F3: Gen-Tie Geotechnical Investigation

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GEOTECHNICAL INVESTIGATION
FOR
Overnight Solar Interconnection Project
41650 Lockhart Road
Hinkley, CA

for

Atlantica
1533 West Todd Drive, Suite 204
Tempe, AZ 85283

June 13, 2024

00-241401-01

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June 10, 2024

Atlantica
1533 West Todd Drive, Suite 204
Tempe, AZ 85283

Attention: Jose Manuel Bravo Romero,

Subject: Geotechnical Investigation for
Overnight Solar Interconnection Project
41650 Lockhart Road
Hinkley, CA

Dear Mr. Romero:

In accordance with your request, a geotechnical investigation has been completed for the above referenced project. The report addresses both engineering geologic and geotechnical conditions. The results of the investigation are presented in the accompanying report, which includes a description of site conditions, results of our field exploration, laboratory testing, conclusions, and recommendations.

We appreciate this opportunity to be of continued service to you. If you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,

RMA Group

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1.00 INTRODUCTION

1.01 Purpose

A draft geotechnical investigation has been completed for the proposed Overnight Solar Interconnect transmission line to be on the south side of the existing Mojave Solar plant in the City of Hinkley, California, California. The purpose of the investigation was to summarize geotechnical and geologic conditions at the alignment, to assess their potential impact on the proposed project, and to develop geotechnical and engineering geologic design parameters.

1.02 Scope of the Investigation

The general scope of this investigation included the following:

- Review of published and unpublished geologic, seismic, groundwater and geotechnical literature.
- Examination of aerial photographs.
- Contacting of underground service alert to locate onsite utility lines.
- Logging, sampling and backfilling of 3 exploratory borings drilled with a CME-75 drill rig.
- Laboratory testing of representative soil samples.
- Geotechnical evaluation of the compiled data.
- Preparation of this report presenting our findings, conclusions and recommendations.

Our scope of work did not include a preliminary site assessment for the potential of hazardous materials onsite.

1.03 Site Location and Description

The proposed sports Interconnect transmission line will run from the existing plant at the Mojave facility to the proposed Overnight Solar facility that will be located to the west of the Mojave Solar facility. The proposed towers will be located at the south end of the existing solar arrays and north of the storm water basin.

The investigation area is bounded by the existing Mojave Solar west arrays to the north, the Harper Lake Road to the east, storm water basin to the south, and Lockhart Ranch Road to the west (Figure 1). The geographic position of the alignment is latitude 35.011818° and longitude -117.339373°. Elevations range from 2,100 to 2,090 feet above sea level.

1.04 Current and Past Land Usage

The site is currently located on the southwest portion of Mojave Solar facility. A row of light wooden poles, two electrical control panel enclosure, one at the east end of the alignment and another at the west end and a weather station enclosure in the western end.

The Mojave Solar facility was constructed in 2010. Prior to that the alignment was part of an agricultural area.

1.05 Planned Usage

It is our understanding that the proposed construction will consist of installation of metal power transmission support poles. Recommendations for associated ground mounted equipment and small structures are included, if need as part of the design.

1.06 Investigation Methods

Our investigation consisted of office research, field exploration, laboratory testing, review of the compiled data, and preparation of this report. It has been performed in a manner consistent with generally accepted engineering and geologic principles and practices and has incorporated applicable requirements of California Building Code. Definitions of technical terms and symbols used in this report include those of the ASTM International, the California Building Code, and commonly used geologic nomenclature.

Technical supporting data are presented in the attached appendices. Appendix A presents a description of the methods and equipment used in performing the field exploration and logs of our subsurface exploration. Appendix B presents a description of our laboratory testing and the test results. Standard grading specifications and references are presented in Appendices C and D, respectively.

2.00 FINDINGS

2.01 Geologic Setting

The subject is located within the Mojave Desert geomorphic province, a triangular shaped block bounded by the San Andreas fault on the southwest and the Garlock fault on the northwest. The Colorado River and Nevada State Line are generally accepted as an arbitrary eastern boundary of the block. The Mojave Desert is an alluvial plain containing low generally north-south trending mountain ranges that separate alluvial filled desert basins characterized in lower parts by dry lakes or playas.

Geologic mapping of area around the site compiled by the Bedrossian (2012) indicates that site is underlain by Holocene to late Pleistocene young alluvial fan deposits (Qyf) and young alluvial valley deposits (Qya). Bedrossian describes the young alluvial fan deposits as: “unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand and silt deposits issued from a confined valley or canyon” and the young alluvial valley deposits as: “unconsolidated to slightly consolidated, undissected to slightly dissected clay silt, sand and gravel along valleys and alluvial flats or larger rivers”. The contact between the two mapped units is indicated with the symbol for a gradational contact. The drainage that crosses the northwest corner of the site is mapped as late Holocene alluvial fan deposits described as unconsolidated boulders, cobbles, gravel, sand and silt recently deposited where a river or stream issues from a confined valley or canyon. The Mojave Solar Facility along with the Luz Solar to the north are indicated on the map as an area of artificial fill.

According to regional geologic mapping by Bedrossian, Hayhurst and Roffers (2010), the site is underlain by Holocene to late Pleistocene age young eolian and dune deposits (Figure 2).

2.02 Earth Materials

Our subsurface investigation encountered artificial fill and alluvium. The artificial fill consisted of light brown silty sand that was typically dry and dense to very dense. The artificial fill appears to be locally sourced that was placed and compacted as part of the construction of the Mojave Solar facility.

The alluvium encountered was light brown to light reddish brown silty sand with a trace of clay at depths below 20 feet. A layer of sand was encountered is B-1 at 9 to 12 feet. The alluvium was typically dry with increasing moisture content with depth. At the conclusion of drilling the bore holes did not exhibit caving.

The subsurface soils encountered in the exploratory borings drilled at the site are described in greater detail on the logs contained in Appendix A.

2.03 Expansive Soils

Based upon soil classification of silty sand and sand with silt and a review of the laboratory testing in the referenced reports, the onsite soil can be visually classified as non-expansive.

2.04 Surface and Groundwater Conditions

No areas of ponding or standing water were present at the time of our study. Further, no springs or areas of natural seepage were found.

Groundwater was not encountered during our subsurface exploration. A water well owned by the Mojave Water Agency located southeast of the site recorded a groundwater level of 218 feet below the ground surface in 2023 and the shallowest level of 170 feet below the ground surface in 1962. The Ninyo and Moore report stated that they encountered shallow groundwater in the eastern portion of their study area near Harper Lake and at the Alpha and Beta power block at depths of 27 to 33 feet. They reported that groundwater as most likely perched layers. Groundwater levels may fluctuate seasonally and based upon recent climatic conditions but the static groundwater level at the site is most likely on the order of more than 100 feet. Since groundwater was not encountered in our borings, we would not anticipate groundwater during excavations for the poler poles.

2.05 Faults

The site is not located within the boundaries of an Earthquake Fault Zone for fault-rupture hazard as defined by the Alquist-Priolo Earthquake Fault Zoning Act and no faults are known to pass through the property. The nearest Earthquake Fault Zone is located about 1 mile to the southwest of the site along the Lockhart fault.

The accompanying Regional Fault Map (Figure 4) illustrates the location of the site with respect to major faults in the region. The distance to notable faults within 100 kilometers of the site is presented on Table 1.

2.06 Historic Seismicity

The nearest historic strong earthquake was epicentered within about 47 miles from the site. It was the 6.4 magnitude Manix Earthquake that occurred in 1947 on the Manix Fault. Historic strong earthquakes in the southern California region are summarized in Table 2.

Strong earthquakes that have occurred in this region in historic time and their approximate epicentral distances are summarized in Table 2.

2.07 Flooding Potential

According to the Federal Emergency Management Agency (F.I.R.M. Map No. 006071C3250H, dated August 28, 2008) the site is located in an area that has not been evaluated for flood hazards. The project site is located over 30 feet higher than the elevation of Harper Lake, no natural drainages project to ward the alignment and the presence of the storm water basin along the south side of the alignment flooding is not expected to be a hazard at the project.

Control of surface runoff originating from within and outside of the site should, of course, be included in the design of the project.

2.08 Landslides

Due to the low gradient of the site and surrounding area, landsliding is not a hazard at this property.

3.00 Conclusions and Recommendations

3.01 General Conclusion

Based on specific data and information contained in this report, our understanding of the project and our general experience in engineering geology and geotechnical engineering, it is our professional judgment that the proposed development is geologically and geotechnically feasible. This is provided that the recommendations presented below are fully implemented during design, grading and construction.

3.02 General Earthwork and Grading

All grading should be performed in accordance with the General Earthwork and Grading Specifications outlined in Appendix C, unless specifically revised or amended below. Recommendations contained in Appendix C are general specifications for typical grading projects and may not be entirely applicable to this project.

It is also recommended that all earthwork and grading be performed in accordance with Appendix J of the 2022 California Building Code and all applicable governmental agency requirements. In the event of conflicts between this report and Appendix J, this report shall govern.

3.03 Earthwork Shrinkage and Subsidence

Shrinkage is the decrease in volume of soil upon removal and recompaction expressed as a percentage of the original in-place volume. Subsidence occurs as natural ground is densified to receive fill. These factors account for changes in earth volumes that will occur during grading. Our estimates are as follows:

- Shrinkage factor = 5% - 10% for soil removed and replaced as compacted fill.
- Subsidence factor = 0.10 foot.

The degree to which fill soils are compacted and variations in the insitu density of existing soils will influence earth volume changes. Consequently, some adjustments in grades near the completion of grading could be required to balance the earthwork.

3.04 Removals and Overexcavation

All vegetation, trash and debris should be cleared from the grading area and removed from the site. Prior to placement of compacted fills, all non-engineered fills and loose, porous, or compressible soils will need to be removed down to competent ground. Removal and requirements will also apply to cut areas, if the depth of cut is not sufficient to reach competent ground. Removed and/or overexcavated soils may be moisture-conditioned and recompacted as engineered fill, except for soils containing detrimental amounts of organic material. Estimated depths of removals are as follows:

- All shallow footing areas, both continuous and spread, shall be undercut, moistened, and compacted as necessary to produce soils compacted to a minimum of 90% relative compaction to a depth equal to the width of the footing below the bottom of the footing or to a depth of 3 feet below the bottom of the footing, whichever is less. Footing areas shall be defined as the area extending from the edge of the footing for a distance of 5 feet.

- Overexcavation will not be required for the pole foundations.

The exposed soils beneath all overexcavation should be scarified an additional 12 inches, moisture conditioned and compacted to a minimum of 90% relative compaction.

The above recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. Hence, overexcavation depths must be verified, and adjusted if necessary, at the time of grading. The overexcavated materials may be moisture-conditioned and re-compacted as engineered fill.

3.05 Rippability and Rock Disposal

Our exploratory borings were advanced without difficulty and no oversize materials were encountered in our subsurface investigation. Accordingly we expect that all earth materials will be rippable with conventional heavy duty grading equipment and oversized materials are not expected.

3.06 Subdrains

Groundwater and surface water were not encountered during the course of our investigation, the proposed grading is will not fill any large canyons and the underlying soils are fairly permeable. Consequently, installation of canyon subdrains is not expected to be necessary.

3.07 Permanent Fill and Cut Slopes

Fill and cut slopes constructed at inclinations of 2 horizontal to 1 vertical or flatter are expected to be grossly and surficially stable. This is provided that fill slopes are properly keyed and compacted, as indicated in Appendix C, and cut slopes expose competent native soils. Cut and fill slope stability should be further reviewed upon development of a grading plan.

3.08 Faulting

Since the site is not located within the boundaries of an Earthquake Fault Zone and no faults are known to pass through the property, surface fault rupture within the site is considered unlikely.

3.09 Seismic Design Parameters

The potential damaging effects of regional earthquake activity must be considered in the design of structures.

Mapped Design Parameters

Mapped seismic design parameters have been developed in accordance with Section 1613A of the 2022 California Building Code (CBC) using the online ACE 7 Hazard Tool (ASCE 7-16 Standard), a site location based on latitude and longitude, and site characterization as Site Class D based on our preliminary geotechnical investigation.

The parameters generated for the subject site are presented below:

2022 California Building Code Seismic Parameters

Parameter	Value
Site Location	Latitude = 35.011818 degrees Longitude = -117.339373 degrees
Site Class	Site Class = D Soil Profile Name = Stiff soil
Mapped Spectral Accelerations (Site Class B)	S_s (0.2- second period) = 1.097g S_1 (1-second period) = 0.409g
Site Coefficients (Site Class D)	F_a = 1.061 F_v = 1.60
Risk-Targeted Maximum Considered Earthquake Spectral Accelerations (Site Class D)	S_{MS} (short, 0.2- second period) = 1.164g S_{M1} (1-second period) = 0.982g*
Risk-Targeted Design Earthquake Spectral Accelerations (Site Class D)	S_{DS} (short, 0.2- second period) = 0.776g S_{D1} (1-second period) = 0.654g*

*The values for S_{M1} and S_{D1} in the table above are calculated based upon Section 11.4.8 Exception 3 as revised by ASCE 7-16 Supplement 3 where S_{M1} is determined by Equation 11.4-2 and is increased by 50%.

The above table shows that the mapped spectral response acceleration parameter a 1-second period (S_{DS}) > 0.5g. Therefore, for the Seismic Design Category is D for all Risk Categories (CBC Section 1613A.5.6). Consequently, as required for Seismic Design Categories D through F by CBC Section 1803A.5.12, lateral pressures for earthquake ground motions, liquefaction and soil strength loss have been evaluated (see Sections 3.10 and 3.16).

Peak earthquake ground acceleration adjusted for site class effects (PGA_M) has been determine in accordance with ASCE 7-10 Section 11.8.3 as follows: $PGA_M = F_{PGA} \times PGA = 1.121 \times 0.479g = 0.537g$.

3.10 Liquefaction and Secondary Earthquake Hazards

Potential secondary seismic hazards that can affect land development projects include liquefaction, tsunamis, seiches, seismically induced settlement, seismically induced flooding and seismically induced landsliding.

Liquefaction

Liquefaction is a phenomenon where earthquake-induced ground motions increase the pore pressure in saturated, sand-like soils until it is equal to the confining, overburden pressure. When this occurs, the soil can completely lose its shear strength and enter a liquefied state. The possibility of liquefaction is dependent upon grain size, relative density, confining pressure, saturation of the soils, and intensity and duration of ground motion. In order for liquefaction to occur, three criteria must be met: underlying loose, sand-like soils, a groundwater depth of less than about 50 feet, and a potential for seismic shaking from nearby large-magnitude earthquake.

As ground water table was not expected in the upper 50 ft and per Section 2.04 above, the ground water table may be much deeper, liquefaction at the site is unlikely to occur and hence it is not a design concern.

Tsunamis and Seiches

Tsunamis are sea waves that are generated in response to large-magnitude earthquakes. When these waves reach shorelines, they sometimes produce coastal flooding. Seiches are the oscillation of large bodies of standing water, such as lakes, that can occur in response to ground shaking. Tsunamis and seiches do not pose hazards due to the inland location of the site and lack of nearby bodies of standing water.

Seismically Induced Settlement

Seismically induced settlement occurs most frequently in areas underlain by loose, granular sediments. Damage as a result of seismically induced settlement is most dramatic when differential settlement occurs in areas with large variations in the thickness of underlying sediments. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement.

Seismic settlement was evaluated for the Design Earthquake event using an empirical method developed by Tokimatsu and Seed (1987) based on site-specific SPT blow count and grain size data obtained from our borings. We estimate less than 0.25-inch of total seismically induced ground settlement may occur at the site when subjected to a Design Earthquake event (see calculations in Appendix D). In our opinion, differential seismic settlement may be taken as one-half of the computed total seismic settlement over 30 feet. Calculations of seismically induced settlements are presented in Appendix D.

Seismically Induced Flooding

According to County of San Bernardino General Plan (2007), the site is not located in the potential inundation area of a dam.

Seismically Induced Landsliding

Due to the low gradient of the site, the potential for seismically induced landsliding is nil. This assumes that any slopes created during development of the site will be properly designed and constructed. It should be noted that the California Geological Survey has not yet prepared a Seismic Hazard Zone Map of potential earthquake-induced landslide hazards for the quadrangle in which the site is located.

3.11 Foundations

Isolated spread footings and/or continuous wall footings are recommended to support the proposed structures. If the recommendations in the section on grading are followed and footings are established in firm native soils or compacted fill materials, footings may be designed using the following allowable soil bearing values:

- Continuous Wall Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 12 inches below the lowest adjacent grade have allowable bearing capacity of 2,000 pounds per square foot (psf). This value may be increased by 10% for each additional foot of width and/or depth to a maximum value of 3,500 psf.

- Isolated Spread Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 12 inches below the lowest adjacent grade have allowable bearing capacity of 2,000 psf. This value may be increased by 10% for each additional foot of width or depth to a maximum value of 3,500 psf.

- Retaining Wall Footings:

  Footings for retaining walls should be founded a minimum depth of 12 inches and have a minimum width of 12 inches. Footings may be designed using the allowable bearing capacity and lateral resistance values recommended for building footings. However, when calculating passive resistance, the upper 6 inches of the footings should be ignored in areas where the footings will not be covered with concrete flatwork. This value may also be increased by 10% for each additional foot of width or depth to a maximum value of 3,000 psf. Reinforcement should be provided for structural considerations as determined by the design engineer.

- Equipment Footings:

  Footings for equipment pads should be founded a minimum depth of 12 inches and have a minimum width of 12 inches. Footings may be designed using the allowable bearing capacity and lateral resistance values recommended for building footings. This value may also be increased by 10% for each additional foot of width or depth to a maximum value of 3,500 psf. Reinforcement should be provided for structural considerations as determined by the design engineer.

Cast in Drilled Hole (CIDH) Pile and Pole Foundation Design

Our analysis and recommendations for cast-in-drilled-holes (CIDH) are provided below.

Axial Capacity Calculations

The axial load bearing capacity of the proposed CIDH piles was calculated based on the procedures outlined in the FHWA Design (1988) and Reese and O'Neill (1999) as implemented in the commercially available computer program SHAFT 2017.8.9 (Ensoft 2017). Appendix B presents allowable total axial capacity for 48- and 60-inch diameter piles extending to up to 25 feet in depth. The single-pile axial capacity presented represents the allowable capacity and includes a factor of safety of 2.0. Vertical uplift capacity and settlement of individual piles versus loads are also presented in Appendix B.

Appendix B shows the results and details of all soil properties, pile properties and results of the axial capacity analysis.

Lateral Capacity

Lateral capacity of the proposed CIDH piles was evaluated using the commercially available computer program LPile (Ensoft 2020). The evaluation was performed for 48– and 60-inch diameter (D) piles (with anticipated embedment depth of up to 20 feet). Appendix C presents deflections, bending moments and shear forces calculated for each of the aforementioned diameter and for fixed and pin pile head conditions. These analyses were performed for maximum pile top deflections (Y_{max}) of:

- Pinned head: 0.1" (Load Case 1), 0.2" (Load Case 2) and 0.5" (Load Case 3).
- Fixed head: 0.1" (Load Case 4), 0.2" (Load Case 5) and 0.5" (Load Case 6).

Axial load of 0 kips was assumed while performing the LPILE analyses. In running the analyses, f'c of 4,000psi for the concrete was assumed. Reinforcement of 12 bars #11 and #14 for 48" and 60" diameter CIDH, respectively. The rebars were assumed to achieve the typical minimum reinforcement. The SEOR is to check if the CIDH can structurally carry the anticipated loads. It is worth noting that LPILE showed that there is loss in EI (i.e., section cracked). The SEOR is to review these results to confirm it is acceptable from a structural standpoint.

Due to the relatively short pile embedment with respect to its diameter. The CIDH appear to be behaving as short piles since deflected shape nearly show a rigid body rotation. The SEOR is to confirm that the deflected shape and rotations presented in Appendix C are acceptable.

If the distance between the centerline of the piles is less than 8-times the CIDH diameter, a group efficiency factor will need to be applied to the group lateral capacity (CBC section 1810.2.5). We recommend the use of p-multipliers as presented in the table below (Table from California Amendments to AASHTO LRFD Bridge Specifications – 8th Edition).

Appendix C shows the results of the lateral capacity analysis.

3.12 Foundation Setbacks from Slopes

Setbacks for footings adjacent to slopes should conform to the requirements of the California Building Code. Specifically, footings should maintain a horizontal distance or setback between any adjacent slope face and the bottom outer edge of the footing.

For slopes descending away from the foundation, the horizontal distance may be calculated by using h/3, where h is the height of the slope. The horizontal setback should not be less than 5 feet, nor need not be greater than 40 feet per the California Building Code. Where structures encroach within the zone of h/3 from the top of the slope the setback may be maintained by deepening the foundations. Flatwork and utilities within the zone of h/3 from the top of slope may be subject to lateral distortion caused by gradual downslope creep. Walls, fences and landscaping improvements constructed at the top of descending slopes should be designed with consideration of the potential for gradual downslope creep.

For ascending slopes, the horizontal setback required may be calculated by using h/2 where h is the height of the slope. The horizontal setback need not be greater than 15 feet per the California Building Code.

3.13 Slabs on Grade

We recommend the use of unreinforced slabs on grade for structures. These floor slabs should have a minimum thickness of 4 inches and should be divided into squares or rectangles using weakened plane joints (contraction joints), each with maximum dimensions not exceeding 15 feet. Contraction joints should be made in accordance with American Concrete Institute (ACI) guidelines. If weakened plane joints are not used, then the slabs shall be reinforced with at a minimum 6x6-10/10 welded wire fabric placed at mid-height of the slab. The project structural engineer may require additional reinforcement.

If heavy concentrated or moving loads are anticipated, slabs should be designed using a modulus of subgrade reaction (k) of 150psi/in when soils are prepared in conformance with the grading recommendations contained within the report.

Special care should be taken on floors slabs to be covered with thin-set tile or other inflexible coverings. These areas may be reinforced with 6x6-10/10 welded wire fabric placed at mid-height of the slab, to mitigate drying shrinkage cracks. Alternatively, inflexible flooring may be installed with unbonded fabric or liners to prevent reflection of slab cracks through the flooring.

A moisture vapor retarder/barrier is recommended beneath all slabs-on-grade that will be covered by moisture-sensitive flooring materials such as vinyl, linoleum, wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist. We recommend that design and construction of the vapor retarder or barrier conform to Section 1805 of the 2019 California Building Code (CBC) and pertinent sections of American Concrete Institute (ACI) guidance documents 302.1R-04, 302.2R-06 and 360R-10.

The moisture vapor retarder/barrier should consist of a minimum 10 mils thick polyethylene with a maximum perm rating of 0.3 in accordance with ASTM E 1745. Seams in the moisture vapor retarder/barrier should be overlapped no less than 6 inches or in accordance with the manufacturer's recommendations. Joints and penetrations should be sealed with the manufacturer's recommended adhesives, pressure-sensitive tape, or both. The contractor must avoid damaging or puncturing the vapor retarder/barrier and repair any punctures with additional polyethylene properly lapped and sealed.

ACI guidelines allow for the placement of moisture vapor retarder/barriers either directly beneath floor slabs or below an intermediate granular soil layer.

Placing the moisture retarder/barrier directly beneath the floor slab will provide improved curing of the slab bottom and will eliminate potential problems caused by water being trapped in a granular fill layer. Concrete slabs poured directly on a vapor retarder/barrier can experience shrinkage cracking and curling due to differential rates of curing through the thickness of the slab. Therefore, for concrete placed directly on the vapor retarded, we recommend a maximum water cement ratio of 0.45 and the use of water-reducing admixtures to increase workability and decrease bleeding.

If granular soil is placed over the vapor retarder/barrier, we recommend that the layer be at least 2 inches thick in accordance with traditional practice in southern California. Granular fill should consist of clean fine graded materials with 10 to 30% passing the No. 100 sieve and free from clay or silt. The granular layer should be uniformly compacted and trimmed to provide the full design thickness of the proposed slab. The granular fill layer should not be left exposed to rain or other sources of water such as wet-grinding, power washing, pipe leaks or other processes, and should be dry at the time of concrete placement. Granular fill layers that become saturated should be removed and replaced prior to concrete placement.

An additional layer of sand may be placed beneath the vapor retarder/barrier at the developer's discretion to minimize the potential of the retarder/barrier being punctured by underlying soils.

3.14 Miscellaneous Concrete Flatwork

Miscellaneous concrete flatwork and walkways may be designed with a minimum thickness of 4 inches. Large slabs should be reinforced with a minimum of 6x6-10/10 welded wire mesh placed at mid-height in the slab. Control joints should be constructed to create squares or rectangles with a maximum spacing of 15 feet.

Walkways may be constructed without reinforcement. Walkways should be separated from foundations with a thick expansion joint filler. Control joints should be constructed into non-reinforced walkways at a maximum of 5 feet spacing.

The subgrade soils beneath all miscellaneous concrete flatwork should be compacted to a minimum of 90 percent relative compaction for a minimum depth of 12 inches. The geotechnical engineer should monitor the compaction of the subgrade soils and perform testing to verify that proper compaction has been obtained.

3.15 Footing Excavation and Slab Preparations

All footing excavations should be observed by the geotechnical consultant to verify that they have been excavated into competent soils. The foundation excavations should be observed prior to the placement of forms, reinforcement steel, or concrete. These excavations should be evenly trimmed and level. Prior to concrete placement, any loose or soft soils should be removed. Excavated soils should not be placed on slab or footing areas unless properly compacted.

Prior to the placement of the moisture barrier and sand, the subgrade soils underlying the slab should be observed by the geotechnical consultant to verify that all under-slab utility trenches have been properly backfilled and compacted, that no loose or soft soils are present, and that the slab subgrade has been properly compacted to a minimum of 90 percent relative compaction within the upper 12 inches.

Footings may experience and overall loss in bearing capacity or an increased potential to settle where located in close proximity to existing or future utility trenches. Furthermore, stresses imposed by the footings on the utility lines may cause cracking, collapse and/or a loss of serviceability. To reduce this risk, footings should extend below a 1:1 plane projected upward from the closest bottom of the trench.

Slabs on grade and walkways should be brought to a minimum of 2% and a maximum of 6% above their optimum moisture content for a depth of 18 inches prior to the placement of concrete. The geotechnical consultant should perform insitu moisture tests to verify that the appropriate moisture content has been achieved a maximum of 24 hours prior to the placement of concrete or moisture barriers.

3.16 Lateral Load Resistance

Lateral loads may be resisted by soil friction and the passive resistance of the soil. The following parameters are recommended.

- Passive Earth Pressure = 430 pcf (equivalent fluid weight).
- Coefficient of Friction (soil to footing) = 0.41
- Retaining structures should be designed to resist the following lateral active earth pressures:

Surface Slope of Retained Materials (Horizontal:Vertical)	Equivalent Fluid Weight (pcf)
Level	38
5:1	40
4:1	41
3:1	44
2:1	56

These active earth pressures are only applicable if the retained earth is allowed to strain sufficiently to achieve the active state. The required minimum horizontal strain to achieve the active state is approximately 0.0025H. Retaining structures should be designed to resist an at-rest lateral earth pressure if this horizontal strain cannot be achieved.

