

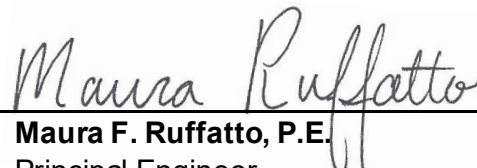
TYPE OF SERVICES	Geotechnical Investigation
PROJECT NAME	Bellarmino College Preparatory New Academic Building
LOCATION	960 W. Hedding Street San Jose, California
CLIENT	Bellarmino College Preparatory
PROJECT NUMBER	596-3-1
DATE	August 23, 2022



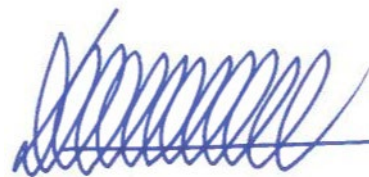
GEOTECHNICAL

Type of Services	Geotechnical Investigation
Project Name	Bellarmino College Preparatory New Academic Building
Location	960 W. Hedding Street San Jose, California
Client	Bellarmino College Preparatory
Client Address	960 West Hedding Street San Jose, California
Project Number	596-3-1
Date	August 23, 2022

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FIGURE 1: VICINITY MAP

FIGURE 2: SITE PLAN

FIGURE 3: REGIONAL FAULT MAP

FIGURE 4A TO 4D: LIQUEFACTION ANALYSIS SUMMARY – CPT-01 TO CPT-04

APPENDIX A: FIELD INVESTIGATION

APPENDIX B: LABORATORY TEST PROGRAM

APPENDIX C: LIQUEFACTION ANALYSES CALCULATIONS

Type of Services	Geotechnical Investigation
Project Name	Bellarmino College Preparatory New Academic Building
Location	960 W. Hedding Street San Jose, California

SECTION 1: INTRODUCTION

This geotechnical report was prepared for the sole use of Bellarmine College Preparatory for the BCP New Academic Building project in San Jose, California. The location of the site is shown on the Vicinity Map, Figure 1. For our use, we were provided with the following documents:

- A conceptual site plan titled, "Bellarmine College Preparatory, New Academic Building, 960 W. Hedding St., San Jose, California," prepared by Devcon Construction Incorporated, dated October 13, 2021.

1.1 PROJECT DESCRIPTION

We understand the project will consist of a new Academic Science Building and the re-location of Berchman Hall. Based on our review of the conceptual site plan provided, the new Academic Building will be a two-story structure with a footprint of approximately 22,900 square feet. Berchman Hall will be re-located approximately 150 to 200 feet southwest of its current location.

Grading information is not available at this time, however, we anticipate cuts and fills on the order of 1 to 2 feet will be required for site grading.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated May 26, 2022 and consisted of field and laboratory programs to evaluate physical and engineering properties of the subsurface soils, engineering analysis to prepare recommendations for site work and grading, building foundations, flatwork, retaining walls, and pavements, and preparation of this report. Brief descriptions of our exploration and laboratory programs are presented below.

1.3 EXPLORATION PROGRAM

Field exploration consisted of three borings drilled on July 18, 2022 with truck-mounted hollow-stem auger drilling equipment and four Cone Penetration Tests (CPTs) advanced on July 1, 2022. The borings were drilled to depths of 30 to 45 feet; the CPTs were advanced to depths of 50 to 100 feet. Seismic shear wave velocity measurements were collected from CPT-2. Three of the borings (Borings EB-1, EB-2, and EB-3) was advanced adjacent to CPT-1, CPT-3, and CPT-4, respectively, for direct evaluation of physical samples to correlated soil behavior.

The borings and CPTs were backfilled with cement grout in accordance with local requirements; exploration permits were obtained as required by local jurisdictions.

The approximate locations of our exploratory borings are shown on the Site Plan, Figure 2. Details regarding our field program are included in Appendix A.

1.4 LABORATORY TESTING PROGRAM

In addition to visual classification of samples, the laboratory program focused on obtaining data for foundation design and seismic ground deformation estimates. Testing included moisture contents, dry densities, washed sieve analyses, Plasticity Index tests, and consolidation tests. Details regarding our laboratory program are included in Appendix B.

1.5 ENVIRONMENTAL SERVICES

Environmental services were not requested for this project. If environmental concerns are determined to be present during future evaluations, the project environmental consultant should review our geotechnical recommendations for compatibility with the environmental concerns.

SECTION 2: REGIONAL SETTING

2.1 GEOLOGICAL SETTING

The site is located within the Santa Clara Valley, which is a broad alluvial plane between the Santa Cruz Mountains to the southwest and west, and the Diablo Range to the northeast. The San Andreas Fault system, including the Monte Vista-Shannon Fault, exists within the Santa Cruz Mountains and the Hayward and Calaveras Fault systems exist within the Diablo Range. Alluvial soil thicknesses in the area of the site are mapped at greater than 500 feet (Rogers & Williams, 1974).

2.2 REGIONAL SEISMICITY

While seismologists cannot predict earthquake events, geologists from the U.S. Geological Survey have recently updated (in 2015) earlier estimates from their 2014 Uniform California Earthquake Rupture Forecast (Version 3; UCERF3) publication. The estimated probability of one or more magnitude 6.7 earthquakes (the size of the destructive 1994 Northridge

earthquake) expected to occur somewhere in the San Francisco Bay Area has been revised (increased) to 72 percent for the period 2014 to 2043 (Aagaard et al., 2016). The faults in the region with the highest estimated probability of generating damaging earthquakes between 2014 and 2043 are the Hayward (33%), Calaveras (26%), and San Andreas Faults (22%). In this 30-year period, the probability of an earthquake of magnitude 6.7 or larger occurring is 22 percent along the San Andreas Fault and 33 percent for the Hayward Fault.

The faults considered capable of generating significant earthquakes are generally associated with the well-defined areas of crustal movement, which trend northwesterly. The table below presents the State-considered active faults within 25 kilometers of the site.

Table 1: Approximate Fault Distances

Fault Name	Distance	
	(miles)	(kilometers)
Hayward (Southeast Extension)	6.6	10.6
Monte Vista-Shannon	6.7	10.8
Calaveras	9.4	15.2
Hayward (Total Length)	9.5	15.3
San Andreas (1906)	10.9	17.5
Sargent	13.9	22.4

A regional fault map is presented as Figure 3, illustrating the relative distances of the site to significant fault zones.

SECTION 3: SITE CONDITIONS

3.1 SURFACE DESCRIPTION

The site is currently occupied by Wade Hall, the current Berchmans Hall, and existing asphalt concrete parking lots and landscaping. The proposed new academic building site is bounded by Liccardo Center and Leontyne Chapel to the east, Elm Street to the south, the existing Berchmans Hall and West Hedding Street to the west, and an existing parking lot to the north. The proposed re-location of Berchmans Hall is southwest of the proposed academic building and is bounded by Elm Street to the east, an existing parking lot to the south and west, and West Hedding Street to the north.

Surface pavements generally consisted of 2 to 8 inches of asphalt concrete over 2 to 6 inches of aggregate base. Based on visual observations, the existing pavements are in fair to good condition.

3.2 SUBSURFACE CONDITIONS

Below the surface pavements, our Exploratory Boring EB-2 encountered approximately 12 feet of undocumented fill consisting of loose to medium dense clayey sand and very stiff lean clay. Boring EB-2 encountered an obstruction at a depth of about 12 feet; original location was abandoned and re-drilled about 5 feet over. Our Exploratory Borings EB-1 and EB-2 did not encounter any undocumented fills below the surface pavements. Beneath the surface pavements and undocumented fill, where encountered, our exploratory borings generally encountered interbedded layers of medium stiff to hard lean clay with varying amounts of sand, medium dense clayey sand with varying amounts of gravel, and loose to medium dense silty sand to depths of about 28 to 32 feet underlain by dense to very dense well graded sand with clay to the terminal boring depths of 30 to 45 feet. Boring EB-1 also encountered a thin layer of medium dense poorly graded sand with silt at a depth of 7 feet. Beneath the terminal boring depths, our CPTs generally encountered medium dense to very dense sands and gravels with varying amounts of clay and silt and stiff to hard clays with varying amounts of sand and silt to the maximum depth explored of 100 feet.

3.2.1 Plasticity/Expansion Potential

We performed one Plasticity Index (PI) test on a representative sample. Test results were used to evaluate expansion potential of surficial soils. The results of the surficial PI test resulted in a PI of 27, indicating moderate expansion potential to wetting and drying cycles.

3.2.2 In-Situ Moisture Contents

Laboratory testing indicated that the in-situ moisture contents within the upper 10 feet range from about 4 percent under to about 6 percent over the estimated laboratory optimum moisture.

3.3 GROUNDWATER

Groundwater was encountered in our exploratory borings at depths ranging from 23 to 29 feet below current grades and inferred from pore pressure dissipation tests in our CPTs at depths ranging from about 18 to 21½ feet below existing grades. All measurements were taken at the time of drilling and may not represent the stabilized levels that can be higher than the initial levels encountered.

We also reviewed groundwater data available online from the website GeoTracker, <https://geotracker.waterboards.ca.gov/>. Nearby monitoring well data indicates that groundwater has been measured at depths of approximately 8½ to 20½ feet at wells located at 795 Stockton Avenue (east of the project site) between 2004 and 2001, at depths of about 12 to 15 feet at 760 West Hedding (northeast of the project site) in 2005, and at depths of about 13 to 28 feet at 901 Emory Street (southeast of the project site) between 2008 and 2015. CGS maps historic high groundwater on the order of 10 to 12 feet below the ground surface.

Based on the above, we recommend a design groundwater depth of 10 feet. Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

SECTION 4: GEOLOGIC HAZARDS

4.1 FAULT SURFACE RUPTURE

As discussed above several significant faults are located within 25 kilometers of the site. The site is not located within a State-designated Alquist Priolo Earthquake Fault Zone, or a Santa Clara County Fault Hazard Zone, or a City of San Jose Potential Hazard Zone. As shown in Figure 3, no known surface expression of fault traces is thought to cross the site; therefore, fault surface rupture hazard is not a significant geologic hazard at the site.

4.2 ESTIMATED GROUND SHAKING

Moderate to severe (design-level) earthquakes can cause strong ground shaking, which is the case for most sites within the Bay Area. A peak ground acceleration (PGA)_M was estimated for analysis using a value equal to $F_{PGA} \times PGA$, as allowed in the 2019 edition of the California Building Code when an exception has been taken per ASCE 7-16, Section 11.4.8. For our liquefaction analysis we used a PGA_M of 0.57g.

4.3 LIQUEFACTION POTENTIAL

The site is within a State-designated Liquefaction Hazard Zone (CGS, San Jose West Quadrangle, 2002) as well as a Santa Clara County Liquefaction Hazard Zone (Santa Clara County, 2003). Our field and laboratory programs addressed this issue by testing and sampling potentially liquefiable layers to depths of at least 50 feet, performing visual classification on sampled materials, evaluating CPT data, and performing various tests to further classify soil properties.

4.3.1 Background

During strong seismic shaking, cyclically induced stresses can cause increased pore pressures within the soil matrix that can result in liquefaction triggering, soil softening due to shear stress loss, potentially significant ground deformation due to settlement within sandy liquefiable layers as pore pressures dissipate, and/or flow failures in sloping ground or where open faces are present (lateral spreading) (NCEER 1998). Limited field and laboratory data is available regarding ground deformation due to settlement; however, in clean sand layers settlement on the order of 2 to 4 percent of the liquefied layer thickness can occur. Soils most susceptible to liquefaction are loose, non-cohesive soils that are saturated and are bedded with poor drainage, such as sand and silt layers bedded with a cohesive cap.

4.3.2 Analysis

As discussed in the “Subsurface” section above, several sand layers were encountered below the design groundwater depth of 10 feet. Following the liquefaction analysis framework in the 2008 monograph, *Soil Liquefaction During Earthquakes* (Idriss and Boulanger, 2008), incorporating updates in *CPT and SPT Based Liquefaction Triggering Procedures* (Boulanger and Idriss, 2014), and in accordance with CDMG Special Publication 117A guidelines (CDMG, 2008) for quantitative analysis, these layers were analyzed for liquefaction triggering and potential post-liquefaction settlement. These methods compare the ratio of the estimated cyclic shaking (Cyclic Stress Ratio - CSR) to the soil’s estimated resistance to cyclic shaking (Cyclic Resistance Ratio - CRR), providing a factor of safety against liquefaction triggering. Factors of safety less than or equal to 1.3 are considered to be potentially liquefiable and capable of post-liquefaction re-consolidation (i.e. settlement).

The CSR for each layer quantifies the stresses anticipated to be generated due to a design-level seismic event, is based on the peak horizontal acceleration generated at the ground surface discussed in the “Estimated Ground Shaking” section above, and is corrected for overburden and stress reduction factors as discussed in the procedure developed by Seed and Idriss (1971) and updated in the 2008 Idriss and Boulanger monograph.

The soil’s CRR is estimated from the in-situ measurements from CPTs and laboratory testing on samples retrieved from our borings. SPT “N” values obtained from hollow-stem auger borings were not used in our analyses, as the “N” values obtained are less reliable in sands below groundwater. The tip pressures are corrected for effective overburden stresses, taking into consideration both the groundwater level at the time of exploration and the design groundwater level, and stress reduction versus depth factors. The CPT method utilizes the soil behavior type index (I_c) to estimate the plasticity of the layers.

The results of our CPT analyses (CPT-1 through CPT-4) are presented on Figures 4A through 4D of this report. Calculations for these CPTs are attached as Appendix C.

4.3.3 Summary

Our analyses indicate that several layers could potentially experience liquefaction triggering that could result in post-liquefaction total settlement at the ground surface ranging from $\frac{1}{4}$ - to $\frac{3}{4}$ -inch based on the Yoshimine (2006) method. As discussed in SP 117A, differential movement for level ground sites over deep soil sites will be up to about two-thirds of the total settlement between independent foundation elements. In our opinion, differential settlements are anticipated to be on the order of $\frac{1}{2}$ -inch or less over a horizontal distance of 30 to 40 feet.

4.3.4 Ground Deformation and Surficial Cracking Potential

The methods used to estimate liquefaction settlements assume that there is a sufficient cap of non-liquefiable material to prevent ground deformation or sand boils. For ground deformation to occur, the pore water pressure within the liquefiable soil layer will need to be great enough to break through the overlying non-liquefiable layer, which could cause significant ground

deformation and settlement. The work of Youd and Garris (1995) indicates that the 10-foot thick layer of non-liquefiable cap is sufficient to prevent ground deformation and significant surficial cracking; therefore, the above total settlement estimates are reasonable.

4.4 LATERAL SPREADING

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically, lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As failure tends to propagate as block failures, it is difficult to analyze and estimate where the first tension crack will form.

There are no open faces within a distance considered susceptible to lateral spreading; therefore, in our opinion, the potential for lateral spreading to affect the site is low.

4.5 SEISMIC SETTLEMENT/UNSATURATED SAND SHAKING

Loose unsaturated sandy soils can settle during strong seismic shaking. As the soils encountered at the site above the design groundwater depth were predominantly stiff to very stiff clays and medium dense to dense sands, in our opinion, the potential for significant differential seismic settlement affecting the proposed improvements is low.

4.6 TSUNAMI/SEICHE

The terms tsunami or seiche are described as ocean waves or similar waves usually created by undersea fault movement or by a coastal or submerged landslide. Tsunamis may be generated at great distance from shore (far field events) or nearby (near field events). Waves are formed, as the displaced water moves to regain equilibrium, and radiates across the open water, similar to ripples from a rock being thrown into a pond. When the waveform reaches the coastline, it quickly raises the water level, with water velocities as high as 15 to 20 knots. The water mass, as well as vessels, vehicles, or other objects in its path create tremendous forces as they impact coastal structures.

Tsunamis have affected the coastline along the Pacific Northwest during historic times. The Fort Point tide gauge in San Francisco recorded approximately 21 tsunamis between 1854 and 1964. The 1964 Alaska earthquake generated a recorded wave height of 7.4 feet and drowned eleven people in Crescent City, California. For the case of a far-field event, the Bay area would have hours of warning; for a near field event, there may be only a few minutes of warning, if any.

A tsunami or seiche originating in the Pacific Ocean would lose much of its energy passing through San Francisco Bay. Based on the mapping of tsunami inundation potential for the San Francisco Bay Area by CGS (conservation.ca.gov/cgs/tsunami/maps), areas most likely to be inundated are marshlands, tidal flats, and former bay margin lands that are now artificially filled, but are still at or below sea level, and are generally within 1½ miles of the shoreline. The site is approximately 10 miles inland from the San Francisco Bay shoreline and is approximately 77 to

80 feet above mean sea level. Therefore, the potential for inundation due to tsunami or seiche is considered low.

4.7 FLOODING

Based on our internet search of the Federal Emergency Management Agency (FEMA) flood map public database, the site is located within Zone D, an area of undetermined, but possible flood hazard. We recommend the project civil engineer be retained to confirm this information and verify the base flood elevation, if appropriate.

The Department of Water Resources (DWR), Division of Safety of Dams (DSOD) compiled a database of Dam Failure Inundation Hazard Maps (DSOD, 2015). The generalized hazard maps were prepared by dam owners as required by the State Office of Emergency Services; they are intended for planning purposes only. Based on our review of these maps, the site is not located within a dam failure inundation area.

SECTION 5: CONCLUSIONS

5.1 SUMMARY

From a geotechnical viewpoint, the project is feasible provided the concerns listed below are addressed in the project design. Descriptions of each concern with brief outlines of our recommendations follow the listed concerns.

- Potential for liquefaction-induced settlements
- Presence of undocumented fill
- Redevelopment considerations
- Shallow groundwater
- Presence of moderately expansive soils

5.1.1 Potential for Liquefaction-Induced Settlements

As discussed, our liquefaction analysis indicates that there is a potential for liquefaction of localized sand layers during a significant seismic event. Although the potential for liquefied sands to vent to the ground surface through cracks in the surficial soils is low, our analysis indicates that liquefaction-induced settlement on the order of ¼- to ¾-inch could occur, resulting in differential settlement up to ½-inch. Foundations should be designed to tolerate the anticipated total and differential settlements. Based on our anticipated foundation loads, it should be feasible to support the proposed buildings on shallow foundations; however, the building foundations will need to be designed to tolerate total and differential settlement due to static loads and liquefaction-induced settlement. Detailed foundation recommendations are presented in the “Foundations” section.

5.1.2 Presence of Undocumented Fill

As discussed above, about 12 feet of undocumented fill was encountered in Boring EB-2. While additional fills were not identified in our other explorations, undocumented fill may be present in other locations at the site as a result of prior development grading; any fills encountered during site grading should be completely removed from within building areas and to a lateral distance of at least 5 feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater. The deeper, undocumented fill encountered at EB-2 may be localized and should be evaluated further at the time of construction. Additional exploratory test pits can be performed to help estimate depths and lateral limits. Provided the fills meet the “Material for Fill” requirements below, the fills may be reused when backfilling the excavations. If materials are encountered that do not meet the requirements, such as debris, wood, trash, those materials should be screened out of the remaining material and be removed from the site. Backfill of excavations should be placed in lifts and compacted in accordance with the “Compaction” section below.

Provided undocumented fills are mitigated by removal and replacement as engineered fill, the potential impact due to undocumented fill should be low.

5.1.3 Redevelopment Considerations

As discussed, the site is currently occupied by existing buildings and appurtenant flatwork, site fixtures, and landscaping. We understand that all of the existing improvements will be demolished for the construction of the building additions. Potential issues that are often associated with redeveloping sites include demolition of existing improvements, abandonment of existing utilities, and undocumented fills. Please refer to the “Earthwork” section below for further recommendations.

5.1.4 Shallow Groundwater

Groundwater was measured in our explorations at depths ranging from approximately 18 to 29 feet below the existing ground surface. As discussed above, we recommend a design groundwater depth of 10 feet. Our experience with similar sites in the vicinity and other projects on campus indicates that shallow groundwater could significantly impact grading and underground construction. These impacts typically consist of potentially wet and unstable pavement subgrade, difficulty achieving compaction, and difficult underground utility installation. Dewatering and shoring of utility trenches may be required in some isolated areas of the site. Detailed recommendations addressing this concern are presented in the “Earthwork” section of this report.

5.1.5 Presence of Moderately Expansive Soils

Moderately expansive surficial soils generally blanket the site. Expansive soils can undergo significant volume change with changes in moisture content. They shrink and harden when dried and expand and soften when wetted. To reduce the potential for damage to the planned structures, slabs-on-grade should have sufficient reinforcement and be supported on a layer of

non-expansive fill; footings should extend below the zone of seasonal moisture fluctuation. In addition, it is important to limit moisture changes in the surficial soils by using positive drainage away from buildings as well as limiting landscaping watering. We recommend that a plug of low-permeability clay soil, sand-cement slurry, or lean concrete be placed within trenches just outside where the trenches pass into building and pavement areas. Detailed grading and foundation recommendations addressing this concern are presented in the following sections.

5.2 PLANS AND SPECIFICATIONS REVIEW

We recommend that we be retained to review the geotechnical aspects of the project structural, civil, and landscape plans and specifications, allowing sufficient time to provide the design team with any comments prior to issuing the plans for construction.

5.3 CONSTRUCTION OBSERVATION AND TESTING

As site conditions may vary significantly between the small-diameter borings performed during this investigation, we also recommend that a Cornerstone representative be present to provide geotechnical observation and testing during earthwork and foundation construction. This will allow us to form an opinion and prepare a letter at the end of construction regarding contractor compliance with project plans and specifications, and with the recommendations in our report. We will also be allowed to evaluate any conditions differing from those encountered during our investigation and provide supplemental recommendations as necessary. For these reasons, the recommendations in this report are contingent of Cornerstone providing observation and testing during construction. Contractors should provide at least a 48-hour notice when scheduling our field personnel.

SECTION 6: EARTHWORK

6.1 SITE DEMOLITION

All existing improvements not to be reused for the current development, including all foundations, flatwork, pavements, utilities, and other improvements should be demolished and removed from the site. Recommendations in this section apply to the removal of these improvements, which are currently present on the site, prior to the start of mass grading or the construction of new improvements for the project.

Cornerstone should be notified prior to the start of demolition and should be present on at least a part-time basis during all backfill and mass grading as a result of demolition. Occasionally, other types of buried structures (wells, cisterns, debris pits, etc.) can be found on sites with prior development. If encountered, Cornerstone should be contacted to address these types of structures on a case-by-case basis.

6.1.1 Demolition of Existing Slabs, Foundations and Pavements

All slabs, foundations, and pavements should be completely removed from within planned building areas.

As an owner value-engineered option, existing slabs, foundations, and pavements that extend into planned flatwork, pavement, or landscape areas may be left in place provided there is at least 3 feet of engineered fill overlying the remaining materials, they are shown not to conflict with new utilities, and that asphalt and concrete more than 10 feet square is broken up to allow subsurface drainage. Future distress and/or higher maintenance may result from leaving these prior improvements in place. A discussion of recycling existing improvements is provided later in this report.

Special care should be taken during the demolition and removal of existing floor slabs, foundations, utilities and pavements to minimize disturbance of the subgrade. Excessive disturbance of the subgrade, which includes either native or previously placed engineered fill, resulting from demolition activities can have serious detrimental effects on planned foundation and paving elements.

Existing foundations are typically mat-slabs, shallow footings, or piers/piles. If slab or shallow footings are encountered, they should be completely removed. If drilled piers are encountered, they should be cut off at an elevation at least 60-inches below proposed footings or the final subgrade elevation, whichever is deeper. The remainder of the drilled pier could remain in place. Foundation elements to remain in place should be surveyed and superimposed on the proposed development plans to determine the potential for conflicts or detrimental impacts to the planned construction. Following review, additional mitigation or planned foundation elements may need to be modified.

6.1.2 Abandonment of Existing Utilities

All utilities should be completely removed from within planned building areas. For any utility line to be considered acceptable to remain within building areas, the utility line must be completely backfilled with grout or sand-cement slurry (sand slurry is not acceptable), the ends outside the building area capped with concrete, and the trench fills either removed and replaced as engineered fill with the trench side slopes flattened to at least 1:1, or the trench fills are determined not to be a risk to the structure. The assessment of the level of risk posed by the particular utility line will determine whether the utility may be abandoned in place or needs to be completely removed. The contractor should assume that all utilities will be removed from within building areas unless provided written confirmation from both the owner and the geotechnical engineer.

Utilities extending beyond the building area may be abandoned in place provided the ends are plugged with concrete, they do not conflict with planned improvements, and that the trench fills do not pose significant risk to the planned surface improvements.

The risk for owners associated with abandoning utilities in place include the potential for future differential settlement of existing trench fills, and/or partial collapse and potential ground loss into utility lines that are not completely filled with grout.

6.2 SITE CLEARING AND PREPARATION

6.2.1 Site Stripping

The site should be stripped of all surface vegetation, and surface and subsurface improvements to be removed within the proposed development area. Demolition of existing improvements is discussed in the prior paragraphs. A detailed discussion of removal of existing fills is provided later in this report. Surface vegetation and topsoil should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight.

6.2.2 Tree and Shrub Removal

Trees and shrubs designated for removal should have the root balls and any roots greater than ½-inch diameter removed completely. Mature trees are estimated to have root balls extending to depths of 2 to 4 feet, depending on the tree size. Significant root zones are anticipated to extend to the diameter of the tree canopy. Grade depressions resulting from root ball removal should be cleaned of loose material and backfilled in accordance with the recommendations in the “Compaction” section of this report.

6.3 MITIGATION OF UNDOCUMENTED FILLS

As discussed above, our Boring EB-2 encountered about 12 feet of undocumented fill. In addition, the site is currently developed and there may be additional fills associated with previous site development across the site. All undocumented fills should be completely removed from within building areas and to a lateral distance of at least 5 feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater. Provided the fills meet the “Material for Fill” requirements below, the fills may be reused when backfilling the excavations. If materials are encountered that do not meet the requirements, such as debris, wood, trash, those materials should be screened out of the remaining material and be removed from the site. Backfill of excavations should be placed in lifts and compacted in accordance with the “Compaction” section below.

Fills extending into planned pavement and flatwork areas may be left in place provided they are determined to be a low risk for future differential settlement and that the upper 12 to 18 inches of fill below pavement subgrade is re-worked and compacted as discussed in the “Compaction” section below.

6.4 TEMPORARY CUT AND FILL SLOPES

The contractor is responsible for maintaining all temporary slopes and providing temporary shoring where required. Temporary shoring, bracing, and cuts/fills should be performed in accordance with the strictest government safety standards. On a preliminary basis, the upper 10 feet at the site may be classified as OSHA Soil Type C materials. A Cornerstone representative should be retained to confirm the preliminary site.

Excavations performed during site demolition and fill removal should be sloped at 3:1 (horizontal:vertical) within the upper 5 feet below building subgrade. Actual excavation inclinations should be reviewed in the field during construction, as needed. Excavations below building subgrade and excavations in pavement and flatwork areas should be sloped in accordance with OSHA soil classification requirements.

6.5 SUBGRADE PREPARATION

After site clearing and demolition is complete, and prior to backfilling any excavations resulting from fill removal or demolition, the excavation subgrade and subgrade within areas to receive additional site fills, slabs-on-grade and/or pavements should be scarified to a depth of 6 inches, moisture conditioned, and compacted in accordance with the “Compaction” section below.

6.6 WET SOIL STABILIZATION GUIDELINES

Native soil and fill materials, especially soils with high fines contents such as clays and silty soils, can become unstable due to high moisture content, whether from high in-situ moisture contents or from winter rains. As the moisture content increases over the laboratory optimum, it becomes more likely the materials will be subject to softening and yielding (pumping) from construction loading or become unworkable during placement and compaction.

As discussed in the “Subsurface” section in this report, the in-situ moisture contents are up to about 6 percent over the estimated laboratory optimum in the upper 10 feet of the soil profile. The contractor should anticipate drying the soils prior to reusing them as fill. In addition, repetitive rubber-tire loading will likely de-stabilize the soils.

There are several methods to address potential unstable soil conditions and facilitate fill placement and trench backfill. Some of the methods are briefly discussed below. Implementation of the appropriate stabilization measures should be evaluated on a case-by-case basis according to the project construction goals and the site conditions.

6.6.1 Scarification and Drying

The subgrade may be scarified to a depth of 6 to 8 inches and allowed to dry to near optimum conditions, if sufficient dry weather is anticipated to allow sufficient drying. More than one round of scarification may be needed to break up the soil clods.

6.6.2 Removal and Replacement

As an alternative to scarification, the contractor may choose to over-excavate the unstable soils and replace them with dry on-site or import materials. A Cornerstone representative should be present to provide recommendations regarding the appropriate depth of over-excavation, whether a geosynthetic (stabilization fabric or geogrid) is recommended, and what materials are recommended for backfill.

6.6.3 Chemical Treatment

Where the unstable area exceeds about 5,000 to 10,000 square feet and/or site winterization is desired, chemical treatment with quicklime (CaO), kiln-dust, or cement may be more cost-effective than removal and replacement. Recommended chemical treatment depths will typically range from 12 to 18 inches depending on the magnitude of the instability.

6.7 MATERIAL FOR FILL

6.7.1 Re-Use of On-site Soils

On-site soils with an organic content less than 3 percent by weight may be reused as general fill. General fill should not have lumps, clods or cobble pieces larger than 6 inches in diameter; 85 percent of the fill should be smaller than 2½ inches in diameter. Minor amounts of oversize material (smaller than 12 inches in diameter) may be allowed provided the oversized pieces are not allowed to nest together and the compaction method will allow for loosely placed lifts not exceeding 12 inches.

6.7.2 Re-Use of On-Site Site Improvements

We anticipate that significant quantities of asphalt concrete (AC) grindings and aggregate base (AB) will be generated during site demolition. If the AC grindings are mixed with the underlying AB to meet Class 2 AB specifications, they may be reused within the new pavement and flatwork structural sections. AC grindings may not be reused within the habitable building areas. Laboratory testing will be required to confirm the grindings meet project specifications.

6.7.3 Potential Import Sources

Imported and non-expansive material should be inorganic with a Plasticity Index (PI) of 15 or less, and not contain recycled asphalt concrete where it will be used within the habitable building areas. To prevent significant caving during trenching or foundation construction, imported material should have sufficient fines. Samples of potential import sources should be delivered to our office at least 10 days prior to the desired import start date. Information regarding the import source should be provided, such as any site geotechnical reports. If the material will be derived from an excavation rather than a stockpile, potholes will likely be required to collect samples from throughout the depth of the planned cut that will be imported. At a minimum, laboratory testing will include PI tests. Material data sheets for select fill materials (Class 2 aggregate base, ¾-inch crushed rock, quarry fines, etc.) listing current laboratory testing data (not older than 6 months from the import date) may be provided for our review without providing a sample. If current data is not available, specification testing will need to be completed prior to approval.

Environmental and soil corrosion characterization should also be considered by the project team prior to acceptance. Suitable environmental laboratory data to the planned import quantity should be provided to the project environmental consultant; additional laboratory testing may be required based on the project environmental consultant's review. The potential import source

should also not be more corrosive than the on-site soils, based on pH, saturated resistivity, and soluble sulfate and chloride testing.

6.7.4 Non-Expansive Fill Using Lime Treatment

As discussed above, non-expansive fill should have a Plasticity Index (PI) of 15 or less. Due to the high clay content and PI of the on-site soil materials, it is not likely that sufficient quantities of non-expansive fill would be generated from cut materials. As an alternative to importing non-expansive fill, chemical treatment can be considered to create non-expansive fill. It has been our experience that for high PI clayey soil will need to be mixed with quicklime (CaO) or approved equivalent to adequately reduce the PI of the on-site soils to 15 or less. If this option is considered, additional laboratory tests should be performed during initial site grading to further evaluate the optimum percentage of quicklime required.

6.8 COMPACTION REQUIREMENTS

All fills, and subgrade areas where fill, slabs-on-grade, and pavements are planned, should be placed in loose lifts 8 inches thick or less and compacted in accordance with ASTM D1557 (latest version) requirements as shown in the table below. In general, clayey soils should be compacted with sheepsfoot equipment and sandy/gravelly soils with vibratory equipment; open-graded materials such as crushed rock should be placed in lifts no thicker than 18 inches and consolidated in place with vibratory equipment. Each lift of fill and all subgrade should be firm and unyielding under construction equipment loading in addition to meeting the compaction requirements to be approved. The contractor (with input from a Cornerstone representative) should evaluate the in-situ moisture conditions, as the use of vibratory equipment on soils with high moistures can cause unstable conditions. General recommendations for soil stabilization are provided in the "Wet Soil Stabilization Guidelines" section of this report. Where the soil's PI is 20 or greater, the expansive soil criteria should be used.

Table 2: Compaction Requirements

Description	Material Description	Minimum Relative Compaction ¹ (percent)	Moisture ² Content (percent)
General Fill (within upper 5 feet)	On-Site Expansive Soils	87 – 92	>3
	Low Expansion Soils	90	>1
General Fill (below a depth of 5 feet)	On-Site Expansive Soils	95	>3
	Low Expansion Soils	95	>1
Trench Backfill	On-Site Expansive Soils	87 – 92	>3
	Low Expansion Soils	90	>1
Trench Backfill (upper 6 inches of subgrade)	On-Site Low Expansion Soils	95	>1
Crushed Rock Fill	¾-inch Clean Crushed Rock	Consolidate In-Place	NA
Non-Expansive Fill	Imported Non-Expansive Fill	90	Optimum
Flatwork Subgrade	On-Site Expansive Soils	87 - 92	>3
	Low Expansion Soils	90	>1
Flatwork Aggregate Base	Class 2 Aggregate Base ³	90	Optimum
Pavement Subgrade	On-Site Expansive Soils	87 - 92	>3
	Low Expansion Soils	95	>1
Pavement Aggregate Base	Class 2 Aggregate Base ³	95	Optimum
Asphalt Concrete	Asphalt Concrete	95 (Marshall)	NA

1 – Relative compaction based on maximum density determined by ASTM D1557 (latest version)

2 – Moisture content based on optimum moisture content determined by ASTM D1557 (latest version)

3 – Class 2 aggregate base shall conform to Caltrans Standard Specifications, latest edition, except that the relative compaction should be determined by ASTM D1557 (latest version)

6.8.1 Construction Moisture Conditioning

Expansive soils can undergo significant volume change when dried then wetted. The contractor should keep all exposed expansive soil subgrade (and also trench excavation side walls) moist until protected by overlying improvements (or trenches are backfilled). If expansive soils are allowed to dry out significantly, re-moisture conditioning may require several days of re-wetting (flooding is not recommended), or deep scarification, moisture conditioning, and re-compaction.

6.9 TRENCH BACKFILL

Utility lines constructed within public right-of-way should be trenched, bedded and shaded, and backfilled in accordance with the local or governing jurisdictional requirements. Utility lines in private improvement areas should be constructed in accordance with the following requirements unless superseded by other governing requirements.

All utility lines should be bedded and shaded to at least 6 inches over the top of the lines with crushed rock ($\frac{3}{8}$ -inch-diameter or greater) or well-graded sand and gravel materials conforming to the pipe manufacturer's requirements. Open-graded shading materials should be consolidated in place with vibratory equipment and well-graded materials should be compacted to at least 90 percent relative compaction with vibratory equipment prior to placing subsequent backfill materials.

General backfill over shading materials may consist of on-site native materials provided they meet the requirements in the "Material for Fill" section, and are moisture conditioned and compacted in accordance with the requirements in the "Compaction" section.

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

On expansive soils sites it is desirable to reduce the potential for water migration into building and pavement areas through the granular shading materials. We recommend that a plug of low-permeability clay soil, sand-cement slurry, or lean concrete be placed within trenches just outside where the trenches pass into building and pavement areas.

6.10 SITE DRAINAGE

6.10.1 Surface Drainage

Ponding should not be allowed adjacent to building foundations, slabs-on-grade, or pavements. Hardscape surfaces should slope at least 2 percent towards suitable discharge facilities; landscape areas should slope at least 3 percent towards suitable discharge facilities. Roof runoff should be directed away from building areas in closed conduits, to approved infiltration facilities, or on to hardscaped surfaces that drain to suitable facilities. Retention, detention or infiltration facilities should be spaced at least 10 feet from buildings, and preferably at least 5 feet from slabs-on-grade or pavements. However, if retention, detention or infiltration facilities are located within these zones, we recommend that these treatment facilities meet the requirements in the Storm Water Treatment Design Considerations section of this report.

6.11 LOW-IMPACT DEVELOPMENT (LID) IMPROVEMENTS

The Municipal Regional Permit (MRP) requires regulated projects to treat 100 percent of the amount of runoff identified in Provision C.3.d from a regulated project's drainage area with low impact development (LID) treatment measures onsite or at a joint stormwater treatment facility. LID treatment measures are defined as rainwater harvesting and use, infiltration,

evapotranspiration, or biotreatment. A biotreatment system may only be used if it is infeasible to implement harvesting and use, infiltration, or evapotranspiration at a project site.

Technical infeasibility of infiltration may result from site conditions that restrict the operability of infiltration measures and devices. Various factors affecting the feasibility of infiltration treatment may create an environmental risk, structural stability risk, or physically restrict infiltration. The presence of any of these limiting factors may render infiltration technically infeasible for a proposed project. To aid in determining if infiltration may be feasible at the site, we provide the following site information regarding factors that may aid in determining the feasibility of infiltration facilities at the site.

- The near-surface soils at the site are clayey and categorized as Hydrologic Soil Group D, and is expected to have infiltration rates of less than 0.2 inches per hour. In our opinion, these clayey soils will significantly limit the infiltration of stormwater.
- Locally, seasonal high groundwater is mapped at a depth of 10 feet, and therefore is expected to be within 10 feet of the base of the infiltration measure.
- The site has a known geotechnical hazard consisting of soils subject to liquefaction; therefore, stormwater infiltration facilities may not be feasible.
- In our opinion, infiltration locations within 10 feet of the buildings would create a geotechnical hazard.

6.11.1 Storm Water Treatment Design Considerations

If storm water treatment improvements, such as shallow bio-retention swales, basins or pervious pavements, are required as part of the site improvements to satisfy Storm Water Quality (C.3) requirements, we recommend the following items be considered for design and construction.

6.11.1.1 General Bioswale Design Guidelines

- If possible, avoid placing bioswales or basins within 10 feet of the building perimeter or within 5 feet of exterior flatwork or pavements. If bioswales must be constructed within these setbacks, the side(s) and bottom of the trench excavation should be lined with 10-mil visqueen to reduce water infiltration into the surrounding expansive clay.
- Bioswales constructed within 3 feet of proposed buildings may be within the foundation zone of influence for perimeter wall loads. Therefore, where bioswales will parallel foundations and will extend below the “foundation plane of influence,” an imaginary 1:1 plane projected down from the bottom edge of the foundation, the foundation will need to be deepened so that the bottom edge of the bioswale filter material is above the foundation plane of influence.

- The bottom of bioswale or detention areas should include a perforated drain placed at a low point, such as a shallow trench or sloped bottom, to reduce water infiltration into the surrounding soils near structural improvements, and to address the low infiltration capacity of the on-site clay soils.

6.11.1.2 Bioswale Infiltration Material

- Gradation specifications for bioswale filter material, if required, should be specified on the grading and improvement plans.
- Compaction requirements for bioswale filter material in non-landscaped areas or in pervious pavement areas, if any, should be indicated on the plans and specifications to satisfy the anticipated use of the infiltration area.
- If bioswales are to be vegetated, the landscape architect should select planting materials that do not reduce or inhibit the water infiltration rate, such as covering the bioswale with grass sod containing a clayey soil base.
- Due to the relatively loose consistency and/or high organic content of many bioswale filter materials, long-term settlement of the bioswale medium should be anticipated. To reduce initial volume loss, bioswale filter material should be wetted in 12-inch lifts during placement to pre-consolidate the material. Mechanical compaction should not be allowed, unless specified on the grading and improvement plans, since this could significantly decrease the infiltration rate of the bioswale materials.
- It should be noted that the volume of bioswale filter material may decrease over time depending on the organic content of the material. Additional filter material may need to be added to bioswales after the initial exposure to winter rains and periodically over the life of the bioswale areas, as needed.

