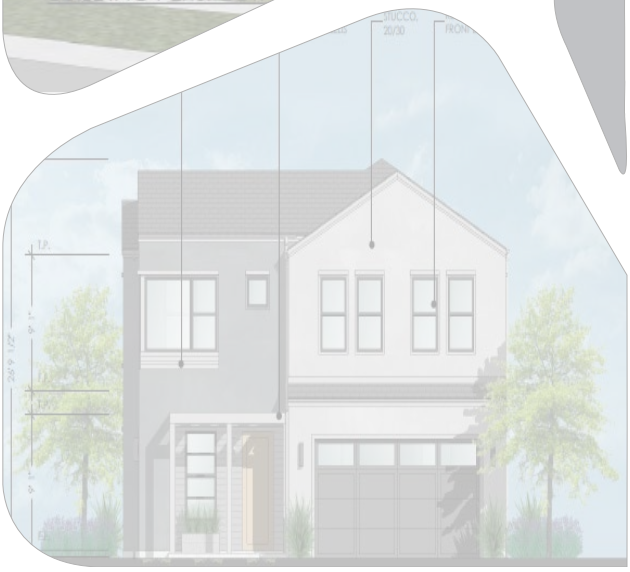
Appendix D

Geotechnical and Infiltration Evaluation



GEOTECHNICAL AND INFILTRATION EVALUATION
FOR
PROPOSED RESIDENTIAL DEVELOPMENT PROJECT
APNS 287-241-01, -04, AND -06
FULLERTON, ORANGE COUNTY, CALIFORNIA

PREPARED FOR

SHOPOFF REALTY INVESTMENTS
2 PARK PLAZA, SUITE 700
IRVINE, CALIFORNIA 92614

PREPARED BY

GEOTEK, INC.
1548 NORTH MAPLE STREET
CORONA, CALIFORNIA 92878

GeoTek, Inc.
1548 North Maple Street, Corona, California 92878
(951) 710-1160 Office (951) 710-1167 Fax www.geotekusa.com

December 14, 2020
(Revised July 7, 2021)
Project No. 2495-CR

Shopoff Realty Investments
2 Park Plaza, Suite 700
Irvine, California 92614

Attention: Mr. James O'Malley

Subject: Geotechnical and Infiltration Evaluation
Proposed Residential Development Project
APNs 287-241-01, -04, and -06
Fullerton, Orange County, California

Dear Mr. O'Malley:

We are pleased to provide our geotechnical report for proposed development at the subject property located in the city of Fullerton, Orange County, California. This report presents a discussion of our evaluation and provides geotechnical recommendations for earthwork, foundation design, and construction.

In our opinion, site development appears feasible from a geotechnical viewpoint provided that the recommendations presented in this report are incorporated into the design and construction phases of the project.

The opportunity to be of service is sincerely appreciated. If you have any questions, please do not hesitate to call our office.

Respectfully submitted,
GeoTek, Inc.

REGISTERED GEOLOGIST
EDWARD H. LaMONT
No. 1892
Exp.
Certified Engineering Geologist
STATE OF CALIFORNIA

LICENSED PROFESSIONAL ENGINEER
GABY M. BOGDANOFF
NO. 3133
GEOTECHNICAL
STATE OF CALIFORNIA

Edward H. LaMont
CEG 1892, Exp. 07/31/22
Principal Geologist

Gaby M. Bogdanoff
GE 3133, Exp. 06/30/22
Project Engineer

Distribution: (1) Addressee via email (one PDF file)

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1. PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to evaluate the existing geotechnical conditions for the currently proposed development. Services provided for this study included the following:

- Research and review of readily available geologic data pertinent to the site,
- A site reconnaissance,
- Site exploration via six exploratory borings to depths between 9.5 and 51.5 feet and four Cone Penetration Test (CPT) soundings to depths of about 50 feet each across the site,
- Testing of two percolation test borings to estimate the infiltration rate of the subsoils,
- Collection relatively undisturbed and bulk samples of the site soils for geotechnical and corrosion assessment,
- Review and evaluation of site seismicity,
- Engineering analyses, and;
- Compilation of this geotechnical and infiltration evaluation which presents our findings, conclusions, and recommendations for site development.

The intent of this report is to aid in the evaluation of the site for future proposed development from a geotechnical perspective. The professional opinions and geotechnical information contained in this report may need to be updated based upon our review of the final site development plans. Final site development plans should be provided to GeoTek for review when available.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 SITE DESCRIPTION

The site is identified with Assessor's Parcel Numbers (APNs) 287-241-01, -04, and -06 and is located southwest of the intersection of Rosecrans Avenue and North Euclid Street in the city of Fullerton, Orange County, California. The site is an irregular-shaped property consisting of 12.52 acres and is currently occupied by various one-story retail buildings and associated parking/drive areas, underground utilities, hardscape as well as landscape improvements. It should be noted that the original project also comprised a 1.3-acre parcel located north of APN 287-241-03 and directly southwest of the intersection of Rosecrans Avenue and North Euclid Street. That parcel was recently removed from the limits of the project.

Based on the review of historic aerial photographs, the site was graded sometime between the late 60s and early 70s. The property has a terrace topography with elevations ranging from a high of about 268 feet above mean sea level (msl) near its northwestern corner to a low of about 207 feet msl towards its southeastern end. Surface drainage is to the south-southeast with some local variations. Descending cut and fill slopes with heights up to 25 feet and at maximum gradients of 2:1 (h:v) are present along the east and south property lines adjacent to Euclid Street and Paseo Dorado, respectively. An existing concrete-lined drainage channel sits at the toe of the descending slope adjacent to Euclid Street. Other smaller 2:1 (h:v) slopes and retaining/screen walls are present within the property and its boundaries.

The site is bounded on the north by Rosecrans Avenue and commercial buildings, on the east by North Euclid Street and commercial and single-family homes, on the south by Paseo Dorado and single-family residences, and on the west by an apartment complex. The general location of the site is shown in Figure 1.

2.2 PROPOSED DEVELOPMENT

According to the *Site Plan* prepared by JZMK Partners and dated July 6, 2021, the existing improvements/structures will be demolished to build 49 single-family homes and 115 townhome units. Associated improvements include various interior streets, underground utilities, a pool area, and the like. The structures are anticipated to be one- to three-stories in height to be supported on conventional shallow footings and concrete floors. Light to moderately foundation loads are expected with such structures.

Based on the spot elevations shown on the referenced *Site Plan* (JZMK, 2021), the site grading will involve cuts and fills of up to 5 feet to reach design grades. The majority of the existing site slopes are anticipated to remain.

If site development differs from the information presented in this report, the recommendations should be subject to further review and evaluation by GeoTek. Final site development plans should be reviewed by GeoTek when they become available.

3. FIELD EXPLORATION, LABORATORY TESTING, AND PERCOLATION TESTING

3.1 FIELD EXPLORATION

GeoTek conducted a field exploration at the site on November 2 and 4, 2020 which consisted of excavating six exploratory borings and four CPT soundings across the property. Some of the explorations were conducted within the 1.3-acre parcel adjacent to the intersection of Rosecrans Avenue and Euclid Street which is not part of the current project. The explorations were performed to depths between 9.5 and 51.5 feet below the existing ground surface. The approximate locations of these excavations are shown on Figure 2, Exploration Location Map. Logs of the excavations are included in Appendix A.

3.2 LABORATORY TESTING

Laboratory testing was performed on selected soil samples collected during our field exploration. The purpose of the laboratory testing was to confirm the field classification of the soil materials encountered and to evaluate the physical properties of the soils for use in the engineering design and analysis. Laboratory testing included in-situ dry density-moisture content, proctor, remolded direct shear, collapse, expansion index, R-Value, among other tests. Test results are presented in Appendix B.

3.3 PERCOLATION TESTING

GeoTek utilized the falling head borehole percolation test procedure (Orange County, 2017) to estimate preliminary infiltration rates of the subsurface materials. At the time our field investigation, specific locations of stormwater disposal areas were unknown. Thus, we drilled test borings within the low-lying portions of the site (i.e. south-southeastern region).

Percolation test borings (Borings I-1 and I-2) were excavated with a hollow-stem auger drill rig. Test borings were eight inches in diameter and were drilled to depths of approximately five feet. A three-inch diameter perforated PVC pipe encapsulated in filter sock was inserted into each of the test holes. The annular space between the test hole sidewalls and PVC pipe was filled with gravel.

Native materials consisting of older alluvial soils of poorly graded sand with silt were encountered in Boring I-2 drilled within the northeastern portion of the property. Bedrock of La Habra Formation was encountered in Boring I-1 excavated in the southeastern portion. Both test holes did not find groundwater. The logs of the borings are presented in Appendix A, and the locations of the test borings are shown on Figure 2.

Subsequent to pre-soaking the test holes, percolation testing was performed in the lower 20 inches of each test hole by a representative from our firm. The percolation rates were converted to infiltration rates via the Porchet Method.

The infiltration rates, which do not include a factor of safety and were determined after the water levels had stabilized, are presented in the following table.

SUMMARY OF INFILTRATION RATES	
Boring No.	Infiltration Field Rate (inches per hour)
I-1	2.4
I-2	1.8

Detailed infiltration/percolation test data and Porchet conversion calculations are presented in Appendix C.

It should be noted that an older version of the site plan considered the construction of a shallow stormwater disposal system near the location of our percolation test I-1 within the southeastern portion of the site. While this test yielded a measured infiltration rate of about 2.4 in/hr at approximately 5 feet below grade, the location is near the edge of a 25 feet height, 2:1 (h:v) descending slope. According to Section 2.4.2.4 of the *Technical Guidance Document* (Orange County, 2017), stormwater disposal systems located less than 50 feet away from slopes steeper than 15 percent could increase site geotechnical hazards. Given that the system location does not comply with the cited requirement and to prevent that the slope stability be negatively impacted by lateral migration of stormwater, it is our opinion that stormwater

infiltration at the referenced location and depth is technically infeasible. It should be noted that test location I-2 is not within the current limits of the project.

The *Proposed Hydrology Exhibit* prepared by Huitt-Zoliars and dated June 9, 2021 indicates that the stormwater will be managed by catch basins and pipelines which will outlet to the existing concrete-lined channel near the eastern property line. This is suitable from the geotechnical standpoint.

4. GEOLOGIC AND SOILS CONDITIONS

4.1 REGIONAL SETTING

The property is situated in the Peninsular Ranges geomorphic province. The Peninsular Ranges province is one of the largest geomorphic units in western North America. Basically, it extends from the point of contact with the Transverse Ranges geomorphic province, southerly to the tip of Baja California. This province varies in width from about 30 to 100 miles. It is bounded on the west by the Pacific Ocean, on the south by the Gulf of California and on the east by the Colorado Desert Province.

The Peninsular Ranges are essentially a series of northwest-southeast oriented fault blocks. Several major fault zones are found in this province. The Elsinore Fault zone and the San Jacinto Fault zone trend northwest-southeast and are found near the middle of the province. The San Andreas Fault zone borders the northeasterly margin of the province.

More specific to the subject property, the site is located in an area geologically mapped to be underlain by older alluvium, La Habra Formation bedrock and some surficial fill locally (Dibblee, T.W. and Ehrenspeck, H.E., 2001). The nearest fault is the West Coyote Hills fault and the Elsinore Fault Zone- Whittier Section located approximately 1.30 miles to the northwest and 4.1 miles to the northeast, respectively. No active faults are shown in the immediate site vicinity on the maps reviewed for the area.

4.2 SUBSURFACE CONDITIONS

A brief description of the earth materials encountered during our field investigation is presented in the following sections.

4.2.1 Undocumented Fill

Explorations B-1 and B-3 noted undocumented fills within the northeastern portion of the site with thickness of approximately 10 and 3 feet, respectively. This is consistent with the penetration data recorded in CPT-2 sounding which suggests 15 feet or more of fill. Our CPT-3 sounding performed within the south-central portion of the property also appears to indicate what we believe is about 20 feet of fill. It should be noted that additional fill areas associated with the existing structures and improvements are likely present. The fill observed was composed of clayey sand which was moist, brown, and medium dense. Tests performed on representative fill samples indicate negligible potential for collapse.

4.2.2 Older Alluvium

Older Alluvial deposits exist below the fills or near the ground surface within the northeastern region of the property. The older alluvium was observed to be comprised of varying layers of silty to clayey sand, poorly graded sand, sandy clay, and sandy silt. The alluvium was mostly orange brown in color, medium dense/stiff to dense/very stiff, and moist. The older alluvium extended between 7 feet and 43 feet below existing grades, as observed in our explorations.

4.2.3 La Habra Formation Bedrock

Sedimentary bedrock materials of La Habra Formation were encountered near ground surface across much of the site and below the fill and older alluvium within the northeastern and south-central regions of the property. The La Habra Formation bedrock was mostly comprised of silty sandstone and sandstone with some siltstone and claystone. The onsite bedrock was relatively soft and relatively easy to excavate upon first encountering, becoming harder at depths.

Our test results showed that the site surficial materials have "very low" to "low" expansion potential (EI ≈ 18 to 30).

The approximate locations of the above-described units are shown on Figure 2, Exploration Location Map. Detailed logs of the site explorations are included in Appendix A.

4.3 SURFACE WATER AND GROUNDWATER

4.3.1 Surface Water

Surface water on this site is the result of precipitation or surface run-off from surrounding areas. Overall surface drainage is generally to the south-southeast.

4.3.2 Groundwater

Our exploratory borings B-1 and B-3 drilled within the northeastern portion of the site encountered perched groundwater at 49 feet and 10 feet, respectively. The rest of the borings and CPT soundings did not encounter groundwater.

According to the *2019 Groundwater Elevation Contours Map* prepared by Orange County Water District (https://www.ocwd.com/what-we-do/groundwater-management/groundwater-location-maps/), the elevation of groundwater near the site is about 120 feet msl. Since the site elevations range from 205 to 268 feet msl, depth to groundwater is estimated to be approximately 85 feet or more. GeoTracker (https://geotracker.waterboards.ca.gov) and the California Water Data Library (https://wdl.water.ca.gov/waterdatalibrary/) also show several groundwater wells located about 1 to 1.5 miles southwest of the project indicating that groundwater in the region is deeper than 100 feet. Thus, the above information confirms that the groundwater encountered during drilling was perched groundwater.

It should be noted that the *Seismic Hazard Zone Report for La Habra 7.5-Minute Quadrangle* (California Department of Conservation, 1997) indicates a historically high groundwater depth of about 10 feet for the easternmost portion of the site and North Euclid Street. Our review of the borehole database used to formulate this 10-foot groundwater level suggests that this level was based on the information from boring 000002_00160_33117H8 which was drilled in June of 1994 at about one mile to the east of the site. The reported ground surface elevation at the borehole location was 290 feet msl and the groundwater depth was 9 feet. This would result in a groundwater elevation of approximately 281 feet msl, which is above site grades (site topography ranges from 205 to 268 feet msl). Therefore, it is our opinion that the reported 10-foot historic high groundwater level for the easternmost portion of the property is not applicable.

4.4 FAULTING AND SEISMICITY

The geologic structure of the entire southern California area is dominated mainly by northwest-trending faults associated with the San Andreas system. The site is in a seismically active region. No active or potentially active fault is presently known to exist at this site nor is the site situated within an *"Alquist-Priolo"* Earthquake Fault Zone. The Geo Application by the California Department of Conservation shows that the site is located in a liquefaction zone. However, our groundwater data review shows that groundwater is deep and thus liquefaction is unlikely. The property is not located in an earthquake fault zone or landslide zone. The nearest fault is the West Coyote Hills fault and the Elsinore Fault Zone-Whittier Section located approximately 1.30 miles to the northwest and 4.1 miles to the northeast, respectively.

4.4.1 Seismic Design Parameters

The site is located at approximately 33.8921° Latitude and -117.9454° Longitude. Given that the currently proposed development area is underlain by bedrock at shallow depths, a Site Class "C" was considered appropriate. Site spectral accelerations (S_a and S_1), for 0.2 and 1.0 second periods for a Class "C" site, was determined from the SEAOC/OSHPD web interface that utilizes the USGS web services and retrieves the seismic design data and presents that information in a report format. The results, based on ASCE 7-16, are provided in the following table:

SITE SEISMIC PARAMETERS	
Mapped 0.2 sec Period Spectral Acceleration, S_s	1.639g
Mapped 1.0 sec Period Spectral Acceleration, S_1	0.578g
Site Coefficient for Site Class "C", F_a	1.2
Site Coefficient for Site Class "C", F_v	1.422
Maximum Considered Earthquake Spectral Response Acceleration for 0.2 Second, S_{MS}	1.967g
Maximum Considered Earthquake Spectral Response Acceleration for 1.0 Second, S_{M1}	0.822g
5% Damped Design Spectral Response Acceleration Parameter at 0.2 Second, S_{DS}	1.311g
5% Damped Design Spectral Response Acceleration Parameter at 1 second, S_{D1}	0.548g
Seismic Design Category	D

Final selection of the appropriate seismic design coefficients should be made by the project structural engineer based upon the local practices and ordinances, expected building response and desired level of conservatism.

4.5 LIQUEFACTION AND SEISMICALLY INDUCED SETTLEMENT

As noted previously, much of the property is underlain by bedrock of La Habra Formation at shallow depths, and the regional groundwater is located at 85 feet or deeper under the site. While two of our borings found groundwater at depths of about 49 feet (boring B-1) and 10 feet (Boring B-3), these were likely perched groundwater levels present within bedrock fractures. Thus, the potential for liquefaction at the site is nil.

However, loose to medium dense granular soils tend to density during strong earthquake shaking. The potential for seismically induced settlements of the upper sandy soils mostly present within the northeastern and south-central portions of the site was assessed using the data from our CPT soundings with the aid of the computer program Cliq Version 2.0 (Geologismiki, 2006). A mean magnitude weighted (Mw) seismic event of 6.72 obtained using

the USGS deaggregation web application (based on a two percent exceedance in 50 years) and a PGA_M of 0.773g obtained from the USGS website were used in our assessment.

The results of the analyses indicated the presence of some layers of loose sands and silty sands that would be prone to settlement. The following table summarizes the amount of total seismically induced settlement estimated at each CPT location:

ESTIMATED SEISMICALLY INDUCED TOTAL SETTLEMENT	
CPT Sounding	Total Settlement (in)
1	1.6
2	0
3	0.8

As noted above, seismically induced settlement of up to about 1.6 inches total and up to 0.8 inches differential over a 30-foot span are estimated for the potential buildings within the northeastern region of the site which contains deep alluvium. Seismically induced settlement is expected to be negligible for the rest of the property underlying by bedrock. Localized areas where fill overlays bedrock such as the south-central region, a total seismic settlement of up to 0.8 inches and differential settlement of up to 0.4 inches over a horizontal distance of 30 feet are estimated. The results of the seismic settlement analyses are presented within Appendix D.

4.6 OTHER HAZARDS

Evidence of ancient landslides or slope instabilities at this site was not observed during our site reconnaissance. Thus, the potential for landslides is considered negligible for design purposes. The potential for secondary seismic hazard such as a tsunami or a seiche is considered negligible due to site elevation and great distance to a body of water.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL

The anticipated site development appears feasible from a geotechnical viewpoint provided that the following recommendations, and those provided by this firm at a later date are incorporated into the design and construction phases of development. Site development and grading and foundation plans should be reviewed by GeoTek, Inc. when they become available.

Moderately deep fills (3-20 feet or more in thickness) appear to exist within the northeastern and south-central portions of the site per our site explorations. However, field and laboratory data suggest that the fill was generally placed in a compacted manner with relatively high values in-place soil density and moderate blow counts and minimal potential for consolidation and collapse. Our analyses also indicate that seismically induced settlement may occur within northeastern portion of the site where fill is underlain by deep. Total seismic settlement up to 1.6 inches and differential seismic settlement up to 0.8 inches over a 30-foot span may occur within these areas. This differential settlement exceeds the differential settlement threshold for the use of standard shallow foundations per ASCE 7-16 (about 1 inch in 30 feet). However, the limits of the project site have recently been updated and do not include the area underlain by deep alluvium. Therefore, the cited large settlement condition is not applicable for project design anymore.

Seismically induced settlement is anticipated to be negligible within the remining areas underlain by bedrock. Localized areas where fill was placed on top of bedrock such as the south-central region, a total seismic settlement of up to 0.8 inches and differential settlement of up to 0.4 inches over a horizontal distance of 30 feet are estimated. Therefore, site buildings can be adequately supported on conventional shallow foundations.

5.2 EARTHWORK CONSIDERATIONS

Earthwork and grading should be performed in accordance with the applicable grading ordinances of the City of Fullerton/Orange County, the 2019 California Building Code (CBC), and recommendations contained in this report. The Grading Guidelines included in Appendix E outline general procedures and do not anticipate all site-specific situations. In the event of conflict, the recommendations presented in the text of this report should supersede those contained in Appendix E.

5.2.1 Site Clearing

The site should be cleared of existing vegetation, roots, and debris. All foundations, slabs, utilities, and underground improvements associated to the currently existing buildings should be removed. These materials should be properly disposed of off-site. Voids resulting from site clearing should be backfilled with engineered fill. Utilities should be located, removed or rerouted, as necessary.

5.2.2 Remedial Grading

In order to provide uniform support for the proposed structures, the upper five feet of the site materials or three feet below building/wall footings, whichever is deeper, should be removed.

The exposed soils should then be proof rolled with a heavy rubber-tired piece of construction equipment approved by and in the presence of the geotechnical engineer. The proof roll equipment should possess a minimum weight of 10 tons and proof rolling should consist of at least four passes, two in each perpendicular direction. Any soil that ruts or excessively ruts during proof rolling should be removed as recommended by the geotechnical engineer. The horizontal limits of the proof rolling and any needed over-excavation should extend at least five feet outside the perimeter of the structural elements, or a distance equal to the depth of the removals, whichever is greater. A representative of this firm should observe the bottom of all excavations.

Proposed pavement areas should be excavated to a minimum of one foot below the pavement subgrade level. The subgrade soils should be evaluated by proof rolling as outlined in the preceding paragraph. The horizontal limits of the proof rolling and any needed over-excavation should extend at least two feet outside the perimeter of the proposed paving area. A representative of this firm should observe the bottom of all excavations.

The bottom of all removals should be scarified to a minimum depth of 8 inches, brought to above the optimum moisture content, and then recompacted to at least 90 percent of the soil's maximum dry density per ASTM D 1557. The bottoms of remedial excavations should be observed by a GeoTek representative prior to scarification.

5.2.3 Excavation Characteristics

Excavation in the onsite materials is expected to be feasible utilizing heavy-duty grading equipment in good operating condition.

All temporary excavations for grading purposes and installation of underground utilities should be constructed in accordance with local and Cal-OSHA guidelines. Temporary vertical excavations within the on-site materials should be stable at four feet with a 1:1 (h:v) cut above.

Based on the soils encountered in our explorations, we consider the onsite materials fall within the category of OSHA Soil Type C. We recommend that temporary slopes greater than four feet in height not be constructed at inclinations steeper than 1:1 (h:v). Flatter inclinations may be needed depending on the field conditions. Temporary construction slopes should be periodically examined by a competent person, per OSHA requirements, to look of evidence of instability.

5.2.4 Engineered Fill

The onsite materials are considered suitable for reuse as engineered fill provided they are free from vegetation, debris, deleterious material, and hard lumps greater than six inches in maximum dimension.

Concrete generated from the demolition of existing site improvements may be incorporated into site fills provided the following guidelines are implemented: 1) concrete should be free of rebar or other deleterious materials and should be broken down to a maximum dimension of six inches; 2) concrete should not be placed within three feet of finish grade in the building pad areas or within one foot of subgrade elevations in the street/drive areas; 3) concrete should be distributed in the fill and should not be "nested" or placed in concentrated pockets.

Fill materials should be placed in horizontal lifts not exceeding six inches in loose thickness, moisture conditioned to at least the optimum moisture content, and compacted to a minimum relative compaction of 90 percent (ASTM D 1557).

Detailed recommendations pertaining to the placement of engineered fill are presented in Appendix E.

5.2.5 Slopes

Fill and cut slopes constructed at gradients of 2:1 (h:v) or flatter, in accordance with industry standards, are anticipated to be both grossly and surficially stable. Fill placed on slopes should be properly benched into competent soils per the geotechnical engineer. Cut slopes should be observed by a geotechnical engineer/engineering geologist to approve the exposed conditions upon excavation.

The existing slopes along the eastern and southern property lines are anticipated to be cut and fill slopes to maximum heights of 25 feet and at maximum gradients of 2:1 (h:v). Based on historical aerial photographs, these slopes were built in the late 60s and have not had stability problems that we are aware of. However, portions of the slopes are landscaped while others are not. Therefore, to improve the existing surficial slope stability, we recommend that a vegetative cover be provided for all slopes. Based on our field observations and data, the existing slopes are considered to be grossly and surficially stable.

5.2.6 Trench Excavation and Backfill

Trench excavations should conform to Cal-OSHA regulations. The contractor should have a competent person, per OSHA requirements, on site during construction to observe conditions and to make the appropriate recommendations.

Utility trench backfill should be compacted to at least 90 percent relative compaction (ASTM D 1557). Compaction should be achieved with a mechanical compaction device. Jetting of trench backfill is not recommended. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

5.2.7 Shrinkage and Subsidence

Several factors will impact earthwork balancing on the site, including shrinkage, subsidence, trench spoil from utilities and footing excavations, as well as the accuracy of topography.

Shrinkage is primarily dependent upon the degree of compactive effort achieved during construction. For planning purposes, a shrinkage factor of up to 10 percent may be considered for the existing fill and older alluvium requiring recompaction. A bulking factor of up to 10 percent may be considered for the onsite bedrock requiring recompaction. Subsidence on the order of 0.1 feet could occur within alluvial and fill areas.

5.3 DESIGN RECOMMENDATIONS

5.3.1 Foundation Design Criteria

The site surficial soils possess "very low" ($0 \leq EI \leq 20$) to "low" ($21 \leq EI \leq 50$) expansion potential in accordance with ASTM D 4829, as noted by our soils data. However, verification testing should be performed after site remedial grading.

The foundation elements for the proposed structures should bear entirely in engineered fill soils and should be designed in accordance with the 2019 CBC.

A summary of our foundation design recommendations for conventionally reinforced shallow foundations is presented in the following table:

DESIGN PARAMETERS FOR CONVENTIONALLY REINFORCED SHALLOW FOUNDATIONS		
Design Parameter	"Very Low" Expansion Potential	"Low" Expansion Potential
Foundation Depth or Minimum Perimeter Beam Depth (inches below lowest adjacent grade)	One- and two-story – 12 Three-story - 18	One- and two-story – 12 Three-story - 18
Minimum Foundation Width (Inches)*	One- and two-story – 12 Three-story - 15	One- and two-story – 12 Three-story - 15
Minimum Slab Thickness (Inches)	4 - Actual	4 - Actual
Minimum Slab Reinforcing	6" x 6" – W1.4/W1.4 welded wire fabric placed in middle of slab	6" x 6" – W2.9/W2.9 welded wire fabric or No. 3 reinforcing bars at 24" on center placed in middle of slab
Minimum Reinforcement for Continuous Footings, Grade Beams, and Retailing Wall Footings	Two No. 4 reinforcing bars, one placed near the top and one near the bottom	Two No. 4 reinforcing bars, one placed near the top and one near the bottom
Effective Plasticity Index	NA	<15**
Presaturation of Subgrade Soil (Percent of Optimum/Depth in Inches)	Minimum 100% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete	Minimum 110% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete

*Code minimums per Table 1809.7 of the 2019 CBC should be complied with
**Effective Plasticity Index should be verified at the completion of the site remedial grading.

In general, an allowable bearing capacity of 1,800 psf may be used for design of continuous and perimeter footings 12 inches deep and 12 inches wide, and pad footings 24 inches square and 12 inches deep. This value may be increased by 400 psf for each additional 12 inches in depth and by 200 psf for each additional 12 inches in width to a maximum value of 3,000 psf. Additionally, an increase of one-third may be applied when considering short-term live loads (e.g. seismic and wind loads).

The passive earth pressure may be computed as an equivalent fluid having a density of 230 psf per foot of depth, to a maximum earth pressure of 2,500 psf for footings founded in engineered fill. A coefficient of friction between engineered fill and concrete of 0.35 may be used with dead load forces. The upper one foot of soil below the adjacent grade should not be used in calculating passive pressure. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

If the site is prepared as recommended, maximum static settlement of less than 1-inch and a maximum differential static settlement of less than 0.50 inches in a 30-foot span are estimated. Seismically induced settlement is estimated to be up to 0.8 inches total and 0.4 inches differential over a horizontal distance of 30 feet.

A moisture and vapor retarding system should be placed below slabs-on-grade where moisture migration through the slab is undesirable. Guidelines for these are provided in the 2019 California Green Building Standards Code (CALGreen) Section 4.505.2, the 2019 CBC Section 1907.1, ACI 360R-10, and ACI 302.2R-06. It should be realized that the effectiveness of the vapor retarding membrane can be adversely impacted as a result of construction related punctures (e.g. stake penetrations, tears, punctures from walking on the aggregate layer, etc.). These occurrences should be limited as much as possible during construction.

Thicker membranes are generally more resistant to accidental puncture than thinner ones. Products specifically designed for use as moisture/vapor retarders may also be more puncture resistant. Although the CBC specifies a 6-mil vapor retarder membrane, it is GeoTek's opinion that a minimum 10 mil thick membrane with joints properly overlapped and sealed should be considered, unless otherwise specified by the slab design professional.

Moisture and vapor retarding systems are intended to provide a certain level of resistance to vapor and moisture transmission through the concrete, but do not eliminate it. The acceptable level of moisture transmission through the slab is to a large extent based on the type of flooring used and environmental conditions. Ultimately, the vapor retarding system should be comprised of suitable elements to limit migration of water and reduce transmission of water vapor through the slab to acceptable levels. The selected elements should have suitable properties (i.e., thickness, composition, strength, and permeability) to achieve the desired performance level. Consideration should be given to consulting with an individual possessing specific expertise in this area for additional evaluation.

GeoTek does not practice in the field of moisture vapor transmission evaluation/mitigation, since this does not fall under the geotechnical disciplines. Therefore, we recommend that a qualified person, such as the flooring contractor, structural engineer, and/or architect be consulted to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. That person (or persons) should provide recommendations for mitigation of potential adverse impact of moisture vapor transmission on various components of the structures as deemed appropriate. In addition, the recommendations in this report and our services in general are not intended to address mold prevention, since we along with geotechnical consultants in general, do no practice in areas of

mold prevention. If specific recommendations are desired, a professional mold prevention consultant should be contacted.

5.3.2 Miscellaneous Foundation Recommendations

- To reduce moisture penetration beneath the slab on grade areas, utility trenches should be backfilled with engineered fill, lean concrete, or concrete slurry where they intercept the perimeter footing or thickened slab edge.
- Soils from the footing excavations should not be placed in the slab-on-grade areas unless properly compacted and tested. The excavations should be free of loose/sloughed materials and be neatly trimmed at the time of concrete placement.
- Under-slab utility trenches should be compacted to project specifications. Compaction should be achieved with a mechanical compaction device. If soils to be used as backfill have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

5.3.3 Foundation Setbacks

Minimum setbacks for all foundations should comply with the *2019 CBC* or City of Fullerton/Orange County requirements, whichever is more stringent. Improvements not conforming to these setbacks are subject to the increased likelihood of excessive lateral movements and/or differential settlements. If large enough, these movements can compromise the integrity of the improvements. The following recommendations are presented:

- The outside bottom edge of all footings should be set back a minimum of H/2 (where H is the slope height) from the face of any ascending slope. The setback should be at least 5 feet and need not to exceed 15 feet. Where a retaining wall is constructed at the toe of the slope, the height of the slope should be measured from top of the wall to the top of the slope.
- The outside bottom edge of all footings should be set back a minimum of H/3 from the face of any descending slope. The setback should be at least 7 feet and need not to exceed 40 feet.
- If pools are planned, pool setback should be one-half of the building footing setback.
- The bottom of any existing foundations for structures should be deepened so as to extend below a 1:1 projection upward from the bottom of the nearest excavation.
- The bottom of all footings for new structures near retaining walls should be deepened so as to extend below a 1:1 projection upward from the bottom inside edge of the wall foundation.

5.3.4 Retaining Wall Design and Construction

5.3.4.1 General Design Criteria

Recommendations presented in this report apply to typical masonry or concrete vertical retaining walls. These are typical design criteria and are not intended to supersede the design by the structural engineer.

Retaining wall foundations should be designed in accordance with Section 5.3.1 of this report. A minimum embedment of 12 inches into engineered compacted fill and a minimum footing width of 12 inches is recommended. Structural needs may govern and should be evaluated by the project structural engineer.

All earth retention structure plans, as applicable, should be reviewed by this office prior to finalization.

The backfill material placement for all earth retention structures should meet the requirement of Section 5.3.4.4 in this report.

In general, cantilever earth retention structures, which are designed to yield at least 0.001H, where H is equal to the height of the wall to the base of the footing, may be designed using the active condition. Rigid earth retention structures (including but not limited to rigid walls, and walls braced at top, such as typical basement walls) should be designed using the at-rest condition.

In addition to the design lateral forces due to retained earth, surcharges due to improvements, such as an adjacent building or traffic loading, should be considered in the design of the earth retention structures. Loads applied within a 1:1 (h:v) projection from the surcharge on the footing of the earth retention structure should be considered in the design.

Final selection of the appropriate design parameters should be made by the designer of the earth retention structures.

5.3.4.2 Cantilevered Walls

The recommendations presented below are for cantilevered retaining walls. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. An equivalent fluid pressure approach may be used to compute the

horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, seismic events, or adverse geologic conditions.

ACTIVE EARTH PRESSURES		
Surface Slope of Retained Materials (h:v)	Equivalent Fluid Pressure (pcf) Native Backfill*	Equivalent Fluid Pressure (pcf) Import Backfill**
Level	42	37
2:1	70	53

*The design pressures assume the backfill material has an expansion index less than or equal to 50. Backfill zone includes area between the back of the wall and footing to a plane (1:1 h:v) up from the bottom of the wall foundation to the ground surface.

**The design pressures assume the imported granular backfill material has an expansion index less than or equal to 20 and a friction angle of at least 34 degrees. Backfill zone includes area between the back of the wall and footing to a plane (1:1 h:v) up from the bottom of the wall foundation to the ground surface.

5.3.4.3 Restrained Retaining Walls

Retaining walls that will be restrained prior to placing and compacting backfill material, or that have reentrant or male corners, should be designed for an at-rest equivalent fluid pressure of 63 pcf, plus any applicable surcharge loading, for native backfill and level back slope condition. For imported granular backfill with level back slope condition, 58 pcf can be used. For areas of male or reentrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall laterally from the corner, or a distance otherwise determined by the project structural engineer.

5.3.4.4 Retaining Wall Backfill and Drainage

Retaining wall backfill should consist of materials with properties as outline in Section 5.3.4.2 and free of deleterious and/or oversized materials. The wall backfill should also include a minimum one-foot wide section of ¾- to 1-inch clean crushed rock (or approved equivalent). The rock should be placed immediately adjacent to the back of wall and extend up from the back drain to within approximately 12 inches of finish grade. The upper 12 inches should consist of compacted onsite materials. Presence of other materials might necessitate revision to the parameters provided and modification of wall designs. The backfill materials should be placed in lifts no greater than 8-inches in thickness and compacted to a minimum of 90 percent relative compaction in accordance with ASTM Test Method D 1557. Proper surface drainage needs to be provided and maintained. Bracing of the walls during backfilling and compaction may also be necessary.

All earth retention structures should be provided with an adequate pipe and gravel back drain system to reduce the potential for hydrostatic pressure build up. As a minimum, backdrains should consist of a four-inch diameter perforated collector pipe (Schedule 40, SDR 35, or approved equivalent) embedded in a minimum of one cubic foot per lineal foot of ¾- to 1-inch clean crushed rock or equivalent, wrapped in filter fabric (Mirafi 140N or approved equivalent). The drain system should be connected to a suitable outlet, as determined by the civil engineer. Drain outlets should be maintained over the life of the project and should not be obstructed or plugged by adjacent improvements. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

Proper surface drainage needs to be provided and maintained. Water should not be allowed to pond behind retaining walls. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

5.3.4.5 Other Design Considerations

- Retaining and garden wall foundation elements should be designed in accordance with building code setback requirements.
- Wall design should consider the additional surcharge loads from superjacent slopes and/or footings, where appropriate.
- No backfill should be placed against concrete until minimum design strengths are evident by compression tests of cylinders.
- The retaining wall footing excavations, backcuts, and backfill materials should be approved by the project geotechnical engineer or their authorized representative.

5.3.5 Pool Design and Construction

The proposed swimming pool should derive support entirely from engineered fill. A minimum 12 inches of fill compacted to at least 90 percent of the soil's maximum dry density (ASTM D 1557) should be provided below the pool shell.

Given the presence of clayey, "low" expansive native materials, we recommend that the pool walls be designed for at-rest soil conditions using an equivalent fluid pressure of 63 pcf. Pool walls surcharged by adjacent structures should be designed for additional pressures. Alternatively, the pool walls may be designed as freestanding walls using the active soil state conditions provided that some lateral movement of the pool walls would be acceptable. If the active state is to be used, an equivalent fluid pressure of 42 pcf is considered suitable. These recommended pressures are based on drained conditions. If a drain system adjacent/beneath

the pool is not provided, the pool walls should then be designed for an equivalent fluid pressure of 98 pcf for the at-rest condition and 86 pcf for the active condition.

As noted above, the use of the lower (drained condition) at-rest or active soil pressures will require a subdrain system beneath/adjacent to the pool. A typical subdrain system includes a series of 4-inch diameter perforated drain pipes encapsulated with at least one cubic foot of free-draining material per linear foot of pipe. The free-draining material should be encapsulated within a geotextile to prevent migration of fines into the drainage medium. The drain pipes should be routed to an acceptable discharge location, as determined by the civil engineer/pool designed. If desired, GeoTek can review the subdrain system once designed to determine if additional measures are warranted.

The fill surface surrounding the pool and below the proposed deck can be reprocessed while removing any existing vegetation, debris and other deleterious material. These areas should be moisture conditioned to at least the optimum moisture content and compacted to a minimum relative compaction of 90 percent as determined by ASTM Test Method D1557.

Pool decking supported on grade should be separated from the pool bond beam by a full-depth, mastic construction joint. If it is desired to extend the pool deck over the bond beam, consideration should be given to designing the deck as a structural slab supported by the pool shell. This will reduce the possibility of deck cracking occurring along the outer edge of the bond beam. Due to the expansive potential of the native site soils, we also recommend that the pool decking subgrade be pre-saturated prior to concrete placement. The subgrade soils should be moisture conditioned to at least 110% of the soil's optimum moisture content to a depth of 12 inches, prior to concrete placement. Testing by the geotechnical engineer is recommended to confirm that the soils have been adequately moisture treated.

Pool decking may consist of 5-inch thick concrete and the use of reinforcement is suggested. A minimum of #3 rebars spaced 24 inches placed on center may be used. Control joints should be placed in two directions and located a distance apart approximately equal to 24 to 36 times the slab thickness. The project structural engineer should provide final design recommendations.

As noted in Section 5.3.8, recent testing showed that the onsite materials have negligible sulfate content. However, it is our recommendation that Type V cement be used for the pool construction due to the chemicals associated with the pool water.

5.3.6 Pavement Design Considerations

Pavement design for proposed on-site pavement improvements was conducted per Caltrans *Highway Design Manual* guidelines for flexible pavements. Based on Traffic Indices (TI) of 5.0 and 6.0 generally used with these types of projects and using a subgrade R-Value of 42 (See Appendix C), the following preliminary sections were estimated:

PRELIMINARY PAVEMENT SECTIONS		
TI	Thickness of Asphalt Concrete (inches)	Thickness of Aggregate Base (inches)
5.0 & 6.0	4*	6*

*Minimum pavement structural section per City of Fullerton Street Standards

The TIs used in our pavement design are considered reasonable values for the proposed pavement 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 may result in premature pavement failure. Traffic parameters used for design were selected based upon engineering judgment and not upon information furnished to us such as an equivalent wheel load analysis or a traffic study.

The recommended pavement sections provided are intended as a minimum guideline and final selection of pavement cross section parameters should be made by the project civil engineer, based upon the local laws and ordinates, expected subgrade and pavement response, and desired level of conservatism. If thinner or highly variable pavement sections are constructed, increased maintenance and repair could be expected. Final pavement design should be checked by testing of soils exposed at subgrade (the upper 12 inches) after final grading has been completed.

Asphalt concrete and aggregate base should conform to current Caltrans Standard Specifications Section 39 and 26-1.02, respectively. As an alternative, asphalt concrete can conform to Section 203-6 of the current Standard Specifications for Public Work (Green Book). Crushed aggregate base or crushed miscellaneous base can conform to Section 200-2.2 and 200-2.4 of the Green Book, respectively. Pavement base should be compacted to at least 95 percent of the ASTM D1557 laboratory maximum dry density (modified proctor).

All pavement installation, including preparation and compaction of subgrade, compaction of base material, placement and rolling of asphaltic concrete, should be done in accordance with the City of Fullerton specifications, and under the observation and testing of GeoTek and a City

Inspector where required. Jurisdictional minimum compaction requirements in excess of the aforementioned minimums may govern.

Deleterious material, excessive wet or dry pockets, oversized rock fragments, and other unsuitable yielding materials encountered during grading should be removed. Once existing compacted fill are brought to the proposed pavement subgrade elevations, the subgrade should be proof-rolled in order to check for a uniform and unyielding surface. The upper 12 inches of pavement subgrade soils should be scarified, moisture conditioned at or near optimum moisture content, and recompacted to at least 95 percent of the laboratory maximum dry density (ASTM D1557). If loose or yielding materials are encountered during construction, additional evaluation of these areas should be carried out by GeoTek. All pavement section changes should be properly transitioned.

5.3.7 Soil Corrosivity

The soil resistivity was tested in the laboratory on two samples collected during our field exploration. The results of the testing (1,206 and 3,752 ohm-cm) indicate that the tested soil samples are "highly corrosive" to buried metals, based on the guidelines provided in *Corrosion Basics: An Introduction* (Roberge, 2000). Chloride content of the samples (0.0008 and 0.0016 percent) was found to be negligible. Consideration should be given to consulting with a corrosion engineer.

5.3.8 Soil Sulfate Content

The sulfate content was determined in the laboratory for two soil samples obtained during our field investigation. The results (0.0054 and 0.0130 percent) indicate that the tested water-soluble sulfate range is less than 0.1 percent by weight which is considered "not applicable" (i.e. negligible) as per Table 4.2.1 of ACI 318. Based upon the test results, no special concrete mix design is required by Code for sulfate attack resistance. Additional testing of soils collected near finish grade should be performed subsequent to site grading.

5.3.9 Concrete Construction

5.3.9.1 General

Concrete construction should follow the 2019 CBC and ACI guidelines regarding design, mix placement, and curing of the concrete. If desired, we could provide quality control testing of the concrete during construction.

5.3.9.2 Concrete Mix Design

As indicated in Section 5.3.7, the site will not require a particular concrete mix design to resist sulfate attack.

5.3.9.3 Concrete Flatwork

Exterior concrete flatwork (sidewalks, driveways, patios, etc.) should have a minimum thickness of four inches. No specific reinforcement is required due to the non-structural nature. However, the use of some reinforcement should be considered. Some shrinkage and cracking of the concrete should be anticipated as a result of typical mix designs and curing practices commonly utilized in residential construction.

"Very low" expansive subgrade soils below exterior concrete flatwork should be pre-saturated to at least 100 percent of optimum moisture content. "Low" expansive soils should be pre-saturated to a minimum of 110 percent of optimum moisture content. Minimum depth of pre-saturation should be 12 inches.

Sidewalks and driveways may be under the jurisdiction of the governing agency. If so, jurisdictional design and construction criteria would apply, if more restrictive than the recommendations presented in this report.

All concrete installation, including preparation and compaction of subgrade, should be done in accordance with the City of Fullerton/Orange County specifications, and under the observation and testing of GeoTek and a City/County inspector, if necessary.

5.3.9.4 Concrete Performance

Concrete cracks should be expected. These cracks can vary from sizes that are essentially unnoticeable to more than 0.125-inch in width. Most cracks in concrete, while unsightly, do not significantly impact long-term performance. While it is possible to take measures (proper concrete mix, placement, curing, control joints, etc.) to reduce the extent and size of cracks that occur, some cracking will occur despite the best efforts to minimize it. Concrete can also undergo chemical processes that are dependent upon a wide range of variables, which are difficult, at best, to control. Concrete, while seemingly a stable material, is subject to internal expansion and contraction due to external changes over time.

One of the simplest means to control cracking is to provide weakened control joints for cracking to occur along. These do not prevent cracks from developing; they simply provide a relief point for the stresses that develop. These joints are a widely accepted means to control cracks but are not always effective. Control joints are more effective the more closely spaced

they are. GeoTek suggests that control joints be placed in two orthogonal directions and located a distance apart approximately equal to 24 to 36 times the slab thickness.

5.4 POST CONSTRUCTION CONSIDERATIONS

5.4.1 Landscape Maintenance and Planting

Water has been shown to weaken the inherent strength of soil, and slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from graded slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Controlling surface drainage and runoff and maintaining a suitable vegetation cover can minimize erosion. Plants selected for landscaping should be lightweight, deep-rooted types that require little water and are capable of surviving the prevailing climate.

Overwatering should be avoided. Care should be taken when adding soil amendments to avoid excessive watering. An abatement program to control ground-burrowing rodents should be implemented and maintained. This is critical as burrowing rodents can decrease the long-term performance of slopes.

It is common for planting to be placed adjacent to structures in planter or lawn areas. This will result in the introduction of water into the ground adjacent to the foundation. This type of landscaping should be avoided.

5.4.2 Drainage

The need to maintain proper surface drainage and subsurface systems cannot be overly emphasized. Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond or seep into the ground adjacent to the footings. Roof leaders and downspouts should discharge onto paved surfaces sloping away from the structure or into a closed pipe system which outfalls to the street gutter pan or directly to the storm drain system. Pad drainage should be directed toward approved areas and not be blocked by other improvements.

It is the owner's responsibility to maintain and clean drainage devices on or contiguous to their lot. In order to be effective, maintenance should be conducted on a regular and routine schedule and necessary corrections made prior to each rainy season.

5.5 PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

We recommend that foundation plans for the site be reviewed by this office prior to construction to check for conformance with the recommendations of this report. We also recommend that GeoTek representatives be present during construction of foundation and other improvements to observe and document proper implementation of the geotechnical recommendations. The owner/developer should verify that GeoTek representatives perform at least the following duties:

- Observe site clearing and grubbing operations for proper removal of unsuitable materials.
- Observe and test bottom of removals prior to fill placement.
- Evaluate the suitability of onsite and import materials for fill placement and collect soil samples for laboratory testing where necessary.
- Observe the fill for uniformity during placement, including utility trenches.
- Perform field density testing of the fill materials.
- Observe and probe foundation excavations to confirm suitability of bearing materials.

If requested, a construction observation and compaction report can be provided by GeoTek, which can comply with the requirements of the governmental agencies having jurisdiction over the project.

6 INTENT

It is the intent of this report to aid in the design and construction of the proposed development. Implementation of the advice presented in this report is intended to reduce risk associated with construction projects. The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual or variable conditions will not be discovered during or after construction.

The scope of our report is limited to the boundaries of the subject property. This update does not and should in no way be construed to encompass any areas beyond the specific area of the proposed construction as indicated to us by our client. Further, no evaluation of any existing site improvements is included. The scope is based on our understanding of the project and the client's needs, our fee estimate (Proposal No. P-0804420-CR) date August 14, 2020 and

geotechnical engineering standards normally used on similar projects in this locality at the present.

7 LIMITATIONS

Our findings are based on site conditions observed and the stated sources. Thus, our comments are professional opinions that are limited to the extent of the available data.

GeoTek has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report.

Since our recommendations are based on the site conditions observed and encountered, and laboratory testing, our conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty of any kind is expressed or implied. Standards of care/practice are subject to change with time.

8 SELECTED REFERENCES

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Shopoff Realty Investments
Mixed-Use Development Project
APNs 287-241-01, -04, and -06
Fullerton, Orange County, California
Project No. 2495-CR

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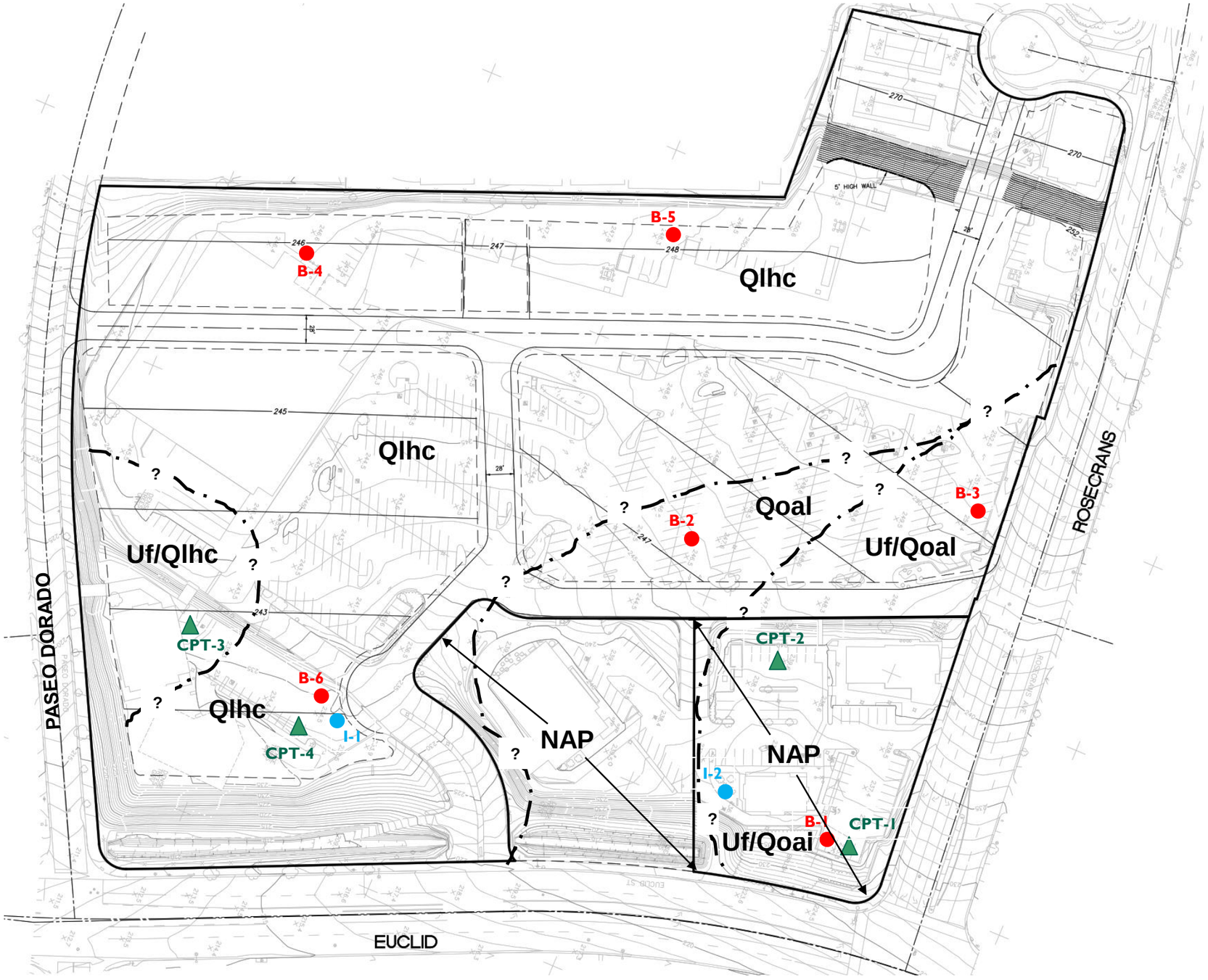
Figure 1

Site Location Map

GEOTEK



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Shopoff Realty Investments
Mixed-Use Development Project
APNs 287-241-01, -04, and -06
Fullerton, Orange County, California

Project No. 2495--CR

GEOTEK

Figure 2

Exploration Location Map

APPENDIX A

LOGS OF BORINGS AND CPT SOUNDINGS

Geotechnical and Infiltration Evaluation
Proposed Residential Development Project, Fullerton, California
Project No. 2495-CR

GEOTEK

A - FIELD TESTING AND SAMPLING PROCEDURES

The Modified Split-Barrel Sampler (Ring)

The ring sampler is driven into the ground in accordance with ASTM Test Method D 3550. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sampler is typically driven into the ground 12 or 18 inches with a 140-pound hammer free falling from a height of 30 inches. Blow counts are recorded for every 6 inches of penetration as indicated on the logs of borings. The samples are removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

Bulk Samples (Large)

These samples are normally large bags of earth materials over 20 pounds in weight collected from the field by means of hand digging or exploratory cuttings.

Bulk Samples (Small)

These are plastic bag samples which are normally airtight and contain less than five pounds in weight of earth materials collected from the field by means of hand digging or exploratory cuttings. These samples are primarily used for determining natural moisture content and classification indices.

B – BORING

The following abbreviations and symbols often appear in the classification and description of soil and rock on the logs of borings:

SOILS

USCS	Unified Soil Classification System
f-c	Fine to coarse
f-m	Fine to medium

GEOLOGIC

B: Attitudes	Bedding: strike/dip
J: Attitudes	Joint: strike/dip
C: Contact line	
……..	Dashed line denotes USCS material change
———	Solid Line denotes unit / formational change
———	Thick solid line denotes end of boring

(Additional denotations and symbols are provided on the logs of borings).

