CORNERSTONE EARTH GROUP

Type of Services	**Geotechnical Investigation**
Project Name	**4962 Almaden Retail Building**
Location	**4962 Almaden Expressway** **San Jose, California**
Client	**Brothers International Holding Corporation**
Client Address	**100 Bush Street, Suite 218** **San Francisco, CA**
Project Number	**1236-1-1**
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SECTION 1: INTRODUCTION

This geotechnical report was prepared for the sole use of Brothers International Holding Corporation for the 4962 Almaden Retail Building project in San Jose, California. The location of the site is shown on the Vicinity Map, Figure 1. For our use, we were provided with the following documents:

- A set of architectural plans titled, "4962 Almaden – Retail Building, 4962 Almaden Expressway, San Jose, CA 95118," prepared by Brereton Architects, dated September 15, 2020.

1.1 PROJECT DESCRIPTION

The planned development will consist of redeveloping an approximately ¾-acre site for a new single-story retail building surrounded by at-grade parking. The planned development will likely be of wood and steel frame construction and have an approximate footprint of 7,800 square feet. We understand that as part of the development sections of the adjacent parking lot will be reworked. Appurtenant utilities, landscaping and other improvements necessary for site development are also planned.

Structural loads are not currently known; however, structural loads are expected to be typical of similar type structures.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated September 22, 2020 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, 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 two borings drilled on October 9, 2020 with truck-mounted, hollow-stem auger drilling equipment and two Cone Penetration Tests (CPTs) advanced on October 7, 2020. The borings were drilled to depths of 25 to 45 feet; the CPTs were advanced to depths of 50 to 100 feet. Seismic shear wave velocity measurements were collected from CPT-1. The borings (EB-1 and EB-2) were advanced adjacent to CPT-1 and CPT-2, respectively, for direct evaluation of physical samples to correlated soil behavior.

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

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

1.4 LABORATORY TESTING PROGRAM

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

1.5 CORROSION EVALUATION

One sample from Boring EB-1 at a depth of 2 feet was tested for saturated resistivity, pH, and soluble sulfates and chlorides. The results of corrosion testing are included in Appendix C. In general, the on-site soils can be characterized as severely corrosive to buried metal, and non-corrosive to buried concrete.

1.6 ENVIRONMENTAL SERVICES

Cornerstone Earth Group also provided environmental services for this project. The environmental findings and conclusions are provided under separate covers.

SECTION 2: REGIONAL SETTING

2.1 GEOLOGICAL SETTING

The site is located within the Santa Clara Valley, which is a broad alluvial plane between the Santa Cruz Mountains to the southwest and west, and the Diablo Range to the northeast. The San Andreas Fault system, including the Monte Vista-Shannon Fault, exists within the Santa Cruz Mountains and the Hayward and Calaveras Fault systems exist within the Diablo Range. Alluvial soil thicknesses in the area of Santa Clara and north San Jose range from about 350 to 450 feet (Rogers & Williams, 1974). The Guadalupe River is located about 900 feet northeast of the site.

2.2 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)
Monte Vista-Shannon	3.7	5.9
Hayward (Southeast Extension)	7.8	12.6
San Andreas (1906)	9.1	14.6
Sargent	9.1	14.6
Calaveras	10.5	16.9
Zayante-Vergeles	13.1	21.0
Hayward (Total Length)	13.4	21.5

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 located at 4962 Almaden Expressway in San Jose, California and is currently occupied by a 4,470 square foot gas station. The site is bounded by Cherry Avenue to the south, Almaden Expressway to the west, and retail development and parking lots to the north

and east. The site is relatively level but graded to drain to storm drainage facilities. Elevations currently range from approximately 177 to 178 feet (Google Earth, 2020).

Surface pavements generally consisted of approximately 5 inches of asphalt concrete over 5 inches of aggregate base. Based on visual observations, the existing pavements are in poor shape with significant alligator cracking.

3.2 SUBSURFACE CONDITIONS

Below the surface pavements, Boring EB-1 encountered hard lean clay with varying amounts of sand and gravel to a depth of 17 feet. Beneath the clay, our exploration encountered medium dense clayey gravel with sand to a depth of 24½ feet, the terminal depth of the boring.

Below the surface pavements at Boring EB-2, our exploration encountered hard to stiff lean clay with varying amounts of sand and gravel to a depth of 17 feet. Beneath the lean clay, our exploration encountered dense clayey sand with gravel to a depth of 27 feet. The clay was underlain by interbedded layers of very stiff lean clay with varying amounts of sand, very dense to medium dense clayey sand with varying amounts of gravel, and medium dense well graded sand with clay and gravel to a depth of 45 feet, the maximum depth explored. In general, the CPTs correlated with the soil profiles encountered in our exploratory borings.

3.2.1 Plasticity/Expansion Potential

We performed one Plasticity Index (PI) tests on representative samples. Test results were used to evaluate expansion potential of surficial soils. The results of the surficial PI tests indicated a PI of 25, indicating moderate expansion potential to wetting and drying cycles.

3.2.2 In-Situ Moisture Contents

Laboratory testing indicated that the in-situ moisture contents within the upper 10 feet range from approximately 3 percent under to 5 percent over the estimated laboratory optimum moisture.

3.3 GROUNDWATER

Groundwater was encountered in Boring EB-2 at a depth of 31½ feet. Groundwater was inferred in CPT-1 and CPT-2 at depths of 30 feet and 34 feet, respectively. Additionally, historic high groundwater in the site vicinity is mapped at depths of approximately 18 feet below the ground surface (CGS, 2002). 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.

Based on the above information and our previous experience in the area, we estimate a design groundwater depth of approximately 18 feet below current site grades. Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

3.4 CORROSION SCREENING

We tested one sample collected at a depth of 2 feet for resistivity, pH, soluble sulfates, and chlorides. The laboratory test results are summarized in Table 2.

Table 2: Summary of Corrosion Test Results

Boring	Depth (feet)	Soil pH[1]	Resistivity[2] (ohm-cm)	Chloride[3] (mg/kg)	Sulfate[4,5] (mg/kg)
EB-1 Sample 1	2.0	7.5	1,466	5	41

Notes: [1]ASTM G51
[2]ASTM G57 - 100% saturation
[3]ASTM D3427/Cal 422 Modified
[4]ASTM D3427/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 for buried metallic improvements. Based on the laboratory test results summarized in Table 3 and published correlations between resistivity and corrosion potential, the soils may be considered severely corrosive to buried metallic improvements (Chaker and Palmer, 1989).

In accordance with the 2019 CBC Section 1904A.2, alternative cementitious materials for sulfate exposure shall be determined in accordance with ACI 318 Table 4.2.1 and Table 4.3.1. 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. We have summarized applicable design values and parameters from ACI 318 Table 4.3.1 below in Table 3.

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

Table 3: ACI Sulfate Soil Corrosion Design Values and Parameters

Category	Water-Soluble Sulfate (SO4) in Soil (% by weight)	Class	Severity	Cementitious Materials
S, Sulfate	< 0.10	S0	not applicable	no type restriction

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, or a Santa Clara County Fault Hazard Zone. As shown 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 (PGA_M) was estimated following the ground motion hazard analysis procedure presented in Chapter 21, Section 21.2 of ASCE 7-16 and Supplement No. 1. For our liquefaction analysis we used a PGA_M of 0.89g which was determined in accordance with Section 21.5 of ASCE 7-16.

4.3 LIQUEFACTION POTENTIAL

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

4.3.1 Background

During strong seismic shaking, cyclically induced stresses can cause increased pore pressures within the soil matrix that can result in liquefaction triggering, soil softening due to shear stress loss, potentially significant ground deformation due to settlement within sandy liquefiable layers as pore pressures dissipate, and/or flow failures in sloping ground or where open faces are present (lateral spreading) (NCEER 1998). Limited field and laboratory data are 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 ground water depth of 18 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 ground water. The tip pressures are corrected for effective overburden stresses, taking into consideration both the ground water level at the time of exploration and the design ground water 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 and CPT-2) are presented on Figures 4A and 4B of this report.

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 ¼ to ⅔-inch based on the Yoshimine (2006) method. As discussed in SP 117A, differential movement for level ground sites over deep soil sites will be up to about two-thirds of the total settlement between independent foundation elements. In our opinion, differential settlements are anticipated to be on the order of less than ¼-inch over a horizontal distance of 30 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 approximately 20-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.

The site is located approximately 900 feet from the top of the bank of the Guadalupe River which is approximately 16 feet lower than current site grades (Google Earth, 2020). The

potentially liquefiable sand layers are thin, non-continuous, and generally located below 30 feet, well below the river bottom. Therefore, in our opinion, the potential for lateral spreading to affect the planned development is low.

4.5 SEISMIC SETTLEMENT/UNSATURATED SAND SHAKING

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

4.6 TSUNAMI/SEICHE

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

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

A tsunami or seiche originating in the Pacific Ocean would lose much of its energy passing through San Francisco Bay. Based on the 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 16 miles inland from the San Francisco Bay shoreline and is approximately 177 to 178 feet above mean sea level. Therefore, the potential for inundation due to tsunami or seiche is considered low.

4.7 FLOODING

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

The California Division of Safety of Dams has compiled an interactive map showing Dam Failure Breach Inundation Maps. Based on our review of these maps, the site is located within a dam

inundation zone for a postulated a dam failure at the Guadalupe reservoir, located approximately 4.1 miles south of the site. 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.

- Redevelopment considerations and native soil/fill transitions
- Presence of moderately expansive soils

5.1.1 Redevelopment Considerations and Native Soil/Fill Transitions

As discussed, the site is currently occupied by a gas station with appurtenant pavement and landscaping. We understand that the gas station will be demolished for construction of the retail building. Potential issues that are often associated with redeveloping sites include demolition of existing improvements, abandonment of existing utilities and undocumented fills. Additionally, we anticipate that significant fills will be required following the removal of existing underground storage tanks (USTs).

Foundations and slabs-on-grade spanning from fill to native materials could experience additional differential movement. To reduce the potential for differential movement, over-excavation beyond the demolished structures replacement with engineered fill will be required. Recommendations addressing this concern are discussed further in the “Earthwork” section below.

5.1.2 Moderately Expansive Soils

As discussed, moderately expansive surficial soils were encountered in the surficial soils that 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. If structures are underlain by expansive soils it is important that foundation systems be capable of tolerating or resisting any potentially damaging soil movements. 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. Grading and foundation recommendations addressing this concern are presented in the “Earthwork” and “Foundations” sections of this report.

5.2 PLANS AND SPECIFICATIONS REVIEW

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

5.3 CONSTRUCTION OBSERVATION AND TESTING

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

SECTION 6: EARTHWORK

6.1 SITE DEMOLITION

All existing improvements not to be reused for the current development, including all foundations, flatwork, pavements, utilities, USTs, 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.

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

Existing foundations are typically mat-slabs, shallow footings, or piers/piles. If slab or shallow footings are encountered, they should be completely removed. If drilled piers are encountered, they should be cut off at an elevation at least 60-inches below proposed footings or the final subgrade elevation, whichever is deeper. The remainder of the drilled pier could remain in place. Foundation elements to remain in place should be surveyed and superimposed on the

proposed development plans to determine the potential for conflicts or detrimental impacts to the planned construction. Following review, additional mitigation or planned foundation elements may need to be modified.

6.1.2 Abandonment of Existing Utilities

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

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

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

6.2 SITE CLEARING AND PREPARATION

6.2.1 Site Stripping

The site should be stripped of all surface vegetation, and surface and subsurface improvements to be removed within the proposed development area. Demolition of existing improvements is discussed in the prior paragraphs. A detailed discussion of removal of existing fills is provided later in this report. Surface vegetation and topsoil should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight. Based on our site observations, surficial stripping should extend about 4 to 6 inches below existing grade in vegetated 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 area. From the provided architectural plan set and site reconnaissance, we understand that there are currently USTs on the west side of the proposed retail building. Fills associated with UST excavations should be removed and replaced as engineered fill. In addition, all fills should be removed 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.

Side slopes of the demolition excavations should be over-excavated or benched to inclinations no steeper than 3:1 (horizontal: vertical) until the footings are supported entirely on native material to reduce abrupt fill thickness transitions. The exact depth of engineered fill should be reviewed once final structural plans are available as well as reviewed again during demolition.

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. A Cornerstone representative should be retained to confirm the preliminary site classification. 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 slope at a 1:1 inclination unless the OSHA soil classification indicates that slope should not exceed 1.5:1.

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 Scarification and Drying

The subgrade may be scarified to a depth of 6 to 12 inches and allowed to dry to near optimum conditions if sufficient dry weather is anticipated to allow sufficient drying. More than one round of scarification may be needed to break up the soil clods.

6.6.2 Removal and Replacement

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

6.6.3 Chemical Treatment

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

6.7 MATERIAL FOR FILL

6.7.1 Re-Use of On-site Soils

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

6.7.2 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.

6.7.3 Non-Expansive Fill Using Lime Treatment

As discussed above, non-expansive fill should have a Plasticity Index (PI) of 15 or less. Due to the high clay content and PI of the on-site soil, 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 and bedrock materials will likely need to be mixed with at least 3 to 4 percent 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 4: 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
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)

6.8.1 Construction Moisture Conditioning

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

6.9 TRENCH BACKFILL

Utility lines constructed within public right-of-way should be trenched, bedded and shaded, and backfilled in accordance with the local or governing jurisdictional requirements. Utility lines in

private improvement areas should be constructed in accordance with the following requirements unless superseded by other governing requirements.

All utility lines should be bedded and shaded to at least 6 inches over the top of the lines with crushed rock (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

6.10.1 Surface Drainage

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

6.11 LOW-IMPACT DEVELOPMENT (LID) IMPROVEMENTS

The Municipal Regional Permit (MRP) requires regulated projects to treat 100 percent of the amount of runoff identified in Provision C.3.d from a regulated project's drainage area with low impact development (LID) treatment measures onsite or at a joint stormwater treatment facility. LID treatment measures are defined as rainwater harvesting and use, infiltration, evapotranspiration, or biotreatment. A biotreatment system may only be used if it is infeasible to implement harvesting and use, infiltration, or evapotranspiration at a project site.

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

- The near-surface soils at the site are clayey, and categorized as Hydrologic Soil Group D, and is expected to have infiltration rates of less than 0.2 inches per hour. In our opinion, these clayey soils will significantly limit the infiltration of stormwater.

- Locally, seasonal high ground water is mapped at a depth of approximately 18 feet, and therefore is expected to be at least 10 feet below the base of the infiltration measure.

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

6.11.1 Storm Water Treatment Design Considerations

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

6.11.1.1 General Bioswale Design Guidelines

- If possible, avoid placing bioswales or basins within 10 feet of the building perimeter or within 5 feet of exterior flatwork or pavements. If bioswales must be constructed within these setbacks, the side(s) and bottom of the trench excavation should be lined with 10-mil visqueen to reduce water infiltration into the surrounding expansive clay.

- Bioswales constructed within 3 feet of proposed buildings may be within the foundation zone of influence for perimeter wall loads. Therefore, where bioswales will parallel foundations and will extend below the “foundation plane of influence,” an imaginary 1:1 plane projected down from the bottom edge of the foundation, the foundation will need to be deepened so that the bottom edge of the bioswale filter material is above the foundation plane of influence.

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

6.11.1.2 Bioswale Infiltration Material

- Gradation specifications for bioswale filter material, if required, should be specified on the grading and improvement plans.
- Compaction requirements for bioswale filter material in non-landscaped areas or in pervious pavement areas, if any, should be indicated on the plans and specifications to satisfy the anticipated use of the infiltration area.
- If 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.

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

- Using drip irrigation
- Avoiding open planting within 3 feet of the building perimeter or near the top of existing slopes

- Regulating the amount of water distributed to lawns or planter areas by using irrigation timers

- Selecting landscaping that requires little or no watering, especially near foundations.

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

SECTION 7: 2019 CBC SEISMIC DESIGN CRITERIA

We developed site-specific seismic design parameters in accordance with Chapter 16, Chapter 18 and Appendix J of the 2019 California Building Code (CBC) and Chapters 11, 12, 20, and 21 and Supplement No. 1 of ASCE 7-16.

7.1 SITE LOCATION AND PROVIDED DATA FOR 2019 CBC SEISMIC DESIGN

The project is located at latitude 37.259475° and longitude -121.875671°, which is based on Google Earth (WGS84) coordinates at the approximate center of the site at 4962 Almaden Expressway in San Jose, California. We have assumed that a Seismic Importance Factor (I_e) of 1.00 has been assigned to the structure in accordance with Table 1.5-2 of ASCE 7-16 for structures classified as Risk Category II. The building period has not been provided by the project structural engineer.

7.2 SITE CLASSIFICATION – CHAPTER 20 OF ASCE 7-16

Code-based site classification and ground motion attenuation relationships are based on the time-weighted average shear wave velocity of the top approximately 100 feet (30 meters) of the soil profile (V_{S30}).

Our explorations generally encountered medium dense to very dense sands and gravels with varying amounts of clay and silt and medium stiff to hard clay deposits with varying amounts of sand to a depth of 100 feet, the maximum depth explored. Shear wave velocity (V_S) measurements were performed while advancing CPT-2, resulting in a time-averaged shear wave velocity for the top 30 meters (V_{S30}) of 355 meters per second. In accordance with Table 20.3-1 of ASCE 7-16, we recommend the site be classified as Soil Classification D, which is described as a “stiff soil” profile. Because we used site specific data from our explorations and laboratory testing, the site class should be considered as “determined” for the purposes of estimating the seismic design parameters from the code outlined below. Our site-specific ground motion hazard analysis considered a V_{S30} of 355 m/s (1165 ft/s).

7.3 CODE-BASED SEISMIC DESIGN PARAMETERS

Code-based spectral acceleration parameters were determined based on mapped acceleration response parameters adjusted for the specific site conditions. Mapped Risk-Adjusted Maximum Considered Earthquake (MCE_R) spectral acceleration parameters (S_S and S_1) were determined using the ATC Hazards by Location website (https://hazards.atcouncil.org).

The mapped acceleration parameters were adjusted for local site conditions based on the average soil conditions for the upper 100 feet (30 meters) of the soil profile. Code-based MCE_R spectral response acceleration parameters adjusted for site effects (S_{MS} and S_{M1}) and design spectral response acceleration parameters (S_{DS} and S_{D1}) are presented in Table 5.

In accordance with Section 11.4.8 of ASCE 7-16, structures on Site Class D sites with mapped 1-second period spectral acceleration (S_1) values greater than or equal to 0.2 require a site-specific ground motion hazard analysis be performed in accordance with Section 21.2 of ASCE 7-16. ***Design seismic parameters determined by performing a Ground Motion Hazard Analysis per Section 21.2 of ASCE 7-16 are presented in Table 8. Recommended values in Table 5 should not be used for design unless in the judgement of the structural engineer an exception can be taken in accordance with Section 11.4.8 of ASCE 7-16.*** Values summarized in Table 5 are only used to determine Seismic Design Category and comparison with minimum code requirements for further use in our ground motion hazard analysis (GMHA).

Table 5: 2019 CBC Site Categorization and Site Coefficients

Classification/Coefficient	Design Value
Site Class	D
Site Latitude	37.259475°
Site Longitude	-121.875671°
Risk Category	II**
Short Period Mapped Spectral Acceleration – S_S	1.691
1-second Period Mapped Spectral Acceleration – S_1	0.6
Short-Period Site Coefficient – F_a	1
Long-Period Site Coefficient – F_v	*null
Short Period MCE Spectral Response Acceleration Adjusted for Site Effects – S_{MS}	1.691
1-second Period MCE Spectral Response Acceleration Adjusted for Site Effects – S_{M1}	*null
Short Period, Design Earthquake Spectral Response Acceleration – S_{DS}	1.127
1-second Period, Design Earthquake Spectral Response Acceleration – S_{D1}	*null
Long-Period Transition – T_L	12
Site Coefficient – F_{PGA}	1.1
Site Modified Peak Ground Acceleration – PGA_M	0.765g

*null – per section 11.4.8 of ASCE 7-16
**Assumed, to be confirmed by Structural Engineer

7.4 SITE-SPECIFIC GROUND MOTION HAZARD ANALYSIS

Following Section 11.4.8 of ASCE 7-16, we performed a ground motion hazards analysis (GMHA) in accordance with Chapter 21, Section 21.2 of ASCE 7. 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 analyses were performed using the USGS interface Unified Hazard Tool (UHT) based on the UCERF 3 Data Set, Building Seismic Safety Council (BSSC) Scenario Catalog 2014 event set (BSSC 2014), and the 2014 National Seismic Hazard Maps – Source Parameters (NSHMP deterministic event set). Additionally, we utilized the USGS program Response Spectra Plotter with combined models (Combined: WUS 2014 (4.1)).

Our analysis utilized the mean ground motions predicted by four of the Next Generation Attenuation West 2 (NGA-West 2) relationships: Boore-Atkinson (2013), Campbell-Bozorgnia (2013), Chiou-Youngs (2013), and Abrahamson-Silva (2013). Rotation factors (scale factors) were determined as specified in ASCE 7-16 Chapter 21, Section 21.2, to calculate the maximum rotated component of ground motions (ASCE, 2016).

7.4.1 Probabilistic MCE_R

We performed a probabilistic seismic hazard analysis (PSHA) in accordance with ASCE 7-16 Section 21.2.1. The probabilistic MCE acceleration response spectrum is defined as the 5 percent damped acceleration response spectrum having a 2 percent probability of exceedance in a 50-year period (2,475-year return period). The probabilistic MCE spectrum was multiplied by Risk Coefficients (C_R) to determine the probabilistic MCE_R. We used Risk Coefficients (C_{RS} and C_{R1}) of 0.956 and 0.930 respectively, based on ASCE 7-16 Section 21.2.1.1 - Method 1 and the ATC website. Risk coefficients for the various periods are presented in Table 6, Column 3.

The resulting probabilistic MCE_R for site class D are presented on Figure 5 (red line). Spectral ordinates are tabulated in Table 6, Column 6.

7.4.2 Deterministic MCE_R

We performed deterministic seismic hazard analyses in accordance with ASCE 7-16 Section 21.2.2 and ASCE 7-16 Supplement No. 1. The deterministic MCE_R acceleration response spectrum is calculated as the largest 84th percentile ground motion in the direction of maximum horizontal response for each period for characteristic earthquakes on all known active faults within the region. The largest deterministic ground motion for periods 3 seconds or less resulted from a M_w 7.14 on the Monte-Vista Shannon Fault, located at a distance of approximately 6.01 km from the site and from a M_w 8.04 earthquake on the San Andreas Fault (SAO+SAN+SAP+SAS segments), located at a distance of approximately 14.37 km from the site for periods greater than 3 seconds.

In accordance with Supplement No.1 of ASCE 7-16, when the largest spectral response acceleration of the resulting deterministic ground motion response spectrum is less than $1.5F_a$

then the largest 84th percentile rotated response spectrum (Table 6, Column 4) shall be scaled by a single factor such that the maximum response spectral acceleration equals $1.5F_a$. For Site Classes A, B, C and D, F_a is determined using Table 11.4.1 with the value of S_s taken as 1.5; for Site Class E, F_a shall be taken as 1.0. When the largest spectral response acceleration of the probabilistic ground motion response of 21.2.1 is less than $1.2F_a$, the deterministic ground motion response spectrum does not need to be calculated.

As the largest probabilistic spectral response acceleration was determined to be 2.858 which is greater than $1.2F_a$, where F_a is taken as 1.000 from Table 11.4-1 in ASCE 7-16 Supplement No.1, the 84th percentile rotated response spectrum was calculated as part of the deterministic analyses. The maximum spectral acceleration from the 84th percentile rotated response spectrum was then compared to $1.5F_a$ to determine if a scale factor needed to be applied. The deterministic MCE spectrum are tabulated in Table 6, Column 5. The deterministic MCE_R is presented graphically on Figure 5 (blue line).

7.4.3 Site-Specific MCE_R

The site-specific MCE_R is defined by ASCE 7-16 Section 21.2.3 as the lesser of the deterministic and probabilistic MCE_R's at each period. Spectral ordinates for the site-specific MCE_R are tabulated in Table 6, Column 7 and shown graphically on Figure 5 (dashed black line).

Table 6: Site Class D: Development of Site-Specific MCE_R Spectrum

Period (seconds)	CBC General Spectrum (g)	Risk Coefficient	Det. 84th Percentile Rotated	Deterministic MCE_R (g)	Probabilistic MCE_R (g)	Site-Specific MCE_R (g)
0.000	0.451	0.956	1.169	1.169	0.934	0.934
0.050	0.642	0.956	1.365	1.365	1.280	1.280
0.075	0.737	0.956	1.657	1.657	1.453	1.453
0.100	0.832	0.956	1.948	1.948	1.626	1.626
0.177	1.126	0.956	2.432	2.432	2.017	2.017
0.200	1.127	0.956	2.576	2.576	2.133	2.133
0.250	1.127	0.954	2.751	2.751	2.300	2.300
0.300	1.127	0.953	2.853	2.853	2.466	2.466
0.400	1.127	0.950	2.858	2.858	2.487	2.487
0.500	1.127	0.946	2.679	2.679	2.507	2.507
0.750	1.127	0.938	2.145	2.145	2.136	2.136
0.887	1.127	0.934	1.905	1.905	1.994	1.905
1.000	1.000	0.930	1.707	1.707	1.877	1.707
2.000	0.500	0.930	0.730	0.730	1.096	0.730

(Table 6 continues on next page)

Table 6: Site Class D: Development of Site-Specific MCE_R Spectrum (continued)

Period (seconds)	CBC General Spectrum (g)	Risk Coefficient	Det. 84th Percentile Rotated	Deterministic MCE_R (g)	Probabilistic MCE_R (g)	Site-Specific MCE_R (g)
3.000	0.333	0.930	0.427	0.427	0.766	0.427
4.000	0.250	0.930	0.328	0.328	0.580	0.328
5.000	0.200	0.930	0.277	0.277	0.457	0.277

7.4.4 Design Response Spectrum

The Design Response Spectrum (DRS) is defined in ASCE 7-16 Section 21.3 as:

- two-thirds of the site-specific MCE_R, but
- not less than 80% of the general design response spectrum

Spectral accelerations corresponding to two-thirds of the MCE_R are tabulated in Table 7, Column 2. Ordinates corresponding to 80% of the general Site Class D response spectrum are tabulated below in Table 7, Column 3. Ordinates of the site-specific DRS are tabulated in Table 7, Column 4. Development of the site-specific DRS is presented graphically on Figure 6 (dashed black line).

Table 7: Site Class D: Development of Site-Specific Design Response Spectrum

Period (seconds)	2/3 Site-Specific MCE_R (g)	80% CBC Site Class C Spectrum (g)	Design Response Spectrum (g)
0.000	0.623	0.361	0.623
0.050	0.853	0.513	0.853
0.075	0.969	0.590	0.969
0.100	1.084	0.666	1.084
0.177	1.344	0.901	1.344
0.200	1.422	0.902	1.422
0.250	1.533	0.902	1.533
0.300	1.644	0.902	1.644
0.400	1.658	0.902	1.658
0.500	1.671	0.902	1.671
0.750	1.424	0.902	1.424

(Table 7 continues on next page)

Table 7: Site Class D: Development of Site-Specific Design Response Spectrum (cont'd)

Period (seconds)	2/3 Site-Specific MCE_R (g)	80% CBC Site Class C Spectrum (g)	Design Response Spectrum (g)
0.887	1.270	0.902	1.270
1.000	1.138	0.800	1.138
2.000	0.487	0.400	0.487
3.000	0.285	0.267	0.285
4.000	0.219	0.200	0.219
5.000	0.184	0.160	0.184

7.5 DESIGN ACCELERATION PARAMETERS

Design acceleration parameters (S_{DS} and S_{D1}) were determined in accordance with Section 21.4 of ASCE 7-16. S_{DS} is defined as the design spectral acceleration at 90% of the maximum spectral acceleration, S_a, obtained from the site-specific spectrum, at any period within the range from 0.2 to 5 seconds, inclusive. S_{D1} is defined as the maximum value of the product, TS_a, for periods from 1 to 2 seconds for sites with vs,30 > 1,200 ft/s ($v_{s,30}$ > 365.76 m/s) and for periods from 1 to 5 seconds for sites with vs,30 ≤ 1,200 ft/s ($v_{s,30}$ ≤365.76 m/s).

Site-specific MCE_R spectral response acceleration parameters (S_{MS} and S_{M1}) are calculated as:

- 1.5 times the S_{DS} and S_{D1} values, respectively, but
- not less than 80% of the code-based values presented in Table 5

Recommended design acceleration parameters are summarized in Table 8
When using the Equivalent Lateral Force Procedure, ASCE 7-16 Section 21.4 allows using the spectral acceleration at any period (T) in lieu of S_{D1}/T in Eq. 12.8-3 and $S_{D1}T_L/T_2$ in Eq. 12.8-4. The site-specific spectral acceleration at any period may be calculated by interpolation of the spectral ordinates in Table 7, Column 4.

Table 8: Site Class D: Site-Specific Design Acceleration Parameters

Parameter	Value
S_{DS}	1.504
S_{D1}	1.138
S_{MS}	2.256
S_{M1}	1.707

7.6 SITE-SPECIFIC MCE_G PEAK GROUND ACCELERATION

7.6.1 Site Class D: Site-Specific MCE_G Peak Ground Acceleration

We calculated the Site-Specific MCE_G Peak Ground Acceleration (PGA_M) in accordance with ASCE 7-16 Section 21.5. The Site-Specific PGA_M is calculated as the lesser of probabilistic and deterministic geometric mean PGA. The 2% in 50-year probabilistic geometric mean PGA is 0.888g. The deterministic PGA is considered the greater of the largest 84th percentile deterministic geometric mean PGA (1.062) or one-half of the tabulated F_{PGA} value from ASCE 7-16 Table 11.8.1 with the value of PGA taken as 0.5g. For the site, F_{PGA} is 1.100 and one-half of the F_{PGA} is 0.55g; therefore, the deterministic PGA is 1.062g. Additionally, the Site-Specific PGA_M may not be less than 80% of the mapped PGA_M determined from ASCE 7-16 Equation 11.8-1. The mapped PGA_M for the site is 0.695g; 80% of PGA_M is 0.556g.

Based on the above, the recommended Site-Specific PGA_M for the site is 0.888g.

SECTION 8: FOUNDATIONS

8.1 SUMMARY OF RECOMMENDATIONS

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

8.2 SHALLOW FOUNDATIONS

8.2.1 Spread Footings

Spread footings should bear 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.

8.2.2 Footing Settlement

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

Table 9: Assumed 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	3 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 ¾-inch with less than ½-inch of post-construction differential settlement between adjacent foundation elements. As our footing loads were assumed, we recommend we be retained to review the final footing layout and loading, and verify the settlement estimates above.

8.2.3 Lateral Loading

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

8.2.4 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.

SECTION 9: CONCRETE SLABS AND PEDESTRIAN PAVEMENTS

9.1 INTERIOR SLABS-ON-GRADE

As the Plasticity Index (PI) of the surficial soils ranges up to 25, the proposed slabs-on-grade should be supported on at least 12 inches of non-expansive fill (NEF) to reduce the potential for slab damage due to soil heave. The NEF layer should be constructed over subgrade prepared in accordance with the recommendations in the "Earthwork" section of this report. If moisture-sensitive floor coverings are planned, the recommendations in the "Interior Slabs Moisture Protection Considerations" section below may be incorporated in the project design if desired. If significant time elapses between initial subgrade preparation and NEF construction, the subgrade should be proof-rolled to confirm subgrade stability, and if the soil has been allowed to dry out, the subgrade should be re-moisture conditioned to at least 3 percent over the optimum moisture content.

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

9.2 INTERIOR SLABS MOISTURE PROTECTION CONSIDERATIONS

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

- Place a minimum 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.

9.3 EXTERIOR FLATWORK

9.3.1 Pedestrian Concrete Flatwork

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

SECTION 10: VEHICULAR PAVEMENTS

10.1 ASPHALT CONCRETE

The following asphalt concrete pavement recommendations tabulated below are based on the Procedure 608 of the Caltrans Highway Design Manual, estimated traffic indices for various pavement-loading conditions, and on a design R-value of 10. The design R-value was chosen based on our previous experience in the area and engineering judgment considering the variable surface conditions.

Table 10: Asphalt Concrete Pavement Recommendations, Design R-value = 10

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	7.0	9.5
4.5	2.5	9.0	11.5
5.0	3.0	9.0	12.0
5.5	3.0	11.0	14.0
6.0	3.5	11.5	15.0
6.5	4.0	12.5	16.5

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

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.

10.2 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). Recommendations for garage slabs-on-grade were provided in the "Concrete Slabs and Pedestrian Pavements" section above. 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.

Table 11: PCC Pavement Recommendations

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

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.

10.2.2 Stress Pads for Trash Enclosures

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

10.3 PAVEMENT CUTOFF

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

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

SECTION 11: RETAINING WALLS

11.1 STATIC LATERAL EARTH PRESSURES

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

Table 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.

11.2 SEISMIC LATERAL EARTH PRESSURES

11.2.2 Site Walls

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

11.3 WALL DRAINAGE

11.3.1 At-Grade Site Walls

Adequate drainage should be provided by a subdrain system behind all walls. This system should consist of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with Class 2 Permeable Material per Caltrans Standard Specifications, latest edition. The permeable backfill should extend at least 12 inches out from the wall and to within 2 feet of outside finished grade. Alternatively, 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.

11.4 BACKFILL

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

11.5 FOUNDATIONS

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

SECTION 12: LIMITATIONS

This report, an instrument of professional service, has been prepared for the sole use of Brothers International Holding Corporation specifically to support the design of the 4962 Almaden Retail Building Geotechnical Investigation and Limited Environmental Sampling project in San Jose, California. The opinions, conclusions, and recommendations presented in this report have been formulated in accordance with accepted geotechnical engineering practices that exist in Northern California at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred.

Recommendations in this report are based upon the soil and ground water 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.

Brothers International Holding Corporation may have provided Cornerstone with plans, reports and other documents prepared by others. Brothers International Holding Corporation understands that Cornerstone reviewed and relied on the information presented in these documents and cannot be responsible for their accuracy.