- At-rest Lateral Earth Pressure = 58 pcf (equivalent fluid weight)

The Mononobe-Okabe method is commonly utilized for calculating seismically induced active and passive lateral earth pressures and is based on the limit equilibrium Coulomb theory for static stress conditions. This method entails three fundamental assumptions (e.g., Seed and Whitman, 1970): Wall movement is sufficient to ensure either active or passive conditions, the driving soil wedge inducing the lateral earth pressures is formed by a planar failure surface starting at the heel of the wall and extending to the free surface of the backfill, and the driving soil wedge and the retaining structure act as rigid bodies, and therefore, experiences uniform accelerations throughout the respective bodies (U.S. Army Corps of Engineers, 2003, Engineering and Design - Stability Analysis of Concrete Structures).

- Seismic Lateral Earth Pressure = 17 pcf (equivalent fluid weight).

The seismic lateral earth pressure given above is a triangle increasing with depth, and the resultant of this pressure is an increment of force which should be applied to the back of the wall at 1/3 of the wall height from the wall base. The seismic increment of earth pressure should be added to the static active earth pressure. Even for the at-rest (Ko) condition, the seismic increment of earth pressure should be added to the static active earth pressure, not to the at-rest static earth pressure (SEAOC Seismology Committee 2019).

Per 2022 CBC Section 1803.5.12 dynamic seismic lateral earth pressures shall be applied to foundation walls and retaining walls supporting more than 6 feet of backfill. Dynamic seismic lateral earth pressures may also be applied to shorter walls at the discretion of the structural engineer.

3.17 Drainage and Moisture Proofing

Surface drainage should be directed away from the proposed structures into suitable drainage devices. Excess rainwater should be allowed to collect or pond against building foundations or within low-lying or level areas of the lot. Surface waters should be diverted away from the tops of slopes and prevented from draining over the top of slopes and down the slope face.

Walls and portions thereof that retain soil and enclose interior spaces and floors below grade should be waterproofed and dampproofed in accordance with CBC Section 1805.

Retaining structures should be drained to prevent the accumulation of subsurface water behind the walls. Backdrains should be installed behind all retaining walls exceeding 3 feet in height. A typical detail for retaining wall back drains is presented in Appendix C. All backdrains should be outlet to suitable drainage devices. Retaining wall less than 3 feet in height should be provided with backdrains or weep holes. Dampproofing and/or waterproofing should also be provided on all retaining walls exceeding 3 feet in height.

3.18 Cement Type and Corrosion Potential

Based upon prior corrosion analysis at the site included in the Ninyo and Moore report, soluble sulfate tests range from 0.002 to 0.011 percent by weight indicate that concrete at the subject site will have a negligible to moderate exposure to water-soluble sulfate in the soil. Our recommendations for concrete exposed to sulfate-containing soils are presented in the table below.

Recommendations for Concrete exposed to Sulfate-containing Soils

Sulfate Exposure	Water Soluble Sulfate (SO_4) in Soil (% by Weight)	Sulfate (SO_4) in Water (ppm)	Cement Type (ASTM C150)	Maximum Water-Cement Ratio (by Weight)	Minimum Compressive Strength (psi)
Negligible	0.00 - 0.10	0-150	--	--	2,500
Moderate	0.10 - 0.20	150-1,500	II	0.50	4,000
Severe	0.20 - 2.00	1,500-10,000	V	0.45	4,500
Very Severe	Over 2.00	Over 10,000	V plus pozzolan or slag	0.45	4,500

Use of alternate combinations of cementitious materials may be permitted if the combinations meet design recommendations contained in American Concrete Institute guideline ACI 318-11.

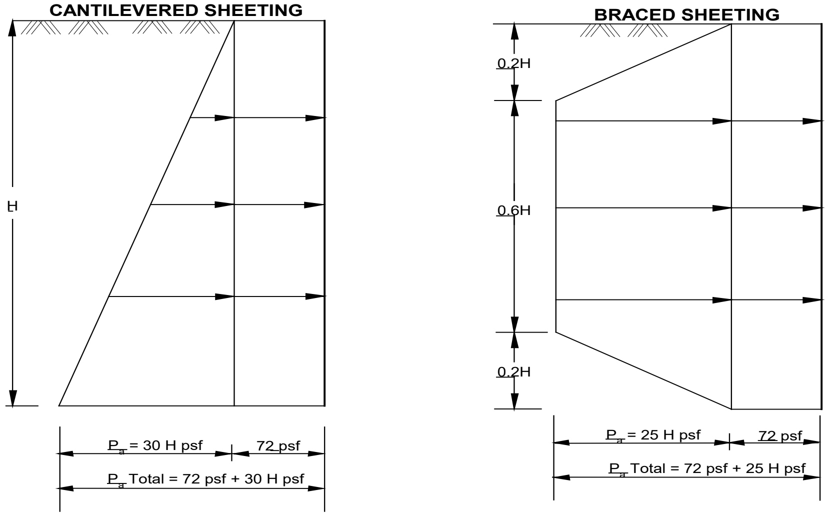
The soils were also tested for soil reactivity (pH), electrical resistivity (ohm-cm) and chloride content. The test results indicate that the on-site soils have a soil reactivity of 7.1 to 7.7, an electrical resistivity of 3,015 to 10,720 ohm-cm, and a chloride content of 25 to 380 ppm. Note that:

- A neutral or non-corrosive soil has a pH value ranging from 5.5 to 8.4.
- Generally, soils that could be considered moderately corrosive to ferrous metals have resistivity values of about 3,000 ohm-cm to 10,000 ohm-cm. Soils with resistivity values less than 3,000 ohm-cm can be considered corrosive and soils with resistivity values less than 1,000 ohm-cm can be considered extremely corrosive.
- Chloride contents of approximately 500 ppm or greater are generally considered corrosive.

Based on our analysis, it appears that the underlying onsite soils are non-corrosive to ferrous metals. Protection of buried pipes utilizing coatings on all underground pipes; clean backfills and a cathodic protection system can be effective in controlling corrosion. A qualified corrosion engineer may be consulted to further assess the corrosive properties of the soil.

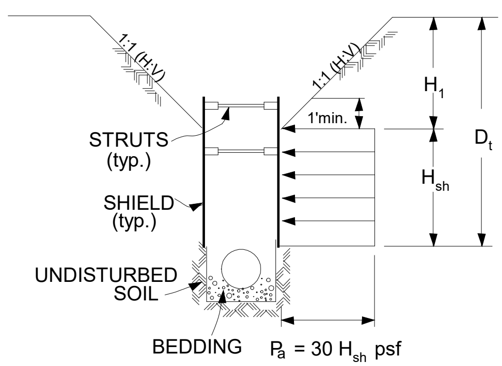
3.19 Temporary Slopes

Excavation of utility trenches will require either temporary sloped excavations or shoring. Temporary excavations in existing alluvial soils may be safely made at an inclination of 1:1 or flatter. If vertical sidewalls are required in excavations greater than 5 feet in depth, the use of cantilevered or braced shoring is recommended. Excavations less than 5 feet in depth may be constructed with vertical sidewalls without shoring or shielding. Our recommendations for lateral earth pressures to be used in the design of cantilevered and/or braced shoring are presented below. These values incorporate a uniform lateral pressure of 72 psf to provide for the normal construction loads imposed by vehicles, equipment, materials, and workmen on the surface adjacent to the trench excavation. However, if vehicles, equipment, materials, etc., are kept a minimum distance equal to the height of the excavation away from the edge of the excavation, this surcharge load need not be applied.



SHORING DESIGN: LATERAL SHORING PRESSURES

Design of the shield struts should be based on a value of 0.65 times the indicated pressure, Pa, for the approximate trench depth. The wales and sheeting can be designed for a value of 2/3 the design strut value.



HEIGHT OF SHIELD, H_{sh} = DEPTH OF TRENCH, D_t, MINUS DEPTH OF SLOPE, H_1

TYPICAL SHORING DETAIL

Placement of the shield may be made after the excavation is completed or driven down as the material is excavated from inside of the shield. If placed after the excavation, some overexcavation may be required to allow for the shield width and advancement of the shield. The shield may be placed at either the top or the bottom of the pipe zone. Due to the anticipated thinness of the shield walls, removal of the shield after construction should have negligible effects on the load factor of pipes. Shields may be successively placed with conventional trenching equipment.

Vehicles, equipment, materials, etc. should be set back away from the edge of temporary excavations a minimum distance of 15 feet from the top edge of the excavation. Surface waters should be diverted away from temporary excavations and prevented from draining over the top of the excavation and down the slope face. During periods of heavy rain, the slope face should be protected with sandbags to prevent drainage over the edge of the slope, and a visqueen liner placed on the slope face to prevent erosion of the slope face.

Periodic observations of the excavations should be made by the geotechnical consultant to verify that the soil conditions have not varied from those anticipated and to monitor the overall condition of the temporary excavations over time. If at any time during construction conditions are encountered which differ from those anticipated, the geotechnical consultant should be contacted and allowed to analyze the field conditions prior to commencing work within the excavation.

Cal/OSHA construction safety orders should be observed during all underground work.

3.20 Utility Trench Backfill

The onsite fill soils will not be suitable for use as pipe bedding for buried utilities. All pipes should be bedded in a sand, gravel or crushed aggregate imported material complying with the requirements of the Standard Specifications for Public Works Construction Section 306-1.2.1. Crushed rock products that do not contain appreciable fines should not be utilized as pipe bedding and/or backfill. Bedding materials should be densified to at least 90% relative compaction (ASTM D1557) by mechanical methods. The geotechnical consultant should review and approve of proposed bedding materials prior to use.

All utility trench backfill within street right of way, utility easements, under or adjacent to sidewalks, driveways, or building pads should be observed and tested by the geotechnical consultant to verify proper compaction. Trenches excavated adjacent to foundations should not extend within the footing influence zone defined as the area within a line projected at a 1:1 drawn from the bottom edge of the footing. Trenches crossing perpendicular to foundations should be excavated and backfilled prior to the construction of the foundations. The excavations should be backfilled in the presence of the geotechnical engineer and tested to verify adequate compaction beneath the proposed footing.

Cal/OSHA construction safety orders should be observed during all underground work.

3.21 Plan Review

Once a formal grading and foundation plans are prepared for the subject property, this office should review the plans from a geotechnical viewpoint, comment on changes from the plan used during preparation of this report and revise the recommendations of this report where necessary.

3.23 Geotechnical Observation and Testing During Construction

The geotechnical engineer should be contacted to provide observation and testing during the following stages of grading:

- During the clearing and grubbing of the site.
- During the demolition of any existing structures, buried utilities or other existing improvements.
- During excavation and overexcavation of compressible soils.
- During all phases of grading including ground preparation and filling operations.
- During trenching and backfilling operations of buried improvements and utilities to verify proper backfill and compaction of the utility trenches.
- After excavation and prior to placement of reinforcing steel or concrete within footing trenches to verify that footings are properly founded in competent materials.
- During fine or precise grading involving the placement of any fills underlying driveways, sidewalks, walkways, or other miscellaneous concrete flatwork to verify proper placement, mixing and compaction of fills.
- When any unusual conditions are encountered during construction.

4.00 Closure

The findings, conclusions and recommendations in this report were prepared in accordance with generally accepted engineering and geologic principles and practices. No other warranty, either expressed or implied, is made. This report has been prepared for Atlantica to be used solely for design purposes. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

The geotechnical and geologic consultant should be retained during the earthwork and foundation phases of construction to monitor compliance with the design concepts and recommendations and to provide additional recommendations as needed. Should subsurface conditions be encountered during construction that are different from those described in this report, this office should be notified immediately so that our recommendations may be re-evaluated.

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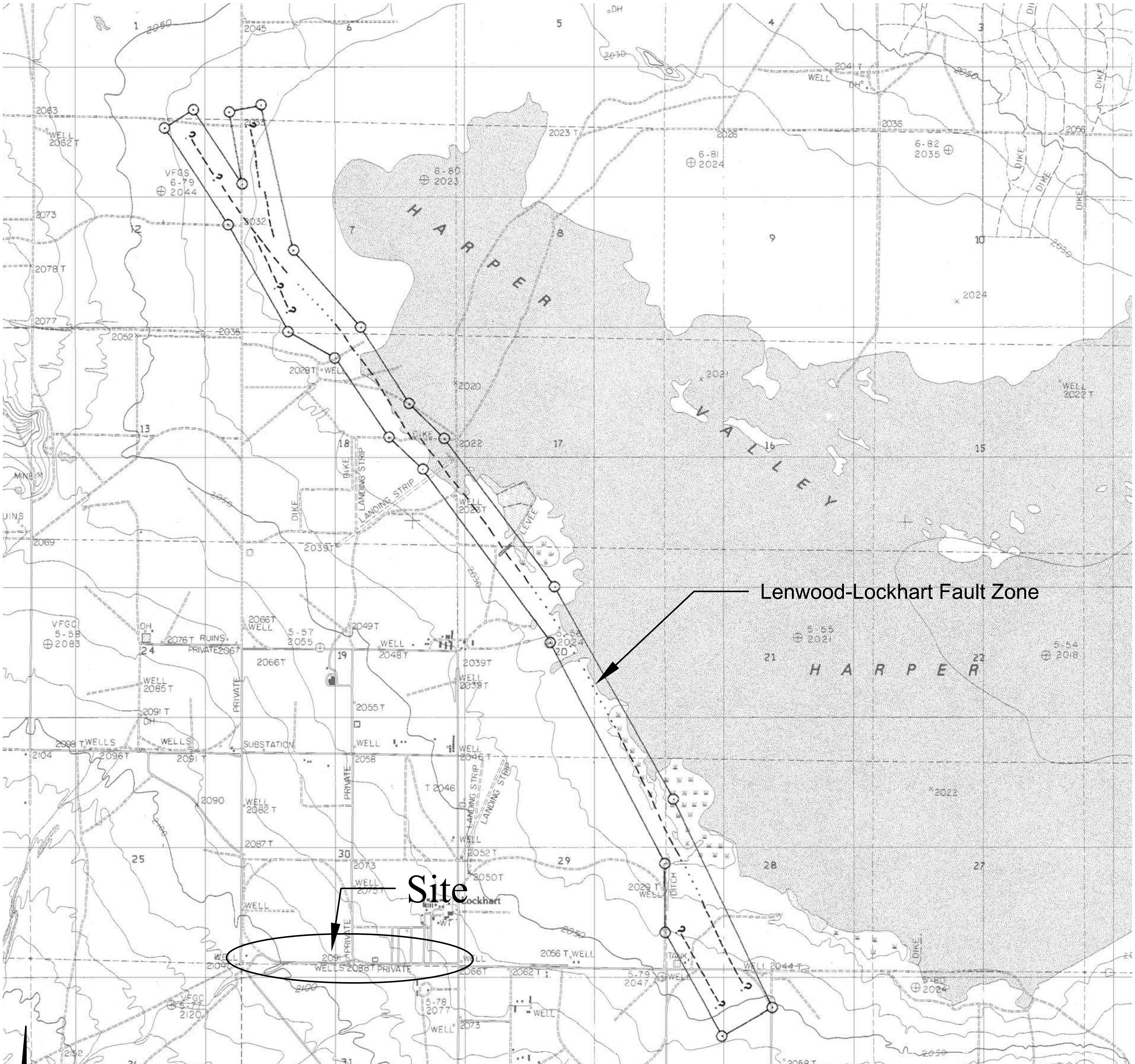
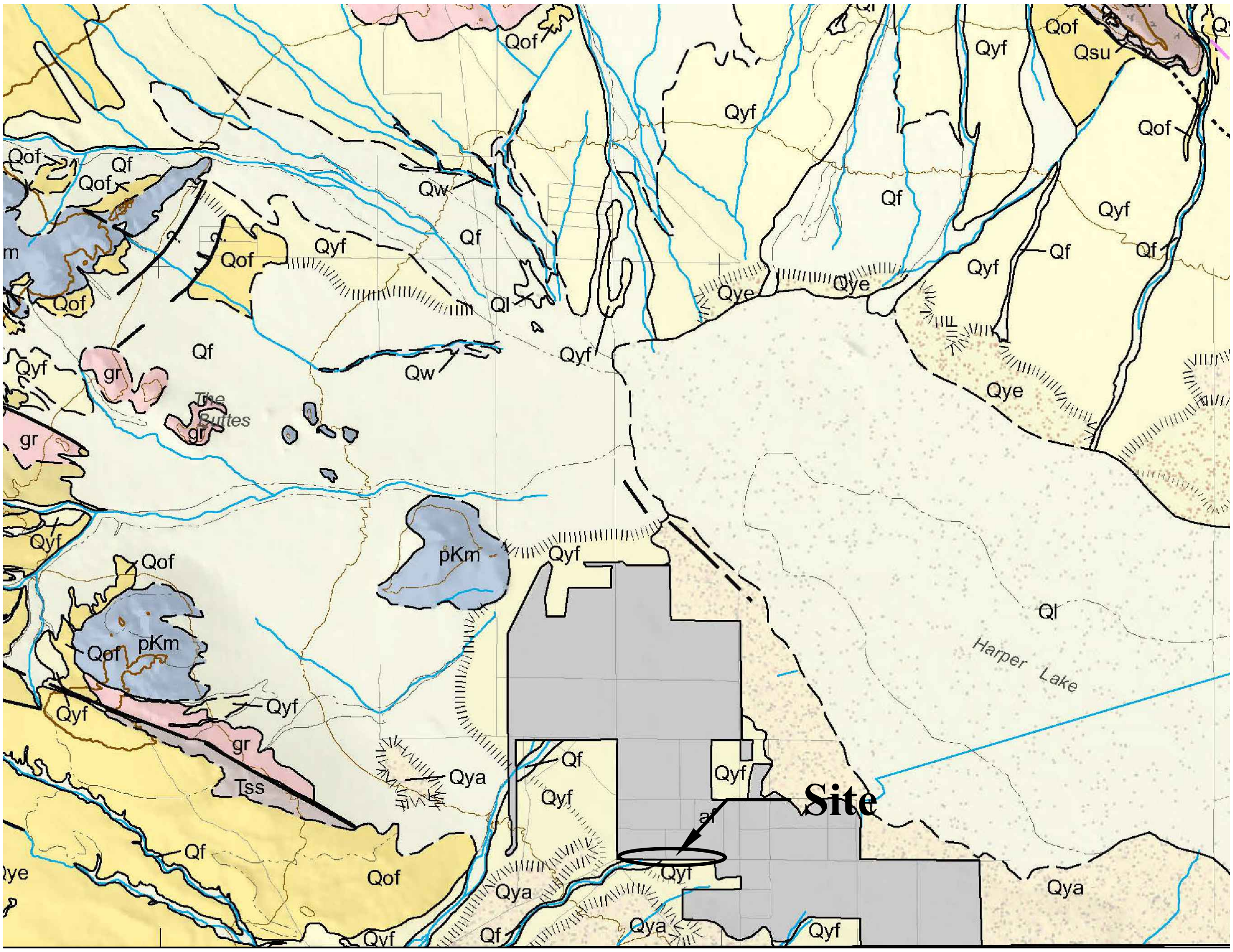
FIGURES AND TABLES



Site Location Map

Scale: 1"=4,000'

Base Map: CDMG, 1988, Special Studies Zones Map for the Lockhart 7.5-Minute Quadrangle



REGIONAL GEOLOGIC MAP

Partial Legend

Late Holocene
af- Artificial fill
Qf - Alluvial Fan Deposits
Holocene to Late PLeistocene
Qyf - Young Alluvial Fan Deposits
Qya - Young Alluvial Valley Deposits
Qf - Alluvial Fan Deposits
Late to Middle Pleistocene
Qof- Old Alluvial Fan Deposits
Mesozoic and Older (bedrock)
pKm- Metavolcanic and Metasedimentary Bedrock
gr - Granitic Bedrock

Scale: 1"= 5,000 feet

Source Map: Bedrossian, T.L., 2012, Geologic Compilation of Quaternary Surficial Deposits in Southern California Cuddleback Lake 30' X 60' Quadrangle, CGS Special Report 217, Plate 5.

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Boring Location Map

LEGEND

B-N - Boring Location

REGIONAL FAULT MAP
Scale: 1" ≈ 3 miles

Partial Legend

Red - Historic (Displacement in last 200 years)