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

BORING NO.: B-1
Sheet 1 of 2

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 2" / Aggregate Base = 5"			
					Undocumented Fill			MD, EI, SA, SH
		8 13 16	R1	SC	Clayey f-m SAND, dark olive brown, grayish brown, moist, medium dense, trace f gravel	12.0	120.4	
5		9 11 13	R2		Same, dark brown	12.6	117.0	HC
		9 8 8	R3		Same, roothairs, minor asphalt fragments	11.8	121.8	HC
10		20	R4		Same, dense	9.9	124.1	
		21 15		SM-SC	**Older Alluvium** Silty to clayey SAND, orangish brown, moist, dense			
15		3 6 8	S1	SW	F-c SAND, orangish brown, moist to very moist, medium dense, friable			
20		6 8 12	R5	CL	Sandy CLAY, orangish brown, moist, medium stiff, low plasticity, trace carbon fragments	14.7	118.4	HC
25		5 6 8	S2	SC	Clayey SAND, orangish brown, moist to very moist, medium dense, carbon fragments, roots locally.			
30		6 7 12	S3	CL	F sandy CLAY, light orangish brown, moist, very stiff, low plasticity			

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

BORING NO.: B-1 Sheet 2 of 2

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
35		4 5 6	S4	ML	Sandy SILT, olive brown, moist to very moist, stiff, trace carbon fragment			
40		6 8 12	S5	CL	Sandy CLAY, pale gray, slightly moist to moist, very stiff, low plasticity			
45		14 16 38	S6		**La Habra Formation** Silty f SANDSTONE, tan to light brown, moist, hard, slightly mottled and oxidized			
		▽			Groundwater at 49 ft			
50		13 25 30	S7		Same, wet			
					BORING TERMINATED AT 51.5 FEET Groundwater encountered at 49 feet Boring backfilled with bentonite			

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: B-2** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 4" / No Aggregate Base			
					Older Alluvium			
		11 19 22	R1	SW	F-c SAND, tan, slightly moist, dense, slightly friable	4.0	108.4	
5		16 21 25	R2	ML	F sandy SILT, light orangish brown, moist, hard, low plasticity, trace interbedded SILT	16.3	107.8	
					La Habra Formation			
		24 50/6	R3		F SANDSTONE, light orangish brown, moist, hard	9.4	108.9	
10		8 18 22	R4		Same, hard, caliche stringers			
					BORING TERMINATED AT 12.5 FEET			
					No groundwater encountered Boring backfilled with soil cuttings			
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

BORING NO.: B-3

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 4" / No Aggregate Base			
					Undocumented Fill			
		12 16 19	R1	SM	Silty f-m SAND, brown, grayish brown, moist, dense	12.7	117.8	
					Older Alluvium			
5		6 8 10	R2	SP	F SAND with SILT, orangish brown, moist, medium dense, trace carbon fragments	12.2	112.6	
		8 9 10	R3		Same, disturbed sample			
					La Habra Formation			
10	▽	8 10 15	R4		Sandy SILTSTONE/Silty f SANDSTONE, light orangish brown, wet, soft, slightly mottled, roots/rootlets	18.0	110.5	
15		8 12 20	R5		Same, hard, some mottling, carbon fragments			
20		8 10 20	R6		Clayey SILTSTONE, orangish brown, reddish brown, wet, soft, highly mottled			
					BORING TERMINATED AT 21.5 FEET			
					Groundwater encountered at 10.0 feet Boring backfilled with bentonite			
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-4 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 4.5" / Aggregate Base = 4"			
					La Habra Formation			RV
		14 31 32	R1		F-m SANSTONE, light orangish brown, moist, hard, interbedded CLAYSTONE/SILTSTONE lenses	10.4	108.7	
5		12 20 20	R2		Silty f SANDSTONE, orangish brown, moist, hard, trace caliche	6.4	115.4	
		12 20 28	R3		F-c SANDSTONE, tan to light brown, slightly moist, hard, trace f gravel	2.4	110.2	
10					**BORING TERMINATED AT 9.5 FEET** No groundwater encountered Boring backfilled with soil cuttings			
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-5 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 4" / Aggregate Base = 0"			
					La Habra Formation			
		6 9 12	R1		Clayey SILTSTONE, olive, very moist to wet, soft, trace oxidation	23.7	96.5	
5		10 15 20	R2		Silty CLAYSTONE, olive brown, moist, soft, slightly mottled	14.3	116.6	
		12 18 20	R3		Same, increased mottling, caliche	12.6	117.6	
10					**BORING TERMINATED AT 9.5 FEET** No groundwater encountered Boring backfilled with soil cuttings			
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: B-6** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 4" / Aggregate Base = 0"			
					La Habra Formation			MD, EI, SH
		32 50/4.5	R1		Silty f SANDSTONE, tan, offwhite, slightly moist, hard	7.1	126.7	
5		31 50/3.5	R2		Same, offwhite, orangish brown, mottled	5.0	110.5	
					Drilling slowed			
		33 50/4	R3		Same, oxidation staining	6.4	98.8	
					BORING TERMINATED AT 9.5 FEET			
10					No groundwater encountered Boring backfilled with soil cuttings			
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: I-1** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 4" / Aggregate Base = 0"			
					La Habra Formation			
					F SANDSTONE, orangish brown, off white, slightly moist, hard			
5					**BORING TERMINATED AT 5.0 FEET**			
					No groundwater encountered			
10								
15								
20								
25								
30								

LEGEND

Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	Shopoff Realty Investments	**DRILLER:**	2R Drilling Inc.	**LOGGED BY:**	KRM
PROJECT NAME:	APNs 287-241-04, -05, & -06	**DRILL METHOD:**	Hollow stem Auger	**OPERATOR:**	George
PROJECT NO.:	2495-CR	**HAMMER:**	140lbs/30in.	**RIG TYPE:**	CME-75
LOCATION:	See Boring Location Map			**DATE:**	11/2/2020

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	**BORING NO.: I-2** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete = 3" / Aggregate Base = 4"			
					Older Alluvium			
					F-m SAND with SILT, tan, slightly moist, dense, trace f gravel			
5					**BORING TERMINATED AT 5.0 FEET**			
					No groundwater encountered			
10								
15								
20								
25								
30								

LEGEND

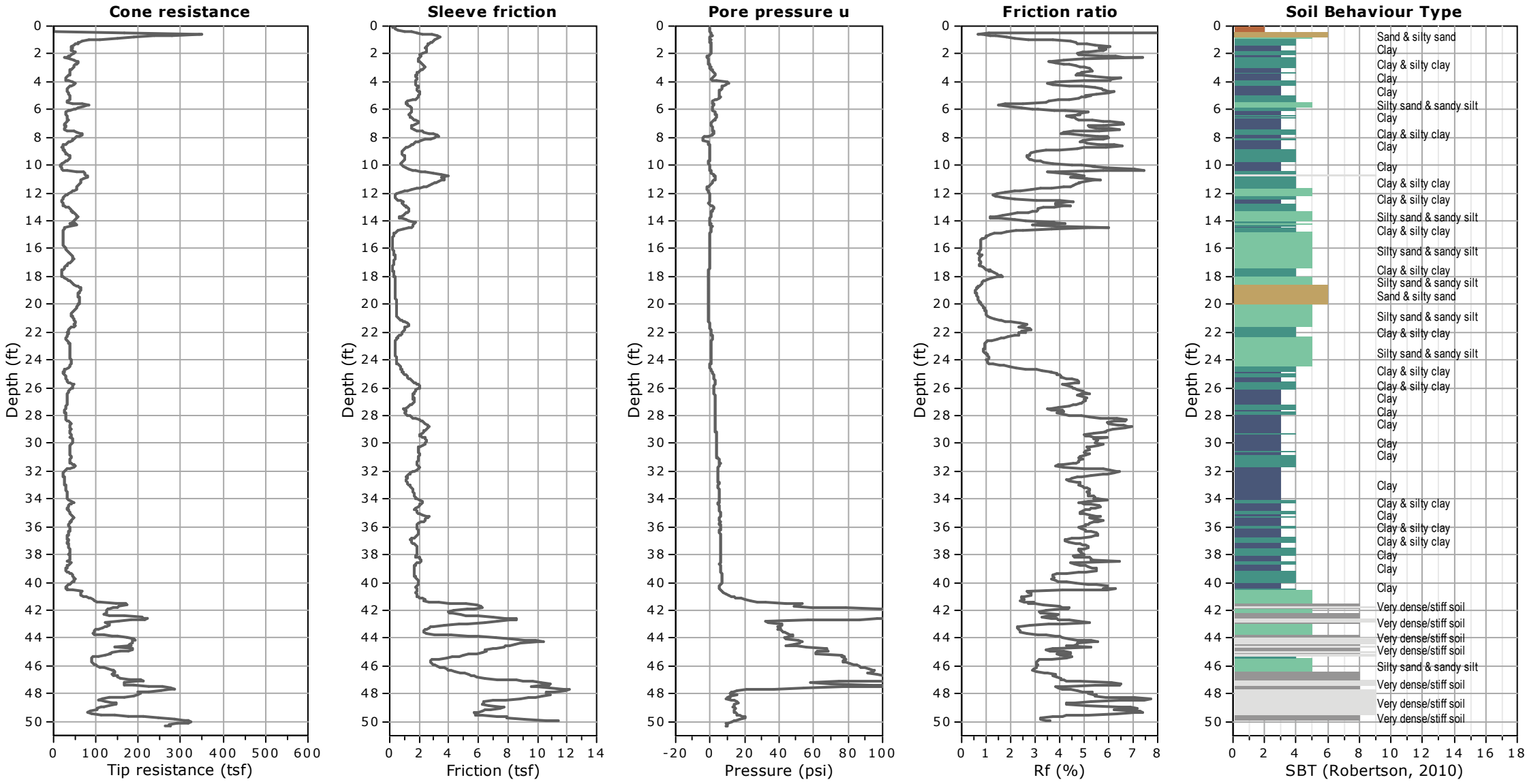
Sample type: ---Ring ---SPT ---Small Bulk ---Large Bulk ---No Recovery ---Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

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

Project: GeoTek
Location: 1020 Rosecrans Ave, Fullerton, CA

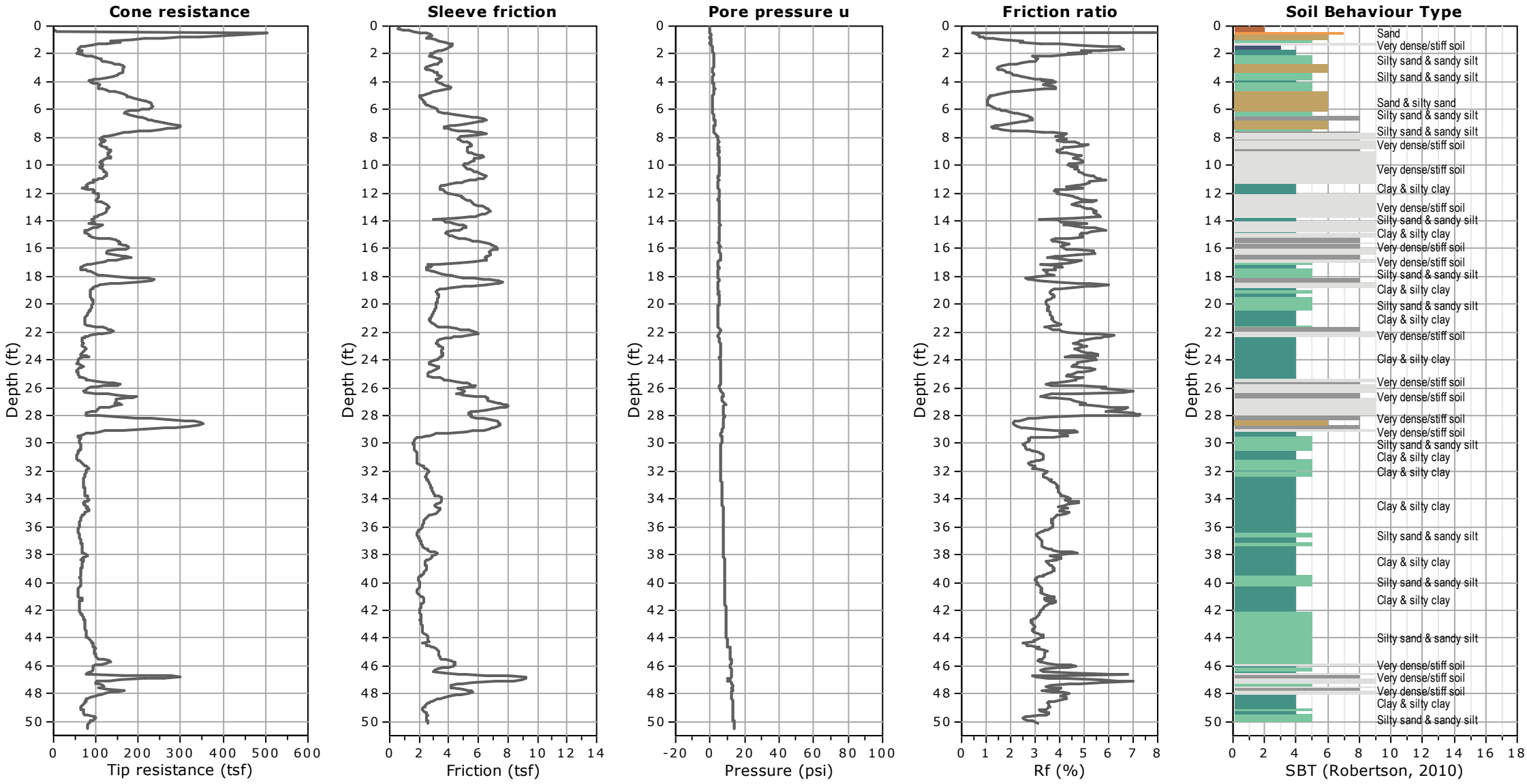
CPT-1
Total depth: 50.35 ft, Date: 11/4/2020



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

Project: GeoTek
Location: 1020 Rosecrans Ave, Fullerton, CA

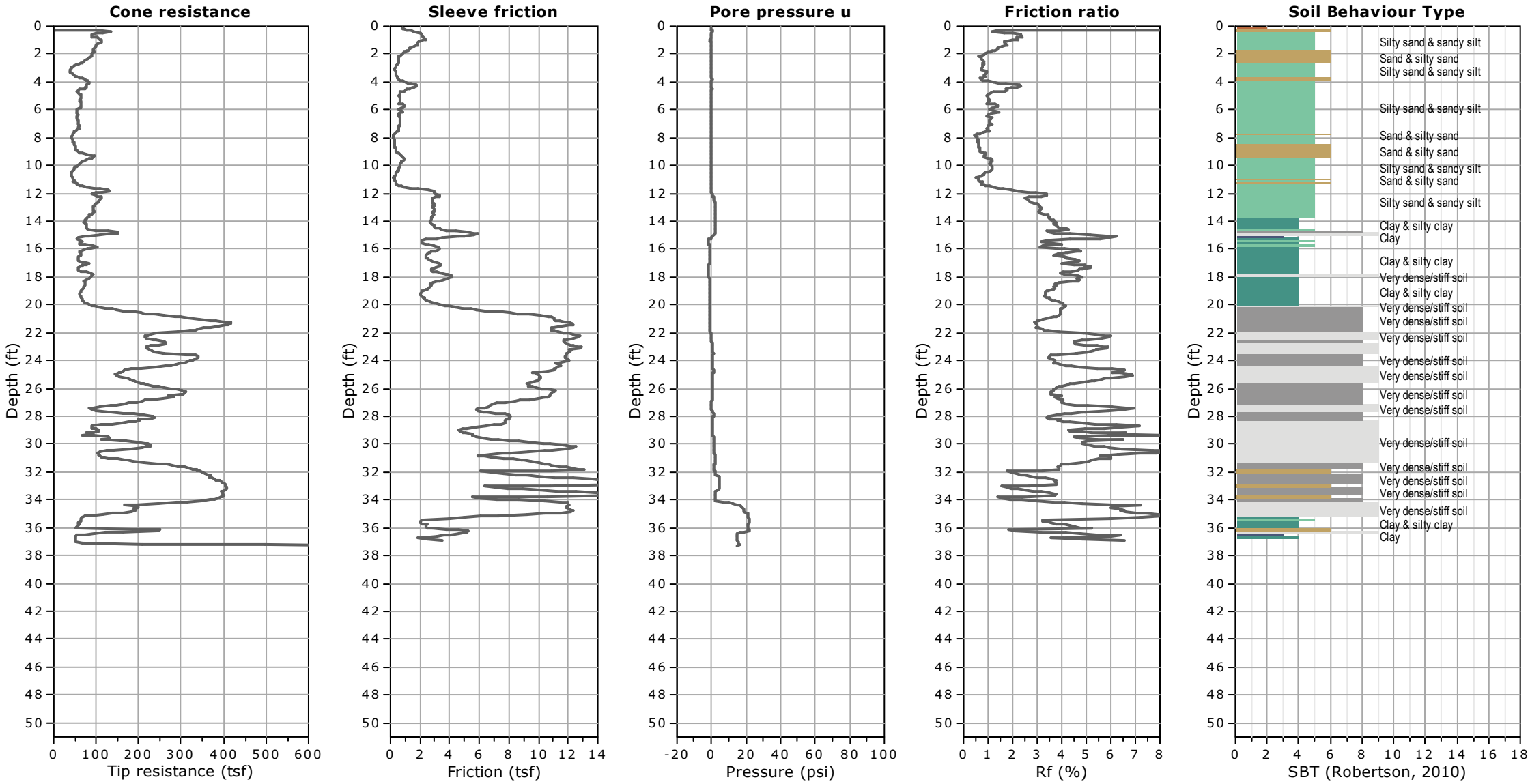
CPT-2
Total depth: 50.48 ft, Date: 11/4/2020



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

Project: GeoTek
Location: 1020 Rosecrans Ave, Fullerton, CA

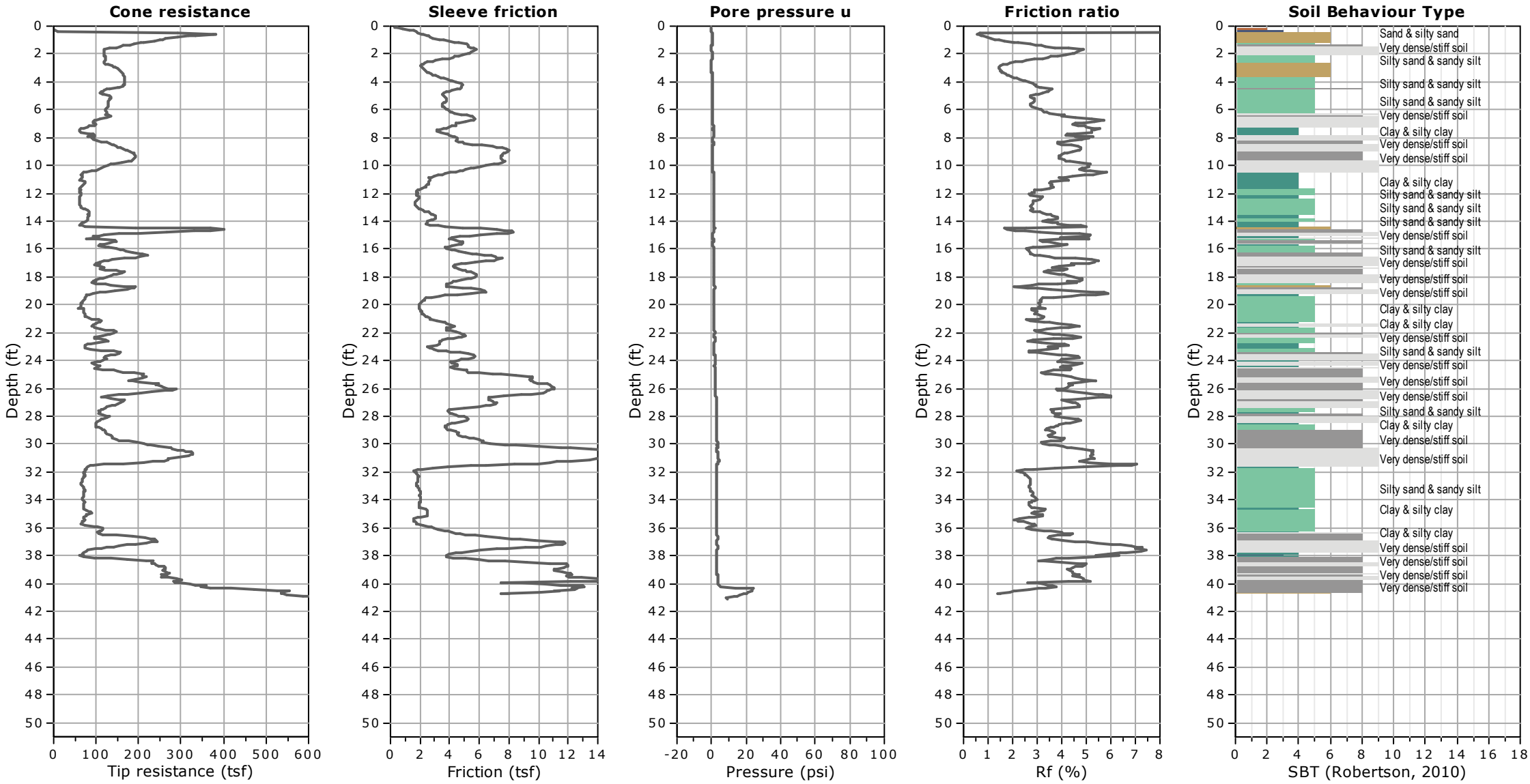
CPT-3
Total depth: 37.27 ft, Date: 11/4/2020



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

Project: GeoTek
Location: 1020 Rosecrans Ave, Fullerton, CA

CPT-4
Total depth: 41.14 ft, Date: 11/4/2020



APPENDIX B

LABORATORY TEST RESULTS

Geotechnical and Infiltration Evaluation
Proposed Residential Development Project, Fullerton, California
Project No. 2495-CR

GEOTEK

SUMMARY OF LABORATORY TESTING

In Situ Moisture Content and Unit Weight

The field moisture content was measured in the laboratory on selected samples collected during the field investigation. The field moisture content is determined as a percentage of the dry unit weight. The dry density was measured in the laboratory on selected ring samples. The results are shown on the logs of exploratory borings in Appendix A.

Moisture-Density Relationship

Laboratory testing was performed on two samples collected during the subsurface exploration. The laboratory maximum dry density and optimum moisture content for the soil types were determined in general accordance with test method ASTM Test Procedure D 1557. The results are included herein.

Direct Shear

Direct shear testing was performed on two remolded samples of the surficial soils according to ASTM Test Method D 3080. The test results are presented herein.

Expansion Index

Expansion Index testing was performed on two soil samples collected from the site. Testing was performed in general accordance with ASTM Test Method D 4829. The test results are presented herein.

Percent Passing No. 200 Sieve

The amount of soil particles passing No. 200 sieve was estimated in accordance with ASTM D 1140. The test results are presented herein.

Collapse

Collapse tests were conducted in accordance with ASTM D2435. The results of these tests are presented herein.

R-Value

R-Value test was conducted by others in general accordance with Caltrans Test Method 301. The results of this test are presented herein.

Sulfate Content, Resistivity and Chloride Content

Testing to determine the water-soluble sulfate content was performed by others in general accordance with ASTM D 516. Resistivity testing was completed by others in general accordance with ASTM G 187. Testing to determine the chloride content was performed by others in general accordance with ASTM D 512B. The results are included herein.

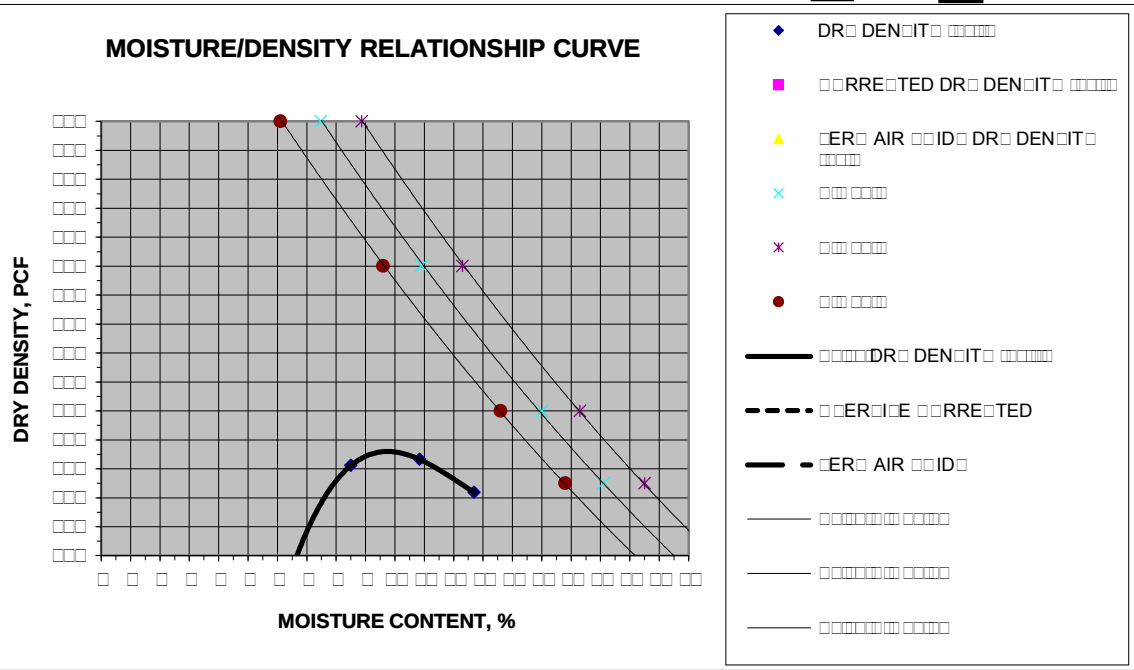
GEOTEK

MOISTURE/DENSITY RELATIONSHIP

Client: □□□□□□□R□□□□□ In□□□□□□ □n□□ **Job No.:** □□□□□□□R
Project: Mi□□□ □□d D□□□□□□□□ □n□ **Lab No.:** □□r□n□
Location: F□□□r□□n
Material Type: □ □□□□□ □□□ □AND□d□r□ □r□□n
Material Supplier: □
Material Source: □
Sample Location: □□□ □ □□□ □□□□
□
Sampled By: □M **Date Sampled:** □□□□□□□□□
Received By: DA **Date Received:** □□□□□□□□□
Tested By: F□ **Date Tested:** □□□□□□□□□
Reviewed By: DA **Date Reviewed:** □□□□□□□□□

Test Procedure: A□TM D□□□□ **Method:** A
Oversized Material (%): □□□ **Correction Required:** ☐ yes ☒ no

MOISTURE/DENSITY RELATIONSHIP CURVE



MOISTURE DENSITY RELATIONSHIP VALUES

Maximum Dry Density, pcf	□□□□□□	**@ Optimum Moisture, %**	□□□□
Corrected Maximum Dry Density, pcf		**@ Optimum Moisture, %**	

MATERIAL DESCRIPTION

Grain Size Distribution:

	□ □r□□□□□r□□□in□d □n N□□□□
	□ □□nd □□□□in□N□□□□R□□□in□d □n N□□□□□□
	□ □i□□nd □□□□ □□□□in□N□□□□□

Atterberg Limits:

	□i□□id □i□i□□□
	□□□□i□ □i□i□□□
	□□□□i□i□□Ind□□□□

Classification:
□ni□□d □□i□□ □□□□□i□□□i□n□
AA□□T□ □□i□□ □□□□□i□□□i□n□

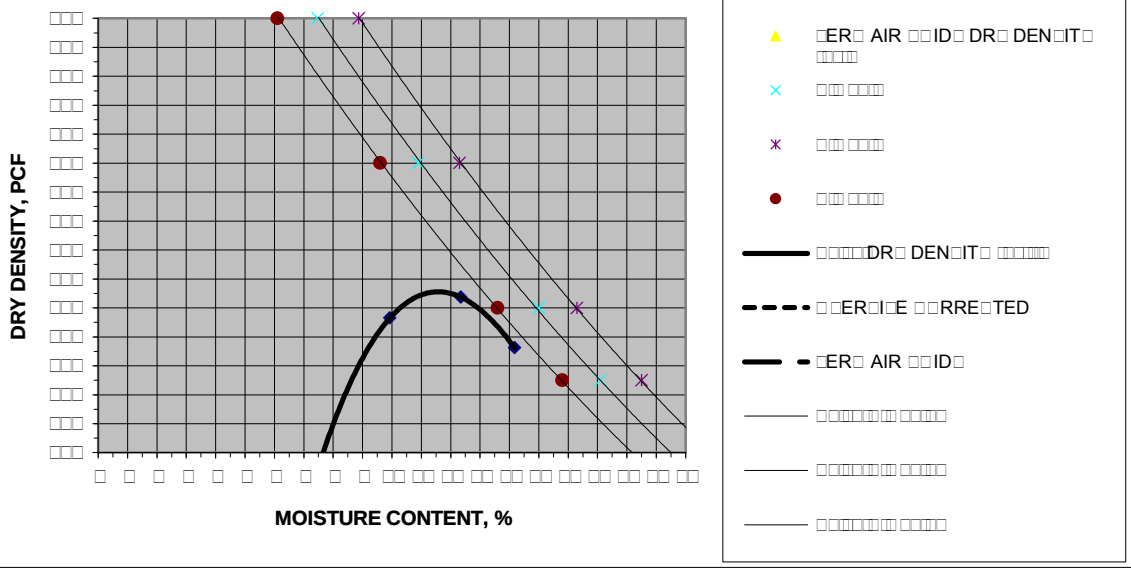
GEOTEK

MOISTURE/DENSITY RELATIONSHIP

Client: □□□□□□□R□□□□□ In□□□□□□ □n□□ **Job No.:** □□□□□□□R
Project: Mi□□□ □□d D□□□□□□□□ □n□ **Lab No.:** □□r□n□
Location: F□□□r□□n
Material Type: □i□□□ □in□ □AND □T□NE□□□n
Material Supplier: □
Material Source: □
Sample Location: □□□ □ □□□ □□□□□
□
Sampled By: □M **Date Sampled:** □□□□□□□□□□
Received By: DA **Date Received:** □□□□□□□□□□
Tested By: F□ **Date Tested:** □□□□□□□□□□
Reviewed By: DA **Date Reviewed:** □□□□□□□□□□

Test Procedure: A□TM D□□□□ **Method:** A
Oversized Material (%): □□□ **Correction Required:** ☐ yes ☒ no

MOISTURE/DENSITY RELATIONSHIP CURVE



MOISTURE DENSITY RELATIONSHIP VALUES

Maximum Dry Density, pcf	□□□□□	**@ Optimum Moisture, %**	□□□□
Corrected Maximum Dry Density, pcf		**@ Optimum Moisture, %**	

MATERIAL DESCRIPTION

Grain Size Distribution:

	□ □r□□□□r□□□in□d □n N□□□□
	□ □□nd □□□□in□N□□□□R□□□in□d □n N□□□□□□
	□ □i□□nd □□□□ □□□□in□N□□□□□

Atterberg Limits:

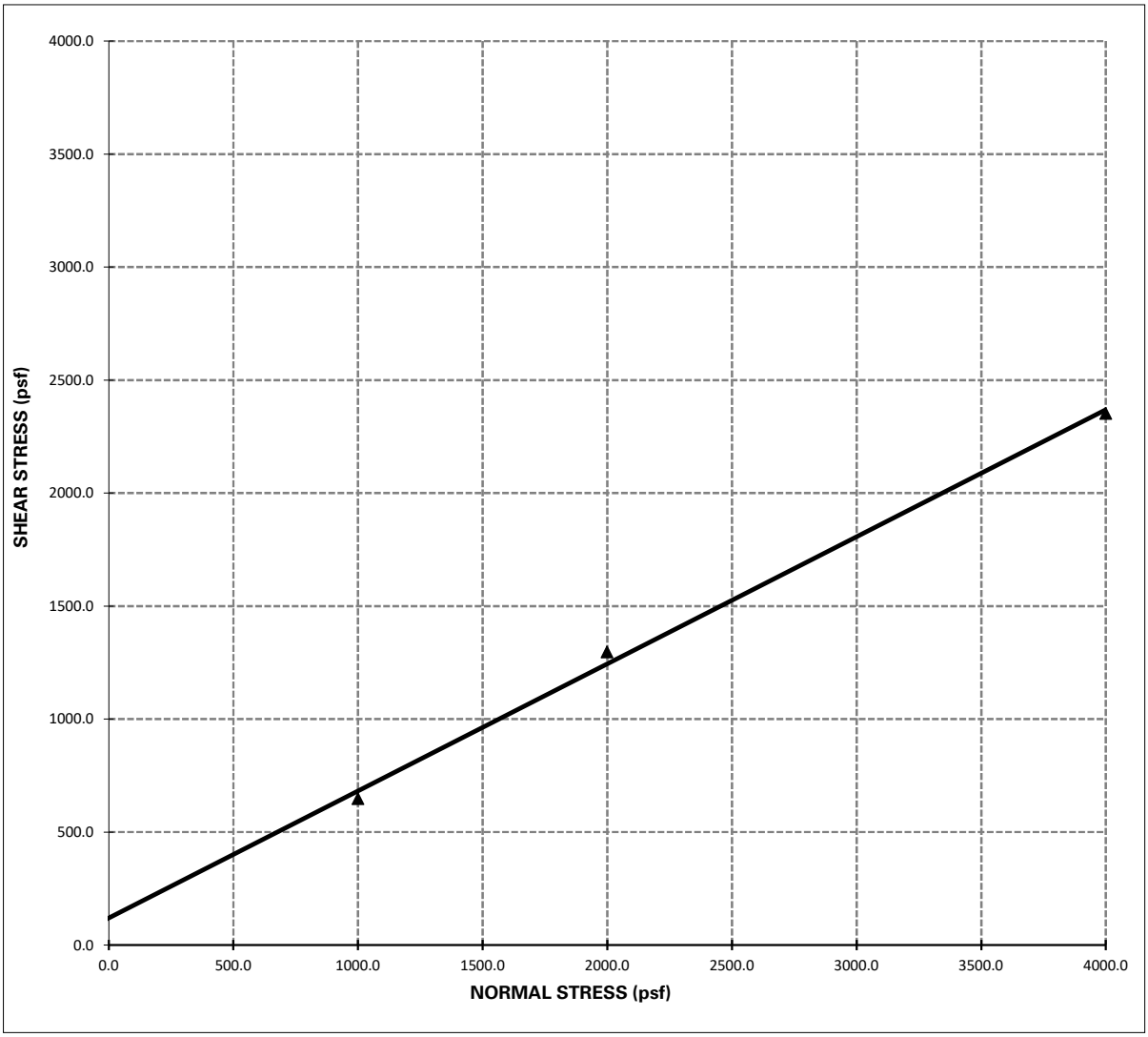
	□i□□id □i□i□□□
	□□□□i□ □i□i□□□
	□□□□i□i□□Ind□□□□

Classification:

□ni□□d □□i□□ □□□□i□□□i□n□ _____
AA□□T□ □□i□□ □□□□i□□□i□n□ _____

DIRECT SHEAR TEST

Project Name:	Mix-Used Development	***Sample Location:***	B-1 @ 1-5 feet
Project Number:	2495-CR	***Date Tested:***	11/24/2020



Shear Strength: Φ = **29 °** , **C = 120 psf**

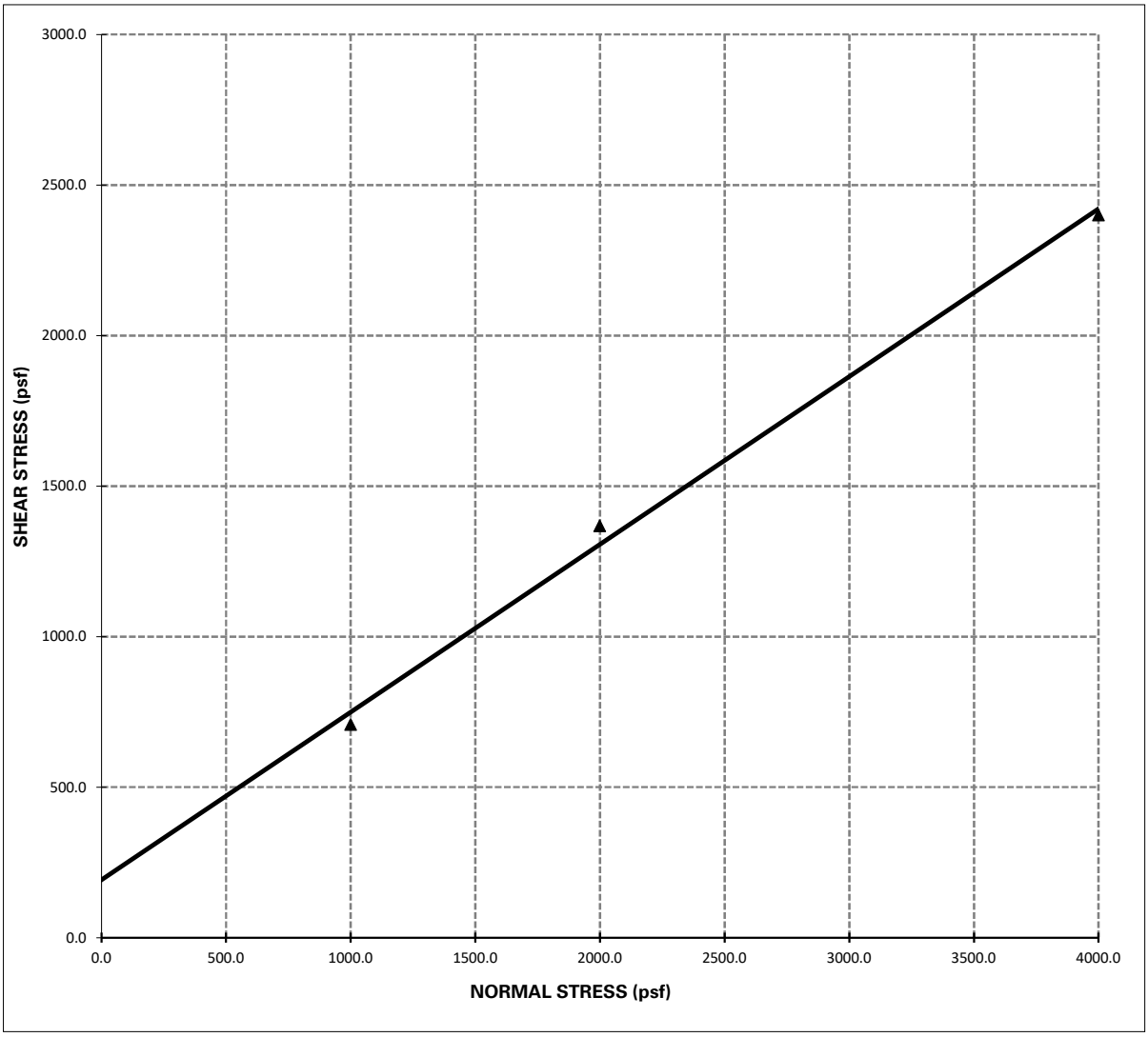
Notes: 1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.

2 - The above reflect direct shear strength at saturated conditions.

3 - The tests were run at a shear rate of 0.035 in/min.

DIRECT SHEAR TEST

Project Name:	Mix-Used Development	***Sample Location:***	B-6 @ 1-5 feet
Project Number:	2495-CR	***Date Tested:***	11/20/2020



Shear Strength: Φ = **29 °** , **C = 192 psf**

Notes:
1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.
2 - The above reflect direct shear strength at saturated conditions.
3 - The tests were run at a shear rate of 0.035 in/min.

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client: □□□□□□□R□□□□ In□□□□□ □n□□

Project Number: 2□95 □□R

Project Location: F□□□r□n

Tested/ Checked By: GP □ab N□ □□r□n□

Date Tested: □1/19 □□02 □

Sample Source: □□□ @ 1-5 fe □t

Sample Description:

Rin□ □□_____ Rin□ Di□. □ 4. □1" Rin□ Ht □"

DENSITY DETERMINATION

A	We□gh □□□com □acte d □ampl □ & rin□ □□□□)	75 □. □
B	We□gh □□□rin□ (gm)	36 □. □
C	Net □□i□□□of samp □e (□□ □	**394.8**
D	We □D□n□i□□, lb / □3 (C □0.30 □6□	**119.1**
E	Dr□ D□n□i□□, □□ / ft3 □D/1□F)	**108.0**

SATURATION DETERMINATION

F	M□i□□□r□ □ □n□□n□, %	10.3
G	□□□□i□i□ □r□□i□□, a□sume d	**2.70**
H	□ni□Wt □of W □te r @ 20 °C, (pcf)	**62.4**
I	% □□□□r□i□n	**49.6**

READINGS			
DATE	TIME	READIN□	
1□/19 □2□20	8: □6	□. □71 □	Ini□i□□
1□/19 □2□20	8: □6	□. □70 □	1□ □in□Dr□
1□/20 □2□20	8: □6	□. □00 □	Fin□□

FINAL MOISTURE	
Fin□□We □gh □□□w□t samp □e & ta □e	□ M□i□□□r□
7□1.1	**18.8**

EXPANSION INDEX = 30

GEOTEK

EXPANSION INDEX TEST

(ASTM D4829)

Client: □□□□□□□R□□□□ In□□□□□ □n□□

Project Number: 2□95 □□R

Project Location: F□□□r□n

Tested/ Checked By: GP □ab N□ □□r□n□

Date Tested: □1/19 □□02 □

Sample Source: □□□ @ 1-5 fe □t

Sample Description:

Rin□ □□_____ Rin□ Di□. □ 4. □1" Rin□ Ht □"

DENSITY DETERMINATION

A	We□gh □□□com □acte d □ampl □ & rin□ □□□□)	75 □. □
B	We□gh □□□rin□ (gm)	36 □. □
C	Net □□i□□□of samp □e (□□ □	**386.8**
D	We □D□n□i□□, lb / □3 (C □0.30 □6□	**116.7**
E	Dr□ D□n□i□□, □□ / ft3 □D/1□F)	**105.1**

SATURATION DETERMINATION

F	M□i□□□r□ □ □n□□n□, %	11.0
G	□□□□i□i□ □r□□i□□, a□sume d	**2.70**
H	□ni□Wt □of W □te r @ 20 °C, (pcf)	**62.4**
I	% □□□□r□i□n	**49.2**

READINGS			
DATE	TIME	READIN□	
1□/19 □2□20	9: □9	□. □06 □	Ini□i□□
1□/19 □2□20	9: □9	□. □05 □	1□ □in□Dr□
1□/20 □2□20	9: □9	□. □23 □	Fin□□

FINAL MOISTURE	
Fin□□We □gh □□□w□t samp □e & ta □e	□ M□i□□□r□
7□9.7	**18.7**

EXPANSION INDEX = 18

GEOTEK

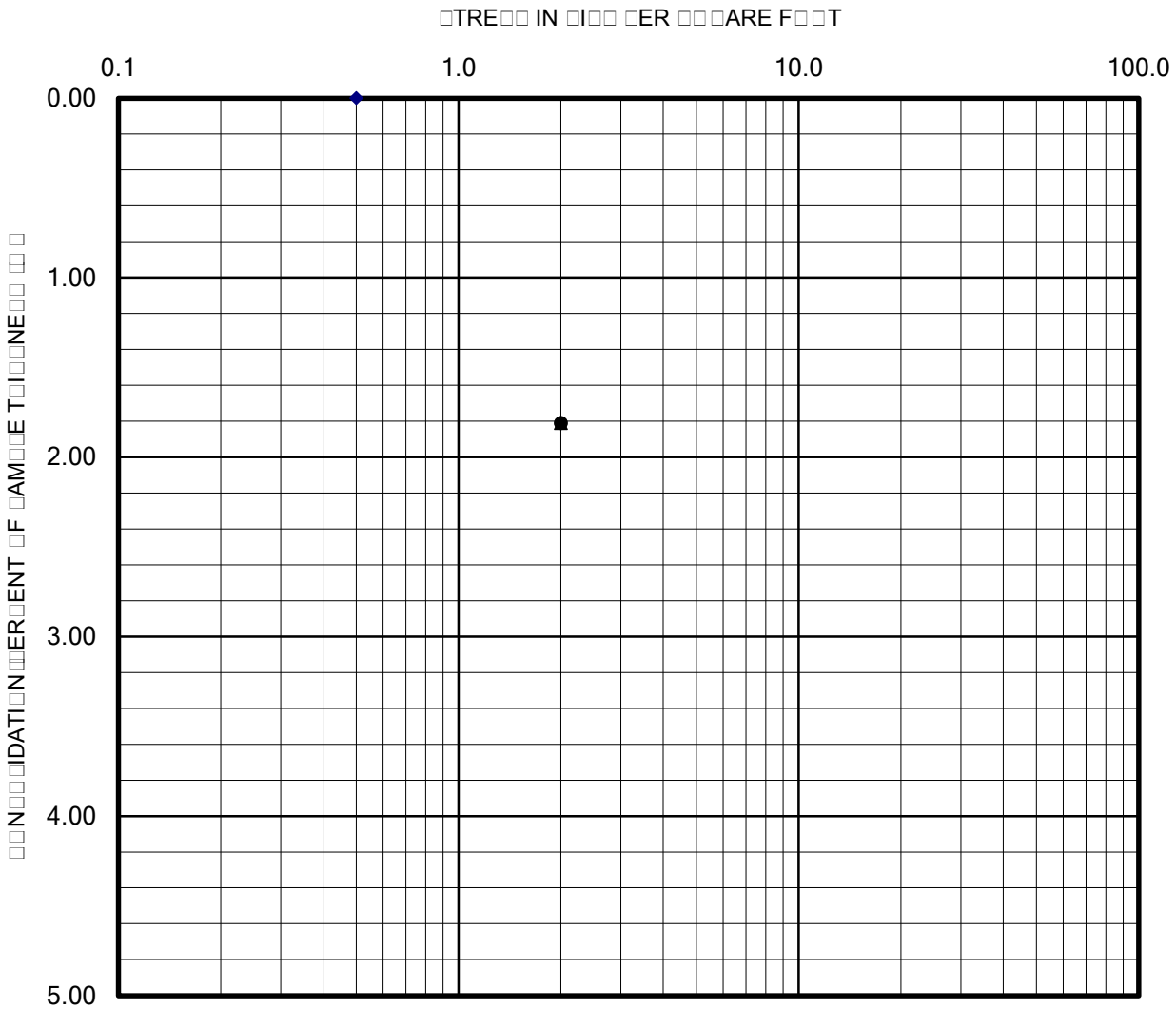
-200 WASH

D□□□□	□□□□□□□□□□		
□ □□□ □□□	□□□□□□□R	□□□□ □□□□ ID	□□
□i□n□□□	□□□ □□FF REA□T□	d□□□□□	□□□□□
□r□□□□□□□	MI□ED □□E DE□E□□ □MENT		

Sieve Size	Particle Diameter		Wt. Retained	Wt. Passing	% Passing	Specs
	in.	mm.				
□□□□□	□□□□□□□	□□□□□□	□□□□	□□□□□□	□□□□□□	

Dr□ □ □i□□□ □□□□□□

□□□□Ti□ □ □□□□□ Min□□□□



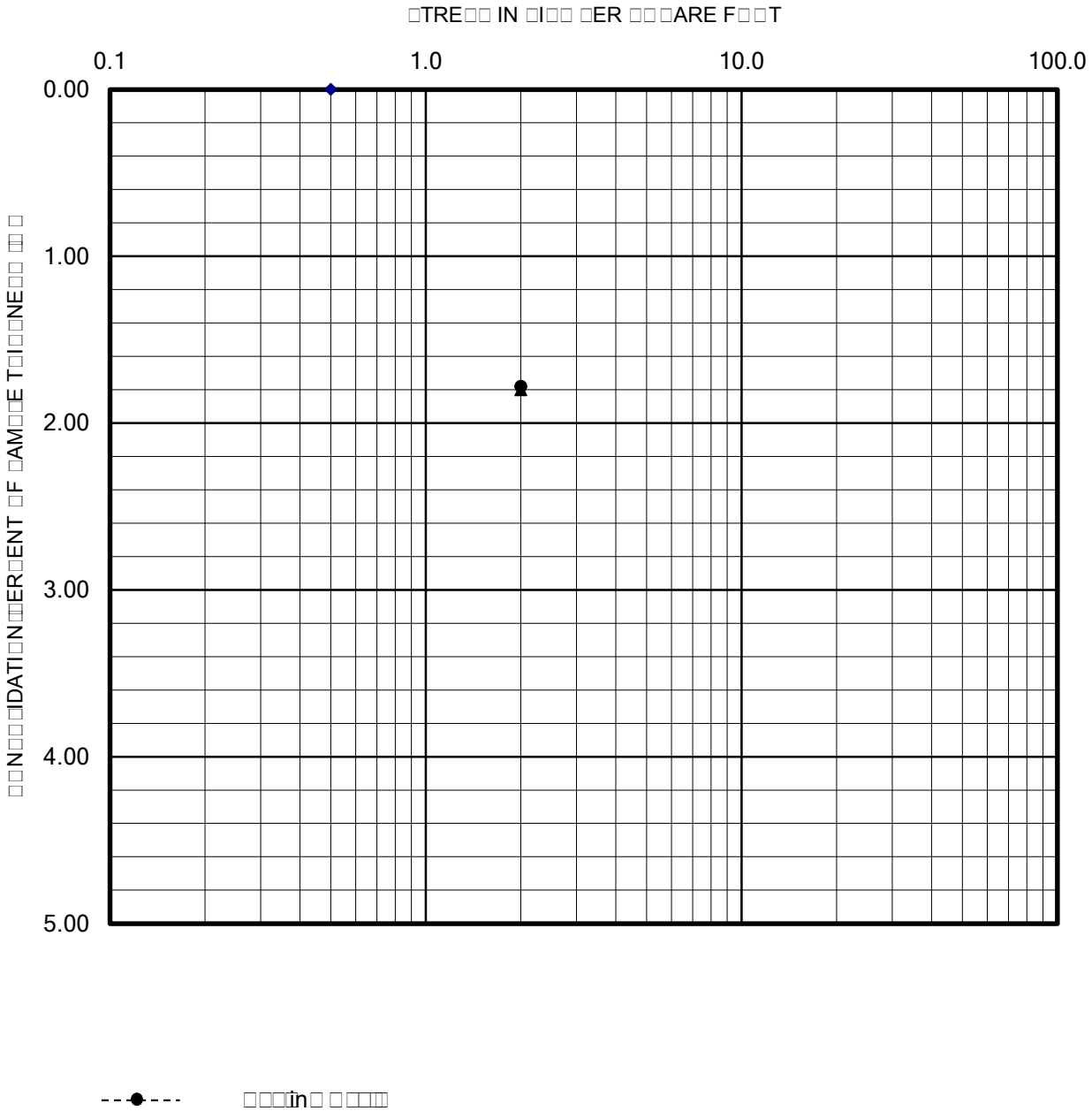
□ERF□RMED IN □ENERA□ A□□□RDAN□E □ IT□ A□TM D □□□□

GEOTEK

COLLAPSE REPORT

Sample: B-1 @ 4 feet

□□E□□ED □□□	□□□□DI
□R□ □E□T N□ □□□□□□□□□R	D□□□□□□□□□



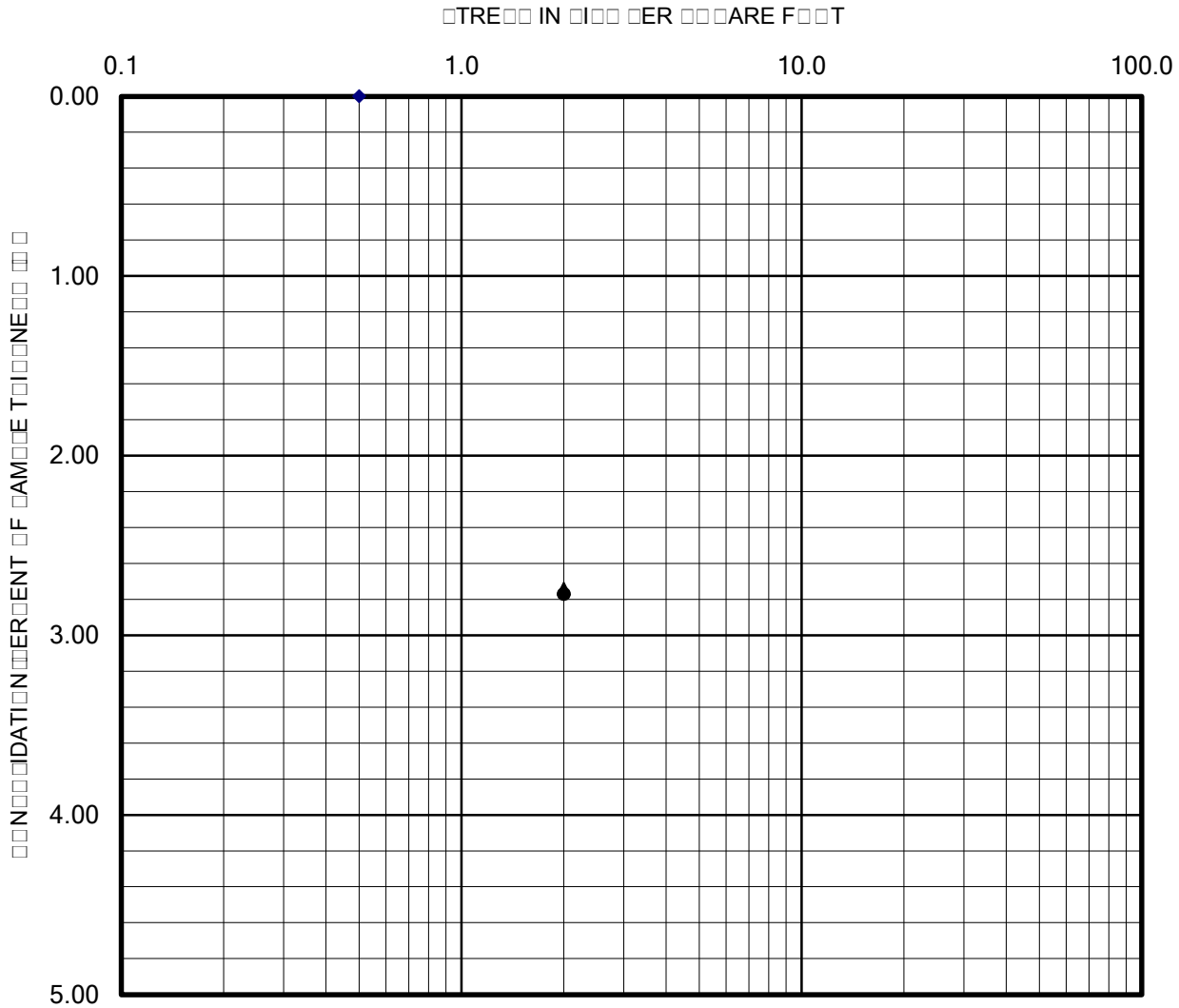
□ERF□RMED IN □ENERA□ A□□□RDAN□E □ IT□ A□TM D □□□□

