Appendix GEO

Geotechnical Investigation

CORNERSTONE
EARTH GROUP

TYPE OF SERV	Geotechnical Investigation
PROJECT NAM	1919 Williams Street Warehouse
LOCATION	1919 Williams Street San Leandro, California
CLIENT	Duke Realty
PROJECT NUMBER	1074-6-1
DATE	January 14, 2020

CORNERSTONE
EARTH GROUP

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Project Name	**1919 Williams Street Warehouse**
Location	**1919 Williams Street** **San Leandro, California**
Client	**Duke Realty**
Client Address	**200 Spectrum Center Drive, Suite 1600** **Irvine, California**
Project Number	**1074-6-1**
Date	**January 14, 2020**

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SECTION 1: INTRODUCTION

This geotechnical report was prepared for the sole use of Duke Realty for the 1919 Williams Street Warehouse in San Leandro, 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, "1919 Williams Street, San Leandro, CA," prepared by Duke Realty, dated September 26, 2019

1.1 PROJECT DESCRIPTION

The project site is located at 1919 Williams Street in San Leandro, California. The project is still in the early development phase, however, based on the information provided, the project will consist of redeveloping the approximately 9.8-acre site for a new commercial/industrial warehouse/distribution facility. The new building will total about 220,875 square feet in plan. We anticipate the building will be single-story with interior clear height of 36 to 38 feet and consist of concrete tilt-up construction. Typically, office spaces will also be allocated. Loading docks will be located along the southwest side of the building. Appurtenant trailer parking, utilities, landscaping, and other improvements necessary for overall site development will also be planned.

Structural loads are expected to be typical of this type of construction. Site grading with cuts and fills on the order of 3 to 6 feet are estimated.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated October 15, 2019 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 five borings drilled on November 13 and 18, 2019 with truck-mounted and track-mounted hollow-stem auger drilling equipment and four Cone Penetration Tests (CPTs) advanced on November 1, 2019. The borings were drilled to depths of approximately 25 to 45 feet; the CPTs were advanced to depths of approximately 50 to 75 feet. Seismic shear wave velocity measurements were collected from CPT-1. Refusal was encountered at a depth of approximately 75 feet at CPT-1. The borings were advanced adjacent to CPTs 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, consolidation testing and corrosivity testing. Details regarding our laboratory program are included in Appendix B.

1.5 CORROSION EVALUATION

Two samples from our borings from depths of 3 and 4 feet were tested for saturated resistivity, pH, and soluble sulfates and chlorides. Based on our site screening, the on-site soils can be characterized as severely corrosive to buried metal, and non-corrosive to buried concrete. Please refer to Section 3.4 for additional recommendations.

1.6 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 REGIONAL SEISMICITY

The San Francisco Bay area region is one of the most seismically active areas in the Country. While seismologists cannot predict earthquake events, the U.S. Geological Survey's Working Group on California Earthquake Probabilities 2015 revises earlier estimates from their 2008 (2008, UCERF2) publication. Compared to the previous assessment issued in 2008, the estimated rate of earthquakes around magnitude 6.7 (the size of the destructive 1994 Northridge earthquake) has gone down by about 30 percent. The expected frequency of such events statewide has dropped from an average of one per 4.8 years to about one per 6.3 years.

However, in the new study, the estimate for the likelihood that California will experience a magnitude 8 or larger earthquake in the next 30 years has increased from about 4.7 percent for UCERF2 to about 7.0 percent for UCERF3.

UCERF3 estimates that each region of California will experience a magnitude 6.7 or larger earthquake in the next 30 years. Additionally, there is a 63 percent chance of at least one magnitude 6.7 or greater earthquake occurring in the Bay Area region between 2007 and 2036.

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	2.7	4.4
Calaveras	11.2	18.1

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 bounded by Merced Street to the northeast, Williams Street to the northwest, and commercial development to the southeast and southwest. The site is currently occupied by a warehouse building with loading docks. Most of the site surrounding the existing structure is paved with asphalt concrete and the loading docks are paved with concrete. Two courtyard areas are located in the northern margin of the property and are planted with trees and shrubs surrounding concrete flatwork. The site is relatively level.

Surface pavements generally consisted of 3 to 6 inches of asphalt concrete over 6 to 8 inches of aggregate base and 8 inches of concrete pavement over subgrade in the loading dock area. Based on visual observations, the existing pavements are in poor shape.

3.2 SUBSURFACE CONDITIONS

Below the surface pavements, our explorations encountered undocumented fill in Borings EB-2, -3, and -4 to depths ranging from 2 to 5½ feet below the existing ground surface. The fill consisted of sandy silty clay and lean clay with sand. Beneath the fill, our borings encountered medium stiff to hard lean clay with variable amounts of sand interbedded with loose clayey sand, very loose to loose silty sand, medium dense poorly graded gravels, and medium dense to very dense poorly graded sand to the maximum depth explored of 45 feet below ground surface.

3.2.1 Plasticity/Expansion Potential

We performed seven Plasticity Index (PI) tests on representative samples. Test results were used to evaluate expansion potential of surficial soils, and the plasticity of the fines in potentially liquefiable layers. The results of the surficial PI tests indicated PIs ranging from 6 to 19, indicating low to 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 9 to 24 percent moisture. In our opinion, we estimated this corresponds to about near optimum to 5 percent above the optimum moisture content.

3.2.3 Sulfate Contents

Laboratory testing indicated that the soluble sulfate contents were 5 and 30 ppm, indicating negligible corrosion potential to buried concrete.

3.3 GROUNDWATER

Groundwater was encountered in our exploratory borings at depths ranging from 17 to 22 feet below current grades. Groundwater was inferred at depths ranging from 14. to 20.7 feet below current grades based on pore pressure dissipation tests at our CPT's. 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.

Historic high groundwater levels are mapped at depths ranging from approximately 10 to 20 feet below existing site grades (CGS, San Leandro 7.5-Minute Quadrangle, 2003). Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors. Based on the above information and our experience in the site vicinity, we recommend a groundwater depth of 10 feet be used for design and evaluation of liquefaction potential.

Table 2: Depth to Groundwater

Boring/CPT Number	Date Drilled	Depth to Groundwater (feet)	Depth of Boring/CPT (feet)
EB-1	11/13/19	2	
EB-2	11/18/19	22	27½
EB-3	11/13/19	19½	2
EB-4	11/18/19	1	
EB-5	11/18/19	19	45
CPT-1	11/1/19	20.7	75.6
CPT-2	11/1/19	14.7	50.7
CPT-3	11/1/19	Not Performed	50.5
CPT-4	11/1/19	19.3	50.7

3.4 CORROSION SCREENING

We tested two samples collected at depths of 3 and 4 feet for resistivity, pH, soluble sulfates, and chlorides. The laboratory test results are summarized in Table 3.

Table 3: Summary of Corrosion Test Results

Boring/Sample	Depth (feet)	Soil pH[1]	Resistivity[2] (ohm-cm)	Chloride[3,5] (mg/kg)	Sulfate[4,5] (% dry wt)
EB-2	4	6.7	1,324	163	0.0300
EB-5	3	6.3	4,734	4	0.0050

Notes:
[1] ASTM G51
[2] ASTM G57 - 100% saturation
[3] ASTM D4327/Cal 422 Modified
[4] ASTM D4327/Cal 417 Modified
[5] 1 mg/kg = 0.0001% by dry weight

Many factors can affect the corrosion potential of soil including moisture content, resistivity, permeability, and pH, as well as chloride and sulfate concentration. Typically, soil resistivity, which is a measurement of how easily electrical current flows through a medium (soil and/or water), is the most influential factor. In addition to soil resistivity, chloride and sulfate ion concentrations, and pH also contribute in affecting corrosion potential.

Based on the laboratory test results summarized in Table 3 and published correlations between resistivity and corrosion potential, the near surface soils are considered severely corrosive to buried metallic improvements (Chaker and Palmer, 1989). Other corrosion parameters (pH and chloride content) do not indicate a significant contribution to corrosion potential to buried metallic structures.

In accordance with the 2016 CBC, Section 1904A.1, alternative cementitious materials shall be determined in accordance with ACI 318-14 Table 19.3.1.1, Table R19.3.1, and Table 19.3.2.1. Based on the laboratory sulfate test results, no cement type restriction is required, although, in our opinion, it is generally a good idea to include some sulfate resistance and to maintain a relatively low water-cement ratio. We have summarized applicable design values and parameters from ACI 318-14, Chapter 19 below in Table 4.

We recommend the structural engineer and a corrosion engineer be retained to confirm the information provided and for additional recommendations, as required.

Table 4: ACI Sulfate Soil Corrosion Design Values and Parameters

Category	Water-Soluble Sulfate (SO4) in Soil (% by weight)	Sulfate (S) Class	Cementitious Materials (2)
S, Sulfate	< 0.10	S0	no type restriction

Notes: (1) above values and parameters are from on ACI 318-14, Table 19.3.1.1, Table R19.3.1, and Table 19.3.2.1
(2) cementitious materials are in accordance with ASTM C150, ASTM C595, and ASTM C1157

SECTION 4: GEOLOGIC HAZARDS

4.1 FAULT 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. Based on review of geologic maps as summarized in Figure 3, no known surface expression of fault traces is thought to cross the site; therefore, fault 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 was estimated for analysis as allowed in the 2019 edition of the California Building Code. For our liquefaction analysis we used a site-specific peak ground acceleration PGA_M of 0.88g.

4.3 LIQUEFACTION POTENTIAL

The site is within a State-designated Liquefaction Hazard Zone (CGS, San Leandro Quadrangle, 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 0.1 to 2.7 inches 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 up to 2 inches or less, over a horizontal distance of 40 to 60 feet.

4.3.4 Ground Rupture Potential

The methods used to estimate liquefaction settlements assume that there is a sufficient cap of non-liquefiable material to prevent ground rupture or sand boils. For ground rupture 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 14-foot thick layer of non-liquefiable cap is sufficient to prevent ground rupture; 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 to medium dense unsaturated sandy soils can settle during strong seismic shaking. We evaluated the potential for seismic compaction of the loose unsaturated sands based on the work by Pradell (1998). Our analyses indicate that loose unsaturated sands could experience up to 0.4 inches of seismic settlement during a design earthquake. Based on the above, in our opinion, the potential for significant differential seismic settlement affecting the proposed improvements is high.

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 study of tsunami inundation potential for the San Francisco Bay Area (Ritter and Dupre, 1972), 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 one mile inland from the San Francisco Bay shoreline, and is approximately 3 to 37 feet above mean sea level. Additionally, the site is also located outside of the tsunami inundation area, according to the Tsunami Inundation Maps for Emergency Planning by the California Geologic Survey. 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 X, described as areas with a 0.2% annual chance flood hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile. We recommend the project civil engineer be retained to confirm this information and verify the base flood elevation, if appropriate.

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.

- Presence of undocumented fill
- Potential for significant static settlements
- Potential for seismic and liquefaction-induced settlements
- Shallow groundwater
- Presence of moderately expansive soils
- Soil corrosion potential

5.1.1 Presence of Undocumented Fill

Undocumented fill was encountered in borings EB-1, EB-2, and EB-3 to depths ranging from 2 to 5½ feet below existing ground surface. The fill consisted of sandy silty clay and lean clay with sand. All fills should be completely removed from within building areas. Detailed grading recommendations are presented in Section 6.3 below.

5.1.2 Potential for Significant Static Settlement

We evaluated immediate and long-term consolidation settlement due to static building loads using estimated interior column loading of about 150 kips. For a conventional footing, total static settlement was estimated to range up to approximately 1 inch, resulting in approximately ½-inch of differential settlement between foundation elements.

Approximately ¾-inch of the total settlement discussed above is due to primary consolidation of saturated clay layers. The time to achieve about 90 to 95 percent of the primary consolidation is anticipated to take several months to a year after all the dead and live loads are in place. The contractor should take this into consideration when scheduling the construction of sensitive finishes.

5.1.3 Potential for Seismic and Liquefaction-Induced Settlements

As discussed, our liquefaction analysis indicates that there is a potential for settlement of loose, unsaturated sand layers and 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 seismic and liquefaction-induced settlement on the order of 0.2 to 3.1 inches could occur, resulting in differential settlement up to 2 inches. Our analysis indicates that seismic and liquefaction-induced settlement on the order of 3.1 inches could occur in the northern portion of the building (CPT-1). We recommend additional CPT explorations be performed after demolition of the existing improvements to explore the extent of settlement of loose sand layers and liquefiable sand layers since these layers were not consistent at the other CPTs performed during this investigation.

To mitigate the combined total and differential seismic and static settlements, we recommend the northern portion of the structure be supported on conventional shallow foundations over ground improvement. The limits of ground improvement should be determined with post demolition CPTs as described above. Detailed ground improvement and foundation recommendations are presented in the following sections.

5.1.4 Shallow Groundwater

Groundwater was measured at depths ranging from approximately 17 to 22 feet below the existing ground surface with a recommended design groundwater depth of 10 feet. Our experience with similar sites in the vicinity 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 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. Detailed grading and foundation recommendations addressing this concern are presented in the following sections.

5.1.6 Soil Corrosion Potential

The laboratory test results indicate that the corrosion potential for buried metallic structures, such as metal pipes, is considered corrosive. Based on the laboratory test results, no cement type restriction is required, although, in our opinion, it is generally a good idea to include some sulfate resistance and to maintain a relatively low water-cement ratio.

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 and widely spaced 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. Surface vegetation and topsoil should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight. Based on our site observations, surficial stripping should extend about 6 inches below existing grade in localized landscape areas.

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 REMOVAL OF EXISTING FILLS

All 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. Based on review of the samples collected from our borings, it appears that the fill may be reused. 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 Site C materials.

Excavations performed during site demolition and fill removal should be sloped at 3:1 (horizontal:vertical) within the upper 5 feet below building subgrade. Excavations extending more than 5 feet below building subgrade and excavations in pavement and flatwork areas should be sloped in accordance with the OSHA soil classification.

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 SUBGRADE STABILIZATION MEASURES

Soil subgrade 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.

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 particular site conditions.

6.6.1 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.

6.6.2 Scarification and Drying

The subgrade may be scarified to a depth of 12 to 18 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.

6.6.3 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 geosynthethic (stabilization fabric or geogrid) is recommended, and what materials are recommended for backfill.

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) and Portland Cement Concrete (PCC) 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. Fill materials containing recycled asphalt including AC grindings may not be reused within the building areas. Laboratory testing will be required to confirm the grindings meet project specifications.

If the site area allows for on-site pulverization of PCC and provided the PCC is pulverized to meet the “Material for Fill” requirements of this report, it may be used as select fill within the building areas, excluding the capillary break layer; as typically pulverized PCC comes close to or meets Class 2 AB specifications, the recycled PCC may likely be used within the pavement structural sections. PCC grindings also make good winter construction access roads, similar to a cement-treated base (CTB) section.

If desired to reuse the asphalt concrete grindings as part of general site fill, the grindings should be thoroughly mixed with on-site soil resulting in a mixture or less than 40 percent grindings by weight. The resulting mixture should also meet the “Material for Fill” requirements in this report. Due to the potential for slight petroleum odors penetrating into habitable building areas, fill containing asphalt concrete should not be used within the building areas.

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 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 Chemical 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 materials can 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 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 “Subgrade Stabilization Measures” section of this report. Where the soil’s PI is 20 or greater, the expansive soil criteria should be used.

Table 5: Compaction Requirements

Description	Material Description	Minimum Relative[1] Compaction (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
Wall Backfill	Without Surface Improvements	90	>1
Wall Backfill	With Surface Improvements	95[4]	>1
Trench Backfill	On-Site Expansive Soils	87 – 92	>3
Trench Backfill	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
Flatwork Subgrade	Low Expansion Soils	90	>1
Flatwork Aggregate Base	Class 2 Aggregate Base[3]	90	Optimum
Pavement Subgrade	On-Site Expansive Soils	87 – 92	>3
Pavement Subgrade	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)
4 – Using light-weight compaction or walls should be braced

6.8 onstruction 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 (⅜-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.

6.10 SITE 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.

- Historic high groundwater levels are mapped at depths ranging from approximately 10 to 20 feet below existing site grades, and therefore is expected to be within 10 feet of the base of the infiltration measure.

- In our opinion, infiltration locations within 10 feet of the building would create a geotechnical hazard.

- Infiltration measures, devices, or facilities may conflict with the location of existing or proposed underground utilities or easements. Infiltration measures, devices, or facilities should not be placed on top of or very near to underground utilities such that they discharge to the utility trench, restrict access, or cause stability concerns.

6.11. 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 required, infiltration (percolation) testing should be performed on representative samples of potential bioswale materials prior to construction to check for general conformance with the specified infiltration rates.

- It should be noted that multiple laboratory tests may be required to evaluate the properties of the bioswale materials, including percolation, landscape suitability and possibly environmental analytical testing depending on the source of the material. We recommend that the landscape architect provide input on the required landscape suitability tests if bioswales are to be planted.

- 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.

- If required by governing agencies, field infiltration testing should be specified on the grading and improvement plans. The appropriate infiltration test method, duration and frequency of testing should be specified in accordance with local requirements.

- 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 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: FOUNDATIONS

7.1 SUMMARY OF RECOMMENDATIONS

Due to the significant anticipated static and seismic settlements, the northern portion of the structure should be supported on conventional shallow foundations over ground improvement. The limits of ground improvement should be determined as described in Section 5.1.3. The remainder of the structure may be supported on conventional shallow foundations provided the recommendations in the “Earthwork” section and the sections below are followed. We recommend a design-build ground improvement contractor design the mitigation using an appropriate ground improvement technique to meet the project requirements and recommendations provided herein.

7.2 SEISMIC DESIGN CRITERIA

We are providing Seismic Design Parameters for the project in accordance with the 2019 California Building Code (2019 CBC), which will be effective for projects that are submitted to the local building department starting January 1, 2020. The new 2019 CBC includes major changes to the procedures used determine the seismic design parameters and has added new requirements for design of foundations for structures constructed on sites with liquefiable soils. The analysis used to provide the requested 2019 CBC seismic design parameters was based on Chapters 16/16A and 18/18A of 2019 CBC and Chapter 11 of ASCE 7-16 including Supplement 1).

The analysis considered mapped spectral acceleration parameters based on distance to the controlling seismic source/fault system. Based on our explorations and review of local geology, the site is underlain by deep alluvial soils. Shear wave velocity (V_s) measurements were performed while advancing CPT-1, resulting in a time-averaged shear wave velocity for the top 30 meters (V_{s30}) of 240 meters per second (794 feet per second). Therefore, the site was classified as Site Class D.

Based on the site coordinates and classification, as well as the Risk Category, Building Period and Importance factor provided by the structural engineer (see Table 4), the following table lists the various factors or site data used for this analysis.

Table 6: 2019 CBC Site Data

Site Data	Design Value
Site Class (Per Chapter 20 ASCE 7-16)	D
Design Shear Wave Velocity, V_{S30}	240
Site Latitude	37.710723°
Site Longitude	-122.17374°
Risk Category	II
Importance Factor, I_e	1
0.2-second Period Mapped Spectral Acceleration[1], S_S	1.32 g
1-second Period Mapped Spectral Acceleration[1], S_1	1.137g

[1] Assumed for Site Class B, 5 percent damped.

In accordance with Section 11.4.8 of ASCE 7-16, we performed a ground motion hazards analysis in accordance with Chapter 21, Section 21.2 of ASCE 7-16. Following the methodology outlined in Section 21.2, we evaluated both Probabilistic MCE_R Ground Motions in accordance with Method 1 and Deterministic MCE_R Ground Motions to generate our recommended design response spectrum for the project. Our recommended Design Response Spectrum is presented graphically on Figure 5.

The structural engineer can use the design response spectrum presented in Figure 5 to evaluate the design acceleration parameters in accordance with Section 21.4 of ASCE 7-16. In accordance with Section 21.5 of ASCE 7-16, we recommend a site-specific MCE_G peak ground acceleration, PGA_M of 0.88g for this project.

Based on ASCE 7-16, Chapter 20, the site should be classified as Site Class F because of the potential for liquefaction and the potential for affects to the structure appear high. ASCE 7-16 generally indicates that sites classified as Site Class F shall have a site response analysis performed in accordance with Section 21.1 of ASCE 7-16, unless the proposed structure has a fundamental period of vibration equal to or less than 0.5 s, site response analysis is not required to determine spectral accelerations for liquefiable soils. Rather, a site class is permitted to be determined in accordance with Section 20.3 and the corresponding values of F_a and F_v determined from Tables 11.4-1 and 11.4-2.

For these reasons, in our opinion, the above Site Classification of D in Table 6 of this report, and the presented seismic coefficients, appear valid due to the above exception, as the structure has a fundamental period equal to or less than 0.5 seconds. The Project Structural Engineer should verify this assumption. If the structure will have a fundamental period of greater than 0.5 seconds, and meets the requirements for a Site Class designation of F, the requirement for a site response analysis will be triggered, and additional geotechnical analysis will need to be approved.

7.3 SHALLOW FOUNDATIONS

7.3.1 Spread Footings

Spread footings should bear entirely on natural, undisturbed soil, or engineered fill, be at least 12 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.

7.3.2 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 7: ssumed Structural Loading

Foundation Area	Range of Assumed Loads
Interior Isolated Column Footing	100 to 150 kips
Exterior Isolated Column Footing	50 to 75 kips
Perimeter Strip Footing	4 to 6 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 1-inch, with about ¾-inch of post-construction differential settlement between adjacent foundation elements. We estimate total static and seismic settlement for the northern portion of the structure to be on the order of 4.1 inches, resulting in differential settlement up to 2¾ inches between foundation elements, assumed to be on the order of 40 to 60 feet. In addition, we recommend the northern portion of the structure be supported on conventional shallow foundations over ground improvement, as required. The final limits of ground improvement should be determined as recommended above.

We estimate total static and seismic settlement for the remainder of the structure to be on the order of 1½ inches, resulting in differential settlement up to 1 inch between foundation elements, assumed to be on the order of 40 to 60 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.

Approximately ¾-inch of the total settlement discussed above is due to primary consolidation of saturated clay layers. The time to the achieve about 90 to 95 percent of the primary consolidation is anticipated to take several months to a year after all the dead and live loads are in place based on the encountered alluvial conditions. The contractor should take this into consideration when scheduling the construction of sensitive finishes.

7.3.3 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 0.35 applied to the footing dead load, and an ultimate passive pressure based on an equivalent fluid pressure of 350 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.

7.3 Spread 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.

7.4 SHALLOW FOUNDATIONS OVER GROUND IMPROVEMENT

As discussed, to minimize potentially high static and seismic total and differential settlements, the northern portion of the structure may be supported on shallow foundations overlying ground improvement. Ground improvement should be designed to provide adequate bearing capacity and reduce total settlement due to static and seismic conditions to tolerable levels as described below. Additional ground improvement recommendations are provided in the following sections.

On a preliminary basis and for your project forward planning, we anticipate Drill Displacement Column^{TM} (DDC) ground improvement or other similar ground densification elements could be utilized to manage settlement under shallow foundations. We estimate DDC column spacing on the order of 4 to 5 feet on-center (square layout) with allowable capacities on the order of 50 to 70 kips each. The above DDC ground improvement element is based on estimated depths of 30 to 40 feet below the ground surface. The improved bearing pressures are estimated to be on the order of 4,000 to 5,000 psf. The above estimates are preliminary, and during design the design-build ground improvement contractor should collaborate with the structural engineer for foundation design.

7.4. Settlement

Ground improvement should be designed to reduce total settlement due to static and seismic conditions to tolerable levels. As discussed in the “Ground Improvement” section below, the ground improvement design should be such that the total foundation settlement (static and seismic) is reduced to about 2½ inches or less, with no more than about 1½ inches for either the static or seismic components.

7.5 GROUND IMPROVEMENT

7.5.1 Ground Improvement Requirements

As discussed above, shallow foundations may be used in combination with ground improvement to improve bearing capacities of the soils beneath the structure as well as reduce the total differential settlements (static and seismic) to tolerable levels. Ground improvement should be designed to increase the soils bearing capacities and improve the subsurface soils such that the combined static and seismic settlement is reduced to 2½ inches or less, and no more than 1½ inches for either the static or seismic component, enabling the structure to be supported on a shallow foundations if determined feasible. Ground improvement should provide adequate confining improvement around all foundations. We anticipate that the ground improvement construction will be a design-build process where Cornerstone Earth Group will review preliminary design-build ground improvement designs, including proposed spacing and layout relative to the foundation plans and installation lengths, and anticipated bearing capacity and densification improvement of the surrounding soils prepared by prospective contractors, provide comments, and come to a general agreement with the contractor on the intended design approach.

Ground improvement should consist of densification techniques to improve the ground’s resistance to liquefaction, reduce static settlement, and improve bearing capacity and seismic performance. We anticipate Drill Displacement Column^{TM} (DDC) ground improvement or other similar ground densification elements could be utilized to manage settlement under shallow foundations. Ground densification techniques could potentially consist of vibro replacement (i.e. stone columns), granular compaction piles (i.e. rammed aggregate), grouted displacement columns (i.e. CLSM), or similar densification techniques. The intent of the ground improvement design would be to increase the bearing capacity of the underlying soils, increase the density of the potentially liquefiable layers, and increase the density of the compressible clays to help reduce post-construction consolidation settlements. The degree to which the density is increased will depend on the improvement method, spacing, and depth.

Based on the chosen ground improvement technique, the upper 1 to 2 feet or more of the working pad will likely need to be re-compacted after ground improvement installation, due to surface disturbance and potential ground heave. For this reason, we do not recommend preparation of the final pad, placement of non-expansive fill, or the construction of utilities prior to ground improvement.

Contractors to perform recommended ground improvement should have adequate experience for the proposed methods to address the requirements herein. All construction quality control and quality assurance records should be supplied to the design team for review on completion of the ground improvement. Adequate quality control readings must be available at the time of installation so that real time oversight can be provided. The instrumentation provided will depend on the ground improvement method chosen. Once a method is chosen, the geotechnical engineer should modify the project design guideline specification for the appropriate method.

We recommend that the ground improvement design include, but not be limited to: 1) drawings showing the ground improvement layout, spacing and diameter, 2) the foundation layout plan, 3) proposed ground improvement length, 4) top and bottom elevations. We should be retained to review the ground improvement contractor’s plan and settlement estimates prior to construction, and to review and confirm that the contractor’s ground improvement design will satisfactorily meet the design criteria based on the performance testing. Following the completion of the Ground Improvement Performance Testing indicated below, a final ground improvement design report and calculation package, including support for the ground improvement design and indicating that the design criteria will be met, should be submitted to the design team for review and approval.

7.5. Ground Improvement Performance Testing

Performance testing typically consists of a pre-construction test section with post-installation load testing and CPT testing to confirm that the necessary soil strength and densification increases were achieved to meet the bearing capacity and settlement criteria. We should observe and monitor installation of the test arrays and production ground improvement on a full-time basis and review the post-test array settlement analyses provided by the contractor. Working with the structural engineer, the team will evaluate whether differential settlement estimates and bearing capacities are tolerable and adequate or whether additional ground improvement is required.

The proposed design capacity of the ground improvement will be confirmed prior to construction by the installation of at least two test array sections of four ground improvement columns with installation lengths and spacing as initially agreed to between the ground improvement contractor and Cornerstone Earth Group. Testing of arrays should include CPT testing at center of array, sampling for strength consolidation testing, and a modulus test of at least one pier in each test array.

The ground improvement contractor shall make their own interpretation of strength parameters and other characteristics for the soil, obtained or derived from the soil boring logs, cone penetration tests, and any geotechnical laboratory testing data provided in the Geotechnical Report and these specifications for bearing capacity analysis. Static settlement shall be assessed using appropriate soil parameters for an elastic settlement analysis based on an area replacement ratio considering the stiffness of the native soils, and the densification columns. Liquefaction and seismic settlement estimates shall be performed using the methodology presented in the project geotechnical report, which followed the procedures in the 2008 monograph, *Soil Liquefaction During Earthquakes* (Idriss and Boulanger, 2008). Liquefaction and settlement shall be evaluated for the upper 50 feet of the soil profile. Any additional subsurface information needed to design the ground improvement shall be the responsibility of the Contractor.

SECTION 8: CONCRETE SLABS AND PEDESTRIAN PAVEMENTS

8.1 INTERIOR SLABS-ON-GRADE

As the Plasticity Index (PI) of the surficial soils ranges up to 19, the proposed slabs-on-grade should be supported on at least 6 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 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 2 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.

8.2 WAREHOUSE SLABS-ON-GRADE

Warehouse slabs-on-grade should be at least 6 inches thick and should have a minimum compressive strength of 3,500 psi. The warehouse slab should also be supported on at least 6 inches of non-expansive, crushed granular base having an R-value of at least 50 and no more than 10 percent passing the No. 200 sieve, such as Class 2 aggregate base. All base and sub-base materials should be placed and compacted in accordance with the “Compaction” section of this report. If there will be areas within the warehouse that are moisture sensitive, such as equipment and elevator rooms, a vapor barrier may be placed over the upper granular base prior to slab construction. Please refer to the recommendations in the “Interior Slabs Moisture Protection Considerations” section for vapor barrier construction. 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.

8.3 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 10-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
¾”	90 – 100
No. 4	0 - 10

  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.

8.4 EXTERIOR FLATWORK

Exterior concrete flatwork subject to pedestrian loading only 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 9: VEHICULAR PAVEMENTS

9.1 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 an assumed R-value of 5. The design R-value was chosen based on engineering judgement considering the proposed pavement areas and potential variable surface conditions following site grading. We have also included pavement structural section alternatives for chemical-treated (lime/cement) subgrade soil with an estimated design R-value of 50 for your consideration. If it is desired to chemical-treat, we recommend that the upper 12 inches of subgrade soil be treated. Additional testing will need to be performed to determine the appropriate lime/cement percentage to be mixed with the subgrade soil.

Table 8: Asphalt Concrete Pavement Recommendations (Untreated Subgrade)

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	7.5	
4.5	2.5	9.5	12.0
5.0	3.0	10.0	13.0
5.5	3.0	12.0	
6.0	3.5	13.0	16.5
6.5	4.0	14.0	18.0
7.0	4.0	16.0	20.
7.5	4.5	17.0	21.5
8.0	5.0	18.0	23.0
8.5	5.0	20.0	25.0
9.0	5.5	21.	
9.5	6.0	22.0	28.0
10.0	6.5	23.0	29.5
10.5	6.5	25.0	31.5
11.0	7.0	26.0	33.0

*Caltrans Class 2 aggregate base; minimum R-value of 78.

Table 9: Asphalt Concrete Pavement Recommendations (Chemical-Treated Subgrade)

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0/4.5	2.5	4.0	6.5
5.0/5.5	3.0	4	
6.0	3.5	4.0	7
6.5	4.0	4.0	8.0
7.0	4.0	4.5	8
7.5	4.5	5.0	9.5
8.0	5.0	5.0	10.0
8.5	5.0	6.5	
9.0	5.5	6.5	12.0
9.5	6.0	7.0	1
10.0	6.5	7.5	
10.5	6.5	8.5	
11.0	7.0	8.5	

*Caltrans Class 2 aggregate base with minimum R-value of 78; minimum chemical-treated subgrade R-value assumed to be 50

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 be using 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.

9.2 PORTLAND CEMENT CONCRETE

The exterior Portland Cement Concrete (PCC) pavement recommendations tabulated below are based on methods presented in the Portland Cement Association (PCA) design manual (PCA, 1984). We have provided a few pavement alternatives as an anticipated Average Daily Truck

Traffic (ADTT) was not provided. An allowable ADTT should be chosen that is greater than what is expected for the development. PCC alternatives for chemical-treated (lime/cement) subgrade are also provided in the tables below.

Table 10: PCC Pavement Recommendations (Untreated Subgrade)

Allowable ADTT	**Minimum PCC Thickness (inches)**
13	5.5
130	6.0

Table 11: PCC Pavement Recommendations (Chemical-Treated Subgrade)

Allowable ADTT	**Minimum PCC Thickness (inches)**
13	5.0
150	5.5

The PCC thicknesses above are based on a concrete compressive strength of at least 3,500 psi, supporting the PCC on at least 6 inches of Class 2 aggregate base compacted as recommended in the “Earthwork” section, 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.

9.2.1 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.

9.3 PAVEMENT CUTOFF

Surface water penetration into the pavement section can significantly reduce the pavement life. 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 10: RETAINING WALLS

10.1 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 12: Recommended Lateral Earth Pressures

Wall Condition	Lateral Earth Pressure*	Additional Surcharge Loads
Unrestrained – Cantilever Wall	45 pcf	⅓ of vertical loads at top of wall
Restrained – Braced Wall	45 pcf + 8H** psf	½ 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.

10 SEISMIC LATERAL EARTH PRESSURES

The 2016 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.

10.3 WALL DRAINAGE

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, ½-inch to ¾-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.

10.4 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.

10.5 FOUNDATIONS

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

SECTION 11: LIMITATIONS

This report, an instrument of professional service, has been prepared for the sole use of Duke Realty specifically to support the design of the 1919 Williams Street Warehouse project in San Leandro, 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.

Duke Realty may have provided Cornerstone with plans, reports and other documents prepared by others. Duke Realty 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 12: REFERENCES

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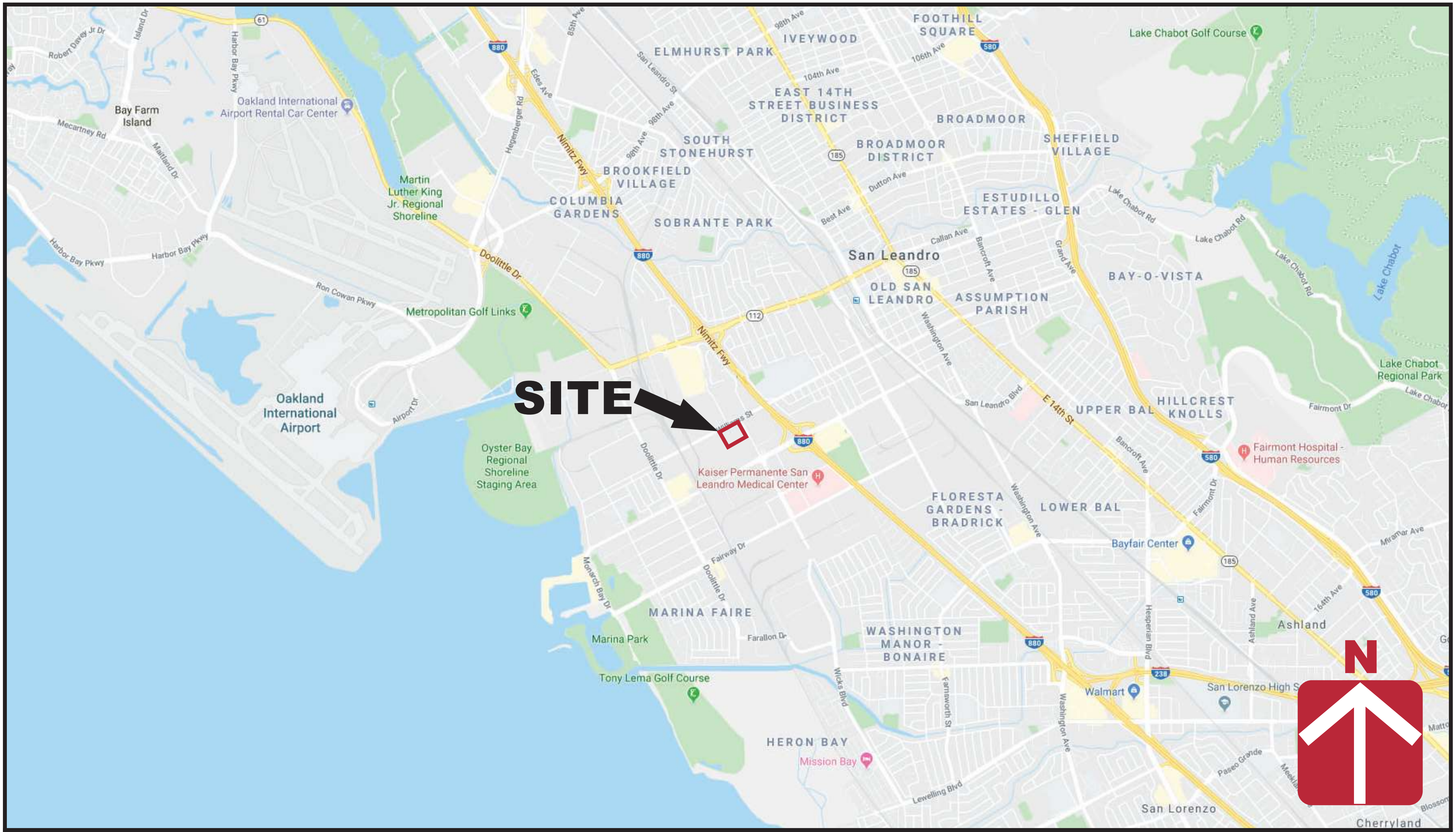

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Vicinity Map

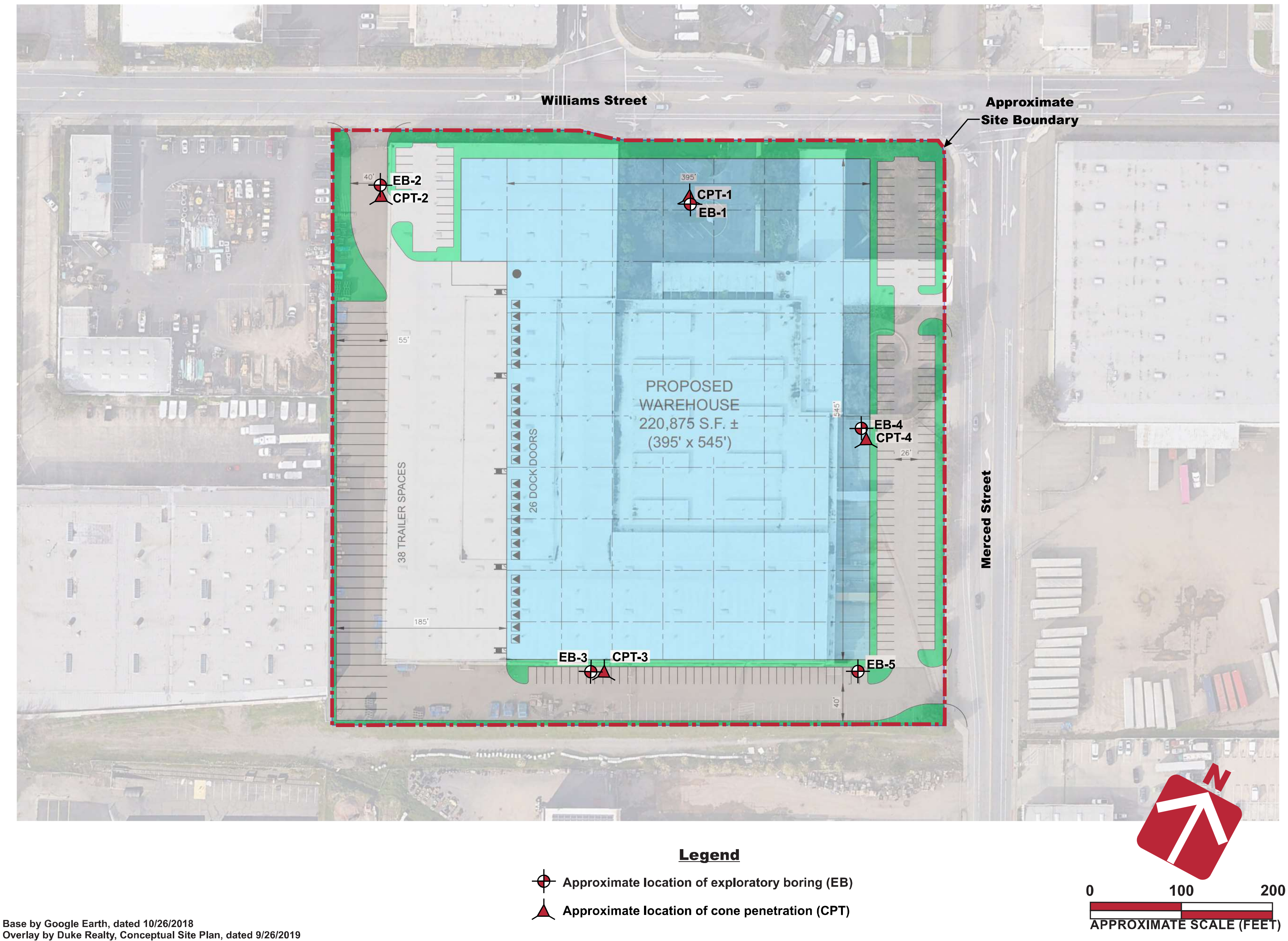
Williams Street Warehouse
1919 Williams Street
San Leandro, CA

Project Number
1074-1-1

Figure Number
Figure 1

Date
November 2019

Drawn By
KLG



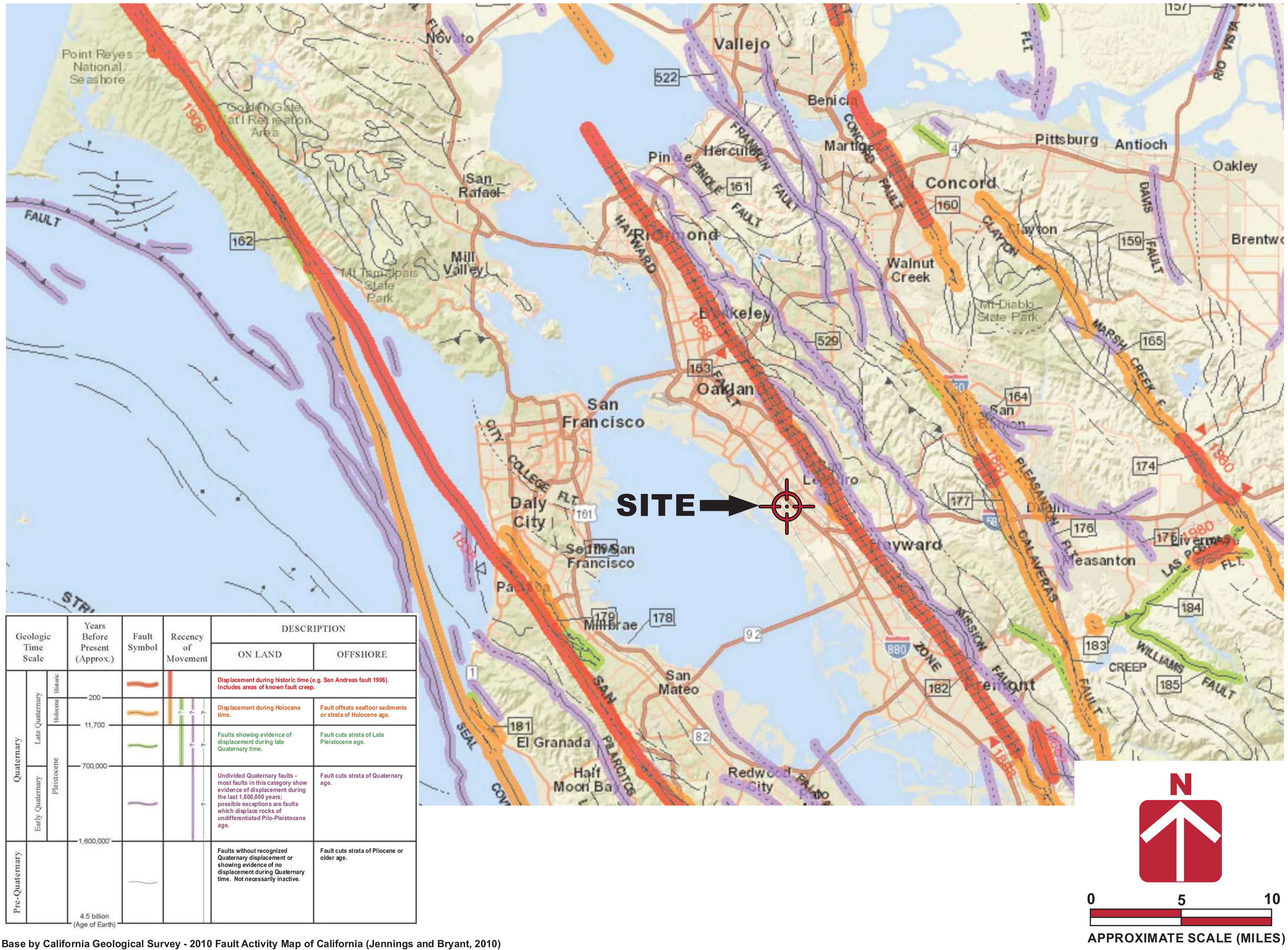
Base by Google Earth, dated 10/26/2018
Overlay by Duke Realty, Conceptual Site Plan, dated 9/26/2019