Orange - Holocene fault displacement

Green - Late Quaternary fault displacement

Purple - Quaternary fault

Black - Pre-Quaternary fault

Base Map: California Geological Survey Fault Activity Map of California, 2010

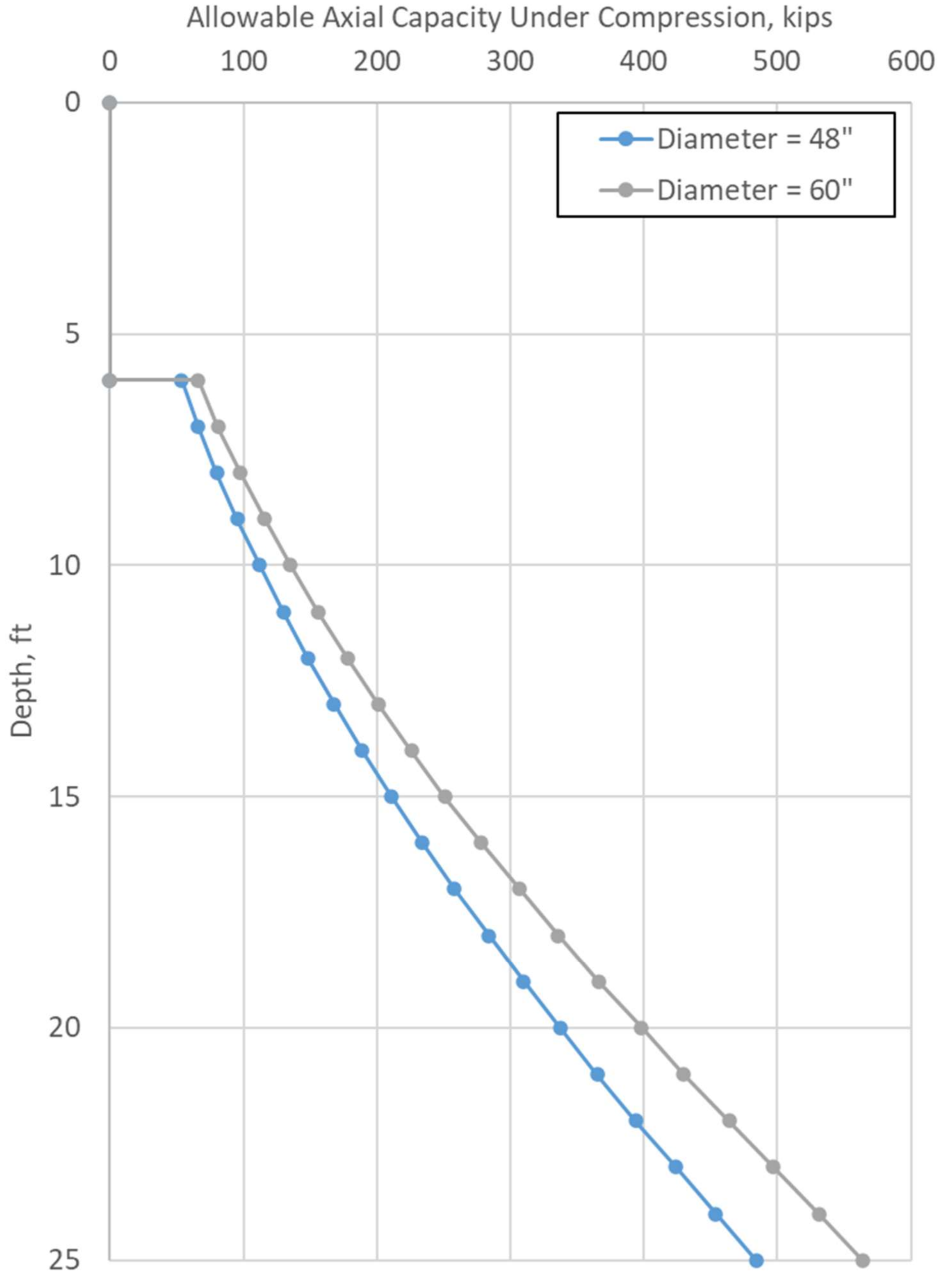

Figure B-1. Allowable Axial Capacity of a Single CIDH Under Compression

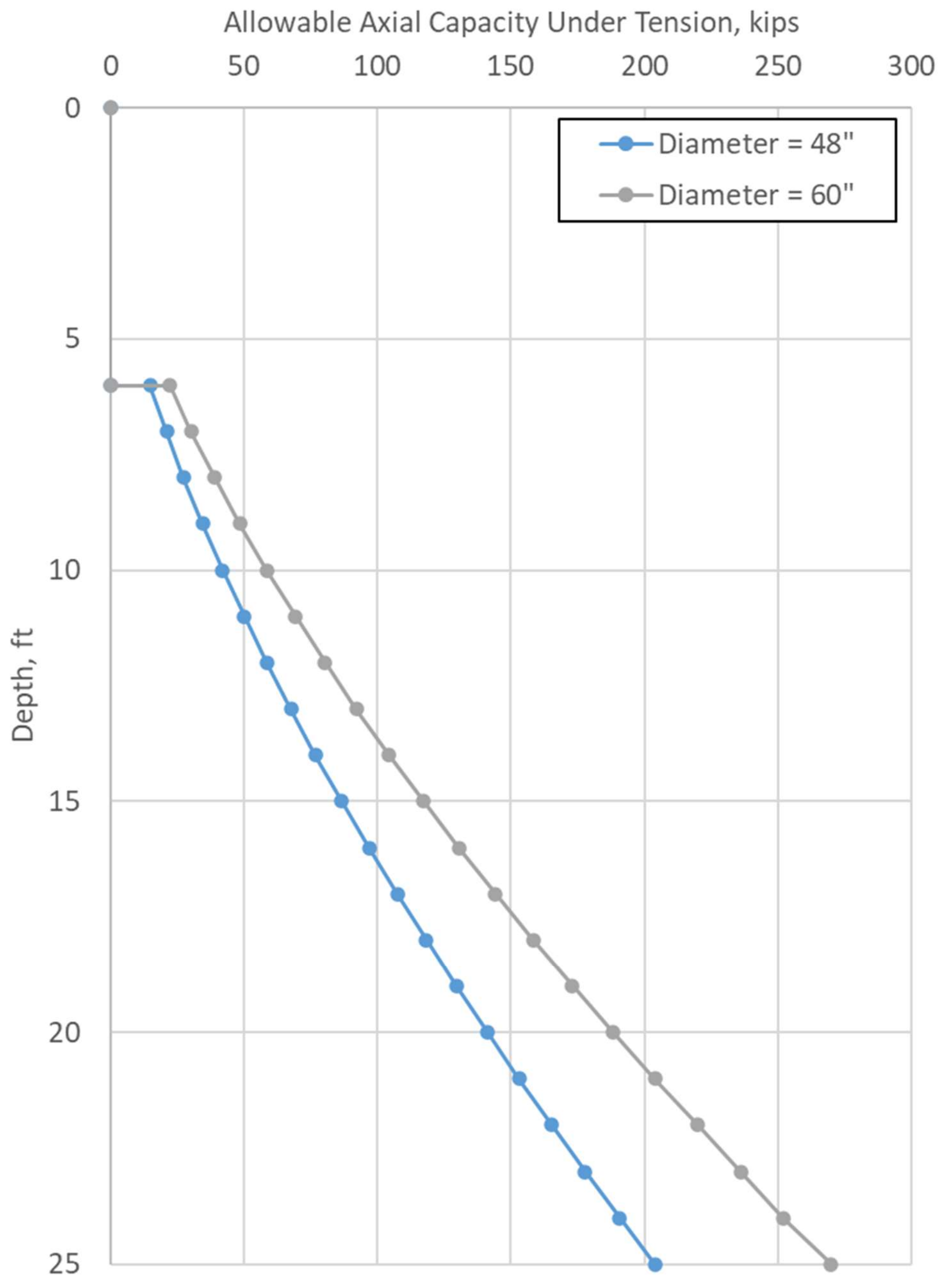

Figure B-2. Allowable Axial Capacity of a Single CIDH Under Uplift

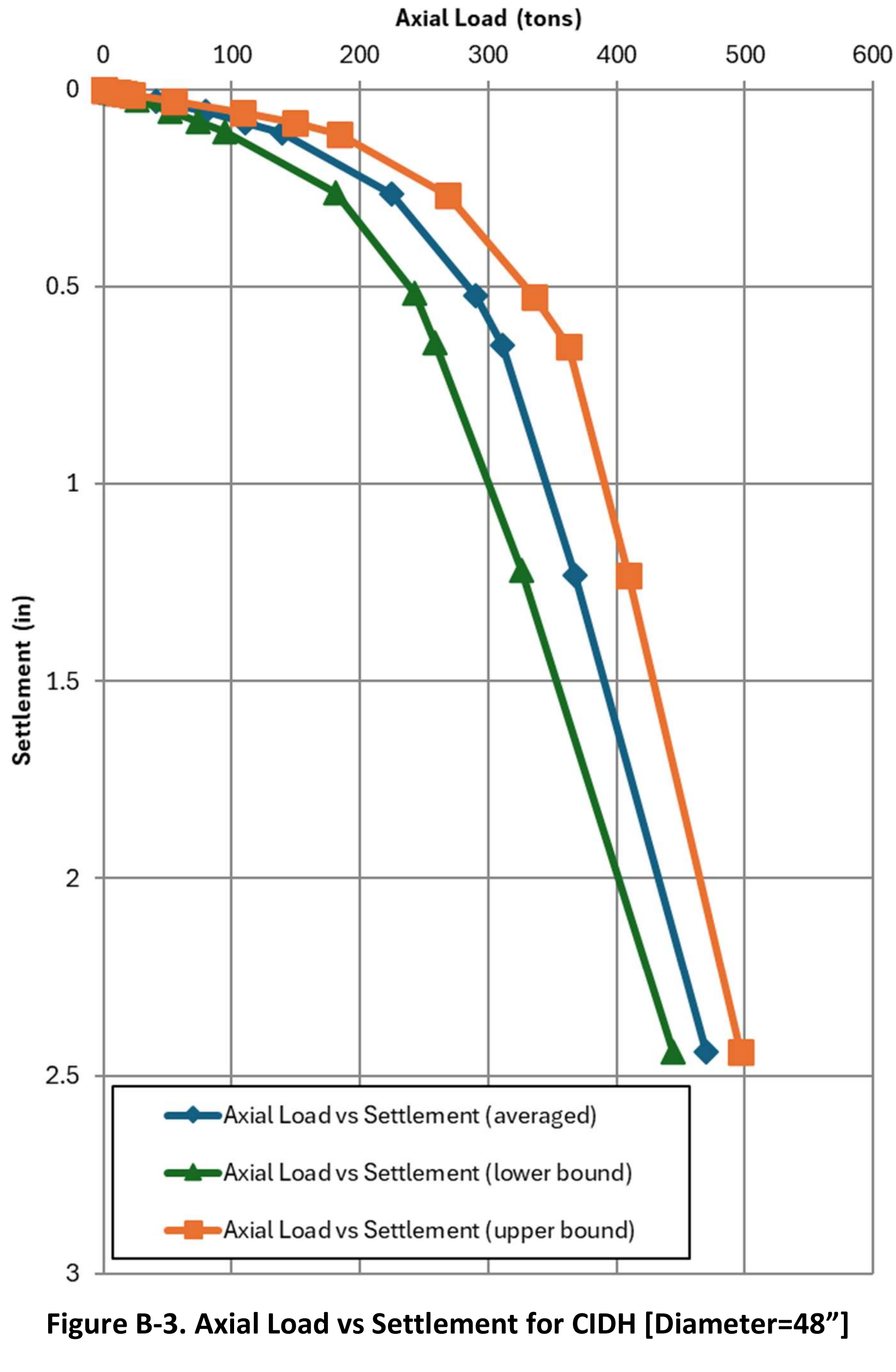

Figure B-3. Axial Load vs Settlement for CIDH [Diameter=48"]

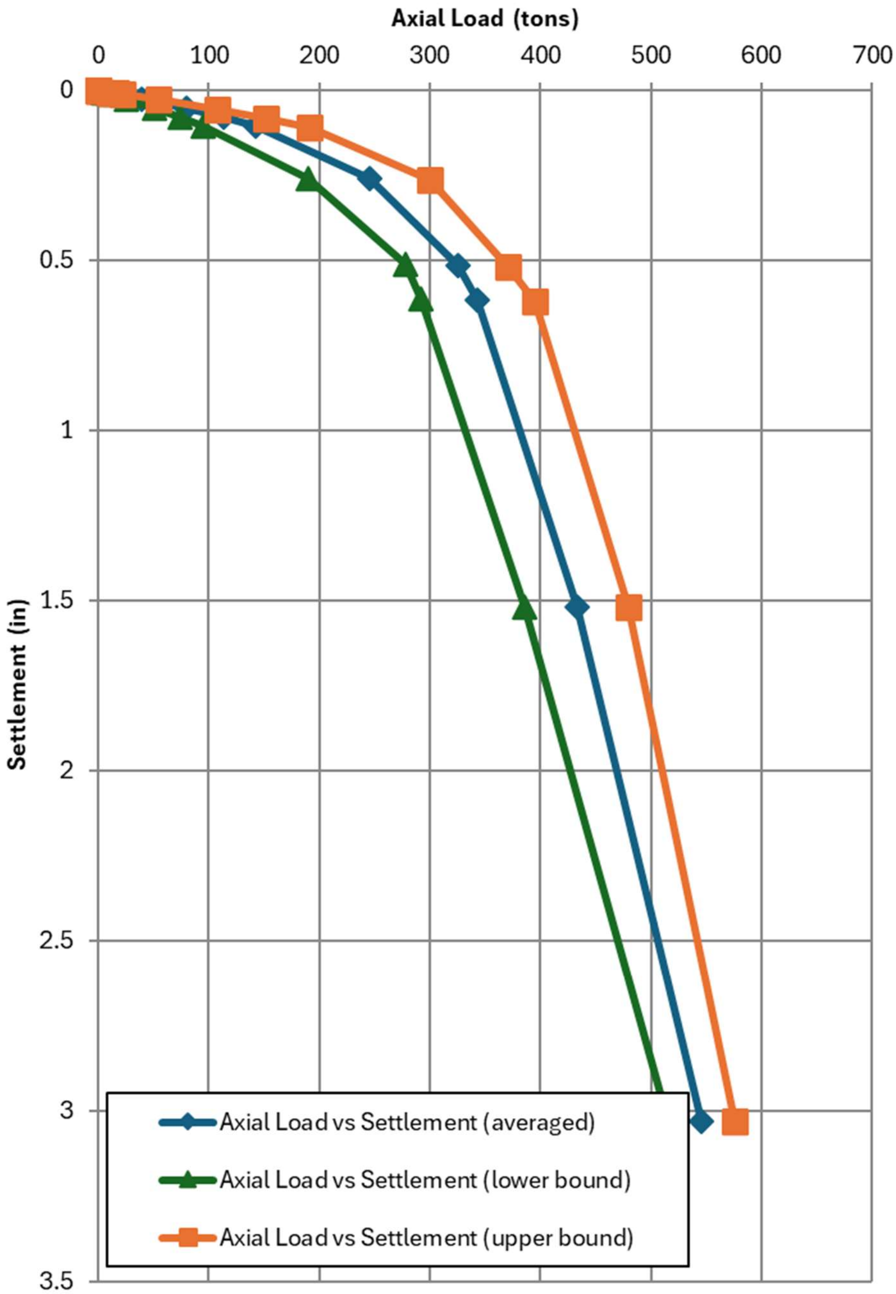

Figure B-4. Axial Load vs Settlement for CIDH [Diameter=60”]

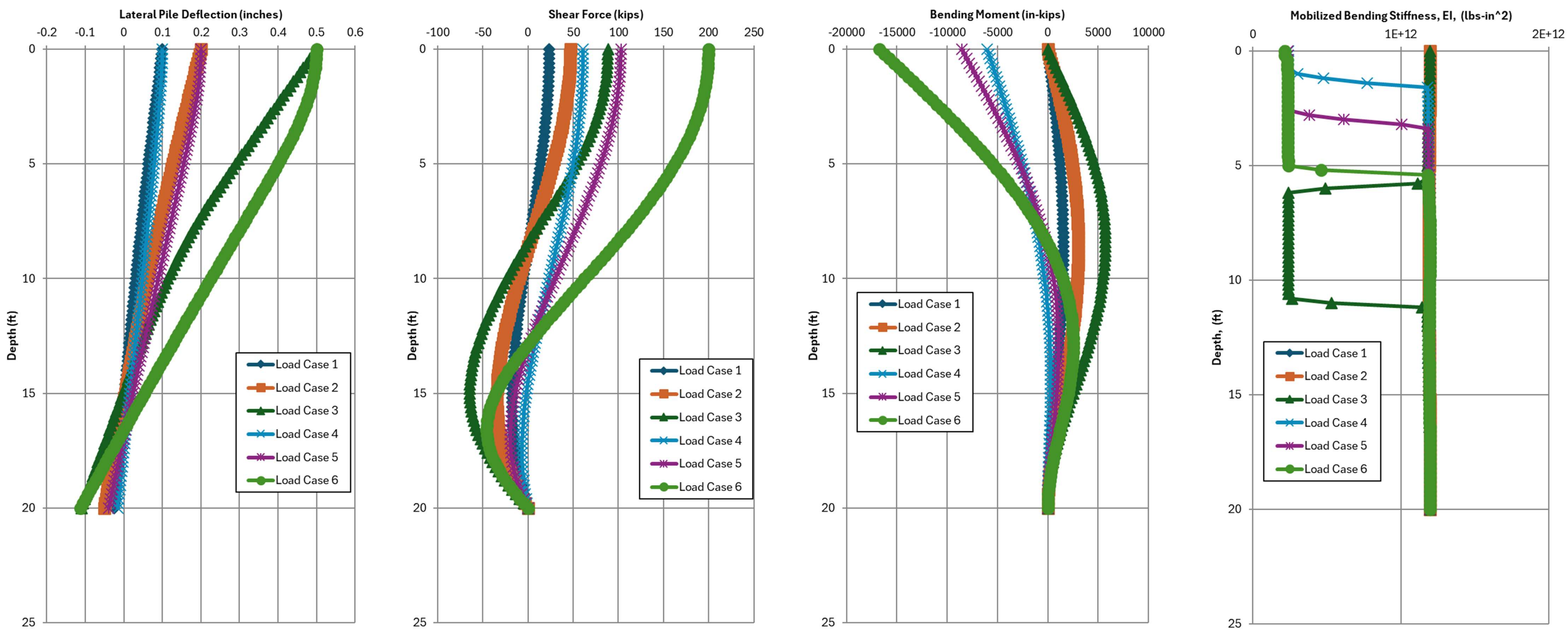

Figure C-1. LPILE Results [lateral displacements, shear, bending moment, and mobilized Bending Stiffness] for 48-in Diameter CIDH

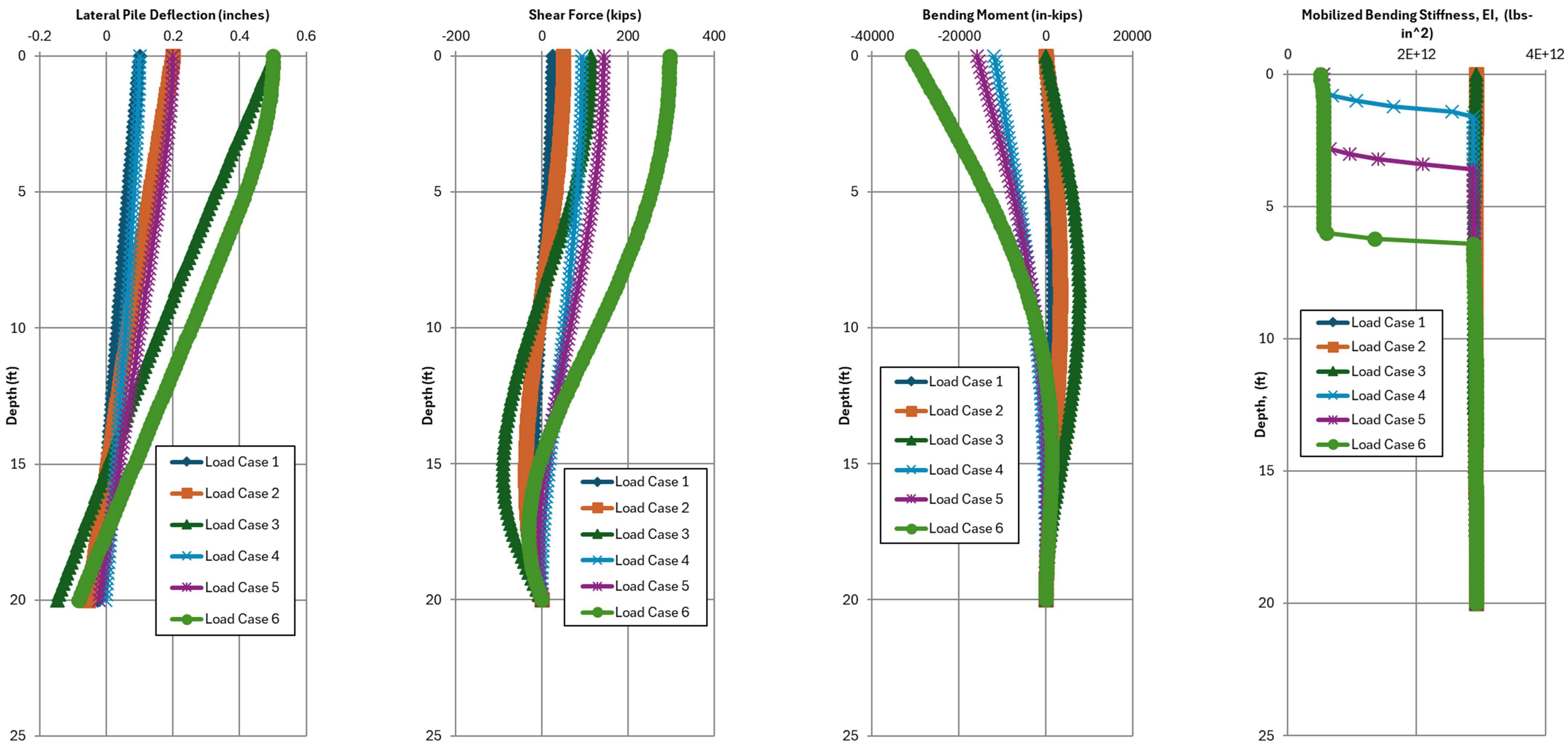

Figure C-2. LPILE Results [lateral displacements, shear, bending moment, and mobilized Bending Stiffness] for 60-in Diameter CIDH

Fault Zone & geometry	Distance (km)	Distance (mi.)	Maximum Moment Magnitude	Slip Rate (mm/yr)
Blackwater (rl-ss)	22	14	7.1	0.6
Calico-Hidalgo (rl-ss)	38	24	7.3	0.6
Clamshell-Sawpit (r)	97	60	6.5	0.5
Cleghorn (ll-ss)	79	49	6.5	3.0
Cucamonga (r)	93	58	6.9	5.0
Garlock (ss)	55	34	6.5	7.0
Gravel Hills-Harper (rl-ss)	14	9	7.1	0.6
Helendale - S Lockhart (rl-ss)	11	7	7.3	0.6
Johnson Valley (rl-ss)	77	48	6.7	0.6
Landers (rl-ss)	42	26	7.3	0.6
Little Lake (ss)	72	45	6.5	0.7
Lenwood-Lockhart - Old Woman Springs (rl-ss)	1.8	1	7.5	0.6
North Frontal - Western (r)	65	40	7.2	1.0
North Frontal - Eastern (r)	90	56	6.7	0.5
Panamint Valley (ss)	77	48	6.5	2.5
Pisgah-Bullion Mtn. - Mesquite Lake (rl-ss)	81	50	7.3	0.6
San Andreas (rl-ss)	77	48	7.5	24.0
San Jacinto - San Jacinto Valley (rl-ss)	82	51	6.9	12.0
South Sierra Nevada (n)	70	43	6.5	0.1
Tank Canyon (n)	70	43	6.4	1.0

Notes:

Fault geometry - (ss) strike slip, (r) reverse, (n) normal, (rl) right lateral, (ll) left lateral, (o) oblique

Fault and Seismic Data - USGS 2008 National Seismic Hazard Maps - Source Parameters

HISTORIC STRONG EARTHQUAKES IN SOUTHERN CALIFORNIA SINCE 1812

Date	Event	Causitive Fault	Magnitude	Epicentral Distance (miles)
Dec. 12, 1812	Wrightwood	San Andreas?	7.3	54
Jan. 9, 1857	Fort Tejon	San Andreas	7.9	220
Dec. 16, 1858	San Bernardino Area	uncertain	6.0	70
Feb. 9,1890	San Jacinto	uncertain	6.3	127
May 28, 1892	San Jacinto	uncertain	6.3	130
July 30, 1894	Lytle Creek	uncertain	6.0	52
July 22, 1899	Cajon Pass	uncertain	6.4	50
Dec.25, 1899	San Jacinto	San Jacinto	6.7	87
Sept. 20, 1907	San Bernardino Area	uncertain	5.3	58
May 15, 1910	Elsinore	Elsinore	6.0	91
April 21, 1918	Hemet	San Jacinto	6.8	90
July 23, 1923	San Bernardino	San Jacinto	6.0	70
March 11, 1933	Long Beach	Newport-Inglewood	6.4	99
April 10, 1947	Manix	Manix	6.4	47
Dec. 4, 1948	Desert Hot Springs	San Andreas or Banning	6.5	94
July 21, 1952	Wheeler Ridge	White Wolf	7.3	99
Feb. 9, 1971	San Fernando	San Fernando	6.6	75
July 8, 1986	North Palm Springs	Banning or Garnet Hills	5.6	83
Oct. 1, 1987	Whittier Narrows	Puente Hills Thrust	6.0	79
Feb. 28, 1990	Upland	San Jose	5.5	65
June 28, 1991	Sierra Madre	Clamshell Sawpit	5.8	65
April 22, 1992	Joshua Tree	Eureka Peak	6.1	94
June 28, 1992	Landers	Johnson Valley & others	7.3	77
June 28, 1992	Big Bear	uncertain	6.5	66
Jan. 17, 1994	Northridge	Northridge Thrust	6.7	90
Oct. 16, 1999	Hector Mine	Lavic Lake	7.1	69
July 4, 2019	Searles Valley	Eastern Calif. Shear Zone	6.4	49
July 5, 2019	Searles Valley	Eastern Calif. Shear Zone	7.1	55

Notes:

Earthquake data: U.S. Geological Survey P.P. 1515 & online data, Southern California Earthquake Center & California Geological Survey online data

Magnitudes prior to 1932 are estimated from intensity.

Magnitudes after 1932 are moment, local or surface wave magnitudes.

Site Location:

Site Longitude: - 117.339373

Site Latitude: 35.011818

APPENDIX A

FIELD INVESTIGATION

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APPENDIX A

FIELD INVESTIGATION

A-1.00 FIELD EXPLORATION

A-1.01 Number of Borings

Our subsurface investigation consisted of 3 borings drilled with a CME-75 drill rig.

A-1.02 Location of Borings

A Site Geologic Map showing the approximate locations of the borings is presented as Figure 3.

A-1.03 Boring Logging

Logs of borings were prepared by one of our staff and are attached in this appendix. The logs contain factual information and interpretation of subsurface conditions between samples. The strata indicated on these logs represent the approximate boundary between earth units and the transition may be gradual. The logs show subsurface conditions at the dates and locations indicated, and may not be representative of subsurface conditions at other locations and times.

Identification of the soils encountered during the subsurface exploration was made using the field identification procedure of the Unified Soils Classification System (ASTM D2488). A legend indicating the symbols and definitions used in this classification system and a legend defining the terms used in describing the relative compaction, consistency or firmness of the soil are attached in this appendix. Bag samples of the major earth units were obtained for laboratory inspection and testing, and the in-place density of the various strata encountered in the exploration was determined

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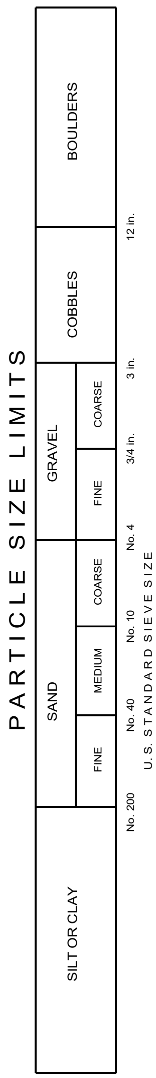

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravel, gravel-sand mixtures. little or no fines.
			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatamaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

UNIFIED SOIL CLASSIFICATION SYSTEM

I. SOIL STRENGTH/DENSITY

BASED ON STANDARD PENETRATION TESTS

Apparent Density of sand		Consistency of clay	
Penetration Resistance N (blows/Ft)	Apparent Density	Penetration Resistance N (blows/ft)	Consistency
0-4	Very Loose	<2	Very Soft
4-10	Loose	2-4	Soft
10-30	Medium Dense	4-8	Medium Stiff
30-50	Dense	8-15	Stiff
>50	Very Dense	15-30	Very Stiff
		>30	Hard

N = Number of blows of 140 lb. weight falling 30 in. to drive 2-in OD sampler 1 ft.

BASED ON RELATIVE COMPACTION

Compactness of sand		Consistency of clay	
% Compaction	Compactness	% Compaction	Consistency
<75	Loose	<80	Soft
75-83	Medium Dense	80-85	Medium Stiff
83-90	Dense	85-90	Stiff
>90	Very Dense	>90	Very Stiff

II. SOIL MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but not visible water
Wet	Visible free water, usually soil is below water table

SOIL DESCRIPTION LEGEND

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Exploratory Boring Log

Boring No. B-1
Sheet 1 of 1

Date Drilled:	5-22-24	Drilling Equipment:	CME-75
Logged By:	KD	Boring Hole Diameter:	8"
Location:	See Boring Location Map	Drive Weights:	140 lbs.
		Drop:	30"

Material Description

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Artificial fill (af): Light brown silty fine to coarse sand, dry, dense to very dense
								Alluvium (Qal): Light brown silty fine to coarse sand, dry, dense
5	R	35		3.9	127.2			
						SP		Dark yellow fine-course sand, dry, medium dense.
10	S	17		1.7				
						SM		Light red brown to dark yellow brown silty sand dry, poorly sorted, dense.
15	S	40		4.3				At 15' light gray sand with silt, dense, dry to slightly moist, very faint trace of clay.
20	S	45		7.6				At 20' there is an increase in silt, light brown in color.
25	S	62		5.9				
								Total depth 26.5 feet No groundwater Hole backfilled

Sample Types:

R - Ring Sample | Bulk Sample | - Groundwater

T - Tube Sample | S - SPT Sample | - End of Boring

Exploratory Boring Log

Boring No. B-2

Sheet 1 of 1

Date Drilled:	5-22-24	Drilling Equipment:	CME-75
Logged By:	KD	Boring Hole Diameter:	8"
Location:	See Boring Location Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
								This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.
						SM		Artificial fill (af): Light brown silty fine to coarse sand, dry, dense to very dense
	R	49		2.0	123.6	SM		Alluvium (Qal): Light brown silty fine to coarse sand, dry, dense
5	R	41		2.4	118.6			Decreasing silt content.
10	S	91		1.4				Hard pan layer yellow-brown to red-brown silty fine to medium sand. Very dense with white carbonate staining.
15	S	50 for 6"		3.6				Decrease in carbonates, very dense.
20	S	63		4.0				Light red brown silty f-m sand, dry, very dense, poorly cemented with calcium carbonate.
25	S	84		5.5				
	S	40		6.9				Total depth 31.5 feet No groundwater Hole backfilled

Sample Types:

R - Ring Sample; Bulk Sample; Groundwater

T - Tube Sample; S - SPT Sample; End of Boring

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Exploratory Boring Log

Boring No. B-3
Sheet 1 of 1

Date Drilled:	5-22-24	Drilling Equipment:	CME-75
Logged By:	KD	Boring Hole Diameter:	8"
Location:	See Boring Location Map	Drive Weights:	140 lbs.
		Drop:	30"

Material Description

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		Artificial fill (af): Light brown silty fine to coarse sand, dry, dense to very dense
								Alluvium (Qal): Light brown silty fine to coarse sand, dry, dense
5	S	18						
10	S	27						Brown in color, trace of clay, dry, poorly sorted medium to dense. Slight carbonate staining on sand pieces with a few pieces of very fine gravel.
15	S	54						Increasing silt content, dense to very dense, decrease in carbonate staining.
20	S	50 for 4.5"						
25	S	50 for 6"						
								Total depth 26.5 feet No groundwater Hole backfilled

Sample Types:

R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

APPENDIX B

LABORATORY TESTS

APPENDIX B

LABORATORY TESTS

B-1.00 LABORATORY TESTS

B-1.01 Maximum Density

Maximum density - optimum moisture relationships for the major soil types encountered during the field exploration were performed in the laboratory using the standard procedures of ASTM D1557.

B-1.02 Particle Size Analysis

Particle size analysis was performed on representative samples of the major soils types in accordance to the standard test methods of the ASTM D422. The hydrometer portion of the standard procedure was not performed and the material retained on the #200 screen was washed.