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

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

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

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

SECTION 13: REFERENCES

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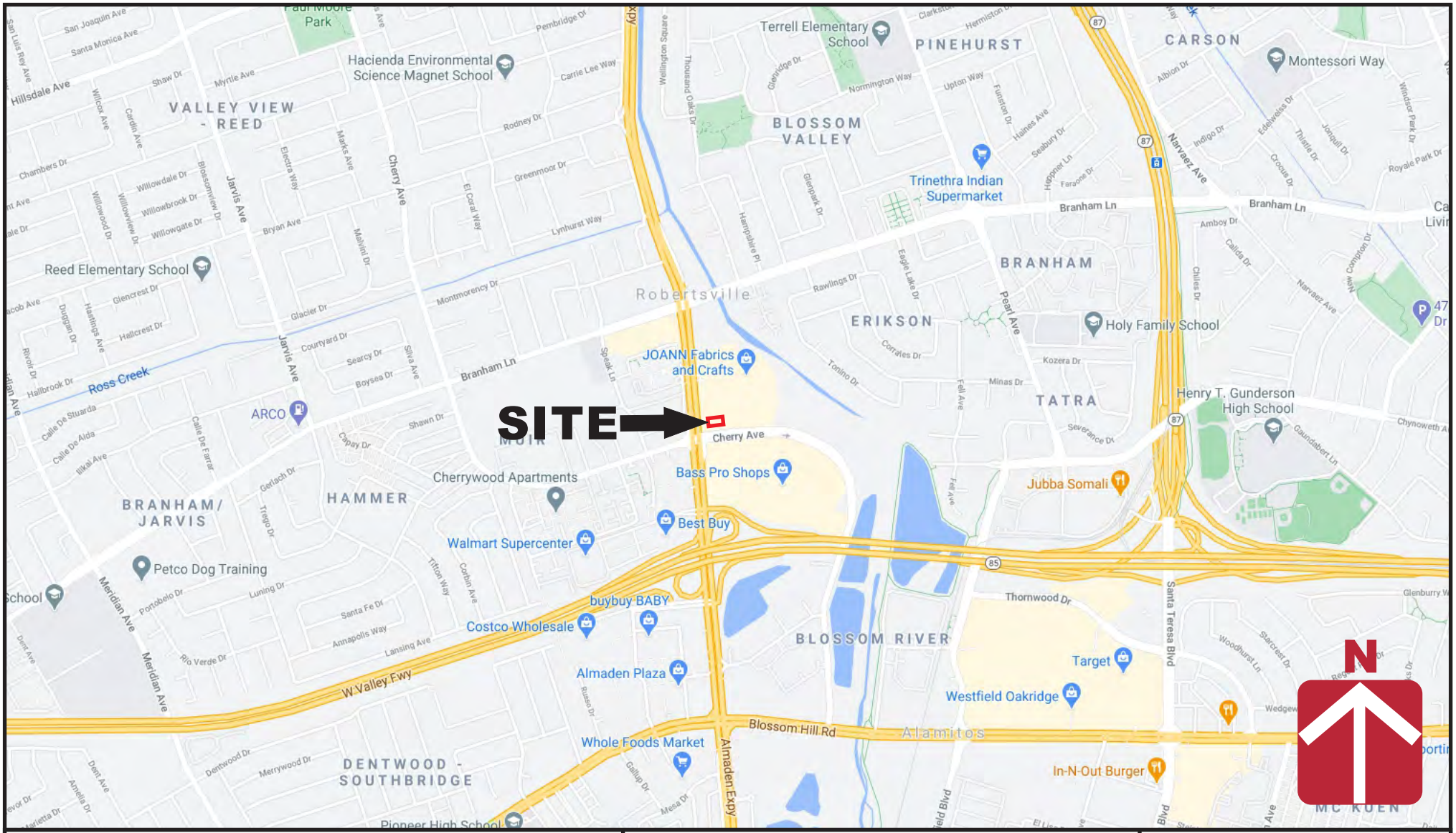

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Vicinity Map

4962 Almaden Retail Building
San Jose, CA

Project Number	1236-1-1
Figure Number	Figure 1
Date	October 2020
Drawn By	RRN

EB-1
CPT-1
EB-2
CPT-2
Proposed Retail Building
ALMADEN EXPRESSWAY
CHERRY AVENUE
RETAIL 5,358 SF
RETAIL 1,622 SF
STORAGE 269 SF
STORAGE 127 SF
STORAGE 138 SF
VAN ACCESSIBLE
EV
36' - 2"
37'
2' - 0" EASEMENT
8' - 2"
3' - 6"
0' - 6"

Legend

Approximate location of exploratory boring (EB)

Approximate location of cone penetration test (CPT)

0 20 40

APPROXIMATE SCALE (FEET)

N

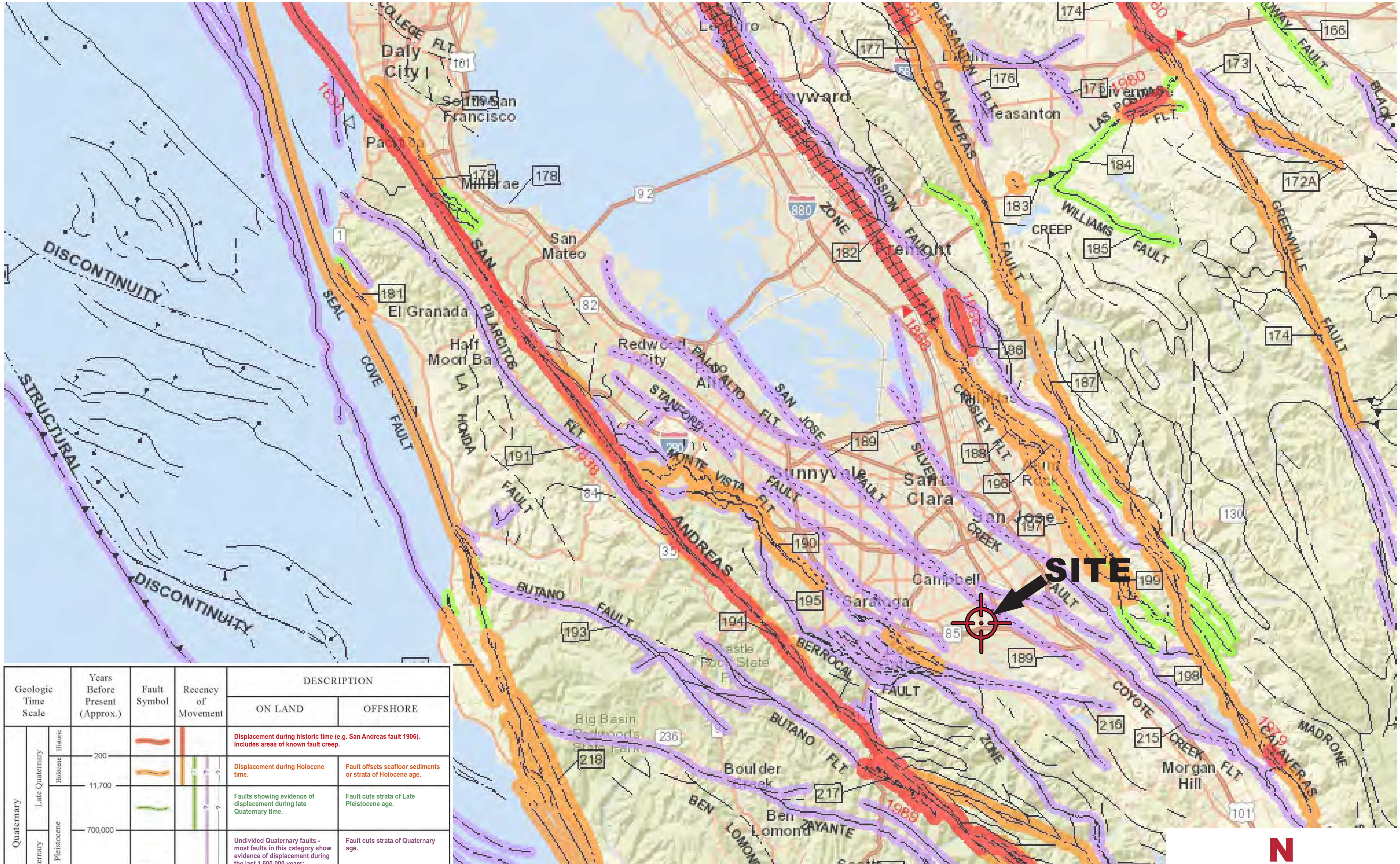
Base by Google Earth, dated 06/19/2019
Overlay by Brereton, Floor Plan - 09, dated 06/05/2020

Project Number	1236-1-1
Figure Number	Figure 2
Date	October 2020
Drawn By	RRN

Site Plan

4962 Almaden Retail Building
San Jose, CA

CORNERSTONE EARTH GROUP



Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION: ON LAND	DESCRIPTION: 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)

Project Number 1236-1-1

Figure Number Figure 3

Date October 2020

Drawn By RRN

Regional Fault Map

4962 Almaden Retail Building San Jose, CA

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FIGURE 4A

CPT NO. 1

PROJECT/CPT DATA

Project Title	4962 Almaden Retail Bldg
Project No.	1236-1-1
Project Manager	ELS

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	8.04	
PGA (Amax)	0.89	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	29.6
Design Water Depth (feet)	18
Ave. Unit Weight Above GW (pcf)	125
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	18	FEET
	0.00	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	0.25	(Inches)
TOTAL SEISMIC SETTLEMENT	0.3	INCHES

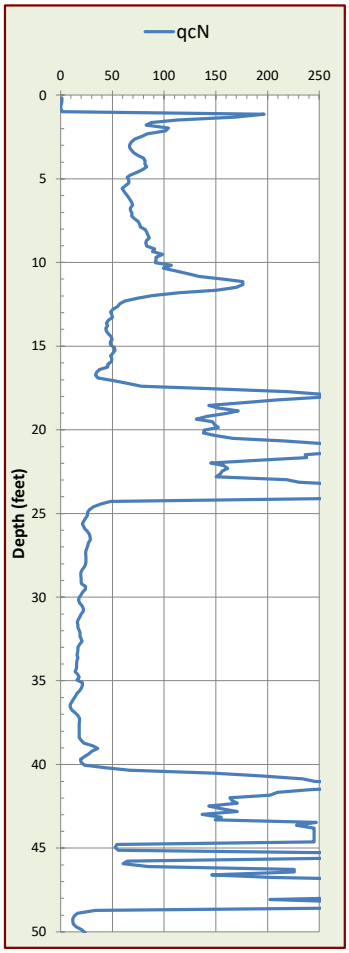
POTENTIAL LATERAL DISPLACEMENT

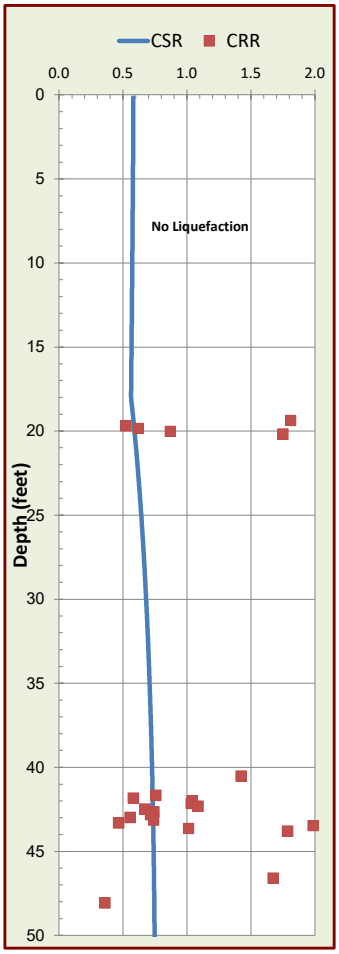
LDI[2]	0.01	L/H	62.5
LDI[1] Corrected for Distance	0.00	(4 < L/H < 40)	

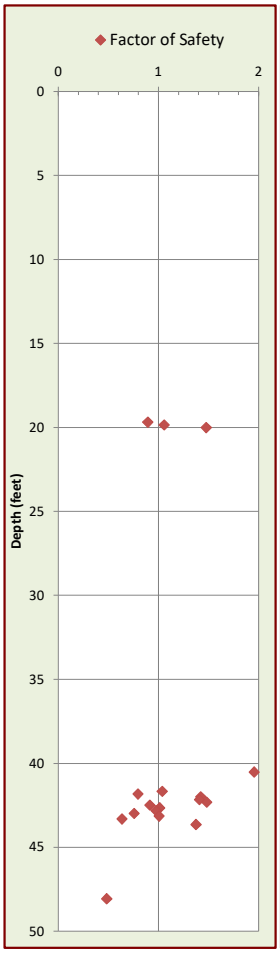
EXPECTED RANGE OF DISPLACEMENT

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.







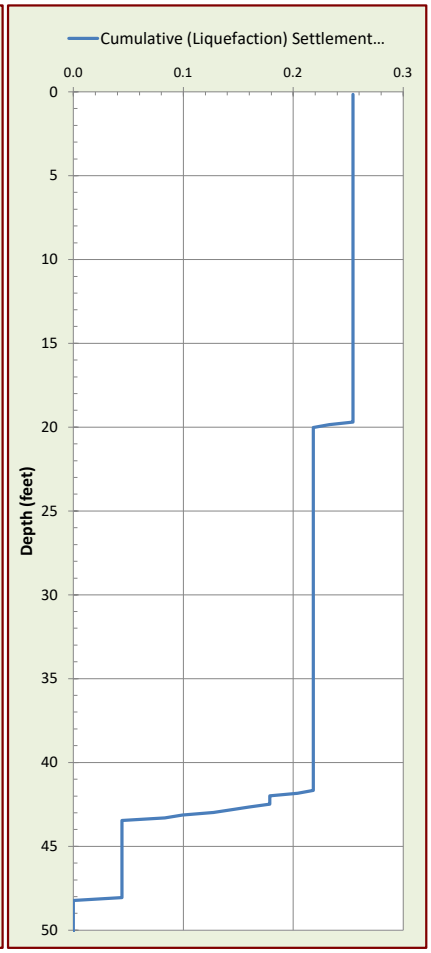


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FIGURE 4B

CPT NO. 2

PROJECT/CPT DATA

Project Title	4962 Almaden Retail Bldg
Project No.	1236-1-1
Project Manager	ELS

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	8.04	
PGA (Amax)	0.89	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	31.8
Design Water Depth (feet)	18
Ave. Unit Weight Above GW (pcf)	125
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	18	FEET
	0.00	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	0.63	(Inches)
TOTAL SEISMIC SETTLEMENT	**0.6**	**INCHES**

POTENTIAL LATERAL DISPLACEMENT

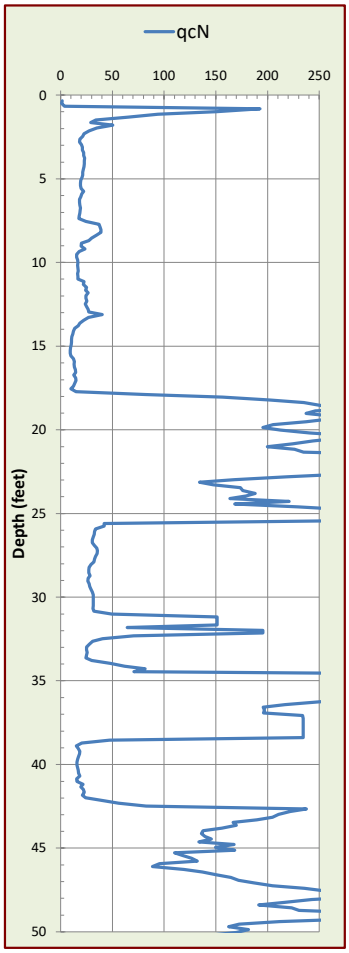
LDI[2]	0.00	L/H	62.5
LDI[1] Corrected for Distance	0.00	(4 < L/H < 40)	

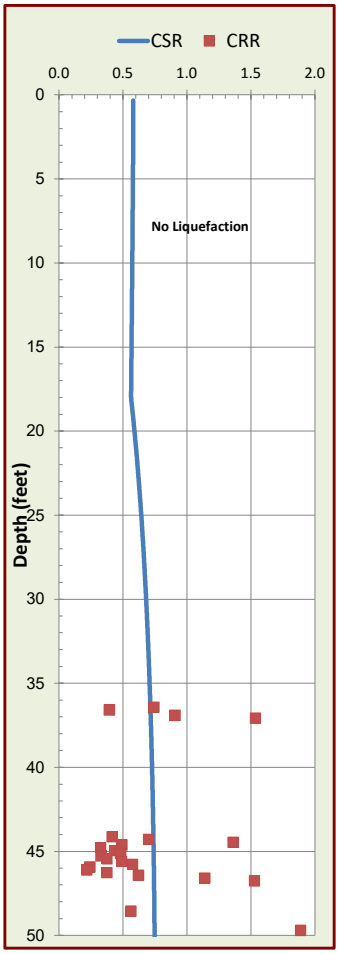
EXPECTED RANGE OF DISPLACEMENT

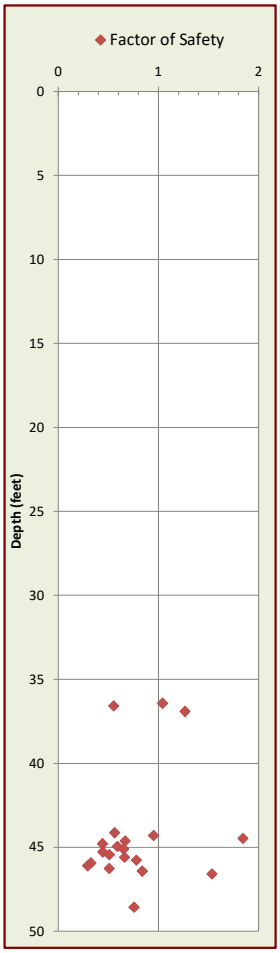
0.0 to 0.0 feet

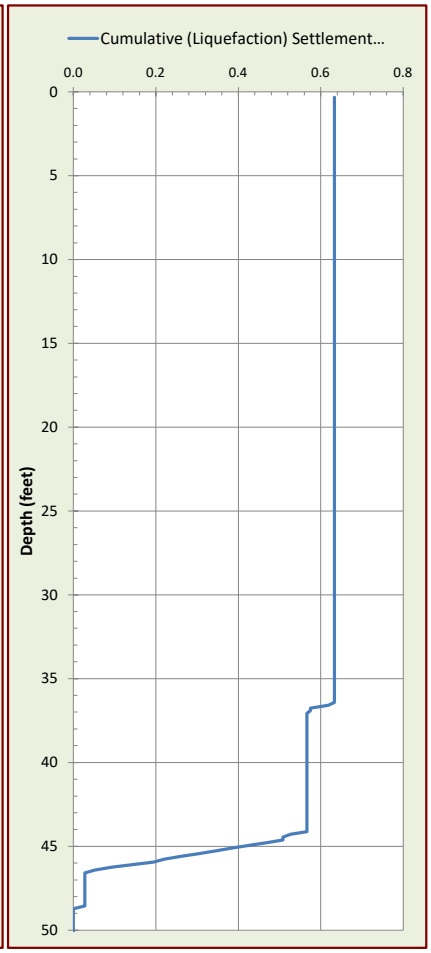
[1]Not Valid for L/H Values < 4 and > 40.

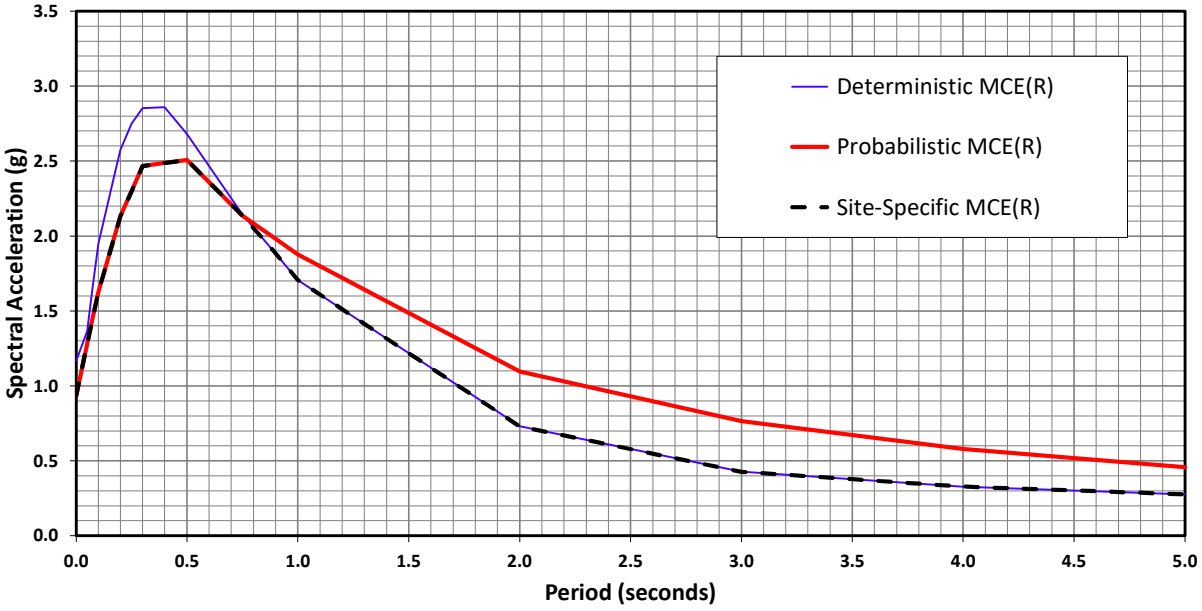
[2]LDI Values Only Summed to 2H Below Grade.











The Site-Specific Maximum Considered Earthquake (MCE_R) is defined as the lesser of the following at all periods:

- Deterministic MCE_R – maximum 84th percentile deterministic, or
- Probabilistic MCE_R – defined as the 2,475–year ground motion.

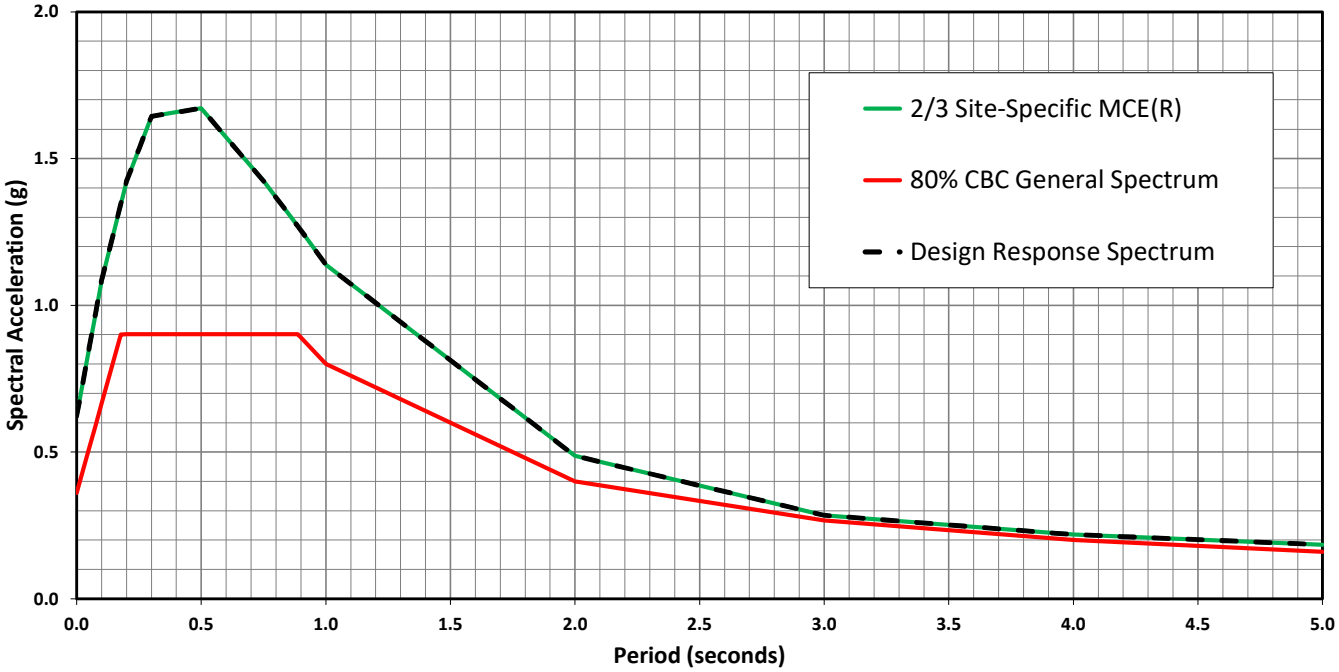
Site-Specific MCE_R	
Period (Seconds)	Spectral Acceleration (g)
0.00	0.934
0.05	1.280
0.08	1.453
0.10	1.626
0.18	2.017
0.20	2.133
0.25	2.300
0.30	2.466
0.40	2.487
0.50	2.507
0.75	2.136
0.89	1.905
1.00	1.707
2.00	0.730
3.00	0.427
4.00	0.328
5.00	0.277

References:

ASCE/SEI 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Strutures with Supplement No. 1.
2019 California Building Code, Title 24, Part 2, Volume 2

CORNERSTONE EARTH GROUP

MCE_R RESPONSE SPECTRA	FIGURE 5
4962 Almaden Expy Retail Building 4962 Almaden Expressway San Jose, CA	PROJECT NO. 1236-1-1
	October 16, 2020 | ELS



The Site-Specific Design Response Spectrum per Section 21.2, 21.3 and 21.4 of ASCE 7-16 is defined as the greater of the following at all periods:

- 2/3 of the Site-Specific MCE_R, or
- 80% of the CBC General Spectrum.

Design Response Spectra	
Period (Seconds)	Spectral Acceleration (g)
0.00	0.623
0.05	0.853
0.08	0.969
0.10	1.084
0.18	1.344
0.20	1.422
0.25	1.533
0.30	1.644
0.40	1.658
0.50	1.671
0.75	1.424
0.89	1.270
1.00	1.138
2.00	0.487
3.00	0.285
4.00	0.219
5.00	0.184

Site Design	Design Values
Site Class (Per Chapter 20 ASCE 7-16)	D
Shear Wave Velocity, V_{S30} (m/sec)	355
Site Latitude (degrees)	37.259475
Site Longitude (degrees)	-121.875671
Risk Category	II
Building Period (sec)	Unknown
Importance Factor, I_e	1
[1]Site Specific PGA_M (g)	0.89

[1] Lower of Deterministic and Probabilistic, but not less than 80% of mapped value of FM x PGA, determined in accordance with Section 21.5 of ASCE 7-16.

Design Acceleration Parameters[1]	
S_{DS}	1.504
S_{D1}	1.138
S_{MS}	2.256
S_{M1}	1.707

References:

ASCE/SEI 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Strutures with Supplement No. 1.
2019 California Building Code, Title 24, Part 2, Volume 2

CORNERSTONE EARTH GROUP

DESIGN RESPONSE SPECTRA

FIGURE 6

4962 Almaden Expy Retail Building
4962 Almaden Expressway
San Jose, CA

PROJECT NO. 1236-1-1

October 16, 2020 | ELS

APPENDIX A: FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted, hollow-stem auger drilling equipment and 20-ton truck-mounted Cone Penetration Test equipment. Two 8-inch-diameter exploratory borings were drilled on October 9, 2020 to depths of 25 to 45 feet. Two CPT soundings were also performed in accordance with ASTM D 5778-95 (revised, 2002) on October 7, 2020, to depths ranging from 50 to 100 feet. The approximate locations of exploratory borings and CPTs are shown on the Site Plan, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil and bedrock, are included as part of this appendix. Boring and CPT locations were approximated using existing site boundaries 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. 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 are 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
- Clayey Sand
- Sandy Silt
- Artificial/Undocumented Fill
- Poorly-Graded Gravelly Sand
- Topsoil
- Well-Graded Gravel with Clay
- Well-Graded Gravel with Silt
- Sand
- Silt
- Well Graded Gravelly Sand
- Gravelly Silt
- Asphalt
- Boulders and Cobble

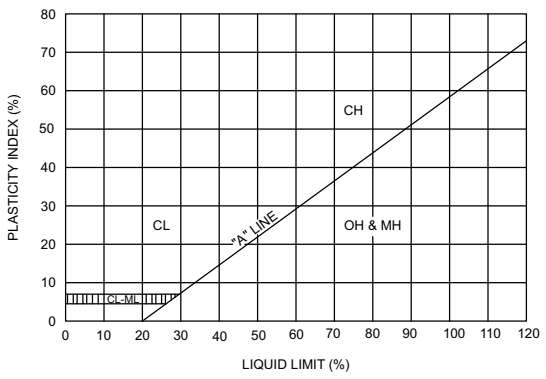
SAMPLER TYPES

- SPT
- Modified California (2.5" I.D.)
- Rock Core
- Shelby Tube
- No Recovery
- 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 Almaden Retail Center
PROJECT NUMBER 1236-1-1
PROJECT LOCATION 4962 Almaden Expressway, San Jose, CA

DATE STARTED 10/9/20 **DATE COMPLETED** 10/9/20
GROUND ELEVATION _____ **BORING DEPTH** 24.4 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE 37.259577° **LONGITUDE** -121.875583°
DRILLING METHOD Mobile B-56, 8 inch Hollow-Stem Auger
GROUND WATER LEVELS:
LOGGED BY RAH
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING Not Encountered

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

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL; 1.0 2.0 3.0 4.0)
	0		5 inches asphalt concrete over 5 inches aggregate base							
			Lean Clay with Sand (CL) hard, moist, dark brown, fine to medium sand, moderate plasticity	43	MC-1	101	15			>4.5 ○
			Sandy Lean Clay (CL) hard, moist, brown, fine to medium sand, low to moderate plasticity	19	MC-2	97	14			>4.5 ○
	5			20	MC-3B	100	12			>4.5 ○
				18	MC-4B	98	12			>4.5 ○
	10		**Lean Clay with Sand (CL)** very stiff, moist, brown, fine to medium sand, some fine subrounded gravel, low to moderate plasticity	8	MC-5B	109	18			○
	15		**Clayey Gravel with Sand (GC)** medium dense, moist, brown, fine to coarse subangular to subrounded gravel, fine to medium sand	47	MC-6B	114	8			
	20		becomes very dense	50/5"	MC-7B	113	8			
	25		Bottom of Boring at 24.4 feet.							

BORING NUMBER EB-2

CORNERSTONE EARTH GROUP

PROJECT NAME Almaden Retail Center
PROJECT NUMBER 1236-1-1
PROJECT LOCATION 4962 Almaden Expressway, San Jose, CA

DATE STARTED 10/9/20 **DATE COMPLETED** 10/9/20
GROUND ELEVATION _____ **BORING DEPTH** 45 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE 37.259431° **LONGITUDE** -121.875959°
DRILLING METHOD Mobile B-56, 8 inch Hollow-Stem Auger
GROUND WATER LEVELS:
LOGGED BY RAH
AT TIME OF DRILLING Not Encountered
NOTES _____
AT END OF DRILLING 31.7 ft.

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

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL; 1.0 2.0 3.0 4.0)
	0		5 inches asphalt concrete over 5 inches aggregate base							
			Lean Clay with Sand (CL) hard, moist, dark brown to brown, fine to medium sand, moderate plasticity Liquid Limit = 43, Plastic Limit = 18	27	MC-1B	105	20	25		○
				30	MC-2	107	19			>4.5 ○
	5			19	MC-3A	106	17			○
			Sandy Lean Clay (CL) very stiff, moist, brown, fine to medium sand, low to moderate plasticity	11	MC-4B	106	19		66	○
	10									
			Lean Clay with Sand (CL) stiff, moist, brown, fine to medium sand, moderate plasticity	9	MC-5B	101	22			○
	15									
			Clayey Sand with Gravel (SC) dense, moist, brown, fine to coarse sand, fine subangular to subrounded gravel	58	MC-6B	117	7			
	20									
				36	SPT-7		8			
	25									

Continued Next Page

BORING NUMBER EB-2

CORNERSTONE EARTH GROUP

PROJECT NAME Almaden Retail Center

PROJECT NUMBER 1236-1-1

PROJECT LOCATION 4962 Almaden Expressway, San Jose, CA

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

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	30		**Lean Clay with Sand (CL)** very stiff, moist, brown, fine to medium sand, moderate plasticity	28	MC-8B	102	24		
				42	MC-9B	118	14		
			Clayey Sand with Gravel (SC) medium dense, wet, brown, fine to coarse sand, fine subangular to subrounded gravel	53	MC-10B	120	13		
	35		**Well Graded Sand with Clay and Gravel (SW-SC)** medium dense, wet, brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	22	SPT-11		9		
	40		becomes dense	70	MC-12B	122	11		
			Sandy Lean Clay (CL) very stiff, moist, brown, fine to medium sand, moderate plasticity						
	45		**Well Graded Sand with Clay and Gravel (SW-SC)** dense, wet, brown, fine to coarse sand, fine subangular to subrounded gravel	62	MC-13B	126	10		11
			Bottom of Boring at 45.0 feet.						
	50								
	55								
	60								

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

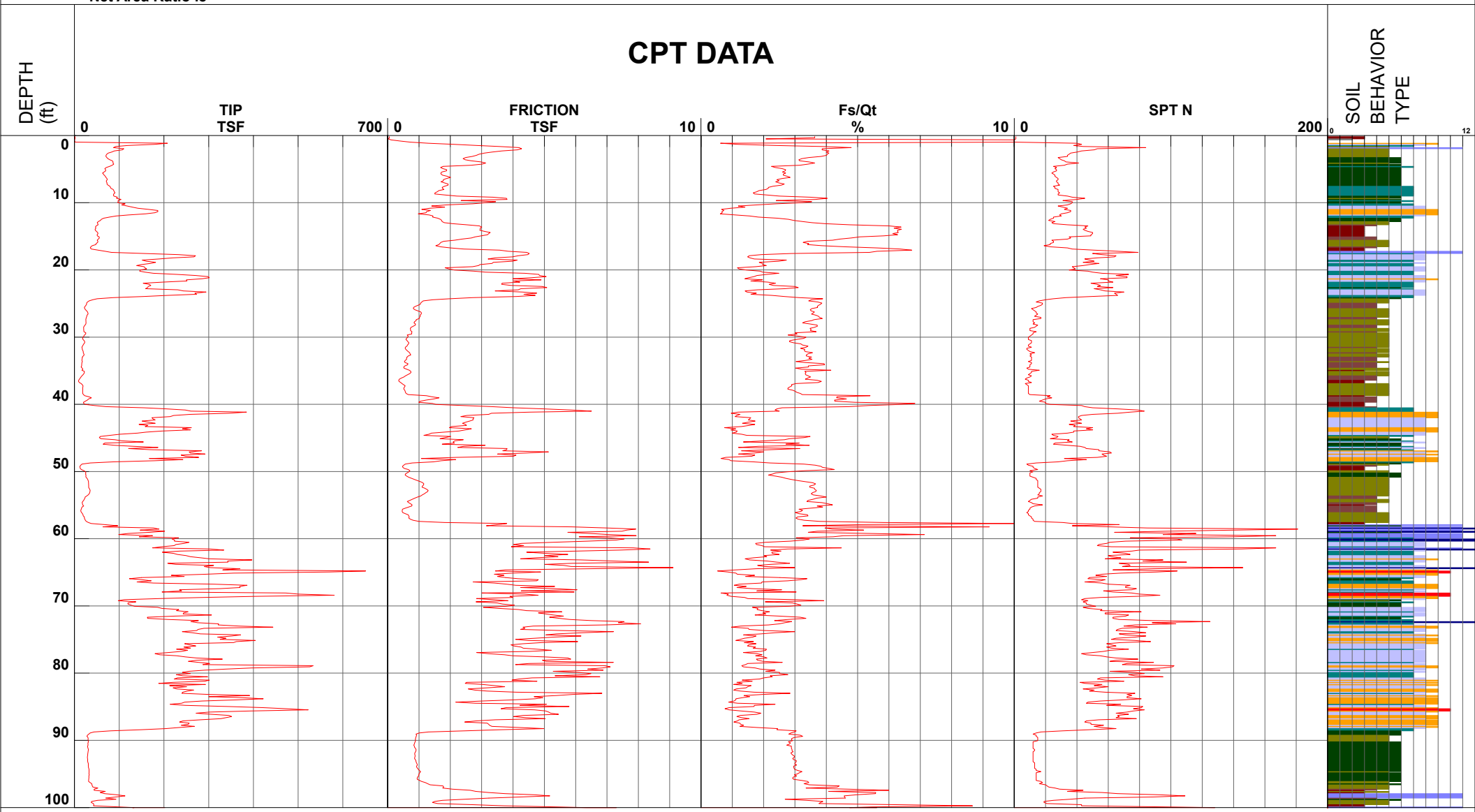
1.0 2.0 3.0 4.0

Cornerstone Earth Group

Project	4962 Almaden Expressway	Operator	JM-ZG	Filename	SDF(285).cpt
Job Number	1236-1-1	Cone Number	DDG1496	GPS	
Hole Number	CPT-01	Date and Time	10/7/2020 8:40:10 AM	Maximum Depth	100.72 ft
EST GW Depth During Test		30.00 ft			

Net Area Ratio .8

CPT DATA



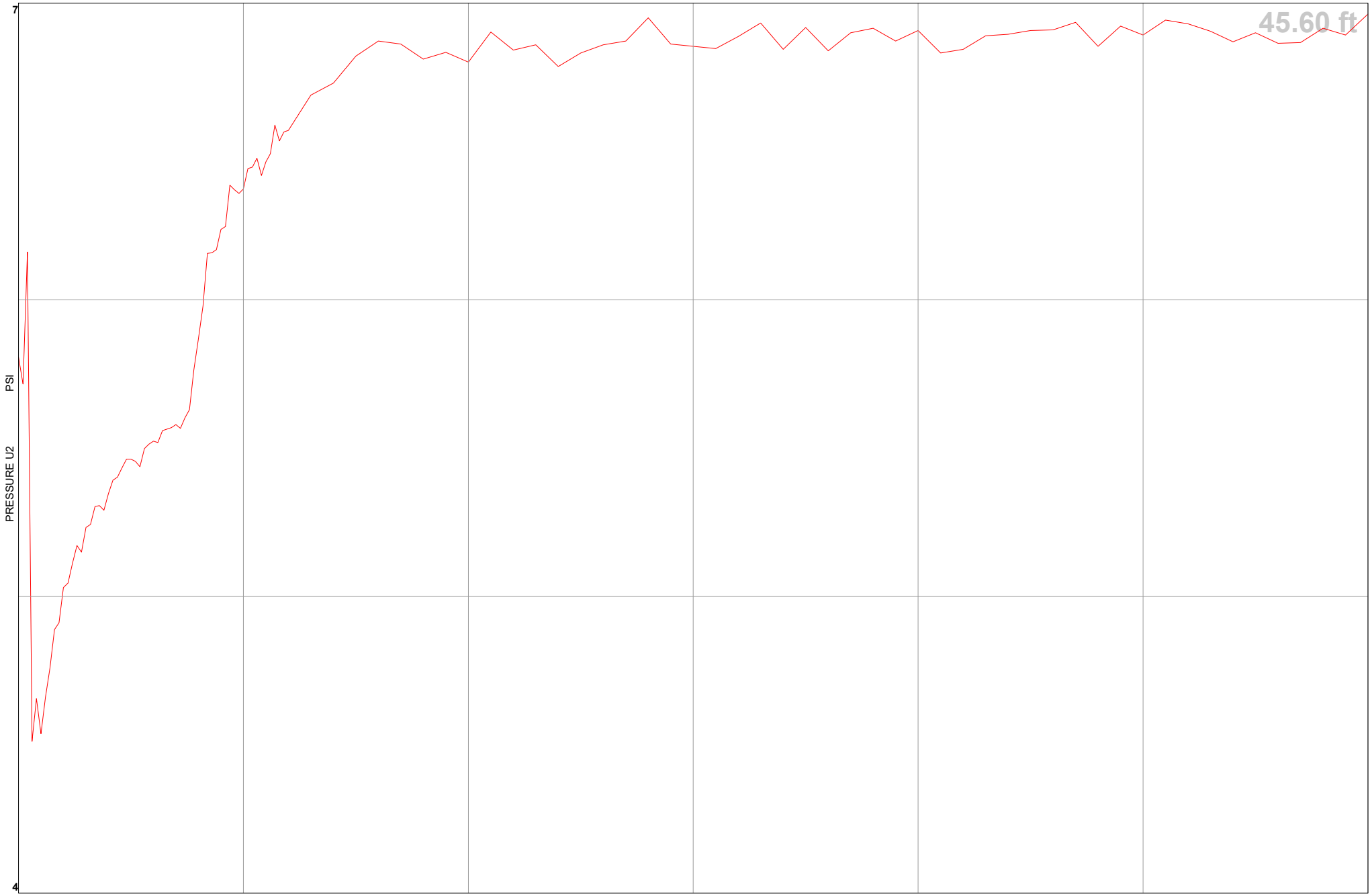
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 15cm squared

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

Cornerstone Earth Group

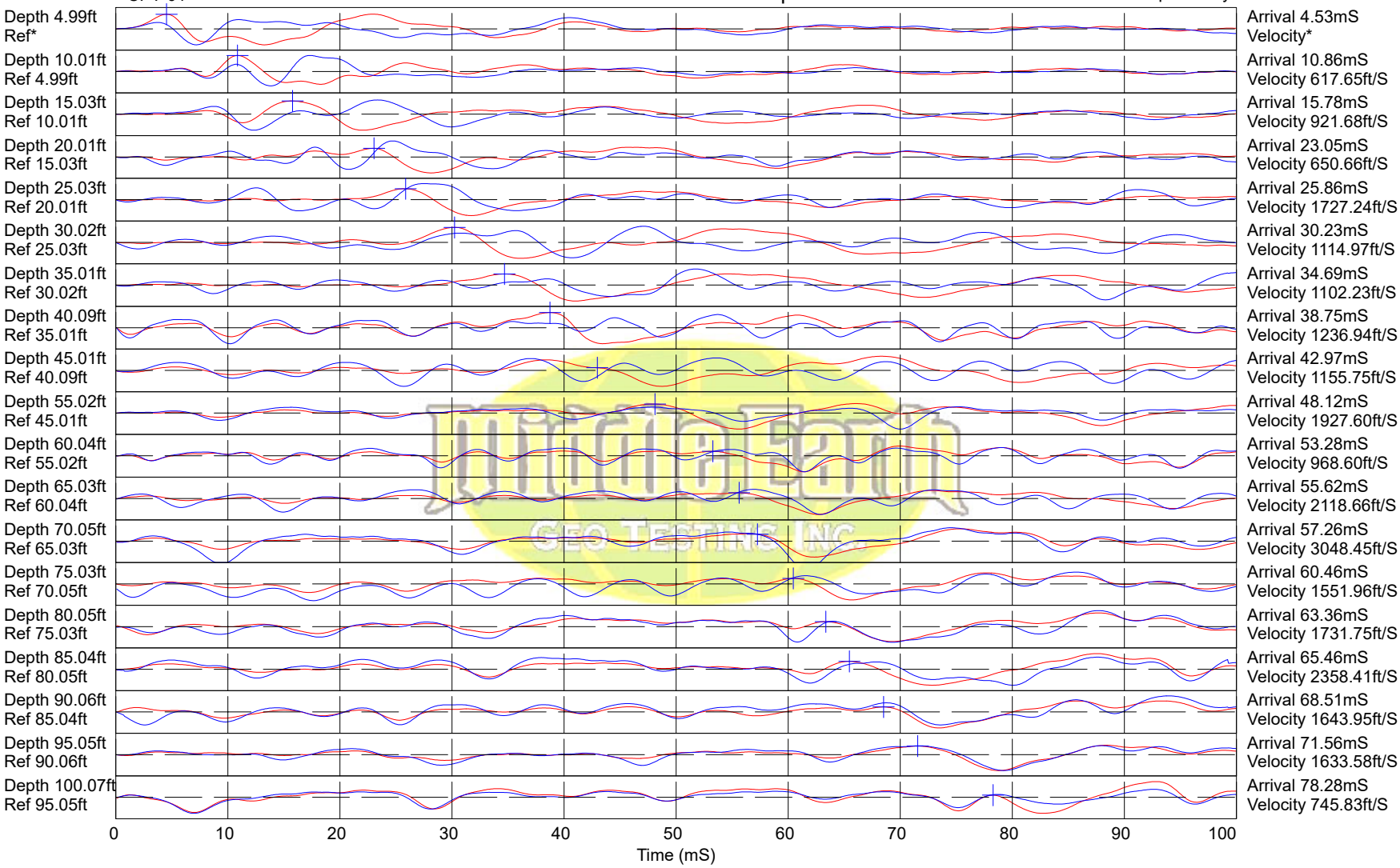
Location	4962 Almaden Expressway	Operator	JM-ZG	GPS
Job Number	1236-1-1	Cone Number	DDG1496	
Hole Number	CPT-01	Date and Time	10/7/2020 8:40:10 AM	
Equilized Pressure	6.95	EST GW Depth During Test	29.55	