6.11.1.3 Bioswale Construction Adjacent to Pavements

If bio-infiltration swales or basins are considered adjacent to proposed parking lots or exterior flatwork, we recommend that mitigative measures be considered in the design and construction of these facilities to reduce potential impacts to flatwork or pavements. Exterior flatwork, concrete curbs, and pavements located directly adjacent to bio-swales may be susceptible to settlement or lateral movement, depending on the configuration of the bioswale and the setback between the improvements and edge of the swale. To reduce the potential for distress to these improvements due to vertical or lateral movement, the following options should be considered by the project civil engineer:

- Improvements should be setback from the vertical edge of a bioswale such that there is at least 1 foot of horizontal distance between the edge of improvements and the top edge of the bioswale excavation for every 1 foot of vertical bioswale depth, or

- Concrete curbs for pavements, or lateral restraint for exterior flatwork, located directly adjacent to a vertical bioswale cut should be designed to resist lateral earth pressures in accordance with the recommendations in the “Retaining Walls” section of this report, or concrete curbs or edge restraint should be adequately keyed into the native soil or engineered to reduce the potential for rotation or lateral movement of the curbs.

6.12 LANDSCAPE CONSIDERATIONS

Since the near-surface soils are moderately expansive, we recommend greatly reducing the amount of surface water infiltrating these soils near foundations and exterior slabs-on-grade. This can typically be achieved by:

- Using drip irrigation
- Avoiding open planting within 3 feet of the building perimeter or near the top of existing slopes
- Regulating the amount of water distributed to lawns or planter areas by using irrigation timers
- Selecting landscaping that requires little or no watering, especially near foundations.

We recommend that the landscape architect consider these items when developing landscaping plans.

SECTION 7: 2019 CBC SEISMIC DESIGN CRITERIA

7.1 SEISMIC DESIGN CRITERIA

We understand that the project structural design will be based on the 2019 California Building Code (CBC), which provides criteria for the seismic design of buildings in Chapter 16. The “Seismic Coefficients” used to design buildings are established based on a series of tables and figures addressing different site factors, including the time-weighted average shear wave velocity of the top approximately 100 feet (30 meters) of the soil profile (V_{s30}) and mapped spectral acceleration parameters based on distance to the controlling seismic source/fault system.

Shear wave velocity (V_s) measurements were performed while advancing CPT-2, resulting in a time-averaged shear wave velocity for the top 30 meters (V_{s30}) of 260 meters per second. Therefore, we have classified the site as Soil Classification D. Because we used site specific data from our explorations and laboratory testing, the site class should be considered as “determined” for the purposes of estimating the seismic design parameters from the code outlined below. The mapped spectral acceleration parameters S_s and S_1 were calculated using the web-based program ATC Hazards by Locations, located at <https://hazards.atcouncil.org/>, based on the site coordinates presented below and the site classification. ***Recommended values in Table 3 may only be used for design if in the judgement of the project structural***

engineer an exception can be taken per ASCE 7-16 Section 11.4.8. The table below lists the various factors used to determine the seismic coefficients and other parameters.

Table 3: CBC Site Categorization and Site Coefficients

Classification/Coefficient	Design Value
Site Class	D
Site Latitude	37.34251°
Site Longitude	-121.91956°
0.2-second Period Mapped Spectral Acceleration ¹ , S_s	1.5g
1-second Period Mapped Spectral Acceleration ¹ , S_1	0.6g
Short-Period Site Coefficient – F_a	1.0
Long-Period Site Coefficient – F_v	1.7
0.2-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects - S_{MS}	1.5g
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects – S_{M1}	1.02g
0.2-second Period, Design Earthquake Spectral Response Acceleration – S_{DS}	1.0g
1-second Period, Design Earthquake Spectral Response Acceleration – S_{D1}	0.68g
Site Amplification Factor at PGA – F_{PGA}	1.1
Site Modified Peak Ground Acceleration – PGA_M	0.574g

SECTION 8: FOUNDATIONS

8.1 SUMMARY OF RECOMMENDATIONS

In our opinion, the proposed structures may be supported on shallow foundations provided the recommendations in the “Earthwork” section and the sections below are followed.

8.2 SHALLOW FOUNDATIONS

8.2.1 Conventional Shallow Footings

Conventional shallow footings should bear on natural, undisturbed soil or engineered fill, be at least 15 inches wide, and extend at least 18 inches below the lowest adjacent grade. Lowest adjacent grade is defined as the deeper of the following: 1) bottom of the adjacent interior slab-on-grade, or 2) finished exterior grade, excluding landscaping topsoil. The deeper footing embedment is due to the presence of moderately expansive soils and is intended to embed the footing below the zone of significant seasonal moisture fluctuation, reducing the potential for differential movement.

Footings constructed to the above dimensions and in accordance with the “Earthwork” recommendations of this report are capable of supporting maximum allowable bearing pressures of 2,000 psf for dead loads, 3,000 psf for combined dead plus live loads, and 4,000 psf for all loads including wind and seismic. These pressures are based on factors of safety of 3.0, 2.0, and 1.5 applied to the ultimate bearing pressure for dead, dead plus live, and all loads, respectively. These pressures are net values; the weight of the footing may be neglected for the portion of the footing extending below grade (typically, the full footing depth). Top and bottom mats of reinforcing steel should be included in continuous footings to help span irregularities and differential settlement.

8.2.2 Footing Settlement

Structural loads were not provided to us at the time this report was prepared; therefore, we assumed the typical loading in the following table.

Table 4: Assumed Structural Loading

Foundation Area	Range of Assumed Loads
Interior Isolated Column Footing	50 to 100 kips
Exterior Isolated Column Footing	150 to 225 kips
Perimeter Strip Footing	2 to 4 kips per lineal foot

Based on the above loading and the allowable bearing pressures presented above, we estimate that the total static footing settlement will be on the order of ½-inch or less, with less than ½-inch of post-construction differential settlement between adjacent foundation elements. In addition, we estimate that differential seismic movement will be on the order of ½-inch or less over a horizontal distance of 30 to 40 feet, resulting in a total estimated differential footing movement of 1-inch or less between foundation elements, assumed to be on the order of 30 feet. As our footing loads were assumed, we recommend we be retained to review the final footing layout and loading, and verify the settlement estimates above.

8.2.3 Lateral Loading

Lateral loads may be resisted by friction between the bottom of footing and the supporting subgrade, and also by passive pressures generated against footing sidewalls. An ultimate frictional resistance of 0.45 applied to the footing dead load, and an ultimate passive pressure based on an equivalent fluid pressure of 450 pcf may be used in design. The structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate values above. Where footings are adjacent to landscape areas without hardscape, the upper 12 inches of soil should be neglected when determining passive pressure capacity.

8.2.4 Conventional Shallow Footing Construction Considerations

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated

foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the “foundation plane of influence,” an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

Footing excavations should be filled as soon as possible or be kept moist until concrete placement by regular sprinkling to prevent desiccation. A Cornerstone representative should observe all footing excavations prior to placing reinforcing steel and concrete. If there is a significant schedule delay between our initial observation and concrete placement, we may need to re-observe the excavations.

SECTION 9: CONCRETE SLABS AND PEDESTRIAN PAVEMENTS

9.1 INTERIOR SLABS-ON-GRADE

Due to the moderate to high expansion potential of the surficial soils, the proposed slabs-on-grade should be supported on at least 12 inches of non-expansive fill (NEF) to reduce the potential for slab damage due to soil heave. The NEF layer should be constructed over subgrade prepared in accordance with the recommendations in the “Earthwork” section of this report. If moisture-sensitive floor coverings are planned, the recommendations in the “Interior Slabs Moisture Protection Considerations” section below may be incorporated in the project design if desired. If significant time elapses between initial subgrade preparation and slab-on-grade [NEF] construction, the subgrade should be proof-rolled to confirm subgrade stability, and if the soil has been allowed to dry out, the subgrade should be re-moisture conditioned to at least 3 percent over the optimum moisture content.

The structural engineer should determine the appropriate slab reinforcement for the loading requirements and considering the expansion potential of the underlying soils. For unreinforced concrete slabs, ACI 302.1R recommends limiting control joint spacing to 24 to 36 times the slab thickness in each direction, or a maximum of 18 feet.

9.2 INTERIOR SLABS MOISTURE PROTECTION CONSIDERATIONS

The following general guidelines for concrete slab-on-grade construction where floor coverings are planned are presented for the consideration by the developer, design team, and contractor. These guidelines are based on information obtained from a variety of sources, including the American Concrete Institute (ACI) and are intended to reduce the potential for moisture-related problems causing floor covering failures, and may be supplemented as necessary based on project-specific requirements. The application of these guidelines or not will not affect the geotechnical aspects of the slab-on-grade performance.

- Place a minimum 15-mil vapor retarder conforming to ASTM E 1745, Class C requirements or better directly below the concrete slab; the vapor retarder should extend

to the slab edges and be sealed at all seams and penetrations in accordance with manufacturer's recommendations and ASTM E 1643 requirements. A 4-inch-thick capillary break, consisting of crushed rock should be placed below the vapor retarder and consolidated in place with vibratory equipment. The mineral aggregate shall be of such size that the percentage composition by dry weight as determined by laboratory sieves will conform to the following gradation:

Sieve Size	Percentage Passing Sieve
1"	100
3/4"	90 – 100
No. 4	0 – 10
No. 200	0 – 5

The capillary break rock may be considered as the upper 4 inches of the non-expansive fill previously recommended.

- The concrete water:cement ratio should be 0.45 or less. Mid-range plasticizers may be used to increase concrete workability and facilitate pumping and placement.
- Water should not be added after initial batching unless the slump is less than specified and/or the resulting water:cement ratio will not exceed 0.45.
- Polishing the concrete surface with metal trowels is not recommended.
- Where floor coverings are planned, all concrete surfaces should be properly cured.
- Water vapor emission levels and concrete pH should be determined in accordance with ASTM F1869-98 and F710-98 requirements and evaluated against the floor covering manufacturer's requirements prior to installation.

9.3 EXTERIOR FLATWORK

9.3.1 Pedestrian Concrete Flatwork

Exterior concrete flatwork subject to pedestrian and/or occasional light pick up loading should be at least 4 inches thick and supported on at least 6 inches of Class 2 aggregate base overlying subgrade prepared in accordance with the "Earthwork" recommendations of this report. Flatwork that will be subject to heavier or frequent vehicular loading should be designed in accordance with the recommendations in the "Vehicular Pavements" section below. To help reduce the potential for uncontrolled shrinkage cracking, adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. Flatwork should be isolated from adjacent foundations or retaining walls except where limited sections of structural slabs are included to help span irregularities in retaining wall backfill at the transitions between at-grade and on-structure flatwork.

SECTION 10: VEHICULAR PAVEMENTS

10.1 ASPHALT CONCRETE

The following asphalt concrete pavement recommendations tabulated below are based on the Procedure 608 of the Caltrans Highway Design Manual, estimated traffic indices for various pavement-loading conditions, and on a design R-value of 5. The design R-value was chosen based on engineering judgement considering the variable and expansive soil conditions.

Table 5: Asphalt Concrete Pavement Recommendations

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base ¹ (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	7.5	10.0
4.5	2.5	9.5	12.0
5.0	3.0	10.0	13.0
5.5	3.0	12.0	15.0
6.0	3.5	13.0	16.5
6.5	4.0	13.5	17.5

¹Caltrans Class 2 aggregate base; minimum R-value of 78; subgrade R-value of 5

Frequently, the full asphalt concrete section is not constructed prior to construction traffic loading. This can result in significant loss of asphalt concrete layer life, rutting, or other pavement failures. To improve the pavement life and reduce the potential for pavement distress through construction, we recommend the full design asphalt concrete section be constructed prior to construction traffic loading. Alternatively, a higher traffic index may be chosen for the areas where construction traffic will use the pavements.

Asphalt concrete pavements constructed on expansive subgrade where the adjacent areas will not be irrigated for several months after the pavements are constructed may experience longitudinal cracking parallel to the pavement edge. These cracks typically form within a few feet of the pavement edge and are due to seasonal wetting and drying of the adjacent soil. The cracking may also occur during construction where the adjacent grade is allowed to significantly dry during the summer, pulling moisture out of the pavement subgrade. Any cracks that form should be sealed with bituminous sealant prior to the start of winter rains. One alternative to reduce the potential for this type of cracking is to install a moisture barrier at least 24 inches deep behind the pavement curb.

10.2 PORTLAND CEMENT CONCRETE

The Portland Cement Concrete (PCC) pavement recommendations outlined below are based on methods presented in American Concrete Pavement Association (ACPA, 2006). We have provided a few pavement alternatives as an anticipated Average Daily Truck Traffic (ADTT) was

not provided. The following table presents minimum PCC pavements thicknesses for various traffic loading categories and the anticipated maximum Average Daily Truck Traffic (ADTT).

Table 6: PCC Pavement Recommendations

Traffic Category	Minimum PCC Thickness¹ (inches)	Class 2 Aggregate Base (inches)
Maximum ADTT = 3	5.0	6.0
Maximum ADTT = 10	5.5	6.0
Maximum ADTT = 20	6.0	6.0

¹Subgrade design R-Value = 5

The PCC thicknesses above are based on a concrete compressive strength of at least 3,500 psi, and laterally restraining the PCC with curbs or concrete shoulders. Adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. Due to the expansive surficial soils present, we recommend that the construction and expansion joints be dowelled.

10.2.1 Stress Pads for Trash Enclosures

Pads where trash containers will be stored, and where garbage trucks will park while emptying trash containers, should be constructed on Portland Cement Concrete. We recommend that the trash enclosure pads and stress (landing) pads where garbage trucks will store, pick up, and empty trash be increased to a minimum PCC thickness of 7 inches. The compressive strength, underlayment, and construction details should be consistent with the above recommendations for PCC pavements.

10.3 PAVEMENT CUTOFF

Surface water penetration into the pavement section can significantly reduce the pavement life, due to the native expansive clays. While quantifying the life reduction is difficult, a normal 20-year pavement design could be reduced to less than 10 years; therefore, increased long-term maintenance may be required.

It would be beneficial to include a pavement cut-off, such as deepened curbs, redwood-headers, or "Deep-Root Moisture Barriers" that are keyed at least 4 inches into the pavement subgrade. This will help limit the additional long-term maintenance.

SECTION 11: RETAINING WALLS

11.1 STATIC LATERAL EARTH PRESSURES

The structural design of any site retaining wall should include resistance to lateral earth pressures that develop from the soil behind the wall, any undrained water pressure, and surcharge loads acting behind the wall. Provided a drainage system is constructed behind the wall to prevent the build-up of hydrostatic pressures as discussed in the section below, we recommend that the walls with level backfill be designed for the following pressures:

Table 7: Recommended Lateral Earth Pressures

Wall Condition	Lateral Earth Pressure*	Additional Surcharge Loads
Unrestrained – Cantilever Wall	45 pcf	1/3 of vertical loads at top of wall
Restrained – Braced Wall	45 pcf + 8H** psf	1/2 of vertical loads at top of wall

* Lateral earth pressures are based on an equivalent fluid pressure for level backfill conditions

** H is the distance in feet between the bottom of footing and top of retained soil

If adequate drainage cannot be provided behind the wall, an additional equivalent fluid pressure of 40 pcf should be added to the values above for both restrained and unrestrained walls for the portion of the wall that will not have drainage. Damp proofing or waterproofing of the walls may be considered where moisture penetration and/or efflorescence are not desired.

11.2 SEISMIC LATERAL EARTH PRESSURES

11.2.1 Site Walls

The 2019 CBC states that lateral pressures from earthquakes should be considered in the design of basements and retaining walls. At this time, we are not aware of any retaining walls for the project. However, minor landscaping walls (i.e. walls 6 feet or less in height) may be proposed. In our opinion, design of these walls for seismic lateral earth pressures in addition to static earth pressures is not warranted.

11.3 WALL DRAINAGE

11.3.1 At-Grade Site Walls

Adequate drainage should be provided by a subdrain system behind all walls. This system should consist of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with Class 2 Permeable Material per Caltrans Standard Specifications, latest edition. The permeable backfill should extend at least 12 inches out from the wall and to within 2 feet of outside finished grade. Alternatively, 1/2-inch to 3/4-inch crushed rock may be used in place of the Class 2 Permeable Material provided the crushed rock and pipe are enclosed in filter fabric, such as Mirafi 140N or

approved equivalent. The upper 2 feet of wall backfill should consist of compacted on-site soil. The subdrain outlet should be connected to a free-draining outlet or sump.

Miradrain, Geotech Drainage Panels, or equivalent drainage matting can be used for wall drainage as an alternative to the Class 2 Permeable Material or drain rock backfill. Horizontal strip drains connecting to the vertical drainage matting may be used in lieu of the perforated pipe and crushed rock section. The vertical drainage panel should be connected to the perforated pipe or horizontal drainage strip at the base of the wall, or to some other closed or through-wall system such as the TotalDrain system from AmerDrain. Sections of horizontal drainage strips should be connected with either the manufacturer's connector pieces or by pulling back the filter fabric, overlapping the panel dimples, and replacing the filter fabric over the connection. At corners, a corner guard, corner connection insert, or a section of crushed rock covered with filter fabric must be used to maintain the drainage path.

Drainage panels should terminate 18 to 24 inches from final exterior grade. The Miradrain panel filter fabric should be extended over the top of and behind the panel to protect it from intrusion of the adjacent soil.

11.4 BACKFILL

Where surface improvements will be located over the retaining wall backfill, backfill placed behind the walls should be compacted to at least 95 percent relative compaction using light compaction equipment. Where no surface improvements are planned, backfill should be compacted to at least 90 percent. If heavy compaction equipment is used, the walls should be temporarily braced.

11.5 FOUNDATIONS

Retaining walls may be supported on a continuous and or spread footing designed in accordance with the recommendations presented in the "Foundations" section of this report.

SECTION 12: LIMITATIONS

This report, an instrument of professional service, has been prepared for the sole use of Bellarmine College Preparatory specifically to support the design of the BCP New Academic Building project in San Jose, California. The opinions, conclusions, and recommendations presented in this report have been formulated in accordance with accepted geotechnical engineering practices that exist in Northern California at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred.

Recommendations in this report are based upon the soil and groundwater conditions encountered during our subsurface exploration. If variations or unsuitable conditions are encountered during construction, Cornerstone must be contacted to provide supplemental recommendations, as needed.

Bellarmino College Preparatory may have provided Cornerstone with plans, reports and other documents prepared by others. Bellarmine College Preparatory understands that Cornerstone reviewed and relied on the information presented in these documents and cannot be responsible for their accuracy.

Cornerstone prepared this report with the understanding that it is the responsibility of the owner or his representatives to see that the recommendations contained in this report are presented to other members of the design team and incorporated into the project plans and specifications, and that appropriate actions are taken to implement the geotechnical recommendations during construction.

Conclusions and recommendations presented in this report are valid as of the present time for the development as currently planned. Changes in the condition of the property or adjacent properties may occur with the passage of time, whether by natural processes or the acts of other persons. In addition, changes in applicable or appropriate standards may occur through legislation or the broadening of knowledge. Therefore, the conclusions and recommendations presented in this report may be invalidated, wholly or in part, by changes beyond Cornerstone's control. This report should be reviewed by Cornerstone after a period of three (3) years has elapsed from the date of this report. In addition, if the current project design is changed, then Cornerstone must review the proposed changes and provide supplemental recommendations, as needed.

An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Recommendations provided in this report are based on the assumption that Cornerstone will be retained to provide observation and testing services during construction to confirm that conditions are similar to that assumed for design, and to form an opinion as to whether the work has been performed in accordance with the project plans and specifications. If we are not retained for these services, Cornerstone cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of Cornerstone's report by others. Furthermore, Cornerstone will cease to be the Geotechnical-Engineer-of-Record if we are not retained for these services.

SECTION 13: REFERENCES

Aagaard, B.T., Blair, J.L., Boatwright, J., Garcia, S.H., Harris, R.A., Michael, A.J., Schwartz, D.P., and DiLeo, J.S., 2016, Earthquake outlook for the San Francisco Bay region 2014–2043 (ver. 1.1, August 2016): U.S. Geological Survey Fact Sheet 2016–3020, 6 p., <http://dx.doi.org/10.3133/fs20163020>.

ATC Hazards by Location, Hazards by Location, 2020, <https://hazards.atcouncil.org/>

American Concrete Pavement Association (ACPA, 2006). *Design of Concrete Pavement for Streets and Roads*.

ASCE 7-16. American Society of Civil Engineers. (2016). *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*.

Boulanger, R.W. and Idriss, I.M., 2004, Evaluating the Potential for Liquefaction or Cyclic Failure of Silts and Clays, Department of Civil & Environmental Engineering, College of Engineering, University of California at Davis.

Boulanger, R.W. and Idriss, I.M., 2014, CPT and SPT Based Liquefaction Triggering Procedures, Department of Civil & Environmental Engineering, College of Engineering, University of California at Davis, Report No. UCD/GCM-14/01, April 2014

California Building Code, 2019, Structural Engineering Design Provisions, Vol. 2.

California Department of Conservation Division of Mines and Geology, 1998, Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada, International Conference of Building Officials, February, 1998.

California Division of Mines and Geology (2008), "Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A, September.

California Geological Survey, 2002, State of California Seismic Hazard Zones, San Jose West 7.5-Minute Quadrangle, California: Seismic Hazard Zone Report 058.

CGS, (2021), *Earthquake Zones of Required Investigation*. CGS Homepage.
<https://maps.conservation.ca.gov/cgs/EQZApp/app/>

Federal Emergency Management Administration (FEMA), 2009, FIRM City of San Jose, California, Community Panel #0603490233H.

Idriss, I.M., and Boulanger, R.W., 2008, Soil Liquefaction During Earthquakes, Earthquake Engineering Research Institute, Oakland, CA, 237 p.

Ishihara, K., 1985, Stability of Natural Deposits During Earthquakes: Proceedings Eleventh International Conference on Soil Mechanics and Foundation Engineering, San Francisco.

Ishihara, K. and Yoshimine, M., 1992, Evaluation of Settlements in Sand Deposits Following Liquefaction During Earthquakes, *Soils and Foundations*, 32 (1): 173-188.

Ritter, J.R., and Dupre, W.R., 1972, Map Showing Areas of Potential Inundation by Tsunamis in the San Francisco Bay Region, California: San Francisco Bay Region Environment and Resources Planning Study, USGS Basic Data Contribution 52, Misc. Field Studies Map MF-480.

Robertson, P.K., Shao, Lisheng, 2010, Estimation of Seismic Compression in Dry Soils Using the CPT, 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, Paper No. 4.05a, May 24-29, 2010.

Rogers, T.H., and J.W. Williams, 1974 Potential Seismic Hazards in Santa Clara County, California, Special Report No. 107: California Division of Mines and Geology.

Seed, H.B. and I.M. Idriss, 1971, A Simplified Procedure for Evaluation soil Liquefaction Potential: JSMFC, ASCE, Vol. 97, No. SM 9, pp. 1249 – 1274.

Seed, Raymond B., Cetin, K.O., Moss, R.E.S., Kammerer, Ann Marie, Wu, J., Pestana, J.M., Riemer, M.F., Sancio, R.B., Bray, Jonathan D., Kayen, Robert E., and Faris, A., 2003, Recent Advances in Soil Liquefaction Engineering: A Unified and Consistent Framework., University of California, Earthquake Engineering Research Center Report 2003-06.

State of California Department of Transportation, Highway Design Manual, Latest Edition.

Tokimatsu, K., and Seed, H. Bolton, 1987, Evaluation of Settlements in Sands due to Earthquake Shaking, ASCE Journal of Geotechnical Engineering, Vol. 113, August 1987, pp. 861-878.

Working Group on California Earthquake Probabilities, 2015, The Third Uniform California Earthquake Rupture Forecast, Version 3 (UCERF), U.S. Geological Survey Open File Report 2013-1165 (CGS Special Report 228). *KMZ files available at: www.scec.org/ucerf/images/ucerf3_timedep_30yr_probs.kmz*

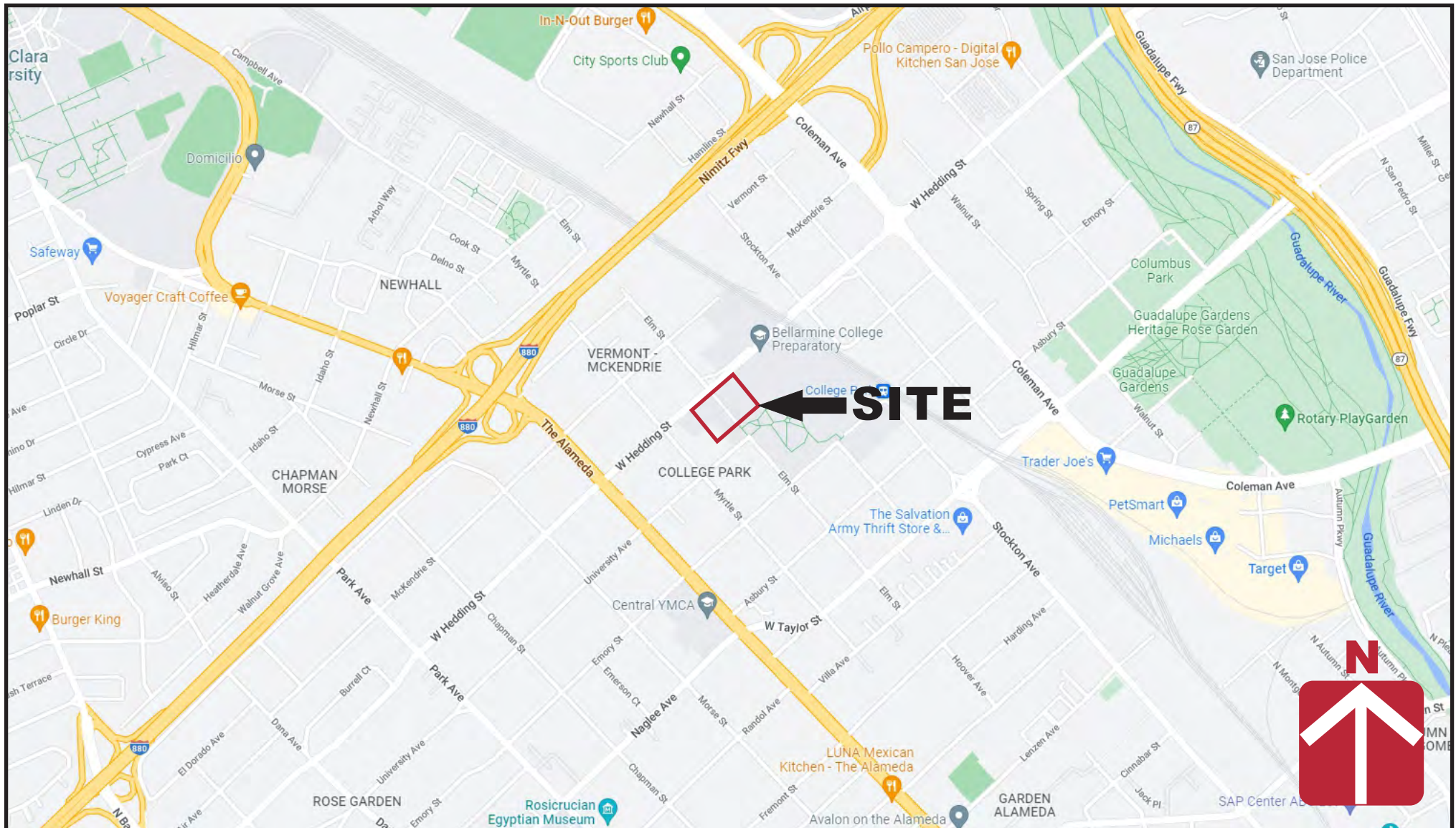
Yoshimine, M., Nishizaki, H., Amano, KI, and Hosono, Y., 2006, Flow Deformation of Liquefied Sand Under Constant Shear Load and Its Application to Analysis of Flow Slide in Infinite Slope, Soil Dynamics and Earthquake Eng. 26, 253-264.

Youd, T.L. and C.T. Garris, 1995, Liquefaction-Induced Ground-Surface Disruption: Journal of Geotechnical Engineering, Vol. 121, No. 11, pp. 805 - 809.

Youd, T.L. and Idriss, I.M., et al, 1997, Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils: National Center for Earthquake Engineering Research, Technical Report NCEER - 97-0022, January 5, 6, 1996.

Youd et al., 2001, "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils," ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vo. 127, No. 10, October, 2001.

Youd, T.L. and Hoose, S.N., 1978, Historic Ground Failures in Northern California Triggered by Earthquakes, United States Geologic Survey Professional Paper 993.



**CORNERSTONE
EARTH GROUP**

Vicinity Map

**Bellarmino College Prep
Academics Building
San Jose, CA**

Project Number

596-3-1

Figure Number

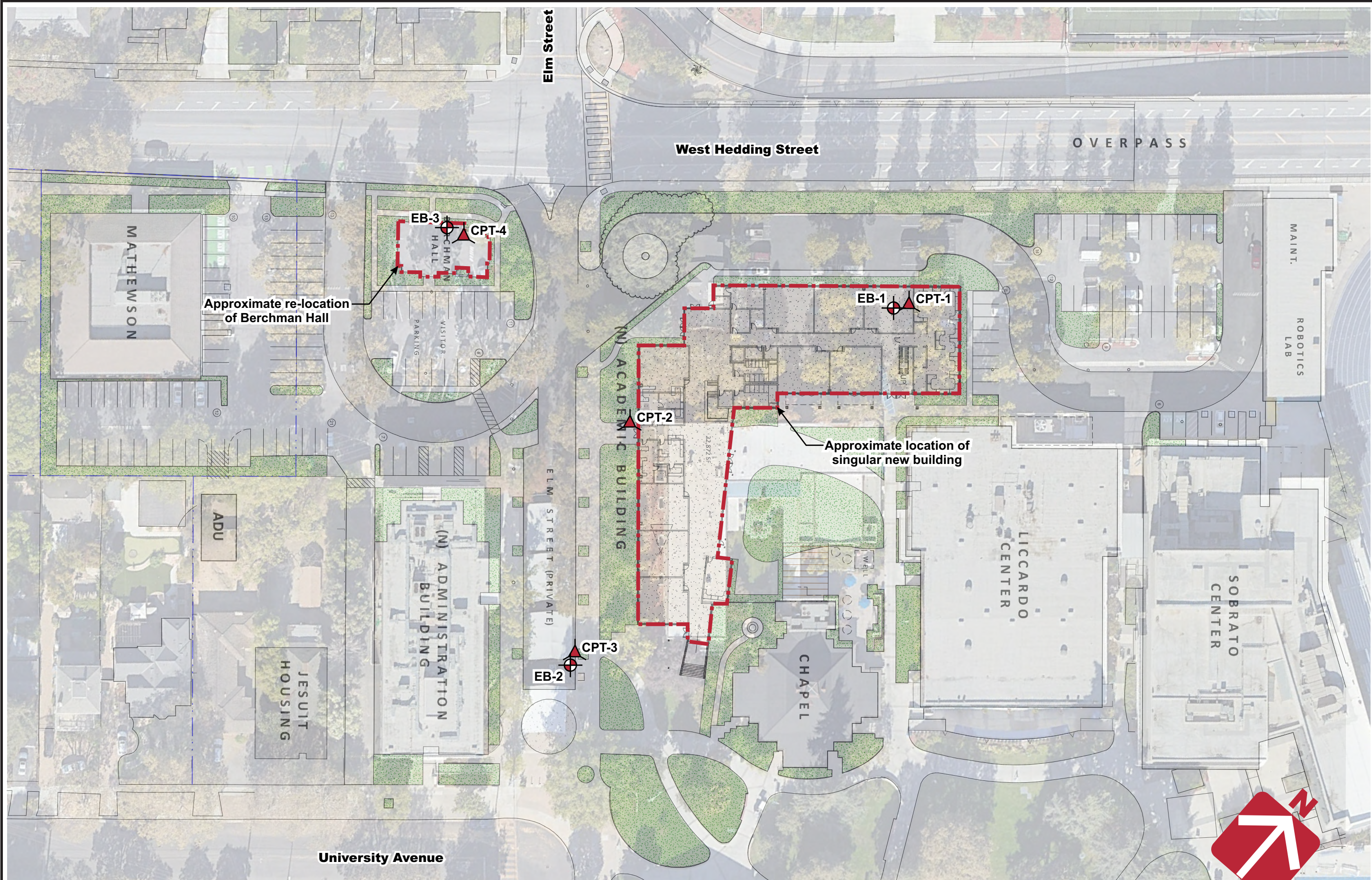
Figure 1

Date

August 2022

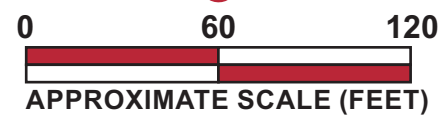
Drawn By

RRN

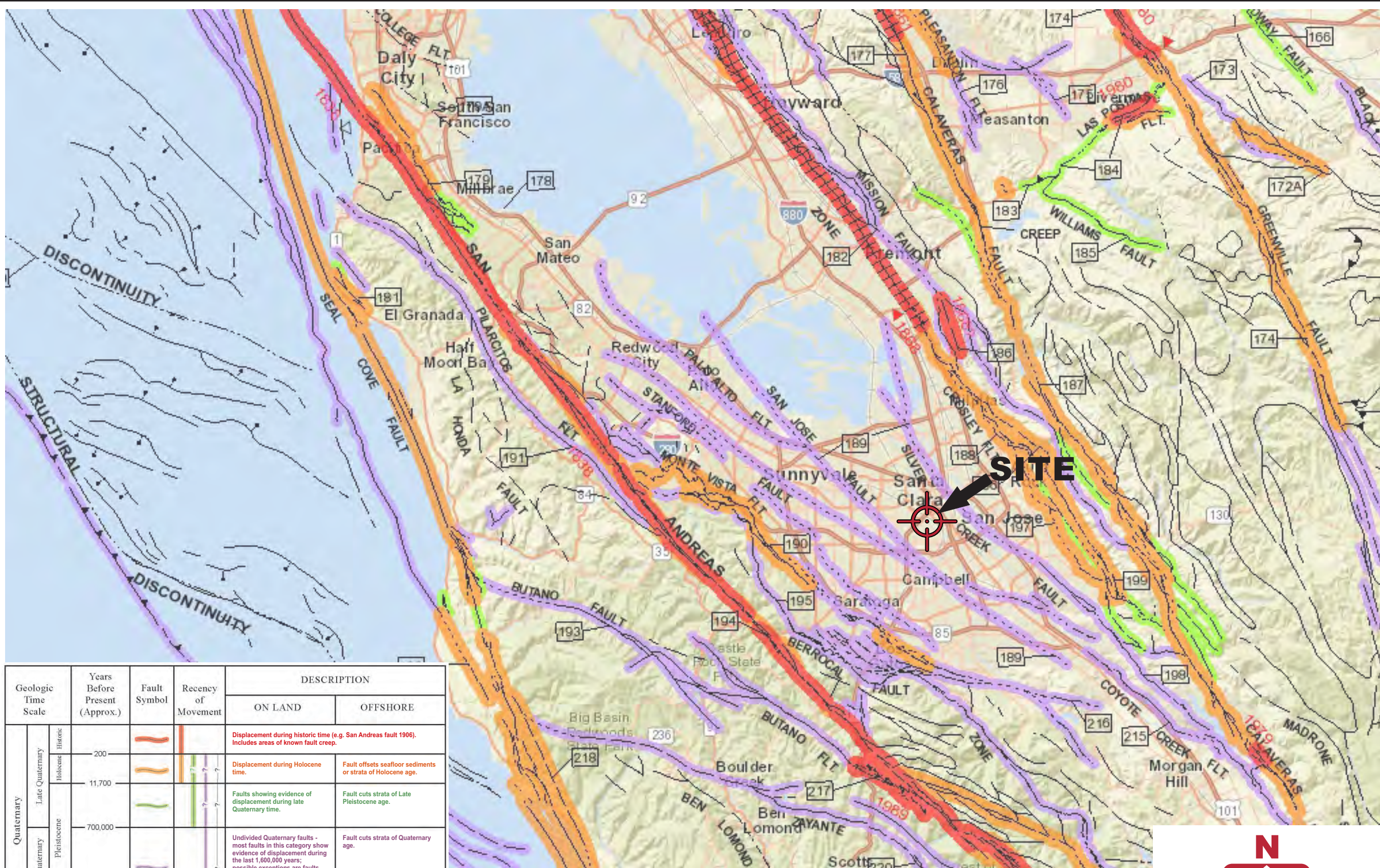


Base by Google Earth, dated 09/04/2020
Overlay by Devcon, Site Plan - Sheet 1, dated 10/13/2021

- Legend**
- Approximate location of exploratory boring (EB)
 - Approximate location of cone penetration test (CPT)

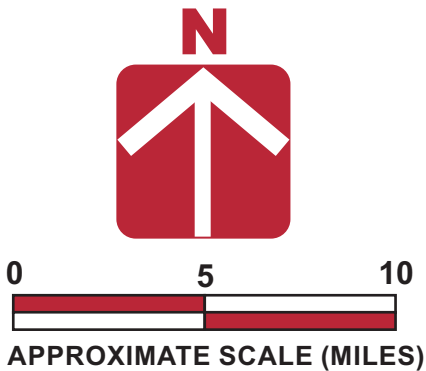


 CORNERSTONE EARTH GROUP	Site Plan	Project Number 596-3-1
	Bellarmine College Prep Academics Building San Jose, CA	Figure Number Figure 2
Date August 2022		Drawn By RRN



Geologic Time Scale		Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
					ON LAND	OFFSHORE
Quaternary	Late Quaternary	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		11,700			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
	Pleistocene	700,000			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
Pre-Quaternary	Early Quaternary	1,600,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
		4.5 billion (Age of Earth)			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.

