
11.52	22.70	30.23	4.57	138.21	2.77	N/A	N/A
11.59	23.84	31.51	4.39	138.46	2.75	N/A	N/A
11.63	29.37	38.30	3.61	138.22	2.64	N/A	N/A
11.72	31.41	40.63	3.48	141.51	2.62	N/A	N/A
11.76	33.51	43.15	3.37	145.35	2.61	N/A	N/A
11.86	34.46	44.08	3.34	147.36	2.60	N/A	N/A
11.90	35.90	45.71	3.26	148.80	2.59	N/A	N/A
11.97	37.27	47.18	3.19	150.62	2.58	N/A	N/A
12.05	38.77	48.76	3.14	153.33	2.57	N/A	N/A
12.12	39.31	49.27	3.18	156.70	2.58	N/A	N/A
12.17	39.18	48.97	3.25	159.04	2.59	N/A	N/A
12.25	38.92	48.44	3.30	159.77	2.60	N/A	N/A
12.30	38.73	48.03	3.31	159.20	2.60	N/A	N/A
12.38	38.32	47.26	3.34	158.06	2.60	N/A	N/A
12.44	37.72	46.36	3.38	156.60	2.61	N/A	N/A
12.51	37.11	45.38	3.42	155.04	2.61	N/A	N/A
12.57	36.79	44.81	3.41	152.71	2.61	N/A	N/A
12.64	36.70	44.43	3.39	150.61	2.61	N/A	N/A
12.71	36.79	44.32	3.36	148.92	2.61	N/A	N/A
12.78	37.02	44.35	3.34	148.14	2.60	N/A	N/A
12.83	37.21	44.42	3.33	148.03	2.60	N/A	N/A
12.91	37.24	44.23	3.34	147.89	2.60	N/A	N/A
12.96	37.27	44.13	3.35	147.74	2.60	N/A	N/A
13.04	37.27	43.89	3.35	147.13	2.60	N/A	N/A
13.09	37.21	43.67	3.36	146.92	2.61	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
13.16	36.95	43.18	3.41	147.02	2.61	N/A	N/A
13.22	36.63	42.66	3.45	147.16	2.62	N/A	N/A
13.27	36.38	42.25	3.47	146.53	2.62	N/A	N/A
13.35	36.09	41.67	3.49	145.22	2.63	N/A	N/A
13.41	35.61	40.95	3.50	143.40	2.63	N/A	N/A
13.49	34.82	39.84	3.55	141.53	2.64	N/A	N/A
13.55	33.96	38.71	3.60	139.26	2.64	N/A	N/A
13.62	33.19	37.67	3.65	137.31	2.65	N/A	N/A
13.67	32.56	36.82	3.68	135.67	2.66	N/A	N/A
13.75	31.98	35.99	3.74	134.56	2.66	N/A	N/A
13.80	31.38	35.20	3.80	133.72	2.67	N/A	N/A
13.88	30.87	34.42	3.77	129.83	2.67	N/A	N/A
13.93	30.42	33.73	3.60	121.44	2.64	N/A	N/A
13.99	30.11	33.17	3.45	114.51	2.62	N/A	N/A
14.06	29.72	32.59	3.42	111.61	2.62	N/A	N/A
14.13	29.44	32.18	3.54	113.82	2.63	N/A	N/A
14.19	29.15	31.76	3.62	115.04	2.65	N/A	N/A
14.26	28.98	31.47	3.71	116.68	2.66	N/A	N/A
14.32	28.72	31.09	3.83	118.96	2.68	N/A	N/A
14.40	28.63	30.86	3.92	121.07	2.69	N/A	N/A
14.51	28.58	30.62	4.00	122.36	2.70	N/A	N/A
14.55	28.80	30.79	4.00	123.17	2.70	N/A	N/A
14.59	29.02	30.95	4.00	123.72	2.70	N/A	N/A
14.64	29.34	31.21	3.99	124.44	2.70	N/A	N/A
14.73	29.73	31.45	3.98	125.07	2.70	N/A	N/A
14.77	32.88	34.73	3.70	128.55	2.66	N/A	N/A
14.94	36.67	38.36	3.46	132.69	2.62	N/A	N/A
14.99	40.68	42.46	3.25	138.05	2.59	N/A	N/A
15.02	42.09	43.86	3.23	141.82	2.58	N/A	N/A
15.07	42.98	44.70	3.24	144.82	2.59	N/A	N/A
15.11	43.65	45.30	3.25	147.18	2.59	N/A	N/A
15.16	44.58	46.14	3.24	149.37	2.59	N/A	N/A
15.25	44.99	46.33	3.25	150.45	2.59	N/A	N/A
15.32	44.26	45.40	3.33	151.34	2.60	N/A	N/A
15.38	41.96	42.91	3.52	151.19	2.63	N/A	N/A
15.44	38.94	39.66	3.75	148.73	2.67	N/A	N/A
15.52	35.59	36.05	4.02	144.87	2.70	N/A	N/A
15.56	32.34	32.62	4.27	139.35	2.74	N/A	N/A
15.63	29.43	29.54	4.61	136.31	2.78	N/A	N/A
15.70	27.78	27.73	4.81	133.43	2.80	N/A	N/A
15.77	26.21	26.02	5.09	132.55	2.84	N/A	N/A
15.82	24.72	24.43	5.40	131.88	2.87	N/A	N/A
15.88	23.35	22.95	5.75	131.91	2.90	N/A	N/A
15.98	23.06	22.53	5.84	131.63	2.91	N/A	N/A
16.02	24.01	23.43	5.60	131.24	2.89	N/A	N/A
16.08	26.18	25.50	5.12	130.60	2.84	N/A	N/A
16.14	29.43	28.63	4.58	131.10	2.78	N/A	N/A
16.26	32.46	31.43	4.20	131.96	2.73	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
16.30	34.16	33.03	4.05	133.66	2.71	N/A	N/A
16.34	35.43	34.21	3.95	135.28	2.69	N/A	N/A
16.44	36.23	34.80	3.94	137.29	2.69	N/A	N/A
16.49	36.64	35.11	3.97	139.40	2.70	N/A	N/A
16.54	35.62	34.03	4.09	139.25	2.71	N/A	N/A
16.78	34.60	32.58	4.22	137.48	2.73	N/A	N/A
16.84	33.83	31.74	4.29	136.17	2.74	N/A	N/A
16.89	33.42	31.25	4.37	136.64	2.75	N/A	N/A
16.97	32.37	30.10	4.55	136.98	2.77	N/A	N/A
17.16	31.57	29.04	4.71	136.66	2.79	N/A	N/A
17.20	31.41	28.81	4.74	136.46	2.79	N/A	N/A
17.28	31.83	29.08	4.67	135.93	2.79	N/A	N/A
17.33	32.18	29.32	4.61	135.03	2.78	N/A	N/A
17.39	32.27	29.32	4.56	133.63	2.77	N/A	N/A
17.46	32.21	29.15	4.54	132.36	2.77	N/A	N/A
17.52	31.83	28.70	4.58	131.40	2.78	N/A	N/A
17.59	31.35	28.13	4.65	130.74	2.78	N/A	N/A
17.64	31.48	28.18	4.59	129.41	2.78	N/A	N/A
17.77	32.08	28.54	4.47	127.72	2.76	N/A	N/A
17.82	32.94	29.26	4.34	127.02	2.75	N/A	N/A
17.90	33.61	29.75	4.31	128.22	2.74	N/A	N/A
17.95	33.64	29.69	4.45	132.13	2.76	N/A	N/A
18.03	32.56	28.56	4.76	135.87	2.80	N/A	N/A
18.08	31.09	27.14	5.08	137.77	2.83	N/A	N/A
18.16	30.04	26.06	5.22	136.15	2.85	N/A	N/A
18.21	29.40	25.42	5.22	132.70	2.85	N/A	N/A
18.28	28.44	24.47	5.22	127.77	2.85	N/A	N/A
18.35	26.91	23.00	5.35	123.12	2.86	N/A	N/A
18.39	25.18	21.41	5.51	118.02	2.88	N/A	N/A
18.47	23.85	20.12	5.67	114.05	2.90	N/A	N/A
18.52	22.86	19.19	5.74	110.13	2.90	N/A	N/A
18.58	22.32	18.66	5.67	105.80	2.90	N/A	N/A
18.66	21.78	18.11	5.71	103.42	2.90	N/A	N/A
18.70	21.27	17.61	5.71	100.55	2.90	N/A	N/A
18.79	20.72	17.05	5.97	101.73	2.93	N/A	N/A
18.83	20.12	16.47	6.33	104.23	2.96	N/A	N/A
18.91	19.55	15.91	6.86	109.06	3.01	N/A	N/A
18.97	17.60	14.18	7.90	112.04	3.10	N/A	N/A
18.98	19.29	15.62	7.28	113.67	3.05	N/A	N/A
19.03	21.04	17.09	6.64	113.50	2.99	N/A	N/A
19.12	23.56	19.19	5.78	110.88	2.91	N/A	N/A
19.22	22.42	18.11	5.91	107.03	2.92	N/A	N/A
19.26	21.05	16.89	6.07	102.55	2.94	N/A	N/A
19.31	19.96	15.92	6.18	98.41	2.95	N/A	N/A
19.37	19.07	15.12	6.29	95.06	2.96	N/A	N/A
19.43	18.58	14.65	6.34	92.80	2.96	N/A	N/A
19.49	18.55	14.58	6.32	92.09	2.96	N/A	N/A
19.58	18.93	14.83	6.25	92.73	2.95	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
19.62	20.31	15.96	6.12	97.69	2.94	N/A	N/A
19.73	22.32	17.56	5.90	103.67	2.92	N/A	N/A
19.79	24.84	19.62	5.64	110.58	2.89	N/A	N/A
19.83	29.97	23.91	5.03	120.33	2.83	N/A	N/A
19.93	37.36	30.04	4.31	129.34	2.74	N/A	N/A
19.97	47.17	38.32	3.60	137.80	2.64	N/A	N/A
20.02	59.92	49.15	2.92	143.71	2.53	0.73	0.73
20.11	68.71	56.45	2.67	150.58	2.48	0.75	0.75
20.15	84.99	70.33	2.25	158.24	2.38	0.78	0.78
20.24	100.41	83.32	1.98	164.78	2.31	0.80	0.80
20.30	120.67	100.66	1.72	173.56	2.22	0.83	0.83
20.35	137.04	114.61	1.59	182.71	2.17	0.85	0.85
20.44	149.72	125.15	1.52	190.20	2.13	0.86	0.86
20.49	159.06	133.01	1.47	195.55	2.11	0.87	0.87
20.54	158.99	132.70	1.47	194.93	2.11	0.87	0.87
20.64	154.60	128.43	1.49	191.94	2.12	0.86	0.86
20.68	145.11	120.04	1.56	186.78	2.15	0.85	0.85
20.77	135.90	111.72	1.63	181.97	2.18	0.84	0.84
20.83	126.66	103.62	1.71	176.86	2.22	0.83	0.83
20.90	119.52	97.26	1.78	172.80	2.24	0.82	0.82
20.95	111.30	90.11	1.88	168.98	2.28	0.81	0.81
21.02	101.93	81.92	2.03	166.05	2.32	0.80	0.80
21.08	86.28	68.58	2.36	161.69	2.41	0.78	0.78
21.27	72.71	56.80	2.75	156.12	2.50	0.75	0.75
21.34	62.36	48.20	3.04	146.38	2.55	0.73	0.73
21.39	61.72	47.80	2.77	132.22	2.50	0.73	0.73
21.44	63.56	49.39	2.50	123.32	2.44	0.73	0.73
21.52	66.49	51.71	2.34	121.23	2.41	0.74	0.74
21.58	68.88	53.45	2.37	126.48	2.41	0.74	0.74
21.65	67.13	51.78	2.50	129.64	2.44	0.74	0.74
21.67	64.42	49.42	2.71	134.02	2.49	0.73	0.73
21.79	58.10	43.95	3.13	137.59	2.57	0.72	0.72
21.80	54.46	40.96	3.39	138.70	2.61	2.84	2.84
21.88	49.33	36.71	3.73	136.76	2.66	2.55	2.55
21.92	42.54	31.28	4.19	130.96	2.73	2.19	2.19
22.06	34.47	24.76	5.06	125.17	2.83	1.75	1.75
22.15	28.10	19.73	6.00	118.36	2.93	1.41	1.41
22.19	27.27	19.08	5.98	114.13	2.93	1.36	1.36
22.27	28.35	19.88	5.60	111.23	2.89	1.41	1.41
22.33	28.95	20.32	5.36	108.92	2.86	1.44	1.44
22.41	28.54	19.92	5.43	108.14	2.87	1.41	1.41
22.47	30.06	21.06	5.14	108.21	2.84	1.49	1.49
22.57	32.45	22.81	4.78	108.98	2.80	1.60	1.60
22.59	35.04	24.75	4.54	112.38	2.77	1.74	1.74
22.71	35.19	24.69	4.70	116.06	2.79	1.73	1.73
22.77	34.72	24.21	4.97	120.25	2.82	1.71	1.71
22.80	34.05	23.62	5.19	122.65	2.85	1.67	1.67
22.85	32.46	22.32	5.58	124.50	2.89	1.58	1.58

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
22.94	30.70	20.88	5.97	124.64	2.93	1.49	1.49
23.01	29.02	19.57	6.29	123.20	2.96	1.40	1.40
23.06	28.06	18.85	6.38	120.28	2.97	1.35	1.35
23.12	26.59	17.76	6.53	115.92	2.98	1.27	1.27
23.23	25.10	16.63	6.67	110.94	2.99	1.19	1.19
23.29	23.50	15.47	6.85	105.90	3.01	1.10	1.10
23.34	22.42	14.67	6.98	102.46	3.02	1.05	1.05
23.38	21.53	14.03	7.08	99.31	3.03	1.00	1.00
23.44	20.92	13.57	7.08	96.09	3.03	0.97	0.97
23.51	20.45	13.19	6.96	91.80	3.02	0.94	0.94
23.56	19.81	12.72	6.36	80.95	2.96	0.91	0.91
23.66	19.23	12.34	5.79	71.48	2.91	0.88	0.88
23.72	18.76	12.00	5.65	67.78	2.89	0.28	0.85
23.82	18.66	11.80	6.52	76.91	2.98	0.84	0.84
23.89	18.25	11.48	7.52	86.39	3.07	0.82	0.82
23.92	19.05	12.01	7.88	94.59	3.10	0.86	0.86
23.98	20.83	13.20	7.82	103.22	3.09	0.94	0.94
24.04	24.75	15.84	7.14	113.07	3.03	1.13	1.13
24.11	28.63	18.45	6.55	120.81	2.98	1.32	1.32
24.15	32.62	21.20	5.98	126.69	2.93	1.51	1.51
24.22	35.86	23.49	5.58	131.20	2.89	1.66	1.66
24.31	38.37	25.24	5.34	134.76	2.86	1.78	1.78
24.35	44.65	29.84	4.58	136.57	2.78	2.08	2.08
24.44	50.47	34.16	3.95	134.87	2.69	2.36	2.36
24.48	47.09	31.73	4.02	127.60	2.70	2.20	2.20
24.67	37.69	24.77	4.80	118.82	2.80	1.74	1.74
24.70	26.15	16.53	6.55	108.34	2.98	1.18	1.18
24.75	22.63	14.16	7.30	103.31	3.05	1.01	1.01
24.79	19.76	12.22	7.98	97.48	3.10	0.87	0.87
24.88	18.35	11.26	8.24	92.74	3.12	0.80	0.80
24.91	17.88	10.93	8.14	89.04	3.12	0.78	0.78
24.97	17.81	10.88	8.02	87.19	3.11	0.78	0.78
25.01	18.07	11.04	7.81	86.24	3.09	0.79	0.79
25.08	18.20	11.11	7.78	86.40	3.09	0.79	0.79
25.15	18.39	11.22	7.82	87.71	3.09	0.80	0.80
25.24	18.29	11.13	7.99	88.88	3.10	0.80	0.80
25.28	18.42	11.21	7.93	88.84	3.10	0.80	0.80
25.36	18.67	11.36	7.51	85.27	3.07	0.81	0.81
25.42	19.37	11.80	6.79	80.14	3.00	0.84	0.84
25.50	19.95	12.17	6.24	75.97	2.95	0.87	0.87
25.57	20.49	12.54	6.02	75.55	2.93	0.89	0.89
25.63	20.02	12.18	6.55	79.77	2.98	0.87	0.87
25.77	19.54	11.83	7.06	83.54	3.03	0.84	0.84
25.78	19.06	11.51	7.61	87.56	3.07	0.82	0.82
25.82	20.46	12.42	7.24	89.93	3.04	0.89	0.89
25.88	22.56	13.79	6.72	92.62	3.00	0.99	0.99
25.93	25.18	15.52	6.09	94.56	2.94	1.11	1.11
26.00	26.61	16.51	5.80	95.74	2.91	1.17	1.17

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
26.13	27.19	16.86	5.72	96.35	2.90	1.20	1.20
26.18	27.19	16.83	5.75	96.85	2.91	1.19	1.19
26.20	27.09	16.75	5.83	97.60	2.91	1.19	1.19
26.27	27.09	16.69	5.97	99.57	2.93	1.19	1.19
26.35	27.95	17.22	5.99	103.15	2.93	1.23	1.23
26.45	29.19	18.01	5.91	106.41	2.92	1.28	1.28
26.48	30.72	19.05	5.71	108.87	2.90	1.35	1.35
26.53	31.74	19.71	5.66	111.68	2.90	1.40	1.40
26.61	32.47	20.11	5.83	117.22	2.91	1.43	1.43
26.71	33.01	20.35	6.06	123.29	2.94	1.45	1.45
26.75	33.49	20.59	6.28	129.31	2.96	1.47	1.47
26.79	35.08	21.60	6.32	136.59	2.96	1.54	1.54
26.88	37.57	23.18	6.19	143.50	2.95	1.65	1.65
26.91	42.32	26.41	5.70	150.63	2.90	1.87	1.87
26.98	49.10	31.09	5.04	156.57	2.83	2.18	2.18
27.11	55.82	35.71	4.53	161.61	2.77	2.48	2.48
27.15	62.04	40.06	4.14	165.82	2.72	2.77	2.77
27.24	65.32	42.31	3.96	167.48	2.69	2.91	2.91
27.28	68.06	44.22	3.82	169.03	2.68	3.03	3.03
27.33	69.59	45.57	3.46	157.46	2.62	3.10	3.10
27.47	70.67	46.53	3.14	145.95	2.57	0.73	0.73
27.51	71.18	47.19	2.87	135.28	2.52	0.73	0.73
27.55	70.57	46.58	2.99	139.41	2.54	0.73	0.73
27.59	69.55	45.67	3.15	143.72	2.57	0.72	0.72
27.63	65.34	42.45	3.48	147.81	2.62	2.89	2.89
27.69	62.89	40.57	3.69	149.69	2.66	2.77	2.77
27.79	58.65	37.43	4.00	149.58	2.70	2.57	2.57
27.87	56.42	35.82	4.12	147.74	2.72	2.47	2.47
27.90	50.56	31.65	4.61	146.08	2.78	2.20	2.20
27.97	45.37	27.98	5.15	144.15	2.84	1.97	1.97
28.02	40.78	24.80	5.68	140.78	2.90	1.76	1.76
28.10	37.47	22.55	5.97	134.69	2.93	1.60	1.60
28.17	35.17	21.06	6.02	126.75	2.93	1.50	1.50
28.23	33.07	19.70	6.05	119.16	2.94	1.40	1.40
28.28	31.70	18.78	6.19	116.31	2.95	1.34	1.34
28.35	31.25	18.47	6.26	115.61	2.96	1.32	1.32
28.45	32.31	19.11	6.13	117.08	2.94	1.36	1.36
28.49	35.46	21.24	5.61	119.10	2.89	1.50	1.50
28.56	41.55	25.38	4.82	122.33	2.80	1.77	1.77
28.62	47.18	29.24	4.30	125.81	2.74	2.02	2.02
28.72	49.89	31.02	4.15	128.66	2.72	2.14	2.14
28.76	47.37	29.15	4.52	131.79	2.77	2.02	2.02
28.83	43.58	26.44	5.03	132.93	2.83	1.85	1.85
28.90	40.49	24.31	5.37	130.47	2.87	1.71	1.71
28.98	39.18	23.43	5.40	126.44	2.87	1.65	1.65
29.01	37.65	22.47	5.36	120.56	2.87	1.58	1.58
29.10	35.96	21.35	5.44	116.21	2.87	1.51	1.51
29.14	34.28	20.27	5.47	110.84	2.88	1.43	1.43

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
29.25	33.48	19.75	5.43	107.19	2.87	1.39	1.39
29.29	33.16	19.58	5.30	103.67	2.86	1.38	1.38
29.38	33.13	19.56	5.18	101.33	2.85	1.37	1.37
29.45	33.06	19.54	5.05	98.76	2.83	1.37	1.37
29.51	32.71	19.38	4.85	94.00	2.81	1.35	1.35
29.56	31.98	18.94	4.73	89.54	2.79	1.32	1.32
29.64	30.17	17.74	4.84	85.94	2.81	1.24	1.24
29.87	26.85	15.39	5.57	85.74	2.89	1.09	1.09
29.89	25.10	14.20	6.03	85.68	2.93	1.01	1.01
29.95	24.62	13.86	6.16	85.38	2.95	0.99	0.99
30.03	25.74	14.59	5.88	85.72	2.92	1.04	1.04
30.10	25.61	14.47	5.96	86.16	2.93	1.03	1.03
30.12	25.45	14.34	6.04	86.63	2.93	1.02	1.02
30.21	25.71	14.49	5.97	86.52	2.93	1.03	1.03
30.26	26.12	14.76	5.87	86.61	2.92	1.05	1.05
30.32	27.37	15.58	5.57	86.84	2.89	1.10	1.10
30.39	27.68	15.76	5.54	87.32	2.88	1.11	1.11
30.45	28.06	15.99	5.49	87.83	2.88	1.13	1.13
30.56	27.68	15.68	5.63	88.25	2.89	1.11	1.11
30.60	28.25	16.05	5.54	88.92	2.88	1.13	1.13
30.65	29.15	16.61	5.43	90.15	2.87	1.17	1.17
30.74	31.06	17.84	5.15	91.79	2.84	1.25	1.25
30.79	34.06	19.76	4.86	96.12	2.81	1.38	1.38
30.93	36.73	21.44	4.66	99.99	2.79	1.49	1.49
30.98	38.49	22.53	4.60	103.64	2.78	1.56	1.56
31.01	38.96	22.81	4.59	104.78	2.78	1.58	1.58
31.05	39.28	22.97	4.63	106.25	2.78	1.59	1.59
31.13	39.47	23.03	4.68	107.77	2.79	1.60	1.60
31.18	39.82	23.21	4.70	109.04	2.79	1.61	1.61
31.27	40.14	23.38	4.68	109.36	2.79	1.62	1.62
31.33	40.68	23.73	4.59	108.84	2.78	1.64	1.64
31.54	40.62	23.61	4.57	107.99	2.77	1.63	1.63
31.61	40.27	23.35	4.59	107.24	2.78	1.62	1.62
31.67	39.60	22.89	4.67	106.80	2.79	1.59	1.59
31.76	39.28	22.64	4.70	106.39	2.79	1.57	1.57
31.80	39.22	22.59	4.70	106.06	2.79	1.57	1.57
31.85	39.22	22.59	4.65	105.03	2.78	1.57	1.57
31.93	39.25	22.65	4.50	101.99	2.77	1.56	1.56
31.98	39.25	22.67	4.42	100.21	2.76	1.56	1.56
32.06	39.06	22.50	4.47	100.51	2.76	1.55	1.55
32.24	38.64	22.08	4.66	102.95	2.79	1.53	1.53
32.29	38.16	21.70	4.80	104.27	2.80	1.51	1.51
32.31	37.99	21.57	4.86	104.88	2.81	1.50	1.50
32.36	38.02	21.53	4.94	106.37	2.82	1.50	1.50
32.45	38.31	21.63	5.01	108.36	2.83	1.51	1.51
32.50	38.58	21.73	5.11	111.01	2.84	1.52	1.52
32.56	39.31	22.15	5.10	112.85	2.84	1.55	1.55
32.67	39.98	22.51	5.07	114.18	2.83	1.57	1.57

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
32.69	40.81	23.03	5.00	115.11	2.82	1.61	1.61
32.76	41.32	23.30	5.00	116.56	2.83	1.63	1.63
32.89	41.60	23.39	5.04	117.83	2.83	1.63	1.63
32.90	41.76	23.47	5.05	118.62	2.83	1.64	1.64
32.96	41.41	23.22	5.11	118.57	2.84	1.62	1.62
33.02	41.54	23.27	5.09	118.49	2.84	1.63	1.63
33.12	41.54	23.23	5.10	118.41	2.84	1.62	1.62
33.16	41.70	23.32	5.07	118.23	2.83	1.63	1.63
33.24	41.35	23.05	5.12	118.03	2.84	1.61	1.61
33.32	40.84	22.68	5.19	117.84	2.85	1.59	1.59
33.34	40.27	22.29	5.30	118.07	2.86	1.56	1.56
33.42	39.73	21.89	5.41	118.48	2.87	1.54	1.54
33.51	39.38	21.62	5.49	118.73	2.88	1.52	1.52
33.55	39.22	21.50	5.52	118.62	2.88	1.51	1.51
33.60	39.41	21.61	5.47	118.27	2.88	1.52	1.52
33.73	39.60	21.68	5.44	117.97	2.87	1.53	1.53
33.78	40.08	21.97	5.37	117.91	2.87	1.54	1.54
33.82	40.33	22.12	5.33	117.88	2.86	1.55	1.55
33.86	40.33	22.11	5.31	117.33	2.86	1.55	1.55
33.95	40.08	21.93	5.31	116.41	2.86	1.54	1.54
33.99	39.54	21.61	5.28	114.14	2.86	1.52	1.52
34.13	39.19	21.38	5.24	111.96	2.85	1.50	1.50
34.17	38.68	21.08	5.21	109.77	2.85	1.48	1.48
34.23	38.39	20.90	5.19	108.55	2.85	1.46	1.46
34.28	37.85	20.56	5.20	107.01	2.85	1.44	1.44
34.39	37.50	20.32	5.21	105.80	2.85	1.42	1.42
34.44	37.34	20.21	5.20	105.14	2.85	1.41	1.41
34.48	37.56	20.34	5.18	105.29	2.84	1.42	1.42
34.53	37.91	20.53	5.16	105.95	2.84	1.43	1.43
34.59	38.39	20.78	5.16	107.18	2.84	1.45	1.45
34.70	38.84	21.00	5.16	108.33	2.84	1.47	1.47
34.75	38.97	21.04	5.18	109.08	2.85	1.47	1.47
34.80	38.74	20.88	5.22	108.93	2.85	1.46	1.46
34.88	38.33	20.59	5.27	108.43	2.85	1.44	1.44
34.91	37.91	20.34	5.28	107.35	2.86	1.42	1.42
35.01	37.34	19.99	5.24	104.71	2.85	1.40	1.40
35.07	36.93	19.79	5.11	101.16	2.84	1.38	1.38
35.14	36.64	19.64	5.03	98.77	2.83	1.37	1.37
35.18	36.45	19.51	5.05	98.47	2.83	1.36	1.36
35.24	36.03	19.20	5.18	99.50	2.85	1.34	1.34
35.34	35.49	18.80	5.31	99.87	2.86	1.32	1.32
35.41	33.84	17.72	5.65	100.11	2.89	1.25	1.25
35.45	33.29	17.37	5.75	99.83	2.91	1.23	1.23
35.51	32.81	17.05	5.83	99.39	2.91	1.21	1.21
35.60	33.52	17.48	5.66	98.93	2.90	1.23	1.23
35.64	32.75	17.00	5.78	98.27	2.91	1.20	1.20
35.82	32.05	16.51	5.90	97.47	2.92	1.17	1.17
35.88	31.38	16.09	6.01	96.65	2.93	1.14	1.14

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
35.91	31.13	15.93	6.05	96.32	2.93	1.13	1.13
35.99	30.87	15.75	6.09	95.96	2.94	1.12	1.12
36.03	30.71	15.65	6.09	95.34	2.94	1.11	1.11
36.10	30.74	15.67	6.02	94.27	2.93	1.11	1.11
36.17	30.90	15.78	5.89	92.94	2.92	1.12	1.12
36.26	31.13	15.92	5.77	91.83	2.91	1.13	1.13
36.30	31.48	16.14	5.66	91.31	2.90	1.14	1.14
36.36	31.86	16.36	5.58	91.37	2.89	1.15	1.15
36.48	32.24	16.56	5.52	91.47	2.88	1.17	1.17
36.53	32.59	16.77	5.45	91.43	2.87	1.18	1.18
36.57	32.91	16.97	5.37	91.03	2.87	1.19	1.19
36.65	33.17	17.10	5.31	90.74	2.86	1.20	1.20
36.70	33.30	17.17	5.29	90.89	2.86	1.20	1.20
36.78	33.30	17.13	5.33	91.33	2.86	1.20	1.20
36.83	33.27	17.08	5.37	91.80	2.87	1.20	1.20
36.88	33.20	17.02	5.42	92.23	2.87	1.19	1.19
36.96	33.20	16.98	5.45	92.57	2.87	1.19	1.19
37.01	33.20	16.95	5.48	92.89	2.88	1.19	1.19
37.10	33.27	16.96	5.48	92.91	2.88	1.19	1.19
37.14	33.65	17.19	5.39	92.63	2.87	1.21	1.21
37.23	34.12	17.48	5.27	92.07	2.85	1.22	1.22
37.28	35.01	18.03	5.08	91.53	2.83	1.26	1.26
37.38	35.75	18.47	4.94	91.22	2.82	1.28	1.28
37.42	36.48	18.91	4.83	91.36	2.81	1.31	1.31
37.47	36.74	19.02	4.86	92.48	2.81	1.32	1.32
37.58	36.77	19.01	4.85	92.19	2.81	1.32	1.32
37.63	36.51	18.90	4.76	89.96	2.80	1.31	1.31
37.67	35.78	18.51	4.71	87.13	2.79	1.28	1.28
37.76	34.73	17.84	4.83	86.12	2.80	1.23	1.23
37.81	33.48	17.03	5.11	86.96	2.84	1.19	1.19
37.87	32.02	16.09	5.43	87.36	2.87	1.13	1.13
37.97	29.34	14.41	6.04	87.10	2.93	1.03	1.03
37.99	27.88	13.58	6.39	86.76	2.97	0.97	0.97
38.07	27.14	13.17	6.54	86.15	2.98	0.94	0.94
38.16	27.94	13.57	6.28	85.29	2.96	0.97	0.97
38.21	28.01	13.59	6.23	84.66	2.95	0.97	0.97
38.28	28.14	13.64	6.21	84.69	2.95	0.97	0.97
38.33	28.39	13.78	6.19	85.32	2.95	0.98	0.98
38.44	28.61	13.87	6.20	85.99	2.95	0.99	0.99
38.47	28.87	14.00	6.18	86.49	2.95	1.00	1.00
38.60	28.71	13.87	6.25	86.63	2.95	0.99	0.99
38.64	28.42	13.71	6.35	87.01	2.96	0.98	0.98
38.68	28.09	13.53	6.46	87.41	2.97	0.97	0.97
38.72	27.80	13.37	6.60	88.19	2.99	0.95	0.95
38.82	27.90	13.40	6.66	89.23	2.99	0.96	0.96
38.91	28.07	13.47	6.71	90.37	3.00	0.96	0.96
38.95	28.74	13.81	6.63	91.48	2.99	0.99	0.99
38.99	31.10	15.03	6.26	94.03	2.95	1.07	1.07

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
39.17	33.55	16.38	5.90	96.64	2.92	1.16	1.16
39.20	36.04	17.81	5.58	99.38	2.89	1.25	1.25
39.23	36.64	18.12	5.57	100.93	2.89	1.28	1.28
39.27	37.12	18.35	5.61	102.87	2.89	1.29	1.29
39.31	37.66	18.60	5.65	105.14	2.90	1.31	1.31
39.40	38.05	18.76	5.69	106.81	2.90	1.32	1.32
39.44	38.36	18.91	5.70	107.74	2.90	1.33	1.33
39.53	38.62	19.03	5.66	107.64	2.90	1.34	1.34
39.57	39.16	19.36	5.53	107.13	2.88	1.36	1.36
39.66	39.89	19.78	5.39	106.69	2.87	1.39	1.39
39.70	40.59	20.20	5.27	106.46	2.85	1.41	1.41
39.79	41.23	20.55	5.18	106.37	2.84	1.43	1.43
39.85	41.55	20.73	5.13	106.27	2.84	1.44	1.44
39.90	41.49	20.68	5.13	106.06	2.84	1.44	1.44
39.97	41.04	20.39	5.19	105.76	2.85	1.42	1.42
40.07	40.78	20.20	5.22	105.39	2.85	1.41	1.41
40.13	41.07	20.36	5.16	105.10	2.84	1.42	1.42
40.18	41.01	20.32	5.14	104.40	2.84	1.41	1.41
40.28	40.53	20.13	4.95	99.74	2.82	1.39	1.39
40.37	39.64	19.67	4.90	96.34	2.81	1.36	1.36
40.42	39.10	19.40	4.84	93.86	2.81	1.34	1.34
40.50	38.59	19.00	5.03	95.66	2.83	1.32	1.32
40.54	37.66	18.43	5.18	95.50	2.85	1.28	1.28
40.68	36.77	17.87	5.30	94.79	2.86	1.25	1.25
40.68	36.18	17.54	5.35	93.89	2.86	1.23	1.23
40.72	35.86	17.35	5.38	93.32	2.87	1.21	1.21
40.76	35.80	17.29	5.42	93.75	2.87	1.21	1.21
40.85	35.75	17.20	5.51	94.75	2.88	1.21	1.21
40.89	35.75	17.11	5.70	97.57	2.90	1.21	1.21
40.98	35.85	17.08	5.83	99.53	2.91	1.21	1.21
41.02	35.50	16.78	6.10	102.31	2.94	1.20	1.20
41.11	35.62	16.78	6.23	104.55	2.95	1.20	1.20
41.16	38.24	18.21	5.93	108.03	2.92	1.29	1.29
41.28	41.36	19.95	5.53	110.25	2.88	1.40	1.40
41.30	44.07	21.53	5.17	111.26	2.84	1.50	1.50
41.38	44.29	21.64	5.12	110.91	2.84	1.50	1.50
41.42	41.74	20.14	5.45	109.74	2.87	1.41	1.41
41.50	38.87	18.46	5.84	107.88	2.91	1.31	1.31
41.55	35.50	16.58	6.29	104.34	2.96	1.18	1.18
41.64	34.57	16.09	6.26	100.70	2.96	1.15	1.15
41.68	33.93	15.79	6.14	96.98	2.94	1.13	1.13
41.75	33.42	15.54	6.09	94.58	2.94	1.11	1.11
41.81	32.37	14.95	6.21	92.77	2.95	1.07	1.07
41.90	30.75	14.11	6.49	91.54	2.98	1.01	1.01
41.99	29.00	13.21	6.87	90.74	3.01	0.94	0.94
42.04	27.60	12.50	7.19	89.91	3.04	0.89	0.89
42.08	26.39	11.89	7.47	88.83	3.06	0.85	0.85
42.17	25.40	11.38	7.68	87.43	3.08	0.81	0.81

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
42.22	24.73	11.04	7.79	86.03	3.09	0.79	0.79
42.26	24.25	10.79	7.85	84.69	3.09	0.77	0.77
42.35	23.87	10.59	7.89	83.50	3.10	0.76	0.76
42.39	23.26	10.28	7.96	81.84	3.10	0.73	0.73
42.54	22.66	9.95	8.05	80.16	3.11	0.71	0.71
42.58	21.89	9.57	8.20	78.43	3.12	0.68	0.68
42.62	21.42	9.32	8.29	77.27	3.13	0.67	0.67
42.67	21.27	9.25	8.29	76.63	3.13	0.66	0.66
42.72	21.37	9.29	8.15	75.69	3.12	0.66	0.66
42.83	21.40	9.28	8.07	74.89	3.11	0.66	0.66
42.88	21.57	9.36	7.93	74.26	3.10	0.67	0.67
42.92	20.84	8.99	8.09	72.76	3.11	0.64	0.64
43.02	20.04	8.59	8.29	71.16	3.13	0.61	0.61
43.10	20.59	8.84	8.13	71.90	3.12	0.63	0.63
43.20	24.44	10.72	6.96	74.65	3.02	0.77	0.77
43.27	29.19	13.09	6.08	79.54	2.94	0.93	0.93
43.33	38.36	18.26	4.69	85.62	2.79	1.25	1.25
43.40	45.82	22.44	4.13	92.68	2.72	1.51	1.51
43.45	48.81	23.96	4.15	99.48	2.72	1.62	1.62
43.51	43.59	20.67	5.03	104.00	2.83	1.43	1.43
43.52	41.04	19.12	5.54	105.91	2.88	1.34	1.34
43.61	42.12	19.73	5.35	105.52	2.86	1.38	1.38
43.65	41.07	19.15	5.42	103.77	2.87	1.34	1.34
43.74	37.69	17.23	5.90	101.70	2.92	1.22	1.22
43.78	33.71	15.14	6.50	98.40	2.98	1.08	1.08
43.87	34.16	15.34	6.20	95.12	2.95	1.10	1.10
43.92	33.26	14.94	6.05	90.46	2.94	1.06	1.06
44.05	33.10	14.91	5.87	87.56	2.92	1.06	1.06
44.08	32.72	14.73	5.81	85.62	2.91	1.04	1.04
44.13	32.31	14.49	5.89	85.40	2.92	1.03	1.03
44.18	31.67	14.12	6.02	85.00	2.93	1.00	1.00
44.26	31.23	13.86	6.10	84.54	2.94	0.99	0.99
44.31	30.88	13.66	6.15	84.07	2.95	0.97	0.97
44.39	30.72	13.54	6.20	84.03	2.95	0.97	0.97
44.44	30.33	13.35	6.34	84.65	2.96	0.95	0.95
44.53	29.73	13.04	6.56	85.54	2.98	0.93	0.93
44.62	29.00	12.67	6.81	86.25	3.01	0.90	0.90
44.66	28.39	12.36	7.00	86.55	3.02	0.88	0.88
44.69	27.85	12.10	7.14	86.44	3.04	0.86	0.86
44.75	27.24	11.80	7.31	86.25	3.05	0.84	0.84
44.84	26.51	11.43	7.48	85.52	3.06	0.82	0.82
44.91	26.03	11.18	7.56	84.53	3.07	0.80	0.80
44.95	25.40	10.87	7.64	83.05	3.08	0.78	0.78
45.03	24.79	10.57	7.71	81.51	3.08	0.75	0.75
45.11	24.35	10.34	7.75	80.16	3.09	0.74	0.74
45.16	25.72	10.99	6.70	73.64	3.00	0.78	0.78
45.27	26.64	11.51	5.89	67.77	2.92	0.22	0.82
45.32	27.08	11.93	5.22	62.21	2.85	0.25	0.83

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
45.37	25.90	11.21	5.63	63.18	2.89	0.26	0.79
45.47	25.62	11.02	5.76	63.51	2.91	0.26	0.78
45.55	24.69	10.48	6.06	63.50	2.94	0.26	0.75
45.56	25.14	10.70	6.02	64.46	2.93	0.27	0.76
45.62	26.77	11.54	5.79	66.87	2.91	0.29	0.82
45.71	29.79	13.16	5.28	69.51	2.86	0.34	0.92
45.74	32.25	14.47	5.00	72.30	2.82	1.00	1.00
45.80	34.03	15.38	4.88	75.09	2.81	1.06	1.06
45.89	35.94	16.35	4.79	78.32	2.80	1.12	1.12
45.95	37.95	17.35	4.74	82.32	2.80	1.19	1.19
46.03	39.57	18.14	4.72	85.65	2.79	1.24	1.24
46.07	41.10	18.85	4.78	90.10	2.80	1.29	1.29
46.17	42.02	19.22	4.88	93.74	2.81	1.32	1.32
46.21	42.82	19.53	5.00	97.61	2.82	1.35	1.35
46.31	43.52	19.83	5.02	99.49	2.83	1.37	1.37
46.35	45.56	21.00	4.72	99.08	2.79	1.44	1.44
46.51	47.48	22.09	4.44	98.05	2.76	1.50	1.50
46.55	49.10	23.04	4.24	97.59	2.73	1.55	1.55
46.61	49.93	23.46	4.20	98.54	2.73	1.58	1.58
46.65	50.91	24.01	4.11	98.73	2.72	1.61	1.61
46.72	50.95	24.01	4.10	98.44	2.71	1.61	1.61
46.77	47.00	21.69	4.54	98.59	2.77	1.48	1.48
46.79	44.10	20.02	4.93	98.75	2.82	1.38	1.38
46.87	42.47	19.08	5.16	98.41	2.84	1.32	1.32
46.94	44.61	20.31	4.80	97.38	2.80	1.39	1.39
47.05	45.28	20.70	4.64	96.10	2.78	1.41	1.41
47.10	45.05	20.59	4.62	95.19	2.78	1.40	1.40
47.16	43.40	19.63	4.83	94.90	2.81	1.35	1.35
47.19	40.98	18.26	5.16	94.33	2.84	1.27	1.27
47.27	38.84	17.06	5.48	93.51	2.88	1.19	1.19
47.32	37.57	16.36	5.68	92.88	2.90	1.15	1.15
47.46	36.58	15.77	5.89	92.81	2.92	1.12	1.12
47.49	36.39	15.63	5.97	93.27	2.93	1.11	1.11
47.54	36.29	15.54	6.06	94.12	2.94	1.11	1.11
47.58	37.54	16.12	6.03	97.19	2.93	1.15	1.15
47.71	38.52	16.50	6.15	101.40	2.94	1.18	1.18
47.76	39.48	16.89	6.33	106.84	2.96	1.21	1.21
47.81	41.20	17.67	6.46	114.24	2.97	1.26	1.26
47.90	44.90	19.35	6.35	122.84	2.96	1.38	1.38
47.94	51.62	22.65	5.87	132.89	2.92	1.60	1.60
47.98	62.90	28.44	5.17	146.98	2.84	1.97	1.97
48.08	75.29	34.87	4.61	160.67	2.78	2.38	2.38
48.13	87.74	41.43	4.19	173.78	2.73	2.78	2.78
48.17	96.98	46.29	3.97	183.89	2.70	3.08	3.08
48.23	106.96	51.44	3.83	196.89	2.68	3.41	3.41
48.32	115.59	55.75	3.77	210.30	2.67	3.68	3.68
48.37	122.09	59.50	3.53	210.27	2.63	3.89	3.89
48.45	124.83	61.25	3.36	205.77	2.61	3.98	3.98

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
48.50	117.47	57.33	3.43	196.75	2.62	3.73	3.73
48.69	109.06	52.21	3.77	196.91	2.67	3.45	3.45
48.74	101.29	47.76	4.09	195.34	2.71	3.19	3.19
48.77	100.52	47.36	4.09	193.77	2.71	3.17	3.17
48.85	98.77	46.39	4.13	191.51	2.72	3.10	3.10
48.91	94.98	44.28	4.28	189.30	2.74	2.98	2.98
48.99	91.48	42.28	4.45	188.04	2.76	2.86	2.86
49.03	89.12	40.98	4.55	186.48	2.77	2.78	2.78
49.12	88.13	40.43	4.56	184.49	2.77	2.75	2.75
49.16	88.93	41.00	4.41	180.90	2.75	2.77	2.77
49.25	88.35	40.74	4.36	177.62	2.75	2.75	2.75
49.30	86.54	39.86	4.35	173.27	2.75	2.69	2.69
49.38	82.71	37.82	4.47	169.23	2.76	2.56	2.56
49.43	78.98	35.88	4.58	164.51	2.78	2.44	2.44
49.49	74.27	33.41	4.78	159.57	2.80	2.29	2.29
49.56	69.24	30.75	5.04	155.04	2.83	2.12	2.12
49.61	64.78	28.41	5.32	151.04	2.86	1.98	1.98
49.68	60.09	26.87	4.56	122.64	2.77	1.83	1.83
49.79	56.17	26.26	3.33	87.47	2.60	1.70	1.70
49.86	52.38	-1.00	1.00	-1.00	-1.00	N/A	N/A
49.92	50.54	-1.00	1.00	-1.00	-1.00	N/A	N/A
49.96	49.64	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.02	49.42	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.08	49.29	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.14	49.07	-1.00	1.00	-1.00	-1.00	N/A	N/A

Abbreviations

q_t:	Total cone resistance
K_c:	Cone resistance correction factor due to fines
$Q_{tn,cs}$:	Adjusted and corrected cone resistance due to fines
I_c:	Soil behavior type index
$S_{u(liq)}/\sigma'_v$:	Calculated liquefied undrained strength ratio
$S_{u(peak)}/\sigma'_v$:	Calculated peak undrained strength ratio

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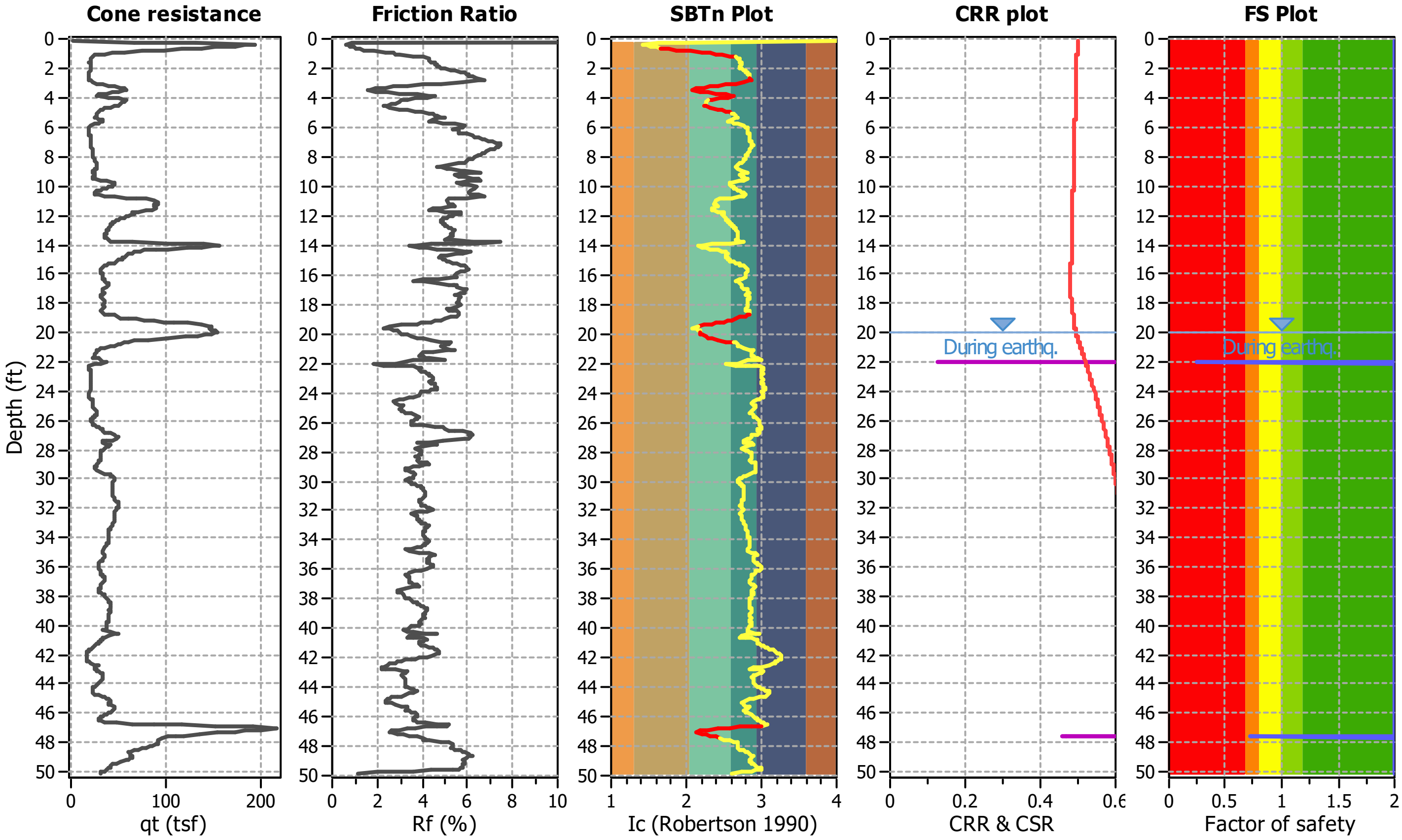
LIQUEFACTION ANALYSIS REPORT

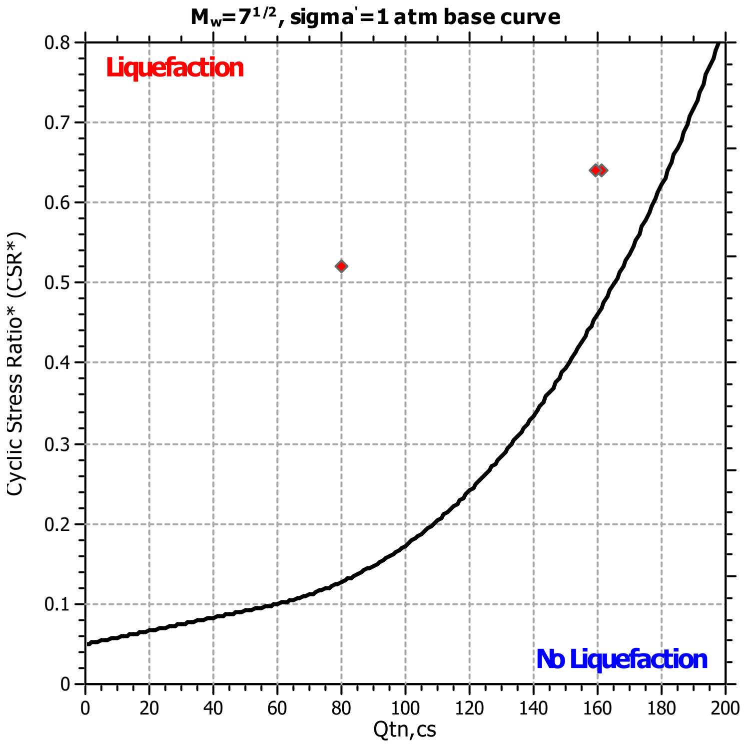
Project title : 10535.020 El Camino College Fire Training Facility **Location : Torrance, CA**

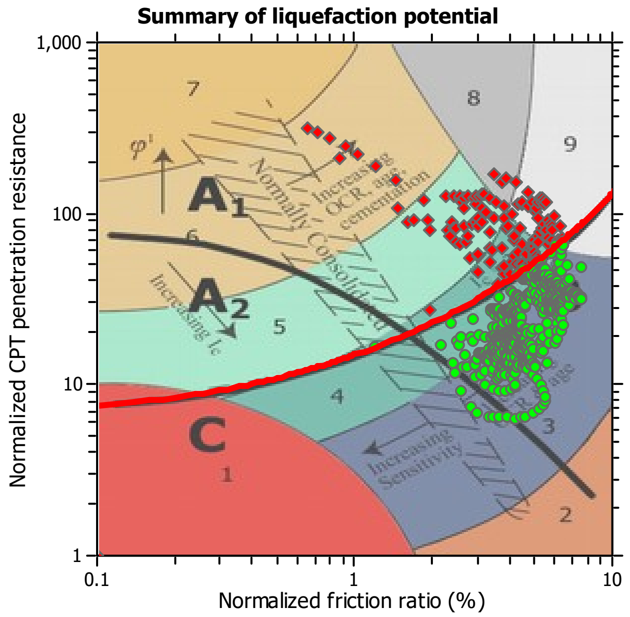
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	24.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	20.00 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:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.82	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

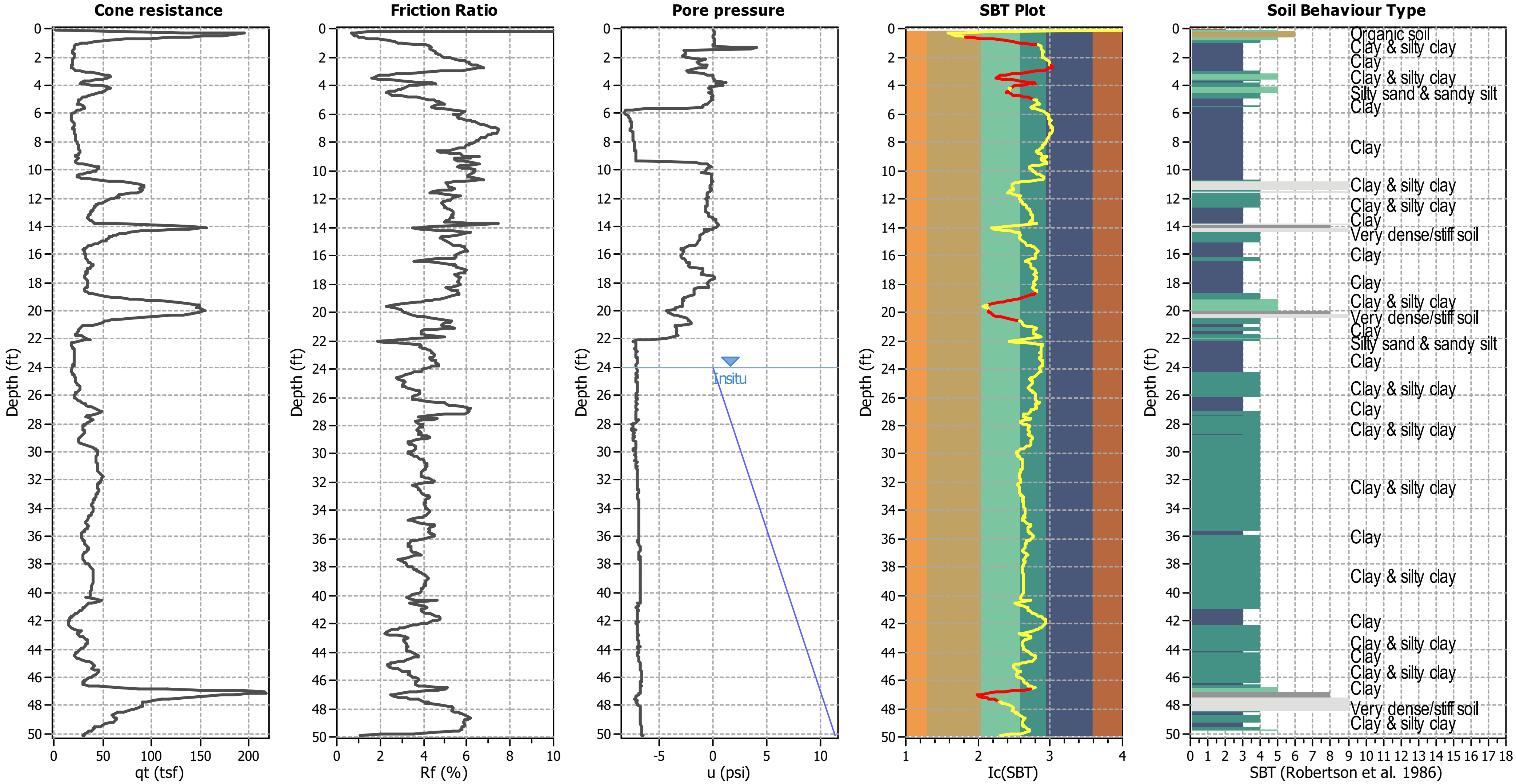






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



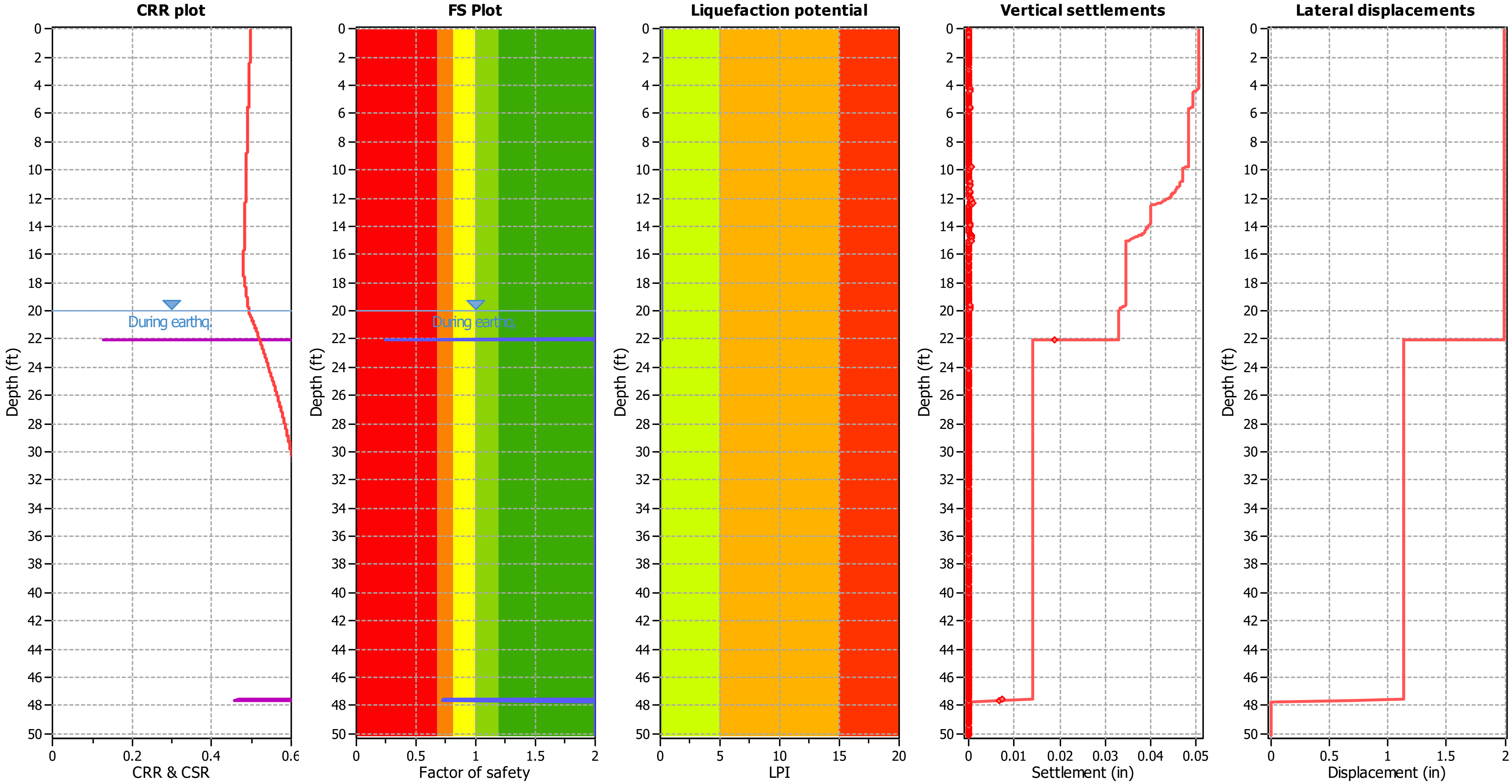
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

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

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 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

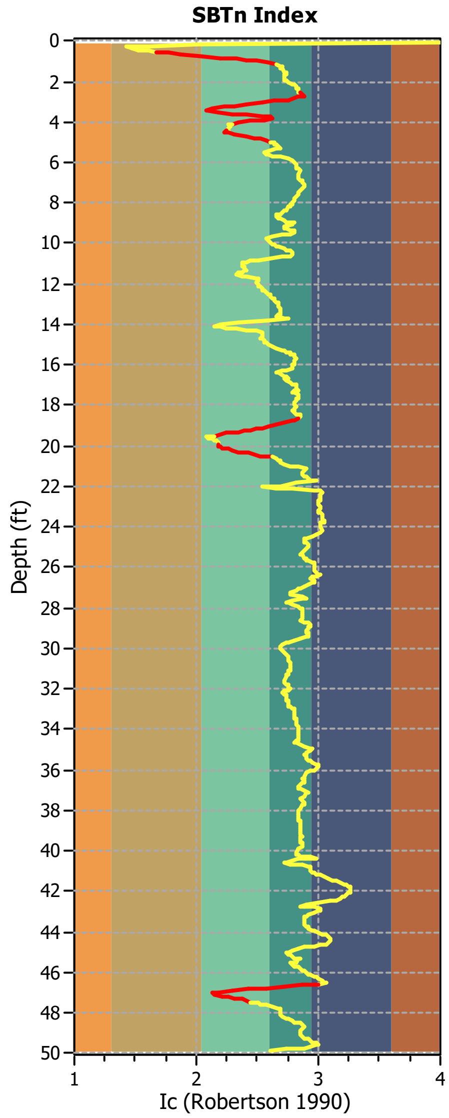
- Very high risk
- High risk
- Low risk

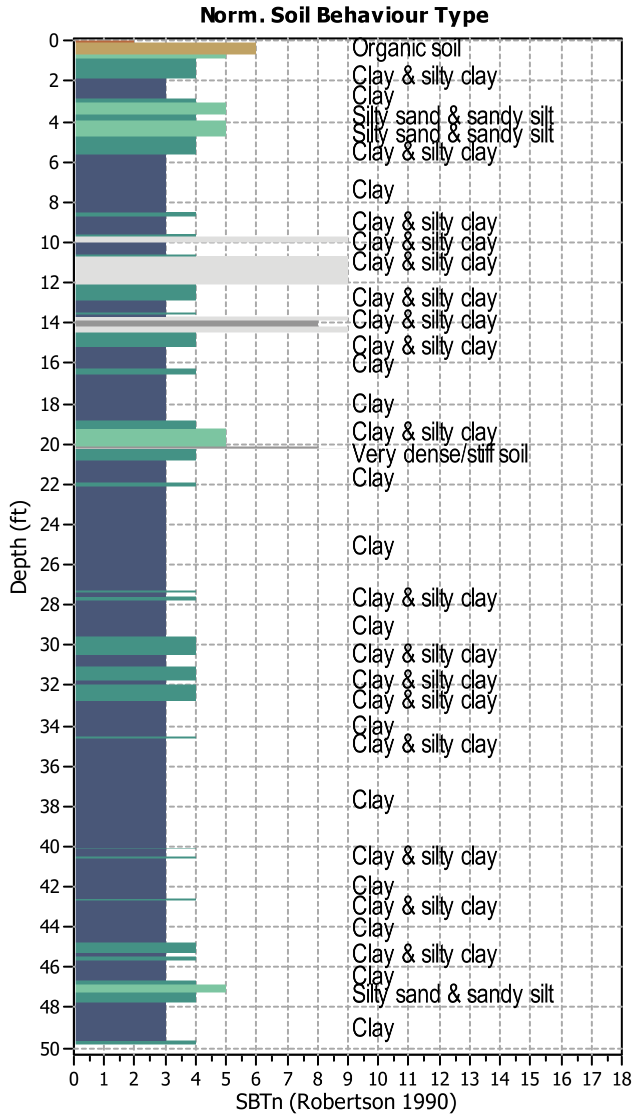
TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between 1.80 < I_c < 3.0) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.





Transition layer algorithm properties

I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0250
Minimum number of points in layer:	4

General statistics

Total points in CPT file:	745
Total points excluded:	79
Exclusion percentage:	10.60%
Number of layers detected:	9