CPT-01

Cornerstone Earth Group

4962 Almaden Expressway



Hammer to Rod String Distance (ft): 5.83

* = Not Determined

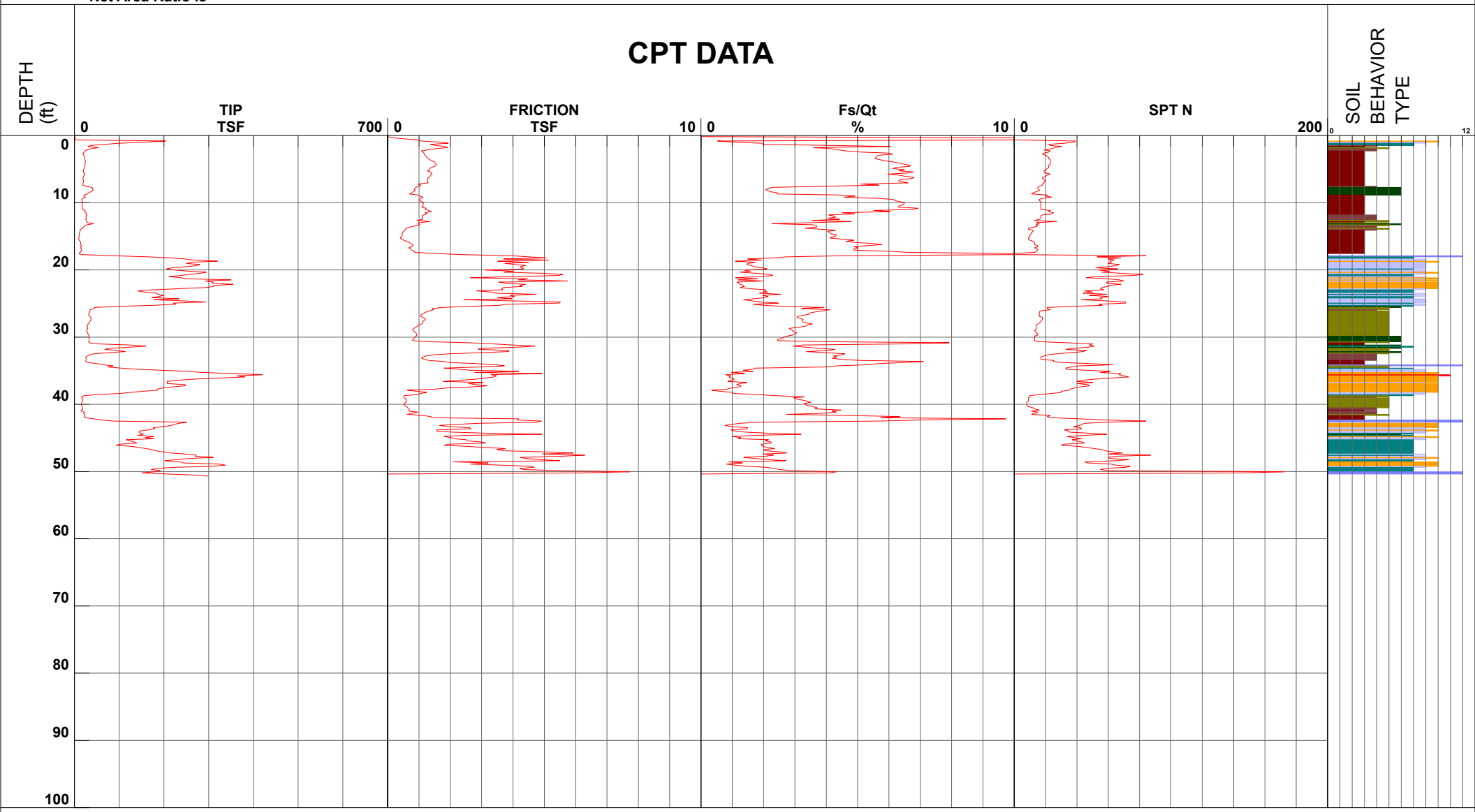
COMMENT:

Cornerstone Earth Group

Project	4962 Almaden Expressway	Operator	JM-ZG	Filename	SDF(286).cpt
Job Number	1236-1-1	Cone Number	DDG1496	GPS	
Hole Number	CPT-02	Date and Time	10/7/2020 11:06:50 AM	Maximum Depth	50.69 ft
EST GW Depth During Test		32.00 ft			

Net Area Ratio .8

CPT DATA



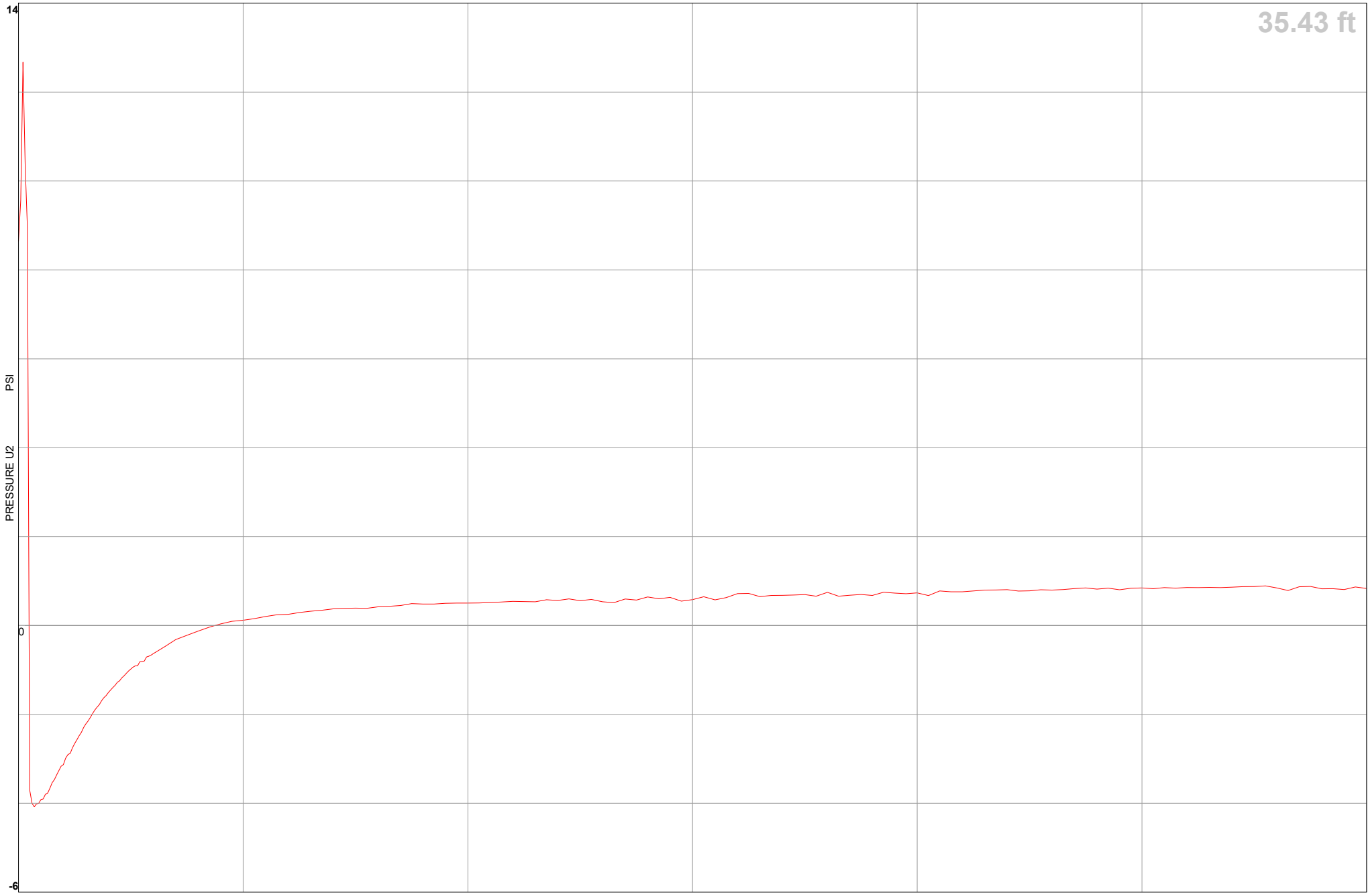
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 15cm squared

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

Cornerstone Earth Group

Location	4962 Almaden Expressway	Operator	JM-ZG	GPS
Job Number	1236-1-1	Cone Number	DDG1496	
Hole Number	CPT-02	Date and Time	10/7/2020 11:06:50 AM	
Equilized Pressure	0.77	EST GW Depth During Test	33.65	



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 20 samples of the materials recovered from the borings. These water contents are recorded on the boring logs at the appropriate sample depths.

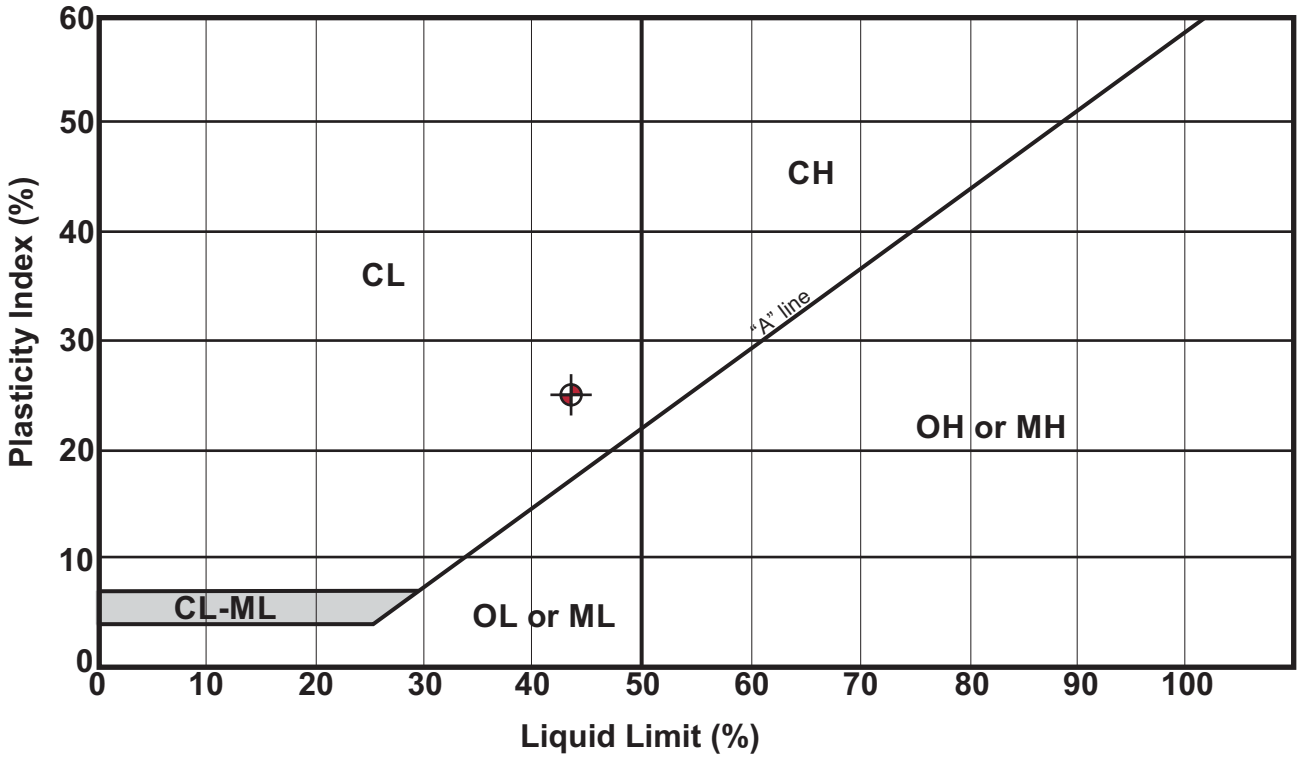
Dry Densities: In place dry density determinations (ASTM D2937) were performed on 18 samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

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

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

Soluble Sulfate: One soluble sulfate determination (California Test Method No. 417-Modified) was performed on a sample of the subsurface soil to measure the water-soluble sulfate content. Results of this test are attached is 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-2	2.0	20	43	18	25	—	Lean Clay with Sand (CL)

CORNERSTONE EARTH GROUP

Plasticity Index Testing Summary

4962 Almaden Retail Building
San Jose, CA

Project Number: 1236-1-1

Figure Number: Figure B1

Date: October 2020

Drawn By: FLL

APPENDIX C: SITE CORROSIVITY EVALUATION

Corrosivity Tests Summary

CORNERSTONE EARTH GROUP

Job Number	1236-1-1	Date Tested	10/14/2020
Job Name	Almaden Retail Building	Tested By	FLL
Location	San Jose, CA		

Sample I.D.			Soil Visual Description	Moisture Content %	pH	Temp. at Testing C°	Resistivity (Ohm-cm) Corrected to 15.5 C°		Chloride Dry Wt.	Sulfate Dry Wt.
Boring	Sample No.	Depth, ft.					As Received	Saturated	mg/kg	mg/kg
				ASTM D2216	ASTM G51		G57	ASTM G57	ASTM D4327	ASTM D4327
EB-1	1	2.0	Dark Brown Lean Clay with Sand (CL)	14.7	7.5	25.2	-	1,466	5	41

APPENDIX D: LIQUEFACTION ANALYSES CALCULATIONS

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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	1.490	0.054	20.0	20.0	36.552	3.642	2.61		Unsaturated	71.8			1.41	1.70	2.39	53.99	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	1.520	0.056	41.3	41.3	22.309	3.702	2.77		Unsaturated	85.0			1.44	1.70	2.44	55.77	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	1.190	0.025	61.3	61.3	13.081	2.148	2.82		Unsaturated	88.5			1.12	1.70	1.91	55.44	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	0.160	0.107	82.5	82.5	2.879	89.937	4.37		Unsaturated	100.0			0.15	1.70	0.26	54.27	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	0.340	0.395	102.5	102.5	5.634	136.762	4.32		Unsaturated	100.0			0.32	1.70	0.55	54.65	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	1.580	0.717	122.5	122.5	24.796	47.230	3.56		Unsaturated	100.0			1.49	1.70	2.54	57.26	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	207.940	1.299	143.8	143.8	753.800	0.625	1.18		Unsaturated	0.0			196.54	1.70	334.12	334.12	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	178.700	2.125	163.8	163.8	606.886	1.190	1.47		Unsaturated	0.0			168.90	1.70	287.14	287.14	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	119.350	2.846	185.0	185.0	381.217	2.386	1.83		Unsaturated	9.3			112.81	1.70	191.77	199.52	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	92.580	3.558	205.0	205.0	280.822	3.847	2.07		Unsaturated	28.9			87.50	1.70	148.76	212.44	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	87.440	4.195	225.0	225.0	253.123	4.803	2.18		Unsaturated	37.4			82.65	1.70	140.50	213.79	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	110.430	4.274	246.3	246.3	305.623	3.875	2.06		Unsaturated	27.7			104.38	1.70	177.44	244.45	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	107.150	4.141	266.3	266.3	285.154	3.870	2.07		Unsaturated	28.8			101.28	1.70	172.17	240.32	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	89.040	3.642	287.5	287.5	227.948	4.096	2.14		Unsaturated	34.5			84.16	1.70	143.07	213.61	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	83.120	3.327	307.5	307.5	205.708	4.011	2.16		Unsaturated	35.7			78.56	1.70	133.56	203.43	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	75.610	3.092	327.5	327.5	181.261	4.098	2.20		Unsaturated	38.8			71.47	1.70	121.49	191.62	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	72.400	2.922	348.8	348.8	168.154	4.045	2.21		Unsaturated	39.8			68.43	1.70	116.33	186.18	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	70.700	2.834	368.8	368.8	159.658	4.019	2.22		Unsaturated	40.7			66.82	1.70	113.60	183.49	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	70.330	2.700	390.0	390.0	154.410	3.850	2.21		Unsaturated	40.1			66.47	1.70	113.01	182.29	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	72.330	2.487	410.0	410.0	154.870	3.448	2.17		Unsaturated	36.9			68.36	1.70	116.22	183.38	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	74.860	2.408	430.0	430.0	156.509	3.225	2.15		Unsaturated	34.9			70.76	1.70	120.29	186.18	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	79.320	2.479	451.3	451.3	161.886	3.134	2.13		Unsaturated	33.4			74.97	1.69	126.76	192.32	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	84.630	2.664	471.3	471.3	169.029	3.157	2.12		Unsaturated	32.7			79.99	1.65	131.84	197.63	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	86.380	2.971	492.5	492.5	168.749	3.449	2.15		Unsaturated	35.2			81.64	1.61	131.81	200.70	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	86.190	3.126	512.5	512.5	165.040	3.638	2.18		Unsaturated	37.2			81.47	1.59	129.88	200.44	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	88.070	3.007	533.8	533.8	165.239	3.425	2.16		Unsaturated	35.4			83.24	1.57	131.05	200.02	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	84.490	2.665	553.8	553.8	155.595	3.165	2.14		Unsaturated	34.5			79.86	1.58	125.89	192.57	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	78.660	1.770	573.8	573.8	142.258	2.259	2.05		Unsaturated	27.2			74.35	1.61	119.69	174.74	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	71.280	1.688	595.0	595.0	126.522	2.377	2.10		Unsaturated	31.2			67.37	1.61	108.53	167.39	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	68.030	1.762	615.0	615.0	118.732	2.602	2.15		Unsaturated	35.0			64.30	1.60	102.79	164.89	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	69.810	1.886	636.3	636.3	119.782	2.714	2.16		Unsaturated	35.9			65.98	1.57	103.73	166.98	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	69.920	1.879	656.3	656.3	118.113	2.699	2.16		Unsaturated	36.1			66.09	1.56	102.85	166.07	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	66.450	1.731	676.3	676.3	110.535	2.619	2.17		Unsaturated	36.8			62.81	1.55	97.63	160.33	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	62.800	1.696	697.5	697.5	102.811	2.716	2.20		Unsaturated	39.4			59.36	1.55	91.94	155.56	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	64.800	1.703	717.5	717.5	104.598	2.643	2.19		Unsaturated	38.3			61.25	1.53	93.62	156.73	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	66.680	1.752	738.8	738.8	106.073	2.643	2.19		Unsaturated	38.0			63.02	1.51	95.01	158.17	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	69.000	1.902	758.8	758.8	108.312	2.772	2.20		Unsaturated	38.7			65.22	1.48	96.84	161.09	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	70.570	2.007	778.8	778.8	109.343	2.860	2.20		Unsaturated	39.3			66.70	1.47	97.80	162.79	1.00	0.576	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.400	72.660	1.875	800.0	800.0	111.077	2.595	2.17		Unsaturated	36.4			68.68	1.45	99.70	162.54	1.00	0.576	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.560	73.430	1.782	820.0	820.0	110.868	2.440	2.15		Unsaturated	34.9			69.40	1.44	99.99	161.33	1.00	0.576	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.730	71.410	1.780	841.3	841.3	106.415	2.507	2.17		Unsaturated	36.5			67.50	1.43	96.63	158.85	1.00	0.576	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.890	71.390	1.702	861.3	861.3	105.128	2.398	2.16		Unsaturated	35.6			67.48	1.42	95.95	157.18	1.00	0.576	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.050	73.050	1.816	881.3	881.3	106.345	2.501	2.17		Unsaturated	36.5			69.05	1.41	97.02	159.28	1.00	0.576	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.220	72.530	1.930	902.5	902.5	104.317	2.678	2.20		Unsaturated	38.7			68.55	1.39	95.44	159.31	0.99	0.575	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.380	75.130	1.928	922.5	922.5	106.888	2.581	2.18		Unsaturated	37.2			71.01	1.38	97.82	160.92	0.99	0.575	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.550	79.110	1.815	943.8	943.8	111.295	2.309	2.13		Unsaturated	33.3			74.77	1.36	101.95	162.07	0.99	0.575	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.710	80.770	1.737	963.8	963.8	112.445	2.164	2.11		Unsaturated	31.4			76.34	1.35	103.33	161.45	0.99	0.575	1.100	n.a.	n.a.	n.a.	0.00	0.00
7.870	81.580	1.751	983.8	983.8	112.405	2.159	2.10		Unsaturated	31.4			77.11	1.34	103.53	161.62	0.99	0.575	1.100	n.a.	n.a.	n.a.	0.00	0.00
8.040	86.700	1.797	1005.0	1005.0	118.218	2.085	2.08		Unsaturated	29.3			81.95	1.33	108.70	165.01	0.99	0.575	1.100	n.a.	n.a.	n.a.	0.00	0.00
8.200	87.940	1.631	1025.0	1025.0	118.729	1.866	2.04		Unsaturated	26.4			83.12	1.32	109.84	161.68	0.99	0.574	1.100	n.a.	n.a.	n.a.	0.00	0.00
8.370	89.190	1.587	1046.3	1046.3	119.183	1.790	2.03		Unsaturated	25.2			84.30	1.31	110.66	160.58	0.99	0.574	1.100	n.a.	n.a.	n.a.	0.00	0.00
8.530	90.790	1.514	1066.3	1066.3	120.177	1.677	2.00		Unsaturated	23.4			85.81	1.31	112.07	158.57	0.99	0.574	1.100	n.a.	n.a.	n.a.	0.00	0.00
8.690	87.870	1.505	1086.3	1086.3	115.201	1.723	2.03		Unsaturated	25.1			83.05	1.30	107.86	157.02	0.99	0.574	1.100	n.a.	n.a.	n.a.	0.00	0.00
8.860	87.140	1.824	1107.5	1107.5	113.123	2.107	2.10		Unsaturated	30.6			82.36	1.28	105.51	163.00	0.99	0.574	1.100	n.a.	n.a.	n.a.	0.00	0.00
9.020	88.230	2.205	1127.5	1127.5	113.513	2.515	2.15		Unsaturated	35.1			83.39	1.27	105.55	168.40	0.99	0.574	1.100	n.a.	n.a.	n.a.	0.00	0.00
9.190	96.230	3.358	1148.8	1148.8	122.707	3.511	2.24		Unsaturated	42.3			90.95	1.24	112.76	183.74	0.99	0.573	1.100	n.a.	n.a.	n.a.	0.00	0.00
9.350	93.990	3.789	1168.8	1168.8	118.791	4.056	2.30		Unsaturated	47.0			88.84	1.23	109.55	182.86	0.99	0.573	1.100	n.a.	n.a.	n.a.	0.00	0.00
9.510	104.290	3.813	1188.8	1188.8	130.764	3.677	2.24		Unsaturated	42.2			98.57	1.22	119.89	192.58	0.99	0.573	1.100	n.a.	n.a.	n.a.	0.00	0.00
9.680	97.620	2.342	1210.0	1210.0	121.260	2.414	2.12		Unsaturated	32.5			92.27	1.23	113.14	174.72	0.99	0.573	1.100	n.a.	n.a.	n.a.	0.00	0.00
9.840	97.540	3.447	1230.0	1230.0	120.159	3.556	2.25		Unsaturated	43.1			92.19	1.21	111.65	182.94	0.99	0.573	1.100	n.a.	n.a.	n.a.	0.00	0.00
10.010	96.900	3.141	1251.3	1251.3	118.334	3.262	2.23		Unsaturated	41.1			91.59	1.21	110.49	179.98	0.99	0.573	1.100	n.a.	n.a.	n.a.	0.00	0.00
10.170	113.320	2.721	1271.3	1271.3	137.411	2.415	2.08		Unsaturated	29.7			107.11	1.19	127.71	188.47	0.99	0.572	1.100	n.a.	n.a.	n.a.	0.00	0.00
10.330	105.260	1.866	1291.3	1291.3	126.578	1.784	2.01		Unsaturated	23.7			99.49	1.20	119.71	168.16	0.99	0.572	1.093	n.a.	n.a.	n.a.	0.00	0.00
10.500	118.120	1.404	1312.5	1312.5	140.970	1.195	1.85		Unsaturated	11.1			111.64	1.21	135.58	147.91	0.99	0.572	1.075	n.a.	n.a.	n.a.	0.00	0.00
10.660	129.730	1.821	1332.5	1332.5	153.724	1.411	1.88		Unsaturated	13.1			122.62	1.19	146.02	166.14	0.99	0.572	1.086	n.a.	n.a.	n.a.	0.00	0.00
10.830	141.930	1.342	1353.8	1353.8	166.917	0.950	1.73		Unsaturated	1.3			134.15	1.19	159.53	159.53	0.99	0.572	1.078	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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)
10.990	165.370	1.089	1373.8	1373.8	193.182	0.661	1.58		Unsaturated	0.0			156.30	1.17	182.14	182.14	0.99	0.571	1.093	n.a.	n.a.	n.a.	0.00	0.00
11.150	186.230	1.364	1393.8	1393.8	216.073	0.735	1.57		Unsaturated	0.0			176.02	1.15	201.78	201.78	0.99	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
11.320	186.650	1.244	1415.0	1415.0	214.918	0.669	1.55		Unsaturated	0.0			176.42	1.14	201.29	201.29	0.99	0.571	1.100	n.a.	n.a.	n.a.	0.00	0.00
11.480	179.750	1.223	1435.0	1435.0	205.484	0.683	1.57		Unsaturated	0.0			169.90	1.14	193.72	193.72	0.99	0.571	1.095	n.a.	n.a.	n.a.	0.00	0.00
11.650	159.200	0.978	1456.3	1456.3	180.554	0.617	1.58		Unsaturated	0.0			150.47	1.15	172.65	172.65	0.99	0.571	1.074	n.a.	n.a.	n.a.	0.00	0.00
11.810	120.600	1.325	1476.3	1476.3	135.635	1.105	1.84		Unsaturated	10.2			113.99	1.16	132.46	141.69	0.99	0.571	1.054	n.a.	n.a.	n.a.	0.00	0.00
11.980	93.350	1.448	1497.5	1497.5	104.041	1.564	2.03		Unsaturated	25.2			88.23	1.15	101.45	149.71	0.99	0.570	1.055	n.a.	n.a.	n.a.	0.00	0.00
12.140	78.550	1.435	1517.5	1517.5	86.824	1.845	2.13		Unsaturated	33.7			74.24	1.15	85.27	142.14	0.99	0.570	1.050	n.a.	n.a.	n.a.	0.00	0.00
12.300	65.500	1.601	1537.5	1537.5	71.776	2.473	2.28		Unsaturated	45.6			61.91	1.15	71.05	133.63	0.99	0.570	1.044	n.a.	n.a.	n.a.	0.00	0.00
12.470	60.230	1.683	1558.8	1558.8	65.470	2.831	2.35		Unsaturated	51.1			56.93	1.14	65.12	128.88	0.98	0.570	1.041	n.a.	n.a.	n.a.	0.00	0.00
12.630	58.230	1.726	1578.8	1578.8	62.854	3.005	2.38		Unsaturated	53.6			55.04	1.14	62.68	126.78	0.98	0.570	1.039	n.a.	n.a.	n.a.	0.00	0.00
12.800	53.490	1.734	1600.0	1600.0	57.272	3.291	2.44		Unsaturated	58.1			50.56	1.14	57.39	121.62	0.98	0.569	1.035	n.a.	n.a.	n.a.	0.00	0.00
12.960	50.990	1.806	1620.0	1620.0	54.206	3.599	2.48		Unsaturated	61.7			48.19	1.13	54.48	118.95	0.98	0.569	1.033	n.a.	n.a.	n.a.	0.00	0.00
13.120	52.330	2.072	1640.0	1640.0	55.302	4.022	2.51		Unsaturated	64.0			49.46	1.12	55.54	120.93	0.98	0.569	1.032	n.a.	n.a.	n.a.	0.00	0.00
13.290	53.120	2.524	1661.3	1661.3	55.779	4.827	2.57		Unsaturated	68.4			50.21	1.12	56.01	122.60	0.98	0.569	1.031	n.a.	n.a.	n.a.	0.00	0.00
13.450	48.750	2.926	1681.3	1681.3	56.993	6.107	2.64		Unsaturated	74.1			46.08	1.11	51.24	117.58	0.98	0.569	1.028	n.a.	n.a.	n.a.	0.00	0.00
13.620	47.000	3.000	1702.5	1702.5	54.213	6.501	2.67		Unsaturated	76.9			44.42	1.11	49.16	115.38	0.98	0.568	1.026	n.a.	n.a.	n.a.	0.00	0.00
13.780	48.010	2.957	1722.5	1722.5	54.745	6.272	2.66		Unsaturated	75.7			45.38	1.10	49.93	116.18	0.98	0.568	1.025	n.a.	n.a.	n.a.	0.00	0.00
13.940	46.200	2.954	1742.5	1742.5	52.027	6.517	2.69		Unsaturated	77.9			43.67	1.10	47.83	113.83	0.98	0.568	1.023	n.a.	n.a.	n.a.	0.00	0.00
14.110	46.930	2.943	1763.8	1763.8	52.216	6.390	2.68		Unsaturated	77.3			44.36	1.09	48.30	114.34	0.98	0.568	1.022	n.a.	n.a.	n.a.	0.00	0.00
14.270	49.200	3.090	1783.8	1783.8	54.165	6.397	2.67		Unsaturated	76.5			46.50	1.08	50.33	116.83	0.98	0.568	1.021	n.a.	n.a.	n.a.	0.00	0.00
14.440	51.930	3.272	1805.0	1805.0	56.540	6.413	2.66		Unsaturated	75.6			49.08	1.08	52.78	119.85	0.98	0.567	1.020	n.a.	n.a.	n.a.	0.00	0.00
14.600	52.570	3.221	1825.0	1825.0	56.611	6.234	2.65		Unsaturated	74.8			49.69	1.07	53.16	120.20	0.98	0.567	1.018	n.a.	n.a.	n.a.	0.00	0.00
14.760	50.700	3.185	1845.0	1845.0	53.959	6.398	2.67		Unsaturated	76.5			47.92	1.07	51.05	117.78	0.98	0.567	1.017	n.a.	n.a.	n.a.	0.00	0.00
14.930	51.180	2.986	1866.3	1866.3	53.848	5.942	2.65		Unsaturated	74.6			48.37	1.06	51.26	117.72	0.98	0.567	1.015	n.a.	n.a.	n.a.	0.00	0.00
15.090	55.050	2.794	1886.3	1886.3	54.166	5.164	2.60		Unsaturated	70.9			52.03	1.05	54.82	121.58	0.98	0.567	1.014	n.a.	n.a.	n.a.	0.00	0.00
15.260	55.700	2.673	1907.5	1907.5	54.500	4.883	2.58		Unsaturated	69.3			52.65	1.05	55.18	121.72	0.98	0.566	1.013	n.a.	n.a.	n.a.	0.00	0.00
15.420	53.510	2.371	1927.5	1927.5	52.038	4.511	2.57		Unsaturated	68.3			50.58	1.04	52.79	118.43	0.98	0.566	1.011	n.a.	n.a.	n.a.	0.00	0.00
15.580	50.900	2.138	1947.5	1947.5	49.188	4.283	2.57		Unsaturated	68.4			48.11	1.04	50.01	114.85	0.98	0.566	1.010	n.a.	n.a.	n.a.	0.00	0.00
15.750	52.480	1.785	1968.8	1968.8	50.460	3.466	2.49		Unsaturated	62.5			49.60	1.03	51.30	115.09	0.98	0.566	1.009	n.a.	n.a.	n.a.	0.00	0.00
15.910	52.090	1.698	1988.8	1988.8	49.816	3.324	2.49		Unsaturated	61.8			49.23	1.03	50.69	114.12	0.98	0.566	1.007	n.a.	n.a.	n.a.	0.00	0.00
16.080	48.410	1.665	2010.0	2010.0	45.973	3.512	2.53		Unsaturated	65.1			45.76	1.02	46.89	110.09	0.98	0.565	1.006	n.a.	n.a.	n.a.	0.00	0.00
16.240	48.080	1.636	2030.0	2030.0	45.417	3.475	2.53		Unsaturated	65.2			45.44	1.02	46.35	109.41	0.98	0.565	1.005	n.a.	n.a.	n.a.	0.00	0.00
16.400	39.860	1.538	2050.0	2050.0	37.888	3.960	2.62		Unsaturated	72.9			37.67	1.02	38.27	100.58	0.98	0.565	1.003	n.a.	n.a.	n.a.	0.00	0.00
16.570	36.700	1.687	2071.3	2071.3	34.438	4.729	2.71		Unsaturated	79.5			34.69	1.01	35.06	97.51	0.98	0.565	1.002	n.a.	n.a.	n.a.	0.00	0.00
16.730	35.640	2.003	2091.3	2091.3	33.085	5.790	2.78		Unsaturated	85.5			33.69	1.01	33.89	96.79	0.98	0.565	1.001	n.a.	n.a.	n.a.	0.00	0.00
16.900	38.150	2.431	2112.5	2112.5	35.118	6.553	2.80		Unsaturated	87.2			36.06	1.00	36.09	99.87	0.98	0.564	1.000	n.a.	n.a.	n.a.	0.00	0.00
17.060	53.140	3.575	2132.5	2132.5	48.838	6.865	2.72		Unsaturated	80.7			50.23	1.00	50.05	117.15	0.98	0.564	0.999	n.a.	n.a.	n.a.	0.00	0.00
17.220	68.480	3.850	2152.5	2152.5	63.166	5.711	2.59		Unsaturated	70.0			64.73	0.99	64.25	133.58	0.97	0.564	0.998	n.a.	n.a.	n.a.	0.00	0.00
17.390	82.570	4.439	2173.8	2173.8	75.986	5.448	2.52		Unsaturated	64.6			78.04	0.99	77.20	148.94	0.97	0.564	0.996	n.a.	n.a.	n.a.	0.00	0.00
17.550	156.690	4.518	2193.8	2193.8	144.434	2.904	2.13		Unsaturated	33.6			148.10	0.99	146.46	216.68	0.97	0.563	0.989	n.a.	n.a.	n.a.	0.00	0.00
17.720	232.350	4.477	2215.0	2215.0	213.625	1.936	1.89		Unsaturated	14.2			219.61	0.99	216.89	246.13	0.97	0.563	0.986	n.a.	n.a.	n.a.	0.00	0.00
17.880	270.670	4.169	2235.0	2235.0	247.900	1.547	1.77		Unsaturated	4.8			255.83	0.99	252.14	252.32	0.97	0.563	0.984	n.a.	n.a.	n.a.	0.00	0.00
18.040	267.300	3.979	2255.0	2255.0	243.704	1.495	1.77		Sand	4.3			252.65	0.98	248.34	248.40	0.97	0.563	0.981	107.963	232.986	413.50	0.00	0.00
18.210	220.090	3.436	2276.3	2276.3	199.531	1.569	1.84		Sand	9.9			208.02	0.98	203.34	213.68	0.97	0.566	0.978	4.479	9.637	17.03	0.00	0.00
18.370	188.640	3.206	2296.3	2296.3	170.116	1.710	1.91		Sand	15.8			178.30	0.97	173.67	205.92	0.97	0.568	0.977	2.682	5.765	10.15	0.00	0.00
18.540	151.430	4.129	2317.5	2317.5	135.718	2.748	2.13		Sand	33.5			143.13	0.97	139.03	207.41	0.97	0.570	0.974	2.945	6.310	11.06	0.00	0.00
18.700	160.950	3.986	2337.5	2337.5	143.689	2.495	2.08		Sand	29.6			152.13	0.97	147.45	212.01	0.97	0.573	0.970	3.988	8.512	14.86	0.00	0.00
18.860	181.670	3.373	2357.5	2357.5	161.623	1.869	1.95		Sand	19.3			171.71	0.97	165.93	209.60	0.97	0.575	0.968	3.394	7.230	12.58	0.00	0.00
19.030	169.540	3.332	2378.8	2378.8	150.076	1.979	1.99		Sand	22.5			160.25	0.96	154.31	205.43	0.97	0.577	0.967	2.602	5.536	9.59	0.00	0.00
19.190	149.940	2.948	2398.8	2398.8	132.041	1.982	2.03		Sand	25.4			141.72	0.96	135.76	190.50	0.97	0.579	0.970	1.152	2.459	4.25	0.00	0.00
19.360	138.940	2.897	2420.0	2420.0	121.729	2.103	2.07		Sand	28.8			131.32	0.95	125.28	184.19	0.97	0.581	0.970	0.864	1.812	3.12	0.00	0.00
19.520	155.600	2.714	2440.0	2440.0	135.884	1.758	1.98		Sand	21.7			147.07	0.95	139.97	186.84	0.97	0.583	0.968	0.971	2.068	3.54	0.00	0.00
19.690	157.510	1.831	2461.3	2461.3	136.961	1.172	1.85		Sand	11.4			148.88	0.94	140.19	153.54	0.97	0.586	0.975	0.314	0.523	0.89	0.01	0.02
19.850	161.250	1.959	2481.3	2481.3	139.663	1.224	1.86		Sand	11.9			152.41	0.94	143.25	158.77	0.97	0.588	0.972	0.359	0.620	1.06	0.01	0.01
20.010	146.890	2.135	2501.3	2501.3	126.611	1.466	1.95		Sand	18.8			138.84	0.94	130.40	168.05	0.97	0.590	0.968	0.472	0.871	1.48	0.00	0.00
20.180	145.870	2.756	2522.5	2522.5	125.185	1.906	2.03		Sand	25.7			137.87	0.94	129.61	183.70	0.97	0.592	0.961	0.846	1.751	2.96	0.00	0.00
20.340	157.930	3.113	2542.5	2542.5	135.082	1.987	2.02		Sand	25.0			149.27	0.94	140.33	194.93	0.97	0.594	0.954	1.437	3.017	5.08	0.00	0.00
20.510	176.340	4.379	2563.8	2563.8	150.320	2.501	2.07		Sand	28.7			166.67	0.94	157.32	222.29	0.97	0.596	0.942	8.536	17.698	29.70	0.00	0.00
20.670	228.870	4.820	2583.8	2583.8	194.660	2.118	1.95		Sand	18.6			216.32	0.95	205.10	251.44	0.97	0.598	0.940	154.660	319.865	535.11	0.00	0.00
20.830	271.490	4.849	2603.8	2603.8	230.218	1.795	1.84		Sand	10.5			256.61	0.95	242.94	256.84	0.97	0.600	0.938	304.024	627.231	1045.98	0.00	0.00
21.000	298.700	5.060	2625.0	2625.0	252.366	1.701	1.80		Sand	7.1			282.33	0.94	266.72	269.46	0.97	0.602	0.935	1795.661	3694.994	6141.42	0.00	0.00
21.160	301.550	4.579	2645.0	2645.0	253.811	1.525	1.76		Sand	4.0			285.02	0.94	268.72	268.75	0.97	0.604	0.933	1612.641	3310.310	5485.11	0.00	0.00
21.330	285.190	3.991	2666.3	2666.3	239.013	1.406	1.75		Sand	3.0			269.56	0.94	253.58	253.58	0.97	0.605	0.931	201.119	411.779	680.11	0.00	0.00
21.490	250.250	4.901	2686.3	2686.3	208.803	1.969	1.90		Sand	15.1			236.53	0.94	222.10	256.00	0.96	0.607	0.928	272.807	557.212	917.56	0.00	0.00
21.650	251.710	4.001	2706.3	2706.3	209.241	1.598	1.83		Sand	9.4			237.91	0.93	221.45	230.20	0.96	0.609	0.926	16.711	34.051	55.91	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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)
21.820	198.440	4.217	2727.5	2727.5	164.068	2.140	1.99		Sand	22.6			187.56	0.93	174.10	228.57	0.96	0.611	0.924	14.454	29.376	48.08	0.00	0.00
21.980	153.650	3.654	2747.5	2747.5	126.309	2.399	2.11		Sand	31.4			145.23	0.92	133.14	197.53	0.96	0.613	0.933	1.648	3.385	5.52	0.00	0.00
22.150	167.050	3.639	2768.8	2768.8	136.887	2.197	2.05		Sand	27.3			157.89	0.92	144.75	204.75	0.96	0.615	0.925	2.496	5.080	8.27	0.00	0.00
22.310	170.940	3.943	2788.8	2788.8	139.590	2.325	2.07		Sand	28.4			161.57	0.92	148.09	210.66	0.96	0.616	0.917	3.641	7.348	11.92	0.00	0.00
22.470	165.080	4.930	2808.8	2808.8	134.276	3.012	2.16		Sand	36.2			156.03	0.92	142.94	215.47	0.96	0.618	0.915	5.084	10.235	16.56	0.00	0.00
22.640	163.550	5.080	2830.0	2830.0	132.512	3.133	2.18		Sand	37.6			154.58	0.91	141.25	214.86	0.96	0.620	0.913	4.869	9.777	15.77	0.00	0.00
22.800	159.030	4.249	2850.0	2850.0	128.357	2.696	2.14		Sand	34.2			150.31	0.91	136.55	205.27	0.96	0.621	0.917	2.577	5.198	8.36	0.00	0.00
22.970	231.150	4.167	2871.3	2871.3	186.391	1.814	1.90		Sand	15.3			218.48	0.92	200.08	232.90	0.96	0.623	0.908	21.408	42.785	68.65	0.00	0.00
23.130	243.780	3.431	2891.3	2891.3	195.950	1.416	1.81		Sand	7.6			230.42	0.91	208.93	212.28	0.96	0.625	0.906	4.063	8.101	12.97	0.00	0.00
23.290	294.180	4.312	2911.3	2911.3	235.880	1.473	1.77		Sand	4.6			278.05	0.92	255.61	255.72	0.96	0.626	0.904	263.186	523.589	835.80	0.00	0.00
23.460	269.350	4.758	2932.5	2932.5	215.080	1.776	1.86		Sand	11.7			254.58	0.92	233.42	252.10	0.96	0.628	0.902	167.597	332.616	529.52	0.00	0.00
23.620	273.090	4.348	2952.5	2952.5	217.335	1.601	1.82		Sand	8.6			258.12	0.91	235.30	241.66	0.96	0.630	0.900	51.174	101.331	160.91	0.00	0.00
23.790	207.880	4.709	2973.8	2973.8	164.557	2.282	2.02		Sand	24.2	258.12		258.12	0.91	235.96	305.16	0.96	0.631	0.898	1.550E+06	3.061E+06	4.848E+06	0.00	0.00
23.950	154.270	4.105	2993.8	2993.8	121.398	2.687	2.15		Sand	35.3	258.12		258.12	0.91	235.54	327.99	0.96	0.633	0.896	5.953E+08	1.173E+09	1.854E+09	0.00	0.00
24.110	86.780	2.717	3013.8	3013.8	67.535	3.186	2.38		Sand	53.3	258.12		258.12	0.91	235.13	345.80	0.96	0.634	0.894	1.771E+11	3.483E+11	5.490E+11	0.00	0.00
24.280	51.200	1.984	3035.0	3035.0	32.740	3.993	2.67		Clay	76.7			48.39	0.91	n.a.	n.a.	0.96	0.636	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	41.230	1.444	3055.0	3055.0	25.992	3.636	2.72		Clay	80.5			38.97	0.91	n.a.	n.a.	0.96	0.638	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	33.360	1.137	3076.3	3076.3	20.689	3.574	2.79		Clay	86.2			31.53	0.91	n.a.	n.a.	0.96	0.639	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	29.530	1.090	3096.3	3096.3	18.075	3.894	2.86		Clay	91.7			27.91	0.90	n.a.	n.a.	0.96	0.641	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	27.540	1.053	3116.3	3116.3	16.675	4.052	2.90		Clay	94.8			26.03	0.90	n.a.	n.a.	0.96	0.642	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	27.470	1.043	3137.5	3137.5	16.511	4.027	2.90		Clay	94.9			25.96	0.90	n.a.	n.a.	0.96	0.644	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	25.920	0.966	3157.5	3157.5	15.418	3.967	2.92		Clay	96.4			24.50	0.90	n.a.	n.a.	0.95	0.645	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	23.900	0.881	3178.8	3178.8	14.037	3.949	2.95		Clay	98.9			22.59	0.90	n.a.	n.a.	0.95	0.646	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	22.340	0.825	3198.8	3198.8	12.968	3.978	2.98		Clay	100.0			21.12	0.90	n.a.	n.a.	0.95	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	23.330	0.820	3218.8	3218.8	13.496	3.774	2.95		Clay	99.0			22.05	0.90	n.a.	n.a.	0.95	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	25.010	0.866	3240.0	3240.0	14.438	3.702	2.92		Clay	96.7			23.64	0.89	n.a.	n.a.	0.95	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	27.490	0.959	3260.0	3260.0	15.865	3.709	2.89		Clay	94.2			25.98	0.89	n.a.	n.a.	0.95	0.652	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	29.400	1.056	3281.3	3281.3	16.920	3.805	2.88		Clay	93.0			27.79	0.89	n.a.	n.a.	0.95	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	30.270	1.079	3301.3	3301.3	17.339	3.770	2.86		Clay	92.1			28.61	0.89	n.a.	n.a.	0.95	0.655	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	30.520	1.070	3321.3	3321.3	17.379	3.706	2.86		Clay	91.7			28.85	0.89	n.a.	n.a.	0.95	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	28.460	1.036	3342.5	3342.5	16.029	3.867	2.90		Clay	94.8			26.90	0.89	n.a.	n.a.	0.95	0.657	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	27.890	1.040	3362.5	3362.5	15.589	3.967	2.91		Clay	96.1			26.36	0.88	n.a.	n.a.	0.95	0.659	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	27.050	1.017	3383.8	3383.8	14.988	4.011	2.93		Clay	97.4			25.57	0.88	n.a.	n.a.	0.95	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	26.130	1.007	3403.8	3403.8	14.354	4.121	2.95		Clay	99.2			24.70	0.88	n.a.	n.a.	0.95	0.661	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	25.450	0.914	3425.0	3425.0	13.861	3.850	2.95		Clay	98.7			24.05	0.88	n.a.	n.a.	0.95	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	25.930	0.910	3445.0	3445.0	14.054	3.761	2.94		Clay	97.8			24.51	0.88	n.a.	n.a.	0.95	0.664	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	25.960	0.857	3465.0	3465.0	13.984	3.538	2.92		Clay	96.7			24.54	0.88	n.a.	n.a.	0.95	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	26.100	0.841	3486.3	3486.3	13.973	3.454	2.91		Clay	96.2			24.67	0.88	n.a.	n.a.	0.95	0.666	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	25.620	0.888	3506.3	3506.3	13.614	3.719	2.94		Clay	98.5			24.22	0.88	n.a.	n.a.	0.95	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	23.900	0.881	3527.5	3527.5	12.551	3.981	2.99		Clay	100.0			22.59	0.87	n.a.	n.a.	0.95	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	22.030	0.814	3547.5	3547.5	11.420	4.019	3.02		Clay	100.0			20.82	0.87	n.a.	n.a.	0.95	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	20.780	0.748	3567.5	3567.5	10.650	3.936	3.04		Clay	100.0			19.64	0.87	n.a.	n.a.	0.95	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	20.820	0.721	3588.8	3588.8	10.603	3.788	3.03		Clay	100.0			19.68	0.87	n.a.	n.a.	0.95	0.672	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	20.900	0.732	3608.8	3608.8	10.583	3.831	3.04		Clay	100.0			19.75	0.87	n.a.	n.a.	0.95	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	21.040	0.731	3630.0	3630.0	10.592	3.800	3.04		Clay	100.0			19.89	0.87	n.a.	n.a.	0.94	0.674	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	21.240	0.777	3650.0	3650.0	10.638	4.001	3.05		Clay	100.0			20.08	0.87	n.a.	n.a.	0.94	0.676	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	25.700	0.768	3670.0	3670.0	13.005	3.217	2.92		Clay	96.7			24.29	0.86	n.a.	n.a.	0.94	0.677	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	25.220	0.770	3691.3	3691.3	12.665	3.294	2.94		Clay	97.9			23.84	0.86	n.a.	n.a.	0.94	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	22.570	0.625	3711.3	3705.6	11.180	3.016	2.96		Clay	99.7			21.33	0.86	n.a.	n.a.	0.94	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	21.020	0.653	3732.5	3716.3	10.308	3.410	3.02		Clay	100.0			19.87	0.86	n.a.	n.a.	0.94	0.680	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	19.140	0.639	3752.5	3726.3	9.266	3.702	3.08		Clay	100.0			18.09	0.86	n.a.	n.a.	0.94	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	18.360	0.598	3772.5	3736.3	8.818	3.627	3.09		Clay	100.0			17.35	0.86	n.a.	n.a.	0.94	0.682	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	19.460	0.585	3793.8	3747.0	9.375	3.328	3.05		Clay	100.0			18.39	0.86	n.a.	n.a.	0.94	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	22.000	0.618	3813.8	3757.0	10.696	3.077	2.98		Clay	100.0			20.79	0.86	n.a.	n.a.	0.94	0.684	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	23.100	0.646	3835.0	3767.6	11.245	3.051	2.96		Clay	99.7			21.83	0.86	n.a.	n.a.	0.94	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	23.130	0.677	3855.0	3777.6	11.225	3.191	2.97		Clay	100.0			21.86	0.86	n.a.	n.a.	0.94	0.686	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	21.130	0.667	3875.0	3787.6	10.134	3.473	3.03		Clay	100.0			19.97	0.86	n.a.	n.a.	0.94	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	19.780	0.634	3896.3	3798.3	9.389	3.553	3.06		Clay	100.0			18.70	0.86	n.a.	n.a.	0.94	0.688	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	18.210	0.616	3916.3	3808.3	8.535	3.787	3.11		Clay	100.0			17.21	0.86	n.a.	n.a.	0.94	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	17.050	0.566	3937.5	3818.9	7.898	3.756	3.14		Clay	100.0			16.12	0.86	n.a.	n.a.	0.94	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	17.700	0.558	3957.5	3829.0	8.212	3.552	3.11		Clay	100.0			16.73	0.86	n.a.	n.a.	0.94	0.691	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	17.680	0.579	3977.5	3839.0	8.175	3.689	3.12		Clay	100.0			16.71	0.85	n.a.	n.a.	0.94	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	18.890	0.616	3998.8	3849.6	8.775	3.648	3.09		Clay	100.0			17.85	0.85	n.a.	n.a.	0.94	0.693	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	19.920	0.658	4018.8	3859.6	9.281	3.674	3.07		Clay	100.0			18.83	0.85	n.a.	n.a.	0.94	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	19.890	0.700	4040.0	3870.3	9.234	3.919	3.09		Clay	100.0			18.80	0.85	n.a.	n.a.	0.94	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	21.150	0.715	4060.0	3880.3	9.855	3.738	3.06		Clay	100.0			19.99	0.85	n.a.	n.a.	0.93	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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)
32.640	22.100	0.736	4080.0	3890.3	10.313	3.670	3.04		Clay	100.0			20.89	0.85	n.a.	n.a.	0.93	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	19.870	0.661	4101.3	3900.9	9.136	3.708	3.08		Clay	100.0			18.78	0.85	n.a.	n.a.	0.93	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	17.770	0.622	4121.3	3911.0	8.034	3.959	3.14		Clay	100.0			16.80	0.85	n.a.	n.a.	0.93	0.698	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	17.670	0.603	4142.5	3921.6	7.955	3.868	3.14		Clay	100.0			16.70	0.85	n.a.	n.a.	0.93	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	17.230	0.606	4162.5	3931.6	7.706	3.997	3.16		Clay	100.0			16.29	0.85	n.a.	n.a.	0.93	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	16.950	0.562	4182.5	3941.6	7.539	3.785	3.16		Clay	100.0			16.02	0.85	n.a.	n.a.	0.93	0.701	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	17.810	0.535	4203.8	3952.3	7.949	3.407	3.11		Clay	100.0			16.83	0.85	n.a.	n.a.	0.93	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	16.850	0.556	4223.8	3962.3	7.439	3.772	3.16		Clay	100.0			15.93	0.85	n.a.	n.a.	0.93	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	16.580	0.648	4245.0	3972.9	7.278	4.482	3.21		Clay	100.0			15.67	0.85	n.a.	n.a.	0.93	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	16.260	0.639	4265.0	3983.0	7.094	4.522	3.22		Clay	100.0			15.37	0.85	n.a.	n.a.	0.93	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	16.210	0.554	4285.0	3993.0	7.046	3.940	3.19		Clay	100.0			15.32	0.85	n.a.	n.a.	0.93	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	14.960	0.511	4306.3	4003.6	6.398	3.992	3.23		Clay	100.0			14.14	0.85	n.a.	n.a.	0.93	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	17.260	0.519	4326.3	4013.6	7.523	3.436	3.13		Clay	100.0			16.31	0.84	n.a.	n.a.	0.93	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	19.060	0.610	4347.5	4024.3	8.392	3.613	3.11		Clay	100.0			18.02	0.84	n.a.	n.a.	0.93	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	16.780	0.692	4367.5	4034.3	7.236	4.739	3.23		Clay	100.0			15.86	0.84	n.a.	n.a.	0.93	0.708	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	22.380	0.736	4387.5	4044.3	9.983	3.647	3.05		Clay	100.0			21.15	0.84	n.a.	n.a.	0.93	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	22.460	0.747	4408.8	4054.9	9.991	3.686	3.05		Clay	100.0			21.23	0.84	n.a.	n.a.	0.93	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	21.360	0.704	4428.8	4065.0	9.420	3.676	3.07		Clay	100.0			20.19	0.84	n.a.	n.a.	0.93	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	19.330	0.639	4450.0	4075.6	8.394	3.734	3.11		Clay	100.0			18.27	0.84	n.a.	n.a.	0.93	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	16.890	0.571	4470.0	4085.6	7.174	3.898	3.18		Clay	100.0			15.96	0.84	n.a.	n.a.	0.92	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	15.040	0.520	4491.3	4096.3	6.247	4.064	3.24		Clay	100.0			14.22	0.84	n.a.	n.a.	0.92	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	13.040	0.438	4511.3	4106.3	5.253	4.064	3.30		Clay	100.0			12.33	0.84	n.a.	n.a.	0.92	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	11.410	0.374	4531.3	4116.3	4.443	4.090	3.36		Clay	100.0			10.78	0.84	n.a.	n.a.	0.92	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	9.720	0.354	4552.5	4126.9	3.607	4.757	3.48		Clay	100.0			9.19	0.84	n.a.	n.a.	0.92	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	9.650	0.364	4572.5	4136.9	3.560	4.936	3.49		Clay	100.0			9.12	0.84	n.a.	n.a.	0.92	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.750	11.320	0.416	4593.8	4147.6	4.351	4.608	3.40		Clay	100.0			10.70	0.84	n.a.	n.a.	0.92	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.910	15.140	0.453	4613.8	4157.6	6.173	3.531	3.21		Clay	100.0			14.31	0.84	n.a.	n.a.	0.92	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.070	17.730	0.504	4633.8	4167.6	7.397	3.273	3.13		Clay	100.0			16.76	0.84	n.a.	n.a.	0.92	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.240	19.520	0.558	4655.0	4178.3	8.229	3.243	3.09		Clay	100.0			18.45	0.84	n.a.	n.a.	0.92	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	19.270	0.540	4675.0	4188.3	8.086	3.187	3.09		Clay	100.0			18.21	0.84	n.a.	n.a.	0.92	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.570	18.830	0.517	4696.3	4198.9	7.851	3.135	3.09		Clay	100.0			17.80	0.83	n.a.	n.a.	0.92	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.730	18.970	0.517	4716.3	4208.9	7.894	3.112	3.09		Clay	100.0			17.93	0.83	n.a.	n.a.	0.92	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.890	18.880	0.543	4736.3	4219.0	7.827	3.289	3.11		Clay	100.0			17.84	0.83	n.a.	n.a.	0.92	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.060	19.000	0.560	4757.5	4229.6	7.859	3.366	3.11		Clay	100.0			17.96	0.83	n.a.	n.a.	0.92	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.220	18.960	0.567	4777.5	4239.6	7.817	3.421	3.12		Clay	100.0			17.92	0.83	n.a.	n.a.	0.92	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	19.120	0.591	4798.8	4250.3	7.868	3.535	3.12		Clay	100.0			18.07	0.83	n.a.	n.a.	0.92	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	20.840	0.655	4818.8	4260.3	8.652	3.556	3.09		Clay	100.0			19.70	0.83	n.a.	n.a.	0.92	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	23.500	1.238	4838.8	4270.3	9.873	5.870	3.18		Clay	100.0			22.21	0.83	n.a.	n.a.	0.92	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	33.090	1.418	4860.0	4280.9	14.324	4.624	2.98		Clay	100.0			31.28	0.83	n.a.	n.a.	0.92	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	38.070	1.640	4880.0	4290.9	16.607	4.602	2.93		Clay	97.7			35.98	0.83	n.a.	n.a.	0.91	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	31.720	1.467	4901.3	4301.6	13.609	5.011	3.02		Clay	100.0			29.98	0.83	n.a.	n.a.	0.91	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	28.950	1.229	4921.3	4311.6	12.287	4.640	3.04		Clay	100.0			27.36	0.83	n.a.	n.a.	0.91	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	24.660	1.047	4941.3	4321.6	10.269	4.716	3.10		Clay	100.0			23.31	0.83	n.a.	n.a.	0.91	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	20.400	0.993	4962.5	4332.3	8.272	5.544	3.22		Clay	100.0			19.28	0.83	n.a.	n.a.	0.91	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	21.080	1.428	4982.5	4342.3	8.562	7.681	3.30		Clay	100.0			19.92	0.83	n.a.	n.a.	0.91	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	24.330	1.540	5003.8	4352.9	10.029	7.056	3.22		Clay	100.0			23.00	0.83	n.a.	n.a.	0.91	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.190	45.380	2.421	5023.8	4362.9	19.651	5.648	2.94		Clay	98.0			42.89	0.83	n.a.	n.a.	0.91	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.350	70.800	3.335	5043.8	4373.0	31.227	4.884	2.75		Clay	82.8			66.92	0.83	n.a.	n.a.	0.91	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.520	155.620	4.028	5065.0	4383.6	100.530	2.631	2.20		Sand	39.1			147.09	0.77	113.66	182.21	0.91	0.729	0.842	0.795	1.424	1.95	0.00	0.00
40.680	206.190	4.990	5085.0	4393.6	133.580	2.450	2.10		Sand	30.7			194.89	0.80	156.81	225.09	0.91	0.729	0.781	10.731	18.434	25.28	0.00	0.00
40.850	247.790	5.855	5106.3	4404.3	160.665	2.387	2.04		Sand	26.0			234.21	0.82	193.02	259.23	0.91	0.730	0.780	416.523	714.834	979.86	0.00	0.00
41.010	260.150	6.506	5126.3	4414.3	168.565	2.526	2.04		Sand	26.5			245.89	0.82	202.53	271.66	0.91	0.730	0.779	2519.747	4320.592	5918.73	0.00	0.00
41.170	384.600	4.538	5146.3	4424.3	249.715	1.188	1.68		Sand	0.0			363.52	0.82	299.24	299.24	0.91	0.730	0.779	4.137E+05	7.088E+05	9.704E+05	0.00	0.00
41.340	345.290	3.314	5167.5	4434.9	223.744	0.967	1.65		Sand	0.0			326.36	0.82	268.48	268.48	0.91	0.731	0.778	1547.778	2649.195	3624.51	0.00	0.00
41.500	258.610	3.225	5187.5	4444.9	166.958	1.259	1.82		Sand	8.3			244.43	0.78	190.52	195.39	0.91	0.731	0.815	1.472	2.639	3.61	0.00	0.00
41.670	221.930	2.525	5208.8	4455.6	142.860	1.151	1.84		Sand	9.9			209.76	0.76	158.59	167.52	0.91	0.732	0.860	0.464	0.758	1.04	0.01	0.01
41.830	214.010	2.337	5228.8	4465.6	137.540	1.105	1.84		Sand	9.8			202.28	0.75	151.51	160.17	0.91	0.732	0.869	0.373	0.582	0.79	0.01	0.03
41.990	173.270	2.756	5248.8	4475.6	110.902	1.615	2.02		Sand	24.4			163.77	0.76	124.70	175.43	0.91	0.733	0.848	0.609	1.042	1.42	0.00	0.00
42.160	175.380	2.724	5270.0	4486.3	112.134	1.577	2.01		Sand	23.5			165.77	0.76	126.08	175.23	0.90	0.733	0.848	0.605	1.032	1.41	0.00	0.00
42.320	180.620	2.727	5290.0	4496.3	115.400	1.532	1.99		Sand	22.1			170.72	0.76	129.92	176.43	0.90	0.734	0.846	0.632	1.087	1.48	0.00	0.00
42.490	151.310	2.617	5311.3	4506.9	96.274	1.760	2.09		Sand	30.0			143.02	0.75	107.26	164.28	0.90	0.734	0.863	0.420	0.670	0.91	0.01	0.02
42.650	165.540	2.492	5331.3	4516.9	105.367	1.530	2.02		Sand	24.4			156.47	0.75	117.62	167.05	0.90	0.734	0.859	0.458	0.742	1.01	0.01	0.02
42.810	180.600	2.388	5351.3	4526.9	114.975	1.342	1.95		Sand	19.0			170.70	0.75	128.08	166.11	0.90	0.735	0.859	0.444	0.716	0.97	0.01	0.02
42.980	144.650	2.481	5372.5	4537.6	91.630	1.747	2.10		Sand	31.0			136.72	0.74	101.62	158.89	0.90	0.735	0.868	0.360	0.556	0.76	0.01	0.03
43.140	164.210	2.516	5392.5	4547.6	104.133	1.558	2.03		Sand	25.1			155.21	0.75	116.38	167.03	0.90	0.735	0.857	0.457	0.740	1.01	0.01	0.02
43.310	158.190	2.043	5413.8	4558.2	100.128	1.314	1.99		Sand	22.0			149.52	0.74	110.19	153.42	0.90	0.736	0.874	0.313	0.467	0.63	0.02	0.04