CORNERSTONE
EARTH GROUP

Site Plan

Williams Street Warehouse
1919 Williams Street
San Leandro, CA

Project Number	1074-6-1
Figure Number	Figure 2
Date	December 2019
Drawn By	KLG/RRN



Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
						ON LAND	OFFSHORE
Quaternary	Late Quaternary	Historic	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	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.
	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 Pilo-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			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)

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Regional Fault Map

Williams Street Warehouse
1919 Williams Street
San Leandro, CA

Project Number 1074-6-1
Figure Number Figure 3
Date November 2019
Drawn By KLG

CORNERSTONE
EARTH GROUP

FIGURE 4A

CPT NO. 1

PROJECT/CPT DATA

Project Title: **1919 Williams Street Warehouse**

Project No.: **1074-6-1**

Project Manager: **RSM**

SEISMIC PARAMETERS

Controlling Fault: **Hayward**

Earthquake Magnitude (Mw): **7.36**

PGA (Amax): **0.88** (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet): **20**

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**

0.45 **(Inches)**

LIQUEFACTION SETTLEMENT FROM 50 **FEET**

2.70 **(Inches)**

TOTAL SEISMIC SETTLEMENT 3.1 **INCHES**

POTENTIAL LATERAL DISPLACEMENT

LDI[2] 0.00 **L/H** 1000.0

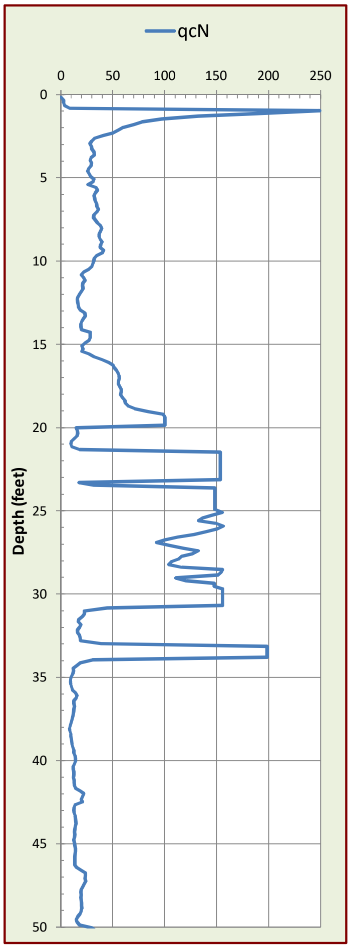
LDI[1]**Corrected for Distance** 0.00 (4 < L/H < 40)

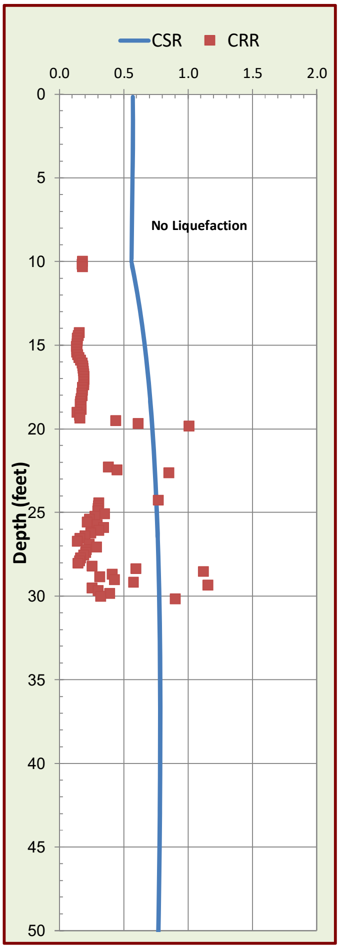
EXPECTED RANGE OF DISPLACEMENT

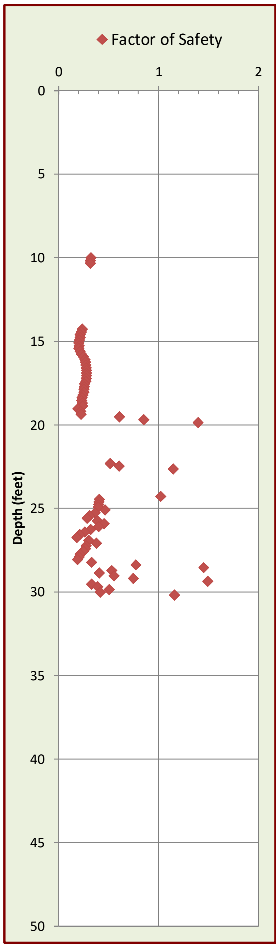
0.0 **to** 0.0 **feet**

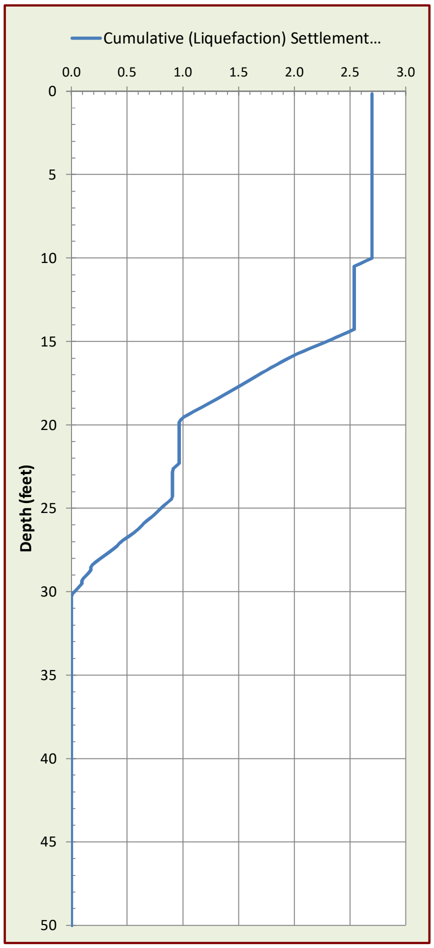
[1] Not Valid for L/H Values < 4 and > 40.

[2] LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 4B

CPT NO. 2

PROJECT/CPT DATA

Project Title: **1919 Williams Street Warehouse**
Project No.: **1074-6-1**
Project Manager: **RSM**

SEISMIC PARAMETERS

Controlling Fault: **Hayward**
Earthquake Magnitude (Mw): **7.36**
PGA (Amax): **0.88** (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet): **20**
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**
0.28 **(Inches)**

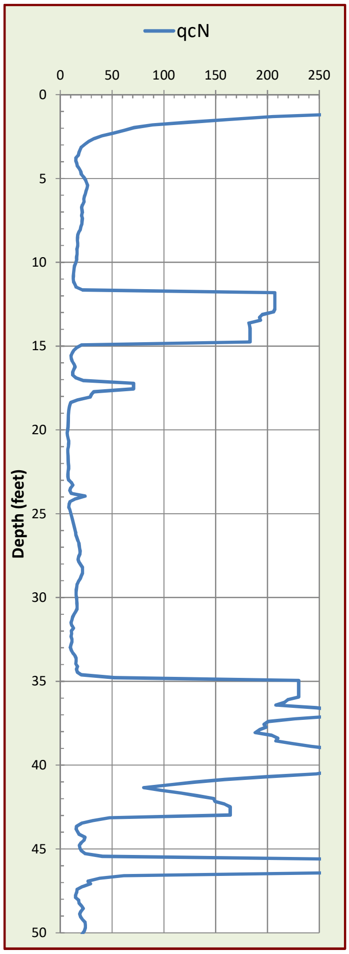
TOTAL SEISMIC SETTLEMENT 0.3 **INCHES**

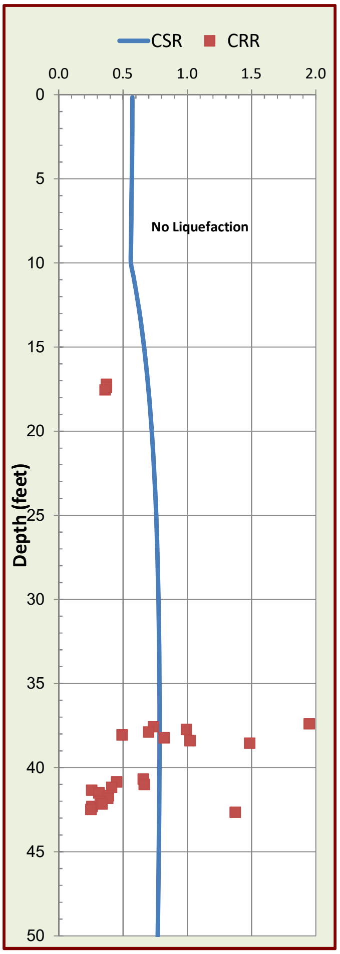
POTENTIAL LATERAL DISPLACEMENT

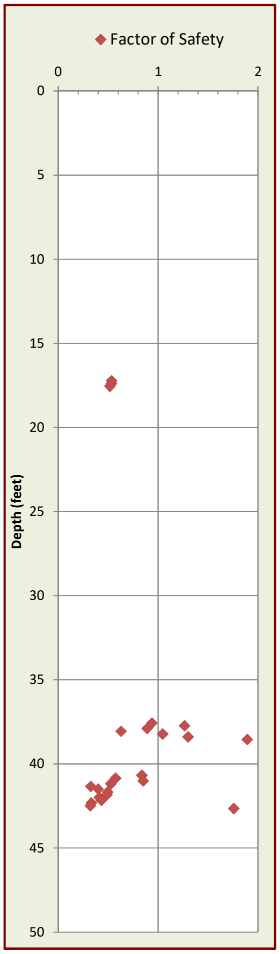
LDI^2 0.00 **L/H** 1000.0
LDI^1 **Corrected for Distance** 0.00 (4 < L/H < 40)

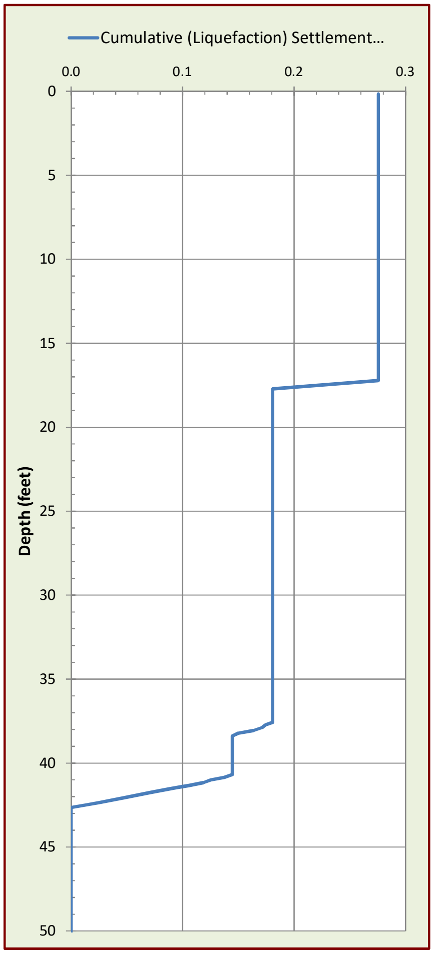
EXPECTED RANGE OF DISPLACEMENT
0.0 **to** 0.0 **feet**

[1] Not Valid for L/H Values < 4 and > 40.
[2] LDI Values Only Summed to 2H Below Grade.









CORNERSTONE
EARTH GROUP

FIGURE 4C

CPT NO. 3

PROJECT/CPT DATA

Project Title **1919 Williams Street Warehouse**

Project No. **1074-6-1**

Project Manager **RSM**

SEISMIC PARAMETERS

Controlling Fault **Hayward**

Earthquake Magnitude (Mw) **7.36**

PGA (Amax) **0.88** (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet) **20**

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**

0.52 **(Inches)**

TOTAL SEISMIC SETTLEMENT 0.5 **INCHES**

POTENTIAL LATERAL DISPLACEMENT

LDI[2] 0.00 **L/H** 1000.0

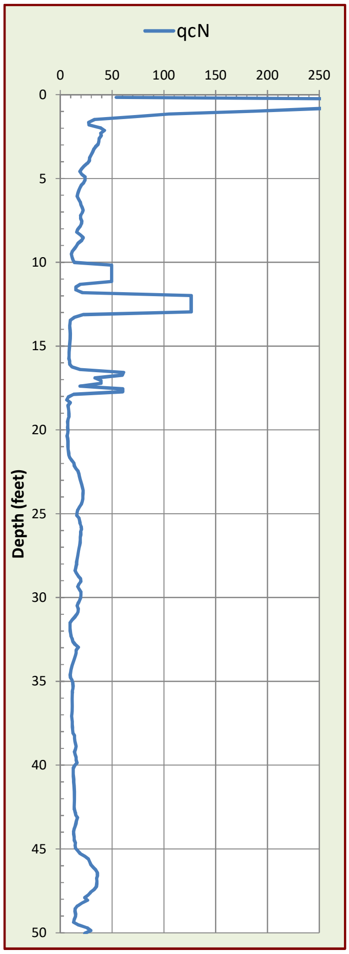
LDI[1]**Corrected for Distance** 0.00 (4 < L/H < 40)

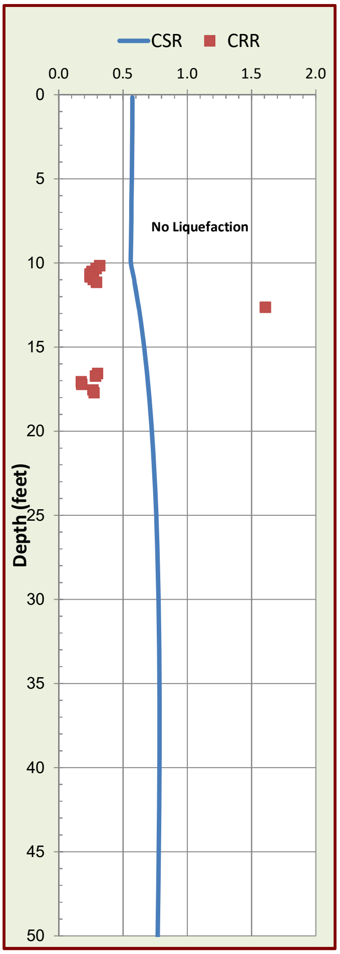
EXPECTED RANGE OF DISPLACEMENT

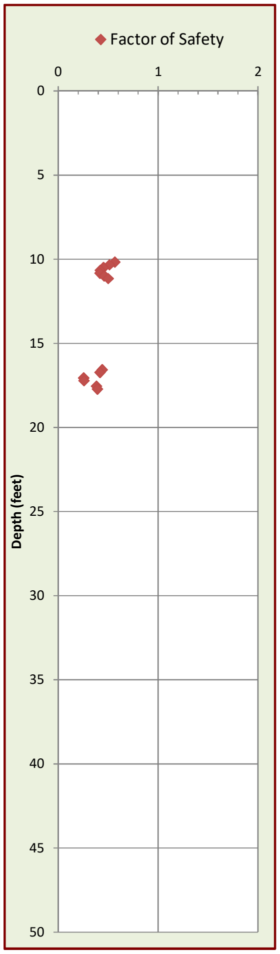
0.0 **to** **0.0** **feet**

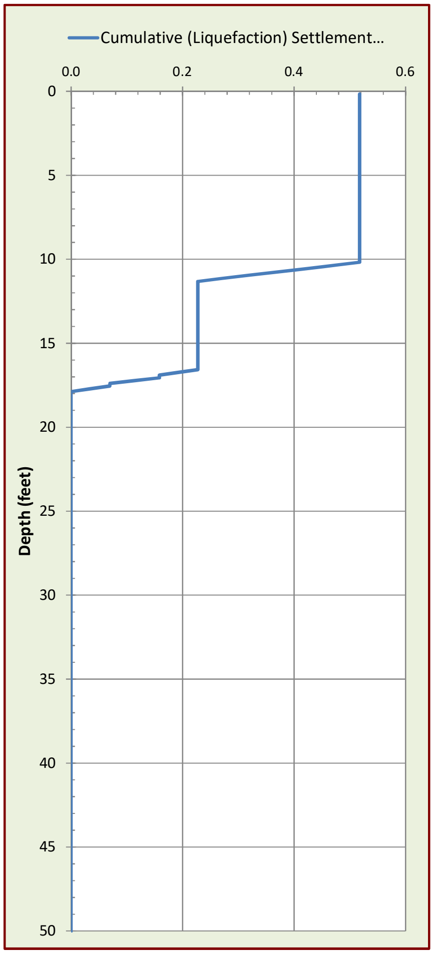
[1] Not Valid for L/H Values < 4 and > 40.

[2] LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE **4D**

CPT NO. **4**

PROJECT/CPT DATA

Project Title: **1919 Williams Street Warehouse**

Project No.: **1074-6-1**

Project Manager: **RSM**

SEISMIC PARAMETERS

Controlling Fault: **Hayward**

Earthquake Magnitude (Mw): **7.36**

PGA (Amax): **0.88** (g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet): **20**

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**

0.10 **(Inches)**

LIQUEFACTION SETTLEMENT FROM 50 **FEET**

0.11 **(Inches)**

TOTAL SEISMIC SETTLEMENT 0.2 **INCHES**

POTENTIAL LATERAL DISPLACEMENT

LDI^2 0.00 **L/H** 1000.0

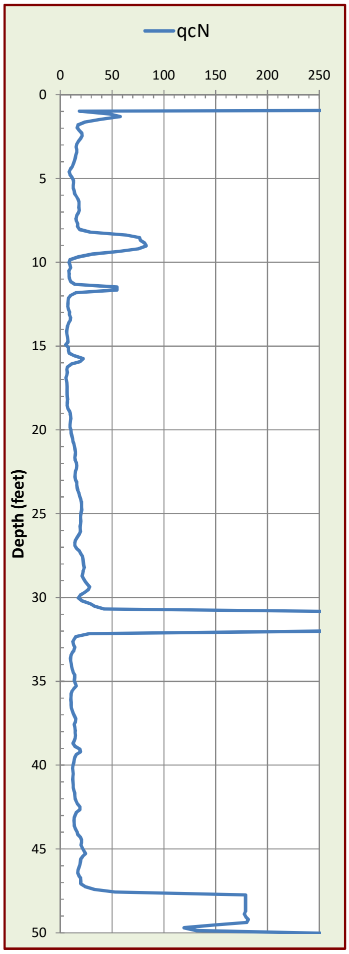
LDI$^1_{\text{Corrected for Distance}}$ 0.00 (4 < L/H < 40)

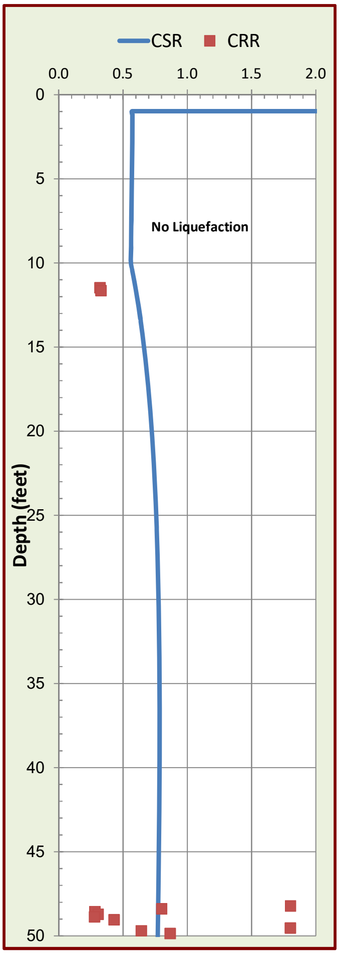
EXPECTED RANGE OF DISPLACEMENT

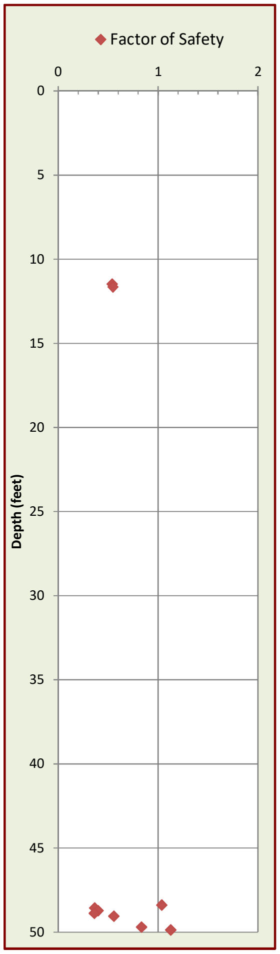
0.0 **to** **0.0** **feet**

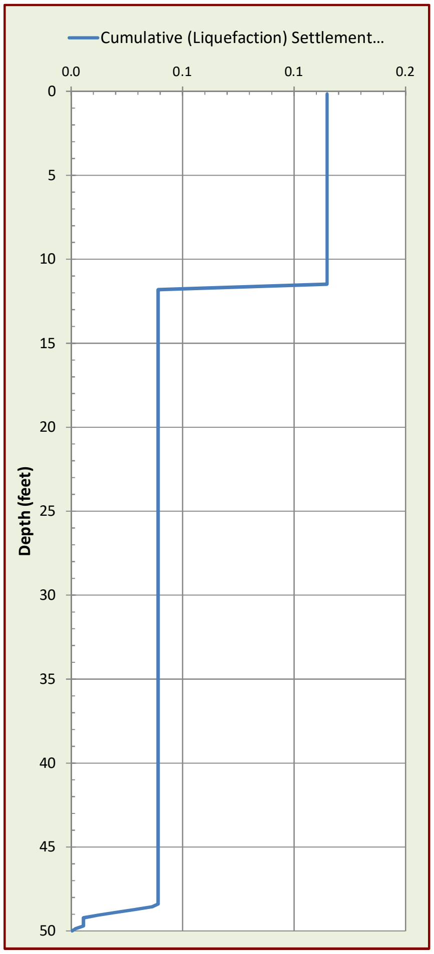
[1] Not Valid for L/H Values < 4 and > 40.

[2] LDI 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 and track-mounted hollow-stem auger drilling equipment and 20-ton truck-mounted Cone Penetration Test equipment. Two 6½-inch-diameter and three 8-inch-diameter exploratory borings were drilled on November 13 and 18, 2019 to depths ranging from 25 to 45 feet. Four CPT soundings were also performed in accordance with ASTM D 5778-95 (revised, 2002) on November 1, 2019, to depths ranging from approximately 50 to 75 feet. Refusal was encountered at a depth of approximately 75 feet at CPT-1. 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, are included as part of this appendix.

Boring and CPT locations were approximated using existing site boundaries 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-2487-10)

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	⁘	Sand
▨	Clayey Sand	▥	Silt
▥	Sandy Silt	○	Well Graded Gravelly Sand
▩	Artificial/Undocumented Fill	○	Gravelly Silt
○	Poorly-Graded Gravelly Sand	■	Asphalt
⁂	Topsoil	●	Boulders and Cobble
●	Well-Graded Gravel with Clay		
●	Well-Graded Gravel with Silt		

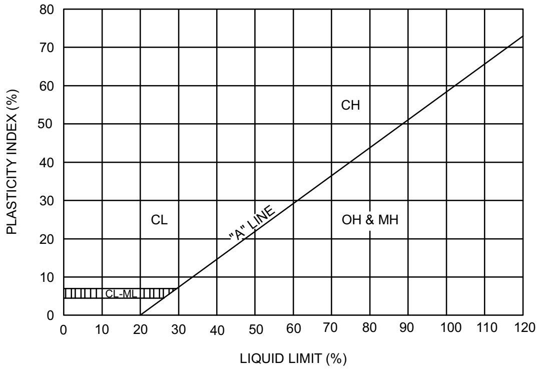
SAMPLER TYPES

☒	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

LEGEND TO SOIL DESCRIPTIONS

Figure Number
A-1

BORING NUMBER EB-1

CORNERSTONE EARTH GROUP

PROJECT NAME 1919 Williams Street Warehouse

PROJECT NUMBER 1074-6-1

PROJECT LOCATION San Leandro, CA

DATE STARTED 11/13/19 **DATE COMPLETED** 11/13/19

GROUND ELEVATION **BORING DEPTH** 35 ft.

DRILLING CONTRACTOR Cuesta Geo

LATITUDE **LONGITUDE**

DRILLING METHOD MPP LAD Track Rig, 6½ inch Hollow-Stem Auger

GROUNDWATER LEVELS:

LOGGED BY BCG

▽ **AT TIME OF DRILLING** 20 ft.

NOTES

▼ **AT END OF DRILLING** 18 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.

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

DEPTH (ft)	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
0	6 inches asphalt concrete over 6 inches aggregate base							
	Lean Clay with Sand (CL) hard, moist, dark brown, fine sand, moderate plasticity Liquid Limit = 37, Plastic Limit = 18	11	MC-1B	96	15	19		>4.5
	Clayey Sand (SC) loose, moist, brown, fine to medium sand	8	MC-2B	96	10			
5		8	MC					
	Silty Sand (SM) loose, moist, brown, fine sand NP = Non plastic	4	SPT-4		9	NP	27	
		7	MC-5B	99	18			
10	**Sandy Lean Clay (CL)** very stiff, moist, brown, fine sand, low plasticity							
	becomes stiff, color changes to gray with brown mottles	8	MC-6B	100	16			
15	**Silty Sand (SM)** very loose, moist, brown, fine sand NP = Non plastic	3	SPT-7		16	NP	34	
	Poorly Graded Gravel with Silt and Sand (GP-GM) medium dense, wet, brown, fine to coarse subrounded to subangular gravel, fine to medium sand	16	MC-8B	107	10		5	
20	**Silty Sand (SM)** loose, wet, brown, fine sand	6	SPT-9B		27			
	Clayey Sand with Gravel (SC) loose, wet, gray and brown, fine to coarse sand, fine to coarse subrounded gravel	4	SPT-10		17			
25		19	SPT-11		12		6	

Continued Next Page

CORNERSTONE
EARTH GROUP

BORING NUMBER EB-1

PROJECT NAME 1919 Williams Street Warehouse
PROJECT NUMBER 1074-6-1
PROJECT LOCATION San Leandro, CA

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

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 1.0 2.0 3.0 4.0
			Poorly Graded Sand with Silt and Gravel (SP-SM) medium dense, wet, gray, medium to coarse sand, fine to coarse subrounded to subangular gravel		☒					
				15	☒ SPT-12		12			
	30			24	☒ SPT-13		10			
			Lean Clay with Sand (CL) stiff, moist, gray with brown mottles, fine to coarse sand, moderate plasticity	8	☒ SPT-14		24			○
	35		Bottom of Boring at 35.0 feet.							
	40									
	45									
	50									
	55									

BORING NUMBER EB-2

PAGE 1 OF 1

CORNERSTONE EARTH GROUP

PROJECT NAME 1919 Williams Street Warehouse
PROJECT NUMBER 1074-6-1
PROJECT LOCATION San Leandro, CA
DATE STARTED 11/18/19 **DATE COMPLETED** 11/18/19
GROUND ELEVATION **BORING DEPTH** 27.5 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE **LONGITUDE**
DRILLING METHOD Mobile B-61, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
▽ **AT TIME OF DRILLING** 22 ft.
NOTES
▼ **AT END OF DRILLING** 21 ft.

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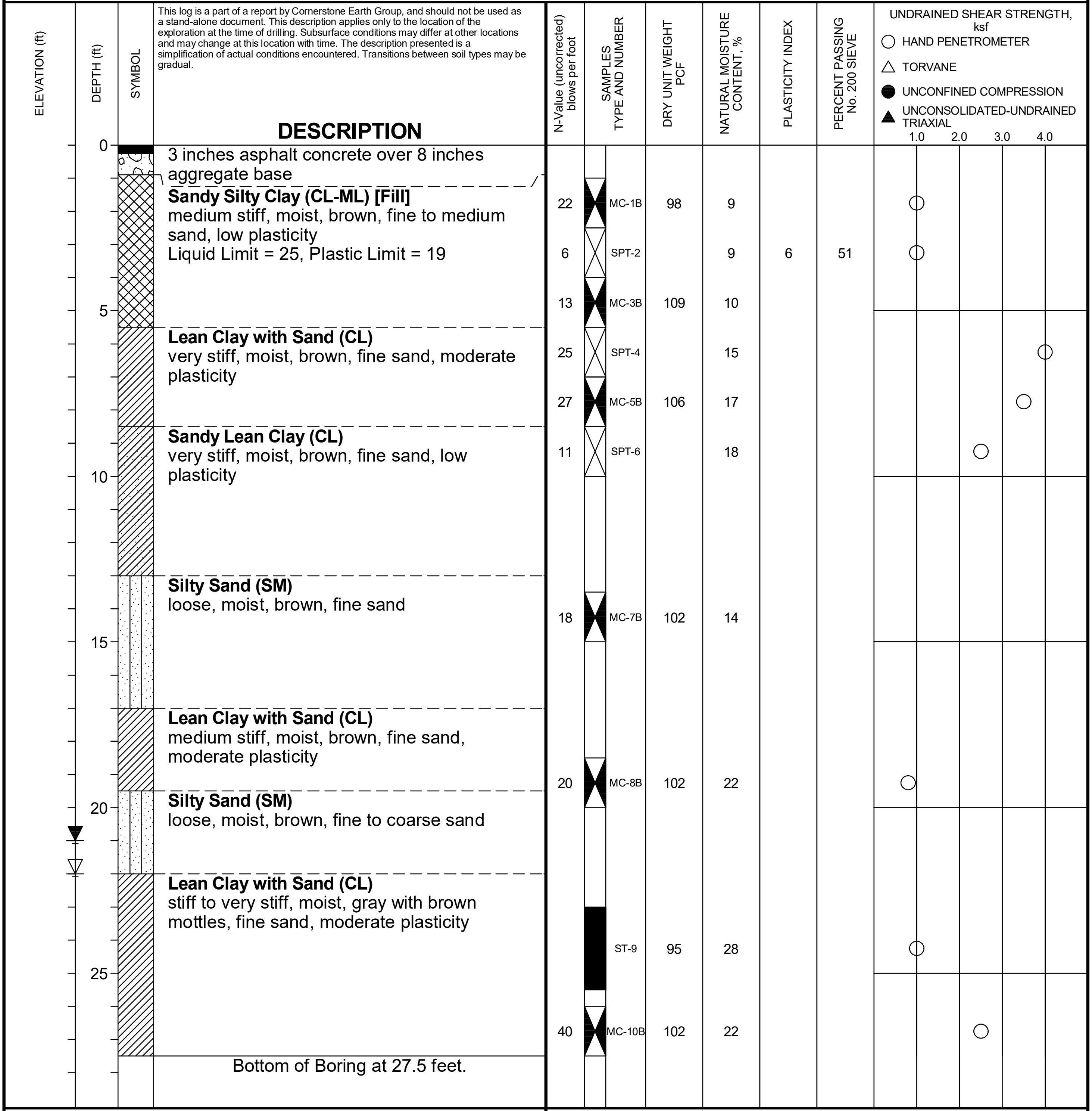

DESCRIPTION

3 inches asphalt concrete over 8 inches aggregate base

Sandy Silty Clay (CL-ML) [Fill]
medium stiff, moist, brown, fine to medium sand, low plasticity
Liquid Limit = 25, Plastic Limit = 19

Lean Clay with Sand (CL)
very stiff, moist, brown, fine sand, moderate plasticity

Sandy Lean Clay (CL)
very stiff, moist, brown, fine sand, low plasticity

Silty Sand (SM)
loose, moist, brown, fine sand

Lean Clay with Sand (CL)
medium stiff, moist, brown, fine sand, moderate plasticity

Silty Sand (SM)
loose, moist, brown, fine to coarse sand

Lean Clay with Sand (CL)
stiff to very stiff, moist, gray with brown mottles, fine sand, moderate plasticity

Bottom of Boring at 27.5 feet.

N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX	PERCENT PASSING No. 200 SIEVE
22	MC-1B	98	9		
6	SPT-2		9	6	51
13	MC-3B	109	10		
25	SPT-4		15		
27	MC-5B	106	17		
11	SPT-6		18		
18	MC-7B	102	14		
20	MC-8B	102	22		
	ST-9	95	28		
40	MC-10B	102	22		

BORING NUMBER EB-3

PAGE 1 OF 1

CORNERSTONE EARTH GROUP

PROJECT NAME 1919 Williams Street Warehouse
PROJECT NUMBER 1074-6-1
PROJECT LOCATION San Leandro, CA
DATE STARTED 11/13/19 **DATE COMPLETED** 11/13/19
GROUND ELEVATION ______ **BORING DEPTH** 25 ft.
DRILLING CONTRACTOR Cuesta Geo
LATITUDE ______ **LONGITUDE** ______
DRILLING METHOD MPP LAD Track Rig, 6½ inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
▽ **AT TIME OF DRILLING** 19.5 ft.
NOTES ______
▼ **AT END OF DRILLING** 19 ft.

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DESCRIPTION

ELEVATION (ft) | DEPTH (ft): 0, 5, 10, 15, 20, 25

3 inches asphalt concrete over 6 inches aggregate base

Lean Clay with Sand (CL) [Fill]
hard, moist, dark brown and brown mottled, fine to medium sand, some fine to coarse subangular gravel, low to moderate plasticity

Sandy Lean Clay (CL)
very stiff, moist, brown, fine sand, low plasticity
Liquid Limit = 28, Plastic Limit = 19

Lean Clay with Sand (CL)
very stiff, moist, brown, fine sand, low plasticity
Liquid Limit = 27, Plastic Limit = 18

Silty Sand (SM)
loose, moist, brown, fine sand
NP = Non plastic

Sandy Lean Clay (CL)
stiff, moist, brown, fine sand, low plasticity

Lean Clay with Sand (CL)
stiff, moist, gray and brown mottled, fine sand, moderate plasticity

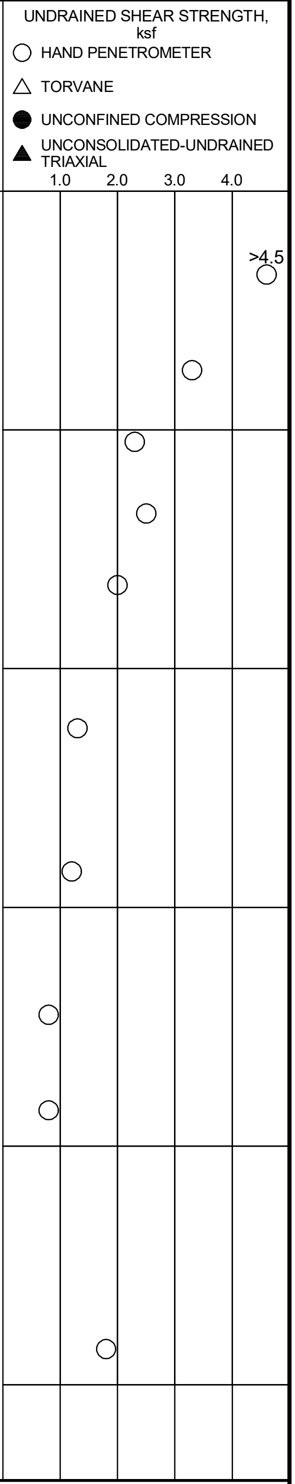
Silty Sand with Gravel (SM)
loose, moist, brown, fine sand, fine to coarse subrounded gravel

Sandy Lean Clay (CL)
medium stiff, moist, gray and brown, fine to medium sand, low plasticity

Lean Clay (CL)
stiff, moist, gray and brown, some fine sand, moderate plasticity

Bottom of Boring at 25.0 feet.

N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX	PERCENT PASSING No. 200 SIEVE
20	MC-1B	114	14		
5	SPT-2		14	9	58
9	MC-3B	101	13		
4	SPT-4		19	9	73
7	MC-5B	104	16		
4	SPT-6		13	NP	39
3	SPT-7B		19		
8	MC-8B	97	24		
8	MC-9A	116	17		
	ST				
17	MC-11B	107	22		



BORING NUMBER EB-4

PAGE 1 OF 1

CORNERSTONE EARTH GROUP

PROJECT NAME 1919 Williams Street Warehouse
PROJECT NUMBER 1074-6-1
PROJECT LOCATION San Leandro, CA
DATE STARTED 11/18/19 **DATE COMPLETED** 11/18/19
GROUND ELEVATION **BORING DEPTH** 25 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE **LONGITUDE**
DRILLING METHOD Mobile B-61, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
∇ **AT TIME OF DRILLING** 17 ft.
NOTES
▼ **AT END OF DRILLING** 19 ft.

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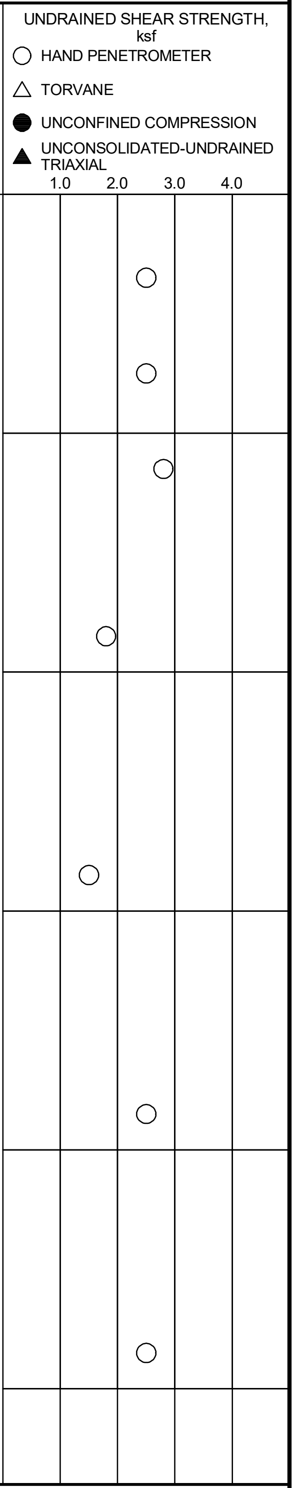
ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX	PERCENT PASSING No. 200 SIEVE
	0	8 inches Portland cement concrete						
		Lean Clay with Sand (CL) [Fill] very stiff, moist, dark brown and brown mottled, fine to medium sand, low to moderate plasticity	16	MC-1B	96	20		
		Lean Clay (CL) very stiff, moist, dark brown to brown, some fine sand, moderate plasticity	39	MC-2B	103	21		
	5		21	MC-3B	109	17		
		Lean Clay with Sand (CL) stiff, moist, brown, fine sand, moderate plasticity	19	MC-4B	103	19		
	10							
			21	MC-5B	102	22		
	15							
		Lean Clay (CL) stiff to very stiff, moist, gray with brown mottles, some fine sand, moderate plasticity	27	MC-6B	104	25		
	20							
			51	MC-7B	104	24		
	25	Bottom of Boring at 25.0 feet.						



BORING NUMBER EB-5

PAGE 1 OF 2

CORNERSTONE EARTH GROUP

PROJECT NAME 1919 Williams Street Warehouse
PROJECT NUMBER 1074-6-1
PROJECT LOCATION San Leandro, CA
DATE STARTED 11/18/19 **DATE COMPLETED** 11/18/19
GROUND ELEVATION ____ **BORING DEPTH** 45 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE ____ **LONGITUDE** ____
DRILLING METHOD Mobile B-61, 8 inch Hollow-Stem Auger
GROUNDWATER LEVELS:
LOGGED BY BCG
▽ **AT TIME OF DRILLING** 19 ft.
NOTES ____
▼ **AT END OF DRILLING** 16 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.