:: 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	0.07	1.40	4.06	59.14	1.00	2.25	26.61	59.89	4.000	No	Yes	2.00
2	0.14	67.43	2.00	1.47	0.64	108.32	1.29	140.27	4.000	No	No	2.00
3	0.25	132.12	1.63	0.88	0.50	212.24	1.00	212.24	4.000	No	No	2.00
4	0.27	194.51	1.42	0.66	0.50	312.48	1.00	312.48	4.000	No	No	2.00
5	0.33	184.58	1.47	0.72	0.50	296.52	1.00	296.52	4.000	No	No	2.00
6	0.46	172.58	1.52	0.81	0.50	277.23	1.00	277.23	4.000	No	No	2.00
7	0.47	153.19	1.60	0.92	0.50	246.08	1.00	246.08	4.000	No	No	2.00
8	0.56	138.39	1.67	1.03	0.51	222.28	1.01	225.55	4.000	No	No	2.00
9	0.60	117.69	1.76	1.20	0.55	189.03	1.08	204.46	4.000	Yes	No	2.00
10	0.68	98.53	1.87	1.43	0.59	158.24	1.16	184.26	4.000	Yes	No	2.00
11	0.73	74.21	2.04	1.87	0.65	119.16	1.36	161.83	4.000	Yes	No	2.00
12	0.81	56.00	2.20	2.38	0.71	89.89	1.67	150.30	4.000	Yes	No	2.00
13	0.87	42.31	2.33	2.71	0.76	67.89	2.04	138.37	4.000	Yes	No	2.00
14	0.95	34.64	2.40	2.83	0.79	55.55	2.32	128.93	4.000	Yes	No	2.00
15	0.99	28.33	2.49	3.03	0.82	45.42	2.70	122.60	4.000	Yes	No	2.00
16	1.08	24.26	2.59	3.60	0.86	38.87	3.25	126.23	4.000	Yes	No	2.00
17	1.13	21.55	2.66	4.08	0.89	34.52	3.72	128.59	4.000	Yes	Yes	2.00
18	1.22	20.45	2.69	4.30	0.90	32.74	3.95	129.39	4.000	Yes	Yes	2.00
19	1.27	20.18	2.70	4.36	0.90	32.30	4.01	129.56	4.000	No	Yes	2.00
20	1.34	20.45	2.69	4.30	0.90	32.73	3.95	129.38	4.000	No	Yes	2.00
21	1.38	20.24	2.70	4.32	0.90	32.39	3.99	129.18	4.000	No	Yes	2.00
22	1.55	19.70	2.72	4.44	0.91	31.50	4.11	129.49	4.000	No	Yes	2.00
23	1.59	19.10	2.74	4.58	0.92	30.53	4.26	130.00	4.000	No	Yes	2.00
24	1.61	19.32	2.73	4.61	0.92	30.88	4.24	130.97	4.000	No	Yes	2.00
25	1.67	19.64	2.73	4.61	0.91	31.39	4.21	132.02	4.000	No	Yes	2.00
26	1.72	20.05	2.72	4.65	0.91	32.05	4.18	133.81	4.000	No	Yes	2.00
27	1.82	20.40	2.72	4.71	0.91	32.60	4.16	135.68	4.000	No	Yes	2.00
28	1.86	20.88	2.72	4.76	0.91	33.36	4.13	137.91	4.000	No	Yes	2.00
29	1.91	21.10	2.72	4.87	0.91	33.72	4.16	140.35	4.000	No	Yes	2.00
30	2.00	21.04	2.73	5.02	0.92	33.61	4.24	142.42	4.000	No	Yes	2.00
31	2.04	20.44	2.76	5.26	0.93	32.64	4.42	144.32	4.000	No	Yes	2.00
32	2.13	19.78	2.78	5.48	0.93	31.58	4.61	145.46	4.000	No	Yes	2.00
33	2.18	19.15	2.80	5.73	0.94	30.56	4.80	146.80	4.000	No	Yes	2.00
34	2.24	18.80	2.82	5.92	0.95	29.99	4.94	148.13	4.000	No	Yes	2.00
35	2.32	18.67	2.83	6.04	0.95	29.77	5.01	149.25	4.000	No	Yes	2.00
36	2.37	18.63	2.83	6.13	0.95	29.71	5.06	150.38	4.000	No	Yes	2.00
37	2.48	18.83	2.83	6.14	0.95	30.01	5.04	151.15	4.000	No	Yes	2.00
38	2.52	18.64	2.84	6.28	0.96	29.71	5.13	152.29	4.000	No	Yes	2.00
39	2.57	18.36	2.85	6.49	0.96	29.25	5.26	153.96	4.000	No	Yes	2.00
40	2.70	17.91	2.88	6.83	0.97	28.52	5.48	156.36	4.000	Yes	Yes	2.00
41	2.76	19.40	2.84	6.55	0.96	30.90	5.14	158.78	4.000	Yes	Yes	2.00
42	2.92	22.51	2.76	5.82	0.93	35.89	4.44	159.26	4.000	Yes	Yes	2.00
43	2.98	27.28	2.65	4.90	0.88	43.54	3.62	157.59	4.000	Yes	Yes	2.00
44	3.05	32.66	2.53	4.08	0.84	52.18	2.95	153.81	4.000	Yes	No	2.00
45	3.11	39.16	2.42	3.34	0.80	62.62	2.38	149.05	4.000	Yes	No	2.00
46	3.18	46.11	2.31	2.76	0.75	73.78	1.97	145.62	4.000	Yes	No	2.00
47	3.24	51.79	2.23	2.41	0.73	82.89	1.75	144.68	4.000	Yes	No	2.00
48	3.29	56.53	2.14	1.94	0.69	90.52	1.52	137.93	4.000	Yes	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	3.41	57.72	2.09	1.69	0.67	92.40	1.43	132.30	4.000	Yes	No	2.00
50	3.48	55.68	2.08	1.59	0.67	89.13	1.42	126.80	4.000	Yes	No	2.00
51	3.54	49.57	2.18	1.95	0.71	79.30	1.62	128.13	4.000	Yes	No	2.00
52	3.60	42.76	2.30	2.46	0.75	68.35	1.93	132.17	4.000	Yes	No	2.00
53	3.67	36.71	2.41	3.02	0.79	58.62	2.34	136.98	4.000	Yes	No	2.00
54	3.72	30.63	2.53	3.81	0.84	48.86	2.94	143.71	4.000	Yes	No	2.00
55	3.76	27.64	2.61	4.37	0.87	44.04	3.37	148.40	4.000	Yes	Yes	2.00
56	3.84	27.10	2.63	4.58	0.88	43.17	3.50	151.16	4.000	Yes	Yes	2.00
57	3.89	31.78	2.55	4.22	0.85	50.68	3.05	154.74	4.000	Yes	No	2.00
58	3.97	39.23	2.45	3.72	0.81	62.65	2.53	158.57	4.000	Yes	No	2.00
59	4.02	48.87	2.35	3.34	0.77	78.13	2.13	166.04	4.000	Yes	No	2.00
60	4.13	55.62	2.29	3.13	0.75	88.96	1.92	171.20	4.000	Yes	No	2.00
61	4.15	58.03	2.27	3.03	0.74	92.84	1.85	172.12	4.000	Yes	No	2.00
62	4.24	56.31	2.27	2.98	0.74	90.07	1.86	167.87	4.000	No	No	2.00
63	4.29	54.08	2.27	2.83	0.74	86.48	1.85	160.07	4.000	No	No	2.00
64	4.37	52.34	2.26	2.68	0.74	83.66	1.83	152.96	4.000	No	No	2.00
65	4.42	50.84	2.24	2.45	0.73	81.25	1.77	144.19	4.000	No	No	2.00
66	4.50	49.56	2.23	2.30	0.72	79.20	1.74	138.04	4.000	Yes	No	2.00
67	4.53	45.58	2.26	2.34	0.74	72.80	1.83	133.27	4.000	Yes	No	2.00
68	4.65	41.38	2.32	2.56	0.76	66.04	2.01	132.54	4.000	Yes	No	2.00
69	4.69	35.78	2.41	2.99	0.79	57.03	2.36	134.54	4.000	Yes	No	2.00
70	4.81	32.56	2.47	3.35	0.82	51.85	2.64	137.08	4.000	Yes	No	2.00
71	4.84	29.99	2.53	3.70	0.84	47.71	2.93	139.91	4.000	Yes	No	2.00
72	4.87	28.21	2.58	4.02	0.86	44.85	3.18	142.59	4.000	Yes	No	2.00
73	4.99	26.81	2.61	4.31	0.87	42.59	3.41	145.07	4.000	Yes	Yes	2.00
74	5.04	25.72	2.64	4.57	0.88	40.84	3.61	147.26	4.000	Yes	Yes	2.00
75	5.09	25.69	2.65	4.62	0.88	40.78	3.63	148.01	4.000	No	Yes	2.00
76	5.13	25.59	2.66	4.72	0.89	40.62	3.68	149.65	4.000	No	Yes	2.00
77	5.25	25.11	2.67	4.87	0.89	39.84	3.79	150.93	4.000	No	Yes	2.00
78	5.30	24.44	2.69	5.05	0.90	38.76	3.93	152.26	4.000	No	Yes	2.00
79	5.34	26.64	2.65	4.79	0.88	42.28	3.63	153.54	4.000	No	Yes	2.00
80	5.45	29.21	2.60	4.57	0.87	46.41	3.36	155.79	4.000	No	Yes	2.00
81	5.51	31.88	2.57	4.38	0.85	50.69	3.12	158.19	4.000	No	No	2.00
82	5.56	31.94	2.57	4.45	0.85	50.78	3.15	159.73	4.000	No	No	2.00
83	5.61	30.96	2.59	4.65	0.86	49.20	3.28	161.54	4.000	No	No	2.00
84	5.66	29.27	2.63	4.96	0.88	46.48	3.52	163.43	4.000	No	Yes	2.00
85	5.74	26.57	2.69	5.47	0.90	42.14	3.93	165.46	4.000	No	Yes	2.00
86	5.78	23.67	2.75	5.99	0.92	37.47	4.41	165.12	4.000	No	Yes	2.00
87	5.91	21.12	2.78	5.88	0.94	33.36	4.64	154.94	4.000	No	Yes	2.00
88	5.98	19.21	2.81	5.79	0.95	30.28	4.86	147.03	4.000	No	Yes	2.00
89	6.05	18.44	2.80	5.48	0.94	29.05	4.82	140.10	4.000	No	Yes	2.00
90	6.10	18.16	2.82	5.77	0.95	28.59	5.00	142.92	4.000	No	Yes	2.00
91	6.18	18.13	2.82	5.75	0.95	28.53	5.00	142.61	4.000	No	Yes	2.00
92	6.23	18.26	2.82	5.72	0.95	28.73	4.96	142.60	4.000	No	Yes	2.00
93	6.31	18.29	2.82	5.74	0.95	28.78	4.97	142.93	4.000	No	Yes	2.00
94	6.33	18.01	2.84	5.92	0.96	28.32	5.10	144.35	4.000	No	Yes	2.00
95	6.39	17.88	2.85	6.12	0.96	28.11	5.21	146.42	4.000	No	Yes	2.00
96	6.44	18.23	2.85	6.32	0.96	28.67	5.24	150.31	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	6.55	19.02	2.84	6.34	0.96	29.93	5.13	153.63	4.000	No	Yes	2.00
98	6.58	19.75	2.83	6.48	0.96	31.11	5.09	158.27	4.000	No	Yes	2.00
99	6.66	20.14	2.84	6.61	0.96	31.71	5.09	161.52	4.000	No	Yes	2.00
100	6.71	20.42	2.84	6.77	0.96	32.17	5.12	164.63	4.000	No	Yes	2.00
101	6.76	20.45	2.84	6.90	0.96	32.21	5.17	166.58	4.000	No	Yes	2.00
102	6.84	20.30	2.86	7.09	0.96	31.95	5.27	168.47	4.000	No	Yes	2.00
103	6.91	20.08	2.87	7.29	0.97	31.59	5.38	170.11	4.000	No	Yes	2.00
104	6.97	19.95	2.88	7.47	0.97	31.38	5.47	171.80	4.000	No	Yes	2.00
105	7.06	19.95	2.88	7.58	0.97	31.37	5.52	173.13	4.000	No	Yes	2.00
106	7.10	20.04	2.88	7.64	0.97	31.52	5.53	174.29	4.000	No	Yes	2.00
107	7.16	20.30	2.88	7.60	0.97	31.92	5.48	174.90	4.000	No	Yes	2.00
108	7.31	20.65	2.87	7.52	0.97	32.47	5.40	175.27	4.000	No	Yes	2.00
109	7.34	21.00	2.86	7.42	0.96	33.03	5.31	175.42	4.000	No	Yes	2.00
110	7.37	21.22	2.85	7.33	0.96	33.39	5.25	175.18	4.000	No	Yes	2.00
111	7.42	21.41	2.85	7.25	0.96	33.69	5.19	174.89	4.000	No	Yes	2.00
112	7.48	21.64	2.84	7.14	0.96	34.04	5.12	174.32	4.000	No	Yes	2.00
113	7.62	21.86	2.83	7.03	0.95	34.39	5.05	173.54	4.000	No	Yes	2.00
114	7.67	22.05	2.82	6.90	0.95	34.69	4.97	172.57	4.000	No	Yes	2.00
115	7.72	22.21	2.81	6.79	0.95	34.94	4.91	171.62	4.000	No	Yes	2.00
116	7.81	22.34	2.81	6.71	0.95	35.14	4.86	170.93	4.000	No	Yes	2.00
117	7.86	22.50	2.80	6.64	0.94	35.39	4.82	170.44	4.000	No	Yes	2.00
118	7.90	22.59	2.80	6.60	0.94	35.54	4.79	170.20	4.000	No	Yes	2.00
119	7.95	22.95	2.79	6.49	0.94	36.10	4.70	169.81	4.000	No	Yes	2.00
120	8.05	23.36	2.78	6.37	0.93	36.75	4.61	169.56	4.000	No	Yes	2.00
121	8.11	23.80	2.77	6.27	0.93	37.46	4.52	169.47	4.000	No	Yes	2.00
122	8.16	24.09	2.76	6.22	0.93	37.92	4.47	169.63	4.000	No	Yes	2.00
123	8.20	24.54	2.75	6.13	0.92	38.63	4.39	169.72	4.000	No	Yes	2.00
124	8.34	25.02	2.74	6.03	0.92	39.39	4.31	169.72	4.000	No	Yes	2.00
125	8.40	25.56	2.72	5.73	0.91	40.25	4.13	166.39	4.000	No	Yes	2.00
126	8.55	25.84	2.69	5.28	0.90	40.70	3.92	159.59	4.000	No	Yes	2.00
127	8.60	26.10	2.66	4.82	0.89	41.10	3.70	152.25	4.000	No	Yes	2.00
128	8.64	26.22	2.65	4.71	0.88	41.30	3.65	150.61	4.000	No	Yes	2.00
129	8.69	26.35	2.66	4.89	0.89	41.50	3.71	154.13	4.000	No	Yes	2.00
130	8.73	26.41	2.68	5.15	0.89	41.60	3.82	158.90	4.000	No	Yes	2.00
131	8.79	26.41	2.69	5.35	0.90	41.59	3.90	162.36	4.000	No	Yes	2.00
132	8.84	25.08	2.73	5.81	0.91	39.44	4.21	166.15	4.000	No	Yes	2.00
133	8.97	24.84	2.74	5.98	0.92	39.04	4.31	168.19	4.000	No	Yes	2.00
134	8.98	22.32	2.81	6.73	0.95	35.00	4.88	170.85	4.000	No	Yes	2.00
135	8.99	23.21	2.78	6.39	0.94	36.43	4.64	169.11	4.000	No	Yes	2.00
136	9.06	22.98	2.78	6.31	0.94	36.04	4.63	167.03	4.000	No	Yes	2.00
137	9.13	25.01	2.72	5.54	0.91	39.31	4.11	161.57	4.000	No	Yes	2.00
138	9.21	24.35	2.73	5.58	0.91	38.23	4.19	160.12	4.000	No	Yes	2.00
139	9.30	23.52	2.74	5.71	0.92	36.89	4.33	159.58	4.000	No	Yes	2.00
140	9.35	22.37	2.78	6.02	0.93	35.05	4.58	160.60	4.000	No	Yes	2.00
141	9.39	22.05	2.80	6.39	0.94	34.52	4.78	164.90	4.000	No	Yes	2.00
142	9.49	22.46	2.81	6.70	0.95	35.17	4.86	170.84	4.000	No	Yes	2.00
143	9.52	25.10	2.77	6.70	0.93	39.42	4.57	180.32	4.000	No	Yes	2.00
144	9.60	30.01	2.70	6.22	0.90	47.29	3.98	188.14	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	9.66	36.92	2.62	5.82	0.87	58.08	3.43	199.38	4.000	No	Yes	2.00
146	9.74	42.59	2.57	5.64	0.86	65.89	3.16	207.97	4.000	No	No	2.00
147	9.78	45.42	2.57	5.86	0.85	70.02	3.13	219.42	4.000	No	No	2.00
148	9.87	45.51	2.59	6.17	0.86	69.87	3.24	226.34	4.000	No	No	2.00
149	9.91	44.05	2.61	6.45	0.87	67.67	3.38	228.96	4.000	No	Yes	2.00
150	10.03	42.49	2.62	6.50	0.88	64.73	3.48	224.97	4.000	No	Yes	2.00
151	10.06	40.07	2.64	6.43	0.88	61.01	3.56	217.13	4.000	No	Yes	2.00
152	10.14	37.33	2.66	6.41	0.89	56.61	3.69	208.93	4.000	No	Yes	2.00
153	10.19	33.70	2.68	6.29	0.90	51.01	3.85	196.46	4.000	No	Yes	2.00
154	10.27	29.82	2.72	6.28	0.91	45.02	4.11	184.93	4.000	No	Yes	2.00
155	10.32	26.55	2.74	6.16	0.92	40.03	4.32	173.03	4.000	No	Yes	2.00
156	10.39	24.38	2.77	6.18	0.93	36.64	4.54	166.45	4.000	No	Yes	2.00
157	10.45	23.68	2.79	6.27	0.94	35.47	4.66	165.26	4.000	No	Yes	2.00
158	10.53	25.15	2.79	6.65	0.94	37.46	4.68	175.22	4.000	No	Yes	2.00
159	10.62	27.82	2.77	6.91	0.93	41.09	4.56	187.22	4.000	No	Yes	2.00
160	10.65	33.97	2.71	6.70	0.91	49.63	4.06	201.32	4.000	No	Yes	2.00
161	10.71	44.47	2.60	6.02	0.87	63.61	3.34	212.71	4.000	No	Yes	2.00
162	10.80	57.01	2.51	5.49	0.83	79.82	2.82	224.89	4.000	No	No	2.00
163	10.85	68.57	2.44	5.19	0.81	94.68	2.50	237.17	4.000	No	No	2.00
164	10.89	78.76	2.40	5.09	0.79	107.65	2.33	250.88	4.000	No	No	2.00
165	10.98	87.13	2.38	5.13	0.78	117.92	2.25	264.95	4.000	No	No	2.00
166	11.12	92.25	2.38	5.21	0.78	123.44	2.22	274.41	4.000	No	No	2.00
167	11.18	91.65	2.39	5.36	0.79	122.30	2.27	277.68	4.000	No	No	2.00
168	11.24	89.90	2.40	5.43	0.79	119.59	2.31	276.51	4.000	No	No	2.00
169	11.29	88.05	2.41	5.49	0.79	116.90	2.35	274.95	4.000	No	No	2.00
170	11.35	88.18	2.40	5.34	0.79	116.36	2.32	269.66	4.000	No	No	2.00
171	11.42	88.85	2.37	4.87	0.78	116.02	2.19	254.25	4.000	No	No	2.00
172	11.47	90.15	2.34	4.48	0.77	116.69	2.08	242.73	4.000	No	No	2.00
173	11.55	88.94	2.33	4.34	0.76	114.32	2.06	235.43	4.000	No	No	2.00
174	11.60	84.70	2.37	4.69	0.78	109.15	2.20	240.52	4.000	No	No	2.00
175	11.68	78.94	2.42	5.06	0.80	101.75	2.38	242.45	4.000	No	No	2.00
176	11.73	70.25	2.49	5.67	0.82	91.04	2.70	245.41	4.000	No	No	2.00
177	11.77	67.61	2.50	5.79	0.83	87.55	2.78	243.64	4.000	No	No	2.00
178	11.81	65.32	2.51	5.80	0.83	84.38	2.84	239.28	4.000	No	No	2.00
179	11.90	67.17	2.48	5.41	0.82	85.85	2.69	231.12	4.000	No	No	2.00
180	11.95	63.73	2.50	5.38	0.83	81.29	2.76	224.14	4.000	No	No	2.00
181	12.04	60.99	2.50	5.28	0.83	77.33	2.79	216.01	4.000	No	No	2.00
182	12.08	57.55	2.51	5.16	0.83	72.78	2.84	206.83	4.000	No	No	2.00
183	12.17	55.29	2.52	5.00	0.83	69.44	2.85	198.24	4.000	No	No	2.00
184	12.21	51.79	2.53	4.96	0.84	64.92	2.94	190.86	4.000	No	No	2.00
185	12.32	49.53	2.54	4.91	0.84	61.67	3.01	185.33	4.000	No	No	2.00
186	12.36	46.66	2.56	4.95	0.85	58.02	3.12	180.80	4.000	No	No	2.00
187	12.43	45.26	2.58	4.95	0.86	56.03	3.18	178.04	4.000	No	No	2.00
188	12.48	43.57	2.59	5.03	0.86	53.85	3.27	176.30	4.000	No	No	2.00
189	12.56	42.81	2.60	5.07	0.87	52.62	3.33	175.41	4.000	No	Yes	2.00
190	12.61	42.20	2.61	5.13	0.87	51.74	3.38	175.09	4.000	No	Yes	2.00
191	12.68	41.50	2.62	5.23	0.87	50.69	3.46	175.40	4.000	No	Yes	2.00
192	12.75	40.67	2.63	5.30	0.88	49.47	3.54	174.88	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	12.83	39.78	2.65	5.40	0.88	48.16	3.63	174.61	4.000	No	Yes	2.00
194	12.87	39.05	2.66	5.45	0.89	47.16	3.69	173.87	4.000	No	Yes	2.00
195	12.96	38.41	2.67	5.51	0.89	46.15	3.76	173.35	4.000	No	Yes	2.00
196	13.00	37.75	2.67	5.50	0.89	45.22	3.79	171.53	4.000	No	Yes	2.00
197	13.11	37.15	2.68	5.47	0.90	44.16	3.83	169.14	4.000	No	Yes	2.00
198	13.15	36.51	2.68	5.43	0.90	43.30	3.86	166.91	4.000	No	Yes	2.00
199	13.20	36.10	2.68	5.41	0.90	42.64	3.88	165.29	4.000	No	Yes	2.00
200	13.28	35.08	2.70	5.46	0.90	41.23	3.97	163.76	4.000	No	Yes	2.00
201	13.37	34.89	2.70	5.38	0.90	40.76	3.96	161.41	4.000	No	Yes	2.00
202	13.48	35.08	2.69	5.30	0.90	40.64	3.93	159.92	4.000	No	Yes	2.00
203	13.53	36.39	2.67	5.14	0.89	41.97	3.80	159.33	4.000	No	Yes	2.00
204	13.58	37.47	2.66	5.11	0.89	43.08	3.73	160.66	4.000	No	Yes	2.00
205	13.64	38.40	2.68	5.45	0.89	44.05	3.83	168.54	4.000	No	Yes	2.00
206	13.69	39.54	2.72	6.40	0.91	45.38	4.14	187.68	4.000	No	Yes	2.00
207	13.75	41.81	2.76	7.60	0.93	48.01	4.45	213.43	4.000	No	Yes	2.00
208	13.80	63.42	2.59	6.42	0.86	72.02	3.27	235.50	4.000	No	No	2.00
209	13.90	102.38	2.34	4.46	0.77	113.70	2.10	238.70	4.000	No	No	2.00
210	13.99	140.17	2.20	3.72	0.71	153.37	1.67	256.78	4.000	No	No	2.00
211	14.06	156.18	2.15	3.48	0.70	169.66	1.56	265.14	4.000	No	No	2.00
212	14.11	149.78	2.20	3.89	0.72	162.83	1.68	273.04	4.000	No	No	2.00
213	14.17	138.48	2.25	4.20	0.73	150.50	1.80	271.32	4.000	No	No	2.00
214	14.23	122.65	2.32	4.70	0.76	133.40	2.02	269.51	4.000	No	No	2.00
215	14.28	102.78	2.42	5.42	0.80	112.08	2.38	266.40	4.000	No	No	2.00
216	14.34	89.19	2.48	5.94	0.82	97.25	2.69	261.53	4.000	No	No	2.00
217	14.38	77.38	2.54	6.24	0.84	84.34	2.97	250.53	4.000	No	No	2.00
218	14.47	73.55	2.53	5.89	0.84	79.65	2.95	234.83	4.000	No	No	2.00
219	14.51	66.36	2.55	5.64	0.85	71.65	3.03	216.80	4.000	No	No	2.00
220	14.60	63.56	2.53	5.20	0.84	68.15	2.95	201.13	4.000	No	No	2.00
221	14.65	60.56	2.53	4.92	0.84	64.70	2.93	189.66	4.000	No	No	2.00
222	14.73	58.91	2.54	4.83	0.84	62.59	2.95	184.80	4.000	No	No	2.00
223	14.78	57.12	2.55	4.91	0.85	60.55	3.03	183.75	4.000	No	No	2.00
224	14.87	55.85	2.56	5.01	0.85	58.91	3.11	183.37	4.000	No	No	2.00
225	14.91	54.23	2.58	5.10	0.86	57.07	3.20	182.64	4.000	No	No	2.00
226	15.00	52.86	2.59	5.15	0.86	55.34	3.27	181.10	4.000	No	No	2.00
227	15.04	49.07	2.62	5.30	0.87	51.25	3.47	177.77	4.000	No	Yes	2.00
228	15.22	45.31	2.66	5.47	0.89	46.83	3.71	173.81	4.000	No	Yes	2.00
229	15.26	41.33	2.70	5.70	0.90	42.60	4.00	170.27	4.000	No	Yes	2.00
230	15.31	39.39	2.72	5.82	0.91	40.47	4.16	168.35	4.000	No	Yes	2.00
231	15.35	37.63	2.74	5.94	0.92	38.56	4.32	166.55	4.000	No	Yes	2.00
232	15.39	36.04	2.76	6.06	0.93	36.81	4.48	164.95	4.000	No	Yes	2.00
233	15.44	34.73	2.78	6.10	0.93	35.36	4.59	162.43	4.000	No	Yes	2.00
234	15.53	33.29	2.80	6.16	0.94	33.69	4.74	159.81	4.000	No	Yes	2.00
235	15.57	31.92	2.81	6.18	0.95	32.20	4.87	156.74	4.000	No	Yes	2.00
236	15.66	30.87	2.82	6.21	0.95	30.95	4.98	154.27	4.000	No	Yes	2.00
237	15.70	30.43	2.82	6.11	0.95	30.40	4.99	151.63	4.000	No	Yes	2.00
238	15.80	30.91	2.81	5.90	0.95	30.70	4.87	149.48	4.000	No	Yes	2.00
239	15.93	31.41	2.80	5.74	0.94	30.95	4.77	147.75	4.000	No	Yes	2.00
240	15.99	31.95	2.79	5.63	0.94	31.39	4.69	147.21	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
241	16.03	31.98	2.79	5.65	0.94	31.34	4.70	147.31	4.000	No	Yes	2.00
242	16.08	32.04	2.79	5.66	0.94	31.30	4.71	147.34	4.000	No	Yes	2.00
243	16.14	32.11	2.79	5.66	0.94	31.26	4.71	147.34	4.000	No	Yes	2.00
244	16.17	32.17	2.79	5.62	0.94	31.26	4.70	146.83	4.000	No	Yes	2.00
245	16.23	32.40	2.74	4.85	0.92	31.34	4.33	135.62	4.000	No	Yes	2.00
246	16.32	32.81	2.70	4.20	0.90	31.57	3.98	125.76	4.000	No	Yes	2.00
247	16.36	33.52	2.65	3.69	0.89	32.16	3.67	118.19	4.000	No	Yes	2.00
248	16.41	34.82	2.68	4.19	0.90	33.39	3.85	128.66	4.000	No	Yes	2.00
249	16.55	35.94	2.71	4.81	0.91	34.24	4.10	140.29	4.000	No	Yes	2.00
250	16.61	37.05	2.74	5.30	0.92	35.21	4.26	149.95	4.000	No	Yes	2.00
251	16.62	37.60	2.75	5.57	0.92	35.72	4.34	155.12	4.000	No	Yes	2.00
252	16.69	39.19	2.73	5.48	0.91	37.14	4.21	156.46	4.000	No	Yes	2.00
253	16.74	39.41	2.74	5.63	0.92	37.25	4.27	159.09	4.000	No	Yes	2.00
254	16.81	39.83	2.74	5.64	0.92	37.48	4.26	159.74	4.000	No	Yes	2.00
255	16.88	37.70	2.77	5.92	0.93	35.30	4.52	159.59	4.000	No	Yes	2.00
256	16.95	36.49	2.78	5.93	0.93	34.00	4.62	157.12	4.000	No	Yes	2.00
257	17.00	33.80	2.82	6.15	0.95	31.34	4.93	154.40	4.000	No	Yes	2.00
258	17.17	33.53	2.82	6.02	0.95	30.77	4.92	151.28	4.000	No	Yes	2.00
259	17.22	32.38	2.83	6.10	0.95	29.61	5.05	149.65	4.000	No	Yes	2.00
260	17.26	33.27	2.81	5.88	0.95	30.37	4.89	148.44	4.000	No	Yes	2.00
261	17.30	33.92	2.80	5.69	0.94	30.93	4.76	147.08	4.000	No	Yes	2.00
262	17.35	33.96	2.79	5.60	0.94	30.86	4.72	145.67	4.000	No	Yes	2.00
263	17.39	32.69	2.81	5.67	0.95	29.60	4.86	143.84	4.000	No	Yes	2.00
264	17.49	30.75	2.84	5.93	0.96	27.63	5.17	142.79	4.000	No	Yes	2.00
265	17.53	30.85	2.84	5.88	0.96	27.66	5.14	142.27	4.000	No	Yes	2.00
266	17.62	31.45	2.83	5.83	0.95	28.08	5.08	142.65	4.000	No	Yes	2.00
267	17.67	32.25	2.83	5.80	0.95	28.73	5.00	143.72	4.000	No	Yes	2.00
268	17.73	33.14	2.82	5.80	0.95	29.46	4.93	145.36	4.000	No	Yes	2.00
269	17.87	34.48	2.80	5.75	0.94	30.47	4.82	146.89	4.000	No	Yes	2.00
270	17.92	34.76	2.81	5.83	0.94	30.63	4.84	148.41	4.000	No	Yes	2.00
271	18.01	34.63	2.81	5.90	0.95	30.36	4.90	148.70	4.000	No	Yes	2.00
272	18.06	33.88	2.82	5.90	0.95	29.60	4.97	147.05	4.000	No	Yes	2.00
273	18.19	33.93	2.81	5.68	0.95	29.43	4.88	143.63	4.000	No	Yes	2.00
274	18.24	33.96	2.80	5.40	0.94	29.39	4.75	139.68	4.000	No	Yes	2.00
275	18.29	34.00	2.79	5.24	0.94	29.36	4.68	137.34	4.000	No	Yes	2.00
276	18.35	33.03	2.80	5.32	0.94	28.39	4.81	136.44	4.000	No	Yes	2.00
277	18.40	31.84	2.83	5.52	0.95	27.24	5.01	136.59	4.000	No	Yes	2.00
278	18.45	30.86	2.85	5.76	0.96	26.28	5.23	137.53	4.000	No	Yes	2.00
279	18.54	31.27	2.85	5.80	0.96	26.52	5.22	138.54	4.000	No	Yes	2.00
280	18.63	32.38	2.84	5.83	0.96	27.37	5.15	140.99	4.000	No	Yes	2.00
281	18.69	33.82	2.83	5.83	0.95	28.55	5.03	143.70	4.000	Yes	Yes	2.00
282	18.73	35.70	2.81	5.81	0.95	30.14	4.88	147.01	4.000	Yes	Yes	2.00
283	18.79	38.34	2.78	5.68	0.94	32.38	4.63	149.97	4.000	Yes	Yes	2.00
284	18.84	45.02	2.71	5.38	0.91	38.19	4.10	156.77	4.000	Yes	Yes	2.00
285	18.98	52.37	2.65	5.12	0.89	44.37	3.68	163.13	4.000	Yes	Yes	2.00
286	19.03	61.02	2.59	4.89	0.86	51.85	3.29	170.39	4.000	Yes	No	2.00
287	19.10	68.19	2.55	4.67	0.85	57.97	3.01	174.61	4.000	Yes	No	2.00
288	19.16	77.16	2.49	4.43	0.82	65.72	2.73	179.50	4.000	Yes	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
289	19.20	87.06	2.44	4.18	0.80	74.29	2.48	184.03	4.000	Yes	No	2.00
290	19.25	97.40	2.39	3.97	0.79	83.23	2.27	188.79	4.000	Yes	No	2.00
291	19.30	108.39	2.34	3.77	0.77	92.70	2.09	194.01	4.000	Yes	No	2.00
292	19.38	123.89	2.24	3.10	0.73	106.28	1.77	187.76	4.000	Yes	No	2.00
293	19.51	136.98	2.15	2.61	0.70	117.44	1.56	183.32	4.000	Yes	No	2.00
294	19.56	146.65	2.09	2.27	0.67	125.99	1.43	180.69	4.000	Yes	No	2.00
295	19.63	148.21	2.11	2.41	0.68	126.90	1.47	186.03	4.000	No	No	2.00
296	19.68	148.31	2.13	2.58	0.69	126.58	1.51	191.08	4.000	No	No	2.00
297	19.73	147.28	2.15	2.73	0.69	125.32	1.56	194.92	4.000	No	No	2.00
298	19.78	146.01	2.17	2.88	0.70	123.84	1.60	198.18	4.000	No	No	2.00
299	19.82	148.17	2.18	2.97	0.71	125.47	1.62	202.74	4.000	No	No	2.00
300	19.90	151.51	2.18	3.04	0.71	127.90	1.62	207.58	4.000	No	No	2.00
301	19.99	154.50	2.18	3.10	0.71	129.95	1.63	211.57	4.000	Yes	No	2.00
302	20.04	153.32	2.20	3.20	0.71	128.63	1.66	213.39	4.000	Yes	No	2.00
303	20.08	148.77	2.22	3.32	0.72	124.40	1.71	213.28	4.000	Yes	No	2.00
304	20.17	141.32	2.26	3.53	0.73	117.44	1.81	212.91	4.000	Yes	No	2.00
305	20.26	132.73	2.30	3.77	0.75	109.57	1.94	212.18	4.000	Yes	No	2.00
306	20.29	121.27	2.35	4.05	0.77	99.57	2.11	209.70	4.000	Yes	No	2.00
307	20.37	101.86	2.43	4.41	0.80	82.74	2.42	200.45	4.000	Yes	No	2.00
308	20.52	81.94	2.53	4.89	0.84	65.48	2.91	190.23	4.000	Yes	No	2.00
309	20.57	65.83	2.62	5.34	0.87	51.96	3.46	179.65	4.000	Yes	Yes	2.00
310	20.61	59.37	2.66	5.40	0.89	46.54	3.70	171.99	4.000	Yes	Yes	2.00
311	20.70	55.26	2.68	5.33	0.89	43.03	3.82	164.56	4.000	No	Yes	2.00
312	20.74	52.11	2.69	5.18	0.90	40.40	3.90	157.46	4.000	No	Yes	2.00
313	20.83	50.14	2.69	5.03	0.90	38.67	3.92	151.70	4.000	No	Yes	2.00
314	20.88	46.00	2.71	4.95	0.91	35.26	4.10	144.39	4.000	No	Yes	2.00
315	20.98	40.30	2.77	5.15	0.93	30.48	4.54	138.37	4.000	No	Yes	2.00
316	21.03	34.27	2.84	5.47	0.96	25.56	5.17	132.09	4.000	No	Yes	2.00
317	21.07	30.26	2.90	5.68	0.98	22.31	5.68	126.72	4.000	No	Yes	2.00
318	21.14	28.47	2.90	5.29	0.98	20.87	5.69	118.66	4.000	No	Yes	2.00
319	21.23	27.36	2.88	4.72	0.97	19.96	5.51	109.95	4.000	No	Yes	2.00
320	21.27	26.47	2.86	4.26	0.97	19.26	5.35	102.97	4.000	No	Yes	2.00
321	21.37	25.64	2.87	4.14	0.97	18.54	5.39	99.85	4.000	No	Yes	2.00
322	21.43	25.07	2.87	4.11	0.97	18.05	5.45	98.44	4.000	No	Yes	2.00
323	21.49	24.72	2.88	4.14	0.97	17.72	5.53	97.97	4.000	No	Yes	2.00
324	21.54	24.12	2.90	4.24	0.98	17.20	5.69	97.86	4.000	No	Yes	2.00
325	21.63	23.51	2.92	4.35	0.99	16.64	5.87	97.67	4.000	No	Yes	2.00
326	21.68	22.81	2.94	4.55	1.00	16.04	6.12	98.23	4.000	No	Yes	2.00
327	21.74	22.59	2.99	5.30	1.00	15.81	6.63	104.82	4.000	No	Yes	2.00
328	21.80	28.22	2.82	3.82	0.95	20.21	4.92	99.48	4.000	No	Yes	2.00
329	21.99	33.14	2.68	2.92	0.90	24.01	3.88	93.21	4.000	No	Yes	2.00
330	22.05	36.94	2.53	1.95	0.84	27.21	2.95	80.27	0.128	No	No	0.25
331	22.10	31.10	2.65	2.38	0.89	22.44	3.66	82.22	4.000	No	Yes	2.00
332	22.15	25.05	2.79	2.93	0.94	17.59	4.71	82.94	4.000	No	Yes	2.00
333	22.21	19.00	2.97	3.83	1.00	12.86	6.42	82.63	4.000	No	Yes	2.00
334	22.25	17.50	3.02	4.13	1.00	11.75	6.99	82.14	4.000	No	Yes	2.00
335	22.32	17.18	3.04	4.26	1.00	11.48	7.18	82.36	4.000	No	Yes	2.00
336	22.41	17.95	3.02	4.15	1.00	11.99	6.92	82.98	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
337	22.45	18.33	3.01	4.19	1.00	12.24	6.88	84.16	4.000	No	Yes	2.00
338	22.54	18.74	3.01	4.28	1.00	12.49	6.86	85.65	4.000	No	Yes	2.00
339	22.61	19.25	3.01	4.40	1.00	12.82	6.84	87.69	4.000	No	Yes	2.00
340	22.67	19.51	3.01	4.55	1.00	12.96	6.90	89.41	4.000	No	Yes	2.00
341	22.70	20.08	3.01	4.62	1.00	13.35	6.83	91.24	4.000	No	Yes	2.00
342	22.81	20.56	3.00	4.65	1.00	13.63	6.78	92.37	4.000	No	Yes	2.00
343	22.85	21.01	3.00	4.69	1.00	13.92	6.72	93.56	4.000	No	Yes	2.00
344	22.91	20.91	3.01	4.77	1.00	13.82	6.80	94.03	4.000	No	Yes	2.00
345	22.99	20.75	3.01	4.83	1.00	13.66	6.89	94.07	4.000	No	Yes	2.00
346	23.10	20.62	3.02	4.84	1.00	13.50	6.94	93.63	4.000	No	Yes	2.00
347	23.13	20.62	3.01	4.78	1.00	13.48	6.90	93.04	4.000	No	Yes	2.00
348	23.17	21.16	2.99	4.60	1.00	13.84	6.69	92.56	4.000	No	Yes	2.00
349	23.26	20.97	3.00	4.63	1.00	13.65	6.76	92.27	4.000	No	Yes	2.00
350	23.34	20.78	3.01	4.69	1.00	13.47	6.85	92.24	4.000	No	Yes	2.00
351	23.38	20.05	3.03	4.90	1.00	12.94	7.14	92.33	4.000	No	Yes	2.00
352	23.51	20.15	3.03	4.88	1.00	12.93	7.13	92.20	4.000	No	Yes	2.00
353	23.55	20.31	3.03	4.92	1.00	13.02	7.13	92.76	4.000	No	Yes	2.00
354	23.60	20.43	3.03	4.96	1.00	13.08	7.13	93.30	4.000	No	Yes	2.00
355	23.64	20.34	3.04	5.02	1.00	12.99	7.20	93.52	4.000	No	Yes	2.00
356	23.73	20.08	3.05	5.04	1.00	12.76	7.29	92.97	4.000	No	Yes	2.00
357	23.77	19.82	3.05	5.05	1.00	12.56	7.35	92.37	4.000	No	Yes	2.00
358	23.82	20.65	3.02	4.72	1.00	13.10	6.97	91.37	4.000	No	Yes	2.00
359	23.91	20.46	3.02	4.60	1.00	12.92	6.95	89.77	4.000	No	Yes	2.00
360	23.96	19.89	3.01	4.28	1.00	12.51	6.85	85.69	4.000	No	Yes	2.00
361	24.18	18.36	3.04	4.22	1.00	11.41	7.17	81.78	4.000	No	Yes	2.00
362	24.24	18.01	3.02	3.87	1.00	11.16	7.00	78.11	4.000	No	Yes	2.00
363	24.32	18.20	3.01	3.72	1.00	11.27	6.85	77.12	4.000	No	Yes	2.00
364	24.38	18.74	2.98	3.46	1.00	11.62	6.52	75.74	4.000	No	Yes	2.00
365	24.50	19.22	2.96	3.26	1.00	11.91	6.26	74.60	4.000	No	Yes	2.00
366	24.57	20.40	2.91	2.96	0.98	12.76	5.77	73.57	4.000	No	Yes	2.00
367	24.62	21.42	2.89	2.94	0.97	13.47	5.56	74.92	4.000	No	Yes	2.00
368	24.74	22.22	2.88	3.01	0.97	13.99	5.50	76.89	4.000	No	Yes	2.00
369	24.79	22.17	2.90	3.23	0.98	13.90	5.69	79.15	4.000	No	Yes	2.00
370	24.84	21.84	2.92	3.35	0.99	13.65	5.85	79.82	4.000	No	Yes	2.00
371	24.88	21.81	2.92	3.36	0.99	13.61	5.86	79.83	4.000	No	Yes	2.00
372	24.97	21.89	2.91	3.34	0.99	13.65	5.84	79.65	4.000	No	Yes	2.00
373	25.05	22.18	2.91	3.28	0.98	13.83	5.75	79.50	4.000	No	Yes	2.00
374	25.08	22.63	2.89	3.24	0.98	14.14	5.64	79.75	4.000	No	Yes	2.00
375	25.15	23.30	2.88	3.25	0.97	14.59	5.54	80.82	4.000	No	Yes	2.00
376	25.23	24.06	2.87	3.25	0.97	15.11	5.43	81.99	4.000	No	Yes	2.00
377	25.28	25.37	2.86	3.36	0.97	15.99	5.33	85.20	4.000	No	Yes	2.00
378	25.36	26.71	2.85	3.44	0.96	16.89	5.21	88.06	4.000	No	Yes	2.00
379	25.41	27.31	2.86	3.73	0.97	17.24	5.35	92.26	4.000	No	Yes	2.00
380	25.54	27.12	2.88	3.93	0.97	17.03	5.52	94.05	4.000	No	Yes	2.00
381	25.58	26.58	2.90	4.10	0.98	16.61	5.71	94.88	4.000	No	Yes	2.00
382	25.63	25.98	2.91	4.08	0.98	16.18	5.79	93.70	4.000	No	Yes	2.00
383	25.67	24.89	2.92	4.06	0.99	15.41	5.94	91.59	4.000	No	Yes	2.00
384	25.76	23.62	2.95	4.08	1.00	14.50	6.17	89.42	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
385	25.80	22.47	2.96	4.00	1.00	13.72	6.31	86.59	4.000	No	Yes	2.00
386	25.89	21.85	2.96	3.91	1.00	13.29	6.36	84.51	4.000	No	Yes	2.00
387	25.93	21.28	2.97	3.80	1.00	12.90	6.39	82.41	4.000	No	Yes	2.00
388	26.11	21.31	2.97	3.76	1.00	12.88	6.36	81.96	4.000	No	Yes	2.00
389	26.15	21.48	2.96	3.77	1.00	12.98	6.35	82.36	4.000	No	Yes	2.00
390	26.20	21.96	2.96	3.90	1.00	13.28	6.36	84.40	4.000	No	Yes	2.00
391	26.24	22.53	2.99	4.37	1.00	13.64	6.58	89.81	4.000	No	Yes	2.00
392	26.33	23.33	3.00	4.88	1.00	14.13	6.79	95.92	4.000	No	Yes	2.00
393	26.37	24.57	3.01	5.30	1.00	14.93	6.84	102.11	4.000	No	Yes	2.00
394	26.41	26.22	2.99	5.35	1.00	15.99	6.62	105.80	4.000	No	Yes	2.00
395	26.45	28.64	2.96	5.34	1.00	17.55	6.29	110.28	4.000	No	Yes	2.00
396	26.55	30.59	2.94	5.44	1.00	18.80	6.11	114.80	4.000	No	Yes	2.00
397	26.60	31.70	2.94	5.69	1.00	19.50	6.12	119.33	4.000	No	Yes	2.00
398	26.64	32.05	2.96	6.14	1.00	19.68	6.32	124.33	4.000	No	Yes	2.00
399	26.74	33.07	2.97	6.44	1.00	20.30	6.37	129.22	4.000	No	Yes	2.00
400	26.80	35.30	2.95	6.50	1.00	21.72	6.17	134.03	4.000	No	Yes	2.00
401	26.86	38.16	2.91	6.37	0.99	23.65	5.83	138.02	4.000	No	Yes	2.00
402	26.90	41.92	2.88	6.31	0.97	26.19	5.50	143.99	4.000	No	Yes	2.00
403	27.02	45.10	2.86	6.34	0.96	28.28	5.29	149.67	4.000	No	Yes	2.00
404	27.08	47.90	2.83	6.29	0.96	30.17	5.09	153.48	4.000	No	Yes	2.00
405	27.13	48.96	2.82	6.11	0.95	30.89	4.94	152.74	4.000	No	Yes	2.00
406	27.21	47.36	2.77	5.12	0.93	30.01	4.56	136.93	4.000	No	Yes	2.00
407	27.33	43.00	2.77	4.47	0.93	27.11	4.50	121.97	4.000	No	Yes	2.00
408	27.39	37.52	2.78	3.94	0.93	23.45	4.58	107.46	4.000	No	Yes	2.00
409	27.44	33.67	2.86	4.62	0.97	20.64	5.35	110.34	4.000	No	Yes	2.00
410	27.52	32.18	2.90	4.90	0.98	19.54	5.68	110.97	4.000	No	Yes	2.00
411	27.57	33.77	2.87	4.67	0.97	20.64	5.38	110.97	4.000	No	Yes	2.00
412	27.64	37.53	2.79	4.17	0.94	23.28	4.74	110.23	4.000	No	Yes	2.00
413	27.73	40.78	2.74	3.81	0.92	25.56	4.28	109.48	4.000	No	Yes	2.00
414	27.77	40.11	2.75	3.83	0.92	25.08	4.34	108.91	4.000	No	Yes	2.00
415	27.86	37.72	2.78	4.00	0.94	23.35	4.63	108.16	4.000	No	Yes	2.00
416	27.89	34.40	2.83	4.18	0.95	21.03	5.03	105.78	4.000	No	Yes	2.00
417	28.01	32.97	2.85	4.19	0.96	20.01	5.18	103.71	4.000	No	Yes	2.00
418	28.04	31.38	2.86	4.20	0.97	18.93	5.36	101.40	4.000	No	Yes	2.00
419	28.12	30.96	2.87	4.16	0.97	18.62	5.39	100.31	4.000	No	Yes	2.00
420	28.15	30.45	2.87	4.08	0.97	18.29	5.39	98.63	4.000	No	Yes	2.00
421	28.25	30.17	2.86	3.98	0.97	18.08	5.36	96.93	4.000	No	Yes	2.00
422	28.34	30.07	2.86	3.93	0.97	17.99	5.35	96.21	4.000	No	Yes	2.00
423	28.38	29.88	2.87	4.02	0.97	17.83	5.44	96.93	4.000	No	Yes	2.00
424	28.43	30.33	2.87	4.09	0.97	18.10	5.43	98.34	4.000	No	Yes	2.00
425	28.50	30.65	2.87	4.10	0.97	18.28	5.40	98.78	4.000	No	Yes	2.00
426	28.61	31.38	2.85	4.00	0.96	18.75	5.27	98.76	4.000	No	Yes	2.00
427	28.66	31.22	2.86	4.05	0.96	18.62	5.32	98.96	4.000	No	Yes	2.00
428	28.70	30.49	2.88	4.22	0.97	18.08	5.52	99.77	4.000	No	Yes	2.00
429	28.75	29.44	2.91	4.46	0.98	17.32	5.81	100.55	4.000	No	Yes	2.00
430	28.83	28.42	2.93	4.58	0.99	16.59	6.02	99.96	4.000	No	Yes	2.00
431	28.88	27.72	2.93	4.41	0.99	16.14	6.01	97.08	4.000	No	Yes	2.00
432	28.96	27.02	2.92	4.15	0.99	15.70	5.94	93.21	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
433	29.01	26.22	2.91	3.85	0.99	15.22	5.84	88.81	4.000	No	Yes	2.00
434	29.12	25.64	2.91	3.67	0.98	14.84	5.79	85.98	4.000	No	Yes	2.00
435	29.18	25.04	2.91	3.54	0.98	14.45	5.79	83.70	4.000	No	Yes	2.00
436	29.27	24.89	2.91	3.54	0.99	14.32	5.83	83.41	4.000	No	Yes	2.00
437	29.32	25.02	2.92	3.63	0.99	14.37	5.88	84.48	4.000	No	Yes	2.00
438	29.37	26.04	2.91	3.75	0.98	15.00	5.82	87.29	4.000	No	Yes	2.00
439	29.43	27.44	2.90	3.89	0.98	15.88	5.72	90.89	4.000	No	Yes	2.00
440	29.49	31.57	2.85	3.87	0.96	18.58	5.20	96.73	4.000	No	Yes	2.00
441	29.62	35.97	2.80	3.83	0.94	21.45	4.76	102.14	4.000	No	Yes	2.00
442	29.69	40.39	2.75	3.81	0.92	24.37	4.40	107.35	4.000	No	Yes	2.00
443	29.75	42.08	2.73	3.73	0.92	25.50	4.24	108.11	4.000	No	Yes	2.00
444	29.81	43.09	2.71	3.59	0.91	26.20	4.09	107.21	4.000	No	Yes	2.00
445	29.87	43.86	2.69	3.42	0.90	26.75	3.94	105.47	4.000	No	Yes	2.00
446	29.93	44.47	2.69	3.41	0.90	27.13	3.90	105.85	4.000	No	Yes	2.00
447	29.99	44.88	2.69	3.48	0.90	27.35	3.92	107.35	4.000	No	Yes	2.00
448	30.06	45.07	2.70	3.56	0.90	27.41	3.96	108.63	4.000	No	Yes	2.00
449	30.11	44.97	2.70	3.63	0.91	27.29	4.02	109.60	4.000	No	Yes	2.00
450	30.14	44.72	2.71	3.69	0.91	27.09	4.07	110.18	4.000	No	Yes	2.00
451	30.20	44.18	2.73	3.82	0.91	26.65	4.18	111.44	4.000	No	Yes	2.00
452	30.32	43.70	2.74	3.96	0.92	26.22	4.30	112.84	4.000	No	Yes	2.00
453	30.37	43.26	2.76	4.10	0.93	25.85	4.42	114.18	4.000	No	Yes	2.00
454	30.40	43.10	2.76	4.16	0.93	25.71	4.46	114.76	4.000	No	Yes	2.00
455	30.45	43.29	2.76	4.18	0.93	25.81	4.46	115.22	4.000	No	Yes	2.00
456	30.56	43.54	2.76	4.19	0.93	25.92	4.46	115.58	4.000	No	Yes	2.00
457	30.62	43.70	2.76	4.21	0.93	25.98	4.47	116.10	4.000	No	Yes	2.00
458	30.67	43.58	2.77	4.28	0.93	25.85	4.52	116.78	4.000	No	Yes	2.00
459	30.71	43.70	2.77	4.32	0.93	25.90	4.54	117.49	4.000	No	Yes	2.00
460	30.87	43.90	2.77	4.34	0.93	25.94	4.54	117.75	4.000	No	Yes	2.00
461	30.91	44.12	2.77	4.31	0.93	26.07	4.51	117.62	4.000	No	Yes	2.00
462	30.96	44.08	2.77	4.30	0.93	26.03	4.51	117.38	4.000	No	Yes	2.00
463	31.03	44.05	2.77	4.27	0.93	25.98	4.50	116.93	4.000	No	Yes	2.00
464	31.07	44.02	2.76	4.25	0.93	25.95	4.49	116.49	4.000	No	Yes	2.00
465	31.12	44.02	2.76	4.19	0.93	25.94	4.46	115.73	4.000	No	Yes	2.00
466	31.21	44.21	2.76	4.13	0.93	26.04	4.42	115.05	4.000	No	Yes	2.00
467	31.26	44.50	2.75	4.07	0.92	26.23	4.36	114.39	4.000	No	Yes	2.00
468	31.32	44.88	2.74	4.03	0.92	26.45	4.32	114.35	4.000	No	Yes	2.00
469	31.38	45.30	2.74	4.04	0.92	26.70	4.30	114.84	4.000	No	Yes	2.00
470	31.43	46.44	2.73	4.05	0.92	27.41	4.24	116.30	4.000	No	Yes	2.00
471	31.56	47.75	2.73	4.09	0.91	28.18	4.19	118.17	4.000	No	Yes	2.00
472	31.62	49.15	2.72	4.15	0.91	29.03	4.16	120.72	4.000	No	Yes	2.00
473	31.69	49.75	2.73	4.25	0.91	29.35	4.18	122.79	4.000	No	Yes	2.00
474	31.74	49.85	2.73	4.39	0.92	29.33	4.26	124.86	4.000	No	Yes	2.00
475	31.82	49.56	2.75	4.51	0.92	29.06	4.34	126.19	4.000	No	Yes	2.00
476	31.87	49.15	2.76	4.62	0.93	28.72	4.43	127.16	4.000	No	Yes	2.00
477	31.95	48.83	2.76	4.65	0.93	28.46	4.47	127.16	4.000	No	Yes	2.00
478	32.00	48.45	2.76	4.62	0.93	28.20	4.48	126.19	4.000	No	Yes	2.00
479	32.05	47.81	2.75	4.37	0.92	27.85	4.37	121.79	4.000	No	Yes	2.00
480	32.13	47.08	2.72	3.95	0.91	27.49	4.18	114.90	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
481	32.19	46.28	2.71	3.65	0.91	27.07	4.05	109.52	4.000	No	Yes	2.00
482	32.26	45.62	2.71	3.67	0.91	26.59	4.10	109.04	4.000	No	Yes	2.00
483	32.31	45.33	2.73	3.84	0.92	26.31	4.23	111.27	4.000	No	Yes	2.00
484	32.39	45.22	2.74	3.95	0.92	26.16	4.30	112.56	4.000	No	Yes	2.00
485	32.54	45.33	2.74	3.97	0.92	26.15	4.31	112.79	4.000	No	Yes	2.00
486	32.56	45.29	2.75	4.03	0.92	26.09	4.35	113.63	4.000	No	Yes	2.00
487	32.68	45.44	2.75	4.07	0.92	26.11	4.38	114.28	4.000	No	Yes	2.00
488	32.72	45.71	2.75	4.10	0.92	26.26	4.38	114.89	4.000	No	Yes	2.00
489	32.77	45.77	2.75	4.10	0.92	26.27	4.38	115.03	4.000	No	Yes	2.00
490	32.84	45.52	2.76	4.14	0.93	26.06	4.42	115.24	4.000	No	Yes	2.00
491	32.89	44.82	2.77	4.28	0.93	25.54	4.55	116.14	4.000	No	Yes	2.00
492	32.98	44.25	2.79	4.40	0.94	25.10	4.66	116.95	4.000	No	Yes	2.00
493	33.01	43.45	2.80	4.48	0.94	24.55	4.77	117.01	4.000	No	Yes	2.00
494	33.14	42.91	2.80	4.45	0.94	24.16	4.80	115.87	4.000	No	Yes	2.00
495	33.18	42.46	2.80	4.37	0.94	23.88	4.78	114.16	4.000	No	Yes	2.00
496	33.28	42.18	2.80	4.32	0.94	23.68	4.77	113.02	4.000	No	Yes	2.00
497	33.32	41.79	2.80	4.29	0.94	23.42	4.79	112.20	4.000	No	Yes	2.00
498	33.38	41.22	2.81	4.31	0.94	23.03	4.84	111.58	4.000	No	Yes	2.00
499	33.42	40.65	2.81	4.29	0.95	22.66	4.88	110.60	4.000	No	Yes	2.00
500	33.47	40.07	2.82	4.27	0.95	22.29	4.92	109.64	4.000	No	Yes	2.00
501	33.56	39.63	2.82	4.27	0.95	21.97	4.96	108.97	4.000	No	Yes	2.00
502	33.60	39.40	2.82	4.29	0.95	21.81	4.99	108.79	4.000	No	Yes	2.00
503	33.70	39.34	2.83	4.30	0.95	21.73	5.00	108.74	4.000	No	Yes	2.00
504	33.74	39.34	2.83	4.32	0.95	21.70	5.02	109.01	4.000	No	Yes	2.00
505	33.84	39.37	2.83	4.35	0.95	21.67	5.05	109.36	4.000	No	Yes	2.00
506	33.88	39.44	2.83	4.39	0.95	21.68	5.07	109.90	4.000	No	Yes	2.00
507	33.93	39.60	2.83	4.43	0.96	21.75	5.08	110.48	4.000	No	Yes	2.00
508	33.99	39.63	2.84	4.48	0.96	21.73	5.11	111.11	4.000	No	Yes	2.00
509	34.09	39.69	2.84	4.50	0.96	21.72	5.13	111.35	4.000	No	Yes	2.00
510	34.19	39.63	2.84	4.48	0.96	21.65	5.12	110.83	4.000	No	Yes	2.00
511	34.26	39.57	2.83	4.40	0.96	21.60	5.08	109.76	4.000	No	Yes	2.00
512	34.32	39.28	2.83	4.31	0.95	21.43	5.06	108.33	4.000	No	Yes	2.00
513	34.39	38.71	2.83	4.26	0.95	21.06	5.08	106.89	4.000	No	Yes	2.00
514	34.44	37.91	2.84	4.21	0.96	20.57	5.11	105.19	4.000	No	Yes	2.00
515	34.52	37.05	2.83	4.04	0.96	20.06	5.09	102.06	4.000	No	Yes	2.00
516	34.57	36.35	2.82	3.74	0.95	19.70	4.95	97.46	4.000	No	Yes	2.00
517	34.63	35.81	2.80	3.48	0.94	19.43	4.82	93.60	4.000	No	Yes	2.00
518	34.70	34.95	2.82	3.61	0.95	18.83	5.00	94.09	4.000	No	Yes	2.00
519	34.89	33.49	2.88	4.10	0.97	17.74	5.50	97.60	4.000	No	Yes	2.00
520	34.94	32.34	2.93	4.61	0.99	16.90	5.98	101.06	4.000	No	Yes	2.00
521	34.99	31.99	2.95	4.85	1.00	16.63	6.18	102.79	4.000	No	Yes	2.00
522	35.07	32.88	2.93	4.78	0.99	17.14	6.04	103.49	4.000	No	Yes	2.00
523	35.14	34.41	2.91	4.60	0.98	18.08	5.75	104.01	4.000	No	Yes	2.00
524	35.23	34.89	2.90	4.56	0.98	18.35	5.68	104.15	4.000	No	Yes	2.00
525	35.29	35.05	2.89	4.51	0.98	18.43	5.63	103.83	4.000	No	Yes	2.00
526	35.40	34.12	2.91	4.56	0.98	17.83	5.77	102.89	4.000	No	Yes	2.00
527	35.46	33.77	2.91	4.49	0.98	17.62	5.77	101.61	4.000	No	Yes	2.00
528	35.52	33.01	2.92	4.50	0.99	17.14	5.87	100.55	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
529	35.58	31.93	2.94	4.59	0.99	16.45	6.06	99.73	4.000	No	Yes	2.00
530	35.64	30.75	2.96	4.71	1.00	15.73	6.29	98.96	4.000	No	Yes	2.00
531	35.72	29.51	2.98	4.82	1.00	15.03	6.52	98.04	4.000	No	Yes	2.00
532	35.77	28.55	2.99	4.84	1.00	14.49	6.67	96.67	4.000	No	Yes	2.00
533	35.85	27.79	3.00	4.79	1.00	14.05	6.75	94.84	4.000	No	Yes	2.00
534	35.96	27.66	2.99	4.57	1.00	13.95	6.63	92.56	4.000	No	Yes	2.00
535	36.03	28.17	2.97	4.26	1.00	14.21	6.36	90.44	4.000	No	Yes	2.00
536	36.09	28.96	2.93	3.94	0.99	14.69	6.03	88.51	4.000	No	Yes	2.00
537	36.16	29.63	2.91	3.73	0.98	15.11	5.78	87.38	4.000	No	Yes	2.00
538	36.29	30.11	2.89	3.60	0.98	15.40	5.62	86.56	4.000	No	Yes	2.00
539	36.34	30.56	2.88	3.54	0.97	15.66	5.52	86.47	4.000	No	Yes	2.00
540	36.40	30.91	2.88	3.54	0.97	15.86	5.48	86.97	4.000	No	Yes	2.00
541	36.48	31.16	2.88	3.57	0.97	15.98	5.48	87.51	4.000	No	Yes	2.00
542	36.53	31.45	2.88	3.66	0.97	16.11	5.52	88.85	4.000	No	Yes	2.00
543	36.60	32.02	2.88	3.69	0.97	16.41	5.48	89.96	4.000	No	Yes	2.00
544	36.66	33.04	2.87	3.71	0.97	17.00	5.38	91.40	4.000	No	Yes	2.00
545	36.74	34.44	2.85	3.64	0.96	17.83	5.18	92.43	4.000	No	Yes	2.00
546	36.84	35.46	2.83	3.63	0.96	18.41	5.08	93.51	4.000	No	Yes	2.00
547	36.91	35.59	2.84	3.71	0.96	18.43	5.12	94.47	4.000	No	Yes	2.00
548	36.96	34.86	2.86	3.87	0.96	17.93	5.31	95.32	4.000	No	Yes	2.00
549	37.04	33.65	2.89	4.06	0.98	17.14	5.59	95.73	4.000	No	Yes	2.00
550	37.10	32.31	2.91	4.19	0.99	16.30	5.84	95.17	4.000	No	Yes	2.00
551	37.17	30.94	2.91	3.89	0.98	15.56	5.79	90.12	4.000	No	Yes	2.00
552	37.36	30.18	2.89	3.49	0.98	15.16	5.59	84.79	4.000	No	Yes	2.00
553	37.41	29.99	2.86	3.09	0.96	15.15	5.29	80.18	4.000	No	Yes	2.00
554	37.49	29.95	2.86	3.11	0.97	15.10	5.32	80.39	4.000	No	Yes	2.00
555	37.54	29.67	2.87	3.17	0.97	14.90	5.41	80.59	4.000	No	Yes	2.00
556	37.55	29.49	2.88	3.22	0.97	14.78	5.47	80.90	4.000	No	Yes	2.00
557	37.59	29.24	2.89	3.28	0.97	14.61	5.56	81.22	4.000	No	Yes	2.00
558	37.61	29.40	2.89	3.34	0.98	14.68	5.59	82.06	4.000	No	Yes	2.00
559	37.69	29.64	2.89	3.41	0.98	14.78	5.62	83.06	4.000	No	Yes	2.00
560	37.73	31.33	2.87	3.44	0.97	15.74	5.44	85.61	4.000	No	Yes	2.00
561	37.91	32.89	2.86	3.50	0.96	16.59	5.31	88.05	4.000	No	Yes	2.00
562	37.95	34.48	2.85	3.55	0.96	17.49	5.18	90.64	4.000	No	Yes	2.00
563	38.00	35.75	2.84	3.70	0.96	18.18	5.16	93.83	4.000	No	Yes	2.00
564	38.17	36.96	2.84	3.82	0.96	18.79	5.14	96.64	4.000	No	Yes	2.00
565	38.22	38.11	2.84	3.92	0.96	19.42	5.11	99.22	4.000	No	Yes	2.00
566	38.26	38.55	2.83	3.95	0.96	19.66	5.09	100.03	4.000	No	Yes	2.00
567	38.29	39.09	2.83	3.98	0.95	19.95	5.06	101.01	4.000	No	Yes	2.00
568	38.35	39.63	2.83	4.03	0.95	20.23	5.05	102.25	4.000	No	Yes	2.00
569	38.42	40.05	2.83	4.11	0.96	20.42	5.08	103.69	4.000	No	Yes	2.00
570	38.48	40.30	2.84	4.20	0.96	20.51	5.12	104.98	4.000	No	Yes	2.00
571	38.53	40.33	2.84	4.30	0.96	20.48	5.18	106.10	4.000	No	Yes	2.00
572	38.61	40.33	2.85	4.37	0.96	20.43	5.23	106.87	4.000	No	Yes	2.00
573	38.66	40.21	2.86	4.44	0.96	20.32	5.29	107.49	4.000	No	Yes	2.00
574	38.75	40.27	2.86	4.46	0.96	20.32	5.30	107.65	4.000	No	Yes	2.00
575	38.79	40.21	2.86	4.46	0.96	20.26	5.31	107.55	4.000	No	Yes	2.00
576	38.86	40.24	2.86	4.43	0.96	20.27	5.29	107.18	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
577	38.92	40.18	2.86	4.41	0.96	20.21	5.28	106.81	4.000	No	Yes	2.00
578	38.99	40.40	2.85	4.35	0.96	20.34	5.23	106.44	4.000	No	Yes	2.00
579	39.06	40.34	2.85	4.32	0.96	20.28	5.22	105.89	4.000	No	Yes	2.00
580	39.19	40.11	2.85	4.31	0.96	20.11	5.24	105.43	4.000	No	Yes	2.00
581	39.24	39.63	2.86	4.35	0.96	19.80	5.31	105.18	4.000	No	Yes	2.00
582	39.28	39.47	2.86	4.36	0.97	19.69	5.34	105.11	4.000	No	Yes	2.00
583	39.33	39.41	2.86	4.30	0.96	19.66	5.31	104.29	4.000	No	Yes	2.00
584	39.48	39.35	2.85	4.21	0.96	19.60	5.26	103.14	4.000	No	Yes	2.00
585	39.54	39.12	2.85	4.15	0.96	19.46	5.25	102.10	4.000	No	Yes	2.00
586	39.58	38.80	2.86	4.16	0.96	19.26	5.28	101.75	4.000	No	Yes	2.00
587	39.64	38.49	2.86	4.18	0.97	19.06	5.33	101.52	4.000	No	Yes	2.00
588	39.72	38.26	2.86	4.18	0.97	18.90	5.35	101.21	4.000	No	Yes	2.00
589	39.76	38.14	2.86	4.15	0.97	18.83	5.34	100.60	4.000	No	Yes	2.00
590	39.84	37.94	2.86	4.09	0.97	18.71	5.33	99.69	4.000	No	Yes	2.00
591	39.89	37.66	2.84	3.76	0.96	18.64	5.13	95.51	4.000	No	Yes	2.00
592	40.08	37.50	2.82	3.54	0.95	18.56	4.99	92.66	4.000	No	Yes	2.00
593	40.16	37.37	2.82	3.42	0.95	18.50	4.92	91.08	4.000	No	Yes	2.00
594	40.23	37.50	2.83	3.59	0.95	18.49	5.03	93.12	4.000	No	Yes	2.00
595	40.29	37.18	2.85	3.85	0.96	18.20	5.26	95.77	4.000	No	Yes	2.00
596	40.34	34.09	2.93	4.43	0.99	16.28	5.99	97.57	4.000	No	Yes	2.00
597	40.34	32.38	2.98	4.94	1.00	15.32	6.53	99.96	4.000	No	Yes	2.00
598	40.37	33.36	2.97	4.99	1.00	15.82	6.44	101.88	4.000	No	Yes	2.00
599	40.43	41.16	2.84	4.16	0.96	20.32	5.12	103.99	4.000	No	Yes	2.00
600	40.56	48.17	2.74	3.64	0.92	24.51	4.29	105.06	4.000	No	Yes	2.00
601	40.58	49.54	2.72	3.54	0.91	25.34	4.15	105.07	4.000	No	Yes	2.00
602	40.64	45.52	2.78	3.83	0.93	22.86	4.59	104.85	4.000	No	Yes	2.00
603	40.69	39.12	2.87	4.32	0.97	19.02	5.42	103.05	4.000	No	Yes	2.00
604	40.79	35.84	2.92	4.50	0.99	17.10	5.88	100.47	4.000	No	Yes	2.00
605	40.83	33.74	2.94	4.48	1.00	15.92	6.11	97.23	4.000	No	Yes	2.00
606	40.90	33.14	2.94	4.33	0.99	15.60	6.08	94.84	4.000	No	Yes	2.00
607	40.96	32.18	2.94	4.23	1.00	15.09	6.13	92.42	4.000	No	Yes	2.00
608	41.05	31.32	2.95	4.20	1.00	14.60	6.22	90.85	4.000	No	Yes	2.00
609	41.09	30.17	2.97	4.26	1.00	14.01	6.41	89.80	4.000	No	Yes	2.00
610	41.14	29.06	2.99	4.35	1.00	13.43	6.63	89.05	4.000	No	Yes	2.00
611	41.22	27.72	3.02	4.52	1.00	12.74	6.95	88.52	4.000	No	Yes	2.00
612	41.28	26.35	3.05	4.72	1.00	12.03	7.31	87.97	4.000	No	Yes	2.00
613	41.36	24.86	3.09	4.97	1.00	11.26	7.75	87.23	4.000	No	Yes	2.00
614	41.44	23.52	3.12	5.14	1.00	10.57	8.13	85.95	4.000	No	Yes	2.00
615	41.49	21.93	3.15	5.30	1.00	9.76	8.59	83.86	4.000	No	Yes	2.00
616	41.59	20.50	3.18	5.41	1.00	9.03	9.03	81.52	4.000	No	Yes	2.00
617	41.65	19.07	3.22	5.51	1.00	8.30	9.50	78.82	4.000	No	Yes	2.00
618	41.71	18.21	3.24	5.50	1.00	7.86	9.76	76.72	4.000	No	Yes	2.00
619	41.76	17.54	3.25	5.43	1.00	7.52	9.93	74.67	4.000	No	Yes	2.00
620	41.80	16.68	3.26	5.23	1.00	7.08	10.10	71.52	4.000	No	Yes	2.00
621	41.94	15.91	3.27	4.99	1.00	6.68	10.22	68.31	4.000	No	Yes	2.00
622	42.00	15.34	3.27	4.66	1.00	6.39	10.20	65.19	4.000	No	Yes	2.00
623	42.06	15.25	3.26	4.43	1.00	6.34	10.06	63.73	4.000	No	Yes	2.00
624	42.10	15.18	3.25	4.21	1.00	6.30	9.90	62.35	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
625	42.16	15.22	3.23	3.94	1.00	6.31	9.66	60.92	4.000	No	Yes	2.00
626	42.23	15.25	3.21	3.69	1.00	6.32	9.43	59.55	4.000	No	Yes	2.00
627	42.28	15.37	3.20	3.50	1.00	6.38	9.20	58.65	4.000	No	Yes	2.00
628	42.36	15.56	3.18	3.34	1.00	6.46	8.98	58.02	4.000	No	Yes	2.00
629	42.42	15.98	3.15	3.03	1.00	6.66	8.52	56.74	4.000	No	Yes	2.00
630	42.48	17.47	3.10	2.87	1.00	7.40	7.87	58.21	4.000	No	Yes	2.00
631	42.60	20.85	3.00	2.63	1.00	9.06	6.75	61.16	4.000	No	Yes	2.00
632	42.68	25.43	2.90	2.47	0.98	11.47	5.70	65.37	4.000	No	Yes	2.00
633	42.72	28.23	2.85	2.41	0.96	13.03	5.21	67.89	4.000	No	Yes	2.00
634	42.78	27.37	2.89	2.66	0.98	12.46	5.59	69.64	4.000	No	Yes	2.00
635	42.81	25.18	2.97	3.14	1.00	11.17	6.41	71.57	4.000	No	Yes	2.00
636	42.87	23.90	3.02	3.57	1.00	10.53	7.00	73.67	4.000	No	Yes	2.00
637	42.96	24.54	3.02	3.69	1.00	10.83	6.98	75.59	4.000	No	Yes	2.00
638	43.00	25.81	3.00	3.64	1.00	11.45	6.71	76.89	4.000	No	Yes	2.00
639	43.09	27.41	2.96	3.47	1.00	12.22	6.33	77.42	4.000	No	Yes	2.00
640	43.13	29.67	2.92	3.35	0.99	13.43	5.91	79.32	4.000	No	Yes	2.00
641	43.22	31.51	2.89	3.33	0.98	14.42	5.64	81.40	4.000	No	Yes	2.00
642	43.28	32.94	2.88	3.40	0.97	15.17	5.53	83.81	4.000	No	Yes	2.00
643	43.34	33.52	2.88	3.44	0.97	15.45	5.50	84.96	4.000	No	Yes	2.00
644	43.39	33.74	2.88	3.51	0.97	15.54	5.53	85.86	4.000	No	Yes	2.00
645	43.48	33.77	2.88	3.53	0.97	15.53	5.55	86.10	4.000	No	Yes	2.00
646	43.57	33.74	2.89	3.54	0.97	15.48	5.56	86.14	4.000	No	Yes	2.00
647	43.62	33.49	2.89	3.54	0.98	15.33	5.60	85.80	4.000	No	Yes	2.00
648	43.66	33.17	2.89	3.54	0.98	15.15	5.63	85.33	4.000	No	Yes	2.00
649	43.70	32.47	2.90	3.53	0.98	14.76	5.71	84.33	4.000	No	Yes	2.00
650	43.80	31.70	2.91	3.51	0.98	14.33	5.80	83.11	4.000	No	Yes	2.00
651	43.86	30.65	2.93	3.52	0.99	13.74	5.95	81.78	4.000	No	Yes	2.00
652	43.92	29.63	2.94	3.58	1.00	13.17	6.15	80.94	4.000	No	Yes	2.00
653	43.96	28.39	2.97	3.71	1.00	12.53	6.43	80.60	4.000	No	Yes	2.00
654	44.05	27.31	3.00	3.87	1.00	11.98	6.72	80.52	4.000	No	Yes	2.00
655	44.10	25.84	3.03	4.05	1.00	11.26	7.10	79.95	4.000	No	Yes	2.00
656	44.19	24.51	3.06	4.19	1.00	10.60	7.45	78.92	4.000	No	Yes	2.00
657	44.25	23.11	3.09	4.27	1.00	9.91	7.79	77.21	4.000	No	Yes	2.00
658	44.30	22.21	3.10	4.26	1.00	9.47	7.98	75.56	4.000	No	Yes	2.00
659	44.37	21.69	3.10	4.09	1.00	9.20	7.98	73.42	4.000	No	Yes	2.00
660	44.45	21.45	3.10	3.88	1.00	9.08	7.87	71.47	4.000	No	Yes	2.00
661	44.50	21.42	3.08	3.68	1.00	9.05	7.71	69.84	4.000	No	Yes	2.00
662	44.60	22.07	3.06	3.49	1.00	9.35	7.41	69.36	4.000	No	Yes	2.00
663	44.64	23.30	3.02	3.23	1.00	9.94	6.94	69.01	4.000	No	Yes	2.00
664	44.71	25.40	2.96	2.96	1.00	10.94	6.32	69.17	4.000	No	Yes	2.00
665	44.75	28.55	2.89	2.76	0.98	12.64	5.63	71.18	4.000	No	Yes	2.00
666	44.85	32.02	2.84	2.71	0.96	14.52	5.12	74.37	4.000	No	Yes	2.00
667	44.90	35.72	2.78	2.58	0.93	16.59	4.61	76.51	4.000	No	Yes	2.00
668	45.00	37.98	2.75	2.53	0.92	17.84	4.37	77.96	4.000	No	Yes	2.00
669	45.05	39.60	2.74	2.62	0.92	18.69	4.31	80.50	4.000	No	Yes	2.00
670	45.11	40.27	2.76	2.83	0.93	18.93	4.44	83.99	4.000	No	Yes	2.00
671	45.16	41.13	2.77	3.04	0.93	19.29	4.54	87.49	4.000	No	Yes	2.00
672	45.33	40.24	2.80	3.25	0.94	18.65	4.78	89.12	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
673	45.35	38.14	2.85	3.54	0.96	17.39	5.19	90.26	4.000	No	Yes	2.00
674	45.36	39.25	2.84	3.59	0.96	17.97	5.13	92.09	4.000	No	Yes	2.00
675	45.48	41.86	2.81	3.56	0.95	19.35	4.88	94.54	4.000	No	Yes	2.00
676	45.54	45.52	2.77	3.49	0.93	21.37	4.56	97.33	4.000	No	Yes	2.00
677	45.64	45.46	2.79	3.62	0.94	21.23	4.66	98.94	4.000	No	Yes	2.00
678	45.72	45.05	2.80	3.74	0.94	20.93	4.78	99.93	4.000	No	Yes	2.00
679	45.78	43.23	2.83	3.90	0.95	19.86	5.03	99.83	4.000	No	Yes	2.00
680	45.91	40.84	2.86	4.04	0.97	18.49	5.33	98.59	4.000	No	Yes	2.00
681	45.96	38.36	2.89	4.06	0.98	17.15	5.58	95.72	4.000	No	Yes	2.00
682	46.04	36.61	2.90	4.00	0.98	16.22	5.73	92.94	4.000	No	Yes	2.00
683	46.08	34.83	2.92	3.93	0.99	15.30	5.87	89.86	4.000	No	Yes	2.00
684	46.17	33.04	2.94	3.96	1.00	14.33	6.13	87.78	4.000	No	Yes	2.00
685	46.22	31.67	2.96	3.96	1.00	13.64	6.30	85.91	4.000	No	Yes	2.00
686	46.27	30.56	2.98	4.01	1.00	13.10	6.49	84.97	4.000	No	Yes	2.00
687	46.35	29.80	2.99	4.13	1.00	12.72	6.68	85.02	4.000	No	Yes	2.00
688	46.40	29.43	3.03	4.55	1.00	12.54	7.03	88.14	4.000	No	Yes	2.00
689	46.48	29.46	3.06	5.11	1.00	12.54	7.40	92.74	4.000	No	Yes	2.00
690	46.54	30.80	3.07	5.65	1.00	13.16	7.54	99.19	4.000	No	Yes	2.00
691	46.60	35.81	3.01	5.48	1.00	15.50	6.81	105.52	4.000	No	Yes	2.00
692	46.66	46.61	2.88	4.93	0.97	20.97	5.47	114.78	4.000	Yes	Yes	2.00
693	46.72	63.73	2.72	4.33	0.91	30.39	4.14	125.79	4.000	Yes	Yes	2.00
694	46.79	86.94	2.57	3.79	0.85	43.70	3.12	136.52	4.000	Yes	No	2.00
695	46.83	116.67	2.43	3.41	0.80	61.30	2.44	149.41	4.000	Yes	No	2.00
696	46.91	152.90	2.30	3.00	0.75	83.65	1.94	162.02	4.000	Yes	No	2.00
697	46.97	191.42	2.19	2.68	0.71	108.23	1.63	176.61	4.000	Yes	No	2.00
698	47.03	215.42	2.13	2.54	0.69	123.72	1.51	187.19	4.000	Yes	No	2.00
699	47.10	217.43	2.14	2.65	0.69	124.36	1.54	191.39	4.000	Yes	No	2.00
700	47.17	201.07	2.21	2.96	0.72	112.85	1.68	189.82	4.000	Yes	No	2.00
701	47.23	184.06	2.27	3.25	0.74	101.39	1.85	187.47	4.000	Yes	No	2.00
702	47.27	172.67	2.31	3.45	0.75	93.92	1.98	185.64	4.000	Yes	No	2.00
703	47.31	154.43	2.38	3.85	0.78	82.11	2.24	184.28	4.000	Yes	No	2.00
704	47.50	136.21	2.45	4.14	0.81	70.77	2.53	178.79	4.000	Yes	No	2.00
705	47.53	117.91	2.51	4.34	0.83	59.99	2.83	169.85	4.000	Yes	No	2.00
706	47.58	110.40	2.52	4.18	0.84	55.89	2.88	160.95	0.468	No	No	0.73
707	47.63	101.58	2.57	4.45	0.85	50.59	3.15	159.46	0.457	No	No	0.71
708	47.74	95.13	2.63	4.93	0.88	46.45	3.51	162.92	4.000	No	Yes	2.00
709	47.79	90.95	2.67	5.35	0.89	43.78	3.80	166.35	4.000	No	Yes	2.00
710	47.85	90.79	2.68	5.48	0.90	43.56	3.86	168.27	4.000	No	Yes	2.00
711	47.92	90.58	2.69	5.56	0.90	43.34	3.90	169.17	4.000	No	Yes	2.00
712	47.97	90.63	2.69	5.52	0.90	43.35	3.89	168.59	4.000	No	Yes	2.00
713	48.09	90.70	2.68	5.46	0.90	43.35	3.86	167.43	4.000	No	Yes	2.00
714	48.11	88.79	2.69	5.50	0.90	42.28	3.93	166.25	4.000	No	Yes	2.00
715	48.22	86.08	2.71	5.63	0.91	40.67	4.07	165.52	4.000	No	Yes	2.00
716	48.25	82.23	2.74	5.82	0.92	38.47	4.28	164.53	4.000	No	Yes	2.00
717	48.32	79.71	2.75	5.90	0.92	37.05	4.40	162.95	4.000	No	Yes	2.00
718	48.37	75.32	2.78	6.01	0.93	34.66	4.61	159.68	4.000	No	Yes	2.00
719	48.47	71.08	2.81	6.13	0.94	32.34	4.84	156.36	4.000	No	Yes	2.00
720	48.50	65.61	2.84	6.33	0.96	29.40	5.18	152.22	4.000	No	Yes	2.00

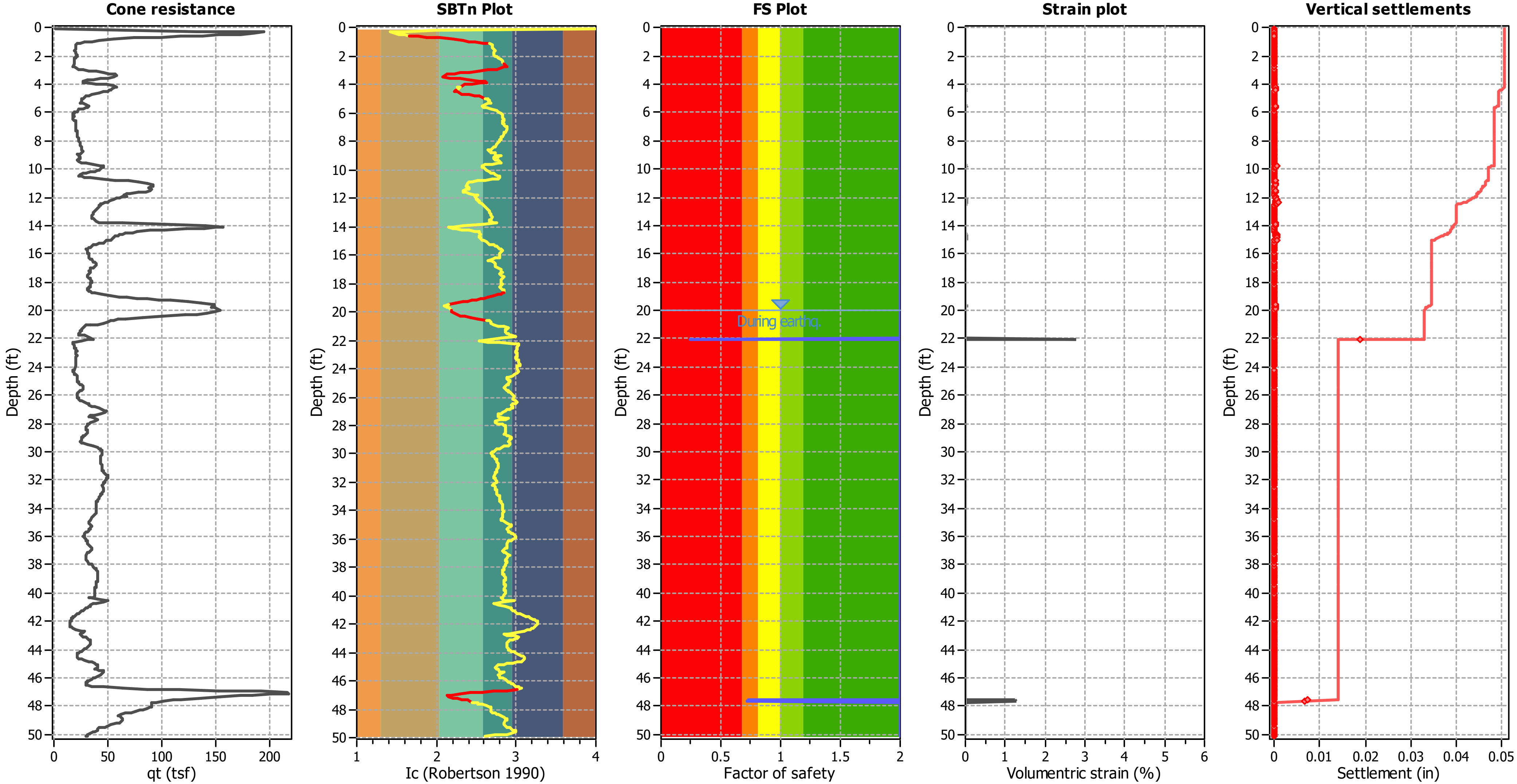
:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

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
721	48.64	62.17	2.87	6.47	0.97	27.53	5.43	149.37	4.000	No	Yes	2.00
722	48.68	59.85	2.89	6.52	0.98	26.31	5.58	146.81	4.000	No	Yes	2.00
723	48.72	60.26	2.88	6.38	0.97	26.55	5.49	145.81	4.000	No	Yes	2.00
724	48.79	61.60	2.86	6.23	0.97	27.26	5.35	145.76	4.000	No	Yes	2.00
725	48.91	63.10	2.85	6.12	0.96	28.01	5.22	146.20	4.000	No	Yes	2.00
726	48.94	63.86	2.84	6.12	0.96	28.38	5.18	147.01	4.000	No	Yes	2.00
727	48.99	63.99	2.85	6.13	0.96	28.42	5.18	147.27	4.000	No	Yes	2.00
728	49.03	63.60	2.85	6.17	0.96	28.19	5.22	147.25	4.000	No	Yes	2.00
729	49.12	62.68	2.86	6.20	0.96	27.66	5.29	146.39	4.000	No	Yes	2.00
730	49.17	60.61	2.87	6.19	0.97	26.60	5.40	143.64	4.000	No	Yes	2.00
731	49.25	58.06	2.88	6.15	0.97	25.29	5.53	139.77	4.000	No	Yes	2.00
732	49.29	52.46	2.92	6.14	0.99	22.47	5.89	132.26	4.000	No	Yes	2.00
733	49.47	47.62	2.96	6.15	1.00	20.03	6.27	125.52	4.000	No	Yes	2.00
734	49.52	43.10	2.99	6.16	1.00	17.98	6.64	119.46	4.000	No	Yes	2.00
735	49.56	41.89	3.00	6.06	1.00	17.43	6.70	116.82	4.000	No	Yes	2.00
736	49.61	41.16	2.99	5.76	1.00	17.09	6.61	112.97	4.000	No	Yes	2.00
737	49.67	40.65	2.93	4.71	0.99	16.92	6.04	102.23	4.000	No	Yes	2.00
738	49.73	39.95	2.88	3.86	0.97	16.85	5.51	92.83	4.000	No	Yes	2.00
739	49.78	38.33	2.73	2.16	0.92	16.80	4.23	70.97	4.000	No	Yes	2.00
740	49.88	36.23	2.60	1.20	0.87	16.37	3.35	54.83	4.000	No	Yes	2.00
741	49.95	34.16	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
742	50.00	31.42	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
743	50.01	30.79	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
744	50.09	30.25	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
745	50.14	31.30	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00