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.89

Total Settlement: 0.25 (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)
43.470	261.290	1.967	5433.8	4568.3	166.334	0.761	1.67		Sand	0.0			246.97	0.77	189.57	189.57	0.90	0.736	0.820	1.102	1.988	2.70	0.00	0.00
43.640	241.270	2.672	5455.0	4578.9	153.270	1.120	1.81		Sand	7.5			228.04	0.75	172.10	174.88	0.90	0.737	0.845	0.597	1.012	1.37	0.00	0.00
43.800	259.080	2.472	5475.0	4588.9	164.527	0.964	1.74		Sand	2.1			244.88	0.76	187.20	187.20	0.90	0.737	0.823	0.987	1.788	2.43	0.00	0.00
43.960	196.630	2.280	5495.0	4598.9	124.303	1.176	1.89		Sand	13.9	244.88		244.88	0.79	193.35	219.58	0.90	0.737	0.767	6.907	11.656	15.81	0.00	0.00
44.130	160.180	1.806	5516.3	4609.6	100.811	1.147	1.95		Sand	18.7	244.88		244.88	0.81	197.52	243.22	0.90	0.738	0.766	60.477	101.971	138.23	0.00	0.00
44.290	140.580	1.396	5536.3	4619.6	88.157	1.013	1.96		Sand	19.5	244.88		244.88	0.81	197.98	246.51	0.90	0.738	0.766	87.005	146.576	198.60	0.00	0.00
44.460	101.290	1.314	5557.5	4630.2	62.944	1.334	2.15		Sand	34.6	244.88		244.88	0.81	199.17	282.39	0.90	0.738	0.765	15131.331	25468.557	34491.19	0.00	0.00
44.620	79.260	1.157	5577.5	4640.3	48.809	1.512	2.27		Sand	44.2	244.88		244.88	0.81	199.06	293.22	0.90	0.739	0.764	1.179E+05	1.983E+05	2.685E+05	0.00	0.00
44.780	57.700	2.008	5597.5	4650.3	23.612	3.657	2.75		Clay	83.2			54.54	0.81	n.a.	n.a.	0.90	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	55.660	1.830	5618.8	4660.9	22.678	3.463	2.75		Clay	83.1			52.61	0.81	n.a.	n.a.	0.90	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	59.030	1.666	5638.8	4670.9	24.068	2.964	2.69		Clay	78.0			55.79	0.81	n.a.	n.a.	0.90	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	90.490	2.413	5660.0	4681.6	55.703	2.752	2.39		Sand	54.5	145.76	1.8	262.37	0.81	212.78	318.10	0.89	0.740	0.762	3.788E+07	6.348E+07	8.578E+07	0.00	0.00
45.440	106.190	2.145	5680.0	4691.6	65.603	2.076	2.26		Sand	43.6	145.76	1.8	262.37	0.81	212.66	309.63	0.89	0.740	0.761	4.454E+06	7.457E+06	1.007E+07	0.00	0.00
45.600	154.210	2.089	5700.0	4701.6	95.976	1.380	2.02		Sand	24.3		1.8	262.36	0.81	212.53	277.81	0.89	0.741	0.760	6838.536	11441.365	15448.15	0.00	0.00
45.770	68.120	2.131	5721.3	4712.2	27.698	3.265	2.67		Clay	76.4			64.39	0.81	n.a.	n.a.	0.89	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	63.980	1.738	5741.3	4722.3	25.881	2.843	2.65		Clay	75.2			60.47	0.81	n.a.	n.a.	0.89	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	89.860	3.111	5762.5	4732.9	36.755	3.576	2.60		Clay	71.2			84.93	0.81	n.a.	n.a.	0.89	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	131.200	2.431	5782.5	4742.9	81.004	1.895	2.16		Sand	36.1	176.47	1.28	225.88	0.81	182.56	264.02	0.89	0.742	0.758	806.189	1344.157	1812.02	0.00	0.00
46.420	186.710	2.237	5802.5	4752.9	115.920	1.217	1.92		Sand	16.5		1.28	225.89	0.77	174.82	209.81	0.89	0.742	0.761	3.441	5.757	7.76	0.00	0.00
46.590	120.700	3.813	5823.8	4763.6	74.201	3.238	2.36		Sand	51.5		1.28	146.03	0.75	110.04	185.97	0.89	0.742	0.817	0.934	1.674	2.25	0.00	0.00
46.750	169.100	3.799	5843.8	4773.6	104.574	2.286	2.14		Sand	34.5		1.28	204.58	0.79	162.55	237.50	0.89	0.743	0.756	33.368	55.492	74.73	0.00	0.00
46.920	283.690	3.672	5865.0	4784.2	176.481	1.308	1.81		Sand	8.0		1.28	343.22	0.81	276.76	281.69	0.89	0.743	0.755	13347.888	22178.495	29854.44	0.00	0.00
47.080	256.440	5.129	5885.0	4794.2	159.179	2.023	1.98		Sand	21.7		1.28	310.25	0.81	250.03	313.60	0.89	0.743	0.755	1.185E+07	1.968E+07	2.648E+07	0.00	0.00
47.240	258.700	4.419	5905.0	4804.3	160.424	1.728	1.93		Sand	17.4		1.28	312.98	0.81	252.10	298.92	0.89	0.743	0.754	3.862E+05	6.406E+05	8.617E+05	0.00	0.00
47.410	291.840	3.506	5926.3	4814.9	181.005	1.213	1.78		Sand	5.4		1.28	353.08	0.80	284.23	284.73	0.89	0.744	0.753	23074.022	38241.851	51425.01	0.00	0.00
47.570	238.320	4.096	5946.3	4824.9	147.311	1.741	1.96		Sand	19.5		1.28	288.33	0.80	231.98	285.07	0.89	0.744	0.753	24551.808	40657.395	54655.83	0.00	0.00
47.740	248.380	4.016	5967.5	4835.6	153.432	1.636	1.92		Sand	17.0		1.28	300.50	0.80	241.63	285.59	0.89	0.744	0.752	26988.580	44653.406	60007.73	0.00	0.00
47.900	277.530	2.192	5987.5	4845.6	171.474	0.798	1.67		Sand	0.0		1.28	335.76	0.80	269.84	269.84	0.89	0.744	0.751	1901.263	3143.100	4222.58	0.00	0.00
48.060	167.290	1.072	6007.5	4855.6	102.507	0.652	1.79		Sand	6.1		1.28	202.39	0.71	143.68	144.46	0.89	0.745	0.873	0.256	0.359	0.48	0.02	0.04
48.230	242.410	2.169	6028.8	4866.2	149.208	0.906	1.75		Sand	3.1		1.28	293.27	0.78	230.06	230.06	0.88	0.745	0.750	16.497	27.226	36.55	0.00	0.00
48.390	178.750	1.715	6048.8	4876.3	109.412	0.976	1.87		Sand	12.9	229.12	1.28	293.27	0.80	235.30	259.77	0.88	0.745	0.750	447.904	738.594	991.37	0.00	0.00
48.560	87.440	1.458	6070.0	4886.9	52.496	1.728	2.28		Sand	45.2	229.12	1.28	293.27	0.80	235.16	339.35	0.88	0.745	0.749	2.006E+10	3.305E+10	4.435E+10	0.00	0.00
48.720	35.580	0.783	6090.0	4896.9	13.288	2.407	2.84		Clay	90.3			33.63	0.80	n.a.	n.a.	0.88	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	17.210	0.561	6110.0	4906.9	5.769	3.966	3.26		Clay	100.0			16.27	0.80	n.a.	n.a.	0.88	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	14.140	0.513	6131.3	4917.6	4.504	4.635	3.39		Clay	100.0			13.36	0.80	n.a.	n.a.	0.88	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	12.450	0.474	6151.3	4927.6	3.805	5.053	3.47		Clay	100.0			11.77	0.80	n.a.	n.a.	0.88	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	12.570	0.485	6172.5	4938.2	3.841	5.110	3.47		Clay	100.0			11.88	0.80	n.a.	n.a.	0.88	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	13.050	0.531	6192.5	4948.2	4.023	5.335	3.46		Clay	100.0			12.33	0.80	n.a.	n.a.	0.88	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	15.540	0.658	6212.5	4958.3	5.015	5.295	3.38		Clay	100.0			14.69	0.80	n.a.	n.a.	0.88	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	21.270	0.706	6233.8	4968.9	7.307	3.889	3.17		Clay	100.0			20.10	0.80	n.a.	n.a.	0.88	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	24.710	0.682	6253.8	4978.9	8.670	3.159	3.06		Clay	100.0			23.36	0.80	n.a.	n.a.	0.88	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.200	25.900	0.617	6275.0	4989.6	9.124	2.711	3.01		Clay	100.0			24.48	0.80	n.a.	n.a.	0.88	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.360	24.830	0.566	6295.0	4999.6	8.674	2.609	3.01		Clay	100.0			23.47	0.80	n.a.	n.a.	0.88	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.520	26.040	0.560	6315.0	5009.6	9.135	2.447	2.98		Clay	100.0			24.61	0.80	n.a.	n.a.	0.88	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.690	25.620	0.608	6336.3	5020.2	8.945	2.709	3.01		Clay	100.0			24.22	0.80	n.a.	n.a.	0.88	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.850	26.060	0.672	6356.3	5030.3	9.098	2.936	3.03		Clay	100.0			24.63	0.80	n.a.	n.a.	0.88	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.020	28.380	0.768	6377.5	5040.9	9.995	3.047	3.00		Clay	100.0			26.82	0.80	n.a.	n.a.	0.88	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.180	29.810	0.858	6397.5	5050.9	10.537	3.225	3.00		Clay	100.0			28.18	0.79	n.a.	n.a.	0.87	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.350	30.840	0.952	6418.8	5061.6	10.918	3.446	3.00		Clay	100.0			29.15	0.79	n.a.	n.a.	0.87	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.510	31.430	1.041	6438.8	5071.6	11.125	3.690	3.01		Clay	100.0			29.71	0.79	n.a.	n.a.	0.87	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.670	31.430	1.118	6458.8	5081.6	11.099	3.964	3.03		Clay	100.0			29.71	0.79	n.a.	n.a.	0.87	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.840	31.620	1.153	6480.0	5092.2	11.146	4.063	3.04		Clay	100.0			29.89	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.000	31.790	1.145	6500.0	5102.2	11.187	4.012	3.03		Clay	100.0			30.05	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.170	32.030	1.109	6521.3	5112.9	11.254	3.854	3.02		Clay	100.0			30.27	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.330	31.740	1.098	6541.3	5122.9	11.115	3.857	3.02		Clay	100.0			30.00	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.490	32.780	1.183	6561.3	5132.9	11.494	4.011	3.02		Clay	100.0			30.98	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.660	34.480	1.248	6582.5	5143.6	12.127	4.002	3.00		Clay	100.0			32.59	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.820	35.210	1.294	6602.5	5153.6	12.383	4.056	3.00		Clay	100.0			33.28	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.990	34.940	1.276	6623.8	5164.2	12.249	4.035	3.00		Clay	100.0			33.02	0.79	n.a.	n.a.	0.87	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.150	34.330	1.218	6643.8	5174.2	11.986	3.928	3.00		Clay	100.0			32.45	0.79	n.a.	n.a.	0.87	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.310	33.260	1.167	6663.8	5184.2	11.546	3.901	3.01		Clay	100.0			31.44	0.79	n.a.	n.a.	0.87	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.480	30.890	1.105	6685.0	5194.9	10.606	4.010	3.05		Clay	100.0			29.20	0.79	n.a.	n.a.	0.87	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.640	27.840	1.059	6705.0	5204.9	9.409	4.324	3.11		Clay	100.0			26.31	0.79	n.a.	n.a.	0.87	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.810	23.950	0.954	6726.3	5215.5	7.894	4.636	3.19		Clay	100.0			22.64	0.79	n.a.	n.a.	0.87	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.970	23.530	0.865	6746.3	5225.6	7.715	4.292	3.18		Clay	100.0			22.24	0.79	n.a.	n.a.	0.87	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.130	22.120	0.788	6766.3	5235.6	7.158	4.206	3.20		Clay	100.0			20.91	0.79	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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)
54.300	20.790	0.708	6787.5	5246.2	6.632	4.070	3.22		Clay	100.0			19.65	0.79	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.460	18.590	0.626	6807.5	5256.2	5.778	4.122	3.27		Clay	100.0			17.57	0.79	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.630	17.390	0.668	6828.8	5266.9	5.307	4.777	3.34		Clay	100.0			16.44	0.79	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.790	18.130	0.731	6848.8	5276.9	5.574	4.972	3.33		Clay	100.0			17.14	0.79	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.950	18.650	0.779	6868.8	5286.9	5.756	5.120	3.33		Clay	100.0			17.63	0.79	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.120	20.830	0.769	6890.0	5297.6	6.563	4.421	3.24		Clay	100.0			19.69	0.78	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.280	17.230	0.665	6910.0	5307.6	5.191	4.825	3.35		Clay	100.0			16.29	0.78	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.450	16.090	0.558	6931.3	5318.2	4.748	4.419	3.36		Clay	100.0			15.21	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.610	15.240	0.472	6951.3	5328.2	4.416	4.016	3.36		Clay	100.0			14.40	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.770	14.550	0.467	6971.3	5338.2	4.145	4.218	3.40		Clay	100.0			13.75	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.940	14.720	0.464	6992.5	5348.9	4.197	4.133	3.39		Clay	100.0			13.91	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.100	16.210	0.481	7012.5	5358.9	4.741	3.789	3.32		Clay	100.0			15.32	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.270	18.230	0.563	7033.8	5369.5	5.480	3.825	3.27		Clay	100.0			17.23	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.430	19.640	0.658	7053.8	5379.6	5.991	4.081	3.26		Clay	100.0			18.56	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.590	20.080	0.674	7073.8	5389.6	6.139	4.075	3.25		Clay	100.0			18.98	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.760	22.760	0.687	7095.0	5400.2	7.115	3.574	3.16		Clay	100.0			21.51	0.78	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.920	22.880	0.675	7115.0	5410.2	7.143	3.491	3.15		Clay	100.0			21.63	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.090	24.020	0.721	7136.3	5420.9	7.546	3.527	3.14		Clay	100.0			22.70	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.250	25.350	0.811	7156.3	5430.9	8.018	3.723	3.13		Clay	100.0			23.96	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.410	27.250	0.998	7176.3	5440.9	8.698	4.217	3.13		Clay	100.0			25.76	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.580	32.260	1.816	7197.5	5451.5	10.515	6.335	3.18		Clay	100.0			30.49	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.740	38.740	3.800	7217.5	5461.6	12.865	10.816	3.26		Clay	100.0			36.62	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.910	69.820	3.506	7238.8	5472.2	24.195	5.295	2.85		Clay	91.1			65.99	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.070	97.050	3.150	7258.8	5482.2	34.081	3.371	2.61		Clay	71.7			91.73	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.230	63.980	5.873	7278.8	5492.2	21.973	9.734	3.07		Clay	100.0			60.47	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.400	176.970	7.003	7300.0	5502.9	101.584	4.041	2.34		Sand	50.2			167.27	0.73	122.18	200.67	0.85	0.751	0.747	1.963	3.225	4.29	0.00	0.00
58.560	189.150	7.919	7320.0	5512.9	108.618	4.269	2.34		Sand	50.3			178.78	0.74	132.69	214.00	0.85	0.751	0.713	4.580	7.182	9.56	0.00	0.00
58.730	147.230	7.632	7341.3	5523.5	51.981	5.316	2.62		Clay	72.6			139.16	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.890	201.550	7.481	7361.3	5533.6	115.651	3.781	2.28		Sand	45.6			190.50	0.75	142.91	223.90	0.85	0.751	0.712	9.728	15.229	20.28	0.00	0.00
59.060	167.910	5.747	7382.5	5544.2	95.891	3.499	2.31		Sand	47.6			158.71	0.72	113.84	188.65	0.85	0.751	0.777	1.055	1.804	2.40	0.00	0.00
59.220	120.650	6.459	7402.5	5554.2	42.112	5.523	2.69		Clay	78.5			114.04	0.78	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.380	98.800	7.048	7422.5	5564.2	34.179	7.412	2.85		Clay	90.9			93.38	0.77	n.a.	n.a.	0.85	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.550	174.510	7.933	7443.8	5574.9	99.452	4.645	2.39		Sand	54.5			164.94	0.73	119.85	199.85	0.85	0.751	0.746	1.874	3.075	4.10	0.00	0.00
59.710	144.760	6.110	7463.8	5584.9	82.049	4.333	2.42		Sand	56.8			136.82	0.70	95.31	169.58	0.85	0.751	0.815	0.496	0.779	1.04	0.01	0.00
59.880	232.610	7.065	7485.0	5595.5	133.026	3.087	2.18		Sand	37.1			219.86	0.77	169.12	248.68	0.84	0.751	0.708	111.581	173.864	231.59	0.00	0.00
60.040	218.160	7.550	7505.0	5605.5	124.510	3.521	2.24		Sand	42.1			206.20	0.76	156.72	238.38	0.84	0.751	0.708	36.456	56.763	75.61	0.00	0.00
60.200	223.640	7.299	7525.0	5615.6	127.572	3.319	2.21		Sand	40.0			211.38	0.76	161.24	242.02	0.84	0.751	0.707	53.161	82.709	110.18	0.00	0.00
60.370	223.490	6.376	7546.3	5626.2	127.358	2.902	2.17		Sand	36.3			211.24	0.76	160.07	236.68	0.84	0.751	0.707	30.776	47.843	63.74	0.00	0.00
60.530	256.170	5.285	7566.3	5636.2	146.166	2.094	2.02		Sand	24.6			242.13	0.77	185.53	246.98	0.84	0.751	0.706	91.697	142.443	189.78	0.00	0.00
60.700	245.030	4.272	7587.5	5646.9	139.576	1.771	1.98		Sand	21.2			231.60	0.74	172.50	222.98	0.84	0.751	0.706	9.027	14.011	18.67	0.00	0.00
60.860	227.050	4.022	7607.5	5656.9	129.053	1.801	2.01		Sand	23.5			214.60	0.73	157.56	211.75	0.84	0.750	0.705	3.919	6.079	8.10	0.00	0.00
61.020	222.650	4.342	7627.5	5666.9	126.392	1.984	2.04		Sand	26.5			210.44	0.74	155.14	215.47	0.84	0.750	0.704	5.084	7.879	10.50	0.00	0.00
61.190	195.010	3.946	7648.8	5677.5	110.318	2.064	2.10		Sand	30.7			184.32	0.72	132.35	195.46	0.84	0.750	0.754	1.477	2.449	3.26	0.00	0.00
61.350	174.860	7.839	7668.8	5687.6	98.599	4.584	2.39		Sand	54.3			165.27	0.72	119.14	198.87	0.84	0.750	0.744	1.775	2.903	3.87	0.00	0.00
61.520	303.160	8.373	7690.0	5698.2	172.398	2.798	2.07		Sand	28.9			286.54	0.77	220.64	298.41	0.84	0.750	0.703	3.466E+05	5.358E+05	7.142E+05	0.00	0.00
61.680	333.730	7.418	7710.0	5708.2	189.833	2.249	1.97		Sand	20.8			315.43	0.77	242.78	302.01	0.84	0.750	0.702	7.596E+05	1.174E+06	1.564E+06	0.00	0.00
61.840	235.470	6.012	7730.0	5718.2	133.165	2.596	2.12		Sand	32.4			222.56	0.76	168.96	242.27	0.84	0.750	0.702	54.610	84.311	112.39	0.00	0.00
62.010	196.430	4.437	7751.3	5728.9	110.609	2.304	2.13		Sand	33.4			185.66	0.72	133.92	201.13	0.84	0.750	0.735	2.015	3.257	4.34	0.00	0.00
62.170	220.990	5.028	7771.3	5738.9	124.603	2.316	2.10		Sand	30.8			208.88	0.74	154.78	222.75	0.84	0.750	0.701	8.864	13.664	18.22	0.00	0.00
62.340	230.440	5.750	7792.5	5749.5	129.900	2.538	2.12		Sand	32.3			217.81	0.75	163.91	236.07	0.84	0.750	0.700	28.987	44.647	59.53	0.00	0.00
62.500	249.290	5.013	7812.5	5759.5	140.580	2.043	2.02		Sand	24.8			235.62	0.75	177.71	238.37	0.84	0.750	0.700	36.423	56.059	74.76	0.00	0.00
62.660	259.290	5.438	7832.5	5769.6	146.176	2.130	2.02		Sand	25.0			245.08	0.76	187.27	250.10	0.83	0.750	0.699	131.714	202.573	270.16	0.00	0.00
62.830	282.290	4.732	7853.8	5780.2	159.189	1.700	1.93		Sand	17.1			266.81	0.76	201.96	242.29	0.83	0.750	0.699	54.713	84.080	112.14	0.00	0.00
62.990	301.550	4.242	7873.8	5790.2	170.050	1.425	1.85		Sand	11.0			285.02	0.74	211.64	226.60	0.83	0.750	0.698	12.197	18.730	24.98	0.00	0.00
63.160	396.780	6.175	7895.0	5800.9	224.251	1.572	1.81		Sand	7.4			375.03	0.77	287.42	291.00	0.83	0.750	0.697	75760.649	116247.483	155079.79	0.00	0.00
63.320	342.810	7.219	7915.0	5810.9	193.269	2.130	1.95		Sand	18.9			324.02	0.77	248.21	301.08	0.83	0.750	0.697	6.188E+05	9.488E+05	1.266E+06	0.00	0.00
63.480	343.290	8.329	7935.0	5820.9	193.370	2.455	2.00		Sand	22.9			324.47	0.77	248.45	315.49	0.83	0.749	0.696	1.920E+07	2.942E+07	3.926E+07	0.00	0.00
63.650	208.660	5.896	7956.3	5831.5	116.536	2.881	2.19		Sand	38.1			197.22	0.73	144.94	219.97	0.83	0.749	0.696	7.117	10.896	14.54	0.00	0.00
63.810	227.280	5.023	7976.3	5841.5	127.023	2.250	2.08		Sand	29.6			214.82	0.74	158.94	225.82	0.83	0.749	0.695	11.415	17.463	23.31	0.00	0.00
63.980	311.020	5.620	7997.5	5852.2	174.494	1.831	1.93		Sand	17.0			293.97	0.76	224.77	267.10	0.83	0.749	0.695	1259.276	1924.916	2569.41	0.00	0.00
64.140	289.870	5.855	8017.5	5862.2	162.329	2.048	1.98		Sand	21.6			273.98	0.76	209.39	266.52	0.83	0.749	0.694	1157.598	1768.187	2360.49	0.00	0.00
64.300	303.970	9.110	8037.5	5872.2	170.185	3.037	2.11		Sand	31.5			287.31	0.76	219.48	302.01	0.83	0.749	0.694	7.593E+05	1.159E+06	1.547E+06	0.00	0.00
64.470	369.870	6.455	8058.8	5882.9	207.381	1.764	1.87		Sand	12.3			349.59	0.76	266.94	290.14	0.83	0.749	0.693	63980.877	97579.764	130300.16	0.00	0.00
64.630	331.380	3.755	8078.8	5892.9	185.399	1.147	1.76		Sand	3.4			313.21	0.74	233.28	233.29	0.83	0.749	0.693	22.191	33.819	45.17	0.00	0.00
64.800	650.640	3.442	8100.0	5903.5	365.886	0.532	1.31		Sand	0.0			614.97	0.76	469.13	469.13	0.83	0.749	0.692	1.14E+44	1.74E+44	2.32E+44	0.00	0.00
64.960	570.650	4.884	8120.0	5913.5	320.345	0.862	1.51		Sand	0.0			539.37	0.76	411.27	411.27	0.83	0.749	0.692	5.01E+24	7.62E+24	1.02E+25	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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)
65.120	355.850	3.966	8140.0	5923.6	198.725	1.127	1.73		Sand	1.4			336.34	0.76	256.35	256.35	0.83	0.748	0.691	285.434	434.029	579.88	0.00	0.00
65.290	294.410	3.406	8161.3	5934.2	163.864	1.173	1.80		Sand	7.0			278.27	0.71	198.17	200.23	0.83	0.748	0.728	1.914	3.067	4.10	0.00	0.00
65.450	216.500	3.711	8181.3	5944.2	119.784	1.747	2.02		Sand	24.5			204.63	0.71	145.62	200.10	0.83	0.748	0.728	1.900	3.045	4.07	0.00	0.00
65.620	245.440	3.505	8202.5	5954.9	135.976	1.452	1.92		Sand	16.8			231.98	0.71	165.02	200.24	0.82	0.748	0.727	1.916	3.066	4.10	0.00	0.00
65.780	149.570	3.769	8222.5	5964.9	81.886	2.591	2.26		Sand	43.5			141.37	0.67	95.01	162.42	0.82	0.748	0.815	0.398	0.591	0.79	0.01	0.00
65.940	123.030	4.162	8242.5	5974.9	66.884	3.500	2.41		Sand	55.9			116.29	0.65	75.76	144.32	0.82	0.748	0.842	0.255	0.345	0.46	0.02	0.00
66.110	151.060	4.809	8263.8	5985.5	82.571	3.273	2.33		Sand	49.3			142.78	0.68	96.68	167.92	0.82	0.748	0.804	0.470	0.720	0.96	0.01	0.00
66.270	171.580	4.756	8283.8	5995.5	94.018	2.840	2.25		Sand	42.6			162.17	0.69	112.38	183.47	0.82	0.748	0.772	0.838	1.389	1.86	0.00	0.00
66.440	139.940	2.724	8305.0	6006.2	76.179	2.006	2.20		Sand	39.0			132.27	0.66	86.65	148.70	0.82	0.748	0.835	0.280	0.387	0.52	0.02	0.00
66.600	176.650	3.409	8325.0	6016.2	96.687	1.976	2.12		Sand	32.7			166.97	0.68	114.34	176.44	0.82	0.747	0.787	0.633	1.011	1.35	0.00	0.00
66.770	310.930	3.799	8346.3	6026.8	171.799	1.238	1.80		Sand	7.2			293.88	0.72	212.43	214.98	0.82	0.747	0.686	4.909	7.408	9.91	0.00	0.00
66.930	385.840	4.087	8366.3	6036.9	213.570	1.071	1.69		Sand	0.0			364.69	0.76	276.57	276.57	0.82	0.747	0.685	5558.471	8382.646	11218.84	0.00	0.00
67.090	369.340	5.331	8386.3	6046.9	204.162	1.460	1.81		Sand	7.5			349.09	0.76	264.63	268.20	0.82	0.747	0.685	1484.163	2236.619	2993.86	0.00	0.00
67.260	370.590	4.246	8407.5	6057.5	204.675	1.159	1.73		Sand	1.4			350.27	0.76	265.40	265.40	0.82	0.747	0.684	982.482	1479.451	1980.70	0.00	0.00
67.420	326.010	5.306	8427.5	6067.5	179.617	1.649	1.88		Sand	13.6			308.14	0.76	233.37	261.08	0.82	0.747	0.684	535.244	805.403	1078.46	0.00	0.00
67.590	234.780	6.046	8448.8	6078.2	128.576	2.622	2.13		Sand	33.4			221.91	0.74	164.96	238.92	0.82	0.747	0.683	38.516	57.912	77.56	0.00	0.00
67.750	239.470	4.261	8468.8	6088.2	131.078	1.811	2.00		Sand	23.3			226.34	0.72	163.86	218.52	0.82	0.747	0.683	6.369	9.570	12.82	0.00	0.00
67.910	195.930	5.949	8488.8	6098.2	106.724	3.103	2.24		Sand	42.0			185.19	0.71	132.04	207.58	0.82	0.746	0.695	2.977	4.554	6.10	0.00	0.00
68.080	472.100	3.010	8510.0	6108.8	260.252	0.643	1.47		Sand	0.0			446.22	0.76	337.34	337.34	0.82	0.746	0.682	1.047E+10	1.570E+10	2.104E+10	0.00	0.00
68.240	500.750	4.357	8530.0	6118.9	275.958	0.878	1.55		Sand	0.0			473.30	0.76	357.66	357.66	0.82	0.746	0.681	1.402E+13	2.102E+13	2.817E+13	0.00	0.00
68.410	580.210	4.800	8551.3	6129.5	319.840	0.833	1.49		Sand	0.0			548.40	0.76	414.23	414.23	0.82	0.746	0.681	3.139E+25	4.702E+25	6.303E+25	0.00	0.00
68.570	405.880	3.902	8571.3	6139.5	222.840	0.972	1.65		Sand	0.0			383.63	0.76	289.64	289.64	0.81	0.746	0.680	58131.389	87020.086	116674.37	0.00	0.00
68.730	287.000	3.999	8591.3	6149.5	156.741	1.414	1.87		Sand	12.7			271.27	0.72	195.35	216.85	0.81	0.746	0.680	5.623	8.412	11.28	0.00	0.00
68.900	189.860	2.834	8612.5	6160.2	102.789	1.527	2.02		Sand	24.9			179.45	0.67	121.03	172.20	0.81	0.746	0.791	0.543	0.843	1.13	0.01	0.00
69.060	111.000	3.394	8632.5	6170.2	59.050	3.181	2.42		Sand	56.5			104.91	0.63	65.91	131.97	0.81	0.745	0.853	0.204	0.258	0.35	0.02	0.00
69.230	99.070	3.838	8653.8	6180.8	30.657	4.051	2.70		Clay	78.8			93.64	0.75	n.a.	n.a.	0.81	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.390	137.400	2.819	8673.8	6190.9	73.528	2.119	2.23		Sand	41.2			129.87	0.64	83.75	146.76	0.81	0.745	0.833	0.269	0.365	0.49	0.02	0.00
69.550	119.550	3.491	8693.8	6200.9	63.608	3.030	2.38		Sand	53.5			113.00	0.63	71.68	138.19	0.81	0.745	0.845	0.227	0.295	0.40	0.02	0.00
69.720	119.630	3.669	8715.0	6211.5	63.592	3.183	2.40		Sand	54.8			113.07	0.63	71.76	138.77	0.81	0.745	0.844	0.229	0.299	0.40	0.02	0.00
69.880	126.600	4.044	8735.0	6221.5	67.377	3.308	2.39		Sand	54.3			119.66	0.64	76.76	144.98	0.81	0.745	0.835	0.259	0.348	0.47	0.02	0.00
70.050	134.670	3.785	8756.3	6232.2	71.758	2.905	2.33		Sand	49.6			127.29	0.65	82.33	149.93	0.81	0.744	0.827	0.288	0.398	0.53	0.02	0.00
70.210	185.740	3.052	8776.3	6242.2	99.799	1.683	2.06		Sand	28.0			175.56	0.67	118.25	174.45	0.81	0.744	0.783	0.588	0.921	1.24	0.00	0.00
70.370	195.530	3.557	8796.3	6252.2	105.097	1.861	2.08		Sand	29.2			184.81	0.69	126.79	186.59	0.81	0.744	0.755	0.960	1.594	2.14	0.00	0.00
70.540	233.290	4.174	8817.5	6262.8	125.747	1.824	2.02		Sand	24.4			220.50	0.71	157.17	213.47	0.81	0.744	0.674	4.413	6.548	8.80	0.00	0.00
70.700	227.960	4.430	8837.5	6272.9	122.715	1.982	2.05		Sand	27.1			215.46	0.71	153.88	215.27	0.81	0.744	0.674	5.011	7.431	9.99	0.00	0.00