B-1.03 Direct Shear

Direct shear tests were performed on representative samples of the major soil types encountered in the test holes using the standard test method of ASTM D3080 (consolidated and drained). Tests were performed on remolded samples. Remolded samples were tested at 90 percent relative compaction.

Shear tests were performed on a direct shear machine of the strain-controlled type. To simulate possible adverse field conditions, the samples were saturated prior to shearing. Several samples were sheared at varying normal loads and the results plotted to establish the angle of the internal friction and cohesion of the tested samples.

B-1.04 Moisture Determination

Moisture content of the soil samples was performed in accordance to standard method for determination of water content of soil by drying oven, ASTM D2216. The mass of material remaining after oven drying is used as the mass of the solid particles.

B-1.05 Density of Split-Barrel Samples

Soil samples were obtained by using a split-barrel sampler in accordance to standard method of ASTM D1586.

B-1.06 Test Results

Test results for all laboratory tests performed on the subject project are presented in this appendix. In addition to the laboratory sampling completed as part of this investigation we have also reviewed and supplemented out analysis of the soil conditions at the site with the referenced geotechnical reports completed by Ninyo and Moore (2009) and Kleinfelder (2023).

SAMPLE INFORMATION

Sample Number	Sample Description	Sample Location Boring No.	Sample Location Depth (ft)
1	Light brown to light grayish-red silty sand	B-1	2-5 feet
2	Light brownish-gray silty sand	B-1	15-18 feet

MAXIMUM DENSITY - OPTIMUM MOISTURE

Test Method: ASTM D1557

Sample Number	Optimum Moisture (Percent)	Maximum Density (lbs/ft^3)
1	8.9	131.4
2	7.1	132.7

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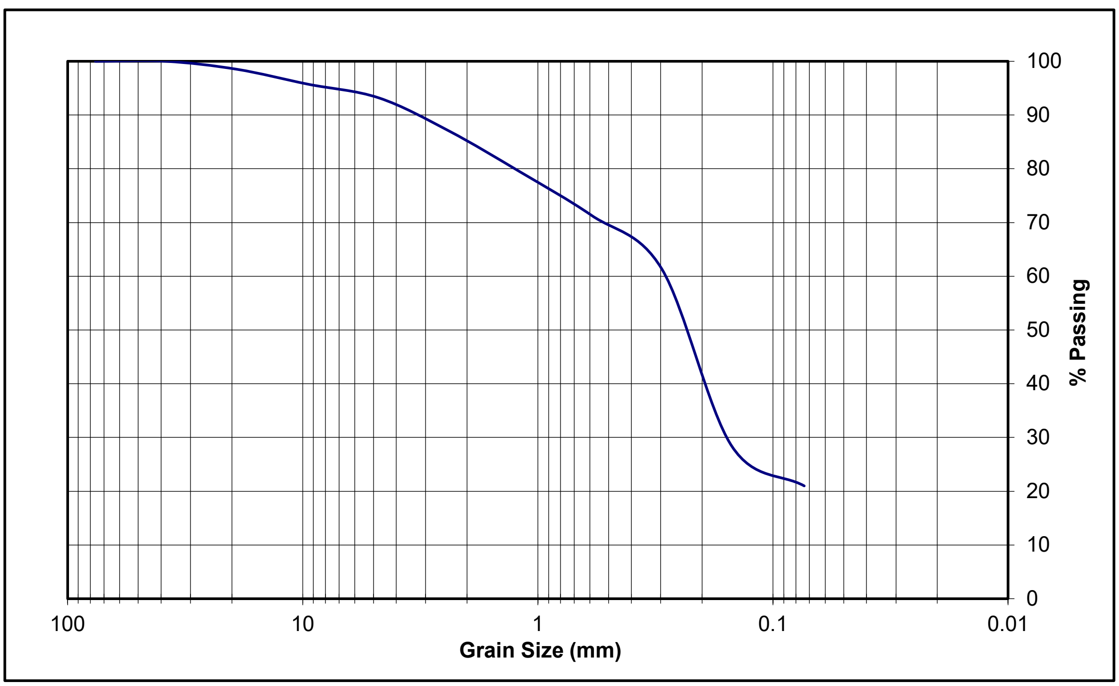
PARTICLE SIZE ANALYSIS
ASTM D422

Sample ID: 1
Location: B-1 @ 2-5 feet

Fraction A: Dry Net Weight (gms): 6,545
Fraction B: Dry Net Weight (gms): 325

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	6545	100
	1-1/2"	0	6545	100
	3/4"	97	6448	99
	3/8"	278	6267	96
	#4	445	6100	93

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	21.6	303.4	87
	#16	48.0	277.0	79
	#30	76.4	248.6	71
	#50	111.0	214.0	61
	#100	225.9	99.1	28
	#200	251.8	73.2	21



PARTICLE SIZE ANALYSIS

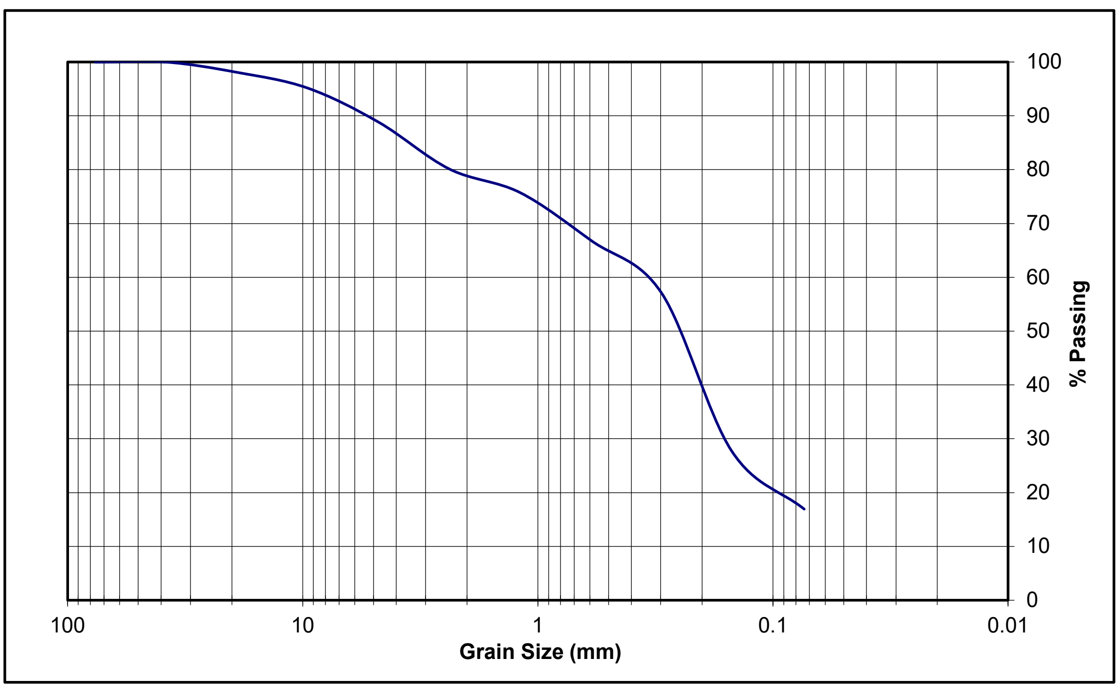
ASTM D422

Sample ID: 2
Location: B-1 @ 15-18 feet

Fraction A: Dry Net Weight (gms): 5,257
Fraction B: Dry Net Weight (gms): 357

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	5257	100
	1-1/2"	0	5257	100
	3/4"	100	5157	98
	3/8"	254	5003	95
	#4	588	4669	89

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	34.9	322.1	80
	#16	52.5	304.5	76
	#30	88.7	268.3	67
	#50	127.8	229.2	57
	#100	245.6	111.4	28
	#200	289.0	68.0	17



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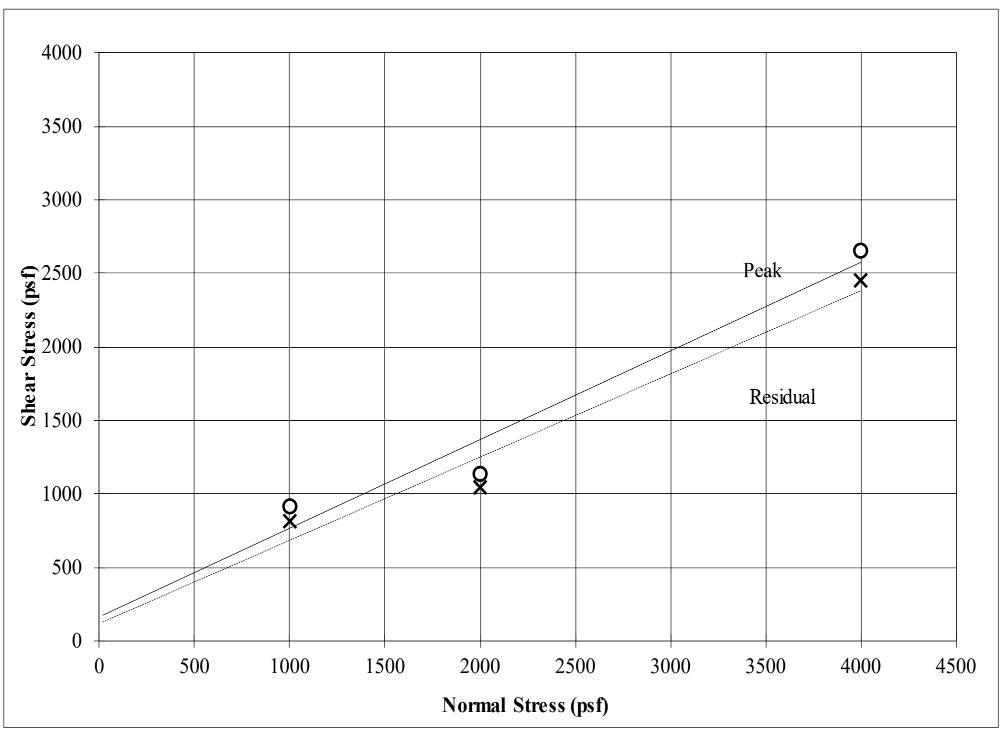
DIRECT SHEAR TEST
ASTM D3080

Sample ID: 1

Maximum Dry Density (pcf) = 131.4
Optimum Moisture Content (%) = 8.9
Initial Dry Density (pcf) = 118.3
Initial Moisture Content (%) = 8.9
Final Moisture Content (%) = 15.7

Normal Pressure	Peak Shear Resist	Residual Shear Resist
1000	921	820
2000	1141	1047
4000	2656	2452

	Peak	Residual
Cohesion (psf) =	160	120
Friction Angle (deg) =	31	30



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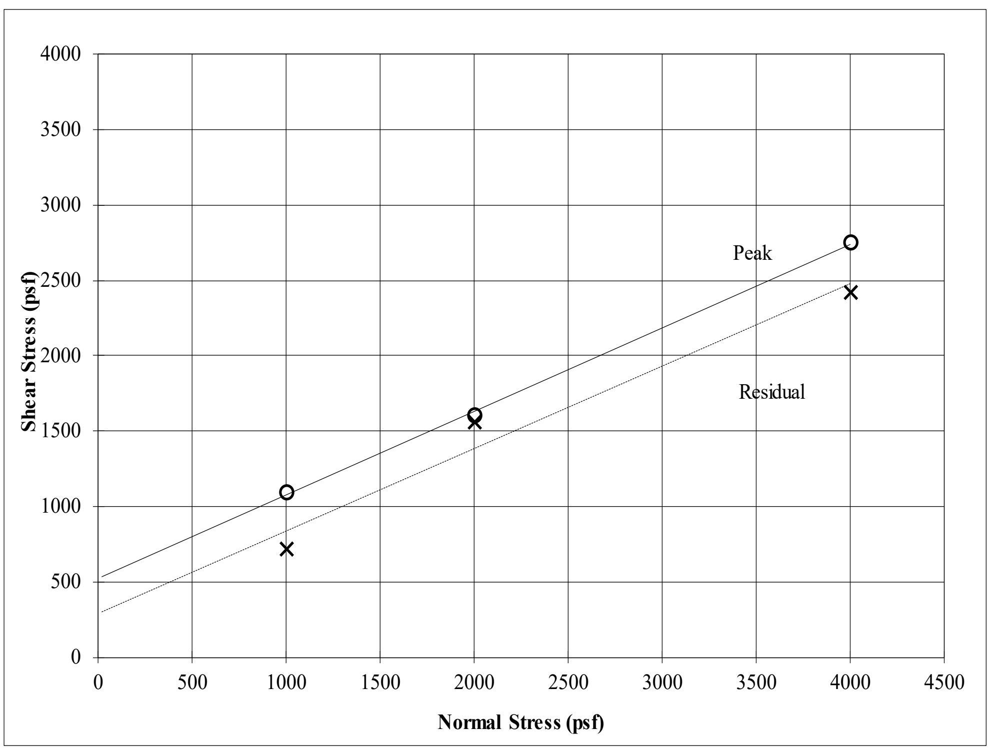
DIRECT SHEAR TEST
ASTM D3080

Sample ID: 2

Maximum Dry Density (pcf) = 132.7
Optimum Moisture Content (%) = 7.1
Initial Dry Density (pcf) = 119.4
Initial Moisture Content (%) = 8.9
Final Moisture Content (%) = 14.5

Normal Pressure	Peak Shear Resist	Residual Shear Resist
1000	1092	720
2000	1608	1560
4000	2748	2424

	Peak	Residual
Cohesion (psf) =	520	290
Friction Angle (deg) =	29	29



APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

C-1.00 GENERAL DESCRIPTION

C-1.01 Introduction

These specifications present our general recommendations for earthwork and grading as shown on the approved grading plans for the subject project. These specifications shall cover all clearing and grubbing, removal of existing structures, preparation of land to be filled, filling of the land, spreading, compaction and control of the fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades and slopes as shown on the approved plans.

The recommendations contained in the geotechnical report of which these general specifications are a part of shall supersede the provisions contained hereinafter in case of conflict.

C-1.02 Laboratory Standard and Field Test Methods

The laboratory standard used to establish the maximum density and optimum moisture shall be ASTM D1557.

The insitu density of earth materials (field compaction tests) shall be determined by the sand cone method (ASTM D1556), direct transmission nuclear method (ASTM D6938) or other test methods as considered appropriate by the geotechnical consultant.

Relative compaction is defined, for purposes of these specifications, as the ratio of the in-place density to the maximum density as determined in the previously mentioned laboratory standard.

C-2.00 CLEARING

C-2.01 Surface Clearing

All structures marked for removal, timber, logs, trees, brush and other rubbish shall be removed and disposed of off the site. Any trees to be removed shall be pulled in such a manner so as to remove as much of the root system as possible.

C-2.02 Subsurface Removals

A thorough search should be made for possible underground storage tanks and/or septic tanks and cesspools. If found, tanks should be removed and cesspools pumped dry.

Any concrete irrigation lines shall be crushed in place and all metal underground lines shall be removed from the site.

C-2.03 Backfill of Cavities

All cavities created or exposed during clearing and grubbing operations or by previous use of the site shall be cleared of deleterious material and backfilled with native soils or other materials approved by the soil engineer. Said backfill shall be compacted to a minimum of 90% relative compaction.

C-3.00 ORIGINAL GROUND PREPARATION

C-3.01 Stripping of Vegetation

After the site has been properly cleared, all vegetation and topsoil containing the root systems of former vegetation shall be stripped from areas to be graded. Materials removed in this stripping process may be used as fill in areas designated by the soil engineer, provided the vegetation is mixed with a sufficient amount of soil to assure that no appreciable settlement or other detriment will occur due to decaying of the organic matter. Soil materials containing more than 3% organics shall not be used as structural fill.

C-3.02 Removals of Non-Engineered Fills

Any non-engineered fills encountered during grading shall be completely removed and the underlying ground shall be prepared in accordance to the recommendations for original ground preparation contained in this section. After cleansing of any organic matter the fill material may be used for engineered fill.

C-3.03 Overexcavation of Fill Areas

The existing ground in all areas determined to be satisfactory for the support of fills shall be scarified to a minimum depth of 6 inches. Scarification shall continue until the soils are broken down and free from lumps or clods and until the scarified zone is uniform. The moisture content of the scarified zone shall be adjusted to within 2% of optimum moisture. The scarified zone shall then be uniformly compacted to 90% relative compaction.

Where fill material is to be placed on ground with slopes steeper than 5:1 (H:V) the sloping ground shall be benched. The lowermost bench shall be a minimum of 15 feet wide, shall be a minimum of 2 feet deep, and shall expose firm material as determined by the geotechnical consultant. Other benches shall be excavated to firm material as determined by the geotechnical consultant and shall have a minimum width of 4 feet.

Existing ground that is determined to be unsatisfactory for the support of fills shall be overexcavated in accordance to the recommendations contained in the geotechnical report of which these general specifications are a part.

C-4.00 FILL MATERIALS

C-4.01 General

Materials for the fill shall be free from vegetable matter and other deleterious substances, shall not contain rocks or lumps of a greater dimension than is recommended by the geotechnical consultant, and shall be approved by the geotechnical consultant. Soils of poor gradation, expansion, or strength properties shall be placed in areas designated by the geotechnical consultant or shall be mixed with other soils providing satisfactory fill material.

C-4.02 Oversize Material

Oversize material, rock or other irreducible material with a maximum dimension greater than 12 inches, shall not be placed in fills, unless the location, materials, and disposal methods are specifically approved by the geotechnical consultant. Oversize material shall be placed in such a manner that nesting of oversize material does not occur and in such a manner that the oversize material is completely surrounded by fill material compacted to a minimum of 90% relative compaction. Oversize material shall not be placed within 10 feet of finished grade without the approval of the geotechnical consultant.

C-4.03 Import

Material imported to the site shall conform to the requirements of Section 4.01 of these specifications. Potential import material shall be approved by the geotechnical consultant prior to importation to the subject site.

C-5.00 Placing and Spreading of Fill

C-5.01 Fill Lifts

The selected fill material shall be placed in nearly horizontal layers which when compacted will not exceed approximately 6 inches in thickness. Thicker lifts may be placed if testing indicates the compaction procedures are such that the required compaction is being achieved and the geotechnical consultant approves their use.
Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to insure uniformity of material in each layer.

C-5.02 Fill Moisture

When the moisture content of the fill material is below that recommended by the soils engineer, water shall then be added until he moisture content is as specified to assure thorough bonding during the compacting process.

When the moisture content of the fill material is above that recommended by the soils engineer, the fill material shall be aerated by blading or other satisfactory methods until the moisture content is as specified.

C-5.03 Fill Compaction

After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to not less than 90% relative compaction. Compaction shall be by sheepsfoot rollers, multiple-wheel pneumatic tired rollers, or other types approved by the soil engineer.

Rolling shall be accomplished while the fill material is at the specified moisture content. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to insure that the desired density has been obtained.

C-5.04 Fill Slopes

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compacting of the slopes may be done progressively in increments of 3 to 4 feet in fill height. At the completion of grading, the slope face shall be compacted to a minimum of 90% relative compaction. This may require track rolling or rolling with a grid roller attached to a tractor mounted side-boom.

Slopes may be over filled and cut back in such a manner that the exposed slope faces are compacted to a minimum of 90% relative compaction.

The fill operation shall be continued in six inch (6") compacted layers, or as specified above, until the fill has been brought to the finished slopes and grades as shown on the accepted plans.

C-5.05 Compaction Testing

Field density tests shall be made by the geotechnical consultant of the compaction of each layer of fill. Density tests shall be made at locations selected by the geotechnical consultant.

Frequency of field density tests shall be not less than one test for each 2.0 feet of fill height and at least every one thousand cubic yards of fill. Where fill slopes exceed four feet in height their finished faces shall be tested at a frequency of one test for each 1000 square feet of slope face.

Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density reading shall be taken in the compacted material below the disturbed surface. When these readings indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portion shall be reworked until the required density has been obtained.

C-6.00 SUBDRAINS

C-6.01 Subdrain Material

Subdrains shall be constructed of a minimum 4-inch diameter pipe encased in a suitable filter material. The subdrain pipe shall be Schedule 40 Acrylonitrile Butadiene Styrene (ABS) or Schedule 40 Polyvinyl Chloride Plastic (PVC) pipe or approved equivalent. Subdrain pipe shall be installed with perforations down. Filter material shall consist of 3/4" to 1 1/2" clean gravel wrapped in an envelope of filter fabric consisting of Mirafi 140N or approved equivalent.

C-6.02 Subdrain Installation

Subdrain systems, if required, shall be installed in approved ground to conform the approximate alignment and details shown on the plans or herein. The subdrain locations shall not be changed or modified without the approval of the geotechnical consultant. The geotechnical consultant may recommend and direct changes in the subdrain line, grade or material upon approval by the design civil engineer and the appropriate governmental agencies.

C-7.00 EXCAVATIONS

C-7.01 General

Excavations and cut slopes shall be examined by the geotechnical consultant. If determined necessary by the geotechnical consultant, further excavation or overexcavation and refilling of overexcavated areas shall be performed, and/or remedial grading of cut slopes shall be performed.

C-7.02 Fill-Over-Cut Slopes

Where fill-over-cut slopes are to be graded the cut portion of the slope shall be made and approved by the geotechnical consultant prior to placement of materials for construction of the fill portion of the slope.

C-8.00 Trench Backfill

C-.01 General

Trench backfill within street right of ways shall be compacted to 90% relative compaction as determined by the ASTM D1557 test method. Backfill may be jetted as a means of initial compaction; however, mechanical compaction will be required to obtain the required percentage of relative compaction. If trenches are jetted, there must be a suitable delay for drainage of excess water before mechanical compaction is applied.

C-9.00 Seasonal Limits

C-9.01 General

No fill material shall be placed, spread or rolled while it is frozen or thawing or during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field tests by the soils engineer indicate that the moisture content and density of the fill are as previously specified.

C-10.00 Supervision

C-10.01 Prior to Grading

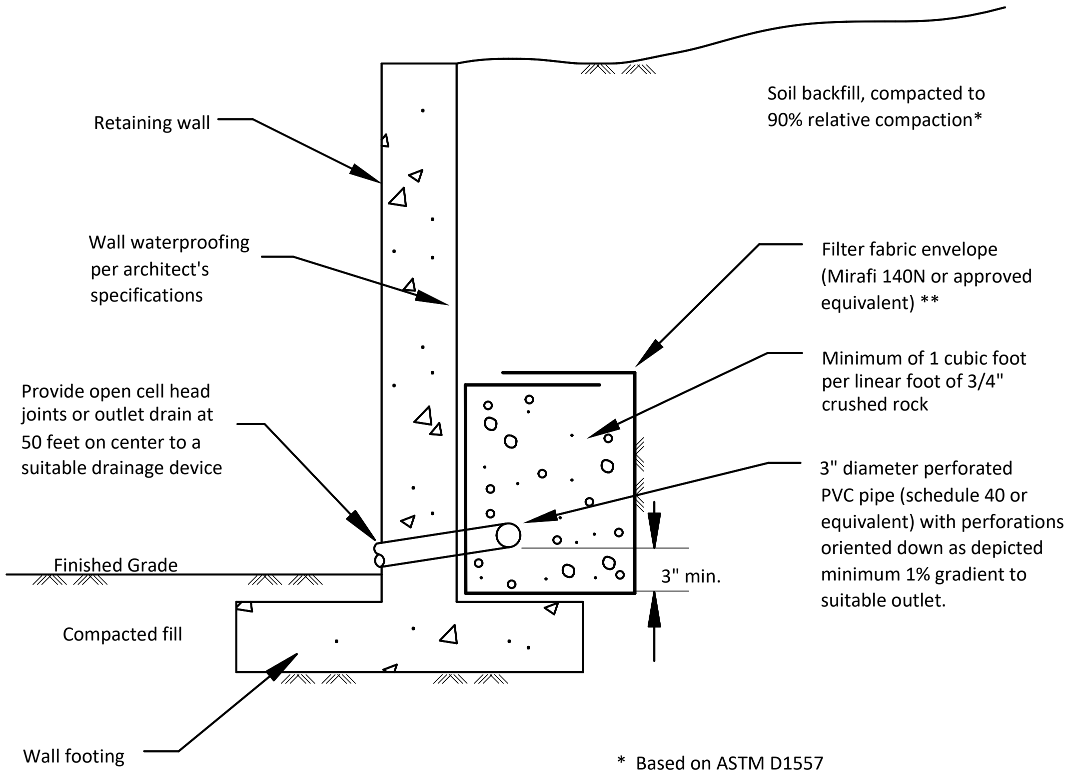
The site shall be observed by the geotechnical consultant upon completion of clearing and grubbing, prior to the preparation of any original ground for preparation of fill.

The supervisor of the grading contractor and the field representative of the geotechnical consultant shall have a meeting and discuss the geotechnical aspects of the earthwork prior to commencement of grading.

C-10.02 During Grading

Site preparation of all areas to receive fill shall be tested and approved by the geotechnical consultant prior to the placement of any fill.

The geotechnical consultant or his representative shall observe the fill and compaction operations so that he can provide an opinion regarding the conformance of the work to the recommendations contained in this report.