GEOTEK

COLLAPSE REPORT

Sample: B-1 @ 7 feet

□□E□□ED □□□	□□□□DI
□R□ □E□T N□ □□□□□□□□□R	D□□□□□□□□□



□ERF□RMED IN □ENERA□ A□□□RDAN□E □ IT□ A□TM D □□□□

GEOTEK

COLLAPSE REPORT

Sample: B-1 @ 20 feet

□□E□□ED □□□	□□□□DI
□R□ □E□T N□ □□□□□□□□□R	D□□□□□□□□□

R - VALUE DATA SHEET

LaBelle Marvin

PROJECT No. 46677

DATE: 11/17/2020

BORING NO. B-4 @ 1'-5'

Shopoof, 1028 Rosecrans Avenue

W.O.# 2495-CR

SAMPLE DESCRIPTION: Brown Clayey Sand

R-VALUE TESTING DATA | CA TEST 301			
	SPECIMEN ID		
	a	b	c
Mold ID Number	1	2	3
Water added, grams	50	80	36
Initial Test Water, %	12.8	15.8	11.4
Compact Gage Pressure,psi	115	40	235
Exudation Pressure, psi	398	171	728
Height Sample, Inches	2.54	2.60	2.52
Gross Weight Mold, grams	3069	3083	3061
Tare Weight Mold, grams	1954	1946	1958
Sample Wet Weight, grams	1115	1137	1103
Expansion, Inches x 10exp-4	28	0	73
Stability 2,000 lbs (160psi)	26 / 54	55 / 130	23 / 43
Turns Displacement	3.93	4.09	3.89
R-Value Uncorrected	56	12	64
R-Value Corrected	56	13	64
Dry Density, pcf	117.9	114.5	119.1

DESIGN CALCULATION DATA

Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.45	0.89	0.37
G. E. by Expansion	0.93	0.00	2.43

Equilibrium R-Value	**42** by EXPANSION	Examined & Checked: 11 /17/ 20
REMARKS:	Gf = 1.25 0.6% Retained on the 3/4" Sieve.	Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle Marvin

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 46677

DATE: 11 /17/ 2020

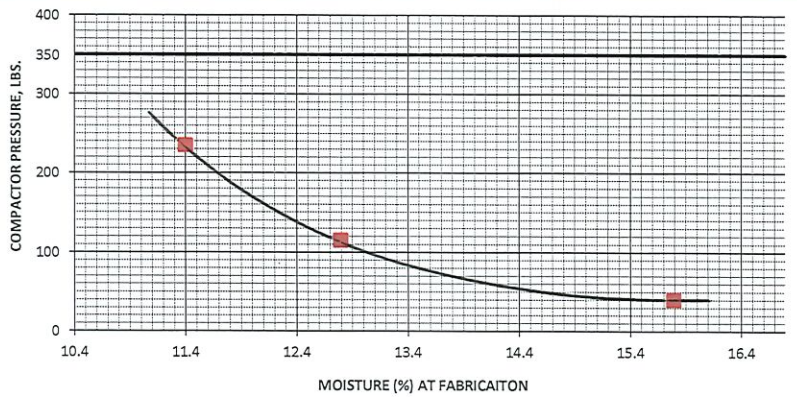
REMARKS:

BORING NO. B-4 @ 1'-5'

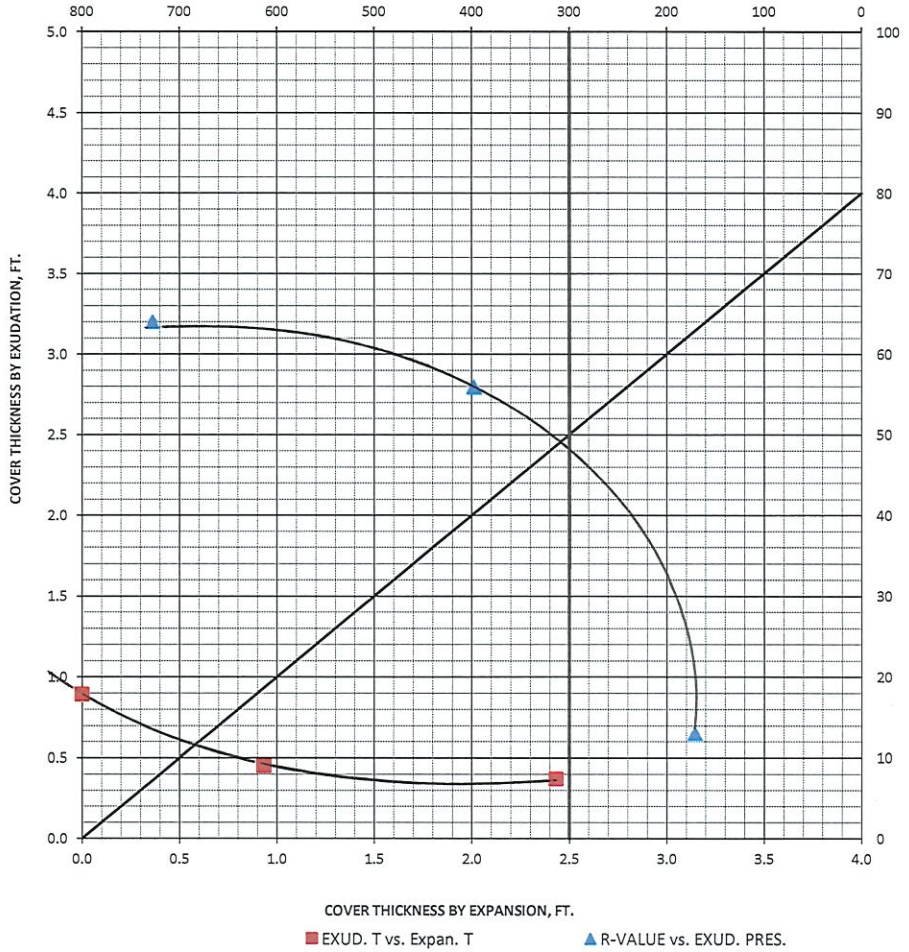
Shopoof, 1028 Rosecrans Avenue

W.O.# 2495-CR

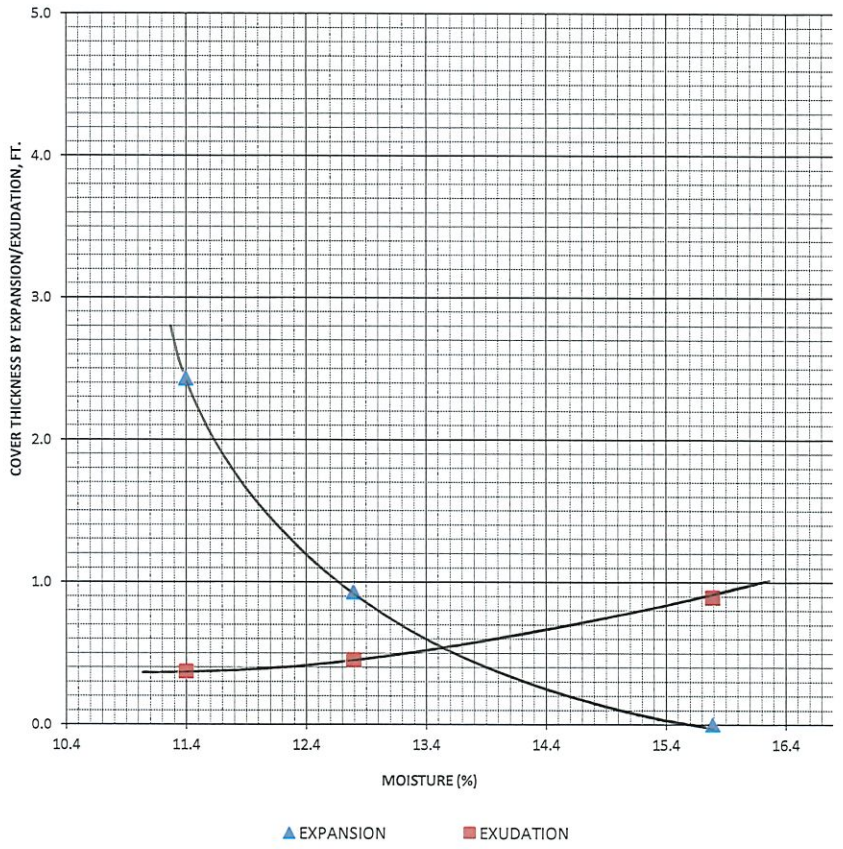
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



Soil Analysis Lab Results

Client: GeoTek, Inc.
Job Name: 1028-Rosecrans
Client Job Number: 2495-CR
Project X Job Number: S201117D
November 22, 2020

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM D4972	ASTM G200	SM 4500-S2-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
B1	1-5	130.4	0.0130	16.3	0.0016	1,809	1,206	8.8	178	<0.01	1.2	8.7	n.a.	108.6	n.a.	2.7	14.2	4.2	0.5
B6	1-5	54.3	0.0054	8.2	0.0008	13,400	3,752	8.7	183	<0.01	0.7	5.4	n.a.	36.0	ND	1.1	9.1	1.5	0.1

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract

APPENDIX C

PERCOLATION/INFILTRATION TEST DATA

Geotechnical and Infiltration Evaluation
Proposed Residential Development Project, Fullerton, California
Project No. 2495-CR

GEOTEK

Client:	**Shopoff Realty Investments**
Project:	**APNs 287-241-04, -05- and -06**
Project No:	**2495-CR**
Date:	**11/2/2020**

Boring No. **I-1**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	44	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40	in
Total Test Hole Depth, D_T =	60	in

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	16	in
$\Delta H = \Delta D = H_O - H_F$ =	4	in
$H_{avg} = (H_O+H_F)/2$ =	18	in

I_t = 2.4 **Inches per Hour**

GEOTEK

Client:	**Shopoff Realty Investments**
Project:	**APNs 287-241-04, -05- and -06**
Project No:	**2495-CR**
Date:	**11/2/2020**

Boring No. **I-2**

Infiltration Rate (Porchet Method)

Time Interval, Δt =	10	min
Final Depth to Water, D_F =	43	in
Test Hole Radius, r =	4	in
Initial Depth to Water, D_O =	40	in
Total Test Hole Depth, D_T =	60	in

Equation - $I_t = \dfrac{\Delta H\ (60r)}{\Delta t\ (r+2H_{avg})}$

$H_O = D_T - D_O$ =	20	in
$H_F = D_T - D_F$ =	17	in
$\Delta H = \Delta D = H_O - H_F$ =	3	in
$H_{avg} = (H_O+H_F)/2$ =	18.5	in

I_t = 1.8 **Inches per Hour**

GEOTEK

Percolation Test Data Sheet

Project: 1025 Rosecrans Ave Job No.: 2495-CR

Test Hole No.: I-1 Date Excavated: 11/2/20

Depth of Test Hole (ft): 5 Soil Description: SP

Percolation Test By: KRM Date: 11/3/20 Presoak: Yes

Percolation Test Data

Time	Time Interval (min)	Total Elapsed Time (min)	Water Depth, from top			Percolation Rate (min/inch)
			Initial (inch)	Final (inch)	Δ (inch)	
8:20						
8:35	25	25	20	9.25	10.75	
8:56						
8:21	25	51	20	9.75	10.25	
8:22						
8:32	10	62	20	15.5	4.5	
8:33						
8:43	10	73	20	15.25	4.75	
8:44						
8:54	10	84	20	15.75	4.25	
8:55						
9:05	10	95	20	16	4	
9:06						
9:16	10	106	20	15.75	4.25	
9:17						
9:27	10	117	20	16	4	
9:28						
9:38	10	128	20	16	4	

Design Percolation Rate: min/inch

Percolation Test Data Sheet

Project: 1028 Rosecrans Ave Job No.: 2495

Test Hole No.: T-2 Date Excavated: 11/2/20

Depth of Test Hole (ft): _____ Soil Description: SP

Percolation Test By: KRM Date: 11/3/20 Presoak: Yes

Percolation Test Data

Time	Time Interval (min)	Total Elapsed Time (min)	Water Depth, from top			Percolation Rate (min/inch)
			Initial (inch)	Final (inch)	Δ (inch)	
9:45						
10:10	25	25	20	11.75	8.25	
10:11						
10:36	26	51	20	12.25	7.75	
10:37						
10:47	10	62	20	16.5	3.5	
10:48						
10:58	10	73	20	17	3	
10:59						
11:09	10	84	20	16.75	3.25	
11:10						
11:20	10	95	20	17	3	
11:21						
11:31	10	106	20	17	3	
11:32						
11:42	10	117	20	17	3	
11:43						
11:53	10	128	20	17	3	

Design Percolation Rate: _____ **min/inch**

APPENDIX D

SEISMIC SETTLEMENT ANALYSES

Geotechnical and Infiltration Evaluation
Proposed Residential Development Project, Fullerton, California
Project No. 2495-CR

GEOTEK

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92880
http://www.geotekusa.com

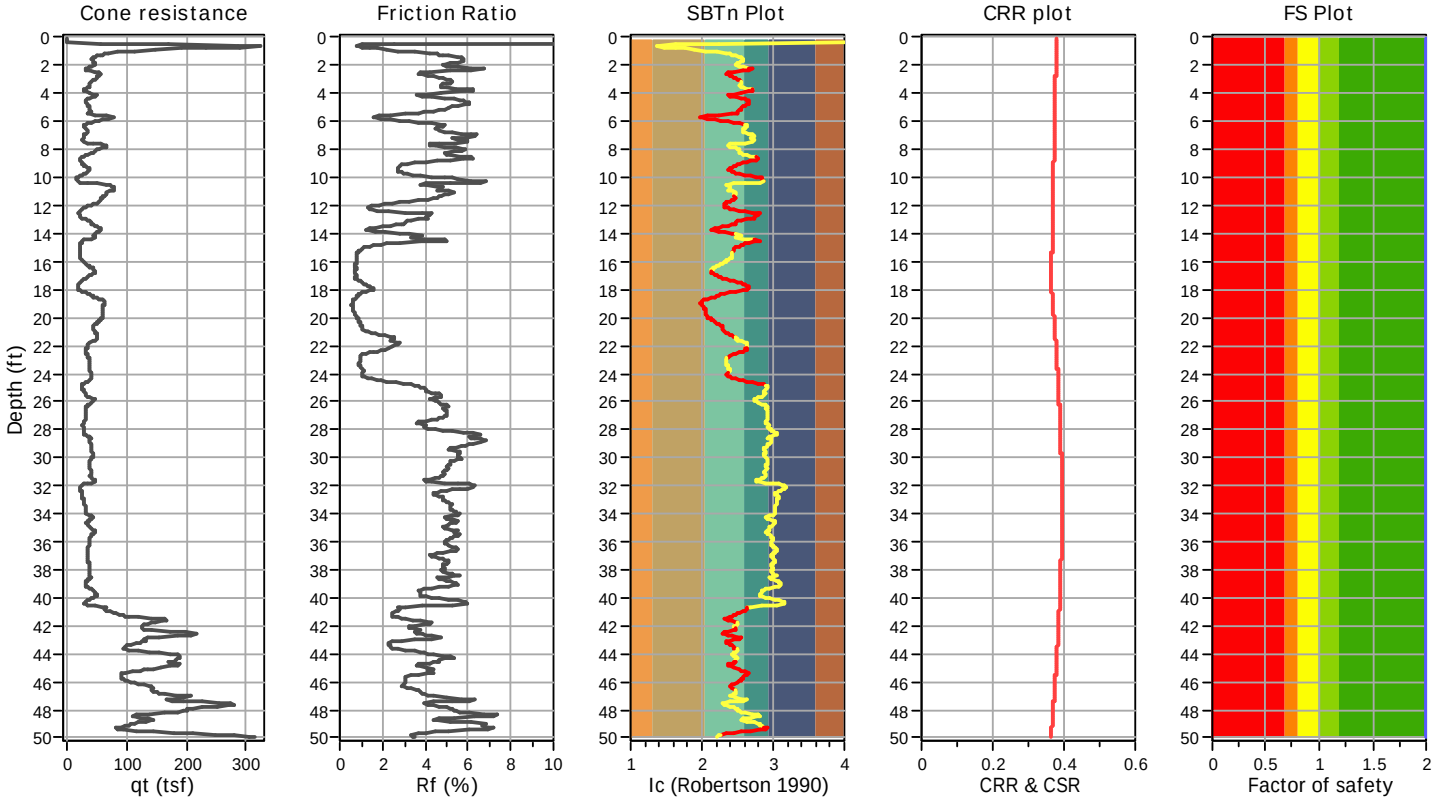
LIQUEFACTION ANALYSIS REPORT

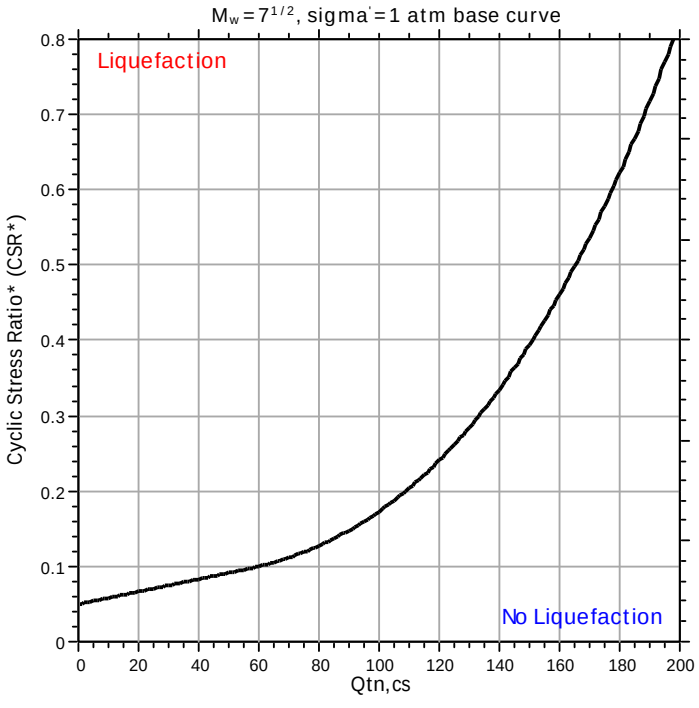
Project title : APN 287-241-04, -05, &-06 Location : Fullerton, CA

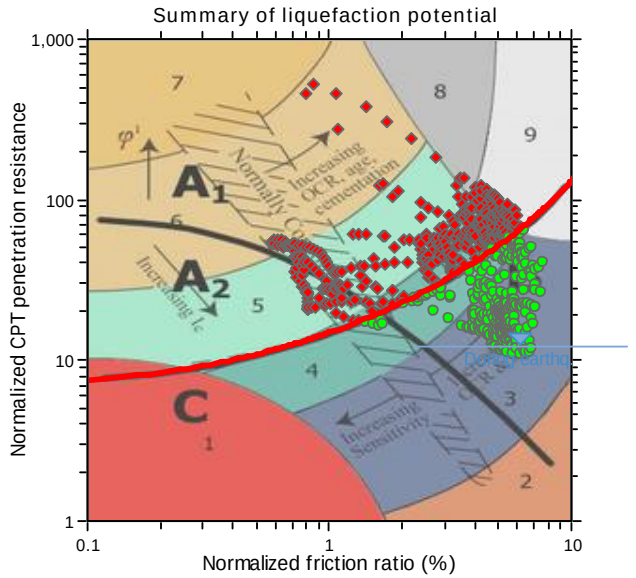
CPT file : CPT-1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A		
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude M_w:	6.72	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	43.00 ft
Peak ground acceleration:	0.77	Unit weight calculation:	Based on SBT	K_σ applied:	Yes	MSF method:	Method based







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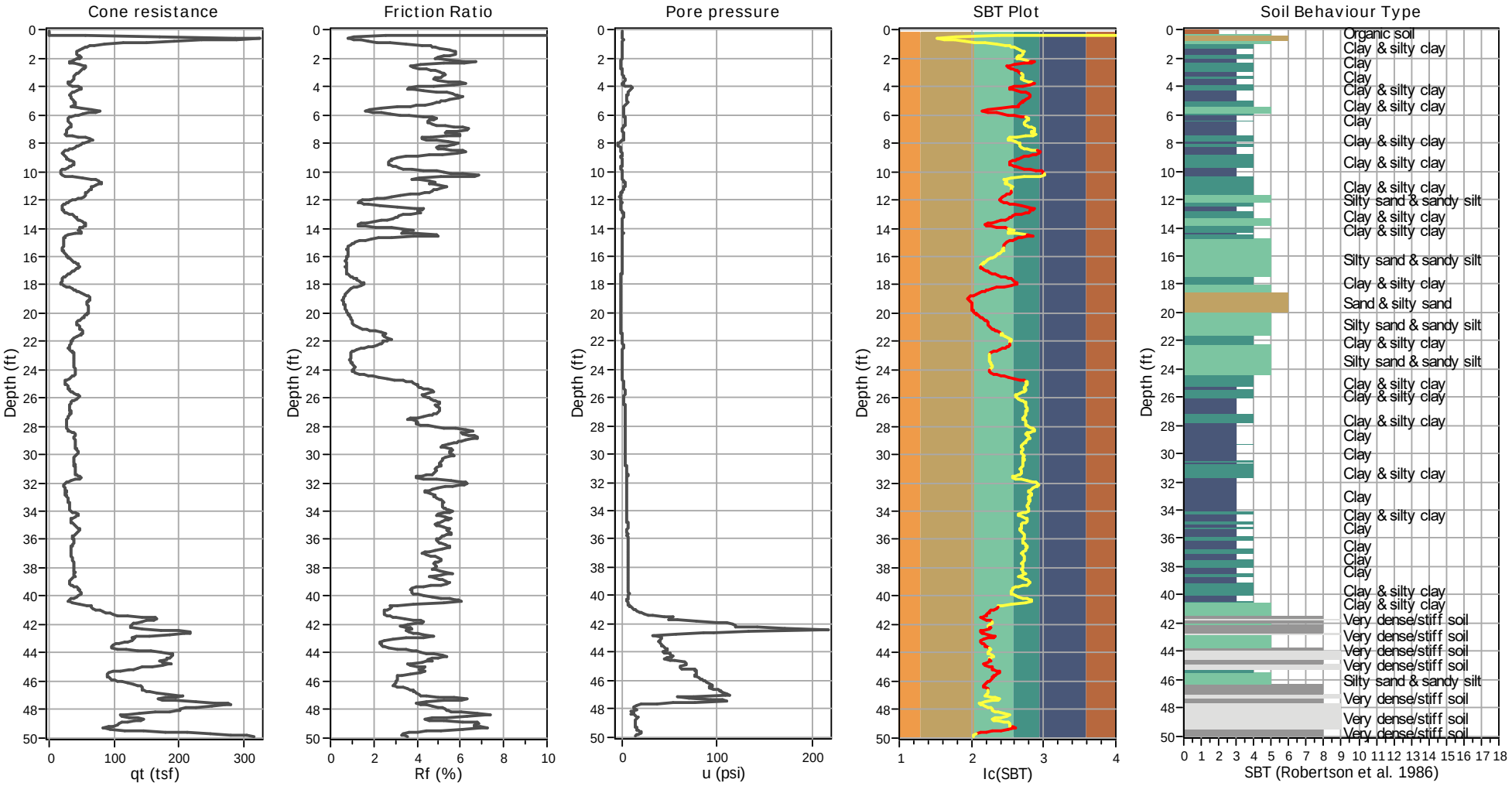
□□n□ □□□i□□□□□□i□n □nd □□□□□□r□□□□□□ □i□n□□ □□□ □□□□ □ni□□□□□□□□□ □□□□i□ □□□□nin□ □□n□ □□ □□□i□ i□□□□□□i□n □nd □i□n□□ □□□□ □□□□i□□ d□□□ndin□ □n □□i□ □□□□i□□ ri□□n□□□□□n□i□i□□□□r□in □□ □□□□ □ndr□in□d □i□n□□ □nd □r□□nd □□□□ □i□

CPT basic interpretation plots



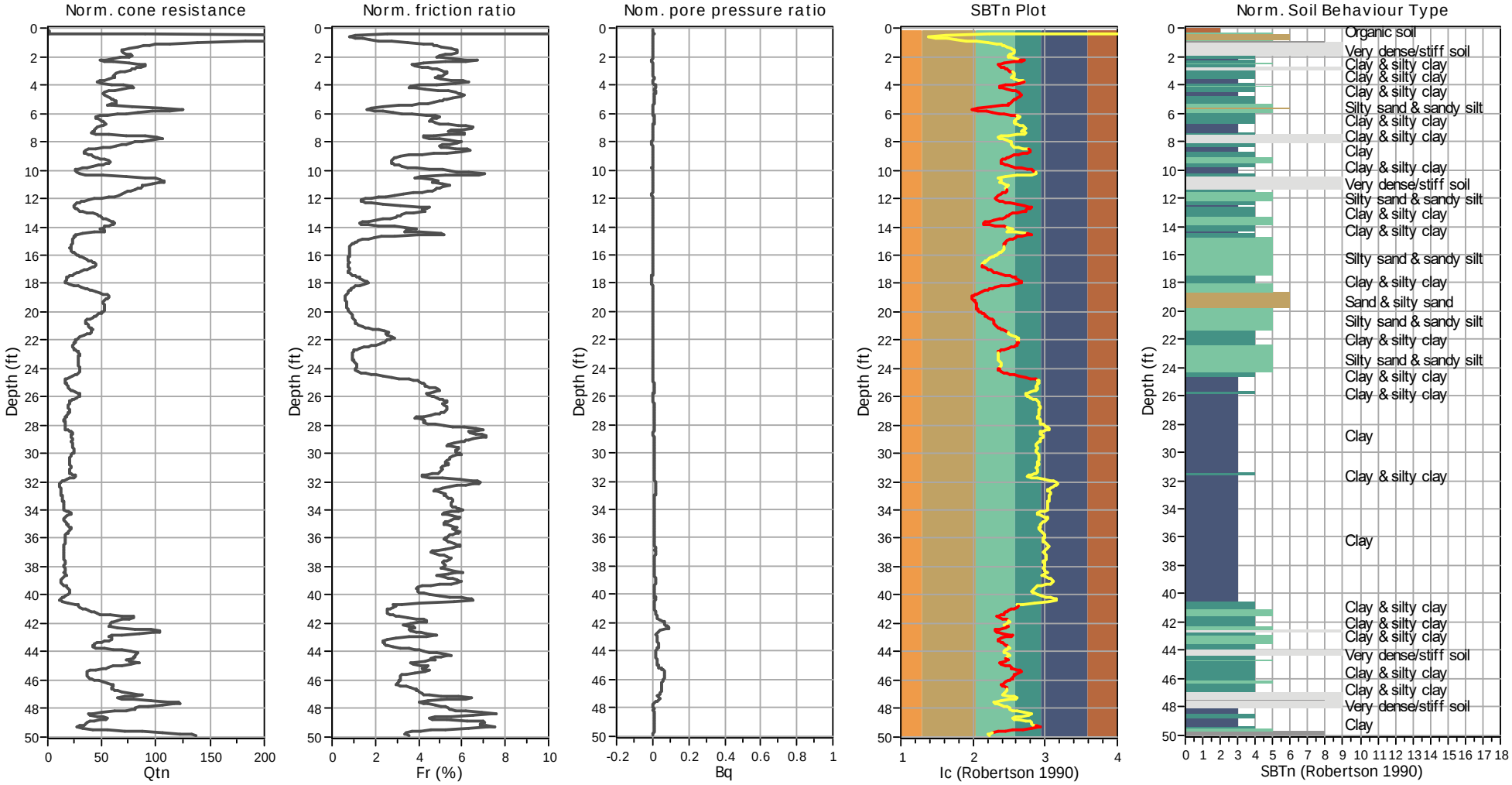
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	43.00 ft

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

CPT basic interpretation plots (normalized)



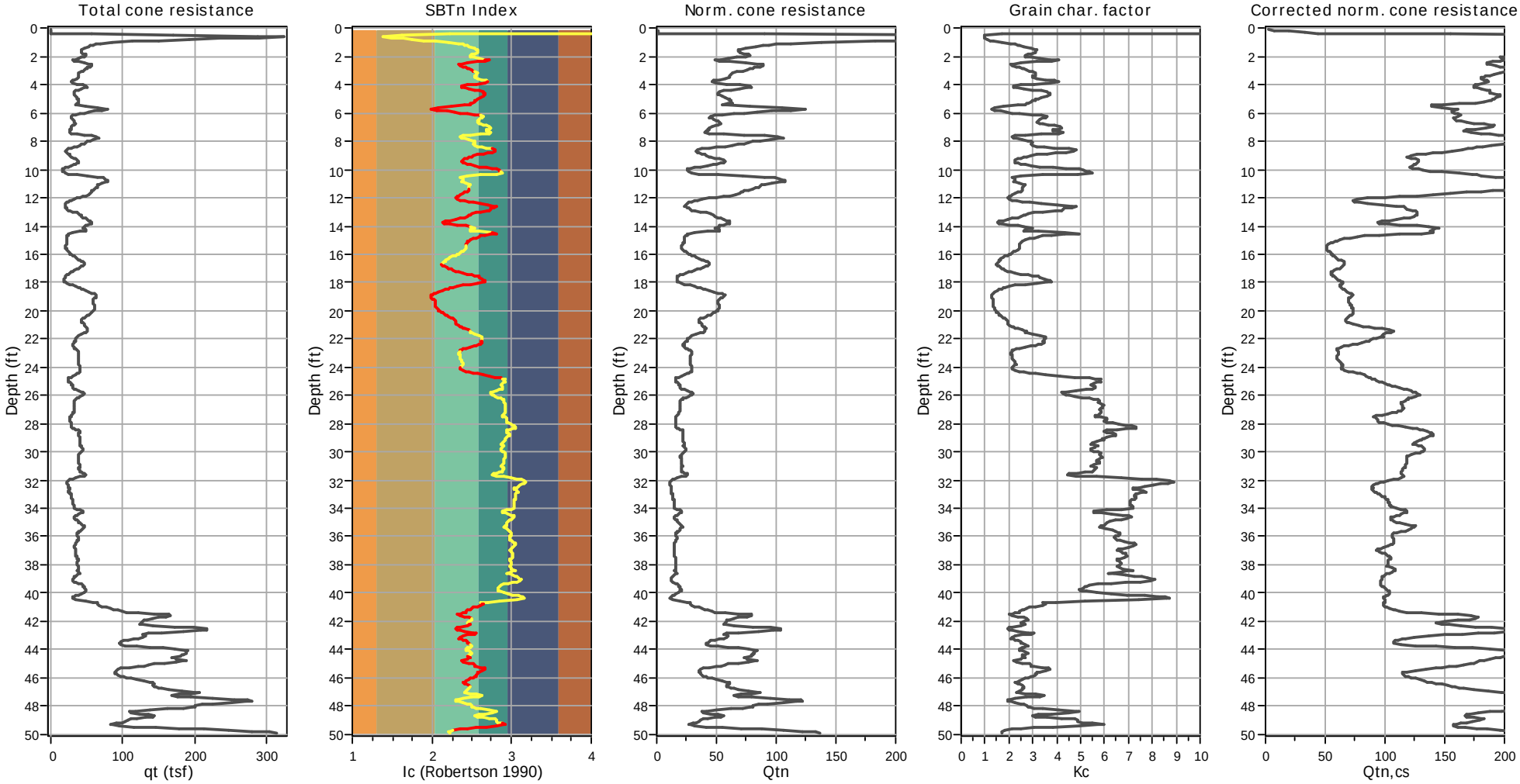
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	43.00 ft

SBTn legend

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

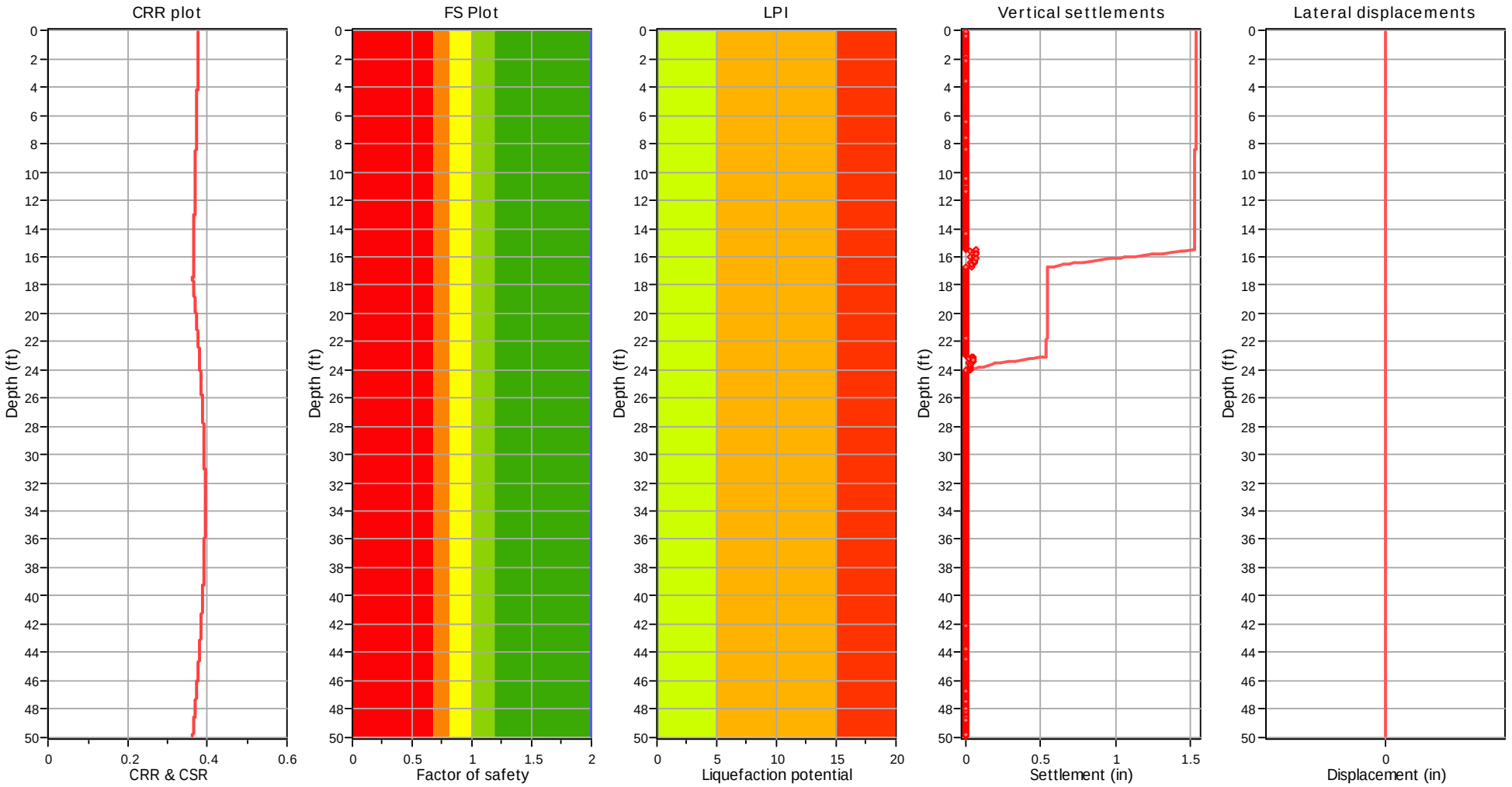
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	43.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	43.00 ft

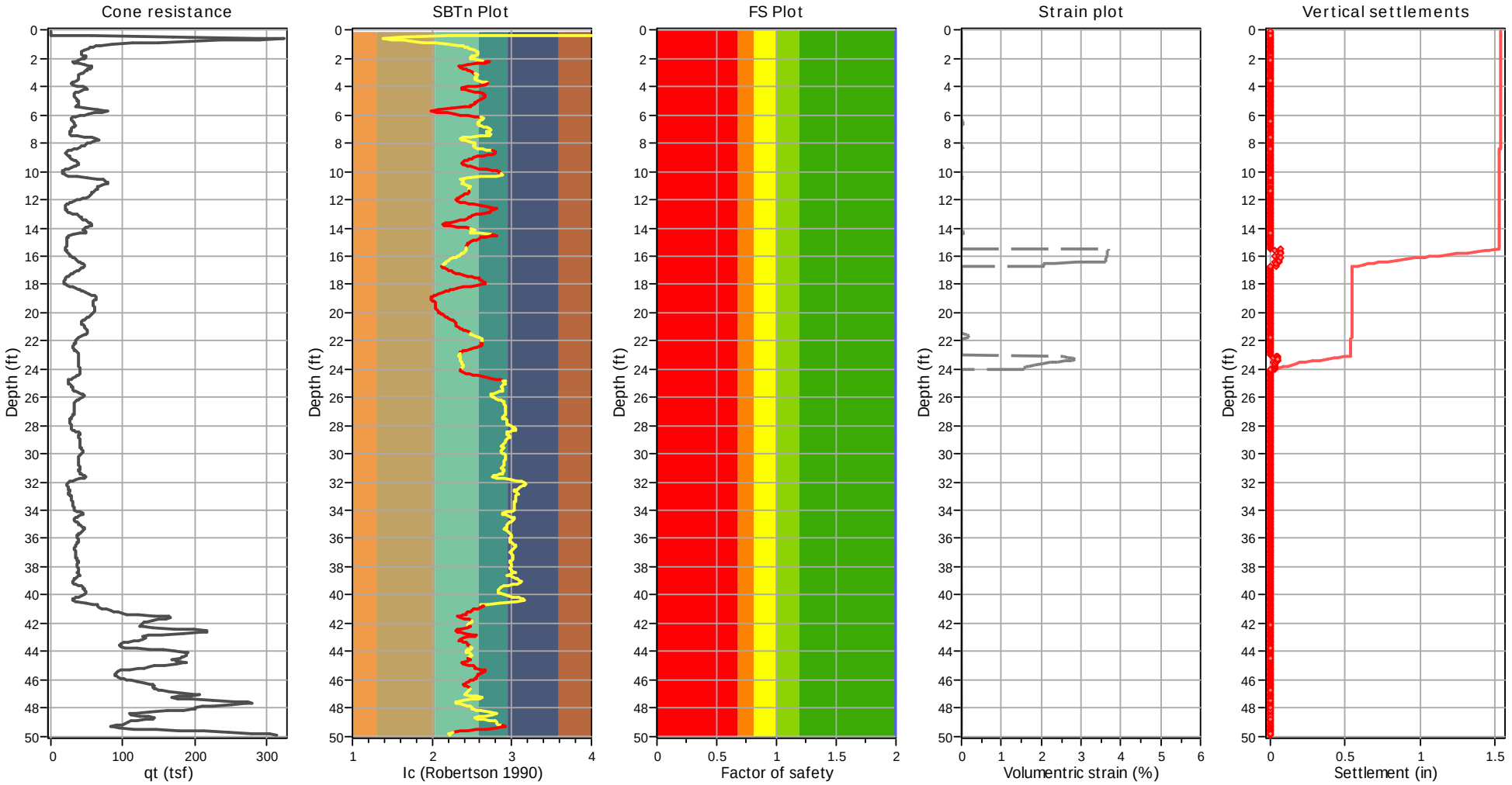
F.S. color scheme

- 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

Estimation of post-earthquake settlements



Abbreviations

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

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.07	4.06	0.09	26.61	2.29	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.14	4.06	0.27	26.61	7.13	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.21	4.06	0.72	26.61	19.22	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.28	4.06	1.23	26.61	32.62	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.35	4.06	1.63	26.61	43.44	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.42	2.22	89.77	1.73	155.31	35	842	0.38	0.001	0.00	8.77	0.00	0.000
0.48	1.63	273.03	1.00	273.03	50	1200	0.38	0.001	0.00	8.77	0.00	0.000
0.54	1.38	460.41	1.00	460.41	77	1489	0.38	0.001	0.00	8.77	0.00	0.000
0.61	1.38	520.51	1.00	520.51	87	1664	0.38	0.001	0.00	8.77	0.00	0.000
0.69	1.49	463.65	1.00	463.65	81	1706	0.38	0.001	0.00	8.77	0.00	0.000
0.72	1.63	376.29	1.00	376.29	69	1671	0.38	0.001	0.00	8.77	0.00	0.000
0.79	1.76	307.89	1.08	331.59	63	1598	0.38	0.002	0.00	8.77	0.00	0.000
0.87	1.90	239.49	1.19	284.89	57	1489	0.38	0.002	0.00	8.77	0.00	0.000
0.94	2.05	182.72	1.37	250.60	53	1373	0.38	0.002	0.00	8.77	0.00	0.000
1.01	2.21	138.10	1.69	233.50	53	1270	0.38	0.003	0.00	8.77	0.00	0.000
1.08	2.33	112.19	2.05	229.89	55	1202	0.38	0.003	0.00	8.77	0.00	0.000
1.14	2.39	99.55	2.27	226.35	55	1151	0.38	0.004	0.00	8.77	0.00	0.000
1.21	2.41	94.27	2.36	222.50	55	1119	0.38	0.004	0.00	8.77	0.00	0.000
1.25	2.44	89.05	2.47	219.79	55	1091	0.38	0.004	0.00	8.77	0.00	0.000
1.32	2.47	83.16	2.63	218.51	56	1065	0.38	0.005	0.00	8.77	0.00	0.000
1.39	2.53	74.64	2.92	217.71	57	1028	0.38	0.005	0.00	8.77	0.00	0.000
1.46	2.56	69.87	3.09	215.84	57	1001	0.38	0.006	0.00	8.77	0.00	0.000
1.52	2.57	68.11	3.15	214.87	57	990	0.38	0.006	0.00	8.77	0.00	0.000
1.59	2.57	68.80	3.13	215.06	57	994	0.38	0.006	0.00	8.77	0.00	0.000
1.66	2.57	69.07	3.13	216.05	57	998	0.38	0.007	0.00	8.77	0.00	0.000
1.73	2.56	69.34	3.12	216.29	58	1000	0.38	0.007	0.00	8.77	0.00	0.000
1.80	2.54	72.71	2.96	214.99	56	1011	0.38	0.007	0.00	8.77	0.00	0.000
1.87	2.50	76.58	2.79	213.72	55	1023	0.38	0.007	0.00	8.77	0.00	0.000
1.90	2.48	78.06	2.67	208.69	53	1012	0.38	0.008	0.00	8.77	0.00	0.000
1.97	2.49	74.76	2.69	201.38	52	974	0.38	0.009	0.00	8.77	0.00	0.000
2.04	2.53	67.66	2.91	196.90	51	930	0.38	0.010	0.00	8.77	0.00	0.000
2.12	2.59	60.33	3.27	197.29	53	899	0.38	0.011	0.00	8.77	0.00	0.000
2.19	2.66	54.11	3.70	200.15	0	0	0.38	0.000	0.00	0.00	0.00	0.000
2.26	2.72	48.78	4.11	200.39	0	0	0.38	0.000	0.00	0.00	0.00	0.000
2.30	2.67	51.83	3.78	195.93	0	0	0.38	0.000	0.00	0.00	0.00	0.000
2.36	2.57	60.39	3.15	190.51	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.43	2.44	74.68	2.48	184.96	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.50	2.37	84.34	2.19	184.87	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.57	2.34	89.62	2.10	187.89	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.64	2.36	89.52	2.15	192.85	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.71	2.39	86.09	2.29	196.89	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.78	2.43	82.30	2.43	200.19	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.85	2.45	79.89	2.54	202.88	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.89	2.47	78.41	2.63	206.26	0	0	0.38	0.000	0.00	8.77	0.00	0.000
2.96	2.49	75.90	2.74	207.68	0	0	0.38	0.000	0.00	8.77	0.00	0.000
3.03	2.52	71.78	2.87	205.93	0	0	0.38	0.000	0.00	8.77	0.00	0.000
3.10	2.55	66.93	3.01	201.30	0	0	0.38	0.000	0.00	8.77	0.00	0.000
3.17	2.57	62.95	3.12	196.45	0	0	0.38	0.000	0.00	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.24	2.56	61.70	3.11	191.78	51	888	0.38	0.019	0.01	8.77	0.00	0.000
3.31	2.56	60.74	3.10	188.21	50	872	0.38	0.020	0.01	8.77	0.01	0.000
3.35	2.54	61.49	3.00	184.55	49	864	0.38	0.021	0.01	8.77	0.01	0.000
3.42	2.54	61.31	2.97	182.33	48	856	0.38	0.022	0.01	8.77	0.01	0.000
3.49	2.54	60.47	2.99	180.74	48	847	0.38	0.023	0.01	8.77	0.01	0.000
3.57	2.57	56.94	3.17	180.76	48	831	0.38	0.025	0.01	8.77	0.01	0.000
3.64	2.63	52.06	3.51	182.78	0	0	0.38	0.000	0.00	0.00	0.00	0.000
3.71	2.68	47.88	3.88	185.60	0	0	0.38	0.000	0.00	0.00	0.00	0.000
3.74	2.71	46.25	4.05	187.12	0	0	0.38	0.000	0.00	0.00	0.00	0.000
3.81	2.71	45.87	4.07	186.56	0	0	0.38	0.000	0.00	0.00	0.00	0.000
3.88	2.66	49.63	3.70	183.41	0	0	0.38	0.000	0.00	0.00	0.00	0.000
3.95	2.55	58.62	3.05	178.65	0	0	0.38	0.000	0.00	8.77	0.00	0.000
4.03	2.44	70.07	2.50	175.10	0	0	0.38	0.000	0.00	8.77	0.00	0.000
4.10	2.38	78.39	2.22	173.79	0	0	0.38	0.000	0.00	8.77	0.00	0.000
4.14	2.37	79.44	2.19	174.03	0	0	0.38	0.000	0.00	8.77	0.00	0.000
4.20	2.41	75.29	2.34	176.49	0	0	0.37	0.000	0.00	8.77	0.00	0.000
4.27	2.47	69.11	2.62	180.85	0	0	0.37	0.000	0.00	8.77	0.00	0.000
4.35	2.54	62.05	2.99	185.66	0	0	0.37	0.000	0.00	8.77	0.00	0.000
4.42	2.60	56.44	3.32	187.62	0	0	0.37	0.000	0.00	8.77	0.00	0.000
4.49	2.64	52.45	3.57	187.48	0	0	0.37	0.000	0.00	0.00	0.00	0.000
4.56	2.66	50.91	3.68	187.50	0	0	0.37	0.000	0.00	0.00	0.00	0.000
4.63	2.66	51.03	3.71	189.42	0	0	0.37	0.000	0.00	0.00	0.00	0.000
4.66	2.66	51.71	3.75	193.69	0	0	0.37	0.000	0.00	0.00	0.00	0.000
4.74	2.66	52.72	3.73	196.63	0	0	0.37	0.000	0.00	0.00	0.00	0.000
4.81	2.64	54.75	3.59	196.54	0	0	0.37	0.000	0.00	0.00	0.00	0.000
4.88	2.60	57.66	3.35	193.22	0	0	0.37	0.000	0.00	0.00	0.00	0.000
4.95	2.58	59.36	3.22	190.88	0	0	0.37	0.000	0.00	8.77	0.00	0.000
4.99	2.56	60.89	3.12	189.84	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.06	2.56	61.32	3.08	189.16	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.14	2.54	62.44	3.00	187.24	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.21	2.53	62.66	2.91	182.51	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.28	2.50	62.84	2.79	175.36	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.32	2.49	59.69	2.71	162.00	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.39	2.49	55.17	2.70	149.16	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.46	2.41	58.71	2.37	138.86	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.53	2.24	77.72	1.78	138.46	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.60	2.07	105.02	1.41	147.97	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.67	1.98	123.57	1.28	157.78	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.71	1.99	124.76	1.29	160.41	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.78	2.07	112.63	1.40	157.83	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.85	2.18	96.38	1.62	156.15	0	0	0.37	0.000	0.00	8.77	0.00	0.000
5.93	2.28	83.55	1.87	156.38	0	0	0.37	0.000	0.00	8.77	0.00	0.000
6.00	2.36	73.05	2.16	157.94	0	0	0.37	0.000	0.00	8.77	0.00	0.000
6.07	2.44	65.09	2.47	160.55	0	0	0.37	0.000	0.00	8.77	0.00	0.000
6.11	2.54	55.10	2.97	163.63	0	0	0.37	0.000	0.00	8.77	0.00	0.000
6.18	2.60	48.88	3.34	163.17	0	0	0.37	0.000	0.00	0.00	0.00	0.000
6.25	2.64	44.84	3.59	161.00	0	0	0.37	0.000	0.00	0.00	0.00	0.000
6.32	2.64	44.42	3.56	158.21	0	0	0.37	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.39	2.61	46.20	3.40	157.02	0	0	0.37	0.000	0.00	0.00	0.00	0.000
6.46	2.60	47.79	3.31	158.20	43	718	0.37	0.102	0.04	8.77	0.03	0.000
6.53	2.58	49.87	3.21	160.01	43	733	0.37	0.097	0.04	8.77	0.03	0.000
6.57	2.58	50.83	3.23	164.01	44	750	0.37	0.091	0.04	8.77	0.02	0.000
6.64	2.58	52.71	3.20	168.66	45	774	0.37	0.084	0.03	8.77	0.02	0.000
6.71	2.59	53.46	3.27	174.97	47	797	0.37	0.078	0.03	8.77	0.02	0.000
6.77	2.62	53.21	3.43	182.37	0	0	0.37	0.000	0.00	0.00	0.00	0.000
6.86	2.65	51.62	3.65	188.41	0	0	0.37	0.000	0.00	0.00	0.00	0.000
6.89	2.68	49.45	3.88	191.91	0	0	0.37	0.000	0.00	0.00	0.00	0.000
6.97	2.72	46.15	4.13	190.68	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.04	2.73	43.64	4.23	184.47	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.12	2.71	42.90	4.08	175.05	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.16	2.68	43.41	3.87	167.89	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.23	2.68	42.90	3.86	165.38	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.29	2.71	41.41	4.05	167.55	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.37	2.74	40.29	4.28	172.55	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.44	2.71	44.22	4.07	180.14	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.51	2.60	56.43	3.34	188.29	0	0	0.37	0.000	0.00	0.00	0.00	0.000
7.58	2.48	72.58	2.69	195.13	50	945	0.37	0.060	0.02	8.77	0.01	0.000
7.62	2.39	89.79	2.28	204.59	50	1040	0.37	0.047	0.02	8.77	0.01	0.000
7.69	2.36	100.65	2.15	216.46	52	1117	0.37	0.041	0.01	8.77	0.01	0.000
7.76	2.36	106.14	2.17	230.02	56	1185	0.37	0.037	0.01	8.77	0.01	0.000
7.83	2.41	102.92	2.34	240.66	59	1214	0.37	0.035	0.01	8.77	0.01	0.000
7.90	2.46	95.05	2.58	245.24	62	1202	0.37	0.036	0.01	8.77	0.01	0.000
7.97	2.51	86.87	2.82	244.70	63	1168	0.37	0.039	0.01	8.77	0.01	0.000
8.01	2.54	80.60	2.95	237.96	62	1119	0.37	0.043	0.01	8.77	0.01	0.000
8.08	2.54	76.61	2.96	227.12	60	1067	0.37	0.049	0.01	8.77	0.01	0.000
8.15	2.53	72.76	2.93	213.07	56	1005	0.37	0.058	0.02	8.77	0.01	0.000
8.22	2.53	68.56	2.91	199.47	52	942	0.37	0.069	0.02	8.77	0.01	0.000
8.29	2.54	62.93	3.00	188.81	50	884	0.37	0.085	0.03	8.77	0.02	0.000
8.36	2.57	57.22	3.17	181.59	49	835	0.37	0.103	0.04	8.77	0.02	0.000
8.40	2.63	50.51	3.50	176.60	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.47	2.69	44.21	3.92	173.35	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.54	2.76	37.91	4.48	170.00	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.62	2.80	34.25	4.80	164.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.69	2.79	33.09	4.71	155.76	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.76	2.75	33.68	4.38	147.48	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.79	2.69	35.44	3.96	140.23	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.86	2.64	37.57	3.57	134.17	0	0	0.37	0.000	0.00	0.00	0.00	0.000
8.94	2.58	40.01	3.18	127.13	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.01	2.53	41.99	2.90	121.79	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.08	2.49	43.73	2.72	119.11	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.15	2.47	45.25	2.63	118.83	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.19	2.45	48.42	2.52	121.88	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.26	2.42	52.63	2.38	125.14	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.33	2.39	56.34	2.27	127.84	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.40	2.38	57.50	2.23	128.30	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.48	2.39	55.85	2.28	127.41	0	0	0.37	0.000	0.00	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.55	2.41	53.42	2.36	126.23	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.58	2.44	50.59	2.48	125.68	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.65	2.48	47.00	2.66	124.97	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.73	2.53	42.14	2.92	123.11	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.80	2.59	36.71	3.29	120.86	0	0	0.37	0.000	0.00	8.77	0.00	0.000
9.87	2.68	31.62	3.82	120.87	0	0	0.37	0.000	0.00	0.00	0.00	0.000
9.94	2.75	28.01	4.41	123.66	0	0	0.37	0.000	0.00	0.00	0.00	0.000
9.98	2.82	26.04	4.94	128.52	0	0	0.37	0.000	0.00	0.00	0.00	0.000
10.05	2.84	25.71	5.13	131.85	0	0	0.37	0.000	0.00	0.00	0.00	0.000
10.12	2.85	26.24	5.24	137.50	0	0	0.37	0.000	0.00	0.00	0.00	0.000
10.19	2.87	27.32	5.39	147.28	0	0	0.37	0.000	0.00	0.00	0.00	0.000
10.26	2.88	29.46	5.49	161.75	0	0	0.37	0.000	0.00	0.00	0.00	0.000
10.33	2.81	35.34	4.89	172.66	0	0	0.37	0.000	0.00	0.00	0.00	0.000
10.37	2.62	51.41	3.43	176.56	0	0	0.37	0.000	0.00	0.00	0.00	0.000
10.44	2.44	72.29	2.49	179.89	45	1011	0.37	0.085	0.03	8.77	0.02	0.000
10.51	2.36	89.91	2.14	192.49	46	1153	0.37	0.061	0.02	8.77	0.01	0.000
10.58	2.35	99.03	2.13	211.03	51	1273	0.37	0.049	0.02	8.77	0.01	0.000
10.65	2.38	102.85	2.24	230.87	56	1373	0.37	0.042	0.01	8.77	0.01	0.000
10.72	2.39	105.96	2.29	242.16	59	1438	0.37	0.039	0.01	8.77	0.01	0.000
10.79	2.38	107.37	2.25	241.80	59	1452	0.37	0.039	0.01	8.77	0.01	0.000
10.86	2.37	106.89	2.21	235.78	57	1435	0.37	0.040	0.01	8.77	0.01	0.000
10.90	2.39	103.26	2.27	234.16	57	1414	0.37	0.041	0.01	8.77	0.01	0.000
10.97	2.43	96.57	2.45	236.77	59	1395	0.37	0.043	0.01	8.77	0.01	0.000
11.04	2.47	90.32	2.63	237.95	61	1371	0.37	0.045	0.01	8.77	0.01	0.000
11.11	2.48	87.21	2.67	233.21	60	1342	0.37	0.047	0.01	8.77	0.01	0.000
11.17	2.46	86.81	2.59	225.00	57	1317	0.37	0.050	0.01	8.77	0.01	0.000
11.24	2.46	85.25	2.56	217.87	55	1289	0.37	0.053	0.02	8.77	0.01	0.000
11.30	2.45	83.07	2.55	211.71	53	1261	0.37	0.056	0.02	8.77	0.01	0.000
11.37	2.46	80.03	2.57	205.99	52	1228	0.37	0.060	0.02	8.77	0.01	0.000
11.44	2.46	76.53	2.59	198.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.52	2.46	73.53	2.58	189.96	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.55	2.45	71.65	2.51	179.95	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.62	2.42	71.03	2.38	168.76	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.70	2.38	69.12	2.24	155.14	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.77	2.35	65.71	2.14	140.33	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.84	2.34	61.26	2.07	126.65	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.88	2.32	55.92	2.01	112.50	0	0	0.37	0.000	0.00	0.00	0.00	0.000
11.95	2.31	50.03	1.99	99.41	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.02	2.31	43.56	1.97	85.96	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.09	2.32	38.18	2.02	77.19	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.16	2.36	34.09	2.15	73.46	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.24	2.40	31.32	2.33	72.90	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.28	2.45	29.09	2.55	74.15	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.35	2.52	27.22	2.86	77.85	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.42	2.61	25.42	3.38	85.88	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.49	2.70	24.27	4.03	97.82	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.56	2.78	23.68	4.61	109.16	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.60	2.80	24.09	4.82	116.12	0	0	0.37	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.67	2.78	25.28	4.64	117.25	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.74	2.75	26.91	4.34	116.76	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.81	2.74	27.80	4.28	118.89	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.89	2.73	29.38	4.19	123.04	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.96	2.70	31.79	3.97	126.16	0	0	0.37	0.000	0.00	0.00	0.00	0.000
12.99	2.62	36.86	3.44	126.89	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.06	2.55	41.68	3.05	126.93	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.13	2.51	45.42	2.80	127.13	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.20	2.49	47.05	2.70	127.04	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.28	2.47	48.11	2.62	126.15	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.35	2.45	49.33	2.53	124.81	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.39	2.41	51.58	2.35	121.14	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.46	2.36	53.87	2.16	116.28	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.53	2.30	56.68	1.94	109.80	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.60	2.23	59.11	1.75	103.71	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.67	2.17	60.99	1.61	97.91	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.74	2.14	61.50	1.53	93.97	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.81	2.16	60.74	1.57	95.09	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.85	2.23	59.03	1.73	102.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.92	2.31	56.52	1.99	112.52	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.99	2.42	52.83	2.40	126.88	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.06	2.47	51.95	2.64	137.15	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.14	2.54	48.53	2.99	144.99	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.17	2.51	50.81	2.82	143.18	37	984	0.37	0.163	0.08	8.77	0.05	0.000
14.24	2.48	52.37	2.67	139.88	36	983	0.37	0.165	0.08	8.77	0.05	0.001
14.31	2.47	52.20	2.64	138.06	35	978	0.37	0.170	0.09	8.77	0.05	0.001
14.38	2.59	43.06	3.25	139.83	38	926	0.37	0.209	0.10	8.77	0.06	0.001
14.45	2.75	32.15	4.35	139.95	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.52	2.82	26.49	4.91	130.15	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.59	2.75	25.73	4.35	111.85	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.66	2.67	25.05	3.78	94.58	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.70	2.62	24.20	3.42	82.84	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.77	2.59	23.53	3.26	76.60	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.84	2.55	23.14	3.05	70.49	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.91	2.51	23.06	2.84	65.52	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.98	2.48	23.14	2.66	61.61	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.06	2.46	23.10	2.57	59.29	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.09	2.45	23.01	2.53	58.23	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.16	2.44	22.68	2.50	56.59	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.23	2.44	22.17	2.48	54.88	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.31	2.43	21.64	2.44	52.82	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.38	2.43	21.17	2.44	51.60	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.45	2.43	20.91	2.43	50.83	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.52	2.43	20.78	2.44	50.66	13	391	0.37	47.761	82.89	8.77	3.68	0.064
15.55	2.43	20.84	2.45	50.98	13	394	0.37	45.362	78.06	8.77	3.68	0.027
15.62	2.43	21.19	2.42	51.25	13	399	0.37	41.433	71.08	8.77	3.68	0.061
15.69	2.41	21.96	2.36	51.74	13	407	0.37	35.032	59.91	8.77	3.67	0.063
15.77	2.39	23.11	2.27	52.45	13	419	0.37	27.939	47.56	8.77	3.66	0.064