Base by California Geological Survey - 2010 Fault Activity Map of California (Jennings and Bryant, 2010)



Project Number596-3-1

Figure NumberFigure 3

DateAugust 2022

Drawn ByRRN

Regional Fault Map

Bellarmine College Prep
Academics Building
San Jose, CA

CORNERSTONE
EARTH GROUP



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PROJECT/CPT DATA

Project Title BCP Academic Building

Project No. 596-3-1

Project Manager MFR

SEISMIC PARAMETERS

Controlling Fault San Andreas

Earthquake Magnitude (Mw) 7.9

PGA (Amax) 0.574 (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet) 18

Design Water Depth (feet) 10

Ave. Unit Weight Above GW (pcf) 120

Ave. Unit Weight Below GW (pcf) 125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 10 FEET

0.00 (Inches)

LIQUEFACTION SETTLEMENT FROM 50 FEET

0.72 (Inches)

TOTAL SEISMIC SETTLEMENT 0.7 INCHES

POTENTIAL LATERAL DISPLACEMENT

LDI² 0.00 L/H 1000.0

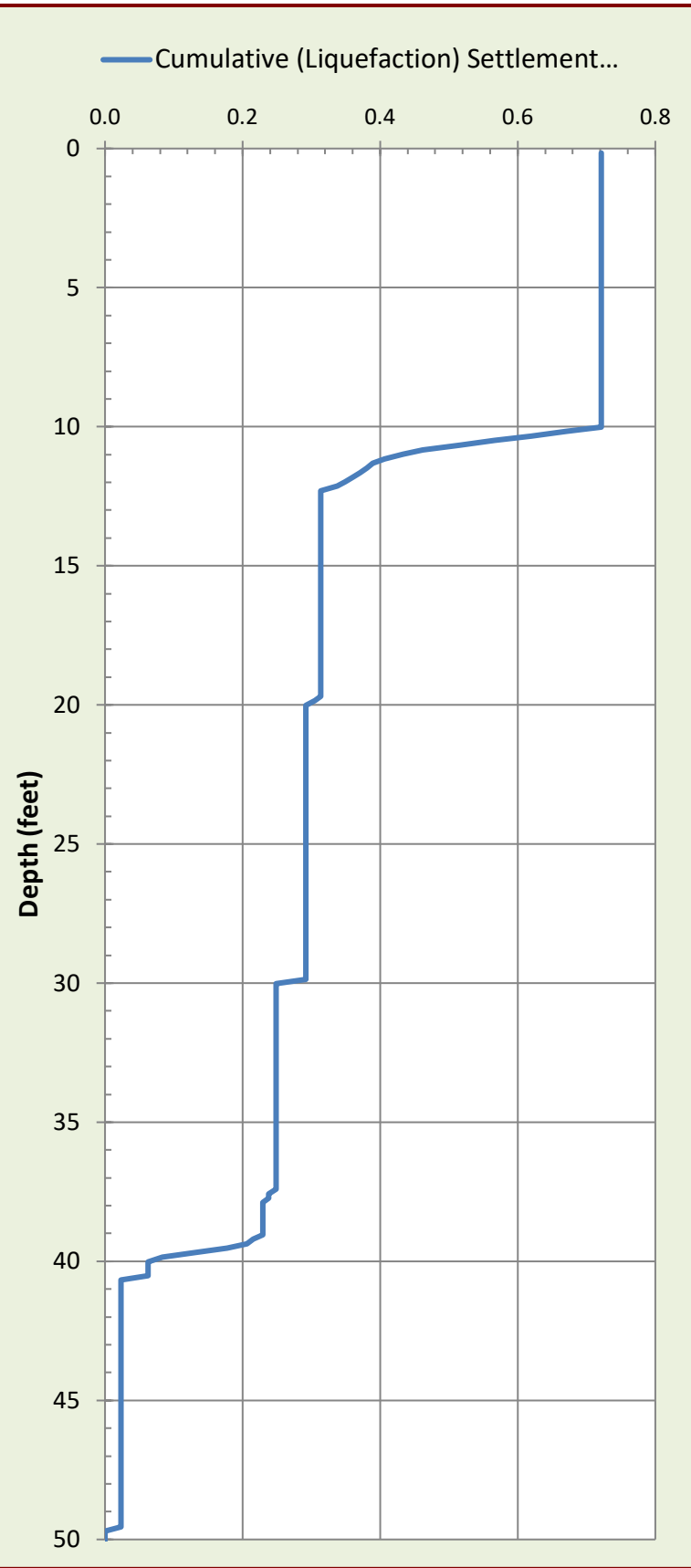
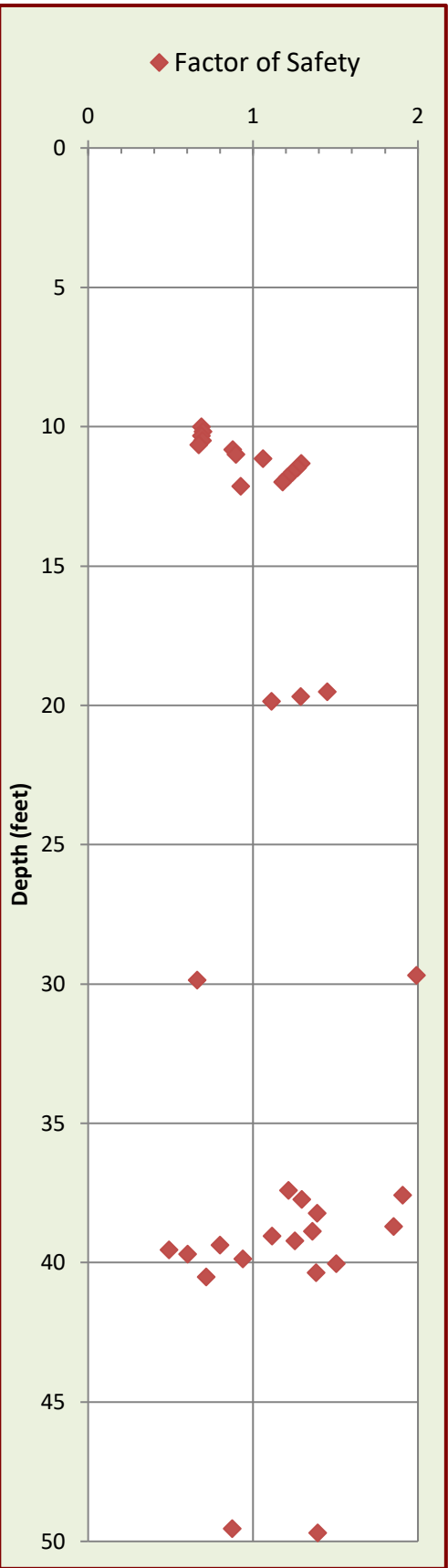
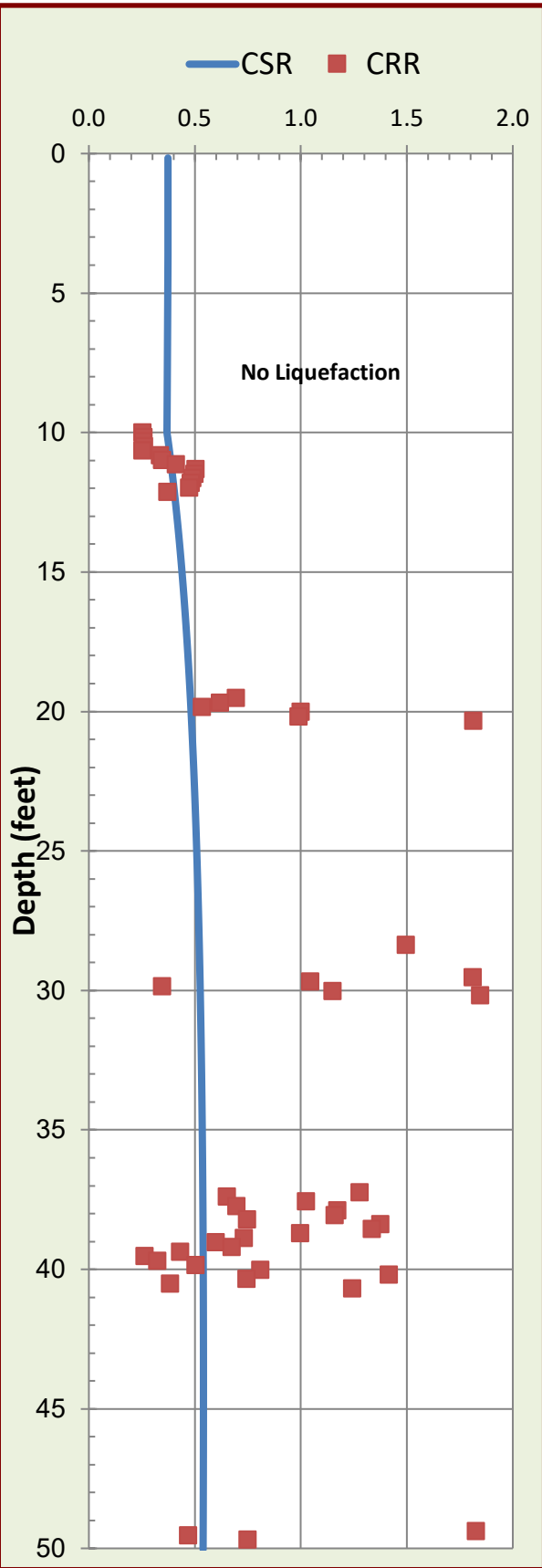
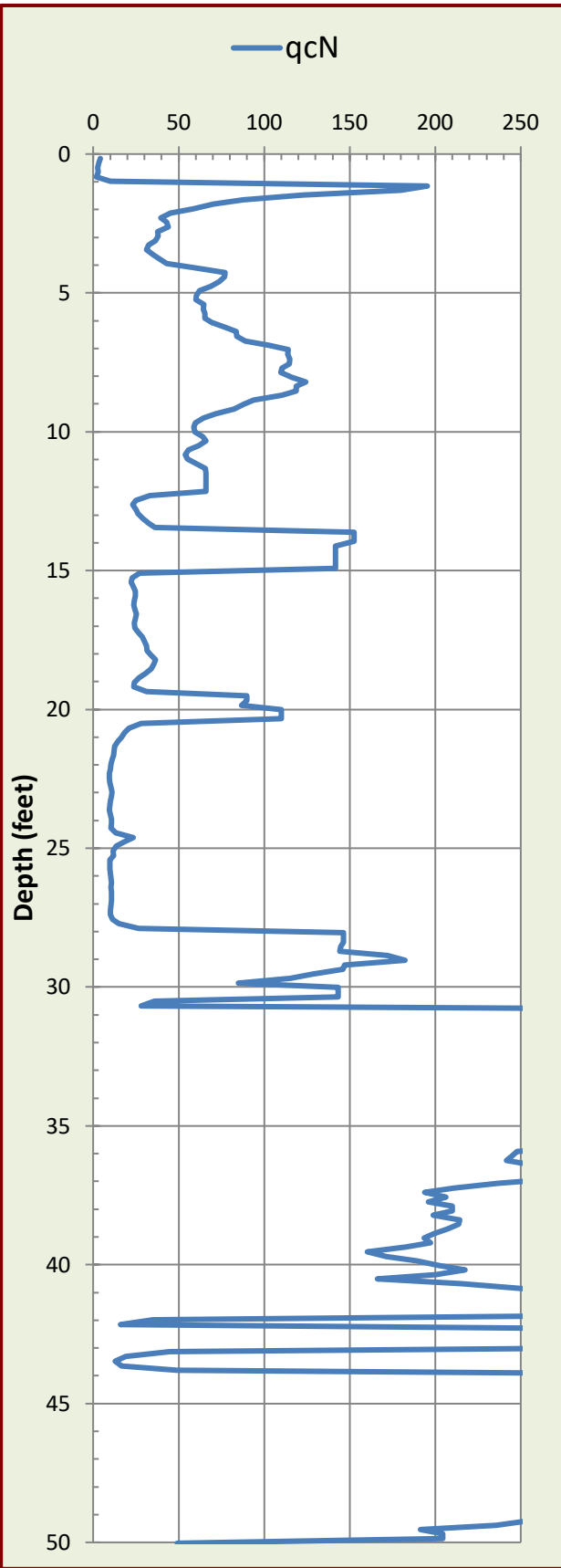
LDI¹ Corrected for Distance 0.00 (4 < L/H < 40)

EXPECTED RANGE OF DISPLACEMENT

0.0 to 0.0 feet

¹Not Valid for L/H Values < 4 and > 40.

²LDI Values Only Summed to 2H Below Grade.





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PROJECT/CPT DATA

Project Title BCP Academic Building

Project No. 596-3-1

Project Manager MFR

SEISMIC PARAMETERS

Controlling Fault San Andreas

Earthquake Magnitude (Mw) 7.9

PGA (Amax) 0.574 (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet) 19

Design Water Depth (feet) 10

Ave. Unit Weight Above GW (pcf) 120

Ave. Unit Weight Below GW (pcf) 125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 10 FEET

0.02 (Inches)

LIQUEFACTION SETTLEMENT FROM 50 FEET

0.36 (Inches)

TOTAL SEISMIC SETTLEMENT 0.4 INCHES

POTENTIAL LATERAL DISPLACEMENT

LDI² 0.00 L/H 1000.0

LDI¹ Corrected for Distance 0.00 (4 < L/H < 40)

EXPECTED RANGE OF DISPLACEMENT

0.0 to 0.0 feet

¹Not Valid for L/H Values < 4 and > 40.

²LDI Values Only Summed to 2H Below Grade.

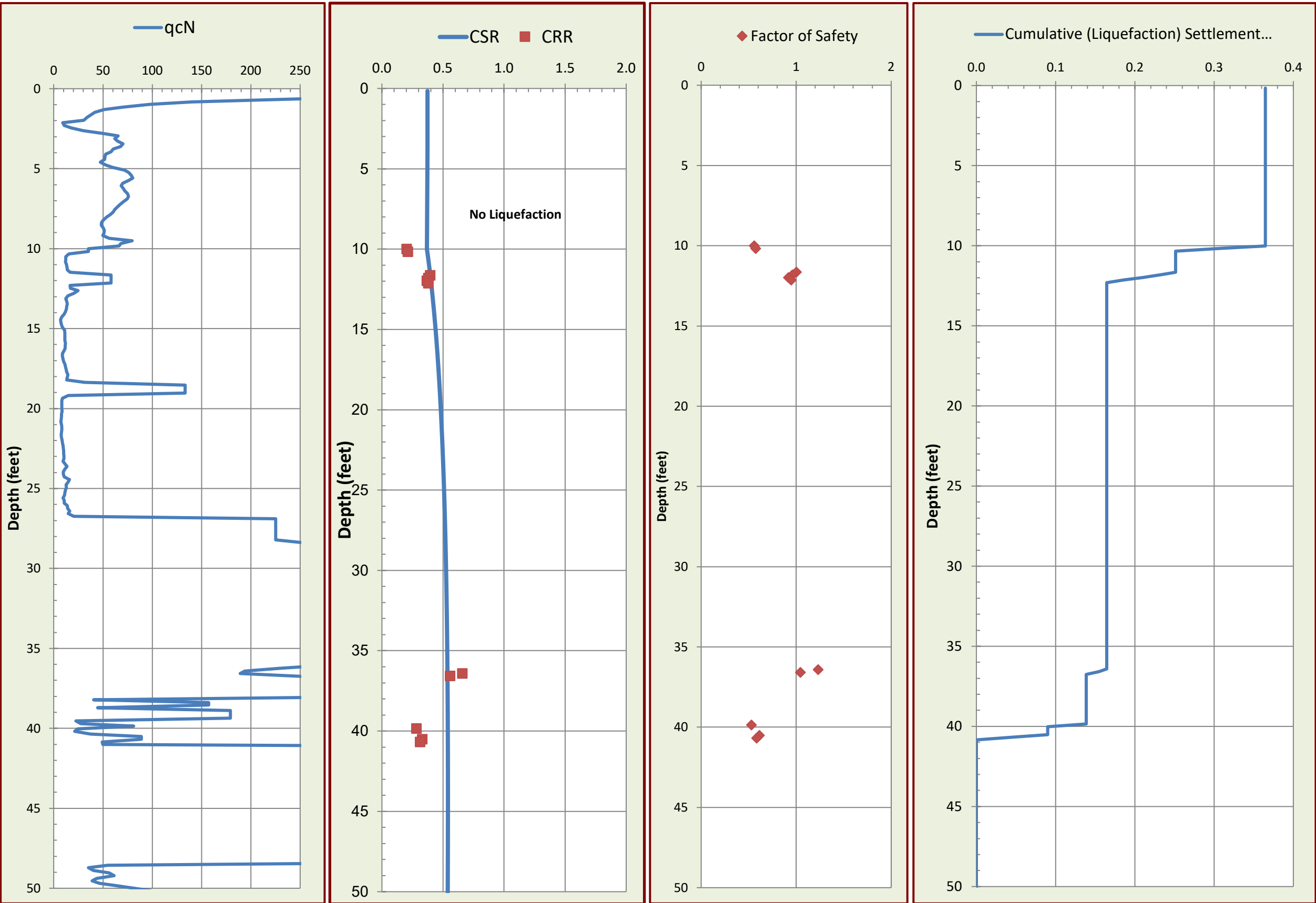




FIGURE 4C

CPT NO. 3

PROJECT/CPT DATA

Project Title BCP Academic Building

Project No. 596-3-1

Project Manager MFR

SEISMIC PARAMETERS

Controlling Fault San Andreas

Earthquake Magnitude (Mw) 7.9

PGA (Amax) 0.574 (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet) 23

Design Water Depth (feet) 10

Ave. Unit Weight Above GW (pcf) 120

Ave. Unit Weight Below GW (pcf) 125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 10 FEET

0.02 (Inches)

LIQUEFACTION SETTLEMENT FROM 50 FEET

0.27 (Inches)

TOTAL SEISMIC SETTLEMENT 0.3 INCHES

POTENTIAL LATERAL DISPLACEMENT

LDI² 0.00 L/H 1000.0

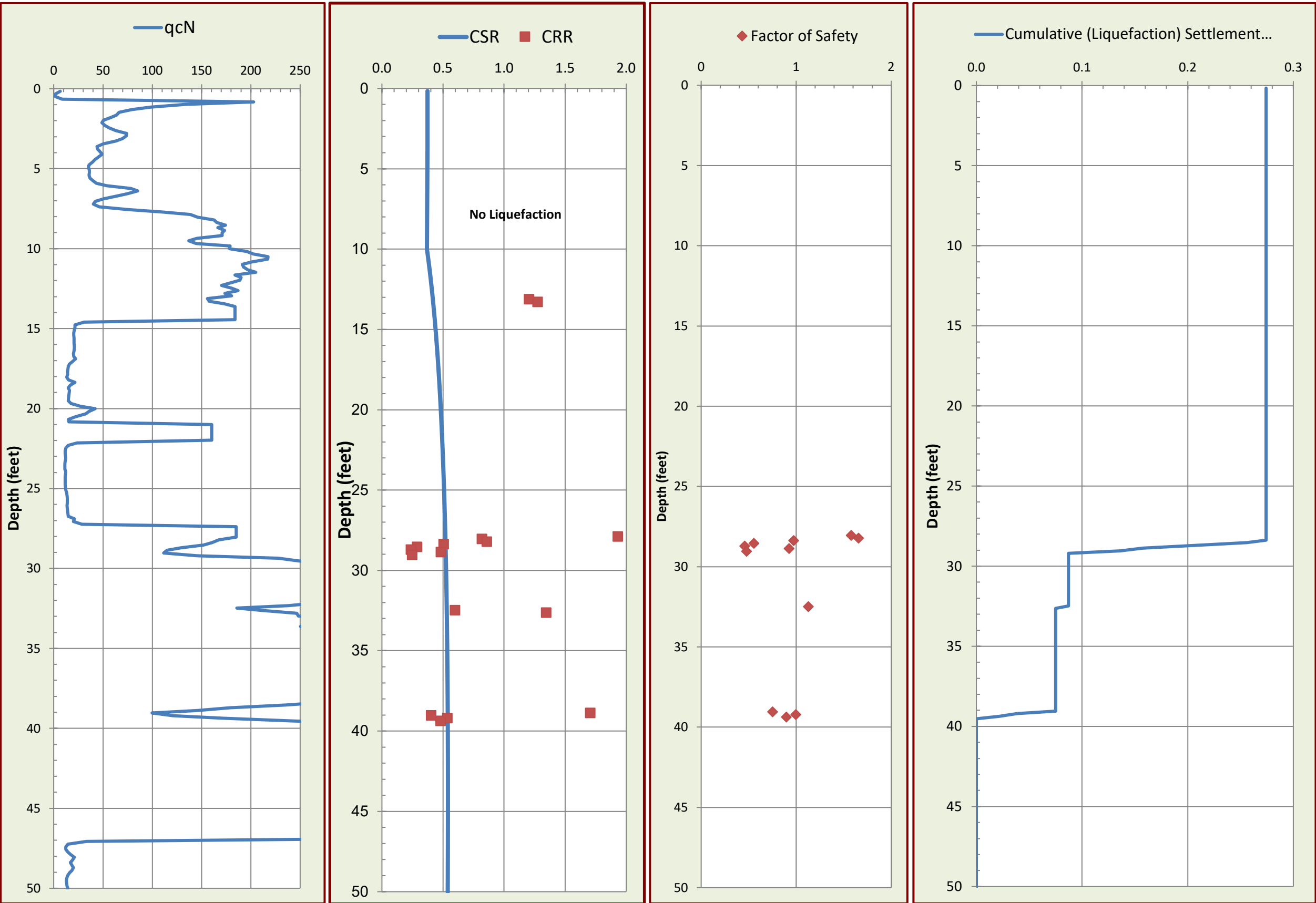
LDI¹ Corrected for Distance 0.00 (4 < L/H < 40)

EXPECTED RANGE OF DISPLACEMENT

0.0 to 0.0 feet

¹Not Valid for L/H Values < 4 and > 40.

²LDI Values Only Summed to 2H Below Grade.





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PROJECT/CPT DATA

Project Title BCP Academic Building

Project No. 596-3-1

Project Manager MFR

SEISMIC PARAMETERS

Controlling Fault San Andreas

Earthquake Magnitude (Mw) 7.9

PGA (Amax) 0.574 (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet) 18

Design Water Depth (feet) 10

Ave. Unit Weight Above GW (pcf) 120

Ave. Unit Weight Below GW (pcf) 125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 10 FEET

0.01 (Inches)

LIQUEFACTION SETTLEMENT FROM 50 FEET

0.21 (Inches)

TOTAL SEISMIC SETTLEMENT 0.2 INCHES

POTENTIAL LATERAL DISPLACEMENT

LDI² 0.00 L/H 1000.0

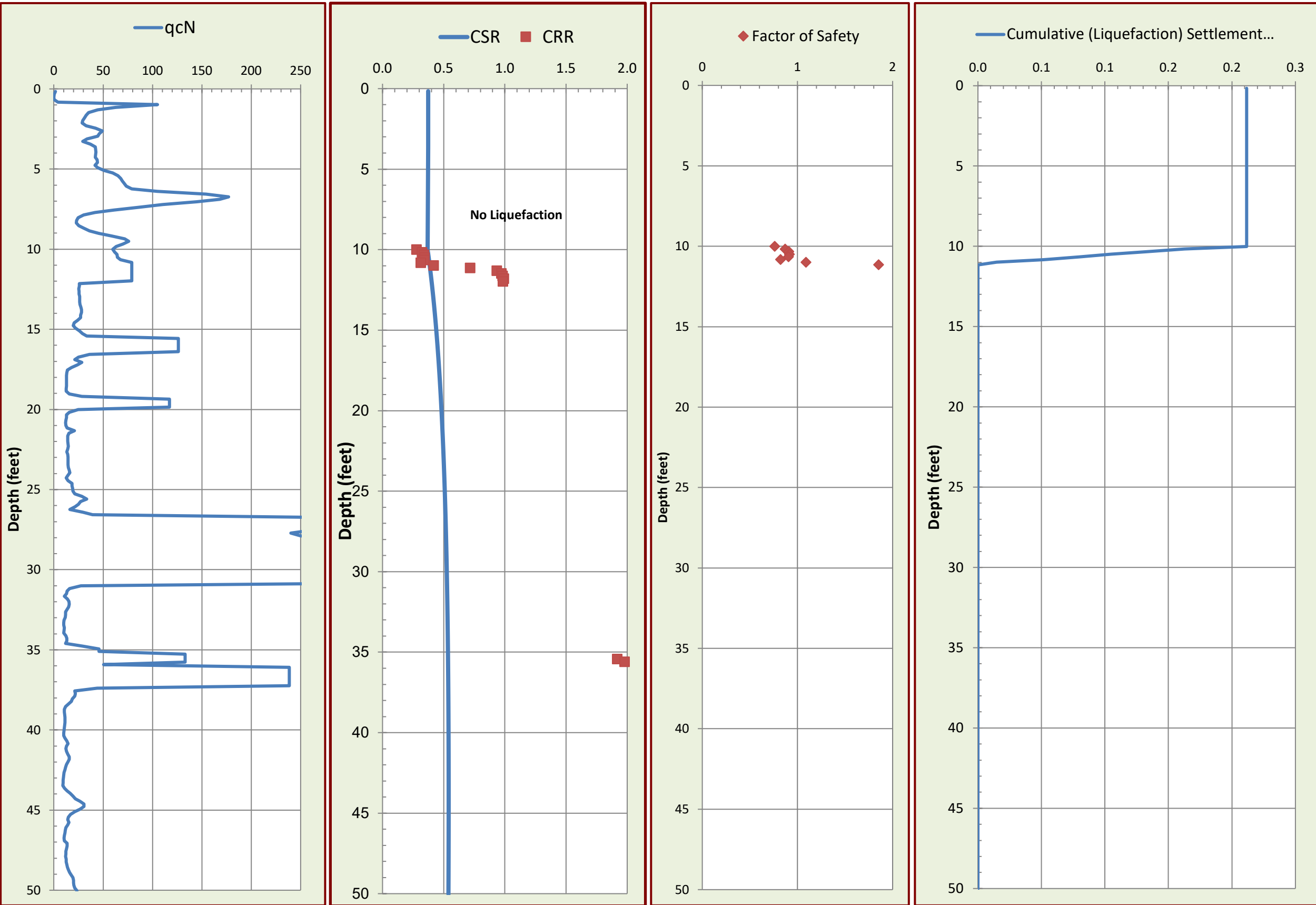
LDI¹ Corrected for Distance 0.00 (4 < L/H < 40)

EXPECTED RANGE OF DISPLACEMENT

0.0 to 0.0 feet

¹Not Valid for L/H Values < 4 and > 40.

²LDI Values Only Summed to 2H Below Grade.



APPENDIX A: FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted, hollow-stem auger drilling equipment and 25-ton truck-mounted Cone Penetration Test equipment. Three 8-inch-diameter exploratory borings were drilled on July 18, 2022 to depths of 30 to 45 feet. Four CPT soundings were also performed in accordance with ASTM D 5778-95 (revised, 2002) on July 1, 2022, to depths ranging from 50 to 100 feet. The approximate locations of exploratory borings and CPTs are shown on the Site Plan, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil and bedrock, are included as part of this appendix.

Boring and CPT locations were approximated using existing site boundaries, a hand held GPS unit, and other site features as references. Boring and CPT elevations were not determined. The locations of the borings and CPTs should be considered accurate only to the degree implied by the method used.

Representative soil samples were obtained from the borings at selected depths. All samples were returned to our laboratory for evaluation and appropriate testing. The standard penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch O.D. split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration (ASTM D1586). 2.5-inch I.D. samples were obtained using a Modified California Sampler driven into the soil with the 140-pound hammer previously described. [Relatively undisturbed samples were also obtained with 2.875-inch I.D. Shelby Tube sampler which were hydraulically pushed.] Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows required to drive the last 12 inches. The various samplers are denoted at the appropriate depth on the boring logs.

The CPT involved advancing an instrumented cone-tipped probe into the ground while simultaneously recording the resistance at the cone tip (q_c) and along the friction sleeve (f_s) at approximately 5-centimeter intervals. Based on the tip resistance and tip to sleeve ratio (R_f), the CPT classified the soil behavior type and estimated engineering properties of the soil, such as equivalent Standard Penetration Test (SPT) blow count, internal friction angle within sand layers, and undrained shear strength in silts and clays. A pressure transducer behind the tip of the CPT cone measured pore water pressure (u_2). Graphical logs of the CPT data is included as part of this appendix.

Field tests included an evaluation of the unconfined compressive strength of the soil samples using a pocket penetrometer device. The results of these tests are presented on the individual boring logs at the appropriate sample depths.

Attached boring and CPT logs and related information depict subsurface conditions at the locations indicated and on the date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring and CPT locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition,

any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

UNIFIED SOIL CLASSIFICATION (ASTM D-2487-98)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND	
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL	
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL	
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL	
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL	
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND	
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND	
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND	
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND	
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY	
			PI>4 AND PLOTS<"A" LINE	ML	SILT	
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT	
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY	
			PI PLOTS <"A" LINE	MH	ELASTIC SILT	
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT	
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT	

OTHER MATERIAL SYMBOLS	
	Poorly-Graded Sand with Clay
	Clayey Sand
	Sandy Silt
	Artificial/Undocumented Fill
	Poorly-Graded Gravelly Sand
	Topsoil
	Well-Graded Gravel with Clay
	Well-Graded Gravel with Silt
	Sand
	Silt
	Well Graded Gravelly Sand
	Gravelly Silt
	Asphalt
	Boulders and Cobble

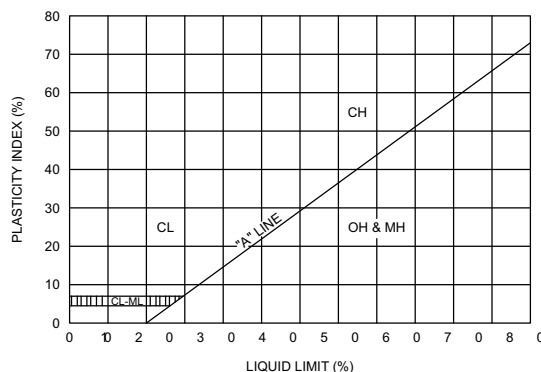
SAMPLER TYPES

	SPT		Shelby Tube
	Modified California (2.5" I.D.)		No Recovery
	Rock Core		Grab Sample

ADDITIONAL TESTS

CA - CHEMICAL ANALYSIS (CORROSIVITY)	PI - PLASTICITY INDEX
CD - CONSOLIDATED DRAINED TRIAXIAL	SW - SWELL TEST
CN - CONSOLIDATION	TC - CYCLIC TRIAXIAL
CU - CONSOLIDATED UNDRAINED TRIAXIAL	TV - TORVANE SHEAR
DS - DIRECT SHEAR	UC - UNCONFINED COMPRESSION
PP - POCKET PENETROMETER (TSF)	(1.5) - (WITH SHEAR STRENGTH IN KSF)
(3.0) - (WITH SHEAR STRENGTH IN KSF)	
RV - R-VALUE	UU - UNCONSOLIDATED UNDRAINED TRIAXIAL
SA - SIEVE ANALYSIS: % PASSING #200 SIEVE	
- WATER LEVEL	

PLASTICITY CHART



PENETRATION RESISTANCE (RECORDED AS BLOWS / FOOT)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** UNDRAINED SHEAR STRENGTH IN KIPS/SQ.FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.



CORNERSTONE EARTH GROUP

BORING NUMBER EB-1

PAGE 1 OF 2

DATE STARTED 7/18/22 DATE COMPLETED 7/18/22

DRILLING CONTRACTOR Exploration Geoservices Inc.

DRILLING METHOD Mobile B-61, 8 inch Hollow-Stem Auger

LOGGED BY RA

NOTES

PROJECT NAME BCP Academic Building

PROJECT NUMBER 596-3-1

PROJECT LOCATION San Jose, CA

GROUND ELEVATION BORING DEPTH 45 ft.

LATITUDE 37.342909° LONGITUDE -121.919362°

GROUND WATER LEVELS:

▼ AT TIME OF DRILLING 29 ft.

▼ AT END OF DRILLING 29 ft.

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)

DEPTH (ft)

SYMBOL

DESCRIPTIONN-Value (uncorrected)
blows per footSAMPLES
TYPE AND NUMBERDRY UNIT WEIGHT
pcfNATURAL
MOISTURE CONTENT

PLASTICITY INDEX, %

PERCENT PASSING
No. 200 SIEVEUNDRAINED SHEAR STRENGTH,
ksf

○ HAND PENETROMETER

△ TORVANE

● UNCONFINED COMPRESSION

▲ UNCONSOLIDATED-UNDRAINED
TRIAXIAL

1.0 2.0 3.0 4.0

2 inches asphalt over 6 inches aggregate base

Lean Clay with Sand (CL)
hard, moist, dark brown, fine to medium sand, moderate plasticity
Liquid Limit = 48, Plastic Limit = 21**Sandy Lean Clay (CL)**
hard, moist, brown with gray mottles, fine to medium sand, low plasticity**Clayey Sand (SC)**
medium dense, moist, brown, fine to medium sand, low plasticity**Poorly Graded Sand with Silt (SP-SM)**
medium dense, moist, brown, fine to medium sand, some coarse sand**Silty Sand (SM)**
medium dense, moist, brown, fine sand**Sandy Lean Clay (CL)**
very stiff, moist, brown with gray mottles, fine to medium sand, low plasticity**Lean Clay (CL)**
very stiff, moist, brown with gray mottles, some fine sand, moderate plasticity

becomes hard

Silty Sand (SM)
medium dense, moist, brown, fine sand**Lean Clay (CL)**
stiff, moist, brown with gray mottles, some fine sand, moderate plasticity

Continued Next Page



PAGE 1 OF 2

NOTES Moved over 5 feet due to obstruction at 12 feet.

GROUND WATER LEVELS:

▼ AT END OF DRILLING 23 ft.



CORNERSTONE EARTH GROUP

BORING NUMBER EB-3

PAGE 1 OF 2

DATE STARTED 7/18/22 DATE COMPLETED 7/18/22

DRILLING CONTRACTOR Exploration Geoservices Inc.

DRILLING METHOD Mobile B-61, 8 inch Hollow-Stem Auger

LOGGED BY RA

NOTES

PROJECT NAME BCP Academic Building

PROJECT NUMBER 596-3-1

PROJECT LOCATION San Jose, CA

GROUND ELEVATION BORING DEPTH 30 ft.

LATITUDE 37.342490° LONGITUDE -121.920240°

GROUND WATER LEVELS:

AT TIME OF DRILLING 24 ft.

AT END OF DRILLING 24 ft.

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ELEVATION (ft)

DEPTH (ft)

SYMBOL

DESCRIPTION

N-Value (uncorrected)
blows per foot

SAMPLES
TYPE AND NUMBER

DRY UNIT WEIGHT
PCF

NATURAL
MOISTURE CONTENT

PLASTICITY INDEX, %

PERCENT PASSING
No. 200 SIEVE

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL

0 6 inches asphalt concrete over 2 inches aggregate base
Lean Clay with Sand (CL)
hard, moist, dark brown, fine to medium sand, moderate plasticity
Lean Clay with Sand (CL)
hard, brown and gray mottled, fine sand, moderate plasticity
5 Sandy Lean Clay (CL)
very stiff, moist, brown, fine sand, low plasticity
becomes hard
10 Silty Sand (SM)
medium dense, moist, brown, fine sand
Lean Clay with Sand (CL)
hard, gray with brown mottles, fine sand, moderate plasticity
15 becomes stiff
20 Clayey Sand (SC)
medium dense, moist, brown, fine to medium sand
Silty Sand (SM)
loose, moist, brown, fine to medium sand
25

N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf ○ HAND PENETROMETER △ TORVANE ● UNCONFINED COMPRESSION ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
28	MC-1B	106	17			>4.5
39	MC-2B	110	15			>4.5
18	MC-3B	89	13		51	
24	MC-4B	97	17			
15	SPT-5B		14			
26	MC-6B	113	17			
39	MC-7B	106	16			
18	MC-8B	105	16			

Continued Next Page



CORNERSTONE EARTH GROUP

BORING NUMBER EB-3

PAGE 2 OF 2

PROJECT NAME BCP Academic BuildingPROJECT NUMBER 596-3-1PROJECT LOCATION San Jose, CA

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf ○ HAND PENETROMETER △ TORVANE ● UNCONFINED COMPRESSION ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL 1.0 2.0 3.0 4.0				
			Lean Clay (CL) stiff, moist, brown, some fine sand, moderate plasticity											
			Well Graded Sand with Clay (SW-SC) very dense, moist, gray and brown, fine to medium sand, some fine subangular to subrounded gravel	50 6"	MC-9B	112	14							
	30		Bottom of Boring at 30.0 feet.											
	35													
	40													
	45													
	50													
	55													

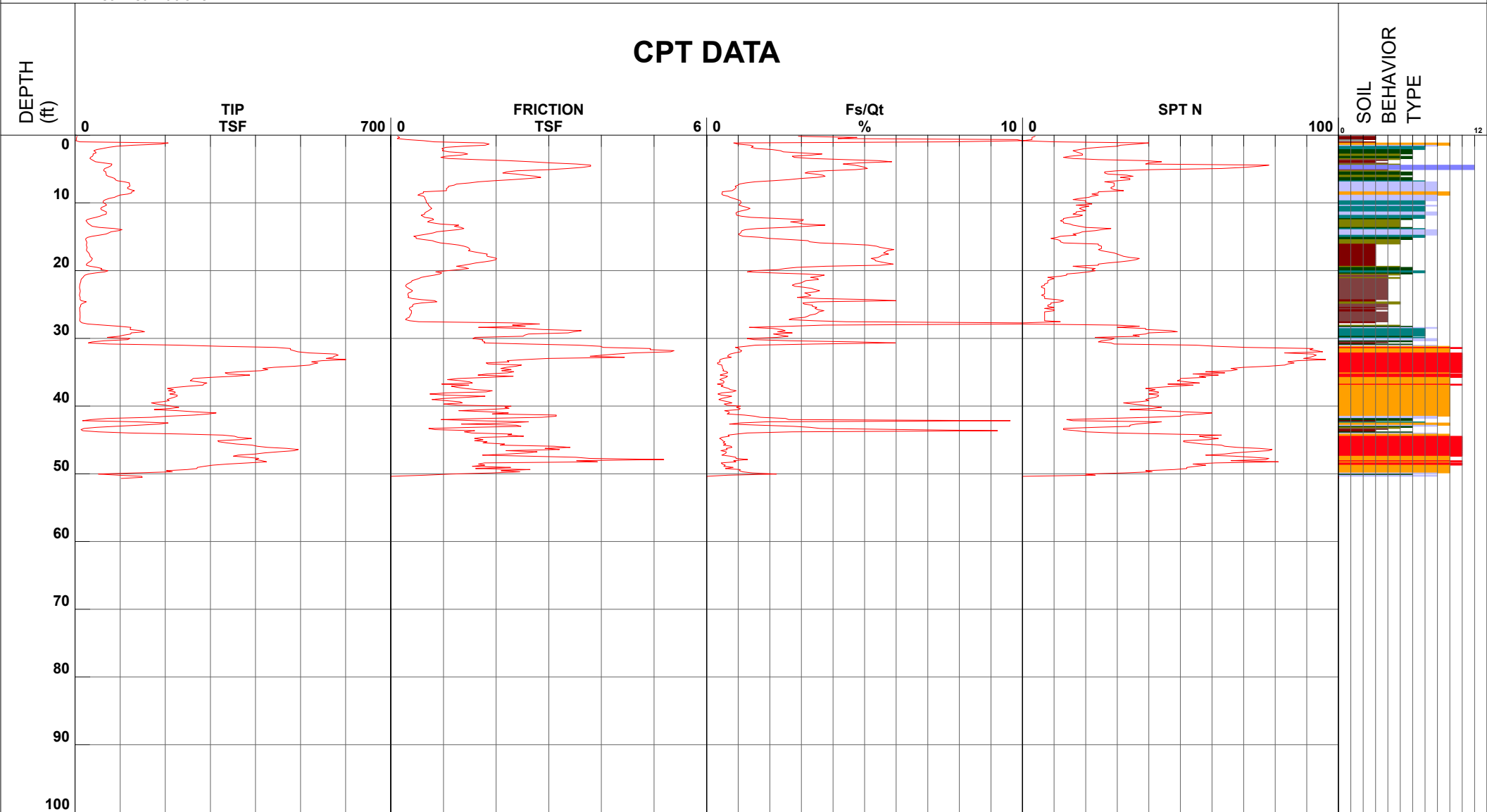


Cornerstone Earth Group

Project Bellarmine College Prep Academic Bldg Operator JM-GM
Job Number 596-3-1 Cone Number DDG1589
Hole Number CPT-01 Date and Time 7/1/2022 12:37:04 PM
EST GW Depth During Test 18.00 ft