* Based on ASTM D1557

** If class 2 permeable material (See gradation to left) is used in place of 3/4" - 1 1/2" gravel. Filter fabric may be deleted. Class 2 permeable material compacted to 90% relative compaction. *

SPECIFICATIONS FOR CLASS 2
PERMEABLE MATERIAL
(CAL TRANS SPECIFICATIONS)

Sieve Size	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.8	18-33
No.30	5-15
No.50	0-7
No.200	0-3

RETAINING WALL DRAINAGE DETAIL

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APPENDIX D

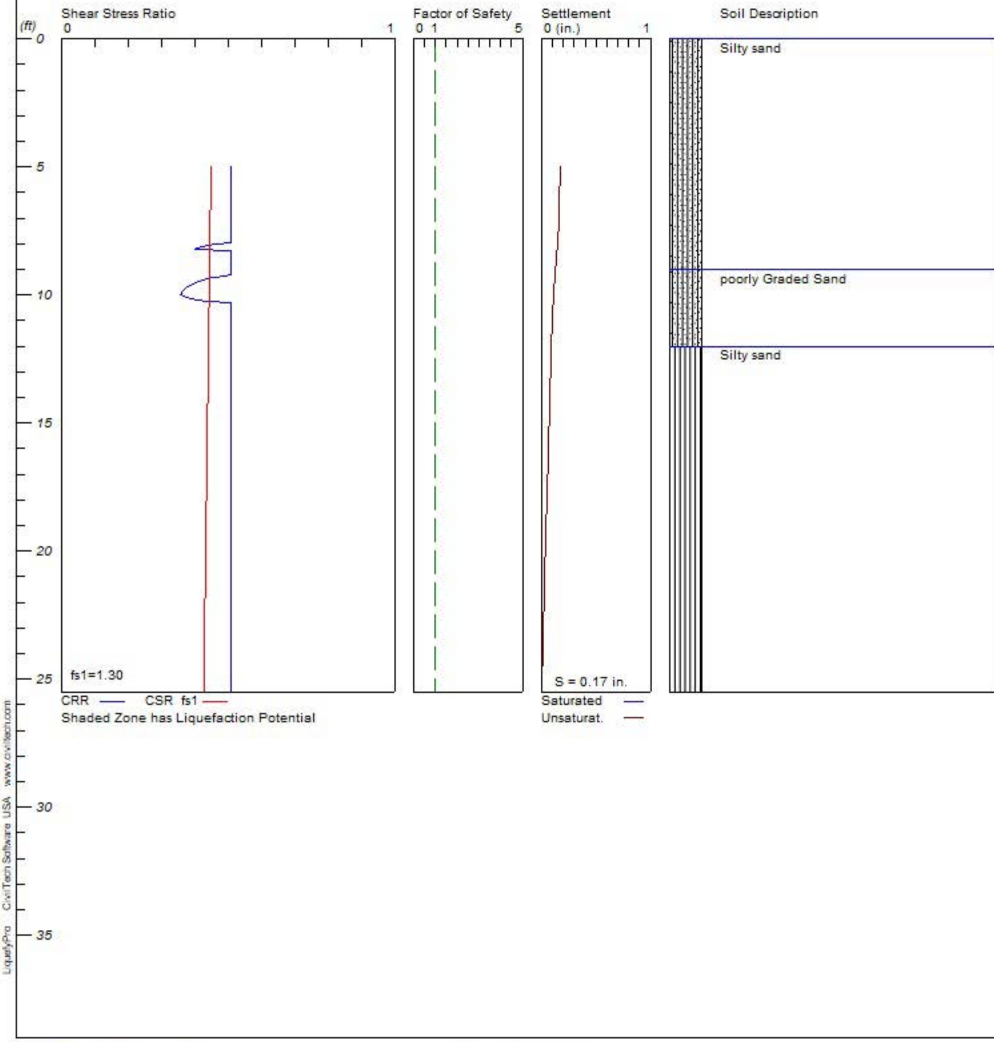
CALCULATIONS OF LIQUEFACTION POTENTIAL
AND SEISMICALLY INDUCED SETTLEMENTS

LIQUEFACTION ANALYSIS

Overnight Solar

Hole No.=B-1 Water Depth=100 ft

Magnitude=7.45
Acceleration=.537g



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*****************************************************************************************************
                                    LIQUEFACTION ANALYSIS SUMMARY
                                   Copyright by CivilTech Software
                                         www.civiltech.com
*****************************************************************************************************
```


Input File Name: C:\Users\jmeneses\Desktop\HMD\Solar\Boring B-1.liq
Title: Overnight Solar
Subtitle: Boring B-1

Surface Elev.=
Hole No.=B-1
Depth of Hole= 25.50 ft
Water Table during Earthquake= 100.00 ft
Water Table during In-Situ Testing= 100.00 ft
Max. Acceleration= 0.54 g
Earthquake Magnitude= 7.45

Input Data:
Surface Elev.=
Hole No.=B-1
Depth of Hole=25.50 ft
Water Table during Earthquake= 100.00 ft
Water Table during In-Situ Testing= 100.00 ft
Max. Acceleration=0.54 g
Earthquake Magnitude=7.45
No-Liquefiable Soils: Based on Analysis

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1.3
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
5.00	19.20	125.00	13.00
10.00	17.00	125.00	5.00
15.00	40.00	125.00	13.00
20.00	45.00	125.00	13.00
25.00	62.00	125.00	13.00

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.17 in.
Total Settlement of Saturated and Unsaturated Sands=0.17 in.
Differential Settlement=0.084 to 0.111 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
5.00	0.51	0.45	5.00	0.00	0.17	0.17
5.05	0.51	0.45	5.00	0.00	0.17	0.17
5.10	0.51	0.45	5.00	0.00	0.17	0.17
5.15	0.51	0.45	5.00	0.00	0.17	0.17
5.20	0.51	0.45	5.00	0.00	0.17	0.17
5.25	0.51	0.45	5.00	0.00	0.17	0.17
5.30	0.51	0.45	5.00	0.00	0.17	0.17
5.35	0.51	0.45	5.00	0.00	0.17	0.17
5.40	0.51	0.45	5.00	0.00	0.17	0.17
5.45	0.51	0.45	5.00	0.00	0.17	0.17
5.50	0.51	0.45	5.00	0.00	0.17	0.17
5.55	0.51	0.45	5.00	0.00	0.17	0.17
5.60	0.51	0.45	5.00	0.00	0.17	0.17
5.65	0.51	0.45	5.00	0.00	0.17	0.17
5.70	0.51	0.45	5.00	0.00	0.17	0.17
5.75	0.51	0.45	5.00	0.00	0.17	0.17

5.80	0.51	0.45	5.00	0.00	0.17	0.17
5.85	0.51	0.45	5.00	0.00	0.17	0.17
5.90	0.51	0.45	5.00	0.00	0.16	0.16
5.95	0.51	0.45	5.00	0.00	0.16	0.16
6.00	0.51	0.45	5.00	0.00	0.16	0.16
6.05	0.51	0.45	5.00	0.00	0.16	0.16
6.10	0.51	0.45	5.00	0.00	0.16	0.16
6.15	0.51	0.45	5.00	0.00	0.16	0.16
6.20	0.51	0.45	5.00	0.00	0.16	0.16
6.25	0.51	0.45	5.00	0.00	0.16	0.16
6.30	0.51	0.45	5.00	0.00	0.16	0.16
6.35	0.51	0.45	5.00	0.00	0.16	0.16
6.40	0.51	0.45	5.00	0.00	0.16	0.16
6.45	0.51	0.45	5.00	0.00	0.16	0.16
6.50	0.51	0.45	5.00	0.00	0.16	0.16
6.55	0.51	0.45	5.00	0.00	0.16	0.16
6.60	0.51	0.45	5.00	0.00	0.16	0.16
6.65	0.51	0.45	5.00	0.00	0.16	0.16
6.70	0.51	0.45	5.00	0.00	0.16	0.16
6.75	0.51	0.45	5.00	0.00	0.16	0.16
6.80	0.51	0.45	5.00	0.00	0.16	0.16
6.85	0.51	0.45	5.00	0.00	0.16	0.16
6.90	0.51	0.45	5.00	0.00	0.16	0.16
6.95	0.51	0.45	5.00	0.00	0.16	0.16
7.00	0.51	0.45	5.00	0.00	0.16	0.16
7.05	0.51	0.45	5.00	0.00	0.16	0.16
7.10	0.51	0.45	5.00	0.00	0.16	0.16
7.15	0.51	0.45	5.00	0.00	0.16	0.16
7.20	0.51	0.45	5.00	0.00	0.16	0.16
7.25	0.51	0.45	5.00	0.00	0.16	0.16
7.30	0.51	0.45	5.00	0.00	0.16	0.16
7.35	0.51	0.45	5.00	0.00	0.16	0.16
7.40	0.51	0.45	5.00	0.00	0.15	0.15
7.45	0.51	0.45	5.00	0.00	0.15	0.15
7.50	0.51	0.45	5.00	0.00	0.15	0.15
7.55	0.51	0.45	5.00	0.00	0.15	0.15
7.60	0.51	0.45	5.00	0.00	0.15	0.15
7.65	0.51	0.45	5.00	0.00	0.15	0.15
7.70	0.51	0.45	5.00	0.00	0.15	0.15
7.75	0.51	0.45	5.00	0.00	0.15	0.15
7.80	0.51	0.45	5.00	0.00	0.15	0.15
7.85	0.51	0.45	5.00	0.00	0.15	0.15
7.90	0.51	0.45	5.00	0.00	0.15	0.15
7.95	0.51	0.45	5.00	0.00	0.15	0.15
8.00	0.47	0.45	5.00	0.00	0.15	0.15
8.05	0.44	0.45	5.00	0.00	0.14	0.14
8.10	0.42	0.45	5.00	0.00	0.14	0.14
8.15	0.41	0.45	5.00	0.00	0.14	0.14
8.20	0.40	0.45	5.00	0.00	0.14	0.14
8.25	0.51	0.45	5.00	0.00	0.14	0.14
8.30	0.51	0.44	5.00	0.00	0.14	0.14
8.35	0.51	0.44	5.00	0.00	0.14	0.14
8.40	0.51	0.44	5.00	0.00	0.14	0.14
8.45	0.51	0.44	5.00	0.00	0.14	0.14
8.50	0.51	0.44	5.00	0.00	0.14	0.14
8.55	0.51	0.44	5.00	0.00	0.14	0.14
8.60	0.51	0.44	5.00	0.00	0.13	0.13
8.65	0.51	0.44	5.00	0.00	0.13	0.13
8.70	0.51	0.44	5.00	0.00	0.13	0.13
8.75	0.51	0.44	5.00	0.00	0.13	0.13
8.80	0.51	0.44	5.00	0.00	0.13	0.13
8.85	0.51	0.44	5.00	0.00	0.13	0.13
8.90	0.51	0.44	5.00	0.00	0.13	0.13
8.95	0.51	0.44	5.00	0.00	0.13	0.13
9.00	0.51	0.44	5.00	0.00	0.13	0.13
9.05	0.51	0.44	5.00	0.00	0.12	0.12
9.10	0.51	0.44	5.00	0.00	0.12	0.12
9.15	0.51	0.44	5.00	0.00	0.12	0.12
9.20	0.51	0.44	5.00	0.00	0.12	0.12
9.25	0.49	0.44	5.00	0.00	0.12	0.12
9.30	0.46	0.44	5.00	0.00	0.12	0.12
9.35	0.44	0.44	5.00	0.00	0.12	0.12
9.40	0.42	0.44	5.00	0.00	0.12	0.12
9.45	0.41	0.44	5.00	0.00	0.12	0.12
9.50	0.40	0.44	5.00	0.00	0.12	0.12
9.55	0.40	0.44	5.00	0.00	0.12	0.12
9.60	0.39	0.44	5.00	0.00	0.12	0.12
9.65	0.38	0.44	5.00	0.00	0.11	0.11
9.70	0.38	0.44	5.00	0.00	0.11	0.11

9.75	0.37	0.44	5.00	0.00	0.11	0.11
9.80	0.37	0.44	5.00	0.00	0.11	0.11
9.85	0.37	0.44	5.00	0.00	0.11	0.11
9.90	0.36	0.44	5.00	0.00	0.11	0.11
9.95	0.36	0.44	5.00	0.00	0.11	0.11
10.00	0.36	0.44	5.00	0.00	0.11	0.11
10.05	0.37	0.44	5.00	0.00	0.11	0.11
10.10	0.38	0.44	5.00	0.00	0.11	0.11
10.15	0.39	0.44	5.00	0.00	0.11	0.11
10.20	0.41	0.44	5.00	0.00	0.11	0.11
10.25	0.44	0.44	5.00	0.00	0.11	0.11
10.30	0.51	0.44	5.00	0.00	0.11	0.11
10.35	0.51	0.44	5.00	0.00	0.10	0.10
10.40	0.51	0.44	5.00	0.00	0.10	0.10
10.45	0.51	0.44	5.00	0.00	0.10	0.10
10.50	0.51	0.44	5.00	0.00	0.10	0.10
10.55	0.51	0.44	5.00	0.00	0.10	0.10
10.60	0.51	0.44	5.00	0.00	0.10	0.10
10.65	0.51	0.44	5.00	0.00	0.10	0.10
10.70	0.51	0.44	5.00	0.00	0.10	0.10
10.75	0.51	0.44	5.00	0.00	0.10	0.10
10.80	0.51	0.44	5.00	0.00	0.10	0.10
10.85	0.51	0.44	5.00	0.00	0.10	0.10
10.90	0.51	0.44	5.00	0.00	0.10	0.10
10.95	0.51	0.44	5.00	0.00	0.10	0.10
11.00	0.51	0.44	5.00	0.00	0.10	0.10
11.05	0.51	0.44	5.00	0.00	0.10	0.10
11.10	0.51	0.44	5.00	0.00	0.10	0.10
11.15	0.51	0.44	5.00	0.00	0.10	0.10
11.20	0.51	0.44	5.00	0.00	0.09	0.09
11.25	0.51	0.44	5.00	0.00	0.09	0.09
11.30	0.51	0.44	5.00	0.00	0.09	0.09
11.35	0.51	0.44	5.00	0.00	0.09	0.09
11.40	0.51	0.44	5.00	0.00	0.09	0.09
11.45	0.51	0.44	5.00	0.00	0.09	0.09
11.50	0.51	0.44	5.00	0.00	0.09	0.09
11.55	0.51	0.44	5.00	0.00	0.09	0.09
11.60	0.51	0.44	5.00	0.00	0.09	0.09
11.65	0.51	0.44	5.00	0.00	0.09	0.09
11.70	0.51	0.44	5.00	0.00	0.09	0.09
11.75	0.51	0.44	5.00	0.00	0.09	0.09
11.80	0.51	0.44	5.00	0.00	0.09	0.09
11.85	0.51	0.44	5.00	0.00	0.09	0.09
11.90	0.51	0.44	5.00	0.00	0.09	0.09
11.95	0.51	0.44	5.00	0.00	0.09	0.09
12.00	0.51	0.44	5.00	0.00	0.09	0.09
12.05	0.51	0.44	5.00	0.00	0.09	0.09
12.10	0.51	0.44	5.00	0.00	0.09	0.09
12.15	0.51	0.44	5.00	0.00	0.09	0.09
12.20	0.51	0.44	5.00	0.00	0.09	0.09
12.25	0.51	0.44	5.00	0.00	0.09	0.09
12.30	0.51	0.44	5.00	0.00	0.09	0.09
12.35	0.51	0.44	5.00	0.00	0.09	0.09
12.40	0.51	0.44	5.00	0.00	0.09	0.09
12.45	0.51	0.44	5.00	0.00	0.09	0.09
12.50	0.51	0.44	5.00	0.00	0.08	0.08
12.55	0.51	0.44	5.00	0.00	0.08	0.08
12.60	0.51	0.44	5.00	0.00	0.08	0.08
12.65	0.51	0.44	5.00	0.00	0.08	0.08
12.70	0.51	0.44	5.00	0.00	0.08	0.08
12.75	0.51	0.44	5.00	0.00	0.08	0.08
12.80	0.51	0.44	5.00	0.00	0.08	0.08
12.85	0.51	0.44	5.00	0.00	0.08	0.08
12.90	0.51	0.44	5.00	0.00	0.08	0.08
12.95	0.51	0.44	5.00	0.00	0.08	0.08
13.00	0.51	0.44	5.00	0.00	0.08	0.08
13.05	0.51	0.44	5.00	0.00	0.08	0.08
13.10	0.51	0.44	5.00	0.00	0.08	0.08
13.15	0.51	0.44	5.00	0.00	0.08	0.08
13.20	0.51	0.44	5.00	0.00	0.08	0.08
13.25	0.51	0.44	5.00	0.00	0.08	0.08
13.30	0.51	0.44	5.00	0.00	0.08	0.08
13.35	0.51	0.44	5.00	0.00	0.08	0.08
13.40	0.51	0.44	5.00	0.00	0.08	0.08
13.45	0.51	0.44	5.00	0.00	0.08	0.08
13.50	0.51	0.44	5.00	0.00	0.08	0.08
13.55	0.51	0.44	5.00	0.00	0.08	0.08
13.60	0.51	0.44	5.00	0.00	0.08	0.08
13.65	0.51	0.44	5.00	0.00	0.08	0.08

13.70	0.51	0.44	5.00	0.00	0.08	0.08
13.75	0.51	0.44	5.00	0.00	0.08	0.08
13.80	0.51	0.44	5.00	0.00	0.08	0.08
13.85	0.51	0.44	5.00	0.00	0.08	0.08
13.90	0.51	0.44	5.00	0.00	0.08	0.08
13.95	0.51	0.44	5.00	0.00	0.07	0.07
14.00	0.51	0.44	5.00	0.00	0.07	0.07
14.05	0.51	0.44	5.00	0.00	0.07	0.07
14.10	0.51	0.44	5.00	0.00	0.07	0.07
14.15	0.51	0.44	5.00	0.00	0.07	0.07
14.20	0.51	0.44	5.00	0.00	0.07	0.07
14.25	0.51	0.44	5.00	0.00	0.07	0.07
14.30	0.51	0.44	5.00	0.00	0.07	0.07
14.35	0.51	0.44	5.00	0.00	0.07	0.07
14.40	0.51	0.44	5.00	0.00	0.07	0.07
14.45	0.51	0.44	5.00	0.00	0.07	0.07
14.50	0.51	0.44	5.00	0.00	0.07	0.07
14.55	0.51	0.44	5.00	0.00	0.07	0.07
14.60	0.51	0.44	5.00	0.00	0.07	0.07
14.65	0.51	0.44	5.00	0.00	0.07	0.07
14.70	0.51	0.44	5.00	0.00	0.07	0.07
14.75	0.51	0.44	5.00	0.00	0.07	0.07
14.80	0.51	0.44	5.00	0.00	0.07	0.07
14.85	0.51	0.44	5.00	0.00	0.07	0.07
14.90	0.51	0.44	5.00	0.00	0.07	0.07
14.95	0.51	0.44	5.00	0.00	0.07	0.07
15.00	0.51	0.44	5.00	0.00	0.07	0.07
15.05	0.51	0.44	5.00	0.00	0.07	0.07
15.10	0.51	0.44	5.00	0.00	0.07	0.07
15.15	0.51	0.44	5.00	0.00	0.07	0.07
15.20	0.51	0.44	5.00	0.00	0.07	0.07
15.25	0.51	0.44	5.00	0.00	0.07	0.07
15.30	0.51	0.44	5.00	0.00	0.07	0.07
15.35	0.51	0.44	5.00	0.00	0.07	0.07
15.40	0.51	0.44	5.00	0.00	0.07	0.07
15.45	0.51	0.44	5.00	0.00	0.07	0.07
15.50	0.51	0.44	5.00	0.00	0.07	0.07
15.55	0.51	0.44	5.00	0.00	0.06	0.06
15.60	0.51	0.44	5.00	0.00	0.06	0.06
15.65	0.51	0.44	5.00	0.00	0.06	0.06
15.70	0.51	0.44	5.00	0.00	0.06	0.06
15.75	0.51	0.44	5.00	0.00	0.06	0.06
15.80	0.51	0.44	5.00	0.00	0.06	0.06
15.85	0.51	0.44	5.00	0.00	0.06	0.06
15.90	0.51	0.44	5.00	0.00	0.06	0.06
15.95	0.51	0.44	5.00	0.00	0.06	0.06
16.00	0.51	0.44	5.00	0.00	0.06	0.06
16.05	0.51	0.44	5.00	0.00	0.06	0.06
16.10	0.51	0.44	5.00	0.00	0.06	0.06
16.15	0.51	0.44	5.00	0.00	0.06	0.06
16.20	0.51	0.44	5.00	0.00	0.06	0.06
16.25	0.51	0.44	5.00	0.00	0.06	0.06
16.30	0.51	0.44	5.00	0.00	0.06	0.06
16.35	0.51	0.44	5.00	0.00	0.06	0.06
16.40	0.51	0.44	5.00	0.00	0.06	0.06
16.45	0.51	0.44	5.00	0.00	0.06	0.06
16.50	0.51	0.44	5.00	0.00	0.06	0.06
16.55	0.51	0.44	5.00	0.00	0.06	0.06
16.60	0.51	0.44	5.00	0.00	0.06	0.06
16.65	0.51	0.44	5.00	0.00	0.06	0.06
16.70	0.51	0.44	5.00	0.00	0.06	0.06
16.75	0.51	0.44	5.00	0.00	0.06	0.06
16.80	0.51	0.44	5.00	0.00	0.06	0.06
16.85	0.51	0.44	5.00	0.00	0.06	0.06
16.90	0.51	0.44	5.00	0.00	0.06	0.06
16.95	0.51	0.44	5.00	0.00	0.06	0.06
17.00	0.51	0.44	5.00	0.00	0.05	0.05
17.05	0.51	0.44	5.00	0.00	0.05	0.05
17.10	0.51	0.44	5.00	0.00	0.05	0.05
17.15	0.51	0.44	5.00	0.00	0.05	0.05
17.20	0.51	0.44	5.00	0.00	0.05	0.05
17.25	0.51	0.44	5.00	0.00	0.05	0.05
17.30	0.51	0.44	5.00	0.00	0.05	0.05
17.35	0.51	0.44	5.00	0.00	0.05	0.05
17.40	0.51	0.44	5.00	0.00	0.05	0.05
17.45	0.51	0.44	5.00	0.00	0.05	0.05
17.50	0.51	0.44	5.00	0.00	0.05	0.05
17.55	0.51	0.44	5.00	0.00	0.05	0.05
17.60	0.51	0.44	5.00	0.00	0.05	0.05

17.65	0.51	0.44	5.00	0.00	0.05	0.05
17.70	0.51	0.44	5.00	0.00	0.05	0.05
17.75	0.51	0.43	5.00	0.00	0.05	0.05
17.80	0.51	0.43	5.00	0.00	0.05	0.05
17.85	0.51	0.43	5.00	0.00	0.05	0.05
17.90	0.51	0.43	5.00	0.00	0.05	0.05
17.95	0.51	0.43	5.00	0.00	0.05	0.05
18.00	0.51	0.43	5.00	0.00	0.05	0.05
18.05	0.51	0.43	5.00	0.00	0.05	0.05
18.10	0.51	0.43	5.00	0.00	0.05	0.05
18.15	0.51	0.43	5.00	0.00	0.05	0.05
18.20	0.51	0.43	5.00	0.00	0.05	0.05
18.25	0.51	0.43	5.00	0.00	0.05	0.05
18.30	0.51	0.43	5.00	0.00	0.05	0.05
18.35	0.51	0.43	5.00	0.00	0.04	0.04
18.40	0.51	0.43	5.00	0.00	0.04	0.04
18.45	0.51	0.43	5.00	0.00	0.04	0.04
18.50	0.51	0.43	5.00	0.00	0.04	0.04
18.55	0.51	0.43	5.00	0.00	0.04	0.04
18.60	0.51	0.43	5.00	0.00	0.04	0.04
18.65	0.51	0.43	5.00	0.00	0.04	0.04
18.70	0.51	0.43	5.00	0.00	0.04	0.04
18.75	0.51	0.43	5.00	0.00	0.04	0.04
18.80	0.51	0.43	5.00	0.00	0.04	0.04
18.85	0.51	0.43	5.00	0.00	0.04	0.04
18.90	0.51	0.43	5.00	0.00	0.04	0.04
18.95	0.51	0.43	5.00	0.00	0.04	0.04
19.00	0.51	0.43	5.00	0.00	0.04	0.04
19.05	0.51	0.43	5.00	0.00	0.04	0.04
19.10	0.51	0.43	5.00	0.00	0.04	0.04
19.15	0.51	0.43	5.00	0.00	0.04	0.04
19.20	0.51	0.43	5.00	0.00	0.04	0.04
19.25	0.51	0.43	5.00	0.00	0.04	0.04
19.30	0.51	0.43	5.00	0.00	0.04	0.04
19.35	0.51	0.43	5.00	0.00	0.04	0.04
19.40	0.51	0.43	5.00	0.00	0.04	0.04
19.45	0.51	0.43	5.00	0.00	0.04	0.04
19.50	0.51	0.43	5.00	0.00	0.03	0.03
19.55	0.51	0.43	5.00	0.00	0.03	0.03
19.60	0.51	0.43	5.00	0.00	0.03	0.03
19.65	0.51	0.43	5.00	0.00	0.03	0.03
19.70	0.51	0.43	5.00	0.00	0.03	0.03
19.75	0.51	0.43	5.00	0.00	0.03	0.03
19.80	0.51	0.43	5.00	0.00	0.03	0.03
19.85	0.51	0.43	5.00	0.00	0.03	0.03
19.90	0.51	0.43	5.00	0.00	0.03	0.03
19.95	0.51	0.43	5.00	0.00	0.03	0.03
20.00	0.51	0.43	5.00	0.00	0.03	0.03
20.05	0.51	0.43	5.00	0.00	0.03	0.03
20.10	0.51	0.43	5.00	0.00	0.03	0.03
20.15	0.51	0.43	5.00	0.00	0.03	0.03
20.20	0.51	0.43	5.00	0.00	0.03	0.03
20.25	0.51	0.43	5.00	0.00	0.03	0.03
20.30	0.51	0.43	5.00	0.00	0.03	0.03
20.35	0.51	0.43	5.00	0.00	0.03	0.03
20.40	0.51	0.43	5.00	0.00	0.03	0.03
20.45	0.51	0.43	5.00	0.00	0.03	0.03
20.50	0.51	0.43	5.00	0.00	0.03	0.03
20.55	0.51	0.43	5.00	0.00	0.03	0.03
20.60	0.51	0.43	5.00	0.00	0.03	0.03
20.65	0.51	0.43	5.00	0.00	0.03	0.03
20.70	0.51	0.43	5.00	0.00	0.03	0.03
20.75	0.51	0.43	5.00	0.00	0.03	0.03
20.80	0.51	0.43	5.00	0.00	0.03	0.03
20.85	0.51	0.43	5.00	0.00	0.03	0.03
20.90	0.51	0.43	5.00	0.00	0.03	0.03
20.95	0.51	0.43	5.00	0.00	0.03	0.03
21.00	0.51	0.43	5.00	0.00	0.03	0.03
21.05	0.51	0.43	5.00	0.00	0.03	0.03
21.10	0.51	0.43	5.00	0.00	0.03	0.03
21.15	0.51	0.43	5.00	0.00	0.03	0.03
21.20	0.51	0.43	5.00	0.00	0.03	0.03
21.25	0.51	0.43	5.00	0.00	0.02	0.02
21.30	0.51	0.43	5.00	0.00	0.02	0.02
21.35	0.51	0.43	5.00	0.00	0.02	0.02