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.84	2.37	24.37	2.19	53.40	13	432	0.37	21.776	36.67	8.77	3.66	0.064
15.91	2.35	25.62	2.12	54.36	13	445	0.37	17.299	28.80	8.77	3.65	0.058
15.98	2.33	26.70	2.06	54.99	13	455	0.37	14.635	24.25	8.77	3.65	0.062
16.01	2.31	27.94	1.99	55.70	13	466	0.37	12.308	20.29	8.77	3.64	0.033
16.09	2.29	29.27	1.92	56.23	13	476	0.37	10.547	17.40	8.77	3.64	0.067
16.16	2.26	31.13	1.83	57.11	13	490	0.37	8.604	14.14	8.77	3.63	0.057
16.23	2.23	33.31	1.74	58.00	13	505	0.37	7.045	11.56	8.77	3.62	0.062
16.30	2.20	35.76	1.66	59.45	13	523	0.37	5.548	8.98	8.77	3.62	0.063
16.37	2.18	37.79	1.62	61.10	14	541	0.36	4.442	7.02	8.77	3.61	0.060
16.41	2.17	39.60	1.61	63.58	14	565	0.36	3.379	5.10	8.77	2.89	0.028
16.48	2.17	41.04	1.59	65.25	15	582	0.36	2.822	4.15	8.77	2.35	0.039
16.55	2.15	42.50	1.56	66.26	15	594	0.36	2.518	3.66	8.77	2.07	0.036
16.62	2.13	43.77	1.51	66.24	15	596	0.36	2.475	3.63	8.77	2.05	0.035
16.69	2.12	44.31	1.49	66.07	14	597	0.36	2.493	3.69	8.77	2.08	0.035
16.77	2.12	44.16	1.49	65.80	0	0	0.36	0.000	0.00	0.00	0.00	0.000
16.80	2.13	43.04	1.52	65.24	0	0	0.36	0.000	0.00	0.00	0.00	0.000
16.87	2.15	41.31	1.56	64.44	0	0	0.36	0.000	0.00	0.00	0.00	0.000
16.94	2.18	39.04	1.62	63.29	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.01	2.21	36.44	1.69	61.71	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.08	2.24	33.59	1.77	59.34	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.16	2.26	31.14	1.83	57.05	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.19	2.29	28.75	1.93	55.52	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.27	2.34	26.57	2.08	55.20	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.33	2.39	24.22	2.29	55.38	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.40	2.44	22.31	2.48	55.37	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.48	2.50	19.97	2.78	55.56	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.53	2.54	18.66	3.00	55.92	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.59	2.58	17.63	3.23	56.86	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.66	2.60	17.60	3.30	58.04	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.73	2.63	17.08	3.49	59.62	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.81	2.65	16.74	3.63	60.78	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.88	2.66	16.57	3.74	62.00	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.95	2.67	16.74	3.78	63.25	0	0	0.36	0.000	0.00	0.00	0.00	0.000
17.99	2.64	17.81	3.61	64.24	0	0	0.36	0.000	0.00	0.00	0.00	0.000
18.06	2.58	20.14	3.19	64.20	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.13	2.48	23.66	2.68	63.33	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.20	2.39	27.69	2.26	62.64	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.27	2.31	31.38	2.00	62.65	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.34	2.26	34.53	1.83	63.21	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.41	2.23	36.64	1.75	64.00	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.44	2.21	38.65	1.68	64.94	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.52	2.18	40.75	1.61	65.76	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.59	2.14	43.99	1.52	66.95	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.66	2.09	47.99	1.43	68.63	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.73	2.05	51.54	1.37	70.49	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.77	2.02	54.52	1.33	72.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.84	2.00	56.11	1.30	73.05	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.91	1.99	56.81	1.28	72.97	0	0	0.37	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.98	1.98	56.27	1.28	71.94	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.06	1.99	55.01	1.29	70.69	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.13	2.00	53.91	1.29	69.80	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.16	2.01	52.71	1.31	69.26	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.23	2.02	51.92	1.33	69.17	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.31	2.04	51.32	1.35	69.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.38	2.04	51.27	1.36	69.57	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.45	2.04	51.48	1.36	69.92	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.51	2.04	51.83	1.36	70.45	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.59	2.04	52.19	1.36	71.02	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.62	2.05	52.50	1.36	71.62	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.69	2.05	52.71	1.37	72.14	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.76	2.05	52.71	1.38	72.54	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.83	2.06	52.41	1.39	72.85	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.91	2.07	51.75	1.41	73.02	0	0	0.37	0.000	0.00	0.00	0.00	0.000
19.98	2.09	51.06	1.43	73.18	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.02	2.10	50.17	1.46	73.19	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.09	2.12	48.99	1.49	73.04	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.17	2.14	47.47	1.53	72.84	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.24	2.16	46.12	1.57	72.58	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.28	2.18	44.71	1.61	71.98	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.35	2.19	43.08	1.65	71.03	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.42	2.22	40.97	1.71	69.89	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.49	2.24	38.75	1.78	68.88	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.56	2.27	36.71	1.85	67.98	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.63	2.28	35.43	1.90	67.35	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.70	2.29	34.87	1.92	67.05	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.74	2.29	34.85	1.93	67.29	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.81	2.30	35.25	1.93	68.15	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.88	2.30	36.16	1.94	69.99	0	0	0.37	0.000	0.00	0.00	0.00	0.000
20.95	2.30	37.32	1.96	73.34	0	0	0.37	0.000	0.00	0.00	0.00	0.000
21.03	2.33	38.23	2.04	77.93	0	0	0.37	0.000	0.00	0.00	0.00	0.000
21.10	2.35	38.82	2.12	82.17	0	0	0.37	0.000	0.00	0.00	0.00	0.000
21.13	2.37	39.68	2.18	86.55	0	0	0.37	0.000	0.00	0.00	0.00	0.000
21.21	2.38	40.61	2.25	91.28	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.28	2.42	41.07	2.38	97.74	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.35	2.46	40.59	2.56	103.85	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.42	2.48	39.98	2.69	107.39	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.49	2.49	39.64	2.72	107.91	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.53	2.49	38.96	2.70	105.01	27	1009	0.38	0.330	0.23	8.77	0.12	0.001
21.59	2.50	36.66	2.76	101.07	26	968	0.38	0.393	0.29	8.77	0.14	0.002
21.67	2.54	33.07	2.98	98.50	26	926	0.38	0.476	0.35	8.77	0.17	0.003
21.74	2.59	29.77	3.29	97.91	26	899	0.38	0.547	0.39	8.77	0.19	0.003
21.82	2.63	27.84	3.53	98.31	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.85	2.62	27.54	3.48	95.93	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.92	2.63	26.43	3.52	92.97	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.99	2.62	25.97	3.46	89.77	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.05	2.63	25.24	3.50	88.24	0	0	0.38	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	2.61	25.39	3.42	86.78	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.19	2.62	24.45	3.46	84.61	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.26	2.62	23.50	3.45	80.98	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.34	2.61	22.79	3.36	76.55	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.41	2.58	22.52	3.23	72.65	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.45	2.56	22.33	3.10	69.28	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.52	2.53	22.71	2.91	66.20	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.59	2.48	23.55	2.68	63.12	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.66	2.43	24.79	2.46	60.95	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.73	2.40	26.14	2.29	59.94	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.80	2.37	27.21	2.20	59.89	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.84	2.35	28.24	2.13	60.27	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.91	2.35	28.77	2.10	60.55	0	0	0.38	0.000	0.00	0.00	0.00	0.000
22.98	2.34	29.07	2.09	60.74	0	0	0.38	0.000	0.00	0.00	0.00	0.000
23.06	2.34	28.95	2.09	60.65	15	652	0.38	3.548	5.20	8.77	2.49	0.044
23.13	2.35	28.67	2.11	60.42	15	650	0.38	3.641	5.35	8.77	2.56	0.045
23.17	2.35	28.46	2.11	60.07	14	647	0.38	3.776	5.59	8.77	2.66	0.024
23.24	2.35	28.30	2.11	59.66	14	644	0.38	3.913	5.84	8.77	2.78	0.048
23.31	2.35	28.22	2.10	59.36	14	643	0.38	4.007	6.02	8.77	2.86	0.049
23.38	2.35	28.13	2.12	59.52	14	645	0.38	3.945	5.90	8.77	2.80	0.048
23.45	2.36	28.00	2.15	60.10	15	651	0.38	3.756	5.52	8.77	2.61	0.045
23.52	2.37	27.89	2.18	60.74	15	658	0.38	3.558	5.14	8.77	2.43	0.041
23.56	2.37	27.87	2.20	61.45	15	664	0.38	3.352	4.76	8.77	2.25	0.019
23.63	2.38	27.85	2.23	62.22	15	672	0.38	3.138	4.37	8.77	2.06	0.034
23.70	2.39	27.82	2.27	63.23	15	682	0.38	2.889	3.93	8.77	1.85	0.031
23.77	2.40	27.87	2.30	64.01	16	690	0.38	2.705	3.61	8.77	1.69	0.029
23.84	2.39	28.29	2.28	64.38	16	697	0.38	2.564	3.41	8.77	1.60	0.028
23.92	2.38	28.99	2.22	64.27	16	702	0.38	2.494	3.35	8.77	1.56	0.027
23.99	2.36	29.60	2.16	63.89	15	703	0.38	2.485	3.39	8.77	1.58	0.027
24.02	2.35	29.87	2.13	63.70	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.09	2.35	29.80	2.14	63.63	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.16	2.36	29.66	2.16	64.18	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.24	2.38	29.33	2.24	65.75	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.31	2.42	28.73	2.42	69.40	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.38	2.47	28.03	2.62	73.33	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.42	2.52	27.08	2.85	77.26	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.49	2.57	25.50	3.13	79.83	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.56	2.64	23.11	3.56	82.37	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.64	2.72	20.35	4.16	84.64	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.71	2.80	18.12	4.77	86.41	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.74	2.87	16.37	5.37	88.01	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.82	2.89	15.94	5.60	89.35	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.89	2.91	15.56	5.85	90.93	0	0	0.38	0.000	0.00	0.00	0.00	0.000
24.96	2.91	15.97	5.80	92.70	0	0	0.38	0.000	0.00	0.00	0.00	0.000
25.03	2.92	16.15	5.87	94.79	0	0	0.38	0.000	0.00	0.00	0.00	0.000
25.07	2.90	17.17	5.69	97.78	0	0	0.38	0.000	0.00	0.00	0.00	0.000
25.14	2.88	18.12	5.54	100.43	0	0	0.38	0.000	0.00	0.00	0.00	0.000
25.21	2.87	18.84	5.43	102.28	0	0	0.38	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.29	2.87	19.11	5.43	103.83	0	0	0.38	0.000	0.00	0.00	0.00	0.000
25.36	2.88	19.17	5.52	105.80	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.40	2.89	19.40	5.61	108.93	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.47	2.89	20.05	5.60	112.27	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.54	2.88	21.12	5.48	115.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.61	2.85	22.74	5.22	118.69	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.68	2.80	25.29	4.80	121.39	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.75	2.75	28.05	4.40	123.37	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.79	2.73	29.77	4.21	125.37	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.86	2.73	29.98	4.24	127.11	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.93	2.75	29.48	4.37	128.75	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.00	2.77	28.46	4.50	128.22	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.07	2.79	26.51	4.73	125.43	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.14	2.83	24.05	5.08	122.17	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.22	2.86	22.41	5.36	120.00	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.25	2.88	21.51	5.54	119.10	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.32	2.90	20.65	5.72	118.08	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.39	2.91	20.10	5.79	116.49	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.46	2.91	19.79	5.80	114.80	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.53	2.91	19.76	5.75	113.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.60	2.92	19.46	5.85	113.80	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.68	2.92	19.24	5.95	114.41	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.71	2.92	19.26	5.94	114.49	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.78	2.92	19.26	5.94	114.46	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.85	2.92	19.47	5.90	114.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
26.93	2.92	19.72	5.86	115.53	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.00	2.91	19.77	5.82	114.99	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.07	2.91	19.49	5.82	113.54	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.11	2.91	19.10	5.84	111.45	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.18	2.91	18.74	5.83	109.32	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.25	2.91	18.24	5.84	106.51	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.32	2.91	17.70	5.80	102.64	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.39	2.90	17.13	5.70	97.66	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.46	2.89	16.63	5.59	92.95	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.50	2.89	16.08	5.63	90.49	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.57	2.92	15.60	5.85	91.30	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.64	2.94	15.29	6.09	93.07	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.70	2.94	15.33	6.12	93.88	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.78	2.93	15.48	6.03	93.42	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.85	2.93	15.60	6.01	93.71	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.92	2.94	15.60	6.12	95.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.96	2.96	15.59	6.35	99.00	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.03	2.99	15.56	6.59	102.56	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.10	3.01	15.54	6.86	106.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.17	3.03	15.63	7.13	111.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.24	3.05	16.07	7.31	117.50	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.31	3.05	16.76	7.32	122.67	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.35	3.02	18.13	6.98	126.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.42	2.98	19.85	6.50	129.00	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.49	2.94	21.65	6.09	131.92	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.56	2.93	22.51	6.00	135.05	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.64	2.94	22.47	6.12	137.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.68	2.96	22.04	6.32	139.20	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.75	2.97	21.66	6.46	140.03	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.82	2.98	21.55	6.49	139.83	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.89	2.96	21.80	6.34	138.26	0	0	0.39	0.000	0.00	0.00	0.00	0.000
28.96	2.94	22.16	6.12	135.67	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.03	2.93	22.24	5.99	133.16	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.11	2.92	22.18	5.94	131.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.14	2.93	22.01	5.95	130.92	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.21	2.91	22.13	5.84	129.30	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.29	2.90	22.29	5.67	126.41	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.36	2.88	22.61	5.48	123.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.43	2.87	22.71	5.43	123.29	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.47	2.88	22.84	5.49	125.32	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.54	2.90	22.41	5.71	127.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.60	2.89	23.23	5.62	130.59	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.69	2.89	23.67	5.59	132.19	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.76	2.87	24.59	5.41	132.93	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.79	2.87	24.44	5.45	133.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.87	2.87	24.36	5.44	132.50	0	0	0.39	0.000	0.00	0.00	0.00	0.000
29.94	2.88	23.72	5.54	131.46	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.01	2.90	22.84	5.71	130.48	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.06	2.92	21.94	5.87	128.75	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.13	2.92	21.47	5.86	125.82	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.20	2.91	20.95	5.82	121.87	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.27	2.91	20.42	5.83	118.99	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.34	2.92	20.09	5.88	118.10	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.41	2.92	19.98	5.92	118.19	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.45	2.92	20.20	5.86	118.42	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.52	2.91	20.49	5.77	118.17	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.59	2.90	20.68	5.70	117.82	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.67	2.90	20.74	5.69	117.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.74	2.91	20.44	5.78	118.18	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.78	2.91	20.46	5.79	118.47	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.85	2.90	20.68	5.71	118.05	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.92	2.88	21.23	5.54	117.54	0	0	0.39	0.000	0.00	0.00	0.00	0.000
30.99	2.87	21.54	5.44	117.23	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.06	2.88	21.27	5.50	117.02	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.13	2.89	20.78	5.61	116.51	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.17	2.90	20.47	5.65	115.74	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.24	2.89	20.40	5.63	114.93	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.32	2.89	20.48	5.57	114.17	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.39	2.88	20.64	5.50	113.56	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.46	2.85	21.69	5.21	113.05	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.53	2.81	23.23	4.87	113.08	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.57	2.77	25.25	4.50	113.68	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.64	2.76	25.76	4.46	114.82	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.71	2.80	24.02	4.82	115.89	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.78	2.90	20.32	5.68	115.45	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.86	3.00	16.91	6.72	113.62	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.90	3.07	14.58	7.58	110.55	0	0	0.39	0.000	0.00	0.00	0.00	0.000
31.97	3.12	13.05	8.19	106.87	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.04	3.16	11.80	8.70	102.60	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.11	3.17	11.17	8.87	99.11	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.18	3.17	10.92	8.84	96.51	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.22	3.15	10.93	8.64	94.40	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.29	3.13	11.01	8.37	92.14	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.37	3.11	11.22	8.05	90.35	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.44	3.08	11.63	7.71	89.61	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.51	3.06	12.07	7.42	89.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.55	3.04	12.45	7.18	89.38	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.62	3.04	12.38	7.18	88.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.69	3.05	12.06	7.37	88.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.77	3.08	11.77	7.62	89.69	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.84	3.08	11.78	7.72	90.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.88	3.07	12.18	7.58	92.31	0	0	0.39	0.000	0.00	0.00	0.00	0.000
32.95	3.06	12.65	7.40	93.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.02	3.05	13.04	7.30	95.20	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.09	3.05	13.32	7.27	96.75	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.16	3.05	13.46	7.29	98.07	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.20	3.05	13.60	7.31	99.41	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.27	3.05	13.75	7.31	100.54	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.35	3.05	13.96	7.27	101.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.42	3.04	14.28	7.15	102.08	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.49	3.03	14.47	7.08	102.51	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.56	3.03	14.58	7.06	102.90	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.60	3.03	14.64	7.05	103.23	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.67	3.03	14.63	7.05	103.12	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.74	3.03	14.62	7.09	103.64	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.82	3.04	14.60	7.15	104.40	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.89	3.04	14.68	7.17	105.33	0	0	0.39	0.000	0.00	0.00	0.00	0.000
33.93	3.04	14.88	7.16	106.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.00	3.04	15.22	7.18	109.23	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.07	3.00	16.91	6.70	113.36	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.14	2.94	19.24	6.07	116.78	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.22	2.89	21.30	5.56	118.35	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.28	2.88	21.29	5.53	117.76	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.32	2.92	19.78	5.86	115.90	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.40	2.96	18.07	6.31	113.98	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.47	3.00	16.60	6.75	112.14	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.54	3.02	15.62	7.03	109.76	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.61	3.03	15.06	7.11	107.01	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.65	3.03	14.82	7.07	104.79	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.72	3.02	15.01	6.95	104.28	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.79	3.00	15.62	6.72	105.07	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.86	2.97	16.53	6.43	106.37	0	0	0.39	0.000	0.00	0.00	0.00	0.000
34.93	2.95	17.32	6.21	107.64	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.01	2.94	17.88	6.11	109.27	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.06	2.94	18.52	6.07	112.40	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.13	2.93	19.37	6.05	117.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.20	2.93	20.35	6.00	122.10	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.24	2.92	21.31	5.87	125.07	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.31	2.91	21.64	5.77	124.77	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.38	2.91	21.26	5.79	123.05	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.45	2.93	20.10	6.04	121.41	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.52	2.96	18.97	6.31	119.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.60	2.97	18.21	6.44	117.33	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.63	2.98	17.48	6.49	113.45	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.70	2.98	16.72	6.58	109.95	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.78	2.99	16.11	6.65	107.20	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.85	2.99	15.92	6.66	106.06	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.92	2.99	16.01	6.60	105.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
35.96	2.98	16.29	6.48	105.54	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.03	2.97	16.51	6.40	105.66	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.10	2.97	16.62	6.39	106.23	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.18	2.97	16.53	6.46	106.84	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.25	2.98	16.39	6.53	107.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.29	2.99	16.13	6.64	107.08	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.36	3.01	15.64	6.85	107.11	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.44	3.03	15.13	7.07	107.06	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.51	3.04	14.76	7.23	106.72	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.58	3.05	14.53	7.29	105.93	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.62	3.05	14.29	7.30	104.35	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.69	3.04	14.22	7.17	101.94	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.76	3.02	14.16	6.98	98.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.83	3.00	14.25	6.74	96.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.91	2.99	14.23	6.61	94.12	0	0	0.39	0.000	0.00	0.00	0.00	0.000
36.94	2.98	14.27	6.54	93.28	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.02	2.99	14.21	6.58	93.54	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.09	3.00	14.17	6.70	94.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.16	3.00	14.28	6.80	97.08	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.23	3.01	14.47	6.87	99.40	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.31	3.01	14.65	6.90	101.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.34	3.02	14.75	6.95	102.53	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.41	3.02	14.95	6.94	103.69	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.49	3.01	15.28	6.84	104.48	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.56	2.99	15.65	6.66	104.31	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.63	2.98	15.85	6.54	103.60	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.67	2.98	15.85	6.50	102.96	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.74	2.98	15.63	6.57	102.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.81	2.99	15.47	6.63	102.61	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.89	3.00	15.35	6.69	102.78	0	0	0.39	0.000	0.00	0.00	0.00	0.000
37.96	3.00	15.36	6.71	102.99	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.03	2.99	15.35	6.64	101.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.06	2.98	15.49	6.53	101.19	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.14	2.98	15.67	6.55	102.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.21	2.99	15.87	6.66	105.62	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.28	3.00	16.01	6.77	108.33	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.35	3.00	16.10	6.76	108.84	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.39	3.04	15.12	7.20	108.86	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.46	3.02	15.54	6.94	107.89	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.53	2.99	15.86	6.68	105.90	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.60	2.94	16.79	6.15	103.29	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.67	2.97	15.74	6.42	101.01	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.74	3.01	14.46	6.88	99.46	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.81	3.05	13.56	7.27	98.54	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.85	3.07	12.95	7.57	97.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.92	3.09	12.49	7.82	97.61	0	0	0.39	0.000	0.00	0.00	0.00	0.000
38.99	3.11	12.10	8.04	97.26	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.06	3.12	11.97	8.12	97.17	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.14	3.10	12.26	7.90	96.92	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.21	3.07	12.85	7.53	96.72	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.25	3.01	13.98	6.90	96.44	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.32	2.96	15.29	6.29	96.15	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.39	2.90	16.90	5.71	96.45	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.46	2.87	18.02	5.37	96.86	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.53	2.85	18.62	5.23	97.47	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.57	2.85	19.01	5.18	98.56	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.64	2.84	19.50	5.11	99.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.71	2.83	20.11	5.01	100.74	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.78	2.82	20.50	4.96	101.69	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.86	2.83	20.46	5.01	102.47	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.90	2.85	19.71	5.24	103.35	0	0	0.39	0.000	0.00	0.00	0.00	0.000
39.97	2.89	18.36	5.65	103.67	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.04	2.96	16.39	6.30	103.19	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.13	3.02	14.77	6.96	102.82	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.16	3.08	13.20	7.70	101.64	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.24	3.13	12.11	8.25	99.93	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.31	3.15	11.61	8.51	98.78	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.38	3.16	11.32	8.69	98.42	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.42	3.15	11.54	8.60	99.16	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.50	3.06	13.38	7.47	99.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.57	2.85	19.28	5.20	100.22	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.64	2.69	25.23	3.94	99.46	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.71	2.62	28.65	3.44	98.62	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.75	2.63	27.88	3.54	98.55	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.82	2.64	27.72	3.56	98.76	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.90	2.61	29.23	3.39	99.07	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.97	2.57	31.84	3.14	99.85	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.04	2.52	35.04	2.89	101.13	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.08	2.49	37.88	2.73	103.46	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.16	2.48	40.32	2.65	106.84	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.22	2.45	43.05	2.53	109.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.30	2.43	45.78	2.46	112.42	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.37	2.43	48.64	2.44	118.74	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.41	2.39	57.16	2.28	130.15	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.48	2.35	68.46	2.13	145.67	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.55	2.32	79.59	2.02	160.73	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.62	2.36	79.41	2.16	171.36	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.69	2.41	75.26	2.35	176.77	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.75	2.47	68.37	2.61	178.38	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.82	2.49	64.49	2.73	176.01	0	0	0.38	0.000	0.00	0.00	0.00	0.000
41.89	2.51	60.64	2.81	170.66	0	0	0.38	0.000	0.00	0.00	0.00	0.000
41.93	2.49	58.55	2.74	160.37	41	2690	0.38	0.063	0.03	8.77	0.01	0.000
42.01	2.46	58.02	2.59	150.57	38	2546	0.38	0.070	0.03	8.77	0.01	0.000
42.08	2.44	57.75	2.49	143.58	36	2443	0.38	0.075	0.04	8.77	0.01	0.000
42.15	2.44	57.66	2.48	142.77	36	2434	0.38	0.076	0.04	8.77	0.01	0.000
42.19	2.47	56.38	2.62	147.64	38	2504	0.38	0.072	0.03	8.77	0.01	0.000
42.27	2.48	57.44	2.68	153.73	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.34	2.45	64.71	2.53	163.52	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.41	2.36	81.03	2.16	175.21	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.48	2.31	94.97	2.00	189.61	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.55	2.30	103.76	1.95	202.15	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.62	2.32	103.61	2.01	208.72	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.66	2.36	97.60	2.14	209.00	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.73	2.42	84.97	2.38	202.21	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.80	2.51	68.02	2.82	192.06	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.88	2.55	58.58	3.04	178.12	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.95	2.54	55.74	2.96	164.71	0	0	0.38	0.000	0.00	0.00	0.00	0.000
42.99	2.45	58.75	2.55	149.52	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.06	2.39	59.68	2.28	136.17	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.14	2.35	58.60	2.12	124.37	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.21	2.34	56.12	2.10	117.67	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.25	2.36	52.75	2.17	114.33	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.32	2.39	49.03	2.27	111.25	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.39	2.42	45.55	2.39	108.75	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.46	2.44	43.41	2.47	107.32	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.54	2.44	42.74	2.50	106.88	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.58	2.46	41.91	2.57	107.85	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.65	2.49	41.72	2.71	113.14	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.72	2.50	44.84	2.79	125.27	0	0	0.38	0.000	0.00	0.00	0.00	0.000
43.80	2.50	51.68	2.75	142.19	37	2480	0.38	0.075	0.04	8.77	0.01	0.000
43.86	2.47	59.99	2.64	158.22	40	2776	0.38	0.062	0.03	8.77	0.01	0.000
43.90	2.45	68.54	2.53	173.73	44	3064	0.38	0.052	0.02	8.77	0.00	0.000
43.97	2.43	76.35	2.46	187.80	47	3327	0.38	0.046	0.02	8.77	0.00	0.000
44.04	2.43	82.61	2.45	202.06	50	3586	0.38	0.041	0.01	8.77	0.00	0.000
44.11	2.46	83.59	2.55	213.42	54	3777	0.38	0.039	0.01	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.18	2.49	82.25	2.70	222.12	57	3913	0.38	0.037	0.01	8.77	0.00	0.000
44.26	2.51	80.76	2.79	225.72	58	3967	0.38	0.036	0.01	8.77	0.00	0.000
44.29	2.49	81.16	2.73	221.50	57	3907	0.38	0.037	0.01	8.77	0.00	0.000
44.36	2.48	80.41	2.65	213.40	54	3781	0.38	0.039	0.01	8.77	0.00	0.000
44.43	2.46	79.30	2.58	204.88	52	3646	0.38	0.041	0.01	8.77	0.00	0.000
44.51	2.45	78.76	2.54	200.21	50	3574	0.38	0.042	0.01	8.77	0.00	0.000
44.59	2.49	72.66	2.70	196.36	0	0	0.38	0.000	0.00	0.00	0.00	0.000
44.62	2.46	74.55	2.58	192.11	0	0	0.38	0.000	0.00	0.00	0.00	0.000
44.72	2.44	75.69	2.48	187.95	0	0	0.38	0.000	0.00	0.00	0.00	0.000
44.75	2.37	84.05	2.18	182.89	0	0	0.38	0.000	0.00	0.00	0.00	0.000
44.83	2.36	82.53	2.17	179.07	0	0	0.38	0.000	0.00	0.00	0.00	0.000
44.90	2.40	76.87	2.30	176.54	0	0	0.38	0.000	0.00	0.00	0.00	0.000
44.97	2.46	68.09	2.57	174.92	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.05	2.52	60.10	2.86	172.16	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.10	2.53	56.87	2.92	166.15	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.17	2.53	54.19	2.94	159.56	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.24	2.55	50.44	3.04	153.54	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.28	2.61	43.66	3.39	148.11	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.35	2.66	38.60	3.69	142.28	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.42	2.66	36.06	3.73	134.42	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.50	2.63	35.69	3.52	125.70	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.57	2.60	35.92	3.30	118.70	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.60	2.58	36.11	3.18	114.98	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.68	2.57	36.03	3.18	114.42	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.75	2.57	36.52	3.14	114.61	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.82	2.56	37.55	3.08	115.80	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.89	2.55	39.01	3.01	117.60	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.93	2.53	40.92	2.93	119.85	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.00	2.51	43.22	2.83	122.24	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.08	2.49	46.37	2.71	125.58	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.15	2.46	50.41	2.56	129.27	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.22	2.42	54.88	2.42	132.64	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.29	2.40	58.58	2.31	135.37	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.33	2.39	60.80	2.28	138.83	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.40	2.41	60.67	2.36	143.13	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.47	2.43	60.45	2.45	147.98	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.55	2.46	59.08	2.58	152.54	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.62	2.47	59.10	2.64	156.05	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.66	2.48	60.11	2.65	159.07	0	0	0.37	0.000	0.00	0.00	0.00	0.000
46.73	2.47	62.03	2.61	161.75	41	3008	0.37	0.056	0.02	8.77	0.00	0.000
46.80	2.46	64.17	2.59	166.30	42	3099	0.37	0.054	0.02	8.77	0.00	0.000
46.87	2.45	68.55	2.54	173.99	44	3253	0.37	0.050	0.02	8.77	0.00	0.000
46.94	2.43	76.66	2.43	186.01	46	3496	0.37	0.045	0.02	8.77	0.00	0.000
47.01	2.40	84.76	2.33	197.39	49	3726	0.37	0.041	0.01	8.77	0.00	0.000
47.05	2.42	87.11	2.38	207.16	51	3907	0.37	0.038	0.01	8.77	0.00	0.000
47.12	2.48	79.45	2.69	213.36	55	3987	0.37	0.037	0.01	8.77	0.00	0.000
47.20	2.56	71.06	3.10	220.24	58	4063	0.37	0.036	0.01	8.77	0.00	0.000
47.27	2.62	65.02	3.45	224.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.33	2.59	68.64	3.27	224.38	60	4128	0.37	0.035	0.01	8.77	0.00	0.000
47.38	2.50	79.13	2.77	219.32	57	4107	0.37	0.036	0.01	8.77	0.00	0.000
47.45	2.39	95.46	2.27	217.09	53	4138	0.37	0.035	0.01	8.77	0.00	0.000
47.52	2.31	110.86	2.00	221.48	52	4248	0.37	0.034	0.01	8.77	0.00	0.000
47.58	2.29	120.23	1.93	231.47	54	4444	0.37	0.032	0.01	8.77	0.00	0.000
47.64	2.31	121.78	1.97	239.60	57	4606	0.37	0.031	0.01	8.77	0.00	0.000
47.71	2.34	116.61	2.08	242.00	58	4654	0.37	0.030	0.01	8.77	0.00	0.000
47.77	2.38	106.08	2.24	237.99	58	4567	0.37	0.031	0.01	8.77	0.00	0.000
47.84	2.44	93.03	2.48	230.65	58	4401	0.37	0.033	0.01	8.77	0.00	0.000
47.90	2.48	85.06	2.65	225.02	57	4276	0.37	0.034	0.01	8.77	0.00	0.000
47.98	2.50	80.50	2.77	223.14	58	4228	0.37	0.035	0.01	8.77	0.00	0.000
48.04	2.50	80.38	2.79	224.00	58	4247	0.37	0.034	0.01	8.77	0.00	0.000
48.10	2.52	77.59	2.87	222.69	58	4215	0.37	0.035	0.01	8.77	0.00	0.000
48.18	2.55	72.32	3.03	218.97	58	4129	0.37	0.036	0.01	8.77	0.00	0.000
48.23	2.62	61.86	3.44	212.79	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.31	2.72	50.22	4.11	206.40	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.37	2.80	41.12	4.80	197.49	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.44	2.82	37.98	4.94	187.59	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.50	2.76	39.59	4.48	177.52	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.56	2.67	45.10	3.79	171.15	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.63	2.59	51.55	3.26	167.86	45	3171	0.37	0.053	0.02	8.77	0.00	0.000
48.69	2.54	55.70	3.00	167.32	44	3190	0.37	0.052	0.02	8.77	0.00	0.000
48.77	2.56	54.15	3.11	168.66	45	3209	0.37	0.052	0.02	8.77	0.00	0.000
48.84	2.64	48.66	3.58	174.10	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.91	2.73	42.83	4.21	180.17	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.95	2.79	38.60	4.74	182.95	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.03	2.81	36.64	4.89	179.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.09	2.81	35.52	4.89	173.59	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.16	2.83	33.18	5.07	168.14	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.23	2.88	29.94	5.47	163.78	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.29	2.93	26.81	5.95	159.55	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.36	2.90	27.47	5.73	157.50	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.42	2.82	31.96	4.93	157.60	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.48	2.68	41.56	3.86	160.61	0	0	0.36	0.000	0.00	0.00	0.00	0.000
49.55	2.55	54.79	3.06	167.56	0	0	0.36	0.000	0.00	0.00	0.00	0.000
49.61	2.45	70.53	2.51	177.17	0	0	0.36	0.000	0.00	0.00	0.00	0.000
49.68	2.35	87.38	2.13	185.86	0	0	0.36	0.000	0.00	0.00	0.00	0.000
49.74	2.27	105.70	1.86	196.54	0	0	0.36	0.000	0.00	0.00	0.00	0.000
49.81	2.23	121.68	1.73	210.74	0	0	0.36	0.000	0.00	0.00	0.00	0.000
49.88	2.22	132.38	1.71	225.80	51	4476	0.36	0.033	0.01	8.77	0.00	0.000
49.94	2.22	136.94	1.71	234.65	53	4658	0.36	0.031	0.01	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 1.54

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92880
http://www.geotekusa.com

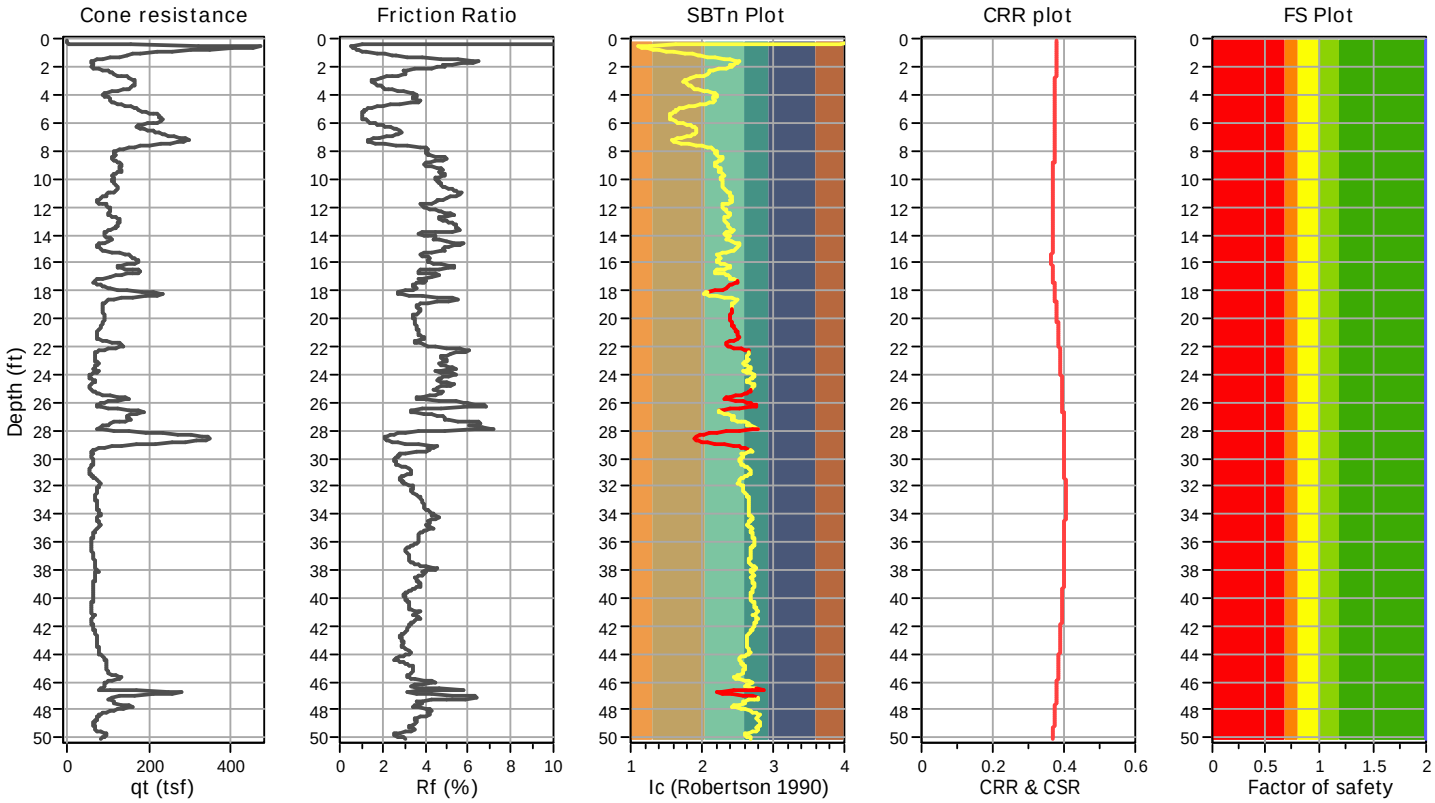
LIQUEFACTION ANALYSIS REPORT

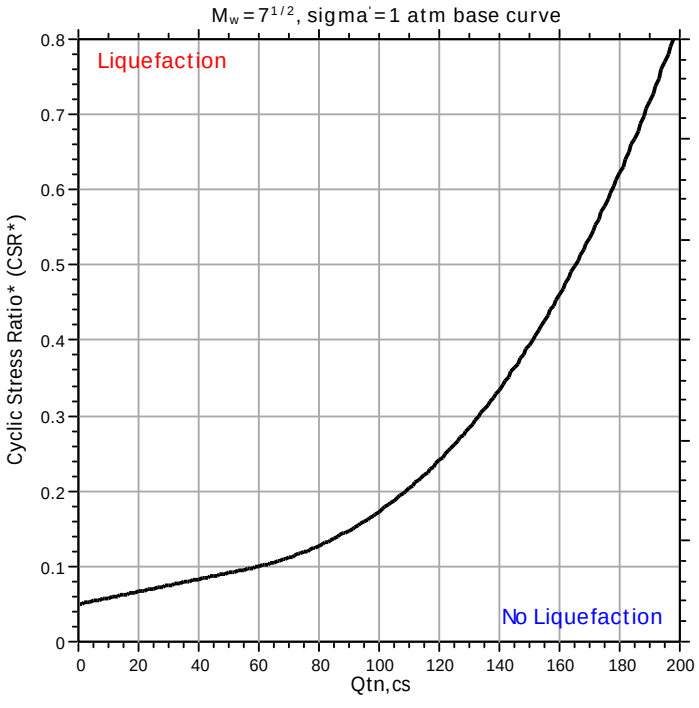
Project title : APN 287-241-04, -05, &-06 Location : Fullerton, CA

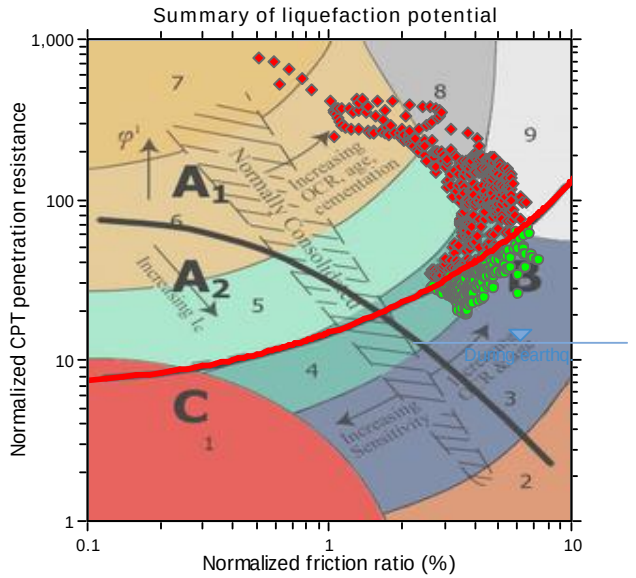
CPT file : CPT-2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A		
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude M_w:	6.72	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	60.00 ft
Peak ground acceleration:	0.77	Unit weight calculation:	Based on SBT	K_σ applied:	Yes	MSF method:	Method based







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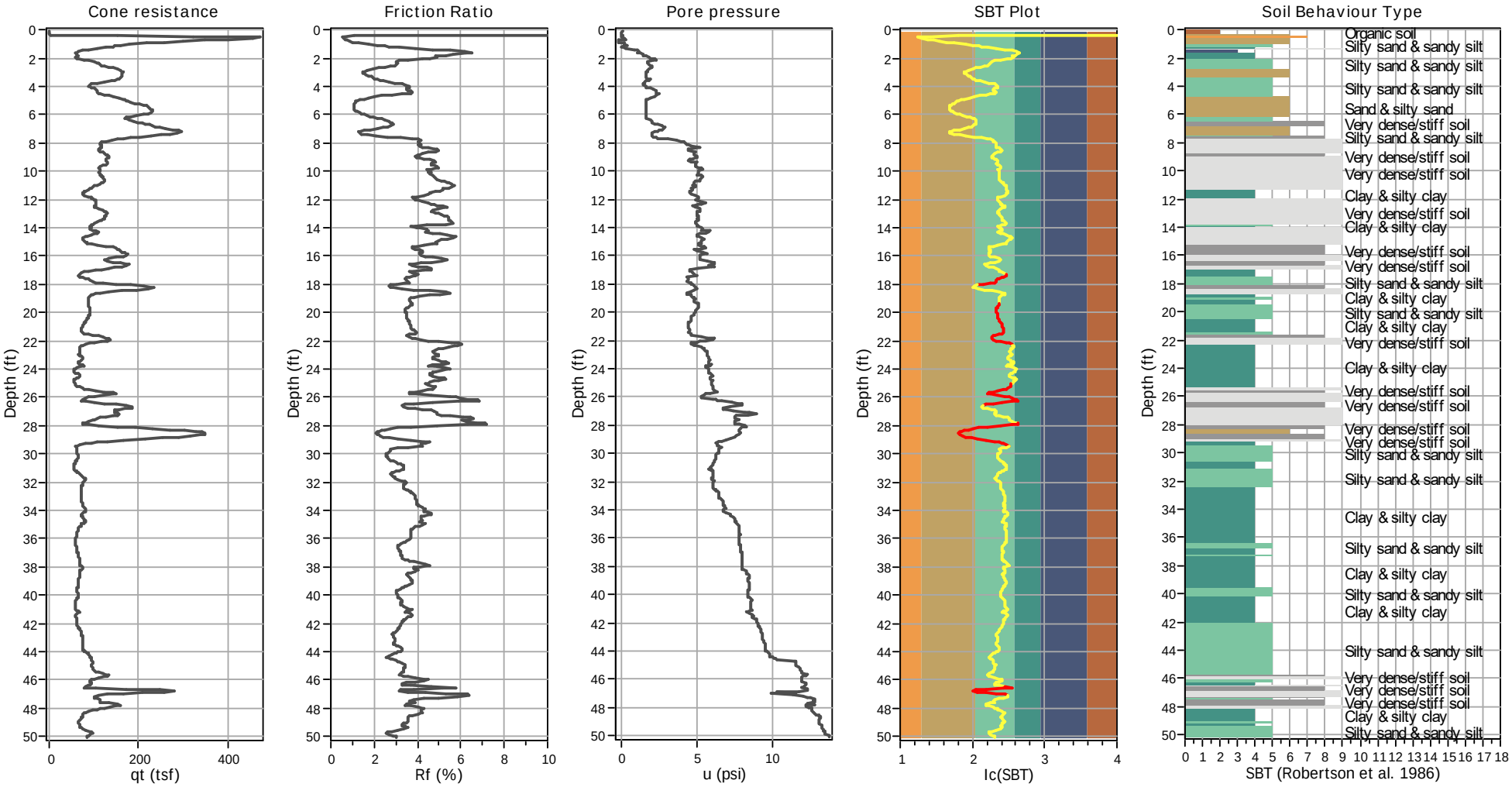
CPT basic interpretation plots