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

Estimation of post-earthquake settlements

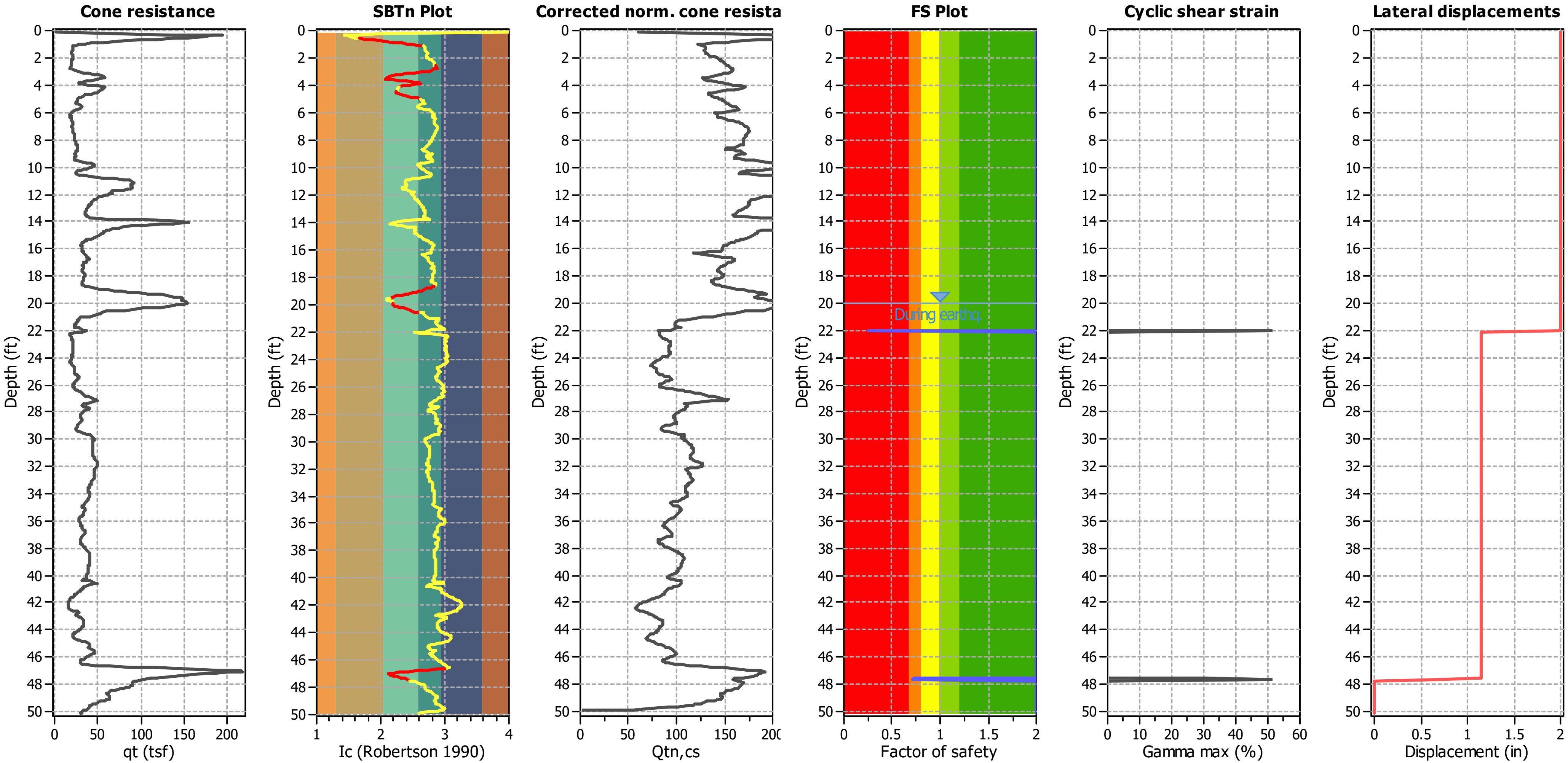


Abbreviations

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

Estimation of post-earthquake lateral Displacements

Geometric parameters: Level ground (or gently sloping) with free face (L: 60.00 ft - H: 20.00 ft)

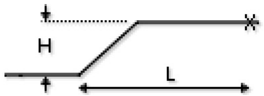


Abbreviations

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)
20.04	153.32	128.63	3.17	213.39	2.00	75.31	0.00	0.00
20.08	148.77	124.40	3.29	213.28	2.00	74.21	0.00	0.00
20.17	141.32	117.44	3.50	212.91	2.00	72.31	0.00	0.00
20.26	132.73	109.57	3.73	212.18	2.00	70.02	0.00	0.00
20.29	121.27	99.57	4.01	209.70	2.00	66.86	0.00	0.00
20.37	101.86	82.74	4.36	200.45	2.00	60.75	0.00	0.00
20.52	81.94	65.48	4.82	190.23	2.00	53.02	0.00	0.00
20.57	65.83	51.96	5.23	179.65	2.00	45.39	0.00	0.00
20.61	59.37	46.54	5.29	171.99	2.00	41.75	0.00	0.00
20.70	55.26	43.03	5.20	164.56	2.00	39.17	0.00	0.00
20.74	52.11	40.40	5.06	157.46	2.00	37.09	0.00	0.00
20.83	50.14	38.67	4.90	151.70	2.00	35.64	0.00	0.00
20.88	46.00	35.26	4.81	144.39	2.00	32.59	0.00	0.00
20.98	40.30	30.48	4.98	138.37	2.00	27.79	0.00	0.00
21.03	34.27	25.56	5.26	132.09	2.00	21.98	0.00	0.00
21.07	30.26	22.31	5.44	126.72	2.00	17.49	0.00	0.00
21.14	28.47	20.87	5.05	118.66	2.00	15.28	0.00	0.00
21.23	27.36	19.96	4.50	109.95	2.00	13.81	0.00	0.00
21.27	26.47	19.26	4.05	102.97	2.00	12.64	0.00	0.00
21.37	25.64	18.54	3.92	99.85	2.00	11.38	0.00	0.00
21.43	25.07	18.05	3.90	98.44	2.00	10.49	0.00	0.00
21.49	24.72	17.72	3.92	97.97	2.00	9.88	0.00	0.00
21.54	24.12	17.20	4.00	97.86	2.00	8.90	0.00	0.00
21.63	23.51	16.64	4.10	97.67	2.00	7.82	0.00	0.00
21.68	22.81	16.04	4.28	98.23	2.00	6.60	0.00	0.00
21.74	22.59	15.81	4.98	104.82	2.00	6.13	0.00	0.00
21.80	28.22	20.21	3.63	99.48	2.00	14.22	0.00	0.00
21.99	33.14	24.01	2.80	93.21	2.00	19.91	0.00	0.00
22.05	36.94	27.21	1.88	80.27	0.25	24.04	51.20	0.86
22.10	31.10	22.44	2.27	82.22	2.00	17.67	0.00	0.00
22.15	25.05	17.59	2.77	82.94	2.00	9.65	0.00	0.00
22.21	19.00	12.86	3.56	82.63	2.00	0.00	0.00	0.00
22.25	17.50	11.75	3.81	82.14	2.00	0.00	0.00	0.00
22.32	17.18	11.48	3.92	82.36	2.00	0.00	0.00	0.00
22.41	17.95	11.99	3.83	82.98	2.00	0.00	0.00	0.00
22.45	18.33	12.24	3.88	84.16	2.00	0.00	0.00	0.00
22.54	18.74	12.49	3.96	85.65	2.00	0.00	0.00	0.00
22.61	19.25	12.82	4.08	87.69	2.00	0.00	0.00	0.00
22.67	19.51	12.96	4.22	89.41	2.00	0.00	0.00	0.00
22.70	20.08	13.35	4.30	91.24	2.00	0.54	0.00	0.00
22.81	20.56	13.63	4.33	92.37	2.00	1.22	0.00	0.00
22.85	21.01	13.92	4.37	93.56	2.00	1.93	0.00	0.00
22.91	20.91	13.82	4.45	94.03	2.00	1.68	0.00	0.00
22.99	20.75	13.66	4.50	94.07	2.00	1.29	0.00	0.00
23.10	20.62	13.50	4.51	93.63	2.00	0.89	0.00	0.00
23.13	20.62	13.48	4.45	93.04	2.00	0.86	0.00	0.00
23.17	21.16	13.84	4.29	92.56	2.00	1.72	0.00	0.00
23.26	20.97	13.65	4.32	92.27	2.00	1.28	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)
23.34	20.78	13.47	4.37	92.24	2.00	0.84	0.00	0.00
23.38	20.05	12.94	4.54	92.33	2.00	0.00	0.00	0.00
23.51	20.15	12.93	4.53	92.20	2.00	0.00	0.00	0.00
23.55	20.31	13.02	4.57	92.76	2.00	0.00	0.00	0.00
23.60	20.43	13.08	4.60	93.30	2.00	0.00	0.00	0.00
23.64	20.34	12.99	4.66	93.52	2.00	0.00	0.00	0.00
23.73	20.08	12.76	4.68	92.97	2.00	0.00	0.00	0.00
23.77	19.82	12.56	4.68	92.37	2.00	0.00	0.00	0.00
23.82	20.65	13.10	4.39	91.37	2.00	0.00	0.00	0.00
23.91	20.46	12.92	4.27	89.77	2.00	0.00	0.00	0.00
23.96	19.89	12.51	3.96	85.69	2.00	0.00	0.00	0.00
24.18	18.36	11.41	3.87	81.78	2.00	0.00	0.00	0.00
24.24	18.01	11.16	3.55	78.11	2.00	0.00	0.00	0.00
24.32	18.20	11.27	3.42	77.12	2.00	0.00	0.00	0.00
24.38	18.74	11.62	3.18	75.74	2.00	0.00	0.00	0.00
24.50	19.22	11.91	3.01	74.60	2.00	0.00	0.00	0.00
24.57	20.40	12.76	2.74	73.57	2.00	0.00	0.00	0.00
24.62	21.42	13.47	2.73	74.92	2.00	0.84	0.00	0.00
24.74	22.22	13.99	2.81	76.89	2.00	2.08	0.00	0.00
24.79	22.17	13.90	3.01	79.15	2.00	1.88	0.00	0.00
24.84	21.84	13.65	3.12	79.82	2.00	1.26	0.00	0.00
24.88	21.81	13.61	3.13	79.83	2.00	1.18	0.00	0.00
24.97	21.89	13.65	3.10	79.65	2.00	1.26	0.00	0.00
25.05	22.18	13.83	3.06	79.50	2.00	1.71	0.00	0.00
25.08	22.63	14.14	3.02	79.75	2.00	2.44	0.00	0.00
25.15	23.30	14.59	3.03	80.82	2.00	3.48	0.00	0.00
25.23	24.06	15.11	3.04	81.99	2.00	4.62	0.00	0.00
25.28	25.37	15.99	3.16	85.20	2.00	6.50	0.00	0.00
25.36	26.71	16.89	3.24	88.06	2.00	8.30	0.00	0.00
25.41	27.31	17.24	3.52	92.26	2.00	8.98	0.00	0.00
25.54	27.12	17.03	3.71	94.05	2.00	8.57	0.00	0.00
25.58	26.58	16.61	3.85	94.88	2.00	7.74	0.00	0.00
25.63	25.98	16.18	3.84	93.70	2.00	6.87	0.00	0.00
25.67	24.89	15.41	3.81	91.59	2.00	5.28	0.00	0.00
25.76	23.62	14.50	3.81	89.42	2.00	3.26	0.00	0.00
25.80	22.47	13.72	3.72	86.59	2.00	1.45	0.00	0.00
25.89	21.85	13.29	3.63	84.51	2.00	0.39	0.00	0.00
25.93	21.28	12.90	3.51	82.41	2.00	0.00	0.00	0.00
26.11	21.31	12.88	3.48	81.96	2.00	0.00	0.00	0.00
26.15	21.48	12.98	3.49	82.36	2.00	0.00	0.00	0.00
26.20	21.96	13.28	3.62	84.40	2.00	0.36	0.00	0.00
26.24	22.53	13.64	4.06	89.81	2.00	1.25	0.00	0.00
26.33	23.33	14.13	4.54	95.92	2.00	2.42	0.00	0.00
26.37	24.57	14.93	4.95	102.11	2.00	4.22	0.00	0.00
26.41	26.22	15.99	5.02	105.80	2.00	6.49	0.00	0.00
26.45	28.64	17.55	5.04	110.28	2.00	9.56	0.00	0.00
26.55	30.59	18.80	5.15	114.80	2.00	11.84	0.00	0.00
26.60	31.70	19.50	5.40	119.33	2.00	13.04	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)
26.64	32.05	19.68	5.82	124.33	2.00	13.34	0.00	0.00
26.74	33.07	20.30	6.12	129.22	2.00	14.36	0.00	0.00
26.80	35.30	21.72	6.20	134.03	2.00	16.61	0.00	0.00
26.86	38.16	23.65	6.09	138.02	2.00	19.42	0.00	0.00
26.90	41.92	26.19	6.06	143.99	2.00	22.78	0.00	0.00
27.02	45.10	28.28	6.11	149.67	2.00	25.32	0.00	0.00
27.08	47.90	30.17	6.07	153.48	2.00	27.45	0.00	0.00
27.13	48.96	30.89	5.90	152.74	2.00	28.23	0.00	0.00
27.21	47.36	30.01	4.94	136.93	2.00	27.27	0.00	0.00
27.33	43.00	27.11	4.30	121.97	2.00	23.92	0.00	0.00
27.39	37.52	23.45	3.76	107.46	2.00	19.13	0.00	0.00
27.44	33.67	20.64	4.39	110.34	2.00	14.92	0.00	0.00
27.52	32.18	19.54	4.65	110.97	2.00	13.11	0.00	0.00
27.57	33.77	20.64	4.44	110.97	2.00	14.92	0.00	0.00
27.64	37.53	23.28	3.98	110.23	2.00	18.89	0.00	0.00
27.73	40.78	25.56	3.65	109.48	2.00	21.98	0.00	0.00
27.77	40.11	25.08	3.67	108.91	2.00	21.35	0.00	0.00
27.86	37.72	23.35	3.82	108.16	2.00	18.98	0.00	0.00
27.89	34.40	21.03	3.97	105.78	2.00	15.54	0.00	0.00
28.01	32.97	20.01	3.97	103.71	2.00	13.90	0.00	0.00
28.04	31.38	18.93	3.97	101.40	2.00	12.06	0.00	0.00
28.12	30.96	18.62	3.93	100.31	2.00	11.52	0.00	0.00
28.15	30.45	18.29	3.85	98.63	2.00	10.92	0.00	0.00
28.25	30.17	18.08	3.75	96.93	2.00	10.54	0.00	0.00
28.34	30.07	17.99	3.70	96.21	2.00	10.38	0.00	0.00
28.38	29.88	17.83	3.79	96.93	2.00	10.09	0.00	0.00
28.43	30.33	18.10	3.86	98.34	2.00	10.58	0.00	0.00
28.50	30.65	18.28	3.86	98.78	2.00	10.91	0.00	0.00
28.61	31.38	18.75	3.78	98.76	2.00	11.75	0.00	0.00
28.66	31.22	18.62	3.82	98.96	2.00	11.51	0.00	0.00
28.70	30.49	18.08	3.98	99.77	2.00	10.54	0.00	0.00
28.75	29.44	17.32	4.19	100.55	2.00	9.12	0.00	0.00
28.83	28.42	16.59	4.29	99.96	2.00	7.71	0.00	0.00
28.88	27.72	16.14	4.13	97.08	2.00	6.80	0.00	0.00
28.96	27.02	15.70	3.88	93.21	2.00	5.89	0.00	0.00
29.01	26.22	15.22	3.59	88.81	2.00	4.85	0.00	0.00
29.12	25.64	14.84	3.41	85.98	2.00	4.02	0.00	0.00
29.18	25.04	14.45	3.29	83.70	2.00	3.14	0.00	0.00
29.27	24.89	14.32	3.29	83.41	2.00	2.85	0.00	0.00
29.32	25.02	14.37	3.37	84.48	2.00	2.98	0.00	0.00
29.37	26.04	15.00	3.49	87.29	2.00	4.39	0.00	0.00
29.43	27.44	15.88	3.64	90.89	2.00	6.26	0.00	0.00
29.49	31.57	18.58	3.65	96.73	2.00	11.46	0.00	0.00
29.62	35.97	21.45	3.64	102.14	2.00	16.19	0.00	0.00
29.69	40.39	24.37	3.64	107.35	2.00	20.41	0.00	0.00
29.75	42.08	25.50	3.57	108.11	2.00	21.89	0.00	0.00
29.81	43.09	26.20	3.44	107.21	2.00	22.79	0.00	0.00
29.87	43.86	26.75	3.28	105.47	2.00	23.47	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)
29.93	44.47	27.13	3.27	105.85	2.00	23.95	0.00	0.00
29.99	44.88	27.35	3.34	107.35	2.00	24.21	0.00	0.00
30.06	45.07	27.41	3.41	108.63	2.00	24.28	0.00	0.00
30.11	44.97	27.29	3.48	109.60	2.00	24.14	0.00	0.00
30.14	44.72	27.09	3.54	110.18	2.00	23.89	0.00	0.00
30.20	44.18	26.65	3.66	111.44	2.00	23.35	0.00	0.00
30.32	43.70	26.22	3.79	112.84	2.00	22.81	0.00	0.00
30.37	43.26	25.85	3.92	114.18	2.00	22.35	0.00	0.00
30.40	43.10	25.71	3.98	114.76	2.00	22.17	0.00	0.00
30.45	43.29	25.81	4.00	115.22	2.00	22.29	0.00	0.00
30.56	43.54	25.92	4.01	115.58	2.00	22.43	0.00	0.00
30.62	43.70	25.98	4.03	116.10	2.00	22.52	0.00	0.00
30.67	43.58	25.85	4.09	116.78	2.00	22.35	0.00	0.00
30.71	43.70	25.90	4.14	117.49	2.00	22.41	0.00	0.00
30.87	43.90	25.94	4.15	117.75	2.00	22.46	0.00	0.00
30.91	44.12	26.07	4.12	117.62	2.00	22.63	0.00	0.00
30.96	44.08	26.03	4.11	117.38	2.00	22.57	0.00	0.00
31.03	44.05	25.98	4.09	116.93	2.00	22.51	0.00	0.00
31.07	44.02	25.95	4.06	116.49	2.00	22.47	0.00	0.00
31.12	44.02	25.94	4.01	115.73	2.00	22.46	0.00	0.00
31.21	44.21	26.04	3.96	115.05	2.00	22.59	0.00	0.00
31.26	44.50	26.23	3.89	114.39	2.00	22.82	0.00	0.00
31.32	44.88	26.45	3.86	114.35	2.00	23.11	0.00	0.00
31.38	45.30	26.70	3.87	114.84	2.00	23.41	0.00	0.00
31.43	46.44	27.41	3.88	116.30	2.00	24.28	0.00	0.00
31.56	47.75	28.18	3.92	118.17	2.00	25.20	0.00	0.00
31.62	49.15	29.03	3.99	120.72	2.00	26.18	0.00	0.00
31.69	49.75	29.35	4.09	122.79	2.00	26.54	0.00	0.00
31.74	49.85	29.33	4.22	124.86	2.00	26.52	0.00	0.00
31.82	49.56	29.06	4.33	126.19	2.00	26.21	0.00	0.00
31.87	49.15	28.72	4.44	127.16	2.00	25.82	0.00	0.00
31.95	48.83	28.46	4.47	127.16	2.00	25.53	0.00	0.00
32.00	48.45	28.20	4.44	126.19	2.00	25.22	0.00	0.00
32.05	47.81	27.85	4.19	121.79	2.00	24.81	0.00	0.00
32.13	47.08	27.49	3.79	114.90	2.00	24.38	0.00	0.00
32.19	46.28	27.07	3.49	109.52	2.00	23.87	0.00	0.00
32.26	45.62	26.59	3.51	109.04	2.00	23.28	0.00	0.00
32.31	45.33	26.31	3.68	111.27	2.00	22.93	0.00	0.00
32.39	45.22	26.16	3.78	112.56	2.00	22.74	0.00	0.00
32.54	45.33	26.15	3.79	112.79	2.00	22.73	0.00	0.00
32.56	45.29	26.09	3.85	113.63	2.00	22.66	0.00	0.00
32.68	45.44	26.11	3.89	114.28	2.00	22.68	0.00	0.00
32.72	45.71	26.26	3.92	114.89	2.00	22.86	0.00	0.00
32.77	45.77	26.27	3.92	115.03	2.00	22.88	0.00	0.00
32.84	45.52	26.06	3.96	115.24	2.00	22.61	0.00	0.00
32.89	44.82	25.54	4.08	116.14	2.00	21.95	0.00	0.00
32.98	44.25	25.10	4.20	116.95	2.00	21.37	0.00	0.00
33.01	43.45	24.55	4.27	117.01	2.00	20.64	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)
33.14	42.91	24.16	4.24	115.87	2.00	20.11	0.00	0.00
33.18	42.46	23.88	4.16	114.16	2.00	19.74	0.00	0.00
33.28	42.18	23.68	4.11	113.02	2.00	19.45	0.00	0.00
33.32	41.79	23.42	4.08	112.20	2.00	19.09	0.00	0.00
33.38	41.22	23.03	4.09	111.58	2.00	18.54	0.00	0.00
33.42	40.65	22.66	4.07	110.60	2.00	18.00	0.00	0.00
33.47	40.07	22.29	4.06	109.64	2.00	17.45	0.00	0.00
33.56	39.63	21.97	4.05	108.97	2.00	16.98	0.00	0.00
33.60	39.40	21.81	4.06	108.79	2.00	16.74	0.00	0.00
33.70	39.34	21.73	4.07	108.74	2.00	16.61	0.00	0.00
33.74	39.34	21.70	4.09	109.01	2.00	16.57	0.00	0.00
33.84	39.37	21.67	4.13	109.36	2.00	16.53	0.00	0.00
33.88	39.44	21.68	4.16	109.90	2.00	16.54	0.00	0.00
33.93	39.60	21.75	4.20	110.48	2.00	16.65	0.00	0.00
33.99	39.63	21.73	4.25	111.11	2.00	16.61	0.00	0.00
34.09	39.69	21.72	4.27	111.35	2.00	16.60	0.00	0.00
34.19	39.63	21.65	4.24	110.83	2.00	16.49	0.00	0.00
34.26	39.57	21.60	4.16	109.76	2.00	16.42	0.00	0.00
34.32	39.28	21.43	4.08	108.33	2.00	16.15	0.00	0.00
34.39	38.71	21.06	4.03	106.89	2.00	15.58	0.00	0.00
34.44	37.91	20.57	3.98	105.19	2.00	14.80	0.00	0.00
34.52	37.05	20.06	3.81	102.06	2.00	13.97	0.00	0.00
34.57	36.35	19.70	3.52	97.46	2.00	13.38	0.00	0.00
34.63	35.81	19.43	3.27	93.60	2.00	12.92	0.00	0.00
34.70	34.95	18.83	3.39	94.09	2.00	11.89	0.00	0.00
34.89	33.49	17.74	3.84	97.60	2.00	9.91	0.00	0.00
34.94	32.34	16.90	4.30	101.06	2.00	8.32	0.00	0.00
34.99	31.99	16.63	4.52	102.79	2.00	7.78	0.00	0.00
35.07	32.88	17.14	4.47	103.49	2.00	8.79	0.00	0.00
35.14	34.41	18.08	4.32	104.01	2.00	10.55	0.00	0.00
35.23	34.89	18.35	4.27	104.15	2.00	11.03	0.00	0.00
35.29	35.05	18.43	4.23	103.83	2.00	11.19	0.00	0.00
35.40	34.12	17.83	4.27	102.89	2.00	10.09	0.00	0.00
35.46	33.77	17.62	4.20	101.61	2.00	9.69	0.00	0.00
35.52	33.01	17.14	4.21	100.55	2.00	8.78	0.00	0.00
35.58	31.93	16.45	4.28	99.73	2.00	7.42	0.00	0.00
35.64	30.75	15.73	4.38	98.96	2.00	5.96	0.00	0.00
35.72	29.51	15.03	4.46	98.04	2.00	4.44	0.00	0.00
35.77	28.55	14.49	4.47	96.67	2.00	3.24	0.00	0.00
35.85	27.79	14.05	4.41	94.84	2.00	2.22	0.00	0.00
35.96	27.66	13.95	4.20	92.56	2.00	1.99	0.00	0.00
36.03	28.17	14.21	3.93	90.44	2.00	2.59	0.00	0.00
36.09	28.96	14.69	3.64	88.51	2.00	3.69	0.00	0.00
36.16	29.63	15.11	3.46	87.38	2.00	4.63	0.00	0.00
36.29	30.11	15.40	3.33	86.56	2.00	5.24	0.00	0.00
36.34	30.56	15.66	3.28	86.47	2.00	5.81	0.00	0.00
36.40	30.91	15.86	3.29	86.97	2.00	6.22	0.00	0.00
36.48	31.16	15.98	3.31	87.51	2.00	6.47	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)
36.53	31.45	16.11	3.40	88.85	2.00	6.74	0.00	0.00
36.60	32.02	16.41	3.44	89.96	2.00	7.36	0.00	0.00
36.66	33.04	17.00	3.46	91.40	2.00	8.52	0.00	0.00
36.74	34.44	17.83	3.41	92.43	2.00	10.08	0.00	0.00
36.84	35.46	18.41	3.40	93.51	2.00	11.14	0.00	0.00
36.91	35.59	18.43	3.47	94.47	2.00	11.19	0.00	0.00
36.96	34.86	17.93	3.62	95.32	2.00	10.28	0.00	0.00
37.04	33.65	17.14	3.79	95.73	2.00	8.79	0.00	0.00
37.10	32.31	16.30	3.90	95.17	2.00	7.13	0.00	0.00
37.17	30.94	15.56	3.60	90.12	2.00	5.58	0.00	0.00
37.36	30.18	15.16	3.22	84.79	2.00	4.74	0.00	0.00
37.41	29.99	15.15	2.85	80.18	2.00	4.71	0.00	0.00
37.49	29.95	15.10	2.87	80.39	2.00	4.60	0.00	0.00
37.54	29.67	14.90	2.92	80.59	2.00	4.16	0.00	0.00
37.55	29.49	14.78	2.97	80.90	2.00	3.90	0.00	0.00
37.59	29.24	14.61	3.02	81.22	2.00	3.50	0.00	0.00
37.61	29.40	14.68	3.08	82.06	2.00	3.66	0.00	0.00
37.69	29.64	14.78	3.14	83.06	2.00	3.89	0.00	0.00
37.73	31.33	15.74	3.19	85.61	2.00	5.98	0.00	0.00
37.91	32.89	16.59	3.25	88.05	2.00	7.71	0.00	0.00
37.95	34.48	17.49	3.31	90.64	2.00	9.46	0.00	0.00
38.00	35.75	18.18	3.46	93.83	2.00	10.73	0.00	0.00
38.17	36.96	18.79	3.58	96.64	2.00	11.83	0.00	0.00
38.22	38.11	19.42	3.68	99.22	2.00	12.90	0.00	0.00
38.26	38.55	19.66	3.71	100.03	2.00	13.31	0.00	0.00
38.29	39.09	19.95	3.74	101.01	2.00	13.80	0.00	0.00
38.35	39.63	20.23	3.79	102.25	2.00	14.26	0.00	0.00
38.42	40.05	20.42	3.87	103.69	2.00	14.56	0.00	0.00
38.48	40.30	20.51	3.96	104.98	2.00	14.72	0.00	0.00
38.53	40.33	20.48	4.05	106.10	2.00	14.67	0.00	0.00
38.61	40.33	20.43	4.12	106.87	2.00	14.58	0.00	0.00
38.66	40.21	20.32	4.18	107.49	2.00	14.40	0.00	0.00
38.75	40.27	20.32	4.19	107.65	2.00	14.40	0.00	0.00
38.79	40.21	20.26	4.20	107.55	2.00	14.31	0.00	0.00
38.86	40.24	20.27	4.17	107.18	2.00	14.32	0.00	0.00
38.92	40.18	20.21	4.15	106.81	2.00	14.23	0.00	0.00
38.99	40.40	20.34	4.10	106.44	2.00	14.43	0.00	0.00
39.06	40.34	20.28	4.06	105.89	2.00	14.34	0.00	0.00
39.19	40.11	20.11	4.05	105.43	2.00	14.06	0.00	0.00
39.24	39.63	19.80	4.08	105.18	2.00	13.55	0.00	0.00
39.28	39.47	19.69	4.10	105.11	2.00	13.36	0.00	0.00
39.33	39.41	19.66	4.04	104.29	2.00	13.31	0.00	0.00
39.48	39.35	19.60	3.96	103.14	2.00	13.20	0.00	0.00
39.54	39.12	19.46	3.90	102.10	2.00	12.98	0.00	0.00
39.58	38.80	19.26	3.90	101.75	2.00	12.64	0.00	0.00
39.64	38.49	19.06	3.92	101.52	2.00	12.29	0.00	0.00
39.72	38.26	18.90	3.92	101.21	2.00	12.02	0.00	0.00
39.76	38.14	18.83	3.88	100.60	2.00	11.88	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)
39.84	37.94	18.71	3.83	99.69	2.00	11.67	0.00	0.00
39.89	37.66	18.64	3.51	95.51	2.00	11.55	0.00	0.00
40.08	37.50	18.56	3.31	92.66	2.00	11.41	0.00	0.00
40.16	37.37	18.50	3.20	91.08	2.00	11.31	0.00	0.00
40.23	37.50	18.49	3.35	93.12	2.00	11.30	0.00	0.00
40.29	37.18	18.20	3.60	95.77	2.00	10.77	0.00	0.00
40.34	34.09	16.28	4.11	97.57	2.00	7.08	0.00	0.00
40.34	32.38	15.32	4.56	99.96	2.00	5.07	0.00	0.00
40.37	33.36	15.82	4.62	101.88	2.00	6.13	0.00	0.00
40.43	41.16	20.32	3.91	103.99	2.00	14.40	0.00	0.00
40.56	48.17	24.51	3.45	105.06	2.00	20.59	0.00	0.00
40.58	49.54	25.34	3.37	105.07	2.00	21.69	0.00	0.00
40.64	45.52	22.86	3.62	104.85	2.00	18.29	0.00	0.00
40.69	39.12	19.02	4.04	103.05	2.00	12.21	0.00	0.00
40.79	35.84	17.10	4.19	100.47	2.00	8.70	0.00	0.00
40.83	33.74	15.92	4.15	97.23	2.00	6.35	0.00	0.00
40.90	33.14	15.60	4.00	94.84	2.00	5.69	0.00	0.00
40.96	32.18	15.09	3.90	92.42	2.00	4.57	0.00	0.00
41.05	31.32	14.60	3.86	90.85	2.00	3.48	0.00	0.00
41.09	30.17	14.01	3.90	89.80	2.00	2.12	0.00	0.00
41.14	29.06	13.43	3.97	89.05	2.00	0.74	0.00	0.00
41.22	27.72	12.74	4.11	88.52	2.00	0.00	0.00	0.00
41.28	26.35	12.03	4.27	87.97	2.00	0.00	0.00	0.00
41.36	24.86	11.26	4.46	87.23	2.00	0.00	0.00	0.00
41.44	23.52	10.57	4.59	85.95	2.00	0.00	0.00	0.00
41.49	21.93	9.76	4.69	83.86	2.00	0.00	0.00	0.00
41.59	20.50	9.03	4.74	81.52	2.00	0.00	0.00	0.00
41.65	19.07	8.30	4.77	78.82	2.00	0.00	0.00	0.00
41.71	18.21	7.86	4.73	76.72	2.00	0.00	0.00	0.00
41.76	17.54	7.52	4.64	74.67	2.00	0.00	0.00	0.00
41.80	16.68	7.08	4.43	71.52	2.00	0.00	0.00	0.00
41.94	15.91	6.68	4.19	68.31	2.00	0.00	0.00	0.00
42.00	15.34	6.39	3.89	65.19	2.00	0.00	0.00	0.00
42.06	15.25	6.34	3.69	63.73	2.00	0.00	0.00	0.00
42.10	15.18	6.30	3.50	62.35	2.00	0.00	0.00	0.00
42.16	15.22	6.31	3.27	60.92	2.00	0.00	0.00	0.00
42.23	15.25	6.32	3.07	59.55	2.00	0.00	0.00	0.00
42.28	15.37	6.38	2.91	58.65	2.00	0.00	0.00	0.00
42.36	15.56	6.46	2.79	58.02	2.00	0.00	0.00	0.00
42.42	15.98	6.66	2.54	56.74	2.00	0.00	0.00	0.00
42.48	17.47	7.40	2.45	58.21	2.00	0.00	0.00	0.00
42.60	20.85	9.06	2.30	61.16	2.00	0.00	0.00	0.00
42.68	25.43	11.47	2.22	65.37	2.00	0.00	0.00	0.00
42.72	28.23	13.03	2.19	67.89	2.00	0.00	0.00	0.00
42.78	27.37	12.46	2.41	69.64	2.00	0.00	0.00	0.00
42.81	25.18	11.17	2.82	71.57	2.00	0.00	0.00	0.00
42.87	23.90	10.53	3.18	73.67	2.00	0.00	0.00	0.00
42.96	24.54	10.83	3.30	75.59	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)
43.00	25.81	11.45	3.27	76.89	2.00	0.00	0.00	0.00
43.09	27.41	12.22	3.14	77.42	2.00	0.00	0.00	0.00
43.13	29.67	13.43	3.06	79.32	2.00	0.73	0.00	0.00
43.22	31.51	14.42	3.05	81.40	2.00	3.08	0.00	0.00
43.28	32.94	15.17	3.13	83.81	2.00	4.75	0.00	0.00
43.34	33.52	15.45	3.17	84.96	2.00	5.36	0.00	0.00
43.39	33.74	15.54	3.23	85.86	2.00	5.55	0.00	0.00
43.48	33.77	15.53	3.25	86.10	2.00	5.52	0.00	0.00
43.57	33.74	15.48	3.26	86.14	2.00	5.42	0.00	0.00
43.62	33.49	15.33	3.26	85.80	2.00	5.10	0.00	0.00
43.66	33.17	15.15	3.25	85.33	2.00	4.71	0.00	0.00
43.70	32.47	14.76	3.24	84.33	2.00	3.85	0.00	0.00
43.80	31.70	14.33	3.22	83.11	2.00	2.87	0.00	0.00
43.86	30.65	13.74	3.21	81.78	2.00	1.48	0.00	0.00
43.92	29.63	13.17	3.25	80.94	2.00	0.08	0.00	0.00
43.96	28.39	12.53	3.36	80.60	2.00	0.00	0.00	0.00
44.05	27.31	11.98	3.49	80.52	2.00	0.00	0.00	0.00
44.10	25.84	11.26	3.63	79.95	2.00	0.00	0.00	0.00
44.19	24.51	10.60	3.73	78.92	2.00	0.00	0.00	0.00
44.25	23.11	9.91	3.77	77.21	2.00	0.00	0.00	0.00
44.30	22.21	9.47	3.74	75.56	2.00	0.00	0.00	0.00
44.37	21.69	9.20	3.58	73.42	2.00	0.00	0.00	0.00
44.45	21.45	9.08	3.39	71.47	2.00	0.00	0.00	0.00
44.50	21.42	9.05	3.21	69.84	2.00	0.00	0.00	0.00
44.60	22.07	9.35	3.06	69.36	2.00	0.00	0.00	0.00
44.64	23.30	9.94	2.86	69.01	2.00	0.00	0.00	0.00
44.71	25.40	10.94	2.64	69.17	2.00	0.00	0.00	0.00
44.75	28.55	12.64	2.50	71.18	2.00	0.00	0.00	0.00
44.85	32.02	14.52	2.48	74.37	2.00	3.32	0.00	0.00
44.90	35.72	16.59	2.38	76.51	2.00	7.71	0.00	0.00
45.00	37.98	17.84	2.35	77.96	2.00	10.11	0.00	0.00
45.05	39.60	18.69	2.44	80.50	2.00	11.63	0.00	0.00
45.11	40.27	18.93	2.64	83.99	2.00	12.06	0.00	0.00
45.16	41.13	19.29	2.84	87.49	2.00	12.68	0.00	0.00
45.33	40.24	18.65	3.03	89.12	2.00	11.58	0.00	0.00
45.35	38.14	17.39	3.28	90.26	2.00	9.27	0.00	0.00
45.36	39.25	17.97	3.34	92.09	2.00	10.34	0.00	0.00
45.48	41.86	19.35	3.33	94.54	2.00	12.80	0.00	0.00
45.54	45.52	21.37	3.27	97.33	2.00	16.06	0.00	0.00
45.64	45.46	21.23	3.40	98.94	2.00	15.85	0.00	0.00
45.72	45.05	20.93	3.51	99.93	2.00	15.37	0.00	0.00
45.78	43.23	19.86	3.65	99.83	2.00	13.65	0.00	0.00
45.91	40.84	18.49	3.76	98.59	2.00	11.28	0.00	0.00
45.96	38.36	17.15	3.76	95.72	2.00	8.80	0.00	0.00
46.04	36.61	16.22	3.70	92.94	2.00	6.96	0.00	0.00
46.08	34.83	15.30	3.61	89.86	2.00	5.03	0.00	0.00
46.17	33.04	14.33	3.62	87.78	2.00	2.87	0.00	0.00
46.22	31.67	13.64	3.61	85.91	2.00	1.24	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)
46.27	30.56	13.10	3.64	84.97	2.00	0.00	0.00	0.00
46.35	29.80	12.72	3.74	85.02	2.00	0.00	0.00	0.00
46.40	29.43	12.54	4.11	88.14	2.00	0.00	0.00	0.00
46.48	29.46	12.54	4.62	92.74	2.00	0.00	0.00	0.00
46.54	30.80	13.16	5.13	99.19	2.00	0.05	0.00	0.00
46.60	35.81	15.50	5.05	105.52	2.00	5.46	0.00	0.00
46.66	46.61	20.97	4.63	114.78	2.00	15.44	0.00	0.00
46.72	63.73	30.39	4.14	125.79	2.00	27.68	0.00	0.00
46.79	86.94	43.70	3.67	136.52	2.00	39.67	0.00	0.00
46.83	116.67	61.30	3.33	149.41	2.00	50.85	0.00	0.00
46.91	152.90	83.65	2.94	162.02	2.00	61.11	0.00	0.00
46.97	191.42	108.23	2.64	176.61	2.00	69.61	0.00	0.00
47.03	215.42	123.72	2.51	187.19	2.00	74.03	0.00	0.00
47.10	217.43	124.36	2.62	191.39	2.00	74.19	0.00	0.00
47.17	201.07	112.85	2.91	189.82	2.00	70.99	0.00	0.00
47.23	184.06	101.39	3.20	187.47	2.00	67.46	0.00	0.00
47.27	172.67	93.92	3.39	185.64	2.00	64.93	0.00	0.00
47.31	154.43	82.11	3.78	184.28	2.00	60.49	0.00	0.00
47.50	136.21	70.77	4.05	178.79	2.00	55.59	0.00	0.00
47.53	117.91	59.99	4.23	169.85	2.00	50.13	0.00	0.00
47.58	110.40	55.89	4.07	160.95	0.73	47.80	31.18	0.45
47.63	101.58	50.59	4.32	159.46	0.71	44.51	51.20	0.69
47.74	95.13	46.45	4.78	162.92	2.00	41.69	0.00	0.00
47.79	90.95	43.78	5.18	166.35	2.00	39.73	0.00	0.00
47.85	90.79	43.56	5.31	168.27	2.00	39.57	0.00	0.00
47.92	90.58	43.34	5.38	169.17	2.00	39.40	0.00	0.00
47.97	90.63	43.35	5.34	168.59	2.00	39.41	0.00	0.00
48.09	90.70	43.35	5.28	167.43	2.00	39.41	0.00	0.00
48.11	88.79	42.28	5.32	166.25	2.00	38.59	0.00	0.00
48.22	86.08	40.67	5.44	165.52	2.00	37.30	0.00	0.00
48.25	82.23	38.47	5.61	164.53	2.00	35.47	0.00	0.00
48.32	79.71	37.05	5.68	162.95	2.00	34.23	0.00	0.00
48.37	75.32	34.66	5.78	159.68	2.00	32.02	0.00	0.00
48.47	71.08	32.34	5.88	156.36	2.00	29.74	0.00	0.00
48.50	65.61	29.40	6.04	152.22	2.00	26.60	0.00	0.00
48.64	62.17	27.53	6.16	149.37	2.00	24.42	0.00	0.00
48.68	59.85	26.31	6.19	146.81	2.00	22.93	0.00	0.00
48.72	60.26	26.55	6.07	145.81	2.00	23.23	0.00	0.00
48.79	61.60	27.26	5.93	145.76	2.00	24.10	0.00	0.00
48.91	63.10	28.01	5.83	146.20	2.00	24.99	0.00	0.00
48.94	63.86	28.38	5.83	147.01	2.00	25.43	0.00	0.00
48.99	63.99	28.42	5.84	147.27	2.00	25.48	0.00	0.00
49.03	63.60	28.19	5.88	147.25	2.00	25.20	0.00	0.00
49.12	62.68	27.66	5.91	146.39	2.00	24.58	0.00	0.00
49.17	60.61	26.60	5.89	143.64	2.00	23.29	0.00	0.00
49.25	58.06	25.29	5.83	139.77	2.00	21.63	0.00	0.00
49.29	52.46	22.47	5.79	132.26	2.00	17.72	0.00	0.00
49.47	47.62	20.03	5.76	125.52	2.00	13.92	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)
49.52	43.10	17.98	5.73	119.46	2.00	10.37	0.00	0.00
49.56	41.89	17.43	5.62	116.82	2.00	9.34	0.00	0.00
49.61	41.16	17.09	5.34	112.97	2.00	8.68	0.00	0.00
49.67	40.65	16.92	4.36	102.23	2.00	8.37	0.00	0.00
49.73	39.95	16.85	3.57	92.83	2.00	8.23	0.00	0.00
49.78	38.33	16.80	1.99	70.97	2.00	8.12	0.00	0.00
49.88	36.23	16.37	1.10	54.83	2.00	7.27	0.00	0.00
49.95	34.16	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.00	31.42	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.01	30.79	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.09	30.25	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.14	31.30	N/A	0.00	-1.00	2.00	0.00	0.00	0.00

Total estimated displacement: 1.99

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

:: Strength loss calculation (Robertson (2009) ::

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
0.07	1.40	2.25	26.61	59.89	4.06	N/A	N/A
0.14	67.43	108.32	1.29	140.27	2.00	N/A	N/A
0.25	132.12	212.24	1.00	212.24	1.63	N/A	N/A
0.27	194.51	312.48	1.00	312.48	1.42	N/A	N/A
0.33	184.58	296.52	1.00	296.52	1.47	N/A	N/A
0.46	172.58	277.23	1.00	277.23	1.52	N/A	N/A
0.47	153.19	246.08	1.00	246.08	1.60	N/A	N/A
0.56	138.39	222.28	1.01	225.55	1.67	N/A	N/A
0.60	117.69	189.03	1.08	204.46	1.76	N/A	N/A
0.68	98.53	158.24	1.16	184.26	1.87	N/A	N/A
0.73	74.21	119.16	1.36	161.83	2.04	N/A	N/A
0.81	56.00	89.89	1.67	150.30	2.20	N/A	N/A
0.87	42.31	67.89	2.04	138.37	2.33	N/A	N/A
0.95	34.64	55.55	2.32	128.93	2.40	N/A	N/A
0.99	28.33	45.42	2.70	122.60	2.49	N/A	N/A
1.08	24.26	38.87	3.25	126.23	2.59	N/A	N/A
1.13	21.55	34.52	3.72	128.59	2.66	N/A	N/A
1.22	20.45	32.74	3.95	129.39	2.69	N/A	N/A
1.27	20.18	32.30	4.01	129.56	2.70	N/A	N/A
1.34	20.45	32.73	3.95	129.38	2.69	N/A	N/A
1.38	20.24	32.39	3.99	129.18	2.70	N/A	N/A
1.55	19.70	31.50	4.11	129.49	2.72	N/A	N/A
1.59	19.10	30.53	4.26	130.00	2.74	N/A	N/A
1.61	19.32	30.88	4.24	130.97	2.73	N/A	N/A
1.67	19.64	31.39	4.21	132.02	2.73	N/A	N/A
1.72	20.05	32.05	4.18	133.81	2.72	N/A	N/A
1.82	20.40	32.60	4.16	135.68	2.72	N/A	N/A
1.86	20.88	33.36	4.13	137.91	2.72	N/A	N/A
1.91	21.10	33.72	4.16	140.35	2.72	N/A	N/A
2.00	21.04	33.61	4.24	142.42	2.73	N/A	N/A
2.04	20.44	32.64	4.42	144.32	2.76	N/A	N/A
2.13	19.78	31.58	4.61	145.46	2.78	N/A	N/A
2.18	19.15	30.56	4.80	146.80	2.80	N/A	N/A
2.24	18.80	29.99	4.94	148.13	2.82	N/A	N/A
2.32	18.67	29.77	5.01	149.25	2.83	N/A	N/A
2.37	18.63	29.71	5.06	150.38	2.83	N/A	N/A
2.48	18.83	30.01	5.04	151.15	2.83	N/A	N/A
2.52	18.64	29.71	5.13	152.29	2.84	N/A	N/A
2.57	18.36	29.25	5.26	153.96	2.85	N/A	N/A
2.70	17.91	28.52	5.48	156.36	2.88	N/A	N/A
2.76	19.40	30.90	5.14	158.78	2.84	N/A	N/A
2.92	22.51	35.89	4.44	159.26	2.76	N/A	N/A
2.98	27.28	43.54	3.62	157.59	2.65	N/A	N/A
3.05	32.66	52.18	2.95	153.81	2.53	N/A	N/A
3.11	39.16	62.62	2.38	149.05	2.42	N/A	N/A
3.18	46.11	73.78	1.97	145.62	2.31	N/A	N/A
3.24	51.79	82.89	1.75	144.68	2.23	N/A	N/A
3.29	56.53	90.52	1.52	137.93	2.14	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
3.41	57.72	92.40	1.43	132.30	2.09	N/A	N/A
3.48	55.68	89.13	1.42	126.80	2.08	N/A	N/A
3.54	49.57	79.30	1.62	128.13	2.18	N/A	N/A
3.60	42.76	68.35	1.93	132.17	2.30	N/A	N/A
3.67	36.71	58.62	2.34	136.98	2.41	N/A	N/A
3.72	30.63	48.86	2.94	143.71	2.53	N/A	N/A
3.76	27.64	44.04	3.37	148.40	2.61	N/A	N/A
3.84	27.10	43.17	3.50	151.16	2.63	N/A	N/A
3.89	31.78	50.68	3.05	154.74	2.55	N/A	N/A
3.97	39.23	62.65	2.53	158.57	2.45	N/A	N/A
4.02	48.87	78.13	2.13	166.04	2.35	N/A	N/A
4.13	55.62	88.96	1.92	171.20	2.29	N/A	N/A
4.15	58.03	92.84	1.85	172.12	2.27	N/A	N/A
4.24	56.31	90.07	1.86	167.87	2.27	N/A	N/A
4.29	54.08	86.48	1.85	160.07	2.27	N/A	N/A
4.37	52.34	83.66	1.83	152.96	2.26	N/A	N/A
4.42	50.84	81.25	1.77	144.19	2.24	N/A	N/A
4.50	49.56	79.20	1.74	138.04	2.23	N/A	N/A
4.53	45.58	72.80	1.83	133.27	2.26	N/A	N/A
4.65	41.38	66.04	2.01	132.54	2.32	N/A	N/A
4.69	35.78	57.03	2.36	134.54	2.41	N/A	N/A
4.81	32.56	51.85	2.64	137.08	2.47	N/A	N/A
4.84	29.99	47.71	2.93	139.91	2.53	N/A	N/A
4.87	28.21	44.85	3.18	142.59	2.58	N/A	N/A
4.99	26.81	42.59	3.41	145.07	2.61	N/A	N/A
5.04	25.72	40.84	3.61	147.26	2.64	N/A	N/A
5.09	25.69	40.78	3.63	148.01	2.65	N/A	N/A
5.13	25.59	40.62	3.68	149.65	2.66	N/A	N/A
5.25	25.11	39.84	3.79	150.93	2.67	N/A	N/A
5.30	24.44	38.76	3.93	152.26	2.69	N/A	N/A
5.34	26.64	42.28	3.63	153.54	2.65	N/A	N/A
5.45	29.21	46.41	3.36	155.79	2.60	N/A	N/A
5.51	31.88	50.69	3.12	158.19	2.57	N/A	N/A
5.56	31.94	50.78	3.15	159.73	2.57	N/A	N/A
5.61	30.96	49.20	3.28	161.54	2.59	N/A	N/A
5.66	29.27	46.48	3.52	163.43	2.63	N/A	N/A
5.74	26.57	42.14	3.93	165.46	2.69	N/A	N/A
5.78	23.67	37.47	4.41	165.12	2.75	N/A	N/A
5.91	21.12	33.36	4.64	154.94	2.78	N/A	N/A
5.98	19.21	30.28	4.86	147.03	2.81	N/A	N/A
6.05	18.44	29.05	4.82	140.10	2.80	N/A	N/A
6.10	18.16	28.59	5.00	142.92	2.82	N/A	N/A
6.18	18.13	28.53	5.00	142.61	2.82	N/A	N/A
6.23	18.26	28.73	4.96	142.60	2.82	N/A	N/A
6.31	18.29	28.78	4.97	142.93	2.82	N/A	N/A
6.33	18.01	28.32	5.10	144.35	2.84	N/A	N/A
6.39	17.88	28.11	5.21	146.42	2.85	N/A	N/A
6.44	18.23	28.67	5.24	150.31	2.85	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
6.55	19.02	29.93	5.13	153.63	2.84	N/A	N/A
6.58	19.75	31.11	5.09	158.27	2.83	N/A	N/A
6.66	20.14	31.71	5.09	161.52	2.84	N/A	N/A
6.71	20.42	32.17	5.12	164.63	2.84	N/A	N/A
6.76	20.45	32.21	5.17	166.58	2.84	N/A	N/A
6.84	20.30	31.95	5.27	168.47	2.86	N/A	N/A
6.91	20.08	31.59	5.38	170.11	2.87	N/A	N/A
6.97	19.95	31.38	5.47	171.80	2.88	N/A	N/A
7.06	19.95	31.37	5.52	173.13	2.88	N/A	N/A
7.10	20.04	31.52	5.53	174.29	2.88	N/A	N/A
7.16	20.30	31.92	5.48	174.90	2.88	N/A	N/A
7.31	20.65	32.47	5.40	175.27	2.87	N/A	N/A
7.34	21.00	33.03	5.31	175.42	2.86	N/A	N/A
7.37	21.22	33.39	5.25	175.18	2.85	N/A	N/A
7.42	21.41	33.69	5.19	174.89	2.85	N/A	N/A
7.48	21.64	34.04	5.12	174.32	2.84	N/A	N/A
7.62	21.86	34.39	5.05	173.54	2.83	N/A	N/A
7.67	22.05	34.69	4.97	172.57	2.82	N/A	N/A
7.72	22.21	34.94	4.91	171.62	2.81	N/A	N/A
7.81	22.34	35.14	4.86	170.93	2.81	N/A	N/A
7.86	22.50	35.39	4.82	170.44	2.80	N/A	N/A
7.90	22.59	35.54	4.79	170.20	2.80	N/A	N/A
7.95	22.95	36.10	4.70	169.81	2.79	N/A	N/A
8.05	23.36	36.75	4.61	169.56	2.78	N/A	N/A
8.11	23.80	37.46	4.52	169.47	2.77	N/A	N/A
8.16	24.09	37.92	4.47	169.63	2.76	N/A	N/A
8.20	24.54	38.63	4.39	169.72	2.75	N/A	N/A
8.34	25.02	39.39	4.31	169.72	2.74	N/A	N/A
8.40	25.56	40.25	4.13	166.39	2.72	N/A	N/A
8.55	25.84	40.70	3.92	159.59	2.69	N/A	N/A
8.60	26.10	41.10	3.70	152.25	2.66	N/A	N/A
8.64	26.22	41.30	3.65	150.61	2.65	N/A	N/A
8.69	26.35	41.50	3.71	154.13	2.66	N/A	N/A
8.73	26.41	41.60	3.82	158.90	2.68	N/A	N/A
8.79	26.41	41.59	3.90	162.36	2.69	N/A	N/A
8.84	25.08	39.44	4.21	166.15	2.73	N/A	N/A
8.97	24.84	39.04	4.31	168.19	2.74	N/A	N/A
8.98	22.32	35.00	4.88	170.85	2.81	N/A	N/A
8.99	23.21	36.43	4.64	169.11	2.78	N/A	N/A
9.06	22.98	36.04	4.63	167.03	2.78	N/A	N/A
9.13	25.01	39.31	4.11	161.57	2.72	N/A	N/A
9.21	24.35	38.23	4.19	160.12	2.73	N/A	N/A
9.30	23.52	36.89	4.33	159.58	2.74	N/A	N/A
9.35	22.37	35.05	4.58	160.60	2.78	N/A	N/A
9.39	22.05	34.52	4.78	164.90	2.80	N/A	N/A
9.49	22.46	35.17	4.86	170.84	2.81	N/A	N/A
9.52	25.10	39.42	4.57	180.32	2.77	N/A	N/A
9.60	30.01	47.29	3.98	188.14	2.70	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
9.66	36.92	58.08	3.43	199.38	2.62	N/A	N/A
9.74	42.59	65.89	3.16	207.97	2.57	N/A	N/A
9.78	45.42	70.02	3.13	219.42	2.57	N/A	N/A
9.87	45.51	69.87	3.24	226.34	2.59	N/A	N/A
9.91	44.05	67.67	3.38	228.96	2.61	N/A	N/A
10.03	42.49	64.73	3.48	224.97	2.62	N/A	N/A
10.06	40.07	61.01	3.56	217.13	2.64	N/A	N/A
10.14	37.33	56.61	3.69	208.93	2.66	N/A	N/A
10.19	33.70	51.01	3.85	196.46	2.68	N/A	N/A
10.27	29.82	45.02	4.11	184.93	2.72	N/A	N/A
10.32	26.55	40.03	4.32	173.03	2.74	N/A	N/A
10.39	24.38	36.64	4.54	166.45	2.77	N/A	N/A
10.45	23.68	35.47	4.66	165.26	2.79	N/A	N/A
10.53	25.15	37.46	4.68	175.22	2.79	N/A	N/A
10.62	27.82	41.09	4.56	187.22	2.77	N/A	N/A
10.65	33.97	49.63	4.06	201.32	2.71	N/A	N/A
10.71	44.47	63.61	3.34	212.71	2.60	N/A	N/A
10.80	57.01	79.82	2.82	224.89	2.51	N/A	N/A
10.85	68.57	94.68	2.50	237.17	2.44	N/A	N/A
10.89	78.76	107.65	2.33	250.88	2.40	N/A	N/A
10.98	87.13	117.92	2.25	264.95	2.38	N/A	N/A
11.12	92.25	123.44	2.22	274.41	2.38	N/A	N/A
11.18	91.65	122.30	2.27	277.68	2.39	N/A	N/A
11.24	89.90	119.59	2.31	276.51	2.40	N/A	N/A
11.29	88.05	116.90	2.35	274.95	2.41	N/A	N/A
11.35	88.18	116.36	2.32	269.66	2.40	N/A	N/A
11.42	88.85	116.02	2.19	254.25	2.37	N/A	N/A
11.47	90.15	116.69	2.08	242.73	2.34	N/A	N/A
11.55	88.94	114.32	2.06	235.43	2.33	N/A	N/A
11.60	84.70	109.15	2.20	240.52	2.37	N/A	N/A
11.68	78.94	101.75	2.38	242.45	2.42	N/A	N/A
11.73	70.25	91.04	2.70	245.41	2.49	N/A	N/A
11.77	67.61	87.55	2.78	243.64	2.50	N/A	N/A
11.81	65.32	84.38	2.84	239.28	2.51	N/A	N/A
11.90	67.17	85.85	2.69	231.12	2.48	N/A	N/A
11.95	63.73	81.29	2.76	224.14	2.50	N/A	N/A
12.04	60.99	77.33	2.79	216.01	2.50	N/A	N/A
12.08	57.55	72.78	2.84	206.83	2.51	N/A	N/A
12.17	55.29	69.44	2.85	198.24	2.52	N/A	N/A
12.21	51.79	64.92	2.94	190.86	2.53	N/A	N/A
12.32	49.53	61.67	3.01	185.33	2.54	N/A	N/A
12.36	46.66	58.02	3.12	180.80	2.56	N/A	N/A
12.43	45.26	56.03	3.18	178.04	2.58	N/A	N/A
12.48	43.57	53.85	3.27	176.30	2.59	N/A	N/A
12.56	42.81	52.62	3.33	175.41	2.60	N/A	N/A
12.61	42.20	51.74	3.38	175.09	2.61	N/A	N/A
12.68	41.50	50.69	3.46	175.40	2.62	N/A	N/A
12.75	40.67	49.47	3.54	174.88	2.63	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
12.83	39.78	48.16	3.63	174.61	2.65	N/A	N/A
12.87	39.05	47.16	3.69	173.87	2.66	N/A	N/A
12.96	38.41	46.15	3.76	173.35	2.67	N/A	N/A
13.00	37.75	45.22	3.79	171.53	2.67	N/A	N/A
13.11	37.15	44.16	3.83	169.14	2.68	N/A	N/A
13.15	36.51	43.30	3.86	166.91	2.68	N/A	N/A
13.20	36.10	42.64	3.88	165.29	2.68	N/A	N/A
13.28	35.08	41.23	3.97	163.76	2.70	N/A	N/A
13.37	34.89	40.76	3.96	161.41	2.70	N/A	N/A
13.48	35.08	40.64	3.93	159.92	2.69	N/A	N/A
13.53	36.39	41.97	3.80	159.33	2.67	N/A	N/A
13.58	37.47	43.08	3.73	160.66	2.66	N/A	N/A
13.64	38.40	44.05	3.83	168.54	2.68	N/A	N/A
13.69	39.54	45.38	4.14	187.68	2.72	N/A	N/A
13.75	41.81	48.01	4.45	213.43	2.76	N/A	N/A
13.80	63.42	72.02	3.27	235.50	2.59	N/A	N/A
13.90	102.38	113.70	2.10	238.70	2.34	N/A	N/A
13.99	140.17	153.37	1.67	256.78	2.20	N/A	N/A
14.06	156.18	169.66	1.56	265.14	2.15	N/A	N/A
14.11	149.78	162.83	1.68	273.04	2.20	N/A	N/A
14.17	138.48	150.50	1.80	271.32	2.25	N/A	N/A
14.23	122.65	133.40	2.02	269.51	2.32	N/A	N/A
14.28	102.78	112.08	2.38	266.40	2.42	N/A	N/A
14.34	89.19	97.25	2.69	261.53	2.48	N/A	N/A
14.38	77.38	84.34	2.97	250.53	2.54	N/A	N/A
14.47	73.55	79.65	2.95	234.83	2.53	N/A	N/A
14.51	66.36	71.65	3.03	216.80	2.55	N/A	N/A
14.60	63.56	68.15	2.95	201.13	2.53	N/A	N/A
14.65	60.56	64.70	2.93	189.66	2.53	N/A	N/A
14.73	58.91	62.59	2.95	184.80	2.54	N/A	N/A
14.78	57.12	60.55	3.03	183.75	2.55	N/A	N/A
14.87	55.85	58.91	3.11	183.37	2.56	N/A	N/A
14.91	54.23	57.07	3.20	182.64	2.58	N/A	N/A
15.00	52.86	55.34	3.27	181.10	2.59	N/A	N/A
15.04	49.07	51.25	3.47	177.77	2.62	N/A	N/A
15.22	45.31	46.83	3.71	173.81	2.66	N/A	N/A
15.26	41.33	42.60	4.00	170.27	2.70	N/A	N/A
15.31	39.39	40.47	4.16	168.35	2.72	N/A	N/A
15.35	37.63	38.56	4.32	166.55	2.74	N/A	N/A
15.39	36.04	36.81	4.48	164.95	2.76	N/A	N/A
15.44	34.73	35.36	4.59	162.43	2.78	N/A	N/A
15.53	33.29	33.69	4.74	159.81	2.80	N/A	N/A
15.57	31.92	32.20	4.87	156.74	2.81	N/A	N/A
15.66	30.87	30.95	4.98	154.27	2.82	N/A	N/A
15.70	30.43	30.40	4.99	151.63	2.82	N/A	N/A
15.80	30.91	30.70	4.87	149.48	2.81	N/A	N/A
15.93	31.41	30.95	4.77	147.75	2.80	N/A	N/A
15.99	31.95	31.39	4.69	147.21	2.79	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
16.03	31.98	31.34	4.70	147.31	2.79	N/A	N/A
16.08	32.04	31.30	4.71	147.34	2.79	N/A	N/A
16.14	32.11	31.26	4.71	147.34	2.79	N/A	N/A
16.17	32.17	31.26	4.70	146.83	2.79	N/A	N/A
16.23	32.40	31.34	4.33	135.62	2.74	N/A	N/A
16.32	32.81	31.57	3.98	125.76	2.70	N/A	N/A
16.36	33.52	32.16	3.67	118.19	2.65	N/A	N/A
16.41	34.82	33.39	3.85	128.66	2.68	N/A	N/A
16.55	35.94	34.24	4.10	140.29	2.71	N/A	N/A
16.61	37.05	35.21	4.26	149.95	2.74	N/A	N/A
16.62	37.60	35.72	4.34	155.12	2.75	N/A	N/A
16.69	39.19	37.14	4.21	156.46	2.73	N/A	N/A
16.74	39.41	37.25	4.27	159.09	2.74	N/A	N/A
16.81	39.83	37.48	4.26	159.74	2.74	N/A	N/A
16.88	37.70	35.30	4.52	159.59	2.77	N/A	N/A
16.95	36.49	34.00	4.62	157.12	2.78	N/A	N/A
17.00	33.80	31.34	4.93	154.40	2.82	N/A	N/A
17.17	33.53	30.77	4.92	151.28	2.82	N/A	N/A
17.22	32.38	29.61	5.05	149.65	2.83	N/A	N/A
17.26	33.27	30.37	4.89	148.44	2.81	N/A	N/A
17.30	33.92	30.93	4.76	147.08	2.80	N/A	N/A
17.35	33.96	30.86	4.72	145.67	2.79	N/A	N/A
17.39	32.69	29.60	4.86	143.84	2.81	N/A	N/A
17.49	30.75	27.63	5.17	142.79	2.84	N/A	N/A
17.53	30.85	27.66	5.14	142.27	2.84	N/A	N/A
17.62	31.45	28.08	5.08	142.65	2.83	N/A	N/A
17.67	32.25	28.73	5.00	143.72	2.83	N/A	N/A
17.73	33.14	29.46	4.93	145.36	2.82	N/A	N/A
17.87	34.48	30.47	4.82	146.89	2.80	N/A	N/A
17.92	34.76	30.63	4.84	148.41	2.81	N/A	N/A
18.01	34.63	30.36	4.90	148.70	2.81	N/A	N/A
18.06	33.88	29.60	4.97	147.05	2.82	N/A	N/A
18.19	33.93	29.43	4.88	143.63	2.81	N/A	N/A
18.24	33.96	29.39	4.75	139.68	2.80	N/A	N/A
18.29	34.00	29.36	4.68	137.34	2.79	N/A	N/A
18.35	33.03	28.39	4.81	136.44	2.80	N/A	N/A
18.40	31.84	27.24	5.01	136.59	2.83	N/A	N/A
18.45	30.86	26.28	5.23	137.53	2.85	N/A	N/A
18.54	31.27	26.52	5.22	138.54	2.85	N/A	N/A
18.63	32.38	27.37	5.15	140.99	2.84	N/A	N/A
18.69	33.82	28.55	5.03	143.70	2.83	N/A	N/A
18.73	35.70	30.14	4.88	147.01	2.81	N/A	N/A
18.79	38.34	32.38	4.63	149.97	2.78	N/A	N/A
18.84	45.02	38.19	4.10	156.77	2.71	N/A	N/A
18.98	52.37	44.37	3.68	163.13	2.65	N/A	N/A
19.03	61.02	51.85	3.29	170.39	2.59	N/A	N/A
19.10	68.19	57.97	3.01	174.61	2.55	N/A	N/A
19.16	77.16	65.72	2.73	179.50	2.49	N/A	N/A

::Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
19.20	87.06	74.29	2.48	184.03	2.44	N/A	N/A
19.25	97.40	83.23	2.27	188.79	2.39	N/A	N/A
19.30	108.39	92.70	2.09	194.01	2.34	N/A	N/A
19.38	123.89	106.28	1.77	187.76	2.24	N/A	N/A
19.51	136.98	117.44	1.56	183.32	2.15	N/A	N/A
19.56	146.65	125.99	1.43	180.69	2.09	N/A	N/A
19.63	148.21	126.90	1.47	186.03	2.11	N/A	N/A
19.68	148.31	126.58	1.51	191.08	2.13	N/A	N/A
19.73	147.28	125.32	1.56	194.92	2.15	N/A	N/A
19.78	146.01	123.84	1.60	198.18	2.17	N/A	N/A
19.82	148.17	125.47	1.62	202.74	2.18	N/A	N/A
19.90	151.51	127.90	1.62	207.58	2.18	N/A	N/A
19.99	154.50	129.95	1.63	211.57	2.18	N/A	N/A
20.04	153.32	128.63	1.66	213.39	2.20	0.86	0.86
20.08	148.77	124.40	1.71	213.28	2.22	0.86	0.86
20.17	141.32	117.44	1.81	212.91	2.26	0.85	0.85
20.26	132.73	109.57	1.94	212.18	2.30	0.84	0.84
20.29	121.27	99.57	2.11	209.70	2.35	0.83	0.83
20.37	101.86	82.74	2.42	200.45	2.43	0.80	0.80
20.52	81.94	65.48	2.91	190.23	2.53	0.77	0.77
20.57	65.83	51.96	3.46	179.65	2.62	3.63	3.63
20.61	59.37	46.54	3.70	171.99	2.66	3.26	3.26
20.70	55.26	43.03	3.82	164.56	2.68	3.01	3.01
20.74	52.11	40.40	3.90	157.46	2.69	2.83	2.83
20.83	50.14	38.67	3.92	151.70	2.69	2.71	2.71
20.88	46.00	35.26	4.10	144.39	2.71	2.47	2.47
20.98	40.30	30.48	4.54	138.37	2.77	2.15	2.15
21.03	34.27	25.56	5.17	132.09	2.84	1.81	1.81
21.07	30.26	22.31	5.68	126.72	2.90	1.59	1.59
21.14	28.47	20.87	5.69	118.66	2.90	1.48	1.48
21.23	27.36	19.96	5.51	109.95	2.88	1.42	1.42
21.27	26.47	19.26	5.35	102.97	2.86	1.37	1.37
21.37	25.64	18.54	5.39	99.85	2.87	1.31	1.31
21.43	25.07	18.05	5.45	98.44	2.87	1.28	1.28
21.49	24.72	17.72	5.53	97.97	2.88	1.26	1.26
21.54	24.12	17.20	5.69	97.86	2.90	1.22	1.22
21.63	23.51	16.64	5.87	97.67	2.92	1.19	1.19
21.68	22.81	16.04	6.12	98.23	2.94	1.14	1.14
21.74	22.59	15.81	6.63	104.82	2.99	1.13	1.13
21.80	28.22	20.21	4.92	99.48	2.82	1.43	1.43
21.99	33.14	24.01	3.88	93.21	2.68	1.67	1.67
22.05	36.94	27.21	2.95	80.27	2.53	0.66	0.66
22.10	31.10	22.44	3.66	82.22	2.65	1.56	1.56
22.15	25.05	17.59	4.71	82.94	2.79	1.24	1.24
22.21	19.00	12.86	6.42	82.63	2.97	0.92	0.92
22.25	17.50	11.75	6.99	82.14	3.02	0.84	0.84
22.32	17.18	11.48	7.18	82.36	3.04	0.82	0.82
22.41	17.95	11.99	6.92	82.98	3.02	0.86	0.86

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
22.45	18.33	12.24	6.88	84.16	3.01	0.87	0.87
22.54	18.74	12.49	6.86	85.65	3.01	0.89	0.89
22.61	19.25	12.82	6.84	87.69	3.01	0.92	0.92
22.67	19.51	12.96	6.90	89.41	3.01	0.93	0.93
22.70	20.08	13.35	6.83	91.24	3.01	0.95	0.95
22.81	20.56	13.63	6.78	92.37	3.00	0.97	0.97
22.85	21.01	13.92	6.72	93.56	3.00	0.99	0.99
22.91	20.91	13.82	6.80	94.03	3.01	0.99	0.99
22.99	20.75	13.66	6.89	94.07	3.01	0.98	0.98
23.10	20.62	13.50	6.94	93.63	3.02	0.96	0.96
23.13	20.62	13.48	6.90	93.04	3.01	0.96	0.96
23.17	21.16	13.84	6.69	92.56	2.99	0.99	0.99
23.26	20.97	13.65	6.76	92.27	3.00	0.98	0.98
23.34	20.78	13.47	6.85	92.24	3.01	0.96	0.96
23.38	20.05	12.94	7.14	92.33	3.03	0.92	0.92
23.51	20.15	12.93	7.13	92.20	3.03	0.92	0.92
23.55	20.31	13.02	7.13	92.76	3.03	0.93	0.93
23.60	20.43	13.08	7.13	93.30	3.03	0.93	0.93
23.64	20.34	12.99	7.20	93.52	3.04	0.93	0.93
23.73	20.08	12.76	7.29	92.97	3.05	0.91	0.91
23.77	19.82	12.56	7.35	92.37	3.05	0.90	0.90
23.82	20.65	13.10	6.97	91.37	3.02	0.94	0.94
23.91	20.46	12.92	6.95	89.77	3.02	0.92	0.92
23.96	19.89	12.51	6.85	85.69	3.01	0.89	0.89
24.18	18.36	11.41	7.17	81.78	3.04	0.81	0.81
24.24	18.01	11.16	7.00	78.11	3.02	0.80	0.80
24.32	18.20	11.27	6.85	77.12	3.01	0.80	0.80
24.38	18.74	11.62	6.52	75.74	2.98	0.83	0.83
24.50	19.22	11.91	6.26	74.60	2.96	0.85	0.85
24.57	20.40	12.76	5.77	73.57	2.91	0.91	0.91
24.62	21.42	13.47	5.56	74.92	2.89	0.95	0.95
24.74	22.22	13.99	5.50	76.89	2.88	0.99	0.99
24.79	22.17	13.90	5.69	79.15	2.90	0.99	0.99
24.84	21.84	13.65	5.85	79.82	2.92	0.97	0.97
24.88	21.81	13.61	5.86	79.83	2.92	0.97	0.97
24.97	21.89	13.65	5.84	79.65	2.91	0.97	0.97
25.05	22.18	13.83	5.75	79.50	2.91	0.98	0.98
25.08	22.63	14.14	5.64	79.75	2.89	1.00	1.00
25.15	23.30	14.59	5.54	80.82	2.88	1.03	1.03
25.23	24.06	15.11	5.43	81.99	2.87	1.07	1.07
25.28	25.37	15.99	5.33	85.20	2.86	1.13	1.13
25.36	26.71	16.89	5.21	88.06	2.85	1.19	1.19
25.41	27.31	17.24	5.35	92.26	2.86	1.22	1.22
25.54	27.12	17.03	5.52	94.05	2.88	1.20	1.20
25.58	26.58	16.61	5.71	94.88	2.90	1.18	1.18
25.63	25.98	16.18	5.79	93.70	2.91	1.15	1.15
25.67	24.89	15.41	5.94	91.59	2.92	1.10	1.10
25.76	23.62	14.50	6.17	89.42	2.95	1.03	1.03

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
25.80	22.47	13.72	6.31	86.59	2.96	0.98	0.98
25.89	21.85	13.29	6.36	84.51	2.96	0.95	0.95
25.93	21.28	12.90	6.39	82.41	2.97	0.92	0.92
26.11	21.31	12.88	6.36	81.96	2.97	0.92	0.92
26.15	21.48	12.98	6.35	82.36	2.96	0.93	0.93
26.20	21.96	13.28	6.36	84.40	2.96	0.95	0.95
26.24	22.53	13.64	6.58	89.81	2.99	0.97	0.97
26.33	23.33	14.13	6.79	95.92	3.00	1.01	1.01
26.37	24.57	14.93	6.84	102.11	3.01	1.07	1.07
26.41	26.22	15.99	6.62	105.80	2.99	1.14	1.14
26.45	28.64	17.55	6.29	110.28	2.96	1.25	1.25
26.55	30.59	18.80	6.11	114.80	2.94	1.34	1.34
26.60	31.70	19.50	6.12	119.33	2.94	1.39	1.39
26.64	32.05	19.68	6.32	124.33	2.96	1.41	1.41
26.74	33.07	20.30	6.37	129.22	2.97	1.45	1.45
26.80	35.30	21.72	6.17	134.03	2.95	1.55	1.55
26.86	38.16	23.65	5.83	138.02	2.91	1.68	1.68
26.90	41.92	26.19	5.50	143.99	2.88	1.85	1.85
27.02	45.10	28.28	5.29	149.67	2.86	1.99	1.99
27.08	47.90	30.17	5.09	153.48	2.83	2.12	2.12
27.13	48.96	30.89	4.94	152.74	2.82	2.16	2.16
27.21	47.36	30.01	4.56	136.93	2.77	2.09	2.09
27.33	43.00	27.11	4.50	121.97	2.77	1.88	1.88
27.39	37.52	23.45	4.58	107.46	2.78	1.63	1.63
27.44	33.67	20.64	5.35	110.34	2.86	1.45	1.45
27.52	32.18	19.54	5.68	110.97	2.90	1.38	1.38
27.57	33.77	20.64	5.38	110.97	2.87	1.46	1.46
27.64	37.53	23.28	4.74	110.23	2.79	1.62	1.62
27.73	40.78	25.56	4.28	109.48	2.74	1.77	1.77
27.77	40.11	25.08	4.34	108.91	2.75	1.74	1.74
27.86	37.72	23.35	4.63	108.16	2.78	1.62	1.62
27.89	34.40	21.03	5.03	105.78	2.83	1.47	1.47
28.01	32.97	20.01	5.18	103.71	2.85	1.41	1.41
28.04	31.38	18.93	5.36	101.40	2.86	1.33	1.33
28.12	30.96	18.62	5.39	100.31	2.87	1.31	1.31
28.15	30.45	18.29	5.39	98.63	2.87	1.29	1.29
28.25	30.17	18.08	5.36	96.93	2.86	1.27	1.27
28.34	30.07	17.99	5.35	96.21	2.86	1.27	1.27
28.38	29.88	17.83	5.44	96.93	2.87	1.26	1.26
28.43	30.33	18.10	5.43	98.34	2.87	1.28	1.28
28.50	30.65	18.28	5.40	98.78	2.87	1.29	1.29
28.61	31.38	18.75	5.27	98.76	2.85	1.32	1.32
28.66	31.22	18.62	5.32	98.96	2.86	1.31	1.31
28.70	30.49	18.08	5.52	99.77	2.88	1.28	1.28
28.75	29.44	17.32	5.81	100.55	2.91	1.23	1.23
28.83	28.42	16.59	6.02	99.96	2.93	1.18	1.18
28.88	27.72	16.14	6.01	97.08	2.93	1.15	1.15
28.96	27.02	15.70	5.94	93.21	2.92	1.12	1.12