Filename SDF(245).cpt
GPS
Maximum Depth 50.69 ft

Net Area Ratio .8



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

Cone Size 15cm squared

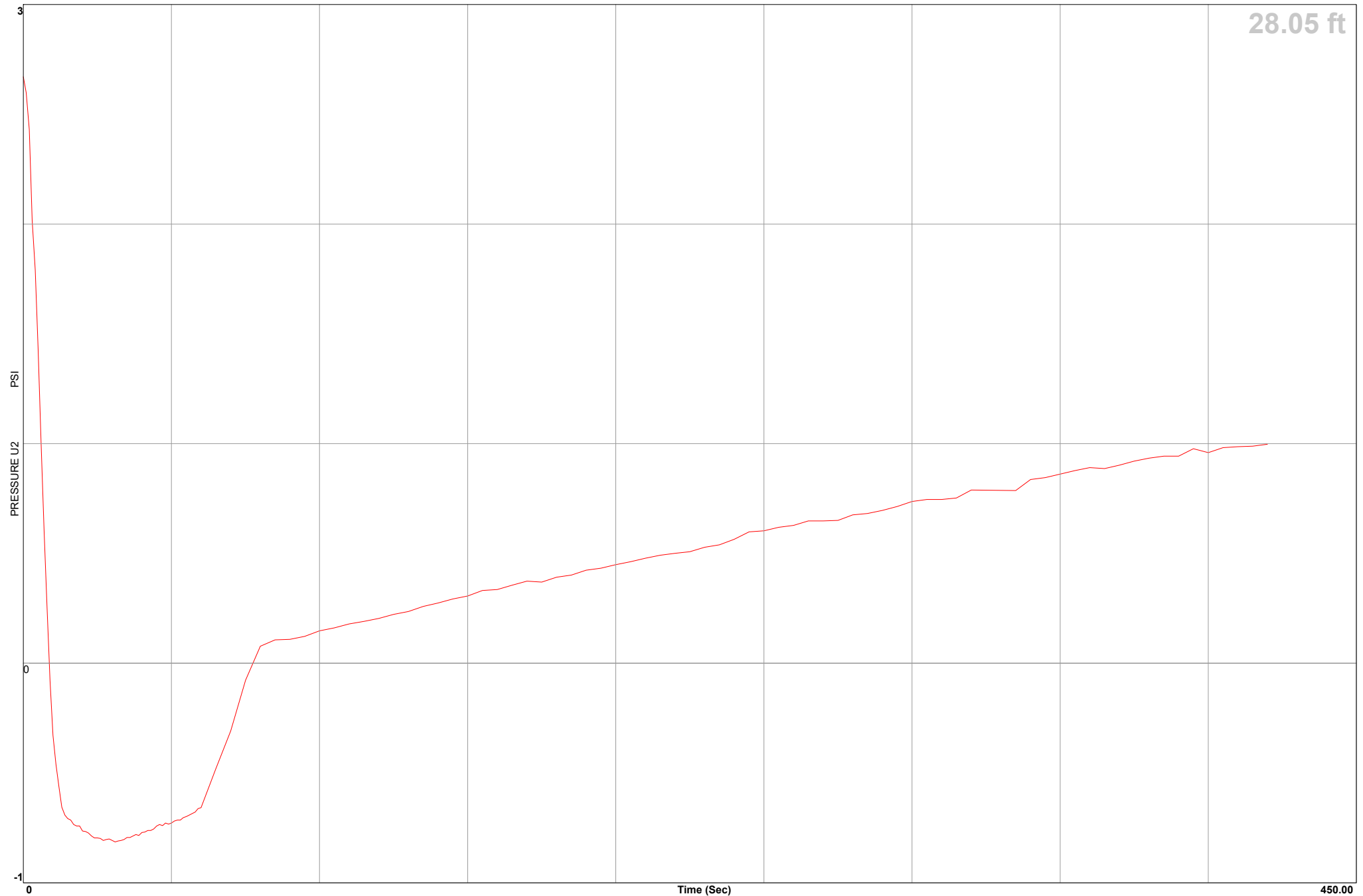
S*Soil behavior type and SPT based on data from UBC-1983



Cornerstone Earth Group

Location	Bellarmino College Prep Academic Bldg	Operator	JM-GM
Job Number	596-3-1	Cone Number	DDG1589
Hole Number	CPT-01	Date and Time	7/1/2022 12:37:04 PM
Equilized Pressure	1.0	EST GW Depth During Test	18.0

GPS





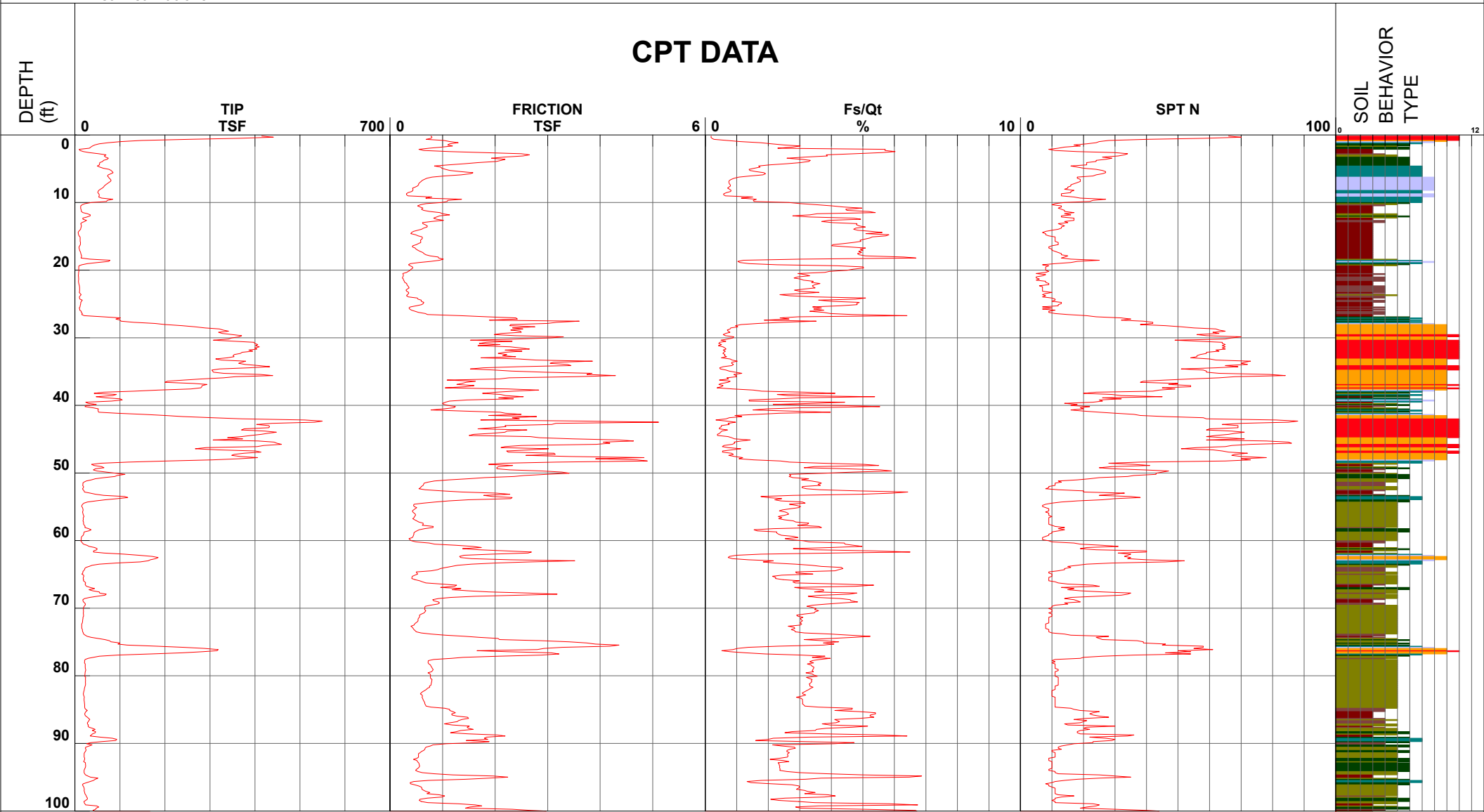
Cornerstone Earth Group

Project Bellarmine College Prep Academic Bldg Operator JM-GM
Job Number 596-3-1 Cone Number DDG1589
Hole Number CPT-02 Date and Time 7/1/2022 1:31:58 PM
EST GW Depth During Test 19.00 ft

Filename SDF(246).cpt
GPS
Maximum Depth 100.72 ft

Net Area Ratio .8

CPT DATA



SOIL
BEHAVIOR
TYPE

12

100

0

10

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30

40

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70

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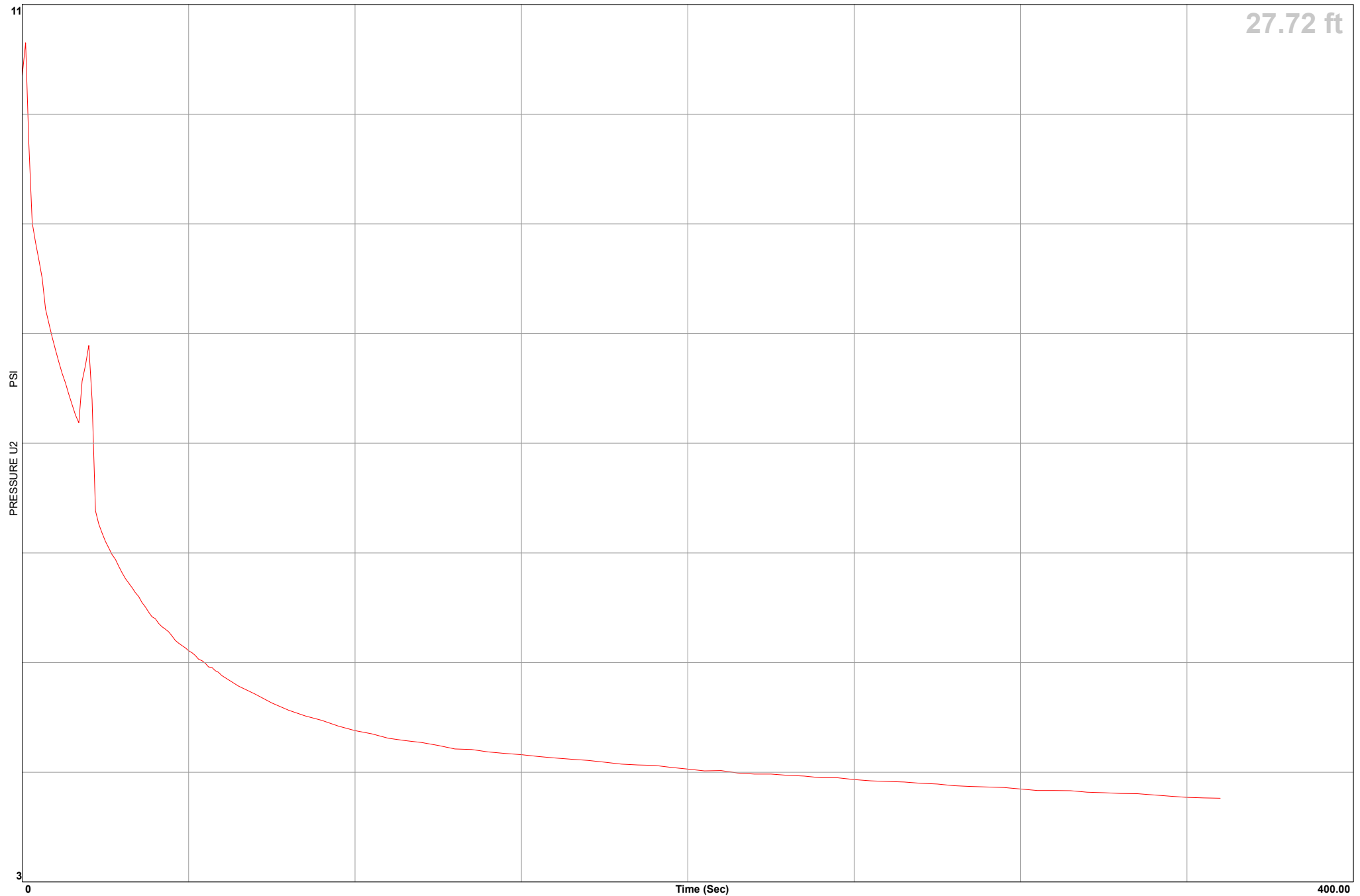
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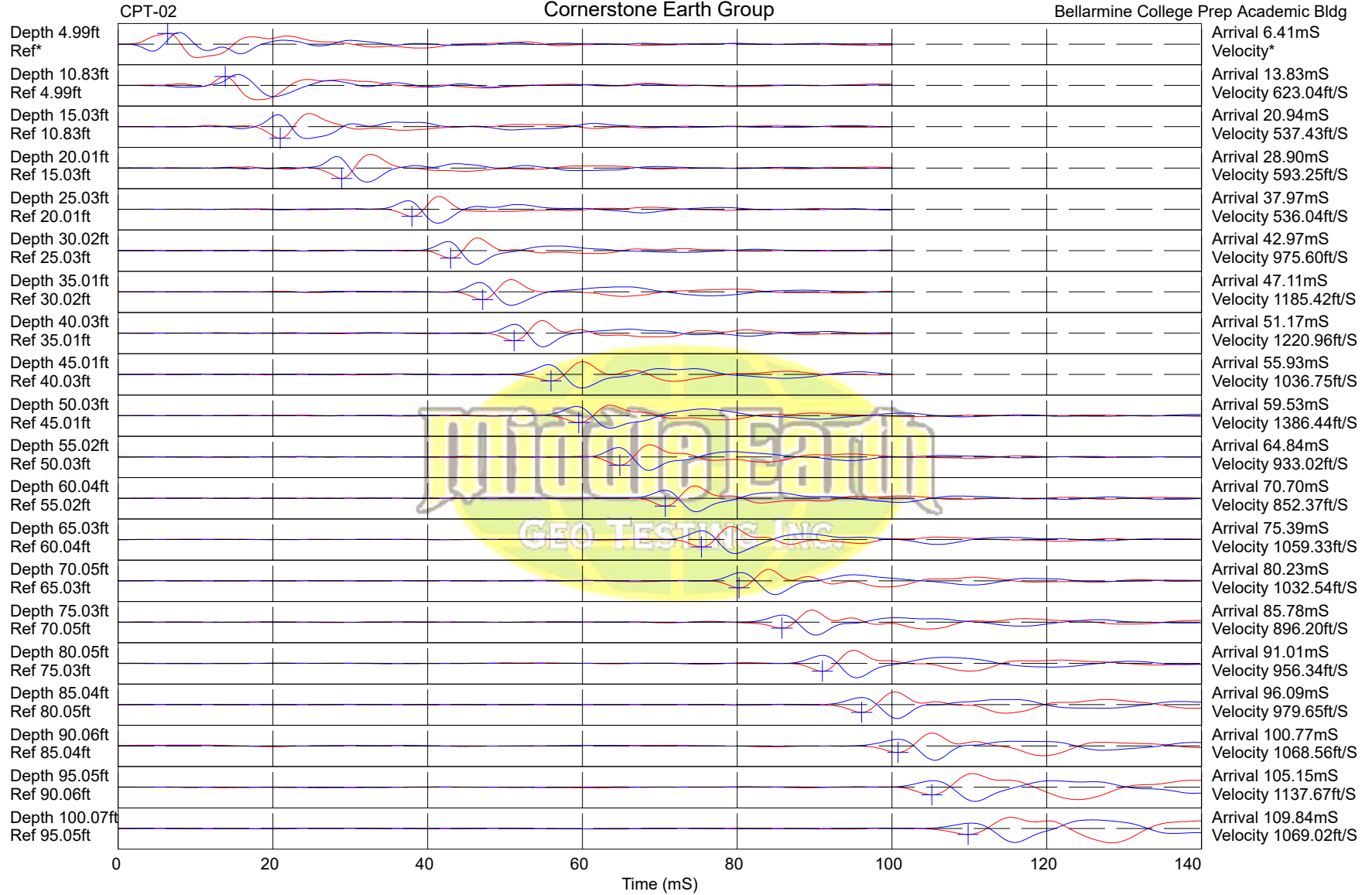
Cornerstone Earth Group

Location	Bellarmine College Prep Academic Bldg	Operator	JM-GM
Job Number	596-3-1	Cone Number	DDG1589
Hole Number	CPT-02	Date and Time	7/1/2022 1:31:58 PM
Equilized Pressure	3.7	EST GW Depth During Test	19.0

GPS



27.72 ft



Hammer to Rod String Distance (ft): 5.83

* = Not Determined

COMMENT:

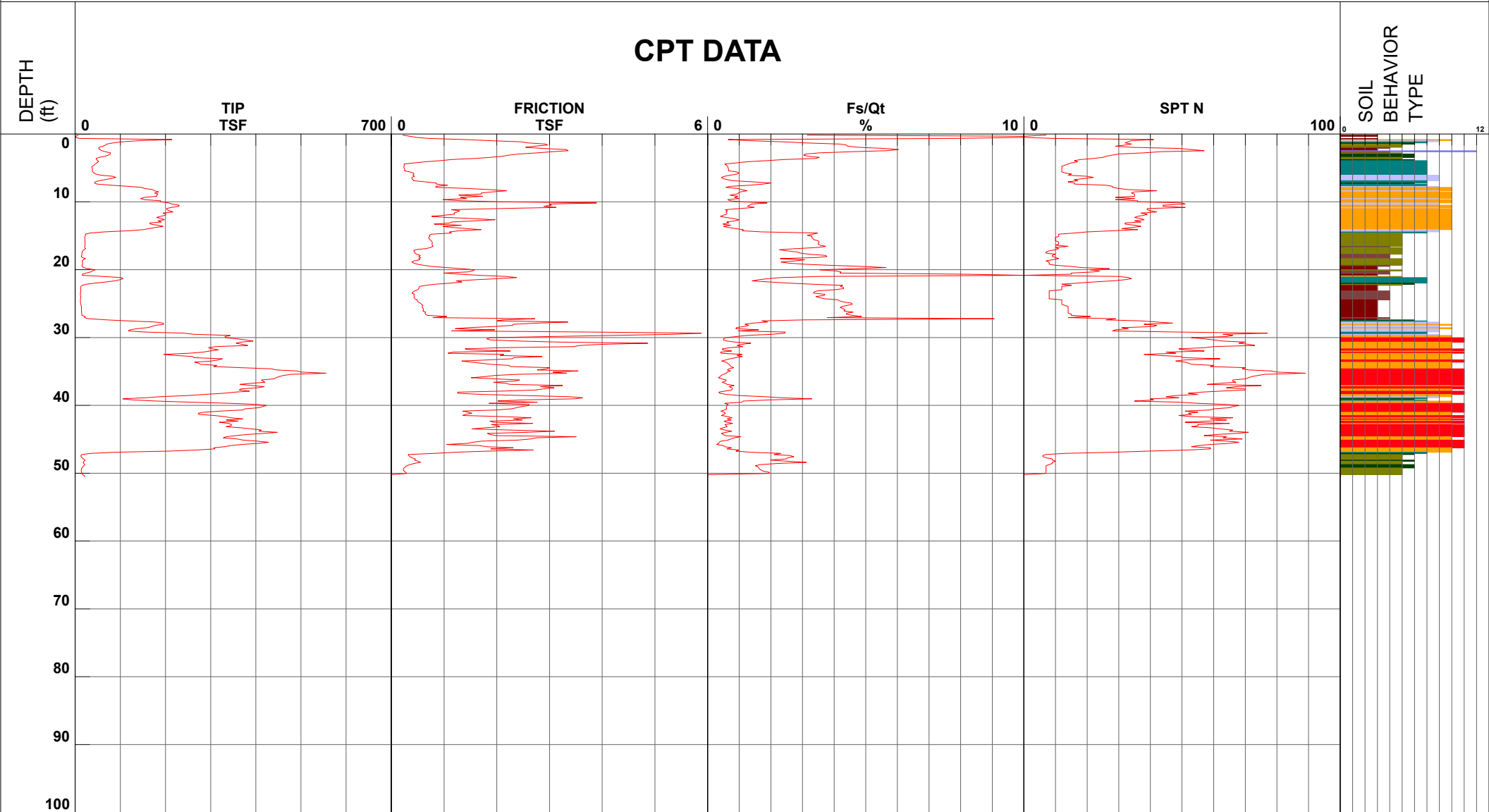


Cornerstone Earth Group

Project Bellarmine College Prep Academic Bldg Operator JM-GM
Job Number 596-3-1 Cone Number DDG1589
Hole Number CPT-03A Date and Time 7/1/2022 9:03:06 AM
EST GW Depth During Test 19.00 ft

Filename SDF(243).cpt
GPS
Maximum Depth 50.52 ft

Net Area Ratio .8



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

Cone Size 15cm squared

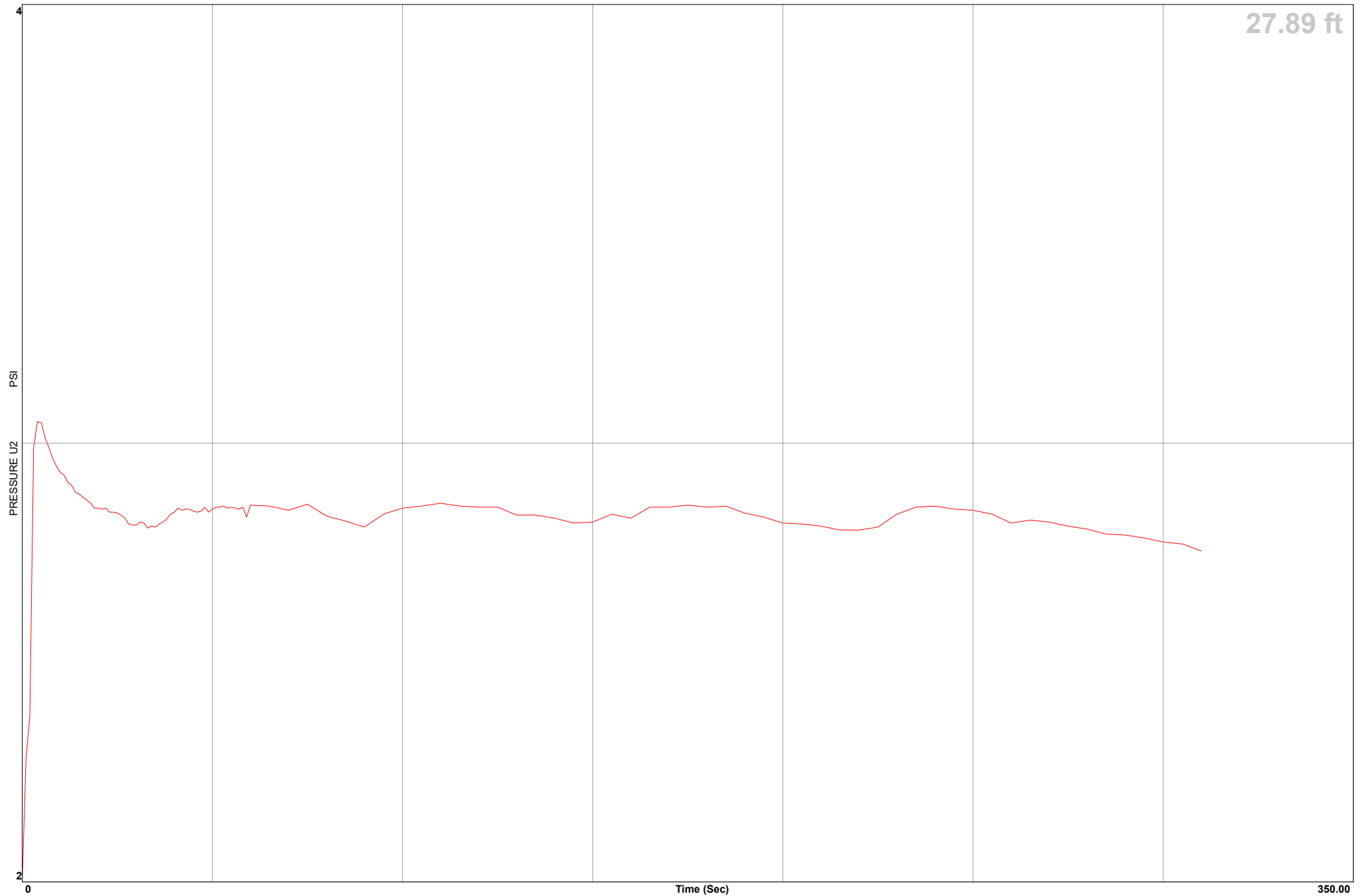
S*Soil behavior type and SPT based on data from UBC-1983



Cornerstone Earth Group

Location	Bellarmino College Prep Academic Bldg	Operator	JM-GM
Job Number	596-3-1	Cone Number	DDG1589
Hole Number	CPT-03A	Date and Time	7/1/2022 9:03:06 AM
Equilized Pressure	2.7	EST GW Depth During Test	21.5

GPS



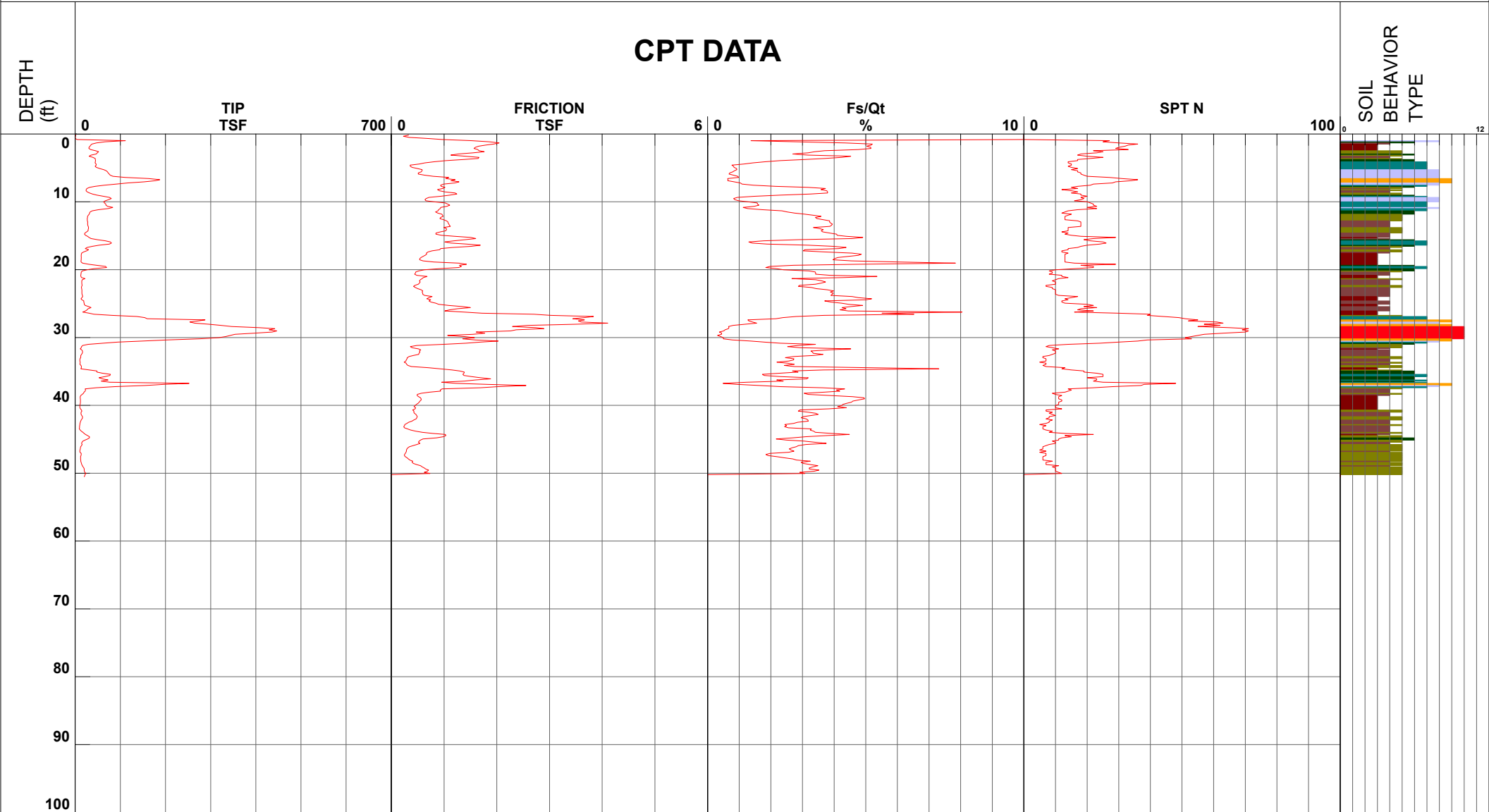


Cornerstone Earth Group

Project Bellarmine College Prep Academic Bldg Operator JM-GM
Job Number 596-3-1 Cone Number DDG1589
Hole Number CPT-04 Date and Time 7/1/2022 10:13:44 AM
EST GW Depth During Test 18.00 ft

Filename SDF(244).cpt
GPS
Maximum Depth 50.52 ft

Net Area Ratio .8



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

Cone Size 15cm squared

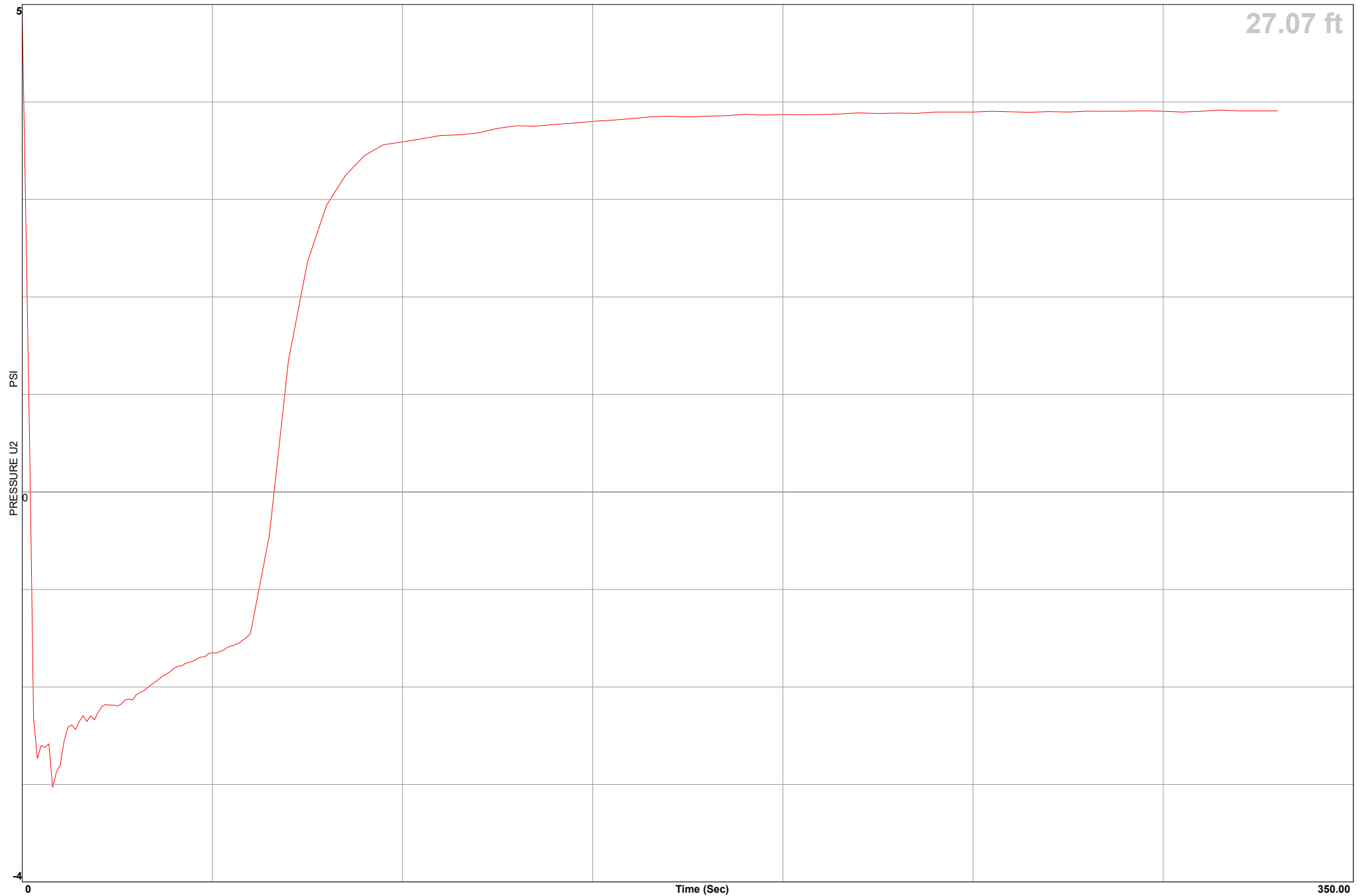
S*Soil behavior type and SPT based on data from UBC-1983



Cornerstone Earth Group

Location	Bellarmino College Prep Academic Bldg	Operator	JM-GM
Job Number	596-3-1	Cone Number	DDG1589
Hole Number	CPT-04	Date and Time	7/1/2022 10:13:44 AM
Equilized Pressure	3.9	EST GW Depth During Test	18.0

GPS



APPENDIX B: LABORATORY TEST PROGRAM

The laboratory testing program was performed to evaluate the physical and mechanical properties of the soils retrieved from the site to aid in verifying soil classification.

Moisture Content: The natural water content was determined (ASTM D2216) on 34 samples of the materials recovered from the borings. These water contents are recorded on the boring logs at the appropriate sample depths.

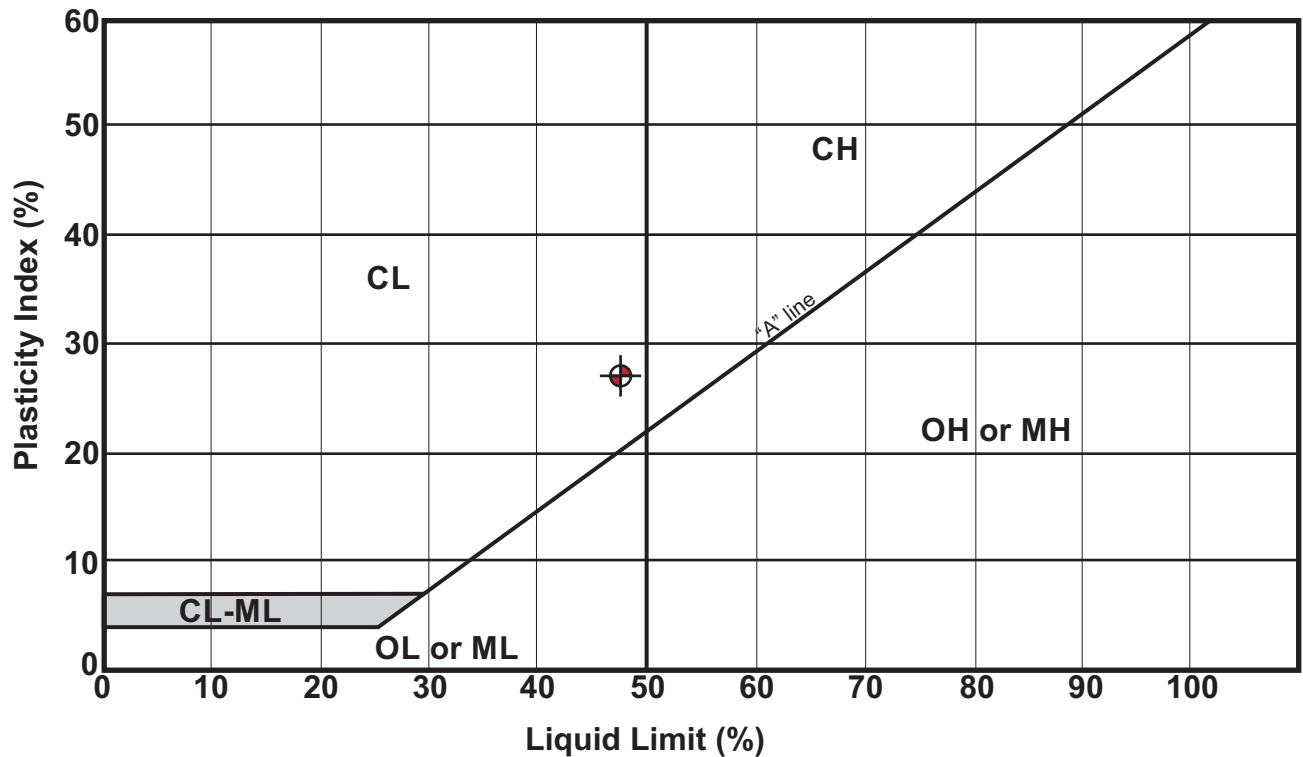
Dry Densities: In place dry density determinations (ASTM D2937) were performed on 26 samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Washed Sieve Analyses: The percent soil fraction passing the No. 200 sieve (ASTM D1140) was determined on three samples of the subsurface soils to aid in the classification of these soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Plasticity Index: One Plasticity Index determination (ASTM D4318) was performed on a sample of the subsurface soil to measure the range of water contents over which this material exhibits plasticity. The Plasticity Index was used to classify the soil in accordance with the Unified Soil Classification System and to evaluate the soil expansion potential. Results of this test are shown on the boring log at the appropriate sample depth.

Consolidation: One consolidation test (ASTM D2435) was performed on a relatively undisturbed sample of the subsurface clayey soils to assist in evaluating the compressibility property of this soil. Results of the consolidation test are presented graphically in this appendix.

Plasticity Index (ASTM D4318) Testing Summary

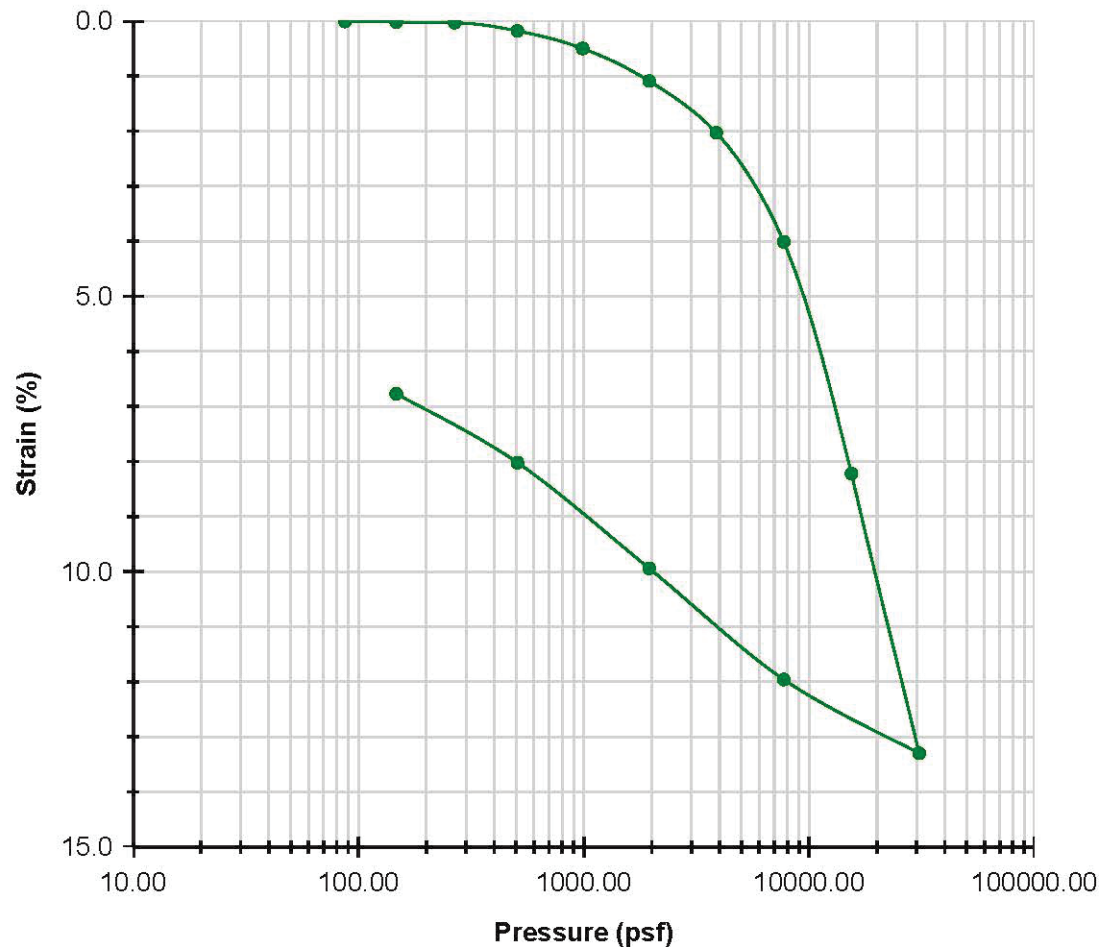


Symbol	Boring No.		Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Passing No. 200 (%)	Group Name (USCS - ASTM D2487)
	EB-1	2.0	18	48	21	27	—	Lean Clay with Sand (CL)

Consolidation Test ASTM D2435

Boring: EB-2 Sample: 9 Depth: 26.0'

Description: Lean Clay (CL)



	BEFORE	AFTER
Moisture (%)	28.3	27.1
Dry Density (pcf)	94.2	97.7
Saturation (%)	96.1	100.0
Void Ratio	0.80	0.74

—●— (A) Stress Strain Curve

APPENDIX C: LIQUEFACTION ANALYSES CALCULATIONS

CPT No.