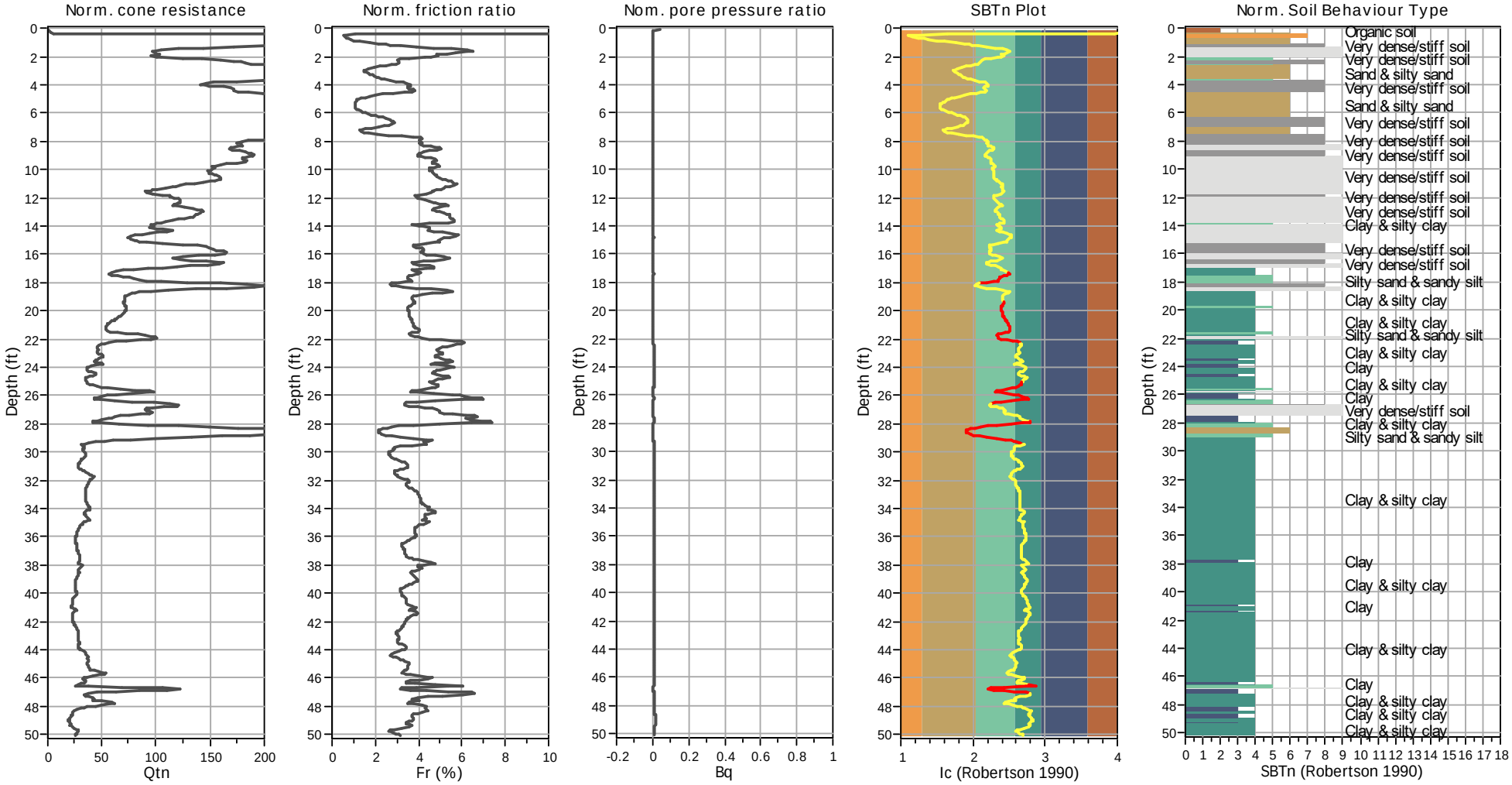
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

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

CPT basic interpretation plots (normalized)



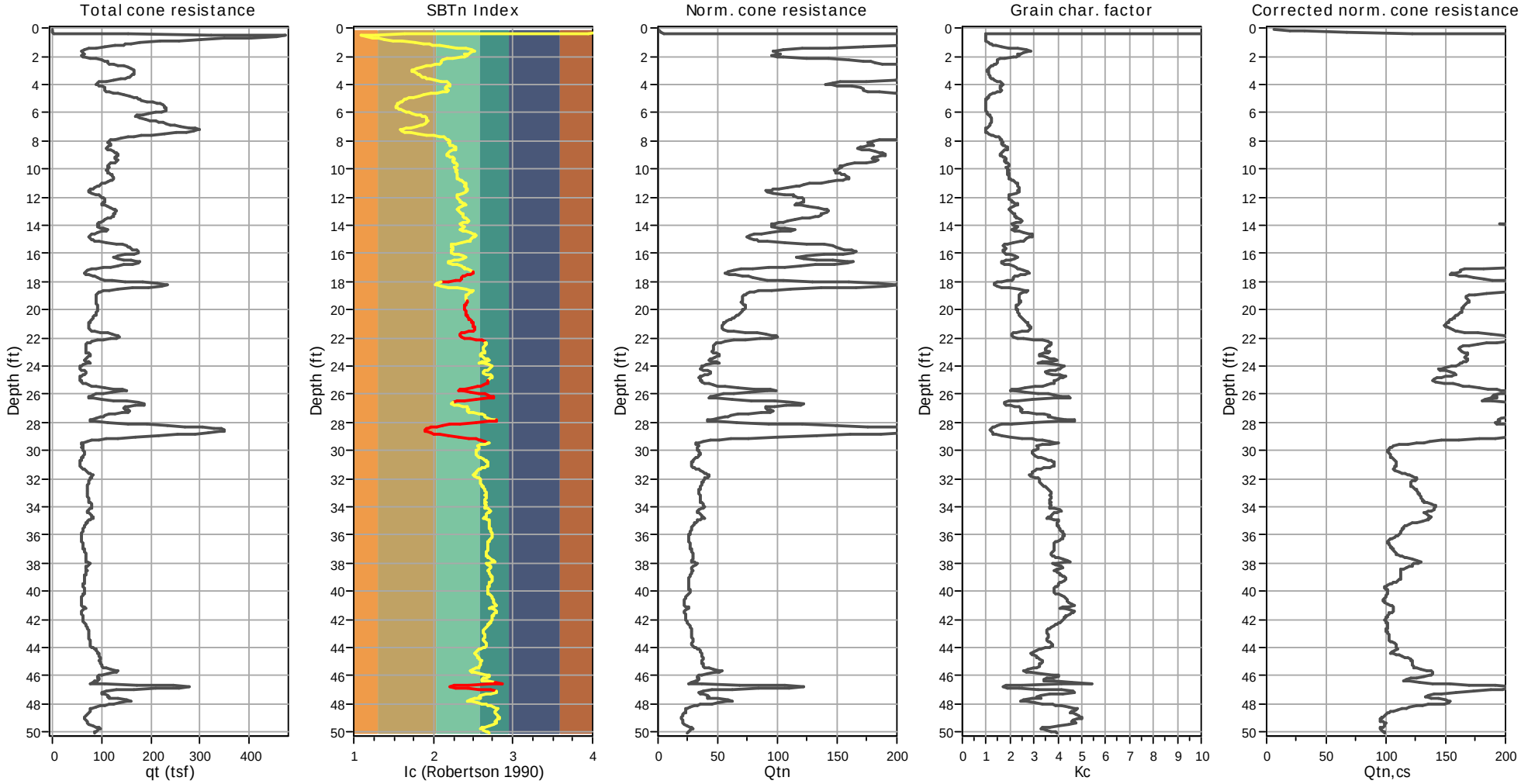
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

SBTn legend

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

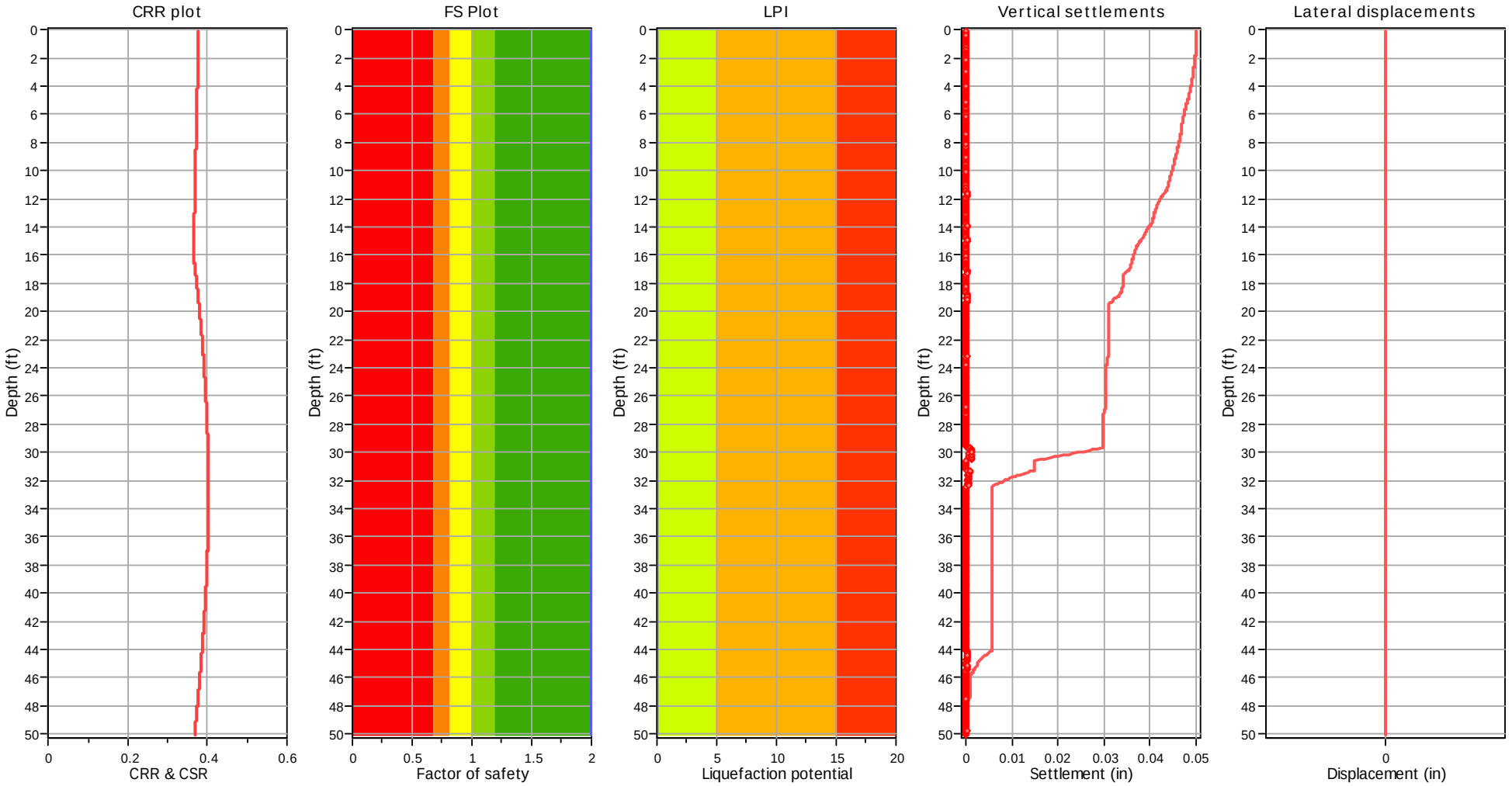
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	60.00 ft

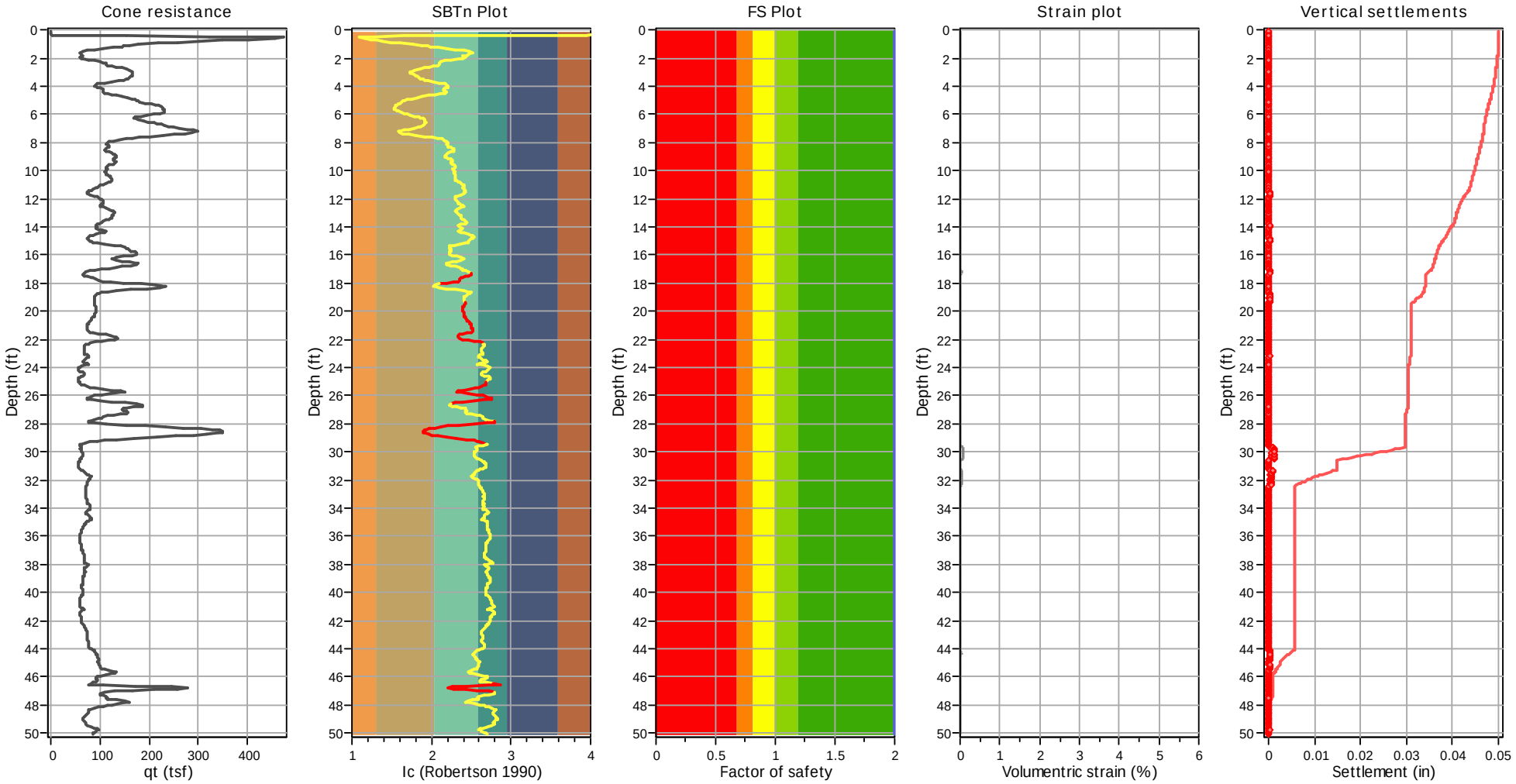
F.S. color scheme

- 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

Estimation of post-earthquake settlements



Abbreviations

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

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.08	4.06	0.23	26.61	6.00	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.15	4.06	0.73	26.61	19.36	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.20	4.06	1.19	26.61	31.62	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.27	4.06	2.53	26.61	67.35	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.33	3.95	5.08	23.90	121.46	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.40	1.64	248.80	1.00	248.26	45	1115	0.38	0.001	0.00	8.77	0.00	0.000
0.46	1.27	517.81	1.00	517.81	84	1443	0.38	0.001	0.00	8.77	0.00	0.000
0.54	1.10	760.00	1.00	760.00	117	1709	0.38	0.001	0.00	8.77	0.00	0.000
0.59	1.16	731.56	1.00	731.56	115	1784	0.38	0.001	0.00	8.77	0.00	0.000
0.66	1.24	646.62	1.00	646.62	104	1743	0.38	0.001	0.00	8.77	0.00	0.000
0.74	1.32	561.57	1.00	561.57	93	1672	0.38	0.001	0.00	8.77	0.00	0.000
0.79	1.39	483.49	1.00	483.49	82	1578	0.38	0.002	0.00	8.77	0.00	0.000
0.87	1.50	412.18	1.00	412.18	72	1534	0.38	0.002	0.00	8.77	0.00	0.000
0.92	1.61	351.87	1.00	351.87	64	1517	0.38	0.002	0.00	8.77	0.00	0.000
1.00	1.77	286.08	1.09	311.05	60	1513	0.38	0.002	0.00	8.77	0.00	0.000
1.06	1.88	255.88	1.17	298.98	59	1545	0.38	0.002	0.00	8.77	0.00	0.000
1.13	1.95	237.36	1.24	293.70	60	1566	0.38	0.003	0.00	8.77	0.00	0.000
1.19	1.98	232.62	1.28	296.87	61	1602	0.38	0.003	0.00	8.77	0.00	0.000
1.26	2.07	205.10	1.41	288.46	62	1584	0.38	0.003	0.00	8.77	0.00	0.000
1.31	2.19	172.12	1.64	283.06	64	1545	0.38	0.003	0.00	8.77	0.00	0.000
1.39	2.30	143.59	1.96	281.87	66	1489	0.38	0.003	0.00	8.77	0.00	0.000
1.46	2.40	120.95	2.33	281.62	69	1422	0.38	0.004	0.00	8.77	0.00	0.000
1.52	2.48	105.23	2.67	280.74	72	1362	0.38	0.004	0.00	8.77	0.00	0.000
1.59	2.52	97.33	2.85	277.52	72	1319	0.38	0.005	0.00	8.77	0.00	0.000
1.65	2.50	96.35	2.79	268.95	69	1287	0.38	0.005	0.00	8.77	0.00	0.000
1.72	2.46	99.78	2.58	257.81	65	1263	0.38	0.005	0.00	8.77	0.00	0.000
1.78	2.44	100.06	2.47	246.70	62	1226	0.38	0.006	0.00	8.77	0.00	0.000
1.85	2.40	102.91	2.31	237.26	58	1202	0.38	0.006	0.00	8.77	0.00	0.000
1.92	2.42	95.62	2.41	230.23	57	1152	0.38	0.007	0.00	8.77	0.00	0.000
2.00	2.38	100.21	2.25	225.46	55	1150	0.38	0.007	0.00	8.77	0.00	0.000
2.07	2.35	105.01	2.12	222.52	54	1153	0.38	0.007	0.00	8.77	0.00	0.000
2.11	2.24	124.91	1.77	220.84	51	1192	0.38	0.007	0.00	8.77	0.00	0.000
2.18	2.16	142.94	1.58	226.46	50	1241	0.38	0.007	0.00	8.77	0.00	0.000
2.25	2.12	160.32	1.49	238.53	52	1312	0.38	0.007	0.00	8.77	0.00	0.000
2.33	2.11	171.40	1.47	251.26	55	1382	0.38	0.007	0.00	8.77	0.00	0.000
2.37	2.10	178.54	1.45	259.14	56	1425	0.38	0.006	0.00	8.77	0.00	0.000
2.44	2.09	182.06	1.44	261.83	56	1440	0.38	0.007	0.00	8.77	0.00	0.000
2.51	2.07	187.52	1.41	263.85	56	1449	0.38	0.007	0.00	8.77	0.00	0.000
2.59	2.03	199.81	1.34	267.41	56	1460	0.38	0.007	0.00	8.77	0.00	0.000
2.66	1.97	215.12	1.27	272.81	56	1469	0.38	0.007	0.00	8.77	0.00	0.000
2.69	1.91	232.37	1.20	279.19	56	1468	0.38	0.007	0.00	8.77	0.00	0.000
2.77	1.86	246.28	1.15	283.07	56	1446	0.38	0.008	0.00	8.77	0.00	0.000
2.84	1.80	258.24	1.10	284.85	55	1404	0.38	0.008	0.00	8.77	0.00	0.000
2.92	1.75	263.84	1.07	283.27	54	1361	0.38	0.009	0.00	8.77	0.00	0.000
2.99	1.73	264.62	1.06	280.69	53	1332	0.38	0.009	0.00	8.77	0.00	0.000
3.03	1.74	263.89	1.06	280.28	53	1332	0.38	0.009	0.00	8.77	0.00	0.000
3.10	1.75	264.07	1.07	283.35	54	1360	0.38	0.009	0.00	8.77	0.00	0.000
3.18	1.78	264.38	1.09	288.40	55	1407	0.38	0.009	0.00	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.25	1.80	263.98	1.11	292.71	57	1450	0.38	0.009	0.00	8.77	0.00	0.000
3.29	1.82	263.10	1.12	295.91	58	1485	0.38	0.009	0.00	8.77	0.00	0.000
3.36	1.85	258.09	1.14	294.64	58	1497	0.38	0.009	0.00	8.77	0.00	0.000
3.44	1.87	251.82	1.16	292.02	58	1501	0.38	0.009	0.00	8.77	0.00	0.000
3.51	1.89	244.99	1.18	288.61	58	1500	0.38	0.010	0.00	8.77	0.00	0.000
3.55	1.92	237.70	1.20	286.40	58	1508	0.38	0.010	0.00	8.77	0.00	0.000
3.62	1.96	223.31	1.25	279.47	57	1497	0.38	0.010	0.00	8.77	0.00	0.000
3.70	2.03	199.23	1.33	265.78	56	1450	0.38	0.011	0.00	8.77	0.00	0.000
3.77	2.09	174.86	1.44	251.53	54	1383	0.38	0.012	0.00	8.77	0.00	0.000
3.81	2.16	152.36	1.58	241.08	54	1322	0.38	0.013	0.00	8.77	0.00	0.000
3.88	2.19	146.34	1.63	238.68	53	1304	0.38	0.013	0.00	8.77	0.00	0.000
3.96	2.22	140.44	1.71	239.50	54	1301	0.38	0.013	0.00	8.77	0.00	0.000
4.03	2.20	145.49	1.68	243.74	55	1327	0.38	0.013	0.00	8.77	0.00	0.000
4.07	2.20	149.46	1.67	249.83	56	1361	0.38	0.013	0.00	8.77	0.00	0.000
4.14	2.17	162.12	1.59	257.10	57	1409	0.38	0.013	0.00	8.77	0.00	0.000
4.22	2.15	169.63	1.56	264.75	59	1453	0.37	0.012	0.00	8.77	0.00	0.000
4.29	2.16	172.37	1.57	270.71	60	1485	0.37	0.012	0.00	8.77	0.00	0.000
4.33	2.18	171.39	1.61	276.10	62	1511	0.37	0.012	0.00	8.77	0.00	0.000
4.41	2.18	171.57	1.63	278.97	62	1525	0.37	0.012	0.00	8.77	0.00	0.000
4.48	2.17	176.01	1.59	279.58	62	1532	0.37	0.012	0.00	8.77	0.00	0.000
4.55	2.12	185.65	1.48	275.58	60	1516	0.37	0.013	0.00	8.77	0.00	0.000
4.62	2.04	198.31	1.36	269.10	57	1472	0.37	0.014	0.00	8.77	0.00	0.000
4.66	1.96	213.98	1.25	267.89	55	1436	0.37	0.014	0.00	8.77	0.00	0.000
4.73	1.89	231.41	1.18	272.01	54	1411	0.37	0.015	0.00	8.77	0.00	0.000
4.81	1.82	250.52	1.12	280.38	55	1401	0.37	0.015	0.00	8.77	0.00	0.000
4.88	1.75	265.77	1.07	284.50	54	1362	0.37	0.016	0.00	8.77	0.00	0.000
4.95	1.69	274.18	1.03	283.57	53	1313	0.37	0.018	0.01	8.77	0.00	0.000
5.02	1.66	277.93	1.01	281.01	52	1276	0.37	0.019	0.01	8.77	0.00	0.000
5.06	1.64	282.28	1.00	282.28	52	1259	0.37	0.019	0.01	8.77	0.00	0.000
5.13	1.62	291.39	1.00	291.39	53	1269	0.37	0.019	0.01	8.77	0.00	0.000
5.20	1.60	307.39	1.00	307.39	55	1301	0.37	0.019	0.01	8.77	0.00	0.000
5.27	1.58	325.75	1.00	325.75	58	1343	0.37	0.018	0.01	8.77	0.00	0.000
5.34	1.56	341.38	1.00	341.38	61	1378	0.37	0.018	0.00	8.77	0.00	0.000
5.38	1.55	352.27	1.00	352.27	62	1401	0.37	0.018	0.00	8.77	0.00	0.000
5.45	1.54	358.34	1.00	358.34	63	1417	0.37	0.018	0.00	8.77	0.00	0.000
5.53	1.54	363.67	1.00	363.67	64	1431	0.37	0.018	0.00	8.77	0.00	0.000
5.60	1.54	367.42	1.00	367.42	65	1446	0.37	0.018	0.00	8.77	0.00	0.000
5.67	1.55	369.64	1.00	369.64	65	1465	0.37	0.018	0.00	8.77	0.00	0.000
5.71	1.56	370.31	1.00	370.31	66	1501	0.37	0.017	0.00	8.77	0.00	0.000
5.79	1.59	368.70	1.00	368.70	66	1552	0.37	0.016	0.00	8.77	0.00	0.000
5.86	1.62	363.20	1.00	363.20	66	1605	0.37	0.016	0.00	8.77	0.00	0.000
5.93	1.66	350.92	1.01	353.84	65	1627	0.37	0.016	0.00	8.77	0.00	0.000
6.00	1.69	335.45	1.03	346.94	65	1619	0.37	0.016	0.00	8.77	0.00	0.000
6.04	1.74	314.17	1.06	333.90	63	1588	0.37	0.017	0.00	8.77	0.00	0.000
6.12	1.78	292.68	1.09	320.28	62	1567	0.37	0.017	0.00	8.77	0.00	0.000
6.19	1.83	276.67	1.13	312.96	61	1578	0.37	0.017	0.00	8.77	0.00	0.000
6.27	1.87	271.51	1.16	314.76	62	1618	0.37	0.017	0.00	8.77	0.00	0.000
6.30	1.89	276.19	1.18	326.46	65	1700	0.37	0.016	0.00	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.38	1.91	286.76	1.20	343.93	69	1806	0.37	0.015	0.00	8.77	0.00	0.000
6.45	1.92	303.50	1.21	367.13	74	1937	0.37	0.014	0.00	8.77	0.00	0.000
6.53	1.92	319.78	1.21	387.61	78	2047	0.37	0.013	0.00	8.77	0.00	0.000
6.56	1.92	335.51	1.21	406.04	82	2143	0.37	0.012	0.00	8.77	0.00	0.000
6.64	1.92	347.24	1.21	419.74	85	2214	0.37	0.012	0.00	8.77	0.00	0.000
6.71	1.91	360.00	1.20	431.64	87	2267	0.37	0.012	0.00	8.77	0.00	0.000
6.79	1.89	369.35	1.18	436.15	87	2288	0.37	0.012	0.00	8.77	0.00	0.000
6.86	1.87	375.08	1.16	435.27	86	2289	0.37	0.012	0.00	8.77	0.00	0.000
6.90	1.83	383.61	1.13	433.95	85	2271	0.37	0.012	0.00	8.77	0.00	0.000
6.97	1.78	393.55	1.09	430.68	83	2237	0.37	0.012	0.00	8.77	0.00	0.000
7.04	1.71	406.63	1.05	425.83	80	2178	0.37	0.013	0.00	8.77	0.00	0.000
7.12	1.65	415.82	1.00	417.73	77	2112	0.37	0.014	0.00	8.77	0.00	0.000
7.16	1.60	423.17	1.00	423.17	76	2024	0.37	0.015	0.00	8.77	0.00	0.000
7.23	1.58	418.47	1.00	418.47	75	1963	0.37	0.015	0.00	8.77	0.00	0.000
7.30	1.59	402.28	1.00	402.28	72	1934	0.37	0.016	0.00	8.77	0.00	0.000
7.38	1.64	379.90	1.00	378.95	69	1948	0.37	0.016	0.00	8.77	0.00	0.000
7.42	1.71	357.80	1.05	374.72	70	1973	0.37	0.016	0.00	8.77	0.00	0.000
7.49	1.81	332.07	1.11	368.95	71	2012	0.37	0.015	0.00	8.77	0.00	0.000
7.57	1.92	302.22	1.20	363.73	73	2049	0.37	0.015	0.00	8.77	0.00	0.000
7.64	2.01	277.13	1.31	363.28	76	2071	0.37	0.015	0.00	8.77	0.00	0.000
7.68	2.08	257.50	1.43	367.33	79	2080	0.37	0.015	0.00	8.77	0.00	0.000
7.75	2.13	239.39	1.51	361.68	79	2036	0.37	0.016	0.00	8.77	0.00	0.000
7.83	2.16	218.20	1.57	342.36	76	1920	0.37	0.017	0.00	8.77	0.00	0.000
7.90	2.17	199.47	1.60	318.67	71	1791	0.37	0.020	0.00	8.77	0.00	0.000
7.94	2.19	185.52	1.63	303.22	68	1698	0.37	0.021	0.00	8.77	0.00	0.000
8.01	2.20	180.23	1.66	299.63	68	1680	0.37	0.022	0.01	8.77	0.00	0.000
8.09	2.21	175.10	1.69	296.60	67	1665	0.37	0.023	0.01	8.77	0.00	0.000
8.15	2.20	178.51	1.66	296.24	67	1683	0.37	0.022	0.01	8.77	0.00	0.000
8.21	2.20	179.14	1.67	299.28	68	1706	0.37	0.022	0.01	8.77	0.00	0.000
8.29	2.21	180.11	1.69	304.85	69	1741	0.37	0.022	0.00	8.77	0.00	0.000
8.36	2.24	175.66	1.77	311.66	72	1764	0.37	0.021	0.00	8.77	0.00	0.000
8.43	2.26	172.42	1.84	316.95	73	1783	0.37	0.021	0.00	8.77	0.00	0.000
8.47	2.28	169.60	1.89	320.77	75	1792	0.37	0.021	0.00	8.77	0.00	0.000
8.54	2.29	167.52	1.92	320.95	75	1796	0.37	0.021	0.00	8.77	0.00	0.000
8.62	2.27	170.20	1.86	316.84	74	1804	0.37	0.022	0.00	8.77	0.00	0.000
8.69	2.24	176.81	1.76	311.03	71	1817	0.37	0.022	0.00	8.77	0.00	0.000
8.76	2.21	182.28	1.68	306.54	69	1827	0.37	0.022	0.00	8.77	0.00	0.000
8.80	2.19	185.46	1.65	305.46	69	1838	0.37	0.021	0.00	8.77	0.00	0.000
8.87	2.18	188.01	1.62	304.68	68	1853	0.37	0.021	0.00	8.77	0.00	0.000
8.94	2.17	190.31	1.60	304.29	68	1868	0.37	0.021	0.00	8.77	0.00	0.000
9.01	2.17	189.81	1.60	304.17	68	1878	0.37	0.021	0.00	8.77	0.00	0.000
9.06	2.19	186.43	1.64	306.01	69	1884	0.37	0.021	0.00	8.77	0.00	0.000
9.13	2.21	182.58	1.70	309.92	70	1901	0.37	0.021	0.00	8.77	0.00	0.000
9.20	2.24	180.21	1.76	317.59	73	1936	0.37	0.021	0.00	8.77	0.00	0.000
9.28	2.25	179.57	1.81	324.93	75	1976	0.37	0.021	0.00	8.77	0.00	0.000
9.32	2.26	182.22	1.82	330.94	76	2017	0.37	0.020	0.00	8.77	0.00	0.000
9.39	2.25	184.35	1.79	329.67	76	2031	0.37	0.020	0.00	8.77	0.00	0.000
9.46	2.24	182.28	1.77	322.84	74	2007	0.37	0.021	0.00	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.54	2.25	174.04	1.81	314.61	73	1955	0.37	0.022	0.00	8.77	0.00	0.000
9.61	2.28	164.85	1.88	309.22	72	1909	0.37	0.023	0.00	8.77	0.00	0.000
9.65	2.30	159.11	1.93	307.68	72	1886	0.37	0.023	0.00	8.77	0.00	0.000
9.72	2.31	154.77	1.97	304.16	72	1865	0.37	0.024	0.01	8.77	0.00	0.000
9.80	2.30	152.34	1.96	297.85	70	1840	0.37	0.025	0.01	8.77	0.00	0.000
9.88	2.29	152.69	1.91	290.88	68	1824	0.37	0.025	0.01	8.77	0.00	0.000
9.91	2.27	154.15	1.85	285.13	66	1811	0.37	0.026	0.01	8.77	0.00	0.000
9.99	2.27	151.58	1.87	283.13	66	1802	0.37	0.026	0.01	8.77	0.00	0.000
10.06	2.28	149.83	1.88	282.20	66	1802	0.37	0.026	0.01	8.77	0.00	0.000
10.11	2.29	147.46	1.93	283.88	67	1805	0.37	0.026	0.01	8.77	0.00	0.000
10.18	2.29	149.18	1.91	284.48	67	1825	0.37	0.026	0.01	8.77	0.00	0.000
10.25	2.29	149.29	1.93	287.70	67	1849	0.37	0.026	0.01	8.77	0.00	0.000
10.33	2.29	152.13	1.92	291.87	68	1889	0.37	0.025	0.01	8.77	0.00	0.000
10.40	2.29	153.93	1.92	295.78	69	1924	0.37	0.025	0.01	8.77	0.00	0.000
10.44	2.29	156.24	1.92	299.64	70	1955	0.37	0.024	0.01	8.77	0.00	0.000
10.51	2.29	157.86	1.92	303.27	71	1988	0.37	0.024	0.01	8.77	0.00	0.000
10.58	2.30	159.48	1.93	308.47	72	2029	0.37	0.023	0.00	8.77	0.00	0.000
10.66	2.31	159.48	1.97	314.57	74	2067	0.37	0.023	0.00	8.77	0.00	0.000
10.73	2.32	157.85	2.02	318.28	76	2087	0.37	0.023	0.00	8.77	0.00	0.000
10.77	2.34	154.63	2.07	319.52	76	2083	0.37	0.023	0.00	8.77	0.00	0.000
10.84	2.35	150.03	2.11	317.14	76	2063	0.37	0.023	0.00	8.77	0.00	0.000
10.92	2.37	143.21	2.18	311.88	76	2018	0.37	0.024	0.00	8.77	0.00	0.000
10.99	2.38	136.18	2.24	305.24	74	1966	0.37	0.026	0.01	8.77	0.00	0.000
11.03	2.41	126.92	2.34	296.88	73	1888	0.37	0.027	0.01	8.77	0.00	0.000
11.09	2.41	122.50	2.34	286.19	71	1829	0.37	0.029	0.01	8.77	0.00	0.000
11.19	2.40	118.24	2.33	275.76	68	1776	0.37	0.031	0.01	8.77	0.00	0.000
11.23	2.40	115.40	2.30	265.21	65	1722	0.37	0.033	0.01	8.77	0.01	0.000
11.30	2.41	108.12	2.36	254.66	63	1647	0.37	0.036	0.01	8.77	0.01	0.000
11.37	2.42	100.89	2.39	241.22	60	1560	0.37	0.040	0.01	8.77	0.01	0.000
11.45	2.42	96.03	2.39	229.49	57	1492	0.37	0.044	0.01	8.77	0.01	0.000
11.49	2.40	94.81	2.33	220.52	54	1451	0.37	0.047	0.01	8.77	0.01	0.000
11.56	2.42	90.37	2.40	217.04	54	1419	0.37	0.049	0.02	8.77	0.01	0.000
11.63	2.41	91.04	2.35	213.91	53	1417	0.37	0.050	0.02	8.77	0.01	0.000
11.71	2.38	95.98	2.23	214.20	52	1452	0.37	0.048	0.02	8.77	0.01	0.000
11.78	2.32	106.36	2.02	214.90	51	1512	0.37	0.045	0.01	8.77	0.01	0.000
11.82	2.29	113.06	1.92	217.63	51	1558	0.37	0.042	0.01	8.77	0.01	0.000
11.89	2.30	113.27	1.94	219.25	51	1575	0.37	0.042	0.01	8.77	0.01	0.000
11.97	2.30	114.28	1.94	221.70	52	1599	0.37	0.041	0.01	8.77	0.01	0.000
12.04	2.29	116.65	1.93	225.33	53	1634	0.37	0.040	0.01	8.77	0.01	0.000
12.08	2.29	120.61	1.93	233.07	55	1694	0.37	0.037	0.01	8.77	0.01	0.000
12.16	2.31	122.47	1.98	242.45	57	1759	0.37	0.035	0.01	8.77	0.01	0.000
12.23	2.33	122.31	2.05	250.77	60	1808	0.37	0.034	0.01	8.77	0.01	0.000
12.30	2.34	121.54	2.10	254.79	61	1832	0.37	0.033	0.01	8.77	0.01	0.000
12.34	2.35	120.42	2.13	256.81	62	1841	0.37	0.033	0.01	8.77	0.01	0.000
12.42	2.37	118.42	2.20	260.37	63	1857	0.37	0.033	0.01	8.77	0.01	0.000
12.49	2.39	116.18	2.29	265.68	65	1879	0.37	0.032	0.01	8.77	0.00	0.000
12.56	2.41	115.22	2.34	269.72	67	1902	0.37	0.032	0.01	8.77	0.00	0.000
12.60	2.39	119.31	2.27	270.88	66	1934	0.37	0.031	0.01	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.67	2.36	126.17	2.14	270.20	65	1975	0.37	0.030	0.01	8.77	0.00	0.000
12.75	2.32	134.00	2.02	270.47	64	2023	0.37	0.029	0.01	8.77	0.00	0.000
12.82	2.31	138.92	1.97	274.32	65	2074	0.37	0.029	0.01	8.77	0.00	0.000
12.89	2.31	141.73	1.97	279.35	66	2122	0.37	0.028	0.01	8.77	0.00	0.000
12.93	2.31	143.23	2.00	286.09	68	2170	0.37	0.027	0.01	8.77	0.00	0.000
13.00	2.33	142.66	2.04	290.36	69	2200	0.37	0.027	0.01	8.77	0.00	0.000
13.08	2.34	140.99	2.08	293.72	70	2221	0.37	0.026	0.01	8.77	0.00	0.000
13.16	2.36	138.37	2.14	295.83	71	2229	0.37	0.026	0.01	8.77	0.00	0.000
13.19	2.37	137.06	2.18	298.23	72	2240	0.37	0.026	0.01	8.77	0.00	0.000
13.27	2.37	136.05	2.19	298.52	72	2246	0.37	0.026	0.01	8.77	0.00	0.000
13.34	2.37	134.61	2.20	296.58	72	2239	0.37	0.027	0.01	8.77	0.00	0.000
13.41	2.38	131.18	2.23	292.20	71	2208	0.37	0.027	0.01	8.77	0.00	0.000
13.49	2.39	126.84	2.27	287.72	70	2171	0.37	0.028	0.01	8.77	0.00	0.000
13.53	2.41	121.08	2.34	283.06	70	2120	0.37	0.030	0.01	8.77	0.00	0.000
13.60	2.42	115.21	2.41	277.55	69	2068	0.37	0.031	0.01	8.77	0.00	0.000
13.67	2.44	108.88	2.48	269.57	67	2000	0.37	0.033	0.01	8.77	0.00	0.000
13.75	2.43	104.52	2.43	254.26	63	1905	0.37	0.036	0.01	8.77	0.01	0.000
13.78	2.38	100.85	2.23	224.80	55	1736	0.37	0.043	0.01	8.77	0.01	0.000
13.86	2.34	97.48	2.09	204.00	49	1612	0.37	0.050	0.02	8.77	0.01	0.000
13.93	2.33	95.37	2.04	194.83	46	1556	0.37	0.054	0.02	8.77	0.01	0.000
14.01	2.35	95.44	2.14	203.80	49	1614	0.37	0.050	0.02	8.77	0.01	0.000
14.05	2.36	97.33	2.15	209.63	51	1659	0.37	0.048	0.02	8.77	0.01	0.000
14.12	2.39	94.56	2.29	216.64	53	1690	0.37	0.046	0.01	8.77	0.01	0.000
14.18	2.38	100.65	2.23	224.58	55	1771	0.37	0.043	0.01	8.77	0.01	0.000
14.24	2.37	106.58	2.18	232.35	56	1852	0.37	0.040	0.01	8.77	0.01	0.000
14.32	2.34	114.77	2.08	238.65	57	1936	0.37	0.037	0.01	8.77	0.01	0.000
14.39	2.37	110.57	2.20	242.94	59	1948	0.37	0.037	0.01	8.77	0.01	0.000
14.46	2.42	102.55	2.38	244.33	61	1919	0.37	0.038	0.01	8.77	0.01	0.000
14.53	2.46	94.35	2.58	243.88	62	1875	0.37	0.040	0.01	8.77	0.01	0.000
14.58	2.50	86.88	2.78	241.40	62	1817	0.37	0.042	0.01	8.77	0.01	0.000
14.65	2.53	80.97	2.91	235.32	61	1752	0.37	0.046	0.01	8.77	0.01	0.000
14.72	2.53	76.52	2.95	225.39	59	1678	0.37	0.050	0.01	8.77	0.01	0.000
14.79	2.53	74.34	2.90	215.74	56	1621	0.37	0.054	0.02	8.77	0.01	0.000
14.83	2.51	74.79	2.80	209.63	54	1596	0.37	0.056	0.02	8.77	0.01	0.000
14.91	2.49	77.00	2.71	208.79	54	1613	0.37	0.055	0.02	8.77	0.01	0.000
14.98	2.47	80.05	2.63	210.41	53	1649	0.37	0.053	0.02	8.77	0.01	0.000
15.06	2.46	82.41	2.59	213.59	54	1688	0.37	0.051	0.02	8.77	0.01	0.000
15.10	2.46	84.52	2.58	217.67	55	1727	0.37	0.049	0.01	8.77	0.01	0.000
15.17	2.42	91.66	2.42	221.50	55	1799	0.37	0.045	0.01	8.77	0.01	0.000
15.24	2.35	106.28	2.13	226.82	55	1917	0.37	0.041	0.01	8.77	0.01	0.000
15.31	2.28	124.97	1.88	235.03	55	2058	0.37	0.036	0.01	8.77	0.01	0.000
15.39	2.23	138.77	1.75	243.44	56	2171	0.37	0.033	0.01	8.77	0.01	0.000
15.42	2.22	146.21	1.72	251.55	57	2255	0.37	0.032	0.01	8.77	0.01	0.000
15.50	2.23	148.68	1.74	258.86	59	2324	0.37	0.030	0.01	8.77	0.00	0.000
15.57	2.25	149.23	1.79	267.49	62	2397	0.37	0.029	0.01	8.77	0.00	0.000
15.64	2.25	152.42	1.80	274.71	63	2468	0.37	0.028	0.01	8.77	0.00	0.000
15.72	2.25	156.35	1.79	279.08	64	2521	0.37	0.027	0.01	8.77	0.00	0.000
15.76	2.23	162.57	1.73	281.88	64	2564	0.37	0.027	0.01	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.83	2.22	164.74	1.72	283.52	65	2592	0.37	0.026	0.01	8.77	0.00	0.000
15.90	2.22	165.45	1.72	285.08	65	2614	0.37	0.026	0.01	8.77	0.00	0.000
15.97	2.23	163.41	1.75	285.37	65	2620	0.37	0.026	0.01	8.77	0.00	0.000
16.01	2.26	155.02	1.82	282.79	65	2580	0.37	0.027	0.01	8.77	0.00	0.000
16.10	2.31	139.29	2.00	278.28	66	2498	0.37	0.028	0.01	8.77	0.00	0.000
16.17	2.37	124.82	2.20	274.13	67	2411	0.37	0.030	0.01	8.77	0.00	0.000
16.24	2.40	116.89	2.33	272.08	67	2363	0.37	0.031	0.01	8.77	0.00	0.000
16.28	2.41	116.02	2.34	271.38	67	2358	0.37	0.031	0.01	8.77	0.00	0.000
16.36	2.38	121.59	2.22	270.50	66	2392	0.37	0.031	0.01	8.77	0.00	0.000
16.43	2.32	132.80	2.02	268.62	64	2443	0.37	0.030	0.01	8.77	0.00	0.000
16.50	2.26	146.63	1.82	266.75	62	2491	0.37	0.029	0.01	8.77	0.00	0.000
16.54	2.21	158.20	1.68	265.76	60	2519	0.37	0.029	0.01	8.77	0.00	0.000
16.61	2.18	162.83	1.63	265.29	59	2532	0.37	0.029	0.01	8.77	0.00	0.000
16.69	2.20	159.04	1.66	263.95	59	2522	0.37	0.029	0.01	8.77	0.00	0.000
16.76	2.24	147.50	1.78	262.28	60	2488	0.37	0.030	0.01	8.77	0.00	0.000
16.80	2.31	131.89	1.97	259.72	61	2418	0.37	0.032	0.01	8.77	0.00	0.000
16.87	2.35	119.82	2.11	252.75	61	2323	0.37	0.034	0.01	8.77	0.00	0.000
16.94	2.38	106.20	2.23	237.11	58	2155	0.37	0.038	0.01	8.77	0.01	0.000
17.02	2.39	92.52	2.27	210.48	52	1911	0.37	0.048	0.02	8.77	0.01	0.000
17.09	2.39	79.38	2.29	181.90	45	1654	0.37	0.064	0.02	8.77	0.01	0.000
17.13	2.42	69.53	2.39	165.97	41	1495	0.37	0.081	0.03	8.77	0.02	0.000
17.21	2.46	63.59	2.55	162.32	41	1440	0.37	0.089	0.04	8.77	0.02	0.000
17.28	2.50	59.09	2.75	162.77	42	1418	0.37	0.093	0.04	8.77	0.02	0.000
17.36	2.50	56.94	2.78	158.02	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.40	2.50	56.08	2.75	154.49	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.48	2.46	59.27	2.59	153.75	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.55	2.43	64.09	2.45	156.76	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.62	2.39	70.39	2.29	161.22	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.65	2.38	75.22	2.22	167.23	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.73	2.36	79.82	2.16	172.59	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.80	2.35	85.16	2.13	181.12	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.88	2.34	90.91	2.08	189.29	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.92	2.28	105.12	1.89	198.32	0	0	0.37	0.000	0.00	0.00	0.00	0.000
17.99	2.18	128.72	1.63	209.53	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.06	2.09	159.64	1.44	229.62	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.14	2.04	184.42	1.36	250.96	0	0	0.37	0.000	0.00	0.00	0.00	0.000
18.21	2.03	198.63	1.34	266.65	56	2693	0.37	0.030	0.01	8.77	0.00	0.000
18.25	2.05	201.56	1.37	276.46	59	2807	0.37	0.028	0.01	8.77	0.00	0.000
18.32	2.10	190.44	1.46	278.53	60	2855	0.37	0.027	0.01	8.77	0.00	0.000
18.40	2.20	165.45	1.66	274.89	62	2815	0.38	0.028	0.01	8.77	0.00	0.000
18.47	2.31	137.06	1.97	269.47	64	2696	0.38	0.030	0.01	8.77	0.00	0.000
18.51	2.41	111.01	2.36	262.06	65	2517	0.38	0.033	0.01	8.77	0.00	0.000
18.59	2.47	95.64	2.61	249.56	63	2343	0.38	0.038	0.01	8.77	0.01	0.000
18.67	2.50	84.64	2.77	234.36	60	2172	0.38	0.043	0.01	8.77	0.01	0.000
18.70	2.48	80.31	2.69	215.92	55	2021	0.38	0.049	0.01	8.77	0.01	0.000
18.78	2.46	77.43	2.58	199.85	51	1897	0.38	0.055	0.02	8.77	0.01	0.000
18.85	2.44	74.82	2.47	184.49	46	1778	0.38	0.063	0.02	8.77	0.01	0.000
18.92	2.42	73.07	2.39	174.50	43	1701	0.38	0.070	0.03	8.77	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
19.00	2.41	71.58	2.37	169.50	42	1661	0.38	0.074	0.03	8.77	0.02	0.000
19.03	2.41	71.06	2.36	167.53	41	1646	0.38	0.076	0.03	8.77	0.02	0.000
19.10	2.41	71.03	2.35	167.17	41	1647	0.38	0.076	0.03	8.77	0.02	0.000
19.18	2.41	71.04	2.36	167.37	41	1654	0.38	0.076	0.03	8.77	0.02	0.000
19.25	2.42	70.78	2.38	168.22	42	1664	0.38	0.075	0.03	8.77	0.02	0.000
19.32	2.42	70.53	2.40	169.07	42	1673	0.38	0.075	0.03	8.77	0.02	0.000
19.36	2.42	70.27	2.42	169.80	42	1680	0.38	0.074	0.03	8.77	0.02	0.000
19.43	2.43	70.10	2.42	169.62	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.51	2.42	70.14	2.41	168.70	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.58	2.41	70.77	2.36	167.32	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.66	2.40	71.56	2.32	166.15	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.69	2.39	72.58	2.28	165.45	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.77	2.39	73.05	2.26	164.79	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.85	2.38	73.09	2.25	164.21	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.89	2.39	72.66	2.26	163.94	0	0	0.38	0.000	0.00	0.00	0.00	0.000
19.96	2.39	71.99	2.27	163.71	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.03	2.40	71.27	2.29	163.53	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.08	2.40	70.62	2.31	163.45	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.15	2.41	69.96	2.33	163.23	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.23	2.41	69.24	2.35	162.50	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.30	2.41	68.58	2.35	161.44	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.34	2.41	67.54	2.37	160.12	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.42	2.42	66.09	2.41	158.94	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.49	2.43	64.39	2.45	157.89	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.57	2.44	63.09	2.49	157.16	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.61	2.45	62.17	2.52	156.48	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.68	2.45	61.11	2.54	155.43	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.75	2.46	59.60	2.59	154.11	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.83	2.47	57.85	2.64	152.88	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.90	2.49	56.35	2.70	151.92	0	0	0.38	0.000	0.00	0.00	0.00	0.000
20.94	2.49	55.19	2.74	151.08	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.01	2.50	54.52	2.75	150.13	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.09	2.50	53.95	2.77	149.50	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.16	2.50	53.65	2.78	149.38	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.20	2.51	53.35	2.81	149.92	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.27	2.51	53.21	2.84	151.05	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.34	2.52	53.58	2.87	153.80	0	0	0.38	0.000	0.00	0.00	0.00	0.000
21.42	2.51	55.25	2.83	156.53	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.49	2.49	57.93	2.73	158.26	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.53	2.44	63.98	2.49	159.50	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.60	2.39	72.73	2.28	166.03	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.68	2.35	83.05	2.13	176.70	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.75	2.34	90.48	2.08	187.92	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.79	2.34	95.23	2.08	198.22	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.86	2.34	98.77	2.09	206.44	0	0	0.39	0.000	0.00	0.00	0.00	0.000
21.94	2.36	100.13	2.14	214.26	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.01	2.40	95.11	2.30	218.43	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.08	2.46	85.64	2.58	220.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	2.54	72.76	3.01	218.71	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.20	2.60	63.51	3.34	212.01	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.27	2.65	55.77	3.62	201.84	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.35	2.65	52.37	3.68	192.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.38	2.66	49.32	3.73	184.05	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.46	2.66	47.36	3.73	176.53	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.53	2.65	45.95	3.68	169.05	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.60	2.64	45.76	3.59	164.45	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.64	2.63	46.07	3.53	162.45	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.72	2.62	46.51	3.46	161.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.79	2.62	46.67	3.46	161.43	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.86	2.63	46.18	3.50	161.61	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.94	2.64	45.33	3.59	162.85	0	0	0.39	0.000	0.00	0.00	0.00	0.000
22.98	2.65	44.98	3.64	163.86	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.05	2.64	46.50	3.57	165.93	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.12	2.61	49.19	3.41	167.80	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.20	2.59	51.60	3.26	168.20	45	1792	0.39	0.084	0.03	8.77	0.01	0.000
23.24	2.59	51.39	3.26	167.46	45	1787	0.39	0.084	0.03	8.77	0.02	0.000
23.31	2.61	49.53	3.36	166.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.38	2.63	47.24	3.52	166.35	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.46	2.65	45.68	3.65	166.86	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.49	2.68	43.88	3.83	167.90	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.57	2.69	42.52	3.96	168.32	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.64	2.66	44.91	3.72	166.94	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.72	2.60	49.38	3.34	164.75	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.76	2.58	51.05	3.19	162.93	44	1780	0.39	0.088	0.03	8.77	0.02	0.000
23.83	2.62	46.78	3.47	162.16	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.91	2.69	40.69	3.96	161.12	0	0	0.39	0.000	0.00	0.00	0.00	0.000
23.98	2.74	37.30	4.26	159.04	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.02	2.74	36.26	4.28	155.30	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.09	2.72	36.05	4.17	150.48	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.17	2.71	35.84	4.07	145.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.24	2.70	35.94	4.01	144.00	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.28	2.69	37.42	3.89	145.64	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.35	2.65	40.85	3.66	149.71	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.43	2.63	44.01	3.50	153.92	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.50	2.64	44.16	3.56	157.11	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.58	2.67	41.89	3.78	158.22	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.62	2.71	38.66	4.08	157.64	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.69	2.73	36.36	4.25	154.68	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.77	2.74	34.80	4.31	150.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.84	2.73	34.58	4.22	145.84	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.88	2.71	34.89	4.09	142.72	0	0	0.39	0.000	0.00	0.00	0.00	0.000
24.95	2.70	35.25	3.99	140.81	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.02	2.69	35.62	3.91	139.19	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.07	2.68	36.24	3.82	138.52	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.14	2.68	36.85	3.84	141.40	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.21	2.68	38.86	3.82	148.45	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.29	2.66	42.22	3.69	155.95	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.37	2.63	45.85	3.51	160.99	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.40	2.60	49.46	3.32	164.42	0	0	0.39	0.000	0.00	0.00	0.00	0.000
25.48	2.55	55.59	3.06	169.85	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.55	2.47	67.40	2.64	177.68	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.62	2.40	80.66	2.30	185.42	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.66	2.33	93.69	2.05	192.35	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.73	2.31	98.30	1.99	196.05	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.80	2.36	92.04	2.17	199.44	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.86	2.47	77.22	2.61	201.43	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.95	2.58	63.18	3.20	202.22	0	0	0.40	0.000	0.00	0.00	0.00	0.000
25.99	2.64	54.45	3.58	195.19	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.06	2.68	49.55	3.84	190.34	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.14	2.72	45.32	4.16	188.59	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.21	2.76	43.39	4.43	192.30	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.25	2.76	42.99	4.48	192.73	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.32	2.68	48.59	3.87	187.79	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.41	2.54	61.77	2.95	182.41	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.48	2.40	78.46	2.30	180.75	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.51	2.30	97.34	1.95	189.43	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.59	2.25	112.77	1.79	201.86	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.66	2.23	121.47	1.75	212.27	0	0	0.40	0.000	0.00	0.00	0.00	0.000
26.74	2.26	119.09	1.81	215.97	50	2868	0.40	0.042	0.01	8.77	0.01	0.000
26.77	2.32	106.87	2.01	214.92	51	2827	0.40	0.043	0.01	8.77	0.01	0.000
26.85	2.37	97.16	2.21	214.63	52	2791	0.40	0.044	0.01	8.77	0.01	0.000
26.92	2.42	90.82	2.39	217.07	54	2792	0.40	0.044	0.01	8.77	0.01	0.000
26.99	2.44	89.92	2.46	221.47	55	2840	0.40	0.043	0.01	8.77	0.01	0.000
27.07	2.44	90.97	2.49	226.10	57	2902	0.40	0.042	0.01	8.77	0.01	0.000
27.11	2.43	93.94	2.45	230.09	57	2963	0.40	0.040	0.01	8.77	0.00	0.000
27.18	2.42	96.46	2.41	232.78	58	3013	0.40	0.040	0.01	8.77	0.00	0.000
27.25	2.45	93.46	2.52	235.39	59	3030	0.40	0.039	0.01	8.77	0.00	0.000
27.33	2.49	86.22	2.74	236.47	61	3002	0.40	0.040	0.01	8.77	0.00	0.000
27.36	2.57	75.35	3.12	235.25	63	2914	0.40	0.042	0.01	8.77	0.00	0.000
27.44	2.62	67.02	3.44	230.48	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.51	2.65	61.25	3.64	222.92	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.59	2.64	58.91	3.61	212.68	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.66	2.65	56.05	3.63	203.48	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.70	2.69	50.09	3.93	196.63	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.77	2.74	45.04	4.32	194.43	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.85	2.79	41.65	4.67	194.40	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.92	2.79	41.50	4.71	195.35	0	0	0.40	0.000	0.00	0.00	0.00	0.000
27.96	2.70	48.78	3.99	194.81	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.03	2.53	65.53	2.93	191.93	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.10	2.34	92.97	2.08	192.97	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.18	2.20	121.11	1.67	202.34	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.23	2.11	148.36	1.47	218.00	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.28	2.03	175.49	1.35	236.41	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.37	1.98	199.49	1.27	253.20	0	0	0.40	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.43	1.93	218.19	1.22	266.30	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.48	1.91	228.30	1.20	273.23	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.54	1.90	233.10	1.19	276.93	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.61	1.90	231.89	1.19	276.49	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.69	1.92	223.48	1.21	270.51	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.77	1.96	206.29	1.25	258.17	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.84	2.01	186.81	1.31	244.69	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.88	2.08	161.39	1.42	229.64	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.95	2.18	132.66	1.62	215.20	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.03	2.32	99.89	2.02	201.49	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.11	2.45	75.93	2.52	191.49	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.15	2.53	60.84	2.92	177.51	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.23	2.57	51.71	3.12	161.36	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.30	2.60	43.91	3.32	145.98	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.34	2.65	37.52	3.65	136.92	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.42	2.69	33.76	3.91	132.11	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.46	2.70	31.37	4.01	125.70	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.53	2.65	32.24	3.67	118.20	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.61	2.60	33.27	3.33	110.73	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.68	2.56	34.14	3.11	106.03	28	1410	0.40	0.233	0.15	8.77	0.06	0.001
29.76	2.57	33.26	3.14	104.55	28	1390	0.40	0.245	0.16	8.77	0.06	0.001
29.80	2.58	32.64	3.19	103.99	28	1381	0.40	0.250	0.17	8.77	0.07	0.001
29.87	2.57	32.70	3.15	103.01	27	1373	0.40	0.256	0.17	8.77	0.07	0.001
29.95	2.56	33.27	3.06	101.93	27	1369	0.40	0.260	0.18	8.77	0.07	0.001
30.02	2.54	34.02	2.98	101.30	27	1370	0.40	0.260	0.18	8.77	0.07	0.001
30.07	2.53	34.67	2.93	101.61	27	1380	0.40	0.254	0.18	8.77	0.07	0.001
30.14	2.53	34.91	2.93	102.36	27	1393	0.40	0.248	0.17	8.77	0.07	0.001
30.22	2.53	34.98	2.95	103.01	27	1403	0.40	0.243	0.17	8.77	0.06	0.001
30.25	2.54	34.83	2.97	103.28	27	1407	0.40	0.241	0.17	8.77	0.06	0.001
30.33	2.54	34.41	3.00	103.20	27	1405	0.40	0.243	0.17	8.77	0.06	0.001
30.40	2.56	33.59	3.07	103.21	27	1402	0.40	0.246	0.17	8.77	0.06	0.001
30.48	2.58	32.49	3.19	103.65	28	1401	0.40	0.247	0.17	8.77	0.06	0.001
30.55	2.60	31.47	3.31	104.32	28	1404	0.40	0.246	0.16	8.77	0.06	0.001
30.59	2.62	30.50	3.46	105.54	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.66	2.64	29.86	3.58	106.82	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.74	2.66	29.21	3.69	107.91	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.78	2.67	28.86	3.76	108.45	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.85	2.67	28.42	3.82	108.50	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.92	2.68	28.14	3.85	108.37	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.00	2.68	27.98	3.87	108.23	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.07	2.68	28.02	3.86	108.05	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.11	2.67	28.55	3.78	107.84	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.18	2.65	29.56	3.63	107.39	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.26	2.62	31.01	3.44	106.76	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.33	2.59	32.28	3.29	106.26	29	1461	0.40	0.225	0.15	8.77	0.05	0.001
31.37	2.57	33.85	3.14	106.20	28	1474	0.40	0.219	0.14	8.77	0.05	0.000
31.44	2.55	35.51	3.02	107.43	28	1503	0.40	0.207	0.14	8.77	0.05	0.001
31.52	2.54	37.34	2.96	110.39	29	1554	0.40	0.188	0.12	8.77	0.04	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.59	2.53	38.64	2.94	113.64	30	1604	0.40	0.173	0.11	8.77	0.04	0.001
31.63	2.53	39.97	2.91	116.34	30	1647	0.40	0.161	0.10	8.77	0.04	0.000
31.70	2.51	41.48	2.84	117.76	31	1677	0.40	0.153	0.09	8.77	0.03	0.001
31.77	2.51	42.64	2.80	119.49	31	1708	0.40	0.147	0.09	8.77	0.03	0.001
31.85	2.52	42.24	2.88	121.68	32	1735	0.40	0.141	0.08	8.77	0.03	0.001
31.92	2.55	40.88	3.03	123.85	33	1754	0.40	0.138	0.08	8.77	0.03	0.000
31.96	2.57	39.47	3.18	125.38	34	1764	0.40	0.136	0.07	8.77	0.03	0.000
32.03	2.58	38.77	3.23	125.25	34	1760	0.40	0.137	0.07	8.77	0.03	0.000
32.11	2.59	38.15	3.25	123.91	33	1743	0.40	0.141	0.08	8.77	0.03	0.000
32.18	2.59	37.65	3.25	122.27	33	1723	0.40	0.146	0.08	8.77	0.03	0.001
32.22	2.59	37.26	3.25	121.13	33	1709	0.40	0.149	0.08	8.77	0.03	0.000
32.29	2.59	37.01	3.26	120.60	32	1704	0.40	0.151	0.08	8.77	0.03	0.001
32.37	2.59	36.69	3.27	120.14	32	1699	0.40	0.152	0.09	8.77	0.03	0.001
32.44	2.60	36.09	3.33	120.32	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.52	2.61	35.46	3.41	120.92	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.55	2.63	34.89	3.50	122.00	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.63	2.63	34.86	3.52	122.85	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.70	2.64	34.87	3.55	123.76	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.78	2.64	34.88	3.57	124.42	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.81	2.64	34.67	3.61	125.22	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.89	2.65	34.47	3.65	126.00	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.96	2.66	34.33	3.69	126.79	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.04	2.66	34.36	3.70	127.26	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.08	2.66	34.56	3.69	127.60	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.15	2.65	34.77	3.68	127.96	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.22	2.66	34.83	3.69	128.45	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.30	2.66	34.76	3.71	128.82	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.33	2.66	34.81	3.71	129.10	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.41	2.66	35.04	3.69	129.33	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.48	2.65	35.40	3.67	129.98	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.56	2.65	35.64	3.67	130.87	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.63	2.65	35.76	3.68	131.59	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.67	2.66	35.79	3.69	132.16	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.74	2.65	36.54	3.67	134.18	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.82	2.65	37.35	3.68	137.29	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.89	2.66	37.99	3.69	140.37	0	0	0.40	0.000	0.00	0.00	0.00	0.000
33.93	2.66	38.28	3.70	141.50	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.00	2.65	38.60	3.66	141.11	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.09	2.65	38.32	3.67	140.50	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.12	2.68	36.62	3.84	140.48	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.20	2.71	34.47	4.07	140.18	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.27	2.72	33.35	4.14	138.10	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.35	2.71	33.20	4.08	135.37	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.39	2.70	33.50	3.96	132.75	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.46	2.68	34.56	3.82	132.16	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.53	2.67	35.31	3.78	133.56	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.61	2.66	36.60	3.71	135.71	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.68	2.66	37.15	3.70	137.47	0	0	0.40	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.72	2.64	38.09	3.61	137.53	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.79	2.63	38.63	3.54	136.88	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.86	2.65	36.99	3.68	135.94	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.94	2.68	35.32	3.82	134.92	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.98	2.70	33.31	4.01	133.59	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.05	2.70	32.58	4.00	130.18	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.14	2.70	31.82	3.97	126.22	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.18	2.69	30.92	3.95	122.15	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.25	2.70	30.15	3.97	119.70	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.32	2.70	29.42	3.99	117.45	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.40	2.70	28.93	4.01	115.88	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.43	2.70	28.46	4.03	114.76	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.51	2.71	28.13	4.06	114.09	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.58	2.71	27.76	4.09	113.47	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.66	2.72	27.48	4.11	112.95	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.73	2.72	27.14	4.14	112.48	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.77	2.73	26.79	4.19	112.14	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.84	2.73	26.50	4.22	111.90	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.92	2.73	26.23	4.25	111.47	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.99	2.74	26.02	4.26	110.90	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.03	2.73	25.85	4.25	109.92	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.10	2.73	25.62	4.24	108.58	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.18	2.73	25.34	4.21	106.75	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.25	2.73	25.11	4.18	105.09	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.29	2.72	25.03	4.14	103.65	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.36	2.71	25.26	4.06	102.58	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.43	2.70	25.66	3.96	101.69	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.51	2.68	26.18	3.87	101.40	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.58	2.68	26.50	3.83	101.52	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.62	2.67	26.77	3.81	102.07	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.70	2.67	26.93	3.81	102.71	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.77	2.68	27.06	3.83	103.53	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.84	2.68	27.12	3.84	104.24	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.88	2.68	27.18	3.86	104.92	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.95	2.68	27.32	3.86	105.45	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.03	2.68	27.54	3.85	106.04	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.10	2.68	27.89	3.82	106.58	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.18	2.67	28.22	3.79	107.06	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.21	2.67	28.58	3.77	107.63	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.29	2.66	28.89	3.75	108.23	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.37	2.66	29.16	3.73	108.89	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.40	2.66	29.40	3.74	109.93	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.48	2.67	29.50	3.78	111.62	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.55	2.68	29.47	3.86	113.73	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.63	2.69	29.39	3.93	115.52	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.66	2.70	29.23	4.02	117.61	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.74	2.73	28.88	4.20	121.36	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.81	2.75	28.46	4.41	125.63	0	0	0.40	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
37.89	2.77	28.46	4.52	128.74	0	0	0.40	0.000	0.00	0.00	0.00	0.000
37.93	2.74	29.93	4.31	129.07	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.00	2.69	31.98	3.96	126.49	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.07	2.67	32.54	3.80	123.77	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.15	2.69	31.30	3.89	121.78	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.19	2.72	29.36	4.14	121.49	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.27	2.72	28.87	4.15	119.83	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.35	2.73	27.91	4.20	117.10	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.41	2.71	28.22	4.05	114.19	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.48	2.70	28.24	3.99	112.57	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.52	2.68	29.13	3.85	112.13	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.59	2.69	28.71	3.91	112.18	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.66	2.70	28.12	3.99	112.20	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.74	2.71	27.64	4.06	112.27	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.81	2.72	27.32	4.12	112.43	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.88	2.72	27.15	4.15	112.65	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.92	2.73	26.90	4.19	112.70	0	0	0.40	0.000	0.00	0.00	0.00	0.000
38.99	2.73	26.50	4.25	112.54	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.07	2.74	26.00	4.31	112.15	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.15	2.74	25.79	4.33	111.65	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.18	2.74	25.68	4.32	110.86	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.26	2.73	25.86	4.24	109.64	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.33	2.72	25.97	4.16	107.93	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.40	2.71	26.13	4.07	106.33	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.44	2.71	25.88	4.05	104.87	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.51	2.71	25.54	4.05	103.36	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.59	2.70	25.23	4.02	101.54	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.67	2.69	25.27	3.96	100.08	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.70	2.69	25.49	3.90	99.33	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.78	2.68	25.81	3.85	99.39	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.85	2.68	26.08	3.83	99.97	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.93	2.68	26.25	3.84	100.69	0	0	0.40	0.000	0.00	0.00	0.00	0.000
39.96	2.68	26.31	3.85	101.23	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.04	2.68	26.37	3.85	101.42	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.12	2.68	26.26	3.86	101.47	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.16	2.69	25.90	3.91	101.38	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.24	2.70	25.05	4.03	101.00	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.31	2.72	24.05	4.17	100.40	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.38	2.74	23.24	4.28	99.55	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.46	2.75	22.77	4.34	98.76	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.49	2.75	22.59	4.35	98.26	0	0	0.40	0.000	0.00	0.00	0.00	0.000
40.57	2.75	22.45	4.37	98.05	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.64	2.75	22.39	4.37	97.91	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.72	2.75	22.33	4.38	97.81	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.76	2.75	22.27	4.41	98.21	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.83	2.76	22.18	4.48	99.30	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.90	2.78	22.04	4.59	101.25	0	0	0.39	0.000	0.00	0.00	0.00	0.000
40.98	2.79	22.01	4.69	103.19	0	0	0.39	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
41.02	2.79	22.30	4.71	104.98	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.09	2.76	23.68	4.47	105.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.16	2.73	25.24	4.22	106.51	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.23	2.71	26.22	4.06	106.57	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.27	2.74	25.02	4.26	106.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.35	2.77	23.60	4.52	106.66	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.42	2.79	22.45	4.72	105.89	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.50	2.79	22.45	4.66	104.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.54	2.78	22.47	4.58	102.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.61	2.76	22.75	4.48	102.03	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.70	2.75	23.06	4.40	101.58	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.74	2.74	23.47	4.33	101.53	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.81	2.74	23.47	4.31	101.18	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.88	2.74	23.49	4.28	100.56	0	0	0.39	0.000	0.00	0.00	0.00	0.000
41.96	2.74	23.39	4.27	99.84	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.03	2.73	23.45	4.24	99.32	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.07	2.73	23.58	4.21	99.28	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.14	2.72	23.97	4.16	99.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.22	2.71	24.47	4.10	100.26	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.29	2.71	24.96	4.04	100.82	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.33	2.70	25.47	3.97	101.20	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.40	2.69	25.98	3.90	101.36	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.47	2.68	26.52	3.82	101.36	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.54	2.66	27.07	3.73	101.08	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.62	2.65	27.54	3.65	100.65	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.66	2.64	28.00	3.58	100.24	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.73	2.63	28.27	3.54	100.06	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.80	2.63	28.43	3.52	100.15	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.88	2.63	28.48	3.53	100.44	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.91	2.63	28.51	3.54	100.89	0	0	0.39	0.000	0.00	0.00	0.00	0.000
42.99	2.64	28.48	3.56	101.33	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.06	2.64	28.42	3.58	101.85	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.14	2.64	28.33	3.61	102.24	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.21	2.64	28.36	3.61	102.34	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.28	2.64	28.43	3.60	102.24	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.32	2.64	28.61	3.57	102.07	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.39	2.63	28.77	3.54	101.97	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.47	2.63	28.94	3.53	102.09	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.53	2.63	29.05	3.53	102.50	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.57	2.64	28.99	3.57	103.53	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.65	2.65	28.82	3.64	105.04	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.72	2.66	28.63	3.73	106.83	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.80	2.67	28.60	3.78	108.22	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.87	2.67	28.71	3.79	108.92	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.91	2.66	29.13	3.74	109.03	0	0	0.39	0.000	0.00	0.00	0.00	0.000
43.98	2.65	29.97	3.63	108.86	0	0	0.39	0.000	0.00	0.00	0.00	0.000
44.05	2.62	31.47	3.46	108.90	0	0	0.39	0.000	0.00	0.00	0.00	0.000
44.13	2.60	32.95	3.31	109.16	30	1999	0.39	0.133	0.08	8.77	0.02	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
44.16	2.58	34.06	3.22	109.61	29	2015	0.39	0.130	0.08	8.77	0.02	0.000
44.24	2.56	34.77	3.08	107.12	28	1981	0.39	0.136	0.09	8.77	0.02	0.000
44.31	2.54	35.49	2.97	105.33	28	1958	0.39	0.140	0.09	8.77	0.02	0.000
44.38	2.52	36.34	2.87	104.25	27	1947	0.39	0.142	0.10	8.77	0.02	0.000
44.46	2.52	36.88	2.87	106.01	28	1982	0.39	0.136	0.09	8.77	0.02	0.000
44.50	2.53	37.11	2.92	108.27	28	2023	0.39	0.130	0.09	8.77	0.02	0.000
44.57	2.54	37.00	2.99	110.75	29	2067	0.39	0.124	0.08	8.77	0.02	0.000
44.65	2.56	36.59	3.10	113.61	30	2115	0.38	0.117	0.07	8.77	0.01	0.000
44.69	2.56	37.35	3.11	115.99	31	2161	0.38	0.112	0.07	8.77	0.01	0.000
44.76	2.57	37.47	3.15	118.13	32	2200	0.38	0.108	0.06	8.77	0.01	0.000
44.83	2.58	37.38	3.21	120.13	32	2236	0.38	0.104	0.06	8.77	0.01	0.000
44.90	2.60	36.30	3.34	121.22	0	0	0.38	0.000	0.00	0.00	0.00	0.000
44.98	2.61	36.04	3.37	121.40	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.02	2.60	36.51	3.33	121.56	0	0	0.38	0.000	0.00	0.00	0.00	0.000
45.11	2.59	37.06	3.29	121.84	33	2275	0.38	0.101	0.06	8.77	0.01	0.000
45.15	2.59	37.55	3.26	122.27	33	2287	0.38	0.100	0.06	8.77	0.01	0.000
45.22	2.59	37.70	3.25	122.40	33	2293	0.38	0.100	0.05	8.77	0.01	0.000
45.29	2.59	37.74	3.25	122.51	33	2298	0.38	0.099	0.05	8.77	0.01	0.000
45.36	2.58	38.28	3.21	122.81	33	2310	0.38	0.098	0.05	8.77	0.01	0.000
45.44	2.57	39.40	3.14	123.53	33	2332	0.38	0.096	0.05	8.77	0.01	0.000
45.48	2.54	42.30	2.97	125.74	33	2388	0.38	0.092	0.05	8.77	0.01	0.000
45.55	2.50	46.92	2.76	129.70	33	2484	0.38	0.085	0.05	8.77	0.01	0.000
45.62	2.47	51.23	2.62	134.21	34	2586	0.38	0.079	0.04	8.77	0.01	0.000
45.70	2.46	53.37	2.57	137.34	35	2654	0.38	0.076	0.04	8.77	0.01	0.000
45.74	2.48	51.72	2.68	138.45	35	2668	0.38	0.075	0.04	8.77	0.01	0.000
45.81	2.52	47.88	2.90	138.65	36	2656	0.38	0.076	0.04	8.77	0.01	0.000
45.88	2.60	42.05	3.30	138.67	37	2627	0.38	0.077	0.04	8.77	0.01	0.000
45.96	2.67	36.77	3.76	138.29	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.00	2.71	33.57	4.05	136.09	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.07	2.70	32.79	4.02	131.95	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.14	2.67	33.53	3.75	125.88	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.21	2.63	34.27	3.51	120.24	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.29	2.61	34.37	3.40	116.78	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.36	2.62	33.47	3.44	115.22	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.40	2.68	31.13	3.83	119.23	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.48	2.77	28.14	4.56	128.44	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.55	2.87	25.66	5.43	139.22	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.59	2.72	36.94	4.17	154.03	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.66	2.44	68.43	2.48	169.41	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.72	2.25	105.94	1.81	191.94	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.79	2.21	122.15	1.69	206.50	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.87	2.28	109.58	1.89	206.85	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.93	2.42	84.01	2.40	201.51	0	0	0.38	0.000	0.00	0.00	0.00	0.000
46.99	2.57	62.47	3.15	196.98	0	0	0.38	0.000	0.00	0.00	0.00	0.000
47.05	2.72	45.21	4.16	188.14	0	0	0.38	0.000	0.00	0.00	0.00	0.000
47.13	2.78	37.33	4.65	173.61	0	0	0.38	0.000	0.00	0.00	0.00	0.000
47.21	2.79	33.76	4.68	158.16	0	0	0.38	0.000	0.00	0.00	0.00	0.000
47.28	2.73	34.89	4.20	146.56	0	0	0.38	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
47.32	2.66	37.88	3.69	139.64	0	0	0.38	0.000	0.00	0.00	0.00	0.000
47.39	2.60	41.12	3.30	135.76	37	2647	0.38	0.077	0.04	8.77	0.01	0.000
47.47	2.57	42.51	3.13	133.04	35	2610	0.38	0.079	0.04	8.77	0.01	0.000
47.54	2.59	41.30	3.24	133.87	36	2621	0.38	0.079	0.04	8.77	0.01	0.000
47.58	2.59	41.95	3.29	138.09	37	2702	0.38	0.075	0.04	8.77	0.01	0.000
47.65	2.53	49.51	2.91	143.98	38	2852	0.38	0.068	0.03	8.77	0.00	0.000
47.72	2.46	58.72	2.55	149.82	38	3003	0.38	0.062	0.03	8.77	0.00	0.000
47.80	2.43	62.37	2.45	153.00	38	3079	0.38	0.060	0.03	8.77	0.00	0.000
47.87	2.48	57.56	2.67	153.94	39	3083	0.38	0.060	0.03	8.77	0.00	0.000
47.91	2.55	50.25	3.04	152.85	40	3031	0.38	0.061	0.03	8.77	0.00	0.000
47.98	2.60	44.66	3.34	148.94	0	0	0.38	0.000	0.00	0.00	0.00	0.000
48.06	2.67	35.69	3.80	135.65	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.10	2.69	33.17	3.92	129.93	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.17	2.72	30.25	4.13	125.08	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.25	2.76	27.08	4.43	120.08	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.32	2.79	24.73	4.71	116.59	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.36	2.80	23.53	4.81	113.11	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.44	2.80	23.08	4.76	109.94	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.51	2.78	22.99	4.64	106.70	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.58	2.77	22.88	4.56	104.26	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.65	2.77	22.66	4.53	102.69	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.69	2.78	21.96	4.62	101.45	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.76	2.79	21.11	4.74	100.03	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.84	2.81	20.24	4.87	98.65	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.92	2.82	19.72	4.95	97.60	0	0	0.37	0.000	0.00	0.00	0.00	0.000
48.95	2.82	19.43	4.98	96.78	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.03	2.82	19.27	4.98	95.89	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.10	2.80	19.74	4.81	94.98	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.16	2.79	20.32	4.66	94.73	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.23	2.78	20.86	4.58	95.63	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.31	2.79	20.81	4.68	97.30	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.38	2.80	20.73	4.77	98.81	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.42	2.79	20.98	4.74	99.40	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.49	2.76	22.18	4.48	99.38	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.57	2.70	24.46	4.03	98.49	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.64	2.65	26.78	3.63	97.24	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.67	2.61	28.46	3.36	95.72	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.75	2.60	28.78	3.30	95.02	26	2248	0.37	0.107	0.08	8.77	0.01	0.000
49.83	2.60	28.38	3.35	95.04	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.90	2.63	27.25	3.52	96.03	0	0	0.37	0.000	0.00	0.00	0.00	0.000
49.97	2.66	26.19	3.71	97.21	0	0	0.37	0.000	0.00	0.00	0.00	0.000
50.01	2.68	25.38	3.87	98.30	0	0	0.37	0.000	0.00	0.00	0.00	0.000
50.10	2.69	25.00	3.95	98.78	0	0	0.37	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)