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
29.01	26.22	15.22	5.84	88.81	2.91	1.08	1.08
29.12	25.64	14.84	5.79	85.98	2.91	1.05	1.05
29.18	25.04	14.45	5.79	83.70	2.91	1.02	1.02
29.27	24.89	14.32	5.83	83.41	2.91	1.02	1.02
29.32	25.02	14.37	5.88	84.48	2.92	1.02	1.02
29.37	26.04	15.00	5.82	87.29	2.91	1.06	1.06
29.43	27.44	15.88	5.72	90.89	2.90	1.12	1.12
29.49	31.57	18.58	5.20	96.73	2.85	1.30	1.30
29.62	35.97	21.45	4.76	102.14	2.80	1.49	1.49
29.69	40.39	24.37	4.40	107.35	2.75	1.68	1.68
29.75	42.08	25.50	4.24	108.11	2.73	1.76	1.76
29.81	43.09	26.20	4.09	107.21	2.71	1.80	1.80
29.87	43.86	26.75	3.94	105.47	2.69	1.83	1.83
29.93	44.47	27.13	3.90	105.85	2.69	1.85	1.85
29.99	44.88	27.35	3.92	107.35	2.69	1.87	1.87
30.06	45.07	27.41	3.96	108.63	2.70	1.88	1.88
30.11	44.97	27.29	4.02	109.60	2.70	1.87	1.87
30.14	44.72	27.09	4.07	110.18	2.71	1.86	1.86
30.20	44.18	26.65	4.18	111.44	2.73	1.83	1.83
30.32	43.70	26.22	4.30	112.84	2.74	1.81	1.81
30.37	43.26	25.85	4.42	114.18	2.76	1.79	1.79
30.40	43.10	25.71	4.46	114.76	2.76	1.78	1.78
30.45	43.29	25.81	4.46	115.22	2.76	1.78	1.78
30.56	43.54	25.92	4.46	115.58	2.76	1.79	1.79
30.62	43.70	25.98	4.47	116.10	2.76	1.80	1.80
30.67	43.58	25.85	4.52	116.78	2.77	1.79	1.79
30.71	43.70	25.90	4.54	117.49	2.77	1.79	1.79
30.87	43.90	25.94	4.54	117.75	2.77	1.80	1.80
30.91	44.12	26.07	4.51	117.62	2.77	1.80	1.80
30.96	44.08	26.03	4.51	117.38	2.77	1.80	1.80
31.03	44.05	25.98	4.50	116.93	2.77	1.80	1.80
31.07	44.02	25.95	4.49	116.49	2.76	1.79	1.79
31.12	44.02	25.94	4.46	115.73	2.76	1.79	1.79
31.21	44.21	26.04	4.42	115.05	2.76	1.80	1.80
31.26	44.50	26.23	4.36	114.39	2.75	1.81	1.81
31.32	44.88	26.45	4.32	114.35	2.74	1.82	1.82
31.38	45.30	26.70	4.30	114.84	2.74	1.84	1.84
31.43	46.44	27.41	4.24	116.30	2.73	1.88	1.88
31.56	47.75	28.18	4.19	118.17	2.73	1.93	1.93
31.62	49.15	29.03	4.16	120.72	2.72	1.99	1.99
31.69	49.75	29.35	4.18	122.79	2.73	2.01	2.01
31.74	49.85	29.33	4.26	124.86	2.73	2.01	2.01
31.82	49.56	29.06	4.34	126.19	2.75	2.00	2.00
31.87	49.15	28.72	4.43	127.16	2.76	1.98	1.98
31.95	48.83	28.46	4.47	127.16	2.76	1.96	1.96
32.00	48.45	28.20	4.48	126.19	2.76	1.95	1.95
32.05	47.81	27.85	4.37	121.79	2.75	1.92	1.92
32.13	47.08	27.49	4.18	114.90	2.72	1.88	1.88

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
32.19	46.28	27.07	4.05	109.52	2.71	1.85	1.85
32.26	45.62	26.59	4.10	109.04	2.71	1.82	1.82
32.31	45.33	26.31	4.23	111.27	2.73	1.80	1.80
32.39	45.22	26.16	4.30	112.56	2.74	1.80	1.80
32.54	45.33	26.15	4.31	112.79	2.74	1.80	1.80
32.56	45.29	26.09	4.35	113.63	2.75	1.79	1.79
32.68	45.44	26.11	4.38	114.28	2.75	1.80	1.80
32.72	45.71	26.26	4.38	114.89	2.75	1.81	1.81
32.77	45.77	26.27	4.38	115.03	2.75	1.81	1.81
32.84	45.52	26.06	4.42	115.24	2.76	1.79	1.79
32.89	44.82	25.54	4.55	116.14	2.77	1.76	1.76
32.98	44.25	25.10	4.66	116.95	2.79	1.74	1.74
33.01	43.45	24.55	4.77	117.01	2.80	1.70	1.70
33.14	42.91	24.16	4.80	115.87	2.80	1.68	1.68
33.18	42.46	23.88	4.78	114.16	2.80	1.66	1.66
33.28	42.18	23.68	4.77	113.02	2.80	1.64	1.64
33.32	41.79	23.42	4.79	112.20	2.80	1.63	1.63
33.38	41.22	23.03	4.84	111.58	2.81	1.60	1.60
33.42	40.65	22.66	4.88	110.60	2.81	1.58	1.58
33.47	40.07	22.29	4.92	109.64	2.82	1.55	1.55
33.56	39.63	21.97	4.96	108.97	2.82	1.53	1.53
33.60	39.40	21.81	4.99	108.79	2.82	1.52	1.52
33.70	39.34	21.73	5.00	108.74	2.83	1.51	1.51
33.74	39.34	21.70	5.02	109.01	2.83	1.51	1.51
33.84	39.37	21.67	5.05	109.36	2.83	1.51	1.51
33.88	39.44	21.68	5.07	109.90	2.83	1.51	1.51
33.93	39.60	21.75	5.08	110.48	2.83	1.52	1.52
33.99	39.63	21.73	5.11	111.11	2.84	1.52	1.52
34.09	39.69	21.72	5.13	111.35	2.84	1.52	1.52
34.19	39.63	21.65	5.12	110.83	2.84	1.51	1.51
34.26	39.57	21.60	5.08	109.76	2.83	1.51	1.51
34.32	39.28	21.43	5.06	108.33	2.83	1.49	1.49
34.39	38.71	21.06	5.08	106.89	2.83	1.47	1.47
34.44	37.91	20.57	5.11	105.19	2.84	1.44	1.44
34.52	37.05	20.06	5.09	102.06	2.83	1.40	1.40
34.57	36.35	19.70	4.95	97.46	2.82	1.37	1.37
34.63	35.81	19.43	4.82	93.60	2.80	1.35	1.35
34.70	34.95	18.83	5.00	94.09	2.82	1.31	1.31
34.89	33.49	17.74	5.50	97.60	2.88	1.25	1.25
34.94	32.34	16.90	5.98	101.06	2.93	1.20	1.20
34.99	31.99	16.63	6.18	102.79	2.95	1.19	1.19
35.07	32.88	17.14	6.04	103.49	2.93	1.22	1.22
35.14	34.41	18.08	5.75	104.01	2.91	1.28	1.28
35.23	34.89	18.35	5.68	104.15	2.90	1.30	1.30
35.29	35.05	18.43	5.63	103.83	2.89	1.30	1.30
35.40	34.12	17.83	5.77	102.89	2.91	1.26	1.26
35.46	33.77	17.62	5.77	101.61	2.91	1.25	1.25
35.52	33.01	17.14	5.87	100.55	2.92	1.22	1.22

::Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
35.58	31.93	16.45	6.06	99.73	2.94	1.17	1.17
35.64	30.75	15.73	6.29	98.96	2.96	1.12	1.12
35.72	29.51	15.03	6.52	98.04	2.98	1.07	1.07
35.77	28.55	14.49	6.67	96.67	2.99	1.03	1.03
35.85	27.79	14.05	6.75	94.84	3.00	1.00	1.00
35.96	27.66	13.95	6.63	92.56	2.99	1.00	1.00
36.03	28.17	14.21	6.36	90.44	2.97	1.01	1.01
36.09	28.96	14.69	6.03	88.51	2.93	1.05	1.05
36.16	29.63	15.11	5.78	87.38	2.91	1.07	1.07
36.29	30.11	15.40	5.62	86.56	2.89	1.09	1.09
36.34	30.56	15.66	5.52	86.47	2.88	1.10	1.10
36.40	30.91	15.86	5.48	86.97	2.88	1.12	1.12
36.48	31.16	15.98	5.48	87.51	2.88	1.12	1.12
36.53	31.45	16.11	5.52	88.85	2.88	1.13	1.13
36.60	32.02	16.41	5.48	89.96	2.88	1.15	1.15
36.66	33.04	17.00	5.38	91.40	2.87	1.19	1.19
36.74	34.44	17.83	5.18	92.43	2.85	1.24	1.24
36.84	35.46	18.41	5.08	93.51	2.83	1.28	1.28
36.91	35.59	18.43	5.12	94.47	2.84	1.29	1.29
36.96	34.86	17.93	5.31	95.32	2.86	1.26	1.26
37.04	33.65	17.14	5.59	95.73	2.89	1.21	1.21
37.10	32.31	16.30	5.84	95.17	2.91	1.16	1.16
37.17	30.94	15.56	5.79	90.12	2.91	1.10	1.10
37.36	30.18	15.16	5.59	84.79	2.89	1.07	1.07
37.41	29.99	15.15	5.29	80.18	2.86	1.06	1.06
37.49	29.95	15.10	5.32	80.39	2.86	1.06	1.06
37.54	29.67	14.90	5.41	80.59	2.87	1.05	1.05
37.55	29.49	14.78	5.47	80.90	2.88	1.04	1.04
37.59	29.24	14.61	5.56	81.22	2.89	1.03	1.03
37.61	29.40	14.68	5.59	82.06	2.89	1.03	1.03
37.69	29.64	14.78	5.62	83.06	2.89	1.04	1.04
37.73	31.33	15.74	5.44	85.61	2.87	1.11	1.11
37.91	32.89	16.59	5.31	88.05	2.86	1.16	1.16
37.95	34.48	17.49	5.18	90.64	2.85	1.22	1.22
38.00	35.75	18.18	5.16	93.83	2.84	1.27	1.27
38.17	36.96	18.79	5.14	96.64	2.84	1.31	1.31
38.22	38.11	19.42	5.11	99.22	2.84	1.35	1.35
38.26	38.55	19.66	5.09	100.03	2.83	1.37	1.37
38.29	39.09	19.95	5.06	101.01	2.83	1.39	1.39
38.35	39.63	20.23	5.05	102.25	2.83	1.41	1.41
38.42	40.05	20.42	5.08	103.69	2.83	1.42	1.42
38.48	40.30	20.51	5.12	104.98	2.84	1.43	1.43
38.53	40.33	20.48	5.18	106.10	2.84	1.43	1.43
38.61	40.33	20.43	5.23	106.87	2.85	1.43	1.43
38.66	40.21	20.32	5.29	107.49	2.86	1.42	1.42
38.75	40.27	20.32	5.30	107.65	2.86	1.42	1.42
38.79	40.21	20.26	5.31	107.55	2.86	1.42	1.42
38.86	40.24	20.27	5.29	107.18	2.86	1.42	1.42

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
38.92	40.18	20.21	5.28	106.81	2.86	1.41	1.41
38.99	40.40	20.34	5.23	106.44	2.85	1.42	1.42
39.06	40.34	20.28	5.22	105.89	2.85	1.42	1.42
39.19	40.11	20.11	5.24	105.43	2.85	1.40	1.40
39.24	39.63	19.80	5.31	105.18	2.86	1.39	1.39
39.28	39.47	19.69	5.34	105.11	2.86	1.38	1.38
39.33	39.41	19.66	5.31	104.29	2.86	1.37	1.37
39.48	39.35	19.60	5.26	103.14	2.85	1.37	1.37
39.54	39.12	19.46	5.25	102.10	2.85	1.36	1.36
39.58	38.80	19.26	5.28	101.75	2.86	1.35	1.35
39.64	38.49	19.06	5.33	101.52	2.86	1.33	1.33
39.72	38.26	18.90	5.35	101.21	2.86	1.32	1.32
39.76	38.14	18.83	5.34	100.60	2.86	1.32	1.32
39.84	37.94	18.71	5.33	99.69	2.86	1.31	1.31
39.89	37.66	18.64	5.13	95.51	2.84	1.30	1.30
40.08	37.50	18.56	4.99	92.66	2.82	1.29	1.29
40.16	37.37	18.50	4.92	91.08	2.82	1.28	1.28
40.23	37.50	18.49	5.03	93.12	2.83	1.28	1.28
40.29	37.18	18.20	5.26	95.77	2.85	1.27	1.27
40.34	34.09	16.28	5.99	97.57	2.93	1.16	1.16
40.34	32.38	15.32	6.53	99.96	2.98	1.09	1.09
40.37	33.36	15.82	6.44	101.88	2.97	1.13	1.13
40.43	41.16	20.32	5.12	103.99	2.84	1.41	1.41
40.56	48.17	24.51	4.29	105.06	2.74	1.67	1.67
40.58	49.54	25.34	4.15	105.07	2.72	1.71	1.71
40.64	45.52	22.86	4.59	104.85	2.78	1.57	1.57
40.69	39.12	19.02	5.42	103.05	2.87	1.33	1.33
40.79	35.84	17.10	5.88	100.47	2.92	1.21	1.21
40.83	33.74	15.92	6.11	97.23	2.94	1.13	1.13
40.90	33.14	15.60	6.08	94.84	2.94	1.11	1.11
40.96	32.18	15.09	6.13	92.42	2.94	1.08	1.08
41.05	31.32	14.60	6.22	90.85	2.95	1.04	1.04
41.09	30.17	14.01	6.41	89.80	2.97	1.00	1.00
41.14	29.06	13.43	6.63	89.05	2.99	0.96	0.96
41.22	27.72	12.74	6.95	88.52	3.02	0.91	0.91
41.28	26.35	12.03	7.31	87.97	3.05	0.86	0.86
41.36	24.86	11.26	7.75	87.23	3.09	0.80	0.80
41.44	23.52	10.57	8.13	85.95	3.12	0.76	0.76
41.49	21.93	9.76	8.59	83.86	3.15	0.70	0.70
41.59	20.50	9.03	9.03	81.52	3.18	0.64	0.64
41.65	19.07	8.30	9.50	78.82	3.22	0.59	0.59
41.71	18.21	7.86	9.76	76.72	3.24	0.56	0.56
41.76	17.54	7.52	9.93	74.67	3.25	0.54	0.54
41.80	16.68	7.08	10.10	71.52	3.26	0.51	0.51
41.94	15.91	6.68	10.22	68.31	3.27	0.32	0.48
42.00	15.34	6.39	10.20	65.19	3.27	0.30	0.46
42.06	15.25	6.34	10.06	63.73	3.26	0.28	0.45
42.10	15.18	6.30	9.90	62.35	3.25	0.27	0.45

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
42.16	15.22	6.31	9.66	60.92	3.23	0.25	0.45
42.23	15.25	6.32	9.43	59.55	3.21	0.23	0.45
42.28	15.37	6.38	9.20	58.65	3.20	0.22	0.46
42.36	15.56	6.46	8.98	58.02	3.18	0.22	0.46
42.42	15.98	6.66	8.52	56.74	3.15	0.21	0.48
42.48	17.47	7.40	7.87	58.21	3.10	0.18	0.53
42.60	20.85	9.06	6.75	61.16	3.00	0.25	0.65
42.68	25.43	11.47	5.70	65.37	2.90	0.29	0.81
42.72	28.23	13.03	5.21	67.89	2.85	0.30	0.91
42.78	27.37	12.46	5.59	69.64	2.89	0.33	0.88
42.81	25.18	11.17	6.41	71.57	2.97	0.80	0.80
42.87	23.90	10.53	7.00	73.67	3.02	0.75	0.75
42.96	24.54	10.83	6.98	75.59	3.02	0.77	0.77
43.00	25.81	11.45	6.71	76.89	3.00	0.82	0.82
43.09	27.41	12.22	6.33	77.42	2.96	0.87	0.87
43.13	29.67	13.43	5.91	79.32	2.92	0.95	0.95
43.22	31.51	14.42	5.64	81.40	2.89	1.02	1.02
43.28	32.94	15.17	5.53	83.81	2.88	1.06	1.06
43.34	33.52	15.45	5.50	84.96	2.88	1.08	1.08
43.39	33.74	15.54	5.53	85.86	2.88	1.09	1.09
43.48	33.77	15.53	5.55	86.10	2.88	1.09	1.09
43.57	33.74	15.48	5.56	86.14	2.89	1.09	1.09
43.62	33.49	15.33	5.60	85.80	2.89	1.08	1.08
43.66	33.17	15.15	5.63	85.33	2.89	1.07	1.07
43.70	32.47	14.76	5.71	84.33	2.90	1.04	1.04
43.80	31.70	14.33	5.80	83.11	2.91	1.01	1.01
43.86	30.65	13.74	5.95	81.78	2.93	0.98	0.98
43.92	29.63	13.17	6.15	80.94	2.94	0.94	0.94
43.96	28.39	12.53	6.43	80.60	2.97	0.89	0.89
44.05	27.31	11.98	6.72	80.52	3.00	0.86	0.86
44.10	25.84	11.26	7.10	79.95	3.03	0.80	0.80
44.19	24.51	10.60	7.45	78.92	3.06	0.76	0.76
44.25	23.11	9.91	7.79	77.21	3.09	0.71	0.71
44.30	22.21	9.47	7.98	75.56	3.10	0.68	0.68
44.37	21.69	9.20	7.98	73.42	3.10	0.66	0.66
44.45	21.45	9.08	7.87	71.47	3.10	0.65	0.65
44.50	21.42	9.05	7.71	69.84	3.08	0.33	0.65
44.60	22.07	9.35	7.41	69.36	3.06	0.32	0.67
44.64	23.30	9.94	6.94	69.01	3.02	0.33	0.71
44.71	25.40	10.94	6.32	69.17	2.96	0.31	0.78
44.75	28.55	12.64	5.63	71.18	2.89	0.89	0.89
44.85	32.02	14.52	5.12	74.37	2.84	1.01	1.01
44.90	35.72	16.59	4.61	76.51	2.78	1.13	1.13
45.00	37.98	17.84	4.37	77.96	2.75	1.21	1.21
45.05	39.60	18.69	4.31	80.50	2.74	1.26	1.26
45.11	40.27	18.93	4.44	83.99	2.76	1.29	1.29
45.16	41.13	19.29	4.54	87.49	2.77	1.31	1.31
45.33	40.24	18.65	4.78	89.12	2.80	1.28	1.28

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
45.35	38.14	17.39	5.19	90.26	2.85	1.21	1.21
45.36	39.25	17.97	5.13	92.09	2.84	1.25	1.25
45.48	41.86	19.35	4.88	94.54	2.81	1.33	1.33
45.54	45.52	21.37	4.56	97.33	2.77	1.46	1.46
45.64	45.46	21.23	4.66	98.94	2.79	1.45	1.45
45.72	45.05	20.93	4.78	99.93	2.80	1.44	1.44
45.78	43.23	19.86	5.03	99.83	2.83	1.37	1.37
45.91	40.84	18.49	5.33	98.59	2.86	1.29	1.29
45.96	38.36	17.15	5.58	95.72	2.89	1.20	1.20
46.04	36.61	16.22	5.73	92.94	2.90	1.14	1.14
46.08	34.83	15.30	5.87	89.86	2.92	1.08	1.08
46.17	33.04	14.33	6.13	87.78	2.94	1.02	1.02
46.22	31.67	13.64	6.30	85.91	2.96	0.97	0.97
46.27	30.56	13.10	6.49	84.97	2.98	0.94	0.94
46.35	29.80	12.72	6.68	85.02	2.99	0.91	0.91
46.40	29.43	12.54	7.03	88.14	3.03	0.90	0.90
46.48	29.46	12.54	7.40	92.74	3.06	0.90	0.90
46.54	30.80	13.16	7.54	99.19	3.07	0.94	0.94
46.60	35.81	15.50	6.81	105.52	3.01	1.11	1.11
46.66	46.61	20.97	5.47	114.78	2.88	1.47	1.47
46.72	63.73	30.39	4.14	125.79	2.72	2.04	2.04
46.79	86.94	43.70	3.12	136.52	2.57	0.72	0.72
46.83	116.67	61.30	2.44	149.41	2.43	0.76	0.76
46.91	152.90	83.65	1.94	162.02	2.30	0.80	0.80
46.97	191.42	108.23	1.63	176.61	2.19	0.84	0.84
47.03	215.42	123.72	1.51	187.19	2.13	0.86	0.86
47.10	217.43	124.36	1.54	191.39	2.14	0.86	0.86
47.17	201.07	112.85	1.68	189.82	2.21	0.84	0.84
47.23	184.06	101.39	1.85	187.47	2.27	0.83	0.83
47.27	172.67	93.92	1.98	185.64	2.31	0.82	0.82
47.31	154.43	82.11	2.24	184.28	2.38	0.80	0.80
47.50	136.21	70.77	2.53	178.79	2.45	0.78	0.78
47.53	117.91	59.99	2.83	169.85	2.51	0.76	0.76
47.58	110.40	55.89	2.88	160.95	2.52	0.75	0.75
47.63	101.58	50.59	3.15	159.46	2.57	0.74	0.74
47.74	95.13	46.45	3.51	162.92	2.63	3.04	3.04
47.79	90.95	43.78	3.80	166.35	2.67	2.90	2.90
47.85	90.79	43.56	3.86	168.27	2.68	2.89	2.89
47.92	90.58	43.34	3.90	169.17	2.69	2.88	2.88
47.97	90.63	43.35	3.89	168.59	2.69	2.88	2.88
48.09	90.70	43.35	3.86	167.43	2.68	2.88	2.88
48.11	88.79	42.28	3.93	166.25	2.69	2.81	2.81
48.22	86.08	40.67	4.07	165.52	2.71	2.72	2.72
48.25	82.23	38.47	4.28	164.53	2.74	2.59	2.59
48.32	79.71	37.05	4.40	162.95	2.75	2.51	2.51
48.37	75.32	34.66	4.61	159.68	2.78	2.36	2.36
48.47	71.08	32.34	4.84	156.36	2.81	2.22	2.22
48.50	65.61	29.40	5.18	152.22	2.84	2.04	2.04

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
48.64	62.17	27.53	5.43	149.37	2.87	1.92	1.92
48.68	59.85	26.31	5.58	146.81	2.89	1.85	1.85
48.72	60.26	26.55	5.49	145.81	2.88	1.86	1.86
48.79	61.60	27.26	5.35	145.76	2.86	1.90	1.90
48.91	63.10	28.01	5.22	146.20	2.85	1.94	1.94
48.94	63.86	28.38	5.18	147.01	2.84	1.97	1.97
48.99	63.99	28.42	5.18	147.27	2.85	1.97	1.97
49.03	63.60	28.19	5.22	147.25	2.85	1.96	1.96
49.12	62.68	27.66	5.29	146.39	2.86	1.92	1.92
49.17	60.61	26.60	5.40	143.64	2.87	1.86	1.86
49.25	58.06	25.29	5.53	139.77	2.88	1.77	1.77
49.29	52.46	22.47	5.89	132.26	2.92	1.59	1.59
49.47	47.62	20.03	6.27	125.52	2.96	1.43	1.43
49.52	43.10	17.98	6.64	119.46	2.99	1.28	1.28
49.56	41.89	17.43	6.70	116.82	3.00	1.24	1.24
49.61	41.16	17.09	6.61	112.97	2.99	1.22	1.22
49.67	40.65	16.92	6.04	102.23	2.93	1.20	1.20
49.73	39.95	16.85	5.51	92.83	2.88	1.18	1.18
49.78	38.33	16.80	4.23	70.97	2.73	1.13	1.13
49.88	36.23	16.37	3.35	54.83	2.60	0.00	1.06
49.95	34.16	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.00	31.42	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.01	30.79	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.09	30.25	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.14	31.30	-1.00	1.00	-1.00	-1.00	N/A	N/A

Abbreviations

q_t: Total cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Adjusted and corrected cone resistance due to fines
I_c: Soil behavior type index
$S_{u(liq)}/\sigma'_v$: Calculated liquefied undrained strength ratio
$S_{u(peak)}/\sigma'_v$: Calculated peak undrained strength ratio

Leighton Consulting, Inc.
17781 Cowan
Irvine, CA 92614

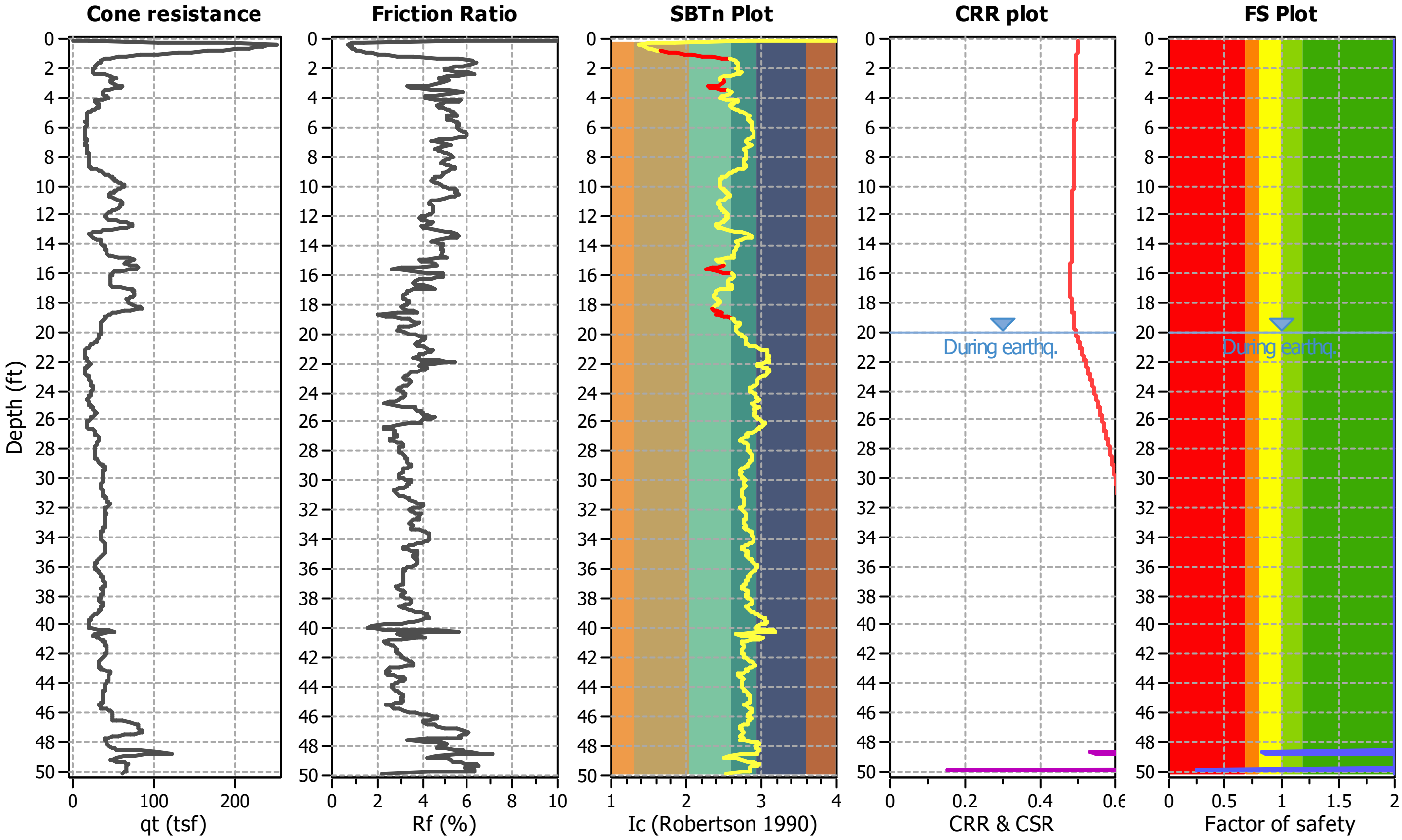
LIQUEFACTION ANALYSIS REPORT

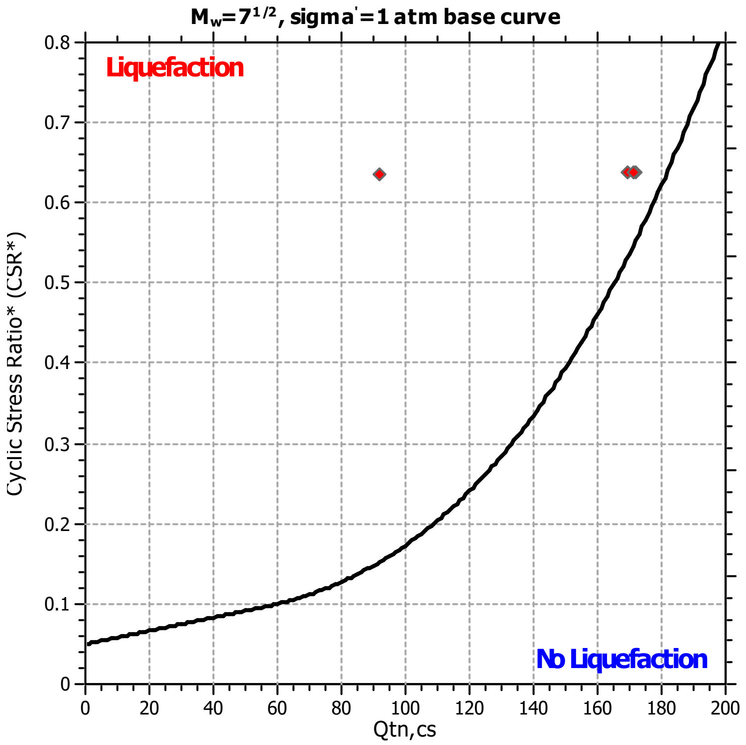
Project title : 10535.020 El Camino College Fire Training Facility **Location : Torrance, CA**

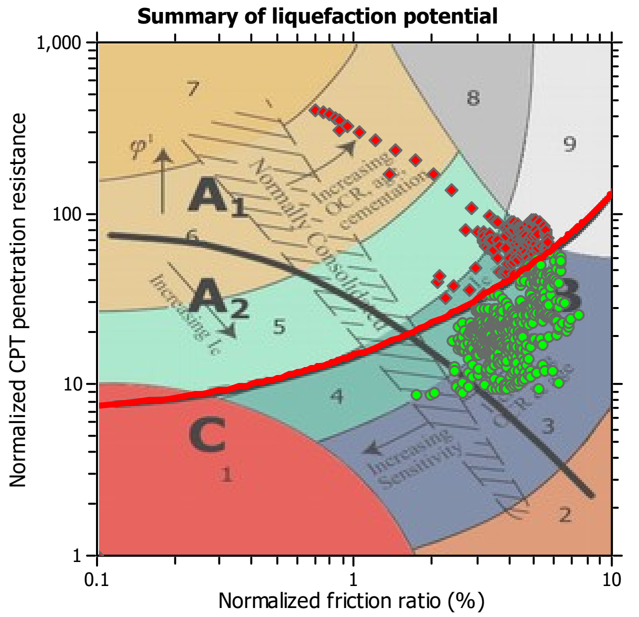
CPT file : CPT-4

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	24.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	20.00 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:	7.30	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.82	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

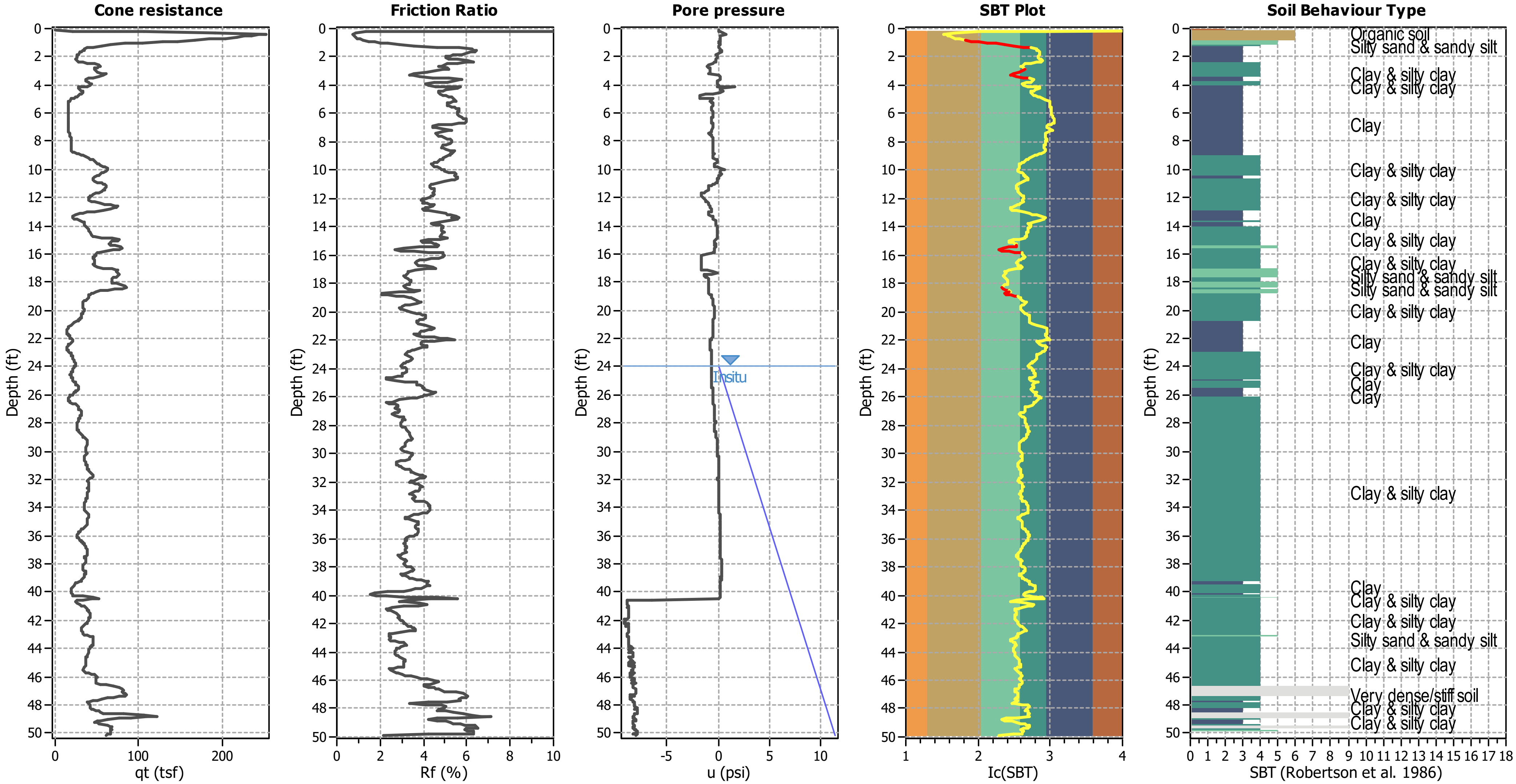






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and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

CPT basic interpretation plots



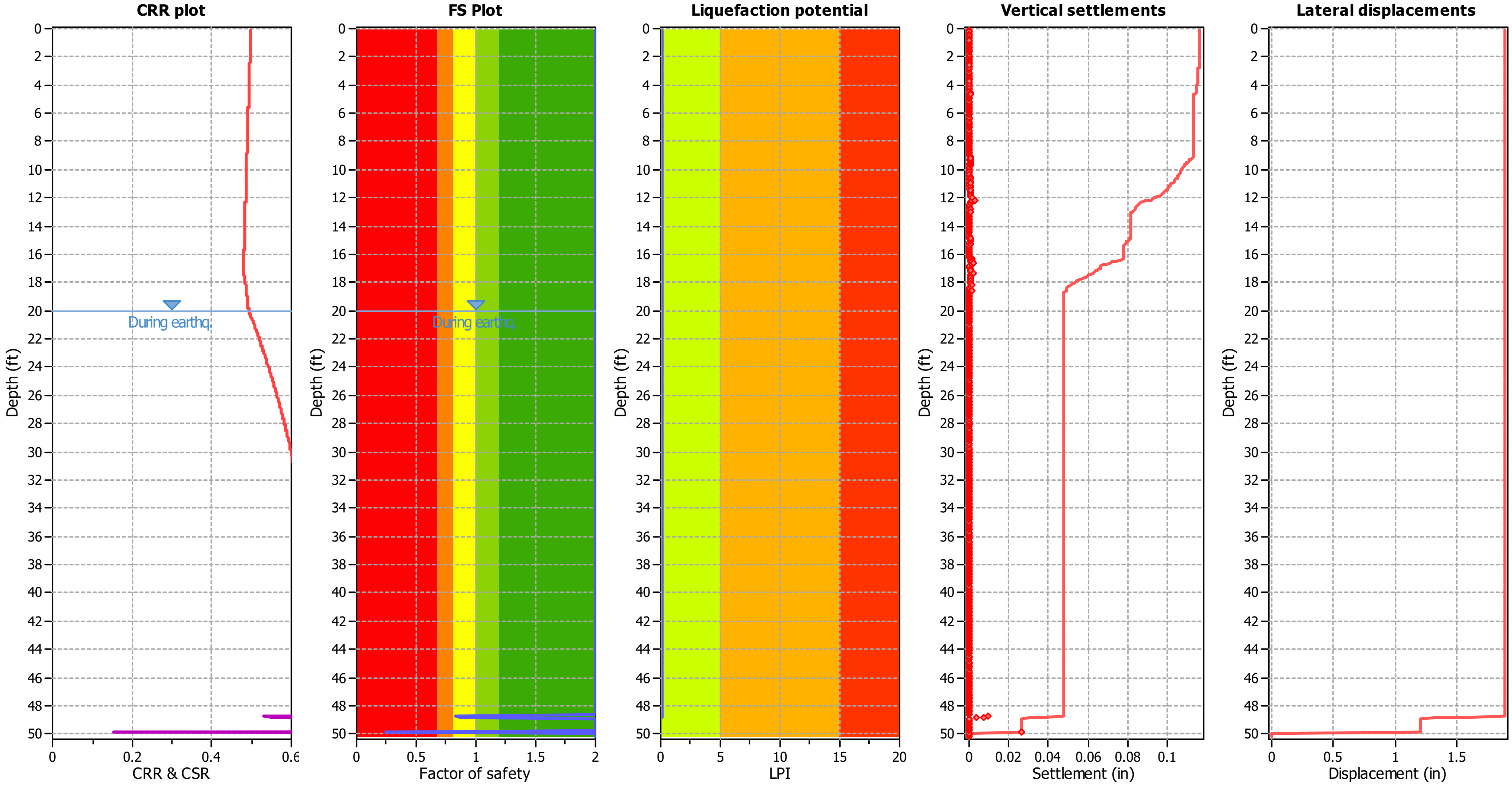
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

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

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	20.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.82	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	24.00 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

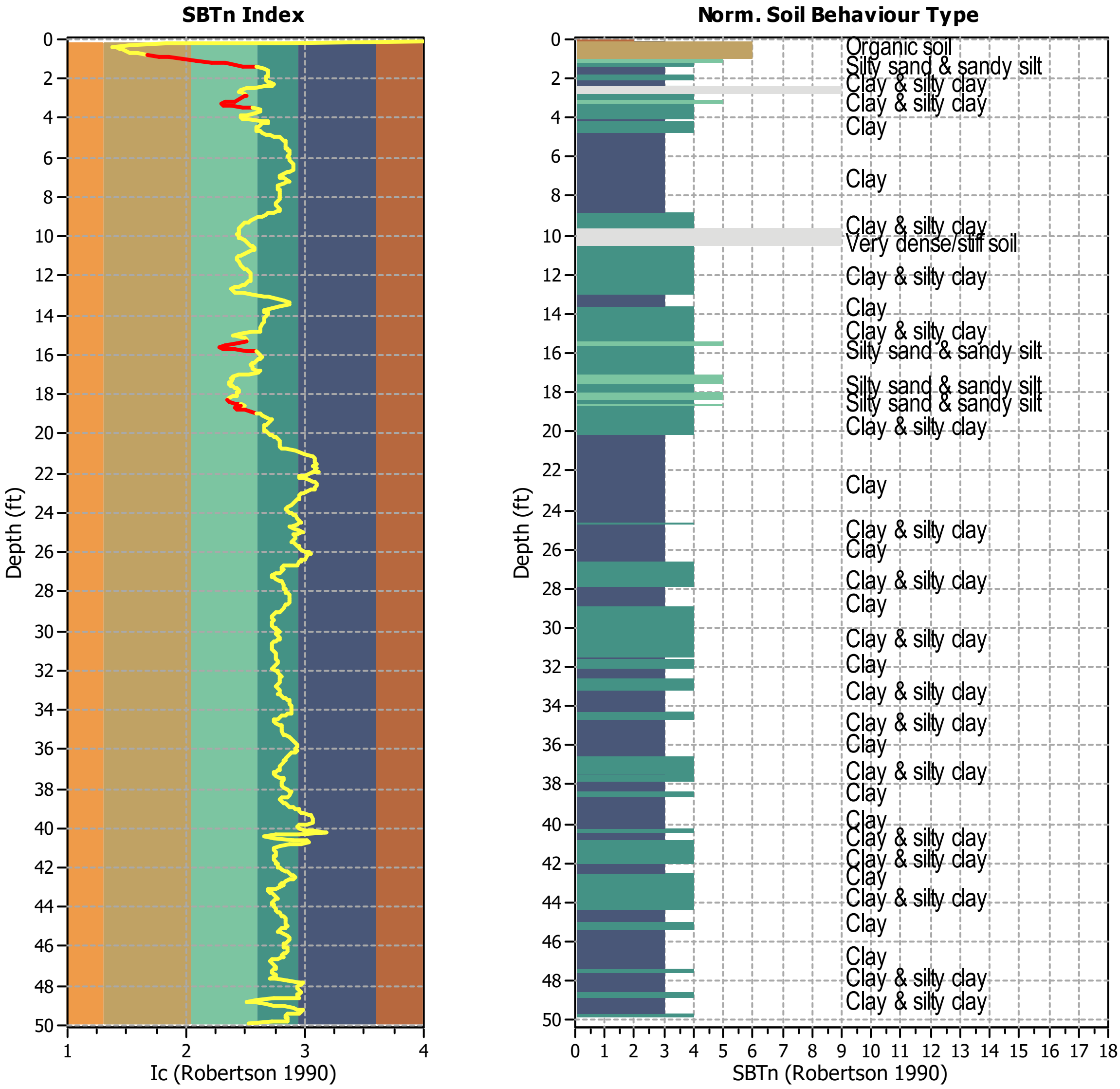
- Very high risk
- High risk
- Low risk

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties	
I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0250
Minimum number of points in layer:	4

General statistics	
Total points in CPT file:	745
Total points excluded:	39
Exclusion percentage:	5.23%
Number of layers detected:	7