DESCRIPTION

3 inches asphalt concrete over 3 inches aggregate base

Lean Clay (CL)
hard, moist, dark brown, some fine sand, moderate plasticity

Silty Sand (SM)
loose, moist, brown, fine sand

Lean Clay with Sand (CL)
hard, moist, brown, fine sand, moderate plasticity

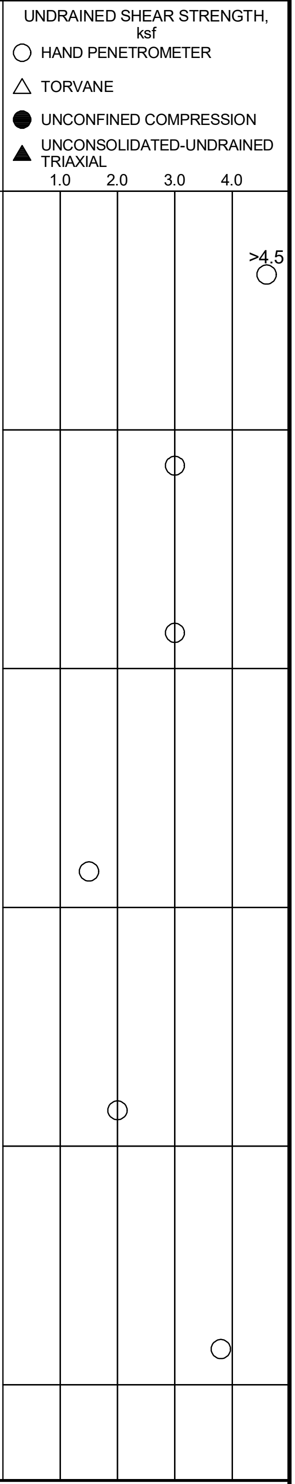
Lean Clay (CL)
very stiff, moist, brown, fine sand, low plasticity

Lean Clay with Sand (CL)
stiff, moist, brown, fine sand, moderate plasticity

Lean Clay (CL)
very stiff, moist, gray with brown mottles, some fine sand, moderate plasticity

Continued Next Page

N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT, %	PLASTICITY INDEX	PERCENT PASSING No. 200 SIEVE
45	MC-1B	117	14		
14	MC-2B	103	18		
26	MC-3B	110	20		
23	MC-4B	102	24		
20	MC-5B	102	24		
36	MC-6B	112	24		
56	MC-7B	103	25		



BORING NUMBER EB-5

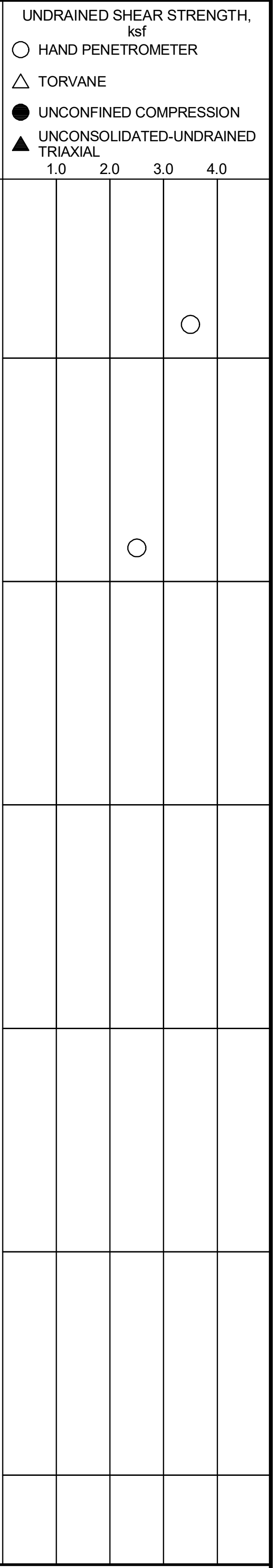
PAGE 2 OF 2

CORNERSTONE EARTH GROUP

PROJECT NAME 1919 Williams Street Warehouse
PROJECT NUMBER 1074-6-1
PROJECT LOCATION San Leandro, 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
			Sandy Lean Clay (CL) very stiff, moist, brown, fine sand, low plasticity	59	MC-8B	117	16		
	30								
			Lean Clay with Sand (CL) very stiff, moist, brown, fine sand, moderate plasticity	81	MC-9B	108	22		
	35								
			Clayey Sand (SC) loose, moist, brown, fine to coarse sand						
			Poorly Graded Sand with Silt and Gravel (SP-SM) very dense, wet, brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	55	MC-10B	116	14		
	40			74	SPT-11		13		
				70	SPT-12		12		
	45		Bottom of Boring at 45.0 feet.						
	50								
	55								



Cornerstone Earth Group

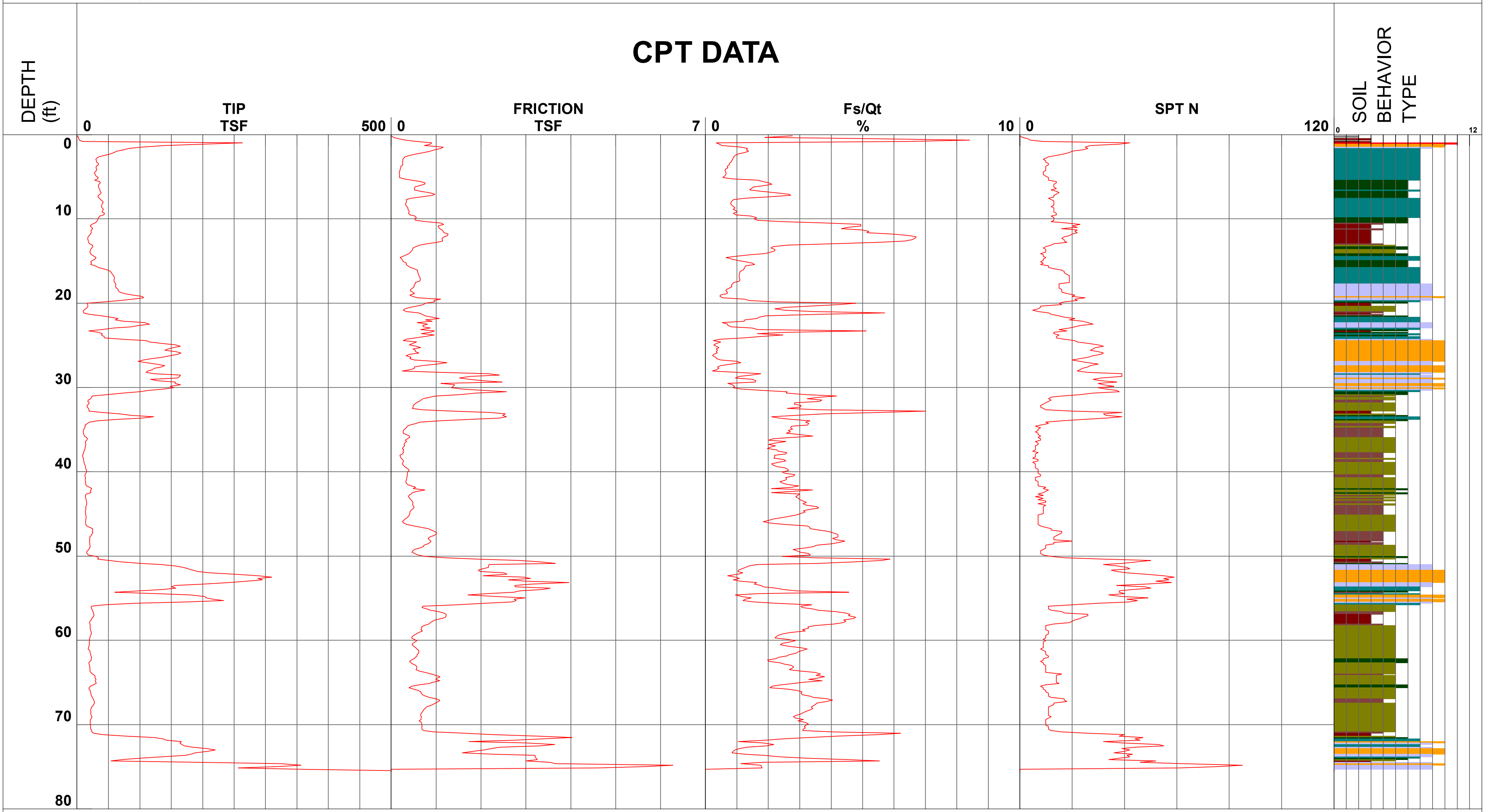
Project 1919 Williams Street
Job Number 1074-6-1
Hole Number CPT-01
EST GW Depth During Test 20.70 ft

Operator JM-BB
Cone Number DDG1489
Date and Time 11/1/2019 7:30:21 AM

Filename SDF(274).cpt
GPS
Maximum Depth 75.62 ft

Net Area Ratio .8

CPT DATA



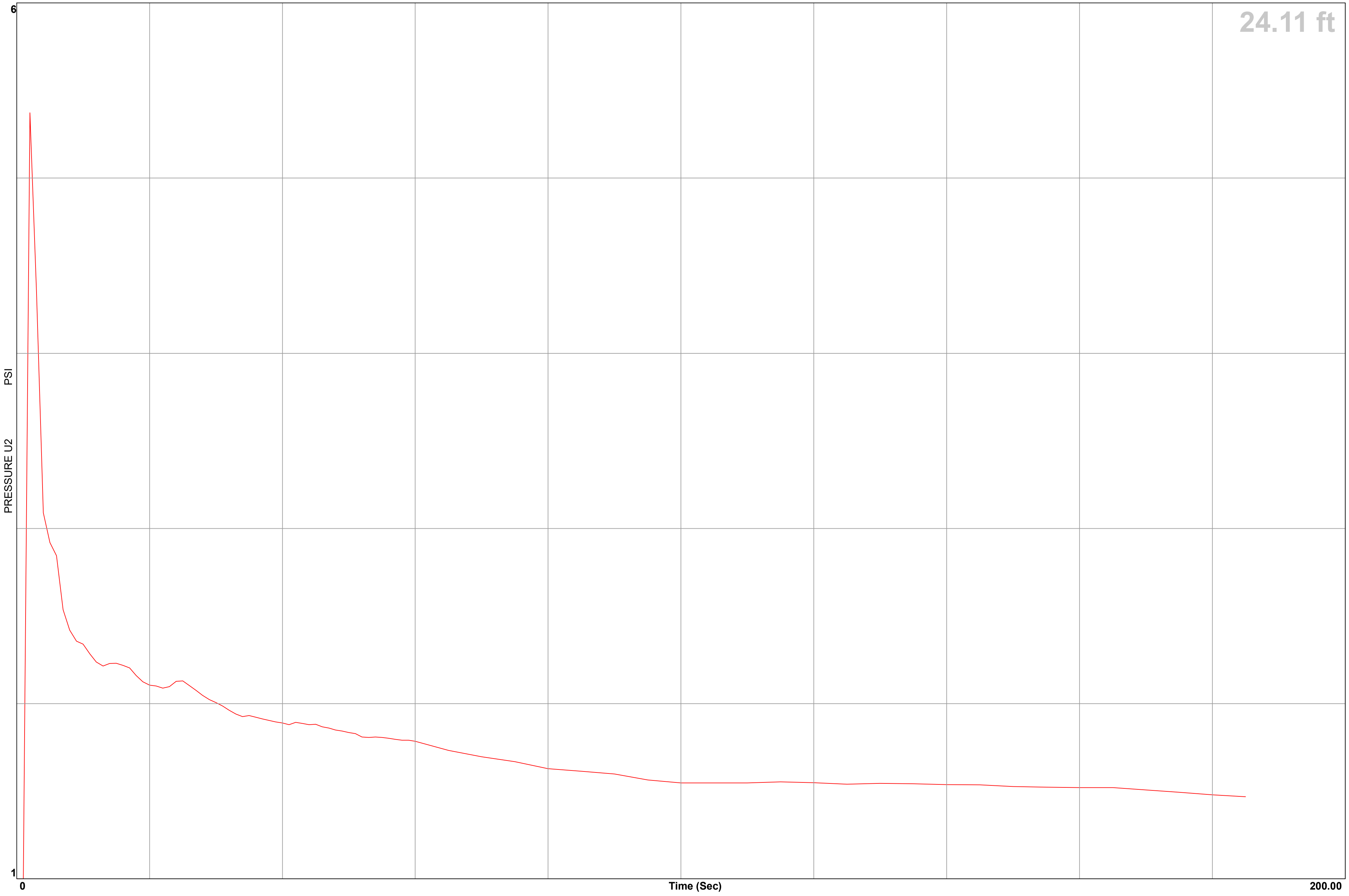
🟫 1 - sensitive fine grained
🟫 2 - organic material
🟥 3 - clay
🟫 4 - silty clay to clay
🟩 5 - clayey silt to silty clay
🟩 6 - sandy silt to clayey silt
🟦 7 - silty sand to sandy silt
🟪 8 - sand to silty sand
🟧 9 - sand
🟥 10 - gravelly sand to sand
🟪 11 - very stiff fine grained (*)
🟦 12 - sand to clayey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

Cone Size 10cm squared

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

Cornerstone Earth Group

Location	1919 Williams Street	Operator	JM-BB		
Job Number	1074-6-1	Cone Number	DDG1489	GPS	
Hole Number	CPT-01	Date and Time	11/1/2019 7:30:21 AM		
Equilized Pressure	1.4	EST GW Depth During Test	20.7		

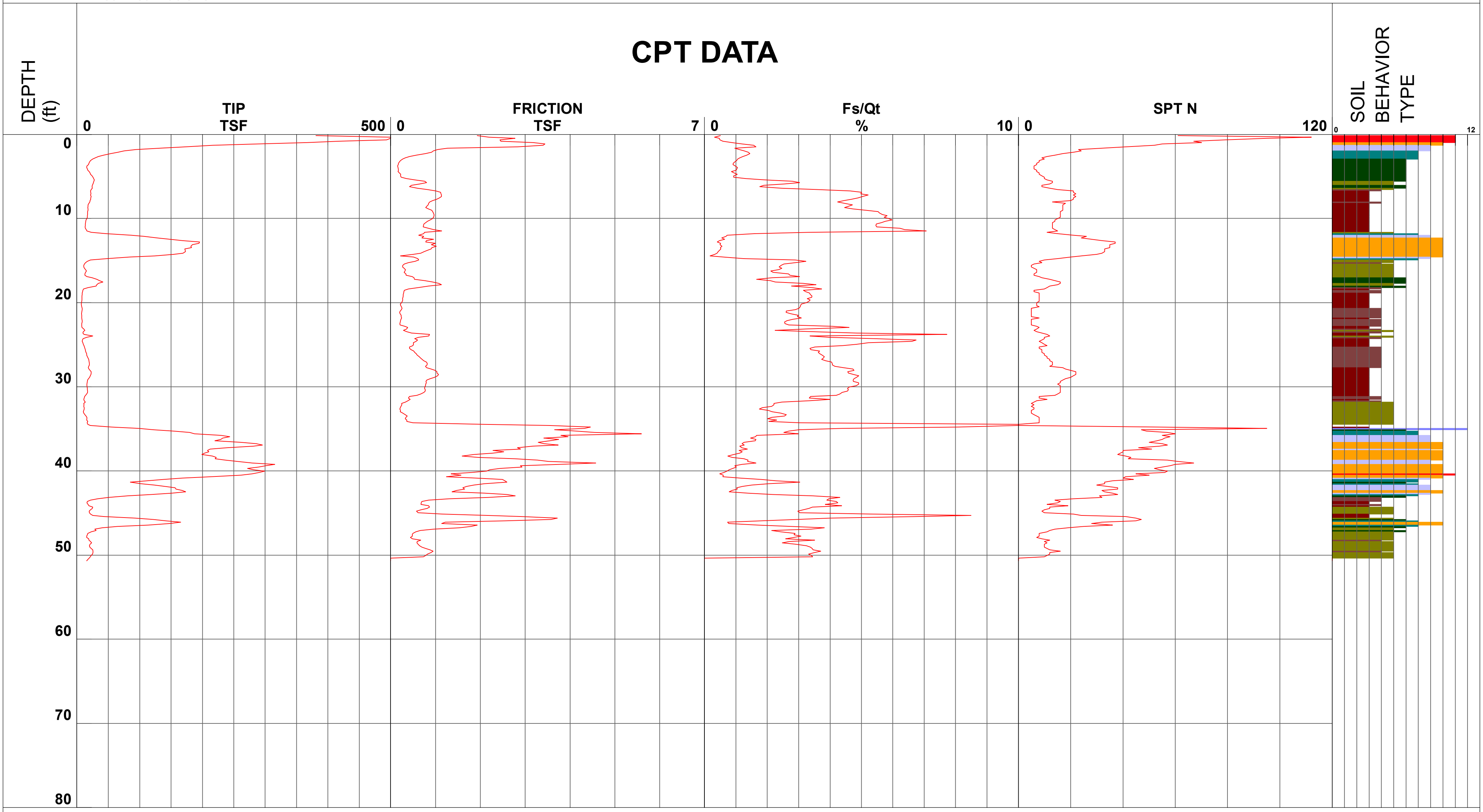


Cornerstone Earth Group

Project	1919 Williams Street	Operator	JM-BB	Filename	SDF(277).cpt
Job Number	1074-6-1	Cone Number	DDG1489	GPS	
Hole Number	CPT-02	Date and Time	11/1/2019 11:24:37 AM	Maximum Depth	50.69 ft
EST GW Depth During Test		14.75 ft			

Net Area Ratio .8

CPT DATA



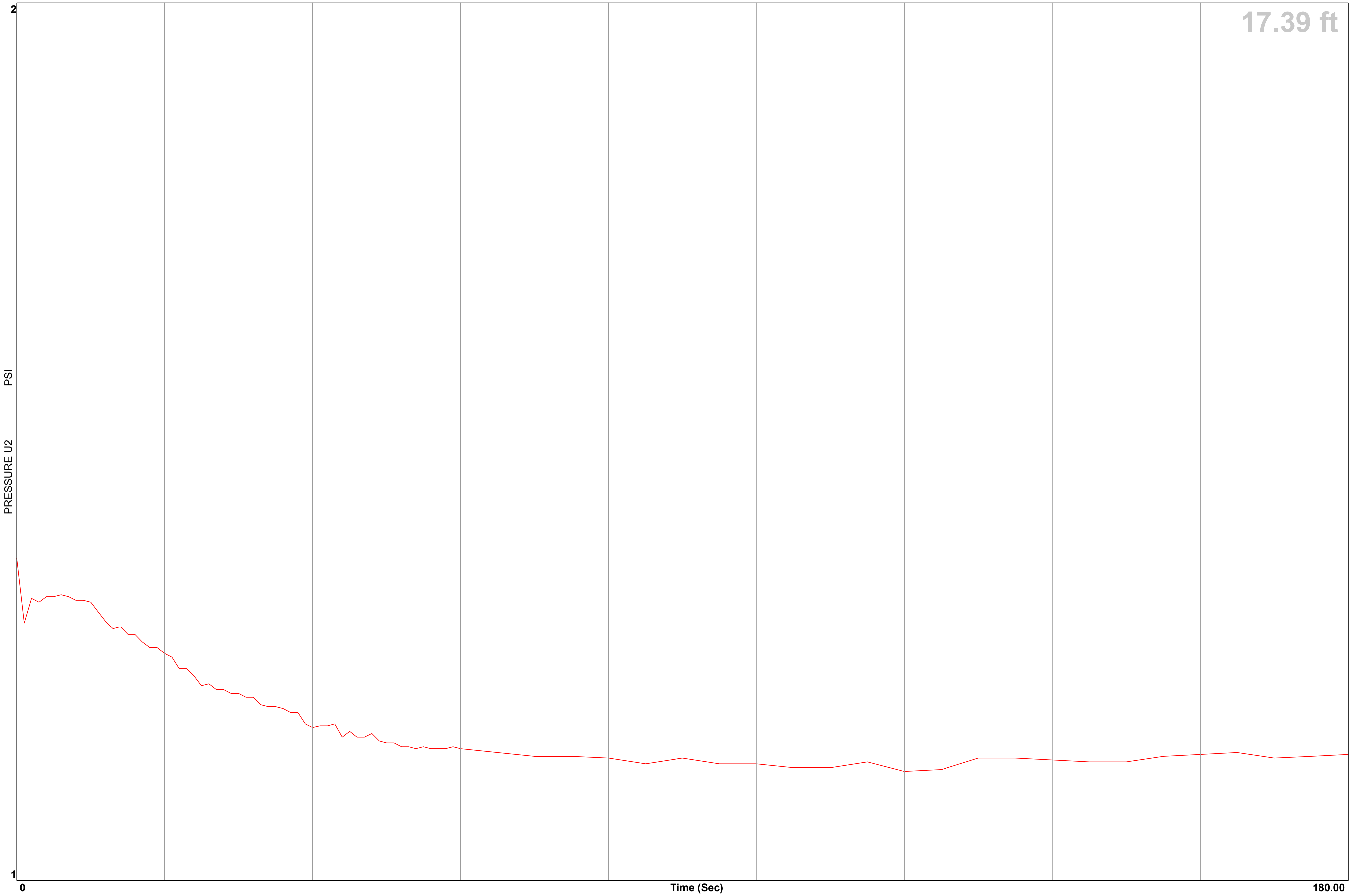
- 🟫 1 - sensitive fine grained
- 🟫 2 - organic material
- 🟥 3 - clay
- 🟫 4 - silty clay to clay
- 🟩 5 - clayey silt to silty clay
- 🟩 6 - sandy silt to clayey silt
- 🟦 7 - silty sand to sandy silt
- 🟪 8 - sand to silty sand
- 🟧 9 - sand
- 🟥 10 - gravelly sand to sand
- 🟦 11 - very stiff fine grained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

Cone Size 10cm squared

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

Cornerstone Earth Group

Location	1919 Williams Street	Operator	JM-BB		
Job Number	1074-6-1	Cone Number	DDG1489	GPS	
Hole Number	CPT-02	Date and Time	11/1/2019 11:24:37 AM		
Equilized Pressure	1.1	EST GW Depth During Test	14.7		

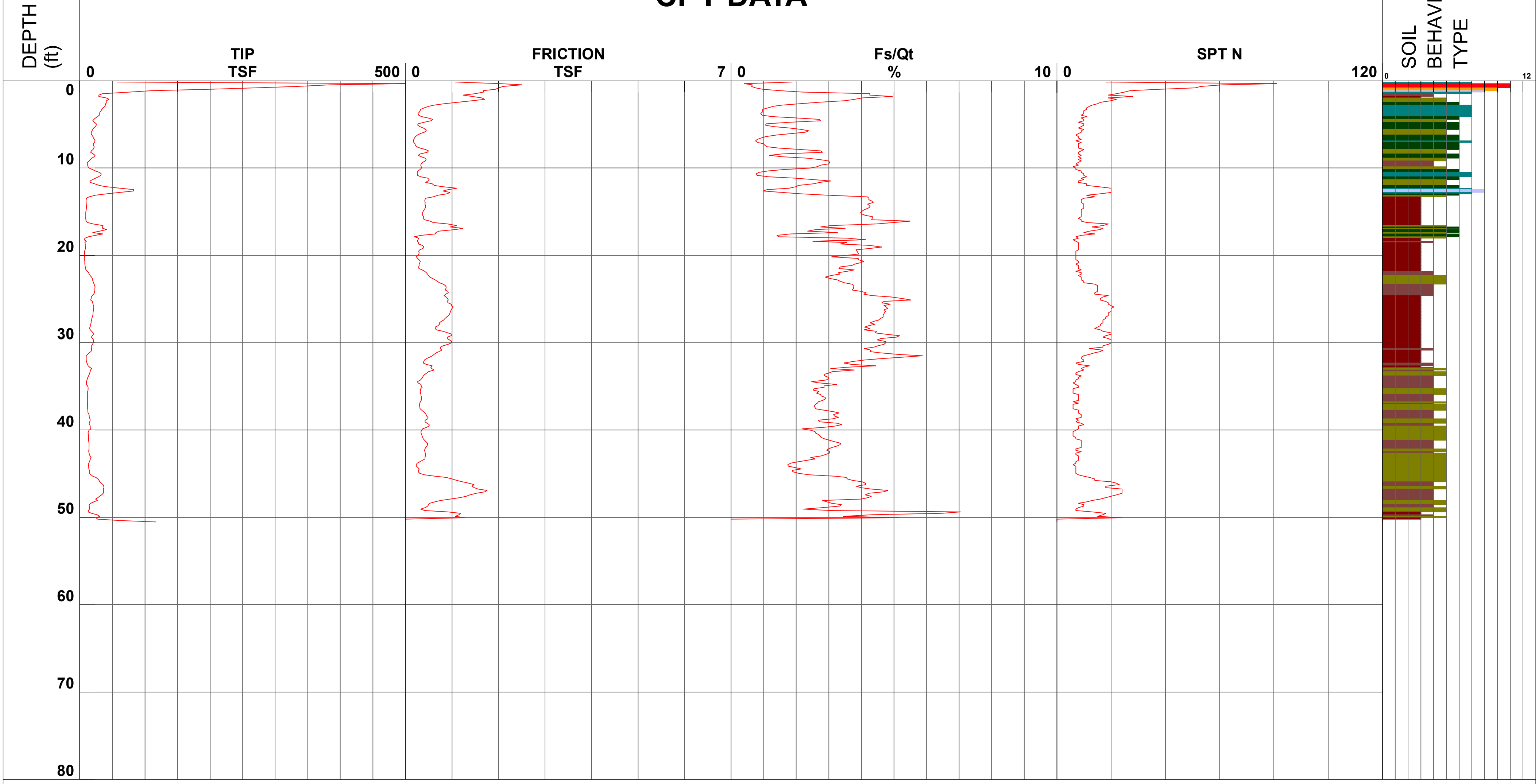


Cornerstone Earth Group

Project	1919 Williams Street	Operator	JM-BB	Filename	SDF(276).cpt
Job Number	1074-6-1	Cone Number	DDG1489	GPS	
Hole Number	CPT-03	Date and Time	11/1/2019 10:39:44 AM	Maximum Depth	50.52 ft
EST GW Depth During Test		14.00 ft			

Net Area Ratio .8

CPT DATA



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

Cone Size 10cm squared

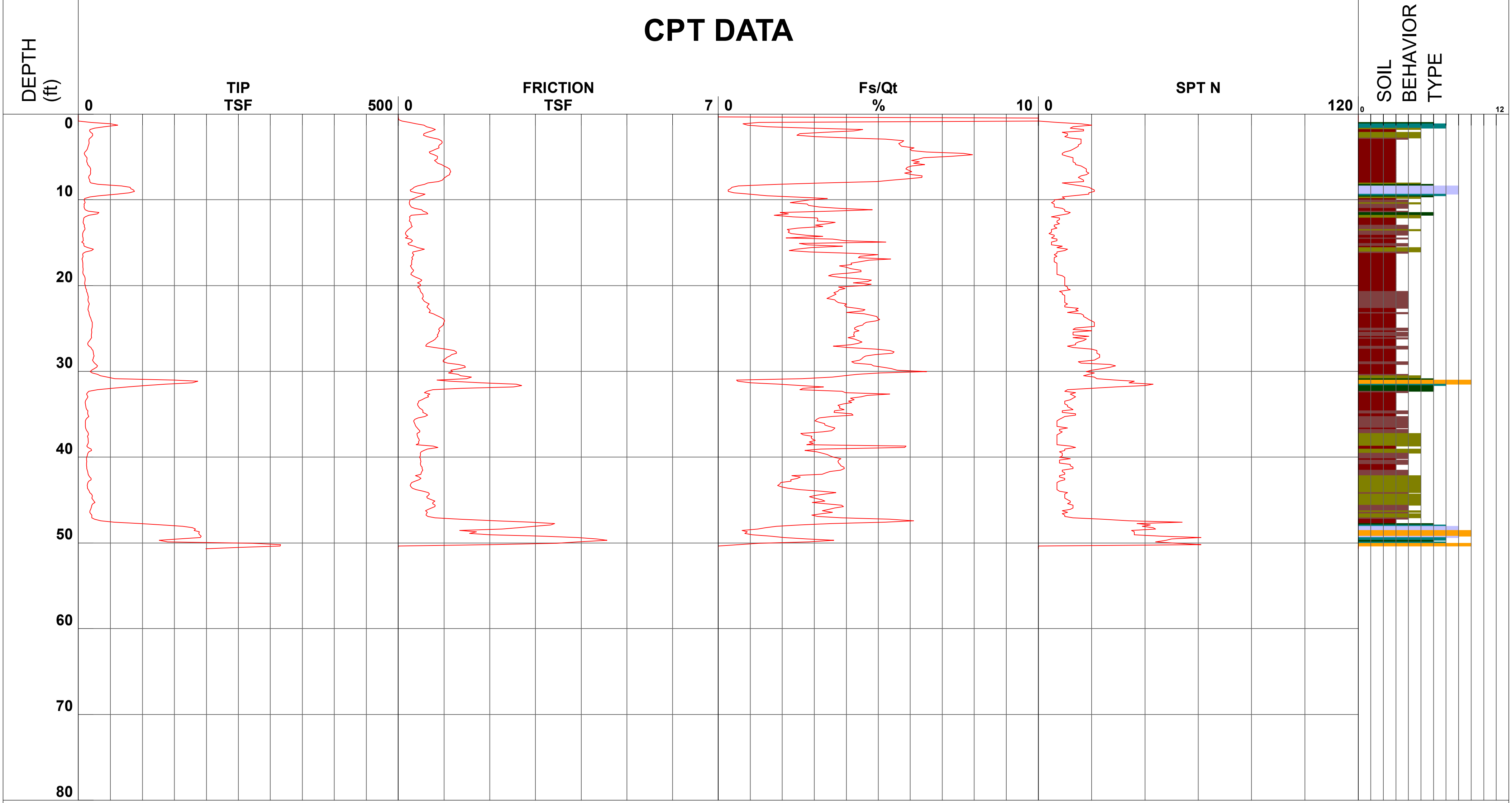
S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Project	1919 Williams Street	Operator	JM-BB	Filename	SDF(275).cpt
Job Number	1074-6-1	Cone Number	DDG1489	GPS	
Hole Number	CPT-04	Date and Time	11/1/2019 9:51:42 AM	Maximum Depth	50.69 ft
EST GW Depth During Test			19.30 ft		

Net Area Ratio .8

CPT DATA



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

Cone Size 10cm squared

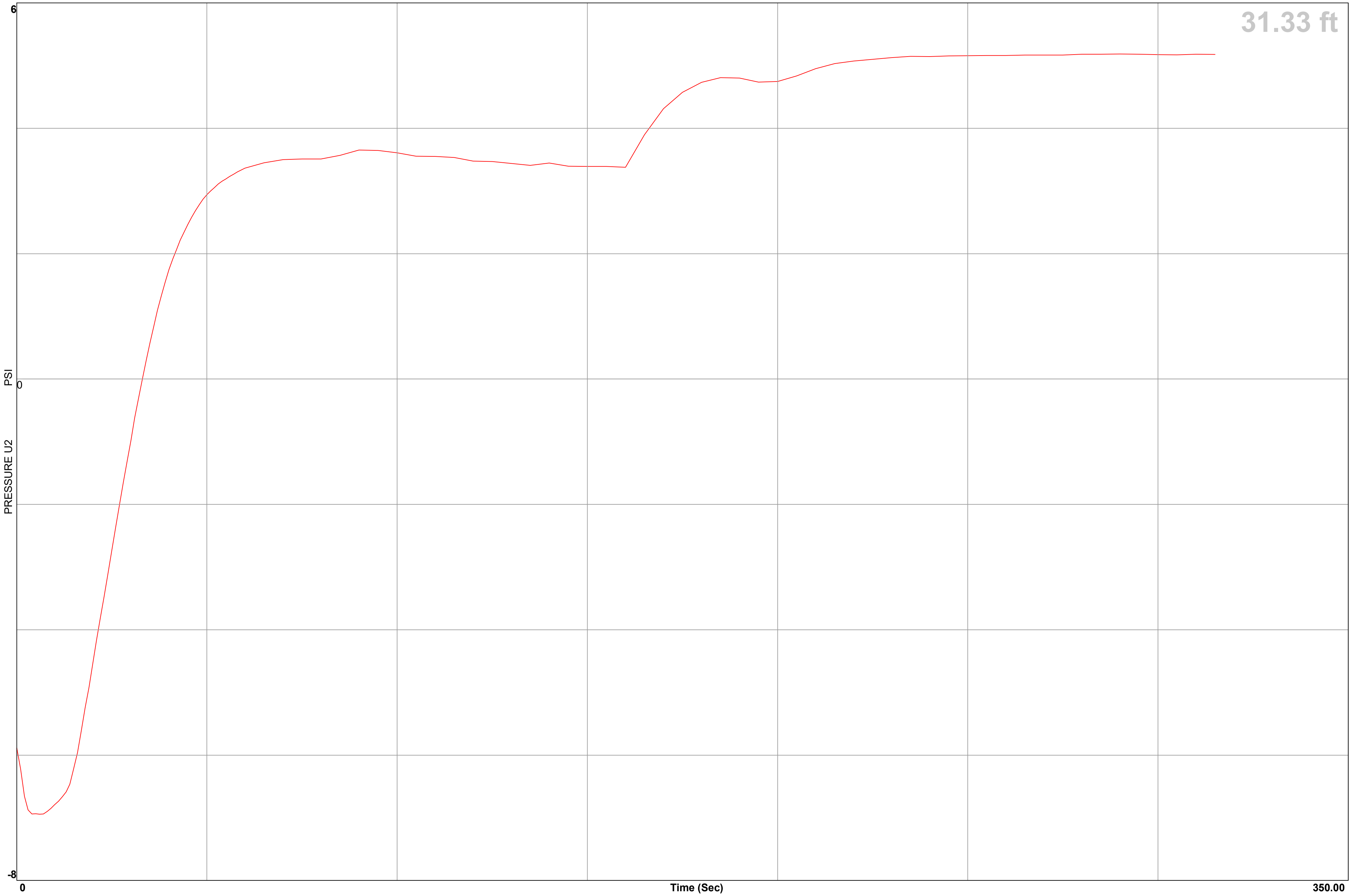
S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Location 1919 Williams Street
Job Number 1074-6-1
Hole Number CPT-04
Equilized Pressure 5.1

Operator JM-BB
Cone Number DDG1489
Date and Time 11/1/2019 9:51:42 AM
EST GW Depth During Test 19.3

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 52 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 35 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.

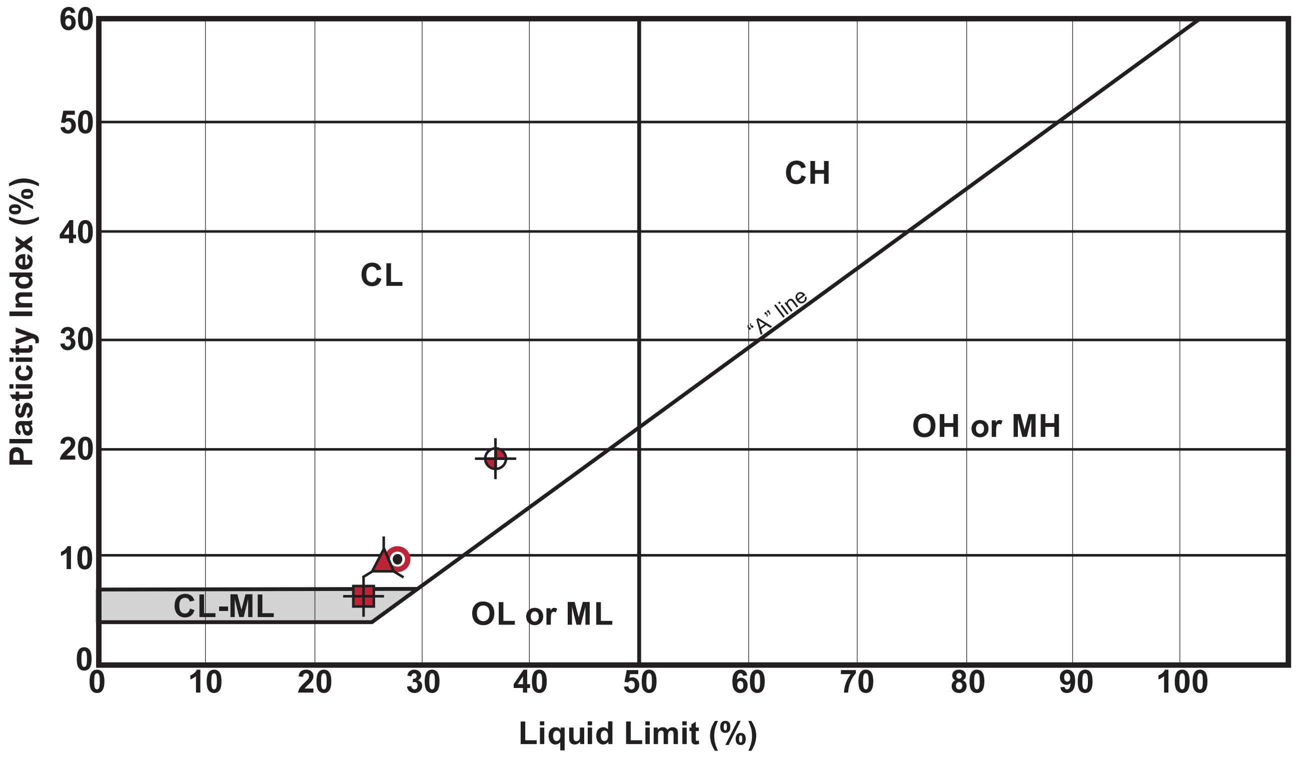
Washed Sieve Analyses: The percent soil fraction passing the No. 200 sieve (ASTM D1140) was determined on eight samples of the subsurface soils to aid in the classification of these soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Plasticity Index: Sevin Plasticity Index determinations (ASTM D4318) were performed on samples of the subsurface soils 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 these tests are shown on the boring logs at the appropriate sample depths.

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.

Corrosivity Testing: Two samples of the subsurface soils were tested for water soluble sulfate content (California Test Method No. 417-Modified), chloride content (ASTM D4327), pH (ASTM G51), and saturated resistivity (ASTM G57). Results of these tests are attached in this appendix.

Plasticity Index (ASTM D4318) Testing Summary



Symbol	Boring No.	Depth (ft)	Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Passing No. 200 (%)	Group Name (USCS - ASTM D2487)
⊕	EB-1	2.0	15	37	18	19	—	Lean Clay with Sand (CL)
	EB-1	6.5	9	determined non-plastic			27	Silty Sand (SM)
	EB-1	16.0	16	determined non-plastic			34	Silty Sand (SM)
⊞	EB-2	2.5	9	25	19	6	51	Sandy Silty Clay (CL-ML) [Fill]
◉	EB-3	2.0	14	28	19	9	58	Sandy Lean Clay(CL)
▲	EB-3	6.0	19	27	18	9	73	Lean Clay with Sand (CL)
	EB-3	9.0	13	determined non-plastic			39	Silty Sand (SM)

Samples prepared in accordance with ASTM D421

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Plasticity Index Testing Summary

Williams Street Warehouse
1919 Williams Street
San Leandro, CA

Project Number
1074-6-1

Figure Number
Figure B1

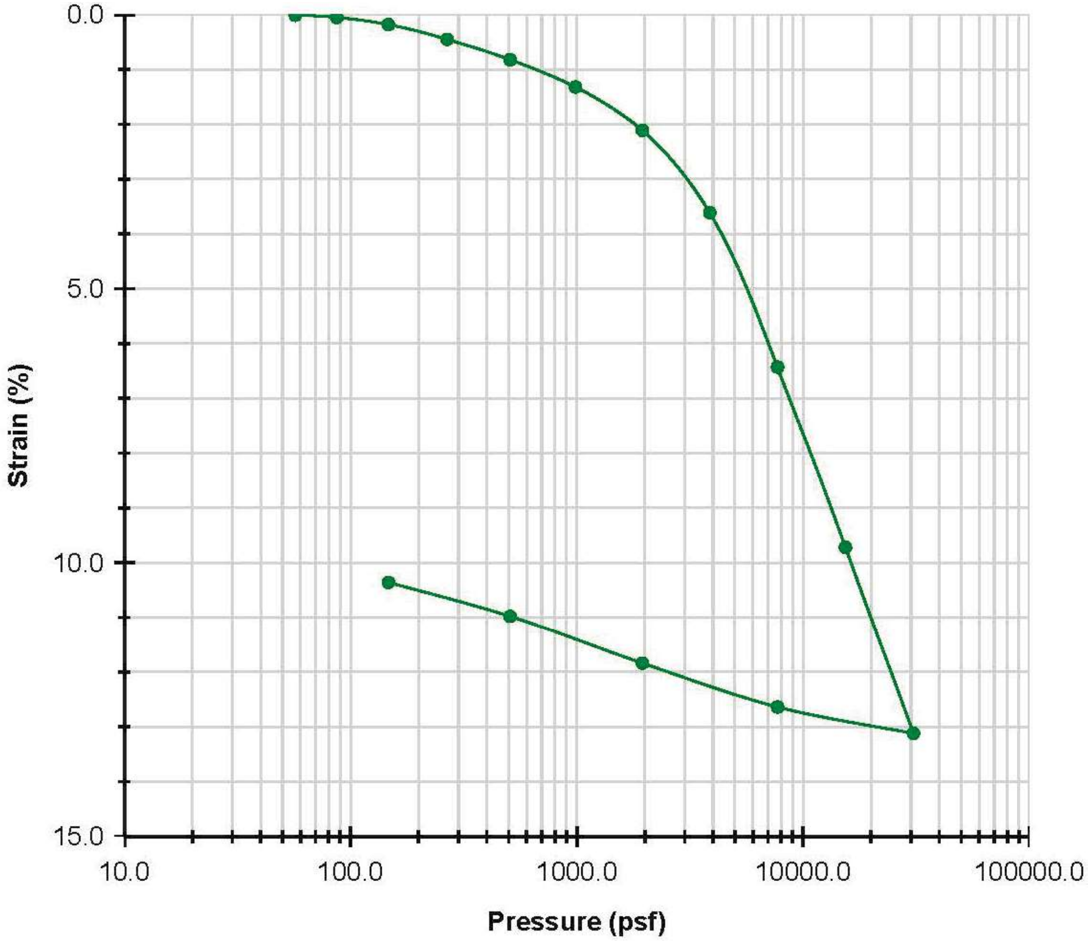
Date
December 2019

Drawn By
FLL

Consolidation Test ASTM D2435

Boring: EB-2 **Sample:** 9 **Depth:** 25.3’

Description: Lean Clay with Sand (CL)



	BEFORE	AFTER
Moisture (%)	27.6	21.1
Dry Density (pcf)	95.3	107.8
Saturation (%)	96.0	100.0
Void Ratio	0.78	0.57

—●— (A) Stress Strain Curve

CORNERSTONE EARTH GROUP

Strain-Log Curve - EB-2 @ 25.3’