1

PGA (A_{max})

0.57

Total Settlement:

0.72 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRR _{M=7.5} , s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
0.160	4.510	0.131	19.2	19.2	44.655	2.906	2.48		Unsaturated	61.3			4.26	1.70	7.25	58.30	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	3.470	0.165	39.6	39.6	52.824	4.788	2.58		Unsaturated	69.5			3.28	1.70	5.58	57.73	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	2.920	0.121	58.8	58.8	33.558	4.196	2.68		Unsaturated	77.3			2.76	1.70	4.69	57.77	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	3.140	0.308	79.2	79.2	78.293	9.931	2.72		Unsaturated	80.6			2.97	1.70	5.05	58.65	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	2.040	0.627	98.4	98.4	40.463	31.480	3.30		Unsaturated	100.0			1.93	1.70	3.28	58.23	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	10.580	0.822	117.6	117.6	75.189	7.811	2.65		Unsaturated	74.7			10.00	1.70	17.00	73.35	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	206.610	1.768	138.0	138.0	764.432	0.856	1.29		Unsaturated	0.0			195.28	1.70	331.98	331.98	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	190.270	1.865	157.2	157.2	659.533	0.981	1.38		Unsaturated	0.0			179.84	1.70	305.73	305.73	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	129.540	1.794	177.6	177.6	422.335	1.386	1.60		Unsaturated	0.0			122.44	1.70	208.15	208.15	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	92.890	1.371	196.8	196.8	287.586	1.478	1.72		Unsaturated	0.5			87.80	1.70	149.26	149.26	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	74.430	1.049	216.0	216.0	219.868	1.412	1.77		Unsaturated	4.9			70.35	1.70	119.59	119.75	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	61.750	0.969	236.4	236.4	174.282	1.573	1.88		Unsaturated	13.0			58.36	1.70	99.22	116.01	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	47.870	0.996	255.6	255.6	129.836	2.087	2.05		Unsaturated	27.2			45.25	1.70	76.92	123.93	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	41.850	0.979	276.0	276.0	109.164	2.347	2.14		Unsaturated	34.2			39.56	1.70	67.24	120.64	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	45.440	1.104	295.2	295.2	114.614	2.437	2.14		Unsaturated	34.1			42.95	1.70	73.01	127.55	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	46.520	1.377	314.4	314.4	113.684	2.970	2.21		Unsaturated	39.5			43.97	1.70	74.75	134.31	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	39.980	1.459	334.8	334.8	94.602	3.665	2.33		Unsaturated	49.2			37.79	1.70	64.24	126.88	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	40.080	1.330	354.0	354.0	92.210	3.333	2.30		Unsaturated	47.2			37.88	1.70	64.40	126.15	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	38.670	1.047	374.4	374.4	86.471	2.721	2.26		Unsaturated	43.5			36.55	1.70	62.14	121.26	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	34.300	0.951	393.6	393.6	74.738	2.789	2.31		Unsaturated	47.6			32.42	1.70	55.11	114.61	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	33.000	1.092	412.8	412.8	70.176	3.329	2.38		Unsaturated	53.5			31.19	1.70	53.02	114.48	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	37.070	1.630	433.2	433.2	76.985	4.422	2.45		Unsaturated	58.8			35.04	1.70	59.56	124.60	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	40.900	2.219	452.4	452.4	83.143	5.456	2.50		Unsaturated	62.7			38.66	1.70	65.72	133.66	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	45.460	2.664	472.8	472.8	90.427	5.891	2.50		Unsaturated	63.0			42.97	1.70	73.05	143.16	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	62.970	3.029	492.0	492.0	122.949	4.829	2.35		Unsaturated	51.1			59.52	1.70	101.18	174.55	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	81.490	3.522	512.4	512.4	156.029	4.336	2.25		Unsaturated	43.3			77.02	1.60	123.42	197.78	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	81.150	3.795	531.6	531.6	152.526	4.692	2.29		Unsaturated	46.0			76.70	1.58	121.52	197.30	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	77.970	3.796	550.8	550.8	143.935	4.886	2.32		Unsaturated	48.3			73.70	1.58	116.44	192.33	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	72.670	3.640	571.2	571.2	131.681	5.029	2.35		Unsaturated	50.9			68.69	1.58	108.81	184.10	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	65.970	3.359	590.4	590.4	117.516	5.114	2.38		Unsaturated	53.7			62.35	1.60	99.54	173.66	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	63.780	3.009	610.8	610.8	111.666	4.740	2.37		Unsaturated	52.6			60.28	1.59	95.94	168.60	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	63.570	2.392	630.0	630.0	109.571	3.781	2.30		Unsaturated	46.8			60.09	1.58	95.21	164.69	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	68.430	2.202	649.2	649.2	116.216	3.233	2.23		Unsaturated	41.3			64.68	1.56	100.73	167.94	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	68.280	2.126	669.6	669.6	114.162	3.130	2.22		Unsaturated	40.8			64.54	1.54	99.65	166.23	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	69.200	2.375	688.8	688.8	114.068	3.449	2.26		Unsaturated	43.4			65.41	1.52	99.61	168.08	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	69.150	2.543	709.2	709.2	112.317	3.696	2.28		Unsaturated	45.6			65.36	1.51	98.45	168.08	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	73.380	2.753	728.4	728.4	117.626	3.771	2.28		Unsaturated	45.2			69.36	1.48	102.62	173.03	1.00	0.371	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	81.740	2.849	747.6	747.6	129.384	3.502	2.23		Unsaturated	41.1			77.26	1.45	111.77	181.57	1.00	0.371	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.400																								

CPT No.

1

PGA (A_{max})

0.57

Total Settlement:

0.72 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRR _{M=7.5} , s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
11.320	69.470	0.676	1358.4	1358.4	81.150	0.983	1.98		Sand	60.0			65.66	1.20	78.55	149.29	0.98	0.391	1.070	0.284	0.505	1.29	0.00	0.01
11.480	69.650	0.644	1377.6	1377.6	80.782	0.934	1.96		Sand	60.0			65.83	1.19	78.33	149.00	0.98	0.393	1.068	0.282	0.499	1.27	0.00	0.01
11.650	68.790	0.644	1398.0	1398.0	79.179	0.946	1.97		Sand	60.0	65.83		65.83	1.18	77.89	148.44	0.98	0.396	1.065	0.279	0.490	1.24	0.01	0.01
11.810	60.660	0.578	1417.2	1417.2	69.240	0.963	2.03		Sand	60.0	65.83		65.83	1.18	77.49	147.93	0.98	0.399	1.063	0.275	0.482	1.21	0.01	0.01
11.980	54.880	0.607	1437.6	1437.6	62.107	1.120	2.10		Sand	60.0	65.83		65.83	1.17	77.06	147.39	0.98	0.401	1.060	0.272	0.473	1.18	0.01	0.01
12.140	46.090	0.646	1456.8	1456.8	51.673	1.423	2.23		Sand	41.4	65.83		65.83	1.17	77.08	138.59	0.98	0.403	1.054	0.228	0.372	0.92	0.01	0.02
12.300	34.990	0.794	1476.0	1476.0	38.763	2.317	2.46	plastic	Clay	59.8			33.07	1.10	n.a.	n.a.	0.98	0.406	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	26.540	0.813	1496.4	1496.4	31.069	3.150	2.62		Clay	72.6			25.09	1.10	n.a.	n.a.	0.98	0.408	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	24.390	0.739	1515.6	1515.6	31.185	3.126	2.62	plastic	Clay	72.3			23.05	1.09	n.a.	n.a.	0.98	0.410	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	26.330	0.699	1536.0	1536.0	30.234	2.733	2.59		Clay	70.1			24.89	1.09	n.a.	n.a.	0.98	0.413	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	27.780	0.811	1555.2	1555.2	31.661	3.003	2.60	plastic	Clay	71.0			26.26	1.08	n.a.	n.a.	0.98	0.415	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	30.610	0.938	1574.4	1574.4	34.669	3.146	2.58	plastic	Clay	69.7			28.93	1.08	n.a.	n.a.	0.98	0.417	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	34.390	1.289	1594.8	1594.8	38.701	3.837	2.61	plastic	Clay	71.6			32.50	1.08	n.a.	n.a.	0.98	0.419	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	38.150	1.209	1614.0	1614.0	40.414	3.237	2.54	plastic	Clay	66.4			36.06	1.07	n.a.	n.a.	0.98	0.421	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	53.500	1.332	1634.4	1634.4	56.658	2.529	2.36		Sand	52.0	98.37	1.55	152.47	1.07	163.24	253.69	0.98	0.423	1.077	203.800	483.098	1141.37	0.00	0.00
13.780	86.710	1.387	1653.6	1653.6	91.826	1.615	2.08		Sand	29.1	98.37	1.55	152.47	1.07	163.80	230.75	0.98	0.425	1.074	17.556	41.481	97.55	0.00	0.00
13.940	104.080	1.274	1672.8	1672.8	109.752	1.234	1.94		Sand	18.2		1.55	152.48	1.08	164.53	204.50	0.98	0.427	1.065	2.459	5.762	13.49	0.00	0.00
14.110	96.720	1.079	1693.2	1693.2	101.302	1.125	1.94		Sand	18.1		1.55	141.70	1.08	152.90	191.29	0.98	0.429	1.053	1.197	2.773	6.46	0.00	0.00
14.270	79.990	0.875	1712.4	1712.4	83.144	1.106	2.00		Sand	23.0	91.42	1.55	141.70	1.07	151.77	203.80	0.98	0.431	1.058	2.357	5.488	12.73	0.00	0.00
14.440	74.780	0.806	1732.8	1732.8	77.201	1.090	2.02		Sand	24.7	91.42	1.55	141.70	1.07	151.07	206.93	0.98	0.433	1.057	2.857	6.644	15.34	0.00	0.00
14.600	68.580	0.693	1752.0	1752.0	70.327	1.024	2.04		Sand	25.9	91.42	1.55	141.70	1.06	150.47	208.83	0.98	0.435	1.055	3.226	7.490	17.22	0.00	0.00
14.760	53.860	0.560	1771.2	1771.2	54.727	1.057	2.13		Sand	33.6	91.42	1.55	141.70	1.06	149.56	220.38	0.98	0.437	1.053	7.347	17.027	39.00	0.00	0.00
14.930	38.110	0.438	1791.6	1791.6	38.226	1.176	2.29		Sand	45.9	91.42	1.55	141.70	1.05	148.71	231.40	0.98	0.438	1.050	18.634	43.042	98.16	0.00	0.00
15.090	28.600	0.482	1810.8	1810.8	28.296	1.741	2.49	plastic	Clay	62.3			27.03	1.04	n.a.	n.a.	0.98	0.440	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	24.180	0.481	1831.2	1831.2	23.637	2.067	2.60		Clay	70.9			22.85	1.04	n.a.	n.a.	0.98	0.442	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	23.550	0.620	1850.4	1850.4	24.454	2.739	2.66		Clay	75.9			22.26	1.04	n.a.	n.a.	0.97	0.444	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	24.660	0.791	1869.6	1869.6	25.380	3.332	2.70		Clay	79.2			23.31	1.03	n.a.	n.a.	0.97	0.445	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	26.010	0.848	1890.0	1890.0	26.524	3.384	2.69		Clay	78.4			24.58	1.03	n.a.	n.a.	0.97	0.447	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	26.240	0.943	1909.2	1909.2	26.488	3.728	2.72		Clay	80.6			24.80	1.03	n.a.	n.a.	0.97	0.449	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	25.430	1.139	1929.6	1929.6	25.358	4.654	2.80		Clay	86.9			24.04	1.02	n.a.	n.a.	0.97	0.450	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	25.190	1.289	1948.8	1948.8	24.852	5.321	2.84		Clay	90.6			23.81	1.02	n.a.	n.a.	0.97	0.452	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	25.850	1.390	1968.0	1968.0	25.270	5.592	2.85		Clay	91.3			24.43	1.02	n.a.	n.a.	0.97	0.453	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	26.610	1.459	1988.4	1988.4	25.765	5.697	2.85		Clay	91.3			25.15	1.02	n.a.	n.a.	0.97	0.455	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	26.170	1.490	2007.6	2007.6	25.071	5.919	2.87		Clay	92.9			24.74	1.01	n.a.	n.a.	0.97	0.456	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	25.350	1.503	2028.0	2028.0	24.000	6.177	2.90		Clay	95.0			23.96	1.01	n.a.	n.a.	0.97	0.458	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	25.770	1.476	2047.2	2047.2	24.176	5.964	2.89		Clay	94.0			24.36	1.01	n.a.	n.a.	0.97	0.459	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	27.840	1.578	2066.4	2066.4	25.945	5.886	2.86		Clay	91.9			26.31	1.01	n.a.	n.a.	0.97	0.461	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	30.400	1.701	2086.8	2086.8	28.136	5.796	2.83		Clay															

CPT No.

1

PGA (A_{max})

0.57

Total Settlement:

0.72

(Inches)

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Depth (ft)	q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _{tt})	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
22.310	10.160	0.283	2698.8	2429.8	7.252	3.213	3.13		Clay	100.0			9.60	0.96	n.a.	n.a.	0.96	0.496	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	9.920	0.306	2718.8	2439.8	7.017	3.572	3.17		Clay	100.0			9.38	0.96	n.a.	n.a.	0.96	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	10.300	0.341	2740.0	2450.5	7.288	3.823	3.17		Clay	100.0			9.74	0.96	n.a.	n.a.	0.96	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	11.010	0.377	2760.0	2460.5	7.828	3.911	3.15		Clay	100.0			10.41	0.96	n.a.	n.a.	0.96	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	11.530	0.412	2781.3	2471.1	8.206	4.059	3.14		Clay	100.0			10.90	0.96	n.a.	n.a.	0.95	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	11.400	0.393	2801.3	2481.1	8.060	3.929	3.14		Clay	100.0			10.78	0.96	n.a.	n.a.	0.95	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	10.810	0.335	2821.3	2491.2	7.546	3.561	3.14		Clay	100.0			10.22	0.96	n.a.	n.a.	0.95	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	10.200	0.325	2842.5	2501.8	7.018	3.707	3.18		Clay	100.0			9.64	0.96	n.a.	n.a.	0.95	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	9.860	0.324	2862.5	2511.8	6.711	3.849	3.20		Clay	100.0			9.32	0.96	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	10.560	0.339	2883.8	2522.5	7.230	3.715	3.17		Clay	100.0			9.98	0.95	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	11.390	0.327	2903.8	2532.5	7.849	3.286	3.11		Clay	100.0			10.77	0.95	n.a.	n.a.	0.95	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	11.280	0.403	2923.8	2542.5	7.723	4.105	3.17		Clay	100.0			10.66	0.95	n.a.	n.a.	0.95	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	11.160	0.587	2945.0	2553.1	7.589	6.056	3.27		Clay	100.0			10.55	0.95	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	13.910	0.833	2965.0	2563.1	9.697	6.700	3.22		Clay	100.0			13.15	0.95	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	24.900	0.876	2986.3	2573.8	18.189	3.741	2.85		Clay	90.7			23.53	0.95	n.a.	n.a.	0.95	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	19.270	0.586	3006.3	2583.8	13.753	3.297	2.91		Clay	95.7			18.21	0.95	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	14.250	0.439	3026.3	2593.8	9.821	3.444	3.04		Clay	100.0			13.47	0.95	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	12.330	0.413	3047.5	2604.5	8.298	3.817	3.12		Clay	100.0			11.65	0.95	n.a.	n.a.	0.95	0.509	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	12.500	0.417	3067.5	2614.5	8.389	3.805	3.12		Clay	100.0			11.81	0.95	n.a.	n.a.	0.95	0.510	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	10.470	0.364	3088.8	2625.1	6.800	4.082	3.21		Clay	100.0			9.90	0.94	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	10.280	0.352	3108.8	2635.1	6.623	4.031	3.22		Clay	100.0			9.72	0.94	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	10.350	0.363	3128.8	2645.2	6.643	4.128	3.22		Clay	100.0			9.78	0.94	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	10.590	0.392	3150.0	2655.8	6.789	4.349	3.23		Clay	100.0			10.01	0.94	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	11.030	0.390	3170.0	2665.8	7.086	4.131	3.20		Clay	100.0			10.43	0.94	n.a.	n.a.	0.95	0.513	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	11.230	0.393	3191.3	2676.5	7.199	4.081	3.19		Clay	100.0			10.61	0.94	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	11.060	0.380	3211.3	2686.5	7.039	4.018	3.19		Clay	100.0			10.45	0.94	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	11.320	0.369	3231.3	2696.5	7.198	3.799	3.17		Clay	100.0			10.70	0.94	n.a.	n.a.	0.94	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	11.340	0.362	3252.5	2707.1	7.176	3.728	3.17		Clay	100.0			10.72	0.94	n.a.	n.a.	0.94	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	11.240	0.347	3272.5	2717.1	7.069	3.613	3.17		Clay	100.0			10.62	0.94	n.a.	n.a.	0.94	0.516	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	11.080	0.299	3293.8	2727.8	6.916	3.170	3.14		Clay	100.0			10.47	0.94	n.a.	n.a.	0.94	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	10.780	0.280	3313.8	2737.8	6.665	3.072	3.15		Clay	100.0			10.19	0.93	n.a.	n.a.	0.94	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	10.520	0.355	3335.0	2748.4	6.442	4.012	3.23		Clay	100.0			9.94	0.93	n.a.	n.a.	0.94	0.518	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	12.060	0.532	3355.0	2758.5	7.528	5.120	3.23		Clay	100.0			11.40	0.93	n.a.	n.a.	0.94	0.518	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	15.810	2.308	3375.0	2768.5	10.202	16.343	3.46		Clay	100.0			14.94	0.93	n.a.	n.a.	0.94	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	28.140	2.825	3396.3	2779.1	19.029	10.685	3.14		Clay	100.0			26.60	0.93	n.a.	n.a.	0.94	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	62.480	2.311	3416.3	2789.1	50.031	3.802	2.53		Sand	65.0	117.09	1.25	146.36	0.92	134.72	223.03	0.94	0.520	0.917	9.067	18.294	35.19	0.00	0.00
28.220	96.660	2.555	3437.5	2799.8	78.013	2.691	2.28		Sand	45.6	117.09	1.25	146.36	0.92	134.09	212.84	0.94	0.520	0.916	4.223	8.509	16.35	0.00	0.00
28.380	123.880	1.667	3457.5	2809.8	100.192	1.365	2.00		Sand	22.9		1.25	146.36	0.90	132.32	180.99	0.94	0.521	0.939	0.756	1.496	2.87	0.00	0.00
28.540	122.580	2.584	3477.5	2819.8	98.941	2.139	2.14		Sand	34.2		1.25	144.83	0.91	131.72	199.35	0.94	0.521	0.925	1.822	3.707	7.11	0.00	0.00
28.710	122.050	2.878	3498.8	2830.4	98.313	2.392	2.18																	

CPT No.

1

PGA (A_{max})

0.57

Total Settlement:

0.72

(Inches)

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Depth (ft)	q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _{tt})	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
33.300	547.620	2.211	4072.5	3117.8	424.826	0.405	1.18		Sand	0.0			517.60	0.90	467.29	467.29	0.92	0.532	0.884	#####	#####	#####	0.00	0.00
33.460	524.740	2.245	4092.5	3127.8	406.350	0.430	1.21		Sand	0.0			495.97	0.90	447.39	447.39	0.92	0.533	0.883	#####	#####	#####	0.00	0.00
33.630	538.240	1.813	4113.8	3138.4	416.130	0.338	1.13		Sand	0.0			508.73	0.90	458.48	458.48	0.92	0.533	0.882	#####	#####	#####	0.00	0.00
33.790	527.520	1.846	4133.8	3148.5	407.153	0.351	1.15		Sand	0.0			498.60	0.90	448.97	448.97	0.92	0.533	0.881	#####	#####	#####	0.00	0.00
33.960	520.240	2.482	4155.0	3159.1	400.827	0.479	1.25		Sand	0.0			491.72	0.90	442.38	442.38	0.92	0.533	0.880	#####	#####	#####	0.00	0.00
34.120	488.040	2.382	4175.0	3169.1	375.316	0.490	1.28		Sand	0.0			461.29	0.90	414.66	414.66	0.92	0.534	0.879	#####	#####	#####	0.00	0.00
34.280	441.570	2.197	4195.0	3179.1	338.883	0.500	1.31		Sand	0.0			417.36	0.90	374.86	374.86	0.92	0.534	0.878	#####	#####	#####	0.00	0.00
34.450	416.500	2.090	4216.3	3189.8	319.010	0.504	1.34		Sand	0.0			393.67	0.90	353.27	353.27	0.92	0.534	0.877	#####	#####	#####	0.00	0.00
34.610	427.320	2.289	4236.3	3199.8	326.819	0.538	1.35		Sand	0.0			403.89	0.90	362.15	362.15	0.92	0.534	0.876	#####	#####	#####	0.00	0.00
34.780	412.170	2.108	4257.5	3210.4	314.643	0.514	1.35		Sand	0.0			389.57	0.90	349.00	349.00	0.92	0.535	0.875	#####	#####	#####	0.00	0.00
34.940	364.050	2.337	4277.5	3220.4	277.279	0.646	1.45		Sand	0.0			344.09	0.90	308.00	308.00	0.92	0.535	0.874	#####	#####	#####	0.00	0.00
35.100	333.140	2.220	4297.5	3230.5	253.196	0.671	1.49		Sand	0.0			314.88	0.89	281.62	281.62	0.92	0.535	0.873	13192.214	25339.024	47363.48	0.00	0.00
35.270	339.300	1.827	4318.8	3241.1	257.476	0.542	1.43		Sand	0.0			320.70	0.89	286.58	286.58	0.92	0.535	0.872	32457.053	62271.625	116348.38	0.00	0.00
35.430	387.520	1.654	4338.8	3251.1	293.841	0.429	1.32		Sand	0.0			366.28	0.89	327.04	327.04	0.92	0.535	0.871	#####	#####	#####	0.00	0.00
35.600	353.770	2.325	4360.0	3261.8	267.660	0.661	1.47		Sand	0.0			334.38	0.89	298.30	298.30	0.91	0.536	0.870	#####	#####	1209572.89	0.00	0.00
35.760	301.720	1.859	4380.0	3271.8	227.678	0.621	1.50		Sand	0.0			285.18	0.89	254.21	254.21	0.91	0.536	0.869	217.361	415.675	775.75	0.00	0.00
35.930	262.140	1.283	4401.3	3282.4	197.264	0.494	1.49		Sand	0.0			247.77	0.87	216.40	216.40	0.91	0.536	0.868	5.441	10.394	19.39	0.00	0.00
36.090	258.970	1.079	4421.3	3292.4	194.554	0.420	1.45		Sand	0.0			244.77	0.87	213.20	213.20	0.91	0.536	0.867	4.331	8.264	15.41	0.00	0.00
36.250	255.590	1.329	4441.3	3302.5	191.694	0.524	1.51		Sand	0.0			241.58	0.87	209.82	209.82	0.91	0.536	0.868	3.442	6.575	12.26	0.00	0.00
36.420	273.140	1.500	4462.5	3313.1	204.634	0.554	1.51		Sand	0.0			258.17	0.88	226.04	226.04	0.91	0.537	0.865	11.627	22.138	41.26	0.00	0.00
36.580	292.620	1.552	4482.5	3323.1	219.010	0.534	1.47		Sand	0.0			276.58	0.88	244.32	244.32	0.91	0.537	0.865	68.114	129.560	241.37	0.00	0.00
36.750	285.020	0.966	4503.8	3333.8	212.930	0.342	1.37		Sand	0.0			269.40	0.88	236.82	236.82	0.91	0.537	0.864	31.203	59.284	110.41	0.00	0.00
36.910	284.100	1.481	4523.8	3343.8	211.911	0.525	1.48		Sand	0.0			268.53	0.88	235.72	235.72	0.91	0.537	0.863	27.997	53.139	98.93	0.00	0.00
37.070	250.470	1.149	4543.8	3353.8	186.339	0.463	1.49		Sand	0.0			236.74	0.86	203.89	203.89	0.91	0.537	0.873	2.369	4.552	8.47	0.00	0.00
37.240	223.110	1.259	4565.0	3364.4	165.527	0.570	1.59		Sand	0.0			210.88	0.85	178.51	178.51	0.91	0.537	0.903	0.685	1.277	2.38	0.00	0.00
37.400	204.930	1.423	4585.0	3374.4	151.667	0.702	1.67		Sand	0.0			193.70	0.84	161.90	161.90	0.91	0.538	0.917	0.392	0.653	1.21	0.01	0.01
37.570	218.140	1.627	4606.3	3385.1	161.292	0.754	1.67		Sand	0.0			206.18	0.84	173.56	173.56	0.91	0.538	0.907	0.569	1.025	1.91	0.00	0.00
37.730	207.480	1.927	4626.3	3395.1	153.092	0.939	1.75		Sand	3.3			196.11	0.84	163.75	163.75	0.91	0.538	0.914	0.413	0.697	1.30	0.00	0.01
37.890	222.040	1.811	4646.3	3405.1	163.708	0.824	1.69		Sand	0.0			209.87	0.84	176.66	176.66	0.91	0.538	0.903	0.638	1.172	2.18	0.00	0.00
38.060	222.090	1.058	4667.5	3415.8	163.482	0.481	1.55		Sand	0.0			209.91	0.84	176.48	176.48	0.91	0.538	0.902	0.633	1.162	2.16	0.00	0.00
38.220	210.330	0.741	4687.5	3425.8	154.500	0.356	1.50		Sand	0.0			198.80	0.83	165.67	165.67	0.91	0.538	0.911	0.438	0.746	1.39	0.00	0.00
38.390	226.680	1.059	4708.8	3436.4	166.379	0.472	1.54		Sand	0.0			214.25	0.84	180.21	180.21	0.90	0.538	0.897	0.732	1.375	2.55	0.00	0.00
38.550	226.250	1.790	4728.8	3446.4	165.811	0.799	1.68		Sand	0.0			213.85	0.84	179.60	179.60	0.90	0.539	0.897	0.715	1.336	2.48	0.00	0.00
38.710	219.190	1.414	4748.8	3456.4	160.342	0.652	1.63		Sand	0.0			207.17	0.84	173.00	173.00	0.90	0.539	0.903	0.558	0.997	1.85	0.00	0.00
38.880	210.760	0.986	4770.0	3467.1	153.863	0.473	1.56		Sand	0.0			199.21	0.83	165.19	165.19	0.90	0.539	0.909	0.432	0.732	1.36	0.00	0.00
39.040	204.730	0.783	4790.0	3477.1	149.188	0.387	1.53		Sand	0.0			193.51	0.82	159.60	159.60	0.90	0.539	0.914	0.367	0.600	1.11	0.01	0.01

CPT No.

1

PGA (A_{max})

0.57

Total Settlement:

0.72

(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5}$, $S'_{vc} = 1 \text{ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ϵ_v	Settlement (Inches)
44.290	328.140	2.221	5446.3	3805.8	229.346	0.682	1.53		Sand	0.0	369.99		369.99	0.86	316.91	316.91	0.88	0.541	0.824	#####	#####	#####	0.00	0.00
44.460	353.610	2.521	5467.5	3816.4	246.945	0.719	1.52		Sand	0.0	369.99		369.99	0.86	316.68	316.68	0.88	0.541	0.823	#####	#####	#####	0.00	0.00
44.620	361.310	1.735	5487.5	3826.4	252.026	0.484	1.40		Sand	0.0	369.99		369.99	0.86	316.46	316.46	0.88	0.541	0.822	#####	#####	#####	0.00	0.00
44.780	391.450	1.589	5507.5	3836.4	272.847	0.409	1.33		Sand	0.0			369.99	0.85	316.24	316.24	0.88	0.541	0.821	#####	#####	#####	0.00	0.00
44.950	366.540	1.751	5528.8	3847.1	255.000	0.481	1.39		Sand	0.0			346.45	0.85	295.90	295.90	0.88	0.540	0.821	#####	#####	681606.87	0.00	0.00
45.110	316.650	1.592	5548.8	3857.1	219.735	0.507	1.46		Sand	0.0			299.29	0.85	255.45	255.45	0.88	0.540	0.820	254.296	458.685	848.67	0.00	0.00
45.280	318.760	1.829	5570.0	3867.7	220.901	0.579	1.49		Sand	0.0			301.29	0.85	256.96	256.96	0.88	0.540	0.819	308.990	556.777	1030.20	0.00	0.00
45.440	336.080	1.749	5590.0	3877.7	232.701	0.525	1.45		Sand	0.0			317.66	0.85	270.74	270.74	0.88	0.540	0.818	2184.649	3932.850	7277.19	0.00	0.00
45.600	358.010	2.161	5610.0	3887.8	247.686	0.608	1.47		Sand	0.0			338.38	0.85	288.21	288.21	0.88	0.540	0.818	44166.446	79434.160	146988.25	0.00	0.00
45.770	392.720	2.077	5631.3	3898.4	271.511	0.533	1.40		Sand	0.0			371.19	0.85	315.93	315.93	0.88	0.540	0.817	#####	#####	#####	0.00	0.00
45.930	403.730	3.101	5651.3	3908.4	278.813	0.774	1.51		Sand	0.0			381.60	0.85	324.56	324.56	0.88	0.540	0.816	#####	#####	#####	0.00	0.00
46.100	427.120	3.406	5672.5	3919.1	294.671	0.803	1.51		Sand	0.0			403.71	0.85	343.12	343.12	0.88	0.540	0.815	#####	#####	#####	0.00	0.00
46.260	469.650	2.930	5692.5	3929.1	323.788	0.628	1.40		Sand	0.0			443.90	0.85	377.03	377.03	0.88	0.540	0.814	#####	#####	#####	0.00	0.00
46.420	495.220	3.202	5712.5	3939.1	341.083	0.650	1.39		Sand	0.0			468.07	0.85	397.29	397.29	0.88	0.540	0.814	#####	#####	#####	0.00	0.00
46.590	486.890	2.189	5733.8	3949.7	334.853	0.452	1.29		Sand	0.0			460.20	0.85	390.33	390.33	0.88	0.540	0.813	#####	#####	#####	0.00	0.00
46.750	452.020	2.781	5753.8	3959.8	310.329	0.619	1.41		Sand	0.0			427.24	0.85	362.14	362.14	0.87	0.540	0.812	#####	#####	#####	0.00	0.00
46.920	420.480	2.584	5775.0	3970.4	288.143	0.619	1.43		Sand	0.0			397.43	0.85	336.63	336.63	0.87	0.540	0.811	#####	#####	#####	0.00	0.00
47.080	399.950	2.236	5795.0	3980.4	273.625	0.563	1.42		Sand	0.0			378.02	0.85	319.98	319.98	0.87	0.540	0.810	#####	#####	#####	0.00	0.00
47.240	361.660	1.743	5815.0	3990.4	246.921	0.486	1.41		Sand	0.0			341.83	0.85	289.15	289.15	0.87	0.540	0.810	52909.230	94248.049	174527.62	0.00	0.00
47.410	351.170	2.592	5836.3	4001.1	239.374	0.744	1.54		Sand	0.0			331.92	0.85	280.57	280.57	0.87	0.540	0.809	10976.053	19532.524	36173.87	0.00	0.00
47.570	382.480	3.521	5856.3	4011.1	260.563	0.928	1.59		Sand	0.0			361.51	0.84	305.38	305.38	0.87	0.540	0.808	#####	#####	5377167.77	0.00	0.00
47.740	407.750	3.773	5877.5	4021.7	277.536	0.932	1.57		Sand	0.0			385.40	0.84	325.33	325.33	0.87	0.540	0.807	#####	#####	#####	0.00	0.00
47.900	400.270	5.187	5897.5	4031.7	272.062	1.306	1.69		Sand	0.0			378.33	0.84	319.16	319.16	0.87	0.540	0.807	#####	#####	#####	0.00	0.00
48.060	414.620	3.528	5917.5	4041.8	281.532	0.857	1.54		Sand	0.0			391.89	0.84	330.38	330.38	0.87	0.540	0.806	#####	#####	#####	0.00	0.00
48.230	424.640	3.923	5938.8	4052.4	287.998	0.930	1.56		Sand	0.0			401.36	0.84	338.13	338.13	0.87	0.540	0.805	#####	#####	#####	0.00	0.00
48.390	383.810	1.782	5958.8	4062.4	259.784	0.468	1.38		Sand	0.0			362.77	0.84	305.42	305.42	0.87	0.540	0.804	#####	#####	5399077.23	0.00	0.00
48.560	338.730	1.666	5980.0	4073.1	228.726	0.496	1.44		Sand	0.0			320.16	0.84	269.36	269.36	0.87	0.540	0.804	1768.130	3125.680	5793.49	0.00	0.00
48.720	305.280	1.785	6000.0	4083.1	205.678	0.591	1.52		Sand	0.0			288.54	0.83	240.09	240.09	0.87	0.539	0.803	43.419	76.685	142.16	0.00	0.00
48.880	287.240	1.550	6020.0	4093.1	193.160	0.545	1.52		Sand	0.0			271.49	0.82	222.66	222.66	0.87	0.539	0.802	8.799	15.526	28.79	0.00	0.00
49.050	271.450	2.276	6041.3	4103.7	182.185	0.848	1.67		Sand	0.0			256.57	0.81	207.63	207.63	0.87	0.539	0.809	2.988	5.319	9.86	0.00	0.00
49.210	270.400	1.610	6061.3	4113.7	181.245	0.602	1.57		Sand	0.0			255.58	0.81	206.46	206.46	0.87	0.539	0.811	2.774	4.951	9.18	0.00	0.00
49.380	249.380	2.646	6082.5	4124.4	166.773	1.074	1.77		Sand	4.4			235.71	0.79	186.95	187.02	0.87	0.539	0.848	0.979	1.827	3.39	0.00	0.00
49.540	202.590	2.094	6102.5	4134.4	134.925	1.050	1.83		Sand	9.1			191.48	0.77	146.63	152.98	0.86	0.539	0.890	0.309	0.469	0.87	0.01	0.02
49.700	216.100	2.449	6122.5	4144.4	143.879	1.150	1.83		Sand	9.7			204.25	0.78	158.57	166.84	0.86	0.539	0.875	0.454	0.750	1.39	0.00	0.00
49.870	132.940	1.921	6143.8	4155.1	87.596	1.479	2.07		Sand	28.2	204.25		204.25	0.82	168.39	234.65	0.86	0.539	0.798	25.252	44.308	82.22	0.00	0.00
50.030	52.020	1.146	6163.8	4165.1	23.499	2.341	2.63		Clay	73.6			49.17	0.84	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
0.160	415.010	0.779	19.2	19.2	4117.846	0.188	0.51		Unsaturated	0.0			392.26	1.70	666.84	666.84	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	441.040	0.799	39.6	39.6	3047.074	0.181	0.48		Unsaturated	0.0			416.86	1.70	708.67	708.67	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	363.500	0.778	58.8	58.8	2060.880	0.214	0.57		Unsaturated	0.0			343.57	1.70	584.07	584.07	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	252.320	0.689	79.2	79.2	1232.517	0.273	0.76		Unsaturated	0.0			238.49	1.70	405.43	405.43	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	148.180	1.027	98.4	98.4	649.262	0.694	1.25		Unsaturated	0.0			140.06	1.70	238.10	238.10	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	103.080	1.137	117.6	117.6	413.043	1.103	1.52		Unsaturated	0.0			97.43	1.70	165.63	165.63	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	74.300	1.298	138.0	138.0	274.737	1.748	1.79		Unsaturated	6.2			70.23	1.70	119.39	120.16	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	53.860	1.134	157.2	157.2	186.500	2.109	1.96		Unsaturated	19.4			50.91	1.70	86.54	120.32	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	44.110	1.097	177.6	177.6	143.619	2.491	2.08		Unsaturated	29.6			41.69	1.70	70.88	120.01	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	39.470	1.189	196.8	196.8	122.023	3.020	2.19		Unsaturated	38.3			37.31	1.70	63.42	119.45	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	35.760	0.988	216.0	216.0	105.470	2.771	2.20		Unsaturated	39.3			33.80	1.70	57.46	112.78	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	32.410	0.744	236.4	236.4	91.315	2.303	2.19		Unsaturated	37.9			30.63	1.70	52.08	105.13	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	9.680	0.549	255.6	255.6	39.645	5.747	2.72		Unsaturated	80.9			9.15	1.70	15.55	72.35	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	11.260	0.638	276.0	276.0	43.744	5.734	2.69		Unsaturated	78.6			10.64	1.70	18.09	75.33	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	18.930	1.136	295.2	295.2	70.477	6.049	2.58		Unsaturated	69.1			17.89	1.70	30.42	89.72	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	31.790	1.779	314.4	314.4	77.565	5.624	2.53		Unsaturated	65.0			30.05	1.70	51.08	115.46	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	52.720	2.499	334.8	334.8	124.874	4.754	2.34		Unsaturated	50.4			49.83	1.70	84.71	153.33	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	69.150	2.653	354.0	354.0	159.386	3.846	2.21		Unsaturated	39.5			65.36	1.70	111.11	179.38	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	65.370	2.528	374.4	374.4	146.466	3.879	2.23		Unsaturated	41.4			61.79	1.70	105.04	173.41	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	68.400	2.173	393.6	393.6	149.468	3.187	2.16		Unsaturated	35.5			64.65	1.70	109.91	174.13	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	74.510	1.930	412.8	412.8	159.006	2.597	2.07		Unsaturated	28.5			70.43	1.70	119.72	177.03	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	71.750	2.191	433.2	433.2	149.430	3.063	2.14		Unsaturated	34.4			67.82	1.70	115.29	179.53	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	63.740	2.120	452.4	452.4	129.831	3.338	2.21		Unsaturated	39.7			60.25	1.70	102.42	168.84	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	61.650	2.022	472.8	472.8	122.800	3.292	2.22		Unsaturated	40.5			58.27	1.70	99.06	165.32	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	55.550	1.674	492.0	492.0	108.404	3.027	2.23		Unsaturated	41.0			52.50	1.70	89.26	153.50	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	54.880	1.419	512.4	512.4	104.918	2.597	2.18		Unsaturated	37.8			51.87	1.70	88.18	149.56	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	54.740	1.121	531.6	531.6	102.724	2.057	2.12		Unsaturated	32.3			51.74	1.70	87.96	143.86	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	50.010	0.845	550.8	550.8	92.137	1.699	2.09		Unsaturated	30.2			47.27	1.70	80.36	132.22	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	55.750	0.967	571.2	571.2	100.900	1.744	2.07		Unsaturated	28.6			52.69	1.70	89.58	141.12	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	63.200	0.984	590.4	590.4	112.560	1.565	2.00		Unsaturated	23.3			59.74	1.69	100.94	145.39	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	75.960	1.053	610.8	610.8	133.094	1.392	1.92		Unsaturated	16.3			71.80	1.66	119.03	147.80	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	80.500	1.139	630.0	630.0	138.898	1.421	1.91		Unsaturated	15.7			76.09	1.63	123.72	151.23	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	83.360	1.341	649.2	649.2	141.692	1.614	1.94		Unsaturated	18.5			78.79	1.58	124.38	160.49	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	84.940	1.579	669.6	669.6	142.155	1.866	1.99		Unsaturated	22.2			80.28	1.54	123.38	168.95	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	80.220	1.532	688.8	688.8	132.324	1.918	2.02		Unsaturated	24.5			75.82	1.53	115.98	165.49	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	74.090	1.352	709.2	709.2	120.383	1.834	2.03		Unsaturated	25.6			70.03	1.53	107.40	157.43	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	72.550	1.033	728.4	728.4	116.289	1.431	1.97		Unsaturated	20.3			68.57	1.55	106.38	144.92	1.00	0.371	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	74.780	0.798	747.6	747.6	118.317	1.073	1.87		Unsaturated	13.0			70.68	1.58	111.66	129.11	1.00	0.371	1.100	n.a.	n.a.	n.a.		