:: 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	0.10	0.13	4.06	761.31	1.00	0.20	26.61	5.37	4.000	No	Yes	2.00
2	0.16	20.23	2.79	5.83	0.94	32.49	4.69	152.43	4.000	No	Yes	2.00
3	0.23	105.91	1.84	1.37	0.58	170.13	1.14	193.21	4.000	No	No	2.00
4	0.28	190.70	1.52	0.88	0.50	306.36	1.00	306.36	4.000	No	No	2.00
5	0.38	252.07	1.37	0.71	0.50	404.95	1.00	404.95	4.000	No	No	2.00
6	0.41	243.44	1.41	0.76	0.50	391.08	1.00	391.08	4.000	No	No	2.00
7	0.47	234.55	1.44	0.80	0.50	376.79	1.00	376.79	4.000	No	No	2.00
8	0.55	226.39	1.46	0.84	0.50	363.68	1.00	363.68	4.000	No	No	2.00
9	0.60	216.62	1.49	0.88	0.50	347.97	1.00	347.97	4.000	No	No	2.00
10	0.69	203.56	1.53	0.93	0.50	326.97	1.00	326.97	4.000	No	No	2.00
11	0.74	184.96	1.59	1.06	0.50	297.09	1.00	297.09	4.000	No	No	2.00
12	0.83	167.18	1.67	1.21	0.51	268.52	1.02	272.93	4.000	No	No	2.00
13	0.88	146.83	1.76	1.45	0.55	235.82	1.08	255.01	4.000	Yes	No	2.00
14	0.94	128.77	1.86	1.72	0.58	206.80	1.15	238.04	4.000	Yes	No	2.00
15	0.99	104.88	1.97	2.04	0.63	168.41	1.27	213.10	4.000	Yes	No	2.00
16	1.08	84.15	2.08	2.38	0.67	135.09	1.43	192.82	4.000	Yes	No	2.00
17	1.16	66.15	2.21	2.87	0.72	106.17	1.70	180.52	4.000	Yes	No	2.00
18	1.21	55.67	2.33	3.56	0.76	89.33	2.06	184.14	4.000	Yes	No	2.00
19	1.34	45.67	2.48	4.62	0.82	73.25	2.65	194.08	4.000	Yes	No	2.00
20	1.36	38.86	2.59	5.63	0.86	62.30	3.25	202.28	4.000	Yes	No	2.00
21	1.48	34.98	2.65	6.24	0.88	56.05	3.65	204.54	4.000	Yes	Yes	2.00
22	1.52	34.02	2.66	6.33	0.89	54.51	3.74	203.65	4.000	No	Yes	2.00
23	1.57	32.59	2.68	6.44	0.90	52.20	3.86	201.39	4.000	No	Yes	2.00
24	1.62	31.34	2.69	6.42	0.90	50.20	3.93	197.24	4.000	No	Yes	2.00
25	1.67	29.50	2.70	6.16	0.90	47.22	3.96	187.09	4.000	No	Yes	2.00
26	1.82	27.90	2.69	5.82	0.90	44.64	3.95	176.24	4.000	No	Yes	2.00
27	1.87	26.69	2.68	5.43	0.90	42.69	3.88	165.71	4.000	No	Yes	2.00
28	1.92	26.34	2.68	5.24	0.90	42.12	3.83	161.42	4.000	No	Yes	2.00
29	1.98	26.08	2.67	5.09	0.89	41.71	3.79	158.05	4.000	No	Yes	2.00
30	2.04	25.64	2.67	5.05	0.89	40.99	3.81	156.08	4.000	No	Yes	2.00
31	2.09	25.33	2.68	5.06	0.90	40.49	3.84	155.44	4.000	No	Yes	2.00
32	2.14	25.09	2.69	5.19	0.90	40.10	3.92	157.01	4.000	No	Yes	2.00
33	2.18	25.06	2.71	5.57	0.91	40.05	4.08	163.40	4.000	No	Yes	2.00
34	2.29	25.81	2.73	6.08	0.92	41.24	4.23	174.24	4.000	No	Yes	2.00
35	2.35	28.15	2.72	6.34	0.91	44.99	4.13	185.88	4.000	No	Yes	2.00
36	2.40	32.93	2.66	6.03	0.89	52.66	3.69	194.48	4.000	No	Yes	2.00
37	2.45	39.17	2.58	5.58	0.86	62.69	3.22	201.68	4.000	No	No	2.00
38	2.50	46.43	2.50	5.11	0.83	74.35	2.79	207.59	4.000	No	No	2.00
39	2.62	51.59	2.46	4.85	0.81	82.62	2.57	211.98	4.000	No	No	2.00
40	2.67	53.91	2.44	4.73	0.80	86.35	2.47	213.63	4.000	No	No	2.00
41	2.72	52.54	2.45	4.87	0.81	84.14	2.55	214.55	4.000	No	No	2.00
42	2.78	49.74	2.48	5.09	0.82	79.63	2.69	214.27	4.000	No	No	2.00
43	2.84	47.49	2.50	5.19	0.83	76.02	2.79	211.99	4.000	No	No	2.00
44	2.89	46.28	2.49	4.89	0.82	74.07	2.72	201.79	4.000	Yes	No	2.00
45	3.13	50.48	2.42	4.18	0.80	80.80	2.38	191.94	4.000	Yes	No	2.00
46	3.20	55.98	2.33	3.57	0.76	89.62	2.06	184.78	4.000	Yes	No	2.00
47	3.25	60.13	2.29	3.36	0.75	96.28	1.93	185.49	4.000	Yes	No	2.00
48	3.32	57.74	2.32	3.48	0.76	92.44	2.00	185.24	4.000	Yes	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	3.38	51.76	2.38	3.86	0.78	82.82	2.24	185.49	4.000	Yes	No	2.00
50	3.46	44.97	2.47	4.46	0.82	71.91	2.62	188.18	4.000	Yes	No	2.00
51	3.51	39.46	2.56	5.18	0.85	63.05	3.07	193.29	4.000	Yes	No	2.00
52	3.57	36.31	2.62	5.79	0.87	57.98	3.43	198.70	4.000	Yes	Yes	2.00
53	3.64	35.92	2.62	5.76	0.87	57.35	3.43	197.00	4.000	No	Yes	2.00
54	3.77	37.33	2.57	5.15	0.85	59.59	3.15	187.64	4.000	No	No	2.00
55	3.82	39.72	2.51	4.50	0.83	63.43	2.81	178.23	4.000	No	No	2.00
56	3.89	42.17	2.46	4.13	0.81	67.36	2.59	174.31	4.000	No	No	2.00
57	3.95	43.22	2.46	4.14	0.81	69.04	2.56	176.61	4.000	No	No	2.00
58	4.02	41.95	2.47	4.23	0.82	66.99	2.63	176.19	4.000	No	No	2.00
59	4.08	37.52	2.53	4.60	0.84	59.87	2.93	175.60	4.000	No	No	2.00
60	4.12	30.87	2.64	5.37	0.88	49.19	3.58	175.88	4.000	No	Yes	2.00
61	4.15	27.78	2.69	5.74	0.90	44.22	3.94	174.07	4.000	No	Yes	2.00
62	4.23	27.21	2.69	5.63	0.90	43.29	3.94	170.40	4.000	No	Yes	2.00
63	4.29	29.43	2.63	5.05	0.88	46.86	3.54	165.89	4.000	No	Yes	2.00
64	4.37	30.07	2.62	4.93	0.87	47.88	3.45	165.14	4.000	No	Yes	2.00
65	4.43	31.06	2.60	4.83	0.87	49.46	3.35	165.69	4.000	No	Yes	2.00
66	4.46	32.30	2.58	4.72	0.86	51.45	3.23	166.39	4.000	No	No	2.00
67	4.55	32.42	2.58	4.73	0.86	51.64	3.23	166.77	4.000	No	No	2.00
68	4.65	31.78	2.60	4.81	0.86	50.60	3.30	166.99	4.000	No	No	2.00
69	4.69	30.49	2.62	4.93	0.87	48.53	3.42	166.20	4.000	No	Yes	2.00
70	4.73	28.70	2.64	5.10	0.88	45.65	3.61	164.89	4.000	No	Yes	2.00
71	4.82	26.95	2.67	5.26	0.89	42.82	3.81	162.98	4.000	No	Yes	2.00
72	4.86	24.94	2.70	5.36	0.90	39.59	4.01	158.95	4.000	No	Yes	2.00
73	4.93	22.75	2.74	5.46	0.92	36.07	4.27	154.11	4.000	No	Yes	2.00
74	4.99	19.92	2.78	5.52	0.93	31.51	4.63	145.90	4.000	No	Yes	2.00
75	5.13	17.63	2.83	5.62	0.95	27.82	5.00	139.22	4.000	No	Yes	2.00
76	5.17	16.45	2.84	5.46	0.96	25.92	5.12	132.78	4.000	No	Yes	2.00
77	5.22	16.26	2.83	5.31	0.95	25.61	5.08	130.19	4.000	No	Yes	2.00
78	5.26	16.24	2.83	5.19	0.95	25.56	5.03	128.53	4.000	No	Yes	2.00
79	5.42	16.27	2.83	5.20	0.95	25.60	5.03	128.71	4.000	No	Yes	2.00
80	5.45	16.27	2.83	5.30	0.95	25.60	5.08	130.03	4.000	No	Yes	2.00
81	5.52	16.21	2.84	5.41	0.96	25.49	5.15	131.18	4.000	No	Yes	2.00
82	5.53	16.08	2.85	5.56	0.96	25.29	5.24	132.60	4.000	No	Yes	2.00
83	5.63	16.04	2.86	5.65	0.96	25.22	5.30	133.56	4.000	No	Yes	2.00
84	5.66	16.01	2.86	5.75	0.97	25.17	5.35	134.62	4.000	No	Yes	2.00
85	5.71	16.10	2.86	5.75	0.97	25.31	5.33	134.99	4.000	No	Yes	2.00
86	5.81	16.14	2.86	5.74	0.97	25.36	5.32	135.01	4.000	No	Yes	2.00
87	5.89	16.17	2.86	5.69	0.96	25.40	5.29	134.50	4.000	No	Yes	2.00
88	5.95	16.08	2.86	5.67	0.96	25.25	5.31	133.94	4.000	No	Yes	2.00
89	6.05	15.98	2.86	5.68	0.97	25.08	5.33	133.56	4.000	No	Yes	2.00
90	6.10	15.89	2.86	5.71	0.97	24.92	5.36	133.58	4.000	No	Yes	2.00
91	6.14	15.69	2.87	5.79	0.97	24.61	5.44	133.79	4.000	No	Yes	2.00
92	6.26	15.47	2.88	5.90	0.97	24.24	5.54	134.22	4.000	No	Yes	2.00
93	6.32	15.21	2.89	6.02	0.98	23.83	5.65	134.50	4.000	No	Yes	2.00
94	6.36	15.06	2.90	6.08	0.98	23.57	5.71	134.56	4.000	No	Yes	2.00
95	6.41	14.96	2.91	6.13	0.98	23.41	5.75	134.70	4.000	No	Yes	2.00
96	6.45	14.93	2.91	6.15	0.98	23.36	5.77	134.74	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	6.56	15.06	2.90	6.11	0.98	23.55	5.72	134.82	4.000	No	Yes	2.00
98	6.63	15.28	2.90	6.05	0.98	23.90	5.65	135.01	4.000	No	Yes	2.00
99	6.68	15.56	2.88	5.81	0.97	24.35	5.48	133.36	4.000	No	Yes	2.00
100	6.76	15.79	2.85	5.42	0.96	24.71	5.24	129.48	4.000	No	Yes	2.00
101	6.80	15.98	2.81	4.82	0.95	25.01	4.90	122.51	4.000	No	Yes	2.00
102	6.88	16.17	2.79	4.56	0.94	25.31	4.73	119.60	4.000	No	Yes	2.00
103	6.94	16.40	2.79	4.52	0.94	25.66	4.66	119.72	4.000	No	Yes	2.00
104	6.98	16.62	2.79	4.71	0.94	26.02	4.73	123.18	4.000	No	Yes	2.00
105	7.07	15.95	2.83	5.04	0.95	24.94	5.02	125.18	4.000	No	Yes	2.00
106	7.22	14.99	2.87	5.44	0.97	23.39	5.42	126.65	4.000	No	Yes	2.00
107	7.23	15.31	2.86	5.33	0.96	23.89	5.30	126.53	4.000	No	Yes	2.00
108	7.30	16.42	2.82	4.99	0.95	25.67	4.91	126.17	4.000	No	Yes	2.00
109	7.43	17.76	2.77	4.65	0.93	27.81	4.53	125.89	4.000	No	Yes	2.00
110	7.47	17.79	2.77	4.72	0.93	27.86	4.56	126.95	4.000	No	Yes	2.00
111	7.52	17.86	2.78	4.78	0.93	27.96	4.58	127.97	4.000	No	Yes	2.00
112	7.57	17.98	2.78	4.84	0.93	28.16	4.59	129.28	4.000	No	Yes	2.00
113	7.63	18.17	2.78	4.96	0.93	28.46	4.62	131.61	4.000	No	Yes	2.00
114	7.71	18.43	2.79	5.11	0.94	28.86	4.66	134.48	4.000	No	Yes	2.00
115	7.77	18.69	2.79	5.26	0.94	29.27	4.70	137.44	4.000	No	Yes	2.00
116	7.82	18.95	2.79	5.36	0.94	29.68	4.71	139.74	4.000	No	Yes	2.00
117	7.91	19.17	2.79	5.41	0.94	30.03	4.70	141.18	4.000	No	Yes	2.00
118	7.96	19.33	2.79	5.44	0.94	30.28	4.69	142.17	4.000	No	Yes	2.00
119	8.05	19.39	2.79	5.41	0.94	30.37	4.67	141.86	4.000	No	Yes	2.00
120	8.11	19.39	2.78	5.35	0.94	30.37	4.64	140.98	4.000	No	Yes	2.00
121	8.18	19.46	2.77	5.19	0.93	30.46	4.56	138.94	4.000	No	Yes	2.00
122	8.26	19.68	2.76	5.05	0.93	30.82	4.46	137.52	4.000	No	Yes	2.00
123	8.41	19.87	2.75	4.97	0.92	31.11	4.40	136.96	4.000	No	Yes	2.00
124	8.45	19.90	2.76	5.04	0.93	31.15	4.43	138.02	4.000	No	Yes	2.00
125	8.52	19.64	2.77	5.19	0.93	30.73	4.54	139.50	4.000	No	Yes	2.00
126	8.58	19.42	2.78	5.36	0.94	30.37	4.65	141.19	4.000	No	Yes	2.00
127	8.62	19.45	2.79	5.48	0.94	30.42	4.70	142.98	4.000	No	Yes	2.00
128	8.68	20.03	2.78	5.55	0.94	31.33	4.66	145.94	4.000	No	Yes	2.00
129	8.75	21.33	2.76	5.53	0.93	33.43	4.49	149.96	4.000	No	Yes	2.00
130	8.80	23.31	2.73	5.43	0.92	36.59	4.22	154.59	4.000	No	Yes	2.00
131	8.84	25.70	2.70	5.35	0.90	40.43	3.96	160.28	4.000	No	Yes	2.00
132	8.92	28.28	2.66	5.31	0.89	44.57	3.74	166.86	4.000	No	Yes	2.00
133	8.97	30.95	2.63	5.23	0.88	48.86	3.53	172.64	4.000	No	Yes	2.00
134	9.03	33.63	2.60	5.12	0.87	53.15	3.33	177.16	4.000	No	Yes	2.00
135	9.10	36.78	2.57	4.99	0.85	58.21	3.13	181.97	4.000	No	No	2.00
136	9.21	39.55	2.54	4.95	0.84	62.65	2.99	187.45	4.000	No	No	2.00
137	9.28	42.39	2.52	4.86	0.83	67.20	2.85	191.74	4.000	No	No	2.00
138	9.32	44.68	2.50	4.76	0.83	70.30	2.75	193.55	4.000	No	No	2.00
139	9.40	46.79	2.48	4.66	0.82	72.82	2.67	194.38	4.000	No	No	2.00
140	9.46	48.47	2.47	4.58	0.82	74.86	2.60	194.99	4.000	No	No	2.00
141	9.53	49.65	2.46	4.49	0.81	76.02	2.55	194.11	4.000	No	No	2.00
142	9.59	51.02	2.44	4.40	0.81	77.49	2.50	193.70	4.000	No	No	2.00
143	9.65	52.52	2.44	4.46	0.81	79.35	2.49	197.45	4.000	No	No	2.00
144	9.72	54.49	2.44	4.57	0.81	81.85	2.49	203.60	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
145	9.78	57.23	2.44	4.71	0.80	85.52	2.48	211.99	4.000	No	No	2.00
146	9.85	59.56	2.44	4.85	0.80	88.53	2.48	219.54	4.000	No	No	2.00
147	9.91	62.08	2.43	4.91	0.80	91.68	2.46	225.31	4.000	No	No	2.00
148	9.99	63.04	2.44	4.98	0.80	92.57	2.47	228.55	4.000	No	No	2.00
149	10.04	63.20	2.44	5.03	0.81	92.41	2.49	229.74	4.000	No	No	2.00
150	10.12	60.90	2.47	5.25	0.81	88.90	2.60	231.03	4.000	No	No	2.00
151	10.19	57.94	2.49	5.46	0.83	84.50	2.73	230.80	4.000	No	No	2.00
152	10.25	55.23	2.51	5.57	0.83	80.40	2.83	227.85	4.000	No	No	2.00
153	10.34	53.92	2.52	5.52	0.84	77.98	2.86	223.15	4.000	No	No	2.00
154	10.38	52.30	2.53	5.52	0.84	75.45	2.91	219.40	4.000	No	No	2.00
155	10.45	50.29	2.54	5.60	0.84	72.31	3.00	216.61	4.000	No	No	2.00
156	10.52	47.61	2.56	5.67	0.85	68.28	3.11	212.35	4.000	No	No	2.00
157	10.61	45.96	2.57	5.63	0.86	65.50	3.16	207.24	4.000	No	No	2.00
158	10.65	45.13	2.57	5.49	0.86	64.03	3.15	201.82	4.000	No	No	2.00
159	10.70	45.25	2.56	5.35	0.85	63.87	3.10	198.31	4.000	No	No	2.00
160	10.79	47.64	2.53	5.04	0.84	66.38	2.94	194.91	4.000	No	No	2.00
161	10.91	51.24	2.50	4.74	0.83	70.33	2.75	193.10	4.000	No	No	2.00
162	10.96	55.35	2.46	4.49	0.81	75.27	2.57	193.21	4.000	No	No	2.00
163	11.00	57.67	2.44	4.42	0.81	77.96	2.50	194.74	4.000	No	No	2.00
164	11.06	59.71	2.43	4.37	0.80	80.26	2.44	196.23	4.000	No	No	2.00
165	11.13	61.01	2.42	4.33	0.80	81.45	2.42	196.78	4.000	No	No	2.00
166	11.19	61.24	2.43	4.35	0.80	81.45	2.42	197.25	4.000	No	No	2.00
167	11.26	60.44	2.44	4.43	0.80	80.05	2.47	197.60	4.000	No	No	2.00
168	11.31	59.23	2.45	4.54	0.81	78.30	2.53	198.25	4.000	No	No	2.00
169	11.44	58.59	2.46	4.56	0.81	76.79	2.56	196.90	4.000	No	No	2.00
170	11.50	57.38	2.46	4.54	0.81	74.90	2.59	194.04	4.000	No	No	2.00
171	11.58	55.50	2.47	4.52	0.82	72.12	2.63	189.94	4.000	No	No	2.00
172	11.63	52.60	2.49	4.51	0.82	68.19	2.71	184.59	4.000	No	No	2.00
173	11.71	49.15	2.51	4.55	0.83	63.53	2.83	179.59	4.000	No	No	2.00
174	11.76	46.13	2.53	4.50	0.84	59.46	2.91	172.90	4.000	No	No	2.00
175	11.84	43.80	2.54	4.47	0.84	56.18	2.98	167.68	4.000	No	No	2.00
176	11.89	41.95	2.55	4.34	0.85	53.62	3.01	161.33	4.000	No	No	2.00
177	11.96	41.30	2.54	4.15	0.84	52.44	2.97	155.76	4.000	No	No	2.00
178	12.02	40.16	2.54	4.05	0.84	50.76	2.98	151.20	4.000	No	No	2.00
179	12.15	40.63	2.53	3.97	0.84	50.85	2.94	149.58	4.000	No	No	2.00
180	12.22	40.56	2.54	4.09	0.84	50.60	3.00	151.92	4.000	No	No	2.00
181	12.29	43.84	2.52	4.03	0.84	54.31	2.86	155.58	4.000	No	No	2.00
182	12.33	47.76	2.51	4.22	0.83	58.99	2.81	165.96	4.000	No	No	2.00
183	12.41	53.65	2.49	4.38	0.82	65.84	2.71	178.57	4.000	No	No	2.00
184	12.46	59.80	2.47	4.56	0.82	73.08	2.63	192.15	4.000	No	No	2.00
185	12.53	66.65	2.44	4.45	0.80	80.83	2.46	199.17	4.000	No	No	2.00
186	12.59	71.91	2.40	4.30	0.79	86.56	2.33	201.93	4.000	No	No	2.00
187	12.64	74.52	2.38	4.15	0.78	89.23	2.25	200.92	4.000	No	No	2.00
188	12.69	73.72	2.38	4.10	0.78	87.96	2.25	198.06	4.000	No	No	2.00
189	12.74	71.21	2.39	4.03	0.79	84.71	2.27	192.35	4.000	No	No	2.00
190	12.84	66.81	2.41	4.05	0.79	79.11	2.36	186.43	4.000	No	No	2.00
191	12.88	57.67	2.47	4.28	0.82	68.45	2.62	179.45	4.000	No	No	2.00
192	12.96	46.97	2.56	4.72	0.85	55.80	3.09	172.65	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
193	13.05	37.73	2.65	5.15	0.89	44.83	3.67	164.48	4.000	No	Yes	2.00
194	13.10	33.53	2.69	5.20	0.90	39.76	3.94	156.59	4.000	No	Yes	2.00
195	13.14	29.04	2.75	5.42	0.92	34.39	4.36	150.12	4.000	No	Yes	2.00
196	13.23	24.23	2.82	5.70	0.95	28.57	4.97	142.04	4.000	No	Yes	2.00
197	13.32	21.09	2.87	5.84	0.97	24.72	5.45	134.63	4.000	No	Yes	2.00
198	13.35	20.90	2.87	5.60	0.97	24.40	5.37	130.92	4.000	No	Yes	2.00
199	13.40	21.83	2.85	5.51	0.96	25.40	5.21	132.21	4.000	No	Yes	2.00
200	13.49	21.97	2.86	5.76	0.97	25.43	5.32	135.38	4.000	No	Yes	2.00
201	13.53	25.38	2.79	5.33	0.94	29.26	4.73	138.39	4.000	No	Yes	2.00
202	13.67	29.20	2.73	4.90	0.91	33.29	4.20	139.92	4.000	No	Yes	2.00
203	13.71	33.66	2.66	4.47	0.89	38.17	3.70	141.18	4.000	No	Yes	2.00
204	13.76	34.84	2.65	4.48	0.88	39.38	3.64	143.27	4.000	No	Yes	2.00
205	13.81	34.97	2.66	4.64	0.89	39.43	3.71	146.26	4.000	No	Yes	2.00
206	13.86	34.46	2.68	4.90	0.90	38.80	3.86	149.71	4.000	No	Yes	2.00
207	13.93	34.94	2.69	5.04	0.90	39.19	3.90	152.78	4.000	No	Yes	2.00
208	14.06	36.34	2.68	5.02	0.89	40.41	3.83	154.62	4.000	No	Yes	2.00
209	14.11	38.31	2.66	4.95	0.89	42.45	3.69	156.82	4.000	No	Yes	2.00
210	14.24	39.49	2.65	4.97	0.89	43.39	3.66	158.70	4.000	No	Yes	2.00
211	14.35	40.07	2.65	5.04	0.89	43.73	3.67	160.64	4.000	No	Yes	2.00
212	14.42	41.28	2.64	4.98	0.88	44.85	3.60	161.28	4.000	No	Yes	2.00
213	14.66	42.71	2.63	4.88	0.88	45.70	3.52	160.84	4.000	No	Yes	2.00
214	14.73	44.75	2.62	4.89	0.87	47.69	3.44	164.06	4.000	No	Yes	2.00
215	14.79	46.95	2.62	5.21	0.88	49.91	3.48	173.79	4.000	No	Yes	2.00
216	14.86	56.06	2.55	4.86	0.85	59.26	3.05	180.63	4.000	No	No	2.00
217	14.91	68.76	2.45	4.28	0.81	72.31	2.55	184.10	4.000	No	No	2.00
218	14.99	76.40	2.40	3.93	0.79	79.85	2.30	184.04	4.000	No	No	2.00
219	15.05	74.81	2.41	4.03	0.79	77.97	2.37	184.52	4.000	No	No	2.00
220	15.12	67.77	2.47	4.45	0.82	70.46	2.64	186.00	4.000	No	No	2.00
221	15.17	66.02	2.49	4.57	0.82	68.48	2.72	186.41	4.000	No	No	2.00
222	15.23	65.38	2.50	4.65	0.83	67.61	2.77	187.22	4.000	No	No	2.00
223	15.30	64.62	2.51	4.74	0.83	66.56	2.82	187.98	4.000	No	No	2.00
224	15.36	66.02	2.51	4.73	0.83	67.77	2.79	189.38	4.000	Yes	No	2.00
225	15.43	71.56	2.42	3.89	0.80	72.98	2.40	174.85	4.000	Yes	No	2.00
226	15.49	77.74	2.33	3.15	0.76	78.81	2.05	161.40	4.000	Yes	No	2.00
227	15.61	79.81	2.27	2.69	0.74	80.29	1.87	150.15	4.000	Yes	No	2.00
228	15.67	77.42	2.32	2.99	0.76	77.75	2.01	155.96	4.000	Yes	No	2.00
229	15.75	69.43	2.41	3.61	0.79	69.57	2.36	163.84	4.000	Yes	No	2.00
230	15.84	60.81	2.51	4.30	0.83	60.70	2.80	169.98	4.000	Yes	No	2.00
231	15.85	52.85	2.59	4.97	0.86	52.74	3.29	173.52	4.000	Yes	No	2.00
232	15.88	51.10	2.61	5.03	0.87	50.89	3.38	171.79	4.000	Yes	Yes	2.00
233	16.00	49.55	2.62	5.04	0.87	49.01	3.45	169.12	4.000	No	Yes	2.00
234	16.10	48.26	2.63	5.03	0.88	47.43	3.51	166.32	4.000	No	Yes	2.00
235	16.15	46.67	2.64	5.02	0.88	45.72	3.57	163.35	4.000	No	Yes	2.00
236	16.20	46.19	2.63	4.80	0.88	45.11	3.51	158.19	4.000	No	Yes	2.00
237	16.25	45.75	2.61	4.47	0.87	44.52	3.39	151.12	4.000	No	Yes	2.00
238	16.32	46.16	2.59	4.17	0.86	44.73	3.25	145.38	4.000	No	No	2.00
239	16.37	46.57	2.57	3.94	0.85	45.01	3.14	141.21	4.000	No	No	2.00
240	16.44	47.50	2.55	3.77	0.85	45.74	3.03	138.81	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
241	16.50	47.78	2.54	3.68	0.84	45.85	2.99	137.04	4.000	No	No	2.00
242	16.55	47.62	2.54	3.67	0.84	45.59	2.99	136.48	4.000	No	No	2.00
243	16.64	46.95	2.56	3.77	0.85	44.72	3.07	137.49	4.000	No	No	2.00
244	16.69	46.97	2.56	3.85	0.85	44.62	3.11	138.98	4.000	No	No	2.00
245	16.77	46.17	2.59	4.17	0.86	43.69	3.29	143.90	4.000	No	No	2.00
246	16.81	46.62	2.62	4.51	0.87	44.03	3.43	151.04	4.000	No	Yes	2.00
247	16.92	49.76	2.61	4.64	0.87	46.78	3.37	157.74	4.000	No	Yes	2.00
248	16.99	58.07	2.53	4.23	0.84	54.53	2.94	160.22	4.000	No	No	2.00
249	17.03	68.29	2.44	3.69	0.81	64.13	2.49	159.49	4.000	No	No	2.00
250	17.12	73.93	2.40	3.43	0.79	69.20	2.29	158.64	4.000	No	No	2.00
251	17.16	75.18	2.38	3.34	0.78	70.24	2.24	157.62	4.000	No	No	2.00
252	17.22	73.92	2.39	3.34	0.79	68.86	2.27	156.05	4.000	No	No	2.00
253	17.38	74.91	2.38	3.24	0.78	69.26	2.22	153.84	4.000	No	No	2.00
254	17.43	75.89	2.37	3.18	0.78	70.02	2.19	153.02	4.000	No	No	2.00
255	17.49	76.04	2.37	3.16	0.78	69.97	2.18	152.53	4.000	No	No	2.00
256	17.56	74.41	2.38	3.18	0.78	68.22	2.21	151.10	4.000	No	No	2.00
257	17.61	72.25	2.39	3.23	0.79	66.05	2.27	150.15	4.000	No	No	2.00
258	17.68	69.67	2.41	3.31	0.79	63.44	2.35	149.29	4.000	No	No	2.00
259	17.74	68.10	2.43	3.41	0.80	61.80	2.43	149.87	4.000	No	No	2.00
260	17.78	67.11	2.44	3.46	0.80	60.74	2.47	150.07	4.000	No	No	2.00
261	17.86	67.65	2.43	3.45	0.80	61.01	2.46	150.08	4.000	No	No	2.00
262	17.91	67.89	2.43	3.45	0.80	61.09	2.46	150.10	4.000	No	No	2.00
263	17.97	68.46	2.43	3.41	0.80	61.46	2.44	149.71	4.000	No	No	2.00
264	18.05	68.59	2.43	3.39	0.80	61.35	2.43	149.04	4.000	No	No	2.00
265	18.09	73.02	2.40	3.25	0.79	65.28	2.30	149.84	4.000	No	No	2.00
266	18.22	78.27	2.37	3.15	0.78	69.68	2.18	152.00	4.000	No	No	2.00
267	18.27	84.01	2.35	3.18	0.77	74.72	2.12	158.10	4.000	No	No	2.00
268	18.40	84.55	2.36	3.34	0.78	74.76	2.17	162.35	4.000	Yes	No	2.00
269	18.44	80.25	2.41	3.61	0.79	70.68	2.33	164.96	4.000	Yes	No	2.00
270	18.52	71.84	2.46	3.88	0.81	62.85	2.59	162.61	4.000	Yes	No	2.00
271	18.58	62.61	2.48	3.62	0.82	54.45	2.69	146.42	4.000	Yes	No	2.00
272	18.62	54.80	2.46	2.94	0.81	47.47	2.59	122.95	4.000	No	No	2.00
273	18.71	49.58	2.41	2.15	0.79	42.77	2.34	100.03	4.000	Yes	No	2.00
274	18.76	45.82	2.43	2.10	0.80	39.34	2.43	95.69	4.000	Yes	No	2.00
275	18.82	43.62	2.49	2.44	0.82	37.23	2.71	100.93	4.000	Yes	No	2.00
276	18.88	41.75	2.55	2.82	0.84	35.41	3.01	106.53	4.000	Yes	No	2.00
277	18.93	39.96	2.60	3.20	0.86	33.71	3.31	111.68	4.000	Yes	No	2.00
278	19.00	39.39	2.62	3.43	0.87	33.08	3.48	115.02	4.000	Yes	Yes	2.00
279	19.03	39.77	2.63	3.56	0.88	33.35	3.53	117.70	4.000	No	Yes	2.00
280	19.10	39.55	2.64	3.65	0.88	33.04	3.60	118.86	4.000	No	Yes	2.00
281	19.22	38.02	2.67	3.81	0.89	31.50	3.79	119.30	4.000	No	Yes	2.00
282	19.26	35.86	2.70	3.97	0.90	29.55	4.02	118.69	4.000	No	Yes	2.00
283	19.31	34.46	2.72	4.00	0.91	28.27	4.14	117.01	4.000	No	Yes	2.00
284	19.39	33.92	2.71	3.80	0.91	27.71	4.08	112.99	4.000	No	Yes	2.00
285	19.48	33.85	2.69	3.51	0.90	27.57	3.92	108.20	4.000	No	Yes	2.00
286	19.53	33.92	2.67	3.25	0.89	27.60	3.76	103.90	4.000	No	Yes	2.00
287	19.57	33.72	2.66	3.11	0.89	27.39	3.70	101.36	4.000	No	Yes	2.00
288	19.71	33.37	2.66	3.06	0.89	26.93	3.71	99.81	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	19.76	33.25	2.66	3.02	0.89	26.76	3.70	98.99	4.000	No	Yes	2.00
290	19.80	33.47	2.66	3.06	0.89	26.90	3.71	99.74	4.000	No	Yes	2.00
291	19.85	33.92	2.66	3.12	0.89	27.21	3.72	101.32	4.000	No	Yes	2.00
292	19.90	34.23	2.68	3.34	0.90	27.38	3.84	105.04	4.000	No	Yes	2.00
293	20.04	34.26	2.70	3.57	0.90	27.20	3.99	108.52	4.000	No	Yes	2.00
294	20.10	33.88	2.72	3.82	0.91	26.78	4.17	111.77	4.000	No	Yes	2.00
295	20.15	33.34	2.74	3.98	0.92	26.24	4.31	113.21	4.000	No	Yes	2.00
296	20.19	32.74	2.76	4.13	0.93	25.67	4.46	114.35	4.000	No	Yes	2.00
297	20.24	32.26	2.77	4.26	0.93	25.19	4.57	115.23	4.000	No	Yes	2.00
298	20.33	31.87	2.78	4.29	0.94	24.76	4.64	114.77	4.000	No	Yes	2.00
299	20.45	31.59	2.78	4.24	0.94	24.39	4.65	113.37	4.000	No	Yes	2.00
300	20.50	31.14	2.78	4.10	0.93	23.99	4.61	110.69	4.000	No	Yes	2.00
301	20.59	30.44	2.78	4.01	0.94	23.33	4.64	108.18	4.000	No	Yes	2.00
302	20.63	29.55	2.79	3.91	0.94	22.56	4.67	105.35	4.000	No	Yes	2.00
303	20.69	28.63	2.79	3.85	0.94	21.75	4.73	103.00	4.000	No	Yes	2.00
304	20.75	27.61	2.81	3.85	0.95	20.86	4.85	101.26	4.000	No	Yes	2.00
305	20.80	25.79	2.84	3.98	0.96	19.33	5.16	99.76	4.000	No	Yes	2.00
306	20.90	22.38	2.92	4.32	0.99	16.48	5.88	96.92	4.000	No	Yes	2.00
307	21.09	19.07	3.00	4.63	1.00	13.73	6.74	92.50	4.000	No	Yes	2.00
308	21.16	16.55	3.07	4.87	1.00	11.74	7.51	88.20	4.000	No	Yes	2.00
309	21.20	15.76	3.08	4.77	1.00	11.11	7.67	85.21	4.000	No	Yes	2.00
310	21.27	15.25	3.08	4.60	1.00	10.69	7.71	82.40	4.000	No	Yes	2.00
311	21.34	14.84	3.08	4.40	1.00	10.33	7.71	79.70	4.000	No	Yes	2.00
312	21.40	14.46	3.09	4.27	1.00	10.01	7.75	77.62	4.000	No	Yes	2.00
313	21.47	14.28	3.09	4.24	1.00	9.85	7.80	76.84	4.000	No	Yes	2.00
314	21.52	14.18	3.09	4.24	1.00	9.75	7.84	76.44	4.000	No	Yes	2.00
315	21.60	14.28	3.07	3.93	1.00	9.78	7.59	74.24	4.000	No	Yes	2.00
316	21.65	14.45	3.08	4.08	1.00	9.90	7.65	75.74	4.000	No	Yes	2.00
317	21.73	15.00	3.08	4.36	1.00	10.27	7.71	79.17	4.000	No	Yes	2.00
318	21.78	15.86	3.09	4.92	1.00	10.89	7.86	85.57	4.000	No	Yes	2.00
319	21.83	16.81	3.09	5.18	1.00	11.57	7.77	89.96	4.000	No	Yes	2.00
320	21.91	17.22	3.10	5.50	1.00	11.84	7.88	93.30	4.000	No	Yes	2.00
321	21.96	17.16	3.12	5.90	1.00	11.76	8.15	95.91	4.000	No	Yes	2.00
322	21.99	18.75	3.06	5.41	1.00	12.93	7.46	96.51	4.000	No	Yes	2.00
323	22.09	20.41	3.00	4.82	1.00	14.09	6.76	95.24	4.000	No	Yes	2.00
324	22.13	21.68	2.94	4.21	1.00	15.02	6.13	92.10	4.000	No	Yes	2.00
325	22.21	20.63	2.96	4.16	1.00	14.18	6.30	89.30	4.000	No	Yes	2.00
326	22.25	19.10	2.99	4.22	1.00	13.03	6.65	86.67	4.000	No	Yes	2.00
327	22.36	17.80	3.03	4.39	1.00	12.01	7.08	85.11	4.000	No	Yes	2.00
328	22.39	16.49	3.07	4.55	1.00	11.04	7.54	83.28	4.000	No	Yes	2.00
329	22.48	15.73	3.09	4.55	1.00	10.44	7.77	81.19	4.000	No	Yes	2.00
330	22.52	14.99	3.10	4.37	1.00	9.89	7.88	77.91	4.000	No	Yes	2.00
331	22.61	14.61	3.09	4.13	1.00	9.57	7.84	75.05	4.000	No	Yes	2.00
332	22.65	14.26	3.09	3.93	1.00	9.30	7.81	72.62	4.000	No	Yes	2.00
333	22.74	14.16	3.09	3.84	1.00	9.19	7.78	71.52	4.000	No	Yes	2.00
334	22.79	14.26	3.08	3.75	1.00	9.25	7.69	71.07	4.000	No	Yes	2.00
335	22.84	14.99	3.05	3.65	1.00	9.75	7.37	71.86	4.000	No	Yes	2.00
336	22.93	16.11	3.02	3.53	1.00	10.51	6.97	73.21	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
337	22.99	17.41	2.98	3.43	1.00	11.41	6.56	74.87	4.000	No	Yes	2.00
338	23.04	18.56	2.96	3.44	1.00	12.20	6.32	77.14	4.000	No	Yes	2.00
339	23.14	19.39	2.95	3.52	1.00	12.73	6.23	79.28	4.000	No	Yes	2.00
340	23.18	20.02	2.95	3.65	1.00	13.16	6.20	81.64	4.000	No	Yes	2.00
341	23.27	20.25	2.95	3.75	1.00	13.27	6.25	82.87	4.000	No	Yes	2.00
342	23.31	20.50	2.95	3.78	1.00	13.42	6.23	83.63	4.000	No	Yes	2.00
343	23.37	20.95	2.94	3.68	0.99	13.72	6.08	83.42	4.000	No	Yes	2.00
344	23.47	21.55	2.92	3.54	0.99	14.12	5.88	82.97	4.000	No	Yes	2.00
345	23.53	22.06	2.90	3.43	0.98	14.47	5.71	82.62	4.000	No	Yes	2.00
346	23.57	22.51	2.89	3.38	0.98	14.78	5.60	82.71	4.000	No	Yes	2.00
347	23.67	22.98	2.88	3.31	0.97	15.07	5.48	82.60	4.000	No	Yes	2.00
348	23.71	23.81	2.85	3.19	0.96	15.67	5.26	82.47	4.000	No	Yes	2.00
349	23.80	24.36	2.84	3.12	0.96	16.01	5.15	82.39	4.000	No	Yes	2.00
350	23.85	24.52	2.84	3.14	0.96	16.09	5.14	82.71	4.000	No	Yes	2.00
351	23.93	24.17	2.86	3.23	0.96	15.77	5.27	83.14	4.000	No	Yes	2.00
352	23.97	23.56	2.87	3.33	0.97	15.29	5.45	83.33	4.000	No	Yes	2.00
353	24.06	22.95	2.89	3.41	0.98	14.80	5.61	83.08	4.000	No	Yes	2.00
354	24.11	22.28	2.91	3.47	0.98	14.30	5.78	82.63	4.000	No	Yes	2.00
355	24.15	21.62	2.92	3.47	0.99	13.80	5.90	81.48	4.000	No	Yes	2.00
356	24.27	20.95	2.93	3.44	0.99	13.30	6.01	79.86	4.000	No	Yes	2.00
357	24.33	20.25	2.94	3.36	1.00	12.79	6.09	77.86	4.000	No	Yes	2.00
358	24.37	19.58	2.95	3.30	1.00	12.31	6.18	76.05	4.000	No	Yes	2.00
359	24.43	18.97	2.96	3.27	1.00	11.88	6.28	74.56	4.000	No	Yes	2.00
360	24.50	18.49	2.97	3.26	1.00	11.53	6.39	73.67	4.000	No	Yes	2.00
361	24.55	18.24	2.96	3.06	1.00	11.35	6.28	71.25	4.000	No	Yes	2.00
362	24.62	18.46	2.93	2.79	0.99	11.52	5.98	68.92	4.000	No	Yes	2.00
363	24.68	19.00	2.89	2.48	0.98	11.94	5.57	66.47	4.000	No	Yes	2.00
364	24.74	19.64	2.87	2.48	0.97	12.38	5.44	67.38	4.000	No	Yes	2.00
365	24.81	20.22	2.90	2.90	0.98	12.70	5.73	72.84	4.000	No	Yes	2.00
366	24.95	20.28	2.95	3.42	1.00	12.64	6.17	78.01	4.000	No	Yes	2.00
367	24.95	20.21	2.99	3.95	1.00	12.59	6.60	83.01	4.000	No	Yes	2.00
368	25.00	21.55	2.96	3.96	1.00	13.47	6.35	85.52	4.000	No	Yes	2.00
369	25.09	23.30	2.93	3.93	0.99	14.66	6.03	88.36	4.000	No	Yes	2.00
370	25.14	24.99	2.91	3.93	0.98	15.84	5.76	91.23	4.000	No	Yes	2.00
371	25.20	25.14	2.91	4.05	0.99	15.90	5.83	92.64	4.000	No	Yes	2.00
372	25.27	25.17	2.92	4.20	0.99	15.88	5.93	94.21	4.000	No	Yes	2.00
373	25.35	25.87	2.91	4.21	0.99	16.34	5.84	95.48	4.000	No	Yes	2.00
374	25.40	27.13	2.90	4.25	0.98	17.20	5.69	97.95	4.000	No	Yes	2.00
375	25.49	28.34	2.88	4.25	0.97	18.02	5.55	99.92	4.000	No	Yes	2.00
376	25.54	28.15	2.90	4.45	0.98	17.83	5.70	101.71	4.000	No	Yes	2.00
377	25.66	27.10	2.93	4.70	0.99	17.01	6.01	102.26	4.000	No	Yes	2.00
378	25.67	25.89	2.96	4.86	1.00	16.16	6.29	101.61	4.000	No	Yes	2.00
379	25.75	25.25	2.96	4.69	1.00	15.71	6.29	98.72	4.000	No	Yes	2.00
380	25.83	24.61	2.95	4.44	1.00	15.26	6.23	95.02	4.000	No	Yes	2.00
381	25.86	23.18	2.96	4.28	1.00	14.30	6.35	90.88	4.000	No	Yes	2.00
382	25.97	21.36	3.00	4.30	1.00	13.07	6.70	87.54	4.000	No	Yes	2.00
383	26.02	19.49	3.03	4.26	1.00	11.82	7.06	83.45	4.000	No	Yes	2.00
384	26.06	18.21	3.04	4.07	1.00	10.97	7.22	79.22	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
385	26.12	17.29	3.04	3.73	1.00	10.35	7.20	74.45	4.000	No	Yes	2.00
386	26.20	16.62	3.02	3.22	1.00	9.89	6.95	68.75	4.000	No	Yes	2.00
387	26.36	16.33	2.99	2.81	1.00	9.67	6.67	64.50	4.000	No	Yes	2.00
388	26.40	16.33	2.97	2.54	1.00	9.66	6.40	61.88	4.000	No	Yes	2.00
389	26.42	16.56	2.96	2.52	1.00	9.81	6.32	62.00	4.000	No	Yes	2.00
390	26.47	16.91	2.96	2.64	1.00	10.03	6.36	63.75	4.000	No	Yes	2.00
391	26.51	18.34	2.96	2.91	1.00	10.96	6.27	68.71	4.000	No	Yes	2.00
392	26.64	20.44	2.93	3.08	0.99	12.34	5.98	73.84	4.000	No	Yes	2.00
393	26.68	23.59	2.87	3.02	0.97	14.52	5.37	78.06	4.000	No	Yes	2.00
394	26.73	25.82	2.82	2.91	0.95	16.08	4.97	79.92	4.000	No	Yes	2.00
395	26.81	27.19	2.80	2.89	0.94	17.02	4.78	81.39	4.000	No	Yes	2.00
396	26.86	27.38	2.81	2.98	0.94	17.12	4.84	82.79	4.000	No	Yes	2.00
397	26.91	27.45	2.81	3.08	0.95	17.12	4.91	84.02	4.000	No	Yes	2.00
398	27.02	28.05	2.81	3.08	0.94	17.51	4.84	84.81	4.000	No	Yes	2.00
399	27.07	29.14	2.78	3.00	0.94	18.26	4.66	85.05	4.000	No	Yes	2.00
400	27.12	30.73	2.75	2.82	0.92	19.41	4.36	84.62	4.000	No	Yes	2.00
401	27.21	31.72	2.73	2.72	0.91	20.09	4.19	84.21	4.000	No	Yes	2.00
402	27.26	32.17	2.72	2.72	0.91	20.39	4.15	84.64	4.000	No	Yes	2.00
403	27.31	31.88	2.74	2.86	0.92	20.13	4.29	86.30	4.000	No	Yes	2.00
404	27.38	31.56	2.76	3.03	0.93	19.83	4.45	88.27	4.000	No	Yes	2.00
405	27.43	30.74	2.79	3.24	0.94	19.18	4.69	90.04	4.000	No	Yes	2.00
406	27.51	29.97	2.80	3.30	0.94	18.61	4.82	89.72	4.000	No	Yes	2.00
407	27.64	29.17	2.82	3.32	0.95	18.01	4.93	88.74	4.000	No	Yes	2.00
408	27.67	28.85	2.81	3.22	0.95	17.79	4.90	87.11	4.000	No	Yes	2.00
409	27.70	28.31	2.82	3.18	0.95	17.42	4.93	85.92	4.000	No	Yes	2.00
410	27.86	27.83	2.82	3.16	0.95	17.04	4.98	84.89	4.000	No	Yes	2.00
411	27.89	27.42	2.83	3.14	0.95	16.75	5.02	84.08	4.000	No	Yes	2.00
412	27.91	27.20	2.83	3.14	0.95	16.59	5.05	83.77	4.000	No	Yes	2.00
413	27.99	26.97	2.83	3.15	0.96	16.41	5.09	83.47	4.000	No	Yes	2.00
414	28.06	26.75	2.84	3.17	0.96	16.23	5.14	83.41	4.000	No	Yes	2.00
415	28.10	26.56	2.85	3.24	0.96	16.08	5.22	83.88	4.000	No	Yes	2.00
416	28.17	26.40	2.86	3.34	0.97	15.93	5.33	84.85	4.000	No	Yes	2.00
417	28.38	26.34	2.87	3.45	0.97	15.79	5.43	85.81	4.000	No	Yes	2.00
418	28.43	26.53	2.87	3.51	0.97	15.90	5.45	86.65	4.000	No	Yes	2.00
419	28.45	26.78	2.87	3.53	0.97	16.05	5.43	87.22	4.000	No	Yes	2.00
420	28.49	27.13	2.87	3.53	0.97	16.28	5.39	87.79	4.000	No	Yes	2.00
421	28.53	27.48	2.87	3.56	0.97	16.49	5.37	88.58	4.000	No	Yes	2.00
422	28.59	27.93	2.86	3.57	0.97	16.78	5.32	89.32	4.000	No	Yes	2.00
423	28.63	28.44	2.85	3.57	0.96	17.11	5.26	90.02	4.000	No	Yes	2.00
424	28.69	29.71	2.84	3.58	0.96	17.94	5.12	91.95	4.000	No	Yes	2.00
425	28.86	31.02	2.83	3.63	0.95	18.75	5.02	94.16	4.000	No	Yes	2.00
426	28.91	32.36	2.82	3.67	0.95	19.63	4.92	96.51	4.000	No	Yes	2.00
427	28.96	33.09	2.81	3.68	0.94	20.10	4.85	97.47	4.000	No	Yes	2.00
428	29.00	33.85	2.80	3.65	0.94	20.61	4.76	98.07	4.000	No	Yes	2.00
429	29.05	34.81	2.78	3.57	0.93	21.26	4.62	98.32	4.000	No	Yes	2.00
430	29.09	36.02	2.76	3.47	0.93	22.09	4.46	98.44	4.000	No	Yes	2.00
431	29.15	37.42	2.74	3.35	0.92	23.06	4.27	98.38	4.000	No	Yes	2.00
432	29.22	38.37	2.72	3.28	0.91	23.70	4.15	98.33	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
433	29.27	38.41	2.72	3.27	0.91	23.70	4.15	98.25	4.000	No	Yes	2.00
434	29.40	38.06	2.73	3.29	0.91	23.40	4.19	97.98	4.000	No	Yes	2.00
435	29.45	37.61	2.73	3.28	0.92	23.08	4.22	97.40	4.000	No	Yes	2.00
436	29.53	37.52	2.72	3.15	0.91	23.02	4.14	95.25	4.000	No	Yes	2.00
437	29.71	36.91	2.72	3.12	0.91	22.54	4.18	94.12	4.000	No	Yes	2.00
438	29.80	36.43	2.73	3.15	0.92	22.17	4.23	93.88	4.000	No	Yes	2.00
439	29.87	36.05	2.75	3.32	0.92	21.83	4.39	95.79	4.000	No	Yes	2.00
440	29.92	36.10	2.76	3.42	0.93	21.81	4.46	97.24	4.000	No	Yes	2.00
441	29.94	36.07	2.77	3.58	0.93	21.73	4.57	99.26	4.000	No	Yes	2.00
442	30.01	36.42	2.78	3.67	0.93	21.91	4.61	100.92	4.000	No	Yes	2.00
443	30.05	37.07	2.77	3.69	0.93	22.32	4.57	101.93	4.000	No	Yes	2.00
444	30.14	37.71	2.76	3.63	0.93	22.73	4.48	101.75	4.000	No	Yes	2.00
445	30.19	37.52	2.76	3.57	0.93	22.60	4.45	100.66	4.000	No	Yes	2.00
446	30.27	36.69	2.77	3.55	0.93	22.01	4.51	99.35	4.000	No	Yes	2.00
447	30.34	35.57	2.78	3.55	0.93	21.24	4.61	97.98	4.000	No	Yes	2.00
448	30.41	34.75	2.79	3.51	0.94	20.67	4.66	96.42	4.000	No	Yes	2.00
449	30.45	34.53	2.78	3.36	0.93	20.55	4.58	94.07	4.000	No	Yes	2.00
450	30.52	34.72	2.75	3.12	0.92	20.73	4.40	91.11	4.000	No	Yes	2.00
451	30.58	35.01	2.73	2.94	0.92	20.96	4.24	88.85	4.000	No	Yes	2.00
452	30.66	35.29	2.73	2.90	0.91	21.13	4.19	88.56	4.000	No	Yes	2.00
453	30.76	35.77	2.73	2.94	0.91	21.40	4.18	89.50	4.000	No	Yes	2.00
454	30.80	36.37	2.73	3.00	0.91	21.76	4.19	91.09	4.000	No	Yes	2.00
455	30.90	36.91	2.72	3.04	0.91	22.07	4.17	92.10	4.000	No	Yes	2.00
456	30.94	37.30	2.73	3.09	0.91	22.29	4.18	93.26	4.000	No	Yes	2.00
457	31.03	37.52	2.73	3.17	0.92	22.38	4.23	94.63	4.000	No	Yes	2.00
458	31.07	37.65	2.75	3.34	0.92	22.39	4.34	97.06	4.000	No	Yes	2.00
459	31.15	37.71	2.76	3.50	0.93	22.34	4.44	99.28	4.000	No	Yes	2.00
460	31.19	38.25	2.76	3.57	0.93	22.66	4.45	100.86	4.000	No	Yes	2.00
461	31.27	38.89	2.75	3.58	0.92	23.04	4.41	101.68	4.000	No	Yes	2.00
462	31.31	39.72	2.75	3.64	0.92	23.55	4.39	103.37	4.000	No	Yes	2.00
463	31.38	40.67	2.76	3.82	0.93	24.09	4.44	106.94	4.000	No	Yes	2.00
464	31.51	41.75	2.76	4.00	0.93	24.68	4.48	110.57	4.000	No	Yes	2.00
465	31.55	42.90	2.76	4.14	0.93	25.37	4.49	113.84	4.000	No	Yes	2.00
466	31.60	43.41	2.77	4.23	0.93	25.65	4.51	115.72	4.000	No	Yes	2.00
467	31.65	44.02	2.76	4.25	0.93	26.01	4.49	116.72	4.000	No	Yes	2.00
468	31.73	44.65	2.75	4.18	0.92	26.41	4.41	116.37	4.000	No	Yes	2.00
469	31.78	45.51	2.73	3.99	0.92	27.02	4.24	114.65	4.000	No	Yes	2.00
470	31.89	44.30	2.72	3.72	0.91	26.27	4.16	109.37	4.000	No	Yes	2.00
471	31.94	42.27	2.73	3.58	0.91	24.95	4.21	104.97	4.000	No	Yes	2.00
472	31.99	39.94	2.75	3.55	0.92	23.42	4.35	101.89	4.000	No	Yes	2.00
473	32.04	39.31	2.77	3.70	0.93	22.93	4.50	103.17	4.000	No	Yes	2.00
474	32.09	39.18	2.78	3.81	0.93	22.79	4.58	104.38	4.000	No	Yes	2.00
475	32.19	39.40	2.78	3.92	0.94	22.86	4.64	106.06	4.000	No	Yes	2.00
476	32.26	39.37	2.79	4.04	0.94	22.77	4.72	107.51	4.000	No	Yes	2.00
477	32.30	39.30	2.80	4.14	0.94	22.68	4.79	108.72	4.000	No	Yes	2.00
478	32.35	40.29	2.79	4.06	0.94	23.32	4.67	108.81	4.000	No	Yes	2.00
479	32.44	40.61	2.78	4.02	0.93	23.49	4.63	108.68	4.000	No	Yes	2.00
480	32.50	40.42	2.78	4.00	0.94	23.35	4.63	108.15	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
481	32.57	39.48	2.79	4.05	0.94	22.70	4.74	107.50	4.000	No	Yes	2.00
482	32.61	39.13	2.79	3.99	0.94	22.47	4.73	106.22	4.000	No	Yes	2.00
483	32.68	39.64	2.77	3.81	0.93	22.83	4.58	104.45	4.000	No	Yes	2.00
484	32.75	39.52	2.76	3.66	0.93	22.77	4.49	102.34	4.000	No	Yes	2.00
485	32.84	39.68	2.76	3.56	0.93	22.87	4.42	101.13	4.000	No	Yes	2.00
486	32.88	39.30	2.77	3.63	0.93	22.58	4.50	101.52	4.000	No	Yes	2.00
487	32.98	38.95	2.78	3.75	0.93	22.28	4.61	102.62	4.000	No	Yes	2.00
488	33.02	38.76	2.78	3.79	0.94	22.13	4.65	102.92	4.000	No	Yes	2.00
489	33.18	38.89	2.78	3.74	0.93	22.16	4.62	102.31	4.000	No	Yes	2.00
490	33.20	38.99	2.77	3.69	0.93	22.23	4.57	101.68	4.000	No	Yes	2.00
491	33.24	38.70	2.78	3.74	0.94	22.01	4.63	101.99	4.000	No	Yes	2.00
492	33.32	38.16	2.80	3.85	0.94	21.60	4.76	102.74	4.000	No	Yes	2.00
493	33.36	37.36	2.82	4.04	0.95	21.02	4.95	104.00	4.000	No	Yes	2.00
494	33.42	36.66	2.84	4.24	0.96	20.50	5.14	105.40	4.000	No	Yes	2.00
495	33.50	36.09	2.86	4.41	0.96	20.06	5.31	106.46	4.000	No	Yes	2.00
496	33.54	35.83	2.87	4.50	0.97	19.86	5.39	107.07	4.000	No	Yes	2.00
497	33.63	35.70	2.87	4.52	0.97	19.74	5.42	107.07	4.000	No	Yes	2.00
498	33.66	35.54	2.87	4.52	0.97	19.63	5.44	106.79	4.000	No	Yes	2.00
499	33.77	35.13	2.88	4.55	0.97	19.32	5.51	106.47	4.000	No	Yes	2.00
500	33.81	34.84	2.88	4.57	0.97	19.12	5.55	106.17	4.000	No	Yes	2.00
501	33.89	34.65	2.89	4.57	0.98	18.97	5.58	105.88	4.000	No	Yes	2.00
502	33.94	34.59	2.89	4.56	0.98	18.92	5.58	105.55	4.000	No	Yes	2.00
503	34.00	34.30	2.89	4.56	0.98	18.72	5.61	105.08	4.000	No	Yes	2.00
504	34.07	34.02	2.89	4.52	0.98	18.52	5.63	104.21	4.000	No	Yes	2.00
505	34.16	34.08	2.89	4.42	0.97	18.56	5.56	103.09	4.000	No	Yes	2.00
506	34.20	35.10	2.86	4.17	0.96	19.23	5.29	101.83	4.000	No	Yes	2.00
507	34.29	36.28	2.83	3.97	0.95	19.99	5.05	101.00	4.000	No	Yes	2.00
508	34.34	37.52	2.80	3.79	0.94	20.80	4.82	100.37	4.000	No	Yes	2.00
509	34.38	38.44	2.78	3.64	0.94	21.41	4.65	99.53	4.000	No	Yes	2.00
510	34.48	39.27	2.76	3.48	0.93	21.95	4.48	98.31	4.000	No	Yes	2.00
511	34.53	39.81	2.74	3.32	0.92	22.33	4.33	96.75	4.000	No	Yes	2.00
512	34.60	39.81	2.75	3.33	0.92	22.30	4.34	96.78	4.000	No	Yes	2.00
513	34.65	39.53	2.76	3.49	0.93	22.04	4.47	98.57	4.000	No	Yes	2.00
514	34.74	39.24	2.78	3.71	0.94	21.75	4.65	101.10	4.000	No	Yes	2.00
515	34.80	39.05	2.80	3.88	0.94	21.55	4.78	102.95	4.000	No	Yes	2.00
516	34.84	39.08	2.80	3.95	0.94	21.53	4.82	103.86	4.000	No	Yes	2.00
517	34.95	39.05	2.81	3.99	0.95	21.45	4.86	104.23	4.000	No	Yes	2.00
518	34.99	39.05	2.81	3.98	0.95	21.44	4.86	104.13	4.000	No	Yes	2.00
519	35.05	39.18	2.80	3.90	0.94	21.52	4.79	103.16	4.000	No	Yes	2.00
520	35.11	38.57	2.80	3.83	0.94	21.15	4.80	101.49	4.000	No	Yes	2.00
521	35.24	37.49	2.81	3.83	0.95	20.42	4.90	100.06	4.000	No	Yes	2.00
522	35.29	35.83	2.84	3.90	0.96	19.36	5.11	98.84	4.000	No	Yes	2.00
523	35.37	34.21	2.86	3.99	0.97	18.31	5.33	97.61	4.000	No	Yes	2.00
524	35.49	32.78	2.88	4.02	0.97	17.39	5.51	95.85	4.000	No	Yes	2.00
525	35.55	30.99	2.90	4.02	0.98	16.29	5.73	93.28	4.000	No	Yes	2.00
526	35.68	29.66	2.92	4.00	0.99	15.44	5.89	91.04	4.000	No	Yes	2.00
527	35.73	28.32	2.93	3.95	0.99	14.64	6.04	88.42	4.000	No	Yes	2.00
528	35.81	27.62	2.94	3.85	0.99	14.22	6.08	86.38	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
529	35.86	27.17	2.93	3.66	0.99	13.97	6.00	83.82	4.000	No	Yes	2.00
530	35.93	27.01	2.92	3.49	0.99	13.90	5.89	81.88	4.000	No	Yes	2.00
531	35.99	26.73	2.92	3.43	0.99	13.73	5.89	80.84	4.000	No	Yes	2.00
532	36.04	26.66	2.92	3.47	0.99	13.67	5.93	81.06	4.000	No	Yes	2.00
533	36.09	26.79	2.93	3.52	0.99	13.71	5.96	81.73	4.000	No	Yes	2.00
534	36.14	27.43	2.91	3.49	0.99	14.10	5.84	82.31	4.000	No	Yes	2.00
535	36.18	28.64	2.89	3.43	0.98	14.83	5.62	83.37	4.000	No	Yes	2.00
536	36.30	29.88	2.87	3.39	0.97	15.55	5.43	84.53	4.000	No	Yes	2.00
537	36.35	31.15	2.85	3.35	0.96	16.32	5.26	85.80	4.000	No	Yes	2.00
538	36.40	31.85	2.85	3.36	0.96	16.73	5.18	86.71	4.000	No	Yes	2.00
539	36.44	32.52	2.84	3.38	0.96	17.11	5.13	87.80	4.000	No	Yes	2.00
540	36.53	33.19	2.83	3.41	0.96	17.48	5.08	88.90	4.000	No	Yes	2.00
541	36.57	34.31	2.82	3.42	0.95	18.15	4.98	90.33	4.000	No	Yes	2.00
542	36.70	35.23	2.81	3.41	0.95	18.67	4.89	91.22	4.000	No	Yes	2.00
543	36.75	35.96	2.80	3.39	0.94	19.10	4.81	91.84	4.000	No	Yes	2.00
544	36.78	36.31	2.80	3.37	0.94	19.31	4.76	91.90	4.000	No	Yes	2.00
545	36.83	36.63	2.79	3.36	0.94	19.49	4.73	92.17	4.000	No	Yes	2.00
546	36.88	37.27	2.79	3.37	0.94	19.86	4.68	92.96	4.000	No	Yes	2.00
547	37.01	37.87	2.78	3.39	0.94	20.17	4.65	93.81	4.000	No	Yes	2.00
548	37.06	38.38	2.77	3.24	0.93	20.52	4.50	92.38	4.000	No	Yes	2.00
549	37.14	38.51	2.75	3.10	0.92	20.62	4.40	90.66	4.000	No	Yes	2.00
550	37.19	38.57	2.74	2.99	0.92	20.69	4.31	89.09	4.000	No	Yes	2.00
551	37.26	38.67	2.75	3.03	0.92	20.71	4.34	89.78	4.000	No	Yes	2.00
552	37.32	38.73	2.75	3.06	0.92	20.71	4.36	90.23	4.000	No	Yes	2.00
553	37.38	38.22	2.76	3.12	0.93	20.36	4.44	90.46	4.000	No	Yes	2.00
554	37.45	36.76	2.79	3.28	0.94	19.38	4.69	90.84	4.000	No	Yes	2.00
555	37.49	35.64	2.81	3.40	0.95	18.65	4.89	91.11	4.000	No	Yes	2.00
556	37.56	35.23	2.82	3.45	0.95	18.36	4.97	91.19	4.000	No	Yes	2.00
557	37.61	35.80	2.81	3.39	0.95	18.71	4.87	91.10	4.000	No	Yes	2.00
558	37.67	36.02	2.80	3.34	0.94	18.84	4.81	90.68	4.000	No	Yes	2.00
559	37.78	36.12	2.80	3.31	0.94	18.87	4.78	90.30	4.000	No	Yes	2.00
560	37.83	36.03	2.80	3.30	0.94	18.81	4.79	90.01	4.000	No	Yes	2.00
561	37.87	35.77	2.81	3.34	0.94	18.63	4.85	90.26	4.000	No	Yes	2.00
562	37.95	35.14	2.83	3.46	0.95	18.18	5.00	90.94	4.000	No	Yes	2.00
563	38.00	34.28	2.85	3.63	0.96	17.60	5.22	91.81	4.000	No	Yes	2.00
564	38.13	33.48	2.87	3.78	0.97	17.04	5.42	92.35	4.000	No	Yes	2.00
565	38.18	32.97	2.88	3.80	0.97	16.72	5.49	91.80	4.000	No	Yes	2.00
566	38.30	32.87	2.88	3.75	0.97	16.64	5.48	91.12	4.000	No	Yes	2.00
567	38.35	33.13	2.87	3.65	0.97	16.80	5.38	90.36	4.000	No	Yes	2.00
568	38.40	33.95	2.85	3.53	0.96	17.31	5.20	89.96	4.000	No	Yes	2.00
569	38.47	35.64	2.81	3.30	0.95	18.37	4.86	89.25	4.000	No	Yes	2.00
570	38.53	36.88	2.79	3.18	0.94	19.13	4.66	89.12	4.000	No	Yes	2.00
571	38.58	37.36	2.78	3.19	0.94	19.40	4.63	89.71	4.000	No	Yes	2.00
572	38.65	36.63	2.80	3.36	0.94	18.88	4.82	90.98	4.000	No	Yes	2.00
573	38.71	36.03	2.82	3.51	0.95	18.44	4.99	92.04	4.000	No	Yes	2.00
574	38.76	35.58	2.84	3.62	0.96	18.13	5.12	92.78	4.000	No	Yes	2.00
575	38.84	35.26	2.85	3.73	0.96	17.88	5.23	93.57	4.000	No	Yes	2.00
576	38.89	34.75	2.87	3.93	0.97	17.51	5.43	95.12	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
577	38.94	34.08	2.90	4.21	0.98	17.02	5.71	97.16	4.000	No	Yes	2.00
578	39.02	33.32	2.93	4.44	0.99	16.50	5.96	98.28	4.000	No	Yes	2.00
579	39.07	32.49	2.94	4.56	1.00	15.98	6.15	98.19	4.000	No	Yes	2.00
580	39.13	31.92	2.95	4.53	1.00	15.64	6.19	96.90	4.000	No	Yes	2.00
581	39.20	30.93	2.96	4.52	1.00	15.09	6.32	95.33	4.000	No	Yes	2.00
582	39.25	29.12	2.99	4.55	1.00	14.12	6.58	92.93	4.000	No	Yes	2.00
583	39.32	26.73	3.02	4.68	1.00	12.84	7.02	90.21	4.000	No	Yes	2.00
584	39.37	24.44	3.05	4.59	1.00	11.63	7.36	85.52	4.000	No	Yes	2.00
585	39.50	23.03	3.06	4.37	1.00	10.86	7.48	81.29	4.000	No	Yes	2.00
586	39.55	21.92	3.06	4.07	1.00	10.27	7.49	76.91	4.000	No	Yes	2.00
587	39.61	20.99	3.07	3.90	1.00	9.77	7.57	73.92	4.000	No	Yes	2.00
588	39.73	20.10	3.06	3.50	1.00	9.28	7.46	69.21	4.000	No	Yes	2.00
589	39.79	19.34	3.01	2.66	1.00	8.87	6.87	60.93	4.000	No	Yes	2.00
590	39.85	18.96	2.95	2.01	1.00	8.67	6.25	54.19	4.000	No	Yes	2.00
591	39.97	18.83	2.93	1.77	0.99	8.62	5.99	51.65	4.000	No	Yes	2.00
592	40.03	19.30	2.95	2.07	1.00	8.82	6.26	55.19	4.000	No	Yes	2.00
593	40.08	19.62	3.00	2.60	1.00	8.98	6.76	60.71	4.000	No	Yes	2.00
594	40.13	20.16	3.07	3.60	1.00	9.26	7.55	69.93	4.000	No	Yes	2.00
595	40.18	20.23	3.17	5.22	1.00	9.28	8.77	81.40	4.000	No	Yes	2.00
596	40.23	21.76	3.19	6.30	1.00	10.07	9.08	91.48	4.000	No	Yes	2.00
597	40.30	32.49	2.96	4.67	1.00	15.64	6.29	98.35	4.000	No	Yes	2.00
598	40.36	44.66	2.75	3.50	0.92	22.99	4.37	100.38	4.000	No	Yes	2.00
599	40.45	51.50	2.65	3.00	0.88	27.29	3.64	99.27	4.000	No	Yes	2.00
600	40.50	44.37	2.74	3.32	0.92	22.84	4.27	97.61	4.000	No	Yes	2.00
601	40.58	33.69	2.91	4.11	0.98	16.35	5.77	94.42	4.000	No	Yes	2.00
602	40.62	26.86	3.02	4.56	1.00	12.64	7.01	88.59	4.000	No	Yes	2.00
603	40.73	24.97	3.03	4.18	1.00	11.64	7.07	82.24	4.000	No	Yes	2.00
604	40.81	25.96	2.96	3.42	1.00	12.14	6.32	76.72	4.000	No	Yes	2.00
605	40.85	28.95	2.86	2.81	0.97	13.96	5.34	74.48	4.000	No	Yes	2.00
606	40.95	32.14	2.79	2.54	0.94	15.87	4.71	74.78	4.000	No	Yes	2.00
607	41.00	34.97	2.74	2.43	0.92	17.56	4.33	76.09	4.000	No	Yes	2.00
608	41.05	36.31	2.74	2.54	0.92	18.28	4.31	78.80	4.000	No	Yes	2.00
609	41.11	37.36	2.74	2.68	0.92	18.82	4.33	81.56	4.000	No	Yes	2.00
610	41.16	38.19	2.75	2.82	0.92	19.22	4.39	84.30	4.000	No	Yes	2.00
611	41.26	38.95	2.75	2.91	0.92	19.60	4.39	86.11	4.000	No	Yes	2.00
612	41.32	39.65	2.75	2.97	0.92	19.96	4.39	87.64	4.000	No	Yes	2.00
613	41.37	40.23	2.75	3.01	0.92	20.26	4.38	88.66	4.000	No	Yes	2.00
614	41.42	40.90	2.75	3.03	0.92	20.62	4.34	89.54	4.000	No	Yes	2.00
615	41.47	41.50	2.74	3.04	0.92	20.96	4.31	90.25	4.000	No	Yes	2.00
616	41.57	42.08	2.74	3.03	0.92	21.26	4.26	90.61	4.000	No	Yes	2.00
617	41.64	42.20	2.74	3.04	0.92	21.31	4.26	90.86	4.000	No	Yes	2.00
618	41.69	41.73	2.75	3.10	0.92	20.98	4.35	91.20	4.000	No	Yes	2.00
619	41.78	41.15	2.76	3.18	0.93	20.58	4.45	91.66	4.000	No	Yes	2.00
620	41.83	40.77	2.77	3.25	0.93	20.31	4.53	92.10	4.000	No	Yes	2.00
621	41.90	40.80	2.77	3.26	0.93	20.30	4.55	92.27	4.000	No	Yes	2.00
622	41.95	40.67	2.77	3.27	0.93	20.20	4.57	92.29	4.000	No	Yes	2.00
623	42.00	39.91	2.79	3.34	0.94	19.72	4.68	92.28	4.000	No	Yes	2.00
624	42.11	38.95	2.81	3.43	0.94	19.10	4.83	92.34	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
625	42.18	37.80	2.83	3.55	0.95	18.38	5.03	92.46	4.000	No	Yes	2.00
626	42.23	36.85	2.85	3.66	0.96	17.79	5.20	92.50	4.000	No	Yes	2.00
627	42.30	35.67	2.87	3.77	0.97	17.07	5.41	92.30	4.000	No	Yes	2.00
628	42.36	34.53	2.89	3.86	0.98	16.38	5.60	91.79	4.000	No	Yes	2.00
629	42.43	33.51	2.91	3.92	0.98	15.78	5.77	91.01	4.000	No	Yes	2.00
630	42.49	32.71	2.92	3.93	0.99	15.32	5.88	90.00	4.000	No	Yes	2.00
631	42.54	32.27	2.90	3.66	0.98	15.13	5.72	86.60	4.000	No	Yes	2.00
632	42.62	31.95	2.87	3.20	0.97	15.07	5.40	81.38	4.000	No	Yes	2.00
633	42.68	31.98	2.83	2.78	0.95	15.22	5.04	76.68	4.000	No	Yes	2.00
634	42.75	32.20	2.81	2.64	0.95	15.38	4.89	75.22	4.000	No	Yes	2.00
635	42.80	32.90	2.80	2.63	0.94	15.77	4.81	75.80	4.000	No	Yes	2.00
636	42.88	33.63	2.79	2.59	0.94	16.18	4.69	75.96	4.000	No	Yes	2.00
637	42.93	32.58	2.82	2.72	0.95	15.52	4.92	76.43	4.000	No	Yes	2.00
638	43.01	34.46	2.79	2.70	0.94	16.58	4.71	78.06	4.000	No	Yes	2.00
639	43.07	37.52	2.75	2.65	0.92	18.32	4.39	80.42	4.000	No	Yes	2.00
640	43.12	42.59	2.69	2.56	0.90	21.28	3.93	83.52	4.000	No	Yes	2.00
641	43.20	44.66	2.68	2.65	0.90	22.40	3.87	86.70	4.000	No	Yes	2.00
642	43.24	45.64	2.70	2.87	0.90	22.83	3.98	90.77	4.000	No	Yes	2.00
643	43.33	46.12	2.71	3.08	0.91	22.96	4.10	94.14	4.000	No	Yes	2.00
644	43.37	45.74	2.74	3.31	0.92	22.60	4.29	96.98	4.000	No	Yes	2.00
645	43.51	45.04	2.76	3.43	0.93	22.09	4.43	97.88	4.000	No	Yes	2.00
646	43.54	44.53	2.76	3.45	0.93	21.78	4.48	97.58	4.000	No	Yes	2.00
647	43.59	44.82	2.75	3.32	0.92	21.99	4.37	96.07	4.000	No	Yes	2.00
648	43.66	44.97	2.73	3.17	0.92	22.13	4.25	94.12	4.000	No	Yes	2.00
649	43.73	44.75	2.72	3.04	0.91	22.04	4.18	92.09	4.000	No	Yes	2.00
650	43.78	43.86	2.72	2.96	0.91	21.56	4.18	90.13	4.000	No	Yes	2.00
651	43.86	42.97	2.73	2.90	0.91	21.06	4.20	88.42	4.000	No	Yes	2.00
652	43.91	41.98	2.73	2.85	0.92	20.51	4.23	86.80	4.000	No	Yes	2.00
653	43.99	41.25	2.74	2.84	0.92	20.06	4.28	85.95	4.000	No	Yes	2.00
654	44.04	40.61	2.75	2.86	0.92	19.68	4.35	85.63	4.000	No	Yes	2.00
655	44.12	40.39	2.75	2.90	0.92	19.51	4.41	85.95	4.000	No	Yes	2.00
656	44.21	40.29	2.76	2.94	0.93	19.41	4.45	86.27	4.000	No	Yes	2.00
657	44.25	40.13	2.77	2.99	0.93	19.28	4.50	86.75	4.000	No	Yes	2.00
658	44.32	39.56	2.78	3.10	0.94	18.89	4.64	87.58	4.000	No	Yes	2.00
659	44.46	38.83	2.80	3.25	0.94	18.38	4.82	88.55	4.000	No	Yes	2.00
660	44.52	38.19	2.82	3.38	0.95	17.95	4.98	89.41	4.000	No	Yes	2.00
661	44.56	37.84	2.83	3.42	0.95	17.73	5.05	89.48	4.000	No	Yes	2.00
662	44.61	37.62	2.83	3.41	0.95	17.60	5.06	89.11	4.000	No	Yes	2.00
663	44.65	37.27	2.83	3.38	0.96	17.40	5.08	88.38	4.000	No	Yes	2.00
664	44.70	36.70	2.84	3.36	0.96	17.08	5.12	87.42	4.000	No	Yes	2.00
665	44.88	36.50	2.84	3.34	0.96	16.93	5.13	86.90	4.000	No	Yes	2.00
666	44.92	36.25	2.84	3.36	0.96	16.77	5.17	86.78	4.000	No	Yes	2.00
667	45.01	36.50	2.84	3.36	0.96	16.89	5.16	87.10	4.000	No	Yes	2.00
668	45.05	36.63	2.84	3.36	0.96	16.95	5.14	87.15	4.000	No	Yes	2.00
669	45.09	36.98	2.81	3.05	0.95	17.25	4.86	83.91	4.000	No	Yes	2.00
670	45.19	36.88	2.79	2.79	0.94	17.28	4.67	80.60	4.000	No	Yes	2.00
671	45.23	36.51	2.77	2.59	0.93	17.15	4.53	77.64	4.000	No	Yes	2.00
672	45.28	35.74	2.79	2.72	0.94	16.65	4.72	78.51	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
673	45.36	34.60	2.82	2.87	0.95	15.94	4.97	79.14	4.000	No	Yes	2.00
674	45.49	33.56	2.85	2.99	0.96	15.29	5.18	79.29	4.000	No	Yes	2.00
675	45.51	32.89	2.86	3.07	0.97	14.90	5.34	79.51	4.000	No	Yes	2.00
676	45.55	33.75	2.87	3.26	0.97	15.29	5.39	82.47	4.000	No	Yes	2.00
677	45.68	35.01	2.87	3.44	0.97	15.87	5.41	85.84	4.000	No	Yes	2.00
678	45.70	37.46	2.86	3.71	0.97	17.09	5.36	91.60	4.000	No	Yes	2.00
679	45.77	40.78	2.85	3.95	0.96	18.77	5.23	98.17	4.000	No	Yes	2.00
680	45.86	44.37	2.83	4.17	0.96	20.60	5.09	104.78	4.000	No	Yes	2.00
681	45.89	47.72	2.82	4.29	0.95	22.35	4.92	110.02	4.000	No	Yes	2.00
682	45.95	49.63	2.81	4.43	0.95	23.31	4.88	113.86	4.000	No	Yes	2.00
683	46.03	50.01	2.83	4.70	0.95	23.38	5.02	117.42	4.000	No	Yes	2.00
684	46.07	49.47	2.85	4.95	0.96	22.97	5.21	119.72	4.000	No	Yes	2.00
685	46.15	48.61	2.86	4.98	0.96	22.47	5.29	118.84	4.000	No	Yes	2.00
686	46.22	48.07	2.85	4.80	0.96	22.22	5.22	116.08	4.000	No	Yes	2.00
687	46.30	48.12	2.83	4.52	0.95	22.32	5.06	112.91	4.000	No	Yes	2.00
688	46.35	48.28	2.82	4.31	0.95	22.48	4.92	110.48	4.000	No	Yes	2.00
689	46.43	48.92	2.81	4.27	0.95	22.81	4.85	110.61	4.000	No	Yes	2.00
690	46.50	49.63	2.82	4.50	0.95	23.07	4.95	114.21	4.000	No	Yes	2.00
691	46.56	53.61	2.81	4.72	0.94	25.09	4.84	121.36	4.000	No	Yes	2.00
692	46.61	60.23	2.77	4.77	0.93	28.62	4.52	129.24	4.000	No	Yes	2.00
693	46.66	70.14	2.72	4.88	0.91	33.95	4.15	140.84	4.000	No	Yes	2.00
694	46.78	77.18	2.71	5.19	0.91	37.54	4.06	152.38	4.000	No	Yes	2.00
695	46.87	80.43	2.73	5.69	0.91	38.95	4.19	163.31	4.000	No	Yes	2.00
696	46.96	81.05	2.74	6.03	0.92	39.02	4.33	168.89	4.000	No	Yes	2.00
697	47.09	80.39	2.76	6.27	0.93	38.44	4.46	171.53	4.000	No	Yes	2.00
698	47.14	81.82	2.75	6.25	0.92	39.19	4.41	172.77	4.000	No	Yes	2.00
699	47.18	83.01	2.75	6.18	0.92	39.84	4.34	172.93	4.000	No	Yes	2.00
700	47.26	85.56	2.72	5.97	0.91	41.29	4.18	172.49	4.000	No	Yes	2.00
701	47.31	85.78	2.72	5.84	0.91	41.46	4.11	170.53	4.000	No	Yes	2.00
702	47.37	82.72	2.73	5.82	0.91	39.77	4.20	167.05	4.000	No	Yes	2.00
703	47.44	76.99	2.76	5.89	0.93	36.59	4.42	161.87	4.000	No	Yes	2.00
704	47.50	70.14	2.76	5.34	0.93	33.19	4.42	146.62	4.000	No	Yes	2.00
705	47.54	63.19	2.73	4.44	0.92	29.93	4.23	126.66	4.000	No	Yes	2.00
706	47.62	56.38	2.70	3.53	0.91	26.73	4.01	107.16	4.000	No	Yes	2.00
707	47.67	50.04	2.76	3.62	0.93	23.21	4.42	102.58	4.000	No	Yes	2.00
708	47.71	44.57	2.86	4.39	0.97	19.94	5.32	106.01	4.000	No	Yes	2.00
709	47.80	40.01	2.95	5.20	1.00	17.31	6.25	108.22	4.000	No	Yes	2.00
710	47.85	39.09	2.98	5.46	1.00	16.86	6.49	109.46	4.000	No	Yes	2.00
711	47.92	39.83	2.97	5.36	1.00	17.19	6.37	109.40	4.000	No	Yes	2.00
712	48.01	41.67	2.93	5.08	0.99	18.11	6.03	109.18	4.000	No	Yes	2.00
713	48.04	41.80	2.93	5.09	0.99	18.16	6.02	109.40	4.000	No	Yes	2.00
714	48.12	41.77	2.93	5.01	0.99	18.14	5.98	108.53	4.000	No	Yes	2.00
715	48.18	41.83	2.95	5.39	1.00	18.04	6.21	112.12	4.000	No	Yes	2.00
716	48.31	42.95	2.96	5.79	1.00	18.52	6.34	117.50	4.000	No	Yes	2.00
717	48.36	45.08	2.97	6.21	1.00	19.49	6.39	124.57	4.000	No	Yes	2.00
718	48.40	48.23	2.94	6.22	1.00	20.98	6.15	128.98	4.000	No	Yes	2.00
719	48.45	51.74	2.94	6.53	0.99	22.63	6.05	136.97	4.000	No	Yes	2.00
720	48.54	54.60	2.94	7.00	1.00	23.91	6.09	145.59	4.000	No	Yes	2.00

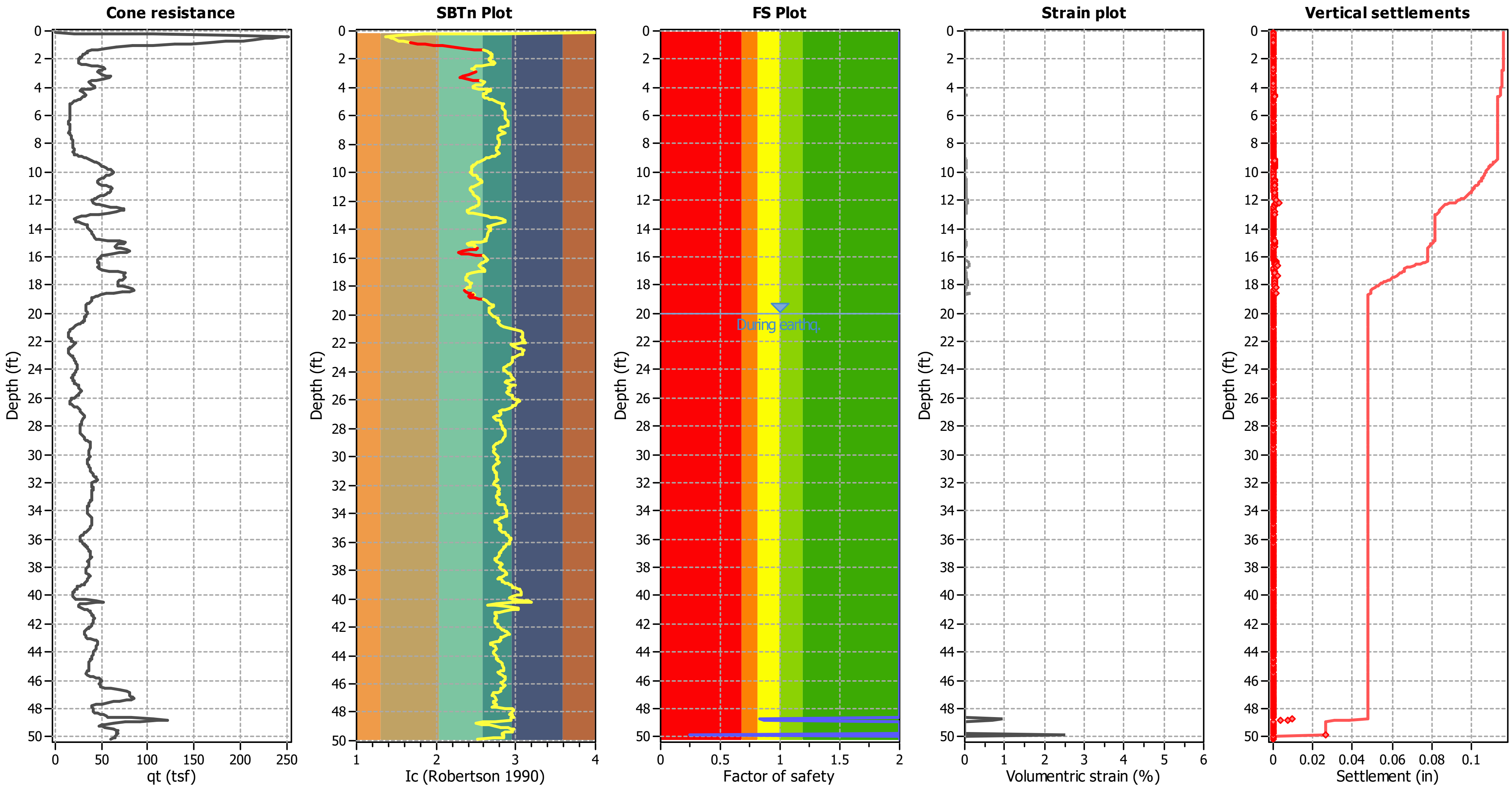
:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

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
721	48.58	57.60	2.94	7.53	1.00	25.23	6.15	155.21	4.000	No	Yes	2.00
722	48.63	81.29	2.74	5.80	0.92	38.24	4.28	163.68	4.000	No	Yes	2.00
723	48.72	105.78	2.58	4.79	0.86	52.30	3.23	169.11	0.530	No	No	0.83
724	48.80	121.51	2.50	4.34	0.83	61.56	2.79	171.92	0.553	No	No	0.87
725	48.85	110.15	2.57	4.74	0.85	54.67	3.14	171.40	0.548	No	No	0.86
726	48.90	91.20	2.67	5.23	0.89	43.76	3.75	164.10	4.000	No	Yes	2.00
727	48.98	76.23	2.74	5.43	0.92	35.56	4.29	152.65	4.000	No	Yes	2.00
728	49.03	62.91	2.82	5.61	0.95	28.45	4.94	140.48	4.000	No	Yes	2.00
729	49.11	53.58	2.90	6.05	0.98	23.45	5.71	133.90	4.000	No	Yes	2.00
730	49.18	50.25	2.94	6.29	0.99	21.66	6.08	131.63	4.000	No	Yes	2.00
731	49.23	47.45	2.98	6.79	1.00	20.28	6.54	132.64	4.000	No	Yes	2.00
732	49.29	50.15	2.96	6.82	1.00	21.50	6.36	136.65	4.000	No	Yes	2.00
733	49.38	53.10	2.95	6.90	1.00	22.82	6.20	141.44	4.000	No	Yes	2.00
734	49.42	62.60	2.86	6.30	0.97	27.81	5.32	148.01	4.000	No	Yes	2.00
735	49.51	66.99	2.83	6.18	0.95	30.06	5.05	151.84	4.000	No	Yes	2.00
736	49.56	68.33	2.83	6.34	0.95	30.65	5.07	155.34	4.000	No	Yes	2.00
737	49.62	66.70	2.86	6.61	0.96	29.67	5.27	156.46	4.000	No	Yes	2.00
738	49.71	66.99	2.85	6.60	0.96	29.78	5.26	156.59	4.000	No	Yes	2.00
739	49.76	67.15	2.85	6.59	0.96	29.83	5.25	156.68	4.000	No	Yes	2.00
740	49.82	66.39	2.73	4.46	0.91	30.50	4.20	128.03	4.000	No	Yes	2.00
741	49.90	65.75	2.52	2.27	0.84	31.99	2.87	91.76	0.152	No	No	0.24
742	49.96	65.47	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
743	50.04	65.47	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
744	50.09	63.04	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00
745	50.18	60.69	N/A	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00

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

Estimation of post-earthquake settlements

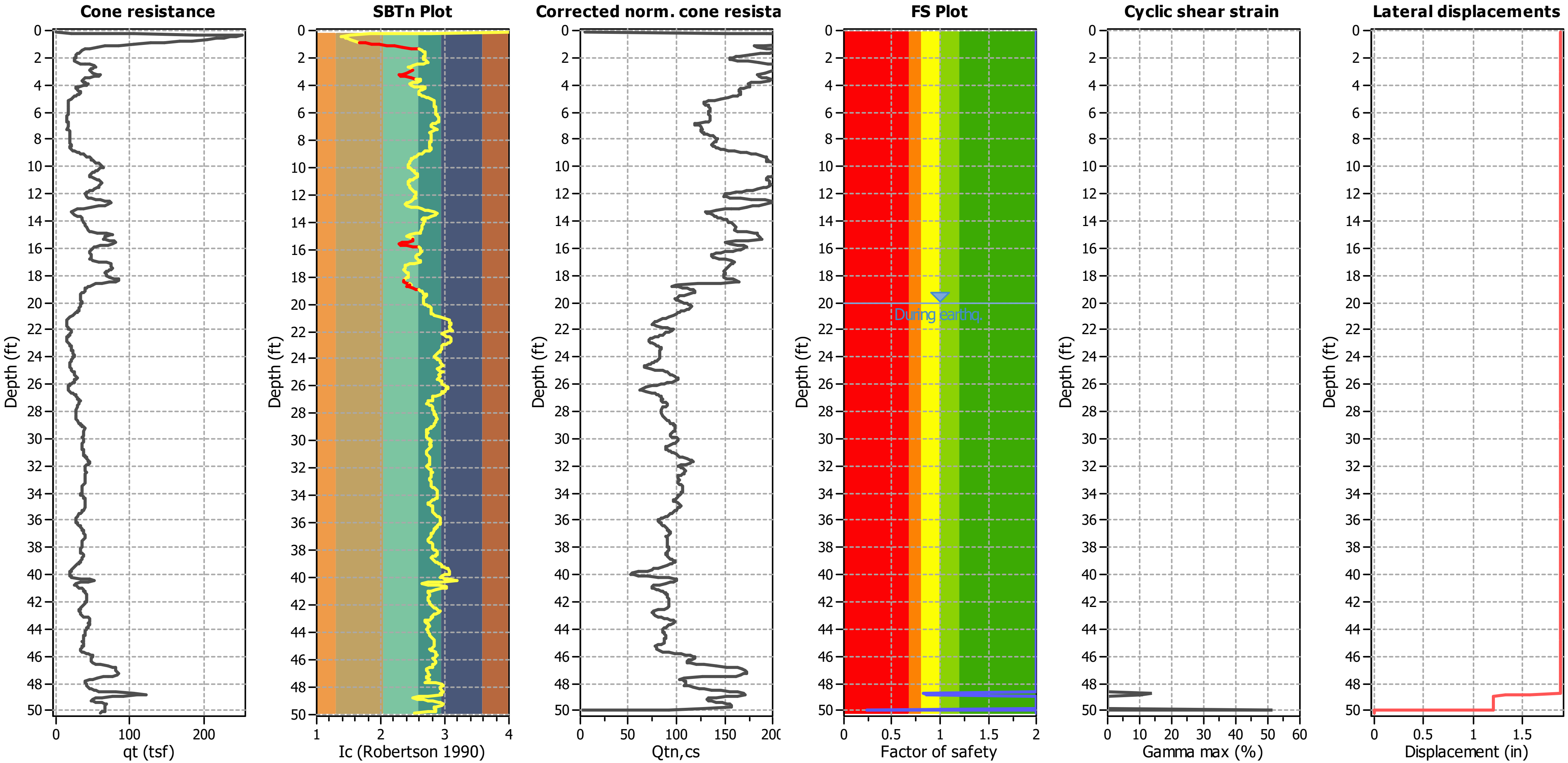


Abbreviations

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

Estimation of post-earthquake lateral Displacements

Geometric parameters: Level ground (or gently sloping) with free face (L: 70.00 ft - H: 20.00 ft)