Williams Street Warehouse
1919 Williams Street
San Leandro, CA

Project Number
1074-6-1

Figure Number
Figure B2

Date
December 2019

Drawn By
FLL

APPENDIX C: LIQUEFACTION ANALYSES CALCULATIONS

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.88

Total Settlement: 2.70 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	0.120	0.004	19.2	19.2	11.500	3.170	2.96		Unsaturated	99.9			0.11	1.70	0.19	54.18	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	2.740	0.052	39.6	39.6	41.648	1.897	2.38		Unsaturated	53.5			2.59	1.70	4.40	52.66	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	2.890	0.143	58.8	58.8	33.210	5.013	2.74		Unsaturated	81.9			2.73	1.70	4.64	58.28	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	3.770	0.317	79.2	79.2	94.202	8.487	2.62		Unsaturated	72.5			3.56	1.70	6.06	58.83	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	8.930	0.574	98.4	98.4	71.900	6.465	2.59		Unsaturated	70.5			8.44	1.70	14.35	69.23	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	263.440	0.902	117.6	117.6	1055.974	0.342	0.88		Unsaturated	0.0			249.00	1.70	423.30	423.30	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	200.530	0.874	138.0	138.0	741.929	0.436	1.05		Unsaturated	0.0			189.54	1.70	322.21	322.21	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	139.910	0.740	157.2	157.2	484.898	0.529	1.23		Unsaturated	0.0			132.24	1.70	224.81	224.81	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	102.620	1.158	177.6	177.6	334.508	1.129	1.59		Unsaturated	0.0			96.99	1.70	164.89	164.89	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	82.800	1.107	196.8	196.8	256.315	1.338	1.71		Unsaturated	0.2			78.26	1.70	133.04	133.04	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	74.330	0.968	216.0	216.0	219.572	1.304	1.75		Unsaturated	2.9			70.26	1.70	119.43	119.43	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	63.630	0.873	236.4	236.4	179.599	1.374	1.82		Unsaturated	8.8			60.14	1.70	102.24	107.03	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	58.810	0.736	255.6	255.6	159.587	1.254	1.83		Unsaturated	9.3			55.59	1.70	94.50	100.22	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	53.540	0.564	276.0	276.0	139.758	1.055	1.82		Unsaturated	8.3			50.60	1.70	86.03	89.58	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	43.500	0.412	295.2	295.2	109.705	0.950	1.87		Unsaturated	12.2			41.12	1.70	69.90	82.61	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	34.650	0.312	314.4	314.4	84.578	0.905	1.94		Unsaturated	18.2			32.75	1.70	55.68	82.83	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	31.740	0.278	334.8	334.8	75.022	0.881	1.98		Unsaturated	21.0			30.00	1.70	51.00	83.34	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	29.720	0.257	354.0	354.0	68.269	0.871	2.01		Unsaturated	23.4			28.09	1.70	47.75	83.88	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	31.190	0.262	374.4	374.4	69.663	0.844	1.99		Unsaturated	22.2			29.48	1.70	50.12	84.58	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	31.560	0.255	393.6	393.6	68.733	0.812	1.99		Unsaturated	21.8			29.83	1.70	50.71	84.55	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	33.890	0.257	412.8	412.8	72.081	0.762	1.95		Unsaturated	19.2			32.03	1.70	54.45	83.68	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	34.330	0.259	433.2	433.2	71.261	0.759	1.96		Unsaturated	19.5			32.45	1.70	55.16	85.02	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	30.900	0.214	452.4	452.4	62.702	0.698	1.98		Unsaturated	21.6			29.21	1.70	49.65	82.91	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	30.170	0.216	472.8	472.8	59.854	0.722	2.01		Unsaturated	23.6			28.52	1.70	48.48	84.97	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	31.480	0.199	492.0	492.0	61.223	0.638	1.97		Unsaturated	20.7			29.75	1.70	50.58	82.20	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	31.110	0.193	512.4	512.4	59.262	0.624	1.98		Unsaturated	21.2			29.40	1.70	49.99	82.59	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	28.750	0.185	531.6	531.6	53.714	0.649	2.02		Unsaturated	24.8			27.17	1.70	46.20	84.24	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	27.460	0.181	550.8	550.8	50.361	0.664	2.05		Unsaturated	27.2			25.95	1.70	44.12	85.02	1.00	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	29.220	0.190	571.2	571.2	52.637	0.656	2.03		Unsaturated	25.6			27.62	1.70	46.95	86.27	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	30.280	0.183	590.4	590.4	53.654	0.611	2.01		Unsaturated	23.8			28.62	1.70	48.65	85.53	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	33.930	0.188	610.8	610.8	59.153	0.558	1.95		Unsaturated	19.3			32.07	1.70	54.52	83.95	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	33.040	0.284	630.0	630.0	56.687	0.868	2.07		Unsaturated	28.7			31.23	1.70	53.09	97.56	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	27.880	0.466	649.2	649.2	47.021	1.691	2.31		Unsaturated	47.7			26.35	1.70	44.80	101.67	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	35.970	0.660	669.6	669.6	59.875	1.852	2.25		Unsaturated	43.3			34.00	1.70	57.80	115.73	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	37.400	0.757	688.8	688.8	61.387	2.042	2.27		Unsaturated	44.9			35.35	1.68	59.22	118.43	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	35.220	0.743	709.2	709.2	56.922	2.132	2.31		Unsaturated	47.8			33.29	1.66	55.42	115.14	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	33.850	0.629	728.4	728.4	53.945	1.879	2.29		Unsaturated	46.3			31.99	1.66	53.03	111.40	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	34.450	0.525	747.6	747.6	54.186	1.541	2.24		Unsaturated	41.8			32.56	1.64	53.53	109.52	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.400	35.380	0.518	768.0	768.0	54.905	1.480	2.22		Unsaturated	40.6			33.44	1.62	54.25	109.65	0.99	0.566	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.560	36.450	0.513	787.2	787.2	55.874	1.423	2.20		Unsaturated	39.3			34.45	1.60	55.21	109.94	0.99	0.566	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.730	36.860	0.648	807.6	807.6	55.776	1.776	2.26		Unsaturated	44.2			34.84	1.57	54.86	112.58	0.99	0.566	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.890	38.480	0.842	826.8	826.8	57.559	2.211	2.32		Unsaturated	48.4			36.37	1.55	56.24	116.43	0.99	0.566	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.050	36.780	0.972	846.0	846.0	54.347	2.674	2.39		Unsaturated	54.4			34.76	1.53	53.31	115.14	0.99	0.565	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.220	33.950	0.921	866.4	866.4	49.508	2.748	2.43		Unsaturated	57.4			32.09	1.53	49.05	110.73	0.99	0.565	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.380	33.440	0.665	885.6	885.6	48.209	2.016	2.35		Unsaturated	50.9			31.61	1.52	48.12	107.24	0.99	0.565	1.098	n.a.	n.a.	n.a.	0.00	0.00
7.550	35.660	0.445	906.0	906.0	50.855	1.263	2.20		Unsaturated	39.3			33.71	1.51	50.98	104.74	0.99	0.564	1.094	n.a.	n.a.	n.a.	0.00	0.00
7.710	37.540	0.335	925.2	925.2	52.999	0.903	2.10		Unsaturated	31.4			35.48	1.51	53.47	101.08	0.99	0.564	1.089	n.a.	n.a.	n.a.	0.00	0.00
7.870	40.570	0.342	944.4	944.4	56.730	0.853	2.07		Unsaturated	28.3			38.35	1.49	57.12	101.93	0.99	0.564	1.087	n.a.	n.a.	n.a.	0.00	0.00
8.040	41.800	0.340	964.8	964.8	57.835	0.822	2.05		Unsaturated	27.0			39.51	1.47	58.26	101.62	0.99	0.564	1.085	n.a.	n.a.	n.a.	0.00	0.00
8.200	40.330	0.323	984.0	984.0	55.217	0.811	2.06		Unsaturated	28.1			38.12	1.46	55.81	100.13	0.98	0.563	1.081	n.a.	n.a.	n.a.	0.00	0.00
8.370	39.240	0.328	1004.4	1004.4	53.144	0.846	2.09		Unsaturated	30.0			37.09	1.45	53.76	99.97	0.98	0.563	1.079	n.a.	n.a.	n.a.	0.00	0.00
8.530	39.040	0.349	1023.6	1023.6	52.358	0.907	2.11		Unsaturated	31.8			36.90	1.43	52.91	100.85	0.98	0.563	1.078	n.a.	n.a.	n.a.	0.00	0.00
8.690	40.000	0.377	1042.8	1042.8	53.154	0.956	2.12		Unsaturated	32.4			37.81	1.42	53.60	102.27	0.98	0.562	1.077	n.a.	n.a.	n.a.	0.00	0.00
8.860	42.000	0.370	1063.2	1063.2	55.295	0.892	2.09		Unsaturated	29.9			39.70	1.40	55.75	102.21	0.98	0.562	1.074	n.a.	n.a.	n.a.	0.00	0.00
9.020	40.810	0.393	1082.4	1082.4	53.217	0.976	2.12		Unsaturated	32.8			38.57	1.39	53.65	102.71	0.98	0.562	1.073	n.a.	n.a.	n.a.	0.00	0.00
9.190	39.970	0.403	1102.8	1102.8	51.609	1.021	2.14		Unsaturated	34.6			37.78	1.38	52.09	102.43	0.98	0.562	1.071	n.a.	n.a.	n.a.	0.00	0.00
9.350	43.780	0.386	1122.0	1122.0	56.098	0.894	2.08		Unsaturated	29.5			41.38	1.37	56.54	102.75	0.98	0.561	1.069	n.a.	n.a.	n.a.	0.00	0.00
9.510	42.500	0.417	1141.2	1141.2	53.965	0.995	2.12		Unsaturated	32.8			40.17	1.35	54.37	103.57	0.98	0.561	1.068	n.a.	n.a.	n.a.	0.00	0.00
9.680	36.570	0.528	1161.6	1161.6	45.911	1.466	2.28		Unsaturated	45.3			34.57	1.34	46.44	102.58	0.98	0.561	1.065	n.a.	n.a.	n.a.	0.00	0.00
9.840	34.380	0.558	1180.8	1180.8	42.753	1.651	2.33		Unsaturated	49.8			32.50	1.34	43.41	100.81	0.98	0.560	1.062	n.a.	n.a.	n.a.	0.00	0.00
10.010	33.660	0.519	1201.2	1201.2	41.472	1.571	2.33		Sand	49.5			31.81	1.33	42.22	99.22	0.98	0.560	1.060	0.136	0.182	0.32	0.03	0.05
10.170	32.720	0.545	1220.4	1220.4	39.963	1.697	2.36		Sand	52.2			30.93	1.32	40.76	98.41	0.98	0.565	1.058	0.135	0.179	0.32	0.03	0.05
10.330	31.660	0.780	1239.6	1239.6	38.332	2.514	2.49		Sand	61.9			29.92	1.31	39.09	99.28	0.98	0.569	1.057	0.136	0.181	0.32	0.03	0.05
10.500	28.460	1.101	1260.0	1260.0	37.812	3.957	2.62	plastic	Clay	72.9			26.90	1.15	n.a.	n.a.	0.98	0.573	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	23.640	1.168	1279.2	1279.2	35.961	5.078	2.72		Clay	80.2			22.34	1.14	n.a.	n.a.	0.98	0.577	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.830	21.080	1.043	1299.6	1299.6	31.441	5.103	2.76		Clay	83.7			19.92	1.14	n.a.	n.a.	0.98	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.990	23.350	1.060	1318.8	1318.8	34.411	4.670	2.70		Clay	79.3			22.07	1.13	n.a.	n.a.	0.98	0.586	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.150	24.950	1.080	1338.0	1338.0	36.294	4.448	2.67		Clay	76.7			23.58	1.13	n.a.	n.a.	0.98	0.589	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.88

Total Settlement: 2.70 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'vc=1\,atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
11.320	22.680	1.134	1358.4	1358.4	32.392	5.156	2.75		Clay	83.2			21.44	1.12	n.a.	n.a.	0.97	0.593	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	22.260	1.158	1377.6	1377.6	31.317	5.369	2.77		Clay	85.0			21.04	1.12	n.a.	n.a.	0.97	0.597	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.650	22.940	1.178	1398.0	1398.0	31.818	5.297	2.77		Clay	84.3			21.68	1.12	n.a.	n.a.	0.97	0.601	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.810	21.360	1.270	1417.2	1417.2	29.144	6.151	2.84		Clay	90.1			20.19	1.11	n.a.	n.a.	0.97	0.605	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.980	19.340	1.255	1437.6	1437.6	25.906	6.741	2.90		Clay	95.2			18.28	1.11	n.a.	n.a.	0.97	0.608	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.140	17.680	1.185	1456.8	1456.8	23.272	6.990	2.95		Clay	98.8			16.71	1.10	n.a.	n.a.	0.97	0.612	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.300	17.010	1.134	1476.0	1476.0	22.049	6.967	2.96		Clay	100.0			16.08	1.10	n.a.	n.a.	0.97	0.615	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	17.330	1.138	1496.4	1496.4	22.162	6.863	2.96		Clay	99.5			16.38	1.10	n.a.	n.a.	0.97	0.619	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	18.080	1.148	1515.6	1515.6	22.859	6.624	2.94		Clay	97.9			17.09	1.09	n.a.	n.a.	0.97	0.622	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	18.500	1.012	1536.0	1536.0	23.089	5.707	2.89		Clay	94.1			17.49	1.09	n.a.	n.a.	0.97	0.625	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	19.970	0.810	1555.2	1555.2	24.682	4.221	2.78		Clay	85.3			18.88	1.08	n.a.	n.a.	0.97	0.628	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	24.460	0.641	1574.4	1574.4	27.520	2.706	2.62	plastic	Clay	72.4			23.12	1.08	n.a.	n.a.	0.97	0.631	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	25.290	0.544	1594.8	1594.8	26.666	2.221	2.58	plastic	Clay	69.0			23.90	1.08	n.a.	n.a.	0.97	0.635	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	23.350	0.487	1614.0	1614.0	24.397	2.161	2.60	plastic	Clay	70.9			22.07	1.07	n.a.	n.a.	0.97	0.638	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	21.600	0.476	1634.4	1634.4	23.536	2.292	2.63	plastic	Clay	73.1			20.42	1.07	n.a.	n.a.	0.97	0.641	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	20.760	0.459	1653.6	1653.6	24.109	2.302	2.62		Clay	72.6			19.62	1.07	n.a.	n.a.	0.97	0.644	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	20.600	0.432	1672.8	1672.8	23.629	2.184	2.61		Clay	72.0			19.47	1.06	n.a.	n.a.	0.97	0.646	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	21.310	0.398	1693.2	1693.2	22.608	1.945	2.60	plastic	Clay	70.9			20.14	1.06	n.a.	n.a.	0.97	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	23.640	0.333	1712.4	1712.4	23.938	1.463	2.51		Sand	63.6	28.55		28.55	1.12	31.87	90.43	0.96	0.652	1.021	0.126	0.157	0.24	0.04	0.05
14.440	27.380	0.261	1732.8	1732.8	27.693	0.984	2.36		Sand	52.0	28.55		28.55	1.11	31.73	86.89	0.96	0.655	1.019	0.122	0.150	0.23	0.04	0.05
14.600	30.210	0.199	1752.0	1752.0	30.470	0.678	2.25		Sand	42.8			28.55	1.11	31.61	82.73	0.96	0.657	1.018	0.118	0.143	0.22	0.04	0.06
14.760	28.690	0.239	1771.2	1771.2	28.724	0.858	2.32		Sand	48.5			27.12	1.10	29.84	83.17	0.96	0.660	1.017	0.119	0.143	0.22	0.04	0.06
14.930	24.750	0.252	1791.6	1791.6	24.503	1.058	2.42		Sand	57.0			23.39	1.09	25.61	80.68	0.96	0.663	1.015	0.116	0.139	0.21	0.04	0.06
15.090	21.750	0.278	1810.8	1810.8	21.298	1.331	2.53		Sand	65.3			20.56	1.09	22.40	78.61	0.96	0.665	1.014	0.115	0.136	0.20	0.04	0.06
15.260	23.060	0.342	1831.2	1831.2	22.499	1.543	2.54		Sand	66.5			21.80	1.08	23.58	80.39	0.96	0.668	1.013	0.116	0.139	0.21	0.04	0.06
15.420	21.530	0.338	1850.4	1850.4	20.826	1.639	2.59		Sand	69.9			20.35	1.08	21.91	78.88	0.96	0.670	1.012	0.115	0.136	0.20	0.04	0.06
15.580	28.830	0.371	1869.6	1869.6	28.050	1.331	2.43		Sand	57.2			27.25	1.07	29.11	85.23	0.96	0.672	1.012	0.121	0.146	0.22	0.04	0.06
15.750	34.010	0.424	1890.0	1890.0	33.068	1.283	2.36		Sand	51.8			32.15	1.06	34.10	89.81	0.96	0.675	1.011	0.125	0.154	0.23	0.04	0.05
15.910	41.900	0.515	1909.2	1909.2	40.743	1.258	2.28		Sand	45.4			39.60	1.05	41.72	96.74	0.96	0.677	1.011	0.133	0.168	0.25	0.03	0.05
16.080	48.950	0.583	1929.6	1929.6	47.495	1.215	2.22		Sand	40.4			46.27	1.05	48.42	102.29	0.96	0.680	1.010	0.140	0.181	0.27	0.03	0.04
16.240	53.160	0.583	1948.8	1948.8	51.397	1.116	2.17		Sand	36.5			50.25	1.04	52.31	104.29	0.96	0.682	1.009	0.143	0.186	0.27	0.03	0.04
16.400	54.500	0.597	1968.0	1968.0	52.450	1.115	2.16		Sand	35.9			51.51	1.04	53.36	105.11	0.96	0.684	1.008	0.144	0.188	0.27	0.03	0.04
16.570	56.550	0.606	1988.4	1988.4	54.169	1.091	2.14		Sand	34.5			53.45	1.03	55.09	106.07	0.96	0.686	1.007	0.146	0.190	0.28	0.03	0.04
16.730	58.160	0.621	2007.6	2007.6	55.462	1.086	2.13		Sand	33.8			54.97	1.03	56.39	106.98	0.96	0.688	1.006	0.147	0.192	0.28	0.03	0.04
16.900	59.160	0.635	2028.0	2028.0	56.138	1.092	2.13		Sand	33.5			55.92	1.02	57.07	107.60	0.95	0.690	1.005	0.148	0.194	0.28	0.03	0.04
17.060	59.560	0.646	2047.2	2047.2	56.249	1.104	2.13		Sand	33.7			56.29	1.02	57.20	107.91	0.95	0.692	1.004	0.149	0.195	0.28	0.03	0.04
17.220	58.990	0.646	2066.4	2066.4	55.433	1.114	2.14		Sand	34.3			55.76	1.01	56.40	107.48	0.95	0.694	1.003	0.148	0.193	0.28	0.03	0.04
17.390	58.640	0.633	2086.8	2086.8	54.819	1.099	2.14		Sand	34.3			55.43	1.01	55.80	106.78	0.95	0.696	1.002	0.147	0.191	0.27	0.03	0.04
17.550	59.940	0.538	2106.0	2106.0	55.791	0.913	2.09		Sand	30.1			56.65	1.00	56.79	103.70	0.95	0.698	1.001	0.142	0.182	0.26	0.03	0.04
17.720	61.610	0.532	2126.4	2126.4	57.087	0.879	2.07		Sand	28.7			58.23	1.00	58.09	103.60	0.95	0.700	0.999	0.142	0.182	0.26	0.03	0.04
17.880	61.510	0.504	2145.6	2145.6	56.729	0.834	2.06		Sand	27.9			58.14	0.99	57.74	102.12	0.95	0.702	0.998	0.140	0.178	0.25	0.03	0.04
18.040	61.000	0.514	2164.8	2164.8	55.991	0.858	2.07		Sand	28.8			57.66	0.99	57.01	102.43	0.95	0.704	0.998	0.141	0.179	0.25	0.03	0.04
18.210	62.800	0.476	2185.2	2185.2	57.394	0.771	2.04		Sand	26.0			59.36	0.98	58.41	100.38	0.95	0.706	0.997	0.138	0.173	0.25	0.03	0.04
18.370	65.160	0.435	2204.4	2204.4	59.320	0.679	2.00		Sand	22.7			61.59	0.98	60.33	97.26	0.95	0.707	0.996	0.134	0.166	0.24	0.03	0.05
18.540	65.750	0.426	2224.8	2224.8	59.582	0.659	1.99		Sand	22.0			62.15	0.97	60.59	96.32	0.95	0.709	0.995	0.133	0.164	0.23	0.03	0.04
18.700	68.580	0.478	2244.0	2244.0	61.915	0.709	1.99		Sand	22.3			64.82	0.97	62.95	99.43	0.95	0.711	0.994	0.137	0.171	0.24	0.03	0.04
18.860	75.130	0.519	2263.2	2263.2	67.629	0.701	1.96		Sand	19.5			71.01	0.97	68.67	100.25	0.95	0.713	0.993	0.138	0.173	0.24	0.03	0.04
19.030	89.140	0.417	2283.6	2283.6	80.064	0.474	1.80		Sand	7.4			84.25	0.96	80.86	82.76	0.95	0.714	0.993	0.118	0.139	0.20	0.04	0.05
19.190	104.190	0.478	2302.8	2302.8	93.356	0.464	1.74		Sand	2.4			98.48	0.96	94.31	94.31	0.95	0.716	0.991	0.130	0.159	0.22	0.03	0.05
19.360	105.950	0.589	2323.2	2323.2	94.524	0.562	1.78		Sand	5.5			100.14	0.95	95.50	95.84	0.95	0.718	0.990	0.132	0.162	0.23	0.03	0.04
19.520	88.310	1.102	2342.4	2342.4	78.280	1.265	2.06		Sand	27.6	100.14		100.14	0.96	96.08	147.36	0.94	0.719	0.984	0.272	0.439	0.61	0.02	0.03
19.690	68.760	0.952	2362.8	2362.8	60.446	1.409	2.17		Sand	36.9	100.14		100.14	0.96	95.92	158.35	0.94	0.721	0.981	0.355	0.617	0.86	0.01	0.02
19.850	43.720	0.966	2382.0	2382.0	37.887	2.272	2.46		Sand	60.0	100.14		100.14	0.96	95.85	171.43	0.94	0.722	0.977	0.529	1.009	1.40	0.00	0.00
20.010	15.880	0.758	2401.3	2400.6	12.230	5.161	3.07		Clay	100.0			15.01	0.97	n.a.	n.a.	0.94	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.180	17.110	0.722	2422.5	2411.3	13.187	4.538	3.01		Clay	100.0			16.17	0.97	n.a.	n.a.	0.94	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	17.320	0.564	2442.5	2421.3	13.298	3.504	2.94		Clay	97.9			16.37	0.97	n.a.	n.a.	0.94	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	16.890	0.431	2463.8	2431.9	12.877	2.754	2.89		Clay	93.8			15.96	0.96	n.a.	n.a.	0.94	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	13.830	0.303	2483.8	2441.9	10.310	2.406	2.93		Clay	97.6			13.07	0.96	n.a.	n.a.	0.94	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	10.980	0.268	2503.8	2452.0	7.935	2.758	3.06		Clay	100.0			10.38	0.96	n.a.	n.a.	0.94	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	10.280	0.338	2525.0	2462.6	7.324	3.746	3.16		Clay	100.0			9.72	0.96	n.a.	n.a.	0.94	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	11.210	0.609	2545.0	2472.6	8.038	6.125	3.26		Clay	100.0			10.60	0.96	n.a.	n.a.	0.94	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.330	19.310	0.689	2566.3	2483.3	14.519	3.819	2.93		Clay	97.3			18.25	0.96	n.a.	n.a.	0.94	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	39.710	0.760	2586.3	2493.3	33.451	1.979	2.47		Sand	60.3	108.97	1.41	153.65	0.95	146.66	236.63	0.94	0.736	0.951	30.623	64.055	87.04	0.00	0.00
21.650	53.650	0.914	2606.3	2503.3	45.489	1.746	2.33		Sand	49.3	108.97	1.41	153.65	0.95	146.32	230.63	0.94	0.737	0.950	17.365	36.276	49.21	0.00	0.00
21.820	65.450	1.069	2627.5	2513.9	55.616	1.667	2.25		Sand	42.8	108.97	1.41	153.65	0.95	145.98	225.63	0.94	0.738	0.948	11.230	23.429	31.73	0.00	0.00
21.980	60.810	0.761	2647.5	2523.9	51.481	1.279	2.20		Sand	39.2	108.97	1.41	153.65	0.95	145.70	222.04	0.93	0.740	0.947	8.371	17.442	23.58	0.00	0.00
22.150	74.100	0.912	2668.8	2534.6	62.841	1.254	2.13		Sand	33.3	108.97	1.41	153.65	0.95	145.28	214.82	0.93	0.741	0.946	4.855	10.103	13.64	0.00	0.00

CORNERSTONE
EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.88

Total Settlement: 2.70 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'vc = 1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
22.310	107.640	0.581	2688.8	2544.6	91.617	0.546	1.79		Sand	5.9	108.97	1.41	153.65	0.93	142.32	142.95	0.93	0.742	0.972	0.248	0.384	0.52	0.02	0.03
22.470	115.290	0.813	2708.8	2554.6	98.010	0.713	1.83		Sand	9.2		1.41	153.65	0.93	142.35	148.79	0.93	0.743	0.970	0.281	0.451	0.61	0.02	0.03
22.640	97.510	0.700	2730.0	2565.3	82.534	0.728	1.89		Sand	14.5	108.97	1.41	153.65	0.93	142.93	167.64	0.93	0.744	0.964	0.466	0.853	1.15	0.01	0.01
22.800	85.840	0.719	2750.0	2575.3	72.366	0.851	1.98		Sand	21.3	108.97	1.41	153.65	0.93	143.64	190.13	0.93	0.745	0.954	1.132	2.374	3.19	0.00	0.00
22.970	58.570	0.870	2771.3	2585.9	48.892	1.522	2.27		Sand	44.3	108.97	1.41	153.65	0.94	144.75	225.26	0.93	0.746	0.940	10.889	22.515	30.17	0.00	0.00
23.130	39.490	0.655	2791.3	2595.9	32.508	1.719	2.44		Sand	58.2	108.97	1.41	153.65	0.94	144.88	233.44	0.93	0.747	0.939	22.513	46.492	62.21	0.00	0.00
23.290	18.780	0.962	2811.3	2606.0	13.334	5.534	3.06		Clay	100.0			17.75	0.95	n.a.	n.a.	0.93	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	33.510	0.871	2832.5	2616.6	24.531	2.715	2.66		Clay	75.6			31.67	0.95	n.a.	n.a.	0.93	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	40.630	0.672	2852.5	2626.6	33.258	1.713	2.43		Sand	57.5	148.53		148.53	0.94	139.31	226.01	0.93	0.750	0.935	11.599	23.864	31.80	0.00	0.00
23.790	38.950	0.960	2873.8	2637.3	31.760	2.558	2.55		Sand	67.3	148.53		148.53	0.94	139.28	229.66	0.93	0.751	0.934	15.926	32.722	43.55	0.00	0.00
23.950	43.180	0.749	2893.8	2647.3	35.266	1.795	2.42		Sand	56.8	148.53		148.53	0.94	138.96	225.28	0.93	0.752	0.933	10.906	22.380	29.75	0.00	0.00
24.110	43.700	0.533	2913.8	2657.3	35.629	1.261	2.33		Sand	49.3	148.53		148.53	0.93	138.64	220.95	0.93	0.753	0.932	7.679	15.740	20.90	0.00	0.00
24.280	72.370	0.328	2935.0	2667.9	59.682	0.462	1.91		Sand	15.9	148.53		148.53	0.92	136.04	165.25	0.92	0.754	0.957	0.433	0.772	1.02	0.01	0.01
24.440	109.990	0.271	2955.0	2677.9	91.170	0.250	1.63		Sand	0.0	148.53		148.53	0.90	134.21	134.21	0.92	0.755	0.967	0.211	0.308	0.41	0.02	0.03
24.610	115.690	0.563	2976.3	2688.6	95.760	0.493	1.75		Sand	2.7	148.53		148.53	0.90	133.97	133.97	0.92	0.756	0.967	0.210	0.306	0.40	0.02	0.03
24.770	133.530	0.482	2996.3	2698.6	110.505	0.365	1.63		Sand	0.0	148.53		148.53	0.90	133.74	133.74	0.92	0.757	0.966	0.210	0.304	0.40	0.02	0.03
24.930	157.150	0.405	3016.3	2708.6	130.024	0.260	1.50		Sand	0.0			148.53	0.90	133.52	133.52	0.92	0.758	0.966	0.209	0.302	0.40	0.02	0.03
25.100	164.540	0.563	3037.5	2719.3	135.922	0.345	1.54		Sand	0.0			155.52	0.90	139.96	139.96	0.92	0.758	0.963	0.234	0.352	0.46	0.02	0.02
25.260	153.680	0.654	3057.5	2729.3	126.626	0.430	1.61		Sand	0.0			145.26	0.89	129.93	129.93	0.92	0.759	0.966	0.197	0.279	0.37	0.02	0.03
25.430	144.600	0.484	3078.8	2739.9	118.829	0.338	1.58		Sand	0.0			136.67	0.89	121.55	121.55	0.92	0.760	0.967	0.175	0.236	0.31	0.03	0.03
25.590	140.040	0.532	3098.8	2749.9	114.824	0.384	1.62		Sand	0.0			132.36	0.89	117.27	117.27	0.92	0.761	0.968	0.165	0.219	0.29	0.03	0.03
25.750	157.560	0.538	3118.8	2760.0	129.106	0.345	1.56		Sand	0.0			148.92	0.89	132.74	132.74	0.92	0.762	0.963	0.206	0.296	0.39	0.02	0.03
25.920	165.320	0.616	3140.0	2770.6	135.259	0.376	1.56		Sand	0.0			156.26	0.89	139.49	139.49	0.92	0.762	0.961	0.232	0.347	0.45	0.02	0.02
26.080	159.940	0.409	3160.0	2780.6	130.571	0.258	1.49		Sand	0.0			151.17	0.89	134.42	134.42	0.92	0.763	0.962	0.212	0.307	0.40	0.02	0.03
26.250	148.390	0.332	3181.3	2791.3	120.808	0.226	1.50		Sand	0.0			140.26	0.88	123.84	123.84	0.92	0.764	0.964	0.180	0.246	0.32	0.03	0.03
26.410	135.710	0.441	3201.3	2801.3	110.168	0.329	1.61		Sand	0.0			128.27	0.88	112.36	112.36	0.92	0.765	0.967	0.156	0.201	0.26	0.03	0.03
26.570	118.980	0.417	3221.3	2811.3	96.244	0.355	1.67		Sand	0.0			112.46	0.87	97.46	97.46	0.91	0.765	0.970	0.134	0.162	0.21	0.03	0.04
26.740	105.620	0.514	3242.5	2821.9	85.119	0.494	1.79		Sand	6.2			99.83	0.86	85.71	86.45	0.91	0.766	0.972	0.122	0.142	0.19	0.04	0.04
26.900	97.440	0.975	3262.5	2831.9	78.277	1.018	2.00		Sand	22.8			92.10	0.88	80.67	121.02	0.91	0.767	0.963	0.174	0.233	0.30	0.03	0.03
27.070	110.460	1.239	3283.8	2842.6	88.739	1.138	1.99		Sand	21.9			104.40	0.88	91.84	132.02	0.91	0.767	0.959	0.204	0.290	0.38	0.02	0.02
27.230	124.940	1.026	3303.8	2852.6	100.363	0.832	1.86		Sand	11.7			118.09	0.87	102.77	115.67	0.91	0.768	0.964	0.162	0.212	0.28	0.03	0.03
27.400	139.660	0.688	3325.0	2863.2	112.128	0.498	1.69		Sand	0.0			132.00	0.87	114.60	114.60	0.91	0.768	0.964	0.160	0.208	0.27	0.03	0.03
27.560	134.390	0.513	3345.0	2873.3	107.650	0.387	1.65		Sand	0.0			127.02	0.86	109.77	109.77	0.91	0.769	0.965	0.152	0.193	0.25	0.03	0.03
27.720	123.120	0.522	3365.0	2883.3	98.329	0.430	1.71		Sand	0.0			116.37	0.86	99.73	99.73	0.91	0.770	0.967	0.137	0.167	0.22	0.03	0.03
27.890	120.130	0.425	3386.3	2893.9	95.723	0.359	1.68		Sand	0.0			113.54	0.85	96.94	96.94	0.91	0.770	0.968	0.133	0.161	0.21	0.03	0.03
28.050	112.790	0.248	3406.3	2903.9	89.628	0.223	1.62		Sand	0.0			106.61	0.85	90.42	90.42	0.91	0.771	0.969	0.126	0.149	0.19	0.04	0.04
28.220	109.900	1.117	3427.5	2914.6	87.128	1.033	1.97		Sand	20.2			103.88	0.87	90.09	126.31	0.91	0.771	0.958	0.187	0.257	0.33	0.03	0.03
28.380	122.940	2.164	3447.5	2924.6	97.454	1.785	2.09		Sand	30.0			116.20	0.88	102.44	158.54	0.91	0.772	0.944	0.357	0.597	0.77	0.01	0.01
28.540	164.720	2.407	3467.5	2934.6	130.812	1.477	1.94		Sand	18.2			155.69	0.89	138.19	174.93	0.91	0.772	0.934	0.598	1.122	1.45	0.00	0.00
28.710	163.240	1.750	3488.8	2945.2	129.381	1.084	1.85		Sand	10.9			154.29	0.87	134.76	146.42	0.91	0.773	0.949	0.267	0.412	0.53	0.02	0.02
28.870	160.120	1.517	3508.8	2955.3	126.659	0.958	1.82		Sand	8.6			151.34	0.87	131.22	135.98	0.90	0.773	0.953	0.218	0.316	0.41	0.02	0.02
29.040	117.220	1.755	3530.0	2965.9	92.174	1.520	2.06		Sand	27.6			110.79	0.87	96.58	147.92	0.90	0.774	0.947	0.275	0.429	0.55	0.02	0.02
29.200	127.700	2.041	3550.0	2975.9	100.363	1.620	2.05		Sand	27.0			120.70	0.88	105.64	157.70	0.90	0.774	0.942	0.349	0.579	0.75	0.02	0.01
29.360	156.520	2.468	3570.0	2985.9	123.118	1.595	1.98		Sand	21.6			147.94	0.88	130.54	175.72	0.90	0.775	0.930	0.616	1.157	1.49	0.00	0.00
29.530	156.280	1.108	3591.3	2996.6	122.700	0.717	1.75		Sand	3.0			147.71	0.86	126.56	126.56	0.90	0.775	0.954	0.187	0.257	0.33	0.03	0.02
29.690	164.650	1.414	3611.3	3006.6	129.124	0.868	1.79		Sand	5.9			155.62	0.86	133.81	134.39	0.90	0.776	0.951	0.212	0.304	0.39	0.02	0.02
29.860	148.540	1.383	3632.5	3017.2	116.136	0.943	1.84		Sand	10.5	155.62		155.62	0.86	134.46	144.77	0.90	0.776	0.946	0.258	0.392	0.51	0.02	0.02
30.020	154.070	1.339	3652.5	3027.3	120.306	0.879	1.81		Sand	8.0	155.62		155.62	0.86	133.65	137.18	0.90	0.776	0.949	0.223	0.324	0.42	0.02	0.02
30.180	137.900	1.578	3672.5	3037.3	107.343	1.160	1.93		Sand	17.3	155.62		155.62	0.87	136.04	169.90	0.90	0.777	0.931	0.502	0.902	1.16	0.01	0.01
30.350	114.320	2.057	3693.8	3047.9	88.577	1.829	2.12		Sand	33.0	155.62		155.62	0.89	138.39	206.01	0.90	0.777	0.897	2.698	5.324	6.85	0.00	0.00
30.510	98.990	2.567	3713.8	3057.9	76.371	2.643	2.28		Sand	45.7	155.62		155.62	0.89	139.10	219.17	0.90	0.778	0.890	6.692	13.095	16.84	0.00	0.00
30.680	73.470	1.886	3735.0	3068.6	56.200	2.634	2.38		Sand	53.2	155.62		155.62	0.89	139.25	223.89	0.90	0.778	0.888	9.719	18.997	24.42	0.00	0.00
30.840	47.100	1.516	3755.0	3078.6	29.379	3.352	2.66		Clay	75.5			44.52	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	24.270	0.990	3775.0	3088.6	14.494	4.424	2.97		Clay	100.0			22.94	0.91	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	24.130	0.869	3796.3	3099.2	14.347	3.910	2.94		Clay	98.1			22.81	0.90	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	22.210	0.707	3816.3	3109.3	13.059	3.480	2.94		Clay	98.2			20.99	0.90	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	18.680	0.668	3837.5	3119.9	10.745	3.988	3.04		Clay	100.0			17.66	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	17.930	0.618	3857.5	3129.9	10.225	3.860	3.05		Clay	100.0			16.95	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	20.600	0.558	3877.5	3139.9	11.886	2.990	2.93		Clay	97.8			19.47	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	19.430	0.524	3898.8	3150.6	11.097	2.996	2.96		Clay	99.8			18.36	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	17.130	0.489	3918.8	3160.6	9.600	3.225	3.03		Clay	100.0			16.19	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	17.360	0.491	3940.0	3171.2	9.706	3.189	3.02		Clay	100.0			16.41	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	19.250	0.473	3960.0	3181.2	10.857	2.739	2.95		Clay	98.6			18.19	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	20.080	0.690	3980.0	3191.3	11.337	3.814	3.01		Clay	100.0			18.98	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	20.460	1.357	4001.3	3201.9	11.530	7.350	3.19		Clay	100.0			19.34	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	41.110	2.206	4021.3	3211.9	24.346	5.643	2.87		Clay	92.5			38.86	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	67.290	2.542	4042.5	3222.6	49.989	3.895	2.53		Sand	65.6	115.43	1.72	198.54	0.89	177.68	278.53	0.88	0.782	0.874	7729.090	14858.180	18995.41	0.00	0.00

CORNERSTONE
EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.88

Total Settlement: 2.70 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
33.300	86.580	2.480	4062.5	3232.6	64.655	2.933	2.37		Sand	52.3	115.43	1.72	198.54	0.89	177.54	272.03	0.88	0.782	0.873	2669.008	5125.357	6550.84	0.00	0.00
33.460	122.120	2.569	4082.5	3242.6	91.684	2.139	2.16		Sand	36.0		1.72	198.53	0.89	177.39	257.56	0.88	0.783	0.872	333.992	640.691	818.68	0.00	0.00
33.630	102.970	2.410	4103.8	3253.2	76.928	2.388	2.25		Sand	43.0	115.43	1.72	198.54	0.89	177.24	264.81	0.88	0.783	0.871	903.119	1730.483	2210.69	0.00	0.00
33.790	62.280	1.732	4123.8	3263.3	45.833	2.875	2.47		Sand	60.4	115.43	1.72	198.54	0.89	177.10	275.66	0.88	0.783	0.870	4780.350	9150.019	11686.54	0.00	0.00
33.960	32.430	1.082	4145.0	3273.9	18.545	3.565	2.83		Clay	89.1			30.65	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	20.020	0.640	4165.0	3283.9	10.924	3.570	3.01		Clay	100.0			18.92	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	16.680	0.551	4185.0	3293.9	8.857	3.775	3.10		Clay	100.0			15.77	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	12.790	0.416	4206.3	3304.6	6.468	3.896	3.22		Clay	100.0			12.09	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	13.030	0.357	4226.3	3314.6	6.587	3.272	3.17		Clay	100.0			12.32	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	12.400	0.336	4247.5	3325.2	6.181	3.274	3.19		Clay	100.0			11.72	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	10.770	0.299	4267.5	3335.2	5.179	3.467	3.27		Clay	100.0			10.18	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	10.240	0.269	4287.5	3345.3	4.840	3.324	3.28		Clay	100.0			9.68	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	10.020	0.271	4308.8	3355.9	4.688	3.447	3.31		Clay	100.0			9.47	0.89	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	10.300	0.264	4328.8	3365.9	4.834	3.250	3.28		Clay	100.0			9.74	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	11.120	0.333	4350.0	3376.6	5.298	3.719	3.28		Clay	100.0			10.51	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	12.090	0.412	4370.0	3386.6	5.850	4.163	3.27		Clay	100.0			11.43	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	15.120	0.411	4391.3	3397.2	7.609	3.178	3.11		Clay	100.0			14.29	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	16.830	0.360	4411.3	3407.2	8.584	2.459	3.00		Clay	100.0			15.91	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	15.770	0.317	4431.3	3417.3	7.933	2.337	3.02		Clay	100.0			14.91	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	13.490	0.344	4452.5	3427.9	6.572	3.050	3.15		Clay	100.0			12.75	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	13.610	0.301	4472.5	3437.9	6.617	2.642	3.12		Clay	100.0			12.86	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.750	14.190	0.285	4493.8	3448.6	6.926	2.387	3.08		Clay	100.0			13.41	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.910	13.500	0.300	4513.8	3458.6	6.502	2.666	3.13		Clay	100.0			12.76	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.070	13.280	0.276	4533.8	3468.6	6.350	2.503	3.12		Clay	100.0			12.55	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.240	12.820	0.252	4555.0	3479.2	6.060	2.387	3.13		Clay	100.0			12.12	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	12.300	0.278	4575.0	3489.2	5.739	2.779	3.18		Clay	100.0			11.63	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.570	11.210	0.259	4596.3	3499.9	5.093	2.910	3.24		Clay	100.0			10.60	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.730	10.660	0.274	4616.3	3509.9	4.759	3.285	3.29		Clay	100.0			10.08	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.890	9.810	0.250	4636.3	3519.9	4.257	3.332	3.33		Clay	100.0			9.27	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.060	8.910	0.195	4657.5	3530.6	3.728	2.963	3.36		Clay	100.0			8.42	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.220	9.270	0.203	4677.5	3540.6	3.915	2.935	3.34		Clay	100.0			8.76	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	10.200	0.221	4698.8	3551.2	4.421	2.819	3.28		Clay	100.0			9.64	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	10.320	0.256	4718.8	3561.2	4.471	3.220	3.31		Clay	100.0			9.75	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	10.740	0.274	4738.8	3571.2	4.688	3.270	3.29		Clay	100.0			10.15	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	11.350	0.264	4760.0	3581.9	5.009	2.941	3.24		Clay	100.0			10.73	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	11.690	0.245	4780.0	3591.9	5.178	2.632	3.21		Clay	100.0			11.05	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	12.600	0.272	4801.3	3602.5	5.662	2.662	3.18		Clay	100.0			11.91	0.87	n.a.	n.a.	0.86	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	13.370	0.302	4821.3	3612.6	6.067	2.752	3.16		Clay	100.0			12.64	0.87	n.a.	n.a.	0.86	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	13.450	0.339	4841.3	3622.6	6.089	3.069	3.18		Clay	100.0			12.71	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	14.750	0.385	4862.5	3633.2	6.781	3.128	3.15		Clay	100.0			13.94	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	15.260	0.402	4882.5	3643.2	7.037	3.136	3.13		Clay	100.0			14.42	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	15.200	0.370	4903.8	3653.9	6.978	2.902	3.12		Clay	100.0			14.37	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.190	14.170	0.359	4923.8	3663.9	6.391	3.062	3.16		Clay	100.0			13.39	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.350	12.750	0.362	4943.8	3673.9	5.595	3.519	3.25		Clay	100.0			12.05	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.520	12.890	0.360	4965.0	3684.6	5.649	3.457	3.24		Clay	100.0			12.18	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	13.570	0.345	4985.0	3694.6	5.997	3.110	3.19		Clay	100.0			12.83	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	13.380	0.345	5006.3	3705.2	5.871	3.175	3.20		Clay	100.0			12.65	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	13.300	0.336	5026.3	3715.2	5.807	3.119	3.20		Clay	100.0			12.57	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	13.810	0.327	5046.3	3725.2	6.060	2.897	3.17		Clay	100.0			13.05	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	13.840	0.337	5067.5	3735.9	6.053	2.981	3.18		Clay	100.0			13.08	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	14.020	0.365	5087.5	3745.9	6.127	3.179	3.19		Clay	100.0			13.25	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	15.290	0.451	5108.8	3756.5	6.781	3.542	3.18		Clay	100.0			14.45	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	19.950	0.546	5128.8	3766.6	9.232	3.142	3.04		Clay	100.0			18.86	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	23.460	0.490	5148.8	3776.6	11.061	2.348	2.90		Clay	95.1			22.17	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	22.140	0.752	5170.0	3787.2	10.327	3.844	3.05		Clay	100.0			20.93	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	21.090	0.587	5190.0	3797.2	9.741	3.172	3.02		Clay	100.0			19.93	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	22.320	0.469	5211.3	3807.9	10.355	2.376	2.93		Clay	97.2			21.10	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	14.940	0.446	5231.3	3817.9	6.456	3.619	3.20		Clay	100.0			14.12	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	13.690	0.398	5251.3	3827.9	5.781	3.598	3.24		Clay	100.0			12.94	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	13.530	0.384	5272.5	3838.5	5.676	3.529	3.24		Clay	100.0			12.79	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	13.930	0.407	5292.5	3848.6	5.864	3.609	3.23		Clay	100.0			13.17	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	14.720	0.438	5313.8	3859.2	6.252	3.631	3.21		Clay	100.0			13.91	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	15.090	0.463	5333.8	3869.2	6.422	3.729	3.21		Clay	100.0			14.26	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	15.300	0.485	5355.0	3879.9	6.507	3.842	3.21		Clay	100.0			14.46	0.85	n.a.	n.a.	0.83	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	15.620	0.478	5375.0	3889.9	6.649	3.696	3.19		Clay	100.0			14.76	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	15.170	0.481	5395.0	3899.9	6.396	3.859	3.22		Clay	100.0			14.34	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	14.390	0.503	5416.3	3910.5	5.975	4.304	3.27		Clay	100.0			13.60	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.88