70.870	253.820	5.556	8858.8	6283.5	136.789	2.228	2.06		Sand	27.7			239.91	0.74	178.07	245.13	0.81	0.744	0.673	74.483	110.357	148.40	0.00	0.00
71.030	243.900	4.812	8878.8	6293.5	131.238	2.009	2.04		Sand	25.9			230.53	0.73	167.54	228.98	0.81	0.744	0.673	14.991	22.195	29.85	0.00	0.00
71.190	243.040	5.028	8898.8	6303.5	130.657	2.107	2.05		Sand	27.3			229.72	0.73	167.46	231.67	0.81	0.743	0.673	19.094	28.251	38.01	0.00	0.00
71.360	306.500	5.284	8920.0	6314.2	165.264	1.749	1.93		Sand	17.0			289.70	0.75	217.11	258.67	0.81	0.743	0.672	386.317	571.148	768.53	0.00	0.00
71.520	223.260	5.614	8940.0	6324.2	119.618	2.566	2.14		Sand	34.4			211.02	0.72	152.30	224.85	0.80	0.743	0.672	10.524	15.548	20.93	0.00	0.00
71.690	163.320	5.169	8961.3	6334.8	86.769	3.254	2.31		Sand	48.0			154.37	0.67	103.69	176.07	0.80	0.743	0.777	0.624	0.982	1.32	0.00	0.00
71.850	163.540	5.481	8981.3	6344.9	86.815	3.446	2.33		Sand	49.5			154.57	0.67	103.97	177.23	0.80	0.743	0.774	0.652	1.031	1.39	0.00	0.00
72.010	209.310	5.805	9001.3	6354.9	111.704	2.835	2.20		Sand	38.6			197.84	0.71	140.73	215.30	0.80	0.742	0.670	5.023	7.405	9.97	0.00	0.00
72.180	277.120	6.500	9022.5	6365.5	148.558	2.384	2.06		Sand	27.7			261.93	0.75	195.88	266.29	0.80	0.742	0.670	1118.540	1647.719	2219.75	0.00	0.00
72.340	260.510	7.546	9042.5	6375.5	139.391	2.948	2.15		Sand	34.8			246.23	0.75	184.06	264.18	0.80	0.742	0.669	824.348	1213.490	1635.15	0.00	0.00
72.510	275.430	7.365	9063.8	6386.2	147.387	2.719	2.10		Sand	31.4			260.33	0.75	194.52	271.71	0.80	0.742	0.669	2541.444	3738.361	5038.60	0.00	0.00
72.670	322.100	8.075	9083.8	6396.2	172.637	2.543	2.04		Sand	26.2			304.44	0.75	227.39	300.30	0.80	0.742	0.668	5.213E+05	7.662E+05	1.033E+06	0.00	0.00
72.830	321.580	6.916	9103.8	6406.2	172.215	2.181	1.99		Sand	22.0			303.95	0.75	226.92	288.00	0.80	0.742	0.668	42453.006	62358.907	84087.66	0.00	0.00
73.000	367.670	4.647	9125.0	6416.8	197.082	1.280	1.77		Sand	4.8			347.51	0.75	259.33	259.52	0.80	0.741	0.667	432.846	635.331	856.93	0.00	0.00
73.160	443.850	4.317	9145.0	6426.9	238.238	0.983	1.63		Sand	0.0			419.52	0.75	312.94	312.94	0.80	0.741	0.667	1.005E+07	1.474E+07	1.989E+07	0.00	0.00
73.330	289.700	4.379	9166.3	6437.5	154.503	1.536	1.90		Sand	15.2			273.82	0.72	197.96	230.03	0.80	0.741	0.666	16.463	24.129	32.56	0.00	0.00
73.490	276.290	4.241	9186.3	6447.5	147.116	1.561	1.92		Sand	16.8			261.14	0.72	187.36	224.69	0.80	0.741	0.666	10.387	15.213	20.53	0.00	0.00
73.650	273.360	5.545	9206.3	6457.5	145.411	2.063	2.02		Sand	24.3			258.37	0.75	192.49	254.43	0.80	0.741	0.665	223.531	327.166	441.71	0.00	0.00
73.820	240.970	7.205	9227.5	6468.2	127.776	3.049	2.18		Sand	37.6			227.76	0.74	168.43	248.43	0.80	0.740	0.665	108.397	158.535	214.10	0.00	0.00
73.980	263.590	6.198	9247.5	6478.2	139.891	2.393	2.08		Sand	29.1			249.14	0.74	185.46	256.68	0.80	0.740	0.664	297.832	435.286	587.99	0.00	0.00
74.150	281.460	5.379	9268.8	6488.8	149.415	1.943	1.99		Sand	22.1			266.03	0.74	197.94	254.71	0.80	0.740	0.664	231.698	338.379	457.21	0.00	0.00
74.310	371.260	5.049	9288.8	6498.8	197.727	1.377	1.80		Sand	6.7			350.91	0.74	260.99	262.85	0.80	0.740	0.663	683.799	997.946	1348.73	0.00	0.00
74.480	351.610	6.173	9310.0	6509.5	186.970	1.779	1.90		Sand	14.7			332.33	0.74	247.07	281.23	0.79	0.740	0.663	12314.502	17958.681	24277.80	0.00	0.00
74.640	320.220	5.281	9330.0	6519.5	169.918	1.673	1.90		Sand	15.2			302.67	0.74	224.92	259.53	0.79	0.740	0.662	433.506	631.758	854.27	0.00	0.00
74.800	338.650	4.709	9350.0	6529.5	179.699	1.410	1.83		Sand	9.5			320.09	0.73	234.83	244.24	0.79	0.739	0.662	67.566	98.397	133.09	0.00	0.00
74.970	325.730	4.082	9371.3	6540.2	172.601	1.272	1.81		Sand	7.8			307.87	0.71	219.54	223.35	0.79	0.739	0.661	9.305	13.540	18.32	0.00	0.00
75.130	404.350	4.490	9391.3	6550.2	214.699	1.123	1.71		Sand	0.0			382.18	0.74	283.66	283.66	0.79	0.739	0.661	18996.916	27625.758	37385.36	0.00	0.00
75.300	361.940	6.065	9412.5	6560.8	191.755	1.698	1.87		Sand	12.9			342.10	0.74	253.80	279.58	0.79	0.739	0.661	9239.155	13425.896	18174.00	0.00	0.00
75.460	355.650	4.914	9432.5	6570.8	188.229	1.400	1.82		Sand	8.2			336.15	0.74	249.29	254.71	0.79	0.739	0.660	231.632	336.363	455.44	0.00	0.00
75.620	246.510	4.333	9452.5	6580.9	129.586	1.792	2.00		Sand	23.3			233.00	0.71	165.03	219.87	0.79	0.738	0.660	7.060	10.245	13.88	0.00	0.00
75.790	257.920	3.933	9473.8	6591.5	135.586	1.554	1.94		Sand	18.6			243.78	0.70	170.86	212.84	0.79	0.738	0.659	4.222	6.122	8.29	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.89

Total Settlement: 0.25 (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)
75.950	271.210	4.028	9493.8	6601.5	142.590	1.512	1.92		Sand	16.7			256.34	0.70	180.66	217.01	0.79	0.738	0.659	5.690	8.246	11.17	0.00	0.00
76.120	244.940	4.258	9515.0	6612.2	128.423	1.773	2.00		Sand	23.2			231.51	0.70	163.22	217.60	0.79	0.738	0.658	5.946	8.610	11.67	0.00	0.00
76.280	259.560	4.323	9535.0	6622.2	136.132	1.697	1.97		Sand	20.7			245.33	0.71	174.34	223.56	0.79	0.738	0.658	9.461	13.690	18.56	0.00	0.00
76.440	228.230	4.767	9555.0	6632.2	119.297	2.133	2.08		Sand	29.7			215.72	0.70	151.91	217.48	0.79	0.737	0.657	5.892	8.519	11.55	0.00	0.00
76.610	252.760	5.224	9576.3	6642.8	132.281	2.107	2.05		Sand	27.0			238.90	0.72	172.90	237.54	0.79	0.737	0.657	33.498	48.403	65.66	0.00	0.00
76.770	239.220	4.524	9596.3	6652.8	124.959	1.930	2.04		Sand	26.0			226.11	0.71	159.61	219.83	0.79	0.737	0.656	7.037	10.162	13.79	0.00	0.00
76.940	209.780	2.840	9617.5	6663.5	109.173	1.386	1.98		Sand	21.1			198.28	0.66	130.39	174.35	0.79	0.737	0.770	0.586	0.902	1.22	0.00	0.00
77.100	179.990	3.204	9637.5	6673.5	93.231	1.829	2.11		Sand	31.7			170.12	0.65	111.26	171.43	0.79	0.737	0.777	0.528	0.802	1.09	0.01	0.00
77.260	191.260	3.729	9657.5	6683.5	99.149	2.000	2.12		Sand	32.4			180.78	0.67	120.60	183.66	0.79	0.736	0.747	0.845	1.358	1.84	0.00	0.00
77.430	228.990	3.990	9678.8	6694.2	119.114	1.780	2.03		Sand	25.1			216.44	0.69	149.41	205.85	0.78	0.736	0.676	2.671	3.969	5.39	0.00	0.00
77.590	247.900	4.996	9698.8	6704.2	129.061	2.056	2.05		Sand	26.9			234.31	0.72	167.67	231.19	0.78	0.736	0.654	18.277	26.299	35.74	0.00	0.00
77.760	273.320	5.757	9720.0	6714.8	142.441	2.144	2.03		Sand	25.8			258.34	0.74	190.49	255.70	0.78	0.736	0.654	262.559	377.518	513.16	0.00	0.00
77.920	330.620	5.843	9740.0	6724.8	172.709	1.794	1.92		Sand	16.7			312.50	0.74	230.34	271.91	0.78	0.735	0.653	2620.292	3764.981	5119.13	0.00	0.00
78.080	273.350	4.939	9760.0	6734.8	142.234	1.840	1.98		Sand	21.8			258.36	0.72	187.26	241.52	0.78	0.735	0.653	50.443	72.430	98.51	0.00	0.00
78.250	254.740	5.050	9781.3	6745.5	132.265	2.021	2.04		Sand	25.9			240.78	0.72	172.98	235.35	0.78	0.735	0.652	27.022	38.773	52.75	0.00	0.00
78.410	277.490	7.204	9801.3	6755.5	144.196	2.643	2.10		Sand	31.1			262.28	0.74	193.09	269.48	0.78	0.735	0.652	1799.532	2580.262	3511.33	0.00	0.00
78.580	302.220	4.511	9822.5	6766.1	157.148	1.517	1.89		Sand	14.5			285.65	0.72	204.78	234.41	0.78	0.735	0.651	24.692	35.379	48.16	0.00	0.00
78.740	287.160	4.080	9842.5	6776.2	149.072	1.445	1.89		Sand	14.5			271.42	0.70	190.23	218.76	0.78	0.734	0.651	6.485	9.286	12.64	0.00	0.00
78.900	533.360	6.942	9862.5	6786.2	278.898	1.314	1.69		Sand	0.0			504.12	0.74	370.69	370.69	0.78	0.734	0.650	3.051E+15	4.366E+15	5.947E+15	0.00	0.00
79.070	526.190	7.102	9883.8	6796.8	274.893	1.362	1.70		Sand	0.0			497.34	0.74	365.56	365.56	0.78	0.734	0.650	3.391E+14	4.849E+14	6.607E+14	0.00	0.00
79.230	396.950	6.856	9903.8	6806.8	206.578	1.749	1.86		Sand	12.1			375.19	0.73	275.66	298.53	0.78	0.734	0.649	3.552E+05	5.076E+05	6.917E+05	0.00	0.00
79.400	339.560	6.387	9925.0	6817.5	176.191	1.909	1.94		Sand	17.9			320.95	0.73	235.71	283.01	0.78	0.734	0.649	16885.916	24110.130	32868.35	0.00	0.00
79.560	290.660	6.877	9945.0	6827.5	150.326	2.407	2.06		Sand	27.7			274.73	0.73	201.69	273.20	0.78	0.733	0.649	3214.542	4586.688	6254.66	0.00	0.00
79.720	255.490	5.280	9965.0	6837.5	131.718	2.108	2.05		Sand	27.1			241.48	0.72	173.59	238.59	0.78	0.733	0.648	37.224	53.078	72.40	0.00	0.00
79.890	241.150	6.054	9986.3	6848.2	124.075	2.563	2.13		Sand	33.6			227.93	0.72	163.51	237.42	0.78	0.733	0.648	33.105	47.169	64.36	0.00	0.00
80.050	259.200	6.489	10006.3	6858.2	133.456	2.553	2.11		Sand	31.9			244.99	0.73	179.65	254.47	0.78	0.733	0.647	224.594	319.799	436.49	0.00	0.00
80.220	227.780	6.321	10027.5	6868.8	116.864	2.837	2.18		Sand	37.6			215.29	0.71	152.46	228.77	0.78	0.732	0.647	14.719	20.944	28.59	0.00	0.00
80.380	241.880	5.340	10047.5	6878.8	124.165	2.255	2.09		Sand	30.2			228.62	0.71	162.30	230.82	0.78	0.732	0.646	17.675	25.132	34.32	0.00	0.00
80.540	297.750	6.776	10067.5	6888.8	153.337	2.315	2.04		Sand	26.2			281.43	0.73	206.12	275.11	0.77	0.732	0.646	4375.413	6217.252	8493.41	0.00	0.00
80.710	230.090	4.608	10088.8	6899.5	117.797	2.047	2.07		Sand	28.9			217.48	0.69	150.69	214.72	0.77	0.732	0.645	4.820	6.845	9.35	0.00	0.00
80.870	223.300	4.183	10108.8	6909.5	114.155	1.917	2.06		Sand	28.0			211.06	0.68	144.07	205.18	0.77	0.732	0.669	2.562	3.772	5.16	0.00	0.00
81.040	301.550	3.966	10130.0	6920.1	154.959	1.338	1.86		Sand	11.6			285.02	0.69	197.03	213.81	0.77	0.731	0.645	4.519	6.408	8.76	0.00	0.00
81.200	291.500	4.768	10150.0	6930.2	149.593	1.665	1.94		Sand	18.0			275.52	0.72	198.06	241.33	0.77	0.731	0.644	49.426	70.038	95.80	0.00	0.00
81.360	220.250	2.521	10170.0	6940.2	112.295	1.172	1.92		Sand	16.4			208.18	0.63	132.03	162.46	0.77	0.731	0.788	0.398	0.572	0.78	0.01	0.00
81.530	188.350	2.474	10191.3	6950.8	95.567	1.350	2.01		Sand	23.9			178.02	0.63	112.28	159.80	0.77	0.731	0.793	0.369	0.524	0.72	0.02	0.00
81.690	292.930	3.038	10211.3	6960.8	149.992	1.055	1.79		Sand	6.6			276.87	0.66	182.00	183.39	0.77	0.730	0.739	0.835	1.325	1.81	0.00	0.00
81.860	212.730	3.404	10232.5	6971.5	108.110	1.640	2.03		Sand	25.4			201.07	0.66	132.93	187.11	0.77	0.730	0.728	0.983	1.576	2.16	0.00	0.00
82.020	250.670	3.735	10252.5	6981.5	127.769	1.521	1.96		Sand	19.5			236.93	0.68	161.06	204.70	0.77	0.730	0.668	2.488	3.658	5.01	0.00	0.00
82.190	220.560	3.174	10273.8	6992.1	112.011	1.473	1.99		Sand	21.9			208.47	0.66	136.96	184.01	0.77	0.730	0.736	0.857	1.363	1.87	0.00	0.00
82.350	229.150	2.575	10293.8	7002.2	116.389	1.149	1.90		Sand	15.0			216.59	0.63	137.13	163.38	0.77	0.730	0.784	0.409	0.589	0.81	0.01	0.00
82.510	266.380	2.778	10313.8	7012.2	135.631	1.063	1.83		Sand	9.3			251.78	0.64	160.60	167.72	0.77	0.729	0.775	0.467	0.688	0.94	0.01	0.00
82.680	252.100	3.178	10335.0	7022.8	128.114	1.287	1.90		Sand	15.3			238.28	0.66	156.74	185.65	0.77	0.729	0.731	0.921	1.472	2.02	0.00	0.00
82.840	242.260	4.107	10355.0	7032.8	122.916	1.732	2.01		Sand	23.7			228.98	0.69	156.91	211.38	0.77	0.729	0.640	3.822	5.379	7.38	0.00	0.00
83.010	240.300	6.837	10376.3	7043.5	121.802	2.908	2.18		Sand	37.4			227.13	0.72	162.41	240.76	0.77	0.729	0.639	46.535	65.443	89.82	0.00	0.00
83.170	299.280	5.916	10396.3	7053.5	152.243	2.012	1.99		Sand	22.6			282.87	0.73	205.89	265.36	0.77	0.728	0.639	976.351	1372.128	1883.79	0.00	0.00
83.330	391.690	5.378	10416.3	7063.5	199.936	1.391	1.80		Sand	6.7			370.22	0.73	269.37	271.30	0.77	0.728	0.638	2382.164	3345.577	4594.53	0.00	0.00
83.500	300.520	4.675	10437.5	7074.1	152.651	1.583	1.92		Sand	16.2			284.05	0.71	202.45	239.32	0.77	0.728	0.638	40.110	56.292	77.33	0.00	0.00
83.660	374.370	4.953	10457.5	7084.2	190.687	1.342	1.80		Sand	6.8			353.85	0.73	257.26	259.36	0.77	0.728	0.638	423.692	594.228	816.58	0.00	0.00
83.830	422.010	4.707	10478.8	7094.8	215.129	1.129	1.71		Sand	0.0			398.88	0.73	289.88	289.88	0.76	0.727	0.637	60867.068	85305.765	117264.60	0.00	0.00
83.990	361.330	4.001	10498.8	7104.8	183.673	1.124	1.75		Sand	3.1			341.52	0.72	245.10	245.10	0.76	0.727	0.637	74.278	104.033	143.05	0.00	0.00
84.150	285.210	3.013	10518.8	7114.8	144.302	1.076	1.81		Sand	8.0			269.57	0.65	174.26	178.18	0.76	0.727	0.748	0.676	1.041	1.43	0.00	0.00
84.320	246.400	2.176	10540.0	7125.5	124.199	0.902	1.81		Sand	7.8			232.89	0.61	141.03	144.10	0.76	0.727	0.816	0.254	0.332	0.46	0.02	0.00
84.480	239.510	2.805	10560.0	7135.5	120.560	1.197	1.90		Sand	15.1			226.38	0.64	144.47	171.57	0.76	0.727	0.763	0.531	0.793	1.09	0.01	0.00
84.650	214.040	5.067	10581.3	7146.1	107.365	2.427	2.16		Sand	35.5			202.31	0.68	137.10	207.46	0.76	0.726	0.650	2.955	4.227	5.82	0.00	0.00
84.810	247.590	4.217	10601.3	7156.1	124.528	1.740	2.01		Sand	23.5			234.02	0.69	160.37	214.94	0.76	0.726	0.634	4.897	6.835	9.41	0.00	0.00
84.970	341.860	5.791	10621.3	7166.2	172.853	1.721	1.91		Sand	15.6			323.12	0.72	234.21	271.20	0.76	0.726	0.634	2347.477	3274.505	4511.24	0.00	0.00
85.140	420.270	3.787	10642.5	7176.8	212.961	0.913	1.64		Sand	0.0			397.23	0.72	287.81	287.81	0.76	0.726	0.634	40924.254	57045.316	78616.55	0.00	0.00
85.300	473.950	3.618	10662.5	7186.8	240.339	0.772	1.55		Sand	0.0			447.97	0.72	324.45	324.45	0.76	0.725	0.633	2.151E+08	2.997E+08	4.131E+08	0.00	0.00
85.470	522.440	4.687	10683.8	7197.5	265.006	0.906	1.58		Sand	0.0			493.80	0.72	357.51	357.51	0.76	0.725	0.633	1.321E+13	1.838E+13	2.535E+13	0.00	0.00
85.630	394.730	5.039	10703.8	7207.5	199.412	1.294	1.77		Sand	4.8			373.09	0.72	270.02	270.21	0.76	0.725	0.632	2013.173	2800.544	3863.25	0.00	0.00
85.790	302.020	5.138	10723.8	7217.5	151.822	1.732	1.95		Sand	18.7			285.46	0.72	206.25	253.03	0.76	0.725	0.632	187.739	260.994	360.15	0.00	0.00
85.960	271.900	5.202	10745.0	7228.1	136.302	1.952	2.02		Sand	24.3			256.99	0.71	183.18	243.58	0.76	0.724	0.631	62.850	87.313	120.52	0.00	0.00
86.120	306.520	5.449	10765.0	7238.2	153.895	1.809	1.96		Sand	19.5			289.72	0.72	209.44	259.62	0.76	0.724	0.631	438.825	609.224	841.21	0.00	0.00
86.290	345.550	4.329	10786.3	7248.8	173.707	1.273	1.81		Sand	7.6			326.61	0.70	228.93	232.52	0.76	0.724	0.631	20.654	28.654	39.58	0.00	0.00
86.450	351.280	4.020	10806.3	7258.8	176.507	1.162	1.77		Sand	4.9			332.02	0.70	232.80	233.02	0.76	0.724	0.630	21.634	29.994	41.44	0.00	0.00
86.610	338.610	4.406	10826.3	7268.8	169.919	1.322	1.83		Sand	9.1			320.05	0.70	223.93	231.85	0.76	0.724	0.630	19.417	26.902	37.18	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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)
86.780	327.460	5.025	10847.5	7279.5	164.107	1.561	1.89		Sand	14.2			309.51	0.72	223.06	252.85	0.76	0.723	0.629	183.657	254.282	351.57	0.00	0.00
86.940	282.070	3.435	10867.5	7289.5	140.875	1.242	1.86		Sand	12.1			266.61	0.66	175.28	192.90	0.76	0.723	0.700	1.296	1.996	2.76	0.00	0.00
87.110	242.440	2.820	10888.8	7300.1	120.600	1.190	1.90		Sand	14.9			229.15	0.63	145.01	171.59	0.75	0.723	0.759	0.531	0.789	1.09	0.01	0.00
87.270	235.040	2.460	10908.8	7310.1	116.749	1.071	1.88		Sand	13.3			222.16	0.61	136.57	156.68	0.75	0.723	0.790	0.340	0.469	0.65	0.02	0.00
87.430	256.480	3.177	10928.8	7320.2	127.559	1.266	1.90		Sand	15.0			242.42	0.65	156.93	184.75	0.75	0.722	0.724	0.885	1.392	1.93	0.00	0.00
87.600	254.810	3.226	10950.0	7330.8	126.613	1.294	1.91		Sand	15.7			240.84	0.65	156.38	186.80	0.75	0.722	0.718	0.969	1.531	2.12	0.00	0.00
87.760	238.890	3.250	10970.0	7340.8	118.443	1.393	1.95		Sand	19.2			225.79	0.65	146.75	187.59	0.75	0.722	0.715	1.005	1.581	2.19	0.00	0.00
87.930	268.380	3.327	10991.3	7351.5	133.306	1.265	1.89		Sand	13.9			253.67	0.65	165.36	189.64	0.75	0.722	0.708	1.105	1.723	2.39	0.00	0.00
88.090	234.670	4.190	11011.3	7361.5	116.128	1.829	2.04		Sand	26.4			221.81	0.67	149.04	208.07	0.75	0.721	0.639	3.073	4.319	5.99	0.00	0.00
88.250	204.020	4.990	11031.3	7371.5	100.523	2.514	2.19		Sand	37.9			192.84	0.66	127.42	198.14	0.75	0.721	0.679	1.704	2.545	3.53	0.00	0.00
88.420	148.940	3.612	11052.5	7382.1	72.572	2.519	2.28		Sand	45.7			140.78	0.61	85.35	151.69	0.75	0.721	0.797	0.300	0.404	0.56	0.02	0.00
88.580	81.210	2.467	11072.5	7392.1	20.474	3.260	2.77		Clay	84.5			76.76	0.72	n.a.	n.a.	0.75	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.750	43.800	1.302	11093.8	7402.8	10.335	3.405	3.02		Clay	100.0			41.40	0.72	n.a.	n.a.	0.75	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.910	35.340	1.007	11113.8	7412.8	8.036	3.381	3.10		Clay	100.0			33.40	0.72	n.a.	n.a.	0.75	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.070	32.610	0.905	11133.8	7422.8	7.286	3.347	3.14		Clay	100.0			30.82	0.72	n.a.	n.a.	0.75	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.240	29.420	0.920	11155.0	7433.5	6.415	3.859	3.22		Clay	100.0			27.81	0.72	n.a.	n.a.	0.75	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.400	28.460	0.911	11175.0	7443.5	6.146	3.985	3.24		Clay	100.0			26.90	0.72	n.a.	n.a.	0.75	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.570	30.600	0.899	11196.3	7454.1	6.708	3.595	3.18		Clay	100.0			28.92	0.72	n.a.	n.a.	0.75	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.730	31.260	0.890	11216.3	7464.1	6.873	3.470	3.17		Clay	100.0			29.55	0.72	n.a.	n.a.	0.75	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.900	31.120	0.883	11237.5	7474.8	6.823	3.462	3.17		Clay	100.0			29.41	0.72	n.a.	n.a.	0.75	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.060	31.000	0.891	11257.5	7484.8	6.779	3.511	3.17		Clay	100.0			29.30	0.72	n.a.	n.a.	0.75	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.220	32.460	0.877	11277.5	7494.8	7.157	3.269	3.14		Clay	100.0			30.68	0.72	n.a.	n.a.	0.75	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.390	31.340	0.863	11298.8	7505.5	6.846	3.357	3.16		Clay	100.0			29.62	0.72	n.a.	n.a.	0.75	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.550	31.410	0.853	11318.8	7515.5	6.853	3.311	3.16		Clay	100.0			29.69	0.72	n.a.	n.a.	0.74	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.720	31.790	0.835	11340.0	7526.1	6.941	3.196	3.14		Clay	100.0			30.05	0.72	n.a.	n.a.	0.74	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.880	30.870	0.850	11360.0	7536.1	6.685	3.374	3.17		Clay	100.0			29.18	0.72	n.a.	n.a.	0.74	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.040	31.310	0.860	11380.0	7546.1	6.790	3.355	3.16		Clay	100.0			29.59	0.72	n.a.	n.a.	0.74	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.210	32.220	0.885	11401.3	7556.8	7.019	3.336	3.15		Clay	100.0			30.45	0.71	n.a.	n.a.	0.74	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.370	32.900	0.907	11421.3	7566.8	7.186	3.335	3.14		Clay	100.0			31.10	0.71	n.a.	n.a.	0.74	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.540	32.790	0.904	11442.5	7577.4	7.145	3.339	3.14		Clay	100.0			30.99	0.71	n.a.	n.a.	0.74	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.700	32.080	0.892	11462.5	7587.5	6.945	3.383	3.16		Clay	100.0			30.32	0.71	n.a.	n.a.	0.74	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.860	32.340	0.869	11482.5	7597.5	7.002	3.267	3.15		Clay	100.0			30.57	0.71	n.a.	n.a.	0.74	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.030	32.020	0.862	11503.8	7608.1	6.905	3.280	3.15		Clay	100.0			30.26	0.71	n.a.	n.a.	0.74	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.190	32.050	0.873	11523.8	7618.1	6.901	3.322	3.16		Clay	100.0			30.29	0.71	n.a.	n.a.	0.74	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.360	31.740	0.878	11545.0	7628.8	6.808	3.380	3.16		Clay	100.0			30.00	0.71	n.a.	n.a.	0.74	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.520	31.330	0.864	11565.0	7638.8	6.689	3.381	3.17		Clay	100.0			29.61	0.71	n.a.	n.a.	0.74	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.680	31.760	0.858	11585.0	7648.8	6.790	3.306	3.16		Clay	100.0			30.02	0.71	n.a.	n.a.	0.74	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.850	32.320	0.880	11606.3	7659.5	6.924	3.318	3.15		Clay	100.0			30.55	0.71	n.a.	n.a.	0.74	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.010	32.150	0.899	11626.3	7669.5	6.868	3.414	3.16		Clay	100.0			30.39	0.71	n.a.	n.a.	0.74	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.180	32.490	0.907	11647.5	7680.1	6.944	3.402	3.16		Clay	100.0			30.71	0.71	n.a.	n.a.	0.74	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.340	33.320	0.919	11667.5	7690.1	7.148	3.345	3.14		Clay	100.0			31.49	0.71	n.a.	n.a.	0.74	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.500	33.980	0.936	11687.5	7700.1	7.308	3.325	3.13		Clay	100.0			32.12	0.71	n.a.	n.a.	0.74	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.670	33.790	0.949	11708.8	7710.8	7.246	3.396	3.14		Clay	100.0			31.94	0.71	n.a.	n.a.	0.74	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.830	33.890	0.921	11728.8	7720.8	7.260	3.287	3.13		Clay	100.0			32.03	0.71	n.a.	n.a.	0.74	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.000	34.140	0.927	11750.0	7731.4	7.312	3.279	3.13		Clay	100.0			32.27	0.71	n.a.	n.a.	0.74	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.160	34.950	0.950	11770.0	7741.5	7.509	3.268	3.12		Clay	100.0			33.03	0.71	n.a.	n.a.	0.73	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.320	35.880	0.979	11790.0	7751.5	7.737	3.266	3.11		Clay	100.0			33.91	0.71	n.a.	n.a.	0.73	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.490	35.890	1.010	11811.3	7762.1	7.726	3.368	3.12		Clay	100.0			33.92	0.71	n.a.	n.a.	0.73	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.650	35.860	1.051	11831.3	7772.1	7.706	3.510	3.13		Clay	100.0			33.89	0.71	n.a.	n.a.	0.73	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.820	35.830	1.024	11852.5	7782.8	7.685	3.424	3.12		Clay	100.0			33.87	0.71	n.a.	n.a.	0.73	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.980	35.850	1.002	11872.5	7792.8	7.677	3.350	3.12		Clay	100.0			33.88	0.71	n.a.	n.a.	0.73	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.140	36.940	0.992	11892.5	7802.8	7.944	3.201	3.10		Clay	100.0			34.91	0.71	n.a.	n.a.	0.73	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.310	35.950	0.985	11913.8	7813.4	7.677	3.282	3.11		Clay	100.0			33.98	0.71	n.a.	n.a.	0.73	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.470	36.160	0.956	11933.8	7823.5	7.719	3.165	3.10		Clay	100.0			34.18	0.71	n.a.	n.a.	0.73	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.640	36.010	0.942	11955.0	7834.1	7.667	3.138	3.10		Clay	100.0			34.04	0.71	n.a.	n.a.	0.73	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.800	35.790	0.946	11975.0	7844.1	7.599	3.173	3.11		Clay	100.0			33.83	0.71	n.a.	n.a.	0.73	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.960	35.550	1.020	11995.0	7854.1	7.525	3.450	3.13		Clay	100.0			33.60	0.71	n.a.	n.a.	0.73	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.130	35.710	1.085	12016.3	7864.8	7.553	3.654	3.15		Clay	100.0			33.75	0.71	n.a.	n.a.	0.73	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.290	38.600	1.201	12036.3	7874.8	8.275	3.685	3.12		Clay	100.0			36.48	0.71	n.a.	n.a.	0.73	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.460	42.610	1.274	12057.5	7885.4	9.278	3.481	3.06		Clay	100.0			40.27	0.71	n.a.	n.a.	0.73	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.620	42.480	1.354	12077.5	7895.5	9.231	3.715	3.08		Clay	100.0			40.15	0.71	n.a.	n.a.	0.73	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.780	43.690	1.766	12097.5	7905.5	9.523	4.691	3.13		Clay	100.0			41.29	0.71	n.a.	n.a.	0.73	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.950	45.000	1.790	12118.8	7916.1	9.838	4.598	3.11		Clay	100.0			42.53	0.71	n.a.	n.a.	0.73	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.110	53.970	1.755	12138.8	7926.1	12.087	3.664	2.98		Clay	100.0			51.01	0.71	n.a.	n.a.	0.73	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.280	45.620	2.064	12160.0	7936.8	9.964	5.220	3.14		Clay	100.0			43.12	0.71	n.a.	n.a.	0.73	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.440	46.290	2.639	12180.0	7946.8	10.117	6.564	3.20		Clay	100.0			43.75	0.71	n.a.	n.a.	0.73	0.708	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.89