21.40	0.51	0.43	5.00	0.00	0.02	0.02
21.45	0.51	0.43	5.00	0.00	0.02	0.02
21.50	0.51	0.43	5.00	0.00	0.02	0.02
21.55	0.51	0.43	5.00	0.00	0.02	0.02

21.60	0.51	0.43	5.00	0.00	0.02	0.02
21.65	0.51	0.43	5.00	0.00	0.02	0.02
21.70	0.51	0.43	5.00	0.00	0.02	0.02
21.75	0.51	0.43	5.00	0.00	0.02	0.02
21.80	0.51	0.43	5.00	0.00	0.02	0.02
21.85	0.51	0.43	5.00	0.00	0.02	0.02
21.90	0.51	0.43	5.00	0.00	0.02	0.02
21.95	0.51	0.43	5.00	0.00	0.02	0.02
22.00	0.51	0.43	5.00	0.00	0.02	0.02
22.05	0.51	0.43	5.00	0.00	0.02	0.02
22.10	0.51	0.43	5.00	0.00	0.02	0.02
22.15	0.51	0.43	5.00	0.00	0.02	0.02
22.20	0.51	0.43	5.00	0.00	0.02	0.02
22.25	0.51	0.43	5.00	0.00	0.02	0.02
22.30	0.51	0.43	5.00	0.00	0.02	0.02
22.35	0.51	0.43	5.00	0.00	0.02	0.02
22.40	0.51	0.43	5.00	0.00	0.02	0.02
22.45	0.51	0.43	5.00	0.00	0.02	0.02
22.50	0.51	0.43	5.00	0.00	0.02	0.02
22.55	0.51	0.43	5.00	0.00	0.02	0.02
22.60	0.51	0.43	5.00	0.00	0.02	0.02
22.65	0.51	0.43	5.00	0.00	0.02	0.02
22.70	0.51	0.43	5.00	0.00	0.02	0.02
22.75	0.51	0.43	5.00	0.00	0.02	0.02
22.80	0.51	0.43	5.00	0.00	0.02	0.02
22.85	0.51	0.43	5.00	0.00	0.02	0.02
22.90	0.51	0.43	5.00	0.00	0.02	0.02
22.95	0.51	0.43	5.00	0.00	0.02	0.02
23.00	0.51	0.43	5.00	0.00	0.01	0.01
23.05	0.51	0.43	5.00	0.00	0.01	0.01
23.10	0.51	0.43	5.00	0.00	0.01	0.01
23.15	0.51	0.43	5.00	0.00	0.01	0.01
23.20	0.51	0.43	5.00	0.00	0.01	0.01
23.25	0.51	0.43	5.00	0.00	0.01	0.01
23.30	0.51	0.43	5.00	0.00	0.01	0.01
23.35	0.51	0.43	5.00	0.00	0.01	0.01
23.40	0.51	0.43	5.00	0.00	0.01	0.01
23.45	0.51	0.43	5.00	0.00	0.01	0.01
23.50	0.51	0.43	5.00	0.00	0.01	0.01
23.55	0.51	0.43	5.00	0.00	0.01	0.01
23.60	0.51	0.43	5.00	0.00	0.01	0.01
23.65	0.51	0.43	5.00	0.00	0.01	0.01
23.70	0.51	0.43	5.00	0.00	0.01	0.01
23.75	0.51	0.43	5.00	0.00	0.01	0.01
23.80	0.51	0.43	5.00	0.00	0.01	0.01
23.85	0.51	0.43	5.00	0.00	0.01	0.01
23.90	0.51	0.43	5.00	0.00	0.01	0.01
23.95	0.51	0.43	5.00	0.00	0.01	0.01
24.00	0.51	0.43	5.00	0.00	0.01	0.01
24.05	0.51	0.43	5.00	0.00	0.01	0.01
24.10	0.51	0.43	5.00	0.00	0.01	0.01
24.15	0.51	0.43	5.00	0.00	0.01	0.01
24.20	0.51	0.43	5.00	0.00	0.01	0.01
24.25	0.51	0.43	5.00	0.00	0.01	0.01
24.30	0.51	0.43	5.00	0.00	0.01	0.01
24.35	0.51	0.43	5.00	0.00	0.01	0.01
24.40	0.51	0.43	5.00	0.00	0.01	0.01
24.45	0.51	0.43	5.00	0.00	0.01	0.01
24.50	0.51	0.43	5.00	0.00	0.01	0.01
24.55	0.51	0.43	5.00	0.00	0.01	0.01
24.60	0.51	0.43	5.00	0.00	0.01	0.01
24.65	0.51	0.43	5.00	0.00	0.01	0.01
24.70	0.51	0.43	5.00	0.00	0.00	0.00
24.75	0.51	0.43	5.00	0.00	0.00	0.00
24.80	0.51	0.43	5.00	0.00	0.00	0.00
24.85	0.51	0.43	5.00	0.00	0.00	0.00
24.90	0.51	0.43	5.00	0.00	0.00	0.00
24.95	0.51	0.43	5.00	0.00	0.00	0.00
25.00	0.51	0.43	5.00	0.00	0.00	0.00
25.05	0.51	0.43	5.00	0.00	0.00	0.00
25.10	0.51	0.43	5.00	0.00	0.00	0.00
25.15	0.51	0.43	5.00	0.00	0.00	0.00
25.20	0.51	0.43	5.00	0.00	0.00	0.00
25.25	0.51	0.43	5.00	0.00	0.00	0.00
25.30	0.51	0.43	5.00	0.00	0.00	0.00
25.35	0.51	0.43	5.00	0.00	0.00	0.00
25.40	0.51	0.43	5.00	0.00	0.00	0.00
25.45	0.51	0.43	5.00	0.00	0.00	0.00
25.50	0.51	0.43	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)

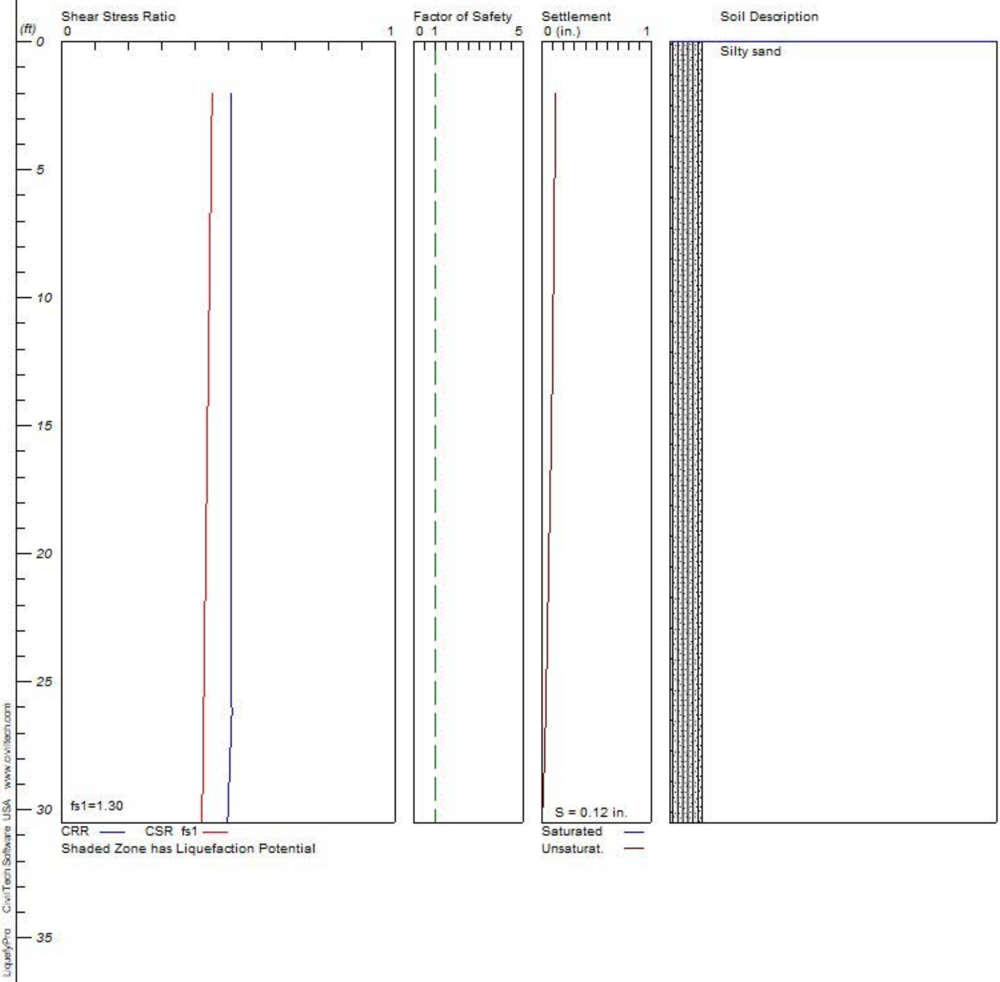
CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS

Overnight Solar

Hole No.=B-2 Water Depth=100 ft

Magnitude=7.45
Acceleration=.537g



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*****************************************************************************************************
                                      LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: C:\Users\jmeneses\Desktop\HMD\Solar\Boring B-2.liq
Title: Overnight Solar
Subtitle: Boring B-2

Surface Elev.=
Hole No.=B-2
Depth of Hole= 30.50 ft
Water Table during Earthquake= 100.00 ft
Water Table during In-Situ Testing= 100.00 ft
Max. Acceleration= 0.54 g
Earthquake Magnitude= 7.45

Input Data:
Surface Elev.=
Hole No.=B-2
Depth of Hole=30.50 ft
Water Table during Earthquake= 100.00 ft
Water Table during In-Situ Testing= 100.00 ft
Max. Acceleration=0.54 g
Earthquake Magnitude=7.45
No-Liquefiable Soils: Based on Analysis

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio,   Ce = 1.25
7. Borehole Diameter,   Cb= 1
8. Sampling Method,   Cs= 1.2
9. User request factor of safety (apply to CSR) ,   User= 1.3
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
2.00	27.00	125.00	13.00
5.00	22.60	125.00	13.00
10.00	91.00	125.00	13.00
15.00	100.00	125.00	13.00
20.00	63.00	125.00	13.00
25.00	84.00	125.00	13.00
30.00	40.00	125.00	13.00

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.12 in.
Total Settlement of Saturated and Unsaturated Sands=0.12 in.
Differential Settlement=0.062 to 0.082 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
2.00	0.51	0.45	5.00	0.00	0.12	0.12
2.05	0.51	0.45	5.00	0.00	0.12	0.12
2.10	0.51	0.45	5.00	0.00	0.12	0.12
2.15	0.51	0.45	5.00	0.00	0.12	0.12
2.20	0.51	0.45	5.00	0.00	0.12	0.12
2.25	0.51	0.45	5.00	0.00	0.12	0.12
2.30	0.51	0.45	5.00	0.00	0.12	0.12
2.35	0.51	0.45	5.00	0.00	0.12	0.12
2.40	0.51	0.45	5.00	0.00	0.12	0.12
2.45	0.51	0.45	5.00	0.00	0.12	0.12
2.50	0.51	0.45	5.00	0.00	0.12	0.12
2.55	0.51	0.45	5.00	0.00	0.12	0.12
2.60	0.51	0.45	5.00	0.00	0.12	0.12
2.65	0.51	0.45	5.00	0.00	0.12	0.12

2.70	0.51	0.45	5.00	0.00	0.12	0.12
2.75	0.51	0.45	5.00	0.00	0.12	0.12
2.80	0.51	0.45	5.00	0.00	0.12	0.12
2.85	0.51	0.45	5.00	0.00	0.12	0.12
2.90	0.51	0.45	5.00	0.00	0.12	0.12
2.95	0.51	0.45	5.00	0.00	0.12	0.12
3.00	0.51	0.45	5.00	0.00	0.12	0.12
3.05	0.51	0.45	5.00	0.00	0.12	0.12
3.10	0.51	0.45	5.00	0.00	0.12	0.12
3.15	0.51	0.45	5.00	0.00	0.12	0.12
3.20	0.51	0.45	5.00	0.00	0.12	0.12
3.25	0.51	0.45	5.00	0.00	0.12	0.12
3.30	0.51	0.45	5.00	0.00	0.12	0.12
3.35	0.51	0.45	5.00	0.00	0.12	0.12
3.40	0.51	0.45	5.00	0.00	0.12	0.12
3.45	0.51	0.45	5.00	0.00	0.12	0.12
3.50	0.51	0.45	5.00	0.00	0.12	0.12
3.55	0.51	0.45	5.00	0.00	0.12	0.12
3.60	0.51	0.45	5.00	0.00	0.12	0.12
3.65	0.51	0.45	5.00	0.00	0.12	0.12
3.70	0.51	0.45	5.00	0.00	0.12	0.12
3.75	0.51	0.45	5.00	0.00	0.12	0.12
3.80	0.51	0.45	5.00	0.00	0.12	0.12
3.85	0.51	0.45	5.00	0.00	0.12	0.12
3.90	0.51	0.45	5.00	0.00	0.12	0.12
3.95	0.51	0.45	5.00	0.00	0.12	0.12
4.00	0.51	0.45	5.00	0.00	0.12	0.12
4.05	0.51	0.45	5.00	0.00	0.12	0.12
4.10	0.51	0.45	5.00	0.00	0.12	0.12
4.15	0.51	0.45	5.00	0.00	0.12	0.12
4.20	0.51	0.45	5.00	0.00	0.12	0.12
4.25	0.51	0.45	5.00	0.00	0.12	0.12
4.30	0.51	0.45	5.00	0.00	0.12	0.12
4.35	0.51	0.45	5.00	0.00	0.12	0.12
4.40	0.51	0.45	5.00	0.00	0.12	0.12
4.45	0.51	0.45	5.00	0.00	0.12	0.12
4.50	0.51	0.45	5.00	0.00	0.12	0.12
4.55	0.51	0.45	5.00	0.00	0.12	0.12
4.60	0.51	0.45	5.00	0.00	0.12	0.12
4.65	0.51	0.45	5.00	0.00	0.12	0.12
4.70	0.51	0.45	5.00	0.00	0.12	0.12
4.75	0.51	0.45	5.00	0.00	0.12	0.12
4.80	0.51	0.45	5.00	0.00	0.12	0.12
4.85	0.51	0.45	5.00	0.00	0.12	0.12
4.90	0.51	0.45	5.00	0.00	0.12	0.12
4.95	0.51	0.45	5.00	0.00	0.12	0.12
5.00	0.51	0.45	5.00	0.00	0.12	0.12
5.05	0.51	0.45	5.00	0.00	0.12	0.12
5.10	0.51	0.45	5.00	0.00	0.12	0.12
5.15	0.51	0.45	5.00	0.00	0.12	0.12
5.20	0.51	0.45	5.00	0.00	0.12	0.12
5.25	0.51	0.45	5.00	0.00	0.12	0.12
5.30	0.51	0.45	5.00	0.00	0.12	0.12
5.35	0.51	0.45	5.00	0.00	0.12	0.12
5.40	0.51	0.45	5.00	0.00	0.12	0.12
5.45	0.51	0.45	5.00	0.00	0.12	0.12
5.50	0.51	0.45	5.00	0.00	0.12	0.12
5.55	0.51	0.45	5.00	0.00	0.12	0.12
5.60	0.51	0.45	5.00	0.00	0.12	0.12
5.65	0.51	0.45	5.00	0.00	0.12	0.12
5.70	0.51	0.45	5.00	0.00	0.12	0.12
5.75	0.51	0.45	5.00	0.00	0.12	0.12
5.80	0.51	0.45	5.00	0.00	0.12	0.12
5.85	0.51	0.45	5.00	0.00	0.12	0.12
5.90	0.51	0.45	5.00	0.00	0.11	0.11
5.95	0.51	0.45	5.00	0.00	0.11	0.11
6.00	0.51	0.45	5.00	0.00	0.11	0.11
6.05	0.51	0.45	5.00	0.00	0.11	0.11
6.10	0.51	0.45	5.00	0.00	0.11	0.11
6.15	0.51	0.45	5.00	0.00	0.11	0.11
6.20	0.51	0.45	5.00	0.00	0.11	0.11
6.25	0.51	0.45	5.00	0.00	0.11	0.11
6.30	0.51	0.45	5.00	0.00	0.11	0.11
6.35	0.51	0.45	5.00	0.00	0.11	0.11
6.40	0.51	0.45	5.00	0.00	0.11	0.11
6.45	0.51	0.45	5.00	0.00	0.11	0.11
6.50	0.51	0.45	5.00	0.00	0.11	0.11
6.55	0.51	0.45	5.00	0.00	0.11	0.11
6.60	0.51	0.45	5.00	0.00	0.11	0.11

6.65	0.51	0.45	5.00	0.00	0.11	0.11
6.70	0.51	0.45	5.00	0.00	0.11	0.11
6.75	0.51	0.45	5.00	0.00	0.11	0.11
6.80	0.51	0.45	5.00	0.00	0.11	0.11
6.85	0.51	0.45	5.00	0.00	0.11	0.11
6.90	0.51	0.45	5.00	0.00	0.11	0.11
6.95	0.51	0.45	5.00	0.00	0.11	0.11
7.00	0.51	0.45	5.00	0.00	0.11	0.11
7.05	0.51	0.45	5.00	0.00	0.11	0.11
7.10	0.51	0.45	5.00	0.00	0.11	0.11
7.15	0.51	0.45	5.00	0.00	0.11	0.11
7.20	0.51	0.45	5.00	0.00	0.11	0.11
7.25	0.51	0.45	5.00	0.00	0.11	0.11
7.30	0.51	0.45	5.00	0.00	0.11	0.11
7.35	0.51	0.45	5.00	0.00	0.11	0.11
7.40	0.51	0.45	5.00	0.00	0.11	0.11
7.45	0.51	0.45	5.00	0.00	0.11	0.11
7.50	0.51	0.45	5.00	0.00	0.11	0.11
7.55	0.51	0.45	5.00	0.00	0.11	0.11
7.60	0.51	0.45	5.00	0.00	0.11	0.11
7.65	0.51	0.45	5.00	0.00	0.11	0.11
7.70	0.51	0.45	5.00	0.00	0.11	0.11
7.75	0.51	0.45	5.00	0.00	0.11	0.11
7.80	0.51	0.45	5.00	0.00	0.11	0.11
7.85	0.51	0.45	5.00	0.00	0.11	0.11
7.90	0.51	0.45	5.00	0.00	0.11	0.11
7.95	0.51	0.45	5.00	0.00	0.11	0.11
8.00	0.51	0.45	5.00	0.00	0.11	0.11
8.05	0.51	0.45	5.00	0.00	0.11	0.11
8.10	0.51	0.45	5.00	0.00	0.11	0.11
8.15	0.51	0.45	5.00	0.00	0.11	0.11
8.20	0.51	0.45	5.00	0.00	0.11	0.11
8.25	0.51	0.45	5.00	0.00	0.11	0.11
8.30	0.51	0.44	5.00	0.00	0.11	0.11
8.35	0.51	0.44	5.00	0.00	0.11	0.11
8.40	0.51	0.44	5.00	0.00	0.11	0.11
8.45	0.51	0.44	5.00	0.00	0.11	0.11
8.50	0.51	0.44	5.00	0.00	0.11	0.11
8.55	0.51	0.44	5.00	0.00	0.11	0.11
8.60	0.51	0.44	5.00	0.00	0.11	0.11
8.65	0.51	0.44	5.00	0.00	0.11	0.11
8.70	0.51	0.44	5.00	0.00	0.11	0.11
8.75	0.51	0.44	5.00	0.00	0.11	0.11
8.80	0.51	0.44	5.00	0.00	0.11	0.11
8.85	0.51	0.44	5.00	0.00	0.11	0.11
8.90	0.51	0.44	5.00	0.00	0.11	0.11
8.95	0.51	0.44	5.00	0.00	0.11	0.11
9.00	0.51	0.44	5.00	0.00	0.11	0.11
9.05	0.51	0.44	5.00	0.00	0.11	0.11
9.10	0.51	0.44	5.00	0.00	0.11	0.11
9.15	0.51	0.44	5.00	0.00	0.11	0.11
9.20	0.51	0.44	5.00	0.00	0.11	0.11
9.25	0.51	0.44	5.00	0.00	0.11	0.11
9.30	0.51	0.44	5.00	0.00	0.11	0.11
9.35	0.51	0.44	5.00	0.00	0.11	0.11
9.40	0.51	0.44	5.00	0.00	0.11	0.11
9.45	0.51	0.44	5.00	0.00	0.11	0.11
9.50	0.51	0.44	5.00	0.00	0.11	0.11
9.55	0.51	0.44	5.00	0.00	0.11	0.11
9.60	0.51	0.44	5.00	0.00	0.10	0.10
9.65	0.51	0.44	5.00	0.00	0.10	0.10
9.70	0.51	0.44	5.00	0.00	0.10	0.10
9.75	0.51	0.44	5.00	0.00	0.10	0.10
9.80	0.51	0.44	5.00	0.00	0.10	0.10
9.85	0.51	0.44	5.00	0.00	0.10	0.10
9.90	0.51	0.44	5.00	0.00	0.10	0.10
9.95	0.51	0.44	5.00	0.00	0.10	0.10
10.00	0.51	0.44	5.00	0.00	0.10	0.10
10.05	0.51	0.44	5.00	0.00	0.10	0.10
10.10	0.51	0.44	5.00	0.00	0.10	0.10
10.15	0.51	0.44	5.00	0.00	0.10	0.10
10.20	0.51	0.44	5.00	0.00	0.10	0.10
10.25	0.51	0.44	5.00	0.00	0.10	0.10
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10.35	0.51	0.44	5.00	0.00	0.10	0.10
10.40	0.51	0.44	5.00	0.00	0.10	0.10
10.45	0.51	0.44	5.00	0.00	0.10	0.10
10.50	0.51	0.44	5.00	0.00	0.10	0.10
10.55	0.51	0.44	5.00	0.00	0.10	0.10

10.60	0.51	0.44	5.00	0.00	0.10	0.10
10.65	0.51	0.44	5.00	0.00	0.10	0.10
10.70	0.51	0.44	5.00	0.00	0.10	0.10
10.75	0.51	0.44	5.00	0.00	0.10	0.10
10.80	0.51	0.44	5.00	0.00	0.10	0.10
10.85	0.51	0.44	5.00	0.00	0.10	0.10
10.90	0.51	0.44	5.00	0.00	0.10	0.10
10.95	0.51	0.44	5.00	0.00	0.10	0.10
11.00	0.51	0.44	5.00	0.00	0.10	0.10
11.05	0.51	0.44	5.00	0.00	0.10	0.10
11.10	0.51	0.44	5.00	0.00	0.10	0.10
11.15	0.51	0.44	5.00	0.00	0.10	0.10
11.20	0.51	0.44	5.00	0.00	0.10	0.10
11.25	0.51	0.44	5.00	0.00	0.10	0.10
11.30	0.51	0.44	5.00	0.00	0.10	0.10
11.35	0.51	0.44	5.00	0.00	0.10	0.10
11.40	0.51	0.44	5.00	0.00	0.10	0.10
11.45	0.51	0.44	5.00	0.00	0.10	0.10
11.50	0.51	0.44	5.00	0.00	0.10	0.10
11.55	0.51	0.44	5.00	0.00	0.10	0.10
11.60	0.51	0.44	5.00	0.00	0.10	0.10
11.65	0.51	0.44	5.00	0.00	0.10	0.10
11.70	0.51	0.44	5.00	0.00	0.10	0.10
11.75	0.51	0.44	5.00	0.00	0.10	0.10
11.80	0.51	0.44	5.00	0.00	0.10	0.10
11.85	0.51	0.44	5.00	0.00	0.10	0.10
11.90	0.51	0.44	5.00	0.00	0.10	0.10
11.95	0.51	0.44	5.00	0.00	0.10	0.10
12.00	0.51	0.44	5.00	0.00	0.10	0.10
12.05	0.51	0.44	5.00	0.00	0.10	0.10
12.10	0.51	0.44	5.00	0.00	0.10	0.10
12.15	0.51	0.44	5.00	0.00	0.10	0.10
12.20	0.51	0.44	5.00	0.00	0.10	0.10
12.25	0.51	0.44	5.00	0.00	0.10	0.10
12.30	0.51	0.44	5.00	0.00	0.10	0.10
12.35	0.51	0.44	5.00	0.00	0.10	0.10
12.40	0.51	0.44	5.00	0.00	0.10	0.10
12.45	0.51	0.44	5.00	0.00	0.10	0.10
12.50	0.51	0.44	5.00	0.00	0.10	0.10
12.55	0.51	0.44	5.00	0.00	0.10	0.10
12.60	0.51	0.44	5.00	0.00	0.10	0.10
12.65	0.51	0.44	5.00	0.00	0.10	0.10
12.70	0.51	0.44	5.00	0.00	0.10	0.10
12.75	0.51	0.44	5.00	0.00	0.10	0.10
12.80	0.51	0.44	5.00	0.00	0.10	0.10
12.85	0.51	0.44	5.00	0.00	0.10	0.10
12.90	0.51	0.44	5.00	0.00	0.09	0.09
12.95	0.51	0.44	5.00	0.00	0.09	0.09
13.00	0.51	0.44	5.00	0.00	0.09	0.09
13.05	0.51	0.44	5.00	0.00	0.09	0.09
13.10	0.51	0.44	5.00	0.00	0.09	0.09
13.15	0.51	0.44	5.00	0.00	0.09	0.09
13.20	0.51	0.44	5.00	0.00	0.09	0.09
13.25	0.51	0.44	5.00	0.00	0.09	0.09
13.30	0.51	0.44	5.00	0.00	0.09	0.09
13.35	0.51	0.44	5.00	0.00	0.09	0.09
13.40	0.51	0.44	5.00	0.00	0.09	0.09
13.45	0.51	0.44	5.00	0.00	0.09	0.09
13.50	0.51	0.44	5.00	0.00	0.09	0.09
13.55	0.51	0.44	5.00	0.00	0.09	0.09
13.60	0.51	0.44	5.00	0.00	0.09	0.09
13.65	0.51	0.44	5.00	0.00	0.09	0.09
13.70	0.51	0.44	5.00	0.00	0.09	0.09
13.75	0.51	0.44	5.00	0.00	0.09	0.09
13.80	0.51	0.44	5.00	0.00	0.09	0.09
13.85	0.51	0.44	5.00	0.00	0.09	0.09
13.90	0.51	0.44	5.00	0.00	0.09	0.09
13.95	0.51	0.44	5.00	0.00	0.09	0.09
14.00	0.51	0.44	5.00	0.00	0.09	0.09
14.05	0.51	0.44	5.00	0.00	0.09	0.09
14.10	0.51	0.44	5.00	0.00	0.09	0.09
14.15	0.51	0.44	5.00	0.00	0.09	0.09
14.20	0.51	0.44	5.00	0.00	0.09	0.09
14.25	0.51	0.44	5.00	0.00	0.09	0.09
14.30	0.51	0.44	5.00	0.00	0.09	0.09
14.35	0.51	0.44	5.00	0.00	0.09	0.09
14.40	0.51	0.44	5.00	0.00	0.09	0.09
14.45	0.51	0.44	5.00	0.00	0.09	0.09
14.50	0.51	0.44	5.00	0.00	0.09	0.09

14.55	0.51	0.44	5.00	0.00	0.09	0.09
14.60	0.51	0.44	5.00	0.00	0.09	0.09
14.65	0.51	0.44	5.00	0.00	0.09	0.09
14.70	0.51	0.44	5.00	0.00	0.09	0.09
14.75	0.51	0.44	5.00	0.00	0.09	0.09
14.80	0.51	0.44	5.00	0.00	0.09	0.09
14.85	0.51	0.44	5.00	0.00	0.09	0.09
14.90	0.51	0.44	5.00	0.00	0.09	0.09
14.95	0.51	0.44	5.00	0.00	0.09	0.09
15.00	0.51	0.44	5.00	0.00	0.09	0.09
15.05	0.51	0.44	5.00	0.00	0.09	0.09