Total Settlement: 2.70 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
44.290	14.190	0.503	5436.3	3920.6	5.852	4.388	3.28		Clay	100.0			13.41	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	14.400	0.473	5457.5	3931.2	5.938	4.054	3.26		Clay	100.0			13.61	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	14.130	0.433	5477.5	3941.2	5.781	3.804	3.25		Clay	100.0			13.36	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	13.340	0.414	5497.5	3951.2	5.361	3.907	3.29		Clay	100.0			12.61	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	14.000	0.413	5518.8	3961.9	5.674	3.677	3.25		Clay	100.0			13.23	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	14.500	0.405	5538.8	3971.9	5.907	3.454	3.22		Clay	100.0			13.71	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	14.950	0.382	5560.0	3982.5	6.112	3.138	3.19		Clay	100.0			14.13	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	15.060	0.358	5580.0	3992.5	6.146	2.914	3.17		Clay	100.0			14.23	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	14.910	0.308	5600.0	4002.6	6.051	2.543	3.14		Clay	100.0			14.09	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.770	14.440	0.278	5621.3	4013.2	5.796	2.390	3.14		Clay	100.0			13.65	0.84	n.a.	n.a.	0.82	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	14.310	0.250	5641.3	4023.2	5.712	2.179	3.13		Clay	100.0			13.53	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	14.440	0.283	5662.5	4033.9	5.756	2.441	3.15		Clay	100.0			13.65	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	14.400	0.344	5682.5	4043.9	5.717	2.974	3.20		Clay	100.0			13.61	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	16.460	0.507	5702.5	4053.9	6.714	3.727	3.19		Clay	100.0			15.56	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	20.950	0.673	5723.8	4064.5	8.900	3.722	3.09		Clay	100.0			19.80	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	25.190	0.826	5743.8	4074.6	10.955	3.700	3.02		Clay	100.0			23.81	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	25.150	0.895	5765.0	4085.2	10.902	4.021	3.04		Clay	100.0			23.77	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	24.850	0.961	5785.0	4095.2	10.724	4.378	3.07		Clay	100.0			23.49	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	25.470	1.013	5805.0	4105.2	10.995	4.490	3.07		Clay	100.0			24.07	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	24.000	0.996	5826.3	4115.9	10.247	4.723	3.10		Clay	100.0			22.68	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	22.600	0.940	5846.3	4125.9	9.538	4.775	3.13		Clay	100.0			21.36	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	20.820	0.858	5867.5	4136.5	8.648	4.798	3.17		Clay	100.0			19.68	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	20.730	0.819	5887.5	4146.5	8.579	4.604	3.16		Clay	100.0			19.59	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	20.850	0.844	5907.5	4156.6	8.611	4.718	3.16		Clay	100.0			19.71	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	20.610	0.886	5928.8	4167.2	8.469	5.023	3.19		Clay	100.0			19.48	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	21.050	0.865	5948.8	4177.2	8.654	4.787	3.17		Clay	100.0			19.90	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	21.140	0.818	5970.0	4187.9	8.670	4.503	3.15		Clay	100.0			19.98	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	21.380	0.730	5990.0	4197.9	8.759	3.968	3.11		Clay	100.0			20.21	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	21.750	0.713	6010.0	4207.9	8.909	3.805	3.10		Clay	100.0			20.56	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	20.850	0.630	6031.3	4218.5	8.455	3.535	3.10		Clay	100.0			19.71	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	19.550	0.522	6051.3	4228.5	7.816	3.160	3.10		Clay	100.0			18.48	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	17.470	0.483	6072.5	4239.2	6.810	3.348	3.16		Clay	100.0			16.51	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	16.050	0.458	6092.5	4249.2	6.121	3.523	3.21		Clay	100.0			15.17	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	16.770	0.521	6112.5	4259.2	6.440	3.801	3.21		Clay	100.0			15.85	0.83	n.a.	n.a.	0.81	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	19.000	0.601	6133.8	4269.9	7.463	3.772	3.16		Clay	100.0			17.96	0.83	n.a.	n.a.	0.80	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	31.750	0.755	6153.8	4279.9	13.399	2.634	2.86		Clay	91.8			30.01	0.83	n.a.	n.a.	0.80	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.200	35.660	1.199	6175.0	4290.5	15.183	3.681	2.90		Clay	95.2			33.71	0.83	n.a.	n.a.	0.80	0.769	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.360	33.830	1.925	6195.0	4300.5	14.292	6.264	3.07		Clay	100.0			31.98	0.83	n.a.	n.a.	0.80	0.769	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.520	51.890	2.856	6215.0	4310.6	22.634	5.854	2.90		Clay	95.2			49.05	0.83	n.a.	n.a.	0.80	0.769	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.690	70.140	3.305	6236.3	4321.2	31.020	4.932	2.75		Clay	83.2			66.29	0.83	n.a.	n.a.	0.80	0.768	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.850	101.460	3.658	6256.3	4331.2	64.962	3.720	2.44		Sand	58.2			95.90	0.74	70.88	138.87	0.80	0.768	0.896	0.229	0.318	0.41	0.02	0.00
51.020	133.020	2.182	6277.5	4341.9	85.700	1.680	2.11		Sand	31.8			125.73	0.75	94.18	150.81	0.80	0.768	0.884	0.294	0.436	0.57	0.02	0.00
51.180	155.390	2.164	6297.5	4351.9	100.338	1.421	2.01		Sand	23.8			146.87	0.75	110.85	158.05	0.80	0.767	0.876	0.352	0.545	0.71	0.02	0.00
51.350	169.810	2.164	6318.8	4362.5	109.701	1.299	1.96		Sand	19.4			160.50	0.76	121.22	159.50	0.80	0.767	0.874	0.366	0.572	0.75	0.01	0.00
51.510	176.840	2.037	6338.8	4372.5	114.191	1.173	1.91		Sand	16.0			167.15	0.75	125.29	153.76	0.80	0.766	0.880	0.315	0.476	0.62	0.02	0.00
51.670	184.500	1.941	6358.8	4382.5	119.085	1.071	1.87		Sand	12.8			174.39	0.74	129.61	147.39	0.80	0.766	0.886	0.272	0.395	0.52	0.02	0.00
51.840	191.750	1.983	6380.0	4393.2	123.689	1.052	1.85		Sand	11.4			181.24	0.74	134.64	147.84	0.80	0.766	0.885	0.275	0.400	0.52	0.02	0.00
52.000	211.770	2.510	6400.0	4403.2	136.659	1.203	1.86		Sand	12.1			200.16	0.76	152.18	168.60	0.79	0.765	0.861	0.481	0.792	1.03	0.01	0.00
52.170	250.440	2.576	6421.3	4413.8	161.795	1.042	1.77		Sand	4.4			236.71	0.77	182.54	182.60	0.79	0.765	0.840	0.808	1.448	1.89	0.00	0.00
52.330	288.880	2.042	6441.3	4423.9	186.733	0.715	1.61		Sand	0.0			273.04	0.80	217.79	217.79	0.79	0.765	0.779	6.031	10.333	13.51	0.00	0.00
52.490	309.820	2.958	6461.3	4433.9	200.188	0.965	1.68		Sand	0.0			292.84	0.81	237.59	237.59	0.79	0.764	0.778	33.691	57.671	75.46	0.00	0.00
52.660	287.880	3.099	6482.5	4444.5	185.632	1.089	1.74		Sand	2.1			272.10	0.80	216.46	216.46	0.79	0.764	0.777	5.465	9.346	12.24	0.00	0.00
52.820	295.160	2.619	6502.5	4454.5	190.160	0.897	1.67		Sand	0.0			278.98	0.80	223.16	223.16	0.79	0.763	0.777	9.158	15.648	20.50	0.00	0.00
52.990	270.240	3.002	6523.8	4465.2	173.712	1.124	1.77		Sand	4.5			255.43	0.78	199.66	199.74	0.79	0.763	0.804	1.863	3.296	4.32	0.00	0.00
53.150	242.610	3.956	6543.8	4475.2	155.553	1.653	1.92		Sand	16.9			229.31	0.80	182.67	220.17	0.79	0.763	0.775	7.227	12.327	16.16	0.00	0.00
53.310	200.570	3.119	6563.8	4485.2	128.080	1.581	1.97		Sand	20.4			189.57	0.77	146.66	191.02	0.79	0.762	0.822	1.181	2.134	2.80	0.00	0.00
53.480	155.660	2.753	6585.0	4495.8	98.800	1.807	2.09		Sand	30.0			147.13	0.75	111.02	168.81	0.79	0.762	0.857	0.484	0.794	1.04	0.01	0.00
53.640	150.310	2.765	6605.0	4505.9	95.219	1.881	2.11		Sand	31.9			142.07	0.75	106.80	166.24	0.79	0.762	0.860	0.446	0.720	0.95	0.01	0.00
53.810	157.150	3.539	6626.3	4516.5	99.525	2.300	2.16		Sand	35.9			148.53	0.76	113.11	178.46	0.79	0.761	0.842	0.683	1.188	1.56	0.00	0.00
53.970	135.800	3.363	6646.3	4526.5	85.611	2.538	2.24		Sand	41.9			128.36	0.75	95.89	162.42	0.79	0.761	0.864	0.398	0.627	0.82	0.01	0.00
54.130	98.690	2.862	6666.3	4536.5	61.555	3.002	2.39		Sand	54.1			93.28	0.72	67.03	132.49	0.78	0.760	0.895	0.205	0.274	0.36	0.02	0.00
54.300	59.850	2.732	6687.5	4547.2	24.853	4.836	2.82		Clay	88.3			56.57	0.82	n.a.	n.a.	0.78	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.460	124.360	2.150	6707.5	4557.2	77.935	1.777	2.16		Sand	35.5			117.54	0.73	85.65	144.43	0.78	0.760	0.883	0.256	0.363	0.48	0.02	0.00
54.630	179.810	1.712	6728.8	4567.8	113.508	0.970	1.86		Sand	11.8			169.95	0.72	122.41	136.40	0.78	0.759	0.890	0.219	0.298	0.39	0.02	0.00
54.790	203.420	2.343	6748.8	4577.9	128.549	1.171	1.87		Sand	12.9			192.27	0.74	142.98	162.16	0.78	0.759	0.862	0.395	0.620	0.82	0.01	0.00
54.950	205.370	2.978	6768.8	4587.9	129.654	1.475	1.94		Sand	18.3			194.11	0.76	148.35	186.86	0.78	0.758	0.824	0.972	1.763	2.32	0.00	0.00
55.120	216.570	2.738	6790.0	4598.5	136.678	1.285	1.88		Sand	13.6			204.70	0.76	154.65	177.21	0.78	0.758	0.840	0.651	1.119	1.48	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.88

Total Settlement: 2.70 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
55.280	233.090	2.783	6810.0	4608.5	147.104	1.211	1.84		Sand	10.4			220.31	0.75	166.33	177.27	0.78	0.757	0.840	0.653	1.121	1.48	0.00	0.00
55.450	175.000	2.694	6831.3	4619.2	109.766	1.570	2.01		Sand	24.0			165.41	0.75	124.31	174.07	0.78	0.757	0.844	0.580	0.976	1.29	0.00	0.00
55.610	92.950	2.075	6851.3	4629.2	57.209	2.318	2.33		Sand	49.7			87.85	0.70	61.82	124.05	0.78	0.757	0.899	0.181	0.230	0.30	0.03	0.00
55.770	42.680	1.441	6871.3	4639.2	16.919	3.671	2.87		Clay	92.2			40.34	0.81	n.a.	n.a.	0.78	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.940	23.230	0.705	6892.5	4649.8	8.509	3.562	3.10		Clay	100.0			21.96	0.81	n.a.	n.a.	0.78	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.100	22.320	0.688	6912.5	4659.9	8.096	3.646	3.12		Clay	100.0			21.10	0.81	n.a.	n.a.	0.77	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.270	23.330	0.793	6933.8	4670.5	8.506	3.991	3.13		Clay	100.0			22.05	0.81	n.a.	n.a.	0.77	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.430	24.560	0.878	6953.8	4680.5	9.009	4.164	3.12		Clay	100.0			23.21	0.81	n.a.	n.a.	0.77	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.590	25.330	1.044	6973.8	4690.5	9.314	4.779	3.14		Clay	100.0			23.94	0.81	n.a.	n.a.	0.77	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.760	26.350	1.172	6995.0	4701.2	9.722	5.127	3.14		Clay	100.0			24.91	0.81	n.a.	n.a.	0.77	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.920	26.650	1.223	7015.0	4711.2	9.824	5.284	3.15		Clay	100.0			25.19	0.81	n.a.	n.a.	0.77	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.090	26.990	1.226	7036.3	4721.8	9.942	5.223	3.14		Clay	100.0			25.51	0.81	n.a.	n.a.	0.77	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.250	25.410	1.212	7056.3	4731.9	9.249	5.537	3.18		Clay	100.0			24.02	0.81	n.a.	n.a.	0.77	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.410	23.700	1.114	7076.3	4741.9	8.504	5.527	3.21		Clay	100.0			22.40	0.81	n.a.	n.a.	0.77	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.580	22.400	0.984	7097.5	4752.5	7.933	5.218	3.22		Clay	100.0			21.17	0.81	n.a.	n.a.	0.77	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.740	20.700	0.924	7117.5	4762.5	7.198	5.390	3.26		Clay	100.0			19.57	0.81	n.a.	n.a.	0.77	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.910	19.960	0.873	7138.8	4773.2	6.868	5.324	3.27		Clay	100.0			18.87	0.81	n.a.	n.a.	0.77	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.070	20.580	0.841	7158.8	4783.2	7.109	4.949	3.24		Clay	100.0			19.45	0.81	n.a.	n.a.	0.77	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.230	20.920	0.730	7178.8	4793.2	7.231	4.213	3.20		Clay	100.0			19.77	0.81	n.a.	n.a.	0.77	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.400	20.850	0.678	7200.0	4803.8	7.182	3.929	3.18		Clay	100.0			19.71	0.81	n.a.	n.a.	0.76	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.560	20.850	0.682	7220.0	4813.9	7.163	3.955	3.18		Clay	100.0			19.71	0.81	n.a.	n.a.	0.76	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.730	21.480	0.662	7241.3	4824.5	7.404	3.708	3.16		Clay	100.0			20.30	0.80	n.a.	n.a.	0.76	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.890	21.970	0.696	7261.3	4834.5	7.587	3.792	3.15		Clay	100.0			20.77	0.80	n.a.	n.a.	0.76	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.060	22.610	0.608	7282.5	4845.2	7.830	3.207	3.10		Clay	100.0			21.37	0.80	n.a.	n.a.	0.76	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.220	22.880	0.562	7302.5	4855.2	7.921	2.920	3.07		Clay	100.0			21.63	0.80	n.a.	n.a.	0.76	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.380	21.860	0.506	7322.5	4865.2	7.481	2.782	3.08		Clay	100.0			20.66	0.80	n.a.	n.a.	0.76	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.550	20.970	0.473	7343.8	4875.8	7.095	2.734	3.10		Clay	100.0			19.82	0.80	n.a.	n.a.	0.76	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.710	20.600	0.455	7363.8	4885.8	6.925	2.686	3.10		Clay	100.0			19.47	0.80	n.a.	n.a.	0.76	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.880	19.660	0.511	7385.0	4896.5	6.522	3.200	3.17		Clay	100.0			18.58	0.80	n.a.	n.a.	0.76	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.040	19.960	0.569	7405.0	4906.5	6.627	3.502	3.18		Clay	100.0			18.87	0.80	n.a.	n.a.	0.76	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.200	19.680	0.528	7425.0	4916.5	6.495	3.304	3.18		Clay	100.0			18.60	0.80	n.a.	n.a.	0.76	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.370	19.690	0.481	7446.3	4927.2	6.481	3.009	3.15		Clay	100.0			18.61	0.80	n.a.	n.a.	0.76	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.530	19.520	0.465	7466.3	4937.2	6.395	2.944	3.15		Clay	100.0			18.45	0.80	n.a.	n.a.	0.75	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.700	18.990	0.500	7487.5	4947.8	6.163	3.278	3.19		Clay	100.0			17.95	0.80	n.a.	n.a.	0.75	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.860	18.010	0.543	7507.5	4957.8	5.751	3.812	3.25		Clay	100.0			17.02	0.80	n.a.	n.a.	0.75	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.020	17.670	0.571	7527.5	4967.9	5.598	4.102	3.28		Clay	100.0			16.70	0.80	n.a.	n.a.	0.75	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.190	19.820	0.613	7548.8	4978.5	6.446	3.822	3.21		Clay	100.0			18.73	0.80	n.a.	n.a.	0.75	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.350	20.820	0.615	7568.8	4988.5	6.830	3.609	3.18		Clay	100.0			19.68	0.80	n.a.	n.a.	0.75	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.520	21.020	0.604	7590.0	4999.2	6.891	3.506	3.17		Clay	100.0			19.87	0.80	n.a.	n.a.	0.75	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.680	21.630	0.577	7610.0	5009.2	7.117	3.234	3.14		Clay	100.0			20.44	0.80	n.a.	n.a.	0.75	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.840	22.320	0.575	7630.0	5019.2	7.374	3.109	3.12		Clay	100.0			21.10	0.80	n.a.	n.a.	0.75	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.010	23.140	0.538	7651.3	5029.8	7.680	2.785	3.07		Clay	100.0			21.87	0.80	n.a.	n.a.	0.75	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.170	22.880	0.511	7671.3	5039.8	7.558	2.682	3.07		Clay	100.0			21.63	0.80	n.a.	n.a.	0.75	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.340	22.810	0.451	7692.5	5050.5	7.510	2.380	3.05		Clay	100.0			21.56	0.79	n.a.	n.a.	0.75	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.500	20.470	0.412	7712.5	5060.5	6.566	2.481	3.11		Clay	100.0			19.35	0.79	n.a.	n.a.	0.75	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.660	18.700	0.442	7732.5	5070.5	5.851	2.980	3.19		Clay	100.0			17.67	0.79	n.a.	n.a.	0.74	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.830	19.420	0.486	7753.8	5081.2	6.118	3.124	3.18		Clay	100.0			18.36	0.79	n.a.	n.a.	0.74	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.990	20.090	0.551	7773.8	5091.2	6.365	3.397	3.19		Clay	100.0			18.99	0.79	n.a.	n.a.	0.74	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.160	20.450	0.573	7795.0	5101.8	6.489	3.462	3.19		Clay	100.0			19.33	0.79	n.a.	n.a.	0.74	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.320	20.680	0.568	7815.0	5111.8	6.562	3.385	3.18		Clay	100.0			19.55	0.79	n.a.	n.a.	0.74	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.480	20.670	0.551	7835.0	5121.8	6.542	3.288	3.17		Clay	100.0			19.54	0.79	n.a.	n.a.	0.74	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.650	20.740	0.627	7856.3	5132.5	6.551	3.729	3.20		Clay	100.0			19.60	0.79	n.a.	n.a.	0.74	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.810	21.680	0.755	7876.3	5142.5	6.900	4.254	3.22		Clay	100.0			20.49	0.79	n.a.	n.a.	0.74	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.980	24.370	0.891	7897.5	5153.1	7.926	4.365	3.17		Clay	100.0			23.03	0.79	n.a.	n.a.	0.74	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.140	28.210	0.993	7917.5	5163.2	9.394	4.093	3.10		Clay	100.0			26.66	0.79	n.a.	n.a.	0.74	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.300	28.750	1.088	7937.5	5173.2	9.581	4.389	3.11		Clay	100.0			27.17	0.79	n.a.	n.a.	0.74	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.470	28.890	1.032	7958.8	5183.8	9.611	4.143	3.09		Clay	100.0			27.31	0.79	n.a.	n.a.	0.74	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.630	30.170	0.990	7978.8	5193.8	10.081	3.781	3.05		Clay	100.0			28.52	0.79	n.a.	n.a.	0.74	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.800	29.170	1.081	8000.0	5204.5	9.672	4.294	3.10		Clay	100.0			27.57	0.79	n.a.	n.a.	0.74	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.960	29.810	0.924	8020.0	5214.5	9.895	3.582	3.04		Clay	100.0			28.18	0.79	n.a.	n.a.	0.73	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.120	30.620	0.856	8040.0	5224.5	10.183	3.217	3.01		Clay	100.0			28.94	0.79	n.a.	n.a.	0.73	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.290	26.020	0.625	8061.3	5235.2	8.401	2.841	3.05		Clay	100.0			24.59	0.79	n.a.	n.a.	0.73	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.450	21.680	0.460	8081.3	5245.2	6.726	2.605	3.11		Clay	100.0			20.49	0.79	n.a.	n.a.	0.73	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.620	19.280	0.393	8102.5	5255.8	5.795	2.580	3.16		Clay	100.0			18.22	0.79	n.a.	n.a.	0.73	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.780	19.150	0.495	8122.5	5265.8	5.731	3.283	3.22		Clay	100.0			18.10	0.79	n.a.	n.a.	0.73	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.940	20.850	0.601	8142.5	5275.8	6.361	3.583	3.20		Clay	100.0			19.71	0.79	n.a.	n.a.	0.73	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.110	21.790	0.664	8163.8	5286.5	6.699	3.750	3.20		Clay	100.0			20.60	0.79	n.a.	n.a.	0.73	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.88

Total Settlement: 2.70 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
66.270	22.130	0.667	8183.8	5296.5	6.811	3.696	3.19		Clay	100.0			20.92	0.79	n.a.	n.a.	0.73	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.440	22.640	0.694	8205.0	5307.1	6.986	3.743	3.18		Clay	100.0			21.40	0.78	n.a.	n.a.	0.73	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.600	23.200	0.762	8225.0	5317.2	7.180	3.994	3.19		Clay	100.0			21.93	0.78	n.a.	n.a.	0.73	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.770	24.900	0.849	8246.3	5327.8	7.799	4.086	3.16		Clay	100.0			23.53	0.78	n.a.	n.a.	0.73	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.930	25.960	0.998	8266.3	5337.8	8.178	4.572	3.17		Clay	100.0			24.54	0.78	n.a.	n.a.	0.73	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.090	26.910	1.081	8286.3	5347.8	8.514	4.747	3.17		Clay	100.0			25.43	0.78	n.a.	n.a.	0.73	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.260	27.560	1.054	8307.5	5358.5	8.736	4.503	3.15		Clay	100.0			26.05	0.78	n.a.	n.a.	0.72	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.420	28.080	0.988	8327.5	5368.5	8.910	4.131	3.12		Clay	100.0			26.54	0.78	n.a.	n.a.	0.72	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.590	26.920	0.934	8348.8	5379.1	8.457	4.106	3.13		Clay	100.0			25.44	0.78	n.a.	n.a.	0.72	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.750	25.430	0.863	8368.8	5389.2	7.885	4.062	3.16		Clay	100.0			24.04	0.78	n.a.	n.a.	0.72	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.910	23.620	0.785	8388.8	5399.2	7.196	4.043	3.19		Clay	100.0			22.33	0.78	n.a.	n.a.	0.72	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.080	22.500	0.759	8410.0	5409.8	6.764	4.148	3.22		Clay	100.0			21.27	0.78	n.a.	n.a.	0.72	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.240	21.990	0.724	8430.0	5419.8	6.559	4.070	3.22		Clay	100.0			20.78	0.78	n.a.	n.a.	0.72	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.410	22.320	0.708	8451.3	5430.5	6.664	3.912	3.21		Clay	100.0			21.10	0.78	n.a.	n.a.	0.72	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.570	22.420	0.689	8471.3	5440.5	6.685	3.789	3.20		Clay	100.0			21.19	0.78	n.a.	n.a.	0.72	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.730	22.090	0.662	8491.3	5450.5	6.548	3.710	3.20		Clay	100.0			20.88	0.78	n.a.	n.a.	0.72	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.900	23.290	0.660	8512.5	5461.1	6.971	3.469	3.16		Clay	100.0			22.01	0.78	n.a.	n.a.	0.72	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.060	24.240	0.670	8532.5	5471.2	7.301	3.356	3.14		Clay	100.0			22.91	0.78	n.a.	n.a.	0.72	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.230	23.480	0.666	8553.8	5481.8	7.006	3.468	3.16		Clay	100.0			22.19	0.78	n.a.	n.a.	0.72	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.390	21.690	0.665	8573.8	5491.8	6.338	3.819	3.22		Clay	100.0			20.50	0.78	n.a.	n.a.	0.72	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.550	21.480	0.621	8593.8	5501.8	6.246	3.612	3.21		Clay	100.0			20.30	0.78	n.a.	n.a.	0.72	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.720	21.740	0.672	8615.0	5512.5	6.325	3.857	3.22		Clay	100.0			20.55	0.78	n.a.	n.a.	0.71	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.880	21.340	0.685	8635.0	5522.5	6.165	4.023	3.24		Clay	100.0			20.17	0.78	n.a.	n.a.	0.71	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.050	21.880	0.688	8656.3	5533.1	6.344	3.917	3.23		Clay	100.0			20.68	0.78	n.a.	n.a.	0.71	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.210	22.570	0.687	8676.3	5543.1	6.578	3.769	3.20		Clay	100.0			21.33	0.78	n.a.	n.a.	0.71	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.370	22.140	0.680	8696.3	5553.2	6.408	3.821	3.22		Clay	100.0			20.93	0.78	n.a.	n.a.	0.71	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.540	22.940	0.687	8717.5	5563.8	6.679	3.698	3.19		Clay	100.0			21.68	0.77	n.a.	n.a.	0.71	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.700	24.090	0.719	8737.5	5573.8	7.076	3.645	3.17		Clay	100.0			22.77	0.77	n.a.	n.a.	0.71	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.870	24.530	0.953	8758.8	5584.5	7.217	4.728	3.23		Clay	100.0			23.19	0.77	n.a.	n.a.	0.71	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.030	27.600	1.650	8778.8	5594.5	8.298	7.108	3.29		Clay	100.0			26.09	0.77	n.a.	n.a.	0.71	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.190	41.750	2.247	8798.8	5604.5	13.329	6.015	3.08		Clay	100.0			39.46	0.77	n.a.	n.a.	0.71	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.360	80.160	3.289	8820.0	5615.1	26.981	4.341	2.76		Clay	83.7			75.77	0.77	n.a.	n.a.	0.71	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.520	122.480	4.030	8840.0	5625.2	68.440	3.414	2.40		Sand	54.8			115.77	0.67	77.56	146.16	0.71	0.712	0.849	0.265	0.366	0.51	0.02	0.00
71.690	136.570	3.359	8861.3	5635.8	76.529	2.542	2.27		Sand	44.7			129.08	0.68	87.48	153.72	0.71	0.711	0.838	0.315	0.452	0.64	0.02	0.00
71.850	142.550	2.726	8881.3	5645.8	79.916	1.974	2.18		Sand	37.4			134.74	0.68	91.12	152.89	0.71	0.711	0.839	0.309	0.441	0.62	0.02	0.00
72.010	166.150	1.731	8901.3	5655.8	93.483	1.070	1.95		Sand	19.1			157.04	0.66	103.73	139.02	0.71	0.710	0.857	0.230	0.306	0.43	0.02	0.00
72.180	163.710	2.998	8922.5	5666.5	91.980	1.883	2.12		Sand	32.8			154.74	0.69	106.86	167.38	0.70	0.710	0.816	0.462	0.714	1.01	0.01	0.00
72.340	166.780	3.638	8942.5	5676.5	93.664	2.241	2.17		Sand	36.7			157.64	0.70	110.11	175.58	0.70	0.709	0.800	0.612	0.989	1.39	0.00	0.00
72.510	170.700	3.314	8963.8	5687.1	95.831	1.994	2.13		Sand	33.2			161.34	0.70	112.48	174.71	0.70	0.709	0.801	0.593	0.953	1.34	0.00	0.00
72.670	183.390	2.415	8983.8	5697.1	103.050	1.350	1.99		Sand	21.9			173.34	0.68	118.66	162.94	0.70	0.708	0.822	0.404	0.608	0.86	0.01	0.00
72.830	206.130	2.239	9003.8	5707.2	116.041	1.110	1.89		Sand	14.3			194.83	0.68	131.61	154.87	0.70	0.708	0.834	0.324	0.467	0.66	0.02	0.00
73.000	219.940	2.070	9025.0	5717.8	123.868	0.961	1.83		Sand	9.3			207.88	0.66	137.98	144.59	0.70	0.708	0.848	0.257	0.350	0.49	0.02	0.00
73.160	208.630	1.837	9045.0	5727.8	117.256	0.900	1.83		Sand	9.2			197.19	0.65	128.64	134.96	0.70	0.707	0.860	0.214	0.278	0.39	0.02	0.00
73.330	187.890	1.580	9066.3	5738.5	105.238	0.862	1.85		Sand	11.2			177.59	0.64	113.77	125.45	0.70	0.707	0.870	0.184	0.229	0.32	0.03	0.00
73.490	181.640	2.259	9086.3	5748.5	101.556	1.275	1.97		Sand	21.0			171.68	0.68	116.19	157.80	0.70	0.706	0.829	0.350	0.511	0.72	0.02	0.00
73.650	172.470	3.203	9106.3	5758.5	96.208	1.907	2.11		Sand	32.0			163.02	0.69	112.99	173.86	0.70	0.706	0.801	0.575	0.917	1.30	0.00	0.00
73.820	133.040	3.202	9127.5	5769.1	73.543	2.492	2.28		Sand	45.2			125.75	0.67	83.84	149.45	0.70	0.705	0.840	0.285	0.398	0.56	0.02	0.00
73.980	99.010	3.228	9147.5	5779.1	32.682	3.418	2.63		Clay	73.2			93.58	0.77	n.a.	n.a.	0.70	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.150	71.930	3.254	9168.8	5789.8	23.264	4.832	2.84		Clay	90.0			67.99	0.77	n.a.	n.a.	0.70	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.310	54.130	3.000	9188.8	5799.8	17.082	6.056	3.00		Clay	100.0			51.16	0.77	n.a.	n.a.	0.70	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.480	193.800	3.533	9210.0	5810.4	107.914	1.867	2.07		Sand	28.7			183.18	0.71	129.29	188.71	0.70	0.703	0.766	1.058	1.783	2.53	0.00	0.00
74.640	324.570	3.660	9230.0	5820.5	182.340	1.144	1.76		Sand	3.8			306.78	0.74	227.78	227.79	0.69	0.703	0.696	13.510	20.699	29.45	0.00	0.00
74.800	356.340	6.276	9250.0	5830.5	200.268	1.784	1.88		Sand	13.3			336.81	0.77	257.78	285.77	0.69	0.702	0.696	27937.264	42773.142	60894.71	0.00	0.00
74.970	318.560	5.660	9271.3	5841.1	178.587	1.803	1.91		Sand	16.1			301.10	0.76	230.34	269.28	0.69	0.702	0.695	1747.405	2673.248	3808.43	0.00	0.00
75.130	256.550	4.615	9291.3	5851.1	143.182	1.832	1.98		Sand	21.5			242.49	0.75	181.04	233.62	0.69	0.701	0.695	22.894	34.998	49.89	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 2

PGA (A_{max}) 0.88

Total Settlement: 0.28 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\,atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	381.000	1.932	19.2	19.2	3780.381	0.507	0.93		Unsaturated	0.0			360.11	1.70	612.19	612.19	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	698.480	2.193	39.6	39.6	4825.766	0.314	0.75		Unsaturated	0.0			660.19	1.70	1122.32	1122.32	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	596.130	2.775	58.8	58.8	3379.894	0.465	0.89		Unsaturated	0.0			563.45	1.70	957.86	957.86	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	493.760	2.438	79.2	79.2	2412.074	0.494	0.92		Unsaturated	0.0			466.69	1.70	793.38	793.38	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	417.270	2.456	98.4	98.4	1828.692	0.589	1.01		Unsaturated	0.0			394.40	1.70	670.47	670.47	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	366.530	3.180	117.6	117.6	1469.293	0.868	1.20		Unsaturated	51.0			346.44	1.70	588.94	792.32	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	289.360	3.441	138.0	138.0	1070.699	1.189	1.37		Unsaturated	51.0			273.50	1.70	464.95	635.26	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	216.850	3.400	157.2	157.2	751.706	1.568	1.53		Unsaturated	51.0			204.96	1.70	348.44	487.68	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	172.550	2.826	177.6	177.6	562.655	1.638	1.60		Unsaturated	51.0			163.09	1.70	277.25	397.52	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	131.990	1.267	196.8	196.8	408.768	0.960	1.48		Unsaturated	51.0			124.75	1.70	212.08	314.96	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	94.090	1.044	216.0	216.0	278.029	1.110	1.63		Unsaturated	51.0			88.93	1.70	151.18	237.83	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	75.320	0.952	236.4	236.4	212.656	1.266	1.75		Unsaturated	51.0			71.19	1.70	121.02	199.63	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	65.380	0.911	255.6	255.6	177.454	1.396	1.83		Unsaturated	51.0			61.80	1.70	105.05	179.40	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	53.810	0.779	276.0	276.0	140.464	1.450	1.91		Unsaturated	51.0			50.86	1.70	86.46	155.85	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	42.610	0.572	295.2	295.2	107.453	1.348	1.97		Unsaturated	51.0			40.27	1.70	68.47	133.05	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	34.480	0.421	314.4	314.4	84.162	1.225	2.02		Unsaturated	51.0			32.59	1.70	55.40	116.51	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	29.160	0.326	334.8	334.8	68.892	1.123	2.07		Unsaturated	51.0			27.56	1.70	46.85	105.68	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	25.330	0.268	354.0	354.0	58.125	1.064	2.11		Unsaturated	51.0			23.94	1.70	40.70	97.88	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	21.660	0.221	374.4	374.4	48.250	1.031	2.17		Unsaturated	51.0			20.47	1.70	34.80	90.41	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	20.220	0.194	393.6	393.6	43.881	0.971	2.19		Unsaturated	51.0			19.11	1.70	32.49	87.48	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	19.190	0.175	412.8	412.8	40.624	0.921	2.21		Unsaturated	51.0			18.14	1.70	30.83	85.39	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	18.450	0.168	433.2	433.2	38.089	0.920	2.23		Unsaturated	51.0			17.44	1.70	29.65	83.88	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	16.000	0.156	452.4	452.4	32.244	0.987	2.31		Unsaturated	51.0			15.12	1.70	25.71	78.89	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	15.770	0.165	472.8	472.8	31.060	1.063	2.34		Unsaturated	51.0			14.91	1.70	25.34	78.43	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	16.750	0.172	492.0	492.0	32.350	1.044	2.32		Unsaturated	51.0			15.83	1.70	26.91	80.42	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	17.580	0.177	512.4	512.4	33.274	1.021	2.30		Unsaturated	51.0			16.62	1.70	28.25	82.11	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	19.460	0.167	531.6	531.6	36.195	0.871	2.24		Unsaturated	51.0			18.39	1.70	31.27	85.94	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	20.920	0.197	550.8	550.8	38.246	0.953	2.24		Unsaturated	51.0			19.77	1.70	33.61	88.91	1.00	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	21.500	0.225	571.2	571.2	38.593	1.058	2.26		Unsaturated	51.0			20.32	1.70	34.55	90.09	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	24.020	0.222	590.4	590.4	42.452	0.935	2.19		Unsaturated	51.0			22.70	1.70	38.60	95.22	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	25.650	0.237	610.8	610.8	44.587	0.936	2.18		Unsaturated	51.0			24.24	1.70	41.21	98.53	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	26.760	0.351	630.0	630.0	45.808	1.327	2.25		Unsaturated	51.0			25.29	1.70	43.00	100.79	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	27.850	0.540	649.2	649.2	46.970	1.961	2.35		Unsaturated	51.0			26.32	1.70	44.75	103.00	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	27.210	0.764	669.6	669.6	45.156	2.841	2.47		Unsaturated	60.5			25.72	1.70	43.72	104.84	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	26.450	0.802	688.8	688.8	43.247	3.070	2.51		Unsaturated	63.4			25.00	1.70	42.50	104.04	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	25.650	0.654	709.2	709.2	41.298	2.586	2.47		Unsaturated	60.6			24.24	1.70	41.21	101.66	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	24.580	0.464	728.4	728.4	39.011	1.914	2.41		Unsaturated	55.4			23.23	1.70	39.50	97.92	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	24.050	0.422	747.6	747.6	37.649	1.783	2.40		Unsaturated	54.9			22.73	1.69	38.49	96.46	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.400	24.320	0.595	768.0	768.0	37.553	2.487	2.49		Unsaturated	62.2			22.99	1.66	38.23	98.26	0.99	0.566	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.560	22.780	0.825	787.2	787.2	42.277	3.683	2.57		Unsaturated	68.4			21.53	1.65	35.54	96.18	0.99	0.566	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.730	21.710	1.007	807.6	807.6	39.522	4.727	2.66		Unsaturated	76.1			20.52	1.63	33.52	94.98	0.99	0.566	1.098	n.a.	n.a.	n.a.	0.00	0.00
6.890	22.210	1.112	826.8	826.8	52.725	5.102	2.60		Unsaturated	71.2			20.99	1.62	33.91	94.63	0.99	0.566	1.096	n.a.	n.a.	n.a.	0.00	0.00
7.050	22.480	1.119	846.0	846.0	52.144	5.074	2.60		Unsaturated	71.3			21.25	1.60	33.92	94.66	0.99	0.565	1.093	n.a.	n.a.	n.a.	0.00	0.00
7.220	21.740	1.133	866.4	866.4	49.185	5.318	2.64		Unsaturated	73.9			20.55	1.58	32.50	93.29	0.99	0.565	1.090	n.a.	n.a.	n.a.	0.00	0.00
7.380	22.530	1.133	885.6	885.6	49.881	5.130	2.62		Unsaturated	72.6			21.29	1.56	33.25	94.04	0.99	0.565	1.088	n.a.	n.a.	n.a.	0.00	0.00
7.550	22.190	1.086	906.0	906.0	47.985	4.994	2.62		Unsaturated	72.8			20.97	1.55	32.44	93.03	0.99	0.564	1.085	n.a.	n.a.	n.a.	0.00	0.00
7.710	21.950	1.027	925.2	925.2	46.449	4.781	2.62		Unsaturated	72.5			20.75	1.53	31.80	92.14	0.99	0.564	1.083	n.a.	n.a.	n.a.	0.00	0.00
7.870	21.100	0.937	944.4	944.4	43.684	4.541	2.62		Unsaturated	72.7			19.94	1.52	30.35	90.30	0.99	0.564	1.079	n.a.	n.a.	n.a.	0.00	0.00
8.040	20.520	0.871	964.8	964.8	41.537	4.345	2.62		Unsaturated	72.8			19.40	1.51	29.26	88.92	0.99	0.564	1.077	n.a.	n.a.	n.a.	0.00	0.00
8.200	19.030	0.848	984.0	984.0	37.679	4.577	2.67		Unsaturated	76.5			17.99	1.50	26.98	86.56	0.98	0.563	1.073	n.a.	n.a.	n.a.	0.00	0.00
8.370	17.820	0.839	1004.4	1004.4	34.484	4.847	2.71		Unsaturated	80.1			16.84	1.49	25.08	84.62	0.98	0.563	1.070	n.a.	n.a.	n.a.	0.00	0.00
8.530	17.630	0.809	1023.6	1023.6	33.447	4.726	2.72		Unsaturated	80.2			16.66	1.48	24.59	84.01	0.98	0.563	1.068	n.a.	n.a.	n.a.	0.00	0.00
8.690	17.500	0.781	1042.8	1042.8	32.563	4.598	2.72		Unsaturated	80.3			16.54	1.46	24.19	83.49	0.98	0.562	1.066	n.a.	n.a.	n.a.	0.00	0.00
8.860	17.830	0.842	1063.2	1063.2	32.540	4.870	2.73		Unsaturated	81.7			16.85	1.45	24.37	83.91	0.98	0.562	1.065	n.a.	n.a.	n.a.	0.00	0.00
9.020	17.790	0.915	1082.4	1082.4	31.871	5.303	2.77		Unsaturated	84.2			16.81	1.43	24.09	83.87	0.98	0.562	1.063	n.a.	n.a.	n.a.	0.00	0.00
9.190	17.000	0.939	1102.8	1102.8	29.831	5.709	2.81		Unsaturated	87.7			16.07	1.42	22.84	82.65	0.98	0.562	1.060	n.a.	n.a.	n.a.	0.00	0.00
9.350	17.120	0.954	1122.0	1122.0	29.517	5.759	2.81		Unsaturated	88.2			16.18	1.41	22.78	82.64	0.98	0.561	1.059	n.a.	n.a.	n.a.	0.00	0.00
9.510	17.090	0.968	1141.2	1141.2	28.951	5.859	2.83		Unsaturated	89.1			16.15	1.40	22.54	82.42	0.98	0.561	1.057	n.a.	n.a.	n.a.	0.00	0.00
9.680	16.630	0.967	1161.6	1161.6	27.633	6.025	2.85		Unsaturated	90.9			15.72	1.38	21.76	81.59	0.98	0.561	1.055	n.a.	n.a.	n.a.	0.00	0.00
9.840	16.700	0.956	1180.8	1180.8	27.286	5.935	2.85		Unsaturated	90.8			15.78	1.37	21.66	81.46	0.98	0.560	1.054	n.a.	n.a.	n.a.	0.00	0.00
10.010	15.950	0.935	1201.2	1201.2	25.557	6.090	2.88		Clay	93.1			15.08	1.16	n.a.	n.a.	0.98	0.560	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.170	14.750	0.881	1220.4	1220.4	23.172	6.227	2.91		Clay	96.1			13.94	1.16	n.a.	n.a.	0.98	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.330	14.280	0.822	1239.6	1239.6	22.040	6.017	2.92		Clay	96.5			13.50	1.15	n.a.	n.a.	0.98	0.569	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.500	13.890	0.783	1260.0	1260.0	21.048	5.902	2.93		Clay	97.2			13.13	1.15	n.a.	n.a.	0.98	0.573	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	13.590	0.743	1279.2	1279.2	20.248	5.735	2.93		Clay	97.5			12.84	1.14	n.a.	n.a.	0.98	0.577	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.830	13.420	0.732	1299.6	1299.6	19.653	5.732	2.94		Clay	98.3			12.68	1.14	n.a.	n.a.	0.98	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.990	13.290	0.728	1318.8	1318.8	19.155	5.764	2.95		Clay	99.1			12.56	1.13	n.a.	n.a.	0.98	0.586	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.150	13.540	0.842	1338.0	1338.0	19.239	6.540	2.99		Clay	100.0			12.80	1.13	n.a.	n.a.	0.98	0.589	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 2