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
11.320	14.610	0.756	1358.4	1358.4	20.511	5.423	2.91		Clay	95.9			13.81	1.12	n.a.	n.a.	0.98	0.391	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	17.650	0.949	1377.6	1377.6	24.624	5.595	2.86		Clay	92.0			16.68	1.12	n.a.	n.a.	0.98	0.393	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.650	28.220	1.000	1398.0	1398.0	34.768	3.634	2.62		Mixed	73.0	32.41	1.8	58.34	1.19	69.39	140.87	0.98	0.396	1.061	0.238	0.397	1.00	0.01	0.02
11.810	34.290	1.134	1417.2	1417.2	38.784	3.377	2.57		Sand	68.5		1.8	58.34	1.18	69.07	139.45	0.98	0.399	1.059	0.232	0.382	0.96	0.01	0.02
11.980	34.080	0.943	1437.6	1437.6	38.256	2.826	2.52		Sand	64.7	32.41	1.8	58.34	1.18	68.72	138.04	0.98	0.401	1.056	0.226	0.368	0.92	0.01	0.02
12.140	26.740	0.885	1456.8	1456.8	31.927	3.404	2.63		Mixed	73.7	32.41	1.8	58.34	1.17	68.26	139.55	0.98	0.403	1.055	0.232	0.381	0.95	0.01	0.02
12.300	17.650	0.829	1476.0	1476.0	22.916	4.899	2.85		Clay	90.7			16.68	1.10	n.a.	n.a.	0.98	0.406	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	18.040	0.886	1496.4	1496.4	23.111	5.126	2.86		Clay	91.5			17.05	1.10	n.a.	n.a.	0.98	0.408	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	26.050	1.018	1515.6	1515.6	33.376	4.025	2.67		Clay	76.4			24.62	1.09	n.a.	n.a.	0.98	0.410	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	21.440	0.790	1536.0	1536.0	26.917	3.821	2.72		Clay	80.8			20.26	1.09	n.a.	n.a.	0.98	0.413	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	15.430	0.619	1555.2	1555.2	18.843	4.227	2.87		Clay	92.4			14.58	1.08	n.a.	n.a.	0.98	0.415	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	13.040	0.625	1574.4	1574.4	15.565	5.098	2.98		Clay	100.0			12.33	1.08	n.a.	n.a.	0.98	0.417	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	14.050	0.671	1594.8	1594.8	16.620	5.060	2.96		Clay	99.8			13.28	1.08	n.a.	n.a.	0.98	0.419	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	14.610	0.710	1614.0	1614.0	17.104	5.144	2.96		Clay	99.4			13.81	1.07	n.a.	n.a.	0.98	0.421	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	13.960	0.705	1634.4	1634.4	16.083	5.366	2.99		Clay	100.0			13.19	1.07	n.a.	n.a.	0.98	0.423	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	13.470	0.640	1653.6	1653.6	15.292	5.064	2.99		Clay	100.0			12.73	1.07	n.a.	n.a.	0.98	0.425	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	12.800	0.600	1672.8	1672.8	14.304	5.016	3.01		Clay	100.0			12.10	1.06	n.a.	n.a.	0.98	0.427	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	10.950	0.527	1693.2	1693.2	11.934	5.214	3.08		Clay	100.0			10.35	1.06	n.a.	n.a.	0.98	0.429	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	8.550	0.448	1712.4	1712.4	8.986	5.825	3.21		Clay	100.0			8.08	1.06	n.a.	n.a.	0.98	0.431	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	7.350	0.410	1732.8	1732.8	7.483	6.316	3.29		Clay	100.0			6.95	1.05	n.a.	n.a.	0.98	0.433	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	7.850	0.395	1752.0	1752.0	7.961	5.664	3.24		Clay	100.0			7.42	1.05	n.a.	n.a.	0.98	0.435	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	8.420	0.485	1771.2	1771.2	8.508	6.433	3.25		Clay	100.0			7.96	1.05	n.a.	n.a.	0.98	0.437	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	9.470	0.537	1791.6	1791.6	9.572	6.262	3.20		Clay	100.0			8.95	1.04	n.a.	n.a.	0.98	0.438	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	11.570	0.610	1810.8	1810.8	11.779	5.723	3.11		Clay	100.0			10.94	1.04	n.a.	n.a.	0.98	0.440	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	11.880	0.617	1831.2	1831.2	11.975	5.629	3.10		Clay	100.0			11.23	1.04	n.a.	n.a.	0.98	0.442	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	11.990	0.604	1850.4	1850.4	11.959	5.458	3.09		Clay	100.0			11.33	1.04	n.a.	n.a.	0.97	0.444	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	11.840	0.579	1869.6	1869.6	11.666	5.306	3.09		Clay	100.0			11.19	1.03	n.a.	n.a.	0.97	0.445	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	11.880	0.583	1890.0	1890.0	11.571	5.332	3.10		Clay	100.0			11.23	1.03	n.a.	n.a.	0.97	0.447	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	12.560	0.586	1909.2	1909.2	12.157	5.045	3.06		Clay	100.0			11.87	1.03	n.a.	n.a.	0.97	0.449	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	12.390	0.539	1929.6	1929.6	11.842	4.720	3.05		Clay	100.0			11.71	1.02	n.a.	n.a.	0.97	0.450	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	12.420	0.500	1948.8	1948.8	11.746	4.364	3.04		Clay	100.0			11.74	1.02	n.a.	n.a.	0.97	0.452	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	10.840	0.432	1968.0	1968.0	10.016	4.379	3.09		Clay	100.0			10.25	1.02	n.a.	n.a.	0.97	0.453	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	9.510	0.427	1988.4	1988.4	8.565	5.011	3.18		Clay	100.0			8.99	1.02	n.a.	n.a.	0.97	0.455	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	9.440	0.476	2007.6	2007.6	8.404	5.636	3.22		Clay	100.0			8.92	1.01	n.a.	n.a.	0.97	0.456	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	10.160	0.495	2028.0	2028.0	9.020	5.413	3.18		Clay	100.0			9.60	1.01	n.a.	n.a.	0.97	0.458	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	10.690	0.530	2047.2	2047.2	9.444	5.487	3.17		Clay	100.0			10.10	1.01	n.a.	n.a.	0.97	0.459	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	11.840	0.572	2066.4	2066.4	10.460	5.296	3.13		Clay	100.0			11.19	1.01	n.a.	n.a.	0.97	0.461	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	12.680	0.625	2086.8	2086.8	11.153	5.369	3.11		Clay	100.0			11.98	1.00	n.a.	n.a.	0.97	0.462	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	13.460	0.646	2106.0	2106.0	11.783	5.205	3.08		Clay	100.0			12.72	1.00	n.a.	n.a.	0.97	0.464	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.720	14.060	0.682	2126.4	2126.4	12.224																			

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
22.310	10.130	0.338	2693.8	2487.2	7.063	3.847	3.18		Clay	100.0			9.57	0.96	n.a.	n.a.	0.96	0.496	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	10.480	0.353	2713.8	2497.2	7.307	3.865	3.17		Clay	100.0			9.91	0.96	n.a.	n.a.	0.96	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	10.630	0.364	2735.0	2507.9	7.387	3.928	3.17		Clay	100.0			10.05	0.96	n.a.	n.a.	0.96	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	10.650	0.328	2755.0	2517.9	7.365	3.534	3.15		Clay	100.0			10.07	0.96	n.a.	n.a.	0.96	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	10.900	0.303	2776.3	2528.5	7.524	3.181	3.11		Clay	100.0			10.30	0.95	n.a.	n.a.	0.95	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	10.860	0.320	2796.3	2538.5	7.455	3.379	3.13		Clay	100.0			10.26	0.95	n.a.	n.a.	0.95	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	10.030	0.354	2816.3	2548.6	6.766	4.106	3.21		Clay	100.0			9.48	0.95	n.a.	n.a.	0.95	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	11.910	0.355	2837.5	2559.2	8.199	3.387	3.10		Clay	100.0			11.26	0.95	n.a.	n.a.	0.95	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	14.130	0.329	2857.5	2569.2	9.887	2.590	2.97		Clay	100.0			13.36	0.95	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	11.870	0.313	2878.8	2579.9	8.086	3.002	3.07		Clay	100.0			11.22	0.95	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	10.320	0.352	2898.8	2589.9	6.850	3.964	3.20		Clay	100.0			9.75	0.95	n.a.	n.a.	0.95	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	10.480	0.520	2918.8	2599.9	6.939	5.761	3.29		Clay	100.0			9.91	0.95	n.a.	n.a.	0.95	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	11.470	0.533	2940.0	2610.5	7.661	5.333	3.24		Clay	100.0			10.84	0.95	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	16.810	0.594	2960.0	2620.5	11.700	3.873	3.01		Clay	100.0			15.89	0.95	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	15.140	0.594	2981.3	2631.2	10.375	4.355	3.08		Clay	100.0			14.31	0.94	n.a.	n.a.	0.95	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	13.440	0.643	3001.3	2641.2	9.041	5.386	3.18		Clay	100.0			12.70	0.94	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	13.490	0.634	3021.3	2651.2	9.037	5.288	3.18		Clay	100.0			12.75	0.94	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	12.800	0.602	3042.5	2661.9	8.474	5.335	3.20		Clay	100.0			12.10	0.94	n.a.	n.a.	0.95	0.509	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	12.030	0.502	3062.5	2671.9	7.859	4.782	3.20		Clay	100.0			11.37	0.94	n.a.	n.a.	0.95	0.510	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	11.730	0.389	3083.8	2682.5	7.596	3.819	3.15		Clay	100.0			11.09	0.94	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	10.110	0.360	3103.8	2692.5	6.357	4.211	3.24		Clay	100.0			9.56	0.94	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	11.200	0.374	3123.8	2702.6	7.133	3.876	3.18		Clay	100.0			10.59	0.94	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	11.230	0.409	3145.0	2713.2	7.119	4.234	3.20		Clay	100.0			10.61	0.94	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	14.730	0.476	3165.0	2723.2	9.656	3.624	3.06		Clay	100.0			13.92	0.94	n.a.	n.a.	0.95	0.513	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	14.810	0.542	3186.3	2733.9	9.669	4.102	3.09		Clay	100.0			14.00	0.93	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	17.270	0.671	3206.3	2743.9	11.420	4.280	3.04		Clay	100.0			16.32	0.93	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	15.560	0.714	3226.3	2753.9	10.129	5.119	3.13		Clay	100.0			14.71	0.93	n.a.	n.a.	0.94	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	21.410	1.350	3247.5	2764.5	14.314	6.823	3.09		Clay	100.0			20.24	0.93	n.a.	n.a.	0.94	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	62.950	1.848	3267.5	2774.5	50.612	3.014	2.45		Sand	59.0	225.03		225.03	0.93	209.51	316.48	0.94	0.516	0.919	#####	#####	#####	0.00	0.00
27.070	101.400	2.398	3288.8	2785.2	82.183	2.403	2.23		Sand	41.6	225.03		225.03	0.93	209.29	303.40	0.94	0.517	0.918	#####	#####	4054356.17	0.00	0.00
27.230	91.250	2.423	3308.8	2795.2	73.681	2.704	2.30		Sand	47.1	225.03		225.03	0.93	209.10	308.29	0.94	0.517	0.916	#####	#####	#####	0.00	0.00
27.400	101.110	1.891	3330.0	2805.8	81.625	1.901	2.16		Sand	36.0	225.03		225.03	0.93	208.89	296.22	0.94	0.518	0.915	#####	#####	848197.41	0.00	0.00
27.560	102.430	3.600	3350.0	2815.9	82.553	3.573	2.36		Sand	51.6	225.03		225.03	0.93	208.69	311.06	0.94	0.518	0.914	#####	#####	#####	0.00	0.00
27.720	130.410	3.170	3370.0	2825.9	105.283	2.463	2.17		Sand	36.3	225.03		225.03	0.93	208.49	296.17	0.94	0.519	0.913	#####	#####	836317.02	0.00	0.00
27.890	177.270	2.998	3391.3	2836.5	143.331	1.708	1.96		Sand	19.7	225.03		225.03	0.93	208.29	258.78	0.94	0.519	0.912	392.480	787.545	1516.49	0.00	0.00
28.050	200.760	2.299	3411.3	2846.5	162.213	1.155	1.80		Sand	6.8	225.03		225.03	0.91	204.59	206.46	0.94	0.520	0.916	2.775	5.591	10.76	0.00	0.00
28.220	238.080	2.278	3432.5	2857.2	192.258	0.964	1.69		Sand	0.0	225.03		225.03	0.91	204.16	204.16	0.94	0.520	0.917	2.409	4.860	9.34	0.00	0.00
28.380	266.710	2.758	3452.5	2867.2	215.161	1.041	1.68		Sand	0.0	252.09		252.09	0.92	230.78	230.78	0.94	0.521	0.909	17.613	35.216	67.62	0.00	0.00
28.540	289.000	2.332	3472.5	2877.2	232.845	0.812	1.58		Sand															

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36

(Inches)

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Depth (ft)	q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _{tt})	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
33.300	325.590	2.773	4067.5	3175.2	249.654	0.857	1.57		Sand	0.0			307.74	0.90	276.49	276.49	0.92	0.532	0.878	5489.579	10606.677	19928.40	0.00	0.00
33.460	379.530	3.852	4087.5	3185.2	290.807	1.021	1.59		Sand	0.0			358.72	0.90	322.03	322.03	0.92	0.533	0.877	#####	#####	#####	0.00	0.00
33.630	369.950	3.109	4108.8	3195.8	282.947	0.845	1.53		Sand	0.0			349.67	0.90	313.63	313.63	0.92	0.533	0.876	#####	#####	#####	0.00	0.00
33.790	363.810	3.048	4128.8	3205.9	277.782	0.843	1.54		Sand	0.0			343.87	0.90	308.17	308.17	0.92	0.533	0.875	#####	#####	#####	0.00	0.00
33.960	378.030	3.380	4150.0	3216.5	288.215	0.899	1.55		Sand	0.0			357.31	0.90	319.93	319.93	0.92	0.533	0.874	#####	#####	#####	0.00	0.00
34.120	408.340	3.443	4170.0	3226.5	310.960	0.847	1.51		Sand	0.0			385.95	0.89	345.30	345.30	0.92	0.534	0.873	#####	#####	#####	0.00	0.00
34.280	433.010	2.459	4190.0	3236.5	329.325	0.571	1.36		Sand	0.0			409.27	0.89	365.86	365.86	0.92	0.534	0.873	#####	#####	#####	0.00	0.00
34.450	386.640	1.774	4211.3	3247.2	293.396	0.461	1.34		Sand	0.0			365.44	0.89	326.40	326.40	0.92	0.534	0.872	#####	#####	#####	0.00	0.00
34.610	321.080	1.530	4231.3	3257.2	242.993	0.480	1.41		Sand	0.0			303.48	0.89	270.84	270.84	0.92	0.534	0.871	2216.850	4245.973	7946.69	0.00	0.00
34.780	304.560	1.996	4252.5	3267.8	230.024	0.660	1.52		Sand	0.0			287.86	0.89	256.68	256.68	0.92	0.535	0.870	297.832	569.803	1065.95	0.00	0.00
34.940	306.030	2.310	4272.5	3277.8	230.781	0.760	1.56		Sand	0.0			289.25	0.89	257.71	257.71	0.92	0.535	0.869	340.618	650.970	1217.28	0.00	0.00
35.100	308.010	2.932	4292.5	3287.9	231.923	0.958	1.63		Sand	0.0			291.12	0.89	259.17	259.17	0.92	0.535	0.868	413.150	788.758	1474.34	0.00	0.00
35.270	330.500	3.845	4313.8	3298.5	248.566	1.171	1.68		Sand	0.0			312.38	0.89	277.86	277.86	0.92	0.535	0.867	6893.869	13146.602	24563.13	0.00	0.00
35.430	412.400	3.745	4333.8	3308.5	310.089	0.913	1.53		Sand	0.0			389.79	0.89	346.43	346.43	0.92	0.535	0.866	#####	#####	#####	0.00	0.00
35.600	439.620	4.291	4355.0	3319.2	330.125	0.981	1.54		Sand	0.0			415.52	0.89	368.99	368.99	0.91	0.536	0.865	#####	#####	#####	0.00	0.00
35.760	356.670	3.538	4375.0	3329.2	267.115	0.998	1.60		Sand	0.0			337.12	0.89	299.13	299.13	0.91	0.536	0.864	#####	#####	1433516.30	0.00	0.00
35.930	329.900	2.267	4396.3	3339.8	246.541	0.692	1.51		Sand	0.0			311.81	0.89	276.44	276.44	0.91	0.536	0.863	5442.936	10334.956	19280.09	0.00	0.00
36.090	281.790	2.085	4416.3	3349.8	210.024	0.746	1.58		Sand	0.0			266.34	0.88	233.38	233.38	0.91	0.536	0.862	22.394	42.477	79.21	0.00	0.00
36.250	242.600	1.086	4436.3	3359.9	180.308	0.452	1.50		Sand	0.0			229.30	0.86	196.47	196.47	0.91	0.536	0.883	1.557	3.026	5.64	0.00	0.00
36.420	205.210	1.624	4457.5	3370.5	152.013	0.800	1.71		Sand	0.0			193.96	0.84	162.23	162.23	0.91	0.537	0.917	0.395	0.661	1.23	0.01	0.01
36.580	200.060	1.447	4477.5	3380.5	147.929	0.732	1.69		Sand	0.0			189.09	0.83	157.42	157.42	0.91	0.537	0.920	0.346	0.560	1.04	0.01	0.02
36.750	263.570	1.366	4498.8	3391.2	195.107	0.523	1.51		Sand	0.0			249.12	0.86	215.26	215.26	0.91	0.537	0.859	5.009	9.461	17.62	0.00	0.00
36.910	293.530	1.269	4518.8	3401.2	217.148	0.436	1.42		Sand	0.0			277.44	0.88	243.39	243.39	0.91	0.537	0.858	61.607	116.239	216.41	0.00	0.00
37.070	282.730	1.600	4538.8	3411.2	208.781	0.570	1.51		Sand	0.0			267.23	0.87	232.88	232.88	0.91	0.537	0.857	21.353	40.247	74.91	0.00	0.00
37.240	282.080	1.443	4560.0	3421.8	207.965	0.516	1.48		Sand	0.0			266.62	0.87	232.02	232.02	0.91	0.537	0.856	19.718	37.125	69.08	0.00	0.00
37.400	279.680	1.050	4580.0	3431.8	205.873	0.379	1.41		Sand	0.0	266.62		266.62	0.87	231.79	231.79	0.91	0.538	0.855	19.318	36.335	67.59	0.00	0.00
37.570	257.600	2.249	4601.3	3442.5	189.185	0.881	1.67		Sand	0.0	266.62		266.62	0.87	231.55	231.55	0.91	0.538	0.854	18.897	35.504	66.02	0.00	0.00
37.730	185.480	2.830	4621.3	3452.5	135.537	1.545	1.94		Sand	18.4	266.62		266.62	0.88	234.31	283.51	0.91	0.538	0.853	18489.017	34701.729	64513.63	0.00	0.00
37.890	131.020	2.342	4641.3	3462.5	95.094	1.820	2.10		Sand	31.1	266.62		266.62	0.88	234.14	319.11	0.91	0.538	0.852	#####	#####	#####	0.00	0.00
38.060	63.870	2.021	4662.5	3473.2	45.400	3.284	2.51		Sand	63.8	266.62		266.62	0.88	233.95	350.14	0.91	0.538	0.851	#####	#####	#####	0.00	0.00
38.220	42.790	1.761	4682.5	3483.2	23.225	4.353	2.81		Clay	87.6			40.44	0.88	n.a.	n.a.	0.91	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	92.320	2.104	4703.8	3493.8	66.178	2.339	2.29		Sand	46.2		1.8	157.07	0.86	134.32	213.53	0.90	0.538	0.850	4.431	8.281	15.38	0.00	0.00
38.550	83.890	2.198	4723.8	3503.8	59.884	2.696	2.36		Sand	52.2	87.26	1.8	157.07	0.86	134.53	217.36	0.90	0.539	0.849	5.839	10.903	20.24	0.00	0.00
38.710	47.250	2.538	4743.8	3513.8	25.544	5.654	2.85		Clay	91.3			44.66	0.87	n.a.	n.a.	0.90	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	68.570	2.069	4765.0	3524.5	48.473	3.126	2.47		Sand	61.0	99.63	1.8	179.33	0.87	156.33	249.29	0.90	0.539	0.847	119.750	223.126	414.12	0.00	0.00
39.040	100.750	2.349	4785.0	3534.5	71.931	2.388	2.27		Sand	44.6	99.63	1.8	179.33	0.87	155.23	238.63								

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36

(Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
44.290	413.860	1.591	5441.3	3863.2	287.601	0.387	1.29		Sand	0.0			391.17	0.85	333.73	333.73	0.88	0.541	0.819	#####	#####	#####	0.00	0.00
44.460	390.860	1.507	5462.5	3873.8	271.131	0.388	1.32		Sand	0.0			369.43	0.85	314.96	314.96	0.88	0.541	0.819	#####	#####	#####	0.00	0.00
44.620	370.400	2.671	5482.5	3883.8	256.500	0.727	1.51		Sand	0.0			350.09	0.85	298.27	298.27	0.88	0.541	0.818	#####	#####	1118379.47	0.00	0.00
44.780	339.180	2.843	5502.5	3893.8	234.410	0.845	1.59		Sand	0.0			320.59	0.85	272.94	272.94	0.88	0.541	0.817	3083.485	5542.531	10254.34	0.00	0.00
44.950	372.800	3.472	5523.8	3904.5	257.476	0.938	1.59		Sand	0.0			352.36	0.85	299.78	299.78	0.88	0.540	0.816	#####	#####	1545965.47	0.00	0.00
45.110	306.990	4.368	5543.8	3914.5	211.407	1.436	1.79		Sand	6.3			290.16	0.85	245.44	246.67	0.88	0.540	0.815	88.536	158.834	293.88	0.00	0.00
45.280	407.700	4.634	5565.0	3925.1	281.004	1.144	1.64		Sand	0.0			385.35	0.85	327.39	327.39	0.88	0.540	0.815	#####	#####	#####	0.00	0.00
45.440	442.790	4.058	5585.0	3935.1	304.959	0.922	1.54		Sand	0.0			418.52	0.85	355.33	355.33	0.88	0.540	0.814	#####	#####	#####	0.00	0.00
45.600	448.970	4.184	5605.0	3945.2	308.843	0.938	1.54		Sand	0.0			424.36	0.85	360.04	360.04	0.88	0.540	0.813	#####	#####	#####	0.00	0.00
45.770	459.140	3.925	5626.3	3955.8	315.450	0.860	1.51		Sand	0.0			433.97	0.85	367.94	367.94	0.88	0.540	0.812	#####	#####	#####	0.00	0.00
45.930	419.900	2.502	5646.3	3965.8	287.953	0.600	1.42		Sand	0.0			396.88	0.85	336.27	336.27	0.88	0.540	0.812	#####	#####	#####	0.00	0.00
46.100	404.860	2.192	5667.5	3976.5	277.190	0.545	1.40		Sand	0.0			382.67	0.85	323.99	323.99	0.88	0.540	0.811	#####	#####	#####	0.00	0.00
46.260	292.140	2.110	5687.5	3986.5	199.214	0.729	1.59		Sand	0.0			276.12	0.83	229.46	229.46	0.88	0.540	0.810	15.647	27.882	51.61	0.00	0.00
46.420	267.570	3.017	5707.5	3996.5	182.059	1.140	1.76		Sand	3.7			252.90	0.82	206.16	206.17	0.88	0.540	0.820	2.724	4.915	9.10	0.00	0.00
46.590	317.230	2.682	5728.8	4007.1	215.919	0.853	1.62		Sand	0.0			299.84	0.84	253.21	253.21	0.88	0.540	0.808	192.034	341.543	632.25	0.00	0.00
46.750	401.390	2.218	5748.8	4017.2	273.375	0.557	1.41		Sand	0.0			379.39	0.84	320.36	320.36	0.87	0.540	0.808	#####	#####	#####	0.00	0.00
46.920	413.310	2.249	5770.0	4027.8	281.172	0.548	1.40		Sand	0.0			390.65	0.84	329.64	329.64	0.87	0.540	0.807	#####	#####	#####	0.00	0.00
47.080	376.010	3.123	5790.0	4037.8	255.295	0.837	1.56		Sand	0.0			355.40	0.84	299.69	299.69	0.87	0.540	0.806	#####	#####	1499967.30	0.00	0.00
47.240	354.300	3.145	5810.0	4047.8	240.136	0.895	1.60		Sand	0.0			334.88	0.84	282.20	282.20	0.87	0.540	0.805	14630.276	25923.236	48004.40	0.00	0.00
47.410	348.540	2.585	5831.3	4058.5	235.882	0.748	1.55		Sand	0.0			329.43	0.84	277.42	277.42	0.87	0.540	0.805	6411.453	11349.277	21018.65	0.00	0.00
47.570	367.330	3.422	5851.3	4068.5	248.393	0.939	1.61		Sand	0.0			347.19	0.84	292.19	292.19	0.87	0.540	0.804	95912.187	#####	314171.63	0.00	0.00
47.740	406.150	4.833	5872.5	4079.1	274.488	1.199	1.66		Sand	0.0			383.88	0.84	322.85	322.85	0.87	0.540	0.803	#####	#####	#####	0.00	0.00
47.900	365.720	3.914	5892.5	4089.1	246.656	1.079	1.65		Sand	0.0	383.88		383.88	0.84	322.63	322.63	0.87	0.540	0.802	#####	#####	#####	0.00	0.00
48.060	305.970	4.698	5912.5	4099.2	205.772	1.550	1.82		Sand	8.9	383.88		383.88	0.84	322.43	331.47	0.87	0.540	0.802	#####	#####	#####	0.00	0.00
48.230	204.930	4.898	5933.8	4109.8	136.973	2.425	2.09		Sand	29.9	383.88		383.88	0.84	322.21	422.64	0.87	0.540	0.801	#####	#####	#####	0.00	0.00
48.390	118.280	3.164	5953.8	4119.8	78.104	2.744	2.29		Sand	46.1	383.88		383.88	0.84	322.00	449.33	0.87	0.540	0.800	#####	#####	#####	0.00	0.00
48.560	58.060	2.159	5975.0	4130.5	26.667	3.920	2.73		Clay	81.6			54.88	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	37.390	1.877	5995.0	4140.5	16.613	5.458	2.98		Clay	100.0			35.34	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	42.550	2.333	6015.0	4150.5	19.054	5.899	2.96		Clay	99.8			40.22	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	59.600	2.062	6036.3	4161.1	27.195	3.643	2.71		Clay	79.4			56.33	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	64.800	2.028	6056.3	4171.1	29.619	3.284	2.65		Clay	74.8			61.25	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	46.150	2.034	6077.5	4181.8	20.619	4.718	2.87		Clay	92.6			43.62	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	41.090	2.275	6097.5	4191.8	18.150	5.981	2.98		Clay	100.0			38.84	0.83	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	49.160	2.900	6117.5	4201.8	21.943	6.289	2.93		Clay	97.7			46.47	0.83	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	70.090	3.272	6138.8	4212.5	31.820	4.882	2.74		Clay	82.3			66.25	0.83	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	90.370	3.411	6158.8	4222.5	58.406	3.908	2.49		Sand	62.0			85.42	0.74	63.13	130.12	0.86	0.539	0.907	0.198	0.263	0.49	0.02	0.00
50.200	111.530	2.970	6180.0	4233.1	72.466	2.738	2.31		Sand	47.8			105.42	0.75	79.26	145.19	0.86	0.539	0.894	0.260	0.375	0.70	0.02	0.00
5																								

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRR _{M=7.5} , s'vc = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
55.280	17.920	0.480	6815.0	4551.1	6.378	3.308	3.18		Clay	100.0			16.94	0.82	n.a.	n.a.	0.84	0.535	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.450	18.500	0.450	6836.3	4561.8	6.612	2.981	3.15		Clay	100.0			17.49	0.82	n.a.	n.a.	0.84	0.535	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.610	18.260	0.425	6856.3	4571.8	6.488	2.864	3.14		Clay	100.0			17.26	0.82	n.a.	n.a.	0.84	0.535	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.770	17.160	0.432	6876.3	4581.8	5.990	3.151	3.19		Clay	100.0			16.22	0.82	n.a.	n.a.	0.84	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.940	17.750	0.461	6897.5	4592.4	6.228	3.223	3.19		Clay	100.0			16.78	0.82	n.a.	n.a.	0.84	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.100	18.420	0.482	6917.5	4602.5	6.501	3.224	3.17		Clay	100.0			17.41	0.81	n.a.	n.a.	0.84	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.270	19.600	0.485	6938.8	4613.1	6.993	3.009	3.13		Clay	100.0			18.53	0.81	n.a.	n.a.	0.84	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.430	20.290	0.466	6958.8	4623.1	7.272	2.771	3.09		Clay	100.0			19.18	0.81	n.a.	n.a.	0.84	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.590	19.000	0.457	6978.8	4633.1	6.696	2.946	3.14		Clay	100.0			17.96	0.81	n.a.	n.a.	0.84	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.760	18.700	0.431	7000.0	4643.8	6.546	2.838	3.14		Clay	100.0			17.67	0.81	n.a.	n.a.	0.84	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.920	18.860	0.468	7020.0	4653.8	6.597	3.049	3.15		Clay	100.0			17.83	0.81	n.a.	n.a.	0.84	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.090	18.380	0.508	7041.3	4664.4	6.371	3.421	3.19		Clay	100.0			17.37	0.81	n.a.	n.a.	0.84	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.250	19.270	0.547	7061.3	4674.5	6.734	3.477	3.17		Clay	100.0			18.21	0.81	n.a.	n.a.	0.84	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.410	19.330	0.627	7081.3	4684.5	6.741	3.972	3.21		Clay	100.0			18.27	0.81	n.a.	n.a.	0.84	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.580	19.770	0.633	7102.5	4695.1	6.909	3.905	3.19		Clay	100.0			18.69	0.81	n.a.	n.a.	0.83	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.740	21.150	0.613	7122.5	4705.1	7.476	3.487	3.14		Clay	100.0			19.99	0.81	n.a.	n.a.	0.83	0.532	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.910	23.000	0.821	7143.8	4715.8	8.240	4.227	3.15		Clay	100.0			21.74	0.81	n.a.	n.a.	0.83	0.532	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.070	22.430	0.818	7163.8	4725.8	7.977	4.339	3.17		Clay	100.0			21.20	0.81	n.a.	n.a.	0.83	0.532	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.230	30.720	0.661	7183.8	4735.8	11.457	2.436	2.90		Clay	94.8			29.04	0.81	n.a.	n.a.	0.83	0.532	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.400	36.200	0.555	7205.0	4746.4	13.736	1.704	2.75		Clay	82.8			34.22	0.81	n.a.	n.a.	0.83	0.532	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.560	31.100	0.510	7225.0	4756.5	11.558	1.857	2.83		Clay	89.4			29.40	0.81	n.a.	n.a.	0.83	0.532	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.730	21.100	0.473	7246.3	4767.1	7.332	2.709	3.08		Clay	100.0			19.94	0.81	n.a.	n.a.	0.83	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.890	20.250	0.454	7266.3	4777.1	6.957	2.730	3.11		Clay	100.0			19.14	0.81	n.a.	n.a.	0.83	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.060	19.800	0.454	7287.5	4787.8	6.749	2.810	3.12		Clay	100.0			18.71	0.81	n.a.	n.a.	0.83	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.220	18.820	0.448	7307.5	4797.8	6.322	2.953	3.16		Clay	100.0			17.79	0.81	n.a.	n.a.	0.83	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.380	15.910	0.438	7327.5	4807.8	5.094	3.579	3.28		Clay	100.0			15.04	0.81	n.a.	n.a.	0.83	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.550	14.690	0.424	7348.8	4818.4	4.572	3.853	3.34		Clay	100.0			13.88	0.80	n.a.	n.a.	0.83	0.530	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.710	14.530	0.362	7368.8	4828.4	4.492	3.333	3.31		Clay	100.0			13.73	0.80	n.a.	n.a.	0.83	0.530	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.880	14.150	0.378	7390.0	4839.1	4.321	3.615	3.35		Clay	100.0			13.37	0.80	n.a.	n.a.	0.83	0.530	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.040	13.410	0.410	7410.0	4849.1	4.003	4.225	3.41		Clay	100.0			12.67	0.80	n.a.	n.a.	0.83	0.530	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.200	15.380	0.495	7430.0	4859.1	4.801	4.239	3.34		Clay	100.0			14.54	0.80	n.a.	n.a.	0.82	0.530	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.370	17.270	0.747	7451.3	4869.8	5.563	5.514	3.36		Clay	100.0			16.32	0.80	n.a.	n.a.	0.82	0.529	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.530	19.510	0.849	7471.3	4879.8	6.465	5.382	3.30		Clay	100.0			18.44	0.80	n.a.	n.a.	0.82	0.529	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.700	27.130	1.258	7492.5	4890.4	9.563	5.380	3.16		Clay	100.0			25.64	0.80	n.a.	n.a.	0.82	0.529	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.860	32.020	1.573	7512.5	4900.4	11.535	5.566	3.11		Clay	100.0			30.26	0.80	n.a.	n.a.	0.82	0.529	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.020	44.320	1.738	7532.5	4910.5	16.517	4.286	2.92		Clay	96.3			41.89	0.80	n.a.	n.a.	0.82	0.529	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.190	49.900	1.382	7553.8	4921.1	18.745	2.997	2.78		Clay	85.1			47.16	0.80	n.a.	n.a.	0.82	0.528	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.350	49.140	1.692	7573.8	4931.1	18.395	3.731	2.84		Clay	90.3			46.45	0.80	n.a.	n.a.	0.82	0.528	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.520	41.670	2.211	7595.0	4941.8	15.328	5.838	3.03		Clay	100.0			39.39	0.80	n.a.	n.a.	0.82	0.528	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.680	41.760	2.691	7615.0	4951.8	15.329	7.089	3.08		Clay	100.0			39.47	0.80	n.a.	n.a.	0.82	0.528	n.a.	n.a.	n.a.	n.a.		

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
66.270	24.400	0.682	8188.8	5239.1	7.752	3.357	3.12		Clay	100.0			23.06	0.79	n.a.	n.a.	0.80	0.522	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.440	23.270	0.983	8210.0	5249.7	7.301	5.130	3.24		Clay	100.0			21.99	0.79	n.a.	n.a.	0.80	0.522	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.600	24.260	1.269	8230.0	5259.8	7.660	6.297	3.28		Clay	100.0			22.93	0.79	n.a.	n.a.	0.80	0.521	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.770	26.310	1.228	8251.3	5270.4	8.418	5.536	3.21		Clay	100.0			24.87	0.79	n.a.	n.a.	0.80	0.521	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.930	34.530	0.962	8271.3	5280.4	11.512	3.165	2.96		Clay	99.8			32.64	0.79	n.a.	n.a.	0.80	0.521	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.090	44.350	1.349	8291.3	5290.4	15.199	3.356	2.88		Clay	93.3			41.92	0.79	n.a.	n.a.	0.80	0.521	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.260	32.140	1.181	8312.5	5301.1	10.558	4.221	3.06		Clay	100.0			30.38	0.78	n.a.	n.a.	0.80	0.521	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.420	40.250	1.487	8332.5	5311.1	13.588	4.122	2.97		Clay	100.0			38.04	0.78	n.a.	n.a.	0.80	0.520	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.590	54.910	1.881	8353.8	5321.7	19.066	3.707	2.83		Clay	89.2			51.90	0.78	n.a.	n.a.	0.80	0.520	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.750	55.460	2.636	8373.8	5331.8	19.233	5.142	2.92		Clay	96.3			52.42	0.78	n.a.	n.a.	0.80	0.520	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.910	70.330	3.180	8393.8	5341.8	24.761	4.809	2.82		Clay	88.3			66.47	0.78	n.a.	n.a.	0.80	0.520	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.080	67.620	2.486	8415.0	5352.4	23.695	3.921	2.77		Clay	84.7			63.91	0.78	n.a.	n.a.	0.80	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.240	49.820	1.611	8435.0	5362.4	17.008	3.533	2.85		Clay	91.3			47.09	0.78	n.a.	n.a.	0.80	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.410	33.120	1.157	8456.3	5373.1	10.754	4.003	3.04		Clay	100.0			31.30	0.78	n.a.	n.a.	0.79	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.570	22.000	0.923	8476.3	5383.1	6.599	5.194	3.28		Clay	100.0			20.79	0.78	n.a.	n.a.	0.79	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.730	18.180	0.814	8496.3	5393.1	5.167	5.841	3.40		Clay	100.0			17.18	0.78	n.a.	n.a.	0.79	0.518	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.900	18.530	0.832	8517.5	5403.7	5.282	5.829	3.39		Clay	100.0			17.51	0.78	n.a.	n.a.	0.79	0.518	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.060	19.610	0.921	8537.5	5413.8	5.668	6.003	3.37		Clay	100.0			18.53	0.78	n.a.	n.a.	0.79	0.518	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.230	22.190	0.941	8558.8	5424.4	6.604	5.253	3.28		Clay	100.0			20.97	0.78	n.a.	n.a.	0.79	0.518	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.390	24.090	0.905	8578.8	5434.4	7.287	4.573	3.21		Clay	100.0			22.77	0.78	n.a.	n.a.	0.79	0.518	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.550	23.230	0.772	8598.8	5444.4	6.954	4.075	3.20		Clay	100.0			21.96	0.78	n.a.	n.a.	0.79	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.720	21.470	0.672	8620.0	5455.1	6.291	3.917	3.23		Clay	100.0			20.29	0.78	n.a.	n.a.	0.79	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.880	20.000	0.661	8640.0	5465.1	5.738	4.212	3.28		Clay	100.0			18.90	0.78	n.a.	n.a.	0.79	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.050	19.500	0.663	8661.3	5475.7	5.541	4.370	3.30		Clay	100.0			18.43	0.78	n.a.	n.a.	0.79	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.210	19.980	0.658	8681.3	5485.7	5.702	4.208	3.28		Clay	100.0			18.88	0.78	n.a.	n.a.	0.79	0.516	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.370	20.030	0.682	8701.3	5495.8	5.706	4.348	3.29		Clay	100.0			18.93	0.78	n.a.	n.a.	0.79	0.516	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.540	20.200	0.666	8722.5	5506.4	5.753	4.204	3.28		Clay	100.0			19.09	0.78	n.a.	n.a.	0.79	0.516	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.700	19.810	0.646	8742.5	5516.4	5.597	4.187	3.29		Clay	100.0			18.72	0.78	n.a.	n.a.	0.79	0.516	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.870	20.140	0.597	8763.8	5527.1	5.702	3.785	3.26		Clay	100.0			19.04	0.78	n.a.	n.a.	0.79	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.030	20.460	0.559	8783.8	5537.1	5.804	3.481	3.23		Clay	100.0			19.34	0.78	n.a.	n.a.	0.79	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.190	20.370	0.563	8803.8	5547.1	5.757	3.523	3.23		Clay	100.0			19.25	0.78	n.a.	n.a.	0.78	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.360	19.250	0.558	8825.0	5557.7	5.339	3.761	3.28		Clay	100.0			18.19	0.78	n.a.	n.a.	0.78	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.520	19.160	0.538	8845.0	5567.8	5.294	3.653	3.27		Clay	100.0			18.11	0.77	n.a.	n.a.	0.78	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.690	18.910	0.533	8866.3	5578.4	5.190	3.684	3.28		Clay	100.0			17.87	0.77	n.a.	n.a.	0.78	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.850	18.760	0.535	8886.3	5588.4	5.124	3.738	3.29		Clay	100.0			17.73	0.77	n.a.	n.a.	0.78	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.010	18.440	0.518	8906.3	5598.4	4.997	3.705	3.30		Clay	100.0			17.43	0.77	n.a.	n.a.	0.78	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.180	17.750	0.491	8927.5	5609.1	4.737	3.694	3.32		Clay	100.0			16.78	0.77	n.a.	n.a.	0.78	0.513	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.340	16.690	0.466	8947.5	5619.1	4.348	3.818	3.36		Clay	100.0			15.78	0.77	n.a.	n.a.	0.78	0.513	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.510	16.600	0.457	8968.8	5629.7	4.304	3.768	3.36		Clay	100.0			15.69	0.77	n.a.	n.a.	0.78	0.513	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.670	16.630	0.398	8988.8	5639.7	4.304	3.282	3.33		Clay	100.0			15.72	0.77	n.a.	n.a.	0.78	0.513	n.a.	n.a.	n.a.	n.a.		