15.10	0.51	0.44	5.00	0.00	0.09	0.09
15.15	0.51	0.44	5.00	0.00	0.09	0.09
15.20	0.51	0.44	5.00	0.00	0.09	0.09
15.25	0.51	0.44	5.00	0.00	0.09	0.09
15.30	0.51	0.44	5.00	0.00	0.09	0.09
15.35	0.51	0.44	5.00	0.00	0.09	0.09
15.40	0.51	0.44	5.00	0.00	0.09	0.09
15.45	0.51	0.44	5.00	0.00	0.09	0.09
15.50	0.51	0.44	5.00	0.00	0.09	0.09
15.55	0.51	0.44	5.00	0.00	0.08	0.08
15.60	0.51	0.44	5.00	0.00	0.08	0.08
15.65	0.51	0.44	5.00	0.00	0.08	0.08
15.70	0.51	0.44	5.00	0.00	0.08	0.08
15.75	0.51	0.44	5.00	0.00	0.08	0.08
15.80	0.51	0.44	5.00	0.00	0.08	0.08
15.85	0.51	0.44	5.00	0.00	0.08	0.08
15.90	0.51	0.44	5.00	0.00	0.08	0.08
15.95	0.51	0.44	5.00	0.00	0.08	0.08
16.00	0.51	0.44	5.00	0.00	0.08	0.08
16.05	0.51	0.44	5.00	0.00	0.08	0.08
16.10	0.51	0.44	5.00	0.00	0.08	0.08
16.15	0.51	0.44	5.00	0.00	0.08	0.08
16.20	0.51	0.44	5.00	0.00	0.08	0.08
16.25	0.51	0.44	5.00	0.00	0.08	0.08
16.30	0.51	0.44	5.00	0.00	0.08	0.08
16.35	0.51	0.44	5.00	0.00	0.08	0.08
16.40	0.51	0.44	5.00	0.00	0.08	0.08
16.45	0.51	0.44	5.00	0.00	0.08	0.08
16.50	0.51	0.44	5.00	0.00	0.08	0.08
16.55	0.51	0.44	5.00	0.00	0.08	0.08
16.60	0.51	0.44	5.00	0.00	0.08	0.08
16.65	0.51	0.44	5.00	0.00	0.08	0.08
16.70	0.51	0.44	5.00	0.00	0.08	0.08
16.75	0.51	0.44	5.00	0.00	0.08	0.08
16.80	0.51	0.44	5.00	0.00	0.08	0.08
16.85	0.51	0.44	5.00	0.00	0.08	0.08
16.90	0.51	0.44	5.00	0.00	0.08	0.08
16.95	0.51	0.44	5.00	0.00	0.08	0.08
17.00	0.51	0.44	5.00	0.00	0.08	0.08
17.05	0.51	0.44	5.00	0.00	0.08	0.08
17.10	0.51	0.44	5.00	0.00	0.08	0.08
17.15	0.51	0.44	5.00	0.00	0.08	0.08
17.20	0.51	0.44	5.00	0.00	0.08	0.08
17.25	0.51	0.44	5.00	0.00	0.08	0.08
17.30	0.51	0.44	5.00	0.00	0.08	0.08
17.35	0.51	0.44	5.00	0.00	0.08	0.08
17.40	0.51	0.44	5.00	0.00	0.08	0.08
17.45	0.51	0.44	5.00	0.00	0.08	0.08
17.50	0.51	0.44	5.00	0.00	0.08	0.08
17.55	0.51	0.44	5.00	0.00	0.08	0.08
17.60	0.51	0.44	5.00	0.00	0.08	0.08
17.65	0.51	0.44	5.00	0.00	0.08	0.08
17.70	0.51	0.44	5.00	0.00	0.08	0.08
17.75	0.51	0.43	5.00	0.00	0.07	0.07
17.80	0.51	0.43	5.00	0.00	0.07	0.07
17.85	0.51	0.43	5.00	0.00	0.07	0.07
17.90	0.51	0.43	5.00	0.00	0.07	0.07
17.95	0.51	0.43	5.00	0.00	0.07	0.07
18.00	0.51	0.43	5.00	0.00	0.07	0.07
18.05	0.51	0.43	5.00	0.00	0.07	0.07
18.10	0.51	0.43	5.00	0.00	0.07	0.07
18.15	0.51	0.43	5.00	0.00	0.07	0.07
18.20	0.51	0.43	5.00	0.00	0.07	0.07
18.25	0.51	0.43	5.00	0.00	0.07	0.07
18.30	0.51	0.43	5.00	0.00	0.07	0.07
18.35	0.51	0.43	5.00	0.00	0.07	0.07
18.40	0.51	0.43	5.00	0.00	0.07	0.07
18.45	0.51	0.43	5.00	0.00	0.07	0.07

18.50	0.51	0.43	5.00	0.00	0.07	0.07
18.55	0.51	0.43	5.00	0.00	0.07	0.07
18.60	0.51	0.43	5.00	0.00	0.07	0.07
18.65	0.51	0.43	5.00	0.00	0.07	0.07
18.70	0.51	0.43	5.00	0.00	0.07	0.07
18.75	0.51	0.43	5.00	0.00	0.07	0.07
18.80	0.51	0.43	5.00	0.00	0.07	0.07
18.85	0.51	0.43	5.00	0.00	0.07	0.07
18.90	0.51	0.43	5.00	0.00	0.07	0.07
18.95	0.51	0.43	5.00	0.00	0.07	0.07
19.00	0.51	0.43	5.00	0.00	0.07	0.07
19.05	0.51	0.43	5.00	0.00	0.07	0.07
19.10	0.51	0.43	5.00	0.00	0.07	0.07
19.15	0.51	0.43	5.00	0.00	0.07	0.07
19.20	0.51	0.43	5.00	0.00	0.07	0.07
19.25	0.51	0.43	5.00	0.00	0.07	0.07
19.30	0.51	0.43	5.00	0.00	0.07	0.07
19.35	0.51	0.43	5.00	0.00	0.07	0.07
19.40	0.51	0.43	5.00	0.00	0.07	0.07
19.45	0.51	0.43	5.00	0.00	0.07	0.07
19.50	0.51	0.43	5.00	0.00	0.07	0.07
19.55	0.51	0.43	5.00	0.00	0.07	0.07
19.60	0.51	0.43	5.00	0.00	0.07	0.07
19.65	0.51	0.43	5.00	0.00	0.06	0.06
19.70	0.51	0.43	5.00	0.00	0.06	0.06
19.75	0.51	0.43	5.00	0.00	0.06	0.06
19.80	0.51	0.43	5.00	0.00	0.06	0.06
19.85	0.51	0.43	5.00	0.00	0.06	0.06
19.90	0.51	0.43	5.00	0.00	0.06	0.06
19.95	0.51	0.43	5.00	0.00	0.06	0.06
20.00	0.51	0.43	5.00	0.00	0.06	0.06
20.05	0.51	0.43	5.00	0.00	0.06	0.06
20.10	0.51	0.43	5.00	0.00	0.06	0.06
20.15	0.51	0.43	5.00	0.00	0.06	0.06
20.20	0.51	0.43	5.00	0.00	0.06	0.06
20.25	0.51	0.43	5.00	0.00	0.06	0.06
20.30	0.51	0.43	5.00	0.00	0.06	0.06
20.35	0.51	0.43	5.00	0.00	0.06	0.06
20.40	0.51	0.43	5.00	0.00	0.06	0.06
20.45	0.51	0.43	5.00	0.00	0.06	0.06
20.50	0.51	0.43	5.00	0.00	0.06	0.06
20.55	0.51	0.43	5.00	0.00	0.06	0.06
20.60	0.51	0.43	5.00	0.00	0.06	0.06
20.65	0.51	0.43	5.00	0.00	0.06	0.06
20.70	0.51	0.43	5.00	0.00	0.06	0.06
20.75	0.51	0.43	5.00	0.00	0.06	0.06
20.80	0.51	0.43	5.00	0.00	0.06	0.06
20.85	0.51	0.43	5.00	0.00	0.06	0.06
20.90	0.51	0.43	5.00	0.00	0.06	0.06
20.95	0.51	0.43	5.00	0.00	0.06	0.06
21.00	0.51	0.43	5.00	0.00	0.06	0.06
21.05	0.51	0.43	5.00	0.00	0.06	0.06
21.10	0.51	0.43	5.00	0.00	0.06	0.06
21.15	0.51	0.43	5.00	0.00	0.06	0.06
21.20	0.51	0.43	5.00	0.00	0.06	0.06
21.25	0.51	0.43	5.00	0.00	0.06	0.06
21.30	0.51	0.43	5.00	0.00	0.06	0.06
21.35	0.51	0.43	5.00	0.00	0.06	0.06
21.40	0.51	0.43	5.00	0.00	0.06	0.06
21.45	0.51	0.43	5.00	0.00	0.06	0.06
21.50	0.51	0.43	5.00	0.00	0.06	0.06
21.55	0.51	0.43	5.00	0.00	0.06	0.06
21.60	0.51	0.43	5.00	0.00	0.06	0.06
21.65	0.51	0.43	5.00	0.00	0.06	0.06
21.70	0.51	0.43	5.00	0.00	0.06	0.06
21.75	0.51	0.43	5.00	0.00	0.06	0.06
21.80	0.51	0.43	5.00	0.00	0.06	0.06
21.85	0.51	0.43	5.00	0.00	0.06	0.06
21.90	0.51	0.43	5.00	0.00	0.05	0.05
21.95	0.51	0.43	5.00	0.00	0.05	0.05
22.00	0.51	0.43	5.00	0.00	0.05	0.05
22.05	0.51	0.43	5.00	0.00	0.05	0.05
22.10	0.51	0.43	5.00	0.00	0.05	0.05
22.15	0.51	0.43	5.00	0.00	0.05	0.05
22.20	0.51	0.43	5.00	0.00	0.05	0.05
22.25	0.51	0.43	5.00	0.00	0.05	0.05
22.30	0.51	0.43	5.00	0.00	0.05	0.05
22.35	0.51	0.43	5.00	0.00	0.05	0.05
22.40	0.51	0.43	5.00	0.00	0.05	0.05

22.45	0.51	0.43	5.00	0.00	0.05	0.05
22.50	0.51	0.43	5.00	0.00	0.05	0.05
22.55	0.51	0.43	5.00	0.00	0.05	0.05
22.60	0.51	0.43	5.00	0.00	0.05	0.05
22.65	0.51	0.43	5.00	0.00	0.05	0.05
22.70	0.51	0.43	5.00	0.00	0.05	0.05
22.75	0.51	0.43	5.00	0.00	0.05	0.05
22.80	0.51	0.43	5.00	0.00	0.05	0.05
22.85	0.51	0.43	5.00	0.00	0.05	0.05
22.90	0.51	0.43	5.00	0.00	0.05	0.05
22.95	0.51	0.43	5.00	0.00	0.05	0.05
23.00	0.51	0.43	5.00	0.00	0.05	0.05
23.05	0.51	0.43	5.00	0.00	0.05	0.05
23.10	0.51	0.43	5.00	0.00	0.05	0.05
23.15	0.51	0.43	5.00	0.00	0.05	0.05
23.20	0.51	0.43	5.00	0.00	0.05	0.05
23.25	0.51	0.43	5.00	0.00	0.05	0.05
23.30	0.51	0.43	5.00	0.00	0.05	0.05
23.35	0.51	0.43	5.00	0.00	0.05	0.05
23.40	0.51	0.43	5.00	0.00	0.05	0.05
23.45	0.51	0.43	5.00	0.00	0.05	0.05
23.50	0.51	0.43	5.00	0.00	0.05	0.05
23.55	0.51	0.43	5.00	0.00	0.05	0.05
23.60	0.51	0.43	5.00	0.00	0.05	0.05
23.65	0.51	0.43	5.00	0.00	0.05	0.05
23.70	0.51	0.43	5.00	0.00	0.05	0.05
23.75	0.51	0.43	5.00	0.00	0.05	0.05
23.80	0.51	0.43	5.00	0.00	0.05	0.05
23.85	0.51	0.43	5.00	0.00	0.05	0.05
23.90	0.51	0.43	5.00	0.00	0.05	0.05
23.95	0.51	0.43	5.00	0.00	0.05	0.05
24.00	0.51	0.43	5.00	0.00	0.05	0.05
24.05	0.51	0.43	5.00	0.00	0.04	0.04
24.10	0.51	0.43	5.00	0.00	0.04	0.04
24.15	0.51	0.43	5.00	0.00	0.04	0.04
24.20	0.51	0.43	5.00	0.00	0.04	0.04
24.25	0.51	0.43	5.00	0.00	0.04	0.04
24.30	0.51	0.43	5.00	0.00	0.04	0.04
24.35	0.51	0.43	5.00	0.00	0.04	0.04
24.40	0.51	0.43	5.00	0.00	0.04	0.04
24.45	0.51	0.43	5.00	0.00	0.04	0.04
24.50	0.51	0.43	5.00	0.00	0.04	0.04
24.55	0.51	0.43	5.00	0.00	0.04	0.04
24.60	0.51	0.43	5.00	0.00	0.04	0.04
24.65	0.51	0.43	5.00	0.00	0.04	0.04
24.70	0.51	0.43	5.00	0.00	0.04	0.04
24.75	0.51	0.43	5.00	0.00	0.04	0.04
24.80	0.51	0.43	5.00	0.00	0.04	0.04
24.85	0.51	0.43	5.00	0.00	0.04	0.04
24.90	0.51	0.43	5.00	0.00	0.04	0.04
24.95	0.51	0.43	5.00	0.00	0.04	0.04
25.00	0.51	0.43	5.00	0.00	0.04	0.04
25.05	0.51	0.43	5.00	0.00	0.04	0.04
25.10	0.51	0.43	5.00	0.00	0.04	0.04
25.15	0.51	0.43	5.00	0.00	0.04	0.04
25.20	0.51	0.43	5.00	0.00	0.04	0.04
25.25	0.51	0.43	5.00	0.00	0.04	0.04
25.30	0.51	0.43	5.00	0.00	0.04	0.04
25.35	0.51	0.43	5.00	0.00	0.04	0.04
25.40	0.51	0.43	5.00	0.00	0.04	0.04
25.45	0.51	0.43	5.00	0.00	0.04	0.04
25.50	0.51	0.43	5.00	0.00	0.04	0.04
25.55	0.51	0.43	5.00	0.00	0.04	0.04
25.60	0.51	0.43	5.00	0.00	0.04	0.04
25.65	0.51	0.43	5.00	0.00	0.04	0.04
25.70	0.51	0.43	5.00	0.00	0.04	0.04
25.75	0.51	0.43	5.00	0.00	0.04	0.04
25.80	0.51	0.43	5.00	0.00	0.04	0.04
25.85	0.51	0.43	5.00	0.00	0.04	0.04
25.90	0.51	0.43	5.00	0.00	0.04	0.04
25.95	0.51	0.43	5.00	0.00	0.04	0.04
26.00	0.51	0.43	5.00	0.00	0.04	0.04
26.05	0.51	0.43	5.00	0.00	0.03	0.03
26.10	0.51	0.43	5.00	0.00	0.03	0.03
26.15	0.51	0.43	5.00	0.00	0.03	0.03
26.20	0.51	0.43	5.00	0.00	0.03	0.03
26.25	0.51	0.43	5.00	0.00	0.03	0.03
26.30	0.51	0.43	5.00	0.00	0.03	0.03
26.35	0.51	0.43	5.00	0.00	0.03	0.03

26.40	0.51	0.43	5.00	0.00	0.03	0.03
26.45	0.51	0.43	5.00	0.00	0.03	0.03
26.50	0.51	0.43	5.00	0.00	0.03	0.03
26.55	0.51	0.43	5.00	0.00	0.03	0.03
26.60	0.51	0.43	5.00	0.00	0.03	0.03
26.65	0.51	0.43	5.00	0.00	0.03	0.03
26.70	0.51	0.43	5.00	0.00	0.03	0.03
26.75	0.51	0.43	5.00	0.00	0.03	0.03
26.80	0.51	0.43	5.00	0.00	0.03	0.03
26.85	0.51	0.43	5.00	0.00	0.03	0.03
26.90	0.51	0.43	5.00	0.00	0.03	0.03
26.95	0.51	0.43	5.00	0.00	0.03	0.03
27.00	0.51	0.43	5.00	0.00	0.03	0.03
27.05	0.51	0.43	5.00	0.00	0.03	0.03
27.10	0.51	0.43	5.00	0.00	0.03	0.03
27.15	0.51	0.43	5.00	0.00	0.03	0.03
27.20	0.51	0.42	5.00	0.00	0.03	0.03
27.25	0.51	0.42	5.00	0.00	0.03	0.03
27.30	0.51	0.42	5.00	0.00	0.03	0.03
27.35	0.51	0.42	5.00	0.00	0.03	0.03
27.40	0.51	0.42	5.00	0.00	0.03	0.03
27.45	0.51	0.42	5.00	0.00	0.03	0.03
27.50	0.51	0.42	5.00	0.00	0.03	0.03
27.55	0.51	0.42	5.00	0.00	0.03	0.03
27.60	0.51	0.42	5.00	0.00	0.03	0.03
27.65	0.51	0.42	5.00	0.00	0.03	0.03
27.70	0.51	0.42	5.00	0.00	0.02	0.02
27.75	0.51	0.42	5.00	0.00	0.02	0.02
27.80	0.51	0.42	5.00	0.00	0.02	0.02
27.85	0.51	0.42	5.00	0.00	0.02	0.02
27.90	0.51	0.42	5.00	0.00	0.02	0.02
27.95	0.51	0.42	5.00	0.00	0.02	0.02
28.00	0.51	0.42	5.00	0.00	0.02	0.02
28.05	0.51	0.42	5.00	0.00	0.02	0.02
28.10	0.51	0.42	5.00	0.00	0.02	0.02
28.15	0.51	0.42	5.00	0.00	0.02	0.02
28.20	0.50	0.42	5.00	0.00	0.02	0.02
28.25	0.50	0.42	5.00	0.00	0.02	0.02
28.30	0.50	0.42	5.00	0.00	0.02	0.02
28.35	0.50	0.42	5.00	0.00	0.02	0.02
28.40	0.50	0.42	5.00	0.00	0.02	0.02
28.45	0.50	0.42	5.00	0.00	0.02	0.02
28.50	0.50	0.42	5.00	0.00	0.02	0.02
28.55	0.50	0.42	5.00	0.00	0.02	0.02
28.60	0.50	0.42	5.00	0.00	0.02	0.02
28.65	0.50	0.42	5.00	0.00	0.02	0.02
28.70	0.50	0.42	5.00	0.00	0.02	0.02
28.75	0.50	0.42	5.00	0.00	0.02	0.02
28.80	0.50	0.42	5.00	0.00	0.02	0.02
28.85	0.50	0.42	5.00	0.00	0.02	0.02
28.90	0.50	0.42	5.00	0.00	0.02	0.02
28.95	0.50	0.42	5.00	0.00	0.02	0.02
29.00	0.50	0.42	5.00	0.00	0.01	0.01
29.05	0.50	0.42	5.00	0.00	0.01	0.01
29.10	0.50	0.42	5.00	0.00	0.01	0.01
29.15	0.50	0.42	5.00	0.00	0.01	0.01
29.20	0.50	0.42	5.00	0.00	0.01	0.01
29.25	0.50	0.42	5.00	0.00	0.01	0.01
29.30	0.50	0.42	5.00	0.00	0.01	0.01
29.35	0.50	0.42	5.00	0.00	0.01	0.01
29.40	0.50	0.42	5.00	0.00	0.01	0.01
29.45	0.50	0.42	5.00	0.00	0.01	0.01
29.50	0.50	0.42	5.00	0.00	0.01	0.01
29.55	0.50	0.42	5.00	0.00	0.01	0.01
29.60	0.50	0.42	5.00	0.00	0.01	0.01
29.65	0.50	0.42	5.00	0.00	0.01	0.01
29.70	0.50	0.42	5.00	0.00	0.01	0.01
29.75	0.50	0.42	5.00	0.00	0.01	0.01
29.80	0.50	0.42	5.00	0.00	0.01	0.01
29.85	0.50	0.42	5.00	0.00	0.01	0.01
29.90	0.50	0.42	5.00	0.00	0.01	0.01
29.95	0.50	0.42	5.00	0.00	0.01	0.01
30.00	0.50	0.42	5.00	0.00	0.01	0.01
30.05	0.50	0.42	5.00	0.00	0.00	0.00
30.10	0.50	0.42	5.00	0.00	0.00	0.00
30.15	0.50	0.42	5.00	0.00	0.00	0.00
30.20	0.50	0.42	5.00	0.00	0.00	0.00
30.25	0.50	0.42	5.00	0.00	0.00	0.00
30.30	0.50	0.42	5.00	0.00	0.00	0.00

30.35	0.50	0.42	5.00	0.00	0.00	0.00
30.40	0.50	0.42	5.00	0.00	0.00	0.00
30.45	0.50	0.42	5.00	0.00	0.00	0.00
30.50	0.50	0.42	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

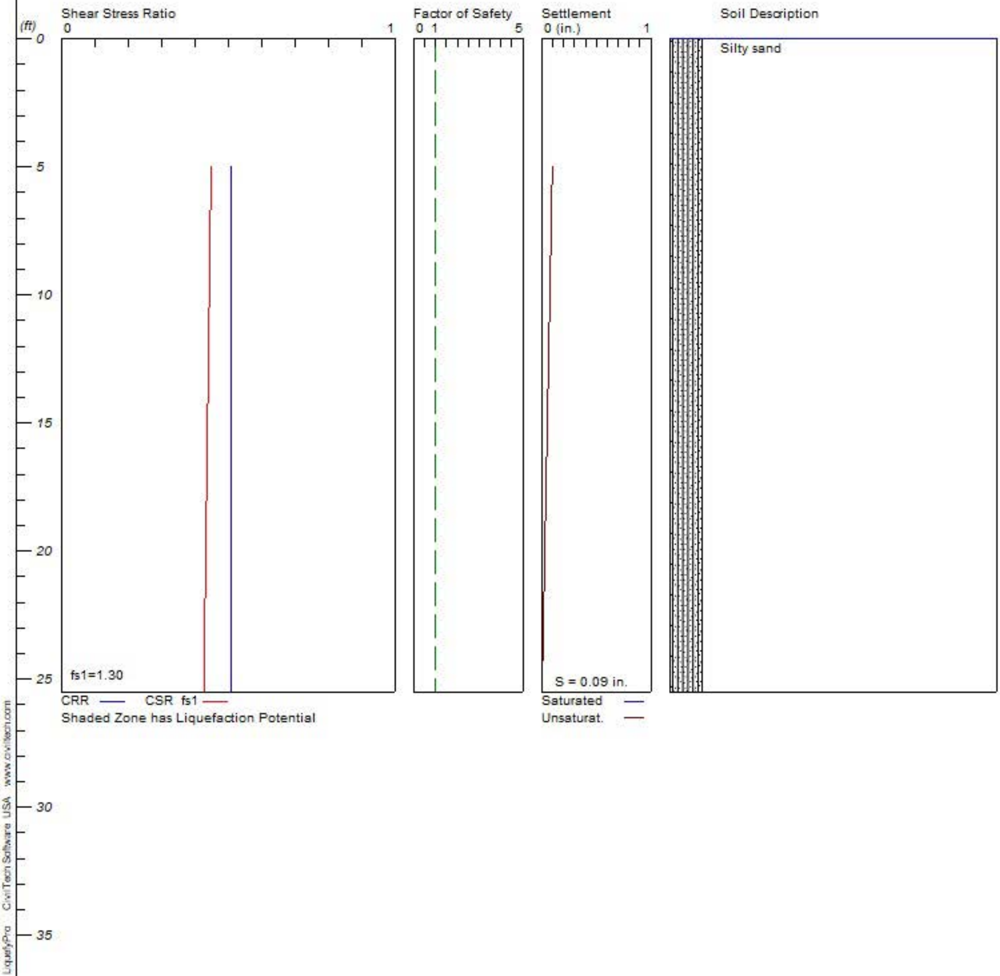
1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS

Overnight Solar

Hole No.=B-3   Water Depth=100 ft

Magnitude=7.45
Acceleration=.537g



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LIQUEFACTION ANALYSIS SUMMARY

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Input File Name: C:\Users\jmeneses\Desktop\HMD\Solar\Boring B-3.liq
Title: Overnight Solar
Subtitle: Boring B-3

Surface Elev.=
Hole No.=B-3
Depth of Hole= 25.50 ft
Water Table during Earthquake= 100.00 ft
Water Table during In-Situ Testing= 100.00 ft
Max. Acceleration= 0.54 g
Earthquake Magnitude= 7.45

Input Data:
Surface Elev.=
Hole No.=B-3
Depth of Hole=25.50 ft
Water Table during Earthquake= 100.00 ft
Water Table during In-Situ Testing= 100.00 ft
Max. Acceleration=0.54 g
Earthquake Magnitude=7.45
No-Liquefiable Soils: Based on Analysis

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio,   Ce = 1.25
7. Borehole Diameter,   Cb= 1
8. Sampling Method,   Cs= 1.2
9. User request factor of safety (apply to CSR) ,   User= 1.3
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
5.00	18.00	125.00	13.00
10.00	27.00	125.00	13.00
15.00	54.00	125.00	13.00
20.00	100.00	125.00	13.00
25.00	100.00	125.00	13.00

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.09 in.
Total Settlement of Saturated and Unsaturated Sands=0.09 in.
Differential Settlement=0.047 to 0.062 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
5.00	0.51	0.45	5.00	0.00	0.09	0.09
5.05	0.51	0.45	5.00	0.00	0.09	0.09
5.10	0.51	0.45	5.00	0.00	0.09	0.09
5.15	0.51	0.45	5.00	0.00	0.09	0.09
5.20	0.51	0.45	5.00	0.00	0.09	0.09
5.25	0.51	0.45	5.00	0.00	0.09	0.09
5.30	0.51	0.45	5.00	0.00	0.09	0.09
5.35	0.51	0.45	5.00	0.00	0.09	0.09
5.40	0.51	0.45	5.00	0.00	0.09	0.09
5.45	0.51	0.45	5.00	0.00	0.09	0.09
5.50	0.51	0.45	5.00	0.00	0.09	0.09
5.55	0.51	0.45	5.00	0.00	0.09	0.09
5.60	0.51	0.45	5.00	0.00	0.09	0.09
5.65	0.51	0.45	5.00	0.00	0.09	0.09
5.70	0.51	0.45	5.00	0.00	0.09	0.09
5.75	0.51	0.45	5.00	0.00	0.09	0.09

5.80	0.51	0.45	5.00	0.00	0.09	0.09
5.85	0.51	0.45	5.00	0.00	0.09	0.09
5.90	0.51	0.45	5.00	0.00	0.09	0.09
5.95	0.51	0.45	5.00	0.00	0.09	0.09
6.00	0.51	0.45	5.00	0.00	0.09	0.09
6.05	0.51	0.45	5.00	0.00	0.09	0.09
6.10	0.51	0.45	5.00	0.00	0.09	0.09
6.15	0.51	0.45	5.00	0.00	0.09	0.09
6.20	0.51	0.45	5.00	0.00	0.09	0.09
6.25	0.51	0.45	5.00	0.00	0.09	0.09
6.30	0.51	0.45	5.00	0.00	0.09	0.09
6.35	0.51	0.45	5.00	0.00	0.09	0.09
6.40	0.51	0.45	5.00	0.00	0.09	0.09
6.45	0.51	0.45	5.00	0.00	0.09	0.09
6.50	0.51	0.45	5.00	0.00	0.09	0.09
6.55	0.51	0.45	5.00	0.00	0.09	0.09
6.60	0.51	0.45	5.00	0.00	0.09	0.09
6.65	0.51	0.45	5.00	0.00	0.09	0.09
6.70	0.51	0.45	5.00	0.00	0.09	0.09
6.75	0.51	0.45	5.00	0.00	0.09	0.09
6.80	0.51	0.45	5.00	0.00	0.09	0.09