PGA (A_{max}) 0.88

Total Settlement: 0.28 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\text{ atm}}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
11.320	15.050	0.958	1358.4	1358.4	21.158	6.669	2.96		Clay	100.0			14.22	1.12	n.a.	n.a.	0.97	0.593	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	16.130	1.138	1377.6	1377.6	22.418	7.368	2.97		Clay	100.0			15.25	1.12	n.a.	n.a.	0.97	0.597	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.650	22.640	0.759	1398.0	1398.0	31.389	3.460	2.64		Clay	74.5			21.40	1.12	n.a.	n.a.	0.97	0.601	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.810	46.390	0.738	1417.2	1417.2	52.759	1.615	2.26		Sand	43.6	184.88	1.12	207.07	1.11	230.16	331.51	0.97	0.605	1.100	#########	########	##########	0.00	0.00
11.980	86.660	0.625	1437.6	1437.6	98.550	0.728	1.83		Sand	9.4	184.88	1.12	207.07	1.11	230.73	239.90	0.97	0.608	1.100	42.557	102.988	169.31	0.00	0.00
12.140	107.190	0.737	1456.8	1456.8	121.273	0.693	1.75		Sand	2.6	184.88	1.12	207.07	1.11	230.80	230.80	0.97	0.612	1.100	17.633	42.673	69.76	0.00	0.00
12.300	127.660	0.697	1476.0	1476.0	143.637	0.549	1.63		Sand	0.0	184.88	1.12	207.07	1.11	230.00	230.00	0.97	0.615	1.100	16.410	39.712	64.56	0.00	0.00
12.470	148.210	0.955	1496.4	1496.4	165.740	0.647	1.62		Sand	0.0	184.88	1.12	207.07	1.11	229.16	229.16	0.97	0.619	1.100	15.229	36.853	59.57	0.00	0.00
12.630	168.490	0.796	1515.6	1515.6	187.325	0.475	1.50		Sand	0.0	184.88	1.12	207.07	1.10	228.38	228.38	0.97	0.622	1.100	14.216	34.403	55.32	0.00	0.00
12.800	195.600	0.785	1536.0	1536.0	216.141	0.403	1.40		Sand	0.0		1.12	207.06	1.10	227.55	227.55	0.97	0.625	1.096	13.231	31.906	51.03	0.00	0.00
12.960	194.400	0.995	1555.2	1555.2	213.469	0.514	1.47		Sand	0.0		1.12	205.79	1.10	225.50	225.50	0.97	0.628	1.092	11.111	26.703	42.50	0.00	0.00
13.120	184.080	0.908	1574.4	1574.4	200.845	0.495	1.48		Sand	0.0		1.12	194.87	1.10	213.68	213.68	0.97	0.631	1.089	4.478	10.725	16.99	0.00	0.00
13.290	181.690	1.017	1594.8	1594.8	196.943	0.562	1.52		Sand	0.0		1.12	192.34	1.09	210.32	210.32	0.97	0.635	1.084	3.558	8.487	13.37	0.00	0.00
13.450	182.630	0.920	1614.0	1614.0	196.775	0.506	1.50		Sand	0.0		1.12	193.33	1.09	210.59	210.59	0.97	0.638	1.081	3.623	8.616	13.51	0.00	0.00
13.620	171.960	0.902	1634.4	1634.4	184.057	0.527	1.53		Sand	0.0		1.12	182.04	1.09	198.32	198.32	0.97	0.641	1.067	1.721	4.039	6.30	0.00	0.00
13.780	172.560	0.823	1653.6	1653.6	183.616	0.479	1.51		Sand	0.0		1.12	182.67	1.09	198.25	198.25	0.97	0.644	1.064	1.714	4.011	6.23	0.00	0.00
13.940	173.000	0.749	1672.8	1672.8	183.017	0.435	1.48		Sand	0.0		1.12	183.14	1.08	198.01	198.01	0.97	0.646	1.060	1.692	3.947	6.11	0.00	0.00
14.110	169.240	0.669	1693.2	1693.2	177.928	0.398	1.47		Sand	0.0	163.52	1.12	183.14	1.08	197.26	197.26	0.97	0.649	1.057	1.625	3.778	5.82	0.00	0.00
14.270	154.260	0.504	1712.4	1712.4	161.178	0.328	1.46		Sand	0.0	163.52	1.12	183.14	1.07	196.56	196.56	0.96	0.652	1.053	1.565	3.627	5.56	0.00	0.00
14.440	124.300	0.222	1732.8	1732.8	128.923	0.180	1.44		Sand	0.0	163.52	1.12	183.14	1.07	195.82	195.82	0.96	0.655	1.050	1.505	3.477	5.31	0.00	0.00
14.600	83.670	0.511	1752.0	1752.0	86.001	0.617	1.84		Sand	10.0	163.52	1.12	183.14	1.06	194.65	205.16	0.96	0.657	1.053	2.560	5.928	9.02	0.00	0.00
14.760	48.260	0.605	1771.2	1771.2	48.942	1.278	2.22		Sand	40.6	163.52	1.12	183.14	1.05	191.94	280.83	0.96	0.660	1.053	11474.593	26591.157	40291.23	0.00	0.00
14.930	21.630	0.624	1791.6	1791.6	23.146	3.009	2.71		Clay	79.4			20.44	1.04	n.a.	n.a.	0.96	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	16.790	0.542	1810.8	1810.8	17.544	3.415	2.83		Clay	89.7			15.87	1.04	n.a.	n.a.	0.96	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	13.770	0.398	1831.2	1831.2	14.039	3.099	2.88		Clay	93.8			13.02	1.04	n.a.	n.a.	0.96	0.668	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	12.130	0.307	1850.4	1850.4	12.111	2.736	2.91		Clay	95.5			11.47	1.04	n.a.	n.a.	0.96	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	10.990	0.268	1869.6	1869.6	10.757	2.667	2.94		Clay	98.4			10.39	1.03	n.a.	n.a.	0.96	0.672	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	11.180	0.266	1890.0	1890.0	10.831	2.598	2.93		Clay	97.6			10.57	1.03	n.a.	n.a.	0.96	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	12.240	0.301	1909.2	1909.2	11.822	2.665	2.91		Clay	95.6			11.57	1.03	n.a.	n.a.	0.96	0.677	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	14.000	0.331	1929.6	1929.6	13.511	2.540	2.85		Clay	90.9			13.23	1.02	n.a.	n.a.	0.96	0.680	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	15.170	0.320	1948.8	1948.8	14.569	2.257	2.79		Clay	86.4			14.34	1.02	n.a.	n.a.	0.96	0.682	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	13.710	0.299	1968.0	1968.0	12.933	2.349	2.84		Clay	90.6			12.96	1.02	n.a.	n.a.	0.96	0.684	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	12.670	0.339	1988.4	1988.4	11.744	2.903	2.93		Clay	97.5			11.98	1.02	n.a.	n.a.	0.96	0.686	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	12.630	0.343	2007.6	2007.6	11.582	2.950	2.94		Clay	98.2			11.94	1.01	n.a.	n.a.	0.96	0.688	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	15.930	0.481	2028.0	2028.0	14.710	3.227	2.88		Clay	93.3			15.06	1.01	n.a.	n.a.	0.95	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	24.070	0.518	2047.2	2047.2	22.515	2.247	2.64		Clay	74.0			22.75	1.01	n.a.	n.a.	0.95	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	31.930	0.530	2066.4	2066.4	29.551	1.714	2.47		Sand	60.8	39.3	1.8	70.74	1.01	71.45	140.43	0.95	0.694	1.003	0.236	0.371	0.53	0.02	0.03
17.390	36.280	0.761	2086.8	2086.8	33.537	2.160	2.49		Sand	62.2	39.3	1.8	70.74	1.01	71.15	140.47	0.95	0.696	1.002	0.236	0.371	0.53	0.02	0.03
17.550	41.580	0.936	2106.0	2106.0	38.396	2.310	2.46		Sand	60.0		1.8	70.74	1.00	70.88	139.47	0.95	0.698	1.001	0.232	0.361	0.52	0.02	0.03
17.720	34.250	1.073	2126.4	2126.4	31.214	3.233	2.63		Clay	73.1			32.37	1.00	n.a.	n.a.	0.95	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.880	31.870	1.133	2145.6	2145.6	28.707	3.679	2.69		Clay	78.2			30.12	1.00	n.a.	n.a.	0.95	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.040	30.610	0.848	2164.8	2164.8	27.280	2.871	2.64		Clay	74.0			28.93	0.99	n.a.	n.a.	0.95	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.210	17.690	0.607	2185.2	2185.2	15.191	3.655	2.90		Clay	95.1			16.72	0.99	n.a.	n.a.	0.95	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.370	10.660	0.397	2204.4	2204.4	8.672	4.157	3.13		Clay	100.0			10.08	0.99	n.a.	n.a.	0.95	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.540	9.730	0.306	2224.8	2224.8	7.747	3.551	3.13		Clay	100.0			9.20	0.99	n.a.	n.a.	0.95	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.700	9.140	0.294	2244.0	2244.0	7.146	3.666	3.17		Clay	100.0			8.64	0.98	n.a.	n.a.	0.95	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.860	8.640	0.288	2263.2	2263.2	6.635	3.840	3.20		Clay	100.0			8.17	0.98	n.a.	n.a.	0.95	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.030	8.350	0.281	2283.6	2283.6	6.313	3.897	3.23		Clay	100.0			7.89	0.98	n.a.	n.a.	0.95	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.190	8.160	0.278	2302.8	2302.8	6.087	3.969	3.24		Clay	100.0			7.71	0.98	n.a.	n.a.	0.95	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.360	8.070	0.274	2323.2	2323.2	5.947	3.972	3.25		Clay	100.0			7.63	0.98	n.a.	n.a.	0.95	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.520	8.100	0.264	2342.4	2342.4	5.916	3.806	3.24		Clay	100.0			7.66	0.97	n.a.	n.a.	0.94	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.690	7.990	0.268	2362.8	2362.8	5.763	3.930	3.26		Clay	100.0			7.55	0.97	n.a.	n.a.	0.94	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.850	7.850	0.260	2382.0	2382.0	5.591	3.898	3.27		Clay	100.0			7.42	0.97	n.a.	n.a.	0.94	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.010	7.520	0.243	2401.3	2400.6	5.265	3.837	3.29		Clay	100.0			7.11	0.97	n.a.	n.a.	0.94	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.180	7.070	0.217	2422.5	2411.3	4.859	3.706	3.31		Clay	100.0			6.68	0.97	n.a.	n.a.	0.94	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	7.410	0.225	2442.5	2421.3	5.112	3.639	3.29		Clay	100.0			7.00	0.97	n.a.	n.a.	0.94	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	7.910	0.240	2463.8	2431.9	5.492	3.598	3.26		Clay	100.0			7.48	0.96	n.a.	n.a.	0.94	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	8.540	0.256	2483.8	2441.9	5.977	3.501	3.22		Clay	100.0			8.07	0.96	n.a.	n.a.	0.94	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	8.390	0.242	2503.8	2452.0	5.822	3.383	3.22		Clay	100.0			7.93	0.96	n.a.	n.a.	0.94	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	8.260	0.214	2525.0	2462.6	5.683	3.060	3.21		Clay	100.0			7.81	0.96	n.a.	n.a.	0.94	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	7.710	0.199	2545.0	2472.6	5.207	3.093	3.24		Clay	100.0			7.29	0.96	n.a.	n.a.	0.94	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.330	7.670	0.209	2566.3	2483.3	5.144	3.279	3.26		Clay	100.0			7.25	0.96	n.a.	n.a.	0.94	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	7.830	0.233	2586.3	2493.3	5.244	3.558	3.27		Clay	100.0			7.40	0.96	n.a.	n.a.	0.94	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	7.980	0.235	2606.3	2503.3	5.334	3.517	3.26		Clay	100.0			7.54	0.96	n.a.	n.a.	0.94	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.820	7.910	0.243	2627.5	2513.9	5.248	3.678	3.28		Clay	100.0			7.48	0.96	n.a.	n.a.	0.94	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	8.270	0.231	2647.5	2523.9	5.504	3.326	3.24		Clay	100.0			7.82	0.95	n.a.	n.a.	0.93	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	8.480	0.222	2668.8	2534.6	5.638	3.100	3.21		Clay	100.0			8.02	0.95	n.a.	n.a.	0.93	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 2

PGA (A_{max}) 0.88

Total Settlement: 0.28 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
22.310	8.510	0.215	2688.8	2544.6	5.632	3.005	3.21		Clay	100.0			8.04	0.95	n.a.	n.a.	0.93	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	8.000	0.204	2708.8	2554.6	5.203	3.062	3.24		Clay	100.0			7.56	0.95	n.a.	n.a.	0.93	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	7.890	0.211	2730.0	2565.3	5.087	3.229	3.26		Clay	100.0			7.46	0.95	n.a.	n.a.	0.93	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	7.800	0.316	2750.0	2575.3	4.990	4.911	3.37		Clay	100.0			7.37	0.95	n.a.	n.a.	0.93	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	8.290	0.380	2771.3	2585.9	5.340	5.497	3.37		Clay	100.0			7.84	0.95	n.a.	n.a.	0.93	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	11.040	0.353	2791.3	2595.9	7.430	3.657	3.15		Clay	100.0			10.43	0.95	n.a.	n.a.	0.93	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	12.890	0.288	2811.3	2606.0	8.814	2.508	3.00		Clay	100.0			12.18	0.95	n.a.	n.a.	0.93	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	10.540	0.362	2832.5	2616.6	6.974	3.967	3.19		Clay	100.0			9.96	0.95	n.a.	n.a.	0.93	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	9.710	0.465	2852.5	2626.6	6.308	5.617	3.32		Clay	100.0			9.18	0.94	n.a.	n.a.	0.93	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	11.300	0.867	2873.8	2637.3	7.480	8.792	3.38		Clay	100.0			10.68	0.94	n.a.	n.a.	0.93	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	25.420	0.850	2893.8	2647.3	18.112	3.546	2.83		Clay	89.6			24.03	0.94	n.a.	n.a.	0.93	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	15.640	0.619	2913.8	2657.3	10.675	4.366	3.07		Clay	100.0			14.78	0.94	n.a.	n.a.	0.93	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	9.940	0.537	2935.0	2667.9	6.351	6.332	3.35		Clay	100.0			9.40	0.94	n.a.	n.a.	0.92	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	8.970	0.600	2955.0	2677.9	5.596	8.004	3.45		Clay	100.0			8.48	0.94	n.a.	n.a.	0.92	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	8.630	0.564	2976.3	2688.6	5.313	7.903	3.47		Clay	100.0			8.16	0.94	n.a.	n.a.	0.92	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	9.760	0.506	2996.3	2698.6	6.123	6.121	3.35		Clay	100.0			9.22	0.94	n.a.	n.a.	0.92	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	10.550	0.507	3016.3	2708.6	6.676	5.608	3.30		Clay	100.0			9.97	0.94	n.a.	n.a.	0.92	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	11.360	0.495	3037.5	2719.3	7.238	5.031	3.24		Clay	100.0			10.74	0.94	n.a.	n.a.	0.92	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	11.990	0.419	3057.5	2729.3	7.666	4.001	3.16		Clay	100.0			11.33	0.94	n.a.	n.a.	0.92	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	12.720	0.423	3078.8	2739.9	8.161	3.786	3.13		Clay	100.0			12.02	0.93	n.a.	n.a.	0.92	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	13.570	0.456	3098.8	2749.9	8.742	3.793	3.10		Clay	100.0			12.83	0.93	n.a.	n.a.	0.92	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	14.100	0.513	3118.8	2760.0	9.088	4.093	3.11		Clay	100.0			13.33	0.93	n.a.	n.a.	0.92	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	14.850	0.535	3140.0	2770.6	9.586	4.028	3.09		Clay	100.0			14.04	0.93	n.a.	n.a.	0.92	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	15.610	0.570	3160.0	2780.6	10.091	4.061	3.07		Clay	100.0			14.75	0.93	n.a.	n.a.	0.92	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	15.790	0.588	3181.3	2791.3	10.174	4.139	3.07		Clay	100.0			14.92	0.93	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	16.700	0.633	3201.3	2801.3	10.780	4.189	3.06		Clay	100.0			15.78	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	17.750	0.668	3221.3	2811.3	11.482	4.138	3.03		Clay	100.0			16.78	0.93	n.a.	n.a.	0.91	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	18.940	0.702	3242.5	2821.9	12.274	4.052	3.00		Clay	100.0			17.90	0.93	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	19.230	0.737	3262.5	2831.9	12.429	4.185	3.01		Clay	100.0			18.18	0.93	n.a.	n.a.	0.91	0.767	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	19.780	0.795	3283.8	2842.6	12.762	4.384	3.01		Clay	100.0			18.70	0.93	n.a.	n.a.	0.91	0.767	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	20.220	0.817	3303.8	2852.6	13.018	4.398	3.00		Clay	100.0			19.11	0.92	n.a.	n.a.	0.91	0.768	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	20.080	0.812	3325.0	2863.2	12.865	4.409	3.01		Clay	100.0			18.98	0.92	n.a.	n.a.	0.91	0.768	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	18.830	0.776	3345.0	2873.3	11.943	4.525	3.04		Clay	100.0			17.80	0.92	n.a.	n.a.	0.91	0.769	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	18.230	0.801	3365.0	2883.3	11.478	4.841	3.07		Clay	100.0			17.23	0.92	n.a.	n.a.	0.91	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	19.230	0.903	3386.3	2893.9	12.120	5.148	3.07		Clay	100.0			18.18	0.92	n.a.	n.a.	0.91	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	20.990	0.993	3406.3	2903.9	13.283	5.146	3.04		Clay	100.0			19.84	0.92	n.a.	n.a.	0.91	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	22.720	1.029	3427.5	2914.6	14.415	4.900	3.00		Clay	100.0			21.47	0.92	n.a.	n.a.	0.91	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	22.730	1.034	3447.5	2924.6	14.365	4.924	3.00		Clay	100.0			21.48	0.92	n.a.	n.a.	0.91	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	22.630	1.065	3467.5	2934.6	14.241	5.096	3.01		Clay	100.0			21.39	0.92	n.a.	n.a.	0.91	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	21.460	1.047	3488.8	2945.2	13.388	5.313	3.05		Clay	100.0			20.28	0.92	n.a.	n.a.	0.91	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	20.360	0.978	3508.8	2955.3	12.592	5.256	3.06		Clay	100.0			19.24	0.92	n.a.	n.a.	0.90	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	18.680	0.882	3530.0	2965.9	11.406	5.215	3.09		Clay	100.0			17.66	0.91	n.a.	n.a.	0.90	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	17.250	0.810	3550.0	2975.9	10.400	5.232	3.13		Clay	100.0			16.30	0.91	n.a.	n.a.	0.90	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	16.750	0.787	3570.0	2985.9	10.024	5.258	3.14		Clay	100.0			15.83	0.91	n.a.	n.a.	0.90	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	16.350	0.796	3591.3	2996.6	9.714	5.466	3.16		Clay	100.0			15.45	0.91	n.a.	n.a.	0.90	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	16.080	0.783	3611.3	3006.6	9.495	5.487	3.17		Clay	100.0			15.20	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	16.230	0.777	3632.5	3017.2	9.554	5.390	3.16		Clay	100.0			15.34	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	16.670	0.762	3652.5	3027.3	9.807	5.133	3.14		Clay	100.0			15.76	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	16.750	0.756	3672.5	3037.3	9.821	5.070	3.14		Clay	100.0			15.83	0.91	n.a.	n.a.	0.90	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	16.940	0.769	3693.8	3047.9	9.904	5.096	3.14		Clay	100.0			16.01	0.91	n.a.	n.a.	0.90	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	17.110	0.772	3713.8	3057.9	9.976	5.064	3.13		Clay	100.0			16.17	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	17.090	0.743	3735.0	3068.6	9.922	4.882	3.12		Clay	100.0			16.15	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	15.690	0.670	3755.0	3078.6	8.973	4.847	3.16		Clay	100.0			14.83	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	14.110	0.586	3775.0	3088.6	7.915	4.795	3.20		Clay	100.0			13.34	0.91	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	12.600	0.421	3796.3	3099.2	6.906	3.933	3.20		Clay	100.0			11.91	0.90	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	11.920	0.392	3816.3	3109.3	6.440	3.919	3.22		Clay	100.0			11.27	0.90	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	10.980	0.433	3837.5	3119.9	5.809	4.773	3.31		Clay	100.0			10.38	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	11.730	0.387	3857.5	3129.9	6.263	3.952	3.23		Clay	100.0			11.09	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	13.550	0.330	3877.5	3139.9	7.396	2.839	3.09		Clay	100.0			12.81	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	11.310	0.247	3898.8	3150.6	5.942	2.639	3.16		Clay	100.0			10.69	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	11.540	0.252	3918.8	3160.6	6.063	2.625	3.15		Clay	100.0			10.91	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	10.970	0.232	3940.0	3171.2	5.676	2.577	3.17		Clay	100.0			10.37	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	11.860	0.215	3960.0	3181.2	6.211	2.178	3.10		Clay	100.0			11.21	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	11.980	0.206	3980.0	3191.3	6.261	2.064	3.08		Clay	100.0			11.32	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	11.030	0.221	4001.3	3201.9	5.640	2.445	3.16		Clay	100.0			10.43	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	10.210	0.217	4021.3	3211.9	5.106	2.640	3.21		Clay	100.0			9.65	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	11.360	0.272	4042.5	3222.6	5.796	2.910	3.19		Clay	100.0			10.74	0.89	n.a.	n.a.	0.88	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE
EARTH GROUP

CPT No. 2

PGA (A_{max}) 0.88

Total Settlement: 0.28 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
33.300	12.760	0.327	4062.5	3232.6	6.638	3.051	3.15		Clay	100.0			12.06	0.89	n.a.	n.a.	0.88	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	14.790	0.373	4082.5	3242.6	7.863	2.925	3.08		Clay	100.0			13.98	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	16.130	0.342	4103.8	3253.2	8.655	2.428	3.00		Clay	100.0			15.25	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	16.280	0.325	4123.8	3263.3	8.714	2.283	2.98		Clay	100.0			15.39	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	15.850	0.360	4145.0	3273.9	8.417	2.614	3.03		Clay	100.0			14.98	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	17.690	0.359	4165.0	3283.9	9.505	2.297	2.95		Clay	99.1			16.72	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	16.600	0.497	4185.0	3293.9	8.809	3.425	3.07		Clay	100.0			15.69	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	17.460	2.082	4206.3	3304.6	9.294	13.559	3.43		Clay	100.0			16.50	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	21.490	3.536	4226.3	3314.6	11.692	18.246	3.45		Clay	100.0			20.31	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	55.270	4.454	4247.5	3325.2	31.965	8.381	2.91		Clay	95.6			52.24	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	98.950	4.324	4267.5	3335.2	72.888	4.466	2.47		Sand	60.3	230.04		230.04	0.89	204.02	310.06	0.88	0.784	0.863	#########	########	##########	0.00	0.00
35.100	121.640	3.657	4287.5	3345.3	89.828	3.061	2.28		Sand	45.6	230.04		230.04	0.89	203.86	300.42	0.88	0.784	0.863	#########	########	1296327.15	0.00	0.00
35.270	154.150	4.144	4308.8	3355.9	114.077	2.727	2.18		Sand	37.1	230.04		230.04	0.89	203.69	291.33	0.87	0.784	0.862	80898.529	########	195559.67	0.00	0.00
35.430	179.990	4.550	4328.8	3365.9	133.265	2.559	2.11		Sand	32.0	230.04		230.04	0.88	203.53	283.56	0.87	0.784	0.861	18656.466	35328.737	45047.04	0.00	0.00
35.600	187.380	5.595	4350.0	3376.6	138.576	3.021	2.16		Sand	35.6	230.04		230.04	0.88	203.36	288.91	0.87	0.784	0.860	50490.294	95505.533	121763.46	0.00	0.00
35.760	229.540	3.798	4370.0	3386.6	169.862	1.671	1.90		Sand	15.2	230.04		230.04	0.87	200.93	233.30	0.87	0.784	0.859	22.215	41.977	53.51	0.00	0.00
35.930	243.380	3.957	4391.3	3397.2	179.912	1.641	1.88		Sand	13.4			230.04	0.87	199.74	224.43	0.87	0.785	0.858	10.163	19.184	24.45	0.00	0.00
36.090	232.500	3.414	4411.3	3407.2	171.536	1.483	1.86		Sand	11.8			219.75	0.86	188.53	205.90	0.87	0.785	0.866	2.680	5.103	6.50	0.00	0.00
36.250	229.220	3.750	4431.3	3417.3	168.837	1.652	1.90		Sand	15.0			216.65	0.86	187.02	217.53	0.87	0.785	0.856	5.913	11.138	14.20	0.00	0.00
36.420	220.130	3.551	4452.5	3427.9	161.817	1.629	1.91		Sand	15.6			208.06	0.86	178.71	210.93	0.87	0.785	0.855	3.707	6.975	8.89	0.00	0.00
36.580	261.540	3.289	4472.5	3437.9	192.280	1.268	1.78		Sand	5.2			247.20	0.86	212.36	212.64	0.87	0.785	0.854	4.165	7.829	9.98	0.00	0.00
36.750	286.010	3.421	4493.8	3448.6	210.092	1.206	1.73		Sand	1.8			270.33	0.87	235.15	235.15	0.87	0.785	0.853	26.496	49.750	63.40	0.00	0.00
36.910	295.460	3.739	4513.8	3458.6	216.767	1.275	1.74		Sand	2.6			279.26	0.87	243.94	243.94	0.87	0.785	0.853	65.386	122.646	156.28	0.00	0.00
37.070	281.580	3.163	4533.8	3468.6	206.199	1.132	1.72		Sand	0.6			266.14	0.87	230.49	230.49	0.87	0.785	0.852	17.154	32.143	40.96	0.00	0.00
37.240	239.440	2.830	4555.0	3479.2	174.814	1.193	1.79		Sand	5.8			226.31	0.84	191.04	191.71	0.87	0.785	0.881	1.222	2.367	3.02	0.00	0.00
37.400	212.160	2.897	4575.0	3489.2	154.476	1.381	1.87		Sand	12.5			200.53	0.84	168.62	187.50	0.86	0.785	0.886	1.001	1.950	2.48	0.00	0.00
37.570	207.970	2.285	4596.3	3499.9	151.154	1.111	1.81		Sand	7.6			196.57	0.83	162.45	165.42	0.86	0.785	0.908	0.435	0.736	0.94	0.01	0.01
37.730	210.210	2.522	4616.3	3509.9	152.575	1.213	1.83		Sand	9.5			198.69	0.83	164.98	173.00	0.86	0.785	0.900	0.558	0.993	1.27	0.00	0.00
37.890	203.370	2.284	4636.3	3519.9	147.338	1.136	1.82		Sand	8.8			192.22	0.82	158.35	164.03	0.86	0.785	0.908	0.417	0.699	0.89	0.01	0.01
38.060	199.000	1.860	4657.5	3530.6	143.910	0.946	1.78		Sand	5.0			188.09	0.82	153.48	153.67	0.86	0.785	0.915	0.315	0.493	0.63	0.02	0.01
38.220	215.910	1.597	4677.5	3540.6	156.055	0.748	1.68		Sand	0.0			204.07	0.82	168.30	168.30	0.86	0.785	0.903	0.476	0.820	1.04	0.01	0.01
38.390	222.160	1.948	4698.8	3551.2	160.373	0.886	1.72		Sand	0.7			209.98	0.83	173.70	173.70	0.86	0.785	0.897	0.572	1.021	1.30	0.00	0.00
38.550	220.180	2.770	4718.8	3561.2	158.698	1.272	1.83		Sand	9.8			208.11	0.83	173.06	182.01	0.86	0.785	0.888	0.788	1.486	1.89	0.00	0.00
38.710	236.370	3.277	4738.8	3571.2	170.247	1.401	1.84		Sand	10.5			223.41	0.84	188.06	200.26	0.86	0.785	0.862	1.917	3.637	4.63	0.00	0.00
38.880	256.000	3.522	4760.0	3581.9	184.247	1.389	1.82		Sand	8.5			241.97	0.85	204.91	210.52	0.86	0.785	0.843	3.607	6.687	8.52	0.00	0.00
39.040	279.330	4.573	4780.0	3591.9	200.907	1.651	1.85		Sand	11.1			264.02	0.86	228.30	244.43	0.86	0.785	0.841	68.998	127.699	162.77	0.00	0.00
39.210	315.090	3.769	4801.3	3602.5	226.506	1.205	1.71		Sand	0.1			297.82	0.87	258.81	258.81	0.86	0.784	0.840	393.815	728.086	928.15	0.00	0.00
39.370	301.120	2.893	4821.3	3612.6	216.079	0.969	1.66		Sand	0.0			284.61	0.86	245.96	245.96	0.86	0.784	0.840	81.700	150.898	192.38	0.00	0.00
39.530	289.560	2.928	4841.3	3622.6	207.423	1.020	1.68		Sand	0.0			273.69	0.86	234.67	234.67	0.85	0.784	0.839	25.314	46.708	59.55	0.00	0.00
39.700	271.850	2.444	4862.5	3633.2	194.336	0.907	1.67		Sand	0.0			256.95	0.85	217.69	217.69	0.85	0.784	0.838	5.985	11.032	14.07	0.00	0.00
39.860	281.260	2.213	4882.5	3643.2	200.840	0.794	1.62		Sand	0.0			265.84	0.85	226.34	226.34	0.85	0.784	0.837	11.929	21.967	28.01	0.00	0.00
40.030	299.060	2.137	4903.8	3653.9	213.343	0.720	1.57		Sand	0.0			282.67	0.86	243.08	243.08	0.85	0.784	0.836	59.528	109.501	139.66	0.00	0.00
40.190	290.720	1.807	4923.8	3663.9	207.053	0.627	1.54		Sand	0.0			274.78	0.85	234.88	234.88	0.85	0.784	0.835	25.827	47.461	60.54	0.00	0.00
40.350	279.270	1.351	4943.8	3673.9	198.551	0.488	1.48		Sand	0.0			263.96	0.85	223.80	223.80	0.85	0.784	0.834	9.651	17.718	22.60	0.00	0.00
40.520	261.550	1.567	4965.0	3684.6	185.564	0.605	1.56		Sand	0.0			247.21	0.84	206.97	206.97	0.85	0.784	0.842	2.864	5.303	6.77	0.00	0.00
40.680	212.950	1.246	4985.0	3694.6	150.541	0.592	1.63		Sand	0.0			201.28	0.81	162.57	162.57	0.85	0.784	0.900	0.399	0.657	0.84	0.01	0.01
40.850	167.740	1.903	5006.3	3705.2	118.025	1.152	1.90		Sand	14.7			158.54	0.80	126.59	150.89	0.85	0.783	0.910	0.294	0.450	0.57	0.02	0.01
41.010	137.870	2.490	5026.3	3715.2	96.552	1.840	2.10		Sand	31.0			130.31	0.81	105.07	163.00	0.85	0.783	0.899	0.404	0.666	0.85	0.01	0.01
41.170	112.190	2.545	5046.3	3725.2	78.121	2.321	2.24		Sand	41.9			106.04	0.79	84.25	147.89	0.85	0.783	0.911	0.275	0.412	0.53	0.02	0.01
41.340	85.300	2.593	5067.5	3735.9	58.875	3.133	2.42		Sand	56.2			80.62	0.78	62.71	127.78	0.85	0.783	0.925	0.191	0.255	0.33	0.02	0.01
41.500	102.040	2.088	5087.5	3745.9	70.681	2.098	2.24		Sand	42.0			96.45	0.78	75.66	137.21	0.85	0.783	0.918	0.223	0.313	0.40	0.02	0.01
41.670	123.420	1.855	5108.8	3756.5	85.739	1.535	2.08		Sand	29.6			116.65	0.79	92.17	145.65	0.84	0.783	0.912	0.262	0.387	0.49	0.02	0.01
41.830	140.350	1.697	5128.8	3766.6	97.612	1.232	1.98		Sand	21.2			132.66	0.79	104.64	145.10	0.84	0.783	0.912	0.259	0.381	0.49	0.02	0.01
41.990	156.650	1.606	5148.8	3776.6	109.008	1.042	1.89		Sand	14.5			148.06	0.78	115.90	138.53	0.84	0.783	0.916	0.228	0.323	0.41	0.02	0.01
42.160	157.940	1.647	5170.0	3787.2	109.758	1.060	1.90		Sand	14.7			149.28	0.78	116.94	140.36	0.84	0.782	0.914	0.236	0.337	0.43	0.02	0.01
42.320	167.770	1.468	5190.0	3797.2	116.542	0.889	1.83		Sand	9.1			158.57	0.77	122.54	128.42	0.84	0.782	0.922	0.193	0.258	0.33	0.02	0.01
42.490	173.450	1.368	5211.3	3807.9	120.374	0.801	1.79		Sand	5.9			163.94	0.77	126.33	126.96	0.84	0.782	0.923	0.189	0.251	0.32	0.02	0.01
42.650	151.350	2.093	5231.3	3817.9	104.658	1.407	1.99		Sand	22.5	163.94		163.94	0.81	132.86	180.73	0.84	0.782	0.874	0.748	1.374	1.76	0.00	0.00
42.810	119.020	2.594	5251.3	3827.9	81.794	2.229	2.21		Sand	39.8	163.94		163.94	0.83	135.95	210.49	0.84	0.782	0.823	3.600	6.519	8.34	0.00	0.00
42.980	80.370	2.780	5272.5	3838.5	54.550	3.576	2.48		Sand	61.4	163.94		163.94	0.84	137.31	225.07	0.84	0.781	0.821	10.713	19.358	24.77	0.00	0.00
43.140	50.350	2.173	5292.5	3848.6	24.790	4.556	2.80		Clay	87.0			47.59	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	33.090	1.311	5313.8	3859.2	15.772	4.308	2.93		Clay	97.6			31.28	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	21.720	0.848	5333.8	3869.2	9.849	4.449	3.10		Clay	100.0			20.53	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	16.630	0.699	5355.0	3879.9	7.192	5.012	3.24		Clay	100.0			15.72	0.85	n.a.	n.a.	0.83	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	16.060	0.684	5375.0	3889.9	6.876	5.115	3.26		Clay	100.0			15.18	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	17.620	0.679	5395.0	3899.9	7.653	4.548	3.20		Clay	100.0			16.65	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	19.340	0.845	5416.3	3910.5	8.506	5.082	3.19		Clay	100.0			18.28	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.88

Total Settlement:	0.28	(Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'vc=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
44.290	25.190	0.868	5436.3	3920.6	11.464	3.862	3.01		Clay	100.0			23.81	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	24.460	0.813	5457.5	3931.2	11.056	3.743	3.02		Clay	100.0			23.12	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	21.550	0.678	5477.5	3941.2	9.546	3.605	3.06		Clay	100.0			20.37	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	19.420	0.577	5497.5	3951.2	8.439	3.460	3.09		Clay	100.0			18.36	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	20.010	0.608	5518.8	3961.9	8.708	3.524	3.09		Clay	100.0			18.91	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	21.620	1.155	5538.8	3971.9	9.492	6.129	3.20		Clay	100.0			20.43	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	25.280	2.148	5560.0	3982.5	11.299	9.548	3.27		Clay	100.0			23.89	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	42.870	2.915	5580.0	3992.5	20.077	7.272	3.01		Clay	100.0			40.52	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	93.070	3.713	5600.0	4002.6	62.036	4.113	2.49		Sand	61.8	156.36	1.66	259.56	0.85	219.38	330.51	0.83	0.778	0.809	#########	########	##########	0.00	0.00
45.770	121.530	3.575	5621.3	4013.2	81.479	3.011	2.31		Sand	47.5	156.36	1.66	259.56	0.84	219.23	321.31	0.82	0.778	0.808	#########	########	##########	0.00	0.00
45.930	141.460	2.568	5641.3	4023.2	95.032	1.852	2.11		Sand	31.6	156.36	1.66	259.56	0.84	219.08	301.73	0.82	0.777	0.807	#########	########	1632655.94	0.00	0.00
46.100	165.430	1.220	5662.5	4033.9	111.309	0.750	1.80		Sand	6.7		1.66	259.56	0.82	212.32	214.00	0.82	0.777	0.806	4.580	8.125	10.46	0.00	0.00
46.260	148.060	1.138	5682.5	4043.9	99.288	0.784	1.85		Sand	10.8	156.36	1.66	259.56	0.83	214.66	228.64	0.82	0.777	0.806	14.551	25.792	33.20	0.00	0.00
46.420	114.040	1.932	5702.5	4053.9	75.927	1.738	2.16		Sand	35.7	156.36	1.66	259.56	0.84	218.65	307.77	0.82	0.777	0.805	#########	########	6500417.14	0.00	0.00
46.590	64.840	1.795	5723.8	4064.5	30.497	2.897	2.60		Clay	71.2			61.29	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	40.180	1.534	5743.8	4074.6	18.313	4.112	2.87		Clay	92.6			37.98	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	28.320	0.961	5765.0	4085.2	12.454	3.778	2.98		Clay	100.0			26.77	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	30.880	0.662	5785.0	4095.2	13.668	2.367	2.83		Clay	89.1			29.19	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	22.900	0.557	5805.0	4105.2	9.742	2.785	2.99		Clay	100.0			21.64	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	17.230	0.497	5826.3	4115.9	6.957	3.473	3.16		Clay	100.0			16.29	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	16.840	0.480	5846.3	4125.9	6.746	3.451	3.17		Clay	100.0			15.92	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	15.710	0.483	5867.5	4136.5	6.177	3.780	3.23		Clay	100.0			14.85	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	15.520	0.441	5887.5	4146.5	6.066	3.505	3.21		Clay	100.0			14.67	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	18.890	0.488	5907.5	4156.6	7.668	3.059	3.10		Clay	100.0			17.85	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	19.190	0.674	5928.8	4167.2	7.787	4.156	3.17		Clay	100.0			18.14	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	21.730	0.589	5948.8	4177.2	8.980	3.138	3.05		Clay	100.0			20.54	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	23.550	0.584	5970.0	4187.9	9.821	2.838	2.99		Clay	100.0			22.26	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	21.070	0.610	5990.0	4197.9	8.612	3.375	3.08		Clay	100.0			19.91	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	19.860	0.646	6010.0	4207.9	8.011	3.830	3.14		Clay	100.0			18.77	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	20.720	0.698	6031.3	4218.5	8.394	3.945	3.13		Clay	100.0			19.58	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	22.780	0.781	6051.3	4228.5	9.343	3.952	3.09		Clay	100.0			21.53	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	25.360	0.877	6072.5	4239.2	10.532	3.929	3.05		Clay	100.0			23.97	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	25.610	0.947	6092.5	4249.2	10.620	4.196	3.06		Clay	100.0			24.21	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	25.670	0.901	6112.5	4259.2	10.619	3.983	3.05		Clay	100.0			24.26	0.83	n.a.	n.a.	0.81	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	24.780	0.821	6133.8	4269.9	10.170	3.783	3.05		Clay	100.0			23.42	0.83	n.a.	n.a.	0.80	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	22.970	0.782	6153.8	4279.9	9.296	3.929	3.09		Clay	100.0			21.71	0.83	n.a.	n.a.	0.80	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.200	21.260	0.732	6175.0	4290.5	8.471	4.029	3.13		Clay	100.0			20.09	0.83	n.a.	n.a.	0.80	0.769	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	3	PGA (A_{max})	0.88	Total Settlement:	0.52	(Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	57.230	1.072	19.2	19.2	567.770	1.873	1.66		Unsaturated	0.0			54.09	1.70	91.96	91.96	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	504.470	2.043	39.6	39.6	3485.322	0.405	0.83		Unsaturated	0.0			476.81	1.70	810.59	810.59	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	384.170	2.500	58.8	58.8	2178.079	0.651	1.04		Unsaturated	0.0			363.11	1.70	617.29	617.29	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	333.130	2.098	79.2	79.2	1627.315	0.630	1.05		Unsaturated	0.0			314.87	1.70	535.28	535.28	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	268.740	2.007	98.4	98.4	1177.680	0.747	1.16		Unsaturated	0.0			254.01	1.70	431.81	431.81	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	199.550	1.936	117.6	117.6	799.820	0.970	1.33		Unsaturated	0.0			188.61	1.70	320.64	320.64	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	110.890	1.668	138.0	138.0	410.161	1.505	1.64		Unsaturated	0.0			104.81	1.70	178.18	178.18	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	77.120	1.683	157.2	157.2	267.159	2.184	1.88		Unsaturated	13.1			72.89	1.70	123.92	142.45	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	35.160	1.497	177.6	177.6	114.420	4.269	2.33		Unsaturated	49.2			33.23	1.70	56.50	117.11	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	29.130	1.239	196.8	196.8	89.977	4.268	2.39		Unsaturated	54.4			27.53	1.70	46.81	106.87	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	29.220	1.446	216.0	216.0	86.123	4.967	2.46		Unsaturated	59.4			27.62	1.70	46.95	108.66	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	40.660	1.636	236.4	236.4	114.644	4.036	2.31		Unsaturated	47.6			38.43	1.70	65.33	127.51	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	45.040	1.706	255.6	255.6	122.139	3.799	2.27		Unsaturated	44.6			42.57	1.70	72.37	134.73	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	41.220	1.442	276.0	276.0	107.515	3.511	2.28		Unsaturated	45.2			38.96	1.70	66.23	127.37	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	41.750	1.112	295.2	295.2	105.277	2.672	2.19		Unsaturated	38.4			39.46	1.70	67.08	124.03	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	39.680	0.835	314.4	314.4	96.912	2.113	2.14		Unsaturated	34.4			37.50	1.70	63.76	116.52	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	39.380	0.613	334.8	334.8	93.176	1.564	2.06		Unsaturated	28.0			37.22	1.70	63.28	108.83	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	38.660	0.500	354.0	354.0	88.928	1.298	2.02		Unsaturated	24.8			36.54	1.70	62.12	102.87	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	35.850	0.401	374.4	374.4	80.135	1.125	2.02		Unsaturated	24.4			33.88	1.70	57.60	96.88	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	34.050	0.331	393.6	393.6	74.190	0.978	2.01		Unsaturated	23.5			32.18	1.70	54.71	92.04	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	32.880	0.315	412.8	412.8	69.920	0.963	2.02		Unsaturated	24.8			31.08	1.70	52.83	91.98	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	31.300	0.299	433.2	433.2	64.932	0.961	2.05		Unsaturated	26.8			29.58	1.70	50.29	91.89	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	29.920	0.270	452.4	452.4	60.698	0.910	2.06		Unsaturated	27.6			28.28	1.70	48.08	90.31	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	29.750	0.283	472.8	472.8	59.014	0.959	2.08		Unsaturated	29.5			28.12	1.70	47.80	92.18	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	27.490	0.343	492.0	492.0	53.402	1.258	2.19		Unsaturated	37.9			25.98	1.70	44.17	95.32	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	24.180	0.486	512.4	512.4	45.951	2.033	2.37		Unsaturated	52.4			22.85	1.70	38.85	96.05	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	21.820	0.592	531.6	531.6	40.645	2.745	2.49		Unsaturated	62.4			20.62	1.70	35.06	94.23	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	19.990	0.548	550.8	550.8	36.523	2.781	2.53		Unsaturated	65.5			18.89	1.70	32.12	91.17	1.00	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	22.110	0.410	571.2	571.2	39.703	1.877	2.39		Unsaturated	54.5			20.90	1.70	35.53	92.57	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	25.440	0.272	590.4	590.4	44.993	1.081	2.21		Unsaturated	39.6			24.05	1.70	40.88	92.40	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	25.320	0.267	610.8	610.8	44.006	1.068	2.21		Unsaturated	40.0			23.93	1.70	40.68	92.42	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	23.890	0.310	630.0	630.0	40.837	1.317	2.29		Unsaturated	46.3			22.58	1.70	38.39	92.97	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	21.370	0.382	649.2	649.2	35.912	1.815	2.42		Unsaturated	56.6			20.20	1.70	34.34	91.70	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	19.990	0.429	669.6	669.6	33.025	2.181	2.50		Unsaturated	62.8			18.89	1.70	32.12	90.54	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	18.850	0.449	688.8	688.8	30.657	2.427	2.55		Unsaturated	67.1			17.82	1.70	30.29	89.16	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	17.820	0.405	709.2	709.2	28.515	2.319	2.56		Unsaturated	68.1			16.84	1.70	28.63	87.22	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	17.300	0.318	728.4	728.4	27.283	1.879	2.52		Unsaturated	64.9			16.35	1.70	27.80	85.48	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	18.550	0.259	747.6	747.6	28.903	1.425	2.43		Unsaturated	57.7			17.53	1.70	29.81	86.25	0.99	0.567	1.099	n.a.	n.a.	n.a.	0.00	0.00
6.400	20.290	0.214	768.0	768.0	31.230	1.075	2.34		Unsaturated	50.1			19.18	1.70	32.60	87.27	0.99	0.566	1.098	n.a.	n.a.	n.a.	0.00	0.00
6.560	21.130	0.194	787.2	787.2	32.134	0.934	2.30		Unsaturated	46.7			19.97	1.69	33.66	87.19	0.99	0.566	1.095	n.a.	n.a.	n.a.	0.00	0.00
6.730	22.350	0.178	807.6	807.6	33.576	0.812	2.25		Unsaturated	42.9			21.12	1.66	35.13	87.17	0.99	0.566	1.093	n.a.	n.a.	n.a.	0.00	0.00
6.890	23.320	0.174	826.8	826.8	34.636	0.759	2.22		Unsaturated	40.8			22.04	1.64	36.19	87.31	0.99	0.566	1.090	n.a.	n.a.	n.a.	0.00	0.00
7.050	22.380	0.181	846.0	846.0	32.822	0.826	2.26		Unsaturated	43.8			21.15	1.62	34.36	86.72	0.99	0.565	1.088	n.a.	n.a.	n.a.	0.00	0.00
7.220	20.640	0.203	866.4	866.4	29.848	1.004	2.34		Unsaturated	50.2			19.51	1.61	31.36	85.73	0.99	0.565	1.085	n.a.	n.a.	n.a.	0.00	0.00
7.380	20.840	0.216	885.6	885.6	29.801	1.057	2.35		Unsaturated	51.1			19.70	1.59	31.28	86.00	0.99	0.565	1.083	n.a.	n.a.	n.a.	0.00	0.00
7.550	21.960	0.240	906.0	906.0	31.066	1.117	2.35		Unsaturated	50.9			20.76	1.56	32.47	87.43	0.99	0.564	1.082	n.a.	n.a.	n.a.	0.00	0.00
7.710	21.530	0.314	925.2	925.2	30.114	1.489	2.43		Unsaturated	57.4			20.35	1.54	31.43	88.24	0.99	0.564	1.080	n.a.	n.a.	n.a.	0.00	0.00
7.870	20.200	0.429	944.4	944.4	27.911	2.175	2.55		Unsaturated	67.3			19.09	1.53	29.20	87.79	0.99	0.564	1.078	n.a.	n.a.	n.a.	0.00	0.00
8.040	17.870	0.492	964.8	964.8	28.478	2.830	2.62		Unsaturated	72.5			16.89	1.52	25.72	84.27	0.99	0.564	1.074	n.a.	n.a.	n.a.	0.00	0.00
8.200	16.680	0.468	984.0	984.0	26.150	2.890	2.65		Unsaturated	75.2			15.77	1.51	23.84	82.30	0.98	0.563	1.071	n.a.	n.a.	n.a.	0.00	0.00
8.370	20.630	0.323	1004.4	1004.4	27.613	1.603	2.48		Unsaturated	61.3			19.50	1.48	28.96	86.13	0.98	0.563	1.071	n.a.	n.a.	n.a.	0.00	0.00
8.530	23.360	0.276	1023.6	1023.6	31.050	1.206	2.37		Unsaturated	52.4			22.08	1.47	32.36	87.83	0.98	0.563	1.070	n.a.	n.a.	n.a.	0.00	0.00
8.690	21.980	0.340	1042.8	1042.8	28.892	1.585	2.46		Unsaturated	59.8			20.78	1.45	30.18	87.31	0.98	0.562	1.068	n.a.	n.a.	n.a.	0.00	0.00
8.860	18.360	0.423	1063.2	1063.2	27.281	2.373	2.59		Unsaturated	69.8			17.35	1.45	25.14	83.04	0.98	0.562	1.064	n.a.	n.a.	n.a.	0.00	0.00
9.020	16.450	0.446	1082.4	1082.4	29.395	2.804	2.61		Unsaturated	71.4			15.55	1.44	22.43	79.84	0.98	0.562	1.061	n.a.	n.a.	n.a.	0.00	0.00
9.190	14.370	0.429	1102.8	1102.8	25.061	3.105	2.69		Unsaturated	78.0			13.58	1.43	19.49	77.06	0.98	0.562	1.058	n.a.	n.a.	n.a.	0.00	0.00
9.350	12.230	0.370	1122.0	1122.0	20.800	3.173	2.76		Unsaturated	83.5			11.56	1.43	16.52	73.92	0.98	0.561	1.055	n.a.	n.a.	n.a.	0.00	0.00
9.510	11.350	0.340	1141.2	1141.2	18.891	3.156	2.79		Unsaturated	86.0			10.73	1.42	15.22	72.52	0.98	0.561	1.053	n.a.	n.a.	n.a.	0.00	0.00
9.680	11.900	0.328	1161.6	1161.6	19.489	2.899	2.75		Unsaturated	83.3			11.25	1.40	15.79	72.95	0.98	0.561	1.052	n.a.	n.a.	n.a.	0.00	0.00
9.840	12.860	0.339	1180.8	1180.8	20.782	2.760	2.72		Unsaturated	80.5			12.16	1.39	16.87	74.01	0.98	0.560	1.051	n.a.	n.a.	n.a.	0.00	0.00
10.010	14.420	0.348	1201.2	1201.2	23.009	2.519	2.66		Clay	75.8			13.63	1.16	n.a.	n.a.	0.98	0.560	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.170	19.510	0.314	1220.4	1220.4	23.522	1.661	2.55		Sand	66.6	31	1.6	49.60	1.27	63.04	131.24	0.98	0.565	1.075	0.201	0.320	0.57	0.02	0.04
10.330	23.960	0.272	1239.6	1239.6	28.823	1.163	2.39		Sand	53.9	31	1.6	49.60	1.27	62.87	127.13	0.98	0.569	1.071	0.189	0.292	0.51	0.02	0.04
10.500	29.710	0.255	1260.0	1260.0	35.619	0.877	2.24		Sand	42.5	31	1.6	49.60	1.27	62.76	121.44	0.98	0.573	1.065	0.175	0.260	0.45	0.03	0.04
10.660	32.800	0.254	1279.2	1279.2	39.095	0.789	2.18		Sand	37.8		1.6	49.60	1.26	62.55	117.95	0.98	0.577	1.062	0.167	0.243	0.42	0.03	0.05
10.830	32.490	0.259	1299.6	1299.6	38.401	0.814	2.20		Sand	38.9	31	1.6	49.60	1.25	62.08	118.19	0.98	0.582	1.060	0.167	0.243	0.42	0.03	0.04
10.990	28.580	0.328	1318.8	1318.8	33.428	1.175	2.33		Sand	49.8	31	1.6	49.60	1.24	61.36	123.52	0.98	0.586	1.061	0.179	0.269	0.46	0.03	0.04
11.150	24.280	0.479	1338.0	1338.0	28.065	2.029	2.53		Sand	65.7	31	1.6	49.60	1.22	60.73	128.03	0.98	0.589	1.061	0.192	0.295	0.50	0.02	0.04