Total Settlement:	0.25	(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)
97.600	71.090	2.815	12200.0	7956.8	16.336	4.332	2.92		Clay	96.8			67.19	0.71	n.a.	n.a.	0.73	0.708	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.770	58.290	3.212	12221.3	7967.4	13.098	6.156	3.09		Clay	100.0			55.09	0.70	n.a.	n.a.	0.73	0.708	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.930	69.000	3.747	12241.3	7977.5	15.764	5.958	3.02		Clay	100.0			65.22	0.70	n.a.	n.a.	0.72	0.708	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.100	95.680	4.662	12262.5	7988.1	22.421	5.206	2.87		Clay	92.7			90.43	0.70	n.a.	n.a.	0.72	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.260	113.650	5.175	12282.5	7998.1	26.884	4.814	2.79		Clay	86.2			107.42	0.70	n.a.	n.a.	0.72	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.430	92.830	4.247	12303.8	8008.8	21.646	4.900	2.86		Clay	92.2			87.74	0.70	n.a.	n.a.	0.72	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.590	70.540	3.230	12323.8	8018.8	16.057	5.017	2.97		Clay	100.0			66.67	0.70	n.a.	n.a.	0.72	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.750	93.560	2.493	12343.8	8028.8	21.769	2.853	2.71		Clay	79.9			88.43	0.70	n.a.	n.a.	0.72	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.920	52.560	1.755	12365.0	8039.4	11.538	3.784	3.01		Clay	100.0			49.68	0.70	n.a.	n.a.	0.72	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.080	39.480	1.500	12385.0	8049.4	8.271	4.506	3.17		Clay	100.0			37.32	0.70	n.a.	n.a.	0.72	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.250	38.740	1.431	12406.3	8060.1	8.074	4.397	3.17		Clay	100.0			36.62	0.70	n.a.	n.a.	0.72	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.410	43.910	1.596	12426.3	8070.1	9.342	4.233	3.11		Clay	100.0			41.50	0.70	n.a.	n.a.	0.72	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.570	45.170	2.717	12446.3	8080.1	9.640	6.976	3.23		Clay	100.0			42.69	0.70	n.a.	n.a.	0.72	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.740	44.580	3.702	12467.5	8090.8	9.479	9.655	3.33		Clay	100.0			42.14	0.70	n.a.	n.a.	0.72	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.900	101.540	5.393	12487.5	8100.8	23.528	5.659	2.88		Clay	93.4			95.97	0.70	n.a.	n.a.	0.72	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
100.070	133.920	6.332	12508.8	8111.4	31.478	4.960	2.75		Clay	82.9			126.58	0.70	n.a.	n.a.	0.72	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
100.230	130.190	7.297	12528.8	8121.4	30.518	5.888	2.81		Clay	87.9			123.05	0.70	n.a.	n.a.	0.72	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 2

PGA (A_{max}) 0.89

Total Settlement: 0.63 (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)
0.330	1.620	0.188	41.3	41.3	77.545	11.761	2.78		Unsaturated	85.6			1.53	1.70	2.60	56.05	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	0.960	0.520	61.3	61.3	30.347	55.930	3.57		Unsaturated	100.0			0.91	1.70	1.54	55.95	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	3.810	0.957	82.5	82.5	91.364	25.390	3.03		Unsaturated	100.0			3.60	1.70	6.12	61.96	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	203.940	1.078	102.5	102.5	875.595	0.529	1.08		Unsaturated	0.0			192.76	1.70	327.69	327.69	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	159.340	1.650	122.5	122.5	625.694	1.036	1.41		Unsaturated	0.0			150.60	1.70	256.03	256.03	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	99.610	1.934	143.8	143.8	360.959	1.943	1.76		Unsaturated	4.0			94.15	1.70	160.05	160.08	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	69.520	1.368	163.8	163.8	235.928	1.970	1.87		Unsaturated	12.6			65.71	1.70	111.71	127.92	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	36.000	1.526	185.0	185.0	114.781	4.250	2.32		Unsaturated	49.0			34.03	1.70	57.84	118.72	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	30.870	1.834	205.0	205.0	93.430	5.960	2.50		Unsaturated	62.7			29.18	1.70	49.60	112.96	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	53.390	1.907	225.0	225.0	154.428	3.580	2.19		Unsaturated	38.1			50.46	1.70	85.79	146.86	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	36.850	1.520	246.3	246.3	101.758	4.139	2.35		Unsaturated	50.8			34.83	1.70	59.21	121.26	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	29.250	1.277	266.3	266.3	77.584	4.384	2.44		Unsaturated	58.4			27.65	1.70	47.00	108.41	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	23.780	1.077	287.5	287.5	60.608	4.556	2.53		Unsaturated	65.0			22.48	1.70	38.21	98.90	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	22.500	1.126	307.5	307.5	55.406	5.038	2.58		Unsaturated	69.7			21.27	1.70	36.15	97.24	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	19.730	1.162	327.5	327.5	68.271	5.937	2.58		Unsaturated	69.3			18.65	1.70	31.70	91.42	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	19.240	1.165	348.8	348.8	63.660	6.112	2.61		Unsaturated	71.6			18.19	1.70	30.91	90.84	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	21.320	1.194	368.8	368.8	67.870	5.649	2.56		Unsaturated	68.1			20.15	1.70	34.26	94.47	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	22.190	1.232	390.0	390.0	67.913	5.602	2.56		Unsaturated	67.9			20.97	1.70	35.66	96.23	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	22.460	1.241	410.0	410.0	66.352	5.577	2.57		Unsaturated	68.3			21.23	1.70	36.09	96.87	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	23.430	1.293	430.0	430.0	66.945	5.569	2.56		Unsaturated	68.0			22.15	1.70	37.65	98.83	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	23.700	1.344	451.3	451.3	65.445	5.726	2.58		Unsaturated	69.3			22.40	1.70	38.08	99.65	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	24.520	1.424	471.3	471.3	65.679	5.865	2.59		Unsaturated	69.8			23.18	1.70	39.40	101.46	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	24.470	1.493	492.5	492.5	63.523	6.161	2.61		Unsaturated	71.9			23.13	1.70	39.32	101.75	1.00	0.579	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	24.160	1.519	512.5	512.5	60.961	6.353	2.63		Unsaturated	73.6			22.84	1.70	38.82	101.42	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	23.980	1.551	533.8	533.8	58.780	6.539	2.65		Unsaturated	75.2			22.67	1.70	38.53	101.32	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	23.150	1.540	553.8	553.8	55.256	6.731	2.68		Unsaturated	77.4			21.88	1.70	37.20	99.95	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	22.530	1.498	573.8	573.8	52.416	6.733	2.69		Unsaturated	78.5			21.29	1.70	36.20	98.84	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	22.550	1.397	595.0	595.0	51.120	6.277	2.68		Unsaturated	77.3			21.31	1.70	36.23	98.68	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	21.900	1.341	615.0	615.0	48.469	6.208	2.69		Unsaturated	78.2			20.70	1.70	35.19	97.47	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	20.600	1.335	636.3	636.3	63.754	6.584	2.63		Unsaturated	73.6			19.47	1.70	33.10	94.01	1.00	0.578	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	20.100	1.267	656.3	656.3	60.257	6.409	2.64		Unsaturated	74.1			19.00	1.70	32.30	93.06	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	20.230	1.370	676.3	676.3	58.830	6.885	2.67		Unsaturated	76.6			19.12	1.70	32.51	93.74	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	21.190	1.395	697.5	697.5	59.760	6.691	2.66		Unsaturated	75.4			20.03	1.70	34.05	95.56	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	23.740	1.415	717.5	717.5	47.116	6.050	2.69		Unsaturated	78.2			22.44	1.70	38.15	101.31	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	21.710	1.371	738.8	738.8	57.775	6.426	2.65		Unsaturated	75.1			20.52	1.70	34.88	96.58	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	20.810	1.355	758.8	758.8	53.853	6.631	2.68		Unsaturated	77.5			19.67	1.69	33.18	94.77	1.00	0.577	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.230	19.240	1.307	778.8	778.8	48.413	6.935	2.73		Unsaturated	81.1			18.19	1.68	30.49	91.79	1.00	0.576	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.400	19.180	1.288	800.0	800.0	46.950	6.859	2.73		Unsaturated	81.5			18.13	1.66	30.01	91.23	1.00	0.576	1.097	n.a.	n.a.	n.a.	0.00	0.00
6.560	19.830	1.264	820.0	820.0	47.366	6.509	2.71		Unsaturated	80.0			18.74	1.63	30.60	91.77	1.00	0.576	1.094	n.a.	n.a.	n.a.	0.00	0.00
6.730	20.430	1.287	841.3	841.3	47.571	6.433	2.71		Unsaturated	79.6			19.31	1.61	31.07	92.33	1.00	0.576	1.092	n.a.	n.a.	n.a.	0.00	0.00
6.890	19.920	1.282	861.3	861.3	45.258	6.578	2.73		Unsaturated	81.3			18.83	1.59	30.00	91.19	1.00	0.576	1.089	n.a.	n.a.	n.a.	0.00	0.00
7.050	19.580	1.293	881.3	881.3	43.437	6.758	2.75		Unsaturated	82.9			18.51	1.58	29.19	90.35	1.00	0.576	1.086	n.a.	n.a.	n.a.	0.00	0.00
7.220	19.040	0.969	902.5	902.5	41.194	5.211	2.68		Unsaturated	77.6			18.00	1.56	28.16	88.25	0.99	0.575	1.083	n.a.	n.a.	n.a.	0.00	0.00
7.380	18.640	1.058	922.5	922.5	39.412	5.822	2.73		Unsaturated	81.4			17.62	1.55	27.28	87.67	0.99	0.575	1.080	n.a.	n.a.	n.a.	0.00	0.00
7.550	25.810	1.026	943.8	943.8	42.145	4.047	2.60		Unsaturated	70.7			24.40	1.50	36.60	98.03	0.99	0.575	1.085	n.a.	n.a.	n.a.	0.00	0.00
7.710	39.470	0.897	963.8	963.8	54.604	2.301	2.35		Unsaturated	50.7			37.31	1.44	53.89	114.47	0.99	0.575	1.094	n.a.	n.a.	n.a.	0.00	0.00
7.870	40.090	0.873	983.8	983.8	54.891	2.205	2.33		Unsaturated	49.6			37.89	1.43	54.22	114.40	0.99	0.575	1.091	n.a.	n.a.	n.a.	0.00	0.00
8.040	41.270	0.853	1005.0	1005.0	55.912	2.093	2.31		Unsaturated	47.9			39.01	1.42	55.22	114.90	0.99	0.575	1.089	n.a.	n.a.	n.a.	0.00	0.00
8.200	41.350	0.881	1025.0	1025.0	55.459	2.156	2.32		Unsaturated	48.8			39.08	1.40	54.83	114.82	0.99	0.574	1.087	n.a.	n.a.	n.a.	0.00	0.00
8.370	36.590	0.810	1046.3	1046.3	48.480	2.245	2.38		Unsaturated	53.2			34.58	1.40	48.48	108.59	0.99	0.574	1.080	n.a.	n.a.	n.a.	0.00	0.00
8.530	31.690	0.771	1066.3	1066.3	41.486	2.475	2.46		Unsaturated	59.5			29.95	1.40	41.99	102.34	0.99	0.574	1.074	n.a.	n.a.	n.a.	0.00	0.00
8.690	28.730	0.695	1086.3	1086.3	37.184	2.467	2.49		Unsaturated	62.3			27.16	1.40	37.97	97.94	0.99	0.574	1.070	n.a.	n.a.	n.a.	0.00	0.00
8.860	21.560	0.946	1107.5	1107.5	37.935	4.502	2.66		Unsaturated	75.9			20.38	1.40	28.62	88.60	0.99	0.574	1.063	n.a.	n.a.	n.a.	0.00	0.00
9.020	20.980	1.032	1127.5	1127.5	36.215	5.054	2.71		Unsaturated	79.9			19.83	1.39	27.62	87.90	0.99	0.574	1.061	n.a.	n.a.	n.a.	0.00	0.00
9.190	24.680	1.124	1148.8	1148.8	41.968	4.664	2.64		Unsaturated	74.3			23.33	1.37	31.95	92.65	0.99	0.573	1.061	n.a.	n.a.	n.a.	0.00	0.00
9.350	18.890	1.064	1168.8	1168.8	31.325	5.810	2.80		Unsaturated	86.9			17.85	1.37	24.51	84.75	0.99	0.573	1.056	n.a.	n.a.	n.a.	0.00	0.00
9.510	16.530	1.011	1188.8	1188.8	26.811	6.346	2.87		Unsaturated	92.9			15.62	1.37	21.37	81.28	0.99	0.573	1.053	n.a.	n.a.	n.a.	0.00	0.00
9.680	16.520	1.021	1210.0	1210.0	26.306	6.414	2.88		Unsaturated	93.6			15.61	1.35	21.16	81.08	0.99	0.573	1.051	n.a.	n.a.	n.a.	0.00	0.00
9.840	17.300	1.096	1230.0	1230.0	27.130	6.569	2.88		Unsaturated	93.5			16.35	1.34	21.93	82.07	0.99	0.573	1.050	n.a.	n.a.	n.a.	0.00	0.00
10.010	17.800	1.155	1251.3	1251.3	27.452	6.724	2.88		Unsaturated	93.7			16.82	1.33	22.34	82.63	0.99	0.573	1.049	n.a.	n.a.	n.a.	0.00	0.00
10.170	17.520	1.134	1271.3	1271.3	26.563	6.713	2.89		Unsaturated	94.5			16.56	1.32	21.81	82.03	0.99	0.572	1.047	n.a.	n.a.	n.a.	0.00	0.00
10.330	17.570	1.123	1291.3	1291.3	26.214	6.634	2.89		Unsaturated	94.5			16.61	1.31	21.70	81.88	0.99	0.572	1.046	n.a.	n.a.	n.a.	0.00	0.00
10.500	18.040	1.139	1312.5	1312.5	26.490	6.554	2.89		Unsaturated	94.0			17.05	1.29	22.07	82.31	0.99	0.572	1.044	n.a.	n.a.	n.a.	0.00	0.00
10.660	17.330	1.088	1332.5	1332.5	25.011	6.530	2.90		Unsaturated	95.3			16.38	1.29	21.06	81.11	0.99	0.572	1.042	n.a.	n.a.	n.a.	0.00	0.00
10.830	17.720	1.227	1353.8	1353.8	25.179	7.197	2.93		Unsaturated	97.5			16.75	1.27	21.33	81.68	0.99	0.572	1.041	n.a.	n.a.	n.a.	0.00	0.00
10.990	17.810	1.201	1373.8	1373.8	24.929	7.011	2.93		Unsaturated	97.1			16.83	1.26	21.28	81.56	0.99	0.571	1.040	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.89

Total Settlement:	0.63	(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)
11.150	23.990	1.320	1393.8	1393.8	33.425	5.665	2.77		Unsaturated	84.7			22.67	1.24	28.21	89.30	0.99	0.571	1.041	n.a.	n.a.	n.a.	0.00	0.00
11.320	23.080	1.391	1415.0	1415.0	31.622	6.216	2.82		Unsaturated	88.4			21.81	1.24	26.95	88.10	0.99	0.571	1.039	n.a.	n.a.	n.a.	0.00	0.00
11.480	26.420	1.193	1435.0	1435.0	35.822	4.643	2.69		Unsaturated	78.1			24.97	1.22	30.53	91.42	0.99	0.571	1.039	n.a.	n.a.	n.a.	0.00	0.00
11.650	25.490	1.250	1456.3	1456.3	34.008	5.048	2.73		Unsaturated	81.4			24.09	1.21	29.27	90.25	0.99	0.571	1.037	n.a.	n.a.	n.a.	0.00	0.00
11.810	28.090	1.146	1476.3	1476.3	37.056	4.191	2.65		Unsaturated	74.8			26.55	1.20	31.96	92.74	0.99	0.571	1.036	n.a.	n.a.	n.a.	0.00	0.00
11.980	25.880	1.094	1497.5	1497.5	33.564	4.353	2.69		Unsaturated	78.2			24.46	1.20	29.30	89.82	0.99	0.570	1.034	n.a.	n.a.	n.a.	0.00	0.00
12.140	26.070	1.119	1517.5	1517.5	33.359	4.419	2.70		Unsaturated	78.7			24.64	1.19	29.30	89.91	0.99	0.570	1.033	n.a.	n.a.	n.a.	0.00	0.00
12.300	27.040	1.094	1537.5	1537.5	34.174	4.165	2.67		Unsaturated	76.7			25.56	1.18	30.17	90.72	0.99	0.570	1.032	n.a.	n.a.	n.a.	0.00	0.00
12.470	25.210	1.115	1558.8	1558.8	31.346	4.565	2.73		Unsaturated	81.0			23.83	1.17	27.97	88.51	0.98	0.570	1.030	n.a.	n.a.	n.a.	0.00	0.00
12.630	26.380	0.937	1578.8	1578.8	32.419	3.663	2.65		Unsaturated	75.0			24.93	1.17	29.07	89.02	0.98	0.570	1.029	n.a.	n.a.	n.a.	0.00	0.00
12.800	28.280	1.353	1600.0	1600.0	34.350	4.925	2.72		Unsaturated	80.6			26.73	1.16	30.88	92.22	0.98	0.569	1.028	n.a.	n.a.	n.a.	0.00	0.00
12.960	28.790	1.011	1620.0	1620.0	34.543	3.612	2.63		Unsaturated	73.0			27.21	1.15	31.25	91.51	0.98	0.569	1.027	n.a.	n.a.	n.a.	0.00	0.00
13.120	42.640	0.965	1640.0	1640.0	44.899	2.307	2.41		Unsaturated	55.8			40.30	1.13	45.61	105.85	0.98	0.569	1.028	n.a.	n.a.	n.a.	0.00	0.00
13.290	28.540	1.023	1661.3	1661.3	33.360	3.692	2.64		Unsaturated	74.4			26.98	1.13	30.59	90.90	0.98	0.569	1.024	n.a.	n.a.	n.a.	0.00	0.00
13.450	23.660	0.872	1681.3	1681.3	27.146	3.823	2.72		Unsaturated	80.6			22.36	1.13	25.28	84.95	0.98	0.569	1.022	n.a.	n.a.	n.a.	0.00	0.00
13.620	19.740	0.728	1702.5	1702.5	22.189	3.854	2.79		Unsaturated	86.0			18.66	1.13	21.01	80.08	0.98	0.568	1.020	n.a.	n.a.	n.a.	0.00	0.00
13.780	18.080	0.601	1722.5	1722.5	19.993	3.490	2.80		Unsaturated	86.6			17.09	1.12	19.15	77.71	0.98	0.568	1.018	n.a.	n.a.	n.a.	0.00	0.00
13.940	14.530	0.555	1742.5	1742.5	15.677	4.063	2.92		Unsaturated	96.5			13.73	1.12	15.32	73.71	0.98	0.568	1.017	n.a.	n.a.	n.a.	0.00	0.00
14.110	12.980	0.556	1763.8	1763.8	13.719	4.592	3.00		Unsaturated	100.0			12.27	1.11	13.61	71.76	0.98	0.568	1.016	n.a.	n.a.	n.a.	0.00	0.00
14.270	12.490	0.505	1783.8	1783.8	13.004	4.351	3.00		Unsaturated	100.0			11.81	1.10	13.01	70.99	0.98	0.568	1.014	n.a.	n.a.	n.a.	0.00	0.00
14.440	11.610	0.474	1805.0	1805.0	11.864	4.429	3.04		Unsaturated	100.0			10.97	1.10	12.02	69.69	0.98	0.567	1.013	n.a.	n.a.	n.a.	0.00	0.00
14.600	11.100	0.458	1825.0	1825.0	11.164	4.496	3.06		Unsaturated	100.0			10.49	1.09	11.43	68.91	0.98	0.567	1.012	n.a.	n.a.	n.a.	0.00	0.00
14.760	10.960	0.471	1845.0	1845.0	10.881	4.691	3.08		Unsaturated	100.0			10.36	1.08	11.21	68.63	0.98	0.567	1.011	n.a.	n.a.	n.a.	0.00	0.00
14.930	10.770	0.462	1866.3	1866.3	10.542	4.693	3.09		Unsaturated	100.0			10.18	1.08	10.95	68.28	0.98	0.567	1.010	n.a.	n.a.	n.a.	0.00	0.00
15.090	10.260	0.431	1886.3	1886.3	9.879	4.625	3.11		Unsaturated	100.0			9.70	1.07	10.37	67.52	0.98	0.567	1.009	n.a.	n.a.	n.a.	0.00	0.00
15.260	9.840	0.403	1907.5	1907.5	9.317	4.532	3.13		Unsaturated	100.0			9.30	1.06	9.88	66.88	0.98	0.566	1.008	n.a.	n.a.	n.a.	0.00	0.00
15.420	9.740	0.434	1927.5	1927.5	9.106	4.947	3.16		Unsaturated	100.0			9.21	1.06	9.72	66.67	0.98	0.566	1.008	n.a.	n.a.	n.a.	0.00	0.00
15.580	10.560	0.512	1947.5	1947.5	9.845	5.345	3.15		Unsaturated	100.0			9.98	1.05	10.47	67.66	0.98	0.566	1.007	n.a.	n.a.	n.a.	0.00	0.00
15.750	13.030	0.599	1968.8	1968.8	12.237	4.972	3.06		Unsaturated	100.0			12.32	1.04	12.83	70.75	0.98	0.566	1.006	n.a.	n.a.	n.a.	0.00	0.00
15.910	13.950	0.680	1988.8	1988.8	13.029	5.249	3.05		Unsaturated	100.0			13.19	1.04	13.66	71.83	0.98	0.566	1.005	n.a.	n.a.	n.a.	0.00	0.00
16.080	13.690	0.748	2010.0	2010.0	12.622	5.898	3.09		Unsaturated	100.0			12.94	1.03	13.32	71.39	0.98	0.565	1.004	n.a.	n.a.	n.a.	0.00	0.00
16.240	14.050	0.806	2030.0	2030.0	12.842	6.182	3.10		Unsaturated	100.0			13.28	1.02	13.60	71.75	0.98	0.565	1.004	n.a.	n.a.	n.a.	0.00	0.00
16.400	15.280	0.801	2050.0	2050.0	13.907	5.622	3.05		Unsaturated	100.0			14.44	1.02	14.70	73.20	0.98	0.565	1.003	n.a.	n.a.	n.a.	0.00	0.00
16.570	15.480	0.752	2071.3	2071.3	13.947	5.204	3.03		Unsaturated	100.0			14.63	1.01	14.81	73.34	0.98	0.565	1.002	n.a.	n.a.	n.a.	0.00	0.00
16.730	13.600	0.677	2091.3	2091.3	12.007	5.396	3.09		Unsaturated	100.0			12.85	1.01	12.94	70.89	0.98	0.565	1.001	n.a.	n.a.	n.a.	0.00	0.00
16.900	15.430	0.745	2112.5	2112.5	13.608	5.182	3.03		Unsaturated	100.0			14.58	1.00	14.60	73.06	0.98	0.564	1.000	n.a.	n.a.	n.a.	0.00	0.00
17.060	15.710	0.762	2132.5	2132.5	13.734	5.204	3.03		Unsaturated	100.0			14.85	1.00	14.78	73.31	0.98	0.564	0.999	n.a.	n.a.	n.a.	0.00	0.00
17.220	14.360	0.857	2152.5	2152.5	12.343	6.455	3.13		Unsaturated	100.0			13.57	0.99	13.44	71.55	0.97	0.564	0.999	n.a.	n.a.	n.a.	0.00	0.00
17.390	13.210	0.869	2173.8	2173.8	11.154	7.166	3.19		Unsaturated	100.0			12.49	0.98	12.29	70.04	0.97	0.564	0.998	n.a.	n.a.	n.a.	0.00	0.00
17.550	10.670	1.527	2193.8	2193.8	8.728	15.955	3.50		Unsaturated	100.0			10.09	0.98	9.88	66.87	0.97	0.563	0.997	n.a.	n.a.	n.a.	0.00	0.00
17.720	15.730	2.361	2215.0	2215.0	13.203	16.143	3.38		Unsaturated	100.0			14.87	0.97	14.49	72.92	0.97	0.563	0.996	n.a.	n.a.	n.a.	0.00	0.00
17.880	87.290	3.969	2235.0	2235.0	79.251	4.606	2.45		Unsaturated	59.2			82.50	0.98	80.72	151.80	0.97	0.563	0.991	n.a.	n.a.	n.a.	0.00	0.00
18.040	165.620	4.513	2255.0	2255.0	150.607	2.743	2.10		Sand	31.2			156.54	0.98	153.57	221.85	0.97	0.563	0.981	8.245	17.794	31.58	0.00	0.00
18.210	213.680	5.039	2276.3	2276.3	193.690	2.371	1.99		Sand	21.9			201.97	0.98	198.11	254.25	0.97	0.566	0.978	218.514	470.202	830.95	0.00	0.00
18.370	248.690	3.703	2296.3	2296.3	224.601	1.496	1.79		Sand	6.0			235.06	0.98	229.53	230.46	0.97	0.568	0.975	17.109	36.717	64.63	0.00	0.00
18.540	265.750	5.128	2317.5	2317.5	238.967	1.938	1.86		Sand	11.9			251.18	0.98	245.23	265.55	0.97	0.570	0.973	1003.687	2147.856	3765.20	0.00	0.00
18.700	320.120	3.516	2337.5	2337.5	286.827	1.102	1.62		Sand	0.0			302.57	0.97	294.73	294.73	0.97	0.573	0.970	1.602E+05	3.419E+05	5.971E+05	0.00	0.00
18.860	260.620	4.496	2357.5	2357.5	232.319	1.733	1.83		Sand	9.4			246.33	0.97	239.24	248.32	0.97	0.575	0.968	106.972	227.708	396.15	0.00	0.00
19.030	250.900	3.744	2378.8	2378.8	222.605	1.499	1.79		Sand	6.3			237.15	0.97	229.20	230.42	0.97	0.577	0.965	17.045	36.182	62.70	0.00	0.00
19.190	279.970	4.086	2398.8	2398.8	247.472	1.466	1.76		Sand	3.4			264.62	0.97	256.01	256.01	0.97	0.579	0.962	273.365	578.775	999.27	0.00	0.00
19.360	273.420	4.410	2420.0	2420.0	240.585	1.620	1.80		Sand	6.8			258.43	0.96	249.34	251.29	0.97	0.581	0.960	151.935	320.795	551.74	0.00	0.00
19.520	250.840	4.241	2440.0	2440.0	219.713	1.699	1.84		Sand	10.0			237.09	0.96	227.79	239.03	0.97	0.583	0.957	38.962	82.054	140.62	0.00	0.00
19.690	217.140	4.273	2461.3	2461.3	189.219	1.979	1.93		Sand	17.4			205.24	0.96	196.64	237.28	0.97	0.586	0.955	32.649	68.572	117.08	0.00	0.00
19.850	206.860	4.337	2481.3	2481.3	179.474	2.109	1.97		Sand	20.2			195.52	0.96	186.87	236.38	0.97	0.588	0.952	29.868	62.570	106.47	0.00	0.00
20.010	224.740	3.125	2501.3	2501.3	194.290	1.398	1.81		Sand	7.5			212.42	0.95	201.22	204.22	0.97	0.590	0.954	2.417	5.071	8.60	0.00	0.00
20.180	254.610	4.018	2522.5	2522.5	219.319	1.586	1.81		Sand	8.1			240.65	0.95	228.81	233.74	0.97	0.592	0.947	23.159	48.264	81.55	0.00	0.00
20.340	294.730	3.710	2542.5	2542.5	253.040	1.264	1.70		Sand	0.0			278.57	0.95	265.40	265.40	0.97	0.594	0.945	982.583	2042.603	3440.02	0.00	0.00
20.510	282.870	4.910	2563.8	2563.8	241.796	1.744	1.82		Sand	8.7			267.36	0.95	254.16	261.14	0.97	0.596	0.942	539.178	1117.886	1876.16	0.00	0.00
20.670	257.810	5.588	2583.8	2583.8	219.414	2.178	1.92		Sand	16.9			243.68	0.95	231.17	273.74	0.97	0.598	0.940	3505.588	7250.218	12129.03	0.00	0.00
20.830	237.290	5.441	2603.8	2603.8	201.077	2.306	1.97		Sand	20.3			224.28	0.95	212.34	265.57	0.97	0.600	0.938	1006.931	2077.399	3464.32	0.00	0.00
21.000	211.400	3.934	2625.0	2625.0	178.282	1.872	1.93		Sand	17.2			199.81	0.94	187.46	226.32	0.97	0.602	0.935	11.900	24.487	40.70	0.00	0.00
21.160	239.330	2.641	2645.0	2645.0	201.210	1.110	1.72		Sand	0.7			226.21	0.93	210.84	210.84	0.97	0.604	0.933	3.684	7.563	12.53	0.00	0.00
21.330	248.240	4.456	2666.3	2666.3	207.900	1.805	1.87		Sand	12.8			234.63	0.94	220.14	243.43	0.97	0.605	0.931	61.824	126.582	209.07	0.00	0.00
21.490	350.450	4.179	2686.3	2686.3	292.858	1.197	1.64		Sand	0.0			331.24	0.94	311.03	311.03	0.96	0.607	0.928	6.259E+06	1.278E+07	2.105E+07	0.00	0.00
21.650	292.430	5.742	2706.3	2706.3	243.274	1.973	1.86		Sand	12.0			276.40	0.94	259.03	280.68	0.96	0.609	0.926	1.118E+04	2.279E+04	3.742E+04	0.00	0.00
21.820	310.380	3.547	2727.5	2727.5	257.259	1.148	1.66		Sand	0.0			293.36	0.94	274.36	274.36	0.96	0.611	0.924	3871.281	7868.200	12878.32	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.89