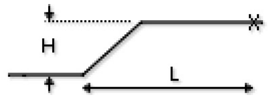


Abbreviations

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)
20.04	34.26	27.20	3.44	108.52	2.00	24.03	0.00	0.00
20.10	33.88	26.78	3.69	111.77	2.00	23.51	0.00	0.00
20.15	33.34	26.24	3.84	113.21	2.00	22.84	0.00	0.00
20.19	32.74	25.67	3.98	114.35	2.00	22.11	0.00	0.00
20.24	32.26	25.19	4.09	115.23	2.00	21.50	0.00	0.00
20.33	31.87	24.76	4.12	114.77	2.00	20.93	0.00	0.00
20.45	31.59	24.39	4.07	113.37	2.00	20.43	0.00	0.00
20.50	31.14	23.99	3.93	110.69	2.00	19.88	0.00	0.00
20.59	30.44	23.33	3.84	108.18	2.00	18.96	0.00	0.00
20.63	29.55	22.56	3.74	105.35	2.00	17.85	0.00	0.00
20.69	28.63	21.75	3.68	103.00	2.00	16.65	0.00	0.00
20.75	27.61	20.86	3.67	101.26	2.00	15.27	0.00	0.00
20.80	25.79	19.33	3.79	99.76	2.00	12.76	0.00	0.00
20.90	22.38	16.48	4.07	96.92	2.00	7.48	0.00	0.00
21.09	19.07	13.73	4.32	92.50	2.00	1.46	0.00	0.00
21.16	16.55	11.74	4.49	88.20	2.00	0.00	0.00	0.00
21.20	15.76	11.11	4.38	85.21	2.00	0.00	0.00	0.00
21.27	15.25	10.69	4.20	82.40	2.00	0.00	0.00	0.00
21.34	14.84	10.33	4.01	79.70	2.00	0.00	0.00	0.00
21.40	14.46	10.01	3.88	77.62	2.00	0.00	0.00	0.00
21.47	14.28	9.85	3.85	76.84	2.00	0.00	0.00	0.00
21.52	14.18	9.75	3.84	76.44	2.00	0.00	0.00	0.00
21.60	14.28	9.78	3.57	74.24	2.00	0.00	0.00	0.00
21.65	14.45	9.90	3.70	75.74	2.00	0.00	0.00	0.00
21.73	15.00	10.27	3.97	79.17	2.00	0.00	0.00	0.00
21.78	15.86	10.89	4.51	85.57	2.00	0.00	0.00	0.00
21.83	16.81	11.57	4.77	89.96	2.00	0.00	0.00	0.00
21.91	17.22	11.84	5.07	93.30	2.00	0.00	0.00	0.00
21.96	17.16	11.76	5.44	95.91	2.00	0.00	0.00	0.00
21.99	18.75	12.93	5.02	96.51	2.00	0.00	0.00	0.00
22.09	20.41	14.09	4.50	95.24	2.00	2.32	0.00	0.00
22.13	21.68	15.02	3.95	92.10	2.00	4.43	0.00	0.00
22.21	20.63	14.18	3.88	89.30	2.00	2.53	0.00	0.00
22.25	19.10	13.03	3.92	86.67	2.00	0.00	0.00	0.00
22.36	17.80	12.01	4.05	85.11	2.00	0.00	0.00	0.00
22.39	16.49	11.04	4.17	83.28	2.00	0.00	0.00	0.00
22.48	15.73	10.44	4.15	81.19	2.00	0.00	0.00	0.00
22.52	14.99	9.89	3.97	77.91	2.00	0.00	0.00	0.00
22.61	14.61	9.57	3.74	75.05	2.00	0.00	0.00	0.00
22.65	14.26	9.30	3.55	72.62	2.00	0.00	0.00	0.00
22.74	14.16	9.19	3.46	71.52	2.00	0.00	0.00	0.00
22.79	14.26	9.25	3.39	71.07	2.00	0.00	0.00	0.00
22.84	14.99	9.75	3.31	71.86	2.00	0.00	0.00	0.00
22.93	16.11	10.51	3.22	73.21	2.00	0.00	0.00	0.00
22.99	17.41	11.41	3.15	74.87	2.00	0.00	0.00	0.00
23.04	18.56	12.20	3.18	77.14	2.00	0.00	0.00	0.00
23.14	19.39	12.73	3.26	79.28	2.00	0.00	0.00	0.00
23.18	20.02	13.16	3.39	81.64	2.00	0.07	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)
23.27	20.25	13.27	3.48	82.87	2.00	0.34	0.00	0.00
23.31	20.50	13.42	3.52	83.63	2.00	0.71	0.00	0.00
23.37	20.95	13.72	3.43	83.42	2.00	1.45	0.00	0.00
23.47	21.55	14.12	3.31	82.97	2.00	2.39	0.00	0.00
23.53	22.06	14.47	3.21	82.62	2.00	3.20	0.00	0.00
23.57	22.51	14.78	3.16	82.71	2.00	3.88	0.00	0.00
23.67	22.98	15.07	3.10	82.60	2.00	4.54	0.00	0.00
23.71	23.81	15.67	3.00	82.47	2.00	5.82	0.00	0.00
23.80	24.36	16.01	2.94	82.39	2.00	6.54	0.00	0.00
23.85	24.52	16.09	2.95	82.71	2.00	6.70	0.00	0.00
23.93	24.17	15.77	3.03	83.14	2.00	6.03	0.00	0.00
23.97	23.56	15.29	3.13	83.33	2.00	5.01	0.00	0.00
24.06	22.95	14.80	3.19	83.08	2.00	3.94	0.00	0.00
24.11	22.28	14.30	3.24	82.63	2.00	2.80	0.00	0.00
24.15	21.62	13.80	3.24	81.48	2.00	1.64	0.00	0.00
24.27	20.95	13.30	3.20	79.86	2.00	0.40	0.00	0.00
24.33	20.25	12.79	3.12	77.86	2.00	0.00	0.00	0.00
24.37	19.58	12.31	3.05	76.05	2.00	0.00	0.00	0.00
24.43	18.97	11.88	3.01	74.56	2.00	0.00	0.00	0.00
24.50	18.49	11.53	3.00	73.67	2.00	0.00	0.00	0.00
24.55	18.24	11.35	2.81	71.25	2.00	0.00	0.00	0.00
24.62	18.46	11.52	2.57	68.92	2.00	0.00	0.00	0.00
24.68	19.00	11.94	2.28	66.47	2.00	0.00	0.00	0.00
24.74	19.64	12.38	2.29	67.38	2.00	0.00	0.00	0.00
24.81	20.22	12.70	2.69	72.84	2.00	0.00	0.00	0.00
24.95	20.28	12.64	3.16	78.01	2.00	0.00	0.00	0.00
24.95	20.21	12.59	3.66	83.01	2.00	0.00	0.00	0.00
25.00	21.55	13.47	3.68	85.52	2.00	0.84	0.00	0.00
25.09	23.30	14.66	3.68	88.36	2.00	3.62	0.00	0.00
25.14	24.99	15.84	3.69	91.23	2.00	6.18	0.00	0.00
25.20	25.14	15.90	3.80	92.64	2.00	6.30	0.00	0.00
25.27	25.17	15.88	3.95	94.21	2.00	6.26	0.00	0.00
25.35	25.87	16.34	3.96	95.48	2.00	7.20	0.00	0.00
25.40	27.13	17.20	4.01	97.95	2.00	8.90	0.00	0.00
25.49	28.34	18.02	4.02	99.92	2.00	10.43	0.00	0.00
25.54	28.15	17.83	4.20	101.71	2.00	10.09	0.00	0.00
25.66	27.10	17.01	4.43	102.26	2.00	8.53	0.00	0.00
25.67	25.89	16.16	4.57	101.61	2.00	6.83	0.00	0.00
25.75	25.25	15.71	4.40	98.72	2.00	5.90	0.00	0.00
25.83	24.61	15.26	4.16	95.02	2.00	4.95	0.00	0.00
25.86	23.18	14.30	3.99	90.88	2.00	2.81	0.00	0.00
25.97	21.36	13.07	3.98	87.54	2.00	0.00	0.00	0.00
26.02	19.49	11.82	3.92	83.45	2.00	0.00	0.00	0.00
26.06	18.21	10.97	3.72	79.22	2.00	0.00	0.00	0.00
26.12	17.29	10.35	3.39	74.45	2.00	0.00	0.00	0.00
26.20	16.62	9.89	2.91	68.75	2.00	0.00	0.00	0.00
26.36	16.33	9.67	2.54	64.50	2.00	0.00	0.00	0.00
26.40	16.33	9.66	2.29	61.88	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)
26.42	16.56	9.81	2.27	62.00	2.00	0.00	0.00	0.00
26.47	16.91	10.03	2.39	63.75	2.00	0.00	0.00	0.00
26.51	18.34	10.96	2.65	68.71	2.00	0.00	0.00	0.00
26.64	20.44	12.34	2.84	73.84	2.00	0.00	0.00	0.00
26.68	23.59	14.52	2.81	78.06	2.00	3.32	0.00	0.00
26.73	25.82	16.08	2.73	79.92	2.00	6.69	0.00	0.00
26.81	27.19	17.02	2.72	81.39	2.00	8.55	0.00	0.00
26.86	27.38	17.12	2.81	82.79	2.00	8.74	0.00	0.00
26.91	27.45	17.12	2.90	84.02	2.00	8.75	0.00	0.00
27.02	28.05	17.51	2.90	84.81	2.00	9.48	0.00	0.00
27.07	29.14	18.26	2.83	85.05	2.00	10.88	0.00	0.00
27.12	30.73	19.41	2.67	84.62	2.00	12.88	0.00	0.00
27.21	31.72	20.09	2.58	84.21	2.00	14.03	0.00	0.00
27.26	32.17	20.39	2.58	84.64	2.00	14.51	0.00	0.00
27.31	31.88	20.13	2.71	86.30	2.00	14.08	0.00	0.00
27.38	31.56	19.83	2.87	88.27	2.00	13.60	0.00	0.00
27.43	30.74	19.18	3.07	90.04	2.00	12.50	0.00	0.00
27.51	29.97	18.61	3.12	89.72	2.00	11.50	0.00	0.00
27.64	29.17	18.01	3.13	88.74	2.00	10.41	0.00	0.00
27.67	28.85	17.79	3.03	87.11	2.00	10.02	0.00	0.00
27.70	28.31	17.42	2.99	85.92	2.00	9.32	0.00	0.00
27.86	27.83	17.04	2.97	84.89	2.00	8.60	0.00	0.00
27.89	27.42	16.75	2.95	84.08	2.00	8.03	0.00	0.00
27.91	27.20	16.59	2.95	83.77	2.00	7.71	0.00	0.00
27.99	26.97	16.41	2.95	83.47	2.00	7.36	0.00	0.00
28.06	26.75	16.23	2.97	83.41	2.00	6.99	0.00	0.00
28.10	26.56	16.08	3.03	83.88	2.00	6.67	0.00	0.00
28.17	26.40	15.93	3.13	84.85	2.00	6.36	0.00	0.00
28.38	26.34	15.79	3.23	85.81	2.00	6.08	0.00	0.00
28.43	26.53	15.90	3.28	86.65	2.00	6.30	0.00	0.00
28.45	26.78	16.05	3.30	87.22	2.00	6.62	0.00	0.00
28.49	27.13	16.28	3.31	87.79	2.00	7.08	0.00	0.00
28.53	27.48	16.49	3.34	88.58	2.00	7.52	0.00	0.00
28.59	27.93	16.78	3.35	89.32	2.00	8.08	0.00	0.00
28.63	28.44	17.11	3.35	90.02	2.00	8.72	0.00	0.00
28.69	29.71	17.94	3.37	91.95	2.00	10.30	0.00	0.00
28.86	31.02	18.75	3.42	94.16	2.00	11.76	0.00	0.00
28.91	32.36	19.63	3.48	96.51	2.00	13.26	0.00	0.00
28.96	33.09	20.10	3.48	97.47	2.00	14.05	0.00	0.00
29.00	33.85	20.61	3.46	98.07	2.00	14.87	0.00	0.00
29.05	34.81	21.26	3.39	98.32	2.00	15.89	0.00	0.00
29.09	36.02	22.09	3.30	98.44	2.00	17.16	0.00	0.00
29.15	37.42	23.06	3.19	98.38	2.00	18.57	0.00	0.00
29.22	38.37	23.70	3.13	98.33	2.00	19.48	0.00	0.00
29.27	38.41	23.70	3.12	98.25	2.00	19.48	0.00	0.00
29.40	38.06	23.40	3.13	97.98	2.00	19.06	0.00	0.00
29.45	37.61	23.08	3.13	97.40	2.00	18.60	0.00	0.00
29.53	37.52	23.02	3.00	95.25	2.00	18.53	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)
29.71	36.91	22.54	2.97	94.12	2.00	17.83	0.00	0.00
29.80	36.43	22.17	2.99	93.88	2.00	17.28	0.00	0.00
29.87	36.05	21.83	3.15	95.79	2.00	16.77	0.00	0.00
29.92	36.10	21.81	3.25	97.24	2.00	16.73	0.00	0.00
29.94	36.07	21.73	3.40	99.26	2.00	16.62	0.00	0.00
30.01	36.42	21.91	3.49	100.92	2.00	16.89	0.00	0.00
30.05	37.07	22.32	3.51	101.93	2.00	17.50	0.00	0.00
30.14	37.71	22.73	3.45	101.75	2.00	18.10	0.00	0.00
30.19	37.52	22.60	3.39	100.66	2.00	17.92	0.00	0.00
30.27	36.69	22.01	3.37	99.35	2.00	17.05	0.00	0.00
30.34	35.57	21.24	3.37	97.98	2.00	15.87	0.00	0.00
30.41	34.75	20.67	3.33	96.42	2.00	14.97	0.00	0.00
30.45	34.53	20.55	3.18	94.07	2.00	14.78	0.00	0.00
30.52	34.72	20.73	2.96	91.11	2.00	15.06	0.00	0.00
30.58	35.01	20.96	2.78	88.85	2.00	15.42	0.00	0.00
30.66	35.29	21.13	2.75	88.56	2.00	15.69	0.00	0.00
30.76	35.77	21.40	2.78	89.50	2.00	16.11	0.00	0.00
30.80	36.37	21.76	2.85	91.09	2.00	16.67	0.00	0.00
30.90	36.91	22.07	2.88	92.10	2.00	17.13	0.00	0.00
30.94	37.30	22.29	2.94	93.26	2.00	17.46	0.00	0.00
31.03	37.52	22.38	3.02	94.63	2.00	17.58	0.00	0.00
31.07	37.65	22.39	3.17	97.06	2.00	17.60	0.00	0.00
31.15	37.71	22.34	3.33	99.28	2.00	17.53	0.00	0.00
31.19	38.25	22.66	3.40	100.86	2.00	18.00	0.00	0.00
31.27	38.89	23.04	3.41	101.68	2.00	18.55	0.00	0.00
31.31	39.72	23.55	3.46	103.37	2.00	19.27	0.00	0.00
31.38	40.67	24.09	3.64	106.94	2.00	20.02	0.00	0.00
31.51	41.75	24.68	3.81	110.57	2.00	20.82	0.00	0.00
31.55	42.90	25.37	3.95	113.84	2.00	21.72	0.00	0.00
31.60	43.41	25.65	4.05	115.72	2.00	22.09	0.00	0.00
31.65	44.02	26.01	4.07	116.72	2.00	22.56	0.00	0.00
31.73	44.65	26.41	4.00	116.37	2.00	23.06	0.00	0.00
31.78	45.51	27.02	3.82	114.65	2.00	23.80	0.00	0.00
31.89	44.30	26.27	3.56	109.37	2.00	22.87	0.00	0.00
31.94	42.27	24.95	3.42	104.97	2.00	21.18	0.00	0.00
31.99	39.94	23.42	3.38	101.89	2.00	19.08	0.00	0.00
32.04	39.31	22.93	3.52	103.17	2.00	18.39	0.00	0.00
32.09	39.18	22.79	3.62	104.38	2.00	18.19	0.00	0.00
32.19	39.40	22.86	3.73	106.06	2.00	18.29	0.00	0.00
32.26	39.37	22.77	3.84	107.51	2.00	18.15	0.00	0.00
32.30	39.30	22.68	3.94	108.72	2.00	18.02	0.00	0.00
32.35	40.29	23.32	3.86	108.81	2.00	18.94	0.00	0.00
32.44	40.61	23.49	3.83	108.68	2.00	19.19	0.00	0.00
32.50	40.42	23.35	3.81	108.15	2.00	18.99	0.00	0.00
32.57	39.48	22.70	3.85	107.50	2.00	18.06	0.00	0.00
32.61	39.13	22.47	3.79	106.22	2.00	17.73	0.00	0.00
32.68	39.64	22.83	3.62	104.45	2.00	18.25	0.00	0.00
32.75	39.52	22.77	3.48	102.34	2.00	18.16	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)
32.84	39.68	22.87	3.39	101.13	2.00	18.31	0.00	0.00
32.88	39.30	22.58	3.45	101.52	2.00	17.89	0.00	0.00
32.98	38.95	22.28	3.56	102.62	2.00	17.44	0.00	0.00
33.02	38.76	22.13	3.60	102.92	2.00	17.21	0.00	0.00
33.18	38.89	22.16	3.55	102.31	2.00	17.26	0.00	0.00
33.20	38.99	22.23	3.50	101.68	2.00	17.37	0.00	0.00
33.24	38.70	22.01	3.55	101.99	2.00	17.04	0.00	0.00
33.32	38.16	21.60	3.65	102.74	2.00	16.41	0.00	0.00
33.36	37.36	21.02	3.82	104.00	2.00	15.52	0.00	0.00
33.42	36.66	20.50	4.00	105.40	2.00	14.69	0.00	0.00
33.50	36.09	20.06	4.16	106.46	2.00	13.98	0.00	0.00
33.54	35.83	19.86	4.24	107.07	2.00	13.65	0.00	0.00
33.63	35.70	19.74	4.26	107.07	2.00	13.45	0.00	0.00
33.66	35.54	19.63	4.26	106.79	2.00	13.26	0.00	0.00
33.77	35.13	19.32	4.29	106.47	2.00	12.74	0.00	0.00
33.81	34.84	19.12	4.30	106.17	2.00	12.40	0.00	0.00
33.89	34.65	18.97	4.30	105.88	2.00	12.14	0.00	0.00
33.94	34.59	18.92	4.29	105.55	2.00	12.05	0.00	0.00
34.00	34.30	18.72	4.28	105.08	2.00	11.70	0.00	0.00
34.07	34.02	18.52	4.25	104.21	2.00	11.35	0.00	0.00
34.16	34.08	18.56	4.15	103.09	2.00	11.41	0.00	0.00
34.20	35.10	19.23	3.93	101.83	2.00	12.59	0.00	0.00
34.29	36.28	19.99	3.74	101.00	2.00	13.86	0.00	0.00
34.34	37.52	20.80	3.58	100.37	2.00	15.18	0.00	0.00
34.38	38.44	21.41	3.44	99.53	2.00	16.13	0.00	0.00
34.48	39.27	21.95	3.30	98.31	2.00	16.96	0.00	0.00
34.53	39.81	22.33	3.15	96.75	2.00	17.52	0.00	0.00
34.60	39.81	22.30	3.16	96.78	2.00	17.47	0.00	0.00
34.65	39.53	22.04	3.30	98.57	2.00	17.09	0.00	0.00
34.74	39.24	21.75	3.51	101.10	2.00	16.65	0.00	0.00
34.80	39.05	21.55	3.67	102.95	2.00	16.34	0.00	0.00
34.84	39.08	21.53	3.74	103.86	2.00	16.31	0.00	0.00
34.95	39.05	21.45	3.77	104.23	2.00	16.20	0.00	0.00
34.99	39.05	21.44	3.77	104.13	2.00	16.18	0.00	0.00
35.05	39.18	21.52	3.69	103.16	2.00	16.30	0.00	0.00
35.11	38.57	21.15	3.62	101.49	2.00	15.72	0.00	0.00
35.24	37.49	20.42	3.61	100.06	2.00	14.57	0.00	0.00
35.29	35.83	19.36	3.67	98.84	2.00	12.81	0.00	0.00
35.37	34.21	18.31	3.74	97.61	2.00	10.97	0.00	0.00
35.49	32.78	17.39	3.75	95.85	2.00	9.27	0.00	0.00
35.55	30.99	16.29	3.74	93.28	2.00	7.10	0.00	0.00
35.68	29.66	15.44	3.71	91.04	2.00	5.35	0.00	0.00
35.73	28.32	14.64	3.65	88.42	2.00	3.57	0.00	0.00
35.81	27.62	14.22	3.55	86.38	2.00	2.61	0.00	0.00
35.86	27.17	13.97	3.37	83.82	2.00	2.04	0.00	0.00
35.93	27.01	13.90	3.21	81.88	2.00	1.87	0.00	0.00
35.99	26.73	13.73	3.15	80.84	2.00	1.45	0.00	0.00
36.04	26.66	13.67	3.18	81.06	2.00	1.31	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)
36.09	26.79	13.71	3.23	81.73	2.00	1.42	0.00	0.00
36.14	27.43	14.10	3.21	82.31	2.00	2.33	0.00	0.00
36.18	28.64	14.83	3.17	83.37	2.00	4.00	0.00	0.00
36.30	29.88	15.55	3.14	84.53	2.00	5.58	0.00	0.00
36.35	31.15	16.32	3.12	85.80	2.00	7.16	0.00	0.00
36.40	31.85	16.73	3.13	86.71	2.00	7.98	0.00	0.00
36.44	32.52	17.11	3.15	87.80	2.00	8.74	0.00	0.00
36.53	33.19	17.48	3.19	88.90	2.00	9.44	0.00	0.00
36.57	34.31	18.15	3.20	90.33	2.00	10.67	0.00	0.00
36.70	35.23	18.67	3.19	91.22	2.00	11.60	0.00	0.00
36.75	35.96	19.10	3.18	91.84	2.00	12.36	0.00	0.00
36.78	36.31	19.31	3.16	91.90	2.00	12.72	0.00	0.00
36.83	36.63	19.49	3.16	92.17	2.00	13.02	0.00	0.00
36.88	37.27	19.86	3.17	92.96	2.00	13.64	0.00	0.00
37.01	37.87	20.17	3.19	93.81	2.00	14.16	0.00	0.00
37.06	38.38	20.52	3.05	92.38	2.00	14.72	0.00	0.00
37.14	38.51	20.62	2.92	90.66	2.00	14.89	0.00	0.00
37.19	38.57	20.69	2.81	89.09	2.00	15.00	0.00	0.00
37.26	38.67	20.71	2.86	89.78	2.00	15.02	0.00	0.00
37.32	38.73	20.71	2.88	90.23	2.00	15.03	0.00	0.00
37.38	38.22	20.36	2.94	90.46	2.00	14.46	0.00	0.00
37.45	36.76	19.38	3.07	90.84	2.00	12.84	0.00	0.00
37.49	35.64	18.65	3.19	91.11	2.00	11.57	0.00	0.00
37.56	35.23	18.36	3.23	91.19	2.00	11.06	0.00	0.00
37.61	35.80	18.71	3.18	91.10	2.00	11.68	0.00	0.00
37.67	36.02	18.84	3.13	90.68	2.00	11.91	0.00	0.00
37.78	36.12	18.87	3.10	90.30	2.00	11.97	0.00	0.00
37.83	36.03	18.81	3.09	90.01	2.00	11.85	0.00	0.00
37.87	35.77	18.63	3.13	90.26	2.00	11.53	0.00	0.00
37.95	35.14	18.18	3.24	90.94	2.00	10.72	0.00	0.00
38.00	34.28	17.60	3.39	91.81	2.00	9.65	0.00	0.00
38.13	33.48	17.04	3.52	92.35	2.00	8.59	0.00	0.00
38.18	32.97	16.72	3.53	91.80	2.00	7.97	0.00	0.00
38.30	32.87	16.64	3.49	91.12	2.00	7.81	0.00	0.00
38.35	33.13	16.80	3.40	90.36	2.00	8.13	0.00	0.00
38.40	33.95	17.31	3.29	89.96	2.00	9.11	0.00	0.00
38.47	35.64	18.37	3.09	89.25	2.00	11.06	0.00	0.00
38.53	36.88	19.13	2.98	89.12	2.00	12.41	0.00	0.00
38.58	37.36	19.40	2.99	89.71	2.00	12.86	0.00	0.00
38.65	36.63	18.88	3.14	90.98	2.00	11.97	0.00	0.00
38.71	36.03	18.44	3.28	92.04	2.00	11.21	0.00	0.00
38.76	35.58	18.13	3.38	92.78	2.00	10.63	0.00	0.00
38.84	35.26	17.88	3.48	93.57	2.00	10.18	0.00	0.00
38.89	34.75	17.51	3.66	95.12	2.00	9.49	0.00	0.00
38.94	34.08	17.02	3.92	97.16	2.00	8.56	0.00	0.00
39.02	33.32	16.50	4.13	98.28	2.00	7.52	0.00	0.00
39.07	32.49	15.98	4.23	98.19	2.00	6.47	0.00	0.00
39.13	31.92	15.64	4.19	96.90	2.00	5.77	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)
39.20	30.93	15.09	4.17	95.33	2.00	4.59	0.00	0.00
39.25	29.12	14.12	4.18	92.93	2.00	2.39	0.00	0.00
39.32	26.73	12.84	4.26	90.21	2.00	0.00	0.00	0.00
39.37	24.44	11.63	4.14	85.52	2.00	0.00	0.00	0.00
39.50	23.03	10.86	3.92	81.29	2.00	0.00	0.00	0.00
39.55	21.92	10.27	3.63	76.91	2.00	0.00	0.00	0.00
39.61	20.99	9.77	3.45	73.92	2.00	0.00	0.00	0.00
39.73	20.10	9.28	3.08	69.21	2.00	0.00	0.00	0.00
39.79	19.34	8.87	2.33	60.93	2.00	0.00	0.00	0.00
39.85	18.96	8.67	1.75	54.19	2.00	0.00	0.00	0.00
39.97	18.83	8.62	1.55	51.65	2.00	0.00	0.00	0.00
40.03	19.30	8.82	1.81	55.19	2.00	0.00	0.00	0.00
40.08	19.62	8.98	2.28	60.71	2.00	0.00	0.00	0.00
40.13	20.16	9.26	3.17	69.93	2.00	0.00	0.00	0.00
40.18	20.23	9.28	4.60	81.40	2.00	0.00	0.00	0.00
40.23	21.76	10.07	5.60	91.48	2.00	0.00	0.00	0.00
40.30	32.49	15.64	4.32	98.35	2.00	5.77	0.00	0.00
40.36	44.66	22.99	3.31	100.38	2.00	18.47	0.00	0.00
40.45	51.50	27.29	2.85	99.27	2.00	24.14	0.00	0.00
40.50	44.37	22.84	3.14	97.61	2.00	18.26	0.00	0.00
40.58	33.69	16.35	3.81	94.42	2.00	7.23	0.00	0.00
40.62	26.86	12.64	4.15	88.59	2.00	0.00	0.00	0.00
40.73	24.97	11.64	3.77	82.24	2.00	0.00	0.00	0.00
40.81	25.96	12.14	3.09	76.72	2.00	0.00	0.00	0.00
40.85	28.95	13.96	2.57	74.48	2.00	2.00	0.00	0.00
40.95	32.14	15.87	2.35	74.78	2.00	6.24	0.00	0.00
41.00	34.97	17.56	2.26	76.09	2.00	9.59	0.00	0.00
41.05	36.31	18.28	2.37	78.80	2.00	10.91	0.00	0.00
41.11	37.36	18.82	2.50	81.56	2.00	11.87	0.00	0.00
41.16	38.19	19.22	2.64	84.30	2.00	12.57	0.00	0.00
41.26	38.95	19.60	2.72	86.11	2.00	13.21	0.00	0.00
41.32	39.65	19.96	2.78	87.64	2.00	13.81	0.00	0.00
41.37	40.23	20.26	2.82	88.66	2.00	14.30	0.00	0.00
41.42	40.90	20.62	2.84	89.54	2.00	14.89	0.00	0.00
41.47	41.50	20.96	2.85	90.25	2.00	15.42	0.00	0.00
41.57	42.08	21.26	2.85	90.61	2.00	15.90	0.00	0.00
41.64	42.20	21.31	2.86	90.86	2.00	15.97	0.00	0.00
41.69	41.73	20.98	2.91	91.20	2.00	15.46	0.00	0.00
41.78	41.15	20.58	2.99	91.66	2.00	14.82	0.00	0.00
41.83	40.77	20.31	3.04	92.10	2.00	14.39	0.00	0.00
41.90	40.80	20.30	3.06	92.27	2.00	14.37	0.00	0.00
41.95	40.67	20.20	3.07	92.29	2.00	14.21	0.00	0.00
42.00	39.91	19.72	3.13	92.28	2.00	13.41	0.00	0.00
42.11	38.95	19.10	3.21	92.34	2.00	12.36	0.00	0.00
42.18	37.80	18.38	3.31	92.46	2.00	11.09	0.00	0.00
42.23	36.85	17.79	3.40	92.50	2.00	10.01	0.00	0.00
42.30	35.67	17.07	3.50	92.30	2.00	8.65	0.00	0.00
42.36	34.53	16.38	3.58	91.79	2.00	7.29	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)
42.43	33.51	15.78	3.62	91.01	2.00	6.05	0.00	0.00
42.49	32.71	15.32	3.63	90.00	2.00	5.07	0.00	0.00
42.54	32.27	15.13	3.37	86.60	2.00	4.68	0.00	0.00
42.62	31.95	15.07	2.95	81.38	2.00	4.55	0.00	0.00
42.68	31.98	15.22	2.56	76.68	2.00	4.87	0.00	0.00
42.75	32.20	15.38	2.43	75.22	2.00	5.21	0.00	0.00
42.80	32.90	15.77	2.43	75.80	2.00	6.04	0.00	0.00
42.88	33.63	16.18	2.39	75.96	2.00	6.89	0.00	0.00
42.93	32.58	15.52	2.50	76.43	2.00	5.51	0.00	0.00
43.01	34.46	16.58	2.49	78.06	2.00	7.68	0.00	0.00
43.07	37.52	18.32	2.47	80.42	2.00	10.99	0.00	0.00
43.12	42.59	21.28	2.40	83.52	2.00	15.92	0.00	0.00
43.20	44.66	22.40	2.50	86.70	2.00	17.61	0.00	0.00
43.24	45.64	22.83	2.71	90.77	2.00	18.24	0.00	0.00
43.33	46.12	22.96	2.90	94.14	2.00	18.43	0.00	0.00
43.37	45.74	22.60	3.12	96.98	2.00	17.91	0.00	0.00
43.51	45.04	22.09	3.23	97.88	2.00	17.16	0.00	0.00
43.54	44.53	21.78	3.25	97.58	2.00	16.70	0.00	0.00
43.59	44.82	21.99	3.12	96.07	2.00	17.01	0.00	0.00
43.66	44.97	22.13	2.98	94.12	2.00	17.22	0.00	0.00
43.73	44.75	22.04	2.86	92.09	2.00	17.09	0.00	0.00
43.78	43.86	21.56	2.78	90.13	2.00	16.35	0.00	0.00
43.86	42.97	21.06	2.72	88.42	2.00	15.58	0.00	0.00
43.91	41.98	20.51	2.67	86.80	2.00	14.70	0.00	0.00
43.99	41.25	20.06	2.66	85.95	2.00	13.98	0.00	0.00
44.04	40.61	19.68	2.67	85.63	2.00	13.34	0.00	0.00
44.12	40.39	19.51	2.71	85.95	2.00	13.05	0.00	0.00
44.21	40.29	19.41	2.74	86.27	2.00	12.89	0.00	0.00
44.25	40.13	19.28	2.79	86.75	2.00	12.67	0.00	0.00
44.32	39.56	18.89	2.89	87.58	2.00	11.99	0.00	0.00
44.46	38.83	18.38	3.02	88.55	2.00	11.08	0.00	0.00
44.52	38.19	17.95	3.14	89.41	2.00	10.32	0.00	0.00
44.56	37.84	17.73	3.18	89.48	2.00	9.90	0.00	0.00
44.61	37.62	17.60	3.17	89.11	2.00	9.65	0.00	0.00
44.65	37.27	17.40	3.14	88.38	2.00	9.28	0.00	0.00
44.70	36.70	17.08	3.11	87.42	2.00	8.68	0.00	0.00
44.88	36.50	16.93	3.09	86.90	2.00	8.38	0.00	0.00
44.92	36.25	16.77	3.11	86.78	2.00	8.07	0.00	0.00
45.01	36.50	16.89	3.11	87.10	2.00	8.30	0.00	0.00
45.05	36.63	16.95	3.11	87.15	2.00	8.41	0.00	0.00
45.09	36.98	17.25	2.83	83.91	2.00	8.99	0.00	0.00
45.19	36.88	17.28	2.59	80.60	2.00	9.05	0.00	0.00
45.23	36.51	17.15	2.40	77.64	2.00	8.80	0.00	0.00
45.28	35.74	16.65	2.51	78.51	2.00	7.83	0.00	0.00
45.36	34.60	15.94	2.65	79.14	2.00	6.38	0.00	0.00
45.49	33.56	15.29	2.74	79.29	2.00	5.02	0.00	0.00
45.51	32.89	14.90	2.82	79.51	2.00	4.15	0.00	0.00
45.55	33.75	15.29	2.99	82.47	2.00	5.01	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)
45.68	35.01	15.87	3.17	85.84	2.00	6.25	0.00	0.00
45.70	37.46	17.09	3.43	91.60	2.00	8.70	0.00	0.00
45.77	40.78	18.77	3.68	98.17	2.00	11.79	0.00	0.00
45.86	44.37	20.60	3.91	104.78	2.00	14.86	0.00	0.00
45.89	47.72	22.35	4.04	110.02	2.00	17.55	0.00	0.00
45.95	49.63	23.31	4.19	113.86	2.00	18.93	0.00	0.00
46.03	50.01	23.38	4.44	117.42	2.00	19.03	0.00	0.00
46.07	49.47	22.97	4.68	119.72	2.00	18.44	0.00	0.00
46.15	48.61	22.47	4.69	118.84	2.00	17.72	0.00	0.00
46.22	48.07	22.22	4.52	116.08	2.00	17.35	0.00	0.00
46.30	48.12	22.32	4.26	112.91	2.00	17.50	0.00	0.00
46.35	48.28	22.48	4.06	110.48	2.00	17.73	0.00	0.00
46.43	48.92	22.81	4.02	110.61	2.00	18.21	0.00	0.00
46.50	49.63	23.07	4.25	114.21	2.00	18.59	0.00	0.00
46.56	53.61	25.09	4.47	121.36	2.00	21.36	0.00	0.00
46.61	60.23	28.62	4.55	129.24	2.00	25.71	0.00	0.00
46.66	70.14	33.95	4.68	140.84	2.00	31.34	0.00	0.00
46.78	77.18	37.54	5.00	152.38	2.00	34.66	0.00	0.00
46.87	80.43	38.95	5.49	163.31	2.00	35.88	0.00	0.00
46.96	81.05	39.02	5.82	168.89	2.00	35.94	0.00	0.00
47.09	80.39	38.44	6.05	171.53	2.00	35.44	0.00	0.00
47.14	81.82	39.19	6.03	172.77	2.00	36.08	0.00	0.00
47.18	83.01	39.84	5.96	172.93	2.00	36.63	0.00	0.00
47.26	85.56	41.29	5.77	172.49	2.00	37.80	0.00	0.00
47.31	85.78	41.46	5.64	170.53	2.00	37.94	0.00	0.00
47.37	82.72	39.77	5.62	167.05	2.00	36.57	0.00	0.00
47.44	76.99	36.59	5.67	161.87	2.00	33.82	0.00	0.00
47.50	70.14	33.19	5.12	146.62	2.00	30.60	0.00	0.00
47.54	63.19	29.93	4.24	126.66	2.00	27.18	0.00	0.00
47.62	56.38	26.73	3.35	107.16	2.00	23.45	0.00	0.00
47.67	50.04	23.21	3.42	102.58	2.00	18.80	0.00	0.00
47.71	44.57	19.94	4.11	106.01	2.00	13.78	0.00	0.00
47.80	40.01	17.31	4.83	108.22	2.00	9.10	0.00	0.00
47.85	39.09	16.86	5.06	109.46	2.00	8.25	0.00	0.00
47.92	39.83	17.19	4.97	109.40	2.00	8.87	0.00	0.00
48.01	41.67	18.11	4.73	109.18	2.00	10.59	0.00	0.00
48.04	41.80	18.16	4.74	109.40	2.00	10.69	0.00	0.00
48.12	41.77	18.14	4.66	108.53	2.00	10.65	0.00	0.00
48.18	41.83	18.04	5.01	112.12	2.00	10.48	0.00	0.00
48.31	42.95	18.52	5.39	117.50	2.00	11.34	0.00	0.00
48.36	45.08	19.49	5.81	124.57	2.00	13.03	0.00	0.00
48.40	48.23	20.98	5.85	128.98	2.00	15.45	0.00	0.00
48.45	51.74	22.63	6.16	136.97	2.00	17.96	0.00	0.00
48.54	54.60	23.91	6.62	145.59	2.00	19.77	0.00	0.00
48.58	57.60	25.23	7.14	155.21	2.00	21.55	0.00	0.00
48.63	81.29	38.24	5.59	163.68	2.00	35.28	0.00	0.00
48.72	105.78	52.30	4.66	169.11	0.83	45.61	13.77	0.31
48.80	121.51	61.56	4.23	171.92	0.87	50.99	10.51	0.24

:: 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)
48.85	110.15	54.67	4.61	171.40	0.86	47.07	11.02	0.13
48.90	91.20	43.76	5.06	164.10	2.00	39.72	0.00	0.00
48.98	76.23	35.56	5.22	152.65	2.00	32.87	0.00	0.00
49.03	62.91	28.45	5.34	140.48	2.00	25.52	0.00	0.00
49.11	53.58	23.45	5.71	133.90	2.00	19.14	0.00	0.00
49.18	50.25	21.66	5.92	131.63	2.00	16.51	0.00	0.00
49.23	47.45	20.28	6.37	132.64	2.00	14.34	0.00	0.00
49.29	50.15	21.50	6.42	136.65	2.00	16.26	0.00	0.00
49.38	53.10	22.82	6.51	141.44	2.00	18.24	0.00	0.00
49.42	62.60	27.81	6.00	148.01	2.00	24.75	0.00	0.00
49.51	66.99	30.06	5.91	151.84	2.00	27.33	0.00	0.00
49.56	68.33	30.65	6.06	155.34	2.00	27.97	0.00	0.00
49.62	66.70	29.67	6.31	156.46	2.00	26.90	0.00	0.00
49.71	66.99	29.78	6.30	156.59	2.00	27.02	0.00	0.00
49.76	67.15	29.83	6.30	156.68	2.00	27.07	0.00	0.00
49.82	66.39	30.50	4.26	128.03	2.00	27.81	0.00	0.00
49.90	65.75	31.99	2.17	91.76	0.24	29.38	51.20	1.20
49.96	65.47	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.04	65.47	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.09	63.04	N/A	0.00	-1.00	2.00	0.00	0.00	0.00
50.18	60.69	N/A	0.00	-1.00	2.00	0.00	0.00	0.00

Total estimated displacement: 1.89

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

:: Strength loss calculation (Robertson (2009) ::

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
0.10	0.13	0.20	26.61	5.37	4.06	N/A	N/A
0.16	20.23	32.49	4.69	152.43	2.79	N/A	N/A
0.23	105.91	170.13	1.14	193.21	1.84	N/A	N/A
0.28	190.70	306.36	1.00	306.36	1.52	N/A	N/A
0.38	252.07	404.95	1.00	404.95	1.37	N/A	N/A
0.41	243.44	391.08	1.00	391.08	1.41	N/A	N/A
0.47	234.55	376.79	1.00	376.79	1.44	N/A	N/A
0.55	226.39	363.68	1.00	363.68	1.46	N/A	N/A
0.60	216.62	347.97	1.00	347.97	1.49	N/A	N/A
0.69	203.56	326.97	1.00	326.97	1.53	N/A	N/A
0.74	184.96	297.09	1.00	297.09	1.59	N/A	N/A
0.83	167.18	268.52	1.02	272.93	1.67	N/A	N/A
0.88	146.83	235.82	1.08	255.01	1.76	N/A	N/A
0.94	128.77	206.80	1.15	238.04	1.86	N/A	N/A
0.99	104.88	168.41	1.27	213.10	1.97	N/A	N/A
1.08	84.15	135.09	1.43	192.82	2.08	N/A	N/A
1.16	66.15	106.17	1.70	180.52	2.21	N/A	N/A
1.21	55.67	89.33	2.06	184.14	2.33	N/A	N/A
1.34	45.67	73.25	2.65	194.08	2.48	N/A	N/A
1.36	38.86	62.30	3.25	202.28	2.59	N/A	N/A
1.48	34.98	56.05	3.65	204.54	2.65	N/A	N/A
1.52	34.02	54.51	3.74	203.65	2.66	N/A	N/A
1.57	32.59	52.20	3.86	201.39	2.68	N/A	N/A
1.62	31.34	50.20	3.93	197.24	2.69	N/A	N/A
1.67	29.50	47.22	3.96	187.09	2.70	N/A	N/A
1.82	27.90	44.64	3.95	176.24	2.69	N/A	N/A
1.87	26.69	42.69	3.88	165.71	2.68	N/A	N/A
1.92	26.34	42.12	3.83	161.42	2.68	N/A	N/A
1.98	26.08	41.71	3.79	158.05	2.67	N/A	N/A
2.04	25.64	40.99	3.81	156.08	2.67	N/A	N/A
2.09	25.33	40.49	3.84	155.44	2.68	N/A	N/A
2.14	25.09	40.10	3.92	157.01	2.69	N/A	N/A
2.18	25.06	40.05	4.08	163.40	2.71	N/A	N/A
2.29	25.81	41.24	4.23	174.24	2.73	N/A	N/A
2.35	28.15	44.99	4.13	185.88	2.72	N/A	N/A
2.40	32.93	52.66	3.69	194.48	2.66	N/A	N/A
2.45	39.17	62.69	3.22	201.68	2.58	N/A	N/A
2.50	46.43	74.35	2.79	207.59	2.50	N/A	N/A
2.62	51.59	82.62	2.57	211.98	2.46	N/A	N/A
2.67	53.91	86.35	2.47	213.63	2.44	N/A	N/A
2.72	52.54	84.14	2.55	214.55	2.45	N/A	N/A
2.78	49.74	79.63	2.69	214.27	2.48	N/A	N/A
2.84	47.49	76.02	2.79	211.99	2.50	N/A	N/A
2.89	46.28	74.07	2.72	201.79	2.49	N/A	N/A
3.13	50.48	80.80	2.38	191.94	2.42	N/A	N/A
3.20	55.98	89.62	2.06	184.78	2.33	N/A	N/A
3.25	60.13	96.28	1.93	185.49	2.29	N/A	N/A
3.32	57.74	92.44	2.00	185.24	2.32	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
3.38	51.76	82.82	2.24	185.49	2.38	N/A	N/A
3.46	44.97	71.91	2.62	188.18	2.47	N/A	N/A
3.51	39.46	63.05	3.07	193.29	2.56	N/A	N/A
3.57	36.31	57.98	3.43	198.70	2.62	N/A	N/A
3.64	35.92	57.35	3.43	197.00	2.62	N/A	N/A
3.77	37.33	59.59	3.15	187.64	2.57	N/A	N/A
3.82	39.72	63.43	2.81	178.23	2.51	N/A	N/A
3.89	42.17	67.36	2.59	174.31	2.46	N/A	N/A
3.95	43.22	69.04	2.56	176.61	2.46	N/A	N/A
4.02	41.95	66.99	2.63	176.19	2.47	N/A	N/A
4.08	37.52	59.87	2.93	175.60	2.53	N/A	N/A
4.12	30.87	49.19	3.58	175.88	2.64	N/A	N/A
4.15	27.78	44.22	3.94	174.07	2.69	N/A	N/A
4.23	27.21	43.29	3.94	170.40	2.69	N/A	N/A
4.29	29.43	46.86	3.54	165.89	2.63	N/A	N/A
4.37	30.07	47.88	3.45	165.14	2.62	N/A	N/A
4.43	31.06	49.46	3.35	165.69	2.60	N/A	N/A
4.46	32.30	51.45	3.23	166.39	2.58	N/A	N/A
4.55	32.42	51.64	3.23	166.77	2.58	N/A	N/A
4.65	31.78	50.60	3.30	166.99	2.60	N/A	N/A
4.69	30.49	48.53	3.42	166.20	2.62	N/A	N/A
4.73	28.70	45.65	3.61	164.89	2.64	N/A	N/A
4.82	26.95	42.82	3.81	162.98	2.67	N/A	N/A
4.86	24.94	39.59	4.01	158.95	2.70	N/A	N/A
4.93	22.75	36.07	4.27	154.11	2.74	N/A	N/A
4.99	19.92	31.51	4.63	145.90	2.78	N/A	N/A
5.13	17.63	27.82	5.00	139.22	2.83	N/A	N/A
5.17	16.45	25.92	5.12	132.78	2.84	N/A	N/A
5.22	16.26	25.61	5.08	130.19	2.83	N/A	N/A
5.26	16.24	25.56	5.03	128.53	2.83	N/A	N/A
5.42	16.27	25.60	5.03	128.71	2.83	N/A	N/A
5.45	16.27	25.60	5.08	130.03	2.83	N/A	N/A
5.52	16.21	25.49	5.15	131.18	2.84	N/A	N/A
5.53	16.08	25.29	5.24	132.60	2.85	N/A	N/A
5.63	16.04	25.22	5.30	133.56	2.86	N/A	N/A
5.66	16.01	25.17	5.35	134.62	2.86	N/A	N/A
5.71	16.10	25.31	5.33	134.99	2.86	N/A	N/A
5.81	16.14	25.36	5.32	135.01	2.86	N/A	N/A
5.89	16.17	25.40	5.29	134.50	2.86	N/A	N/A
5.95	16.08	25.25	5.31	133.94	2.86	N/A	N/A
6.05	15.98	25.08	5.33	133.56	2.86	N/A	N/A
6.10	15.89	24.92	5.36	133.58	2.86	N/A	N/A
6.14	15.69	24.61	5.44	133.79	2.87	N/A	N/A
6.26	15.47	24.24	5.54	134.22	2.88	N/A	N/A
6.32	15.21	23.83	5.65	134.50	2.89	N/A	N/A
6.36	15.06	23.57	5.71	134.56	2.90	N/A	N/A
6.41	14.96	23.41	5.75	134.70	2.91	N/A	N/A
6.45	14.93	23.36	5.77	134.74	2.91	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
6.56	15.06	23.55	5.72	134.82	2.90	N/A	N/A
6.63	15.28	23.90	5.65	135.01	2.90	N/A	N/A
6.68	15.56	24.35	5.48	133.36	2.88	N/A	N/A
6.76	15.79	24.71	5.24	129.48	2.85	N/A	N/A
6.80	15.98	25.01	4.90	122.51	2.81	N/A	N/A
6.88	16.17	25.31	4.73	119.60	2.79	N/A	N/A
6.94	16.40	25.66	4.66	119.72	2.79	N/A	N/A
6.98	16.62	26.02	4.73	123.18	2.79	N/A	N/A
7.07	15.95	24.94	5.02	125.18	2.83	N/A	N/A
7.22	14.99	23.39	5.42	126.65	2.87	N/A	N/A
7.23	15.31	23.89	5.30	126.53	2.86	N/A	N/A
7.30	16.42	25.67	4.91	126.17	2.82	N/A	N/A
7.43	17.76	27.81	4.53	125.89	2.77	N/A	N/A
7.47	17.79	27.86	4.56	126.95	2.77	N/A	N/A
7.52	17.86	27.96	4.58	127.97	2.78	N/A	N/A
7.57	17.98	28.16	4.59	129.28	2.78	N/A	N/A
7.63	18.17	28.46	4.62	131.61	2.78	N/A	N/A
7.71	18.43	28.86	4.66	134.48	2.79	N/A	N/A
7.77	18.69	29.27	4.70	137.44	2.79	N/A	N/A
7.82	18.95	29.68	4.71	139.74	2.79	N/A	N/A
7.91	19.17	30.03	4.70	141.18	2.79	N/A	N/A
7.96	19.33	30.28	4.69	142.17	2.79	N/A	N/A
8.05	19.39	30.37	4.67	141.86	2.79	N/A	N/A
8.11	19.39	30.37	4.64	140.98	2.78	N/A	N/A
8.18	19.46	30.46	4.56	138.94	2.77	N/A	N/A
8.26	19.68	30.82	4.46	137.52	2.76	N/A	N/A
8.41	19.87	31.11	4.40	136.96	2.75	N/A	N/A
8.45	19.90	31.15	4.43	138.02	2.76	N/A	N/A
8.52	19.64	30.73	4.54	139.50	2.77	N/A	N/A
8.58	19.42	30.37	4.65	141.19	2.78	N/A	N/A
8.62	19.45	30.42	4.70	142.98	2.79	N/A	N/A
8.68	20.03	31.33	4.66	145.94	2.78	N/A	N/A
8.75	21.33	33.43	4.49	149.96	2.76	N/A	N/A
8.80	23.31	36.59	4.22	154.59	2.73	N/A	N/A
8.84	25.70	40.43	3.96	160.28	2.70	N/A	N/A
8.92	28.28	44.57	3.74	166.86	2.66	N/A	N/A
8.97	30.95	48.86	3.53	172.64	2.63	N/A	N/A
9.03	33.63	53.15	3.33	177.16	2.60	N/A	N/A
9.10	36.78	58.21	3.13	181.97	2.57	N/A	N/A
9.21	39.55	62.65	2.99	187.45	2.54	N/A	N/A
9.28	42.39	67.20	2.85	191.74	2.52	N/A	N/A
9.32	44.68	70.30	2.75	193.55	2.50	N/A	N/A
9.40	46.79	72.82	2.67	194.38	2.48	N/A	N/A
9.46	48.47	74.86	2.60	194.99	2.47	N/A	N/A
9.53	49.65	76.02	2.55	194.11	2.46	N/A	N/A
9.59	51.02	77.49	2.50	193.70	2.44	N/A	N/A
9.65	52.52	79.35	2.49	197.45	2.44	N/A	N/A
9.72	54.49	81.85	2.49	203.60	2.44	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
9.78	57.23	85.52	2.48	211.99	2.44	N/A	N/A
9.85	59.56	88.53	2.48	219.54	2.44	N/A	N/A
9.91	62.08	91.68	2.46	225.31	2.43	N/A	N/A
9.99	63.04	92.57	2.47	228.55	2.44	N/A	N/A
10.04	63.20	92.41	2.49	229.74	2.44	N/A	N/A
10.12	60.90	88.90	2.60	231.03	2.47	N/A	N/A
10.19	57.94	84.50	2.73	230.80	2.49	N/A	N/A
10.25	55.23	80.40	2.83	227.85	2.51	N/A	N/A
10.34	53.92	77.98	2.86	223.15	2.52	N/A	N/A
10.38	52.30	75.45	2.91	219.40	2.53	N/A	N/A
10.45	50.29	72.31	3.00	216.61	2.54	N/A	N/A
10.52	47.61	68.28	3.11	212.35	2.56	N/A	N/A
10.61	45.96	65.50	3.16	207.24	2.57	N/A	N/A
10.65	45.13	64.03	3.15	201.82	2.57	N/A	N/A
10.70	45.25	63.87	3.10	198.31	2.56	N/A	N/A
10.79	47.64	66.38	2.94	194.91	2.53	N/A	N/A
10.91	51.24	70.33	2.75	193.10	2.50	N/A	N/A
10.96	55.35	75.27	2.57	193.21	2.46	N/A	N/A
11.00	57.67	77.96	2.50	194.74	2.44	N/A	N/A
11.06	59.71	80.26	2.44	196.23	2.43	N/A	N/A
11.13	61.01	81.45	2.42	196.78	2.42	N/A	N/A
11.19	61.24	81.45	2.42	197.25	2.43	N/A	N/A
11.26	60.44	80.05	2.47	197.60	2.44	N/A	N/A
11.31	59.23	78.30	2.53	198.25	2.45	N/A	N/A
11.44	58.59	76.79	2.56	196.90	2.46	N/A	N/A
11.50	57.38	74.90	2.59	194.04	2.46	N/A	N/A
11.58	55.50	72.12	2.63	189.94	2.47	N/A	N/A
11.63	52.60	68.19	2.71	184.59	2.49	N/A	N/A
11.71	49.15	63.53	2.83	179.59	2.51	N/A	N/A
11.76	46.13	59.46	2.91	172.90	2.53	N/A	N/A
11.84	43.80	56.18	2.98	167.68	2.54	N/A	N/A
11.89	41.95	53.62	3.01	161.33	2.55	N/A	N/A
11.96	41.30	52.44	2.97	155.76	2.54	N/A	N/A
12.02	40.16	50.76	2.98	151.20	2.54	N/A	N/A
12.15	40.63	50.85	2.94	149.58	2.53	N/A	N/A
12.22	40.56	50.60	3.00	151.92	2.54	N/A	N/A
12.29	43.84	54.31	2.86	155.58	2.52	N/A	N/A
12.33	47.76	58.99	2.81	165.96	2.51	N/A	N/A
12.41	53.65	65.84	2.71	178.57	2.49	N/A	N/A
12.46	59.80	73.08	2.63	192.15	2.47	N/A	N/A
12.53	66.65	80.83	2.46	199.17	2.44	N/A	N/A
12.59	71.91	86.56	2.33	201.93	2.40	N/A	N/A
12.64	74.52	89.23	2.25	200.92	2.38	N/A	N/A
12.69	73.72	87.96	2.25	198.06	2.38	N/A	N/A
12.74	71.21	84.71	2.27	192.35	2.39	N/A	N/A
12.84	66.81	79.11	2.36	186.43	2.41	N/A	N/A
12.88	57.67	68.45	2.62	179.45	2.47	N/A	N/A
12.96	46.97	55.80	3.09	172.65	2.56	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
13.05	37.73	44.83	3.67	164.48	2.65	N/A	N/A
13.10	33.53	39.76	3.94	156.59	2.69	N/A	N/A
13.14	29.04	34.39	4.36	150.12	2.75	N/A	N/A
13.23	24.23	28.57	4.97	142.04	2.82	N/A	N/A
13.32	21.09	24.72	5.45	134.63	2.87	N/A	N/A
13.35	20.90	24.40	5.37	130.92	2.87	N/A	N/A
13.40	21.83	25.40	5.21	132.21	2.85	N/A	N/A
13.49	21.97	25.43	5.32	135.38	2.86	N/A	N/A
13.53	25.38	29.26	4.73	138.39	2.79	N/A	N/A
13.67	29.20	33.29	4.20	139.92	2.73	N/A	N/A
13.71	33.66	38.17	3.70	141.18	2.66	N/A	N/A
13.76	34.84	39.38	3.64	143.27	2.65	N/A	N/A
13.81	34.97	39.43	3.71	146.26	2.66	N/A	N/A
13.86	34.46	38.80	3.86	149.71	2.68	N/A	N/A
13.93	34.94	39.19	3.90	152.78	2.69	N/A	N/A
14.06	36.34	40.41	3.83	154.62	2.68	N/A	N/A
14.11	38.31	42.45	3.69	156.82	2.66	N/A	N/A
14.24	39.49	43.39	3.66	158.70	2.65	N/A	N/A
14.35	40.07	43.73	3.67	160.64	2.65	N/A	N/A
14.42	41.28	44.85	3.60	161.28	2.64	N/A	N/A
14.66	42.71	45.70	3.52	160.84	2.63	N/A	N/A
14.73	44.75	47.69	3.44	164.06	2.62	N/A	N/A
14.79	46.95	49.91	3.48	173.79	2.62	N/A	N/A
14.86	56.06	59.26	3.05	180.63	2.55	N/A	N/A
14.91	68.76	72.31	2.55	184.10	2.45	N/A	N/A
14.99	76.40	79.85	2.30	184.04	2.40	N/A	N/A
15.05	74.81	77.97	2.37	184.52	2.41	N/A	N/A
15.12	67.77	70.46	2.64	186.00	2.47	N/A	N/A
15.17	66.02	68.48	2.72	186.41	2.49	N/A	N/A
15.23	65.38	67.61	2.77	187.22	2.50	N/A	N/A
15.30	64.62	66.56	2.82	187.98	2.51	N/A	N/A
15.36	66.02	67.77	2.79	189.38	2.51	N/A	N/A
15.43	71.56	72.98	2.40	174.85	2.42	N/A	N/A
15.49	77.74	78.81	2.05	161.40	2.33	N/A	N/A
15.61	79.81	80.29	1.87	150.15	2.27	N/A	N/A
15.67	77.42	77.75	2.01	155.96	2.32	N/A	N/A
15.75	69.43	69.57	2.36	163.84	2.41	N/A	N/A
15.84	60.81	60.70	2.80	169.98	2.51	N/A	N/A
15.85	52.85	52.74	3.29	173.52	2.59	N/A	N/A
15.88	51.10	50.89	3.38	171.79	2.61	N/A	N/A
16.00	49.55	49.01	3.45	169.12	2.62	N/A	N/A
16.10	48.26	47.43	3.51	166.32	2.63	N/A	N/A
16.15	46.67	45.72	3.57	163.35	2.64	N/A	N/A
16.20	46.19	45.11	3.51	158.19	2.63	N/A	N/A
16.25	45.75	44.52	3.39	151.12	2.61	N/A	N/A
16.32	46.16	44.73	3.25	145.38	2.59	N/A	N/A
16.37	46.57	45.01	3.14	141.21	2.57	N/A	N/A
16.44	47.50	45.74	3.03	138.81	2.55	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
16.50	47.78	45.85	2.99	137.04	2.54	N/A	N/A
16.55	47.62	45.59	2.99	136.48	2.54	N/A	N/A
16.64	46.95	44.72	3.07	137.49	2.56	N/A	N/A
16.69	46.97	44.62	3.11	138.98	2.56	N/A	N/A
16.77	46.17	43.69	3.29	143.90	2.59	N/A	N/A
16.81	46.62	44.03	3.43	151.04	2.62	N/A	N/A
16.92	49.76	46.78	3.37	157.74	2.61	N/A	N/A
16.99	58.07	54.53	2.94	160.22	2.53	N/A	N/A
17.03	68.29	64.13	2.49	159.49	2.44	N/A	N/A
17.12	73.93	69.20	2.29	158.64	2.40	N/A	N/A
17.16	75.18	70.24	2.24	157.62	2.38	N/A	N/A
17.22	73.92	68.86	2.27	156.05	2.39	N/A	N/A
17.38	74.91	69.26	2.22	153.84	2.38	N/A	N/A
17.43	75.89	70.02	2.19	153.02	2.37	N/A	N/A
17.49	76.04	69.97	2.18	152.53	2.37	N/A	N/A
17.56	74.41	68.22	2.21	151.10	2.38	N/A	N/A
17.61	72.25	66.05	2.27	150.15	2.39	N/A	N/A
17.68	69.67	63.44	2.35	149.29	2.41	N/A	N/A
17.74	68.10	61.80	2.43	149.87	2.43	N/A	N/A
17.78	67.11	60.74	2.47	150.07	2.44	N/A	N/A
17.86	67.65	61.01	2.46	150.08	2.43	N/A	N/A
17.91	67.89	61.09	2.46	150.10	2.43	N/A	N/A
17.97	68.46	61.46	2.44	149.71	2.43	N/A	N/A
18.05	68.59	61.35	2.43	149.04	2.43	N/A	N/A
18.09	73.02	65.28	2.30	149.84	2.40	N/A	N/A
18.22	78.27	69.68	2.18	152.00	2.37	N/A	N/A
18.27	84.01	74.72	2.12	158.10	2.35	N/A	N/A
18.40	84.55	74.76	2.17	162.35	2.36	N/A	N/A
18.44	80.25	70.68	2.33	164.96	2.41	N/A	N/A
18.52	71.84	62.85	2.59	162.61	2.46	N/A	N/A
18.58	62.61	54.45	2.69	146.42	2.48	N/A	N/A
18.62	54.80	47.47	2.59	122.95	2.46	N/A	N/A
18.71	49.58	42.77	2.34	100.03	2.41	N/A	N/A
18.76	45.82	39.34	2.43	95.69	2.43	N/A	N/A
18.82	43.62	37.23	2.71	100.93	2.49	N/A	N/A
18.88	41.75	35.41	3.01	106.53	2.55	N/A	N/A
18.93	39.96	33.71	3.31	111.68	2.60	N/A	N/A
19.00	39.39	33.08	3.48	115.02	2.62	N/A	N/A
19.03	39.77	33.35	3.53	117.70	2.63	N/A	N/A
19.10	39.55	33.04	3.60	118.86	2.64	N/A	N/A
19.22	38.02	31.50	3.79	119.30	2.67	N/A	N/A
19.26	35.86	29.55	4.02	118.69	2.70	N/A	N/A
19.31	34.46	28.27	4.14	117.01	2.72	N/A	N/A
19.39	33.92	27.71	4.08	112.99	2.71	N/A	N/A
19.48	33.85	27.57	3.92	108.20	2.69	N/A	N/A
19.53	33.92	27.60	3.76	103.90	2.67	N/A	N/A
19.57	33.72	27.39	3.70	101.36	2.66	N/A	N/A
19.71	33.37	26.93	3.71	99.81	2.66	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
19.76	33.25	26.76	3.70	98.99	2.66	N/A	N/A
19.80	33.47	26.90	3.71	99.74	2.66	N/A	N/A
19.85	33.92	27.21	3.72	101.32	2.66	N/A	N/A
19.90	34.23	27.38	3.84	105.04	2.68	N/A	N/A
20.04	34.26	27.20	3.99	108.52	2.70	1.91	1.91
20.10	33.88	26.78	4.17	111.77	2.72	1.89	1.89
20.15	33.34	26.24	4.31	113.21	2.74	1.85	1.85
20.19	32.74	25.67	4.46	114.35	2.76	1.81	1.81
20.24	32.26	25.19	4.57	115.23	2.77	1.78	1.78
20.33	31.87	24.76	4.64	114.77	2.78	1.75	1.75
20.45	31.59	24.39	4.65	113.37	2.78	1.72	1.72
20.50	31.14	23.99	4.61	110.69	2.78	1.69	1.69
20.59	30.44	23.33	4.64	108.18	2.78	1.65	1.65
20.63	29.55	22.56	4.67	105.35	2.79	1.59	1.59
20.69	28.63	21.75	4.73	103.00	2.79	1.54	1.54
20.75	27.61	20.86	4.85	101.26	2.81	1.47	1.47
20.80	25.79	19.33	5.16	99.76	2.84	1.37	1.37
20.90	22.38	16.48	5.88	96.92	2.92	1.17	1.17
21.09	19.07	13.73	6.74	92.50	3.00	0.98	0.98
21.16	16.55	11.74	7.51	88.20	3.07	0.84	0.84
21.20	15.76	11.11	7.67	85.21	3.08	0.79	0.79
21.27	15.25	10.69	7.71	82.40	3.08	0.76	0.76
21.34	14.84	10.33	7.71	79.70	3.08	0.74	0.74
21.40	14.46	10.01	7.75	77.62	3.09	0.72	0.72
21.47	14.28	9.85	7.80	76.84	3.09	0.70	0.70
21.52	14.18	9.75	7.84	76.44	3.09	0.70	0.70
21.60	14.28	9.78	7.59	74.24	3.07	0.70	0.70
21.65	14.45	9.90	7.65	75.74	3.08	0.71	0.71
21.73	15.00	10.27	7.71	79.17	3.08	0.73	0.73
21.78	15.86	10.89	7.86	85.57	3.09	0.78	0.78
21.83	16.81	11.57	7.77	89.96	3.09	0.83	0.83
21.91	17.22	11.84	7.88	93.30	3.10	0.85	0.85
21.96	17.16	11.76	8.15	95.91	3.12	0.84	0.84
21.99	18.75	12.93	7.46	96.51	3.06	0.92	0.92
22.09	20.41	14.09	6.76	95.24	3.00	1.01	1.01
22.13	21.68	15.02	6.13	92.10	2.94	1.07	1.07
22.21	20.63	14.18	6.30	89.30	2.96	1.01	1.01
22.25	19.10	13.03	6.65	86.67	2.99	0.93	0.93
22.36	17.80	12.01	7.08	85.11	3.03	0.86	0.86
22.39	16.49	11.04	7.54	83.28	3.07	0.79	0.79
22.48	15.73	10.44	7.77	81.19	3.09	0.75	0.75
22.52	14.99	9.89	7.88	77.91	3.10	0.71	0.71
22.61	14.61	9.57	7.84	75.05	3.09	0.68	0.68
22.65	14.26	9.30	7.81	72.62	3.09	0.66	0.66
22.74	14.16	9.19	7.78	71.52	3.09	0.66	0.66
22.79	14.26	9.25	7.69	71.07	3.08	0.66	0.66
22.84	14.99	9.75	7.37	71.86	3.05	0.70	0.70
22.93	16.11	10.51	6.97	73.21	3.02	0.75	0.75

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
22.99	17.41	11.41	6.56	74.87	2.98	0.81	0.81
23.04	18.56	12.20	6.32	77.14	2.96	0.87	0.87
23.14	19.39	12.73	6.23	79.28	2.95	0.91	0.91
23.18	20.02	13.16	6.20	81.64	2.95	0.94	0.94
23.27	20.25	13.27	6.25	82.87	2.95	0.95	0.95
23.31	20.50	13.42	6.23	83.63	2.95	0.96	0.96
23.37	20.95	13.72	6.08	83.42	2.94	0.98	0.98
23.47	21.55	14.12	5.88	82.97	2.92	1.00	1.00
23.53	22.06	14.47	5.71	82.62	2.90	1.03	1.03
23.57	22.51	14.78	5.60	82.71	2.89	1.05	1.05
23.67	22.98	15.07	5.48	82.60	2.88	1.07	1.07
23.71	23.81	15.67	5.26	82.47	2.85	1.11	1.11
23.80	24.36	16.01	5.15	82.39	2.84	1.13	1.13
23.85	24.52	16.09	5.14	82.71	2.84	1.13	1.13
23.93	24.17	15.77	5.27	83.14	2.86	1.11	1.11
23.97	23.56	15.29	5.45	83.33	2.87	1.08	1.08
24.06	22.95	14.80	5.61	83.08	2.89	1.05	1.05
24.11	22.28	14.30	5.78	82.63	2.91	1.02	1.02
24.15	21.62	13.80	5.90	81.48	2.92	0.98	0.98
24.27	20.95	13.30	6.01	79.86	2.93	0.95	0.95
24.33	20.25	12.79	6.09	77.86	2.94	0.91	0.91
24.37	19.58	12.31	6.18	76.05	2.95	0.88	0.88
24.43	18.97	11.88	6.28	74.56	2.96	0.85	0.85
24.50	18.49	11.53	6.39	73.67	2.97	0.82	0.82
24.55	18.24	11.35	6.28	71.25	2.96	0.81	0.81
24.62	18.46	11.52	5.98	68.92	2.93	0.30	0.82
24.68	19.00	11.94	5.57	66.47	2.89	0.29	0.85
24.74	19.64	12.38	5.44	67.38	2.87	0.29	0.88
24.81	20.22	12.70	5.73	72.84	2.90	0.90	0.90
24.95	20.28	12.64	6.17	78.01	2.95	0.90	0.90
24.95	20.21	12.59	6.60	83.01	2.99	0.90	0.90
25.00	21.55	13.47	6.35	85.52	2.96	0.96	0.96
25.09	23.30	14.66	6.03	88.36	2.93	1.04	1.04
25.14	24.99	15.84	5.76	91.23	2.91	1.12	1.12
25.20	25.14	15.90	5.83	92.64	2.91	1.13	1.13
25.27	25.17	15.88	5.93	94.21	2.92	1.13	1.13
25.35	25.87	16.34	5.84	95.48	2.91	1.16	1.16
25.40	27.13	17.20	5.69	97.95	2.90	1.22	1.22
25.49	28.34	18.02	5.55	99.92	2.88	1.28	1.28
25.54	28.15	17.83	5.70	101.71	2.90	1.26	1.26
25.66	27.10	17.01	6.01	102.26	2.93	1.21	1.21
25.67	25.89	16.16	6.29	101.61	2.96	1.15	1.15
25.75	25.25	15.71	6.29	98.72	2.96	1.12	1.12
25.83	24.61	15.26	6.23	95.02	2.95	1.09	1.09
25.86	23.18	14.30	6.35	90.88	2.96	1.02	1.02
25.97	21.36	13.07	6.70	87.54	3.00	0.93	0.93
26.02	19.49	11.82	7.06	83.45	3.03	0.84	0.84
26.06	18.21	10.97	7.22	79.22	3.04	0.78	0.78

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
26.12	17.29	10.35	7.20	74.45	3.04	0.74	0.74
26.20	16.62	9.89	6.95	68.75	3.02	0.33	0.71
26.36	16.33	9.67	6.67	64.50	2.99	0.25	0.69
26.40	16.33	9.66	6.40	61.88	2.97	0.24	0.69
26.42	16.56	9.81	6.32	62.00	2.96	0.24	0.70
26.47	16.91	10.03	6.36	63.75	2.96	0.25	0.72
26.51	18.34	10.96	6.27	68.71	2.96	0.30	0.78
26.64	20.44	12.34	5.98	73.84	2.93	0.88	0.88
26.68	23.59	14.52	5.37	78.06	2.87	1.02	1.02
26.73	25.82	16.08	4.97	79.92	2.82	1.13	1.13
26.81	27.19	17.02	4.78	81.39	2.80	1.19	1.19
26.86	27.38	17.12	4.84	82.79	2.81	1.20	1.20
26.91	27.45	17.12	4.91	84.02	2.81	1.20	1.20
27.02	28.05	17.51	4.84	84.81	2.81	1.22	1.22
27.07	29.14	18.26	4.66	85.05	2.78	1.27	1.27
27.12	30.73	19.41	4.36	84.62	2.75	1.35	1.35
27.21	31.72	20.09	4.19	84.21	2.73	1.39	1.39
27.26	32.17	20.39	4.15	84.64	2.72	1.41	1.41
27.31	31.88	20.13	4.29	86.30	2.74	1.39	1.39
27.38	31.56	19.83	4.45	88.27	2.76	1.38	1.38
27.43	30.74	19.18	4.69	90.04	2.79	1.34	1.34
27.51	29.97	18.61	4.82	89.72	2.80	1.30	1.30
27.64	29.17	18.01	4.93	88.74	2.82	1.26	1.26
27.67	28.85	17.79	4.90	87.11	2.81	1.25	1.25
27.70	28.31	17.42	4.93	85.92	2.82	1.22	1.22
27.86	27.83	17.04	4.98	84.89	2.82	1.19	1.19
27.89	27.42	16.75	5.02	84.08	2.83	1.17	1.17
27.91	27.20	16.59	5.05	83.77	2.83	1.16	1.16
27.99	26.97	16.41	5.09	83.47	2.83	1.15	1.15
28.06	26.75	16.23	5.14	83.41	2.84	1.14	1.14
28.10	26.56	16.08	5.22	83.88	2.85	1.13	1.13
28.17	26.40	15.93	5.33	84.85	2.86	1.12	1.12
28.38	26.34	15.79	5.43	85.81	2.87	1.11	1.11
28.43	26.53	15.90	5.45	86.65	2.87	1.12	1.12
28.45	26.78	16.05	5.43	87.22	2.87	1.13	1.13
28.49	27.13	16.28	5.39	87.79	2.87	1.15	1.15
28.53	27.48	16.49	5.37	88.58	2.87	1.16	1.16
28.59	27.93	16.78	5.32	89.32	2.86	1.18	1.18
28.63	28.44	17.11	5.26	90.02	2.85	1.20	1.20
28.69	29.71	17.94	5.12	91.95	2.84	1.26	1.26
28.86	31.02	18.75	5.02	94.16	2.83	1.31	1.31
28.91	32.36	19.63	4.92	96.51	2.82	1.37	1.37
28.96	33.09	20.10	4.85	97.47	2.81	1.40	1.40
29.00	33.85	20.61	4.76	98.07	2.80	1.44	1.44
29.05	34.81	21.26	4.62	98.32	2.78	1.48	1.48
29.09	36.02	22.09	4.46	98.44	2.76	1.53	1.53
29.15	37.42	23.06	4.27	98.38	2.74	1.59	1.59
29.22	38.37	23.70	4.15	98.33	2.72	1.63	1.63

::Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
29.27	38.41	23.70	4.15	98.25	2.72	1.63	1.63
29.40	38.06	23.40	4.19	97.98	2.73	1.61	1.61
29.45	37.61	23.08	4.22	97.40	2.73	1.59	1.59
29.53	37.52	23.02	4.14	95.25	2.72	1.58	1.58
29.71	36.91	22.54	4.18	94.12	2.72	1.55	1.55
29.80	36.43	22.17	4.23	93.88	2.73	1.53	1.53
29.87	36.05	21.83	4.39	95.79	2.75	1.51	1.51
29.92	36.10	21.81	4.46	97.24	2.76	1.51	1.51
29.94	36.07	21.73	4.57	99.26	2.77	1.51	1.51
30.01	36.42	21.91	4.61	100.92	2.78	1.52	1.52
30.05	37.07	22.32	4.57	101.93	2.77	1.55	1.55
30.14	37.71	22.73	4.48	101.75	2.76	1.57	1.57
30.19	37.52	22.60	4.45	100.66	2.76	1.56	1.56
30.27	36.69	22.01	4.51	99.35	2.77	1.53	1.53
30.34	35.57	21.24	4.61	97.98	2.78	1.47	1.47
30.41	34.75	20.67	4.66	96.42	2.79	1.44	1.44
30.45	34.53	20.55	4.58	94.07	2.78	1.43	1.43
30.52	34.72	20.73	4.40	91.11	2.75	1.43	1.43
30.58	35.01	20.96	4.24	88.85	2.73	1.44	1.44
30.66	35.29	21.13	4.19	88.56	2.73	1.45	1.45
30.76	35.77	21.40	4.18	89.50	2.73	1.47	1.47
30.80	36.37	21.76	4.19	91.09	2.73	1.50	1.50
30.90	36.91	22.07	4.17	92.10	2.72	1.52	1.52
30.94	37.30	22.29	4.18	93.26	2.73	1.53	1.53
31.03	37.52	22.38	4.23	94.63	2.73	1.54	1.54
31.07	37.65	22.39	4.34	97.06	2.75	1.54	1.54
31.15	37.71	22.34	4.44	99.28	2.76	1.54	1.54
31.19	38.25	22.66	4.45	100.86	2.76	1.57	1.57
31.27	38.89	23.04	4.41	101.68	2.75	1.59	1.59
31.31	39.72	23.55	4.39	103.37	2.75	1.63	1.63
31.38	40.67	24.09	4.44	106.94	2.76	1.66	1.66
31.51	41.75	24.68	4.48	110.57	2.76	1.71	1.71
31.55	42.90	25.37	4.49	113.84	2.76	1.75	1.75
31.60	43.41	25.65	4.51	115.72	2.77	1.77	1.77
31.65	44.02	26.01	4.49	116.72	2.76	1.80	1.80
31.73	44.65	26.41	4.41	116.37	2.75	1.82	1.82
31.78	45.51	27.02	4.24	114.65	2.73	1.86	1.86
31.89	44.30	26.27	4.16	109.37	2.72	1.80	1.80
31.94	42.27	24.95	4.21	104.97	2.73	1.71	1.71
31.99	39.94	23.42	4.35	101.89	2.75	1.61	1.61
32.04	39.31	22.93	4.50	103.17	2.77	1.58	1.58
32.09	39.18	22.79	4.58	104.38	2.78	1.58	1.58
32.19	39.40	22.86	4.64	106.06	2.78	1.58	1.58
32.26	39.37	22.77	4.72	107.51	2.79	1.58	1.58
32.30	39.30	22.68	4.79	108.72	2.80	1.58	1.58
32.35	40.29	23.32	4.67	108.81	2.79	1.62	1.62
32.44	40.61	23.49	4.63	108.68	2.78	1.63	1.63
32.50	40.42	23.35	4.63	108.15	2.78	1.62	1.62

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
32.57	39.48	22.70	4.74	107.50	2.79	1.58	1.58
32.61	39.13	22.47	4.73	106.22	2.79	1.56	1.56
32.68	39.64	22.83	4.58	104.45	2.77	1.58	1.58
32.75	39.52	22.77	4.49	102.34	2.76	1.57	1.57
32.84	39.68	22.87	4.42	101.13	2.76	1.58	1.58
32.88	39.30	22.58	4.50	101.52	2.77	1.56	1.56
32.98	38.95	22.28	4.61	102.62	2.78	1.54	1.54
33.02	38.76	22.13	4.65	102.92	2.78	1.53	1.53
33.18	38.89	22.16	4.62	102.31	2.78	1.53	1.53
33.20	38.99	22.23	4.57	101.68	2.77	1.54	1.54
33.24	38.70	22.01	4.63	101.99	2.78	1.52	1.52
33.32	38.16	21.60	4.76	102.74	2.80	1.50	1.50
33.36	37.36	21.02	4.95	104.00	2.82	1.46	1.46
33.42	36.66	20.50	5.14	105.40	2.84	1.43	1.43
33.50	36.09	20.06	5.31	106.46	2.86	1.41	1.41
33.54	35.83	19.86	5.39	107.07	2.87	1.40	1.40
33.63	35.70	19.74	5.42	107.07	2.87	1.39	1.39
33.66	35.54	19.63	5.44	106.79	2.87	1.38	1.38
33.77	35.13	19.32	5.51	106.47	2.88	1.36	1.36
33.81	34.84	19.12	5.55	106.17	2.88	1.35	1.35
33.89	34.65	18.97	5.58	105.88	2.89	1.34	1.34
33.94	34.59	18.92	5.58	105.55	2.89	1.34	1.34
34.00	34.30	18.72	5.61	105.08	2.89	1.32	1.32
34.07	34.02	18.52	5.63	104.21	2.89	1.31	1.31
34.16	34.08	18.56	5.56	103.09	2.89	1.31	1.31
34.20	35.10	19.23	5.29	101.83	2.86	1.35	1.35
34.29	36.28	19.99	5.05	101.00	2.83	1.40	1.40
34.34	37.52	20.80	4.82	100.37	2.80	1.44	1.44
34.38	38.44	21.41	4.65	99.53	2.78	1.48	1.48
34.48	39.27	21.95	4.48	98.31	2.76	1.51	1.51
34.53	39.81	22.33	4.33	96.75	2.74	1.53	1.53
34.60	39.81	22.30	4.34	96.78	2.75	1.53	1.53
34.65	39.53	22.04	4.47	98.57	2.76	1.52	1.52
34.74	39.24	21.75	4.65	101.10	2.78	1.50	1.50
34.80	39.05	21.55	4.78	102.95	2.80	1.49	1.49
34.84	39.08	21.53	4.82	103.86	2.80	1.49	1.49
34.95	39.05	21.45	4.86	104.23	2.81	1.49	1.49
34.99	39.05	21.44	4.86	104.13	2.81	1.49	1.49
35.05	39.18	21.52	4.79	103.16	2.80	1.49	1.49
35.11	38.57	21.15	4.80	101.49	2.80	1.47	1.47
35.24	37.49	20.42	4.90	100.06	2.81	1.42	1.42
35.29	35.83	19.36	5.11	98.84	2.84	1.35	1.35
35.37	34.21	18.31	5.33	97.61	2.86	1.28	1.28
35.49	32.78	17.39	5.51	95.85	2.88	1.22	1.22
35.55	30.99	16.29	5.73	93.28	2.90	1.15	1.15
35.68	29.66	15.44	5.89	91.04	2.92	1.10	1.10
35.73	28.32	14.64	6.04	88.42	2.93	1.04	1.04
35.81	27.62	14.22	6.08	86.38	2.94	1.01	1.01

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
35.86	27.17	13.97	6.00	83.82	2.93	0.99	0.99
35.93	27.01	13.90	5.89	81.88	2.92	0.99	0.99
35.99	26.73	13.73	5.89	80.84	2.92	0.97	0.97
36.04	26.66	13.67	5.93	81.06	2.92	0.97	0.97
36.09	26.79	13.71	5.96	81.73	2.93	0.97	0.97
36.14	27.43	14.10	5.84	82.31	2.91	1.00	1.00
36.18	28.64	14.83	5.62	83.37	2.89	1.05	1.05
36.30	29.88	15.55	5.43	84.53	2.87	1.09	1.09
36.35	31.15	16.32	5.26	85.80	2.85	1.14	1.14
36.40	31.85	16.73	5.18	86.71	2.85	1.17	1.17
36.44	32.52	17.11	5.13	87.80	2.84	1.19	1.19
36.53	33.19	17.48	5.08	88.90	2.83	1.22	1.22
36.57	34.31	18.15	4.98	90.33	2.82	1.26	1.26
36.70	35.23	18.67	4.89	91.22	2.81	1.30	1.30
36.75	35.96	19.10	4.81	91.84	2.80	1.32	1.32
36.78	36.31	19.31	4.76	91.90	2.80	1.34	1.34
36.83	36.63	19.49	4.73	92.17	2.79	1.35	1.35
36.88	37.27	19.86	4.68	92.96	2.79	1.37	1.37
37.01	37.87	20.17	4.65	93.81	2.78	1.39	1.39
37.06	38.38	20.52	4.50	92.38	2.77	1.41	1.41
37.14	38.51	20.62	4.40	90.66	2.75	1.41	1.41
37.19	38.57	20.69	4.31	89.09	2.74	1.41	1.41
37.26	38.67	20.71	4.34	89.78	2.75	1.42	1.42
37.32	38.73	20.71	4.36	90.23	2.75	1.42	1.42
37.38	38.22	20.36	4.44	90.46	2.76	1.40	1.40
37.45	36.76	19.38	4.69	90.84	2.79	1.34	1.34
37.49	35.64	18.65	4.89	91.11	2.81	1.29	1.29
37.56	35.23	18.36	4.97	91.19	2.82	1.28	1.28
37.61	35.80	18.71	4.87	91.10	2.81	1.30	1.30
37.67	36.02	18.84	4.81	90.68	2.80	1.30	1.30
37.78	36.12	18.87	4.78	90.30	2.80	1.31	1.31
37.83	36.03	18.81	4.79	90.01	2.80	1.30	1.30
37.87	35.77	18.63	4.85	90.26	2.81	1.29	1.29
37.95	35.14	18.18	5.00	90.94	2.83	1.26	1.26
38.00	34.28	17.60	5.22	91.81	2.85	1.23	1.23
38.13	33.48	17.04	5.42	92.35	2.87	1.20	1.20
38.18	32.97	16.72	5.49	91.80	2.88	1.18	1.18
38.30	32.87	16.64	5.48	91.12	2.88	1.17	1.17
38.35	33.13	16.80	5.38	90.36	2.87	1.18	1.18
38.40	33.95	17.31	5.20	89.96	2.85	1.21	1.21
38.47	35.64	18.37	4.86	89.25	2.81	1.27	1.27
38.53	36.88	19.13	4.66	89.12	2.79	1.32	1.32
38.58	37.36	19.40	4.63	89.71	2.78	1.33	1.33
38.65	36.63	18.88	4.82	90.98	2.80	1.31	1.31
38.71	36.03	18.44	4.99	92.04	2.82	1.28	1.28
38.76	35.58	18.13	5.12	92.78	2.84	1.26	1.26
38.84	35.26	17.88	5.23	93.57	2.85	1.25	1.25
38.89	34.75	17.51	5.43	95.12	2.87	1.23	1.23

::Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
38.94	34.08	17.02	5.71	97.16	2.90	1.20	1.20
39.02	33.32	16.50	5.96	98.28	2.93	1.17	1.17
39.07	32.49	15.98	6.15	98.19	2.94	1.14	1.14
39.13	31.92	15.64	6.19	96.90	2.95	1.12	1.12
39.20	30.93	15.09	6.32	95.33	2.96	1.08	1.08
39.25	29.12	14.12	6.58	92.93	2.99	1.01	1.01
39.32	26.73	12.84	7.02	90.21	3.02	0.92	0.92
39.37	24.44	11.63	7.36	85.52	3.05	0.83	0.83
39.50	23.03	10.86	7.48	81.29	3.06	0.78	0.78
39.55	21.92	10.27	7.49	76.91	3.06	0.73	0.73
39.61	20.99	9.77	7.57	73.92	3.07	0.70	0.70
39.73	20.10	9.28	7.46	69.21	3.06	0.34	0.66
39.79	19.34	8.87	6.87	60.93	3.01	0.25	0.63
39.85	18.96	8.67	6.25	54.19	2.95	0.12	0.62
39.97	18.83	8.62	5.99	51.65	2.93	0.15	0.61
40.03	19.30	8.82	6.26	55.19	2.95	0.19	0.63
40.08	19.62	8.98	6.76	60.71	3.00	0.21	0.64
40.13	20.16	9.26	7.55	69.93	3.07	0.31	0.66
40.18	20.23	9.28	8.77	81.40	3.17	0.66	0.66
40.23	21.76	10.07	9.08	91.48	3.19	0.72	0.72
40.30	32.49	15.64	6.29	98.35	2.96	1.12	1.12
40.36	44.66	22.99	4.37	100.38	2.75	1.57	1.57
40.45	51.50	27.29	3.64	99.27	2.65	1.82	1.82
40.50	44.37	22.84	4.27	97.61	2.74	1.55	1.55
40.58	33.69	16.35	5.77	94.42	2.91	1.16	1.16
40.62	26.86	12.64	7.01	88.59	3.02	0.90	0.90
40.73	24.97	11.64	7.07	82.24	3.03	0.83	0.83
40.81	25.96	12.14	6.32	76.72	2.96	0.87	0.87
40.85	28.95	13.96	5.34	74.48	2.86	0.98	0.98
40.95	32.14	15.87	4.71	74.78	2.79	1.09	1.09
41.00	34.97	17.56	4.33	76.09	2.74	1.20	1.20
41.05	36.31	18.28	4.31	78.80	2.74	1.24	1.24
41.11	37.36	18.82	4.33	81.56	2.74	1.28	1.28
41.16	38.19	19.22	4.39	84.30	2.75	1.31	1.31
41.26	38.95	19.60	4.39	86.11	2.75	1.34	1.34
41.32	39.65	19.96	4.39	87.64	2.75	1.36	1.36
41.37	40.23	20.26	4.38	88.66	2.75	1.38	1.38
41.42	40.90	20.62	4.34	89.54	2.75	1.40	1.40
41.47	41.50	20.96	4.31	90.25	2.74	1.43	1.43
41.57	42.08	21.26	4.26	90.61	2.74	1.44	1.44
41.64	42.20	21.31	4.26	90.86	2.74	1.45	1.45
41.69	41.73	20.98	4.35	91.20	2.75	1.43	1.43
41.78	41.15	20.58	4.45	91.66	2.76	1.41	1.41
41.83	40.77	20.31	4.53	92.10	2.77	1.39	1.39
41.90	40.80	20.30	4.55	92.27	2.77	1.39	1.39
41.95	40.67	20.20	4.57	92.29	2.77	1.38	1.38
42.00	39.91	19.72	4.68	92.28	2.79	1.35	1.35
42.11	38.95	19.10	4.83	92.34	2.81	1.32	1.32

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
42.18	37.80	18.38	5.03	92.46	2.83	1.27	1.27
42.23	36.85	17.79	5.20	92.50	2.85	1.24	1.24
42.30	35.67	17.07	5.41	92.30	2.87	1.20	1.20
42.36	34.53	16.38	5.60	91.79	2.89	1.15	1.15
42.43	33.51	15.78	5.77	91.01	2.91	1.11	1.11
42.49	32.71	15.32	5.88	90.00	2.92	1.09	1.09
42.54	32.27	15.13	5.72	86.60	2.90	1.07	1.07
42.62	31.95	15.07	5.40	81.38	2.87	1.06	1.06
42.68	31.98	15.22	5.04	76.68	2.83	1.06	1.06
42.75	32.20	15.38	4.89	75.22	2.81	1.06	1.06
42.80	32.90	15.77	4.81	75.80	2.80	1.09	1.09
42.88	33.63	16.18	4.69	75.96	2.79	1.11	1.11
42.93	32.58	15.52	4.92	76.43	2.82	1.07	1.07
43.01	34.46	16.58	4.71	78.06	2.79	1.14	1.14
43.07	37.52	18.32	4.39	80.42	2.75	1.25	1.25
43.12	42.59	21.28	3.93	83.52	2.69	1.43	1.43
43.20	44.66	22.40	3.87	86.70	2.68	1.50	1.50
43.24	45.64	22.83	3.98	90.77	2.70	1.53	1.53
43.33	46.12	22.96	4.10	94.14	2.71	1.55	1.55
43.37	45.74	22.60	4.29	96.98	2.74	1.53	1.53
43.51	45.04	22.09	4.43	97.88	2.76	1.50	1.50
43.54	44.53	21.78	4.48	97.58	2.76	1.49	1.49
43.59	44.82	21.99	4.37	96.07	2.75	1.49	1.49
43.66	44.97	22.13	4.25	94.12	2.73	1.50	1.50
43.73	44.75	22.04	4.18	92.09	2.72	1.49	1.49
43.78	43.86	21.56	4.18	90.13	2.72	1.46	1.46
43.86	42.97	21.06	4.20	88.42	2.73	1.42	1.42
43.91	41.98	20.51	4.23	86.80	2.73	1.39	1.39
43.99	41.25	20.06	4.28	85.95	2.74	1.36	1.36
44.04	40.61	19.68	4.35	85.63	2.75	1.34	1.34
44.12	40.39	19.51	4.41	85.95	2.75	1.33	1.33
44.21	40.29	19.41	4.45	86.27	2.76	1.32	1.32
44.25	40.13	19.28	4.50	86.75	2.77	1.32	1.32
44.32	39.56	18.89	4.64	87.58	2.78	1.29	1.29
44.46	38.83	18.38	4.82	88.55	2.80	1.27	1.27
44.52	38.19	17.95	4.98	89.41	2.82	1.24	1.24
44.56	37.84	17.73	5.05	89.48	2.83	1.23	1.23
44.61	37.62	17.60	5.06	89.11	2.83	1.22	1.22
44.65	37.27	17.40	5.08	88.38	2.83	1.21	1.21
44.70	36.70	17.08	5.12	87.42	2.84	1.19	1.19
44.88	36.50	16.93	5.13	86.90	2.84	1.18	1.18
44.92	36.25	16.77	5.17	86.78	2.84	1.17	1.17
45.01	36.50	16.89	5.16	87.10	2.84	1.17	1.17
45.05	36.63	16.95	5.14	87.15	2.84	1.18	1.18
45.09	36.98	17.25	4.86	83.91	2.81	1.19	1.19
45.19	36.88	17.28	4.67	80.60	2.79	1.18	1.18
45.23	36.51	17.15	4.53	77.64	2.77	1.17	1.17
45.28	35.74	16.65	4.72	78.51	2.79	1.14	1.14