CORNERSTONE EARTH GROUP

CPT No. 3

PGA (A_{max}) 0.88

Total Settlement: 0.52 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
11.320	20.090	0.507	1358.4	1358.4	25.021	2.611	2.64	plastic	Clay	74.2			18.99	1.12	n.a.	n.a.	0.97	0.593	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	15.800	0.483	1377.6	1377.6	21.938	3.195	2.74		Clay	82.2			14.93	1.12	n.a.	n.a.	0.97	0.597	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.650	15.950	0.435	1398.0	1398.0	21.818	2.851	2.71		Clay	79.9			15.08	1.12	n.a.	n.a.	0.97	0.601	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.810	22.790	0.576	1417.2	1417.2	27.631	2.609	2.61	plastic	Clay	71.5			21.54	1.11	n.a.	n.a.	0.97	0.605	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.980	30.000	0.618	1437.6	1437.6	33.577	2.111	2.48		Sand	61.6	78.51	1.61	126.40	1.12	141.45	230.47	0.97	0.608	1.100	17.119	41.429	68.11	0.00	0.00
12.140	39.110	0.783	1456.8	1456.8	43.722	2.041	2.38		Sand	53.8	78.51	1.61	126.40	1.12	141.15	226.61	0.97	0.612	1.100	12.204	29.533	48.28	0.00	0.00
12.300	62.030	1.103	1476.0	1476.0	69.364	1.800	2.20		Sand	38.8	78.51	1.61	126.40	1.12	141.26	216.14	0.97	0.615	1.100	5.339	12.922	21.01	0.00	0.00
12.470	83.060	0.922	1496.4	1496.4	92.515	1.120	1.97		Sand	20.4		1.61	126.40	1.13	142.59	186.52	0.97	0.619	1.078	0.957	2.271	3.67	0.00	0.00
12.630	82.310	0.810	1515.6	1515.6	91.078	0.993	1.94		Sand	18.2	78.51	1.61	126.40	1.13	142.42	179.77	0.97	0.622	1.070	0.720	1.607	2.58	0.00	0.00
12.800	61.450	0.957	1536.0	1536.0	67.319	1.577	2.17		Sand	36.5	78.51	1.61	126.40	1.11	139.77	211.96	0.97	0.625	1.096	3.974	9.584	15.33	0.00	0.00
12.960	41.610	0.895	1555.2	1555.2	45.018	2.191	2.39		Sand	54.6	78.51	1.61	126.40	1.10	138.60	223.77	0.97	0.628	1.092	9.628	23.138	36.82	0.00	0.00
13.120	23.710	0.703	1574.4	1574.4	29.119	3.067	2.63		Clay	73.7			22.41	1.08	n.a.	n.a.	0.97	0.631	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	14.290	0.598	1594.8	1594.8	16.921	4.431	2.92		Clay	96.4			13.51	1.08	n.a.	n.a.	0.97	0.635	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	10.290	0.435	1614.0	1614.0	11.751	4.589	3.05		Clay	100.0			9.73	1.07	n.a.	n.a.	0.97	0.638	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	9.880	0.417	1634.4	1634.4	11.090	4.602	3.07		Clay	100.0			9.34	1.07	n.a.	n.a.	0.97	0.641	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	9.640	0.416	1653.6	1653.6	10.659	4.720	3.09		Clay	100.0			9.11	1.07	n.a.	n.a.	0.97	0.644	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	9.760	0.425	1672.8	1672.8	10.669	4.763	3.09		Clay	100.0			9.22	1.06	n.a.	n.a.	0.97	0.646	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	10.050	0.420	1693.2	1693.2	10.871	4.566	3.07		Clay	100.0			9.50	1.06	n.a.	n.a.	0.97	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	10.120	0.428	1712.4	1712.4	10.820	4.618	3.08		Clay	100.0			9.57	1.06	n.a.	n.a.	0.96	0.652	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	10.170	0.434	1732.8	1732.8	10.738	4.659	3.08		Clay	100.0			9.61	1.05	n.a.	n.a.	0.96	0.655	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	10.080	0.424	1752.0	1752.0	10.507	4.605	3.09		Clay	100.0			9.53	1.05	n.a.	n.a.	0.96	0.657	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	9.920	0.405	1771.2	1771.2	10.201	4.480	3.09		Clay	100.0			9.38	1.05	n.a.	n.a.	0.96	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	9.570	0.384	1791.6	1791.6	9.683	4.428	3.11		Clay	100.0			9.05	1.04	n.a.	n.a.	0.96	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	9.310	0.369	1810.8	1810.8	9.283	4.393	3.12		Clay	100.0			8.80	1.04	n.a.	n.a.	0.96	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	9.020	0.361	1831.2	1831.2	8.851	4.448	3.14		Clay	100.0			8.53	1.04	n.a.	n.a.	0.96	0.668	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	9.100	0.373	1850.4	1850.4	8.836	4.563	3.15		Clay	100.0			8.60	1.04	n.a.	n.a.	0.96	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	9.040	0.391	1869.6	1869.6	8.671	4.828	3.17		Clay	100.0			8.54	1.03	n.a.	n.a.	0.96	0.672	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	8.820	0.381	1890.0	1890.0	8.333	4.841	3.18		Clay	100.0			8.34	1.03	n.a.	n.a.	0.96	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	9.480	0.407	1909.2	1909.2	8.931	4.777	3.15		Clay	100.0			8.96	1.03	n.a.	n.a.	0.96	0.677	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	9.660	0.529	1929.6	1929.6	9.012	6.083	3.22		Clay	100.0			9.13	1.02	n.a.	n.a.	0.96	0.680	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	11.970	0.595	1948.8	1948.8	11.284	5.409	3.11		Clay	100.0			11.31	1.02	n.a.	n.a.	0.96	0.682	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	20.270	0.904	1968.0	1968.0	19.600	4.688	2.88		Clay	93.7			19.16	1.02	n.a.	n.a.	0.96	0.684	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	35.870	1.099	1988.4	1988.4	34.005	3.152	2.59		Sand	70.2		1.8	61.03	1.03	62.70	131.64	0.96	0.686	1.009	0.203	0.303	0.44	0.02	0.03
16.730	35.160	0.967	2007.6	2007.6	33.144	2.831	2.57		Sand	68.5		1.8	59.82	1.02	61.22	129.32	0.96	0.688	1.007	0.195	0.287	0.42	0.02	0.04
16.900	35.320	1.236	2028.0	2028.0	33.832	3.603	2.63		Clay	73.5			33.38	1.01	n.a.	n.a.	0.95	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	41.710	1.084	2047.2	2047.2	39.097	2.663	2.50		Sand	62.7			39.42	1.02	40.08	100.75	0.95	0.692	1.004	0.138	0.176	0.25	0.03	0.04
17.220	30.620	0.718	2066.4	2066.4	28.298	2.427	2.58		Sand	69.3	39.42		39.42	1.01	39.88	101.98	0.95	0.694	1.003	0.140	0.178	0.26	0.03	0.05
17.390	20.130	0.655	2086.8	2086.8	18.293	3.433	2.82		Clay	88.7			19.03	1.00	n.a.	n.a.	0.95	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	35.450	0.643	2106.0	2106.0	32.588	1.868	2.46		Sand	59.8		1.8	60.31	1.00	60.44	126.05	0.95	0.698	1.001	0.186	0.267	0.38	0.03	0.04
17.720	24.000	0.338	2126.4	2126.4	21.626	1.472	2.55		Sand	66.7	33.51	1.8	60.32	1.00	60.19	127.59	0.95	0.700	0.999	0.190	0.275	0.39	0.02	0.03
17.880	13.580	0.197	2145.6	2145.6	11.658	1.573	2.79		Clay	86.2			12.84	1.00	n.a.	n.a.	0.95	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.040	8.070	0.286	2164.8	2164.8	6.456	4.093	3.23		Clay	100.0			7.63	0.99	n.a.	n.a.	0.95	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.210	6.550	0.269	2185.2	2185.2	4.995	4.925	3.37		Clay	100.0			6.19	0.99	n.a.	n.a.	0.95	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.370	10.210	0.255	2204.4	2204.4	8.263	2.798	3.05		Clay	100.0			9.65	0.99	n.a.	n.a.	0.95	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.540	7.880	0.278	2224.8	2224.8	6.084	4.108	3.25		Clay	100.0			7.45	0.99	n.a.	n.a.	0.95	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.700	8.360	0.279	2244.0	2244.0	6.451	3.851	3.22		Clay	100.0			7.90	0.98	n.a.	n.a.	0.95	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.860	8.610	0.364	2263.2	2263.2	6.609	4.867	3.26		Clay	100.0			8.14	0.98	n.a.	n.a.	0.95	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.030	8.750	0.402	2283.6	2283.6	6.663	5.285	3.28		Clay	100.0			8.27	0.98	n.a.	n.a.	0.95	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.190	8.830	0.375	2302.8	2302.8	6.669	4.885	3.26		Clay	100.0			8.35	0.98	n.a.	n.a.	0.95	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.360	8.100	0.309	2323.2	2323.2	5.973	4.446	3.28		Clay	100.0			7.66	0.98	n.a.	n.a.	0.95	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.520	7.490	0.288	2342.4	2342.4	5.395	4.553	3.32		Clay	100.0			7.08	0.97	n.a.	n.a.	0.94	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.690	7.640	0.296	2362.8	2362.8	5.467	4.577	3.32		Clay	100.0			7.22	0.97	n.a.	n.a.	0.94	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.850	7.510	0.292	2382.0	2382.0	5.306	4.624	3.33		Clay	100.0			7.10	0.97	n.a.	n.a.	0.94	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.010	7.800	0.273	2401.3	2400.6	5.498	4.137	3.29		Clay	100.0			7.37	0.97	n.a.	n.a.	0.94	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.180	7.650	0.234	2422.5	2411.3	5.341	3.639	3.27		Clay	100.0			7.23	0.97	n.a.	n.a.	0.94	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	6.900	0.267	2442.5	2421.3	4.691	4.703	3.38		Clay	100.0			6.52	0.97	n.a.	n.a.	0.94	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	7.470	0.290	2463.8	2431.9	5.130	4.641	3.34		Clay	100.0			7.06	0.96	n.a.	n.a.	0.94	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	7.880	0.319	2483.8	2441.9	5.437	4.807	3.33		Clay	100.0			7.45	0.96	n.a.	n.a.	0.94	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	7.880	0.312	2503.8	2452.0	5.406	4.703	3.33		Clay	100.0			7.45	0.96	n.a.	n.a.	0.94	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	7.750	0.293	2525.0	2462.6	5.269	4.513	3.33		Clay	100.0			7.33	0.96	n.a.	n.a.	0.94	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	8.010	0.296	2545.0	2472.6	5.450	4.386	3.31		Clay	100.0			7.57	0.96	n.a.	n.a.	0.94	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.330	8.450	0.283	2566.3	2483.3	5.772	3.942	3.26		Clay	100.0			7.99	0.96	n.a.	n.a.	0.94	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	8.810	0.290	2586.3	2493.3	6.030	3.858	3.24		Clay	100.0			8.33	0.96	n.a.	n.a.	0.94	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	9.640	0.363	2606.3	2503.3	6.661	4.349	3.23		Clay	100.0			9.11	0.96	n.a.	n.a.	0.94	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.820	11.710	0.415	2627.5	2513.9	8.271	3.991	3.14		Clay	100.0			11.07	0.96	n.a.	n.a.	0.94	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	13.800	0.452	2647.5	2523.9	9.886	3.622	3.05		Clay	100.0			13.04	0.95	n.a.	n.a.	0.93	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	14.340	0.477	2668.8	2534.6	10.263	3.666	3.04		Clay	100.0			13.55	0.95	n.a.	n.a.	0.93	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE
EARTH GROUP

CPT No. 3

PGA (A_{max}) 0.88

Total Settlement: 0.52 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\text{ atm}}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
22.310	16.120	0.493	2688.8	2544.6	11.613	3.338	2.97		Clay	100.0			15.24	0.95	n.a.	n.a.	0.93	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	18.260	0.525	2708.8	2554.6	13.235	3.105	2.91		Clay	95.5			17.26	0.95	n.a.	n.a.	0.93	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	19.170	0.582	2730.0	2565.3	13.882	3.268	2.90		Clay	95.2			18.12	0.95	n.a.	n.a.	0.93	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	19.690	0.641	2750.0	2575.3	14.224	3.501	2.91		Clay	96.0			18.61	0.95	n.a.	n.a.	0.93	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	20.460	0.681	2771.3	2585.9	14.752	3.568	2.90		Clay	95.4			19.34	0.95	n.a.	n.a.	0.93	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	21.210	0.735	2791.3	2595.9	15.266	3.711	2.90		Clay	95.3			20.05	0.95	n.a.	n.a.	0.93	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	22.020	0.813	2811.3	2606.0	15.821	3.944	2.91		Clay	95.6			20.81	0.95	n.a.	n.a.	0.93	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	22.800	0.859	2832.5	2616.6	16.345	4.015	2.90		Clay	95.1			21.55	0.95	n.a.	n.a.	0.93	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	23.340	0.875	2852.5	2626.6	16.686	3.992	2.89		Clay	94.4			22.06	0.94	n.a.	n.a.	0.93	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	23.220	0.871	2873.8	2637.3	16.520	3.997	2.90		Clay	94.7			21.95	0.94	n.a.	n.a.	0.93	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	23.110	0.856	2893.8	2647.3	16.366	3.950	2.90		Clay	94.7			21.84	0.94	n.a.	n.a.	0.93	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	22.980	0.914	2913.8	2657.3	16.199	4.246	2.92		Clay	96.6			21.72	0.94	n.a.	n.a.	0.93	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	22.300	0.923	2935.0	2667.9	15.617	4.429	2.94		Clay	98.5			21.08	0.94	n.a.	n.a.	0.92	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	21.360	0.868	2955.0	2677.9	14.849	4.366	2.96		Clay	99.5			20.19	0.94	n.a.	n.a.	0.92	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	19.390	0.835	2976.3	2688.6	13.317	4.665	3.01		Clay	100.0			18.33	0.94	n.a.	n.a.	0.92	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	17.810	0.873	2996.3	2698.6	12.089	5.350	3.08		Clay	100.0			16.83	0.94	n.a.	n.a.	0.92	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	17.220	0.906	3016.3	2708.6	11.601	5.767	3.12		Clay	100.0			16.28	0.94	n.a.	n.a.	0.92	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	16.790	0.923	3037.5	2719.3	11.232	6.045	3.14		Clay	100.0			15.87	0.94	n.a.	n.a.	0.92	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	19.120	0.894	3057.5	2729.3	12.891	5.083	3.05		Clay	100.0			18.07	0.94	n.a.	n.a.	0.92	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	19.890	0.918	3078.8	2739.9	13.395	5.000	3.03		Clay	100.0			18.80	0.93	n.a.	n.a.	0.92	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	20.200	0.984	3098.8	2749.9	13.564	5.275	3.04		Clay	100.0			19.09	0.93	n.a.	n.a.	0.92	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	21.180	0.991	3118.8	2760.0	14.218	5.049	3.01		Clay	100.0			20.02	0.93	n.a.	n.a.	0.92	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	21.620	1.028	3140.0	2770.6	14.473	5.125	3.01		Clay	100.0			20.43	0.93	n.a.	n.a.	0.92	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	20.900	1.002	3160.0	2780.6	13.896	5.184	3.03		Clay	100.0			19.75	0.93	n.a.	n.a.	0.92	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	20.910	0.981	3181.3	2791.3	13.843	5.075	3.02		Clay	100.0			19.76	0.93	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	20.520	0.971	3201.3	2801.3	13.508	5.133	3.03		Clay	100.0			19.40	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	20.330	0.954	3221.3	2811.3	13.317	5.098	3.04		Clay	100.0			19.22	0.93	n.a.	n.a.	0.91	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	20.280	0.947	3242.5	2821.9	13.224	5.077	3.04		Clay	100.0			19.17	0.93	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	19.790	0.920	3262.5	2831.9	12.824	5.067	3.05		Clay	100.0			18.71	0.93	n.a.	n.a.	0.91	0.767	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	19.050	0.887	3283.8	2842.6	12.248	5.096	3.06		Clay	100.0			18.01	0.93	n.a.	n.a.	0.91	0.767	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	18.650	0.853	3303.8	2852.6	11.918	5.018	3.07		Clay	100.0			17.63	0.92	n.a.	n.a.	0.91	0.768	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	18.240	0.824	3325.0	2863.2	11.580	4.969	3.08		Clay	100.0			17.24	0.92	n.a.	n.a.	0.91	0.768	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	17.630	0.769	3345.0	2873.3	11.108	4.817	3.08		Clay	100.0			16.66	0.92	n.a.	n.a.	0.91	0.769	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	17.240	0.734	3365.0	2883.3	10.792	4.717	3.09		Clay	100.0			16.29	0.92	n.a.	n.a.	0.91	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	16.700	0.734	3386.3	2893.9	10.371	4.894	3.11		Clay	100.0			15.78	0.92	n.a.	n.a.	0.91	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	16.670	0.703	3406.3	2903.9	10.308	4.696	3.10		Clay	100.0			15.76	0.92	n.a.	n.a.	0.91	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	15.740	0.643	3427.5	2914.6	9.625	4.581	3.12		Clay	100.0			14.88	0.92	n.a.	n.a.	0.91	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	15.050	0.639	3447.5	2924.6	9.113	4.798	3.15		Clay	100.0			14.22	0.92	n.a.	n.a.	0.91	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	16.400	0.668	3467.5	2934.6	9.995	4.555	3.10		Clay	100.0			15.50	0.92	n.a.	n.a.	0.91	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	18.170	0.809	3488.8	2945.2	11.154	4.923	3.09		Clay	100.0			17.17	0.92	n.a.	n.a.	0.91	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	20.710	0.915	3508.8	2955.3	12.828	4.825	3.03		Clay	100.0			19.57	0.92	n.a.	n.a.	0.90	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	21.040	1.001	3530.0	2965.9	12.998	5.192	3.05		Clay	100.0			19.89	0.91	n.a.	n.a.	0.90	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	19.060	0.983	3550.0	2975.9	11.617	5.687	3.11		Clay	100.0			18.02	0.91	n.a.	n.a.	0.90	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	17.770	0.900	3570.0	2985.9	10.707	5.632	3.14		Clay	100.0			16.80	0.91	n.a.	n.a.	0.90	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	19.530	0.895	3591.3	2996.6	11.836	5.048	3.07		Clay	100.0			18.46	0.91	n.a.	n.a.	0.90	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	21.140	0.945	3611.3	3006.6	12.861	4.889	3.04		Clay	100.0			19.98	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	21.010	0.994	3632.5	3017.2	12.723	5.181	3.06		Clay	100.0			19.86	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	20.780	0.983	3652.5	3027.3	12.522	5.185	3.06		Clay	100.0			19.64	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	19.610	0.917	3672.5	3037.3	11.704	5.160	3.08		Clay	100.0			18.53	0.91	n.a.	n.a.	0.90	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	18.090	0.813	3693.8	3047.9	10.659	5.006	3.11		Clay	100.0			17.10	0.91	n.a.	n.a.	0.90	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	17.260	0.754	3713.8	3057.9	10.074	4.893	3.12		Clay	100.0			16.31	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	18.410	0.750	3735.0	3068.6	10.782	4.534	3.08		Clay	100.0			17.40	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	18.210	0.780	3755.0	3078.6	10.610	4.773	3.10		Clay	100.0			17.21	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	16.960	0.721	3775.0	3088.6	9.760	4.780	3.12		Clay	100.0			16.03	0.91	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	14.700	0.666	3796.3	3099.2	8.261	5.202	3.20		Clay	100.0			13.89	0.90	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	12.080	0.616	3816.3	3109.3	6.543	6.051	3.32		Clay	100.0			11.42	0.90	n.a.	n.a.	0.89	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	9.940	0.581	3837.5	3119.9	5.142	7.242	3.46		Clay	100.0			9.40	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	9.890	0.517	3857.5	3129.9	5.087	6.499	3.43		Clay	100.0			9.35	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	9.880	0.454	3877.5	3139.9	5.058	5.718	3.40		Clay	100.0			9.34	0.90	n.a.	n.a.	0.89	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	10.050	0.410	3898.8	3150.6	5.142	5.063	3.36		Clay	100.0			9.50	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	10.520	0.394	3918.8	3160.6	5.417	4.599	3.32		Clay	100.0			9.94	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	11.090	0.382	3940.0	3171.2	5.752	4.193	3.28		Clay	100.0			10.48	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	12.200	0.449	3960.0	3181.2	6.425	4.395	3.25		Clay	100.0			11.53	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	13.030	0.577	3980.0	3191.3	6.919	5.222	3.27		Clay	100.0			12.32	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	15.360	0.547	4001.3	3201.9	8.345	4.092	3.14		Clay	100.0			14.52	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	18.530	0.565	4021.3	3211.9	10.286	3.419	3.02		Clay	100.0			17.51	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	16.270	0.613	4042.5	3222.6	8.843	4.303	3.13		Clay	100.0			15.38	0.89	n.a.	n.a.	0.88	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 3

PGA (A_{max}) 0.88

Total Settlement: 0.52 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'vc = 1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
33.300	16.050	0.497	4062.5	3232.6	8.673	3.545	3.09		Clay	100.0			15.17	0.89	n.a.	n.a.	0.88	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	15.430	0.461	4082.5	3242.6	8.258	3.444	3.10		Clay	100.0			14.58	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	14.660	0.416	4103.8	3253.2	7.751	3.301	3.11		Clay	100.0			13.86	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	13.530	0.387	4123.8	3263.3	7.029	3.373	3.15		Clay	100.0			12.79	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	12.540	0.371	4145.0	3273.9	6.395	3.543	3.20		Clay	100.0			11.85	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	11.820	0.352	4165.0	3283.9	5.930	3.618	3.23		Clay	100.0			11.17	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	11.040	0.320	4185.0	3293.9	5.433	3.572	3.26		Clay	100.0			10.43	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	10.520	0.258	4206.3	3304.6	5.094	3.063	3.25		Clay	100.0			9.94	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	10.160	0.272	4226.3	3314.6	4.855	3.378	3.29		Clay	100.0			9.60	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	10.340	0.332	4247.5	3325.2	4.942	4.044	3.32		Clay	100.0			9.77	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	11.960	0.338	4267.5	3335.2	5.892	3.443	3.22		Clay	100.0			11.30	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	12.760	0.362	4287.5	3345.3	6.347	3.407	3.19		Clay	100.0			12.06	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	13.070	0.332	4308.8	3355.9	6.505	3.038	3.16		Clay	100.0			12.35	0.89	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	12.870	0.322	4328.8	3365.9	6.361	3.009	3.16		Clay	100.0			12.16	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	12.340	0.331	4350.0	3376.6	6.021	3.251	3.20		Clay	100.0			11.66	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	12.270	0.319	4370.0	3386.6	5.956	3.163	3.20		Clay	100.0			11.60	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	12.230	0.333	4391.3	3397.2	5.907	3.322	3.21		Clay	100.0			11.56	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	12.160	0.334	4411.3	3407.2	5.843	3.351	3.22		Clay	100.0			11.49	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	12.180	0.349	4431.3	3417.3	5.832	3.501	3.23		Clay	100.0			11.51	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	12.170	0.350	4452.5	3427.9	5.802	3.518	3.23		Clay	100.0			11.50	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	12.160	0.339	4472.5	3437.9	5.773	3.420	3.23		Clay	100.0			11.49	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.750	12.190	0.323	4493.8	3448.6	5.767	3.252	3.22		Clay	100.0			11.52	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.910	11.930	0.313	4513.8	3458.6	5.594	3.231	3.23		Clay	100.0			11.28	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.070	11.680	0.300	4533.8	3468.6	5.428	3.186	3.23		Clay	100.0			11.04	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.240	12.010	0.303	4555.0	3479.2	5.595	3.111	3.22		Clay	100.0			11.35	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	12.180	0.311	4575.0	3489.2	5.670	3.143	3.21		Clay	100.0			11.51	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.570	12.250	0.314	4596.3	3499.9	5.687	3.152	3.21		Clay	100.0			11.58	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.730	12.400	0.350	4616.3	3509.9	5.751	3.469	3.23		Clay	100.0			11.72	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.890	12.520	0.387	4636.3	3519.9	5.797	3.791	3.25		Clay	100.0			11.83	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.060	12.780	0.419	4657.5	3530.6	5.920	4.013	3.26		Clay	100.0			12.08	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.220	14.440	0.448	4677.5	3540.6	6.836	3.700	3.18		Clay	100.0			13.65	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	14.560	0.456	4698.8	3551.2	6.877	3.734	3.18		Clay	100.0			13.76	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	14.860	0.482	4718.8	3561.2	7.020	3.857	3.19		Clay	100.0			14.05	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	15.590	0.481	4738.8	3571.2	7.404	3.636	3.15		Clay	100.0			14.74	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	16.160	0.427	4760.0	3581.9	7.694	3.095	3.10		Clay	100.0			15.27	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	15.580	0.419	4780.0	3591.9	7.344	3.178	3.12		Clay	100.0			14.73	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	14.470	0.464	4801.3	3602.5	6.700	3.844	3.20		Clay	100.0			13.68	0.87	n.a.	n.a.	0.86	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	15.320	0.513	4821.3	3612.6	7.147	3.972	3.19		Clay	100.0			14.48	0.87	n.a.	n.a.	0.86	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	16.080	0.508	4841.3	3622.6	7.541	3.716	3.15		Clay	100.0			15.20	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	16.180	0.449	4862.5	3633.2	7.568	3.264	3.12		Clay	100.0			15.29	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	17.120	0.368	4882.5	3643.2	8.058	2.505	3.03		Clay	100.0			16.18	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	14.550	0.351	4903.8	3653.9	6.622	2.897	3.14		Clay	100.0			13.75	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.190	13.240	0.335	4923.8	3663.9	5.883	3.110	3.20		Clay	100.0			12.51	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.350	13.140	0.334	4943.8	3673.9	5.808	3.131	3.20		Clay	100.0			12.42	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.520	13.320	0.350	4965.0	3684.6	5.883	3.228	3.21		Clay	100.0			12.59	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	13.320	0.357	4985.0	3694.6	5.861	3.301	3.21		Clay	100.0			12.59	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	13.700	0.371	5006.3	3705.2	6.044	3.317	3.20		Clay	100.0			12.95	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	13.640	0.385	5026.3	3715.2	5.990	3.457	3.22		Clay	100.0			12.89	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	13.840	0.410	5046.3	3725.2	6.076	3.624	3.22		Clay	100.0			13.08	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	14.130	0.439	5067.5	3735.9	6.208	3.787	3.22		Clay	100.0			13.36	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	14.420	0.476	5087.5	3745.9	6.341	4.006	3.23		Clay	100.0			13.63	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	14.500	0.475	5108.8	3756.5	6.360	3.974	3.23		Clay	100.0			13.71	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	14.420	0.458	5128.8	3766.6	6.295	3.861	3.22		Clay	100.0			13.63	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	14.370	0.435	5148.8	3776.6	6.247	3.689	3.22		Clay	100.0			13.58	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	14.380	0.420	5170.0	3787.2	6.229	3.560	3.21		Clay	100.0			13.59	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	14.290	0.410	5190.0	3797.2	6.160	3.509	3.21		Clay	100.0			13.51	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	14.190	0.421	5211.3	3807.9	6.084	3.630	3.22		Clay	100.0			13.41	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	14.400	0.425	5231.3	3817.9	6.173	3.606	3.22		Clay	100.0			13.61	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	15.330	0.435	5251.3	3827.9	6.638	3.422	3.18		Clay	100.0			14.49	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	15.820	0.430	5272.5	3838.5	6.869	3.259	3.15		Clay	100.0			14.95	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	17.590	0.420	5292.5	3848.6	7.766	2.813	3.07		Clay	100.0			16.63	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	16.660	0.420	5313.8	3859.2	7.257	3.002	3.11		Clay	100.0			15.75	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	16.030	0.365	5333.8	3869.2	6.907	2.730	3.11		Clay	100.0			15.15	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	15.290	0.309	5355.0	3879.9	6.502	2.446	3.11		Clay	100.0			14.45	0.85	n.a.	n.a.	0.83	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	14.300	0.255	5375.0	3889.9	5.971	2.198	3.11		Clay	100.0			13.52	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	13.500	0.228	5395.0	3899.9	5.540	2.110	3.13		Clay	100.0			12.76	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	13.670	0.233	5416.3	3910.5	5.606	2.126	3.13		Clay	100.0			12.92	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No. 3

PGA (A_{max}) 0.88

Total Settlement: 0.52 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'vc = 1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
44.290	14.160	0.271	5436.3	3920.6	5.837	2.370	3.14		Clay	100.0			13.38	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	14.150	0.296	5457.5	3931.2	5.811	2.588	3.16		Clay	100.0			13.37	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	15.450	0.282	5477.5	3941.2	6.450	2.218	3.09		Clay	100.0			14.60	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	15.080	0.277	5497.5	3951.2	6.242	2.249	3.10		Clay	100.0			14.25	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	15.460	0.312	5518.8	3961.9	6.411	2.456	3.11		Clay	100.0			14.61	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	17.670	0.412	5538.8	3971.9	7.503	2.768	3.08		Clay	100.0			16.70	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	20.450	0.634	5560.0	3982.5	8.874	3.589	3.08		Clay	100.0			19.33	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	25.200	0.869	5580.0	3992.5	11.226	3.876	3.02		Clay	100.0			23.82	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	28.740	1.006	5600.0	4002.6	12.962	3.879	2.97		Clay	100.0			27.16	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.770	30.110	1.101	5621.3	4013.2	13.605	4.031	2.96		Clay	100.0			28.46	0.84	n.a.	n.a.	0.82	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	31.250	1.230	5641.3	4023.2	14.133	4.326	2.97		Clay	100.0			29.54	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	33.790	1.365	5662.5	4033.9	15.349	4.408	2.95		Clay	98.9			31.94	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	36.380	1.473	5682.5	4043.9	16.587	4.392	2.92		Clay	96.7			34.39	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	37.850	1.427	5702.5	4053.9	17.267	4.076	2.89		Clay	94.0			35.78	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	37.950	1.480	5723.8	4064.5	17.266	4.217	2.90		Clay	94.7			35.87	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	37.120	1.558	5743.8	4074.6	16.811	4.549	2.93		Clay	97.1			35.09	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	37.370	1.757	5765.0	4085.2	16.884	5.094	2.96		Clay	99.5			35.32	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	37.330	1.707	5785.0	4095.2	16.818	4.957	2.95		Clay	99.0			35.28	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	36.930	1.528	5805.0	4105.2	16.578	4.491	2.93		Clay	97.2			34.91	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	34.570	1.384	5826.3	4115.9	15.383	4.370	2.95		Clay	98.6			32.67	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	31.190	1.306	5846.3	4125.9	13.702	4.619	3.00		Clay	100.0			29.48	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	28.590	1.170	5867.5	4136.5	12.405	4.558	3.03		Clay	100.0			27.02	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	24.910	0.964	5887.5	4146.5	10.595	4.388	3.07		Clay	100.0			23.54	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	27.810	0.759	5907.5	4156.6	11.960	3.054	2.94		Clay	98.0			26.29	0.84	n.a.	n.a.	0.81	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	22.030	0.629	5928.8	4167.2	9.150	3.301	3.05		Clay	100.0			20.82	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	17.560	0.523	5948.8	4177.2	6.983	3.584	3.17		Clay	100.0			16.60	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	15.230	0.495	5970.0	4187.9	5.848	4.045	3.26		Clay	100.0			14.40	0.84	n.a.	n.a.	0.81	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	15.000	0.478	5990.0	4197.9	5.720	3.984	3.27		Clay	100.0			14.18	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	15.660	0.418	6010.0	4207.9	6.015	3.305	3.20		Clay	100.0			14.80	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	15.410	0.328	6031.3	4218.5	5.876	2.648	3.16		Clay	100.0			14.57	0.83	n.a.	n.a.	0.81	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	14.150	0.411	6051.3	4228.5	5.262	3.694	3.28		Clay	100.0			13.37	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	13.600	0.912	6072.5	4239.2	4.984	8.632	3.51		Clay	100.0			12.85	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	18.930	1.181	6092.5	4249.2	7.476	7.433	3.33		Clay	100.0			17.89	0.83	n.a.	n.a.	0.81	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	27.110	1.151	6112.5	4259.2	11.295	4.786	3.07		Clay	100.0			25.62	0.83	n.a.	n.a.	0.81	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	31.250	1.071	6133.8	4269.9	13.201	3.801	2.96		Clay	99.8			29.54	0.83	n.a.	n.a.	0.80	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	25.060	1.281	6153.8	4279.9	10.273	5.827	3.16		Clay	100.0			23.69	0.83	n.a.	n.a.	0.80	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 4