Total Settlement:	0.63	(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)
21.980	308.140	3.780	2747.5	2747.5	254.455	1.232	1.69		Sand	0.0			291.25	0.93	271.86	271.86	0.96	0.613	0.922	2598.589	5268.981	8599.27	0.00	0.00
22.150	354.880	4.394	2768.8	2768.8	292.088	1.243	1.65		Sand	0.0			335.43	0.93	312.46	312.46	0.96	0.615	0.919	8.909E+06	1.802E+07	2.932E+07	0.00	0.00
22.310	311.290	4.216	2788.8	2788.8	255.143	1.360	1.72		Sand	0.7			294.22	0.93	273.56	273.56	0.96	0.616	0.917	3402.253	6865.054	11139.25	0.00	0.00
22.470	311.090	4.288	2808.8	2808.8	254.060	1.384	1.73		Sand	1.3			294.04	0.93	272.87	272.87	0.96	0.618	0.915	3047.661	6135.186	9927.53	0.00	0.00
22.640	294.210	3.700	2830.0	2830.0	239.300	1.264	1.71		Sand	0.1			278.08	0.93	257.55	257.55	0.96	0.620	0.913	333.441	669.584	1080.35	0.00	0.00
22.800	231.750	3.640	2850.0	2850.0	187.582	1.580	1.86		Sand	11.5			219.05	0.91	199.82	216.24	0.96	0.621	0.911	5.379	10.777	17.34	0.00	0.00
22.970	177.560	3.672	2871.3	2871.3	142.908	2.085	2.02		Sand	24.9			167.83	0.91	152.31	208.94	0.96	0.623	0.911	3.250	6.511	10.45	0.00	0.00
23.130	142.040	2.843	2891.3	2891.3	113.683	2.022	2.08		Sand	29.4			134.25	0.89	120.02	178.80	0.96	0.625	0.935	0.692	1.340	2.14	0.00	0.00
23.290	156.040	3.304	2911.3	2911.3	124.566	2.137	2.07		Sand	28.7			147.49	0.90	132.34	192.45	0.96	0.626	0.923	1.267	2.572	4.11	0.00	0.00
23.460	184.020	3.443	2932.5	2932.5	146.570	1.886	1.98		Sand	21.7			173.93	0.90	156.61	206.16	0.96	0.628	0.908	2.723	5.438	8.66	0.00	0.00
23.620	186.130	4.746	2952.5	2952.5	147.753	2.570	2.09		Sand	29.8			175.93	0.91	159.43	226.73	0.96	0.630	0.900	12.333	24.420	38.78	0.00	0.00
23.790	198.890	3.911	2973.8	2973.8	157.389	1.981	1.98		Sand	21.4			187.99	0.90	169.53	220.15	0.96	0.631	0.898	7.216	14.255	22.58	0.00	0.00
23.950	189.440	4.048	2993.8	2993.8	149.345	2.154	2.02		Sand	24.8			179.05	0.90	161.07	218.93	0.96	0.633	0.896	6.573	12.955	20.47	0.00	0.00
24.110	173.240	3.513	3013.8	3013.8	136.011	2.045	2.03		Sand	25.6			163.74	0.89	145.92	202.74	0.96	0.634	0.904	2.213	4.402	6.94	0.00	0.00
24.280	233.700	3.961	3035.0	3035.0	183.241	1.706	1.89		Sand	14.1			220.89	0.90	198.47	225.79	0.96	0.636	0.892	11.383	22.333	35.11	0.00	0.00
24.440	178.110	2.431	3055.0	3055.0	138.904	1.377	1.90		Sand	15.0			168.35	0.87	147.18	174.05	0.96	0.638	0.927	0.579	1.071	1.68	0.00	0.00
24.610	242.920	3.931	3076.3	3076.3	189.220	1.629	1.86		Sand	12.1			229.60	0.89	205.37	224.64	0.96	0.639	0.888	10.342	20.199	31.60	0.00	0.00
24.770	294.460	5.516	3096.3	3096.3	228.871	1.883	1.86		Sand	12.0			278.32	0.90	251.72	272.75	0.96	0.641	0.886	2993.881	5834.360	9107.71	0.00	0.00
24.930	221.710	5.466	3116.3	3116.3	171.466	2.483	2.03		Sand	25.7	278.32		278.32	0.90	251.30	327.18	0.96	0.642	0.884	4.698E+08	9.135E+08	1.423E+09	0.00	0.00
25.100	227.130	3.798	3137.5	3137.5	175.083	1.684	1.90		Sand	14.7	278.32		278.32	0.90	250.85	285.26	0.96	0.644	0.882	25412.769	49301.454	76606.547	0.00	0.00
25.260	176.480	3.567	3157.5	3157.5	135.330	2.039	2.03		Sand	25.6	278.32		278.32	0.90	250.43	325.94	0.95	0.645	0.880	3.283E+08	6.355E+08	9.852E+08	0.00	0.00
25.430	93.760	2.516	3178.8	3178.8	71.078	2.730	2.32		Sand	48.2	278.32		278.32	0.90	249.99	360.74	0.95	0.646	0.878	4.728E+13	9.132E+13	1.413E+14	0.00	0.00
25.590	44.600	1.741	3198.8	3198.8	26.886	4.049	2.74		Clay	82.1			42.16	0.90	n.a.	n.a.	0.95	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	44.470	1.425	3218.8	3218.8	26.632	3.324	2.69		Clay	77.9			42.03	0.90	n.a.	n.a.	0.95	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	35.730	1.456	3240.0	3240.0	21.056	4.268	2.83		Clay	89.7			33.77	0.89	n.a.	n.a.	0.95	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	34.810	1.344	3260.0	3260.0	20.356	4.050	2.83		Clay	89.4			32.90	0.89	n.a.	n.a.	0.95	0.652	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	34.380	1.240	3281.3	3281.3	19.955	3.789	2.82		Clay	88.5			32.50	0.89	n.a.	n.a.	0.95	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	33.430	1.149	3301.3	3301.3	19.253	3.615	2.82		Clay	88.4			31.60	0.89	n.a.	n.a.	0.95	0.655	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	32.370	1.111	3321.3	3321.3	18.493	3.619	2.83		Clay	89.5			30.60	0.89	n.a.	n.a.	0.95	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	32.460	1.056	3342.5	3342.5	18.423	3.430	2.82		Clay	88.4			30.68	0.89	n.a.	n.a.	0.95	0.657	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	34.330	1.051	3362.5	3362.5	19.419	3.218	2.78		Clay	85.6			32.45	0.88	n.a.	n.a.	0.95	0.659	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	36.770	1.113	3383.8	3383.8	20.733	3.172	2.76		Clay	83.5			34.75	0.88	n.a.	n.a.	0.95	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	37.820	1.192	3403.8	3403.8	21.223	3.301	2.76		Clay	83.8			35.75	0.88	n.a.	n.a.	0.95	0.661	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	37.320	1.205	3425.0	3425.0	20.793	3.385	2.77		Clay	84.9			35.27	0.88	n.a.	n.a.	0.95	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	35.830	1.149	3445.0	3445.0	19.801	3.370	2.79		Clay	86.1			33.87	0.88	n.a.	n.a.	0.95	0.664	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	34.680	1.112	3465.0	3465.0	19.017	3.374	2.80		Clay	87.2			32.78	0.88	n.a.	n.a.	0.95	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	33.860	1.119	3486.3	3486.3	18.425	3.484	2.82		Clay	88.8			32.00	0.88	n.a.	n.a.	0.95	0.666	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	31.050	1.090	3506.3	3506.3	16.711	3.720	2.87		Clay	92.9			29.35	0.88	n.a.	n.a.	0.95	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	29.250	0.982	3527.5	3527.5	15.584	3.571	2.89		Clay	93.9			27.65	0.87	n.a.	n.a.	0.95	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	28.980	0.955	3547.5	3547.5	15.338	3.510	2.89		Clay	93.9			27.39	0.87	n.a.	n.a.	0.95	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	29.060	0.886	3567.5	3567.5	15.292	3.248	2.87		Clay	92.4			27.47	0.87	n.a.	n.a.	0.95	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	30.180	0.843	3588.8	3588.8	15.819	2.970	2.83		Clay	89.6			28.53	0.87	n.a.	n.a.	0.95	0.672	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	28.240	0.795	3608.8	3608.8	14.651	3.008	2.86		Clay	92.0			26.69	0.87	n.a.	n.a.	0.95	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	27.880	0.807	3630.0	3630.0	14.361	3.097	2.88		Clay	93.1			26.35	0.87	n.a.	n.a.	0.94	0.674	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	29.200	0.849	3650.0	3650.0	15.000	3.100	2.86		Clay	92.0			27.60	0.87	n.a.	n.a.	0.94	0.676	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	29.810	0.897	3670.0	3670.0	15.245	3.208	2.87		Clay	92.2			28.18	0.86	n.a.	n.a.	0.94	0.677	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	31.120	0.926	3691.3	3691.3	15.861	3.164	2.85		Clay	90.8			29.41	0.86	n.a.	n.a.	0.94	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	32.340	0.933	3711.3	3711.3	16.428	3.061	2.83		Clay	89.2			30.57	0.86	n.a.	n.a.	0.94	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	33.550	0.902	3732.5	3732.5	16.977	2.847	2.80		Clay	86.7			31.71	0.86	n.a.	n.a.	0.94	0.680	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	33.470	0.870	3752.5	3752.5	16.839	2.754	2.79		Clay	86.3			31.64	0.86	n.a.	n.a.	0.94	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	33.290	0.837	3772.5	3772.5	16.649	2.666	2.79		Clay	85.9			31.47	0.86	n.a.	n.a.	0.94	0.682	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	33.390	0.797	3793.8	3793.8	16.603	2.531	2.77		Clay	84.9			31.56	0.86	n.a.	n.a.	0.94	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	33.580	0.799	3813.8	3813.8	16.610	2.524	2.77		Clay	84.9			31.74	0.86	n.a.	n.a.	0.94	0.684	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	32.950	1.255	3835.0	3835.0	16.184	4.045	2.91		Clay	95.5			31.14	0.85	n.a.	n.a.	0.94	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	33.990	2.599	3855.0	3855.0	16.634	8.105	3.10		Clay	100.0			32.13	0.85	n.a.	n.a.	0.94	0.686	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	52.400	3.359	3875.0	3875.0	26.045	6.657	2.90		Clay	94.8			49.53	0.85	n.a.	n.a.	0.94	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	124.180	3.983	3896.3	3896.3	85.140	3.259	2.32		Sand	48.5	151.35		151.35	0.82	123.96	201.91	0.94	0.688	0.836	2.108	3.878	5.64	0.00	0.00
31.330	160.130	4.702	3916.3	3916.3	109.892	2.973	2.22		Sand	40.2			151.35	0.81	123.04	194.87	0.94	0.689	0.847	1.432	2.670	3.87	0.00	0.00
31.500	122.810	4.118	3937.5	3937.5	83.729	3.408	2.34		Sand	50.0	151.35		151.35	0.82	123.58	202.32	0.94	0.690	0.832	2.159	3.953	5.73	0.00	0.00
31.660	78.830	2.951	3957.5	3957.5	38.838	3.839	2.61		Clay	71.5	151.35		151.35	0.85	n.a.	n.a.	0.94	0.691	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	68.110	2.897	3977.5	3976.3	33.258	4.382	2.69		Clay	78.6			64.38	0.85	n.a.	n.a.	0.94	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	95.270	3.879	3998.8	3986.9	64.224	4.159	2.48		Sand	61.3	108.52	1.8	195.34	0.85	165.27	260.89	0.94	0.693	0.810	520.933	928.250	1339.81	0.00	0.00
32.150	114.810	3.851	4018.8	3996.9	77.575	3.414	2.36		Sand	51.8		1.8	195.33	0.85	165.16	256.02	0.94	0.694	0.809	273.691	487.237	702.36	0.00	0.00
32.320	74.820	2.976	4040.0	4007.6	36.331	4.088	2.65		Clay	74.7			70.72	0.84	n.a.	n.a.	0.94	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	42.880	1.960	4060.0	4017.6	20.336	4.798	2.88		Clay	93.3			40.53	0.84	n.a.	n.a.	0.93	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	32.660	1.442	4080.0	4027.6	15.205	4.708	2.97		Clay	100.0			30.87	0.84	n.a.	n.a.	0.93	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 2

PGA (A_{max}) 0.89

Total Settlement: 0.63 (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)
32.810	29.500	1.228	4101.3	4038.2	13.595	4.472	2.99		Clay	100.0			27.88	0.84	n.a.	n.a.	0.93	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	26.350	1.122	4121.3	4048.2	12.000	4.618	3.04		Clay	100.0			24.91	0.84	n.a.	n.a.	0.93	0.698	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	26.370	1.080	4142.5	4058.9	11.973	4.446	3.03		Clay	100.0			24.92	0.84	n.a.	n.a.	0.93	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	27.180	1.172	4162.5	4068.9	12.337	4.670	3.04		Clay	100.0			25.69	0.84	n.a.	n.a.	0.93	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	26.500	1.309	4182.5	4078.9	11.968	5.362	3.09		Clay	100.0			25.05	0.84	n.a.	n.a.	0.93	0.701	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	25.830	1.788	4203.8	4089.6	11.604	7.536	3.19		Clay	100.0			24.41	0.84	n.a.	n.a.	0.93	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	31.920	2.004	4223.8	4099.6	14.542	6.724	3.08		Clay	100.0			30.17	0.84	n.a.	n.a.	0.93	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	50.810	2.853	4245.0	4110.2	23.691	5.859	2.89		Clay	94.1			48.02	0.84	n.a.	n.a.	0.93	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	65.710	3.449	4265.0	4120.2	30.861	5.425	2.78		Clay	85.6			62.11	0.84	n.a.	n.a.	0.93	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	86.480	3.728	4285.0	4130.2	40.839	4.420	2.63		Clay	73.7			81.74	0.84	n.a.	n.a.	0.93	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	74.930	2.958	4306.3	4140.9	35.150	4.064	2.65		Clay	75.4			70.82	0.84	n.a.	n.a.	0.93	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	104.290	1.801	4326.3	4150.9	68.919	1.763	2.19		Sand	38.5	396.84		396.84	0.84	332.21	451.98	0.93	0.706	0.798	2.794E+37	4.905E+37	6.945E+37	0.00	0.00
34.780	138.720	2.271	4347.5	4161.5	92.029	1.663	2.08		Sand	29.7	396.84		396.84	0.84	331.99	433.97	0.93	0.707	0.797	2.114E+31	3.707E+31	5.243E+31	0.00	0.00
34.940	193.620	2.616	4367.5	4171.6	128.869	1.366	1.92		Sand	16.6	396.84		396.84	0.84	331.78	383.26	0.93	0.708	0.796	1.023E+18	1.793E+18	2.533E+18	0.00	0.00
35.100	254.140	4.191	4387.5	4181.6	169.399	1.664	1.90		Sand	15.1	396.84		396.84	0.84	331.57	374.94	0.93	0.709	0.796	2.028E+16	3.551E+16	5.011E+16	0.00	0.00
35.270	285.420	2.781	4408.8	4192.2	190.181	0.982	1.70		Sand	0.0	396.84		396.84	0.83	331.34	331.34	0.93	0.709	0.795	1.613E+09	2.820E+09	3.976E+09	0.00	0.00
35.430	354.750	4.928	4428.8	4202.2	236.448	1.398	1.75		Sand	3.1	396.84		396.84	0.83	331.14	331.14	0.93	0.710	0.794	1.515E+09	2.647E+09	3.728E+09	0.00	0.00
35.600	419.860	3.307	4450.0	4212.9	279.756	0.792	1.52		Sand	0.0			396.84	0.83	330.92	330.92	0.93	0.711	0.793	1.418E+09	2.474E+09	3.481E+09	0.00	0.00
35.760	364.040	3.478	4470.0	4222.9	242.070	0.961	1.62		Sand	0.0			344.08	0.83	286.74	286.74	0.92	0.711	0.793	33462.970	58357.552	82028.81	0.00	0.00
35.930	380.960	3.402	4491.3	4233.5	253.065	0.898	1.59		Sand	0.0			360.08	0.83	299.87	299.87	0.92	0.712	0.792	4.747E+05	8.270E+05	1.161E+06	0.00	0.00
36.090	324.960	3.111	4511.3	4243.6	215.383	0.964	1.66		Sand	0.0			307.15	0.83	255.63	255.63	0.92	0.713	0.791	260.267	453.053	635.57	0.00	0.00
36.250	265.320	2.813	4531.3	4253.6	175.364	1.069	1.75		Sand	3.0			250.78	0.79	199.06	199.06	0.92	0.713	0.818	1.793	3.229	4.52	0.00	0.00
36.420	229.270	2.295	4552.5	4264.2	151.136	1.011	1.78		Sand	5.3			216.70	0.77	166.42	166.74	0.92	0.714	0.870	0.453	0.743	1.04	0.01	0.01
36.580	207.210	1.774	4572.5	4274.2	136.281	0.866	1.77		Sand	4.4			195.85	0.75	146.99	147.05	0.92	0.715	0.890	0.270	0.393	0.55	0.02	0.04
36.750	208.380	3.041	4593.8	4284.9	136.882	1.476	1.93		Sand	17.1			196.96	0.78	154.54	189.51	0.92	0.716	0.835	1.098	2.018	2.82	0.00	0.00
36.910	207.480	2.583	4613.8	4294.9	136.118	1.259	1.88		Sand	13.3			196.11	0.77	151.01	171.86	0.92	0.716	0.862	0.536	0.906	1.26	0.00	0.01
37.070	247.450	2.816	4633.8	4304.9	162.440	1.149	1.80		Sand	6.7			233.88	0.78	182.16	183.68	0.92	0.717	0.844	0.845	1.535	2.14	0.00	0.00
37.240	248.120	3.177	4655.0	4315.5	162.676	1.293	1.83		Sand	9.6			234.52	0.79	184.14	192.75	0.92	0.717	0.827	1.286	2.340	3.26	0.00	0.00
37.400	220.800	2.708	4675.0	4325.6	144.420	1.239	1.86		Sand	11.4	234.52		234.52	0.79	185.46	200.93	0.92	0.718	0.810	1.992	3.550	4.94	0.00	0.00
37.570	196.420	1.866	4696.3	4336.2	128.139	0.961	1.82		Sand	8.4	234.52		234.52	0.78	182.98	187.97	0.92	0.719	0.835	1.022	1.878	2.61	0.00	0.00
37.730	185.780	1.533	4716.3	4346.2	120.967	0.836	1.80		Sand	6.7	234.52		234.52	0.78	182.04	183.68	0.92	0.719	0.842	0.845	1.532	2.13	0.00	0.00
37.890	185.030	0.631	4736.3	4356.2	120.327	0.346	1.58		Sand	0.0	234.52		234.52	0.77	181.48	181.48	0.92	0.720	0.845	0.771	1.378	1.91	0.00	0.00
38.060	154.700	0.922	4757.5	4366.9	100.218	0.605	1.78		Sand	5.3	234.52		234.52	0.77	181.36	181.66	0.92	0.721	0.844	0.777	1.389	1.93	0.00	0.00
38.220	126.080	1.239	4777.5	4376.9	81.288	1.002	1.98		Sand	21.5	234.52		234.52	0.82	192.42	246.54	0.92	0.721	0.782	87.282	150.151	208.23	0.00	0.00
38.390	101.640	1.065	4798.8	4387.5	65.141	1.073	2.08		Sand	29.0	234.52		234.52	0.82	193.48	266.16	0.92	0.722	0.781	1097.303	1885.937	2613.26	0.00	0.00
38.550	50.220	0.922	4818.8	4397.6	21.744	1.929	2.61		Clay	71.8			47.47	0.82	n.a.	n.a.	0.92	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	21.700	0.520	4838.8	4407.6	8.749	2.694	3.02		Clay	100.0			20.51	0.82	n.a.	n.a.	0.92	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	16.070	0.520	4860.0	4418.2	6.174	3.809	3.23		Clay	100.0			15.19	0.82	n.a.	n.a.	0.92	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	18.010	0.517	4880.0	4428.2	7.032	3.323	3.15		Clay	100.0			17.02	0.82	n.a.	n.a.	0.91	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	19.780	0.580	4901.3	4438.9	7.808	3.345	3.11		Clay	100.0			18.70	0.82	n.a.	n.a.	0.91	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	19.450	0.602	4921.3	4448.9	7.638	3.540	3.13		Clay	100.0			18.38	0.82	n.a.	n.a.	0.91	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	18.390	0.594	4941.3	4458.9	7.140	3.733	3.17		Clay	100.0			17.38	0.82	n.a.	n.a.	0.91	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	17.420	0.579	4962.5	4469.5	6.685	3.872	3.20		Clay	100.0			16.47	0.82	n.a.	n.a.	0.91	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	16.920	0.527	4982.5	4479.6	6.442	3.655	3.20		Clay	100.0			15.99	0.82	n.a.	n.a.	0.91	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	16.690	0.525	5003.8	4490.2	6.320	3.700	3.21		Clay	100.0			15.78	0.82	n.a.	n.a.	0.91	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.190	17.300	0.551	5023.8	4500.2	6.572	3.723	3.20		Clay	100.0			16.35	0.82	n.a.	n.a.	0.91	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.350	18.010	0.608	5043.8	4510.2	6.868	3.923	3.20		Clay	100.0			17.02	0.82	n.a.	n.a.	0.91	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.520	18.380	0.643	5065.0	4520.9	7.011	4.059	3.20		Clay	100.0			17.37	0.82	n.a.	n.a.	0.91	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	19.730	0.686	5085.0	4530.9	7.587	3.992	3.17		Clay	100.0			18.65	0.82	n.a.	n.a.	0.91	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	16.250	0.692	5106.3	4541.5	6.032	5.054	3.31		Clay	100.0			15.36	0.82	n.a.	n.a.	0.91	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	16.830	0.673	5126.3	4551.5	6.269	4.716	3.28		Clay	100.0			15.91	0.82	n.a.	n.a.	0.91	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	22.870	0.967	5146.3	4561.6	8.899	4.763	3.16		Clay	100.0			21.62	0.82	n.a.	n.a.	0.91	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	20.740	0.787	5167.5	4572.2	7.942	4.333	3.17		Clay	100.0			19.60	0.82	n.a.	n.a.	0.91	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	23.180	0.617	5187.5	4582.2	8.985	2.997	3.04		Clay	100.0			21.91	0.82	n.a.	n.a.	0.91	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	24.190	1.123	5208.8	4592.9	9.400	5.204	3.16		Clay	100.0			22.86	0.82	n.a.	n.a.	0.91	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	22.370	1.381	5228.8	4602.9	8.584	6.991	3.27		Clay	100.0			21.14	0.81	n.a.	n.a.	0.91	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	25.480	1.409	5248.8	4612.9	9.909	6.166	3.19		Clay	100.0			24.08	0.81	n.a.	n.a.	0.91	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	43.460	4.176	5270.0	4623.5	17.660	10.230	3.15		Clay	100.0			41.08	0.81	n.a.	n.a.	0.90	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	59.220	4.155	5290.0	4633.6	24.420	7.344	2.95		Clay	98.8			55.97	0.81	n.a.	n.a.	0.90	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	87.310	4.904	5311.3	4644.2	36.456	5.793	2.75		Clay	83.2			82.52	0.81	n.a.	n.a.	0.90	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	251.240	4.773	5331.3	4654.2	158.418	1.920	1.97	plastic	Clay	20.4			237.47	0.81	n.a.	n.a.	0.90	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	234.510	2.897	5351.3	4664.2	147.591	1.249	1.85	plastic	Clay	11.1			221.65	0.81	n.a.	n.a.	0.90	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	222.830	2.195	5372.5	4674.9	139.989	0.997	1.80	plastic	Clay	7.0			210.61	0.81	n.a.	n.a.	0.90	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	216.640	1.659	5392.5	4684.9	135.901	0.775	1.74	plastic	Clay	2.0			204.76	0.81	n.a.	n.a.	0.90	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	200.420	1.900	5413.8	4695.5	125.449	0.961	1.82	plastic	Clay	8.9			189.43	0.81	n.a.	n.a.	0.90	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	176.310	2.619	5433.8	4705.5	110.027	1.509	2.00	plastic	Clay	22.9			166.64	0.81	n.a.	n.a.	0.90	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 2

PGA (A_{max}) 0.89

Total Settlement: 0.63 (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)
43.640	179.660	2.652	5455.0	4716.2	112.017	1.499	1.99	plastic	Clay	22.3			169.81	0.81	n.a.	n.a.	0.90	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	164.870	1.581	5475.0	4726.2	102.538	0.975	1.89	plastic	Clay	14.6			155.83	0.81	n.a.	n.a.	0.90	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	145.520	1.566	5495.0	4736.2	90.199	1.097	1.97	plastic	Clay	20.6			137.54	0.81	n.a.	n.a.	0.90	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	144.120	2.053	5516.3	4746.9	89.207	1.453	2.05		Sand	27.3			136.22	0.72	98.29	149.58	0.90	0.738	0.871	0.286	0.414	0.56	0.02	0.04
44.290	147.530	3.091	5536.3	4756.9	91.257	2.135	2.16		Sand	36.1			139.44	0.74	102.65	165.82	0.90	0.738	0.851	0.440	0.701	0.95	0.01	0.02
44.460	154.160	4.917	5557.5	4767.5	95.323	3.248	2.28		Sand	45.8			145.71	0.75	109.23	181.73	0.90	0.738	0.825	0.779	1.362	1.84	0.00	0.00
44.620	141.560	2.476	5577.5	4777.5	87.291	1.785	2.12		Sand	32.8			133.80	0.73	97.04	155.44	0.90	0.739	0.863	0.329	0.493	0.67	0.02	0.04
44.780	177.340	1.795	5597.5	4787.5	109.677	1.029	1.89		Sand	14.0			167.62	0.71	119.00	140.33	0.90	0.739	0.880	0.236	0.324	0.44	0.02	0.05
44.950	158.560	2.014	5618.8	4798.2	97.760	1.293	1.99		Sand	22.3			149.87	0.72	107.92	151.36	0.90	0.739	0.868	0.298	0.435	0.59	0.02	0.04
45.110	178.060	2.111	5638.8	4808.2	109.879	1.205	1.93		Sand	17.6			168.30	0.72	121.65	154.78	0.90	0.740	0.863	0.324	0.482	0.65	0.02	0.04
45.280	116.600	2.508	5660.0	4818.8	71.257	2.204	2.25		Sand	42.9			110.21	0.71	78.09	140.88	0.89	0.740	0.878	0.238	0.328	0.44	0.02	0.04
45.440	124.540	2.541	5680.0	4828.9	76.145	2.088	2.21		Sand	40.0			117.71	0.71	83.95	146.11	0.89	0.740	0.872	0.265	0.375	0.51	0.02	0.04
45.600	133.720	2.973	5700.0	4838.9	81.797	2.272	2.22		Sand	40.3			126.39	0.72	91.19	155.33	0.89	0.741	0.861	0.328	0.490	0.66	0.02	0.04
45.770	139.660	3.134	5721.3	4849.5	85.410	2.291	2.21		Sand	39.4			132.00	0.73	95.79	160.37	0.89	0.741	0.855	0.375	0.576	0.78	0.01	0.03
45.930	101.210	1.954	5741.3	4859.5	61.334	1.986	2.27		Sand	44.3			95.66	0.69	66.14	126.74	0.89	0.741	0.891	0.188	0.241	0.32	0.03	0.05
46.100	93.800	1.808	5762.5	4870.2	56.644	1.989	2.29		Sand	46.4			88.66	0.68	60.69	121.04	0.89	0.742	0.895	0.174	0.217	0.29	0.03	0.05
46.260	126.040	2.485	5782.5	4880.2	76.645	2.018	2.20		Sand	39.0			119.13	0.71	84.60	146.15	0.89	0.742	0.871	0.265	0.375	0.51	0.02	0.04
46.420	144.900	3.045	5802.5	4890.2	88.286	2.145	2.17		Sand	37.0			136.96	0.73	99.36	162.65	0.89	0.742	0.850	0.400	0.622	0.84	0.01	0.02
46.590	159.550	3.753	5823.8	4900.9	97.282	2.396	2.18		Sand	37.4			150.80	0.74	111.45	177.98	0.89	0.742	0.826	0.671	1.139	1.53	0.00	0.00
46.750	174.030	3.488	5843.8	4910.9	106.161	2.039	2.10		Sand	31.3			164.49	0.74	122.40	184.30	0.89	0.743	0.814	0.868	1.529	2.06	0.00	0.00
46.920	182.060	3.727	5865.0	4921.5	111.016	2.081	2.10		Sand	30.7			172.08	0.75	129.05	191.57	0.89	0.743	0.798	1.213	2.130	2.87	0.00	0.00
47.080	197.530	5.048	5885.0	4931.5	120.475	2.594	2.14		Sand	34.6			186.70	0.77	143.50	214.25	0.89	0.743	0.746	4.662	7.653	10.30	0.00	0.00
47.240	216.850	5.919	5905.0	4941.5	132.296	2.767	2.14		Sand	34.2			204.96	0.78	160.87	235.03	0.89	0.743	0.746	26.199	42.973	57.81	0.00	0.00
47.410	249.220	4.948	5926.3	4952.2	152.147	2.009	1.99		Sand	22.6			235.56	0.79	186.14	242.46	0.89	0.744	0.745	55.688	91.262	122.72	0.00	0.00
47.570	272.520	6.294	5946.3	4962.2	166.368	2.335	2.02		Sand	24.6			257.58	0.80	205.71	270.84	0.89	0.744	0.744	2217.500	3631.084	4881.27	0.00	0.00
47.740	270.470	5.529	5967.5	4972.8	164.919	2.067	1.98		Sand	21.5			255.64	0.80	204.05	260.07	0.89	0.744	0.744	466.204	762.735	1025.01	0.00	0.00
47.900	310.810	4.241	5987.5	4982.9	189.594	1.378	1.81		Sand	7.6			293.77	0.78	229.60	233.22	0.89	0.744	0.743	22.046	36.039	48.42	0.00	0.00
48.060	256.820	4.409	6007.5	4992.9	156.177	1.737	1.94		Sand	18.1			242.74	0.78	189.38	232.06	0.89	0.745	0.742	19.797	32.336	43.43	0.00	0.00
48.230	228.980	4.911	6028.8	5003.5	138.892	2.173	2.05		Sand	26.7			216.43	0.78	168.74	232.02	0.88	0.745	0.742	19.717	32.179	43.20	0.00	0.00
48.390	202.520	5.488	6048.8	5013.5	122.499	2.751	2.16		Sand	35.8			191.42	0.77	147.35	220.38	0.88	0.745	0.741	7.346	11.980	16.08	0.00	0.00
48.560	236.430	2.092	6070.0	5024.2	143.163	0.896	1.76		Sand	3.9			223.47	0.72	159.86	159.87	0.88	0.745	0.849	0.370	0.563	0.75	0.01	0.03
48.720	243.730	3.209	6090.0	5034.2	147.488	1.333	1.87		Sand	12.7			230.37	0.74	171.39	191.37	0.88	0.745	0.793	1.201	2.096	2.81	0.00	0.00
48.880	323.410	2.651	6110.0	5044.2	196.113	0.828	1.64		Sand	0.0			305.68	0.78	239.64	239.64	0.88	0.746	0.739	41.438	67.405	90.40	0.00	0.00
49.050	337.080	3.651	6131.3	5054.9	204.260	1.093	1.71		Sand	0.0			318.60	0.79	252.94	252.94	0.88	0.746	0.739	185.841	302.039	404.95	0.00	0.00
49.210	307.500	4.585	6151.3	5064.9	185.981	1.506	1.84		Sand	10.4			290.64	0.78	227.86	240.83	0.88	0.746	0.738	46.915	76.188	102.12	0.00	0.00
49.380	223.750	4.667	6172.5	5075.5	134.668	2.115	2.05		Sand	26.7			211.48	0.77	163.03	225.22	0.88	0.746	0.738	10.848	17.601	23.59	0.00	0.00
49.540	182.520	4.216	6192.5	5085.5	109.392	2.350	2.14		Sand	34.2			172.51	0.75	128.54	195.50	0.88	0.746	0.781	1.480	2.543	3.41	0.00	0.00
49.700	171.970	4.338	6212.5	5095.5	102.852	2.569	2.19		Sand	37.9			162.54	0.74	120.11	189.13	0.88	0.747	0.795	1.079	1.888	2.53	0.00	0.00
49.870	192.190	5.569	6233.8	5106.2	115.041	2.945	2.20		Sand	39.0			181.65	0.76	137.77	211.98	0.88	0.747	0.736	3.981	6.443	8.63	0.00	0.00
50.030	179.560	7.742	6253.8	5116.2	107.245	4.388	2.35		Sand	51.3			169.72	0.76	128.18	208.86	0.88	0.747	0.742	3.233	5.276	7.06	0.00	0.00
50.200	151.030	6.187	6275.0	5126.8	89.804	4.184	2.39		Sand	53.9			142.75	0.73	103.98	179.40	0.88	0.747	0.814	0.709	1.200	1.61	0.00	0.00

CORNERSTONE EARTH GROUP

Date:	October 27, 2020
Project No.:	1236-1-1
Prepared For:	Mr. Joshua Kwan **BROTHERS INTERNATIONAL HOLDING CORPORATION** 100 Bush Street, Suite 218 San Francisco, California 94104
Re:	Limited Environmental Sampling 4962 Almaden Retail Building 4962 Almaden Expressway San Jose, CA

Dear Mr. Kwan:

We are pleased to present this letter summarizing the results of the limited environmental sampling performed at 4962 Almaden Expressway located in San Jose, California (Site). This work was performed for Brothers International Holding Corporation in accordance with our Agreement dated September 22, 2020.

Project Background

The planned development will consist of redeveloping an approximately ¾-acre Site for a new single-story retail building surrounded by at-grade parking. The planned development will likely be of wood and steel frame construction and have an approximate footprint of 7,800 square feet. We understand that as part of the development sections of the adjacent parking lot will be reworked. Appurtenant utilities, landscaping and other improvements necessary for Site development are also planned. Limited environmental soil sampling for organochlorine pesticides (OCPs) and pesticide-related metals was requested.

Soil Sampling

Soil Sample Collection and Analyses

During our concurrent geotechnical investigation on October 9, 2020, our staff engineer used hollow stem auger sampling methods to collect four soil samples (two per geotechnical boring) from the upper approximate ½ foot of soil immediately beneath the pavement or concrete section and from an approximate depth that was 2 feet below the shallower sample. Soil samples were collected in stainless steel liners, the ends covered in Teflon film, fitted with plastic end caps, and labeled with a unique identification number. The soil samples were placed in an ice-chilled cooler and submitted to a state-certified laboratory with chain of custody documentation. The four soil samples were analyzed for organochlorine pesticides (OCPs; EPA Test Method 8081A) and pesticide-related metals arsenic, lead, and mercury (EPA Test Method 6010/7470) on a dry-weight basis.

Environmental Screening Criteria

Analytical data sheets and chain of custody documentation are attached to this letter. Detections of OCPs, lead, and mercury were compared to Tier 1 Environmental Screening Levels (ESLs)[1] and total DDT[2] concentrations were compared to its Total Threshold Limit Concentration (TTLC) established in Title 22 California Code of Regulations. The TTLC is the level at which a solid waste is considered hazardous and is pertinent when evaluating waste disposal options. Since natural background concentrations of arsenic often exceed its health-based ESL of 0.067 milligrams per kilogram (mg/kg), the arsenic data was compared to published regional background studies (Scott, 1991; LBNL, 1995 and 2009; Bradford, 1996; and Duverge, 2011). Bradford et.al. (1996) estimated that background arsenic concentrations in California soil types range from 0.6 mg/kg to 11 mg/kg. Scott (1991) documented background arsenic concentrations ranging up to 20 mg/kg. Duverge (2011) concluded that the mean and upper estimate (the 99th percentile) for background arsenic levels in the San Francisco Bay Region are 4.61 mg/kg and 11 mg/kg, respectively. An assumed background arsenic concentration of 11 mg/kg was used for comparison of the analytical results.

Discussion of Analytical Results

A brief discussion of the results is provided below:

- The OCP compounds 4,4-DDD and 4,4-DDE were detected at concentrations that were less than their respective Tier 1 ESLs.
- Total DDT (the sum of DDD, DDE, and DDT) concentrations were less than its TTLC.
- The remaining OCP compounds were not detected above their respective laboratory reporting limits.
- Concentrations for arsenic, lead and mercury were either less than selected Tier 1 ESLs and/or appeared consistent with published background/ambient conditions.

Conclusions

Laboratory analyses of the soil samples detected OCPs and pesticide-related metals less than Tier 1 ESLs, TTLCs and/or typical of natural background levels. Based on the limited data, soil in the approximate area of the two borings does not appear to have been significantly impacted by past agricultural uses.

Limitations

Cornerstone performed this investigation to support Brothers International Holding Corporation in evaluation of soil quality beneath the Site. Brothers International Holding Corporation understands that the extent of soil data obtained is based on the reasonable limits of time and budgetary constraints. In addition, the chemical information presented in this report can change over time and is only valid at the time of this investigation and for the locations sampled.

[1] Environmental Screening Level (ESL), San Francisco Bay, Regional Water Quality Control Board, January 2019.

[2] Total DDT is the sum of dichlorodiphenyldichloroethane (4,4'-DDD), dichlorodiphenyldichloroethylene (4,4'-DDE), and dichlorodiphenyltrichloroethane (4,4'-DDT).

This letter, an instrument of professional service, was prepared for the sole use of Brothers International Holding Corporation and may not be reproduced or distributed without written authorization from Cornerstone. Cornerstone makes no warranty, expressed or implied, except that our services have been performed in accordance with the environmental principles generally accepted at this time and location.

Closing

Should you have any questions regarding this letter, or if we may be of further service, please contact us at your convenience.

Sincerely,

Cornerstone Earth Group, Inc.

Emily Holland
Staff Engineer

Kurt M. Soenen
Principal Engineer, P.E.

Attachments: Figures
Laboratory Data Sheets

References

Duverge, Dylan Jacques. December 2011. *Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region*.