Total estimated settlement: 0.05

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

GeoTek, Inc.
1548 N. Maple Street
Corona, CA 92880
http://www.geotekusa.com

LIQUEFACTION ANALYSIS REPORT

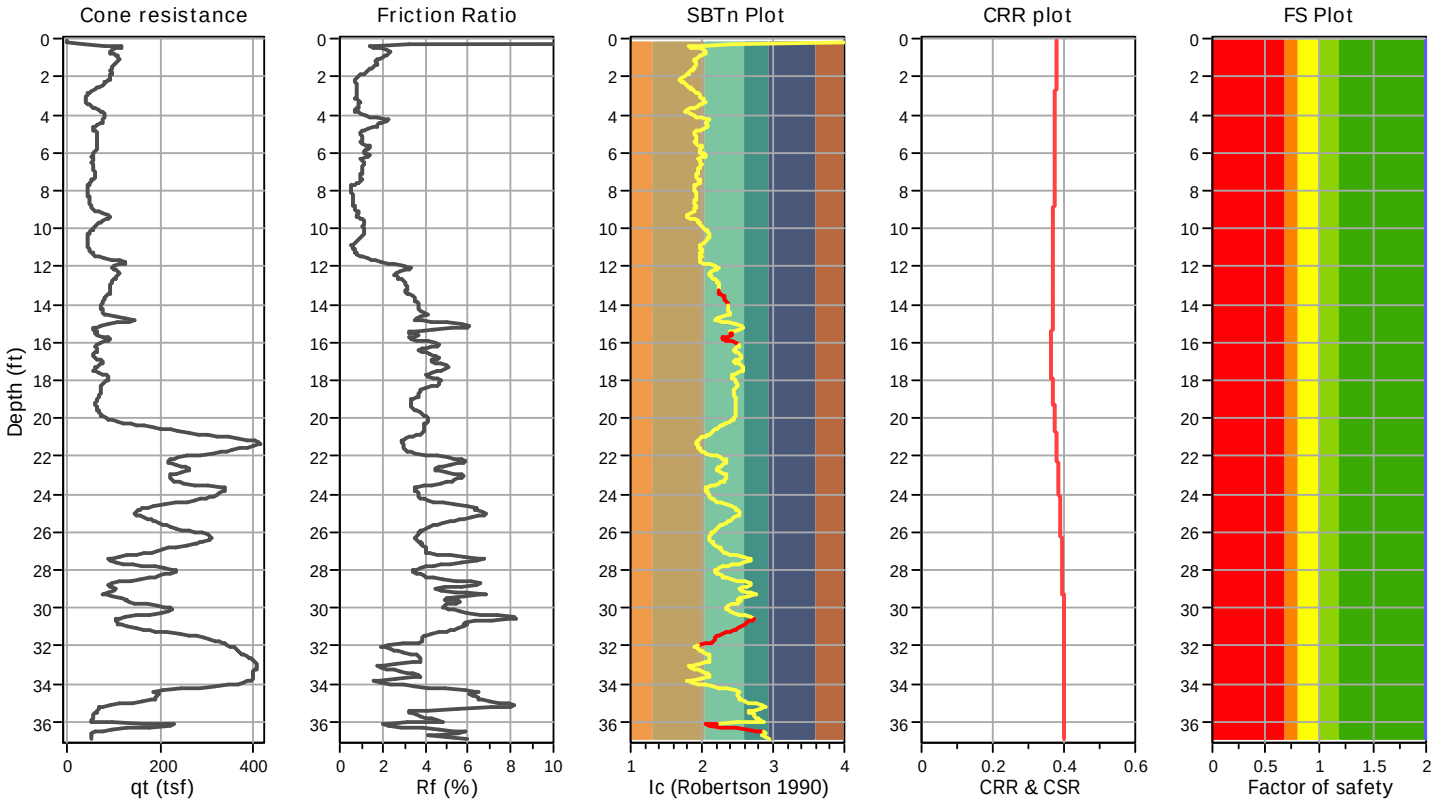
Project title : APN 287-241-04, -05, &-06

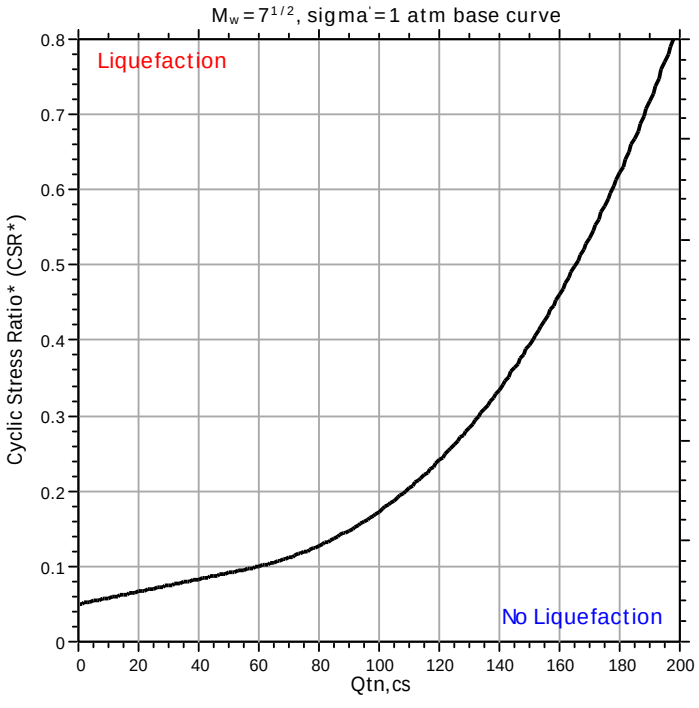
Location : Fullerton, CA

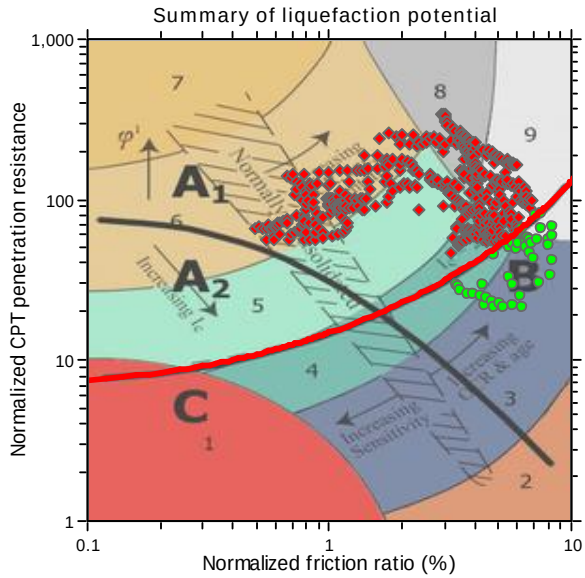
CPT file : CPT-3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	80.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	80.00 ft	Fill height:	N/A		
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	Yes
Earthquake magnitude M_w:	6.72	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	20.00 ft
Peak ground acceleration:	0.77	Unit weight calculation:	Based on SBT	K_σ applied:	Yes	MSF method:	Method based







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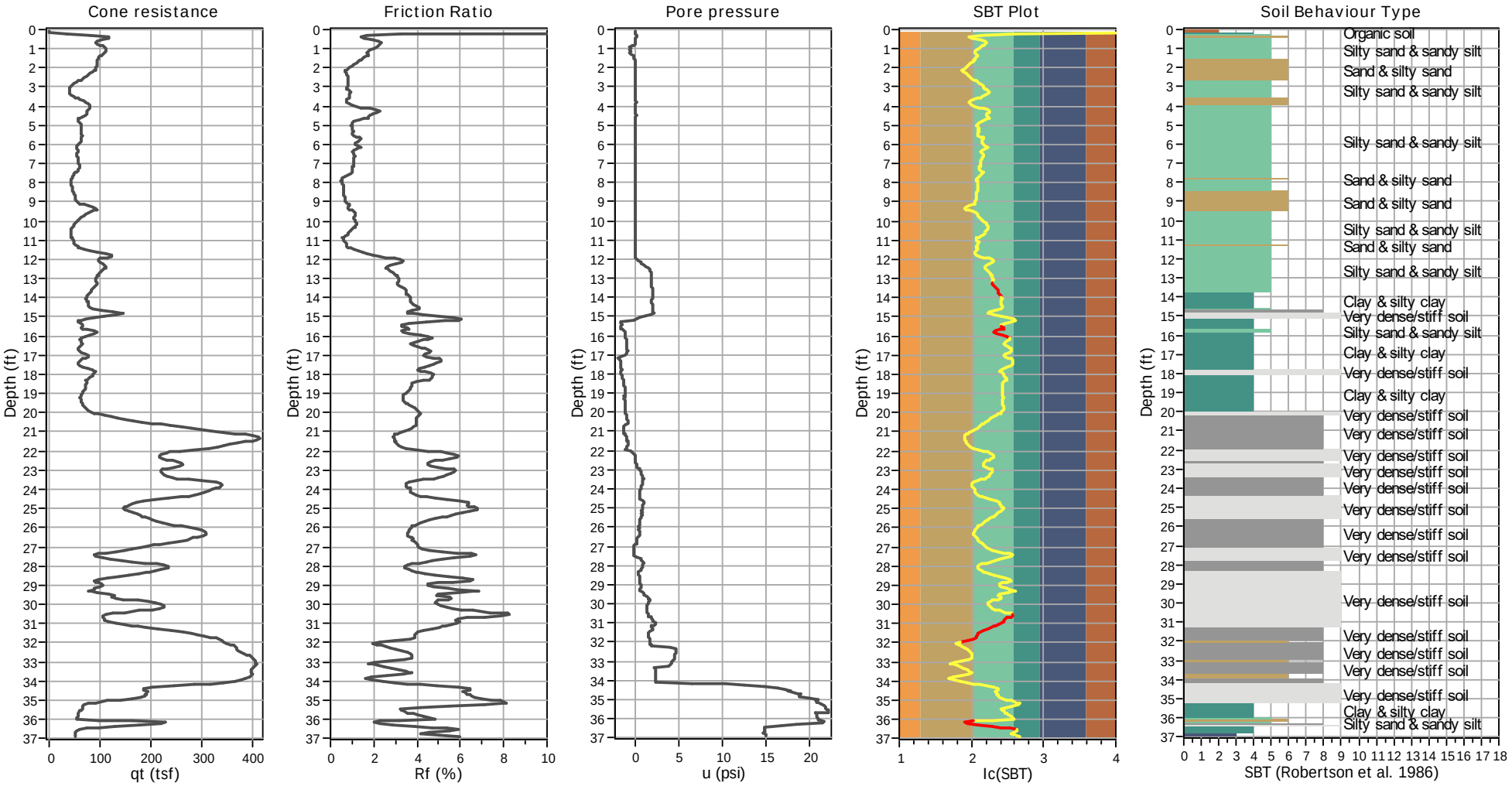
CPT basic interpretation plots



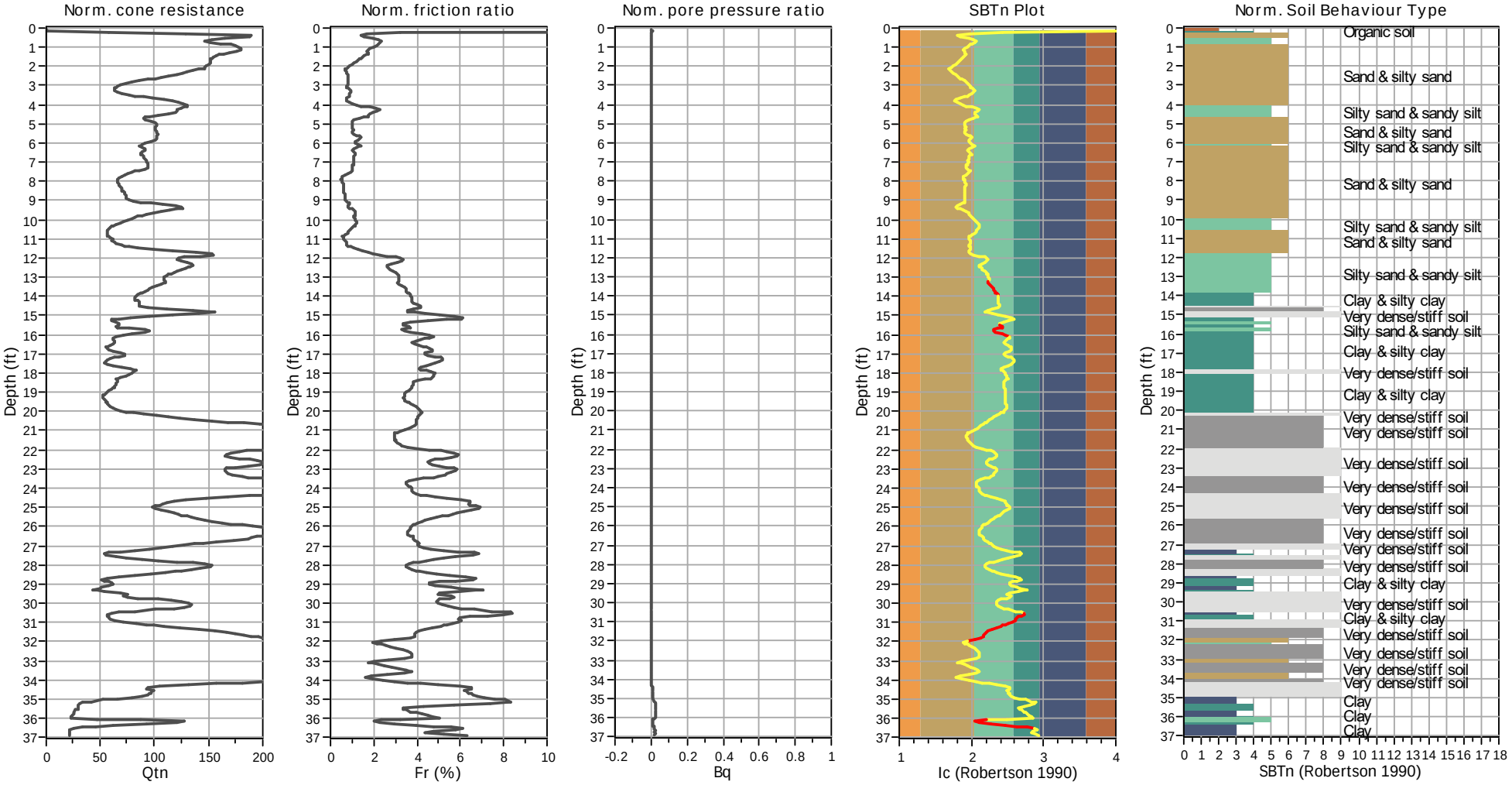
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	20.00 ft

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

CPT basic interpretation plots (normalized)



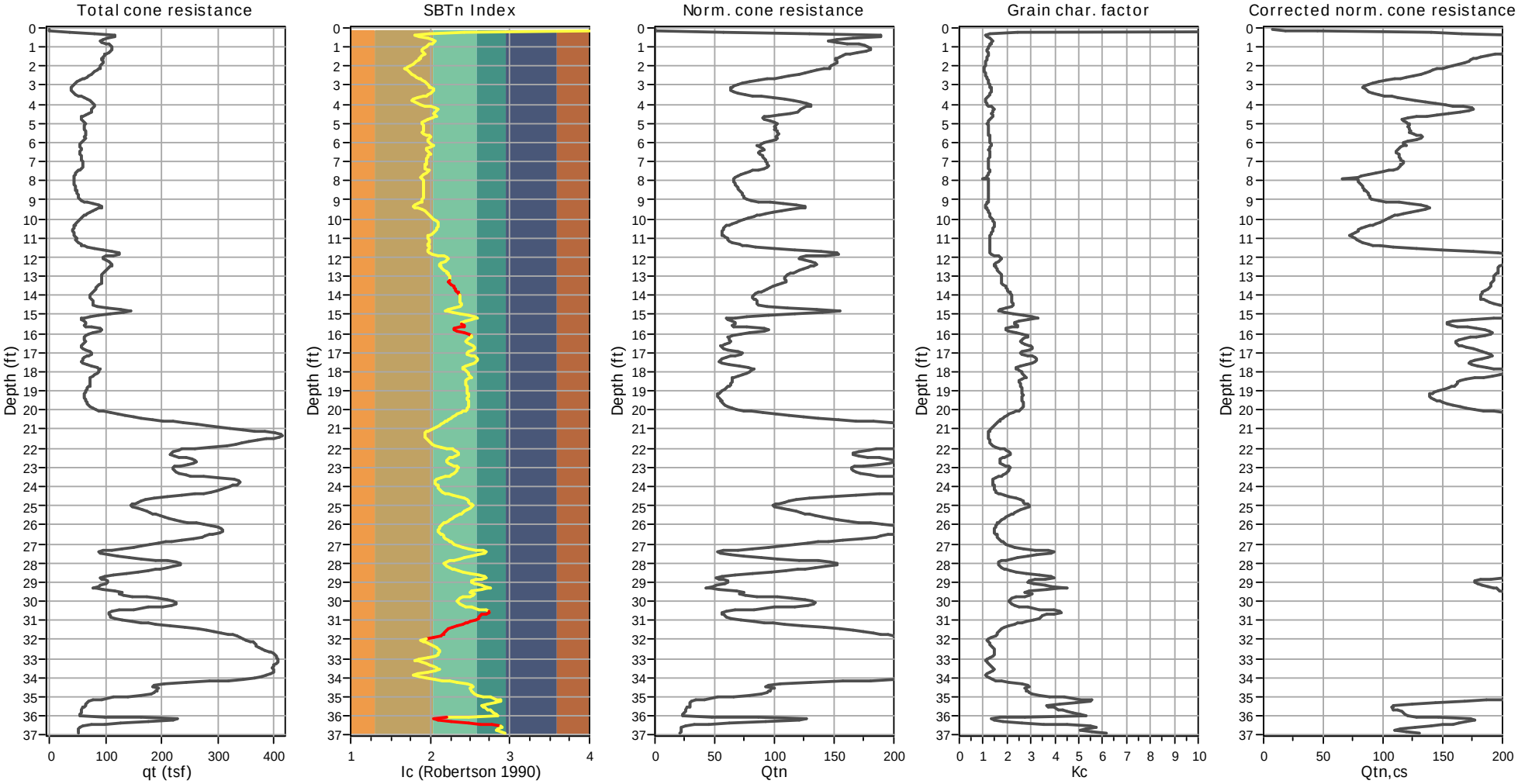
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	20.00 ft

SBTn legend

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

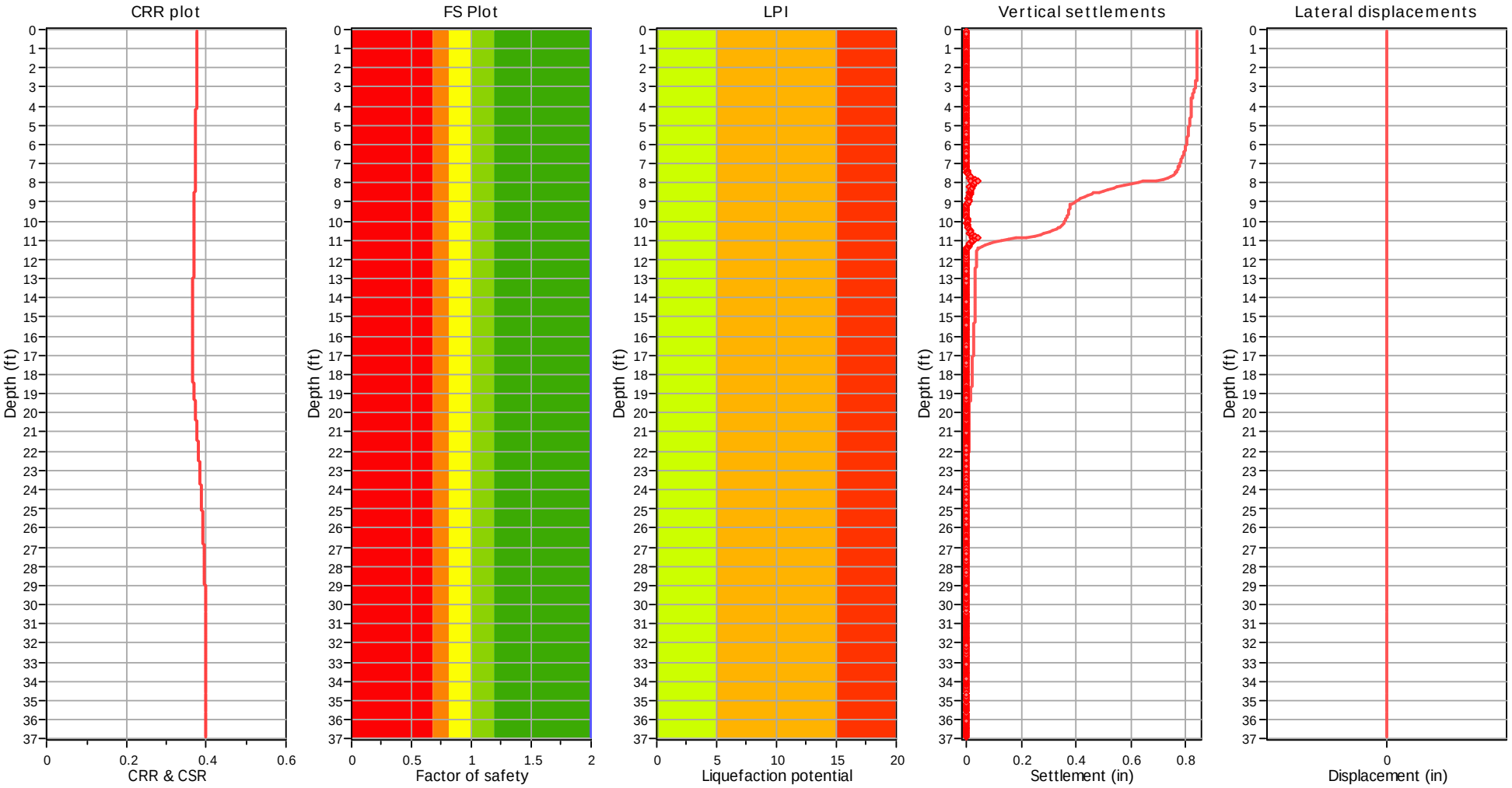
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	20.00 ft

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	80.00 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:	6.72	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.77	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	80.00 ft	Fill height:	N/A	Limit depth:	20.00 ft