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
77.260	41.350	1.396	9562.5	5927.1	12.340	3.818	2.98		Clay	100.0			39.08	0.76	n.a.	n.a.	0.76	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.430	29.740	1.171	9583.8	5937.7	8.403	4.693	3.17		Clay	100.0			28.11	0.76	n.a.	n.a.	0.76	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.590	23.200	0.834	9603.8	5947.7	6.187	4.535	3.27		Clay	100.0			21.93	0.76	n.a.	n.a.	0.76	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.760	21.800	0.731	9625.0	5958.4	5.702	4.306	3.29		Clay	100.0			20.60	0.76	n.a.	n.a.	0.76	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.920	22.220	0.727	9645.0	5968.4	5.830	4.176	3.27		Clay	100.0			21.00	0.76	n.a.	n.a.	0.76	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.080	21.450	0.727	9665.0	5978.4	5.559	4.372	3.30		Clay	100.0			20.27	0.76	n.a.	n.a.	0.76	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.250	23.220	0.741	9686.3	5989.1	6.137	4.031	3.24		Clay	100.0			21.95	0.76	n.a.	n.a.	0.76	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.410	23.290	0.770	9706.3	5999.1	6.147	4.177	3.25		Clay	100.0			22.01	0.76	n.a.	n.a.	0.76	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.580	23.340	0.778	9727.5	6009.7	6.149	4.209	3.25		Clay	100.0			22.06	0.76	n.a.	n.a.	0.76	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.740	23.400	0.794	9747.5	6019.7	6.155	4.287	3.26		Clay	100.0			22.12	0.76	n.a.	n.a.	0.76	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.900	23.800	0.805	9767.5	6029.7	6.274	4.253	3.25		Clay	100.0			22.50	0.76	n.a.	n.a.	0.76	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.070	24.430	0.820	9788.8	6040.4	6.468	4.198	3.24		Clay	100.0			23.09	0.76	n.a.	n.a.	0.76	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.230	24.360	0.811	9808.8	6050.4	6.431	4.171	3.24		Clay	100.0			23.02	0.76	n.a.	n.a.	0.76	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.400	23.450	0.789	9830.0	6061.0	6.116	4.256	3.26		Clay	100.0			22.16	0.76	n.a.	n.a.	0.76	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.560	23.070	0.722	9850.0	6071.1	5.978	3.980	3.25		Clay	100.0			21.81	0.76	n.a.	n.a.	0.76	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.720	22.960	0.762	9870.0	6081.1	5.928	4.227	3.27		Clay	100.0			21.70	0.76	n.a.	n.a.	0.76	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.890	22.880	0.771	9891.3	6091.7	5.888	4.301	3.28		Clay	100.0			21.63	0.76	n.a.	n.a.	0.75	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.050	22.230	0.770	9911.3	6101.7	5.662	4.459	3.30		Clay	100.0			21.01	0.76	n.a.	n.a.	0.75	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.220	24.940	0.769	9932.5	6112.4	6.536	3.852	3.21		Clay	100.0			23.57	0.76	n.a.	n.a.	0.75	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.380	24.470	0.774	9952.5	6122.4	6.368	3.973	3.23		Clay	100.0			23.13	0.76	n.a.	n.a.	0.75	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.540	24.610	0.800	9972.5	6132.4	6.400	4.075	3.23		Clay	100.0			23.26	0.76	n.a.	n.a.	0.75	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.710	24.720	0.795	9993.8	6143.0	6.421	4.032	3.23		Clay	100.0			23.36	0.75	n.a.	n.a.	0.75	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.870	24.570	0.793	10013.8	6153.1	6.359	4.052	3.23		Clay	100.0			23.22	0.75	n.a.	n.a.	0.75	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.040	24.670	0.787	10035.0	6163.7	6.377	4.003	3.23		Clay	100.0			23.32	0.75	n.a.	n.a.	0.75	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.200	24.900	0.782	10055.0	6173.7	6.438	3.937	3.22		Clay	100.0			23.53	0.75	n.a.	n.a.	0.75	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.360	24.750	0.781	10075.0	6183.7	6.376	3.964	3.23		Clay	100.0			23.39	0.75	n.a.	n.a.	0.75	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.530	23.920	0.751	10096.3	6194.4	6.093	3.982	3.24		Clay	100.0			22.61	0.75	n.a.	n.a.	0.75	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.690	23.360	0.754	10116.3	6204.4	5.900	4.121	3.26		Clay	100.0			22.08	0.75	n.a.	n.a.	0.75	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.860	22.630	0.712	10137.5	6215.0	5.651	4.053	3.28		Clay	100.0			21.39	0.75	n.a.	n.a.	0.75	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.020	22.320	0.689	10157.5	6225.1	5.539	3.997	3.28		Clay	100.0			21.10	0.75	n.a.	n.a.	0.75	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.190	21.810	0.658	10178.8	6235.7	5.363	3.932	3.29		Clay	100.0			20.61	0.75	n.a.	n.a.	0.75	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.350	21.150	0.621	10198.8	6245.7	5.140	3.871	3.30		Clay	100.0			19.99	0.75	n.a.	n.a.	0.75	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.510	20.780	0.594	10218.8	6255.7	5.010	3.790	3.30		Clay	100.0			19.64	0.75	n.a.	n.a.	0.75	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.680	20.260	0.578	10240.0	6266.4	4.832	3.816	3.32		Clay	100.0			19.15	0.75	n.a.	n.a.	0.75	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.840	20.780	0.610	10260.0	6276.4	4.987	3.900	3.31		Clay	100.0			19.64	0.75	n.a.	n.a.	0.75	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.010	21.820	0.617	10281.3	6287.0	5.306	3.697	3.28		Clay	100.0			20.62	0.75	n.a.	n.a.	0.74	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.170	22.940	0.610	10301.3	6297.0	5.650	3.430	3.24		Clay	100.0			21.68	0.75	n.a.	n.a.	0.74	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.330	22.210	0.620	10321.3	6307.1	5.406	3.637	3.27		Clay	100.0			20.99	0.75	n.a.	n.a.	0.74	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.500	22.290	0.630	10342.5	6317.7	5.419	3.678	3.27		Clay	100.0			21.07	0.75	n.a.	n.a.	0.74	0.496	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.660	22.570	0.637	10362.5	6327.7	5.496	3.662	3.26		Clay	100.0			21.33	0.75	n.a.	n.a.	0.74	0.496	n.a.	n.a.</				

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRR _{M=7.5} , s'vc = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
88.250	47.380	1.265	10936.3	6615.1	12.672	3.018	2.91		Clay	96.1			44.78	0.74	n.a.	n.a.	0.73	0.490	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.420	46.720	1.151	10957.5	6625.7	12.449	2.791	2.90		Clay	95.1			44.16	0.74	n.a.	n.a.	0.73	0.489	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.580	40.460	1.498	10977.5	6635.7	10.540	4.284	3.07		Clay	100.0			38.24	0.74	n.a.	n.a.	0.73	0.489	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.750	37.360	2.042	10998.8	6646.4	9.587	6.409	3.21		Clay	100.0			35.31	0.74	n.a.	n.a.	0.73	0.489	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.910	35.470	2.191	11018.8	6656.4	9.002	7.313	3.27		Clay	100.0			33.53	0.74	n.a.	n.a.	0.73	0.489	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.070	57.180	1.841	11038.8	6666.4	15.499	3.563	2.89		Clay	94.0			54.05	0.74	n.a.	n.a.	0.73	0.488	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.240	84.110	1.794	11060.0	6677.0	23.537	2.283	2.63		Clay	73.1			79.50	0.74	n.a.	n.a.	0.73	0.488	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.400	93.910	1.861	11080.0	6687.0	46.985	2.106	2.37		Sand	52.6			88.76	0.58	51.56	112.25	0.73	0.488	0.865	0.156	0.180	0.37	0.03	0.00
89.570	91.430	1.449	11101.3	6697.7	45.625	1.687	2.32		Sand	48.4			86.42	0.57	49.67	108.16	0.72	0.488	0.869	0.149	0.169	0.35	0.03	0.00
89.730	59.790	1.887	11121.3	6707.7	16.169	3.480	2.87		Clay	92.3			56.51	0.74	n.a.	n.a.	0.72	0.487	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.900	35.940	1.669	11142.5	6718.3	9.041	5.497	3.19		Clay	100.0			33.97	0.74	n.a.	n.a.	0.72	0.487	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.060	26.840	1.069	11162.5	6728.4	6.319	5.029	3.29		Clay	100.0			25.37	0.74	n.a.	n.a.	0.72	0.487	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.220	39.410	0.817	11182.5	6738.4	10.038	2.415	2.94		Clay	98.4			37.25	0.74	n.a.	n.a.	0.72	0.487	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.390	32.800	0.768	11203.8	6749.0	8.060	2.824	3.06		Clay	100.0			31.00	0.74	n.a.	n.a.	0.72	0.487	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.550	25.550	0.686	11223.8	6759.0	5.900	3.440	3.22		Clay	100.0			24.15	0.74	n.a.	n.a.	0.72	0.486	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.720	24.720	0.667	11245.0	6769.7	5.642	3.490	3.24		Clay	100.0			23.36	0.74	n.a.	n.a.	0.72	0.486	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.880	26.140	0.663	11265.0	6779.7	6.050	3.232	3.20		Clay	100.0			24.71	0.74	n.a.	n.a.	0.72	0.486	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.040	26.280	0.641	11285.0	6789.7	6.079	3.106	3.19		Clay	100.0			24.84	0.74	n.a.	n.a.	0.72	0.486	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.210	24.810	0.599	11306.3	6800.3	5.634	3.129	3.22		Clay	100.0			23.45	0.73	n.a.	n.a.	0.72	0.485	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.370	23.080	0.572	11326.3	6810.4	5.115	3.285	3.26		Clay	100.0			21.81	0.73	n.a.	n.a.	0.72	0.485	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.540	22.370	0.540	11347.5	6821.0	4.896	3.234	3.27		Clay	100.0			21.14	0.73	n.a.	n.a.	0.72	0.485	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.700	22.490	0.542	11367.5	6831.0	4.921	3.223	3.27		Clay	100.0			21.26	0.73	n.a.	n.a.	0.72	0.485	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.860	22.390	0.541	11387.5	6841.0	4.881	3.238	3.28		Clay	100.0			21.16	0.73	n.a.	n.a.	0.72	0.485	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.030	22.670	0.542	11408.8	6851.7	4.952	3.192	3.27		Clay	100.0			21.43	0.73	n.a.	n.a.	0.72	0.484	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.190	23.710	0.513	11428.8	6861.7	5.245	2.852	3.22		Clay	100.0			22.41	0.73	n.a.	n.a.	0.72	0.484	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.360	23.680	0.447	11450.0	6872.3	5.225	2.487	3.19		Clay	100.0			22.38	0.73	n.a.	n.a.	0.72	0.484	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.520	22.750	0.514	11470.0	6882.4	4.945	3.019	3.25		Clay	100.0			21.50	0.73	n.a.	n.a.	0.72	0.484	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.680	21.740	0.521	11490.0	6892.4	4.641	3.255	3.30		Clay	100.0			20.55	0.73	n.a.	n.a.	0.72	0.483	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.850	25.460	0.541	11511.3	6903.0	5.709	2.747	3.18		Clay	100.0			24.06	0.73	n.a.	n.a.	0.72	0.483	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.010	25.800	0.552	11531.3	6913.0	5.796	2.755	3.18		Clay	100.0			24.39	0.73	n.a.	n.a.	0.72	0.483	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.180	26.080	0.556	11552.5	6923.7	5.865	2.738	3.17		Clay	100.0			24.65	0.73	n.a.	n.a.	0.71	0.483	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.340	26.270	0.565	11572.5	6933.7	5.908	2.759	3.17		Clay	100.0			24.83	0.73	n.a.	n.a.	0.71	0.483	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.500	25.830	0.552	11592.5	6943.7	5.770	2.755	3.18		Clay	100.0			24.41	0.73	n.a.	n.a.	0.71	0.482	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.670	24.870	0.533	11613.8	6954.3	5.482	2.794	3.20		Clay	100.0			23.51	0.73	n.a.	n.a.	0.71	0.482	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.830	23.590	0.502	11633.8	6964.4	5.104	2.824	3.23		Clay	100.0			22.30	0.73	n.a.	n.a.	0.71	0.482	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.000	23.070	0.487	11655.0	6975.0	4.944	2.823	3.24		Clay	100.0			21.81	0.73	n.a.	n.a.	0.71	0.482	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.160	22.910	0.529	11675.0	6985.0	4.888	3.100	3.27		Clay	100.0			21.65	0.73	n.a.	n.a.	0.71	0.481	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.320	22.920	0.612	11695.0	6995.0	4.881	3.585	3.30		Clay	100.0			21.66	0.73	n.a.	n.a.	0.71	0.481	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.490	24.200	0.843	11716.3	7005.7	5.236	4.595	3.33		Clay	100.0			22.87	0.73	n.a.	n.a.	0.71	0.481	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.650	26.080	1.190	11736.3	7015.7	5.762	5.889	3.36		Clay	100.0		</												

CPT No.

2

PGA (A_{max})

0.57

Total Settlement:

0.36

(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	In situ S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5}$, $S'_{vc} = 1 \text{ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ϵ_v	Settlement (Inches)
99.250	50.270	1.745	12311.3	7303.7	12.080	3.956	3.00		Clay	100.0			47.51	0.72	n.a.	n.a.	0.70	0.475	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.410	54.260	1.518	12331.3	7313.7	13.152	3.156	2.91		Clay	96.0			51.29	0.72	n.a.	n.a.	0.70	0.475	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.570	48.760	1.434	12351.3	7323.7	11.629	3.368	2.97		Clay	100.0			46.09	0.72	n.a.	n.a.	0.70	0.475	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.740	47.660	2.331	12372.5	7334.3	11.309	5.621	3.12		Clay	100.0			45.05	0.72	n.a.	n.a.	0.70	0.474	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.900	41.610	2.677	12392.5	7344.3	9.644	7.559	3.25		Clay	100.0			39.33	0.72	n.a.	n.a.	0.70	0.474	n.a.	n.a.	n.a.	n.a.	0.00	0.00
100.070	45.950	2.974	12413.8	7355.0	10.807	7.484	3.21		Clay	100.0			43.43	0.72	n.a.	n.a.	0.70	0.474	n.a.	n.a.	n.a.	n.a.	0.00	0.00
100.230	68.650	2.969	12433.8	7365.0	16.954	4.756	2.94		Clay	97.9			64.89	0.72	n.a.	n.a.	0.70	0.474	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No.

3

PGA (A_{max})

0.57

Total Settlement:

0.27

(Inches)

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Depth (ft)	q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _{tt})	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
0.160	6.940	0.218	19.2	19.2	68.767	3.147	2.37		Unsaturated	52.6			6.56	1.70	11.15	60.97	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	1.720	0.350	39.6	39.6	85.869	20.568	2.96		Unsaturated	100.0			1.63	1.70	2.76	57.55	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	1.440	0.472	58.8	58.8	47.980	33.454	3.28		Unsaturated	100.0			1.36	1.70	2.31	56.97	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	8.890	0.704	79.2	79.2	83.412	7.954	2.63		Unsaturated	73.1			8.40	1.70	14.28	69.58	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	214.560	1.391	98.4	98.4	940.208	0.648	1.15		Unsaturated	0.0	202.80	1.70	344.76	1.70	344.76	344.76	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	141.600	1.868	117.6	117.6	567.481	1.320	1.52		Unsaturated	0.0	133.84	1.70	227.52	1.70	227.52	227.52	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	103.880	2.455	138.0	138.0	384.216	2.365	1.82		Unsaturated	8.9	98.19	1.70	166.91	1.70	166.91	172.95	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	83.890	2.598	157.2	157.2	290.636	3.100	1.99		Unsaturated	21.8	79.29	1.70	134.79	1.70	134.79	181.32	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	70.140	2.929	177.6	177.6	228.542	4.181	2.15		Unsaturated	35.0	66.29	1.70	112.70	1.70	112.70	177.09	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	67.480	2.959	196.8	196.8	208.834	4.391	2.19		Unsaturated	38.1	63.78	1.70	108.43	1.70	108.43	174.89	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	61.380	2.712	216.0	216.0	181.262	4.425	2.22		Unsaturated	41.0	58.02	1.70	98.63	1.70	98.63	165.12	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	53.320	2.547	236.4	236.4	150.444	4.788	2.30		Unsaturated	46.9	50.40	1.70	85.67	1.70	85.67	152.73	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	51.600	2.888	255.6	255.6	139.980	5.611	2.37		Unsaturated	52.8	48.77	1.70	82.91	1.70	82.91	152.16	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	54.930	3.313	276.0	276.0	143.395	6.047	2.39		Unsaturated	54.5	51.92	1.70	88.26	1.70	88.26	159.68	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	59.460	3.357	295.2	295.2	150.093	5.660	2.36		Unsaturated	51.7	56.20	1.70	95.54	1.70	95.54	167.70	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	66.800	3.047	314.4	314.4	163.412	4.573	2.26		Unsaturated	43.9	63.14	1.70	107.33	1.70	107.33	178.11	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	78.320	2.775	334.8	334.8	185.705	3.551	2.14		Unsaturated	34.2	74.03	1.70	125.84	1.70	125.84	192.16	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	77.970	2.426	354.0	354.0	179.767	3.118	2.10		Unsaturated	31.1	73.70	1.70	125.28	1.70	125.28	187.53	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	73.560	2.234	374.4	374.4	164.869	3.045	2.11		Unsaturated	32.2	69.53	1.70	118.20	1.70	118.20	180.41	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	66.630	2.115	393.6	393.6	145.589	3.183	2.16		Unsaturated	36.0	62.98	1.70	107.06	1.70	107.06	171.17	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	53.200	1.878	412.8	412.8	113.403	3.545	2.27		Unsaturated	44.3	50.28	1.70	85.48	1.70	85.48	150.98	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	46.400	1.582	433.2	433.2	96.475	3.425	2.30		Unsaturated	46.9	43.86	1.70	74.56	1.70	74.56	138.78	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	47.200	1.149	452.4	452.4	96.021	2.446	2.19		Unsaturated	38.3	44.61	1.70	75.84	1.70	75.84	134.74	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	49.880	0.938	472.8	472.8	99.265	1.889	2.10		Unsaturated	31.0	47.15	1.70	80.15	1.70	80.15	132.87	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	52.060	0.654	492.0	492.0	101.563	1.261	1.97		Unsaturated	20.7	49.21	1.70	83.65	1.70	83.65	120.03	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	48.060	0.437	512.4	512.4	91.818	0.914	1.91		Unsaturated	16.2	45.43	1.70	77.22	1.70	77.22	101.59	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	44.590	0.242	531.6	531.6	83.584	0.545	1.82		Unsaturated	8.6	42.15	1.70	71.65	1.70	71.65	75.42	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	41.680	0.246	550.8	550.8	76.705	0.593	1.87		Unsaturated	12.6	39.40	1.70	66.97	1.70	66.97	80.71	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	38.030	0.241	571.2	571.2	68.664	0.638	1.93		Unsaturated	17.2	35.95	1.70	61.11	1.70	61.11	86.60	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	37.160	0.237	590.4	590.4	65.965	0.643	1.94		Unsaturated	18.6	35.12	1.70	59.71	1.70	59.71	88.18	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	38.200	0.248	610.8	610.8	66.665	0.656	1.95		Unsaturated	18.6	36.11	1.70	61.38	1.70	61.38	90.14	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	38.260	0.255	630.0	630.0	65.729	0.672	1.96		Unsaturated	19.5	36.16	1.70	61.48	1.70	61.48	92.19	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	37.920	0.249	649.2	649.2	64.153	0.663	1.96		Unsaturated	20.0	35.84	1.70	60.93	1.70	60.93	92.56	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	38.990	0.352	669.6	669.6	64.949	0.911	2.03		Unsaturated	25.7	36.85	1.70	62.65	1.70	62.65	104.94	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	41.740	0.414	688.8	688.8	68.577	1.001	2.04		Unsaturated	26.1	39.45	1.70	67.07	1.70	67.07	110.76	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	45.760	0.428	709.2	709.2	74.130	0.942	2.00		Unsaturated	22.7	43.25	1.68	72.60	1.68	72.60	111.46	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	56.840	0.408	728.4	728.4	90.981	0.723	1.86		Unsaturated	11.5	53.72	1.69	90.8											

CPT No.

3

PGA (A_{max})

0.57

Total Settlement:

0.27

(Inches)

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Depth (ft)	q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _{tt})	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
11.320	208.420	1.296	1358.4	1358.4	245.064	0.624	1.48		Sand	0.0			196.99	1.14	224.80	224.80	0.98	0.391	1.100	10.478	25.357	64.86	0.00	0.00
11.480	216.950	1.249	1377.6	1377.6	253.332	0.578	1.45		Sand	0.0			205.06	1.13	232.14	232.14	0.98	0.393	1.100	19.943	48.261	122.65	0.00	0.00
11.650	194.490	1.192	1398.0	1398.0	225.347	0.615	1.51		Sand	0.0			183.83	1.14	209.63	209.63	0.98	0.396	1.100	3.401	8.229	20.78	0.00	0.00
11.810	201.150	1.201	1417.2	1417.2	231.496	0.599	1.49		Sand	0.0			190.12	1.13	215.26	215.26	0.98	0.399	1.100	5.008	12.119	30.41	0.00	0.00
11.980	199.920	1.000	1437.6	1437.6	228.426	0.502	1.44		Sand	0.0			188.96	1.13	213.21	213.21	0.98	0.401	1.100	4.332	10.484	26.14	0.00	0.00
12.140	189.420	0.765	1456.8	1456.8	214.944	0.406	1.41		Sand	0.0			179.04	1.13	202.24	202.24	0.98	0.403	1.100	2.149	5.202	12.89	0.00	0.00
12.300	180.160	1.058	1476.0	1476.0	203.051	0.589	1.53		Sand	0.0			170.28	1.13	192.45	192.45	0.98	0.406	1.087	1.267	3.029	7.47	0.00	0.00
12.470	190.970	1.561	1496.4	1496.4	213.800	0.821	1.61		Sand	0.0			180.50	1.12	202.13	202.13	0.98	0.408	1.093	2.135	5.136	12.59	0.00	0.00
12.630	197.860	1.969	1515.6	1515.6	220.126	0.999	1.66		Sand	0.0			187.01	1.11	208.02	208.02	0.98	0.410	1.097	3.062	7.387	18.00	0.00	0.00
12.800	183.590	1.584	1536.0	1536.0	202.817	0.866	1.64		Sand	0.0			173.53	1.11	193.39	193.39	0.98	0.413	1.078	1.328	3.150	7.63	0.00	0.00
12.960	190.840	1.151	1555.2	1555.2	209.544	0.606	1.52		Sand	0.0			180.38	1.11	199.67	199.67	0.98	0.415	1.081	1.855	4.409	10.63	0.00	0.00
13.120	164.930	1.103	1574.4	1574.4	179.861	0.672	1.60		Sand	0.0			155.89	1.11	173.72	173.72	0.98	0.417	1.059	0.573	1.206	2.89	0.00	0.00
13.290	167.070	0.814	1594.8	1594.8	181.025	0.490	1.52		Sand	0.0			157.91	1.11	175.05	175.05	0.98	0.419	1.057	0.601	1.276	3.04	0.00	0.00
13.450	183.210	1.326	1614.0	1614.0	197.402	0.727	1.60		Sand	0.0			173.17	1.10	190.02	190.02	0.98	0.421	1.064	1.126	2.634	6.26	0.00	0.00
13.620	194.590	0.981	1634.4	1634.4	208.394	0.506	1.48		Sand	0.0			183.92	1.09	200.24	200.24	0.98	0.423	1.068	1.916	4.501	10.63	0.00	0.00
13.780	177.470	1.169	1653.6	1653.6	188.866	0.662	1.58		Sand	0.0	183.92		183.92	1.08	199.52	199.52	0.98	0.425	1.064	1.839	4.307	10.13	0.00	0.00
13.940	162.680	1.444	1672.8	1672.8	172.046	0.892	1.70		Sand	0.0	183.92		183.92	1.08	198.80	198.80	0.98	0.427	1.061	1.768	4.126	9.66	0.00	0.00
14.110	151.360	1.703	1693.2	1693.2	159.035	1.132	1.80		Sand	6.8	183.92		183.92	1.08	197.95	199.76	0.98	0.429	1.058	1.864	4.340	10.11	0.00	0.00
14.270	117.440	1.283	1712.4	1712.4	122.492	1.100	1.87		Sand	12.7	183.92		183.92	1.07	196.26	217.57	0.98	0.431	1.063	5.933	13.881	32.20	0.00	0.00
14.440	63.900	1.104	1732.8	1732.8	65.837	1.752	2.21		Sand	39.5	183.92		183.92	1.05	193.87	282.07	0.98	0.433	1.060	14284.296	33308.987	76920.99	0.00	0.00
14.600	32.830	1.140	1752.0	1752.0	36.477	3.567	2.60		Clay	71.3			31.03	1.05	n.a.	n.a.	0.98	0.435	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	22.960	0.763	1771.2	1771.2	24.926	3.456	2.72		Clay	80.5			21.70	1.05	n.a.	n.a.	0.98	0.437	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	22.900	0.720	1791.6	1791.6	24.564	3.273	2.71		Clay	79.7			21.64	1.04	n.a.	n.a.	0.98	0.438	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	22.190	0.731	1810.8	1810.8	23.509	3.434	2.74		Clay	81.9			20.97	1.04	n.a.	n.a.	0.98	0.440	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	21.600	0.708	1831.2	1831.2	22.591	3.425	2.75		Clay	82.9			20.42	1.04	n.a.	n.a.	0.98	0.442	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	21.540	0.715	1850.4	1850.4	22.281	3.469	2.76		Clay	83.6			20.36	1.04	n.a.	n.a.	0.97	0.444	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	21.830	0.732	1869.6	1869.6	22.353	3.504	2.76		Clay	83.7			20.63	1.03	n.a.	n.a.	0.97	0.445	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	21.780	0.760	1890.0	1890.0	22.048	3.646	2.77		Clay	85.0			20.59	1.03	n.a.	n.a.	0.97	0.447	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	21.940	0.772	1909.2	1909.2	21.983	3.679	2.78		Clay	85.2			20.74	1.03	n.a.	n.a.	0.97	0.449	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	22.230	0.777	1929.6	1929.6	22.041	3.652	2.78		Clay	85.0			21.01	1.02	n.a.	n.a.	0.97	0.450	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	22.070	0.769	1948.8	1948.8	21.650	3.647	2.78		Clay	85.4			20.86	1.02	n.a.	n.a.	0.97	0.452	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	21.880	0.777	1968.0	1968.0	21.236	3.717	2.79		Clay	86.4			20.68	1.02	n.a.	n.a.	0.97	0.453	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	21.280	0.792	1988.4	1988.4	20.404	3.904	2.82		Clay	88.5			20.11	1.02	n.a.	n.a.	0.97	0.455	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	21.360	0.741	2007.6	2007.6	20.279	3.642	2.80		Clay	87.2			20.19	1.01	n.a.	n.a.	0.97	0.456	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	23.420	0.657	2028.0	2028.0	22.097	2.933	2.71		Clay	80.1			22.14	1.01	n.a.	n.a.	0.97	0.458	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	20.110	0.455	2047.2	2047.2	18.646	2.383	2.72		Clay	80.5			19.01	1.01	n.a.	n.a.	0.97	0.459	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	16.910	0.423	2066.4	2066.4	15.367	2.666	2.81		Clay	88.2			15.98	1.01	n.a.	n.a.	0.97	0.461	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	15.660	0.442	2086.8																					

CPT No.

3

PGA (A_{max})

0.57

Total Settlement:

0.27

(Inches)

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Depth (ft)	q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
22.310	15.440	0.655	2677.2	2677.2	10.534	4.644	3.09		Clay	100.0			14.59	0.94	n.a.	n.a.	0.96	0.496	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	12.960	0.538	2696.4	2696.4	8.613	4.631	3.16		Clay	100.0			12.25	0.94	n.a.	n.a.	0.96	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	12.360	0.525	2716.8	2716.8	8.099	4.767	3.19		Clay	100.0			11.68	0.94	n.a.	n.a.	0.96	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	12.290	0.521	2736.0	2736.0	7.984	4.768	3.19		Clay	100.0			11.62	0.93	n.a.	n.a.	0.96	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	12.650	0.500	2756.4	2756.4	8.179	4.437	3.17		Clay	100.0			11.96	0.93	n.a.	n.a.	0.95	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	13.020	0.444	2776.3	2768.1	8.404	3.820	3.12		Clay	100.0			12.31	0.93	n.a.	n.a.	0.95	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	12.480	0.413	2796.3	2778.2	7.978	3.723	3.13		Clay	100.0			11.80	0.93	n.a.	n.a.	0.95	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	11.910	0.392	2817.5	2788.8	7.531	3.729	3.15		Clay	100.0			11.26	0.93	n.a.	n.a.	0.95	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	12.000	0.436	2837.5	2798.8	7.561	4.121	3.18		Clay	100.0			11.34	0.93	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	11.910	0.430	2858.8	2809.5	7.461	4.106	3.18		Clay	100.0			11.26	0.93	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	12.990	0.433	2878.8	2819.5	8.193	3.746	3.12		Clay	100.0			12.28	0.93	n.a.	n.a.	0.95	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	12.540	0.431	2898.8	2829.5	7.839	3.887	3.15		Clay	100.0			11.85	0.93	n.a.	n.a.	0.95	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	12.440	0.445	2920.0	2840.1	7.732	4.048	3.16		Clay	100.0			11.76	0.93	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	12.290	0.489	2940.0	2850.1	7.593	4.515	3.20		Clay	100.0			11.62	0.92	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	12.200	0.491	2961.3	2860.8	7.494	4.584	3.21		Clay	100.0			11.53	0.92	n.a.	n.a.	0.95	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	12.330	0.514	2981.3	2870.8	7.551	4.739	3.21		Clay	100.0			11.65	0.92	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	12.520	0.549	3001.3	2880.8	7.650	4.986	3.22		Clay	100.0			11.83	0.92	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	12.990	0.573	3022.5	2891.5	7.940	4.990	3.21		Clay	100.0			12.28	0.92	n.a.	n.a.	0.95	0.509	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	14.080	0.600	3042.5	2901.5	8.657	4.775	3.17		Clay	100.0			13.31	0.92	n.a.	n.a.	0.95	0.510	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	14.290	0.587	3063.8	2912.1	8.762	4.603	3.15		Clay	100.0			13.51	0.92	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	14.480	0.586	3083.8	2922.1	8.855	4.532	3.14		Clay	100.0			13.69	0.92	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	14.690	0.608	3103.8	2932.2	8.961	4.631	3.15		Clay	100.0			13.88	0.92	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	14.530	0.609	3125.0	2942.8	8.813	4.697	3.15		Clay	100.0			13.73	0.92	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	14.430	0.599	3145.0	2952.8	8.709	4.657	3.16		Clay	100.0			13.64	0.92	n.a.	n.a.	0.95	0.513	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	14.640	0.649	3166.3	2963.5	8.812	4.967	3.17		Clay	100.0			13.84	0.91	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	15.060	0.637	3186.3	2973.5	9.058	4.732	3.15		Clay	100.0			14.23	0.91	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	15.390	0.650	3206.3	2983.5	9.242	4.714	3.14		Clay	100.0			14.55	0.91	n.a.	n.a.	0.94	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	15.470	0.681	3227.5	2994.1	9.256	4.915	3.15		Clay	100.0			14.62	0.91	n.a.	n.a.	0.94	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	22.070	1.051	3247.5	3004.1	13.612	5.140	3.03		Clay	100.0			20.86	0.91	n.a.	n.a.	0.94	0.516	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	21.150	0.791	3268.8	3014.8	12.947	4.051	2.98		Clay	100.0			19.99	0.91	n.a.	n.a.	0.94	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	30.300	2.723	3288.8	3024.8	18.947	9.502	3.10		Clay	100.0			28.64	0.91	n.a.	n.a.	0.94	0.517	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	69.060	2.121	3310.0	3035.4	53.193	3.147	2.45		Sand	58.8	185.27		185.27	0.91	168.45	263.87	0.94	0.518	0.892	789.565	1549.011	2991.87	0.00	0.00
27.560	116.570	2.003	3330.0	3045.5	90.528	1.743	2.10		Sand	31.3	185.27		185.27	0.90	167.22	238.53	0.94	0.518	0.891	37.021	72.549	139.98	0.00	0.00
27.720	177.460	3.348	3350.0	3055.5	138.266	1.905	2.00		Sand	23.3	185.27		185.27	0.89	165.77	220.88	0.94	0.519	0.890	7.637	14.949	28.82	0.00	0.00
27.890	194.620	2.755	3371.3	3066.1	151.491	1.428	1.88		Sand	13.8	185.27		185.27	0.88	162.84	186.56	0.94	0.519	0.916	0.959	1.932	3.72	0.00	0.00
28.050	196.020	2.312	3391.3	3076.1	152.334	1.190	1.83		Sand	9.1	185.27		185.27	0.87	160.99	167.58	0.94	0.520	0.930	0.465	0.821	1.58	0.00	0.00
28.220	177.170	2.301	3412.5	3086.8	137.312	1.311	1.89		Sand	14.0			167.46	0.87	145.42	168.80	0.94	0.520	0.928	0.484	0.860	1.65	0.00	0.00
28.380	169.860	1.942	3432.5	3096.8	131.370	1.155	1.86		Sand	12.1			160.55	0.86	138.01	153.70	0.94	0.521	0.937	0.315	0.506	0.97	0.01	0.02
28.540	160.650	1.456	3452.5	3106.8	123.966	0.916	1.81		Sand	8.2			151.84	0.85	128.54	132.25	0.94	0.521	0.947	0.205				

CPT No.

3

PGA (A_{max})

0.57

Total Settlement:

0.27

(Inches)

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Depth (ft)	q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted q _{cN}	C _N	q _{c1N}	q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
33.300	316.870	1.835	4047.5	3404.8	234.599	0.583	1.48		Sand	0.0			299.50	0.88	264.18	264.18	0.92	0.532	0.857	824.568	1555.192	2921.98	0.00	0.00
33.460	302.110	1.338	4067.5	3414.8	223.265	0.446	1.42		Sand	0.0			285.55	0.88	251.31	251.31	0.92	0.533	0.856	152.382	287.107	539.16	0.00	0.00
33.630	264.910	1.523	4088.8	3425.4	195.276	0.579	1.54		Sand	0.0			250.39	0.86	215.75	215.75	0.92	0.533	0.855	5.188	9.764	18.33	0.00	0.00
33.790	273.400	1.702	4108.8	3435.5	201.281	0.627	1.55		Sand	0.0			258.41	0.86	223.50	223.50	0.92	0.533	0.855	9.416	17.704	33.21	0.00	0.00
33.960	277.840	1.879	4130.0	3446.1	204.251	0.681	1.57		Sand	0.0			262.61	0.87	227.45	227.45	0.92	0.533	0.854	13.119	24.639	46.20	0.00	0.00
34.120	313.640	2.237	4150.0	3456.1	230.424	0.718	1.54		Sand	0.0			296.45	0.88	260.45	260.45	0.92	0.534	0.853	491.246	921.672	1727.35	0.00	0.00
34.280	307.040	2.256	4170.0	3466.1	225.209	0.740	1.56		Sand	0.0			290.21	0.88	254.78	254.78	0.92	0.534	0.852	233.618	437.866	820.25	0.00	0.00
34.450	366.910	3.007	4191.3	3476.8	269.002	0.824	1.54		Sand	0.0			346.80	0.88	304.21	304.21	0.92	0.534	0.851	#####	#####	4375078.57	0.00	0.00
34.610	433.970	2.948	4211.3	3486.8	317.985	0.683	1.43		Sand	0.0			410.18	0.88	359.54	359.54	0.92	0.534	0.850	#####	#####	#####	0.00	0.00
34.780	446.310	2.768	4232.5	3497.4	326.565	0.623	1.39		Sand	0.0			421.84	0.88	369.47	369.47	0.92	0.535	0.849	#####	#####	#####	0.00	0.00
34.940	490.600	3.543	4252.5	3507.4	358.606	0.725	1.42		Sand	0.0			463.71	0.88	405.83	405.83	0.92	0.535	0.848	#####	#####	#####	0.00	0.00
35.100	501.020	3.065	4272.5	3517.5	365.727	0.614	1.36		Sand	0.0			473.55	0.87	414.13	414.13	0.92	0.535	0.848	#####	#####	#####	0.00	0.00
35.270	555.440	3.324	4293.8	3528.1	405.002	0.601	1.32		Sand	0.0			524.99	0.87	458.75	458.75	0.92	0.535	0.847	#####	#####	#####	0.00	0.00
35.430	477.700	2.386	4313.8	3538.1	347.597	0.502	1.31		Sand	0.0			451.51	0.87	394.25	394.25	0.92	0.535	0.846	#####	#####	#####	0.00	0.00
35.600	461.120	1.954	4335.0	3548.8	334.967	0.426	1.27		Sand	0.0			435.84	0.87	380.26	380.26	0.91	0.536	0.845	#####	#####	#####	0.00	0.00
35.760	451.570	1.780	4355.0	3558.8	327.527	0.396	1.26		Sand	0.0			426.81	0.87	372.11	372.11	0.91	0.536	0.844	#####	#####	#####	0.00	0.00
35.930	444.440	1.517	4376.3	3569.4	321.842	0.343	1.22		Sand	0.0			420.08	0.87	365.95	365.95	0.91	0.536	0.843	#####	#####	#####	0.00	0.00
36.090	440.010	1.970	4396.3	3579.4	318.165	0.450	1.30		Sand	0.0			415.89	0.87	362.03	362.03	0.91	0.536	0.842	#####	#####	#####	0.00	0.00
36.250	412.710	2.428	4416.3	3589.5	297.902	0.591	1.41		Sand	0.0			390.09	0.87	339.32	339.32	0.91	0.536	0.841	#####	#####	#####	0.00	0.00
36.420	415.690	2.339	4437.5	3600.1	299.613	0.566	1.39		Sand	0.0			392.90	0.87	341.50	341.50	0.91	0.537	0.841	#####	#####	#####	0.00	0.00
36.580	419.820	1.942	4457.5	3610.1	302.178	0.465	1.33		Sand	0.0			396.81	0.87	344.64	344.64	0.91	0.537	0.840	#####	#####	#####	0.00	0.00
36.750	388.580	2.174	4478.8	3620.8	279.154	0.563	1.41		Sand	0.0			367.28	0.87	318.75	318.75	0.91	0.537	0.839	#####	#####	#####	0.00	0.00
36.910	364.950	2.249	4498.8	3630.8	261.711	0.620	1.46		Sand	0.0			344.94	0.87	299.15	299.15	0.91	0.537	0.838	#####	#####	1393381.84	0.00	0.00
37.070	391.270	3.246	4518.8	3640.8	280.309	0.834	1.53		Sand	0.0			369.82	0.87	320.49	320.49	0.91	0.537	0.837	#####	#####	#####	0.00	0.00
37.240	418.860	2.827	4540.0	3651.4	299.744	0.679	1.45		Sand	0.0			395.90	0.87	342.82	342.82	0.91	0.537	0.836	#####	#####	#####	0.00	0.00
37.400	403.820	3.086	4560.0	3661.4	288.519	0.769	1.50		Sand	0.0			381.68	0.87	330.28	330.28	0.91	0.538	0.836	#####	#####	#####	0.00	0.00
37.570	367.360	2.885	4581.3	3672.1	261.934	0.790	1.53		Sand	0.0			347.22	0.86	300.23	300.23	0.91	0.538	0.835	#####	#####	1751140.67	0.00	0.00
37.730	363.520	2.734	4601.3	3682.1	258.819	0.757	1.52		Sand	0.0			343.59	0.86	296.87	296.87	0.91	0.538	0.834	#####	#####	853189.73	0.00	0.00
37.890	385.840	2.066	4621.3	3692.1	274.431	0.539	1.40		Sand	0.0			364.69	0.86	314.88	314.88	0.91	0.538	0.833	#####	#####	#####	0.00	0.00
38.060	353.720	1.256	4642.5	3702.8	251.079	0.358	1.32		Sand	0.0			334.33	0.86	288.44	288.44	0.91	0.538	0.832	46172.073	84527.078	157061.58	0.00	0.00
38.220	328.170	1.263	4662.5	3712.8	232.501	0.387	1.37		Sand	0.0			310.18	0.86	267.42	267.42	0.91	0.538	0.831	1320.811	2415.650	4487.49	0.00	0.00
38.390	286.790	1.710	4683.8	3723.4	202.677	0.601	1.53		Sand	0.0			271.07	0.85	229.86	229.86	0.90	0.538	0.830	16.214	29.624	55.02	0.00	0.00
38.550	249.040	2.493	4703.8	3733.4	175.536	1.011	1.73		Sand	1.6			235.39	0.83	194.39	194.39	0.90	0.539	0.860	1.397	2.643	4.91	0.00	0.00
38.710	189.240	3.375	4723.8	3743.4	132.799	1.806	2.00		Sand	22.9			178.87	0.83	148.14	199.33	0.90	0.539	0.851	1.820	3.408	6.33	0.00	0.00
38.880	154.250	3.629	4745.0	3754.1	107.774	2.389	2.15		Sand	35.0			145.79	0.82	119.29	185.09	0.90	0.539	0.872	0.898	1.706	3.17	0.00	0.00
39.040	105.670	3.482	4765.0	3764.1	73.196	3.371	2.37		Sand	52.9			99.88	0.79	78.96	147.16	0.90	0.539	0.910	0.271	0.403	0.75	0.02	0.04
39.210	127.950	2.469	4786.3	3774.7	88.852																			

CPT No.