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
45.36	34.60	15.94	4.97	79.14	2.82	1.10	1.10
45.49	33.56	15.29	5.18	79.29	2.85	1.06	1.06
45.51	32.89	14.90	5.34	79.51	2.86	1.04	1.04
45.55	33.75	15.29	5.39	82.47	2.87	1.07	1.07
45.68	35.01	15.87	5.41	85.84	2.87	1.11	1.11
45.70	37.46	17.09	5.36	91.60	2.86	1.19	1.19
45.77	40.78	18.77	5.23	98.17	2.85	1.31	1.31
45.86	44.37	20.60	5.09	104.78	2.83	1.43	1.43
45.89	47.72	22.35	4.92	110.02	2.82	1.54	1.54
45.95	49.63	23.31	4.88	113.86	2.81	1.61	1.61
46.03	50.01	23.38	5.02	117.42	2.83	1.62	1.62
46.07	49.47	22.97	5.21	119.72	2.85	1.60	1.60
46.15	48.61	22.47	5.29	118.84	2.86	1.57	1.57
46.22	48.07	22.22	5.22	116.08	2.85	1.55	1.55
46.30	48.12	22.32	5.06	112.91	2.83	1.55	1.55
46.35	48.28	22.48	4.92	110.48	2.82	1.55	1.55
46.43	48.92	22.81	4.85	110.61	2.81	1.57	1.57
46.50	49.63	23.07	4.95	114.21	2.82	1.59	1.59
46.56	53.61	25.09	4.84	121.36	2.81	1.73	1.73
46.61	60.23	28.62	4.52	129.24	2.77	1.95	1.95
46.66	70.14	33.95	4.15	140.84	2.72	2.28	2.28
46.78	77.18	37.54	4.06	152.38	2.71	2.52	2.52
46.87	80.43	38.95	4.19	163.31	2.73	2.62	2.62
46.96	81.05	39.02	4.33	168.89	2.74	2.64	2.64
47.09	80.39	38.44	4.46	171.53	2.76	2.61	2.61
47.14	81.82	39.19	4.41	172.77	2.75	2.66	2.66
47.18	83.01	39.84	4.34	172.93	2.75	2.69	2.69
47.26	85.56	41.29	4.18	172.49	2.72	2.78	2.78
47.31	85.78	41.46	4.11	170.53	2.72	2.78	2.78
47.37	82.72	39.77	4.20	167.05	2.73	2.68	2.68
47.44	76.99	36.59	4.42	161.87	2.76	2.48	2.48
47.50	70.14	33.19	4.42	146.62	2.76	2.25	2.25
47.54	63.19	29.93	4.23	126.66	2.73	2.02	2.02
47.62	56.38	26.73	4.01	107.16	2.70	1.79	1.79
47.67	50.04	23.21	4.42	102.58	2.76	1.57	1.57
47.71	44.57	19.94	5.32	106.01	2.86	1.39	1.39
47.80	40.01	17.31	6.25	108.22	2.95	1.24	1.24
47.85	39.09	16.86	6.49	109.46	2.98	1.20	1.20
47.92	39.83	17.19	6.37	109.40	2.97	1.23	1.23
48.01	41.67	18.11	6.03	109.18	2.93	1.29	1.29
48.04	41.80	18.16	6.02	109.40	2.93	1.29	1.29
48.12	41.77	18.14	5.98	108.53	2.93	1.29	1.29
48.18	41.83	18.04	6.21	112.12	2.95	1.29	1.29
48.31	42.95	18.52	6.34	117.50	2.96	1.32	1.32
48.36	45.08	19.49	6.39	124.57	2.97	1.39	1.39
48.40	48.23	20.98	6.15	128.98	2.94	1.50	1.50
48.45	51.74	22.63	6.05	136.97	2.94	1.61	1.61
48.54	54.60	23.91	6.09	145.59	2.94	1.70	1.70

:: Strength loss calculation (Robertson (2009) :: (continued)

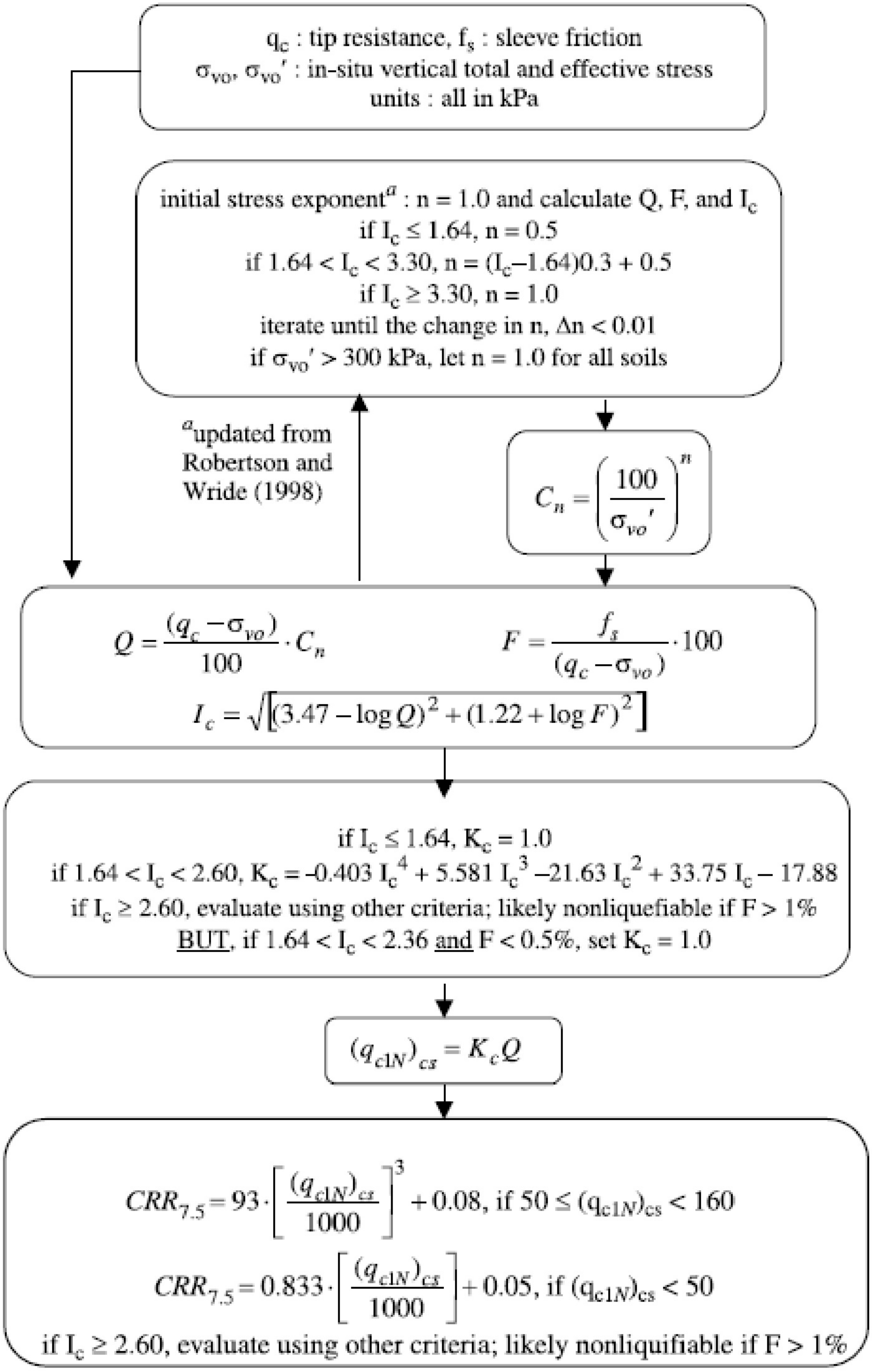
Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
48.58	57.60	25.23	6.15	155.21	2.94	1.80	1.80
48.63	81.29	38.24	4.28	163.68	2.74	2.58	2.58
48.72	105.78	52.30	3.23	169.11	2.58	0.74	0.74
48.80	121.51	61.56	2.79	171.92	2.50	0.76	0.76
48.85	110.15	54.67	3.14	171.40	2.57	0.75	0.75
48.90	91.20	43.76	3.75	164.10	2.67	2.89	2.89
48.98	76.23	35.56	4.29	152.65	2.74	2.40	2.40
49.03	62.91	28.45	4.94	140.48	2.82	1.96	1.96
49.11	53.58	23.45	5.71	133.90	2.90	1.65	1.65
49.18	50.25	21.66	6.08	131.63	2.94	1.54	1.54
49.23	47.45	20.28	6.54	132.64	2.98	1.45	1.45
49.29	50.15	21.50	6.36	136.65	2.96	1.54	1.54
49.38	53.10	22.82	6.20	141.44	2.95	1.63	1.63
49.42	62.60	27.81	5.32	148.01	2.86	1.94	1.94
49.51	66.99	30.06	5.05	151.84	2.83	2.08	2.08
49.56	68.33	30.65	5.07	155.34	2.83	2.12	2.12
49.62	66.70	29.67	5.27	156.46	2.86	2.06	2.06
49.71	66.99	29.78	5.26	156.59	2.85	2.07	2.07
49.76	67.15	29.83	5.25	156.68	2.85	2.07	2.07
49.82	66.39	30.50	4.20	128.03	2.73	2.05	2.05
49.90	65.75	31.99	2.87	91.76	2.52	0.68	0.68
49.96	65.47	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.04	65.47	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.09	63.04	-1.00	1.00	-1.00	-1.00	N/A	N/A
50.18	60.69	-1.00	1.00	-1.00	-1.00	N/A	N/A

Abbreviations

q_t:	Total cone resistance
K_c:	Cone resistance correction factor due to fines
$Q_{tn,cs}$:	Adjusted and corrected cone resistance due to fines
I_c:	Soil behavior type index
$S_{u(liq)}/\sigma'_v$:	Calculated liquefied undrained strength ratio
$S_{u(peak)}/\sigma'_v$:	Calculated peak undrained strength ratio

Procedure for the evaluation of soil liquefaction resistance, NCEER (1998)

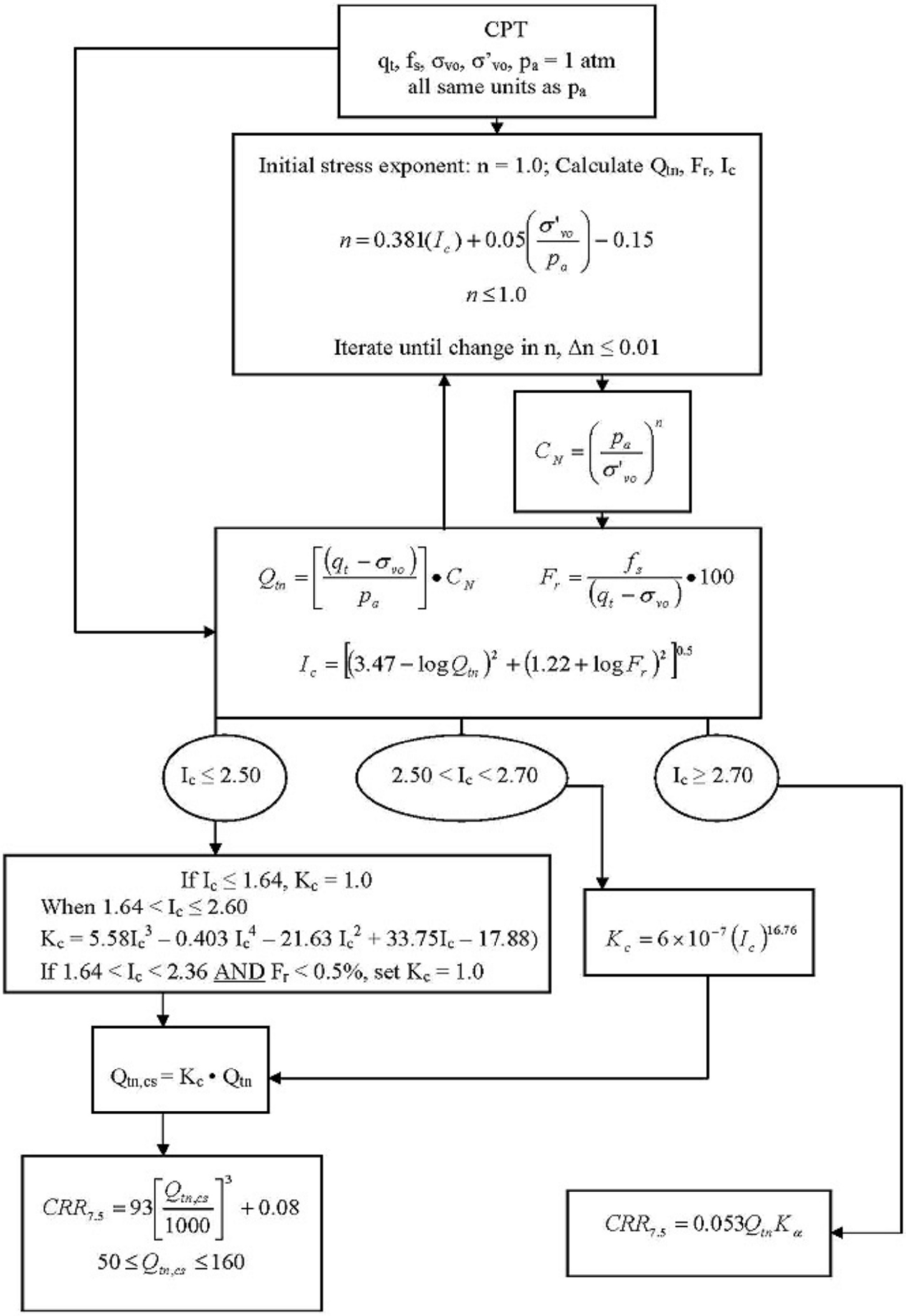
Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. The procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

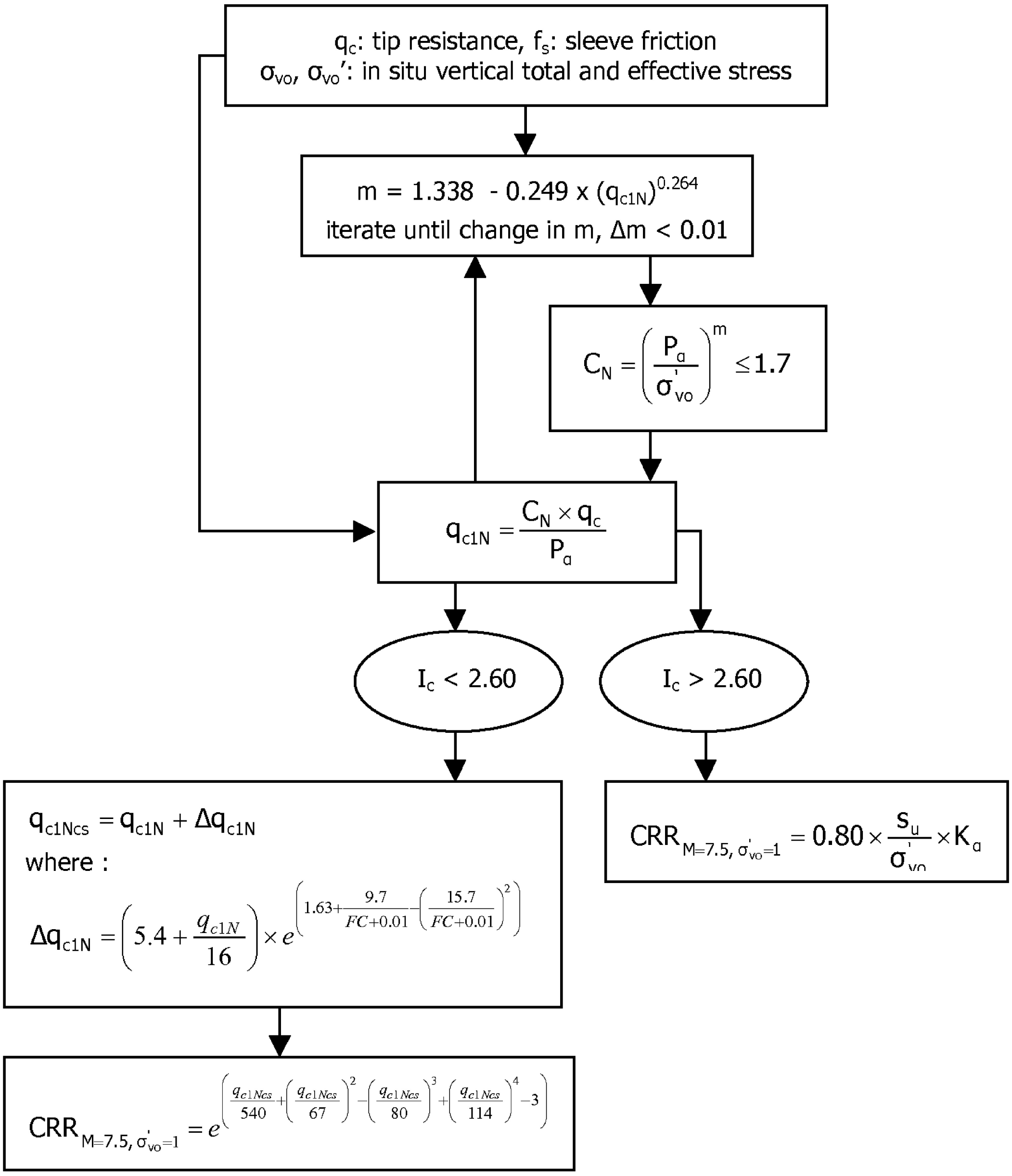
Procedure for the evaluation of soil liquefaction resistance (all soils), Robertson (2010)

Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. This procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] P.K. Robertson, 2009. "Performance based earthquake design using the CPT", Keynote Lecture, International Conference on Performance-based Design in Earthquake Geotechnical Engineering – from case history to practice, IS-Tokyo, June 2009

Procedure for the evaluation of soil liquefaction resistance, Idriss & Boulanger (2008)



Procedure for the evaluation of soil liquefaction resistance (sandy soils), Moss et al. (2006)

CPT

q_t, f_s, I_c

$I_c < I_c$ cut-off

Initial estimate using raw tip measurements, friction ratio. Calculate $q_{t,1}$. Repeat until an acceptable convergence tolerance is achieved.

$$c = f_1 \cdot \left(\frac{R_f}{f_3}\right)^{f_2}$$

$$C_q = \left(\frac{P_a}{\sigma'_v}\right)^{c}$$

$$q_{t,1} = C_q \cdot q_t$$

$$CRR = \exp\left[\frac{q_{t,1}^{1.045} + q_{t,1} \cdot (0.110 \cdot R_f) + (0.001 \cdot R_f) + c \cdot (1 + 0.850 \cdot R_f) - 0.848 \cdot \ln(M_w) - 0.002 \cdot \ln(\sigma'_v) - 20.923 + 1.632 \cdot \Phi^{-1}(P_L)}{7.177}\right]$$

Procedure for the evaluation of soil liquefaction resistance, Boulanger & Idriss(2014)

$$FS_{liq} = \frac{CRR_{M=7.5,\sigma_v'=1atm}}{CSR_{M=7.5,\sigma_v'=1atm}}$$

$$CSR_{M=7.5,\sigma_v'=1atm} = 0.65 \frac{\sigma_v}{\sigma_v'} \frac{a_{\max}}{g} r_d \frac{1}{MSF} \frac{1}{K_\sigma}$$

$$r_d = \exp\left[\alpha(z) + \beta(z) \cdot M\right]$$

$$\alpha(z) = -1.012 - 1.126 \sin\left(\frac{z}{11.73} + 5.133\right)$$

$$\beta(z) = 0.106 + 0.118 \sin\left(\frac{z}{11.28} + 5.142\right)$$

$$K_\sigma = 1 - C_\sigma \ln\left(\frac{\sigma_v'}{P_a}\right) \le 1.1$$

$$C_\sigma = \frac{1}{37.3 - 8.27\left(q_{c1Ncs}\right)^{0.264}} \le 0.3$$

$$MSF = 1 + \left(MSF_{max} - 1\right)\left(8.64 \exp\left(\frac{-M}{4}\right) - 1.325\right)$$

$$MSF_{max} = 1.09 + \left(\frac{q_{c1Ncs}}{180}\right)^3 \le 2.2$$

σ_v' *and* σ_v *at start of earthquake shaking*

$$CRR_{M=7.5,\sigma_v'=1atm} = \exp\left(\frac{q_{c1Ncs}}{113} + \left(\frac{q_{c1Ncs}}{1000}\right)^2 - \left(\frac{q_{c1Ncs}}{140}\right)^3 + \left(\frac{q_{c1Ncs}}{137}\right)^4 - 2.80\right)$$

$$q_{c1Ncs} = q_{c1N} + \Delta q_{c1N}$$

$$\Delta q_{c1N} = \left(11.9 + \frac{q_{c1N}}{14.6}\right) \exp\left(1.63 - \frac{9.7}{FC+2} - \left(\frac{15.7}{FC+2}\right)^2\right)$$

$$q_{c1N} = C_{N\sigma} \frac{q_c}{P_a}$$

$$C_{N\sigma} = \left(\frac{P_a}{\sigma_v'}\right)^m \le 1.7$$

$$m = 1.338 - 0.249\left(q_{c1Ncs}\right)^{0.264} \quad with \quad 0.264 \le m \le 0.782$$

$$FC = 80\left(I_C + C_{FC}\right) - 137 \quad with \quad 0\% \le FC \le 100\%$$

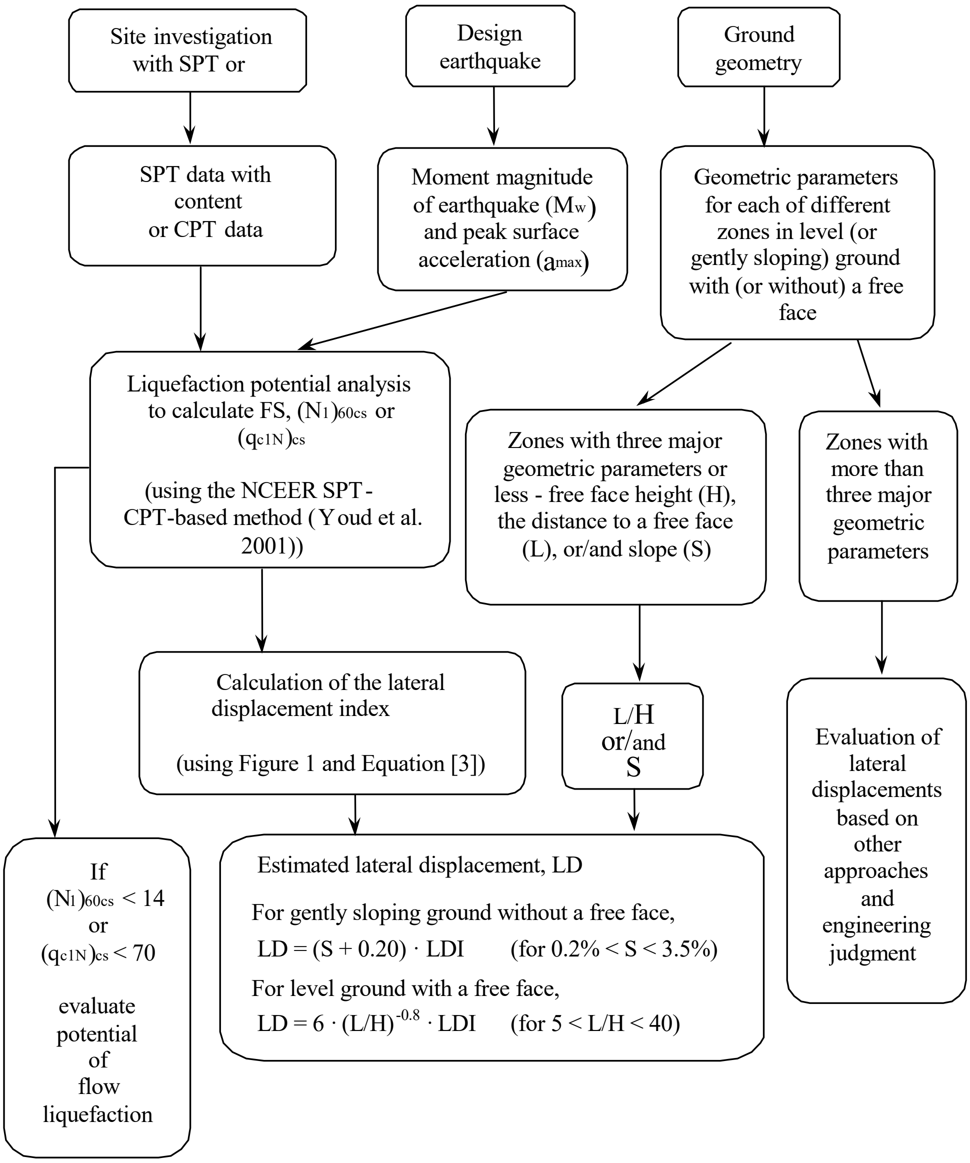
$$I_c = \left[\left(3.47 - \log(Q)\right)^2 + \left(1.22 + \log(F)\right)^2\right]^{0.5}$$

$$Q = \left(\frac{q_c - \sigma_{vc}}{P_a}\right)\left(\frac{P_a}{\sigma_{vc}'}\right)^n \; with\; 0.5 \le n \le 1.0 \; per \; Robertson \;\&\; Wride\, (1998)$$

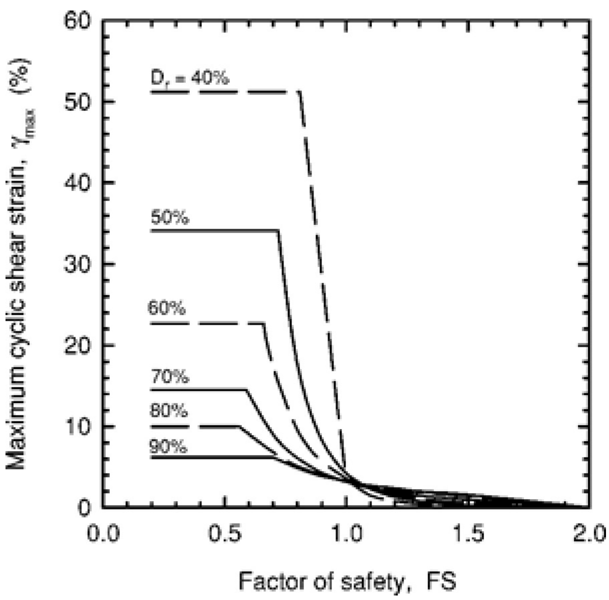
$$F = \left(\frac{f_s}{q_c - \sigma_{vc}}\right) \cdot 100\%$$

σ_v' *at time of CPT sounding*

Procedure for the evaluation of liquefaction-induced lateral spreading displacements



[1] Flow chart illustrating major steps in estimating liquefaction-induced lateral spreading displacements using the proposed approach



[1] **Figure 1**

$$\mathrm{LDI} = \int_0^{Z_{max}} \gamma_{max}\, dz$$

[1] **Equation [3]**

[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

Procedure for the estimation of seismic induced settlements in dry sands

Average shear stress, τ_{av}

$$\tau_{av} = CSR^{*} \cdot \sigma_{v0}' = 0.65 \cdot \frac{\alpha_{max}}{g} \cdot \sigma_{v0} \cdot \tau_{a}$$

Estimate small shear strain modulus, G_0

$$G_0 = 0.0188 \cdot \left[10^{(0.55 I_c - 1.68)}\right] \cdot (q_t - \sigma_v)$$

Estimate shear strain amplitude, γ

(based on Pradel (1998))

$$\gamma = \left[\frac{1 + \alpha \cdot e^{bR}}{1 + \alpha}\right] \cdot R \cdot 100\ (\%)$$

$$R = \frac{\tau_{av}}{G_0}\ \text{(Note } \tau_{av} \text{ and } G_0 \text{ same units)}$$

$$\alpha = 0.0389 \cdot \left(\frac{\sigma_v}{p_a}\right) + 0.124$$

$$b = 6400 \cdot \left(\frac{\sigma_v}{p_a}\right)$$

Estimate volumetric strain in 15 cycles

$$\varepsilon_{vol(15)} = \gamma \cdot \left[\frac{(N_1)_{60,cs}}{20}\right]^{-1.20}$$

$$(N_1)_{60,cs} = \frac{Q_{tn,cs}}{8.5 \cdot \left[1 - \frac{I_c}{4.6}\right]}$$

Volumetric strain in design earthquake

$$\Sigma_{vol} = \varepsilon_{vol(15)} \cdot \left[\frac{N_c}{15}\right]^{0.45}$$

$$N_c = (M - 4)^{2.17}$$

Seismic settlement, s

$$s = 2 \cdot \int_0^{GWT} \Sigma_{vol} \cdot dz$$

Robertson, P.K. and Lisheng, S., 2010, "Estimation of seismic compression in dry soils using the CPT" FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, Symposium in honor of professor I. M. Idriss, San Diego, CA

Liquefaction Potential Index (LPI) calculation procedure

Calculation of the Liquefaction Potential Index (LPI) is used to interpret the liquefaction assessment calculations in terms of severity over depth. The calculation procedure is based on the methology developed by Iwasaki (1982) and is adopted by AFPS.

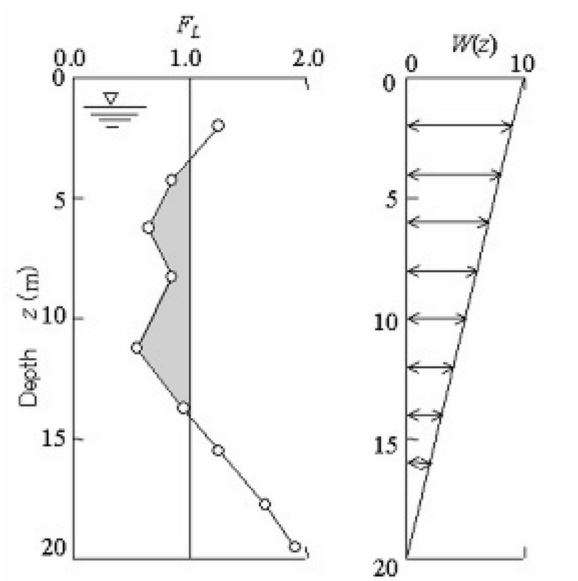
To estimate the severity of liquefaction extent at a given site, LPI is calculated based on the following equation:

$$\mathbf{LPI} = \int_0^{20} (10 - 0{,}5_z) \times F_L \times d_z$$

where:
F_L = 1 - F.S. when F.S. less than 1
F_L = 0 when F.S. greater than 1
z depth of measurment in meters

Values of LPI range between zero (0) when no test point is characterized as liquefiable and 100 when all points are characterized as susceptible to liquefaction. Iwasaki proposed four (4) discrete categories based on the numeric value of LPI:

- LPI = 0 : Liquefaction risk is very low
- 0 < LPI <= 5 : Liquefaction risk is low
- 5 < LPI <= 15 : Liquefaction risk is high
- LPI > 15 : Liquefaction risk is very high



Graphical presentation of the LPI calculation procedure

Shear-Induced Building Settlement (Ds) calculation procedure

The shear-induced building settlement (Ds) due to liquefaction below the building can be estimated using the relationship developed by Bray and Macedo (2017):

$$Ln(Ds) = c1 + c2 * LBS + 0.58 * Ln\left(Tanh\left(\frac{HL}{6}\right)\right) +$$

$$4.59 * Ln(Q) - 0.42 * Ln(Q)^2 - 0.02 * B +$$
$$0.84 * Ln(CAVdp) + 0.41 * Ln(Sa1) + \varepsilon$$

where Ds is in the units of mm, c1= -8.35 and c2= 0.072 for LBS ≤ 16, and c1= -7.48 and c2= 0.014 otherwise. Q is the building contact pressure in units of kPa, HL is the cumulative thickness of the liquefiable layers in the units of m, B is the building width in the units of m, CAVdp is a standardized version of the cumulative absolute velocity in the units of g-s, Sa1 is 5%-damped pseudo-acceleration response spectral value at a period of 1 s in the units of g, and ε is a normal random variable with zero mean and 0.50 standard deviation in Ln units. The liquefaction-induced building settlement index (LBS) is:

$$LBS = \sum W * \frac{\varepsilon_{shear}}{z} dz$$

where z (m) is the depth measured from the ground surface > 0, W is a foundation-weighting factor wherein W = 0.0 for z less than Df, which is the embedment depth of the foundation, and W = 1.0 otherwise. The shear strain parameter (ε_shear) is the liquefaction-induced free-field shear strain (in %) estimated using Zhang et al. (2004). It is calculated based on the estimated Dr of the liquefied soil layer and the calculated safety factor against liquefaction triggering (FSL).

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APPENDIX F

SITE-SPECIFIC GROUND MOTION HAZARD ANALYSIS

Leighton

APPENDIX F

Site-Specific Ground Motion Hazard Analysis

Code-based seismic design parameters derived from the USGS online tool are appended at the end of this appendix.

Leighton performed a site-specific ground motion study using the computer program Hazard Spectrum Application (OpenSHA, 2019), in accordance with the requirements of the 2019 California Building Code (CBC) and ASCE 7-16. A site-specific seismic hazard analysis was performed and the results processed in accordance with the procedures of ASCE 7-16.

Attenuation Relationships

Attenuation relationships (Ground Motion Prediction Equations or GMPEs) describe the relation of ground motion levels with earthquake magnitude and distance (distance between the site and seismic source), site geology, and subsurface characterization. These relationships can be used to describe the variation of peak ground acceleration and response spectral acceleration with earthquake magnitude and distance, and to also incorporate the local geological conditions and near-source effects.

We used three GMPEs: Boore et. al. (2014) NGA West 2, Campbell and Bozorgnia (2014) NGA West 2, and Chiou and Youngs (2014) NGA West 2. These GMPEs are based on the median rotated direction (RotD50) of horizontal ground motion. Site Class D and the measured Vs30 of 325 m/sec were used with the selected GMPEs.

Design Criteria

The earthquake ground motions considered include the Risk-Targeted Maximum Considered Earthquake (MCER) and the Design Earthquake (DE). The MCER is defined as the maximum component of horizontal ground motion with a 2% probability of exceedance in 50 years (2,475-year average return interval) adjusted for targeted risk (ASCE 7-16). The DE ground motions are defined as 2/3 of MCER ground motions (ASCE 7-16).

Methodology

The 2019 CBC requires the procedures of Chapter 21, Site-Specific Ground Motion Procedures for Seismic Design, of ASCE 7-16 be used to determine site-specific seismic response spectra and design parameters. We performed both deterministic and probabilistic seismic hazard analyses (DSHA and PSHA) and process the results in accordance with the procedures in Chapter 21 of ASCE 7-16.

Probabilistic Seismic Hazard Analysis

A PSHA is a mathematical process based on probability and statistics that is used to estimate the mean number of events per year in which the level of some ground motion parameter, Z (peak ground acceleration and/or spectral response acceleration in this study), exceeds a specified value z at the project site. This mean number of events per year, also referred to as "annual frequency of exceedance," is designated as "$v(Z \geq z)$." The inverse of this number is called the "average return period (ARP)," which is expressed in terms of years. Having the annual frequency of exceedance of a certain level of acceleration or spectral response acceleration, $v(Z \geq z)$, the probability of exceeding that level $Pr(Z \geq z)$, within any time period of interest, t, is then obtained assuming a Poisson Distribution as follows:

$$Pr(Z \geq z) = 1 - e - \upsilon(Z \geq z)t$$

PSHA procedures require the specification of probability functions to describe the uncertainty in both the time and location of future earthquake occurrences and the uncertainty in the ground motion level that will be produced at the site.

The basic key elements of a PSHA are:

- Defining the location, geometry, and characteristics of earthquake sources relative the site;
- Specifying an earthquake recurrence relationship for various magnitudes on each source up to the maximum magnitude;
- Selecting appropriate attenuation relationships, which relate the variation of the earthquake ground motion parameter with earthquake distance, directivity, magnitude, site geology, and subsurface characterization; and
- Determining the probability of exceedance of peak ground accelerations and/or response spectral levels (i.e., seismic hazards) utilizing the above input parameters.

The frequencies of exceedance of peak ground accelerations and spectral response accelerations at the site were calculated by evaluating the following:

- The annual frequency of earthquakes of various magnitudes on a fault obtained from the fault recurrence relationships;

- Given an earthquake of a certain magnitude on a certain fault, the probability distribution of the location of the earthquake on the fault was obtained using the selected rupture area versus magnitude relationship and assuming equal likelihood of rupture along the length and some prescribed probabilities along the depth of the fault; and

- Given an earthquake of a certain magnitude occurring at a certain distance from the site, the probability distribution of ground motion at the site was obtained from the selected attenuation relationships.

The above process is repeated a sufficient number of times to cover all the sources, then summed to obtain the total seismic hazard at the site. This process results in a relationship between ground motion level and the probability of being exceeded.

The computer program Hazard Spectrum Application (OpenSHA, 2019) was used to perform the seismic hazard analysis.

Deterministic Seismic Hazard Analysis

The DSHA consists of a four-step process (Reiter, 1990):

- Defining the location, geometry, and characteristics of earthquake sources relative to the site;

- Determination of the site-to-source distance for each earthquake source defined relative to the site;

- Selection of the controlling earthquake relative to the site as defined by some ground motion parameter. The controlling earthquake is defined by the seismic scenario based on the above two steps that produces the largest magnitude of the ground motion parameter being used; and

- Using the controlling earthquake, the deterministic ground motions at the site is obtained from the selected attenuation relationships.

- Deterministic ground motions represent the 84th percentile average horizontal component and modified using Shahi and Baker (2014) to represent the maximum component horizontal ground motions.

The NGA-West2 deterministic spreadsheet by the Pacific Earthquake Engineering Research Center (PEER, 2015) was used for the DSHA.

Code-Based General Seismic Response Spectra and Design Parameters

Seismic response spectra and design parameters were computed as determined by Chapter 11 of ASCE 7-16. These values are used to process the site-specific design response spectrum to ensure the site-specific DE and MCER response spectra meet or exceed minimum requirements. The Seismic Design Map Tool by the United States Geological Survey (USGS) was used to determine the code-specific seismic response spectra and design parameters.

The code-based parameters determined from the referenced USGS program are attached at the end of this appendix.

Site-Specific Response Spectra

The site-specific MCER and DE response spectra were developed per the methodology prescribed in Chapter 21 of ASCE 7-16. Site-specific response spectra for MCER and DE were computed for a structural damping ratio of 5 percent of critical damping. Targeted risk coefficients were determined from mapped values in ASCE 7-16 to calculate MCER.

We used the Shahi and Baker (2014) SaRotD100/SaRotD50 factors to develop the maximum component of horizontal ground motion as required in the definition of ground motion in the current building codes (2019 CBC and ASCE 7-16). These factors enabled us to estimate the maximum horizontal component of ground motion.

Table 1: Site-Specific Seismic Ground Motion Analysis per ASCE 7-16

Project Name: El Camino College - Fire Training Facility
Date: May 2021

Project Location: 16670 Crenshaw Boulevard, Torrance, CA
Latitude: 33.881184°

Project Number: 10535.020
Longitude: -118.329844°

Site Class: D

Shear Wave Velocity: 270 m/sec

Return Period: 2475 years (2% probability of exceedance in 50 years)

Percent Damping: 5%

Seismic Design Coefficients: Per ASCE 7-16 & 2019 CBC

S_s	1.793	**S_{MS}**	**2.001**	T_0	0.177
S_1	0.635	**S_{M1}**	**1.593**	T_s	0.885
F_a	1	**S_{DS}**	**1.334**	T_L	8
F_v	2.5	**S_{D1}**	**1.062**	**PGA_M**	**0.824**
C_{RS}	0.903	C_{R1}	0.899		

	Sec. 21.2.1.1 Probabilistic				Sec. 21.2.2 Deterministic			Sec. 11.4.6 General Procedure	Sec. 21.3 Design Response Spectrum				Risk Targeted Spectrum
Period (sec)	Spectral Acceleration (g)	Seismic Risk Coefficients	Maximum Response Coefficients	MCE_R Response Spectrum (g)	Spectral Acceleration (g)	Maximum Response Coefficients	MCE_R Response Spectrum (g)	Design Response Spectral Acceleration (g)	Lower Limit of General Procedure - 80% of S_a (g)	MCE_R - S_{aM} (g)	2/3 * S_{aM} (g)	Design Response Spectrum (g)	1.5 * Design Response Spectrum (g)
0.01	0.824	0.903	1.19	0.885	1.083	1.19	1.288	0.519	0.415	0.885	0.590	0.590	0.885
0.02	0.827	0.903	1.19	0.889	1.063	1.19	1.265	0.559	0.447	0.889	0.593	0.593	0.889
0.03	0.846	0.903	1.19	0.909	1.076	1.19	1.280	0.600	0.480	0.909	0.606	0.606	0.909
0.05	0.966	0.903	1.19	1.038	1.156	1.19	1.375	0.681	0.545	1.038	0.692	0.692	1.038
0.075	1.214	0.903	1.19	1.305	1.349	1.19	1.606	0.782	0.626	1.305	0.870	0.870	1.305
0.1	1.430	0.903	1.19	1.537	1.549	1.19	1.843	0.883	0.707	1.537	1.024	1.024	1.537
0.15	1.676	0.903	1.20	1.816	1.794	1.20	2.152	1.086	0.869	1.816	1.211	1.211	1.816
0.2	1.824	0.903	1.21	1.992	2.032	1.21	2.458	1.195	0.956	1.992	1.328	1.328	1.992
0.25	1.937	0.903	1.22	2.133	2.231	1.22	2.722	1.195	0.956	2.133	1.422	1.422	2.133
0.3	2.019	0.903	1.22	2.223	2.459	1.22	3.001	1.195	0.956	2.223	1.482	1.482	2.223
0.4	2.002	0.902	1.23	2.221	2.659	1.23	3.271	1.195	0.956	2.221	1.481	1.481	2.221
0.5	1.915	0.902	1.23	2.123	2.635	1.23	3.241	1.195	0.956	2.123	1.416	1.416	2.123
0.75	1.575	0.900	1.24	1.758	2.303	1.24	2.855	1.195	0.956	1.758	1.172	1.172	1.758
1	1.319	0.899	1.24	1.471	1.910	1.24	2.368	1.058	0.847	1.471	0.981	0.981	1.471
1.5	0.937	0.899	1.24	1.045	1.337	1.24	1.658	0.706	0.564	1.045	0.697	0.697	1.045
2	0.715	0.899	1.24	0.797	1.014	1.24	1.258	0.529	0.423	0.797	0.531	0.531	0.797
3	0.461	0.899	1.25	0.518	0.609	1.25	0.762	0.353	0.282	0.518	0.345	0.345	0.518
4	0.319	0.899	1.26	0.362	0.393	1.26	0.495	0.265	0.212	0.362	0.241	0.241	0.362
5	0.236	0.899	1.26	0.268	0.277	1.26	0.348	0.212	0.169	0.268	0.178	0.178	0.268
7.5	0.131	0.899	1.28	0.151	0.132	1.28	0.170	0.141	0.113	0.151	0.101	0.113	0.169
10	0.080	0.899	1.29	0.093	0.073	1.29	0.094	0.085	0.068	0.093	0.062	0.068	0.102

ATC Hazards by Location

Search Information

Coordinates:	33.881184, -118.329844
Elevation:	47 ft
Timestamp:	2021-05-11T22:47:41.853Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	III
Site Class:	D

Basic Parameters

Name	Value	Description
S_S	1.793	MCE_R ground motion (period=0.2s)
S_1	0.635	MCE_R ground motion (period=1.0s)
S_{MS}	1.793	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.195	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.903	Coefficient of risk (0.2s)
CR_1	0.899	Coefficient of risk (1.0s)
PGA	0.777	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.855	Site modified peak ground acceleration
T_L	8	Long-period transition period (s)
SsRT	1.793	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.986	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.425	Factored deterministic acceleration value (0.2s)

S1RT	0.635	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.707	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.835	Factored deterministic acceleration value (1.0s)
PGAd	0.987	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (update…

Latitude

Decimal degrees

33.881184

Longitude

Decimal degrees, negative values for western longitudes

-118.329844

Site Class

259 m/s (Site class D)

Spectral Period

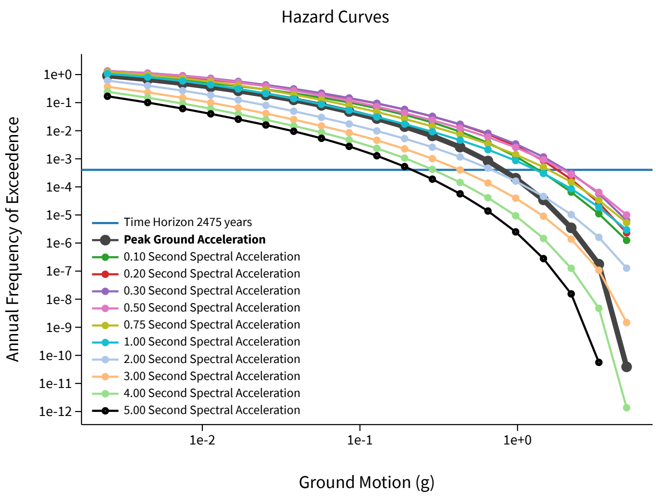
Peak Ground Acceleration

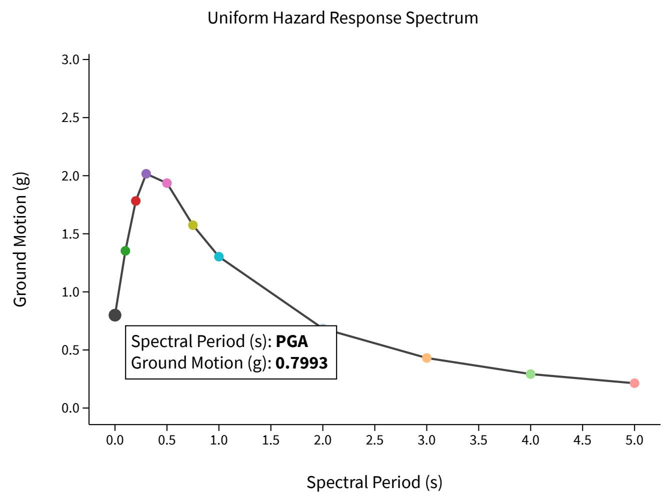
Time Horizon

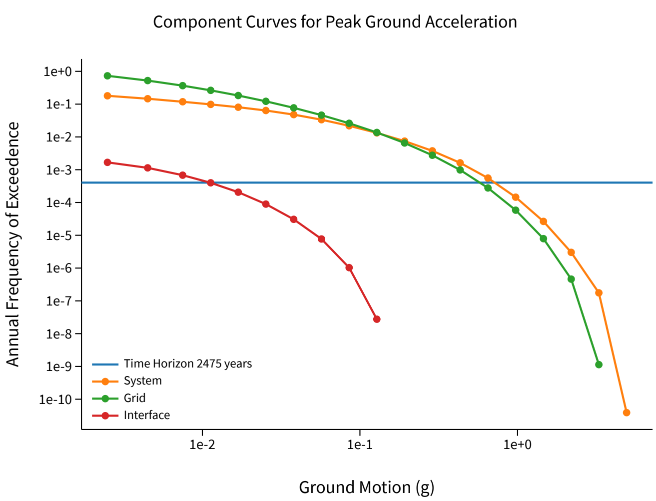
Return period in years

2475

Hazard Curve





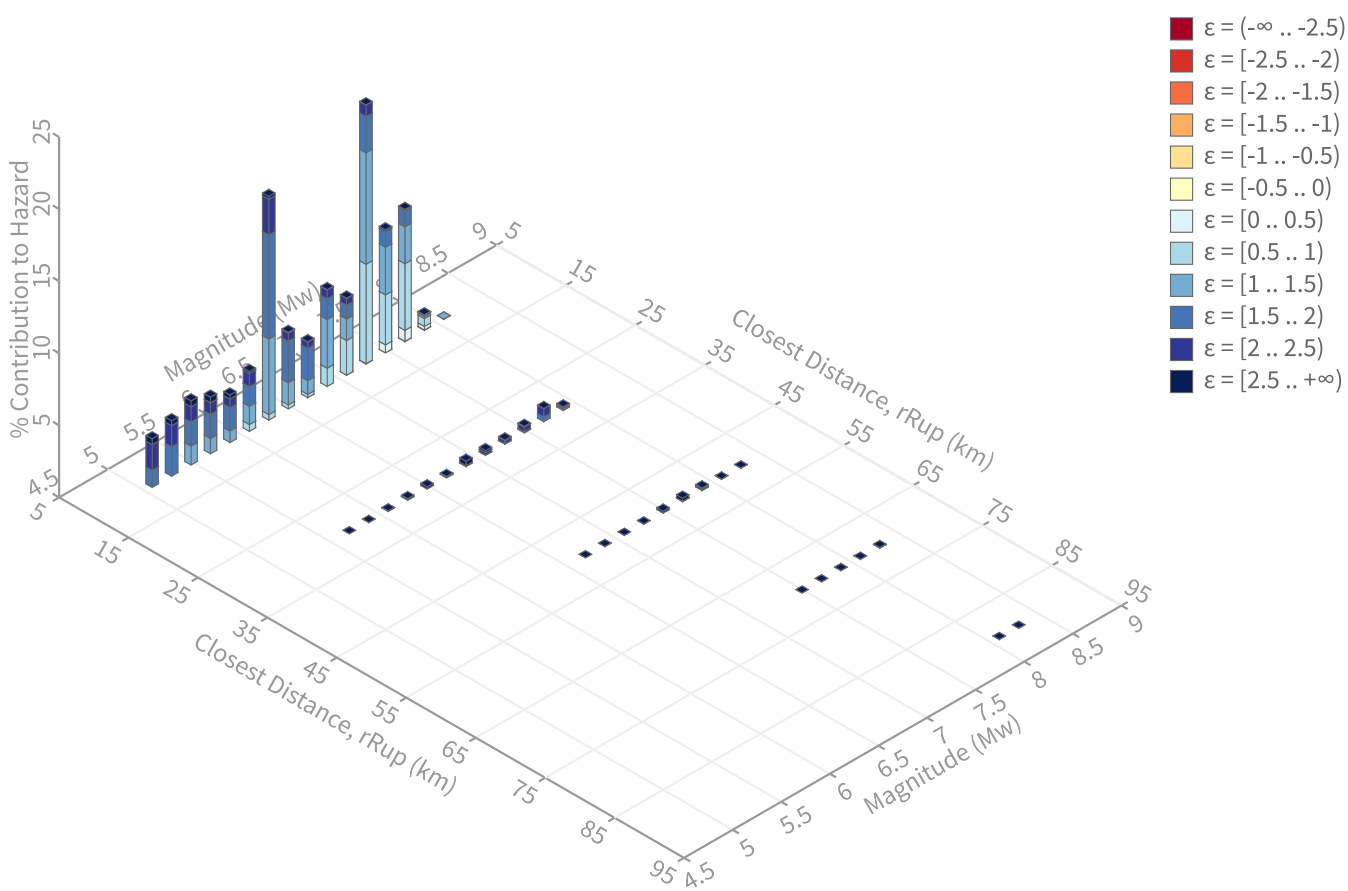


View Raw Data

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.79930417 g

Recovered targets

Return period: 2933.9589 yrs
Exceedance rate: 0.00034083641 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.07 %

Mean (over all sources)

m: 6.72
r: 8.77 km
ε_0: 1.46 σ

Mode (largest m-r bin)

m: 7.3
r: 8.32 km
ε_0: 1.17 σ
Contribution: 17.97 %

Mode (largest m-r-ε_0 bin)

m: 7.3
r: 8.54 km
ε_0: 1.35 σ
Contribution: 7.73 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							37.51
Newport-Inglewood alt 1 [6]		5.38	7.35	0.99	118.283°W	33.906°N	57.58	9.17
Palos Verdes [12]		9.35	7.18	1.55	118.377°W	33.808°N	208.06	7.64
Newport-Inglewood alt 1 [7]		6.11	6.36	1.56	118.316°W	33.933°N	12.60	6.31
Compton [2]		7.49	7.26	0.78	118.354°W	33.844°N	208.29	5.51
San Pedro Escarpment [0]		6.96	7.63	0.54	118.434°W	33.771°N	218.29	1.44
UC33brAvg_FM32	System							32.43
Palos Verdes [12]		9.35	7.29	1.52	118.377°W	33.808°N	208.06	7.29
Newport-Inglewood alt 2 [6]		5.91	7.35	1.02	118.284°W	33.916°N	47.83	7.07
Compton [2]		7.49	7.33	0.76	118.354°W	33.844°N	208.29	6.14
Newport-Inglewood alt 2 [7]		6.44	6.37	1.59	118.305°W	33.933°N	21.89	4.14
San Pedro Escarpment [0]		6.96	7.63	0.60	118.434°W	33.771°N	218.29	1.08
Palos Verdes [13]		9.47	6.48	1.89	118.415°W	33.835°N	236.91	1.03
UC33brAvg_FM31 (opt)	Grid							15.29
PointSourceFinite: -118.330, 33.913		6.14	5.68	1.55	118.330°W	33.913°N	0.00	3.33
PointSourceFinite: -118.330, 33.913		6.14	5.68	1.55	118.330°W	33.913°N	0.00	3.33
PointSourceFinite: -118.330, 33.940		7.85	5.78	1.78	118.330°W	33.940°N	0.00	2.19
PointSourceFinite: -118.330, 33.940		7.85	5.78	1.78	118.330°W	33.940°N	0.00	2.19
UC33brAvg_FM32 (opt)	Grid							14.77
PointSourceFinite: -118.330, 33.913		6.14	5.68	1.55	118.330°W	33.913°N	0.00	3.21
PointSourceFinite: -118.330, 33.913		6.14	5.68	1.55	118.330°W	33.913°N	0.00	3.21
PointSourceFinite: -118.330, 33.940		7.85	5.79	1.78	118.330°W	33.940°N	0.00	2.10
PointSourceFinite: -118.330, 33.940		7.85	5.79	1.78	118.330°W	33.940°N	0.00	2.10

X-Axis: Period (sec)
Y-Axis: SA (g)
Number of Data Sets: 1

DATASET #1

Name:
Num Points: 21
Info:
IMR Param List:

IMR = NGAWest2 2014 Averaged No Idriss; IMR Weights = ['Abrahamson, Silva & Kamai (2014)': 0.25, 'Boore, Stewart, Seyhan & Atkinson (2014)': 0.25, 'Campbell & Bozorgnia (2014)': 0.25, 'Chiou & Youngs (2014)': 0.25]; Std Dev Type = Total; Tectonic Region = Active Shallow Crust; Additional Epistemic Uncertainty = null; Component = RotD50; Gaussian Truncation = None

Site Param List:

Longitude = -118.329844; Latitude = 33.881184; Vs30 = 270.0; Vs30 Type = Measured; Depth 2.5 km/sec = 3.7; Depth 1.0 km/sec = 700.0

IML/Prob Param List:

Map Type = IML@Prob; Probability = 0.02

Forecast Param List:

Eqk Rup Forecast = Mean UCERF3; Mean UCERF3 Presets = (POISSON ONLY) Both FM Branch Averaged; Apply Aftershock Filter = false; Aleatory Mag-Area StdDev = 0.0; Background Seismicity = Include; Treat Background Seismicity As = Point Sources; Fault Grid Spacing = 1.0; Probability Model = Poisson; Sect Upper Depth Averaging Tolerance = 100.0; Use Mean Upper Depth = true; Rup Mag Averaging Tolerance = 1.0; Rupture Rake To Use = Def. Model Mean; Fault Model(s) = Both; Ignore Cache = false

TimeSpan Param List:

Duration = 50.0

Maximum Distance = 200.0; Pt Src Dist Corr = None

X, Y Data:
0.01 0.8239131
0.02 0.827337
0.03 0.8457601
0.05 0.96581
0.075 1.2140468
0.1 1.4300624
0.15 1.6763266
0.2 1.8235515
0.25 1.9371276
0.3 2.019105
0.4 2.0019608

0.5	1.9148377
0.75	1.5746305
1.0	1.3194265
1.5	0.93722504
2.0	0.71459657
3.0	0.46060008
4.0	0.31924888
5.0	0.23632132
7.5	0.13137154
10.0	0.08018152

Compton (2)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	*Weighted average of the natural logarithm of the spectral values*

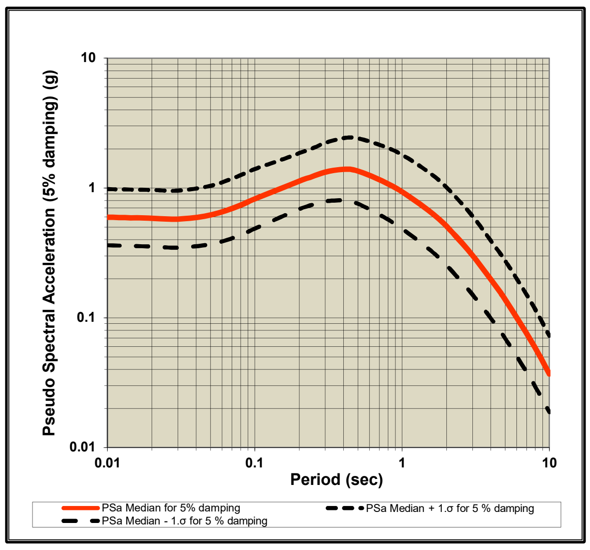
GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1	
Damping ratio (%)	5	*Modification factors are calculated in Sheet DSF*

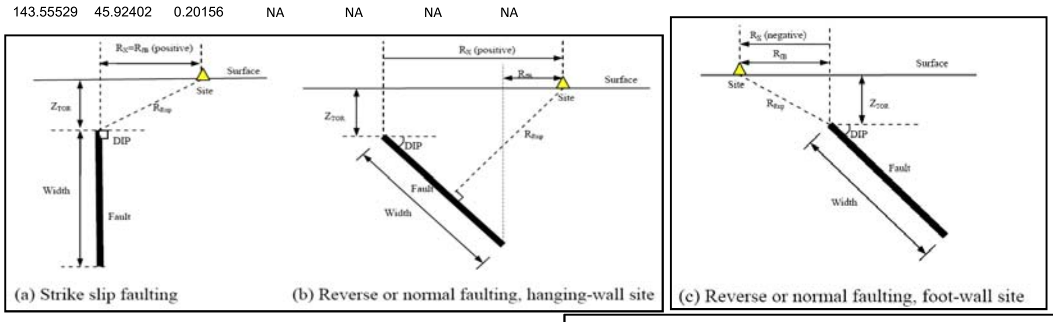
ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

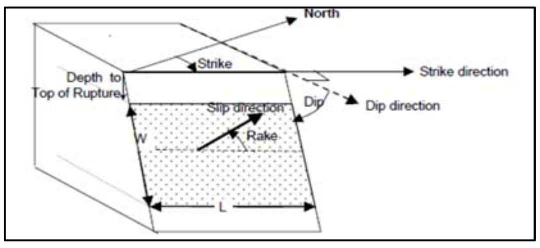
RotD50 Horizontal Component of PGA, PGV and *IMs*

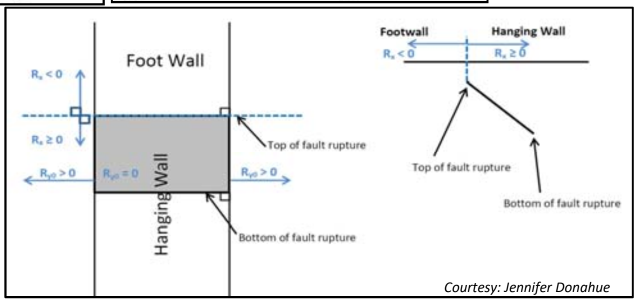
GMP	*T* (s)	Baseline: 5% Damping PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	User defined: 5% Damping PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	**0.01**	0.59505	0.97921	0.36161	0.00148	0.59505	0.97921	0.36161	0.00148
	0.02	0.58397	0.96407	0.35373	0.00580	0.58397	0.96407	0.35373	0.00580
	0.03	0.57543	0.95404	0.34708	0.01286	0.57486	0.95308	0.34673	0.01284
	0.05	0.61796	1.03788	0.36793	0.03835	0.61796	1.03788	0.36793	0.03835
	0.075	0.71383	1.21378	0.41981	0.09967	0.71526	1.21620	0.42065	0.09987
	0.1	0.82190	1.39423	0.48451	0.20402	0.82436	1.39841	0.48596	0.20464
	0.15	0.98660	1.63820	0.59417	0.55105	0.98857	1.64148	0.59536	0.55215
	0.2	1.12660	1.85030	0.68596	1.11865	1.12885	1.85400	0.68733	1.12089
	0.25	1.22766	2.02486	0.74433	1.90470	1.23135	2.03094	0.74656	1.91041
	0.3	1.32301	2.22219	0.78767	2.95578	1.32433	2.22441	0.78846	2.95873
	0.4	1.39043	2.41625	0.80013	5.52250	1.39182	2.41866	0.80093	5.52803
	0.5	1.35072	2.41122	0.75665	8.38249	1.35207	2.41363	0.75741	8.39087
	0.75	1.11734	2.09303	0.59648	15.60175	1.11734	2.09303	0.59648	15.60175
	1	0.93487	1.80345	0.48462	23.20701	0.93394	1.80164	0.48414	23.18380
	1.5	0.67479	1.33191	0.34188	37.68951	0.67547	1.33324	0.34222	37.72720
	2	0.50816	1.01436	0.25458	50.45808	0.50715	1.01233	0.25407	50.35717
	3	0.30369	0.60949	0.15131	67.84744	0.30338	0.60888	0.15116	67.77960
	4	0.19747	0.39251	0.09935	78.43255	0.19728	0.39212	0.09925	78.35412
	5	0.13882	0.27651	0.06970	86.15083	0.13840	0.27568	0.06949	85.89237
	7.5	0.06669	0.13246	0.03357	93.11476	0.06649	0.13207	0.03347	92.83541
	10	0.03697	0.07276	0.01879	91.78454	0.03683	0.07247	0.01871	91.41740
PGA (g)	**0**	0.57423	0.94427	0.34920	0.00143	0.57423	0.94427	0.34920	0.00143
PGV (cm/s)	**-1**	81.19504	143.55529	45.92402	0.20156	NA	NA	NA	NA



Input variables	Errors and warnings
M_w	
7.45	
R_{RUP} (km)	
7.49	
R_{JB} (km)	
0	
R_X (km)	
4.7	
Ry0 (km)	*If unknown use 999*
999	
V_{S30} (m/sec)	
270	
U (BSSA13)	*1: Unspecified fault mech.*
0	
F_{RV}	*1: reverse fault*
1	
F_{NM}	*1: normal fault*
0	
F_{HW}	*1: hanging wall side*
1	
Dip (deg)	
20	
Z_{TOR} (km)	*If unknown use 999*
999	
Z_{HYP} (km)	*If unknown use 999*
999	
$Z_{1.0}$ (km)	*If unknown use 999*
0.7	
$Z_{2.5}$ (km)	*If unknown use 999*
3.7	
W (km)	*If unknown use 999*
27.37	
Vs30Flag	
measured	*Choose options for V_{s30} from the list*
F_{AS}	
no	*Aftershock effect is not applicable.*
Region	
California	*Choose region from the list*







Courtesy: Jennifer Donahue

Calculated Variables/Flags

ΔDPP	*Always 0 for median calcs.*
0	
PGA_r (g)	
0.471	
Z_{BOT} (km) (CB14)	*Enter for default W calcs*
15	
SS	
0	*auto calculated*
$V_{s30Flag}$	
1	*measured*
F_{AS}	
0	*Aftershock effect is not applicable.*
Region	
0	*California*
Option for Sa value	
1	*Weighted average of the natural logarithm of the spectral values*

Definition of Parameters

- ***Damping ratio*** = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
- ***PSA*** = Pseudo-absolute acceleration response spectrum (g)
- ***PGA*** = Peak ground acceleration (g)
- ***PGV*** = Peak ground velocity (cm/s)
- ***S_d*** = Relative displacement response spectrum (cm)
- ***M_w*** = Moment magnitude
- ***R_{RUP}*** = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
- ***R_{JB}*** = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
- ***R_X*** = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
- ***R_{y0}*** = The horizontal distance off the end of the rupture measured parallel to strike (km)
- ***V_{S30}*** = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
- ***U*** = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
- ***F_{RV}*** = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
- ***F_{NM}*** = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
- ***F_{HW}*** = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
- ***Dip*** = Average dip of rupture plane (degrees)
- ***Z_{TOR}*** = Depth to top of coseismic rupture (km)
- ***Z_{HYP}*** = Hypocentral depth from the earthquake
- ***$Z_{1.0}$*** = Depth to Vs=1 km/sec
- ***$Z_{2.5}$*** = Depth to Vs=2.5 km/sec
- ***W*** = Fault rupture width (km)
- ***$V_{s30flag}$*** = 1 for measured, 0 for inferred Vs30
- ***F_{AS}*** = 0 for mainshock; 1 for aftershock
- ***Region*** = Specific regions considered in the models, Click on Region to see codes
- ***ΔDPP*** = Directivity term, direct point parameter; uses 0 for median predictions
- ***PGA_r (g)*** = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
- ***Z_{BOT} (km)*** = The depth to the bottom of the seismogenic crust
- ***Z_{BOR} (km)*** = The depth to the bottom of the rupture plane
- ***SS*** = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	27.37			42.251		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		**0.220**			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			**5.000**		
Z_{tor} (km)	999.00			**0.549**	**0.549**	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

Newport-Inglewood Alt 1 (6)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	*Weighted average of the natural logarithm of the spectral values*

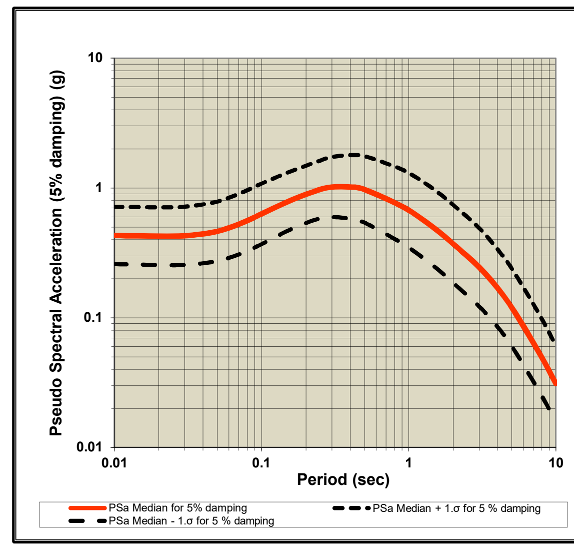
GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1	
Damping ratio (%)	5	*Modification factors are calculated in Sheet DSF*

ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

RotD50 Horizontal Component of PGA, PGV and *IMs*

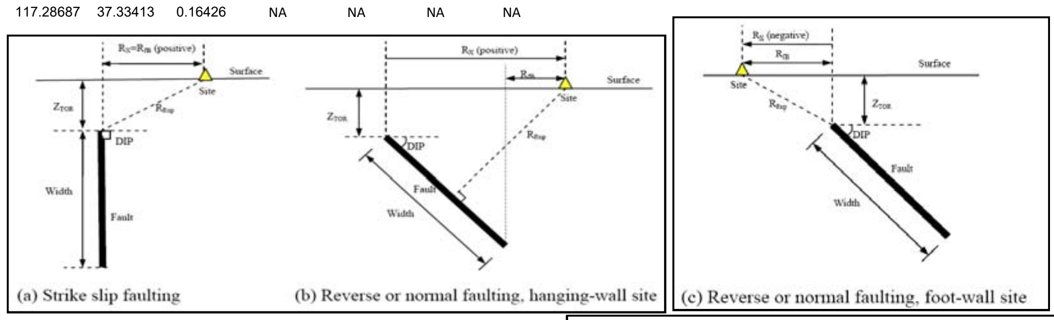
GMP	*T* (s)	Baseline: 5% Damping				User defined: 5% Damping			
		PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	**0.01**	0.43004	0.71527	0.25856	0.00107	0.43004	0.71527	0.25856	0.00107
	0.02	0.42554	0.71013	0.25500	0.00423	0.42554	0.71013	0.25500	0.00423
	0.03	0.42827	0.71761	0.25559	0.00957	0.42784	0.71689	0.25534	0.00956
	0.05	0.46268	0.78439	0.27291	0.02871	0.46268	0.78439	0.27291	0.02871
	0.075	0.54140	0.92827	0.31577	0.07560	0.54249	0.93013	0.31640	0.07575
	0.1	0.62943	1.07694	0.36788	0.15625	0.63132	1.08017	0.36898	0.15672
	0.15	0.78082	1.30979	0.46548	0.43611	0.78238	1.31241	0.46641	0.43699
	0.2	0.88923	1.47763	0.53513	0.88296	0.89101	1.48058	0.53620	0.88472
	0.25	0.96887	1.61875	0.57990	1.50318	0.97274	1.62522	0.58222	1.50919
	0.3	1.01494	1.72796	0.59614	2.26751	1.01595	1.72968	0.59674	2.26978
	0.4	1.01698	1.78782	0.57850	4.03922	1.01800	1.78961	0.57907	4.04326
	0.5	0.97343	1.75499	0.53992	6.04100	0.97440	1.75675	0.54046	6.04704
	0.75	0.79697	1.50372	0.42240	11.12839	0.79697	1.50372	0.42240	11.12839
	1	0.67482	1.30865	0.34798	16.75164	0.67415	1.30734	0.34764	16.73489
	1.5	0.48749	0.96463	0.24636	27.22793	0.48798	0.96559	0.24661	27.25515
	2	0.37188	0.74294	0.18615	36.92569	0.37114	0.74145	0.18577	36.85184
	3	0.24605	0.49383	0.12259	54.97062	0.24580	0.49334	0.12247	54.91565
	4	0.17000	0.33790	0.08553	67.52008	0.16983	0.33756	0.08544	67.45256
	5	0.12081	0.24062	0.06065	74.97073	0.12044	0.23990	0.06047	74.74582
	7.5	0.05650	0.11223	0.02844	78.88828	0.05638	0.11200	0.02838	78.73050
	10	0.03120	0.06139	0.01585	77.44807	0.03107	0.06115	0.01579	77.13827
PGA (g)	**0**	0.42325	0.70347	0.25466	0.00105	0.42325	0.70347	0.25466	0.00105
PGV (cm/s)	**-1**	66.17253	117.28687	37.33413	0.16426	NA	NA	NA	NA

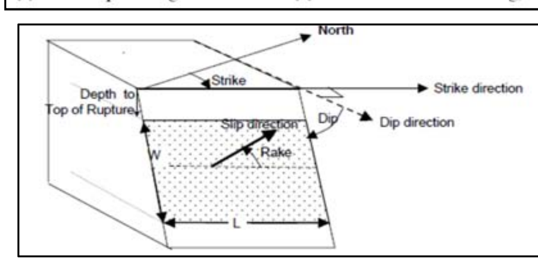


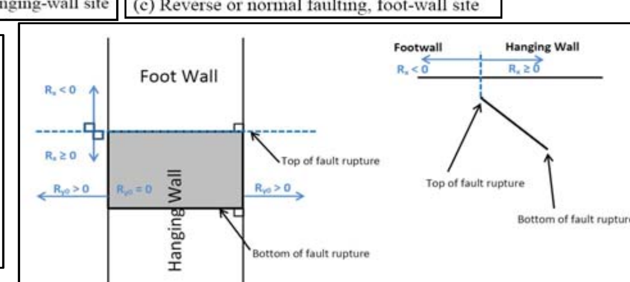
Input variables	Errors and warnings
M_w 7.15	
R_{RUP} (km) 5.38	
R_{JB} (km) 5.17	
R_X (km) -5.16	
Ry0 (km) 999	*If unknown use 999*
V_{S30} (m/sec) 270	
U (BSSA13) 0	*1: Unspecified fault mech.*
F_{RV} 0	*1: reverse fault*
F_{NM} 0	*1: normal fault*
F_{HW} 0	*1: hanging wall side*
Dip (deg) 88	
Z_{TOR} (km) 0	*If unknown use 999*
Z_{HYP} (km) 999	*If unknown use 999*
$Z_{1.0}$ (km) 0.7	*If unknown use 999*
$Z_{2.5}$ (km) 3.7	*If unknown use 999*
W (km) 13.15	*If unknown use 999*
Vs30Flag measured	*Choose options for V_{S30} from the list*
F_{AS} no	*Aftershock effect is not applicable.*
Region California	*Choose region from the list*

Calculated Variables/Flags

ΔDPP 0	*Always 0 for median calcs.*
PGA_r (g) 0.353	
Z_{BOT} (km) (CB14) 15	*Enter for default W calcs*
SS 1	*auto calculated*
$V_{s30Flag}$ 1	*measured*
F_{AS} 0	*Aftershock effect is not applicable.*
Region 0	*California*
Option for Sa value 1	*Weighted average of the natural logarithm of the spectral values*







Courtesy: Jennifer Donahue

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_X = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	13.15			14.970		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		0.220			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			10.265		
Z_{tor} (km)	0.00			0.039	0.039	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

Newport-Inglewood Alt 1 (7)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	*Weighted average of the natural logarithm of the spectral values*

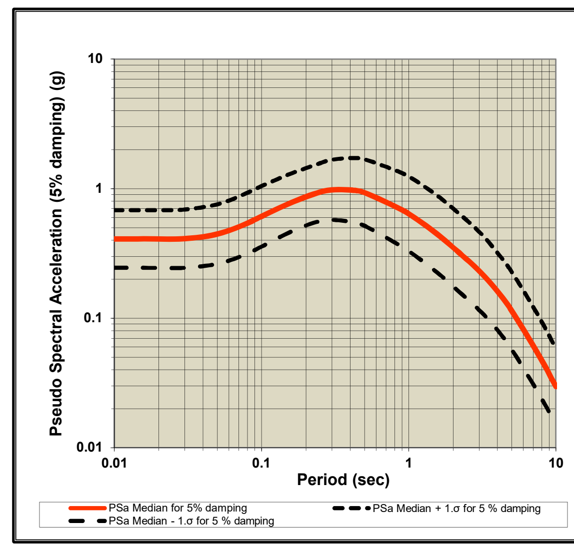
GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1	
Damping ratio (%)	5	*Modification factors are calculated in Sheet DSF*