PGA (A_{max}) 0.88

Total Settlement: 0.11 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160			19.2	19.2					Unsaturated					1.70										
0.330			39.6	39.6					Unsaturated					1.70										
0.490			58.8	58.8					Unsaturated					1.70										
0.660			79.2	79.2					Unsaturated					1.70										
0.820			98.4	98.4					Unsaturated					1.70										
0.980	19.440	0.248	117.6	117.6	77.705	1.280	2.06		Unsaturated	28.0			18.37	1.70	31.24	70.72	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	50.280	0.389	138.0	138.0	185.837	0.775	1.63		Unsaturated	0.0			47.52	1.70	80.79	80.79	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	61.320	0.562	157.2	157.2	212.369	0.917	1.64		Unsaturated	0.0			57.96	1.70	98.53	98.53	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	40.330	0.622	177.6	177.6	131.287	1.546	1.95		Unsaturated	19.2			38.12	1.70	64.80	95.33	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	25.260	0.736	196.8	196.8	77.983	2.925	2.31		Unsaturated	47.8			23.88	1.70	40.59	96.40	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	18.030	0.813	216.0	216.0	53.019	4.536	2.56		Unsaturated	68.0			17.04	1.70	28.97	87.65	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	17.350	0.736	236.4	236.4	48.728	4.272	2.57		Unsaturated	68.5			16.40	1.70	27.88	86.34	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	19.210	0.640	255.6	255.6	51.894	3.353	2.48		Unsaturated	61.0			18.16	1.70	30.87	88.50	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	21.960	0.559	276.0	276.0	57.110	2.561	2.36		Unsaturated	52.1			20.76	1.70	35.29	91.43	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	22.340	0.548	295.2	295.2	56.159	2.470	2.36		Unsaturated	51.7			21.12	1.70	35.90	92.04	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	20.760	0.629	314.4	314.4	50.519	3.052	2.45		Unsaturated	59.4			19.62	1.70	33.36	91.26	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	18.460	0.757	334.8	334.8	43.467	4.138	2.59		Unsaturated	70.5			17.45	1.70	29.66	89.02	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	16.780	0.878	354.0	354.0	54.860	5.288	2.60		Unsaturated	71.2			15.86	1.70	26.96	85.65	1.00	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	16.220	0.940	374.4	374.4	50.939	5.864	2.66		Unsaturated	75.6			15.33	1.70	26.06	85.23	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	16.770	0.963	393.6	393.6	50.844	5.812	2.65		Unsaturated	75.4			15.85	1.70	26.95	86.34	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	16.790	0.946	412.8	412.8	49.208	5.705	2.66		Unsaturated	75.7			15.87	1.70	26.98	86.43	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	15.880	0.902	433.2	433.2	44.934	5.759	2.69		Unsaturated	78.0			15.01	1.70	25.52	84.89	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	15.360	0.879	452.4	452.4	42.117	5.809	2.71		Unsaturated	79.8			14.52	1.70	24.68	84.06	1.00	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	14.590	0.892	472.8	472.8	60.717	6.217	2.63		Unsaturated	73.1			13.79	1.70	23.44	81.44	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	13.660	0.819	492.0	492.0	54.528	6.102	2.65		Unsaturated	75.1			12.91	1.70	21.95	79.81	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	12.440	0.752	512.4	512.4	47.556	6.172	2.69		Unsaturated	78.5			11.76	1.70	19.99	77.78	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	10.420	0.677	531.6	531.6	38.202	6.670	2.78		Unsaturated	85.6			9.85	1.70	16.74	74.47	1.00	0.570	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	9.110	0.699	550.8	550.8	32.079	7.906	2.89		Unsaturated	94.1			8.61	1.70	14.64	72.60	1.00	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	9.850	0.782	571.2	571.2	33.489	8.180	2.89		Unsaturated	93.9			9.31	1.70	15.83	74.14	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	11.820	0.859	590.4	590.4	39.041	7.453	2.81		Unsaturated	87.9			11.17	1.70	18.99	77.67	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	13.380	0.858	610.8	610.8	42.811	6.562	2.74		Unsaturated	82.5			12.65	1.70	21.50	80.29	0.99	0.569	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	13.560	0.849	630.0	630.0	42.048	6.409	2.74		Unsaturated	82.3			12.82	1.70	21.79	80.64	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	13.150	0.793	649.2	649.2	39.511	6.184	2.75		Unsaturated	82.9			12.43	1.70	21.13	79.85	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	13.210	0.830	669.6	669.6	38.456	6.446	2.77		Unsaturated	84.6			12.49	1.70	21.23	80.19	0.99	0.568	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	14.130	0.862	688.8	688.8	40.028	6.252	2.75		Unsaturated	82.9			13.36	1.70	22.70	81.90	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	14.700	0.947	709.2	709.2	40.455	6.600	2.76		Unsaturated	84.0			13.89	1.70	23.62	83.23	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	16.480	0.996	728.4	728.4	44.250	6.182	2.72		Unsaturated	80.2			15.58	1.70	26.48	86.46	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	18.010	1.063	747.6	747.6	47.181	6.026	2.69		Unsaturated	78.1			17.02	1.70	28.94	89.34	0.99	0.567	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.400	19.110	1.120	768.0	768.0	48.766	5.983	2.68		Unsaturated	77.1			18.06	1.69	30.54	91.27	0.99	0.566	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.560	19.040	1.134	787.2	787.2	47.374	6.083	2.69		Unsaturated	78.2			18.00	1.67	30.07	90.83	0.99	0.566	1.098	n.a.	n.a.	n.a.	0.00	0.00
6.730	18.930	1.146	807.6	807.6	45.880	6.185	2.70		Unsaturated	79.4			17.89	1.65	29.54	90.31	0.99	0.566	1.095	n.a.	n.a.	n.a.	0.00	0.00
6.890	19.330	1.126	826.8	826.8	45.759	5.952	2.69		Unsaturated	78.5			18.27	1.63	29.78	90.49	0.99	0.566	1.093	n.a.	n.a.	n.a.	0.00	0.00
7.050	18.460	1.119	846.0	846.0	42.641	6.202	2.73		Unsaturated	81.2			17.45	1.62	28.21	88.83	0.99	0.565	1.089	n.a.	n.a.	n.a.	0.00	0.00
7.220	16.810	1.071	866.4	866.4	37.804	6.542	2.78		Unsaturated	85.4			15.89	1.61	25.53	85.89	0.99	0.565	1.085	n.a.	n.a.	n.a.	0.00	0.00
7.380	16.030	1.020	885.6	885.6	35.201	6.546	2.80		Unsaturated	87.1			15.15	1.59	24.15	84.29	0.99	0.565	1.082	n.a.	n.a.	n.a.	0.00	0.00
7.550	16.620	0.986	906.0	906.0	35.689	6.098	2.77		Unsaturated	85.0			15.71	1.57	24.71	84.77	0.99	0.564	1.080	n.a.	n.a.	n.a.	0.00	0.00
7.710	17.820	0.964	925.2	925.2	37.521	5.554	2.73		Unsaturated	81.4			16.84	1.55	26.12	86.16	0.99	0.564	1.079	n.a.	n.a.	n.a.	0.00	0.00
7.870	17.650	0.876	944.4	944.4	36.378	5.101	2.71		Unsaturated	80.0			16.68	1.54	25.64	85.34	0.99	0.564	1.076	n.a.	n.a.	n.a.	0.00	0.00
8.040	19.570	0.647	964.8	964.8	31.262	3.389	2.64		Unsaturated	74.1			18.50	1.51	27.99	87.48	0.99	0.564	1.076	n.a.	n.a.	n.a.	0.00	0.00
8.200	30.770	0.576	984.0	984.0	41.966	1.901	2.38		Unsaturated	53.3			29.08	1.46	42.51	101.04	0.98	0.563	1.082	n.a.	n.a.	n.a.	0.00	0.00
8.370	67.200	0.421	1004.4	1004.4	91.502	0.631	1.82		Unsaturated	8.7			63.52	1.46	92.55	96.88	0.98	0.563	1.077	n.a.	n.a.	n.a.	0.00	0.00
8.530	80.960	0.343	1023.6	1023.6	109.326	0.426	1.66		Unsaturated	0.0			76.52	1.42	108.44	108.44	0.98	0.563	1.082	n.a.	n.a.	n.a.	0.00	0.00
8.690	81.880	0.315	1042.8	1042.8	109.541	0.387	1.64		Unsaturated	0.0			77.39	1.40	108.66	108.66	0.98	0.562	1.081	n.a.	n.a.	n.a.	0.00	0.00
8.860	86.310	0.260	1063.2	1063.2	114.378	0.303	1.58		Unsaturated	0.0			81.58	1.38	112.81	112.81	0.98	0.562	1.081	n.a.	n.a.	n.a.	0.00	0.00
9.020	87.680	0.274	1082.4	1082.4	115.157	0.314	1.58		Unsaturated	0.0			82.87	1.37	113.53	113.53	0.98	0.562	1.079	n.a.	n.a.	n.a.	0.00	0.00
9.190	79.690	0.390	1102.8	1102.8	103.612	0.492	1.72		Unsaturated	0.4			75.32	1.38	103.67	103.67	0.98	0.562	1.071	n.a.	n.a.	n.a.	0.00	0.00
9.350	60.210	0.587	1122.0	1122.0	77.425	0.984	1.99		Unsaturated	22.4			56.91	1.34	76.48	115.36	0.98	0.561	1.076	n.a.	n.a.	n.a.	0.00	0.00
9.510	32.720	0.498	1141.2	1141.2	41.377	1.550	2.33		Unsaturated	49.3			30.93	1.36	42.12	99.00	0.98	0.561	1.065	n.a.	n.a.	n.a.	0.00	0.00
9.680	18.010	0.422	1161.6	1161.6	25.068	2.419	2.62		Unsaturated	72.5			17.02	1.38	23.57	81.50	0.98	0.561	1.055	n.a.	n.a.	n.a.	0.00	0.00
9.840	9.950	0.339	1180.8	1180.8	15.853	3.621	2.88		Unsaturated	93.7			9.40	1.40	13.13	70.59	0.98	0.560	1.049	n.a.	n.a.	n.a.	0.00	0.00
10.010	8.910	0.254	1201.2	1201.2	13.835	3.062	2.89		Clay	94.0			8.42	1.16	n.a.	n.a.	0.98	0.560	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.170	9.910	0.252	1220.4	1220.4	15.241	2.704	2.82		Clay	88.7			9.37	1.16	n.a.	n.a.	0.98	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.330	10.600	0.239	1239.6	1239.6	16.102	2.390	2.77		Clay	84.7			10.02	1.15	n.a.	n.a.	0.98	0.569	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.500	8.800	0.245	1260.0	1260.0	12.968	2.995	2.90		Clay	95.3			8.32	1.15	n.a.	n.a.	0.98	0.573	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	9.110	0.258	1279.2	1279.2	13.243	3.045	2.90		Clay	95.1			8.61	1.14	n.a.	n.a.	0.98	0.577	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.830	8.930	0.284	1299.6	1299.6	12.743	3.424	2.94		Clay	98.6			8.44	1.14	n.a.	n.a.	0.98	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.990	9.490	0.362	1318.8	1318.8	13.392	4.101	2.97		Clay	100.0			8.97	1.13	n.a.	n.a.	0.98	0.586	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.150	10.590	0.511	1338.0	1338.0	14.830	5.153	3.00		Clay	100.0			10.01	1.13	n.a.	n.a.	0.98	0.589	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No. 4

PGA (A_{max}) 0.88

Total Settlement: 0.11 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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}	$q_{c1N\text{-}CS}$	Stress Reduction Coeff, r_d	CSR	K_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
11.320	15.180	0.539	1358.4	1358.4	21.350	3.719	2.79		Clay	86.3			14.35	1.12	n.a.	n.a.	0.97	0.593	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	32.120	0.621	1377.6	1377.6	36.819	1.975	2.43		Sand	57.7		1.8	54.65	1.20	65.83	132.25	0.97	0.597	1.059	0.205	0.322	0.54	0.02	0.04
11.650	29.540	0.648	1398.0	1398.0	33.537	2.248	2.50		Sand	63.0	30.36	1.8	54.65	1.20	65.36	133.29	0.97	0.601	1.058	0.208	0.329	0.55	0.02	0.04
11.810	16.330	0.285	1417.2	1417.2	19.548	1.826	2.63	plastic	Clay	73.8			15.43	1.11	n.a.	n.a.	0.97	0.605	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.980	10.580	0.247	1437.6	1437.6	13.719	2.503	2.84		Clay	90.1			10.00	1.11	n.a.	n.a.	0.97	0.608	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.140	8.300	0.257	1456.8	1456.8	10.395	3.393	3.01		Clay	100.0			7.84	1.10	n.a.	n.a.	0.97	0.612	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.300	8.010	0.249	1476.0	1476.0	9.854	3.424	3.03		Clay	100.0			7.57	1.10	n.a.	n.a.	0.97	0.615	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	7.820	0.241	1496.4	1496.4	9.452	3.408	3.05		Clay	100.0			7.39	1.10	n.a.	n.a.	0.97	0.619	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	7.600	0.277	1515.6	1515.6	9.029	4.047	3.11		Clay	100.0			7.18	1.09	n.a.	n.a.	0.97	0.622	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	8.260	0.281	1536.0	1536.0	9.755	3.745	3.06		Clay	100.0			7.81	1.09	n.a.	n.a.	0.97	0.625	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	9.470	0.287	1555.2	1555.2	11.178	3.298	2.98		Clay	100.0			8.95	1.08	n.a.	n.a.	0.97	0.628	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	9.350	0.305	1574.4	1574.4	10.878	3.557	3.01		Clay	100.0			8.84	1.08	n.a.	n.a.	0.97	0.631	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	10.420	0.258	1594.8	1594.8	12.067	2.685	2.90		Clay	95.2			9.85	1.08	n.a.	n.a.	0.97	0.635	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	10.240	0.220	1614.0	1614.0	11.689	2.328	2.88		Clay	93.3			9.68	1.07	n.a.	n.a.	0.97	0.638	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	8.540	0.189	1634.4	1634.4	9.450	2.450	2.97		Clay	100.0			8.07	1.07	n.a.	n.a.	0.97	0.641	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	7.540	0.164	1653.6	1653.6	8.119	2.443	3.02		Clay	100.0			7.13	1.07	n.a.	n.a.	0.97	0.644	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	6.930	0.157	1672.8	1672.8	7.286	2.573	3.08		Clay	100.0			6.55	1.06	n.a.	n.a.	0.97	0.646	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	6.510	0.176	1693.2	1693.2	6.690	3.115	3.15		Clay	100.0			6.15	1.06	n.a.	n.a.	0.97	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	6.680	0.217	1712.4	1712.4	6.802	3.728	3.19		Clay	100.0			6.31	1.06	n.a.	n.a.	0.96	0.652	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	7.280	0.154	1732.8	1732.8	7.403	2.396	3.05		Clay	100.0			6.88	1.05	n.a.	n.a.	0.96	0.655	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	7.650	0.272	1752.0	1752.0	7.733	4.020	3.16		Clay	100.0			7.23	1.05	n.a.	n.a.	0.96	0.657	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	7.820	0.308	1771.2	1771.2	7.830	4.440	3.18		Clay	100.0			7.39	1.05	n.a.	n.a.	0.96	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	5.440	0.283	1791.6	1791.6	5.073	6.228	3.42		Clay	100.0			5.14	1.04	n.a.	n.a.	0.96	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	8.380	0.212	1810.8	1810.8	8.256	2.831	3.05		Clay	100.0			7.92	1.04	n.a.	n.a.	0.96	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	8.320	0.230	1831.2	1831.2	8.087	3.106	3.08		Clay	100.0			7.86	1.04	n.a.	n.a.	0.96	0.668	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	9.110	0.352	1850.4	1850.4	8.847	4.299	3.13		Clay	100.0			8.61	1.04	n.a.	n.a.	0.96	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	14.570	0.423	1869.6	1869.6	14.586	3.101	2.87		Clay	92.7			13.77	1.03	n.a.	n.a.	0.96	0.672	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	23.430	0.571	1890.0	1890.0	23.794	2.540	2.65		Clay	75.0			22.15	1.03	n.a.	n.a.	0.96	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	20.650	0.458	1909.2	1909.2	20.632	2.324	2.68		Clay	77.1			19.52	1.03	n.a.	n.a.	0.96	0.677	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	11.210	0.320	1929.6	1929.6	10.619	3.126	2.99		Clay	100.0			10.60	1.02	n.a.	n.a.	0.96	0.680	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	7.300	0.311	1948.8	1948.8	6.492	4.913	3.27		Clay	100.0			6.90	1.02	n.a.	n.a.	0.96	0.682	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	6.720	0.339	1968.0	1968.0	5.829	5.914	3.36		Clay	100.0			6.35	1.02	n.a.	n.a.	0.96	0.684	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	7.140	0.320	1988.4	1988.4	6.182	5.210	3.31		Clay	100.0			6.75	1.02	n.a.	n.a.	0.96	0.686	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	6.670	0.295	2007.6	2007.6	5.645	5.213	3.34		Clay	100.0			6.30	1.01	n.a.	n.a.	0.96	0.688	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	5.760	0.314	2028.0	2028.0	4.680	6.610	3.46		Clay	100.0			5.44	1.01	n.a.	n.a.	0.95	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	6.240	0.297	2047.2	2047.2	5.096	5.697	3.40		Clay	100.0			5.90	1.01	n.a.	n.a.	0.95	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	6.680	0.298	2066.4	2066.4	5.465	5.283	3.35		Clay	100.0			6.31	1.01	n.a.	n.a.	0.95	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	6.950	0.291	2086.8	2086.8	5.661	4.922	3.32		Clay	100.0			6.57	1.00	n.a.	n.a.	0.95	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	6.980	0.293	2106.0	2106.0	5.629	4.949	3.33		Clay	100.0			6.60	1.00	n.a.	n.a.	0.95	0.698	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.720	6.930	0.265	2126.4	2126.4	5.518	4.510	3.31		Clay	100.0			6.55	1.00	n.a.	n.a.	0.95	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.880	7.010	0.284	2145.6	2145.6	5.534	4.775	3.32		Clay	100.0			6.63	1.00	n.a.	n.a.	0.95	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.040	7.190	0.300	2164.8	2164.8	5.643	4.905	3.32		Clay	100.0			6.80	0.99	n.a.	n.a.	0.95	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.210	7.420	0.333	2185.2	2185.2	5.791	5.266	3.33		Clay	100.0			7.01	0.99	n.a.	n.a.	0.95	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.370	7.160	0.321	2204.4	2204.4	5.496	5.304	3.35		Clay	100.0			6.77	0.99	n.a.	n.a.	0.95	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.540	6.960	0.287	2224.8	2224.8	5.257	4.915	3.35		Clay	100.0			6.58	0.99	n.a.	n.a.	0.95	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.700	7.620	0.275	2244.0	2244.0	5.791	4.226	3.28		Clay	100.0			7.20	0.98	n.a.	n.a.	0.95	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.860	9.220	0.319	2263.2	2263.2	7.148	3.944	3.18		Clay	100.0			8.71	0.98	n.a.	n.a.	0.95	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.030	10.180	0.389	2283.6	2283.6	7.916	4.300	3.17		Clay	100.0			9.62	0.98	n.a.	n.a.	0.95	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.190	10.560	0.464	2302.8	2302.8	8.171	4.930	3.19		Clay	100.0			9.98	0.98	n.a.	n.a.	0.95	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.360	10.720	0.515	2323.2	2323.2	8.229	5.383	3.21		Clay	100.0			10.13	0.98	n.a.	n.a.	0.95	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.520	10.260	0.482	2342.4	2342.4	7.760	5.300	3.23		Clay	100.0			9.70	0.97	n.a.	n.a.	0.94	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.690	9.960	0.422	2362.8	2362.8	7.431	4.804	3.22		Clay	100.0			9.41	0.97	n.a.	n.a.	0.94	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.850	9.990	0.479	2382.0	2382.0	7.388	5.442	3.25		Clay	100.0			9.44	0.97	n.a.	n.a.	0.94	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.010	10.830	0.490	2401.3	2400.6	8.022	5.091	3.21		Clay	100.0			10.24	0.97	n.a.	n.a.	0.94	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.180	11.130	0.419	2422.5	2411.3	8.227	4.228	3.15		Clay	100.0			10.52	0.97	n.a.	n.a.	0.94	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	11.790	0.468	2442.5	2421.3	8.730	4.426	3.14		Clay	100.0			11.14	0.97	n.a.	n.a.	0.94	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	12.550	0.475	2463.8	2431.9	9.308	4.197	3.11		Clay	100.0			11.86	0.96	n.a.	n.a.	0.94	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	12.930	0.483	2483.8	2441.9	9.573	4.132	3.09		Clay	100.0			12.22	0.96	n.a.	n.a.	0.94	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	13.970	0.505	2503.8	2452.0	10.374	3.968	3.05		Clay	100.0			13.20	0.96	n.a.	n.a.	0.94	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	14.450	0.532	2525.0	2462.6	10.710	4.036	3.05		Clay	100.0			13.66	0.96	n.a.	n.a.	0.94	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	14.970	0.538	2545.0	2472.6	11.079	3.930	3.03		Clay	100.0			14.15	0.96	n.a.	n.a.	0.94	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.330	15.490	0.543	2566.3	2483.3	11.442	3.821	3.01		Clay	100.0			14.64	0.96	n.a.	n.a.	0.94	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	15.340	0.521	2586.3	2493.3	11.268	3.707	3.01		Clay	100.0			14.50	0.96	n.a.	n.a.	0.94	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	14.920	0.542	2606.3	2503.3	10.879	3.981	3.04		Clay	100.0			14.10	0.96	n.a.	n.a.	0.94	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.820	15.310	0.563	2627.5	2513.9	11.135	4.025	3.03		Clay	100.0			14.47	0.96	n.a.	n.a.	0.94	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	16.390	0.615	2647.5	2523.9	11.939	4.080	3.01		Clay	100.0			15.49	0.95	n.a.	n.a.	0.93	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	16.880	0.677	2668.8	2534.6	12.267	4.352	3.02		Clay	100.0			15.95	0.95	n.a.	n.a.	0.93	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No. 4

PGA (A_{max}) 0.88

Total Settlement: 0.11 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
22.310	16.420	0.648	2688.8	2544.6	11.849	4.295	3.03		Clay	100.0			15.52	0.95	n.a.	n.a.	0.93	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	15.640	0.625	2708.8	2554.6	11.184	4.373	3.05		Clay	100.0			14.78	0.95	n.a.	n.a.	0.93	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	15.150	0.656	2730.0	2565.3	10.747	4.760	3.09		Clay	100.0			14.32	0.95	n.a.	n.a.	0.93	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	15.040	0.689	2750.0	2575.3	10.612	5.041	3.11		Clay	100.0			14.22	0.95	n.a.	n.a.	0.93	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	15.580	0.702	2771.3	2585.9	10.978	4.948	3.09		Clay	100.0			14.73	0.95	n.a.	n.a.	0.93	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	16.780	0.672	2791.3	2595.9	11.853	4.367	3.03		Clay	100.0			15.86	0.95	n.a.	n.a.	0.93	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	16.780	0.765	2811.3	2606.0	11.799	4.973	3.07		Clay	100.0			15.86	0.95	n.a.	n.a.	0.93	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	17.350	0.826	2832.5	2616.6	12.179	5.185	3.07		Clay	100.0			16.40	0.95	n.a.	n.a.	0.93	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	17.980	0.891	2852.5	2626.6	12.605	5.384	3.07		Clay	100.0			16.99	0.94	n.a.	n.a.	0.93	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	19.190	0.953	2873.8	2637.3	13.463	5.366	3.05		Clay	100.0			18.14	0.94	n.a.	n.a.	0.93	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	19.860	1.001	2893.8	2647.3	13.911	5.437	3.04		Clay	100.0			18.77	0.94	n.a.	n.a.	0.93	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	20.580	1.012	2913.8	2657.3	14.393	5.291	3.02		Clay	100.0			19.45	0.94	n.a.	n.a.	0.93	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	21.540	0.995	2935.0	2667.9	15.047	4.956	2.99		Clay	100.0			20.36	0.94	n.a.	n.a.	0.92	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	21.680	0.986	2955.0	2677.9	15.088	4.878	2.98		Clay	100.0			20.49	0.94	n.a.	n.a.	0.92	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	21.740	0.979	2976.3	2688.6	15.065	4.834	2.98		Clay	100.0			20.55	0.94	n.a.	n.a.	0.92	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	21.880	0.949	2996.3	2698.6	15.106	4.657	2.97		Clay	100.0			20.68	0.94	n.a.	n.a.	0.92	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	21.230	0.902	3016.3	2708.6	14.562	4.576	2.98		Clay	100.0			20.07	0.94	n.a.	n.a.	0.92	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	20.750	0.884	3037.5	2719.3	14.144	4.597	2.99		Clay	100.0			19.61	0.94	n.a.	n.a.	0.92	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	20.710	0.909	3057.5	2729.3	14.056	4.740	3.00		Clay	100.0			19.57	0.94	n.a.	n.a.	0.92	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	20.880	0.884	3078.8	2739.9	14.118	4.571	2.99		Clay	100.0			19.74	0.93	n.a.	n.a.	0.92	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	20.650	0.876	3098.8	2749.9	13.892	4.585	2.99		Clay	100.0			19.52	0.93	n.a.	n.a.	0.92	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	20.210	0.852	3118.8	2760.0	13.515	4.568	3.00		Clay	100.0			19.10	0.93	n.a.	n.a.	0.92	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	20.320	0.865	3140.0	2770.6	13.535	4.611	3.00		Clay	100.0			19.21	0.93	n.a.	n.a.	0.92	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	20.580	0.832	3160.0	2780.6	13.666	4.381	2.99		Clay	100.0			19.45	0.93	n.a.	n.a.	0.92	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	19.130	0.813	3181.3	2791.3	12.567	4.633	3.03		Clay	100.0			18.08	0.93	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	17.370	0.761	3201.3	2801.3	11.259	4.823	3.08		Clay	100.0			16.42	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	15.660	0.702	3221.3	2811.3	9.995	4.995	3.13		Clay	100.0			14.80	0.93	n.a.	n.a.	0.91	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	14.810	0.646	3242.5	2821.9	9.347	4.897	3.15		Clay	100.0			14.00	0.93	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	14.830	0.612	3262.5	2831.9	9.321	4.635	3.13		Clay	100.0			14.02	0.93	n.a.	n.a.	0.91	0.767	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	16.690	0.599	3283.8	2842.6	10.588	3.979	3.05		Clay	100.0			15.78	0.93	n.a.	n.a.	0.91	0.767	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	19.580	0.793	3303.8	2852.6	12.570	4.422	3.02		Clay	100.0			18.51	0.92	n.a.	n.a.	0.91	0.768	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	21.100	1.038	3325.0	2863.2	13.577	5.339	3.04		Clay	100.0			19.94	0.92	n.a.	n.a.	0.91	0.768	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	22.740	1.219	3345.0	2873.3	14.665	5.787	3.04		Clay	100.0			21.49	0.92	n.a.	n.a.	0.91	0.769	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	23.200	1.272	3365.0	2883.3	14.926	5.910	3.04		Clay	100.0			21.93	0.92	n.a.	n.a.	0.91	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	23.470	1.275	3386.3	2893.9	15.050	5.854	3.03		Clay	100.0			22.18	0.92	n.a.	n.a.	0.91	0.770	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	23.830	1.167	3406.3	2903.9	15.239	5.273	3.00		Clay	100.0			22.52	0.92	n.a.	n.a.	0.91	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	24.480	1.126	3427.5	2914.6	15.622	4.947	2.97		Clay	100.0			23.14	0.92	n.a.	n.a.	0.91	0.771	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	23.520	1.064	3447.5	2924.6	14.906	4.881	2.99		Clay	100.0			22.23	0.92	n.a.	n.a.	0.91	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	23.110	1.034	3467.5	2934.6	14.568	4.839	2.99		Clay	100.0			21.84	0.92	n.a.	n.a.	0.91	0.772	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	22.250	0.982	3488.8	2945.2	13.925	4.789	3.00		Clay	100.0			21.03	0.92	n.a.	n.a.	0.91	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	23.640	0.984	3508.8	2955.3	14.811	4.494	2.97		Clay	100.0			22.34	0.92	n.a.	n.a.	0.90	0.773	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	25.360	1.077	3530.0	2965.9	15.911	4.564	2.95		Clay	98.7			23.97	0.91	n.a.	n.a.	0.90	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	27.710	1.322	3550.0	2975.9	17.430	5.097	2.95		Clay	98.7			26.19	0.91	n.a.	n.a.	0.90	0.774	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	29.970	1.450	3570.0	2985.9	18.879	5.145	2.92		Clay	96.8			28.33	0.91	n.a.	n.a.	0.90	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	28.600	1.469	3591.3	2996.6	17.890	5.480	2.96		Clay	99.7			27.03	0.91	n.a.	n.a.	0.90	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	24.900	1.345	3611.3	3006.6	15.362	5.826	3.03		Clay	100.0			23.53	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	20.500	1.145	3632.5	3017.2	12.385	6.127	3.11		Clay	100.0			19.38	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	18.390	1.197	3652.5	3027.3	10.943	7.226	3.20		Clay	100.0			17.38	0.91	n.a.	n.a.	0.90	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	21.780	1.097	3672.5	3037.3	13.133	5.499	3.06		Clay	100.0			20.59	0.91	n.a.	n.a.	0.90	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	30.130	1.307	3693.8	3047.9	18.559	4.621	2.90		Clay	94.8			28.48	0.91	n.a.	n.a.	0.90	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	34.580	1.364	3713.8	3057.9	21.402	4.168	2.82		Clay	88.8			32.68	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	44.850	1.599	3735.0	3068.6	28.015	3.720	2.70		Clay	79.1			42.39	0.91	n.a.	n.a.	0.90	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	57.020	1.495	3755.0	3078.6	43.210	2.711	2.47		Sand	60.6	176.32	1.55	273.30	0.91	247.56	365.98	0.90	0.778	0.888	#########	########	##########	0.00	0.00
31.000	149.280	0.849	3775.0	3088.6	115.310	0.576	1.72		Sand	0.3	176.32	1.55	273.30	0.90	246.56	246.56	0.89	0.779	0.887	87.451	170.564	219.05	0.00	0.00
31.170	186.550	1.133	3796.3	3099.2	144.211	0.613	1.65		Sand	0.0		1.55	273.30	0.90	246.31	246.31	0.89	0.779	0.886	84.985	165.561	212.53	0.00	0.00
31.330	177.910	1.817	3816.3	3109.3	137.234	1.033	1.82		Sand	8.3	176.32	1.55	273.30	0.90	246.73	252.30	0.89	0.779	0.885	171.817	334.355	429.04	0.00	0.00
31.500	135.620	2.584	3837.5	3119.9	104.073	1.932	2.09		Sand	30.4	176.32	1.55	273.30	0.90	246.69	332.84	0.89	0.780	0.884	#########	########	##########	0.00	0.00
31.660	104.270	2.700	3857.5	3129.9	79.535	2.639	2.27		Sand	44.7	176.32	1.55	273.30	0.90	246.48	353.05	0.89	0.780	0.883	#########	########	##########	0.00	0.00
31.820	76.600	2.520	3877.5	3139.9	57.931	3.375	2.44		Sand	58.5	176.32	1.55	273.30	0.90	246.27	363.19	0.89	0.780	0.882	#########	########	##########	0.00	0.00
31.990	51.970	1.378	3898.8	3150.6	38.746	2.754	2.51		Sand	63.7	176.32	1.55	273.30	0.90	246.05	365.65	0.89	0.781	0.881	#########	########	##########	0.00	0.00
32.150	29.740	0.760	3918.8	3160.6	17.579	2.735	2.77		Clay	84.9			28.11	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	16.040	0.624	3940.0	3171.2	8.874	4.435	3.14		Clay	100.0			15.16	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	14.220	0.570	3960.0	3181.2	7.695	4.654	3.20		Clay	100.0			13.44	0.90	n.a.	n.a.	0.89	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	12.790	0.691	3980.0	3191.3	6.768	6.396	3.33		Clay	100.0			12.09	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	13.650	0.639	4001.3	3201.9	7.277	5.484	3.26		Clay	100.0			12.90	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	14.780	0.663	4021.3	3211.9	7.951	5.195	3.22		Clay	100.0			13.97	0.90	n.a.	n.a.	0.89	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	13.930	0.579	4042.5	3222.6	7.391	4.861	3.23		Clay	100.0			13.17	0.89	n.a.	n.a.	0.88	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No. 4

PGA (A_{max}) 0.88

Total Settlement: 0.11 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'vc=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
33.300	12.060	0.516	4062.5	3232.6	6.205	5.147	3.30		Clay	100.0			11.40	0.89	n.a.	n.a.	0.88	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	10.930	0.448	4082.5	3242.6	5.482	5.036	3.34		Clay	100.0			10.33	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	10.460	0.440	4103.8	3253.2	5.169	5.231	3.37		Clay	100.0			9.89	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	10.690	0.422	4123.8	3263.3	5.288	4.885	3.34		Clay	100.0			10.10	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	11.260	0.424	4145.0	3273.9	5.613	4.611	3.31		Clay	100.0			10.64	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	11.600	0.444	4165.0	3283.9	5.796	4.665	3.30		Clay	100.0			10.96	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	12.160	0.463	4185.0	3293.9	6.113	4.600	3.28		Clay	100.0			11.49	0.89	n.a.	n.a.	0.88	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	13.130	0.519	4206.3	3304.6	6.674	4.707	3.25		Clay	100.0			12.41	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	14.750	0.539	4226.3	3314.6	7.625	4.263	3.18		Clay	100.0			13.94	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	14.690	0.534	4247.5	3325.2	7.558	4.247	3.18		Clay	100.0			13.88	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	14.380	0.602	4267.5	3335.2	7.344	4.917	3.23		Clay	100.0			13.59	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	15.090	0.639	4287.5	3345.3	7.740	4.935	3.21		Clay	100.0			14.26	0.89	n.a.	n.a.	0.88	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	16.370	0.581	4308.8	3355.9	8.472	4.088	3.13		Clay	100.0			15.47	0.89	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	13.810	0.437	4328.8	3365.9	6.920	3.752	3.18		Clay	100.0			13.05	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	11.880	0.367	4350.0	3376.6	5.748	3.782	3.25		Clay	100.0			11.23	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	11.030	0.335	4370.0	3386.6	5.224	3.785	3.29		Clay	100.0			10.43	0.88	n.a.	n.a.	0.87	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	10.880	0.344	4391.3	3397.2	5.113	3.965	3.31		Clay	100.0			10.28	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	10.740	0.358	4411.3	3407.2	5.010	4.195	3.33		Clay	100.0			10.15	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	11.100	0.370	4431.3	3417.3	5.200	4.169	3.31		Clay	100.0			10.49	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	11.110	0.386	4452.5	3427.9	5.183	4.347	3.32		Clay	100.0			10.50	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	11.330	0.414	4472.5	3437.9	5.290	4.555	3.33		Clay	100.0			10.71	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.750	12.170	0.439	4493.8	3448.6	5.755	4.426	3.29		Clay	100.0			11.50	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.910	13.220	0.469	4513.8	3458.6	6.340	4.281	3.25		Clay	100.0			12.50	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.070	14.460	0.471	4533.8	3468.6	7.031	3.862	3.19		Clay	100.0			13.67	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.240	15.800	0.408	4555.0	3479.2	7.773	3.015	3.09		Clay	100.0			14.93	0.88	n.a.	n.a.	0.87	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	15.410	0.411	4575.0	3489.2	7.522	3.128	3.11		Clay	100.0			14.57	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.570	14.270	0.418	4596.3	3499.9	6.841	3.495	3.17		Clay	100.0			13.49	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.730	14.840	0.431	4616.3	3509.9	7.141	3.441	3.15		Clay	100.0			14.03	0.88	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.890	15.260	0.449	4636.3	3519.9	7.354	3.468	3.14		Clay	100.0			14.42	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.060	15.120	0.458	4657.5	3530.6	7.246	3.582	3.16		Clay	100.0			14.29	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.220	15.410	0.439	4677.5	3540.6	7.384	3.359	3.13		Clay	100.0			14.57	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	15.140	0.450	4698.8	3551.2	7.204	3.519	3.15		Clay	100.0			14.31	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	14.120	0.390	4718.8	3561.2	6.605	3.319	3.17		Clay	100.0			13.35	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	12.990	0.764	4738.8	3571.2	5.948	7.192	3.40		Clay	100.0			12.28	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	14.890	0.868	4760.0	3581.9	6.985	6.935	3.34		Clay	100.0			14.07	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	19.920	0.637	4780.0	3591.9	9.761	3.635	3.05		Clay	100.0			18.83	0.87	n.a.	n.a.	0.86	0.785	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	20.610	0.559	4801.3	3602.5	10.109	3.068	3.00		Clay	100.0			19.48	0.87	n.a.	n.a.	0.86	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	16.270	0.501	4821.3	3612.6	7.673	3.615	3.14		Clay	100.0			15.38	0.87	n.a.	n.a.	0.86	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	14.810	0.482	4841.3	3622.6	6.840	3.887	3.20		Clay	100.0			14.00	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	14.220	0.484	4862.5	3633.2	6.489	4.106	3.23		Clay	100.0			13.44	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	13.710	0.479	4882.5	3643.2	6.186	4.252	3.25		Clay	100.0			12.96	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	12.890	0.466	4903.8	3653.9	5.713	4.465	3.30		Clay	100.0			12.18	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.190	12.620	0.484	4923.8	3663.9	5.545	4.761	3.32		Clay	100.0			11.93	0.87	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.350	12.900	0.485	4943.8	3673.9	5.677	4.646	3.31		Clay	100.0			12.19	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.520	13.180	0.493	4965.0	3684.6	5.807	4.605	3.30		Clay	100.0			12.46	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	12.830	0.482	4985.0	3694.6	5.596	4.664	3.31		Clay	100.0			12.13	0.86	n.a.	n.a.	0.85	0.784	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	12.710	0.483	5006.3	3705.2	5.509	4.728	3.32		Clay	100.0			12.01	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	12.980	0.496	5026.3	3715.2	5.635	4.741	3.31		Clay	100.0			12.27	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	13.300	0.521	5046.3	3725.2	5.786	4.838	3.31		Clay	100.0			12.57	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	13.290	0.523	5067.5	3735.9	5.758	4.859	3.31		Clay	100.0			12.56	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	13.970	0.534	5087.5	3745.9	6.101	4.672	3.28		Clay	100.0			13.20	0.86	n.a.	n.a.	0.85	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	14.730	0.514	5108.8	3756.5	6.482	4.217	3.24		Clay	100.0			13.92	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	14.880	0.499	5128.8	3766.6	6.539	4.053	3.22		Clay	100.0			14.06	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	15.270	0.495	5148.8	3776.6	6.723	3.897	3.20		Clay	100.0			14.43	0.86	n.a.	n.a.	0.84	0.783	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	16.300	0.374	5170.0	3787.2	7.243	2.728	3.09		Clay	100.0			15.41	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	17.740	0.454	5190.0	3797.2	7.977	2.996	3.08		Clay	100.0			16.77	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	20.050	0.494	5211.3	3807.9	9.162	2.832	3.01		Clay	100.0			18.95	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	20.060	0.452	5231.3	3817.9	9.138	2.592	2.99		Clay	100.0			18.96	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	16.440	0.373	5251.3	3827.9	7.218	2.700	3.09		Clay	100.0			15.54	0.86	n.a.	n.a.	0.84	0.782	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	15.120	0.295	5272.5	3838.5	6.504	2.363	3.10		Clay	100.0			14.29	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	14.090	0.269	5292.5	3848.6	5.947	2.348	3.13		Clay	100.0			13.32	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	14.080	0.260	5313.8	3859.2	5.920	2.273	3.12		Clay	100.0			13.31	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	14.140	0.279	5333.8	3869.2	5.930	2.432	3.14		Clay	100.0			13.36	0.85	n.a.	n.a.	0.84	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	14.370	0.313	5355.0	3879.9	6.027	2.676	3.15		Clay	100.0			13.58	0.85	n.a.	n.a.	0.83	0.781	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	15.480	0.392	5375.0	3889.9	6.577	3.061	3.15		Clay	100.0			14.63	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	17.040	0.548	5395.0	3899.9	7.355	3.819	3.17		Clay	100.0			16.11	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	17.890	0.656	5416.3	3910.5	7.765	4.323	3.18		Clay	100.0			16.91	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CPT No. 4

PGA (A_{max}) 0.88

Total Settlement: 0.11 (Inches)

Depth (ft)	q_c (tsf)	f_s (tsf)	σ_{vc} (psf)	Insitu σ'_{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_σ for Sand	$CRR_{M=7.5,\sigma'_{vc}=1\ atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
44.290	20.430	0.683	5436.3	3920.6	9.035	3.854	3.10		Clay	100.0			19.31	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	21.770	0.660	5457.5	3931.2	9.687	3.467	3.04		Clay	100.0			20.58	0.85	n.a.	n.a.	0.83	0.780	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	21.790	0.620	5477.5	3941.2	9.668	3.253	3.03		Clay	100.0			20.60	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	21.070	0.633	5497.5	3951.2	9.274	3.453	3.06		Clay	100.0			19.91	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	22.590	0.727	5518.8	3961.9	10.011	3.668	3.05		Clay	100.0			21.35	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	24.140	0.802	5538.8	3971.9	10.761	3.751	3.03		Clay	100.0			22.82	0.85	n.a.	n.a.	0.83	0.779	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	25.840	0.757	5560.0	3982.5	11.581	3.284	2.97		Clay	100.0			24.42	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	22.830	0.753	5580.0	3992.5	10.039	3.759	3.05		Clay	100.0			21.58	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	20.940	0.806	5600.0	4002.6	9.064	4.440	3.13		Clay	100.0			19.79	0.85	n.a.	n.a.	0.83	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.770	20.590	0.804	5621.3	4013.2	8.860	4.519	3.14		Clay	100.0			19.46	0.84	n.a.	n.a.	0.82	0.778	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	20.000	0.726	5641.3	4023.2	8.540	4.228	3.14		Clay	100.0			18.90	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	19.010	0.656	5662.5	4033.9	8.021	4.052	3.15		Clay	100.0			17.97	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	18.280	0.593	5682.5	4043.9	7.636	3.840	3.15		Clay	100.0			17.28	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	17.830	0.635	5702.5	4053.9	7.390	4.237	3.19		Clay	100.0			16.85	0.84	n.a.	n.a.	0.82	0.777	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	19.060	0.614	5723.8	4064.5	7.970	3.789	3.14		Clay	100.0			18.02	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	20.780	0.606	5743.8	4074.6	8.790	3.385	3.07		Clay	100.0			19.64	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	20.930	0.649	5765.0	4085.2	8.836	3.598	3.09		Clay	100.0			19.78	0.84	n.a.	n.a.	0.82	0.776	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	21.010	0.810	5785.0	4095.2	8.848	4.469	3.14		Clay	100.0			19.86	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	25.110	1.343	5805.0	4105.2	10.819	6.046	3.15		Clay	100.0			23.73	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	35.010	2.133	5826.3	4115.9	15.597	6.646	3.06		Clay	100.0			33.09	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	55.890	2.906	5846.3	4125.9	25.675	5.486	2.84		Clay	90.5			52.83	0.84	n.a.	n.a.	0.82	0.775	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	96.730	3.421	5867.5	4136.5	63.407	3.648	2.44		Sand	58.3	178.77		178.77	0.83	147.89	237.33	0.81	0.774	0.799	32.799	57.647	74.46	0.00	0.00
47.900	131.120	3.337	5887.5	4146.5	86.544	2.603	2.24		Sand	42.3	178.77		178.77	0.82	146.42	225.73	0.81	0.774	0.798	11.327	19.890	25.70	0.00	0.00
48.060	163.360	2.971	5907.5	4156.6	108.175	1.852	2.07		Sand	28.4	178.77		178.77	0.80	143.83	205.64	0.81	0.774	0.810	2.636	4.700	6.07	0.00	0.00
48.230	178.300	2.633	5928.8	4167.2	118.092	1.502	1.98		Sand	21.1	178.77		178.77	0.79	141.25	186.78	0.81	0.773	0.846	0.969	1.803	2.33	0.00	0.00
48.390	183.260	2.263	5948.8	4177.2	121.280	1.255	1.91		Sand	16.1	178.77		178.77	0.78	138.62	168.61	0.81	0.773	0.871	0.481	0.801	1.04	0.01	0.00
48.560	180.940	1.344	5970.0	4187.9	119.560	0.755	1.77		Sand	4.9	178.77		178.77	0.74	133.11	133.25	0.81	0.773	0.905	0.208	0.282	0.36	0.02	0.01
48.720	189.140	1.713	5990.0	4197.9	124.913	0.920	1.81		Sand	8.1			178.77	0.75	133.61	137.18	0.81	0.772	0.902	0.223	0.308	0.40	0.02	0.01
48.880	187.950	1.557	6010.0	4207.9	123.960	0.842	1.79		Sand	6.3			177.65	0.74	131.93	132.82	0.81	0.772	0.905	0.207	0.279	0.36	0.02	0.01
49.050	189.440	2.013	6031.3	4218.5	124.794	1.080	1.86		Sand	11.8			179.05	0.76	135.59	150.14	0.81	0.772	0.890	0.289	0.430	0.56	0.02	0.01
49.210	191.980	3.149	6051.3	4228.5	126.338	1.666	1.99		Sand	22.0			181.46	0.79	143.31	191.60	0.81	0.771	0.834	1.215	2.230	2.89	0.00	0.00
49.380	190.460	3.914	6072.5	4239.2	125.157	2.088	2.06		Sand	28.0			180.02	0.80	143.83	204.96	0.81	0.771	0.806	2.529	4.486	5.82	0.00	0.00
49.540	157.150	4.334	6092.5	4249.2	102.785	2.813	2.22		Sand	40.3			148.53	0.78	116.58	186.90	0.81	0.771	0.842	0.974	1.803	2.34	0.00	0.00
49.700	126.290	4.566	6112.5	4259.2	82.099	3.705	2.37		Sand	52.6			119.37	0.77	91.32	162.76	0.81	0.770	0.875	0.402	0.642	0.83	0.01	0.00
49.870	139.340	3.923	6133.8	4269.9	90.672	2.879	2.26		Sand	43.8			131.70	0.77	101.52	170.74	0.80	0.770	0.864	0.516	0.867	1.13	0.01	0.00
50.030	272.410	3.466	6153.8	4279.9	178.997	1.287	1.80		Sand	7.2			257.48	0.80	205.70	208.22	0.80	0.770	0.796	3.101	5.429	7.05	0.00	0.00
50.200	315.910	2.021	6175.0	4290.5	207.642	0.646	1.55		Sand	0.0			298.59	0.82	246.27	246.27	0.80	0.769	0.788	84.599	146.650	190.62	0.00	0.00