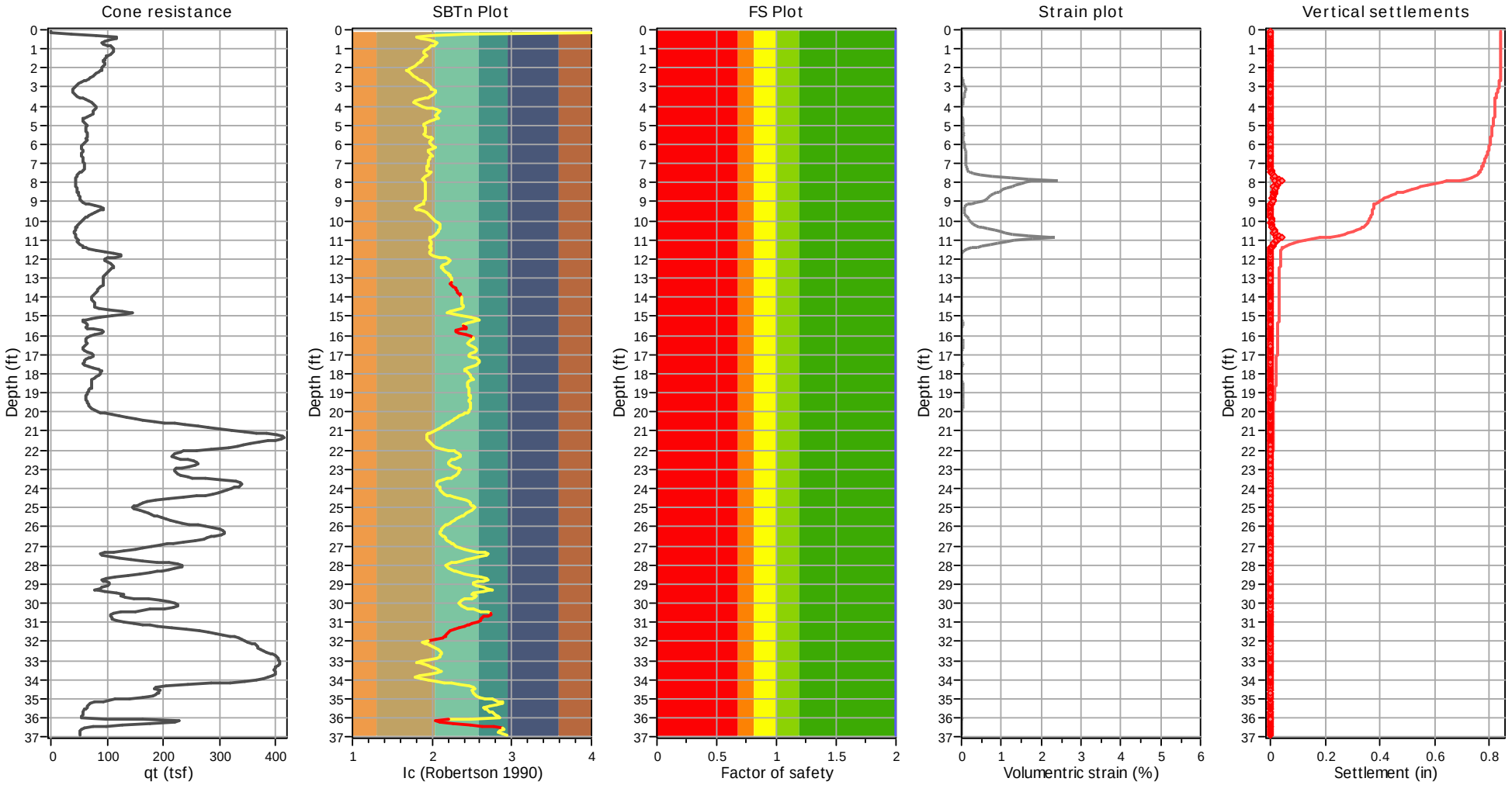
F.S. color scheme

- 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

Estimation of post-earthquake settlements



Abbreviations

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

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
0.09	4.06	0.28	26.61	7.35	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.16	4.06	0.69	26.61	18.32	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.20	4.06	1.70	26.61	45.32	0	0	0.38	0.000	0.00	0.00	0.00	0.000
0.27	2.43	57.58	2.44	140.47	35	700	0.38	0.001	0.00	8.77	0.00	0.000
0.34	1.99	128.86	1.29	165.87	34	897	0.38	0.001	0.00	8.77	0.00	0.000
0.41	1.81	189.10	1.12	210.88	41	1050	0.38	0.001	0.00	8.77	0.00	0.000
0.48	1.85	188.53	1.15	216.40	43	1104	0.38	0.001	0.00	8.77	0.00	0.000
0.53	1.96	165.25	1.26	207.69	43	1115	0.38	0.002	0.00	8.77	0.00	0.000
0.60	2.03	152.51	1.33	203.50	43	1110	0.38	0.002	0.00	8.77	0.00	0.000
0.68	2.06	145.68	1.39	202.14	43	1109	0.38	0.002	0.00	8.77	0.00	0.000
0.75	2.04	151.98	1.36	206.42	44	1129	0.38	0.002	0.00	8.77	0.00	0.000
0.82	2.02	160.49	1.32	212.08	44	1155	0.38	0.002	0.00	8.77	0.00	0.000
0.86	1.99	170.26	1.29	219.43	46	1187	0.38	0.003	0.00	8.77	0.00	0.000
0.93	1.97	175.12	1.27	221.89	46	1194	0.38	0.003	0.00	8.77	0.00	0.000
1.01	1.95	177.80	1.24	220.36	45	1176	0.38	0.003	0.00	8.77	0.00	0.000
1.08	1.92	180.11	1.20	216.76	44	1141	0.38	0.003	0.00	8.77	0.00	0.000
1.12	1.90	180.29	1.18	213.56	43	1114	0.38	0.004	0.00	8.77	0.00	0.000
1.19	1.90	176.34	1.19	209.44	42	1094	0.38	0.004	0.00	8.77	0.00	0.000
1.27	1.92	169.47	1.20	204.11	41	1074	0.38	0.004	0.00	8.77	0.00	0.000
1.35	1.93	163.17	1.22	199.02	40	1054	0.38	0.005	0.00	8.77	0.00	0.000
1.38	1.92	160.01	1.21	194.12	39	1026	0.38	0.005	0.00	8.77	0.00	0.000
1.46	1.90	157.50	1.19	187.89	38	984	0.38	0.006	0.00	8.77	0.00	0.000
1.53	1.88	154.75	1.17	181.75	36	942	0.38	0.007	0.00	8.77	0.00	0.000
1.61	1.88	152.57	1.17	178.00	35	919	0.38	0.007	0.00	8.77	0.00	0.000
1.64	1.87	151.64	1.16	175.93	35	905	0.38	0.008	0.00	8.77	0.00	0.000
1.72	1.85	151.26	1.15	173.54	34	885	0.38	0.008	0.00	8.77	0.00	0.000
1.79	1.83	152.04	1.13	171.36	33	861	0.38	0.009	0.00	8.77	0.00	0.000
1.87	1.80	152.12	1.11	168.68	33	836	0.38	0.010	0.01	8.77	0.00	0.000
1.91	1.78	150.13	1.09	163.73	31	799	0.38	0.011	0.01	8.77	0.01	0.000
1.98	1.75	147.66	1.07	158.60	30	762	0.38	0.013	0.01	8.77	0.01	0.000
2.06	1.72	145.80	1.05	153.22	29	720	0.38	0.015	0.01	8.77	0.01	0.000
2.13	1.69	145.74	1.03	150.16	28	693	0.38	0.017	0.01	8.77	0.01	0.000
2.17	1.68	141.29	1.03	145.15	27	668	0.38	0.019	0.01	8.77	0.01	0.000
2.24	1.70	135.76	1.04	141.33	26	659	0.38	0.021	0.01	8.77	0.01	0.000
2.30	1.73	130.66	1.06	138.43	26	656	0.38	0.022	0.02	8.77	0.01	0.000
2.38	1.75	126.20	1.07	135.52	26	651	0.38	0.023	0.02	8.77	0.01	0.000
2.44	1.78	120.49	1.09	131.39	25	641	0.38	0.025	0.02	8.77	0.01	0.000
2.52	1.81	112.46	1.11	125.17	24	622	0.38	0.028	0.02	8.77	0.02	0.000
2.60	1.83	106.19	1.13	119.98	23	604	0.38	0.032	0.03	8.77	0.02	0.000
2.63	1.85	100.11	1.15	114.78	23	585	0.38	0.036	0.03	8.77	0.02	0.000
2.71	1.87	93.75	1.17	109.22	22	563	0.38	0.042	0.04	8.77	0.03	0.001
2.78	1.90	86.05	1.19	102.40	21	535	0.38	0.051	0.05	8.77	0.04	0.001
2.86	1.93	79.31	1.22	96.41	20	510	0.38	0.063	0.06	8.77	0.05	0.001
2.89	1.96	73.19	1.25	91.24	19	488	0.38	0.075	0.08	8.77	0.06	0.001
2.97	1.97	69.10	1.27	87.52	18	471	0.38	0.090	0.10	8.77	0.08	0.001
3.05	1.98	65.71	1.28	84.14	17	454	0.38	0.110	0.13	8.77	0.10	0.002
3.12	1.99	64.17	1.29	82.52	17	446	0.38	0.125	0.15	8.77	0.11	0.002
3.16	2.01	63.28	1.32	83.39	17	454	0.38	0.119	0.14	8.77	0.10	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
3.23	2.04	62.95	1.35	84.91	18	464	0.38	0.114	0.13	8.77	0.10	0.002
3.31	2.05	63.13	1.37	86.58	18	474	0.38	0.110	0.12	8.77	0.09	0.002
3.35	2.03	65.40	1.34	87.78	18	479	0.38	0.108	0.12	8.77	0.09	0.001
3.43	2.00	69.94	1.30	90.91	19	493	0.38	0.101	0.11	8.77	0.08	0.002
3.50	1.97	76.10	1.26	96.00	20	516	0.38	0.089	0.09	8.77	0.07	0.001
3.58	1.94	82.08	1.23	101.25	21	539	0.38	0.079	0.08	8.77	0.06	0.001
3.62	1.91	89.54	1.19	106.92	21	560	0.38	0.070	0.06	8.77	0.05	0.000
3.69	1.85	98.44	1.14	112.35	22	571	0.38	0.069	0.06	8.77	0.04	0.001
3.76	1.79	108.72	1.10	119.80	23	590	0.38	0.064	0.05	8.77	0.04	0.001
3.84	1.77	116.28	1.09	126.43	24	615	0.38	0.058	0.05	8.77	0.03	0.001
3.87	1.80	122.31	1.10	135.11	26	667	0.38	0.046	0.03	8.77	0.02	0.000
3.95	1.84	126.70	1.13	143.64	28	726	0.38	0.038	0.03	8.77	0.02	0.000
4.02	1.88	129.94	1.17	152.38	30	789	0.38	0.032	0.02	8.77	0.01	0.000
4.10	1.93	130.26	1.22	159.13	32	844	0.38	0.028	0.02	8.77	0.01	0.000
4.14	2.01	127.38	1.31	167.04	35	908	0.38	0.024	0.01	8.77	0.01	0.000
4.21	2.07	124.55	1.40	173.94	37	955	0.37	0.023	0.01	8.77	0.01	0.000
4.29	2.10	121.39	1.45	176.08	38	969	0.37	0.023	0.01	8.77	0.01	0.000
4.36	2.08	120.91	1.43	172.38	37	948	0.37	0.024	0.01	8.77	0.01	0.000
4.40	2.06	119.47	1.38	164.91	35	904	0.37	0.027	0.01	8.77	0.01	0.000
4.47	2.05	113.15	1.37	155.22	33	850	0.37	0.032	0.02	8.77	0.01	0.000
4.55	2.07	103.73	1.40	144.85	31	795	0.37	0.038	0.02	8.77	0.02	0.000
4.62	2.09	95.42	1.43	136.57	29	751	0.37	0.046	0.03	8.77	0.02	0.000
4.66	2.07	91.52	1.40	127.98	27	703	0.37	0.056	0.04	8.77	0.03	0.000
4.74	2.02	90.45	1.33	120.35	25	656	0.37	0.071	0.05	8.77	0.04	0.001
4.81	1.97	91.79	1.26	115.60	24	621	0.37	0.088	0.07	8.77	0.05	0.001
4.89	1.93	96.19	1.22	117.58	24	624	0.37	0.089	0.07	8.77	0.05	0.001
4.93	1.90	100.54	1.19	119.91	24	628	0.37	0.088	0.07	8.77	0.05	0.000
5.00	1.90	102.14	1.19	121.13	24	632	0.37	0.089	0.07	8.77	0.05	0.001
5.05	1.90	102.13	1.19	121.36	24	634	0.37	0.090	0.07	8.77	0.05	0.001
5.12	1.91	101.66	1.20	121.79	24	639	0.37	0.089	0.07	8.77	0.05	0.001
5.20	1.92	100.10	1.21	120.96	24	638	0.37	0.093	0.07	8.77	0.05	0.001
5.27	1.92	101.11	1.20	121.69	25	640	0.37	0.094	0.07	8.77	0.05	0.001
5.35	1.92	100.23	1.21	121.42	25	641	0.37	0.096	0.08	8.77	0.05	0.001
5.39	1.91	102.45	1.20	122.75	25	644	0.37	0.096	0.07	8.77	0.05	0.000
5.46	1.90	101.83	1.19	121.52	24	636	0.37	0.103	0.08	8.77	0.06	0.001
5.53	1.92	103.50	1.21	125.02	25	659	0.37	0.094	0.07	8.77	0.05	0.001
5.61	1.96	102.61	1.25	127.99	26	685	0.37	0.085	0.06	8.77	0.04	0.001
5.65	1.99	102.20	1.29	132.06	27	715	0.37	0.075	0.05	8.77	0.04	0.000
5.73	2.00	101.49	1.30	132.42	28	719	0.37	0.075	0.05	8.77	0.04	0.001
5.80	1.99	102.55	1.28	131.40	27	710	0.37	0.080	0.06	8.77	0.04	0.001
5.87	1.98	100.73	1.27	127.86	26	689	0.37	0.091	0.07	8.77	0.05	0.001
5.91	1.96	96.60	1.25	121.12	25	649	0.37	0.113	0.09	8.77	0.06	0.001
5.99	1.98	91.49	1.28	117.04	24	632	0.37	0.128	0.10	8.77	0.07	0.001
6.06	2.01	88.89	1.32	117.15	25	638	0.37	0.127	0.10	8.77	0.07	0.001
6.14	2.05	87.39	1.37	119.69	25	656	0.37	0.118	0.09	8.77	0.06	0.001
6.18	2.05	85.91	1.37	117.35	25	643	0.37	0.128	0.10	8.77	0.07	0.001
6.25	2.00	88.17	1.31	115.09	24	625	0.37	0.147	0.12	8.77	0.08	0.001
6.33	1.96	90.67	1.25	113.35	23	607	0.37	0.169	0.14	8.77	0.10	0.002

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
6.37	1.94	91.36	1.23	112.51	23	599	0.37	0.181	0.15	8.77	0.11	0.001
6.44	1.97	88.25	1.26	111.22	23	598	0.37	0.188	0.16	8.77	0.11	0.002
6.52	1.99	86.62	1.28	111.12	23	600	0.37	0.188	0.16	8.77	0.11	0.002
6.59	2.00	87.21	1.30	113.20	24	614	0.37	0.177	0.15	8.77	0.10	0.002
6.63	1.99	88.28	1.28	113.40	23	613	0.37	0.180	0.15	8.77	0.10	0.001
6.70	1.97	89.80	1.27	113.68	23	612	0.37	0.186	0.15	8.77	0.11	0.002
6.78	1.97	90.16	1.26	113.46	23	609	0.37	0.194	0.16	8.77	0.11	0.002
6.85	1.96	91.55	1.25	114.17	23	611	0.37	0.196	0.16	8.77	0.11	0.002
6.93	1.96	92.19	1.25	114.91	24	615	0.37	0.196	0.16	8.77	0.11	0.002
6.96	1.96	93.25	1.25	116.55	24	624	0.37	0.186	0.15	8.77	0.10	0.001
7.04	1.95	94.03	1.24	116.86	24	624	0.37	0.190	0.15	8.77	0.11	0.002
7.11	1.94	94.30	1.23	116.32	24	619	0.37	0.202	0.16	8.77	0.11	0.002
7.15	1.93	94.35	1.22	115.16	23	610	0.37	0.217	0.18	8.77	0.12	0.001
7.23	1.93	94.62	1.21	114.92	23	608	0.37	0.227	0.19	8.77	0.13	0.002
7.30	1.93	93.55	1.22	113.98	23	604	0.37	0.239	0.20	8.77	0.14	0.002
7.38	1.94	90.99	1.23	111.88	23	595	0.37	0.261	0.22	8.77	0.15	0.003
7.45	1.97	86.16	1.26	108.43	22	582	0.37	0.294	0.26	8.77	0.18	0.003
7.49	1.98	81.84	1.27	104.33	22	563	0.37	0.350	0.32	8.77	0.22	0.002
7.56	1.97	78.86	1.26	99.47	20	534	0.37	0.462	0.45	8.77	0.31	0.005
7.64	1.94	75.69	1.23	93.34	19	501	0.37	0.669	0.71	8.77	0.49	0.009
7.71	1.92	72.47	1.21	87.56	18	471	0.37	0.968	1.12	8.77	0.77	0.014
7.75	1.89	69.42	1.18	82.12	16	441	0.37	1.455	1.84	8.77	1.26	0.013
7.82	1.89	67.17	1.18	79.05	16	427	0.37	1.858	2.47	8.77	1.68	0.030
7.90	1.89	65.61	1.00	65.61	13	420	0.37	2.124	3.53	8.77	2.40	0.044
7.94	1.90	65.52	1.19	78.17	16	426	0.37	1.942	2.60	8.77	1.77	0.017
8.02	1.91	65.99	1.20	78.94	16	433	0.37	1.806	2.38	8.77	1.62	0.030
8.09	1.91	66.18	1.20	79.63	16	440	0.37	1.686	2.20	8.77	1.49	0.027
8.17	1.92	66.70	1.21	80.48	16	447	0.37	1.563	2.01	8.77	1.36	0.024
8.20	1.92	67.28	1.21	81.21	16	452	0.37	1.472	1.87	8.77	1.26	0.011
8.28	1.91	68.58	1.20	82.40	17	461	0.37	1.346	1.68	8.77	1.14	0.020
8.35	1.91	69.27	1.20	83.29	17	468	0.37	1.246	1.54	8.77	1.04	0.018
8.42	1.91	69.90	1.20	83.99	17	475	0.37	1.179	1.44	8.77	0.97	0.017
8.50	1.91	70.19	1.20	84.21	17	478	0.37	1.157	1.41	8.77	0.95	0.017
8.54	1.91	71.30	1.19	85.16	17	484	0.37	1.086	1.31	8.77	0.88	0.008
8.61	1.91	72.09	1.19	86.08	17	492	0.37	1.015	1.21	8.77	0.81	0.014
8.69	1.91	72.98	1.20	87.25	18	501	0.37	0.933	1.09	8.77	0.73	0.013
8.76	1.91	73.29	1.20	87.92	18	508	0.37	0.886	1.03	8.77	0.69	0.012
8.80	1.91	73.83	1.20	88.59	18	513	0.37	0.846	0.97	8.77	0.65	0.006
8.87	1.91	74.45	1.20	89.12	18	518	0.37	0.818	0.93	8.77	0.62	0.010
8.94	1.90	76.38	1.19	90.83	18	530	0.37	0.740	0.83	8.77	0.55	0.010
9.02	1.90	80.76	1.19	96.08	19	563	0.37	0.547	0.57	8.77	0.38	0.007
9.09	1.90	86.59	1.19	103.01	21	607	0.37	0.386	0.37	8.77	0.25	0.004
9.13	1.88	96.20	1.17	112.92	22	664	0.37	0.259	0.22	8.77	0.15	0.001
9.20	1.84	107.25	1.14	122.31	24	715	0.37	0.195	0.16	8.77	0.10	0.002
9.27	1.80	118.83	1.11	131.73	25	763	0.37	0.154	0.12	8.77	0.08	0.001
9.35	1.78	125.14	1.10	137.09	26	792	0.37	0.137	0.10	8.77	0.07	0.001
9.39	1.80	126.05	1.11	139.46	27	813	0.37	0.127	0.09	8.77	0.06	0.001
9.46	1.84	121.42	1.14	138.42	27	823	0.37	0.124	0.09	8.77	0.06	0.001

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
9.54	1.90	113.76	1.18	134.79	27	817	0.37	0.129	0.09	8.77	0.06	0.001
9.61	1.94	106.00	1.22	129.81	26	797	0.37	0.143	0.10	8.77	0.07	0.001
9.65	1.96	98.68	1.25	123.18	25	760	0.37	0.171	0.13	8.77	0.08	0.001
9.73	1.97	92.88	1.26	117.36	24	729	0.37	0.204	0.16	8.77	0.11	0.002
9.80	1.98	88.17	1.28	112.53	23	703	0.37	0.241	0.20	8.77	0.13	0.002
9.84	1.99	85.20	1.29	109.78	23	688	0.37	0.266	0.23	8.77	0.15	0.001
9.91	2.00	82.45	1.30	107.52	22	677	0.37	0.290	0.25	8.77	0.17	0.003
9.99	2.03	78.53	1.34	104.87	22	664	0.37	0.323	0.29	8.77	0.19	0.003
10.06	2.05	74.71	1.37	102.61	22	652	0.37	0.357	0.32	8.77	0.21	0.004
10.11	2.07	71.01	1.41	100.16	21	636	0.37	0.403	0.37	8.77	0.24	0.003
10.18	2.09	67.88	1.44	97.43	21	621	0.37	0.463	0.44	8.77	0.28	0.005
10.26	2.10	64.72	1.46	94.22	20	602	0.37	0.550	0.54	8.77	0.35	0.006
10.33	2.11	62.31	1.47	91.38	20	586	0.37	0.644	0.65	8.77	0.42	0.007
10.37	2.11	60.32	1.47	88.48	19	568	0.37	0.762	0.80	8.77	0.52	0.005
10.45	2.10	58.71	1.45	85.32	18	552	0.37	0.916	1.01	8.77	0.65	0.012
10.52	2.09	57.45	1.43	82.11	18	534	0.37	1.118	1.30	8.77	0.84	0.015
10.59	2.07	56.80	1.41	79.86	17	523	0.37	1.292	1.56	8.77	1.00	0.018
10.63	2.06	56.59	1.39	78.69	17	517	0.37	1.398	1.73	8.77	1.11	0.011
10.71	2.05	56.32	1.37	77.23	16	510	0.37	1.546	1.96	8.77	1.26	0.022
10.78	2.02	56.16	1.32	74.25	16	493	0.37	1.955	2.64	8.77	1.70	0.031
10.86	1.98	56.13	1.28	71.83	15	478	0.37	2.435	3.48	8.77	2.23	0.041
10.90	1.96	57.08	1.25	71.59	15	476	0.37	2.529	3.66	8.77	2.35	0.023
10.97	1.97	58.94	1.26	74.12	15	495	0.37	2.004	2.78	8.77	1.78	0.030
11.04	1.96	61.47	1.26	77.22	16	518	0.37	1.549	2.05	8.77	1.31	0.024
11.12	1.99	60.78	1.29	78.36	16	529	0.37	1.383	1.77	8.77	1.13	0.020
11.17	1.99	62.74	1.29	80.82	17	547	0.37	1.150	1.42	8.77	0.90	0.012
11.24	1.99	64.80	1.29	83.32	17	566	0.37	0.964	1.15	8.77	0.73	0.012
11.31	1.96	70.19	1.26	88.13	18	599	0.37	0.721	0.81	8.77	0.52	0.008
11.39	1.97	72.68	1.26	91.75	19	627	0.37	0.581	0.62	8.77	0.39	0.007
11.43	1.98	76.79	1.28	98.06	20	673	0.37	0.416	0.41	8.77	0.26	0.002
11.50	1.99	84.58	1.29	108.79	23	750	0.37	0.262	0.23	8.77	0.14	0.002
11.57	1.98	99.60	1.28	127.45	26	882	0.37	0.144	0.10	8.77	0.07	0.001
11.65	1.97	117.42	1.27	148.77	31	1032	0.37	0.089	0.05	8.77	0.03	0.001
11.69	1.97	138.80	1.26	175.23	36	1218	0.37	0.059	0.03	8.77	0.02	0.000
11.76	1.99	152.78	1.28	195.89	41	1370	0.37	0.046	0.02	8.77	0.01	0.000
11.83	2.03	153.70	1.35	206.85	44	1458	0.37	0.041	0.02	8.77	0.01	0.000
11.90	2.10	142.49	1.45	207.00	45	1461	0.37	0.041	0.02	8.77	0.01	0.000
11.95	2.18	126.90	1.62	205.19	46	1426	0.37	0.043	0.02	8.77	0.01	0.000
12.02	2.22	122.16	1.70	208.22	47	1435	0.37	0.043	0.02	8.77	0.01	0.000
12.10	2.23	120.89	1.75	211.82	48	1457	0.37	0.042	0.01	8.77	0.01	0.000
12.17	2.22	125.35	1.70	213.69	48	1488	0.37	0.041	0.01	8.77	0.01	0.000
12.21	2.18	129.89	1.62	210.55	47	1487	0.37	0.041	0.01	8.77	0.01	0.000
12.28	2.14	134.48	1.53	205.48	45	1474	0.37	0.042	0.02	8.77	0.01	0.000
12.36	2.11	135.81	1.48	200.82	44	1454	0.37	0.044	0.02	8.77	0.01	0.000
12.43	2.12	133.51	1.48	198.03	43	1440	0.37	0.045	0.02	8.77	0.01	0.000
12.47	2.13	130.93	1.51	197.26	43	1435	0.37	0.046	0.02	8.77	0.01	0.000
12.55	2.14	128.35	1.53	196.55	43	1433	0.37	0.046	0.02	8.77	0.01	0.000
12.62	2.16	124.91	1.57	196.00	43	1429	0.37	0.047	0.02	8.77	0.01	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
12.69	2.18	121.24	1.62	195.85	44	1427	0.37	0.047	0.02	8.77	0.01	0.000
12.73	2.20	118.06	1.66	196.35	44	1425	0.37	0.048	0.02	8.77	0.01	0.000
12.81	2.21	115.45	1.70	196.28	45	1424	0.37	0.048	0.02	8.77	0.01	0.000
12.88	2.22	112.96	1.73	195.19	44	1416	0.37	0.049	0.02	8.77	0.01	0.000
12.95	2.23	110.89	1.75	193.65	44	1408	0.37	0.050	0.02	8.77	0.01	0.000
13.03	2.24	109.18	1.76	192.37	44	1402	0.37	0.051	0.02	8.77	0.01	0.000
13.07	2.24	108.67	1.77	192.55	44	1404	0.37	0.051	0.02	8.77	0.01	0.000
13.14	2.24	108.87	1.77	192.65	44	1412	0.37	0.051	0.02	8.77	0.01	0.000
13.22	2.24	109.47	1.76	192.39	44	1419	0.37	0.051	0.02	8.77	0.01	0.000
13.29	2.23	109.71	1.75	191.68	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.33	2.23	109.20	1.75	190.99	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.40	2.25	106.50	1.79	190.54	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.48	2.27	102.57	1.85	190.16	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.55	2.29	98.55	1.93	189.89	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.59	2.31	95.83	1.97	189.16	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.66	2.32	93.68	2.00	187.28	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.74	2.32	91.29	2.03	185.04	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.82	2.33	89.10	2.06	183.19	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.85	2.35	86.93	2.10	182.90	0	0	0.37	0.000	0.00	0.00	0.00	0.000
13.93	2.36	84.45	2.16	182.63	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.01	2.37	83.23	2.19	182.10	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.05	2.38	81.79	2.22	181.58	0	0	0.37	0.000	0.00	0.00	0.00	0.000
14.12	2.37	82.26	2.20	181.23	44	1320	0.37	0.067	0.03	8.77	0.02	0.000
14.20	2.37	82.40	2.20	181.67	44	1330	0.37	0.067	0.03	8.77	0.02	0.000
14.24	2.36	84.51	2.17	183.69	44	1354	0.37	0.064	0.02	8.77	0.01	0.000
14.32	2.37	85.38	2.18	186.20	45	1377	0.37	0.062	0.02	8.77	0.01	0.000
14.39	2.37	85.78	2.20	188.67	46	1397	0.37	0.061	0.02	8.77	0.01	0.000
14.46	2.38	85.87	2.24	192.65	47	1424	0.37	0.059	0.02	8.77	0.01	0.000
14.54	2.39	86.40	2.29	197.53	48	1457	0.37	0.056	0.02	8.77	0.01	0.000
14.57	2.37	93.46	2.20	205.19	50	1537	0.37	0.050	0.02	8.77	0.01	0.000
14.65	2.30	111.22	1.93	215.17	51	1680	0.37	0.043	0.01	8.77	0.01	0.000
14.72	2.22	135.08	1.73	233.21	53	1880	0.37	0.035	0.01	8.77	0.01	0.000
14.79	2.19	153.05	1.64	251.38	56	2054	0.37	0.031	0.01	8.77	0.01	0.000
14.83	2.21	155.06	1.70	263.81	60	2146	0.37	0.029	0.01	8.77	0.00	0.000
14.91	2.28	140.65	1.89	265.69	62	2119	0.37	0.029	0.01	8.77	0.00	0.000
14.98	2.38	117.21	2.23	260.91	64	1993	0.37	0.033	0.01	8.77	0.00	0.000
15.06	2.48	95.21	2.66	253.08	65	1834	0.37	0.038	0.01	8.77	0.01	0.000
15.10	2.55	77.41	3.05	236.29	62	1637	0.37	0.047	0.01	8.77	0.01	0.000
15.19	2.59	66.77	3.26	217.96	59	1484	0.37	0.058	0.02	8.77	0.01	0.000
15.23	2.58	60.14	3.21	193.27	52	1326	0.37	0.076	0.02	8.77	0.01	0.000
15.30	2.52	60.82	2.86	174.22	45	1248	0.37	0.089	0.03	8.77	0.02	0.000
15.38	2.44	64.07	2.48	159.14	40	1201	0.37	0.099	0.04	8.77	0.03	0.000
15.46	2.39	67.29	2.29	153.86	38	1197	0.37	0.101	0.05	8.77	0.03	0.000
15.50	2.40	66.86	2.30	153.72	38	1196	0.37	0.102	0.05	8.77	0.03	0.000
15.57	2.43	64.20	2.46	157.63	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.65	2.43	66.21	2.45	162.41	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.68	2.38	76.61	2.23	170.50	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.76	2.30	91.25	1.96	178.41	0	0	0.37	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
15.83	2.30	95.43	1.95	185.78	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.91	2.34	91.07	2.08	189.11	0	0	0.37	0.000	0.00	0.00	0.00	0.000
15.95	2.42	79.61	2.40	191.10	0	0	0.37	0.000	0.00	0.00	0.00	0.000
16.02	2.48	71.57	2.65	189.78	0	0	0.37	0.000	0.00	0.00	0.00	0.000
16.10	2.52	64.54	2.87	185.39	0	0	0.37	0.000	0.00	0.00	0.00	0.000
16.18	2.52	62.10	2.88	178.65	0	0	0.37	0.000	0.00	0.00	0.00	0.000
16.22	2.51	61.20	2.82	172.77	45	1310	0.37	0.087	0.03	8.77	0.02	0.000
16.29	2.49	62.18	2.70	167.81	43	1296	0.37	0.090	0.04	8.77	0.02	0.000
16.37	2.47	62.51	2.62	163.76	42	1282	0.36	0.093	0.04	8.77	0.02	0.000
16.44	2.45	63.67	2.53	161.15	41	1280	0.36	0.095	0.04	8.77	0.02	0.000
16.48	2.47	61.73	2.61	161.26	41	1271	0.36	0.097	0.04	8.77	0.02	0.000
16.56	2.50	58.54	2.77	162.35	42	1261	0.36	0.100	0.04	8.77	0.02	0.000
16.64	2.53	56.15	2.91	163.58	43	1255	0.36	0.102	0.04	8.77	0.02	0.000
16.67	2.54	55.34	2.99	165.73	44	1263	0.36	0.100	0.04	8.77	0.02	0.000
16.75	2.55	55.90	3.04	169.78	45	1293	0.36	0.095	0.04	8.77	0.02	0.000
16.82	2.55	57.49	3.05	175.28	46	1339	0.36	0.088	0.03	8.77	0.02	0.000
16.90	2.53	61.48	2.92	179.52	47	1396	0.36	0.080	0.03	8.77	0.02	0.000
16.93	2.48	69.12	2.65	182.97	47	1470	0.36	0.071	0.03	8.77	0.01	0.000
17.01	2.46	73.01	2.56	186.94	47	1523	0.36	0.066	0.02	8.77	0.01	0.000
17.08	2.47	72.56	2.62	190.27	48	1545	0.36	0.064	0.02	8.77	0.01	0.000
17.16	2.51	67.52	2.84	191.90	50	1526	0.36	0.066	0.02	8.77	0.01	0.000
17.20	2.55	63.00	3.04	191.31	51	1493	0.36	0.070	0.02	8.77	0.01	0.000
17.27	2.57	59.63	3.16	188.29	50	1457	0.36	0.075	0.02	8.77	0.01	0.000
17.35	2.59	56.37	3.25	182.97	49	1409	0.36	0.081	0.03	8.77	0.02	0.000
17.42	2.59	54.58	3.24	176.88	48	1368	0.36	0.088	0.03	8.77	0.02	0.000
17.46	2.58	54.25	3.18	172.66	46	1346	0.36	0.092	0.03	8.77	0.02	0.000
17.53	2.55	56.28	3.06	171.96	45	1363	0.36	0.090	0.03	8.77	0.02	0.000
17.59	2.51	61.97	2.81	173.94	45	1419	0.36	0.082	0.03	8.77	0.02	0.000
17.67	2.45	70.44	2.54	178.86	45	1510	0.36	0.071	0.03	8.77	0.01	0.000
17.74	2.42	78.28	2.38	186.19	46	1608	0.37	0.062	0.02	8.77	0.01	0.000
17.82	2.41	82.05	2.36	193.28	48	1679	0.37	0.057	0.02	8.77	0.01	0.000
17.86	2.43	82.93	2.42	200.65	50	1733	0.37	0.054	0.02	8.77	0.01	0.000
17.93	2.45	80.94	2.53	204.77	52	1753	0.37	0.053	0.02	8.77	0.01	0.000
18.01	2.47	79.15	2.61	206.44	52	1758	0.37	0.053	0.02	8.77	0.01	0.000
18.05	2.47	77.02	2.64	203.27	52	1729	0.37	0.055	0.02	8.77	0.01	0.000
18.13	2.48	73.71	2.69	198.00	51	1681	0.37	0.059	0.02	8.77	0.01	0.000
18.20	2.50	69.07	2.76	190.93	49	1613	0.37	0.065	0.02	8.77	0.01	0.000
18.28	2.51	65.50	2.82	184.39	48	1555	0.37	0.070	0.02	8.77	0.01	0.000
18.31	2.49	64.67	2.73	176.47	45	1505	0.37	0.076	0.03	8.77	0.02	0.000
18.39	2.47	65.15	2.60	169.70	43	1472	0.37	0.081	0.03	8.77	0.02	0.000
18.46	2.45	65.20	2.52	164.44	41	1445	0.37	0.085	0.04	8.77	0.02	0.000
18.54	2.45	64.52	2.52	162.59	41	1434	0.37	0.087	0.04	8.77	0.02	0.000
18.58	2.45	64.01	2.53	162.08	41	1430	0.37	0.088	0.04	8.77	0.02	0.000
18.66	2.45	63.41	2.54	160.96	41	1425	0.37	0.090	0.04	8.77	0.02	0.000
18.73	2.45	62.60	2.55	159.53	40	1415	0.37	0.092	0.04	8.77	0.02	0.000
18.77	2.46	61.51	2.56	157.72	40	1399	0.37	0.095	0.04	8.77	0.02	0.000
18.85	2.46	59.83	2.59	155.14	39	1376	0.37	0.100	0.04	8.77	0.02	0.000
18.92	2.47	58.06	2.60	150.86	38	1342	0.37	0.107	0.05	8.77	0.03	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
18.99	2.46	56.50	2.59	146.59	37	1309	0.37	0.115	0.05	8.77	0.03	0.001
19.03	2.46	55.14	2.59	142.99	36	1279	0.37	0.124	0.06	8.77	0.03	0.000
19.11	2.47	53.85	2.62	140.90	36	1261	0.37	0.130	0.06	8.77	0.03	0.001
19.18	2.47	52.83	2.64	139.43	35	1249	0.37	0.134	0.07	8.77	0.04	0.001
19.25	2.48	52.33	2.65	138.87	35	1246	0.37	0.136	0.07	8.77	0.04	0.001
19.29	2.47	52.82	2.63	139.15	35	1254	0.37	0.134	0.07	8.77	0.04	0.000
19.37	2.47	53.50	2.62	140.34	36	1270	0.37	0.130	0.07	8.77	0.03	0.001
19.44	2.47	54.41	2.62	142.60	36	1295	0.37	0.124	0.06	8.77	0.03	0.001
19.52	2.47	55.05	2.63	145.00	37	1319	0.37	0.119	0.06	8.77	0.03	0.001
19.56	2.48	55.76	2.65	147.65	38	1344	0.37	0.113	0.05	8.77	0.03	0.000
19.63	2.48	56.38	2.66	150.09	38	1368	0.37	0.108	0.05	8.77	0.03	0.000
19.70	2.48	57.22	2.69	153.99	39	1404	0.37	0.102	0.05	8.77	0.02	0.000
19.78	2.49	58.97	2.70	159.09	41	1454	0.37	0.094	0.04	8.77	0.02	0.000
19.85	2.48	61.13	2.69	164.35	42	1509	0.37	0.086	0.04	8.77	0.02	0.000
19.89	2.47	64.57	2.63	170.02	43	1572	0.37	0.079	0.03	8.77	0.02	0.000
19.96	2.46	68.87	2.56	176.46	45	1649	0.37	0.071	0.03	8.77	0.01	0.000
20.04	2.44	73.84	2.49	183.65	46	1736	0.37	0.064	0.02	8.77	0.01	0.000
20.08	2.42	80.80	2.38	192.31	48	1842	0.37	0.057	0.02	8.77	0.01	0.000
20.16	2.38	89.76	2.24	201.48	49	1965	0.37	0.051	0.02	8.77	0.01	0.000
20.23	2.34	101.77	2.09	212.93	51	2118	0.37	0.044	0.01	8.77	0.01	0.000
20.31	2.31	112.53	1.98	223.27	53	2253	0.37	0.040	0.01	8.77	0.01	0.000
20.34	2.28	124.02	1.90	235.22	55	2397	0.37	0.036	0.01	8.77	0.01	0.000
20.42	2.26	136.81	1.82	248.57	57	2560	0.38	0.033	0.01	8.77	0.00	0.000
20.49	2.23	153.25	1.74	266.09	61	2766	0.38	0.029	0.01	8.77	0.00	0.000
20.57	2.20	167.72	1.68	281.51	64	2947	0.38	0.027	0.01	8.77	0.00	0.000
20.61	2.18	182.91	1.63	297.59	67	3128	0.38	0.025	0.01	8.77	0.00	0.000
20.68	2.16	197.75	1.58	312.65	69	3301	0.38	0.023	0.01	8.77	0.00	0.000
20.75	2.13	216.87	1.52	329.82	72	3494	0.38	0.022	0.00	8.77	0.00	0.000
20.83	2.11	232.91	1.47	342.89	75	3639	0.38	0.021	0.00	8.77	0.00	0.000
20.87	2.08	249.45	1.42	353.77	76	3748	0.38	0.020	0.00	8.77	0.00	0.000
20.94	2.05	265.84	1.36	362.46	77	3826	0.38	0.020	0.00	8.77	0.00	0.000
21.02	2.01	285.62	1.31	373.38	78	3909	0.38	0.019	0.00	8.77	0.00	0.000
21.10	1.97	303.17	1.27	384.14	79	3986	0.38	0.019	0.00	8.77	0.00	0.000
21.14	1.95	319.43	1.24	396.30	81	4078	0.38	0.018	0.00	8.77	0.00	0.000
21.21	1.94	332.28	1.23	407.17	83	4172	0.38	0.018	0.00	8.77	0.00	0.000
21.28	1.93	341.35	1.22	415.67	84	4254	0.38	0.017	0.00	8.77	0.00	0.000
21.35	1.93	342.45	1.22	418.03	85	4293	0.38	0.017	0.00	8.77	0.00	0.000
21.40	1.94	338.07	1.23	414.96	84	4281	0.38	0.017	0.00	8.77	0.00	0.000
21.46	1.95	328.93	1.24	406.48	83	4218	0.38	0.018	0.00	8.77	0.00	0.000
21.53	1.95	317.12	1.24	394.05	81	4110	0.38	0.018	0.00	8.77	0.00	0.000
21.60	1.97	302.47	1.26	380.57	78	4002	0.38	0.019	0.00	8.77	0.00	0.000
21.67	1.99	288.31	1.28	369.63	77	3928	0.38	0.020	0.00	8.77	0.00	0.000
21.75	2.01	277.19	1.31	362.98	76	3896	0.38	0.020	0.00	8.77	0.00	0.000
21.79	2.03	267.53	1.34	358.56	75	3880	0.38	0.020	0.00	8.77	0.00	0.000
21.86	2.07	253.14	1.39	353.10	75	3864	0.38	0.020	0.00	8.77	0.00	0.000
21.94	2.14	225.74	1.53	345.03	76	3815	0.38	0.021	0.00	8.77	0.00	0.000
22.00	2.21	202.96	1.69	342.84	78	3785	0.38	0.021	0.00	8.77	0.00	0.000
22.06	2.27	184.84	1.86	344.50	80	3767	0.38	0.021	0.00	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
22.12	2.30	179.18	1.95	349.14	82	3799	0.38	0.021	0.00	8.77	0.00	0.000
22.19	2.33	170.85	2.06	352.27	84	3804	0.38	0.021	0.00	8.77	0.00	0.000
22.26	2.35	166.25	2.12	353.08	85	3800	0.38	0.021	0.00	8.77	0.00	0.000
22.33	2.35	165.47	2.12	350.49	84	3784	0.38	0.021	0.00	8.77	0.00	0.000
22.39	2.32	170.75	2.02	345.13	82	3768	0.38	0.022	0.00	8.77	0.00	0.000
22.47	2.29	177.91	1.91	340.01	80	3760	0.38	0.022	0.00	8.77	0.00	0.000
22.51	2.25	187.56	1.80	337.39	78	3769	0.38	0.022	0.00	8.77	0.00	0.000
22.57	2.23	194.41	1.73	337.21	77	3791	0.38	0.022	0.00	8.77	0.00	0.000
22.64	2.21	200.03	1.69	338.59	77	3824	0.38	0.021	0.00	8.77	0.00	0.000
22.71	2.21	201.57	1.69	340.35	77	3854	0.38	0.021	0.00	8.77	0.00	0.000
22.79	2.23	196.72	1.74	341.35	78	3868	0.38	0.021	0.00	8.77	0.00	0.000
22.86	2.26	186.04	1.84	341.79	79	3857	0.38	0.021	0.00	8.77	0.00	0.000
22.91	2.31	174.69	1.97	343.38	81	3842	0.38	0.022	0.00	8.77	0.00	0.000
22.97	2.34	166.94	2.07	346.34	83	3847	0.38	0.022	0.00	8.77	0.00	0.000
23.03	2.35	164.51	2.12	348.23	84	3861	0.38	0.022	0.00	8.77	0.00	0.000
23.11	2.34	164.57	2.09	344.64	83	3841	0.38	0.022	0.00	8.77	0.00	0.000
23.19	2.33	165.95	2.05	340.27	81	3817	0.38	0.022	0.00	8.77	0.00	0.000
23.24	2.31	168.37	2.00	336.31	80	3798	0.38	0.022	0.00	8.77	0.00	0.000
23.32	2.30	171.37	1.96	335.90	79	3816	0.38	0.022	0.00	8.77	0.00	0.000
23.37	2.27	180.57	1.86	335.00	78	3844	0.38	0.022	0.00	8.77	0.00	0.000
23.45	2.25	187.05	1.79	334.07	77	3862	0.39	0.022	0.00	8.77	0.00	0.000
23.50	2.19	206.43	1.63	337.33	76	3932	0.39	0.022	0.00	8.77	0.00	0.000
23.56	2.13	225.95	1.52	343.15	75	4006	0.39	0.021	0.00	8.77	0.00	0.000
23.63	2.08	248.15	1.42	351.82	76	4088	0.39	0.021	0.00	8.77	0.00	0.000
23.69	2.06	255.62	1.39	354.87	76	4115	0.39	0.021	0.00	8.77	0.00	0.000
23.76	2.06	256.50	1.38	354.75	76	4119	0.39	0.021	0.00	8.77	0.00	0.000
23.83	2.06	254.49	1.39	354.27	76	4128	0.39	0.021	0.00	8.77	0.00	0.000
23.89	2.07	250.29	1.41	353.19	76	4134	0.39	0.021	0.00	8.77	0.00	0.000
23.95	2.09	244.96	1.44	351.55	76	4134	0.39	0.021	0.00	8.77	0.00	0.000
24.03	2.10	239.26	1.45	347.37	75	4101	0.39	0.021	0.00	8.77	0.00	0.000
24.09	2.10	233.82	1.46	341.25	74	4039	0.39	0.022	0.00	8.77	0.00	0.000
24.15	2.11	227.00	1.47	334.48	73	3970	0.39	0.022	0.00	8.77	0.00	0.000
24.22	2.13	219.46	1.50	329.81	72	3930	0.39	0.022	0.00	8.77	0.00	0.000
24.28	2.15	210.66	1.55	327.49	72	3916	0.39	0.023	0.00	8.77	0.00	0.000
24.36	2.18	200.73	1.62	325.13	73	3898	0.39	0.023	0.00	8.77	0.00	0.000
24.42	2.22	187.44	1.71	320.71	73	3844	0.39	0.023	0.00	8.77	0.00	0.000
24.48	2.27	168.36	1.87	314.61	73	3746	0.39	0.024	0.01	8.77	0.00	0.000
24.55	2.34	147.67	2.10	310.22	74	3637	0.39	0.025	0.01	8.77	0.00	0.000
24.61	2.42	129.24	2.39	308.88	77	3539	0.39	0.026	0.01	8.77	0.00	0.000
24.68	2.46	118.42	2.59	306.21	78	3459	0.39	0.027	0.01	8.77	0.00	0.000
24.74	2.48	111.93	2.66	297.62	76	3348	0.39	0.029	0.01	8.77	0.00	0.000
24.82	2.48	108.01	2.68	289.84	74	3263	0.39	0.030	0.01	8.77	0.00	0.000
24.88	2.50	104.04	2.74	285.49	73	3205	0.39	0.031	0.01	8.77	0.00	0.000
24.94	2.52	100.69	2.86	287.98	75	3210	0.39	0.031	0.01	8.77	0.00	0.000
25.01	2.53	98.60	2.94	289.71	76	3217	0.39	0.031	0.01	8.77	0.00	0.000
25.08	2.53	100.18	2.90	290.75	76	3246	0.39	0.030	0.01	8.77	0.00	0.000
25.14	2.50	105.94	2.74	290.76	75	3295	0.39	0.030	0.01	8.77	0.00	0.000
25.21	2.46	112.56	2.57	289.57	73	3337	0.39	0.029	0.01	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
25.28	2.43	118.23	2.44	287.89	72	3364	0.39	0.029	0.01	8.77	0.00	0.000
25.35	2.41	121.79	2.35	285.90	71	3374	0.39	0.029	0.01	8.77	0.00	0.000
25.42	2.39	125.26	2.27	283.89	69	3382	0.39	0.029	0.01	8.77	0.00	0.000
25.46	2.36	129.59	2.17	281.04	68	3380	0.39	0.029	0.01	8.77	0.00	0.000
25.54	2.33	134.20	2.06	276.90	66	3366	0.39	0.029	0.01	8.77	0.00	0.000
25.60	2.30	140.11	1.95	273.64	64	3361	0.39	0.030	0.01	8.77	0.00	0.000
25.67	2.27	146.10	1.87	273.04	64	3380	0.39	0.029	0.01	8.77	0.00	0.000
25.73	2.25	153.36	1.79	274.43	63	3418	0.39	0.029	0.01	8.77	0.00	0.000
25.80	2.22	161.79	1.72	277.78	63	3477	0.39	0.028	0.01	8.77	0.00	0.000
25.88	2.19	171.07	1.65	282.14	63	3545	0.39	0.028	0.01	8.77	0.00	0.000
25.92	2.17	180.94	1.60	289.31	64	3640	0.39	0.027	0.01	8.77	0.00	0.000
25.99	2.15	190.79	1.56	297.43	66	3747	0.39	0.026	0.01	8.77	0.00	0.000
26.07	2.14	200.68	1.53	306.45	67	3864	0.39	0.025	0.01	8.77	0.00	0.000
26.13	2.12	208.84	1.50	313.11	68	3949	0.39	0.024	0.01	8.77	0.00	0.000
26.21	2.11	213.69	1.48	315.99	69	3988	0.39	0.024	0.01	8.77	0.00	0.000
26.28	2.11	215.22	1.47	315.47	68	3985	0.39	0.024	0.01	8.77	0.00	0.000
26.32	2.11	213.73	1.47	313.50	68	3965	0.39	0.024	0.01	8.77	0.00	0.000
26.40	2.11	210.71	1.48	311.06	68	3946	0.39	0.025	0.01	8.77	0.00	0.000
26.47	2.14	200.38	1.53	306.03	67	3904	0.39	0.025	0.01	8.77	0.00	0.000
26.51	2.15	194.56	1.56	302.97	67	3874	0.39	0.025	0.01	8.77	0.00	0.000
26.59	2.16	189.05	1.58	299.06	66	3835	0.39	0.026	0.01	8.77	0.00	0.000
26.64	2.16	185.94	1.58	294.19	65	3779	0.39	0.026	0.01	8.77	0.00	0.000
26.71	2.19	173.09	1.64	284.26	64	3660	0.39	0.028	0.01	8.77	0.00	0.000
26.78	2.22	157.48	1.73	272.24	62	3508	0.39	0.029	0.01	8.77	0.00	0.000
26.86	2.25	145.39	1.80	261.48	60	3368	0.39	0.031	0.01	8.77	0.00	0.000
26.91	2.26	136.84	1.84	251.24	58	3236	0.39	0.033	0.01	8.77	0.00	0.000
26.98	2.28	127.62	1.89	240.94	56	3101	0.39	0.035	0.01	8.77	0.00	0.000
27.06	2.31	117.45	1.97	231.30	55	2970	0.39	0.038	0.01	8.77	0.00	0.000
27.11	2.35	106.40	2.11	224.48	54	2859	0.39	0.040	0.01	8.77	0.01	0.000
27.19	2.40	95.45	2.32	221.34	54	2782	0.39	0.042	0.01	8.77	0.01	0.000
27.24	2.48	81.78	2.69	220.28	56	2694	0.39	0.044	0.01	8.77	0.01	0.000
27.32	2.58	68.94	3.18	219.16	59	2596	0.39	0.047	0.01	8.77	0.01	0.000
27.37	2.66	57.73	3.74	215.62	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.44	2.70	53.02	3.98	210.82	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.52	2.68	54.39	3.82	207.69	0	0	0.39	0.000	0.00	0.00	0.00	0.000
27.57	2.59	63.88	3.26	208.34	56	2475	0.39	0.052	0.02	8.77	0.01	0.000
27.65	2.51	74.42	2.84	211.28	55	2591	0.39	0.048	0.01	8.77	0.01	0.000
27.69	2.43	88.63	2.45	217.16	54	2745	0.39	0.044	0.01	8.77	0.01	0.000
27.76	2.37	102.77	2.19	225.31	55	2910	0.40	0.040	0.01	8.77	0.01	0.000
27.84	2.30	120.29	1.95	234.65	55	3086	0.40	0.037	0.01	8.77	0.00	0.000
27.91	2.24	136.04	1.78	241.90	56	3215	0.40	0.035	0.01	8.77	0.00	0.000
27.98	2.20	146.84	1.67	245.75	55	3280	0.40	0.034	0.01	8.77	0.00	0.000
28.02	2.18	152.92	1.62	247.26	55	3302	0.40	0.034	0.01	8.77	0.00	0.000
28.10	2.18	152.02	1.62	246.44	55	3298	0.40	0.034	0.01	8.77	0.00	0.000
28.17	2.21	142.81	1.70	242.67	55	3255	0.40	0.035	0.01	8.77	0.00	0.000
28.22	2.24	134.10	1.78	239.01	55	3204	0.40	0.036	0.01	8.77	0.00	0.000
28.29	2.28	125.06	1.88	235.66	55	3152	0.40	0.037	0.01	8.77	0.00	0.000
28.36	2.30	119.87	1.95	233.88	55	3123	0.40	0.037	0.01	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
28.43	2.35	109.43	2.13	232.72	56	3080	0.40	0.038	0.01	8.77	0.00	0.000
28.50	2.42	97.04	2.38	231.09	57	3009	0.40	0.040	0.01	8.77	0.00	0.000
28.55	2.50	82.10	2.78	228.07	59	2891	0.40	0.042	0.01	8.77	0.00	0.000
28.62	2.60	66.61	3.34	222.41	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.69	2.68	55.82	3.82	213.24	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.77	2.69	51.05	3.95	201.57	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.84	2.64	53.11	3.58	190.32	0	0	0.40	0.000	0.00	0.00	0.00	0.000
28.88	2.57	57.12	3.17	181.28	48	2261	0.40	0.065	0.02	8.77	0.01	0.000
28.95	2.53	61.04	2.90	177.19	46	2255	0.40	0.066	0.02	8.77	0.01	0.000
29.03	2.52	61.37	2.88	176.60	46	2257	0.40	0.066	0.02	8.77	0.01	0.000
29.11	2.56	58.09	3.08	179.11	47	2263	0.40	0.066	0.02	8.77	0.01	0.000
29.14	2.64	51.04	3.59	183.01	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.22	2.67	49.25	3.81	187.71	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.29	2.76	43.05	4.49	193.25	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.33	2.73	46.55	4.20	195.61	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.41	2.65	53.75	3.64	195.88	0	0	0.40	0.000	0.00	0.00	0.00	0.000
29.48	2.53	67.92	2.90	197.28	51	2551	0.40	0.054	0.02	8.77	0.01	0.000
29.55	2.49	74.72	2.74	204.59	53	2681	0.40	0.050	0.02	8.77	0.01	0.000
29.63	2.55	70.63	3.03	214.03	56	2757	0.40	0.047	0.01	8.77	0.01	0.000
29.67	2.54	75.74	2.96	223.82	59	2901	0.40	0.044	0.01	8.77	0.00	0.000
29.73	2.49	85.11	2.74	232.93	60	3069	0.40	0.040	0.01	8.77	0.00	0.000
29.80	2.41	102.83	2.37	243.57	60	3297	0.40	0.036	0.01	8.77	0.00	0.000
29.88	2.38	114.78	2.22	255.33	62	3498	0.40	0.033	0.01	8.77	0.00	0.000
29.95	2.35	125.33	2.12	266.03	64	3676	0.40	0.031	0.01	8.77	0.00	0.000
29.99	2.34	132.11	2.10	277.27	67	3842	0.40	0.029	0.01	8.77	0.00	0.000
30.07	2.35	134.09	2.13	285.73	69	3959	0.40	0.028	0.01	8.77	0.00	0.000
30.12	2.37	132.78	2.21	293.66	71	4054	0.40	0.028	0.01	8.77	0.00	0.000
30.20	2.40	127.92	2.32	296.27	73	4071	0.40	0.027	0.01	8.77	0.00	0.000
30.27	2.44	117.68	2.50	293.89	74	3997	0.40	0.028	0.01	8.77	0.00	0.000
30.34	2.52	100.44	2.85	286.42	74	3814	0.40	0.030	0.01	8.77	0.00	0.000
30.42	2.61	82.45	3.37	278.08	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.46	2.70	67.40	3.97	267.50	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.53	2.73	59.97	4.23	253.71	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.60	2.73	56.32	4.24	238.79	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.64	2.70	56.37	3.98	224.30	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.72	2.66	57.33	3.68	211.02	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.79	2.63	58.31	3.49	203.31	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.87	2.62	59.46	3.42	203.45	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.91	2.61	63.43	3.36	213.15	0	0	0.40	0.000	0.00	0.00	0.00	0.000
30.98	2.56	71.63	3.11	223.10	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.06	2.51	82.76	2.81	232.59	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.13	2.46	91.97	2.60	238.87	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.17	2.44	99.14	2.47	244.57	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.24	2.40	108.13	2.32	250.71	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.31	2.34	123.33	2.09	258.21	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.38	2.28	141.11	1.88	265.86	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.46	2.23	155.48	1.75	272.41	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.50	2.21	166.07	1.68	279.34	0	0	0.40	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
31.58	2.19	174.27	1.64	286.40	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.65	2.18	182.41	1.61	294.36	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.71	2.17	189.40	1.59	301.55	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.77	2.16	195.48	1.58	308.33	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.83	2.13	200.56	1.52	304.74	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.90	2.05	207.76	1.37	283.98	0	0	0.40	0.000	0.00	0.00	0.00	0.000
31.96	1.95	215.28	1.24	267.07	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.03	1.88	222.51	1.17	261.43	0	0	0.40	0.000	0.00	0.00	0.00	0.000
32.09	1.91	224.89	1.20	270.58	55	3605	0.40	0.035	0.01	8.77	0.00	0.000
32.16	1.94	226.72	1.23	279.03	57	3790	0.40	0.032	0.01	8.77	0.00	0.000
32.23	1.97	227.26	1.26	286.67	59	3965	0.40	0.030	0.01	8.77	0.00	0.000
32.30	2.00	225.94	1.30	293.83	61	4142	0.40	0.029	0.01	8.77	0.00	0.000
32.36	2.04	224.15	1.35	302.99	64	4352	0.40	0.027	0.01	8.77	0.00	0.000
32.43	2.07	224.26	1.41	315.29	67	4596	0.40	0.025	0.01	8.77	0.00	0.000
32.50	2.10	225.69	1.45	326.66	71	4806	0.40	0.024	0.01	8.77	0.00	0.000
32.55	2.11	228.61	1.47	335.60	73	4958	0.40	0.023	0.00	8.77	0.00	0.000
32.64	2.11	231.46	1.47	340.30	74	5039	0.40	0.023	0.00	8.77	0.00	0.000
32.69	2.11	234.05	1.47	343.57	75	5091	0.40	0.022	0.00	8.77	0.00	0.000
32.76	2.11	235.80	1.47	345.49	75	5126	0.40	0.022	0.00	8.77	0.00	0.000
32.81	2.11	236.88	1.47	347.27	75	5159	0.40	0.022	0.00	8.77	0.00	0.000
32.89	2.06	240.59	1.39	335.41	72	4926	0.40	0.023	0.01	8.77	0.00	0.000
32.96	1.97	247.44	1.26	312.09	64	4382	0.40	0.027	0.01	8.77	0.00	0.000
33.01	1.86	255.34	1.15	293.64	58	3810	0.40	0.033	0.01	8.77	0.00	0.000
33.08	1.81	259.00	1.11	287.95	56	3591	0.40	0.036	0.01	8.77	0.00	0.000
33.14	1.85	256.16	1.15	293.43	58	3800	0.40	0.033	0.01	8.77	0.00	0.000
33.21	1.90	252.29	1.19	299.09	60	4020	0.40	0.031	0.01	8.77	0.00	0.000
33.28	1.95	246.74	1.24	304.84	62	4248	0.40	0.029	0.01	8.77	0.00	0.000
33.34	2.00	240.77	1.30	311.80	65	4482	0.40	0.027	0.01	8.77	0.00	0.000
33.41	2.04	236.39	1.36	320.95	68	4722	0.40	0.025	0.01	8.77	0.00	0.000
33.47	2.08	233.38	1.42	330.30	71	4935	0.40	0.024	0.01	8.77	0.00	0.000
33.53	2.10	232.36	1.45	337.48	73	5083	0.40	0.023	0.00	8.77	0.00	0.000
33.60	2.11	231.65	1.47	340.20	74	5144	0.40	0.023	0.00	8.77	0.00	0.000
33.66	2.07	234.14	1.40	328.05	70	4906	0.40	0.024	0.01	8.77	0.00	0.000
33.75	1.97	239.32	1.26	301.46	62	4298	0.40	0.029	0.01	8.77	0.00	0.000
33.81	1.85	244.45	1.14	279.00	55	3643	0.40	0.036	0.01	8.77	0.00	0.000
33.87	1.79	243.56	1.10	268.39	52	3355	0.40	0.041	0.01	8.77	0.00	0.000
33.94	1.87	232.94	1.16	270.29	54	3604	0.40	0.037	0.01	8.77	0.00	0.000
34.01	1.96	219.27	1.25	274.30	56	3912	0.40	0.033	0.01	8.77	0.00	0.000
34.07	2.06	200.60	1.38	277.53	59	4169	0.40	0.030	0.01	8.77	0.00	0.000
34.14	2.15	180.63	1.55	279.80	62	4321	0.40	0.029	0.01	8.77	0.00	0.000
34.20	2.24	157.10	1.77	277.88	64	4331	0.40	0.029	0.01	8.77	0.00	0.000
34.26	2.34	130.88	2.10	274.74	66	4249	0.40	0.029	0.01	8.77	0.00	0.000
34.34	2.47	104.87	2.61	273.25	69	4121	0.40	0.031	0.01	8.77	0.00	0.000
34.39	2.52	94.52	2.89	273.04	71	4059	0.40	0.031	0.01	8.77	0.00	0.000
34.45	2.53	93.06	2.92	271.91	71	4041	0.40	0.032	0.01	8.77	0.00	0.000
34.53	2.49	99.45	2.72	270.97	70	4079	0.40	0.031	0.01	8.77	0.00	0.000
34.59	2.50	97.54	2.78	271.37	70	4078	0.40	0.031	0.01	8.77	0.00	0.000
34.67	2.51	96.61	2.82	272.64	71	4098	0.40	0.031	0.01	8.77	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Q_{tn}	Kc	$Q_{tn,cs}$	$N_{1,60}$ (blows)	G_{max} (tsf)	CSR	Shear, γ (%)	$e_{vol(15)}$ (%)	N_c	e_v (%)	Settle. (in)
34.73	2.52	94.97	2.89	274.35	71	4115	0.40	0.031	0.01	8.77	0.00	0.000
34.79	2.53	93.80	2.93	274.77	72	4118	0.40	0.031	0.01	8.77	0.00	0.000
34.87	2.55	89.20	3.04	271.43	72	4052	0.40	0.032	0.01	8.77	0.00	0.000
34.93	2.60	78.99	3.33	262.98	0	0	0.40	0.000	0.00	0.00	0.00	0.000
34.98	2.67	66.32	3.77	250.09	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.04	2.75	52.56	4.39	231.00	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.13	2.83	41.40	5.06	209.60	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.19	2.89	33.55	5.58	187.07	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.25	2.88	30.51	5.52	168.25	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.30	2.81	29.60	4.88	144.47	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.39	2.73	29.70	4.18	124.26	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.45	2.65	29.84	3.66	109.12	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.51	2.66	28.89	3.74	108.16	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.57	2.69	27.36	3.94	107.73	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.67	2.72	26.05	4.17	108.68	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.70	2.75	25.72	4.35	112.00	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.77	2.77	25.46	4.53	115.31	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.84	2.80	24.75	4.75	117.52	0	0	0.40	0.000	0.00	0.00	0.00	0.000
35.92	2.83	23.44	5.03	117.96	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.00	2.86	22.85	5.28	120.69	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.03	2.49	47.19	2.72	128.42	33	2005	0.40	0.110	0.06	8.77	0.02	0.000
36.11	2.21	86.79	1.68	145.77	33	2363	0.40	0.078	0.04	8.77	0.01	0.000
36.16	2.05	127.16	1.37	173.75	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.22	2.10	120.71	1.46	176.56	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.30	2.26	92.47	1.83	169.39	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.36	2.47	61.91	2.64	163.56	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.43	2.63	45.09	3.51	158.21	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.49	2.77	33.06	4.53	149.69	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.56	2.88	25.46	5.49	139.89	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.62	2.91	22.00	5.76	126.69	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.71	2.86	21.66	5.28	114.36	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.75	2.83	21.73	5.04	109.60	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.83	2.89	21.46	5.57	119.61	0	0	0.40	0.000	0.00	0.00	0.00	0.000
36.91	2.94	21.28	6.13	130.48	0	0	0.40	0.000	0.00	0.00	0.00	0.000

Total estimated settlement: 0.84

Abbreviations

Q_{tn}: Equivalent clean sand normalized cone resistance
K_c: Fines correction factor
$Q_{tn,cs}$: Post-liquefaction volumentric strain
G_{max}: Small strain shear modulus
CSR: Soil cyclic stress ratio
γ: Cyclic shear strain
$e_{vol(15)}$: Volumetric strain after 15 cycles
N_c: Equivalent number of cycles
e_v: Volumetric strain
Settle.: Calculated settlement

APPENDIX E

GENERAL GRADING GUIDELINES

Geotechnical and Infiltration Evaluation
Proposed Residential Development Project, Fullerton, California
Project No. 2495-CR

GEOTEK

GENERAL GRADING GUIDELINES

Guidelines presented herein are intended to address general construction procedures for earthwork construction. Specific situations and conditions often arise which cannot reasonably be discussed in general guidelines, when anticipated these are discussed in the text of the report. Often unanticipated conditions are encountered which may necessitate modification or changes to these guidelines. It is our hope that these will assist the contractor to more efficiently complete the project by providing a reasonable understanding of the procedures that would be expected during earthwork and the testing and observation used to evaluate those procedures.