3

PGA (A_{max})

0.57

Total Settlement:

0.27

(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5}$, $S'_{vc} = 1 \text{ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ϵ_v	Settlement (Inches)
44.290	381.600	1.870	5421.3	4092.8	257.500	0.493	1.40		Sand	0.0			360.68	0.84	303.07	303.07	0.88	0.541	0.802	#####	#####	3142088.70	0.00	0.00
44.460	356.200	1.982	5442.5	4103.4	239.919	0.561	1.46		Sand	0.0			336.67	0.84	282.70	282.70	0.88	0.541	0.801	15977.092	28165.861	52108.55	0.00	0.00
44.620	334.960	3.507	5462.5	4113.4	225.221	1.055	1.67		Sand	0.0			316.60	0.84	265.67	265.67	0.88	0.541	0.801	1022.080	1800.171	3330.47	0.00	0.00
44.780	328.070	2.743	5482.5	4123.4	220.275	0.843	1.61		Sand	0.0			310.09	0.84	260.04	260.04	0.88	0.541	0.800	464.394	817.183	1511.89	0.00	0.00
44.950	358.970	2.645	5503.8	4134.1	240.879	0.743	1.54		Sand	0.0			339.29	0.84	284.34	284.34	0.88	0.540	0.799	21471.449	37746.269	69836.86	0.00	0.00
45.110	371.580	2.401	5523.8	4144.1	249.098	0.651	1.49		Sand	0.0			351.21	0.84	294.14	294.14	0.88	0.540	0.798	#####	#####	461612.27	0.00	0.00
45.280	402.130	1.724	5545.0	4154.7	269.378	0.432	1.35		Sand	0.0			380.09	0.84	318.11	318.11	0.88	0.540	0.798	#####	#####	#####	0.00	0.00
45.440	427.990	1.548	5565.0	4164.7	286.470	0.364	1.28		Sand	0.0			404.53	0.84	338.35	338.35	0.88	0.540	0.797	#####	#####	#####	0.00	0.00
45.600	407.280	1.444	5585.0	4174.8	272.183	0.357	1.29		Sand	0.0			384.95	0.84	321.77	321.77	0.88	0.540	0.796	#####	#####	#####	0.00	0.00
45.770	367.520	1.045	5606.3	4185.4	245.109	0.286	1.28		Sand	0.0			347.37	0.84	290.16	290.16	0.88	0.540	0.795	64341.329	#####	208345.46	0.00	0.00
45.930	344.130	1.683	5626.3	4195.4	229.109	0.493	1.44		Sand	0.0			325.26	0.83	271.53	271.53	0.88	0.540	0.795	2468.153	4314.955	7985.42	0.00	0.00
46.100	329.940	1.814	5647.5	4206.1	219.299	0.554	1.48		Sand	0.0			311.85	0.83	260.16	260.16	0.88	0.540	0.794	471.787	824.015	1525.05	0.00	0.00
46.260	307.150	2.311	5667.5	4216.1	203.771	0.759	1.60		Sand	0.0			290.31	0.82	239.24	239.24	0.88	0.540	0.793	39.791	69.436	128.52	0.00	0.00
46.420	309.340	1.887	5687.5	4226.1	204.988	0.616	1.54		Sand	0.0			292.38	0.82	241.16	241.16	0.88	0.540	0.792	48.535	84.619	156.63	0.00	0.00
46.590	269.510	2.690	5708.8	4236.7	178.118	1.009	1.73		Sand	1.2	292.38		292.38	0.82	240.95	240.95	0.88	0.540	0.792	47.472	82.685	153.06	0.00	0.00
46.750	204.320	1.828	5728.8	4246.8	134.407	0.907	1.79		Sand	5.8	292.38		292.38	0.82	240.93	241.67	0.87	0.540	0.791	51.246	89.180	165.10	0.00	0.00
46.920	86.180	1.195	5750.0	4257.4	55.510	1.434	2.21		Sand	39.6	292.38		292.38	0.83	243.13	343.23	0.87	0.540	0.790	#####	#####	#####	0.00	0.00
47.080	35.220	0.813	5770.0	4267.4	15.154	2.514	2.80		Clay	87.4			33.29	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	15.140	0.318	5790.0	4277.4	5.725	2.593	3.17		Clay	100.0			14.31	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	12.810	0.331	5811.3	4288.1	4.620	3.346	3.30		Clay	100.0			12.11	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	12.900	0.349	5831.3	4298.1	4.646	3.495	3.31		Clay	100.0			12.19	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	15.430	0.389	5852.5	4308.7	5.804	3.109	3.20		Clay	100.0			14.58	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	18.360	0.454	5872.5	4318.7	7.143	2.943	3.11		Clay	100.0			17.35	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	22.240	0.440	5892.5	4328.8	8.914	2.282	2.97		Clay	100.0			21.02	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	20.070	0.499	5913.8	4339.4	7.887	2.914	3.08		Clay	100.0			18.97	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	17.830	0.554	5933.8	4349.4	6.835	3.727	3.19		Clay	100.0			16.85	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	19.440	0.434	5955.0	4360.1	7.552	2.633	3.07		Clay	100.0			18.37	0.83	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	21.230	0.357	5975.0	4370.1	8.349	1.958	2.96		Clay	100.0			20.07	0.83	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	19.570	0.294	5995.0	4380.1	7.567	1.773	2.98		Clay	100.0			18.50	0.83	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	17.000	0.269	6016.3	4390.7	6.373	1.923	3.06		Clay	100.0			16.07	0.82	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	15.100	0.243	6036.3	4400.7	5.491	2.015	3.13		Clay	100.0			14.27	0.82	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	13.930	0.227	6057.5	4411.4	4.942	2.079	3.17		Clay	100.0			13.17	0.82	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	13.620	0.230	6077.5	4421.4	4.786	2.169	3.19		Clay	100.0			12.87	0.82	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	13.820	0.243	6097.5	4431.4	4.861	2.251	3.20		Clay	100.0			13.06	0.82	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	14.190	0.276	6118.8	4442.1	5.011	2.476	3.21		Clay	100.0			13.41	0.82	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	15.150	0.290	6138.8	4452.1	5.427	2.399	3.17		Clay	100.0			14.32	0.82	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No.

4

PGA (A_{max})

0.57

Total Settlement:

0.21 (Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
0.160	1.950	0.327	19.2	19.2	202.125	16.837	2.71		Unsaturated	79.7			1.84	1.70	3.13	56.06	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	0.610	0.228	39.6	39.6	29.808	38.580	3.44		Unsaturated	100.0			0.58	1.70	0.98	55.22	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	0.210	0.337	58.8	58.8	6.143	186.766	4.40		Unsaturated	100.0			0.20	1.70	0.34	54.38	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	0.100	0.670	79.2	79.2	1.525	1109.934	5.38		Unsaturated	100.0			0.09	1.70	0.16	54.14	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	4.450	0.973	98.4	98.4	89.447	22.114	2.98		Unsaturated	100.0			4.21	1.70	7.15	63.30	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	111.280	1.522	117.6	117.6	445.919	1.368	1.59		Unsaturated	0.0			105.18	1.70	178.81	178.81	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	66.500	1.858	138.0	138.0	245.869	2.797	1.99		Unsaturated	21.8			62.85	1.70	106.85	149.19	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	47.190	2.044	157.2	157.2	163.370	4.340	2.24		Unsaturated	42.4			44.60	1.70	75.83	137.72	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	37.390	1.942	177.6	177.6	121.695	5.206	2.38		Unsaturated	53.5			35.34	1.70	60.08	123.41	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	34.750	1.792	196.8	196.8	107.395	5.172	2.41		Unsaturated	55.8			32.84	1.70	55.84	118.88	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	33.040	1.658	216.0	216.0	97.423	5.034	2.43		Unsaturated	57.1			31.23	1.70	53.09	115.80	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	30.940	1.594	236.4	236.4	87.158	5.171	2.47		Unsaturated	60.2			29.24	1.70	49.71	112.44	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	30.400	1.568	255.6	255.6	82.326	5.178	2.48		Unsaturated	61.5			28.73	1.70	48.85	111.68	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	34.490	1.641	276.0	276.0	89.902	4.777	2.43		Unsaturated	57.4			32.60	1.70	55.42	118.87	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	44.980	1.661	295.2	295.2	113.450	3.706	2.28		Unsaturated	45.5			42.51	1.70	72.27	135.12	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	52.060	1.762	314.4	314.4	127.269	3.394	2.22		Unsaturated	40.6			49.21	1.70	83.65	146.22	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	48.860	1.550	334.8	334.8	115.702	3.184	2.22		Unsaturated	40.9			46.18	1.70	78.51	140.06	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	47.150	1.270	354.0	354.0	108.547	2.704	2.19		Unsaturated	38.0			44.57	1.70	75.76	134.45	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	35.570	1.128	374.4	374.4	79.505	3.189	2.33		Unsaturated	49.5			33.62	1.70	57.15	118.08	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	31.040	1.403	393.6	393.6	67.593	4.548	2.49		Unsaturated	62.5			29.34	1.70	49.88	113.25	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	39.170	1.661	412.8	412.8	83.380	4.263	2.41		Unsaturated	56.0			37.02	1.70	62.94	127.99	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	44.570	1.648	433.2	433.2	92.652	3.715	2.34		Unsaturated	50.0			42.13	1.70	71.62	136.59	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	44.690	1.373	452.4	452.4	90.890	3.087	2.28		Unsaturated	45.6			42.24	1.70	71.81	134.58	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	45.280	1.036	472.8	472.8	90.067	2.300	2.19		Unsaturated	38.2			42.80	1.70	72.76	130.91	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	44.870	0.814	492.0	492.0	87.470	1.823	2.13		Unsaturated	33.2			42.41	1.70	72.10	125.60	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	44.420	0.634	512.4	512.4	84.827	1.435	2.07		Unsaturated	28.4			41.98	1.70	71.37	119.01	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	46.360	0.533	531.6	531.6	86.921	1.155	2.00		Unsaturated	22.8			43.82	1.70	74.49	113.76	1.00	0.373	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	46.660	0.357	550.8	550.8	85.931	0.771	1.89		Unsaturated	14.4			44.10	1.70	74.97	94.36	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	44.050	0.358	571.2	571.2	79.616	0.818	1.94		Unsaturated	17.8			41.64	1.70	70.78	98.77	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	47.240	0.396	590.4	590.4	84.001	0.844	1.92		Unsaturated	17.0			44.65	1.70	75.91	102.27	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	54.110	0.496	610.8	610.8	94.655	0.921	1.91		Unsaturated	15.5			51.14	1.70	86.94	110.37	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	63.240	0.583	630.0	630.0	109.000	0.926	1.86		Unsaturated	11.8			59.77	1.70	101.61	114.74	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	68.920	0.584	649.2	649.2	117.052	0.851	1.81		Unsaturated	8.0			65.14	1.70	110.74	114.01	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	71.600	0.565	669.6	669.6	119.741	0.793	1.79		Unsaturated	5.9			67.67	1.70	115.05	115.61	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	73.310	0.511	688.8	688.8	120.877	0.701	1.75		Unsaturated	3.0			69.29	1.68	116.57	116.57	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	75.580	0.510	709.2	709.2	122.815	0.678	1.74		Unsaturated	1.8			71.44	1.65	118.16	118.16	1.00	0.372	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	77.540	0.631	728.4	728.4	124.328	0.818	1.78		Unsaturated	5.6			73.29	1.63	119.35	119.73	1.00	0.371	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	83.620	0.794	747.6	747.6	132.374	0.954	1.80		Unsaturated	7.4			79.04	1.58	125.25	127.49	1.00	0.371	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.400	110.690																							

CPT No.

4

PGA (A_{max})

0.57

Total Settlement:

0.21

(Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRR _{M=7.5} , s' _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
11.320	37.810	0.887	1358.4	1358.4	43.802	2.388	2.43		Sand	57.3	78.85		78.85	1.18	93.16	167.02	0.98	0.391	1.083	0.457	0.935	2.39	0.00	0.00
11.480	33.380	0.839	1377.6	1377.6	38.295	2.566	2.49		Sand	62.4	78.85		78.85	1.17	92.61	168.09	0.98	0.393	1.081	0.473	0.973	2.47	0.00	0.00
11.650	32.010	0.879	1398.0	1398.0	36.410	2.807	2.54		Sand	65.8	78.85		78.85	1.17	92.08	168.41	0.98	0.396	1.078	0.478	0.984	2.48	0.00	0.00
11.810	31.180	0.958	1417.2	1417.2	35.192	3.143	2.58		Sand	69.3	78.85		78.85	1.16	91.60	168.72	0.98	0.399	1.076	0.483	0.994	2.49	0.00	0.00
11.980	29.160	0.970	1437.6	1437.6	35.235	3.412	2.60		Mixed	71.2	78.85		78.85	1.16	91.12	168.56	0.98	0.401	1.073	0.480	0.985	2.46	0.00	0.00
12.140	27.430	0.983	1456.8	1456.8	36.658	3.682	2.61		Clay	72.0			25.93	1.10	n.a.	n.a.	0.98	0.403	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.300	27.400	0.934	1476.0	1476.0	36.127	3.502	2.60		Clay	71.1			25.90	1.10	n.a.	n.a.	0.98	0.406	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	26.740	0.923	1496.4	1496.4	34.739	3.550	2.62		Clay	72.5			25.27	1.10	n.a.	n.a.	0.98	0.408	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	27.070	0.990	1515.6	1515.6	34.722	3.761	2.64		Clay	73.8			25.59	1.09	n.a.	n.a.	0.98	0.410	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	27.140	1.047	1536.0	1536.0	34.339	3.969	2.65		Clay	75.4			25.65	1.09	n.a.	n.a.	0.98	0.413	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	27.870	1.074	1555.2	1555.2	34.841	3.962	2.65		Clay	75.0			26.34	1.08	n.a.	n.a.	0.98	0.415	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	27.730	1.078	1574.4	1574.4	34.226	4.000	2.66		Clay	75.7			26.21	1.08	n.a.	n.a.	0.98	0.417	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	27.660	1.090	1594.8	1594.8	33.688	4.059	2.67		Clay	76.4			26.14	1.08	n.a.	n.a.	0.98	0.419	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	28.160	1.103	1614.0	1614.0	33.895	4.031	2.66		Clay	76.1			26.62	1.07	n.a.	n.a.	0.98	0.421	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	28.950	1.118	1634.4	1634.4	34.426	3.973	2.65		Clay	75.4			27.36	1.07	n.a.	n.a.	0.98	0.423	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	29.760	0.995	1653.6	1653.6	34.994	3.438	2.61		Clay	71.5			28.13	1.07	n.a.	n.a.	0.98	0.425	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	29.560	1.047	1672.8	1672.8	34.342	3.645	2.63		Clay	73.4			27.94	1.06	n.a.	n.a.	0.98	0.427	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	28.670	1.047	1693.2	1693.2	32.865	3.761	2.65		Clay	75.2			27.10	1.06	n.a.	n.a.	0.98	0.429	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	28.790	1.033	1712.4	1712.4	32.625	3.698	2.65		Clay	75.0			27.21	1.06	n.a.	n.a.	0.98	0.431	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	25.580	0.930	1732.8	1732.8	28.524	3.764	2.70		Clay	78.9			24.18	1.05	n.a.	n.a.	0.98	0.433	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	21.980	0.846	1752.0	1752.0	24.091	4.009	2.77		Clay	84.8			20.78	1.05	n.a.	n.a.	0.98	0.435	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	20.760	0.845	1771.2	1771.2	22.442	4.253	2.81		Clay	88.0			19.62	1.05	n.a.	n.a.	0.98	0.437	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	23.210	0.948	1791.6	1791.6	24.910	4.250	2.78		Clay	85.2			21.94	1.04	n.a.	n.a.	0.98	0.438	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	27.450	1.200	1810.8	1810.8	29.318	4.521	2.74		Clay	82.5			25.95	1.04	n.a.	n.a.	0.98	0.440	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	30.730	1.506	1831.2	1831.2	32.563	5.052	2.74		Clay	82.5			29.05	1.04	n.a.	n.a.	0.98	0.442	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	35.160	1.603	1850.4	1850.4	37.003	4.682	2.68		Clay	77.5			33.23	1.04	n.a.	n.a.	0.97	0.444	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	49.100	1.402	1869.6	1869.6	48.432	2.912	2.45		Sand	59.3	75.99	1.66	126.14	1.04	131.05	216.24	0.97	0.445	1.037	5.379	12.273	27.56	0.00	0.00
15.750	67.070	1.190	1890.0	1890.0	66.131	1.800	2.21		Sand	40.0	75.99	1.66	126.14	1.04	130.84	204.37	0.97	0.447	1.031	2.439	5.535	12.38	0.00	0.00
15.910	78.080	1.014	1909.2	1909.2	76.744	1.315	2.07		Sand	29.0	75.99	1.66	126.14	1.04	130.66	190.84	0.97	0.449	1.024	1.171	2.638	5.88	0.00	0.00
16.080	80.400	1.132	1929.6	1929.6	78.623	1.425	2.09		Sand	30.2		1.66	126.15	1.03	130.17	192.09	0.97	0.450	1.022	1.244	2.799	6.21	0.00	0.00
16.240	76.090	1.428	1948.8	1948.8	73.981	1.901	2.19		Sand	38.5	75.99	1.66	126.14	1.03	129.59	201.36	0.97	0.452	1.022	2.042	4.590	10.16	0.00	0.00
16.400	53.050	1.689	1968.0	1968.0	51.029	3.245	2.47		Sand	60.6	75.99	1.66	126.14	1.02	129.02	214.15	0.97	0.453	1.022	4.628	10.404	22.95	0.00	0.00
16.570	38.160	1.514	1988.4	1988.4	37.383	4.074	2.64		Clay	73.9			36.07	1.02	n.a.	n.a.	0.97	0.455	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	26.570	1.161	2007.6	2007.6	25.469	4.541	2.79		Clay	86.2			25.11	1.01	n.a.	n.a.	0.97	0.456	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	22.610	0.935	2028.0	2028.0	21.298	4.327	2.83		Clay	89.7			21.37	1.01	n.a.	n.a.	0.97	0.458	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	29.910	0.916	2047.2	2047.2	28.220	3.171	2.65		Clay	75.3			28.27	1.01	n.a.	n.a.	0.97	0.459	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	25.580	0.772	2066.4	2066.4	23.758	3.145	2.71		Clay	79.7			24.18	1.01	n.a.	n.a.	0.97	0.461	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	18.720	0.696	2086.8	2086.8	16.941	3.935	2.88		Clay	93.7			17.69	1.00	n.a.	n.a.	0.97	0.462	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	14.640	0.665	2106.0	2106.0	12.903	4																		

CPT No.

4

PGA (A_{max})

0.57

Total Settlement:

0.21

(Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s _{vc} = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
22.310	15.570	0.446	2698.8	2429.8	11.705	3.134	2.95		Clay	99.1			14.72	0.96	n.a.	n.a.	0.96	0.496	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	14.890	0.421	2718.8	2439.8	11.091	3.111	2.97		Clay	100.0			14.07	0.96	n.a.	n.a.	0.96	0.497	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	14.120	0.456	2740.0	2450.5	10.406	3.573	3.03		Clay	100.0			13.35	0.96	n.a.	n.a.	0.96	0.498	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	14.860	0.502	2760.0	2460.5	10.957	3.723	3.02		Clay	100.0			14.05	0.96	n.a.	n.a.	0.96	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	15.210	0.565	2781.3	2471.1	11.185	4.086	3.04		Clay	100.0			14.38	0.96	n.a.	n.a.	0.95	0.499	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	15.230	0.596	2801.3	2481.1	11.148	4.308	3.05		Clay	100.0			14.40	0.96	n.a.	n.a.	0.95	0.500	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	15.280	0.582	2821.3	2491.2	11.135	4.199	3.04		Clay	100.0			14.44	0.96	n.a.	n.a.	0.95	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	15.220	0.594	2842.5	2501.8	11.031	4.301	3.05		Clay	100.0			14.39	0.96	n.a.	n.a.	0.95	0.502	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	15.450	0.598	2862.5	2511.8	11.162	4.264	3.05		Clay	100.0			14.60	0.96	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	16.450	0.630	2883.8	2522.5	11.900	4.196	3.02		Clay	100.0			15.55	0.95	n.a.	n.a.	0.95	0.503	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	17.250	0.775	2903.8	2532.5	12.476	4.904	3.05		Clay	100.0			16.30	0.95	n.a.	n.a.	0.95	0.504	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	15.210	0.712	2923.8	2542.5	10.815	5.178	3.11		Clay	100.0			14.38	0.95	n.a.	n.a.	0.95	0.505	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	13.240	0.673	2945.0	2553.1	9.218	5.721	3.19		Clay	100.0			12.51	0.95	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	15.140	0.748	2965.0	2563.1	10.657	5.477	3.13		Clay	100.0			14.31	0.95	n.a.	n.a.	0.95	0.506	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	19.490	0.715	2986.3	2573.8	13.985	3.975	2.95		Clay	99.1			18.42	0.95	n.a.	n.a.	0.95	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	19.450	0.750	3006.3	2583.8	13.892	4.178	2.97		Clay	100.0			18.38	0.95	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	20.120	0.842	3026.3	2593.8	14.347	4.523	2.98		Clay	100.0			19.02	0.95	n.a.	n.a.	0.95	0.508	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	20.390	0.896	3047.5	2604.5	14.488	4.749	2.99		Clay	100.0			19.27	0.95	n.a.	n.a.	0.95	0.509	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	22.540	1.089	3067.5	2614.5	16.069	5.184	2.98		Clay	100.0			21.30	0.95	n.a.	n.a.	0.95	0.510	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	29.910	1.344	3088.8	2625.1	21.611	4.738	2.86		Clay	91.4			28.27	0.94	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	35.280	1.499	3108.8	2635.1	25.597	4.444	2.78		Clay	85.6			33.35	0.94	n.a.	n.a.	0.95	0.511	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	28.740	1.257	3128.8	2645.2	20.548	4.625	2.86		Clay	92.2			27.16	0.94	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	26.440	1.106	3150.0	2655.8	18.725	4.446	2.88		Clay	93.7			24.99	0.94	n.a.	n.a.	0.95	0.512	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	22.830	1.014	3170.0	2665.8	15.939	4.773	2.96		Clay	99.6			21.58	0.94	n.a.	n.a.	0.95	0.513	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	17.220	1.380	3191.3	2676.5	11.675	8.834	3.24		Clay	100.0			16.28	0.94	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	31.290	1.722	3211.3	2686.5	22.099	5.801	2.91		Clay	95.6			29.57	0.94	n.a.	n.a.	0.94	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	41.490	2.703	3231.3	2696.5	29.575	6.779	2.86		Clay	92.1			39.22	0.94	n.a.	n.a.	0.94	0.515	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	82.110	3.023	3252.5	2707.1	67.255	3.756	2.43		Sand	57.6	271.95		271.95	0.94	254.84	373.63	0.94	0.515	0.926	#####	#####	#####	0.00	0.00
26.900	136.890	3.834	3272.5	2717.1	112.815	2.835	2.19		Sand	38.4	271.95		271.95	0.94	254.59	355.85	0.94	0.516	0.925	#####	#####	#####	0.00	0.00
27.070	153.990	3.663	3293.8	2727.8	126.821	2.405	2.11		Sand	31.4	271.95		271.95	0.94	254.33	344.08	0.94	0.517	0.924	#####	#####	#####	0.00	0.00
27.230	159.450	3.444	3313.8	2737.8	131.117	2.182	2.06		Sand	28.1	271.95		271.95	0.93	254.08	336.63	0.94	0.517	0.923	#####	#####	#####	0.00	0.00
27.400	287.720	3.663	3335.0	2748.4	237.233	1.280	1.72		Sand	0.7			271.95	0.93	253.80	253.80	0.94	0.518	0.922	206.703	419.071	809.42	0.00	0.00
27.560	272.920	3.549	3355.0	2758.5	224.542	1.308	1.74		Sand	2.4			257.96	0.93	239.48	239.48	0.94	0.518	0.920	40.763	82.545	159.27	0.00	0.00
27.720	254.110	3.604	3375.0	2768.5	208.584	1.428	1.79		Sand	6.4			240.18	0.92	221.56	222.90	0.94	0.519	0.919	8.971	18.144	34.97	0.00	0.00
27.890	264.670	4.104	3396.3	2779.1	216.884	1.561	1.81		Sand	8.0			250.16	0.93	231.49	235.93	0.94	0.519	0.918	28.573	57.720	111.15	0.00	0.00
28.050	296.310	3.488	3416.3	2789.1	242.534	1.184	1.69		Sand	0.0			280.07	0.93	260.38	260.38	0.94	0.520	0.917	486.546	981.706	1888.55	0.00	0.00
28.220	323.230	2.588	3437.5	2799.8	264.184	0.805	1.54		Sand	0.0			305.51	0.93	283.75	283.75	0.94	0.520	0.916	19312.768	38918.956	74794.74	0.00	0.00
28.380	346.680	2.297	3457.5	2809.8	282.939	0.666	1.46		Sand	0.0			327.67	0.93	304.05	304.05	0.94	0.521	0.915	#####	#####	4652145.91	0.00	0.00
28.540	407.270	2.742	3477.5	2819.8	332.037	0.676	1.42		Sand	0.0														

CPT No.

4

PGA (A_{max})

0.57

Total Settlement:

0.21

(Inches)

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Depth (ft)	Q _c (tsf)	f _s (tsf)	S _{vc} (psf)	Insitu S' _{vc} (psf)	Q	F (%)	I _c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	Q _{cN} near interfaces (soft layer)	Thin Layer Factor (K _H)	Interpreted Q _{cN}	C _N	Q _{c1N}	Q _{c1N-CS}	Stress Reduction Coeff, r _d	CSR	K _s for Sand	CRRM=7.5, s'vc = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε _v	Settlement (Inches)
33.300	10.540	0.284	4072.5	3117.8	5.455	3.341	3.24		Clay	100.0			9.96	0.90	n.a.	n.a.	0.92	0.532	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	10.770	0.275	4092.5	3127.8	5.578	3.149	3.22		Clay	100.0			10.18	0.90	n.a.	n.a.	0.92	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	11.260	0.245	4113.8	3138.4	5.865	2.660	3.16		Clay	100.0			10.64	0.90	n.a.	n.a.	0.92	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	11.120	0.279	4133.8	3148.5	5.751	3.085	3.20		Clay	100.0			10.51	0.90	n.a.	n.a.	0.92	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	10.720	0.291	4155.0	3159.1	5.472	3.371	3.24		Clay	100.0			10.13	0.90	n.a.	n.a.	0.92	0.533	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	13.000	0.313	4175.0	3169.1	6.887	2.872	3.12		Clay	100.0			12.29	0.90	n.a.	n.a.	0.92	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	13.910	0.379	4195.0	3179.1	7.431	3.210	3.12		Clay	100.0			13.15	0.90	n.a.	n.a.	0.92	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	13.850	0.697	4216.3	3189.8	7.362	5.933	3.28		Clay	100.0			13.09	0.90	n.a.	n.a.	0.92	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	12.710	0.924	4236.3	3199.8	6.620	8.721	3.42		Clay	100.0			12.01	0.90	n.a.	n.a.	0.92	0.534	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	31.300	1.148	4257.5	3210.4	18.173	3.935	2.86		Clay	91.8			29.58	0.90	n.a.	n.a.	0.92	0.535	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	48.400	1.296	4277.5	3220.4	28.730	2.801	2.61		Clay	72.0			45.75	0.90	n.a.	n.a.	0.92	0.535	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	48.440	1.384	4297.5	3230.5	28.659	2.989	2.63		Clay	73.5			45.78	0.89	n.a.	n.a.	0.92	0.535	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	60.360	1.376	4318.8	3241.1	44.448	2.364	2.42		Sand	56.7	73.92	1.8	133.06	0.87	115.29	195.00	0.92	0.535	0.894	1.442	2.837	5.30	0.00	0.00
35.430	78.210	1.355	4338.8	3251.1	57.983	1.782	2.25		Sand	43.2		1.8	133.06	0.86	114.61	186.73	0.92	0.535	0.903	0.966	1.919	3.58	0.00	0.00
35.600	77.030	1.378	4360.0	3261.8	56.982	1.840	2.27		Sand	44.4	73.92	1.8	133.06	0.86	114.52	187.47	0.91	0.536	0.901	0.999	1.981	3.70	0.00	0.00
35.760	66.000	1.521	4380.0	3271.8	48.503	2.383	2.39		Sand	54.6	73.92	1.8	133.06	0.86	114.82	193.50	0.91	0.536	0.894	1.335	2.625	4.90	0.00	0.00
35.930	53.210	1.691	4401.3	3282.4	31.080	3.315	2.63		Clay	73.8			50.29	0.89	n.a.	n.a.	0.91	0.536	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	60.100	1.884	4421.3	3292.4	43.864	3.255	2.52		Sand	64.5	238.38		238.38	0.89	212.14	322.39	0.91	0.536	0.867	#####	#####	#####	0.00	0.00
36.250	72.920	1.591	4441.3	3302.5	53.490	2.251	2.35		Sand	50.7	238.38		238.38	0.89	211.97	314.62	0.91	0.536	0.866	#####	#####	#####	0.00	0.00
36.420	58.060	1.388	4462.5	3313.1	42.171	2.486	2.45		Sand	59.2	238.38		238.38	0.89	211.79	319.47	0.91	0.537	0.865	#####	#####	#####	0.00	0.00
36.580	77.050	0.956	4482.5	3323.1	56.423	1.278	2.17		Sand	36.7	238.38		238.38	0.89	211.62	300.53	0.91	0.537	0.865	#####	#####	1941781.12	0.00	0.00
36.750	252.210	1.226	4503.8	3333.8	188.223	0.490	1.50		Sand	0.0			238.38	0.86	205.96	205.96	0.91	0.537	0.872	2.688	5.156	9.60	0.00	0.00
36.910	196.400	1.825	4523.8	3343.8	145.970	0.940	1.77		Sand	4.5	238.38		238.38	0.86	205.74	205.82	0.91	0.537	0.871	2.666	5.110	9.51	0.00	0.00
37.070	154.840	2.554	4543.8	3353.8	114.543	1.674	2.02		Sand	24.5	238.38		238.38	0.89	211.11	276.78	0.91	0.537	0.862	5753.743	10909.268	20304.52	0.00	0.00
37.240	87.990	2.023	4565.0	3364.4	64.244	2.360	2.30		Sand	47.2	238.38		238.38	0.88	210.93	310.64	0.91	0.537	0.861	#####	#####	#####	0.00	0.00
37.400	46.600	1.687	4585.0	3374.4	26.261	3.808	2.73		Clay	81.3			44.05	0.88	n.a.	n.a.	0.91	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.570	22.440	0.964	4606.3	3385.1	11.897	4.786	3.06		Clay	100.0			21.21	0.88	n.a.	n.a.	0.91	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.730	23.050	0.929	4626.3	3395.1	12.216	4.481	3.03		Clay	100.0			21.79	0.88	n.a.	n.a.	0.91	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.890	22.580	0.935	4646.3	3405.1	11.898	4.614	3.05		Clay	100.0			21.34	0.88	n.a.	n.a.	0.91	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.060	19.920	0.728	4667.5	3415.8	10.297	4.137	3.07		Clay	100.0			18.83	0.88	n.a.	n.a.	0.91	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.220	18.780	0.567	4687.5	3425.8	9.596	3.450	3.05		Clay	100.0			17.75	0.88	n.a.	n.a.	0.91	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	15.670	0.492	4708.8	3436.4	7.750	3.695	3.14		Clay	100.0			14.81	0.88	n.a.	n.a.	0.90	0.538	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	12.780	0.490	4728.8	3446.4	6.044	4.702	3.29		Clay	100.0			12.08	0.88	n.a.	n.a.	0.90	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	11.490	0.516	4748.8	3456.4	5.275	5.664	3.38		Clay	100.0			10.86	0.88	n.a.	n.a.	0.90	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	11.420	0.555	4770.0	3467.1	5.212	6.137	3.41		Clay	100.0			10.79	0.88	n.a.	n.a.	0.90	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	11.620	0.566	4790.0	3477.1	5.306	6.136	3.40		Clay	100.0			10.98	0.88	n.a.	n.a.	0.90	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	12.100	0.567	4811.3	3487.7	5.559	5.846	3.37		Clay	100.0			11.44	0.88	n.a.	n.a.	0.90	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	12.030	0.542	4831.3	3497.8	5.497	5.642	3.37		Clay	100.0			11.37	0.88	n.a.	n.a.	0.90	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	11.850	0.528	4851.3	3507.8	5.373	5.607	3.37																	

CPT No.

4

PGA (A_{max})

0.57

Total Settlement:

0.21

(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5}$, $S'_{vc} = 1 \text{ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ϵ_v	Settlement (Inches)
44.290	23.290	1.024	5446.3	3805.8	10.808	4.980	3.10		Clay	100.0			22.01	0.86	n.a.	n.a.	0.88	0.541	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	27.920	1.035	5467.5	3816.4	13.199	4.108	2.98		Clay	100.0			26.39	0.86	n.a.	n.a.	0.88	0.541	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	32.280	0.986	5487.5	3826.4	15.438	3.339	2.87		Clay	92.7			30.51	0.86	n.a.	n.a.	0.88	0.541	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	32.380	0.859	5507.5	3836.4	15.445	2.899	2.83		Clay	89.8			30.60	0.85	n.a.	n.a.	0.88	0.541	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	28.150	0.600	5528.8	3847.1	13.197	2.362	2.84		Clay	90.1			26.61	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	22.600	0.552	5548.8	3857.1	10.280	2.785	2.97		Clay	100.0			21.36	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	17.800	0.527	5570.0	3867.7	7.764	3.510	3.13		Clay	100.0			16.82	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	15.650	0.513	5590.0	3877.7	6.630	3.988	3.21		Clay	100.0			14.79	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	14.960	0.541	5610.0	3887.8	6.253	4.453	3.26		Clay	100.0			14.14	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.770	16.180	0.486	5631.3	3898.4	6.856	3.634	3.18		Clay	100.0			15.29	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	14.860	0.411	5651.3	3908.4	6.158	3.415	3.20		Clay	100.0			14.05	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	12.850	0.344	5672.5	3919.1	5.110	3.439	3.27		Clay	100.0			12.15	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	12.290	0.313	5692.5	3929.1	4.807	3.318	3.29		Clay	100.0			11.62	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	12.110	0.298	5712.5	3939.1	4.698	3.215	3.29		Clay	100.0			11.45	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	11.400	0.285	5733.8	3949.7	4.321	3.340	3.33		Clay	100.0			10.78	0.85	n.a.	n.a.	0.88	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	11.080	0.287	5753.8	3959.8	4.143	3.493	3.35		Clay	100.0			10.47	0.85	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	11.470	0.279	5775.0	3970.4	4.323	3.251	3.32		Clay	100.0			10.84	0.85	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	14.150	0.266	5795.0	3980.4	5.654	2.360	3.15		Clay	100.0			13.37	0.85	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	14.300	0.250	5815.0	3990.4	5.710	2.198	3.13		Clay	100.0			13.52	0.85	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	13.730	0.248	5836.3	4001.1	5.404	2.295	3.16		Clay	100.0			12.98	0.85	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	12.850	0.266	5856.3	4011.1	4.947	2.677	3.23		Clay	100.0			12.15	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	13.120	0.299	5877.5	4021.7	5.063	2.941	3.24		Clay	100.0			12.40	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	12.770	0.322	5897.5	4031.7	4.872	3.283	3.28		Clay	100.0			12.07	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	13.320	0.351	5917.5	4041.8	5.127	3.386	3.27		Clay	100.0			12.59	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	13.340	0.406	5938.8	4052.4	5.118	3.916	3.30		Clay	100.0			12.61	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	14.120	0.393	5958.8	4062.4	5.485	3.523	3.25		Clay	100.0			13.35	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	14.730	0.419	5980.0	4073.1	5.765	3.567	3.24		Clay	100.0			13.92	0.84	n.a.	n.a.	0.87	0.540	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	15.620	0.479	6000.0	4083.1	6.182	3.795	3.23		Clay	100.0			14.76	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	16.840	0.555	6020.0	4093.1	6.758	4.014	3.21		Clay	100.0			15.92	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	18.470	0.583	6041.3	4103.7	7.529	3.774	3.15		Clay	100.0			17.46	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	20.390	0.624	6061.3	4113.7	8.440	3.592	3.10		Clay	100.0			19.27	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	21.260	0.651	6082.5	4124.4	8.835	3.573	3.08		Clay	100.0			20.09	0.84	n.a.	n.a.	0.87	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	21.070	0.706	6102.5	4134.4	8.716	3.916	3.11		Clay	100.0			19.91	0.84	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	21.390	0.685	6122.5	4144.4	8.845	3.738	3.10		Clay	100.0			20.22	0.84	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	22.530	0.625	6143.8	4155.1	9.366	3.210	3.04		Clay	100.0			21.29	0.84	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	24.930	0.734	6163.8	4165.1	10.491	3.358	3.01		Clay	100.0			23.56	0.84	n.a.	n.a.	0.86	0.539	n.a.	n.a.	n.a.	n.a.	0.00	0.00