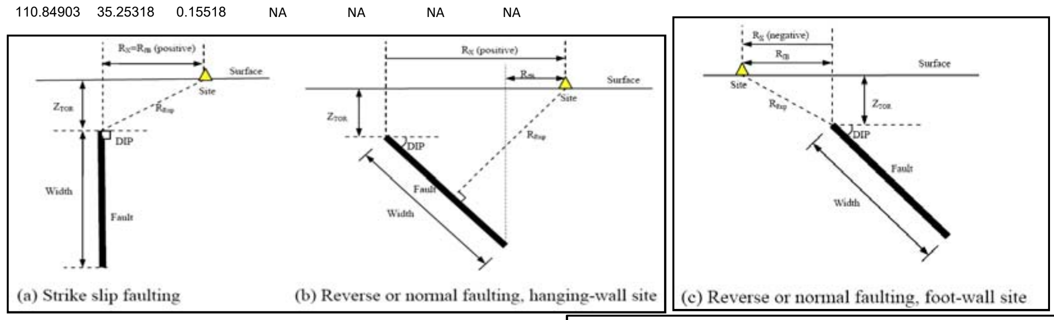
ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

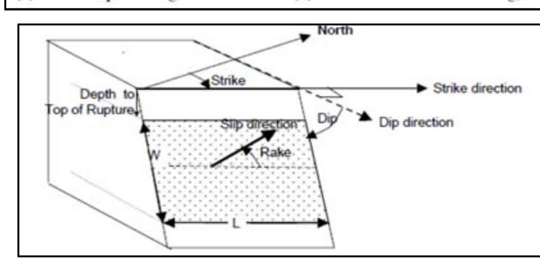
RotD50 Horizontal Component of PGA, PGV and *IMs*

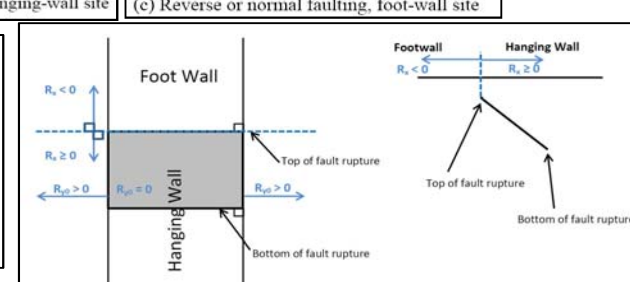
GMP	*T* (s)	Baseline: 5% Damping				User defined: 5% Damping			
		PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.40844	0.68044	0.24517	0.00101	0.40844	0.68044	0.24517	0.00101
	0.02	0.40813	0.68221	0.24417	0.00405	0.40813	0.68221	0.24417	0.00405
	0.03	0.41104	0.68988	0.24490	0.00918	0.41063	0.68919	0.24466	0.00917
	0.05	0.44492	0.75545	0.26204	0.02761	0.44492	0.75545	0.26204	0.02761
	0.075	0.52227	0.89672	0.30418	0.07293	0.52332	0.89852	0.30479	0.07307
	0.1	0.60862	1.04283	0.35521	0.15108	0.61045	1.04596	0.35627	0.15154
	0.15	0.75690	1.27179	0.45047	0.42276	0.75842	1.27434	0.45137	0.42360
	0.2	0.86188	1.43486	0.51770	0.85580	0.86360	1.43773	0.51874	0.85751
	0.25	0.93620	1.56727	0.55924	1.45250	0.93901	1.57197	0.56092	1.45686
	0.3	0.97763	1.66771	0.57310	2.18415	0.97861	1.66937	0.57367	2.18633
	0.4	0.97548	1.71760	0.55400	3.87439	0.97645	1.71932	0.55456	3.87826
	0.5	0.93127	1.68129	0.51584	5.77942	0.93221	1.68297	0.51635	5.78520
	0.75	0.75770	1.43103	0.40118	10.57997	0.75770	1.43103	0.40118	10.57997
	1	0.63958	1.24120	0.32957	15.87663	0.63894	1.23995	0.32924	15.86075
	1.5	0.46125	0.91306	0.23301	25.76248	0.46171	0.91398	0.23324	25.78824
	2	0.35189	0.70310	0.17611	34.94049	0.35118	0.70169	0.17576	34.87060
	3	0.23270	0.46705	0.11594	51.98794	0.23247	0.46658	0.11582	51.93595
	4	0.16118	0.32038	0.08109	64.01846	0.16102	0.32006	0.08101	63.95444
	5	0.11472	0.22850	0.05760	71.19409	0.11438	0.22782	0.05742	70.98051
	7.5	0.05392	0.10712	0.02715	75.29616	0.05382	0.10690	0.02709	75.14556
	10	0.02974	0.05851	0.01511	73.81410	0.02962	0.05828	0.01505	73.51885
PGA (g)	0	0.40618	0.67618	0.24399	0.00101	0.40618	0.67618	0.24399	0.00101
PGV (cm/s)	-1	62.51225	110.84903	35.25318	0.15518	NA	NA	NA	NA



Input variables	Errors and warnings
M_w	
7.15	
R_{RUP} (km)	
6.11	
R_{JB} (km)	
5.93	
R_X (km)	
-4.26	
Ry0 (km)	*If unknown use 999*
999	
V_{S30} (m/sec)	
270	
U (BSSA13)	*1: Unspecified fault mech.*
0	
F_{RV}	*1: reverse fault*
0	
F_{NM}	*1: normal fault*
0	
F_{HW}	*1: hanging wall side*
0	
Dip (deg)	
88	
Z_{TOR} (km)	*If unknown use 999*
0	
Z_{HYP} (km)	*If unknown use 999*
999	
$Z_{1.0}$ (km)	*If unknown use 999*
0.7	
$Z_{2.5}$ (km)	*If unknown use 999*
3.7	
W (km)	*If unknown use 999*
13.51	
Vs30Flag	
measured	*Choose options for V_{S30} from the list*
F_{AS}	
no	*Aftershock effect is not applicable.*
Region	
California	*Choose region from the list*







Courtesy: Jennifer Donahue

Calculated Variables/Flags

ΔDPP	*Always 0 for median calcs.*
0	
PGA_r (g)	
0.334	
Z_{BOT} (km) (CB14)	*Enter for default W calcs*
15	
SS	
1	*auto calculated*
$V_{s30Flag}$	
1	*measured*
F_{AS}	
0	*Aftershock effect is not applicable.*
Region	
0	*California*
Option for Sa value	
1	*Weighted average of the natural logarithm of the spectral values*

Definition of Parameters

- ***Damping ratio*** = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
- ***PSA*** = Pseudo-absolute acceleration response spectrum (g)
- ***PGA*** = Peak ground acceleration (g)
- ***PGV*** = Peak ground velocity (cm/s)
- ***S_d*** = Relative displacement response spectrum (cm)
- ***M_w*** = Moment magnitude
- ***R_{RUP}*** = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustration
- ***R_{JB}*** = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustration
- ***R_X*** = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
- ***R_{y0}*** = The horizontal distance off the end of the rupture measured parallel to strike (km)
- ***V_{S30}*** = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
- ***U*** = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
- ***F_{RV}*** = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
- ***F_{NM}*** = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
- ***F_{HW}*** = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
- ***Dip*** = Average dip of rupture plane (degrees)
- ***Z_{TOR}*** = Depth to top of coseismic rupture (km)
- ***Z_{HYP}*** = Hypocentral depth from the earthquake
- ***$Z_{1.0}$*** = Depth to Vs=1 km/sec
- ***$Z_{2.5}$*** = Depth to Vs=2.5 km/sec
- ***W*** = Fault rupture width (km)
- ***$V_{s30flag}$*** = 1 for measured, 0 for inferred Vs30
- ***F_{AS}*** = 0 for mainshock; 1 for aftershock
- ***Region*** = Specific regions considered in the models, Click on Region to see codes
- ***ΔDPP*** = Directivity term, direct point parameter; uses 0 for median predictions
- ***PGA_r (g)*** = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
- ***Z_{BOT} (km)*** = The depth to the bottom of the seismogenic crust
- ***Z_{BOR} (km)*** = The depth to the bottom of the rupture plane
- ***SS*** = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	13.51			14.970		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		0.220			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			10.265		
Z_{tor} (km)	0.00			0.039	0.039	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

Newport-Inglewood Alt 2 (6)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	Weighted average of the natural logarithm of the spectral values

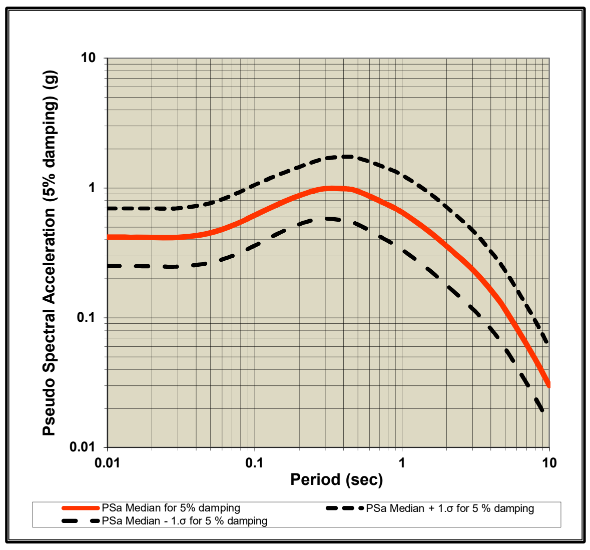
GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1	
Damping ratio (%)	5	Modification factors are calculated in Sheet DSF

ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

RotD50 Horizontal Component of PGA, PGV and *IMs*

GMP	*T* (s)	Baseline: 5% Damping				User defined: 5% Damping			
		PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.41720	0.69473	0.25054	0.00104	0.41720	0.69473	0.25054	0.00104
	0.02	0.41626	0.69548	0.24914	0.00413	0.41626	0.69548	0.24914	0.00413
	0.03	0.41575	0.69746	0.24782	0.00929	0.41533	0.69676	0.24757	0.00928
	0.05	0.44977	0.76336	0.26501	0.02791	0.44977	0.76336	0.26501	0.02791
	0.075	0.52751	0.90537	0.30736	0.07366	0.52857	0.90718	0.30797	0.07381
	0.1	0.61434	1.05221	0.35869	0.15250	0.61619	1.05537	0.35977	0.15296
	0.15	0.76351	1.28230	0.45461	0.42645	0.76504	1.28486	0.45552	0.42730
	0.2	0.86944	1.44670	0.52252	0.86331	0.87118	1.44959	0.52356	0.86503
	0.25	0.94520	1.58147	0.56492	1.46646	0.94804	1.58621	0.56662	1.47086
	0.3	0.98787	1.68427	0.57941	2.20703	0.98886	1.68595	0.57999	2.20924
	0.4	0.98683	1.73683	0.56069	3.91948	0.98782	1.73857	0.56126	3.92340
	0.5	0.94278	1.70143	0.52241	5.85084	0.94373	1.70313	0.52293	5.85669
	0.75	0.76835	1.45077	0.40693	10.72878	0.76835	1.45077	0.40693	10.72878
	1	0.64913	1.25949	0.33456	16.11383	0.64848	1.25823	0.33422	16.09772
	1.5	0.46836	0.92704	0.23663	26.15964	0.46883	0.92797	0.23686	26.18580
	2	0.35731	0.71391	0.17883	35.47932	0.35660	0.71249	0.17848	35.40836
	3	0.23632	0.47431	0.11774	52.79711	0.23608	0.47384	0.11763	52.74431
	4	0.16358	0.32514	0.08230	64.97016	0.16342	0.32481	0.08222	64.90519
	5	0.11637	0.23180	0.05843	72.22125	0.11603	0.23110	0.05825	72.00459
	7.5	0.05462	0.10851	0.02750	76.27348	0.05451	0.10829	0.02744	76.12093
	10	0.03013	0.05930	0.01531	74.80021	0.03001	0.05906	0.01525	74.50101
PGA (g)	0	0.41084	0.68364	0.24690	0.00102	0.41084	0.68364	0.24690	0.00102
PGV (cm/s)	-1	63.50179	112.58982	35.81565	0.15763	NA	NA	NA	NA

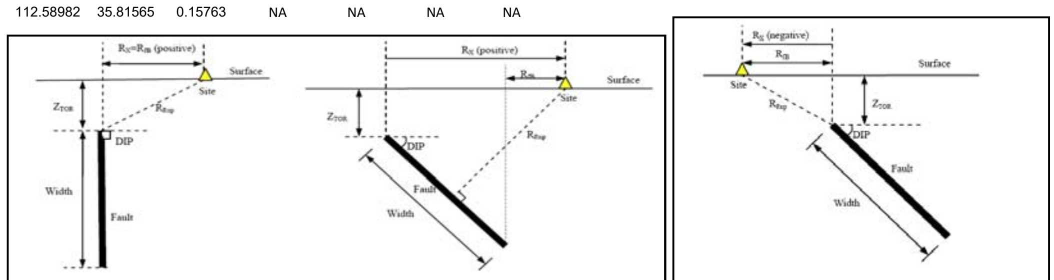


Input variables | Errors and warnings

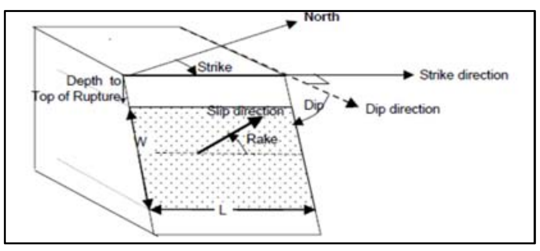
Input variables	Value	Errors and warnings
M_w	7.15	
R_{RUP} (km)	5.91	
R_{JB} (km)	5.71	
R_X (km)	-5.7	
Ry0 (km)	999	*If unknown use 999*
V_{S30} (m/sec)	270	
U (BSSA13)	0	*1: Unspecified fault mech.*
F_{RV}	0	*1: reverse fault*
F_{NM}	0	*1: normal fault*
F_{HW}	0	*1: hanging wall side*
Dip (deg)	90	
Z_{TOR} (km)	0	*If unknown use 999*
Z_{HYP} (km)	999	*If unknown use 999*
$Z_{1.0}$ (km)	0.7	*If unknown use 999*
$Z_{2.5}$ (km)	3.7	*If unknown use 999*
W (km)	13.59	*If unknown use 999*
Vs30Flag	measured	*Choose options for V_{S30} from the list*
F_{AS}	no	*Aftershock effect is not applicable.*
Region	California	*Choose region from the list*

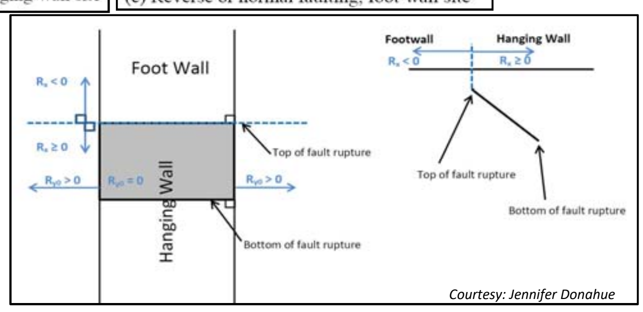
Calculated Variables/Flags

ΔDPP	0	*Always 0 for median calcs.*
PGA_r (g)	0.339	
Z_{BOT} (km) (CB14)	15	*Enter for default W calcs*
SS	1	*auto calculated*
$V_{s30Flag}$	1	*measured*
F_{AS}	0	*Aftershock effect is not applicable.*
Region	0	*California*
Option for Sa value	1	*Weighted average of the natural logarithm of the spectral values*



(a) Strike slip faulting (b) Reverse or normal faulting, hanging-wall site (c) Reverse or normal faulting, foot-wall site





Courtesy: Jennifer Donahue

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_X = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	13.59			14.961		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		0.220			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			10.265		
Z_{tor} (km)	0.00			0.039	0.039	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

Newport-Inglewood Alt 2 (7)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	Weighted average of the natural logarithm of the spectral values

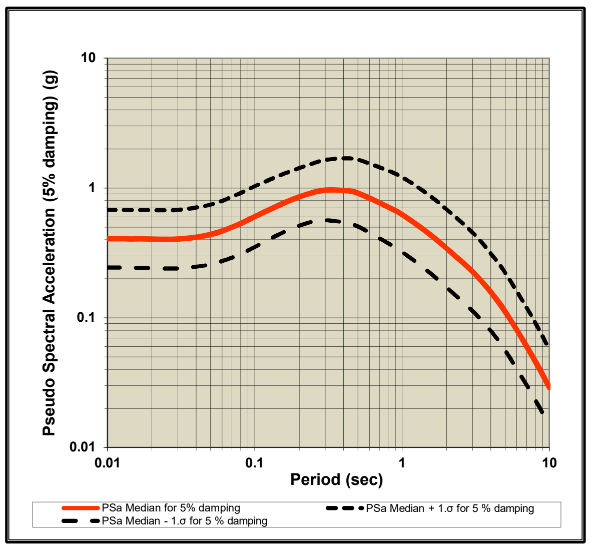
GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1	
Damping ratio (%)	5	Modification factors are calculated in Sheet DSF

ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

RotD50 Horizontal Component of PGA, PGV and *IMs*

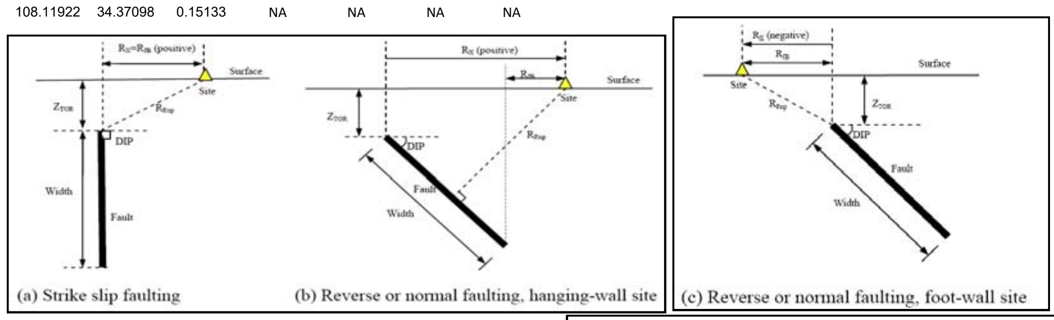
GMP	T (s)	Baseline: 5% Damping				User defined: 5% Damping			
		PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.40645	0.67761	0.24380	0.00101	0.40645	0.67761	0.24380	0.00101
	0.02	0.40367	0.67524	0.24132	0.00401	0.40367	0.67524	0.24132	0.00401
	0.03	0.40363	0.67796	0.24031	0.00902	0.40323	0.67728	0.24007	0.00901
	0.05	0.43729	0.74302	0.25736	0.02714	0.43729	0.74302	0.25736	0.02714
	0.075	0.51402	0.88314	0.29918	0.07177	0.51505	0.88490	0.29978	0.07192
	0.1	0.59961	1.02808	0.34971	0.14885	0.60141	1.03117	0.35076	0.14929
	0.15	0.74647	1.25525	0.44391	0.41693	0.74797	1.25776	0.44480	0.41776
	0.2	0.84992	1.41618	0.51008	0.84392	0.85162	1.41902	0.51110	0.84561
	0.25	0.92198	1.54485	0.55024	1.43043	0.92474	1.54949	0.55189	1.43472
	0.3	0.96145	1.64157	0.56311	2.14800	0.96241	1.64322	0.56367	2.15015
	0.4	0.95755	1.68725	0.54343	3.80319	0.95851	1.68894	0.54397	3.80700
	0.5	0.91312	1.64951	0.50547	5.66673	0.91403	1.65116	0.50598	5.67240
	0.75	0.74094	1.40000	0.39214	10.34598	0.74094	1.40000	0.39214	10.34598
	1	0.62457	1.21246	0.32173	15.50406	0.62394	1.21125	0.32141	15.48856
	1.5	0.45008	0.89110	0.22733	25.13865	0.45053	0.89200	0.22756	25.16379
	2	0.34335	0.68609	0.17183	34.09289	0.34266	0.68472	0.17148	34.02470
	3	0.22699	0.45560	0.11310	50.71366	0.22677	0.45514	0.11298	50.66295
	4	0.15740	0.31285	0.07919	62.51547	0.15724	0.31254	0.07911	62.45295
	5	0.11210	0.22328	0.05628	69.56824	0.11176	0.22261	0.05611	69.35953
	7.5	0.05281	0.10490	0.02659	73.73971	0.05270	0.10469	0.02653	73.59223
	10	0.02910	0.05727	0.01479	72.24550	0.02899	0.05704	0.01473	71.95651
PGA (g)	0	0.39883	0.66443	0.23940	0.00099	0.39883	0.66443	0.23940	0.00099
PGV (cm/s)	-1	60.96035	108.11922	34.37098	0.15133	NA	NA	NA	NA

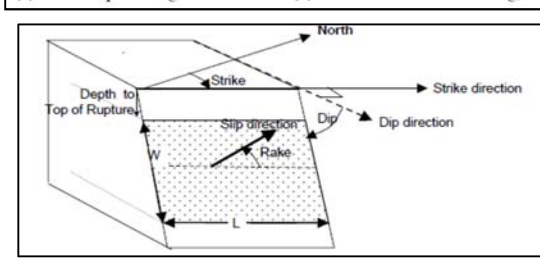


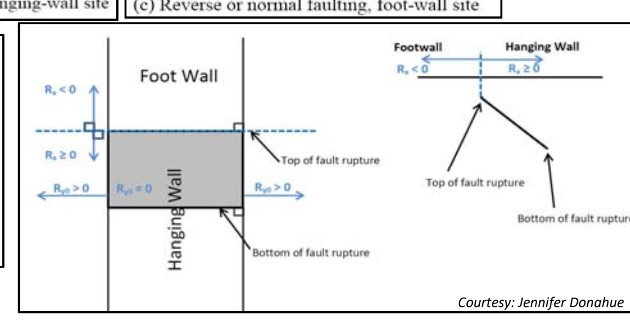
Input variables	Errors and warnings
M_w = 7.15	
R_{RUP} (km) = 6.44	
R_{JB} (km) = 6.26	
R_X (km) = -5.24	
Ry0 (km) = 999	If unknown use 999
V_{S30} (m/sec) = 270	
U (BSSA13) = 0	1: Unspecified fault mech.
F_{RV} = 0	1: reverse fault
F_{NM} = 0	1: normal fault
F_{HW} = 0	1: hanging wall side
Dip (deg) = 90	
Z_{TOR} (km) = 0	If unknown use 999
Z_{HYP} (km) = 999	If unknown use 999
$Z_{1.0}$ (km) = 0.7	If unknown use 999
$Z_{2.5}$ (km) = 3.7	If unknown use 999
W (km) = 13.59	If unknown use 999
Vs30Flag = measured	Choose options for V_{S30} from the list
F_{AS} = no	Aftershock effect is not applicable.
Region = California	Choose region from the list

Calculated Variables/Flags

ΔDPP = 0	Always 0 for median calcs.
PGA_r (g) = 0.326	
Z_{BOT} (km) (CB14) = 15	Enter for default W calcs
SS = 1	auto calculated
$V_{s30Flag}$ = 1	measured
F_{AS} = 0	Aftershock effect is not applicable.
Region = 0	California
Option for Sa value = 1	Weighted average of the natural logarithm of the spectral values







Definition of Parameters

- ***Damping ratio*** = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
- ***PSA*** = Pseudo-absolute acceleration response spectrum (g)
- ***PGA*** = Peak ground acceleration (g)
- ***PGV*** = Peak ground velocity (cm/s)
- ***S_d*** = Relative displacement response spectrum (cm)
- ***M_w*** = Moment magnitude
- ***R_{RUP}*** = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
- ***R_{JB}*** = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
- ***R_X*** = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
- ***R_{y0}*** = The horizontal distance off the end of the rupture measured parallel to strike (km)
- ***V_{S30}*** = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
- ***U*** = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
- ***F_{RV}*** = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
- ***F_{NM}*** = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
- ***F_{HW}*** = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
- ***Dip*** = Average dip of rupture plane (degrees)
- ***Z_{TOR}*** = Depth to top of coseismic rupture (km)
- ***Z_{HYP}*** = Hypocentral depth from the earthquake
- ***$Z_{1.0}$*** = Depth to Vs=1 km/sec
- ***$Z_{2.5}$*** = Depth to Vs=2.5 km/sec
- ***W*** = Fault rupture width (km)
- ***$V_{s30flag}$*** = 1 for measured, 0 for inferred Vs30
- ***F_{AS}*** = 0 for mainshock; 1 for aftershock
- ***Region*** = Specific regions considered in the models, Click on Region to see codes
- ***ΔDPP*** = Directivity term, direct point parameter; uses 0 for median predictions
- ***PGA_r (g)*** = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
- ***Z_{BOT} (km)*** = The depth to the bottom of the seismogenic crust
- ***Z_{BOR} (km)*** = The depth to the bottom of the rupture plane
- ***SS*** = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	13.59			14.961		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		0.220			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			10.265		
Z_{tor} (km)	0.00			0.039	0.039	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

Palos Verdes (12)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	*Weighted average of the natural logarithm of the spectral values*

GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

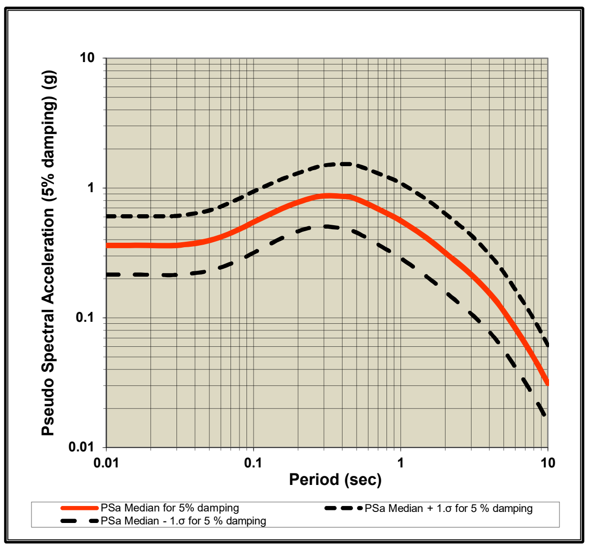
# of std. dev.	1	
Damping ratio (%)	5	*Modification factors are calculated in Sheet DSF*

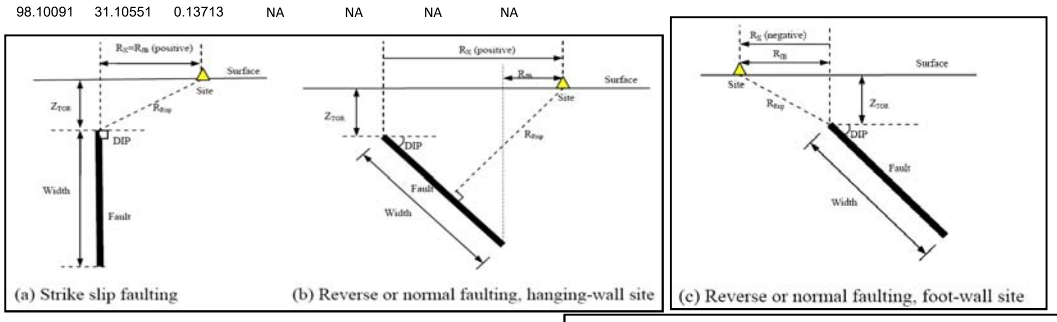
ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

RotD50 Horizontal Component of PGA, PGV and *IMs*

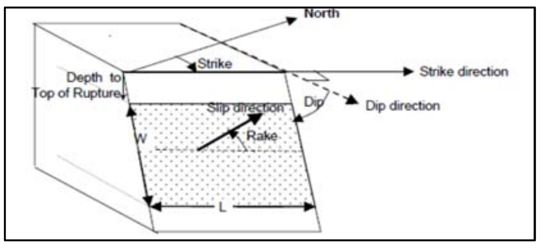
Input variables	Errors and warnings
M_w: 7.38	
R_{RUP} (km): 9.35	
R_{JB} (km): 9.25	
R_X (km): 9.25	
Ry0 (km): 999	*If unknown use 999*
V_{S30} (m/sec): 270	
U (BSSA13): 0	*1: Unspecified fault mech.*
F_{RV}: 0	*1: reverse fault*
F_{NM}: 0	*1: normal fault*
F_{HW}: 1	*1: hanging wall side*
Dip (deg): 90	
Z_{TOR} (km): 0	*If unknown use 999*
Z_{HYP} (km): 999	*If unknown use 999*
$Z_{1.0}$ (km): 0.7	*If unknown use 999*
$Z_{2.5}$ (km): 3.7	*If unknown use 999*
W (km): 12.24	*If unknown use 999*
Vs30Flag: measured	*Choose options for V_{s30} from the list*
F_{AS}: no	*Aftershock effect is not applicable.*
Region: California	*Choose region from the list*

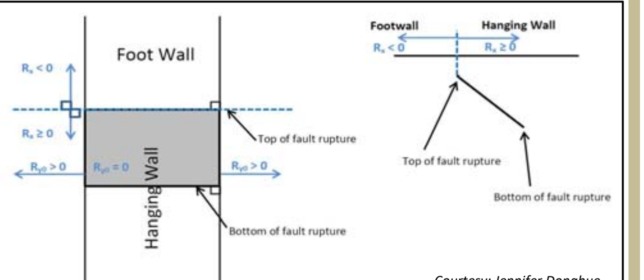
GMP	T (s)	Baseline: 5% Damping				User defined: 5% Damping			
		PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.36030	0.60358	0.21508	0.00089	0.36030	0.60358	0.21508	0.00089
	0.02	0.36023	0.60554	0.21429	0.00358	0.36023	0.60554	0.21429	0.00358
	0.03	0.36130	0.60994	0.21402	0.00807	0.36094	0.60933	0.21380	0.00806
	0.05	0.39255	0.67028	0.22990	0.02436	0.39255	0.67028	0.22990	0.02436
	0.075	0.46386	0.80064	0.26874	0.06477	0.46478	0.80224	0.26928	0.06490
	0.1	0.54316	0.93573	0.31528	0.13483	0.54479	0.93853	0.31623	0.13524
	0.15	0.67887	1.14770	0.40156	0.37917	0.68023	1.15000	0.40236	0.37993
	0.2	0.77356	1.29633	0.46160	0.76810	0.77510	1.29893	0.46252	0.76964
	0.25	0.83510	1.40727	0.49556	1.29564	0.83760	1.41149	0.49705	1.29952
	0.3	0.86759	1.48935	0.50540	1.93832	0.86846	1.49084	0.50591	1.94025
	0.4	0.86184	1.52492	0.48708	3.42303	0.86270	1.52645	0.48757	3.42646
	0.5	0.82209	1.49013	0.45354	5.10185	0.82292	1.49162	0.45400	5.10695
	0.75	0.66378	1.25701	0.35052	9.26861	0.66378	1.25701	0.35052	9.26861
	1	0.55983	1.08844	0.28794	13.89704	0.55927	1.08736	0.28765	13.88314
	1.5	0.41070	0.81373	0.20729	22.93910	0.41111	0.81455	0.20749	22.96204
	2	0.31808	0.63576	0.15914	31.58412	0.31745	0.63449	0.15883	31.52095
	3	0.21608	0.43371	0.10766	48.27594	0.21587	0.43328	0.10755	48.22766
	4	0.15478	0.30764	0.07787	61.47368	0.15462	0.30733	0.07779	61.41221
	5	0.11293	0.22494	0.05670	70.08534	0.11259	0.22427	0.05653	69.87508
	7.5	0.05591	0.11106	0.02815	78.07214	0.05574	0.11073	0.02806	77.83792
	10	0.03132	0.06162	0.01591	77.73712	0.03119	0.06138	0.01585	77.42617
PGA (g)	0	0.35750	0.59844	0.21356	0.00089	0.35750	0.59844	0.21356	0.00089
PGV (cm/s)	-1	55.24019	98.10091	31.10551	0.13713	NA	NA	NA	NA





(a) Strike slip faulting (b) Reverse or normal faulting, hanging-wall site (c) Reverse or normal faulting, foot-wall site





Courtesy: Jennifer Donahue

Calculated Variables/Flags

ΔDPP	0	*Always 0 for median calcs.*
PGA_r (g)	0.284	
Z_{BOT} (km) (CB14)	15	*Enter for default W calcs*
SS	1	*auto calculated*
$V_{s30Flag}$	1	*measured*
F_{AS}	0	*Aftershock effect is not applicable.*
Region	0	*California*
Option for Sa value	1	*Weighted average of the natural logarithm of the spectral values*

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_X = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	12.24			15.000		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		0.220			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			10.227		
Z_{tor} (km)	0.00			0.000	0.000	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

Palos Verdes (13)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	Weighted average of the natural logarithm of the spectral values

GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

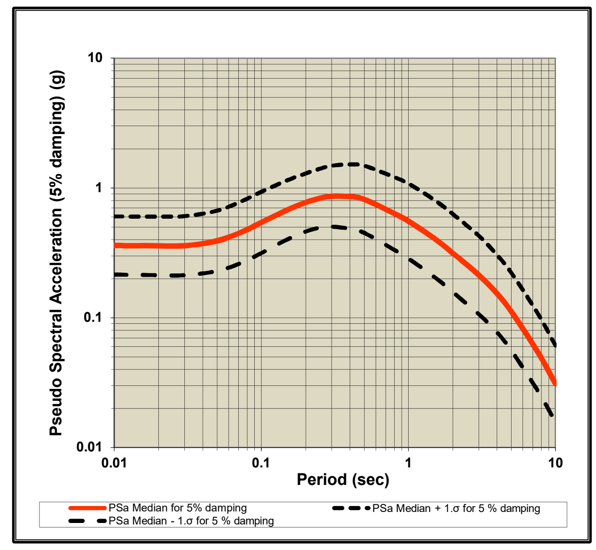
# of std. dev.	1	
Damping ratio (%)	5	Modification factors are calculated in Sheet DSF

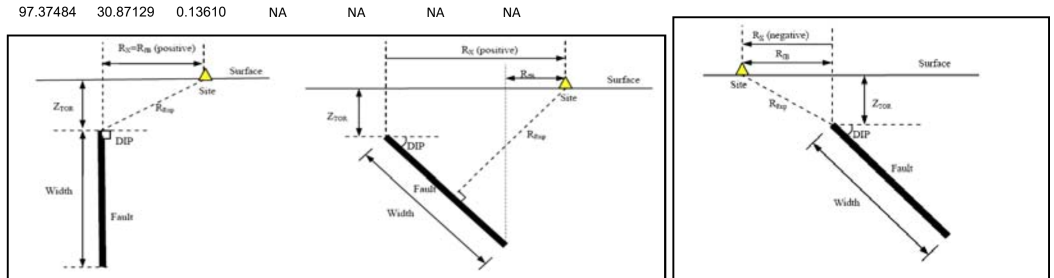
ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

RotD50 Horizontal Component of PGA, PGV and *IMs*

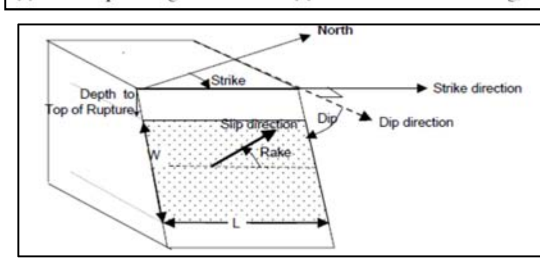
Input variables	Errors and warnings
M_w: 7.38	
R_{RUP} (km): 9.47	
R_{JB} (km): 9.37	
R_X (km): 9.37	
Ry0 (km): 999	If unknown use 999
V_{S30} (m/sec): 270	
U (BSSA13): 0	1: Unspecified fault mech.
F_{RV}: 0	1: reverse fault
F_{NM}: 0	1: normal fault
F_{HW}: 1	1: hanging wall side
Dip (deg): 90	
Z_{TOR} (km): 0	If unknown use 999
Z_{HYP} (km): 999	If unknown use 999
$Z_{1.0}$ (km): 0.7	If unknown use 999
$Z_{2.5}$ (km): 3.7	If unknown use 999
W (km): 12.24	If unknown use 999
Vs30Flag: measured	Choose options for V_{S30} from the list
F_{AS}: no	Aftershock effect is not applicable.
Region: California	Choose region from the list

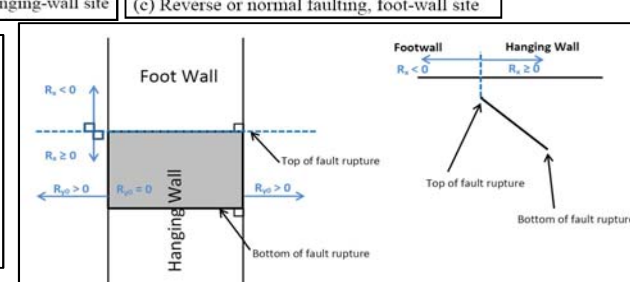
GMP	T (s)	Baseline: 5% Damping PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	User defined: 5% Damping PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.35988	0.60301	0.21478	0.00089	0.35988	0.60301	0.21478	0.00089
	0.02	0.35781	0.60161	0.21280	0.00355	0.35781	0.60161	0.21280	0.00355
	0.03	0.35931	0.60673	0.21279	0.00803	0.35895	0.60613	0.21257	0.00802
	0.05	0.39049	0.66693	0.22864	0.02423	0.39049	0.66693	0.22864	0.02423
	0.075	0.46159	0.79691	0.26736	0.06445	0.46251	0.79850	0.26790	0.06458
	0.1	0.54062	0.93159	0.31374	0.13420	0.54224	0.93438	0.31468	0.13461
	0.15	0.67583	1.14287	0.39965	0.37747	0.67718	1.14516	0.40044	0.37823
	0.2	0.77004	1.29082	0.45936	0.76460	0.77158	1.29340	0.46028	0.76613
	0.25	0.83102	1.40081	0.49299	1.28931	0.83351	1.40502	0.49447	1.29318
	0.3	0.86306	1.48199	0.50262	1.92819	0.86392	1.48347	0.50312	1.93012
	0.4	0.85688	1.51648	0.48417	3.40333	0.85773	1.51800	0.48465	3.40673
	0.5	0.81710	1.48135	0.45070	5.07084	0.81791	1.48283	0.45115	5.07591
	0.75	0.65933	1.24873	0.34812	9.20638	0.65933	1.24873	0.34812	9.20638
	1	0.55582	1.08076	0.28586	13.79761	0.55527	1.07968	0.28557	13.78381
	1.5	0.40766	0.80774	0.20574	22.76893	0.40806	0.80854	0.20595	22.79170
	2	0.31569	0.63098	0.15794	31.34608	0.31506	0.62972	0.15763	31.28339
	3	0.21443	0.43039	0.10683	47.90677	0.21422	0.42996	0.10673	47.85887
	4	0.15362	0.30535	0.07729	61.01637	0.15347	0.30505	0.07721	60.95536
	5	0.11211	0.22330	0.05628	69.57365	0.11177	0.22263	0.05612	69.36493
	7.5	0.05554	0.11033	0.02796	77.55396	0.05537	0.11000	0.02788	77.32130
	10	0.03111	0.06121	0.01581	77.21842	0.03098	0.06097	0.01574	76.90955
PGA (g)	0	0.35552	0.59526	0.21233	0.00088	0.35552	0.59526	0.21233	0.00088
PGV (cm/s)	-1	54.82779	97.37484	30.87129	0.13610	NA	NA	NA	NA





(a) Strike slip faulting (b) Reverse or normal faulting, hanging-wall site (c) Reverse or normal faulting, foot-wall site





Courtesy: Jennifer Donahue

Definition of Parameters

- ***Damping ratio*** = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
- ***PSA*** = Pseudo-absolute acceleration response spectrum (g)
- ***PGA*** = Peak ground acceleration (g)
- ***PGV*** = Peak ground velocity (cm/s)
- ***S_d*** = Relative displacement response spectrum (cm)
- ***M_w*** = Moment magnitude
- ***R_{RUP}*** = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
- ***R_{JB}*** = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
- ***R_X*** = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
- ***R_{y0}*** = The horizontal distance off the end of the rupture measured parallel to strike (km)
- ***V_{S30}*** = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
- ***U*** = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
- ***F_{RV}*** = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
- ***F_{NM}*** = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
- ***F_{HW}*** = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
- ***Dip*** = Average dip of rupture plane (degrees)
- ***Z_{TOR}*** = Depth to top of coseismic rupture (km)
- ***Z_{HYP}*** = Hypocentral depth from the earthquake
- ***$Z_{1.0}$*** = Depth to Vs=1 km/sec
- ***$Z_{2.5}$*** = Depth to Vs=2.5 km/sec
- ***W*** = Fault rupture width (km)
- ***$V_{s30flag}$*** = 1 for measured, 0 for inferred Vs30
- ***F_{AS}*** = 0 for mainshock; 1 for aftershock
- ***Region*** = Specific regions considered in the models, Click on Region to see codes
- ***ΔDPP*** = Directivity term, direct point parameter; uses 0 for median predictions
- ***PGA_r (g)*** = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
- ***Z_{BOT} (km)*** = The depth to the bottom of the seismogenic crust
- ***Z_{BOR} (km)*** = The depth to the bottom of the rupture plane
- ***SS*** = 1 for strike slip, automatically updated in the cell

Calculated Variables/Flags

Variable	Value	Comment
ΔDPP	0	Always 0 for median calcs.
PGA_r (g)	0.282	
Z_{BOT} (km) (CB14)	15	Enter for default W calcs
SS	1	auto calculated
$V_{s30Flag}$	1	measured
F_{AS}	0	Aftershock effect is not applicable.
Region	0	California
Option for Sa value	1	Weighted average of the natural logarithm of the spectral values

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	12.24			15.000		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		0.220			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			10.227		
Z_{tor} (km)	0.00			0.000	0.000	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

San Pedro Escarpment (0)

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric	*Weighted average of the natural logarithm of the spectral values*

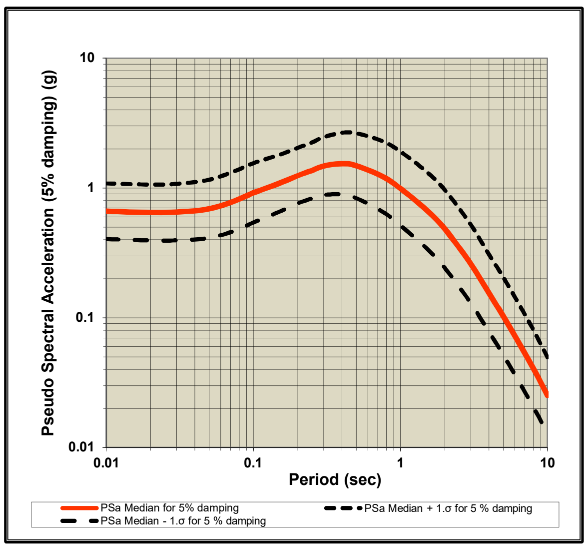
GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1	
Damping ratio (%)	5	*Modification factors are calculated in Sheet DSF*

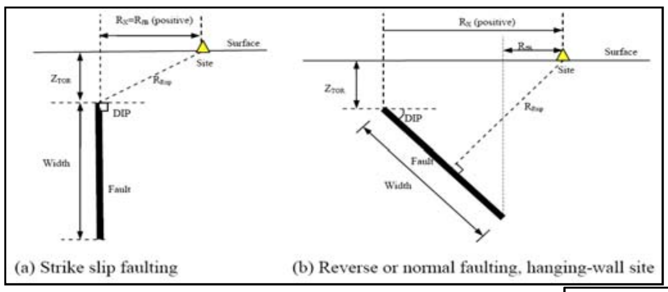
ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

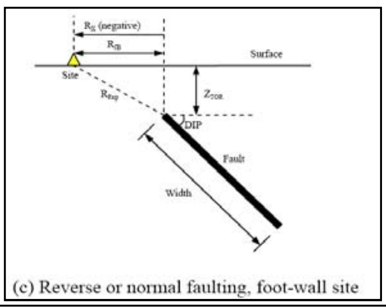
RotD50 Horizontal Component of PGA, PGV and *IMs*

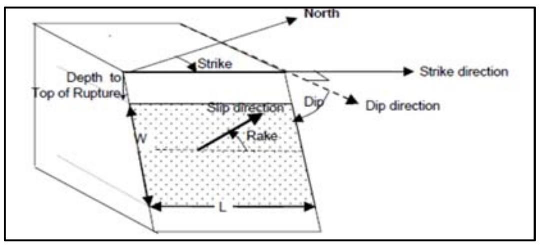
GMP	*T* (s)	Baseline: 5% Damping – PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	User defined: 5% Damping – PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	**0.01**	0.66104	1.08252	0.40366	0.00164	0.66104	1.08252	0.40366	0.00164
	0.02	0.64690	1.06284	0.39374	0.00642	0.64690	1.06284	0.39374	0.00642
	0.03	0.65149	1.07552	0.39464	0.01456	0.65149	1.07552	0.39464	0.01456
	0.05	0.68989	1.15552	0.41189	0.04281	0.68989	1.15552	0.41189	0.04281
	0.075	0.79471	1.34923	0.46810	0.11097	0.79630	1.35193	0.46903	0.11119
	0.1	0.91412	1.54857	0.53961	0.22692	0.91686	1.55321	0.54122	0.22760
	0.15	1.08280	1.79375	0.65363	0.60478	1.08496	1.79734	0.65494	0.60599
	0.2	1.24150	2.03178	0.75861	1.23275	1.24399	2.03584	0.76013	1.23521
	0.25	1.35890	2.23075	0.82779	2.10830	1.36297	2.23744	0.83028	2.11463
	0.3	1.47237	2.45948	0.88144	3.28947	1.47384	2.46194	0.88232	3.29276
	0.4	1.53801	2.65916	0.88956	6.10865	1.53955	2.66182	0.89044	6.11476
	0.5	1.48254	2.63486	0.83417	9.20055	1.48403	2.63750	0.83501	9.20975
	0.75	1.23294	2.30253	0.66020	17.21589	1.23294	2.30253	0.66020	17.21589
	1	0.99207	1.90991	0.51532	24.62688	0.99108	1.90800	0.51480	24.60225
	1.5	0.67799	1.33723	0.34375	37.86789	0.67867	1.33857	0.34409	37.90576
	2	0.48545	0.96892	0.24323	48.20299	0.48448	0.96698	0.24274	48.10658
	3	0.26146	0.52477	0.13027	58.41434	0.26120	0.52424	0.13014	58.35593
	4	0.15474	0.30756	0.07785	61.45814	0.15458	0.30726	0.07777	61.39668
	5	0.10331	0.20577	0.05187	64.11279	0.10300	0.20516	0.05171	63.92045
	7.5	0.04671	0.09278	0.02351	65.21733	0.04661	0.09259	0.02347	65.08689
	10	0.02528	0.04975	0.01285	62.75810	0.02518	0.04955	0.01280	62.50707
PGA (g)	**0**	0.64393	1.05376	0.39349	0.00160	0.64393	1.05376	0.39349	0.00160
PGV (cm/s)	**-1**	77.28342	136.45902	43.76938	0.19185	NA	NA	NA	NA

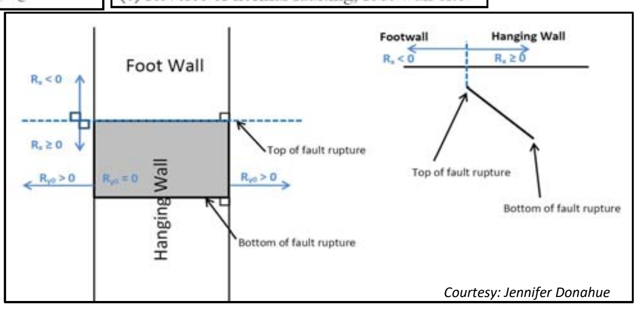


Input variables	Errors and warnings
M_w = 7.07	
R_{RUP} (km) = 6.96	
R_{JB} (km) = 0	
R_X (km) = 15.59	
Ry0 (km) = 999	*If unknown use 999*
V_{S30} (m/sec) = 270	
U (BSSA13) = 0	*1: Unspecified fault mech.*
F_{RV} = 1	*1: reverse fault*
F_{NM} = 0	*1: normal fault*
F_{HW} = 1	*1: hanging wall side*
Dip (deg) = 17	
Z_{TOR} (km) = 999	*If unknown use 999*
Z_{HYP} (km) = 999	*If unknown use 999*
$Z_{1.0}$ (km) = 0.7	*If unknown use 999*
$Z_{2.5}$ (km) = 3.7	*If unknown use 999*
W (km) = 999	*If unknown use 999*
Vs30Flag = measured	*Choose options for V_{s30} from the list*
F_{AS} = no	*Aftershock effect is not applicable.*
Region = California	*Choose region from the list*









Courtesy: Jennifer Donahue

Calculated Variables/Flags

ΔDPP	0	*Always 0 for median calcs.*
PGA_r (g)	0.449	
Z_{BOT} (km) (CB14)	15	*Enter for default W calcs*
SS	0	*auto calculated*
$V_{s30Flag}$	1	*measured*
F_{AS}	0	*Aftershock effect is not applicable.*
Region	0	*California*
Option for Sa value	1	*Weighted average of the natural logarithm of the spectral values*

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_X = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTs	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	999.00			33.932		
$Z_{1.0}$ (km)	0.700	0.700			0.479	
$\delta Z_{1.0}$ (km)	0.220		0.220			
$Z_{2.5}$ (V_{S30}=1100)(km)	3.700			0.398		
$Z_{2.5}$ (V_{S30})(km)	3.700			1.983		
Z_{hyp} (km)	999.00			5.132		
Z_{tor} (km)	999.00			1.457	1.457	
Z_{BOR} (km)	-			11.378		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

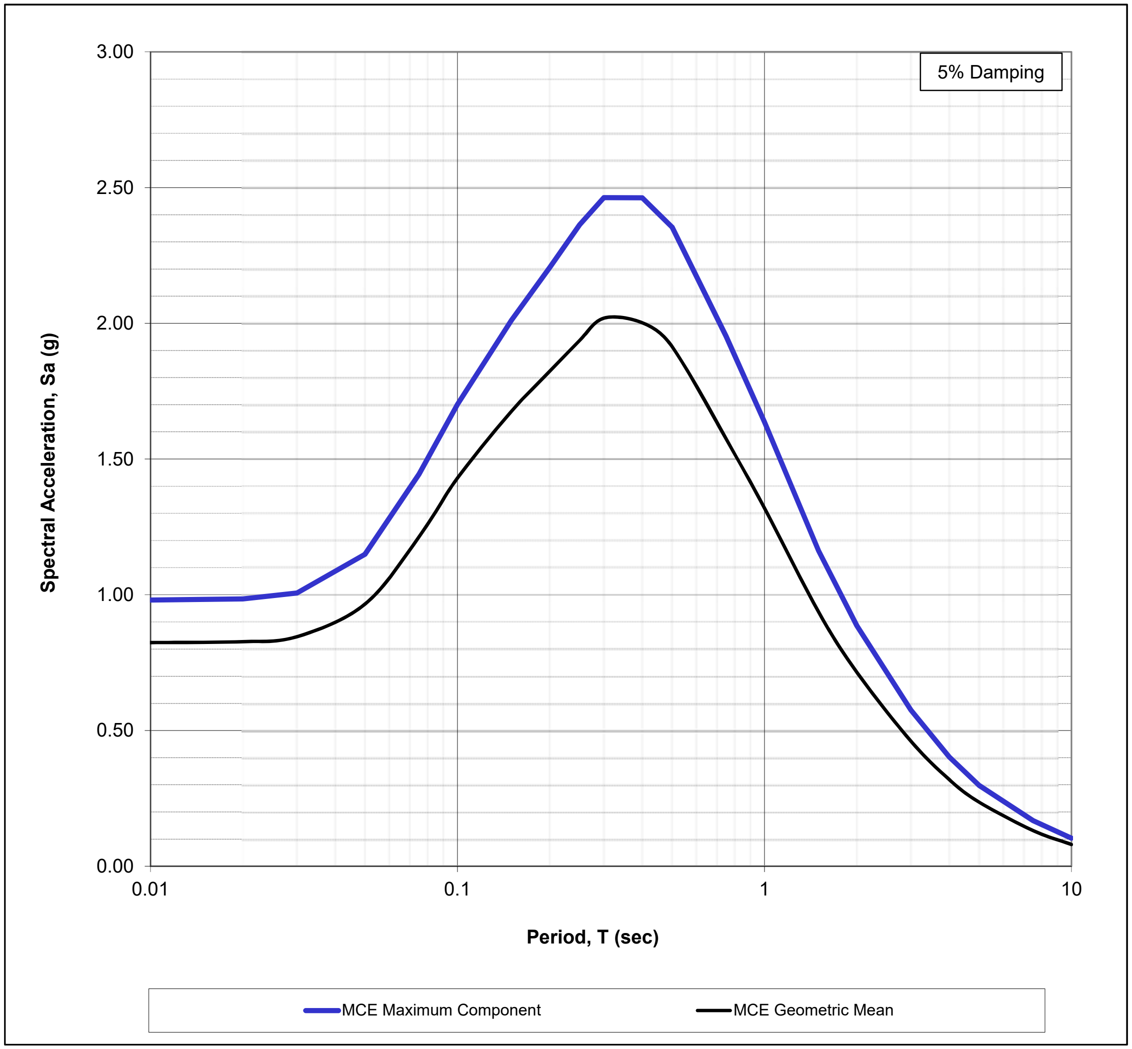
All NGA West-2 participants are acknowledged for their constructive comments and feedback.

MCE PROBABILISTIC SPECTRA (2,475-YEAR AVERAGE RETURN INTERVAL)

Project: El Camino College - Fire Training Facility

Project Number: 10535.020

Location: 16670 Crenshaw Boulevard, Torrance, CA



Period T (s)	MCE GEOMEAN Sa (g)	Maximum Component Factor	MCE MAX COMP Site-Specific Sa (g)
0.01	0.824	1.19	0.980
0.02	0.827	1.19	0.985
0.03	0.846	1.19	1.006
0.05	0.966	1.19	1.149
0.075	1.214	1.19	1.445
0.10	1.430	1.19	1.702
0.15	1.676	1.20	2.012
0.20	1.824	1.21	2.206
0.25	1.937	1.22	2.363
0.30	2.019	1.22	2.463
0.40	2.002	1.23	2.462
0.50	1.915	1.23	2.355
0.75	1.575	1.24	1.953
1.00	1.319	1.24	1.636
1.50	0.937	1.24	1.162
2.00	0.715	1.24	0.886
3.00	0.461	1.25	0.576
4.00	0.319	1.26	0.402
5.00	0.236	1.26	0.298
7.50	0.131	1.28	0.168
10.00	0.080	1.29	0.103

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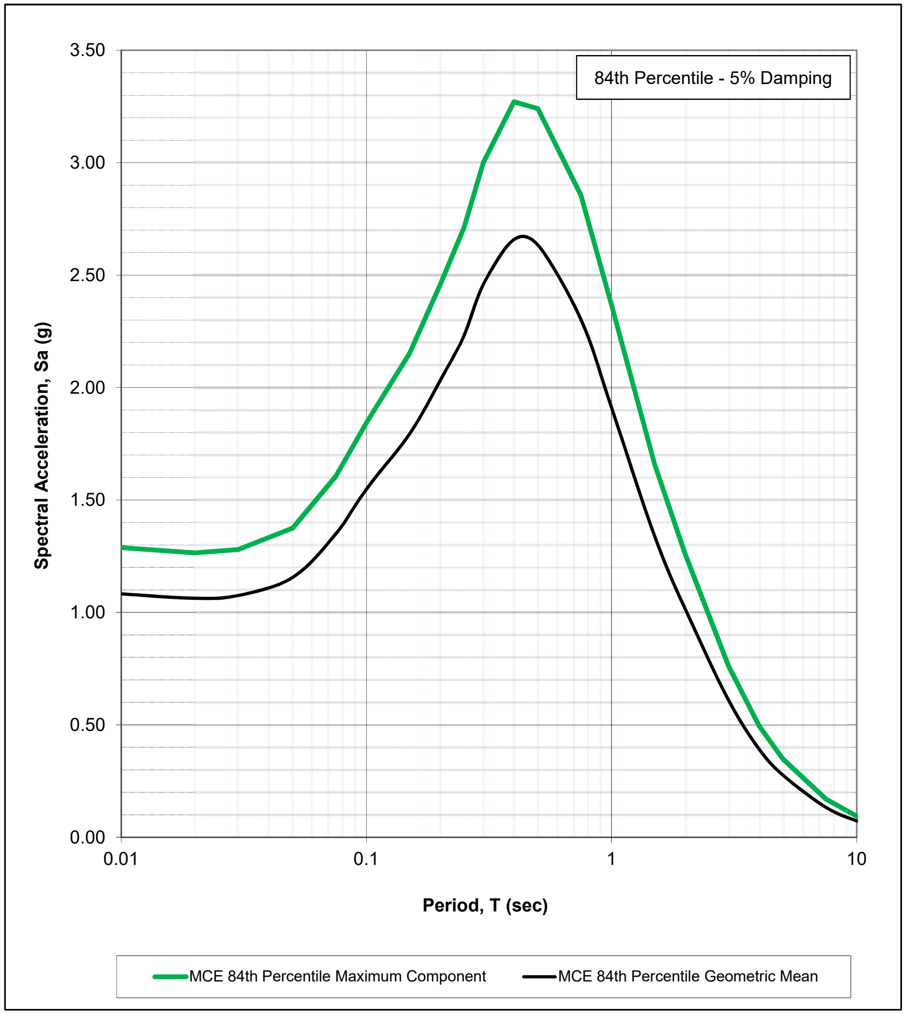
Figure F.1

MCE DETERMINISTIC SPECTRA

Project: El Camino College - Fire Training Facility

Project Number: 10535.020

Location: 16670 Crenshaw Boulevard, Torrance, CA



DETERMINISTIC PGA MAGNITUDE				
MC FACTOR		DSHA - 84TH PERCENTILE		
Period T (s)	Maximum Component Factor	Period T (s)	MCE GEOMEAN Sa (g)	MCE MAX COMP Sa (g)
0.01	1.19	0.01	1.083	1.288
0.02	1.19	0.02	1.063	1.265
0.03	1.19	0.03	1.076	1.280
0.05	1.19	0.05	1.156	1.375
0.075	1.19	0.075	1.349	1.606
0.10	1.19	0.10	1.549	1.843
0.15	1.20	0.15	1.794	2.152
0.20	1.21	0.20	2.032	2.458
0.25	1.22	0.25	2.231	2.710
0.30	1.22	0.30	2.459	3.001
0.40	1.23	0.40	2.659	3.271
0.50	1.23	0.50	2.635	3.241
0.75	1.24	0.75	2.303	2.855
1.00	1.24	1.00	1.910	2.368
1.50	1.24	1.50	1.337	1.658
2.00	1.24	2.00	1.014	1.258
3.00	1.25	3.00	0.609	0.762
4.00	1.26	4.00	0.393	0.495
5.00	1.26	5.00	0.277	0.348
7.50	1.28	7.50	0.132	0.170
10.00	1.29	10.00	0.073	0.094

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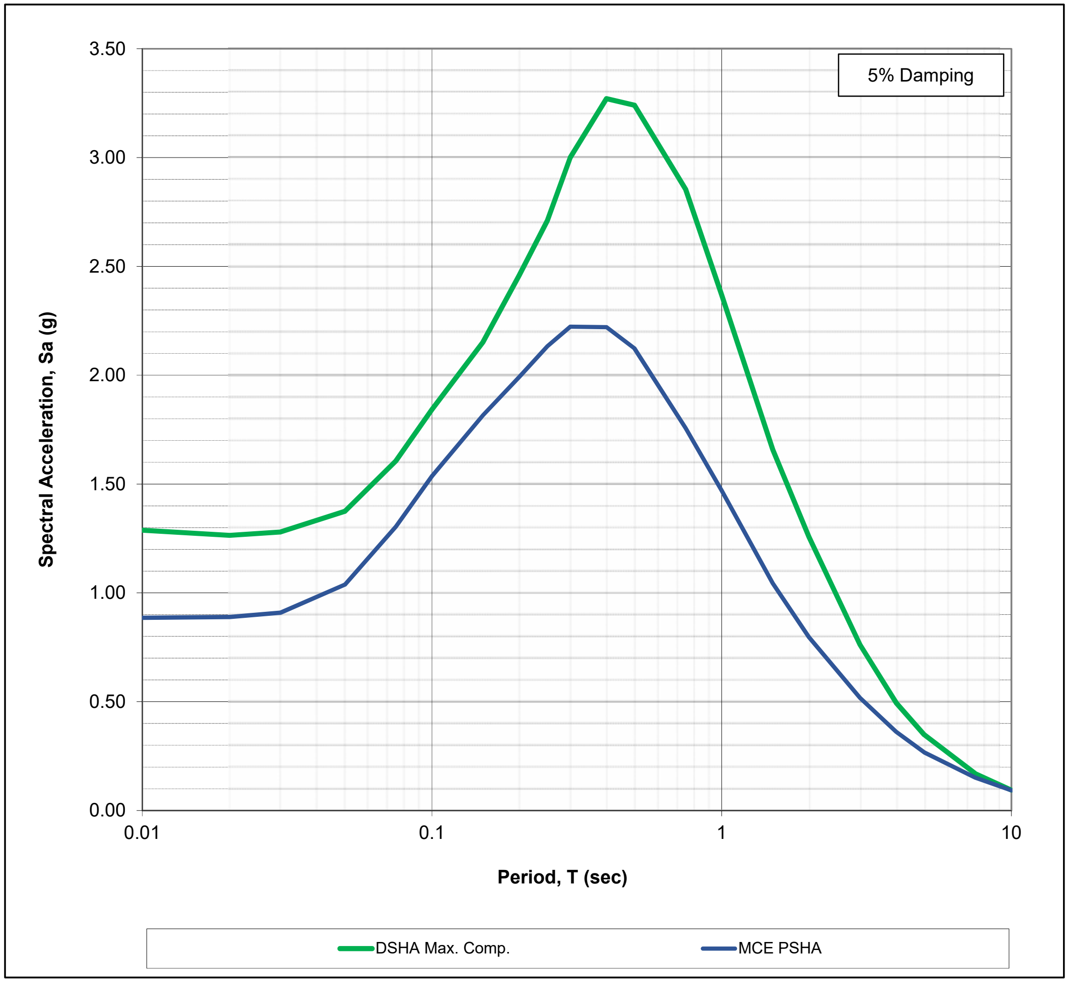
Figure F.2

MCE SPECTRA COMPARISON - MAXIMUM HORIZONTAL COMPONENT

Project: El Camino College - Fire Training Facility

Project Number: 10535.020

Location: 16670 Crenshaw Boulevard, Torrance, CA



DSHA		PSHA			
Period T (s)	MAX COMP. Sa (g)	Period T (s)	MCE MAX COMP. Sa (g)	Site Risk Coefficient (Cs)	MCE_R Sa (g)
0.01	1.288	0.01	0.980	0.903	0.885
0.02	1.265	0.02	0.985	0.903	0.889
0.03	1.280	0.03	1.006	0.903	0.909
0.05	1.375	0.05	1.149	0.903	1.038
0.075	1.606	0.075	1.445	0.903	1.305
0.10	1.843	0.10	1.702	0.903	1.537
0.15	2.152	0.15	2.012	0.903	1.816
0.20	2.458	0.20	2.206	0.903	1.992
0.25	2.710	0.25	2.363	0.903	2.133
0.30	3.001	0.30	2.463	0.903	2.223
0.40	3.271	0.40	2.462	0.902	2.221
0.50	3.241	0.50	2.355	0.902	2.123
0.75	2.855	0.75	1.953	0.900	1.758
1.00	2.368	1.00	1.636	0.899	1.471
1.50	1.658	1.50	1.162	0.899	1.045
2.00	1.258	2.00	0.886	0.899	0.797
3.00	0.762	3.00	0.576	0.899	0.518
4.00	0.495	4.00	0.402	0.899	0.362
5.00	0.348	5.00	0.298	0.899	0.268
7.50	0.170	7.50	0.168	0.899	0.151
10.00	0.094	10.00	0.103	0.899	0.093

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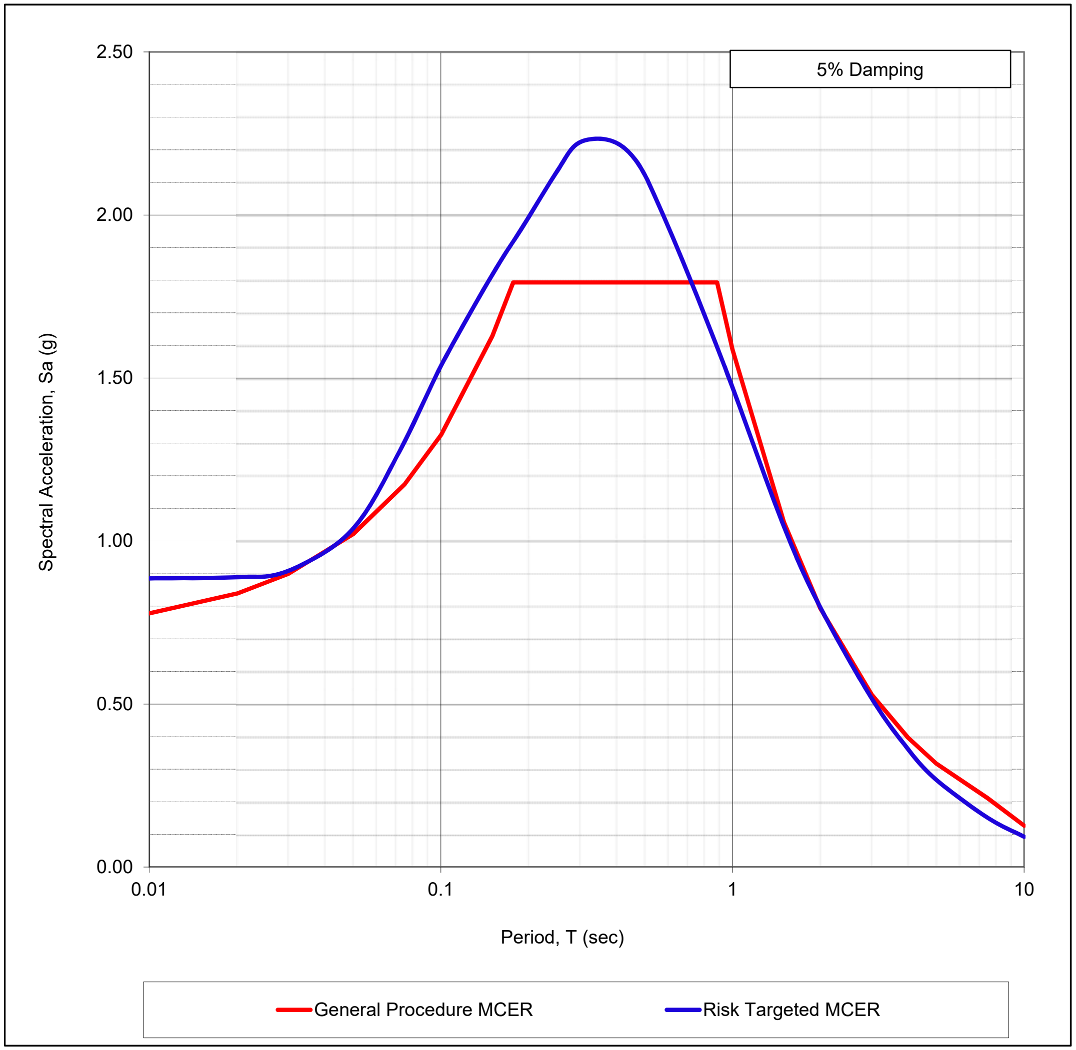
Figure F.3

RISK TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE_R) RESPONSE SPECTRUM

Project: El Camino College - Fire Training Facility
Project Number: 10535.020
Location: 16670 Crenshaw Boulevard, Torrance, CA



SITE-SPECIFIC vs. GENERAL CODE-BASED SPECTRA

Period T (s)	DETERM. MCE_R Sa (g)	PROB. MCE_R Sa (g)	**Risk TGT MCE_R Sa (g)**	General Procedure MCER Sa (g)
0.01	1.288	0.885	**0.885**	0.778
0.02	1.265	0.889	**0.889**	0.839
0.03	1.280	0.909	**0.909**	0.899
0.05	1.375	1.038	**1.038**	1.021
0.075	1.606	1.305	**1.305**	1.173
0.10	1.843	1.537	**1.537**	1.325
0.15	2.152	1.816	**1.816**	1.628
0.20	2.458	1.992	**1.992**	1.793
0.25	2.722	2.133	**2.133**	1.793
0.30	3.001	2.223	**2.223**	1.793
0.40	3.271	2.221	**2.221**	1.793
0.50	3.241	2.123	**2.123**	1.793
0.75	2.855	1.758	**1.758**	1.793
1.00	2.368	1.471	**1.471**	1.588
1.50	1.658	1.045	**1.045**	1.058
2.00	1.258	0.797	**0.797**	0.794
3.00	0.762	0.518	**0.518**	0.529
4.00	0.495	0.362	**0.362**	0.397
5.00	0.348	0.268	**0.268**	0.318
7.50	0.170	0.151	**0.151**	0.212
10.00	0.094	0.093	**0.093**	0.127

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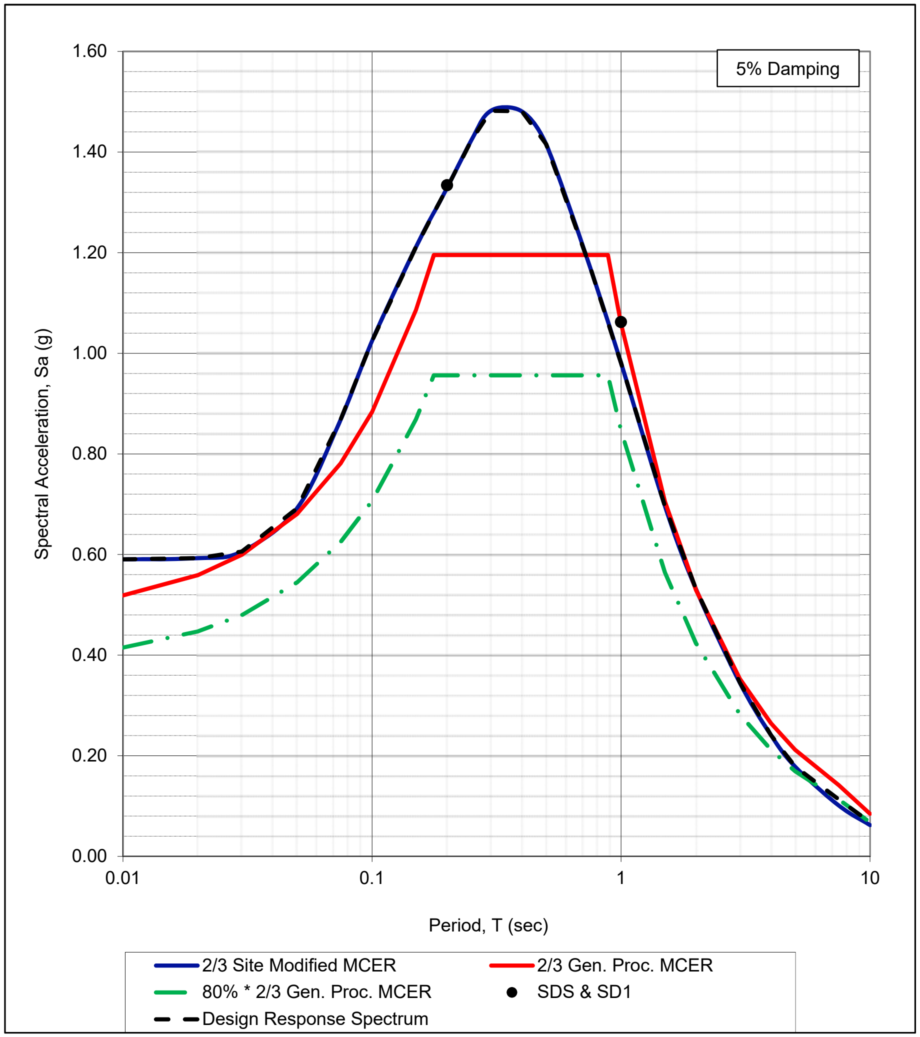
Figure F.4

ASCE 7-16 DESIGN RESPONSE SPECTRUM AND SITE-SPECIFIC S_{DS} AND S_{D1}

Project: El Camino College - Fire Training Facility

Project Number: 10535.020

Location: 16670 Crenshaw Boulevard, Torrance, CA



	CODE BASED GENERAL PROCEDURE SPECTRUM			RISK TGT SPECTRUM	DESIGN RESPONSE SPECTRUM
Period T (s)	GENERAL PROC. MCER CURVE Sa (g)	2/3 GENERAL PROC. MCER CURVE Sa (g)	80% * 2/3 GENERAL PROC. MCER CURVE Sa (g)	2/3*MCE_R CURVE Sa (g)	MAX of 2/3 MCE_R and 80% * 2/3 GENERAL PROC. MCER Sa (g)
0.01	0.778	0.519	0.415	0.590	0.590
0.02	0.839	0.559	0.447	0.593	0.593
0.03	0.899	0.600	0.480	0.606	0.606
0.05	1.021	0.681	0.545	0.692	0.692
0.075	1.173	0.782	0.626	0.870	0.870
0.10	1.325	0.883	0.707	1.024	1.024
0.15	1.628	1.086	0.869	1.211	1.211
0.20	1.793	1.195	0.956	1.328	1.328
0.25	1.793	1.195	0.956	1.422	1.422
0.30	1.793	1.195	0.956	1.482	1.482
0.40	1.793	1.195	0.956	1.481	1.481
0.50	1.793	1.195	0.956	1.416	1.416
0.75	1.793	1.195	0.956	1.172	1.172
1.00	1.588	1.058	0.847	0.981	0.981
1.50	1.058	0.706	0.564	0.697	0.697
2.00	0.794	0.529	0.423	0.531	0.531
3.00	0.529	0.353	0.282	0.345	0.345
4.00	0.397	0.265	0.212	0.241	0.241
5.00	0.318	0.212	0.169	0.178	0.178
7.50	0.212	0.141	0.113	0.101	0.113
10.00	0.127	0.085	0.068	0.062	0.068

S_{DS} = 1.334 g

S_{D1} = 1.062 g

Note: Based on ASCE 7-16 Section 21.4, the parameter S_{DS} shall be taken as 90% of the maximum spectral acceleration, Sa, obtained from the site-specific spectrum, at any period within the range from 0.2 to 5 s, inclusive. The parameter S_{D1} shall be taken as the maximum value of the product, TSa, for periods from 1 to 2 s for sites with Vs_{30} > 1,200 ft/s (Vs_{30} > 365.76 m/s) and for periods from 1 to 5 s for sites with Vs_{30} ≤ 1,200 ft/s (Vs_{30} ≤ 365.76 m/s). The design Sa shall not be less than 80% of 2/3 of the general procedure (ASCE 7-16 Sec 11.4.6)

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Figure F.5

APPENDIX G

GBA *IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT*

Important Information about This

Geotechnical-Engineering Report

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

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

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

Understand the Geotechnical-Engineering Services Provided for this Report

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

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

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

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

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

Do not rely on this report if your geotechnical engineer prepared it:

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

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

Read this Report in Full

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

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

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

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

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

This Report's Recommendations Are Confirmation-Dependent

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

This Report Could Be Misinterpreted

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

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

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

Give Constructors a Complete Report and Guidance

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

Read Responsibility Provisions Closely

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

Geoenvironmental Concerns Are <u>Not</u> Covered

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

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

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

GEOPROFESSIONAL BUSINESS ASSOCIATION

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