General

Grading should be performed to at least the minimum requirements of governing agencies, Chapters 18 and 33 of the Uniform Building Code, CBC (2019) and the guidelines presented below.

Preconstruction Meeting

A preconstruction meeting should be held prior to site earthwork. Any questions the contractor has regarding our recommendations, general site conditions, apparent discrepancies between reported and actual conditions and/or differences in procedures the contractor intends to use should be brought up at that meeting. The contractor (including the main onsite representative) should review our report and these guidelines in advance of the meeting. Any comments the contractor may have regarding these guidelines should be brought up at that meeting.

Grading Observation and Testing

1. Observation of the fill placement should be provided by our representative during grading. Verbal communication during the course of each day will be used to inform the contractor of test results. The contractor should receive a copy of the "Daily Field Report" indicating results of field density tests that day. If our representative does not provide the contractor with these reports, our office should be notified.
2. Testing and observation procedures are, by their nature, specific to the work or area observed and location of the tests taken, variability may occur in other locations. The contractor is responsible for the uniformity of the grading operations; our observations and test results are intended to evaluate the contractor's overall level of efforts during grading. The contractor's personnel are the only individuals participating in all aspect of site work. Compaction testing and observation should not be considered as relieving the contractor's responsibility to properly compact the fill.
3. Cleanouts, processed ground to receive fill, key excavations, and subdrains should be observed by our representative prior to placing any fill. It will be the contractor's responsibility to notify our representative or office when such areas are ready for observation.
4. Density tests may be made on the surface material to receive fill, as considered warranted by this firm.
5. In general, density tests would be made at maximum intervals of two feet of fill height or every 1,000 cubic yards of fill placed. Criteria will vary depending on soil conditions and size of the fill. More frequent testing may be performed. In any case, an adequate number of field density tests should be made to evaluate the required compaction and moisture content is generally being obtained.

6. Laboratory testing to support field test procedures will be performed, as considered warranted, based on conditions encountered (e.g. change of material sources, types, etc.) Every effort will be made to process samples in the laboratory as quickly as possible and in progress construction projects are our first priority. However, laboratory workloads may cause in delays and some soils may require a **minimum of 48 to 72 hours to complete test procedures**. Whenever possible, our representative(s) should be informed in advance of operational changes that might result in different source areas for materials.
7. Procedures for testing of fill slopes are as follows:
   a) Density tests should be taken periodically during grading on the flat surface of the fill, three to five feet horizontally from the face of the slope.
   b) If a method other than over building and cutting back to the compacted core is to be employed, slope compaction testing during construction should include testing the outer six inches to three feet in the slope face to determine if the required compaction is being achieved.
8. Finish grade testing of slopes and pad surfaces should be performed after construction is complete.

Site Clearing

1. All vegetation, and other deleterious materials, should be removed from the site. If material is not immediately removed from the site it should be stockpiled in a designated area(s) well outside of all current work areas and delineated with flagging or other means. Site clearing should be performed in advance of any grading in a specific area.
2. Efforts should be made by the contractor to remove all organic or other deleterious material from the fill, as even the most diligent efforts may result in the incorporation of some materials. This is especially important when grading is occurring near the natural grade. All equipment operators should be aware of these efforts. Laborers may be required as root pickers.
3. Nonorganic debris or concrete may be placed in deeper fill areas provided the procedures used are observed and found acceptable by our representative. Typical procedures are similar to those indicated on Plate G-4.

Treatment of Existing Ground

1. Following site clearing, all surficial deposits of alluvium and colluvium as well as weathered or creep effected bedrock, should be removed (see Plates E-1, E-2 and E-3) unless otherwise specifically indicated in the text of this report.
2. In some cases, removal may be recommended to a specified depth (e.g. flat sites where partial alluvial removals may be sufficient). The contractor should not exceed these depths unless directed otherwise by our representative.
3. Groundwater existing in alluvial areas may make excavation difficult. Deeper removals than indicated in the text of the report may be necessary due to saturation during winter months.
4. Subsequent to removals, the natural ground should be processed to a depth of six inches, moistened to near optimum moisture conditions and compacted to fill standards.
5. Exploratory back hoe or dozer trenches still remaining after site removal should be excavated and filled with compacted fill if they can be located.

Fill Placement

1. Unless otherwise indicated, all site soil and bedrock may be reused for compacted fill; however, some special processing or handling may be required (see text of report).
2. Material used in the compacting process should be evenly spread, moisture conditioned, processed, and compacted in thin lifts six (6) to eight (8) inches in compacted thickness to obtain a uniformly dense layer. The fill should be placed and compacted on a nearly horizontal plane, unless otherwise found acceptable by our representative.
3. If the moisture content or relative density varies from that recommended by this firm, the contractor should rework the fill until it is in accordance with the following:
   a) Moisture content of the fill should be at or above optimum moisture. Moisture should be evenly distributed without wet and dry pockets. Pre-watering of cut or removal areas should be considered in addition to watering during fill placement, particularly in clay or dry surficial soils. The ability of the contractor to obtain the proper moisture content will control production rates.
   b) Each six-inch layer should be compacted to at least 90 percent of the maximum dry density in compliance with the testing method specified by the controlling governmental agency. In most cases, the testing method is ASTM Test Designation D 1557.
4. Rock fragments less than eight inches in diameter may be utilized in the fill, provided:
   a) They are not placed in concentrated pockets;
   b) There is a sufficient percentage of fine-grained material to surround the rocks;
   c) The distribution of the rocks is observed by, and acceptable to, our representative.
5. Rocks exceeding eight (8) inches in diameter should be taken off site, broken into smaller fragments, or placed in accordance with recommendations of this firm in areas designated suitable for rock disposal (see Plate E-4). On projects where significant large quantities of oversized materials are anticipated, alternate guidelines for placement may be included. If significant oversize materials are encountered during construction, these guidelines should be requested.
6. In clay soil, dry or large chunks or blocks are common. If in excess of eight (8) inches minimum dimension, then they are considered as oversized. Sheepsfoot compactors or other suitable methods should be used to break up blocks. When dry, they should be moisture conditioned to provide a uniform condition with the surrounding fill.

Slope Construction

1. The contractor should obtain a minimum relative compaction of 90 percent out to the finished slope face of fill slopes. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment.
2. Slopes trimmed to the compacted core should be overbuilt by at least three (3) feet with compaction efforts out to the edge of the false slope. Failure to properly compact the outer edge results in trimming not exposing the compacted core and additional compaction after trimming may be necessary.
3. If fill slopes are built "at grade" using direct compaction methods, then the slope construction should be performed so that a constant gradient is maintained throughout construction. Soil should not be "spilled" over the slope face nor should slopes be "pushed out" to obtain grades. Compaction equipment should compact each lift along the immediate top of slope. Slopes should be back rolled or otherwise compacted at approximately every 4 feet vertically as the slope is built.

4. Corners and bends in slopes should have special attention during construction as these are the most difficult areas to obtain proper compaction.
5. Cut slopes should be cut to the finished surface. Excessive undercutting and smoothing of the face with fill may necessitate stabilization.

Keyways, Buttress and Stabilization Fills

Keyways are needed to provide support for fill slope and various corrective procedures.

1. Side-hill fills should have an equipment-width key at their toe excavated through all surficial soil and into competent material and tilted back into the hill (Plates E-2, E-3). As the fill is elevated, it should be benched through surficial soil and slopewash, and into competent bedrock or other material deemed suitable by our representatives (See Plates E-1, E-2, and E-3).
2. Fill over cut slopes should be constructed in the following manner:
   a) All surficial soils and weathered rock materials should be removed at the cut-fill interface.
   b) A key at least one and one-half (1.5) equipment width wide (or as needed for compaction), and tipped at least one (1) foot into slope, should be excavated into competent materials and observed by our representative.
   c) The cut portion of the slope should be excavated prior to fill placement to evaluate if stabilization is necessary. The contractor should be responsible for any additional earthwork created by placing fill prior to cut excavation. (see Plate E-3 for schematic details.)
3. Daylight cut lots above descending natural slopes may require removal and replacement of the outer portion of the lot. A schematic diagram for this condition is presented on Plate E-2.
4. A basal key is needed for fill slopes extending over natural slopes. A schematic diagram for this condition is presented on Plate E-2.
5. All fill slopes should be provided with a key unless within the body of a larger overall fill mass. Please refer to Plate E-3 for specific guidelines.

Anticipated buttress and stabilization fills are discussed in the text of the report. The need to stabilize other proposed cut slopes will be evaluated during construction. Plate E-5 shows a schematic of buttress construction.

1. All backcuts should be excavated at gradients of 1:1 or flatter. The backcut configuration should be determined based on the design, exposed conditions, and need to maintain a minimum fill width and provide working room for the equipment.
2. On longer slopes, backcuts and keyways should be excavated in maximum 250 feet long segments. The specific configurations will be determined during construction.
3. All keys should be a minimum of two (2) feet deep at the toe and slope toward the heel at least one foot or two (2%) percent, whichever is greater.
4. Subdrains are to be placed for all stabilization slopes exceeding 10 feet in height. Lower slopes are subject to review. Drains may be required. Guidelines for subdrains are presented on Plate E-5.
5. Benching of backcuts during fill placement is required.

Lot Capping

1. When practical, the upper three (3) feet of material placed below finish grade should be comprised of the least expansive material available. Preferably, highly and very highly expansive materials should not be used. We will attempt to offer advice based on visual evaluations of the

materials during grading, but it must be realized that laboratory testing is needed to evaluate the expansive potential of soil. Minimally, this testing takes two (2) to four (4) days to complete.

2. Transition lots (cut and fill) both per plan and those created by remedial grading (e.g. lots above stabilization fills, along daylight lines, above natural slopes, etc.) should be capped with a minimum three foot thick compacted fill blanket.
3. Cut pads should be observed by our representative(s) to evaluate the need for overexcavation and replacement with fill. This may be necessary to reduce water infiltration into highly fractured bedrock or other permeable zones, and/or due to differing expansive potential of materials beneath a structure. The overexcavation should be at least three feet. Deeper overexcavation may be recommended in some cases.

UTILITY TRENCH CONSTRUCTION AND BACKFILL

Utility trench excavation and backfill is the contractor's responsibility. The geotechnical consultant typically provides periodic observation and testing of these operations. While efforts are made to make sufficient observations and tests to verify that the contractors' methods and procedures are adequate to achieve proper compaction, it is typically impractical to observe all backfill procedures. As such, it is critical that the contractor use consistent backfill procedures.

Compaction methods vary for trench compaction and experience indicates many methods can be successful. However, procedures that "worked" on previous projects may or may not prove effective on a given site. The contractor(s) should outline the procedures proposed, so that we may discuss them **prior** to construction. We will offer comments based on our knowledge of site conditions and experience.

1. Utility trench backfill in slopes, structural areas, in streets and beneath flat work or hardscape should be brought to at least optimum moisture and compacted to at least 90 percent of the laboratory standard. Soil should be moisture conditioned prior to placing in the trench.
2. Flooding and jetting are not typically recommended or acceptable for native soils. Flooding or jetting may be used with select sand having a Sand Equivalent (SE) of 30 or higher. This is typically limited to the following uses:
   a) shallow (12 + inches) under slab interior trenches and,
   b) as bedding in pipe zone.

   The water should be allowed to dissipate prior to pouring slabs or completing trench compaction.
3. Care should be taken not to place soils at high moisture content within the upper three feet of the trench backfill in street areas, as overly wet soils may impact subgrade preparation. Moisture may be reduced to 2% below optimum moisture in areas to be paved within the upper three feet below sub grade.
4. Sand backfill should not be allowed in exterior trenches adjacent to and within an area extending below a 1:1 projection from the outside bottom edge of a footing, unless it is similar to the surrounding soil.
5. Trench compaction testing is generally at the discretion of the geotechnical consultant. Testing frequency will be based on trench depth and the contractor's procedures. A probing rod would be used to assess the consistency of compaction between tested areas and untested areas. If zones are found that are considered less compact than other areas, this would be brought to the contractor's attention.

JOB SAFETY

General

Personnel safety is a primary concern on all job sites. The following summaries are safety considerations for use by all our employees on multi-employer construction sites. On ground personnel are at highest risk of injury and possible fatality on grading construction projects. The company recognizes that construction activities will vary on each site and that job site safety is the contractor's responsibility. However, it is, imperative that all personnel be safety conscious to avoid accidents and potential injury.

In an effort to minimize risks associated with geotechnical testing and observation, the following precautions are to be implemented for the safety of our field personnel on grading and construction projects.

1. Safety Meetings: Our field personnel are directed to attend the contractor's regularly scheduled safety meetings.
2. Safety Vests: Safety vests are provided for and are to be worn by our personnel while on the job site.
3. Safety Flags: Safety flags are provided to our field technicians; one is to be affixed to the vehicle when on site, the other is to be placed atop the spoil pile on all test pits.

In the event that the contractor's representative observes any of our personnel not following the above, we request that it be brought to the attention of our office.

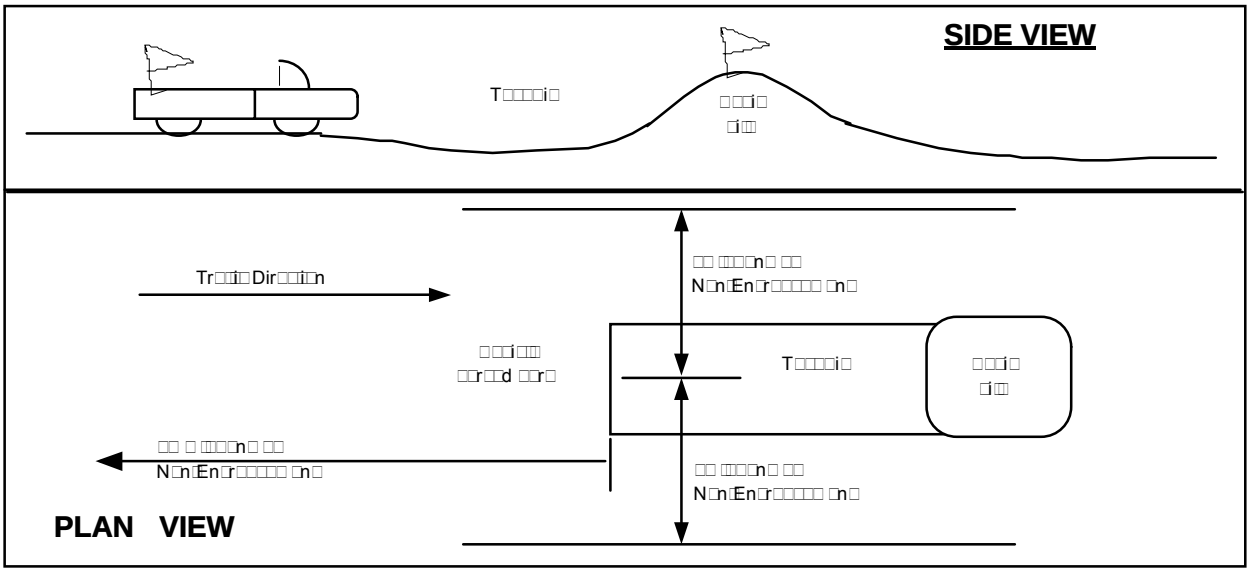
Test Pits Location, Orientation and Clearance

The technician is responsible for selecting test pit locations. The primary concern is the technician's safety. However, it is necessary to take sufficient tests at various locations to obtain a representative sampling of the fill. As such, efforts will be made to coordinate locations with the grading contractors authorized representatives (e.g. dump man, operator, supervisor, grade checker, etc.), and to select locations following or behind the established traffic pattern, preferably outside of current traffic. The contractors authorized representative should direct excavation of the pit and safety during the test period. Again, safety is the paramount concern.

Test pits should be excavated so that the spoil pile is placed away from oncoming traffic. The technician's vehicle is to be placed next to the test pit, opposite the spoil pile. This necessitates that the fill be maintained in a drivable condition. Alternatively, the contractor may opt to park a piece of equipment in front of test pits, particularly in small fill areas or those with limited access.

A zone of non-encroachment should be established for all test pits (see diagram below). No grading equipment should enter this zone during the test procedure. The zone should extend outward to the sides approximately 50 feet from the center of the test pit and 100 feet in the direction of traffic flow. This zone is established both for safety and to avoid excessive ground vibration, which typically decreases test results.

TEST PIT SAFETY PLAN



Slope Tests

When taking slope tests, the technician should park their vehicle directly above or below the test location on the slope. The contractor's representative should effectively keep all equipment at a safe operation distance (e.g. 50 feet) away from the slope during testing.

The technician is directed to withdraw from the active portion of the fill as soon as possible following testing. The technician's vehicle should be parked at the perimeter of the fill in a highly visible location.

Trench Safety

It is the contractor's responsibility to provide safe access into trenches where compaction testing is needed. Trenches for all utilities should be excavated in accordance with CAL-OSHA and any other applicable safety standards. Safe conditions will be required to enable compaction testing of the trench backfill.

All utility trench excavations in excess of 5 feet deep, which a person enters, are to be shored or laid back. Trench access should be provided in accordance with OSHA standards. Our personnel are directed not to enter any trench by being lowered or "riding down" on the equipment.

Our personnel are directed not to enter any excavation which;

1. is 5 feet or deeper unless shored or laid back,
2. exit points or ladders are not provided,
3. displays any evidence of instability, has any loose rock or other debris which could fall into the trench, or
4. displays any other evidence of any unsafe conditions regardless of depth.

If the contractor fails to provide safe access to trenches for compaction testing, our company policy requires that the soil technician withdraws and notifies their supervisor. The contractor's representative will then be contacted in an effort to affect a solution. All backfill not tested due to safety concerns or other reasons is subject to reprocessing and/or removal.

Procedures

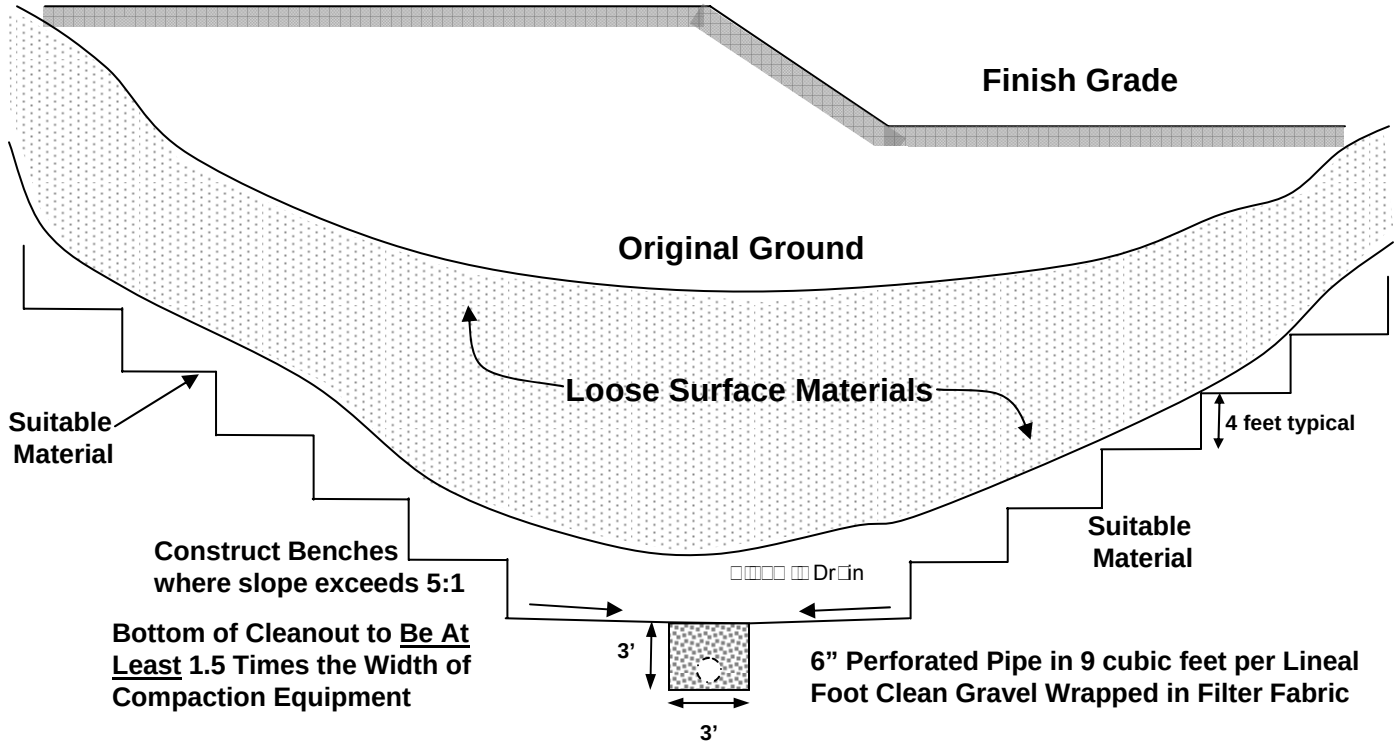
In the event that the technician's safety is jeopardized or compromised as a result of the contractor's failure to comply with any of the above, the technician is directed to inform both the developer's and contractor's representatives. If the condition is not rectified, the technician is required, by company policy, to immediately withdraw and notify their supervisor. The contractor's representative will then be contacted in an effort to affect a solution. No further testing will be performed until the situation is rectified. Any fill placed in the interim can be considered unacceptable and subject to reprocessing, recompaction or removal.

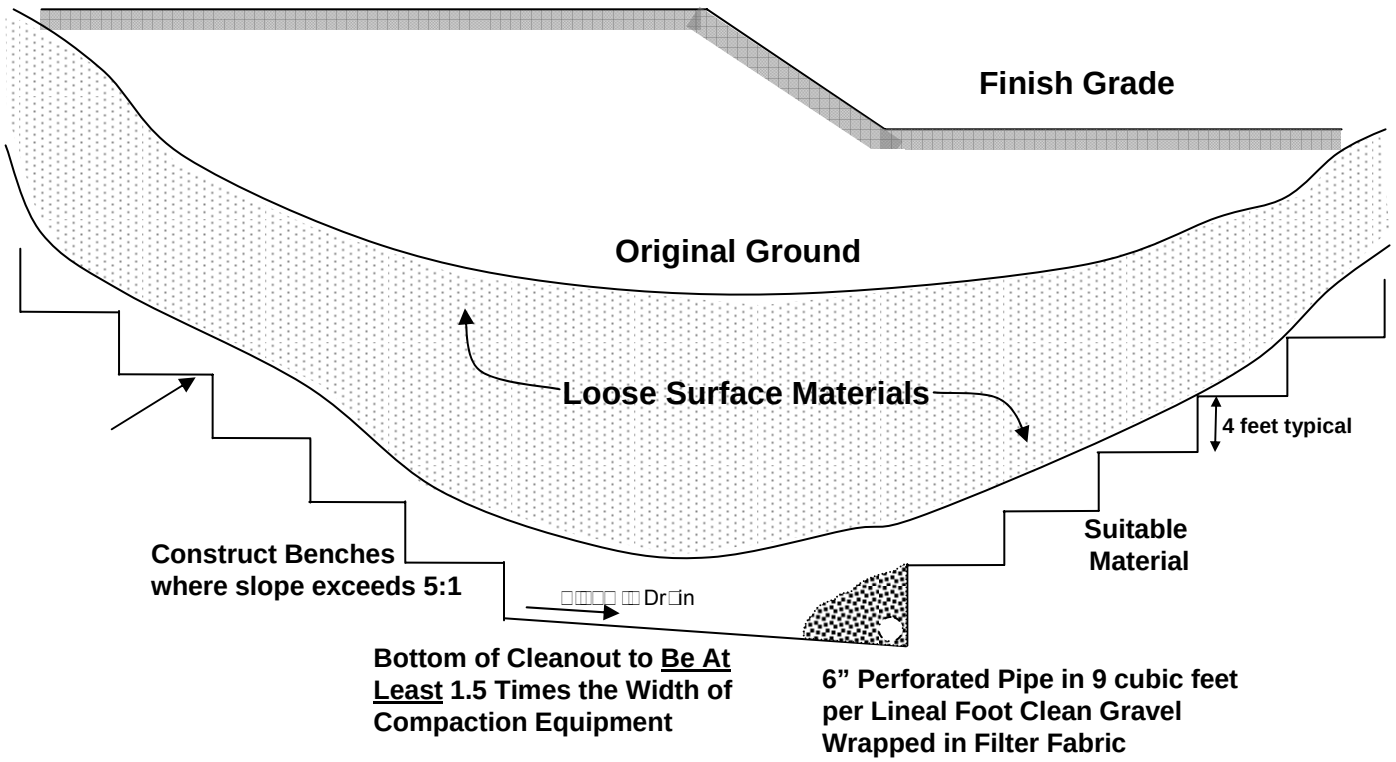
In the event that the soil technician does not comply with the above or other established safety guidelines, we request that the contractor bring this to technician's attention and notify our project manager or office. Effective communication and coordination between the contractors' representative and the field technician(s) is strongly encouraged in order to implement the above safety program and safety in general.

The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

The safety procedures outlined above should be discussed at the contractor's safety meetings. This will serve to inform and remind equipment operators of these safety procedures particularly the zone of non-encroachment.

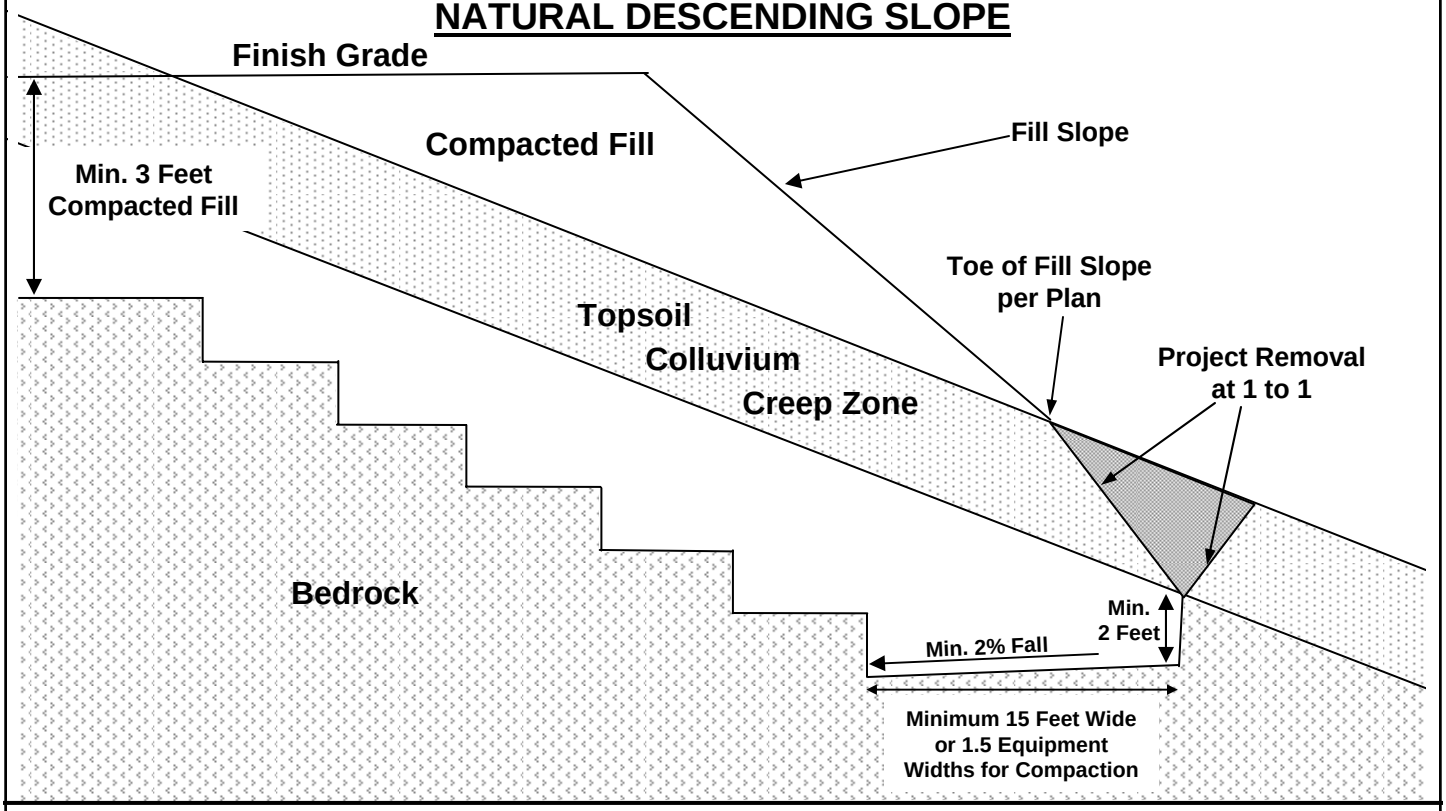
ALTERNATES



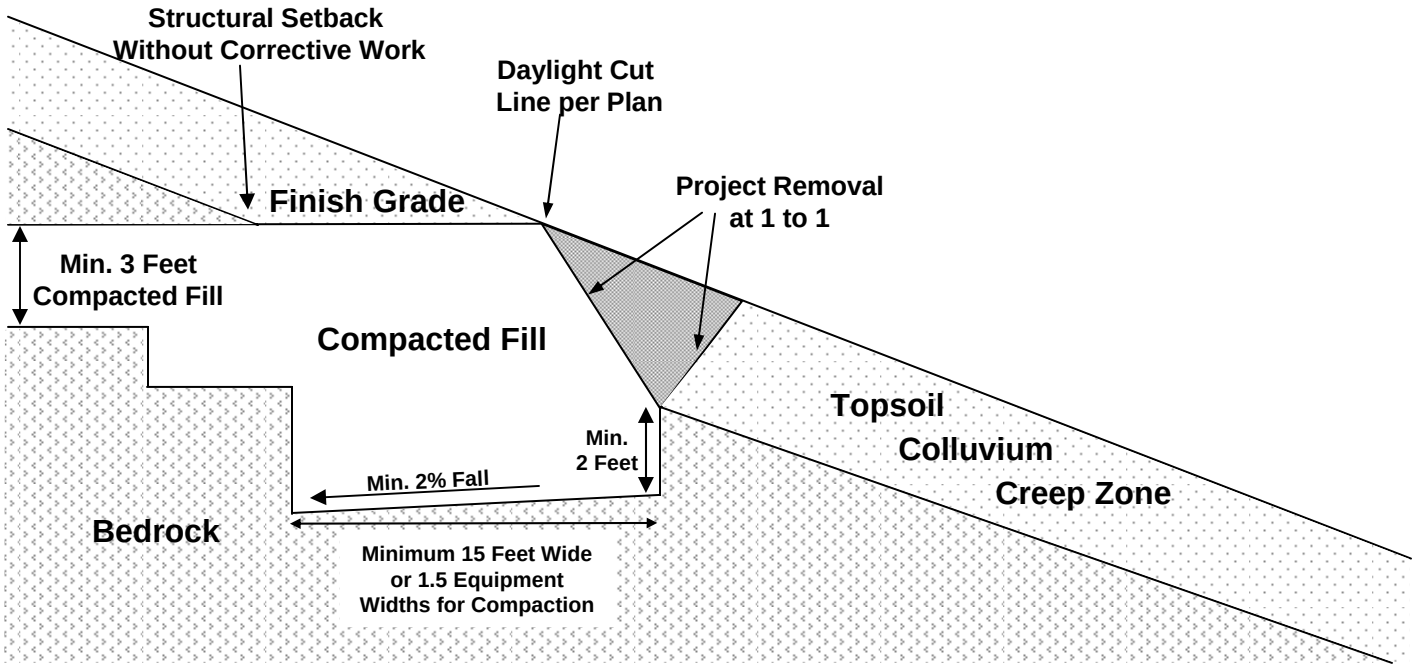


GEOTEK	1548 North Maple Street Corona, California 92880	TYPICAL CANYON CLEANOUT	STANDARD GRADING GUIDELINES PLATE E-1

TYPICAL FILL SLOPE OVER NATURAL DESCENDING SLOPE



DAYLIGHT CUT AREA OVER NATURAL DESCENDING SLOPE



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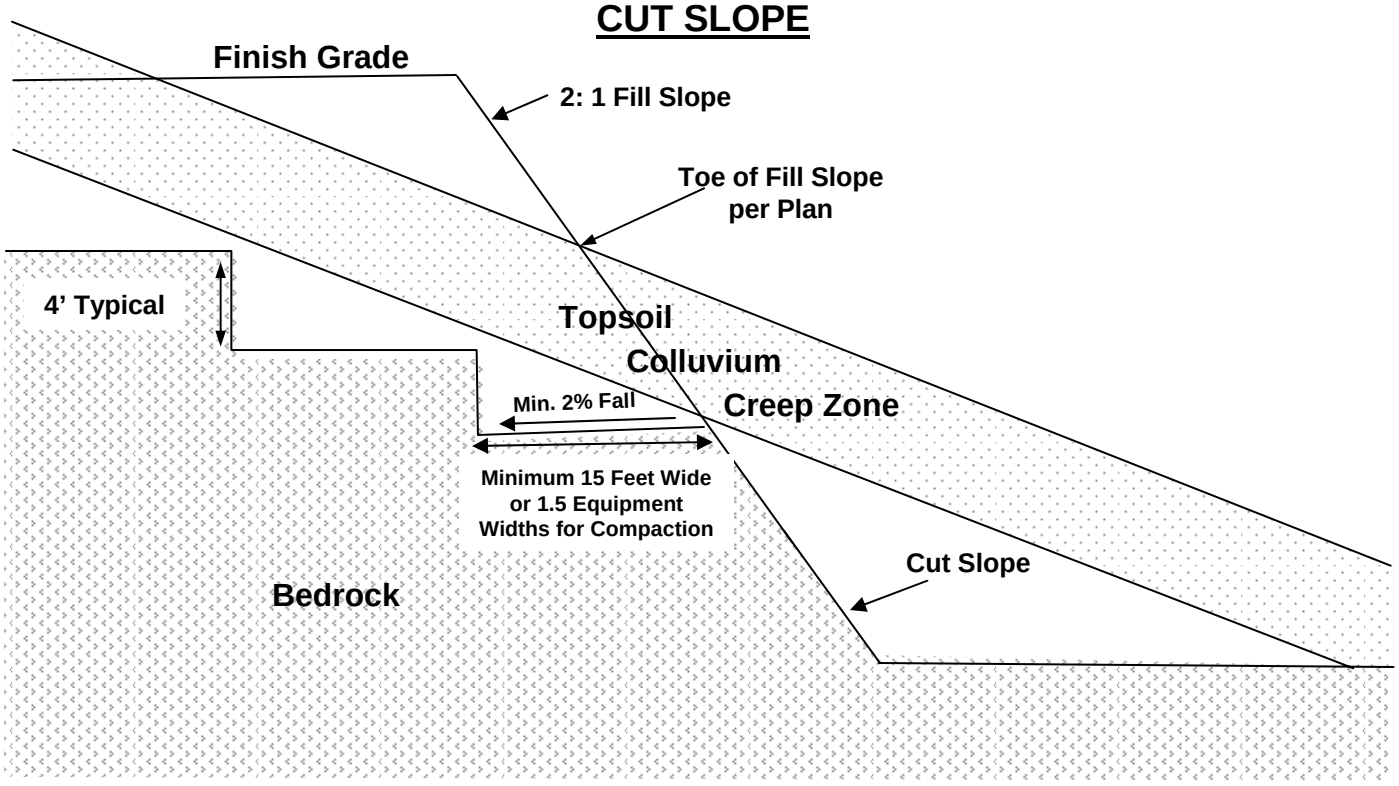
TREATMENT ABOVE NATURAL SLOPES

STANDARD GRADING GUIDELINES

PLATE E-2

TYPICAL FILL SLOPE OVER CUT SLOPE



TYPICAL FILL SLOPE

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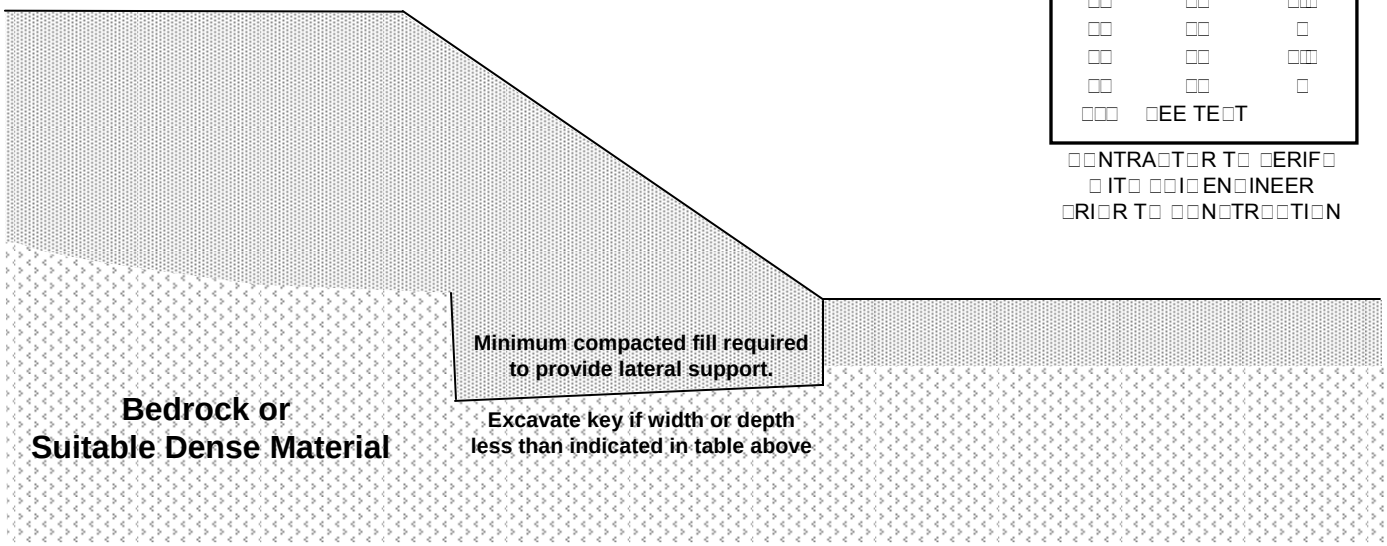

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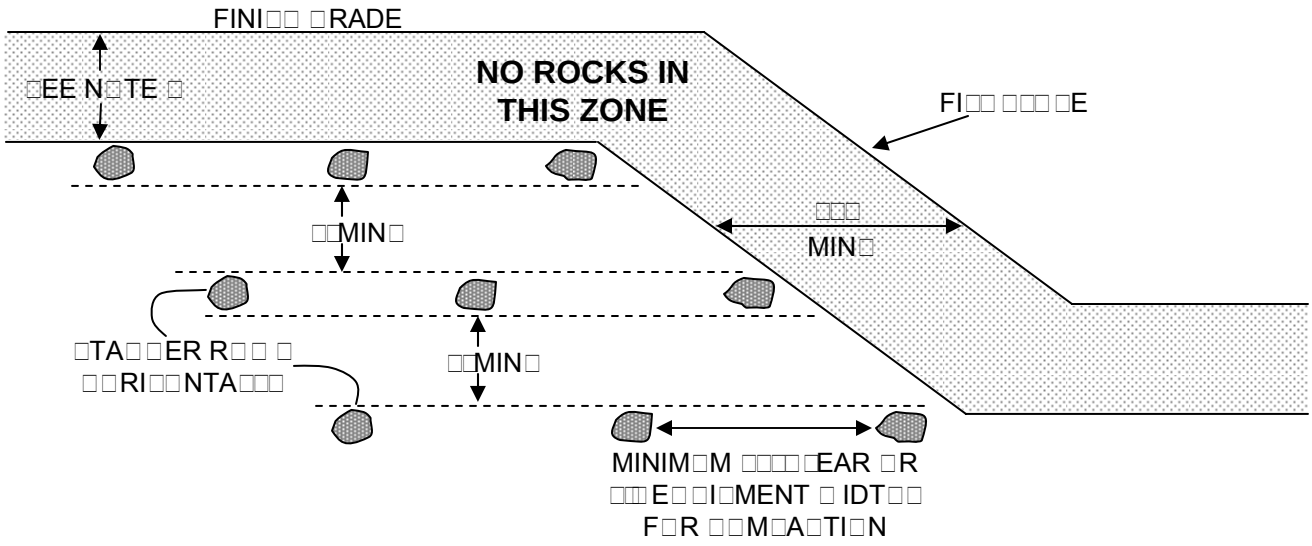
COMMON FILL SLOPE KEYS

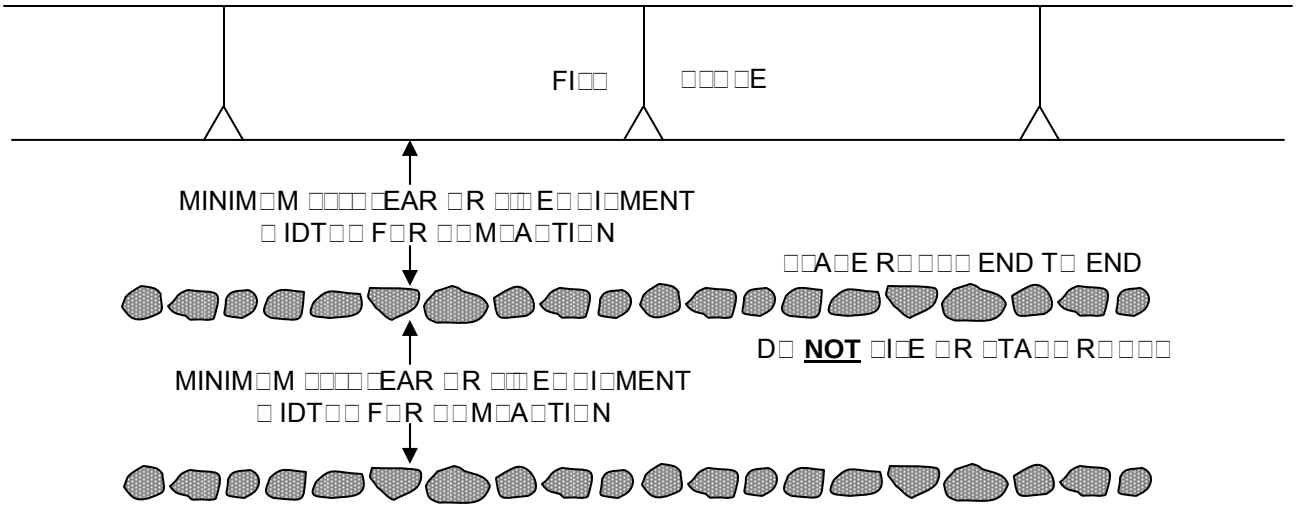
STANDARD GRADING GUIDELINES

PLATE E-3

CROSS SECTIONAL VIEW



PLAN VIEW



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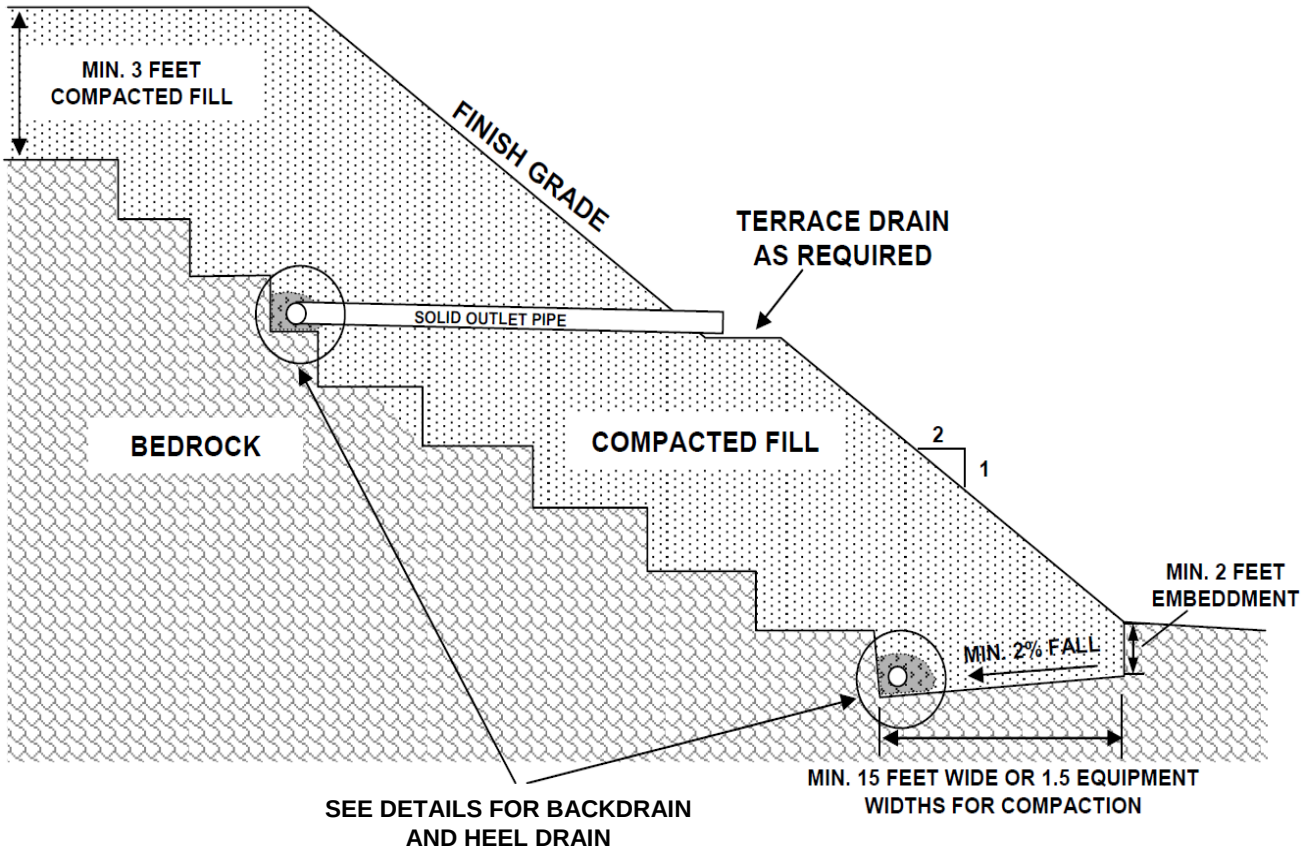
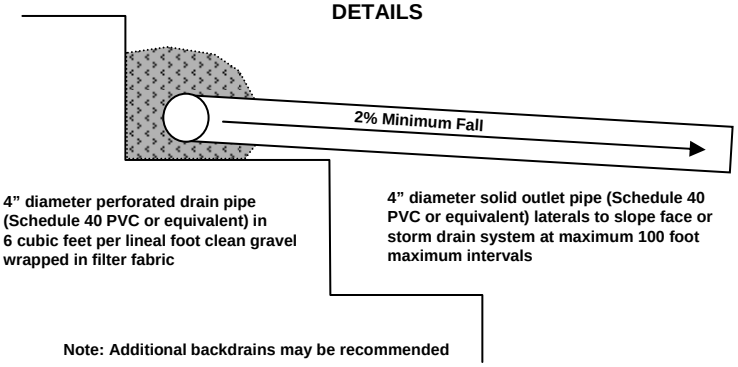


BACKDRAIN DETAILS



4" diameter perforated drain pipe (Schedule 40 PVC or equivalent) in 6 cubic feet per lineal foot clean gravel wrapped in filter fabric

4" diameter solid outlet pipe (Schedule 40 PVC or equivalent) laterals to slope face or storm drain system at maximum 100 foot maximum intervals

Note: Additional backdrains may be recommended

HEEL DRAIN DETAILS

6" diameter perforated drain pipe in 6 cubic feet per lineal foot clean gravel wrapped in filter fabric, outlet pipe to gravity flow with 2% minimum fall

GEOTEK	1548 North Maple Street Corona, California 92880	TYPICAL BUTTRESS AND STABILIZATION FILL	STANDARD GRADING GUIDELINES PLATE E-5