San Francisco Bay, Regional Water Quality Control Board. Revised January 2019. *Environmental Screening Levels.* https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.html

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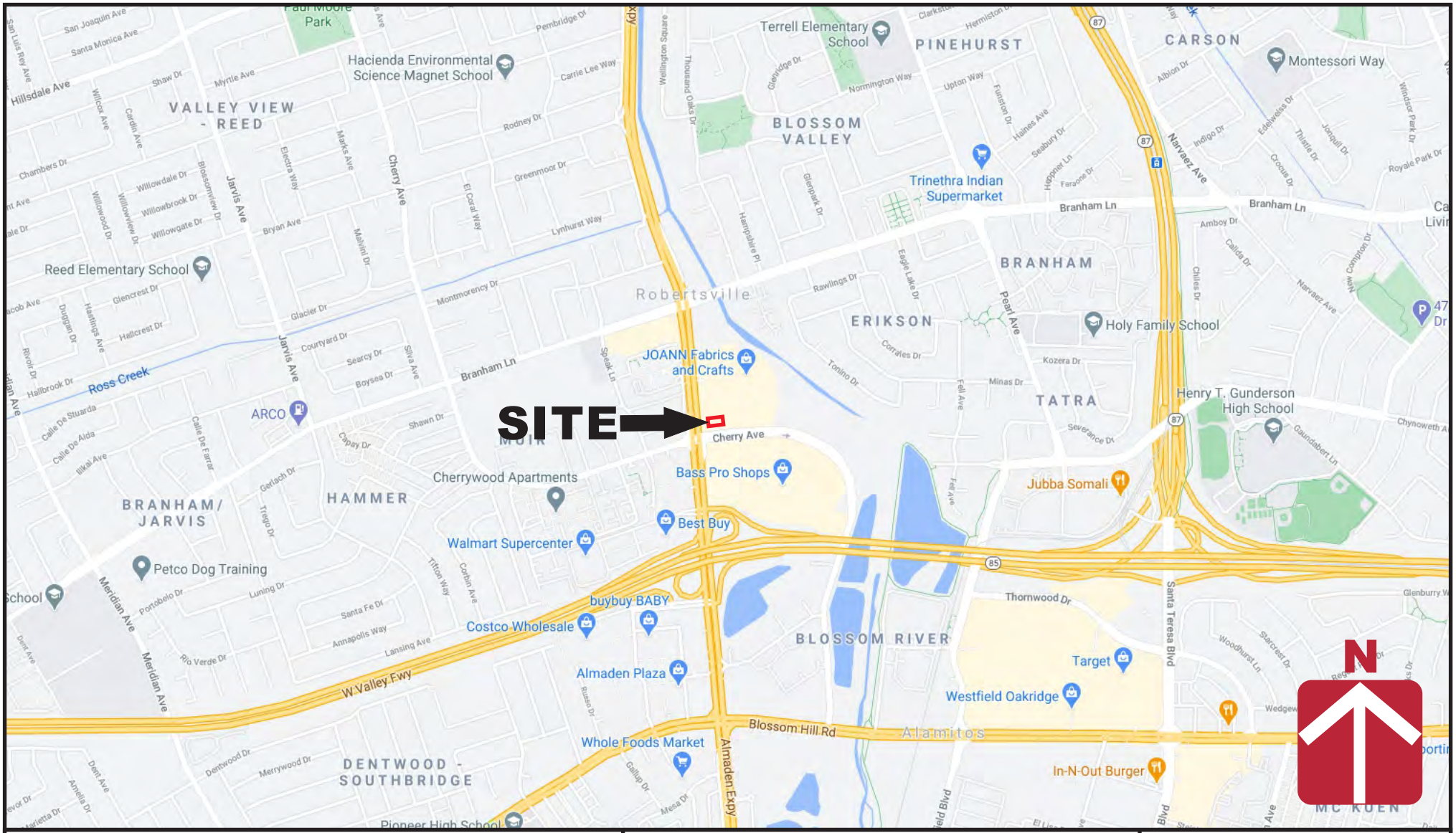
FIGURES



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Vicinity Map

4962 Almaden Retail Building
San Jose, CA

Project Number	1236-1-1
Figure Number	Figure 1
Date	October 2020
Drawn By	RRN

EB-1
CPT-1
EB-2
CPT-2
Proposed Retail Building
ALMADEN EXPRESSWAY
CHERRY AVENUE
RETAIL 5,358 SF
RETAIL 1,622 SF
STORAGE 269 SF
STORAGE 127 SF
STORAGE 138 SF
VAN ACCESSIBLE
EV
36' - 2"
37'
2' - 0" EASEMENT
8' - 2"
3' - 6"
0' - 6"

Legend

Approximate location of exploratory boring (EB)

Approximate location of cone penetration test (CPT)

0 20 40

APPROXIMATE SCALE (FEET)

N

Base by Google Earth, dated 06/19/2019
Overlay by Brereton, Floor Plan - 09, dated 06/05/2020

Project Number	1236-1-1
Figure Number	Figure 2
Date	October 2020
Drawn By	RRN

Site Plan

4962 Almaden Retail Building
San Jose, CA

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LABORATORY DATA SHEETS

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

Laboratory Job ID: 720-100154-1
Client Project/Site: 4962 Almaden
Revision: 1

For:
Cornerstone Earth Group
1220 Oakland Blvd
Suite 220
Walnut Creek, California 94085

Attn: Stephen Ohlsen

Authorized for release by:
10/27/2020 12:35:35 PM

Afsaneh Salimpour, Senior Project Manager
(925)484-1919
Afsaneh.Salimpour@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Job ID: 720-100154-1

Laboratory: Eurofins TestAmerica, Pleasanton

Narrative

Job Narrative
720-100154-1

Revised Report on 10/27/2020 to remove PCB's data per client request.

Comments
No additional comments.

Receipt
The samples were received on 10/9/2020 2:40 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 14.2º C.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Client Sample ID: EB-2 (3.5-4) — Lab Sample ID: 720-100154-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.5		0.85		mg/Kg	1	☼	6010B	Total/NA
Lead	2.4		0.56		mg/Kg	1	☼	6010B	Total/NA
Mercury	0.69		0.096		mg/Kg	1	☼	7471A	Total/NA

Client Sample ID: EB-2 (1.5-2) — Lab Sample ID: 720-100154-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
4,4'-DDE	9.3		1.2		ug/Kg	1	☼	8081A	Total/NA
4,4'-DDD	2.1		1.2		ug/Kg	1	☼	8081A	Total/NA
Arsenic	4.1		0.83		mg/Kg	1	☼	6010B	Total/NA
Lead	21		0.56		mg/Kg	1	☼	6010B	Total/NA
Mercury	3.3		0.95		mg/Kg	10	☼	7471A	Total/NA

Client Sample ID: EB-1 (1.5-2.0) — Lab Sample ID: 720-100154-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
4,4'-DDE	2.3		1.1		ug/Kg	1	☼	8081A	Total/NA
Arsenic	4.1		0.82		mg/Kg	1	☼	6010B	Total/NA
Lead	3.2		0.55		mg/Kg	1	☼	6010B	Total/NA
Mercury	0.59		0.090		mg/Kg	1	☼	7471A	Total/NA

Client Sample ID: EB-1 (3.5-4.0) — Lab Sample ID: 720-100154-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.0		0.82		mg/Kg	1	☼	6010B	Total/NA
Lead	2.1		0.54		mg/Kg	1	☼	6010B	Total/NA
Mercury	1.6		0.089		mg/Kg	1	☼	7471A	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Client Sample ID: EB-2 (3.5-4)
Date Collected: 10/09/20 07:54
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-1
Matrix: Solid
Percent Solids: 85.6

Method: 8081A - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Dieldrin	ND		0.23		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Endrin aldehyde	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Endrin	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Endrin ketone	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Heptachlor	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Heptachlor epoxide	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
4,4'-DDT	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
4,4'-DDE	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
4,4'-DDD	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Endosulfan I	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Endosulfan II	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
alpha-BHC	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
beta-BHC	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
gamma-BHC (Lindane)	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
delta-BHC	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Endosulfan sulfate	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Methoxychlor	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Toxaphene	ND		5.9		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
Chlordane (technical)	ND		5.9		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
cis-Chlordane	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1
trans-Chlordane	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*90*		*25 - 126*	*10/12/20 08:11*	*10/14/20 07:15*	*1*
DCB Decachlorobiphenyl (Surr)	*74*		*20 - 155*	*10/12/20 08:11*	*10/14/20 07:15*	*1*

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.5**		0.85		mg/Kg	☼	10/13/20 20:00	10/16/20 23:42	1
Lead	**2.4**		0.56		mg/Kg	☼	10/13/20 20:00	10/16/20 23:42	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.69**		0.096		mg/Kg	☼	10/13/20 20:00	10/14/20 10:22	1

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Client Sample ID: EB-2 (1.5-2)

Date Collected: 10/09/20 07:50
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-2

Matrix: Solid
Percent Solids: 86.1

Method: 8081A - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Dieldrin	ND		0.23		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Endrin aldehyde	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Endrin	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Endrin ketone	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Heptachlor	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Heptachlor epoxide	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
4,4'-DDT	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
4,4'-DDE	**9.3**		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
4,4'-DDD	**2.1**		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Endosulfan I	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Endosulfan II	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
alpha-BHC	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
beta-BHC	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
gamma-BHC (Lindane)	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
delta-BHC	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Endosulfan sulfate	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Methoxychlor	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Toxaphene	ND		5.8		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
Chlordane (technical)	ND		5.8		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
cis-Chlordane	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1
trans-Chlordane	ND		1.2		ug/Kg	☼	10/12/20 08:11	10/14/20 07:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*105*		*25 - 126*	*10/12/20 08:11*	*10/14/20 07:29*	*1*
DCB Decachlorobiphenyl (Surr)	*105*		*20 - 155*	*10/12/20 08:11*	*10/14/20 07:29*	*1*

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.1**		0.83		mg/Kg	☼	10/13/20 20:00	10/16/20 23:44	1
Lead	**21**		0.56		mg/Kg	☼	10/13/20 20:00	10/16/20 23:44	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**3.3**		0.95		mg/Kg	☼	10/13/20 20:00	10/14/20 10:30	10

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Client Sample ID: EB-1 (1.5-2.0)
Date Collected: 10/09/20 10:40
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-4
Matrix: Solid
Percent Solids: 87.9

Method: 8081A - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Dieldrin	ND		0.23		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Endrin aldehyde	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Endrin	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Endrin ketone	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Heptachlor	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Heptachlor epoxide	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
4,4'-DDT	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
4,4'-DDE	**2.3**		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
4,4'-DDD	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Endosulfan I	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Endosulfan II	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
alpha-BHC	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
beta-BHC	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
gamma-BHC (Lindane)	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
delta-BHC	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Endosulfan sulfate	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Methoxychlor	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Toxaphene	ND		5.7		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
Chlordane (technical)	ND		5.7		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
cis-Chlordane	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1
trans-Chlordane	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*91*		*25 - 126*	*10/12/20 08:11*	*10/14/20 07:44*	*1*
DCB Decachlorobiphenyl (Surr)	*82*		*20 - 155*	*10/12/20 08:11*	*10/14/20 07:44*	*1*

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.1**		0.82		mg/Kg	☼	10/13/20 20:00	10/16/20 23:46	1
Lead	**3.2**		0.55		mg/Kg	☼	10/13/20 20:00	10/16/20 23:46	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.59**		0.090		mg/Kg	☼	10/13/20 20:00	10/14/20 10:32	1

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Client Sample ID: EB-1 (3.5-4.0)
Date Collected: 10/09/20 10:44
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-5
Matrix: Solid
Percent Solids: 90.5

Method: 8081A - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Dieldrin	ND		0.22		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Endrin aldehyde	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Endrin	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Endrin ketone	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Heptachlor	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Heptachlor epoxide	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
4,4'-DDT	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
4,4'-DDE	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
4,4'-DDD	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Endosulfan I	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Endosulfan II	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
alpha-BHC	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
beta-BHC	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
gamma-BHC (Lindane)	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
delta-BHC	ND	F1	1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Endosulfan sulfate	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Methoxychlor	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Toxaphene	ND		5.5		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
Chlordane (technical)	ND		5.5		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
cis-Chlordane	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1
trans-Chlordane	ND		1.1		ug/Kg	☼	10/12/20 08:11	10/14/20 07:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*103*		*25 - 126*	*10/12/20 08:11*	*10/14/20 07:58*	*1*
DCB Decachlorobiphenyl (Surr)	*94*		*20 - 155*	*10/12/20 08:11*	*10/14/20 07:58*	*1*

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.0**		0.82		mg/Kg	☼	10/13/20 20:00	10/17/20 00:01	1
Lead	**2.1**		0.54		mg/Kg	☼	10/13/20 20:00	10/17/20 00:01	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**1.6**		0.089		mg/Kg	☼	10/13/20 20:00	10/14/20 10:34	1

Surrogate Summary

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Method: 8081A - Organochlorine Pesticides (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)											
		TCX1	DCB1										
Lab Sample ID	Client Sample ID	(25-126)	(20-155)										
720-100154-1	EB-2 (3.5-4)	90	74										
720-100154-2	EB-2 (1.5-2)	105	105										
720-100154-4	EB-1 (1.5-2.0)	91	82										
720-100154-5	EB-1 (3.5-4.0)	103	94										
720-100154-5 MS	EB-1 (3.5-4.0)	104	99										
720-100154-5 MSD	EB-1 (3.5-4.0)	109	98										
LCS 570-101010/2-A	Lab Control Sample	121	117										
LCSD 570-101010/3-A	Lab Control Sample Dup	120	114										
MB 570-101010/1-A	Method Blank	122	117										

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCB = DCB Decachlorobiphenyl (Surr)

Method: 8081A - Organochlorine Pesticides (GC)

Lab Sample ID: MB 570-101010/1-A
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 101010

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Dieldrin	ND		0.20		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Endrin aldehyde	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Endrin	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Endrin ketone	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Heptachlor	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Heptachlor epoxide	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
4,4'-DDT	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
4,4'-DDE	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
4,4'-DDD	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Endosulfan I	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Endosulfan II	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
alpha-BHC	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
beta-BHC	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
gamma-BHC (Lindane)	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
delta-BHC	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Endosulfan sulfate	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Methoxychlor	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Toxaphene	ND		5.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
Chlordane (technical)	ND		5.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
cis-Chlordane	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1
trans-Chlordane	ND		1.0		ug/Kg		10/12/20 08:11	10/14/20 02:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*122*		*25 - 126*	*10/12/20 08:11*	*10/14/20 02:30*	*1*
DCB Decachlorobiphenyl (Surr)	*117*		*20 - 155*	*10/12/20 08:11*	*10/14/20 02:30*	*1*

Lab Sample ID: LCS 570-101010/2-A
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 101010

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aldrin	5.01	4.64		ug/Kg		93	50 - 135
Dieldrin	5.01	4.99		ug/Kg		100	50 - 135
Endrin aldehyde	5.01	4.59		ug/Kg		92	50 - 135
Endrin	5.01	5.02		ug/Kg		100	50 - 135
Endrin ketone	5.01	5.07		ug/Kg		101	50 - 135
Heptachlor	5.01	5.24		ug/Kg		105	50 - 135
Heptachlor epoxide	5.01	5.03		ug/Kg		100	50 - 135
4,4'-DDT	5.01	4.90		ug/Kg		98	50 - 135
4,4'-DDE	5.01	5.13		ug/Kg		102	50 - 135
4,4'-DDD	5.01	5.28		ug/Kg		105	50 - 135
Endosulfan I	5.01	4.85		ug/Kg		97	50 - 135
Endosulfan II	5.01	4.96		ug/Kg		99	50 - 135
alpha-BHC	5.01	4.90		ug/Kg		98	50 - 135
beta-BHC	5.01	4.73		ug/Kg		95	50 - 135
gamma-BHC (Lindane)	5.01	4.84		ug/Kg		97	50 - 135
delta-BHC	5.01	2.65		ug/Kg		53	50 - 135

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 570-101010/2-A
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 101010

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Endosulfan sulfate	5.01	4.47		ug/Kg		89	50 - 135
Methoxychlor	5.01	4.93		ug/Kg		99	50 - 135
cis-Chlordane	5.01	4.88		ug/Kg		97	50 - 135
trans-Chlordane	5.01	4.97		ug/Kg		99	50 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*121*		*25 - 126*
DCB Decachlorobiphenyl (Surr)	*117*		*20 - 155*

Lab Sample ID: LCSD 570-101010/3-A
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 101010

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aldrin	5.01	4.93		ug/Kg		98	50 - 135	6	25
Dieldrin	5.01	5.09		ug/Kg		102	50 - 135	2	25
Endrin aldehyde	5.01	4.72		ug/Kg		94	50 - 135	3	25
Endrin	5.01	5.06		ug/Kg		101	50 - 135	1	25
Endrin ketone	5.01	5.28		ug/Kg		105	50 - 135	4	25
Heptachlor	5.01	5.33		ug/Kg		106	50 - 135	2	25
Heptachlor epoxide	5.01	5.06		ug/Kg		101	50 - 135	1	25
4,4'-DDT	5.01	5.21		ug/Kg		104	50 - 135	6	25
4,4'-DDE	5.01	5.28		ug/Kg		105	50 - 135	3	25
4,4'-DDD	5.01	5.22		ug/Kg		104	50 - 135	1	25
Endosulfan I	5.01	4.90		ug/Kg		98	50 - 135	1	25
Endosulfan II	5.01	5.11		ug/Kg		102	50 - 135	3	25
alpha-BHC	5.01	5.06		ug/Kg		101	50 - 135	3	25
beta-BHC	5.01	4.97		ug/Kg		99	50 - 135	5	25
gamma-BHC (Lindane)	5.01	5.06		ug/Kg		101	50 - 135	4	25
delta-BHC	5.01	2.80		ug/Kg		56	50 - 135	6	25
Endosulfan sulfate	5.01	4.75		ug/Kg		95	50 - 135	6	25
Methoxychlor	5.01	5.30		ug/Kg		106	50 - 135	7	25
cis-Chlordane	5.01	5.00		ug/Kg		100	50 - 135	3	25
trans-Chlordane	5.01	5.05		ug/Kg		101	50 - 135	2	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*120*		*25 - 126*
DCB Decachlorobiphenyl (Surr)	*114*		*20 - 155*

Lab Sample ID: 720-100154-5 MS
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: EB-1 (3.5-4.0)
Prep Type: Total/NA
Prep Batch: 101010

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aldrin	ND		5.55	4.24		ug/Kg	☼	76	50 - 135
Dieldrin	ND		5.55	4.58		ug/Kg	☼	82	50 - 135
Endrin aldehyde	ND		5.55	4.09		ug/Kg	☼	74	50 - 135
Endrin	ND		5.55	4.65		ug/Kg	☼	84	50 - 135

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 720-100154-5 MS
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: EB-1 (3.5-4.0)
Prep Type: Total/NA
Prep Batch: 101010

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Endrin ketone	ND		5.55	4.97		ug/Kg	☼	90	50 - 135
Heptachlor	ND		5.55	4.56		ug/Kg	☼	82	50 - 135
Heptachlor epoxide	ND		5.55	4.44		ug/Kg	☼	80	50 - 135
4,4'-DDT	ND		5.55	4.56		ug/Kg	☼	82	50 - 135
4,4'-DDE	ND		5.55	5.07		ug/Kg	☼	88	50 - 135
4,4'-DDD	ND		5.55	5.18		ug/Kg	☼	93	50 - 135
Endosulfan I	ND		5.55	4.27		ug/Kg	☼	77	50 - 135
Endosulfan II	ND		5.55	4.72		ug/Kg	☼	85	50 - 135
alpha-BHC	ND		5.55	4.30		ug/Kg	☼	77	50 - 135
beta-BHC	ND		5.55	4.26		ug/Kg	☼	77	50 - 135
gamma-BHC (Lindane)	ND		5.55	4.48		ug/Kg	☼	81	50 - 135
delta-BHC	ND	F1	5.55	2.45	F1	ug/Kg	☼	44	50 - 135
Endosulfan sulfate	ND		5.55	4.17		ug/Kg	☼	75	50 - 135
Methoxychlor	ND		5.55	4.60		ug/Kg	☼	83	50 - 135
cis-Chlordane	ND		5.55	4.29		ug/Kg	☼	77	50 - 135
trans-Chlordane	ND		5.55	4.63		ug/Kg	☼	83	50 - 135

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene	*104*		*25 - 126*
DCB Decachlorobiphenyl (Surr)	*99*		*20 - 155*

Lab Sample ID: 720-100154-5 MSD
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: EB-1 (3.5-4.0)
Prep Type: Total/NA
Prep Batch: 101010

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aldrin	ND		5.54	4.30		ug/Kg	☼	78	50 - 135	1	25
Dieldrin	ND		5.54	4.76		ug/Kg	☼	86	50 - 135	4	25
Endrin aldehyde	ND		5.54	4.05		ug/Kg	☼	73	50 - 135	1	25
Endrin	ND		5.54	4.85		ug/Kg	☼	88	50 - 135	4	25
Endrin ketone	ND		5.54	4.91		ug/Kg	☼	89	50 - 135	1	25
Heptachlor	ND		5.54	4.55		ug/Kg	☼	82	50 - 135	0	25
Heptachlor epoxide	ND		5.54	4.61		ug/Kg	☼	83	50 - 135	4	25
4,4'-DDT	ND		5.54	4.54		ug/Kg	☼	82	50 - 135	0	25
4,4'-DDE	ND		5.54	5.10		ug/Kg	☼	88	50 - 135	1	25
4,4'-DDD	ND		5.54	5.37		ug/Kg	☼	97	50 - 135	4	25
Endosulfan I	ND		5.54	4.33		ug/Kg	☼	78	50 - 135	1	25
Endosulfan II	ND		5.54	4.79		ug/Kg	☼	86	50 - 135	1	25
alpha-BHC	ND		5.54	4.33		ug/Kg	☼	78	50 - 135	1	25
beta-BHC	ND		5.54	4.27		ug/Kg	☼	77	50 - 135	0	25
gamma-BHC (Lindane)	ND		5.54	4.63		ug/Kg	☼	84	50 - 135	3	25
delta-BHC	ND	F1	5.54	2.59	F1	ug/Kg	☼	47	50 - 135	6	25
Endosulfan sulfate	ND		5.54	4.18		ug/Kg	☼	75	50 - 135	0	25
Methoxychlor	ND		5.54	4.62		ug/Kg	☼	83	50 - 135	0	25
cis-Chlordane	ND		5.54	4.42		ug/Kg	☼	80	50 - 135	3	25
trans-Chlordane	ND		5.54	4.81		ug/Kg	☼	87	50 - 135	4	25

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 720-100154-5 MSD
Matrix: Solid
Analysis Batch: 101548

Client Sample ID: EB-1 (3.5-4.0)
Prep Type: Total/NA
Prep Batch: 101010

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*109*		*25 - 126*
DCB Decachlorobiphenyl (Surr)	*98*		*20 - 155*

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 570-101576/1-A
Matrix: Solid
Analysis Batch: 102648

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 101576

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.75		mg/Kg		10/13/20 20:00	10/16/20 23:13	1
Lead	ND		0.50		mg/Kg		10/13/20 20:00	10/16/20 23:13	1

Lab Sample ID: LCS 570-101576/2-A
Matrix: Solid
Analysis Batch: 102706

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 101576

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	25.0	25.2		mg/Kg		101	80 - 120
Lead	25.0	26.5		mg/Kg		106	80 - 120

Lab Sample ID: LCSD 570-101576/3-A
Matrix: Solid
Analysis Batch: 102706

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 101576

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	25.1	26.7		mg/Kg		106	80 - 120	6	20
Lead	25.1	27.3		mg/Kg		109	80 - 120	3	20

Lab Sample ID: 570-40694-A-1-C MS
Matrix: Solid
Analysis Batch: 102648

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 101576

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	12		25.3	36.9		mg/Kg		100	75 - 125
Lead	49		25.3	71.4		mg/Kg		87	75 - 125

Lab Sample ID: 570-40694-A-1-D MSD
Matrix: Solid
Analysis Batch: 102648

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 101576

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	12		25.3	35.2		mg/Kg		93	75 - 125	5	20
Lead	49		25.3	74.2		mg/Kg		98	75 - 125	4	20

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 570-101577/1-A
Matrix: Solid
Analysis Batch: 101745

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 101577

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.081		mg/Kg		10/13/20 20:00	10/14/20 10:03	1

Lab Sample ID: LCS 570-101577/2-A
Matrix: Solid
Analysis Batch: 101745

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 101577

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury			0.794	0.755		mg/Kg		95	85 - 121		

Lab Sample ID: LCSD 570-101577/3-A
Matrix: Solid
Analysis Batch: 101745

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 101577

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury			0.806	0.730		mg/Kg		90	85 - 121	3	10

Lab Sample ID: 570-40694-A-1-F MS
Matrix: Solid
Analysis Batch: 101745

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 101577

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury	ND		0.794	0.798		mg/Kg		96	71 - 137		

Lab Sample ID: 570-40694-A-1-G MSD
Matrix: Solid
Analysis Batch: 101745

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 101577

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.833	0.830		mg/Kg		95	71 - 137	4	14

QC Association Summary

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

GC Semi VOA

Prep Batch: 101010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-1	EB-2 (3.5-4)	Total/NA	Solid	3546	
720-100154-2	EB-2 (1.5-2)	Total/NA	Solid	3546	
720-100154-4	EB-1 (1.5-2.0)	Total/NA	Solid	3546	
720-100154-5	EB-1 (3.5-4.0)	Total/NA	Solid	3546	
MB 570-101010/1-A	Method Blank	Total/NA	Solid	3546	
LCS 570-101010/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 570-101010/3-A	Lab Control Sample Dup	Total/NA	Solid	3546	
720-100154-5 MS	EB-1 (3.5-4.0)	Total/NA	Solid	3546	
720-100154-5 MSD	EB-1 (3.5-4.0)	Total/NA	Solid	3546	

Analysis Batch: 101548

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-1	EB-2 (3.5-4)	Total/NA	Solid	8081A	101010
720-100154-2	EB-2 (1.5-2)	Total/NA	Solid	8081A	101010
720-100154-4	EB-1 (1.5-2.0)	Total/NA	Solid	8081A	101010
720-100154-5	EB-1 (3.5-4.0)	Total/NA	Solid	8081A	101010
MB 570-101010/1-A	Method Blank	Total/NA	Solid	8081A	101010
LCS 570-101010/2-A	Lab Control Sample	Total/NA	Solid	8081A	101010
LCSD 570-101010/3-A	Lab Control Sample Dup	Total/NA	Solid	8081A	101010
720-100154-5 MS	EB-1 (3.5-4.0)	Total/NA	Solid	8081A	101010
720-100154-5 MSD	EB-1 (3.5-4.0)	Total/NA	Solid	8081A	101010

Metals

Prep Batch: 101576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-1	EB-2 (3.5-4)	Total/NA	Solid	3050B	
720-100154-2	EB-2 (1.5-2)	Total/NA	Solid	3050B	
720-100154-4	EB-1 (1.5-2.0)	Total/NA	Solid	3050B	
720-100154-5	EB-1 (3.5-4.0)	Total/NA	Solid	3050B	
MB 570-101576/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 570-101576/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 570-101576/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
570-40694-A-1-C MS	Matrix Spike	Total/NA	Solid	3050B	
570-40694-A-1-D MSD	Matrix Spike Duplicate	Total/NA	Solid	3050B	

Prep Batch: 101577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-1	EB-2 (3.5-4)	Total/NA	Solid	7471A	
720-100154-2	EB-2 (1.5-2)	Total/NA	Solid	7471A	
720-100154-4	EB-1 (1.5-2.0)	Total/NA	Solid	7471A	
720-100154-5	EB-1 (3.5-4.0)	Total/NA	Solid	7471A	
MB 570-101577/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 570-101577/2-A	Lab Control Sample	Total/NA	Solid	7471A	
LCSD 570-101577/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	
570-40694-A-1-F MS	Matrix Spike	Total/NA	Solid	7471A	
570-40694-A-1-G MSD	Matrix Spike Duplicate	Total/NA	Solid	7471A	

Analysis Batch: 101745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-1	EB-2 (3.5-4)	Total/NA	Solid	7471A	101577

Metals (Continued)

Analysis Batch: 101745 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-2	EB-2 (1.5-2)	Total/NA	Solid	7471A	101577
720-100154-4	EB-1 (1.5-2.0)	Total/NA	Solid	7471A	101577
720-100154-5	EB-1 (3.5-4.0)	Total/NA	Solid	7471A	101577
MB 570-101577/1-A	Method Blank	Total/NA	Solid	7471A	101577
LCS 570-101577/2-A	Lab Control Sample	Total/NA	Solid	7471A	101577
LCSD 570-101577/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	101577
570-40694-A-1-F MS	Matrix Spike	Total/NA	Solid	7471A	101577
570-40694-A-1-G MSD	Matrix Spike Duplicate	Total/NA	Solid	7471A	101577

Analysis Batch: 102648

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-1	EB-2 (3.5-4)	Total/NA	Solid	6010B	101576
720-100154-2	EB-2 (1.5-2)	Total/NA	Solid	6010B	101576
720-100154-4	EB-1 (1.5-2.0)	Total/NA	Solid	6010B	101576
720-100154-5	EB-1 (3.5-4.0)	Total/NA	Solid	6010B	101576
MB 570-101576/1-A	Method Blank	Total/NA	Solid	6010B	101576
570-40694-A-1-C MS	Matrix Spike	Total/NA	Solid	6010B	101576
570-40694-A-1-D MSD	Matrix Spike Duplicate	Total/NA	Solid	6010B	101576

Analysis Batch: 102706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 570-101576/2-A	Lab Control Sample	Total/NA	Solid	6010B	101576
LCSD 570-101576/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	101576

General Chemistry

Analysis Batch: 101221

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-100154-1	EB-2 (3.5-4)	Total/NA	Solid	Moisture	
720-100154-2	EB-2 (1.5-2)	Total/NA	Solid	Moisture	
720-100154-4	EB-1 (1.5-2.0)	Total/NA	Solid	Moisture	
720-100154-5	EB-1 (3.5-4.0)	Total/NA	Solid	Moisture	
570-40706-C-2 DU	Duplicate	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Client Sample ID: EB-2 (3.5-4)
Date Collected: 10/09/20 07:54
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	101221	10/12/20 15:49	B4PP	ECL 1

Client Sample ID: EB-2 (3.5-4)
Date Collected: 10/09/20 07:54
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-1
Matrix: Solid
Percent Solids: 85.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			101010	10/12/20 08:11	F7UI	ECL 1
Total/NA	Analysis	8081A		1	101548	10/14/20 07:15	UHHN	ECL 1
Total/NA	Prep	3050B			101576	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	6010B		1	102648	10/16/20 23:42	OYW3	ECL 1
Total/NA	Prep	7471A			101577	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	7471A		1	101745	10/14/20 10:22	MD3A	ECL 1

Client Sample ID: EB-2 (1.5-2)
Date Collected: 10/09/20 07:50
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	101221	10/12/20 15:49	B4PP	ECL 1

Client Sample ID: EB-2 (1.5-2)
Date Collected: 10/09/20 07:50
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-2
Matrix: Solid
Percent Solids: 86.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			101010	10/12/20 08:11	F7UI	ECL 1
Total/NA	Analysis	8081A		1	101548	10/14/20 07:29	UHHN	ECL 1
Total/NA	Prep	3050B			101576	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	6010B		1	102648	10/16/20 23:44	OYW3	ECL 1
Total/NA	Prep	7471A			101577	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	7471A		10	101745	10/14/20 10:30	MD3A	ECL 1

Client Sample ID: EB-1 (1.5-2.0)
Date Collected: 10/09/20 10:40
Date Received: 10/09/20 14:40

Lab Sample ID: 720-100154-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	101221	10/12/20 15:49	B4PP	ECL 1

Lab Chronicle

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Client Sample ID: EB-1 (1.5-2.0)

Lab Sample ID: 720-100154-4
Date Collected: 10/09/20 10:40
Matrix: Solid
Date Received: 10/09/20 14:40
Percent Solids: 87.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			101010	10/12/20 08:11	F7UI	ECL 1
Total/NA	Analysis	8081A		1	101548	10/14/20 07:44	UHHN	ECL 1
Total/NA	Prep	3050B			101576	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	6010B		1	102648	10/16/20 23:46	OYW3	ECL 1
Total/NA	Prep	7471A			101577	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	7471A		1	101745	10/14/20 10:32	MD3A	ECL 1

Client Sample ID: EB-1 (3.5-4.0)

Lab Sample ID: 720-100154-5
Date Collected: 10/09/20 10:44
Matrix: Solid
Date Received: 10/09/20 14:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	101221	10/12/20 15:49	B4PP	ECL 1

Client Sample ID: EB-1 (3.5-4.0)

Lab Sample ID: 720-100154-5
Date Collected: 10/09/20 10:44
Matrix: Solid
Date Received: 10/09/20 14:40
Percent Solids: 90.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			101010	10/12/20 08:11	F7UI	ECL 1
Total/NA	Analysis	8081A		1	101548	10/14/20 07:58	UHHN	ECL 1
Total/NA	Prep	3050B			101576	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	6010B		1	102648	10/17/20 00:01	OYW3	ECL 1
Total/NA	Prep	7471A			101577	10/13/20 20:00	SP7J	ECL 1
Total/NA	Analysis	7471A		1	101745	10/14/20 10:34	MD3A	ECL 1

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

Accreditation/Certification Summary

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Laboratory: Eurofins Calscience LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
California	State	2944	09-30-21

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture

Method Summary

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Method	Method Description	Protocol	Laboratory
8081A	Organochlorine Pesticides (GC)	SW846	ECL 1
6010B	Metals (ICP)	SW846	ECL 1
7471A	Mercury (CVAA)	SW846	ECL 1
Moisture	Percent Moisture	EPA	ECL 1
3050B	Preparation, Metals	SW846	ECL 1
3546	Microwave Extraction (Low Level)	SW846	ECL 1
7471A	Preparation, Mercury	SW846	ECL 1

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

Sample Summary

Client: Cornerstone Earth Group
Project/Site: 4962 Almaden

Job ID: 720-100154-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
720-100154-1	EB-2 (3.5-4)	Solid	10/09/20 07:54	10/09/20 14:40	
720-100154-2	EB-2 (1.5-2)	Solid	10/09/20 07:50	10/09/20 14:40	
720-100154-4	EB-1 (1.5-2.0)	Solid	10/09/20 10:40	10/09/20 14:40	
720-100154-5	EB-1 (3.5-4.0)	Solid	10/09/20 10:44	10/09/20 14:40	

CORNERSTONE EARTH GROUP

Chain of Custody Record

720-100154

197529

Cornerstone Earth Group, Inc.	Project Manager:	Site Sampler:	Date: 10/9/20
1259 Oakmead Pkwy	Tel/Fax: 408-245-4600	Lab Contact: Afsaneh Salimpour	Lab: Test America
Sunnyvale, California 94085	Analysis Turnaround Time		
(408) 245-4600 Phone	TAT if different from Below ____		
(408) 245-4620 FAX	■ 1 week		
Project Name: 4962 Almaden	☐ 3 days		
Site: San Jose, CA	☐ 2 days		
Project Number: 1236-1-1	☐ 1 day		

COC No: 1 of 2 COCs

Laboratory's Job No.

19.2-c

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	TPHd/o w/ silica gel 8015B	CAM17 6010/7471	OCPs & PCBs 8081A/8082	TPHg & full list of VOCs 8260B	Arsenic (6010/7471)	STLC-Cr	Lead (6010/7471)	Mercury (6010/7471)	HOLD	Laboratory's Sample Specific Notes:
EB-2 (3.5-4)	10/9	7:54	liner	soil	1				X		X		X	X		run on dry
EB-2 (1.5-2)	10/9	7:50	liner	soil	1				X		X		X	X		weight basis
EB-2 (5-5.5)	10/9	7:57	liner	soil	1										X	
EB-1 (1.5-2.0)	10/9	10:40	liner	↓	1				X		X		X	X		
EB-1 (3.5-4.0)	10/9	10:44	liner		1				X		X		X	X		
EB-1 (5-5.5)	10/9	10:48	liner		1										X	

720-100154 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments: Please email confirmation & results to= *bcervantes@cornerstoneearth.com* ; *sohlsen@cornerstoneearth.com* , Please run on a dry weight basis *rhorewitz@cornerstoneearth.com*

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Robert Horewitz	Cornerstone Earth Group	10/9 2:40		EA-Ry	10/9/20 1650
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Eurofins TestAmerica, Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Phone: 925-484-1919 Fax: 925-600-3002

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Salimpour, Afsaneh F	Carrier Tracking No(s):	COC No: 720-50177.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Afsaneh.Salimpour@Eurofinset.com	State of Origin: California	Page: Page 1 of 1
Company: Eurofins Calscience LLC		Accreditations Required (See note): State - California; State Program - California		Job #: 720-100154-1
Address: 7440 Lincoln Way, ,	Due Date Requested: 10/13/2020			
City: Garden Grove	TAT Requested (days):			
State, Zip: CA, 92841				
Phone: 714-895-5494(Tel) 714-894-7501(Fax)	PO #:			
Email:	WO #:			
Project Name: 4962 Almaden	Project #: 72007780			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B/3050B (MOD) California Administrative Manual L	7471A/7471A_Prep Mercury	8081A_LL/3546_LL (MOD) Local Method	8082_LL/3546_LL Routine PCBs	Moisture/ Percent Moisture Only	6010B/3050B (MOD) California Administrative Manual L (Hold)	7471A/7471A_Prep Mercury (Hold)	8081A_LL/3546_LL (MOD) Local Method (Hold)	8082_LL/3546_LL Routine PCBs (Hold)	Moisture/ Percent Moisture Only (Hold)				Total Number of containers	Special Instructions/Note:
			Preservation Code:																		
EB-2 (3.5-4) (720-100154-1)	10/9/20	07:54 Pacific		Solid			X	X	X	X	X									1	
EB-2 (1.5-2) (720-100154-2)	10/9/20	07:50 Pacific		Solid			X	X	X	X	X									1	
EB-2 (5-5.5) (720-100154-3)	10/9/20	07:57 Pacific		Solid								X	X	X	X	X				1	
EB-1 (1.5-2.0) (720-100154-4)	10/9/20	10:40 Pacific		Solid			X	X	X	X	X									1	
EB-1 (3.5-4.0) (720-100154-5)	10/9/20	10:44 Pacific		Solid			X	X	X	X	X									1	
EB-1 (5-5.5) (720-100154-6)	10/9/20	10:48 Pacific		Solid								X	X	X	X	X				1	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10/9/20 1600	FEDEX		10/10/20 0800	
2		Date/Time:	Company	Received by:	Date/Time:	Company
3		Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
☐ Yes ☐ No	N/A	4.0 / 3.2 SLC

Login Sample Receipt Checklist

Client: Cornerstone Earth Group

Job Number: 720-100154-1

Login Number: 100154
List Number: 1
Creator: Mullen, Joan

List Source: Eurofins TestAmerica, Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Cornerstone Earth Group

Job Number: 720-100154-1

Login Number: 100154
List Number: 2
Creator: Ramos, Maribel

List Source: Eurofins Calscience
List Creation: 10/10/20 02:28 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	Seal present with no number.
Sample custody seals, if present, are intact.	True	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	