6.85	0.51	0.45	5.00	0.00	0.09	0.09
6.90	0.51	0.45	5.00	0.00	0.09	0.09
6.95	0.51	0.45	5.00	0.00	0.09	0.09
7.00	0.51	0.45	5.00	0.00	0.09	0.09
7.05	0.51	0.45	5.00	0.00	0.09	0.09
7.10	0.51	0.45	5.00	0.00	0.09	0.09
7.15	0.51	0.45	5.00	0.00	0.09	0.09
7.20	0.51	0.45	5.00	0.00	0.09	0.09
7.25	0.51	0.45	5.00	0.00	0.09	0.09
7.30	0.51	0.45	5.00	0.00	0.09	0.09
7.35	0.51	0.45	5.00	0.00	0.09	0.09
7.40	0.51	0.45	5.00	0.00	0.09	0.09
7.45	0.51	0.45	5.00	0.00	0.08	0.08
7.50	0.51	0.45	5.00	0.00	0.08	0.08
7.55	0.51	0.45	5.00	0.00	0.08	0.08
7.60	0.51	0.45	5.00	0.00	0.08	0.08
7.65	0.51	0.45	5.00	0.00	0.08	0.08
7.70	0.51	0.45	5.00	0.00	0.08	0.08
7.75	0.51	0.45	5.00	0.00	0.08	0.08
7.80	0.51	0.45	5.00	0.00	0.08	0.08
7.85	0.51	0.45	5.00	0.00	0.08	0.08
7.90	0.51	0.45	5.00	0.00	0.08	0.08
7.95	0.51	0.45	5.00	0.00	0.08	0.08
8.00	0.51	0.45	5.00	0.00	0.08	0.08
8.05	0.51	0.45	5.00	0.00	0.08	0.08
8.10	0.51	0.45	5.00	0.00	0.08	0.08
8.15	0.51	0.45	5.00	0.00	0.08	0.08
8.20	0.51	0.45	5.00	0.00	0.08	0.08
8.25	0.51	0.45	5.00	0.00	0.08	0.08
8.30	0.51	0.44	5.00	0.00	0.08	0.08
8.35	0.51	0.44	5.00	0.00	0.08	0.08
8.40	0.51	0.44	5.00	0.00	0.08	0.08
8.45	0.51	0.44	5.00	0.00	0.08	0.08
8.50	0.51	0.44	5.00	0.00	0.08	0.08
8.55	0.51	0.44	5.00	0.00	0.08	0.08
8.60	0.51	0.44	5.00	0.00	0.08	0.08
8.65	0.51	0.44	5.00	0.00	0.08	0.08
8.70	0.51	0.44	5.00	0.00	0.08	0.08
8.75	0.51	0.44	5.00	0.00	0.08	0.08
8.80	0.51	0.44	5.00	0.00	0.08	0.08
8.85	0.51	0.44	5.00	0.00	0.08	0.08
8.90	0.51	0.44	5.00	0.00	0.08	0.08
8.95	0.51	0.44	5.00	0.00	0.08	0.08
9.00	0.51	0.44	5.00	0.00	0.08	0.08
9.05	0.51	0.44	5.00	0.00	0.08	0.08
9.10	0.51	0.44	5.00	0.00	0.08	0.08
9.15	0.51	0.44	5.00	0.00	0.08	0.08
9.20	0.51	0.44	5.00	0.00	0.08	0.08
9.25	0.51	0.44	5.00	0.00	0.08	0.08
9.30	0.51	0.44	5.00	0.00	0.08	0.08
9.35	0.51	0.44	5.00	0.00	0.08	0.08
9.40	0.51	0.44	5.00	0.00	0.07	0.07
9.45	0.51	0.44	5.00	0.00	0.07	0.07
9.50	0.51	0.44	5.00	0.00	0.07	0.07
9.55	0.51	0.44	5.00	0.00	0.07	0.07
9.60	0.51	0.44	5.00	0.00	0.07	0.07
9.65	0.51	0.44	5.00	0.00	0.07	0.07
9.70	0.51	0.44	5.00	0.00	0.07	0.07

9.75	0.51	0.44	5.00	0.00	0.07	0.07
9.80	0.51	0.44	5.00	0.00	0.07	0.07
9.85	0.51	0.44	5.00	0.00	0.07	0.07
9.90	0.51	0.44	5.00	0.00	0.07	0.07
9.95	0.51	0.44	5.00	0.00	0.07	0.07
10.00	0.51	0.44	5.00	0.00	0.07	0.07
10.05	0.51	0.44	5.00	0.00	0.07	0.07
10.10	0.51	0.44	5.00	0.00	0.07	0.07
10.15	0.51	0.44	5.00	0.00	0.07	0.07
10.20	0.51	0.44	5.00	0.00	0.07	0.07
10.25	0.51	0.44	5.00	0.00	0.07	0.07
10.30	0.51	0.44	5.00	0.00	0.07	0.07
10.35	0.51	0.44	5.00	0.00	0.07	0.07
10.40	0.51	0.44	5.00	0.00	0.07	0.07
10.45	0.51	0.44	5.00	0.00	0.07	0.07
10.50	0.51	0.44	5.00	0.00	0.07	0.07
10.55	0.51	0.44	5.00	0.00	0.07	0.07
10.60	0.51	0.44	5.00	0.00	0.07	0.07
10.65	0.51	0.44	5.00	0.00	0.07	0.07
10.70	0.51	0.44	5.00	0.00	0.07	0.07
10.75	0.51	0.44	5.00	0.00	0.07	0.07
10.80	0.51	0.44	5.00	0.00	0.07	0.07
10.85	0.51	0.44	5.00	0.00	0.07	0.07
10.90	0.51	0.44	5.00	0.00	0.07	0.07
10.95	0.51	0.44	5.00	0.00	0.07	0.07
11.00	0.51	0.44	5.00	0.00	0.07	0.07
11.05	0.51	0.44	5.00	0.00	0.07	0.07
11.10	0.51	0.44	5.00	0.00	0.07	0.07
11.15	0.51	0.44	5.00	0.00	0.07	0.07
11.20	0.51	0.44	5.00	0.00	0.07	0.07
11.25	0.51	0.44	5.00	0.00	0.07	0.07
11.30	0.51	0.44	5.00	0.00	0.07	0.07
11.35	0.51	0.44	5.00	0.00	0.07	0.07
11.40	0.51	0.44	5.00	0.00	0.07	0.07
11.45	0.51	0.44	5.00	0.00	0.07	0.07
11.50	0.51	0.44	5.00	0.00	0.07	0.07
11.55	0.51	0.44	5.00	0.00	0.07	0.07
11.60	0.51	0.44	5.00	0.00	0.06	0.06
11.65	0.51	0.44	5.00	0.00	0.06	0.06
11.70	0.51	0.44	5.00	0.00	0.06	0.06
11.75	0.51	0.44	5.00	0.00	0.06	0.06
11.80	0.51	0.44	5.00	0.00	0.06	0.06
11.85	0.51	0.44	5.00	0.00	0.06	0.06
11.90	0.51	0.44	5.00	0.00	0.06	0.06
11.95	0.51	0.44	5.00	0.00	0.06	0.06
12.00	0.51	0.44	5.00	0.00	0.06	0.06
12.05	0.51	0.44	5.00	0.00	0.06	0.06
12.10	0.51	0.44	5.00	0.00	0.06	0.06
12.15	0.51	0.44	5.00	0.00	0.06	0.06
12.20	0.51	0.44	5.00	0.00	0.06	0.06
12.25	0.51	0.44	5.00	0.00	0.06	0.06
12.30	0.51	0.44	5.00	0.00	0.06	0.06
12.35	0.51	0.44	5.00	0.00	0.06	0.06
12.40	0.51	0.44	5.00	0.00	0.06	0.06
12.45	0.51	0.44	5.00	0.00	0.06	0.06
12.50	0.51	0.44	5.00	0.00	0.06	0.06
12.55	0.51	0.44	5.00	0.00	0.06	0.06
12.60	0.51	0.44	5.00	0.00	0.06	0.06
12.65	0.51	0.44	5.00	0.00	0.06	0.06
12.70	0.51	0.44	5.00	0.00	0.06	0.06
12.75	0.51	0.44	5.00	0.00	0.06	0.06
12.80	0.51	0.44	5.00	0.00	0.06	0.06
12.85	0.51	0.44	5.00	0.00	0.06	0.06
12.90	0.51	0.44	5.00	0.00	0.06	0.06
12.95	0.51	0.44	5.00	0.00	0.06	0.06
13.00	0.51	0.44	5.00	0.00	0.06	0.06
13.05	0.51	0.44	5.00	0.00	0.06	0.06
13.10	0.51	0.44	5.00	0.00	0.06	0.06
13.15	0.51	0.44	5.00	0.00	0.06	0.06
13.20	0.51	0.44	5.00	0.00	0.06	0.06
13.25	0.51	0.44	5.00	0.00	0.06	0.06
13.30	0.51	0.44	5.00	0.00	0.06	0.06
13.35	0.51	0.44	5.00	0.00	0.06	0.06
13.40	0.51	0.44	5.00	0.00	0.06	0.06
13.45	0.51	0.44	5.00	0.00	0.06	0.06
13.50	0.51	0.44	5.00	0.00	0.06	0.06
13.55	0.51	0.44	5.00	0.00	0.06	0.06
13.60	0.51	0.44	5.00	0.00	0.06	0.06
13.65	0.51	0.44	5.00	0.00	0.06	0.06

13.70	0.51	0.44	5.00	0.00	0.06	0.06
13.75	0.51	0.44	5.00	0.00	0.05	0.05
13.80	0.51	0.44	5.00	0.00	0.05	0.05
13.85	0.51	0.44	5.00	0.00	0.05	0.05
13.90	0.51	0.44	5.00	0.00	0.05	0.05
13.95	0.51	0.44	5.00	0.00	0.05	0.05
14.00	0.51	0.44	5.00	0.00	0.05	0.05
14.05	0.51	0.44	5.00	0.00	0.05	0.05
14.10	0.51	0.44	5.00	0.00	0.05	0.05
14.15	0.51	0.44	5.00	0.00	0.05	0.05
14.20	0.51	0.44	5.00	0.00	0.05	0.05
14.25	0.51	0.44	5.00	0.00	0.05	0.05
14.30	0.51	0.44	5.00	0.00	0.05	0.05
14.35	0.51	0.44	5.00	0.00	0.05	0.05
14.40	0.51	0.44	5.00	0.00	0.05	0.05
14.45	0.51	0.44	5.00	0.00	0.05	0.05
14.50	0.51	0.44	5.00	0.00	0.05	0.05
14.55	0.51	0.44	5.00	0.00	0.05	0.05
14.60	0.51	0.44	5.00	0.00	0.05	0.05
14.65	0.51	0.44	5.00	0.00	0.05	0.05
14.70	0.51	0.44	5.00	0.00	0.05	0.05
14.75	0.51	0.44	5.00	0.00	0.05	0.05
14.80	0.51	0.44	5.00	0.00	0.05	0.05
14.85	0.51	0.44	5.00	0.00	0.05	0.05
14.90	0.51	0.44	5.00	0.00	0.05	0.05
14.95	0.51	0.44	5.00	0.00	0.05	0.05
15.00	0.51	0.44	5.00	0.00	0.05	0.05
15.05	0.51	0.44	5.00	0.00	0.05	0.05
15.10	0.51	0.44	5.00	0.00	0.05	0.05
15.15	0.51	0.44	5.00	0.00	0.05	0.05
15.20	0.51	0.44	5.00	0.00	0.05	0.05
15.25	0.51	0.44	5.00	0.00	0.05	0.05
15.30	0.51	0.44	5.00	0.00	0.05	0.05
15.35	0.51	0.44	5.00	0.00	0.05	0.05
15.40	0.51	0.44	5.00	0.00	0.05	0.05
15.45	0.51	0.44	5.00	0.00	0.05	0.05
15.50	0.51	0.44	5.00	0.00	0.05	0.05
15.55	0.51	0.44	5.00	0.00	0.05	0.05
15.60	0.51	0.44	5.00	0.00	0.05	0.05
15.65	0.51	0.44	5.00	0.00	0.05	0.05
15.70	0.51	0.44	5.00	0.00	0.05	0.05
15.75	0.51	0.44	5.00	0.00	0.05	0.05
15.80	0.51	0.44	5.00	0.00	0.05	0.05
15.85	0.51	0.44	5.00	0.00	0.04	0.04
15.90	0.51	0.44	5.00	0.00	0.04	0.04
15.95	0.51	0.44	5.00	0.00	0.04	0.04
16.00	0.51	0.44	5.00	0.00	0.04	0.04
16.05	0.51	0.44	5.00	0.00	0.04	0.04
16.10	0.51	0.44	5.00	0.00	0.04	0.04
16.15	0.51	0.44	5.00	0.00	0.04	0.04
16.20	0.51	0.44	5.00	0.00	0.04	0.04
16.25	0.51	0.44	5.00	0.00	0.04	0.04
16.30	0.51	0.44	5.00	0.00	0.04	0.04
16.35	0.51	0.44	5.00	0.00	0.04	0.04
16.40	0.51	0.44	5.00	0.00	0.04	0.04
16.45	0.51	0.44	5.00	0.00	0.04	0.04
16.50	0.51	0.44	5.00	0.00	0.04	0.04
16.55	0.51	0.44	5.00	0.00	0.04	0.04
16.60	0.51	0.44	5.00	0.00	0.04	0.04
16.65	0.51	0.44	5.00	0.00	0.04	0.04
16.70	0.51	0.44	5.00	0.00	0.04	0.04
16.75	0.51	0.44	5.00	0.00	0.04	0.04
16.80	0.51	0.44	5.00	0.00	0.04	0.04
16.85	0.51	0.44	5.00	0.00	0.04	0.04
16.90	0.51	0.44	5.00	0.00	0.04	0.04
16.95	0.51	0.44	5.00	0.00	0.04	0.04
17.00	0.51	0.44	5.00	0.00	0.04	0.04
17.05	0.51	0.44	5.00	0.00	0.04	0.04
17.10	0.51	0.44	5.00	0.00	0.04	0.04
17.15	0.51	0.44	5.00	0.00	0.04	0.04
17.20	0.51	0.44	5.00	0.00	0.04	0.04
17.25	0.51	0.44	5.00	0.00	0.04	0.04
17.30	0.51	0.44	5.00	0.00	0.04	0.04
17.35	0.51	0.44	5.00	0.00	0.04	0.04
17.40	0.51	0.44	5.00	0.00	0.04	0.04
17.45	0.51	0.44	5.00	0.00	0.04	0.04
17.50	0.51	0.44	5.00	0.00	0.04	0.04
17.55	0.51	0.44	5.00	0.00	0.04	0.04
17.60	0.51	0.44	5.00	0.00	0.04	0.04

17.65	0.51	0.44	5.00	0.00	0.04	0.04
17.70	0.51	0.44	5.00	0.00	0.04	0.04
17.75	0.51	0.43	5.00	0.00	0.04	0.04
17.80	0.51	0.43	5.00	0.00	0.04	0.04
17.85	0.51	0.43	5.00	0.00	0.04	0.04
17.90	0.51	0.43	5.00	0.00	0.04	0.04
17.95	0.51	0.43	5.00	0.00	0.04	0.04
18.00	0.51	0.43	5.00	0.00	0.03	0.03
18.05	0.51	0.43	5.00	0.00	0.03	0.03
18.10	0.51	0.43	5.00	0.00	0.03	0.03
18.15	0.51	0.43	5.00	0.00	0.03	0.03
18.20	0.51	0.43	5.00	0.00	0.03	0.03
18.25	0.51	0.43	5.00	0.00	0.03	0.03
18.30	0.51	0.43	5.00	0.00	0.03	0.03
18.35	0.51	0.43	5.00	0.00	0.03	0.03
18.40	0.51	0.43	5.00	0.00	0.03	0.03
18.45	0.51	0.43	5.00	0.00	0.03	0.03
18.50	0.51	0.43	5.00	0.00	0.03	0.03
18.55	0.51	0.43	5.00	0.00	0.03	0.03
18.60	0.51	0.43	5.00	0.00	0.03	0.03
18.65	0.51	0.43	5.00	0.00	0.03	0.03
18.70	0.51	0.43	5.00	0.00	0.03	0.03
18.75	0.51	0.43	5.00	0.00	0.03	0.03
18.80	0.51	0.43	5.00	0.00	0.03	0.03
18.85	0.51	0.43	5.00	0.00	0.03	0.03
18.90	0.51	0.43	5.00	0.00	0.03	0.03
18.95	0.51	0.43	5.00	0.00	0.03	0.03
19.00	0.51	0.43	5.00	0.00	0.03	0.03
19.05	0.51	0.43	5.00	0.00	0.03	0.03
19.10	0.51	0.43	5.00	0.00	0.03	0.03
19.15	0.51	0.43	5.00	0.00	0.03	0.03
19.20	0.51	0.43	5.00	0.00	0.03	0.03
19.25	0.51	0.43	5.00	0.00	0.03	0.03
19.30	0.51	0.43	5.00	0.00	0.03	0.03
19.35	0.51	0.43	5.00	0.00	0.03	0.03
19.40	0.51	0.43	5.00	0.00	0.03	0.03
19.45	0.51	0.43	5.00	0.00	0.03	0.03
19.50	0.51	0.43	5.00	0.00	0.03	0.03
19.55	0.51	0.43	5.00	0.00	0.03	0.03
19.60	0.51	0.43	5.00	0.00	0.03	0.03
19.65	0.51	0.43	5.00	0.00	0.03	0.03
19.70	0.51	0.43	5.00	0.00	0.03	0.03
19.75	0.51	0.43	5.00	0.00	0.03	0.03
19.80	0.51	0.43	5.00	0.00	0.03	0.03
19.85	0.51	0.43	5.00	0.00	0.03	0.03
19.90	0.51	0.43	5.00	0.00	0.03	0.03
19.95	0.51	0.43	5.00	0.00	0.03	0.03
20.00	0.51	0.43	5.00	0.00	0.02	0.02
20.05	0.51	0.43	5.00	0.00	0.02	0.02
20.10	0.51	0.43	5.00	0.00	0.02	0.02
20.15	0.51	0.43	5.00	0.00	0.02	0.02
20.20	0.51	0.43	5.00	0.00	0.02	0.02
20.25	0.51	0.43	5.00	0.00	0.02	0.02
20.30	0.51	0.43	5.00	0.00	0.02	0.02
20.35	0.51	0.43	5.00	0.00	0.02	0.02
20.40	0.51	0.43	5.00	0.00	0.02	0.02
20.45	0.51	0.43	5.00	0.00	0.02	0.02
20.50	0.51	0.43	5.00	0.00	0.02	0.02
20.55	0.51	0.43	5.00	0.00	0.02	0.02
20.60	0.51	0.43	5.00	0.00	0.02	0.02
20.65	0.51	0.43	5.00	0.00	0.02	0.02
20.70	0.51	0.43	5.00	0.00	0.02	0.02
20.75	0.51	0.43	5.00	0.00	0.02	0.02
20.80	0.51	0.43	5.00	0.00	0.02	0.02
20.85	0.51	0.43	5.00	0.00	0.02	0.02
20.90	0.51	0.43	5.00	0.00	0.02	0.02
20.95	0.51	0.43	5.00	0.00	0.02	0.02
21.00	0.51	0.43	5.00	0.00	0.02	0.02
21.05	0.51	0.43	5.00	0.00	0.02	0.02
21.10	0.51	0.43	5.00	0.00	0.02	0.02
21.15	0.51	0.43	5.00	0.00	0.02	0.02
21.20	0.51	0.43	5.00	0.00	0.02	0.02
21.25	0.51	0.43	5.00	0.00	0.02	0.02
21.30	0.51	0.43	5.00	0.00	0.02	0.02
21.35	0.51	0.43	5.00	0.00	0.02	0.02
21.40	0.51	0.43	5.00	0.00	0.02	0.02
21.45	0.51	0.43	5.00	0.00	0.02	0.02
21.50	0.51	0.43	5.00	0.00	0.02	0.02
21.55	0.51	0.43	5.00	0.00	0.02	0.02

21.60	0.51	0.43	5.00	0.00	0.02	0.02
21.65	0.51	0.43	5.00	0.00	0.02	0.02
21.70	0.51	0.43	5.00	0.00	0.02	0.02
21.75	0.51	0.43	5.00	0.00	0.02	0.02
21.80	0.51	0.43	5.00	0.00	0.02	0.02
21.85	0.51	0.43	5.00	0.00	0.02	0.02
21.90	0.51	0.43	5.00	0.00	0.02	0.02
21.95	0.51	0.43	5.00	0.00	0.02	0.02
22.00	0.51	0.43	5.00	0.00	0.02	0.02
22.05	0.51	0.43	5.00	0.00	0.02	0.02
22.10	0.51	0.43	5.00	0.00	0.02	0.02
22.15	0.51	0.43	5.00	0.00	0.02	0.02
22.20	0.51	0.43	5.00	0.00	0.02	0.02
22.25	0.51	0.43	5.00	0.00	0.02	0.02
22.30	0.51	0.43	5.00	0.00	0.02	0.02
22.35	0.51	0.43	5.00	0.00	0.01	0.01
22.40	0.51	0.43	5.00	0.00	0.01	0.01
22.45	0.51	0.43	5.00	0.00	0.01	0.01
22.50	0.51	0.43	5.00	0.00	0.01	0.01
22.55	0.51	0.43	5.00	0.00	0.01	0.01
22.60	0.51	0.43	5.00	0.00	0.01	0.01
22.65	0.51	0.43	5.00	0.00	0.01	0.01
22.70	0.51	0.43	5.00	0.00	0.01	0.01
22.75	0.51	0.43	5.00	0.00	0.01	0.01
22.80	0.51	0.43	5.00	0.00	0.01	0.01
22.85	0.51	0.43	5.00	0.00	0.01	0.01
22.90	0.51	0.43	5.00	0.00	0.01	0.01
22.95	0.51	0.43	5.00	0.00	0.01	0.01
23.00	0.51	0.43	5.00	0.00	0.01	0.01
23.05	0.51	0.43	5.00	0.00	0.01	0.01
23.10	0.51	0.43	5.00	0.00	0.01	0.01
23.15	0.51	0.43	5.00	0.00	0.01	0.01
23.20	0.51	0.43	5.00	0.00	0.01	0.01
23.25	0.51	0.43	5.00	0.00	0.01	0.01
23.30	0.51	0.43	5.00	0.00	0.01	0.01
23.35	0.51	0.43	5.00	0.00	0.01	0.01
23.40	0.51	0.43	5.00	0.00	0.01	0.01
23.45	0.51	0.43	5.00	0.00	0.01	0.01
23.50	0.51	0.43	5.00	0.00	0.01	0.01
23.55	0.51	0.43	5.00	0.00	0.01	0.01
23.60	0.51	0.43	5.00	0.00	0.01	0.01
23.65	0.51	0.43	5.00	0.00	0.01	0.01
23.70	0.51	0.43	5.00	0.00	0.01	0.01
23.75	0.51	0.43	5.00	0.00	0.01	0.01
23.80	0.51	0.43	5.00	0.00	0.01	0.01
23.85	0.51	0.43	5.00	0.00	0.01	0.01
23.90	0.51	0.43	5.00	0.00	0.01	0.01
23.95	0.51	0.43	5.00	0.00	0.01	0.01
24.00	0.51	0.43	5.00	0.00	0.01	0.01
24.05	0.51	0.43	5.00	0.00	0.01	0.01
24.10	0.51	0.43	5.00	0.00	0.01	0.01
24.15	0.51	0.43	5.00	0.00	0.01	0.01
24.20	0.51	0.43	5.00	0.00	0.01	0.01
24.25	0.51	0.43	5.00	0.00	0.01	0.01
24.30	0.51	0.43	5.00	0.00	0.01	0.01
24.35	0.51	0.43	5.00	0.00	0.01	0.01
24.40	0.51	0.43	5.00	0.00	0.01	0.01
24.45	0.51	0.43	5.00	0.00	0.01	0.01
24.50	0.51	0.43	5.00	0.00	0.00	0.00
24.55	0.51	0.43	5.00	0.00	0.00	0.00
24.60	0.51	0.43	5.00	0.00	0.00	0.00
24.65	0.51	0.43	5.00	0.00	0.00	0.00
24.70	0.51	0.43	5.00	0.00	0.00	0.00
24.75	0.51	0.43	5.00	0.00	0.00	0.00
24.80	0.51	0.43	5.00	0.00	0.00	0.00
24.85	0.51	0.43	5.00	0.00	0.00	0.00
24.90	0.51	0.43	5.00	0.00	0.00	0.00
24.95	0.51	0.43	5.00	0.00	0.00	0.00
25.00	0.51	0.43	5.00	0.00	0.00	0.00
25.05	0.51	0.43	5.00	0.00	0.00	0.00
25.10	0.51	0.43	5.00	0.00	0.00	0.00
25.15	0.51	0.43	5.00	0.00	0.00	0.00
25.20	0.51	0.43	5.00	0.00	0.00	0.00
25.25	0.51	0.43	5.00	0.00	0.00	0.00
25.30	0.51	0.43	5.00	0.00	0.00	0.00
25.35	0.51	0.43	5.00	0.00	0.00	0.00
25.40	0.51	0.43	5.00	0.00	0.00	0.00
25.45	0.51	0.43	5.00	0.00	0.00	0.00
25.50	0.51	0.43	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)

CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

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APPENDIX E

REFERENCES

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APPENDIX E

REFERENCES

1. Amoroso, Lee and Miller, D.M., 2006, Preliminary surficial geologic map of the Cuddeback Lake 30' x 60' quadrangle, California, U.S. Geological Survey, Open-File Report OF-2006-1276, 1:100,000.

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